Güvenal GTH

+79 | NEW REASONS TO EXPLORE

2026

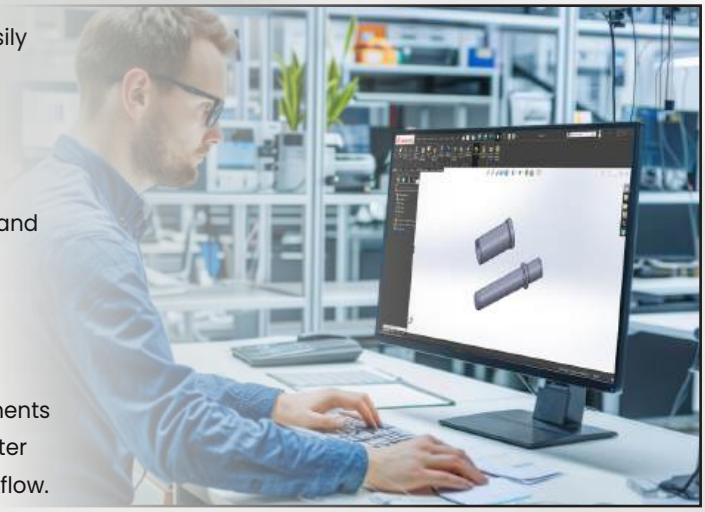
DESIGNED EXCLUSIVELY
FOR DIE & MOULD MANUFACTURERS

CAD Data & Design Assets

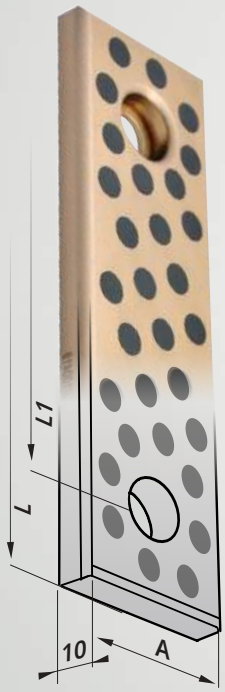
3D CAD FILES GUVENAL

CAD

Simplify Your Design Process with GÜVENAL's Online CAD Resources



Through the Güvenal Web Portal, you can easily and quickly access all relevant technical information and documentation related to our products. The enhanced product search function allows you to efficiently locate the required standard die & mould components and review their technical specifications in detail.
In addition, to accelerate your design process, 3D CAD data for each product is available for download in various formats.
This enables seamless integration of components into your CAD environment, allowing for a faster and more efficient project development workflow.

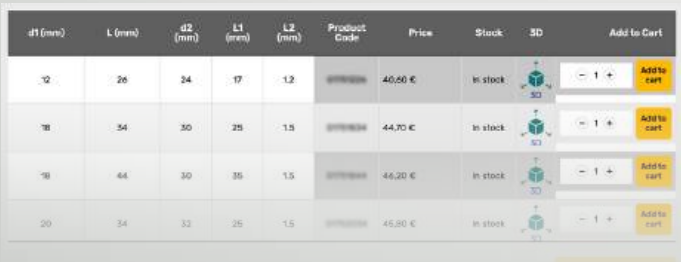


SOLIDWORKS CATIA

By using Güvenal's native CAD databases, you can take full advantage of parametric data. The consistent parametric design structure allows for quick modifications and offers additional benefits such as automatic generation of parts lists. In addition to component geometries, installation spaces are also provided, significantly accelerating the entire design process. Güvenal's original CAD databases are compatible with **CATIA and SOLIDWORKS** systems and are available for free download.

GÜVENAL CAD Services – Your Assurance for Efficient Design Processes

Güvenal CAD Services – Efficient Solutions for Modern Design Workflows with over 60,000 standardized die & mould components and a wide range of digital solutions, Güvenal delivers high added value throughout the toolmaking process.
Its comprehensive portfolio of CAD services enables designers to manage complex design tasks more quickly and efficiently. Technical resources such as parametric data, 3D CAD models, and installation space information help save time, minimize errors, and accelerate the transition from design to production. As a result, each step of the workflow is optimized, supporting greater efficiency and contributing to long-term success.

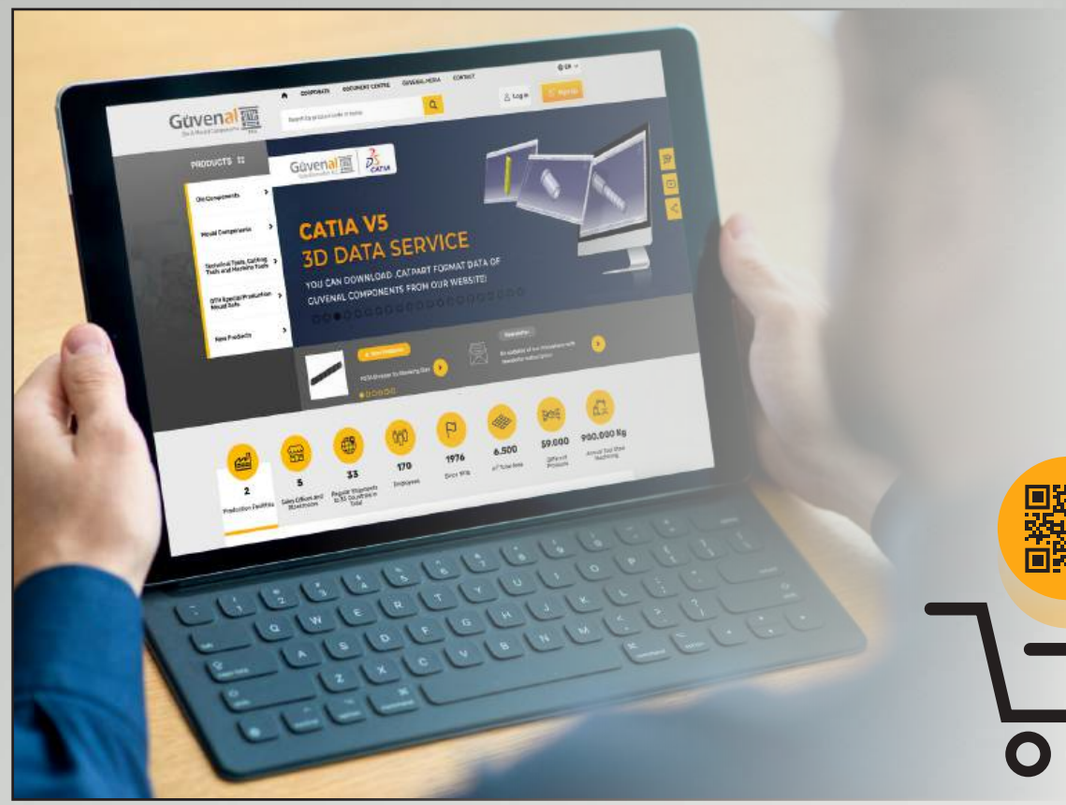


CATIA V5 – Formats: .CATPart
3D CAD – Formats: STEP, IGES 3D, X_T

GÜVENAL – Standard Components

CAD data is available on our website **www.guvenal.net**
This service is free of charge, and you only need to register to access it.
If, as a designer, you notice that a specific Güvenal product is missing from a CAD system, please contact the relevant CAD team directly.

SIGN UP
www.guvenal.net



SIGN UP
www.guvenal.net

GÜVENAL DIGITAL ORDERING SYSTEM

STAY INFORMED, STAY CONNECTED

Download CAD files, check prices, and place orders fast and precisely with G-DOS.

www.guvenal.net

3D CAD FILES GUVENAL

GÜVENAL Products Online Available - 24/7

1. **Real-Time Stock and Lead Time Information**
2. **Download 2D/3D CAD Data Directly**
3. **Configure & Auto Code Matching**
4. **Create and Manage Multiple Project / Order Baskets Simultaneously**
5. **Guaranteed Competitive Prices**
6. **Self-Service: Create Orders, Quotations, and Packing Lists**
7. **Explore 80.000+ Standard Products Directly**
8. **Track Your Orders Anytime**
9. **Access Complete Offer and Order History**
10. **Download Excel Reports**

- ✓ Press Die Components
- ✓ Injection Mould Components
- ✓ Machine Tools
- ✓ Machine, Jig, and Fixture Construction

BEYOND MANUFACTURING:
A CULTURE OF PRODUCTIVITY AND VALUE

Die & Mould Components and Systems
Your Global Partner

Since 1976, Güvenal Kalıp Elemanları A.Ş. a proud member of the Güvenal Corporate Group, has delivered customer-focused solutions worldwide—supported by nearly five decades of industry experience.
Rooted in family values, we are an independent company committed to steady, sustainable development.
We are your trusted partner for standard and custom-made die & mould components and bases, offering the ideal balance of high quality and affordability. Thanks to our strict quality control, strong product availability, and short lead times, Güvenal products are actively used in 32 countries across the globe. We support our customers with flexible solutions tailored to technical requirements and project budgets—always aiming to provide the most effective outcome. Güvenal is your reliable partner for professional and productive cooperation.

About This Catalogue

The Güvenal Die & Mould Components catalogue is more than just a product list.
It offers valuable insights into the effective use of our components—combining standard technical details with expert recommendations. Prepared with the principle of delivering a "quick way to perfect dies & moulds", this catalogue is both a reference and a guide for professionals. With our experienced production teams, global logistics network, and strategically located warehouses, we ensure fast, consistent, and dependable delivery.
We have classified our products based on the principle of offering both high quality and affordable pricing, providing solutions tailored to every need., while also considering their impact on human health.
We take great care in selecting safe, non-hazardous materials.

Customer Services

At Güvenal, we believe that qualified human resources are the most important factor in sustainable competition. We view continuous learning as a core cultural value and have adopted a service-oriented approach centered on customer satisfaction. Our entire team is at your service, always working to provide rapid solutions—while expecting a touch of mutual patience when needed. What you call “service” is simply the way we do business.

info@guvenal.net
www.guvenal.net

Güvenal GTH

COMPANY & CONTACT DETAILS

GÜVENAL KALIP ELEMANLARI SAN. VE TİC. A.Ş.

Rami Kışla Cad. Emintaş-3 San. Sit. No: 56 - 57 - 58
Postcode: 34055 Topçular - Eyüp, İstanbul / Türkiye

+90 212 501 53 81 (pbx: 153) +90 212 577 3743 www.guvenal.net

info@guvenal.net | sales@guvenal.net | support@guvenal.net

Tax Identification No: 4510 3150 97 • **Trade Register No:** 296816

DIE & MOULD COMPONENTS AND PUNCH PRODUCTION FACILITIES

Rami Kışla Cad. Emintaş-3 San. Sit. No: 12 - 13
Postcode: 34055 Topçular - Eyüp, İstanbul / Türkiye

İKİTELLİ BRANCH

İkitelli Organize Sanayi Bölgesi, Demirciler San. Sit. B1 Blok No: 34
Postcode: 34490 İkitelli - Başakşehir, İstanbul / Türkiye

HADIMKÖY BRANCH

Akçaburgaz Mah. 1592 Sk. Alkop A Blok No: 8
Postcode: 34522 Kıraç - Esenyurt, İstanbul / Türkiye

GEBZE OFFICE – GEBZE AUTOMOTIVE INDUSTRIAL AREA

TOSB Sosyal Tesisler 8/3 C Blok No: 108
Postcode: 41420 Çayırova, Kocaeli / Türkiye

BURSA OFFICE – BURSA INDUSTRIAL AREA

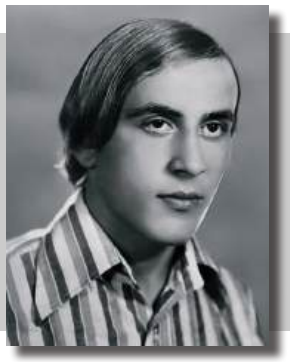
Workinton Nilüfer - Cumhuriyet Mah. F.S.M. Bulvarı No:41A / A
Postcode: 16140 Nilüfer / Bursa

Production Facilities Sales & Support Offices Home Office Employees

Our production facilities:

Video

The contact information of our Branches and Home Office team in Türkiye is available in our Turkish catalogue and on our website. For more details, please visit our Contact page.



Avni Tarakçıoğlu

Founder of Güvenal
Honorary President

The shop with the stepped front on the right is where Güvenal first started its journey.

About Güvenal, The Heritage of Trust

Güvenal was founded in 1976 in the Vefa District of Istanbul, Türkiye, through the visionary efforts and strong ethical values of our Honorary President, Mr. Avni Tarakçıoğlu. The company is now managed by the second generation of his family, upholding the same principles.
Mr. Tarakçıoğlu continues to remain actively involved in the company, contributing his invaluable experience and insights as our Honorary President. Rooted in family values, we remain an independent company committed to steady and sustainable development.
What began as a small operation with just two employees in 1976 has evolved into an organization with over 150 team members and exports to more than 32 countries today.

The very first Güvenal catalogue, prepared in 1986 by Mr. Avni Tarakçıoğlu — a milestone that marked the beginning of our publishing journey.

Each year, we meet with our clients at leading industry-specific fairs around the world

İkitelli Branch

Hadımköy Branch

Our standard parts warehouses, located at our headquarters, cover an area of 2,000 m²

Sales and Support Teams are located in our headquarters

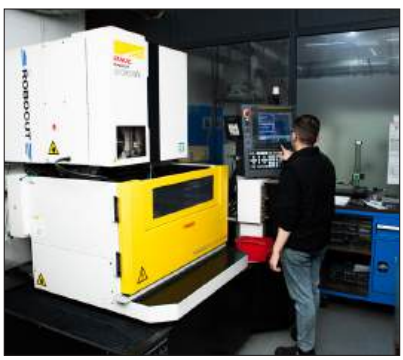
GÜVENAL HUB
2027

As of the second half of 2027,, we will be relocating to GÜVENAL HUB — our new facility currently under construction in the Deliklikaya region of Istanbul. The new site will offer 18,000 m² of operational space, enabling us to better serve our clients with expanded capabilities and enhanced efficiency.

Inside GÜVENAL: A Glimpse into Our Production Facilities

In our facilities, thousands of parts bearing the Güvenal quality assurance label are meticulously produced every day, powered by our 50 years of experience and passion for manufacturing

Our 5-Axis Grinding Lines with Advanced Automation and High Precision Technology.



Wire EDM, Pneumatic Measurement-Controlled Honing, and CNC Surface Grinding Lines.

Our CNC Milling, Turning, and Cylindrical Grinding Lines.

In-house Induction Hardening Facility. Product Development and Quality Control Laboratory.

TAILORED SOLUTIONS FOR YOUR PROJECTS

(On demand custom parts manufacturing service)

Güvenal combines its expertise in design and manufacturing with modern, integrated production facilities to offer tailored solutions for your projects. In addition to our wide range of standard components, we also provide custom part production based on your specific requirements. Furthermore, we can modify existing Güvenal standard components to meet your needs - delivering fast, effective, and cost - efficient solutions.

- **Custom shapes and sizes**
- **Custom material selection**
- **Custom coatings and surface treatments**
- **Personalized product laser marking**

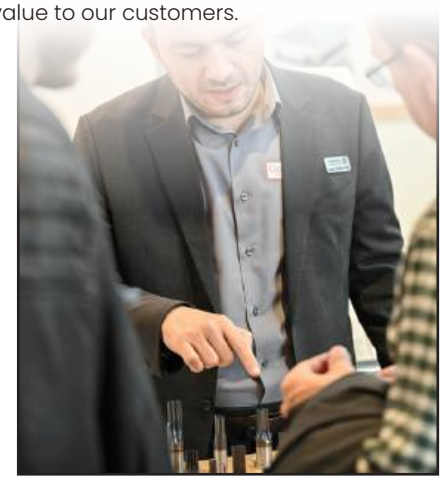
DESIGNED EXCLUSIVELY FOR DIE & MOULD MANUFACTURERS

Designing and manufacturing technical solutions for the die and mould industry represents Güvenal's dedication and success. Our commitment to quality and fair pricing provides real value to our customers.

DESIGNED EXCLUSIVELY
FOR DIE & MOULD MANUFACTURERS

OUR STRENGTHS

- Advanced technological infrastructure
- 50 years of experience, driven by innovation
- Best value with quality and fair pricing
- Worldwide sales network
- Strong stock and fast delivery
- Custom solutions and technical support for your company



CERTIFIED QUALITY STANDARDS

Our operations and products are certified under globally recognized ISO standards covering quality management, occupational health and safety, environmental responsibility, and information security. These certifications reflect our integrated approach to product excellence, employee well-being, sustainable practices, and data protection.

ISO 9001:2015
Quality Management System (QMS)

ISO 45001:2018
Occupational Health and Safety Management System (OHSMS)

ISO 27001:2013
Information Security Management System (ISMS)

ISO 14001:2015
Environmental Management System (EMS)

DISCOVER WHAT'S NEW: +79 PRODUCTS, COUNTLESS POSSIBILITIES

2026

Each one crafted to solve real-world production needs — specifi ally tailored for your die & mould projects!

FAST, DIRECT, AND COMPREHENSIVE SUPPORT

Güvenal's unique range of standard components includes the right solution for nearly every application – and when not, custom support is available.
All parts bearing the Güvenal quality assurance mark are produced with a focus on high value and reasonable pricing, offering optimal support throughout the design and procurement process.

GUIDING COMPONENTS

From DLC-coated pillars for injection moulds, to new-generation rollers and linear system bushes — including newly stocked WDX-standard wear plates for Ford projects — we offer a wide range of innovative new solutions.

MECHANICAL DIE COMPONENTS SOLUTIONS

Our updated range now includes new guides, roller strip lifters, and coil supports—engineered for precision and durability. All components are available at competitive prices to support your tooling requirements efficiently.

STAMPING SOLUTIONS

Discover our latest innovations — including NAAMS-standard matrixes, ball-lock special retainer inserts, heavy-duty headed punch retainers, punch stripper units, removable multi-change punch retainers, and pneumatic retractable punch systems — engineered to meet the evolving demands of modern stamping applications.

SPRING SYSTEMS

Discover new high-performance CHT and CSMHT gas spring series—developed specifically for hot forming and injection mould applications. Now also available: our compact Mini Series round wire springs, ready to ship from stock.

ADVANCED ADDITIONS FOR INJECTION MOULD DESIGN AND MANUFACTURING

We have expanded our stock with a wide range of newly developed components engineered to optimize injection mould design and production workflows. These additions offer increased precision, durability, and efficiency for high-performance tooling applications.

NEW OPPORTUNITIES IN TOOLROOM EQUIPMENT & CHEMICALS

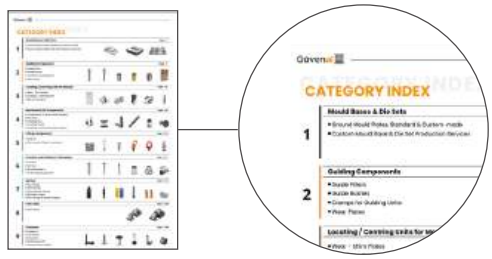
Explore our newly developed high-temperature grease—engineered to withstand up to 1400°C—specially formulated for SBMAV03 series ejector pins. Also available: our cost-effective general-purpose cleaning spray. For your toolroom workholding operations, discover new Güvenal-quality products designed to deliver reliable performance at competitive prices.

QUICK GUIDE TO NAVIGATING THE GÜVENAL CATALOGUE

This section is designed to help you maximize your use of our catalogue — from using the indexes and understanding page layouts to identifying newly added products

1. Category Index

Quickly access the main product group of interest (e.g., Category 2: "Guiding Components"). The catalogue includes 18 distinct categories, each numbered and marked with a unique colour for easy identification.

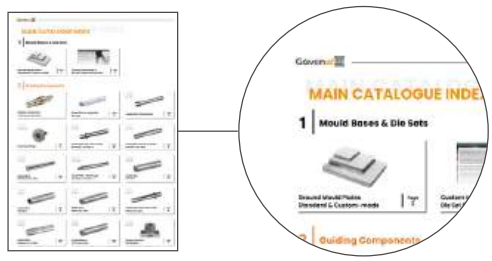


2. Traditional Güvenal "G" Series Index

Allows you to quickly locate our products using the well-known Güvenal “G” codes.

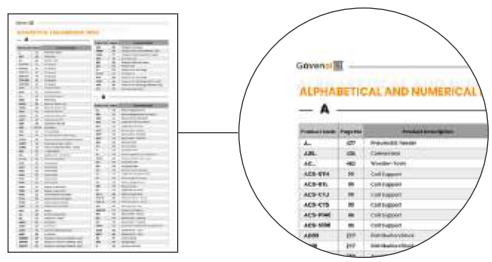
3. Main Catalogue Index

Follow the sequence of all listed products in the catalogue to easily navigate and locate the desired product series.



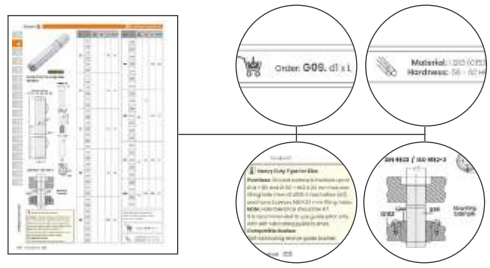
4. Alphabetical and Numerical Index

Allows you to quickly access our products, which are categorized using letter and number combinations.



5. Page Layout

Includes technical data, usage instructions, mounting guidelines, and how to choose the correct order code.



6. NEW Tag NEW

Look for the NEW symbol to discover the latest additions and innovations in our product range. These products have been recently introduced to our portfolio and were not included in previous editions of the Güvenal catalogue.

CATEGORY INDEX

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- Custom Mould Base & Die Set Production Services

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3 Locating / Centring Units for Moulds — Page - 134

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- Locating - Centring Units
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4 Mechanical Die Components — Page - 144

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- Pilot Units
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5 Lifting Components — Page - 158

- Eyebolts
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- Cam Units

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- Ejector Pins
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11 Standard Parts for Mould-Making

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- Pneumatic Feeders, Transporters, and Lubricators

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TRADITIONAL GÜVENAL "G" SERIES PRODUCT INDEX

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G01	68	Guide Pillar with Centre Collar - WDX
G02	68	Guide Pillar - Reference: WDX
G03	69	Guide Pillar - Reference: CNOMO
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G05		
G06	67	Guide Pillar - DIN 9833
G07	67	Guide Pillar - DIN 9833
G08	73	Guide Pillar with Centre Fixing
G09	62	Guide Pillar for Large Dies - DIN 9833
G10	64	Guide Pillar with Centre Collar
G11	76	Guide Pillar - (with oil groove)
G12	82 - 83	Guide Pillar - Shouldered
G12D	82 - 83	Guide Pillar - Shouldered
G13	79 - 81	Guide Pillar with Centring Collar
G13D	79 - 81	Guide Pillar with Centring Collar
G13DLC	89 - 90	Guide Pillar with Centring Collar
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G15	63	Guide Pillar, Thickbacked
G16	78	Ejector Rod
G17	75	Guide Pillar - (without oil groove)
G18	74	Guide Pillar for Ball Cage
G19	65	Guide Pillar - DIN 9825 / ISO 9182
G20	70	Guide Pillar for Cast Block Bush
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G22	104	Perforated Flange
G23	144	Sheet Lifting Pin
G24	65	Guide Pillar, Plain & Threaded
G25	98	Guide Bush Headed
G26	97	Guide Bush with Centre Collar
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G28	92	Centring Bush
G29	107	Steel Bush + Ball Cage Bush Set
G30	95	Guide Bush - Headed
G31	94	Guide Bush with Centring Collar
G32	95	Guide Bush with Centre Collar
G33	110	Guide Bush, Thin & Long Type
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G37	106	Guide Bush for Ball Cage
G38	106	Guide Bush for Ball Cage
G39	297	Shoulder Screw
G40	115	Guide Bush with Collar - NAAMS
G41	115	Guide Bush, Headed - NAAMS
G42	116	Guide Bush Headed
G43	117	Guide Bush, Headed - CNOMO
G44	114	Guide Bush with Collar, Self-Lubricating
G45	114	Guide Bush with Centre Collar
G46	147	Locating Cone
G47	162	Die Lifting Bolt - Heavy Duty
G48	113	Guide Bush - Plain Self-Lubricating
G48-1	116	Bronze Bush - Plain
G49	93	Guide Bush - Headed
G50	84 - 86	Guide Pillar - Shouldered
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G50DLC	88	Guide Pillar - Shouldered
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G52-1	160	Bush for Lifting Pin
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G53B	158	Die Lifting Bracket with Pin - BMW
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G55	160	Die Lifting Pin - FCA
G56	163	Safety Pin - FCA
G56.1	291	Shock Absorber for Safety Pin
G57	163	Safety Pin - VDI
G57.2	291	Shock Absorber for Safety Pin
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G59	136	Support Washer
G60	136	Tapered Locating Unit
G61	77	Angled Guide Bush
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G63	147	Locating Cone - NAAMS
G64	146	Locating Cone
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G71B	296	Spacer Tube
G71Y	296	Spacer Tube
G71P	296	Washer
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G72-2	111	Guide Bush with Flange, Bronze Coated
G72-3	111	Guide Bush with Flange, Steel
G73	374	Mounted Dial Caliper for Load Monitoring
G74	108	Linear Ball Bearing Bush Headed
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G76	132	Return Cam Plate
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G78	126	Wear Plate with Visual Wear Indicators
G78-12	127	Wear Plate with Visual Wear Indicators
G79	70	Flange Cast Bush - Rectangular
G80-1	71	Flange Cast Bush - Steel Type
G80-2	71	Flange Cast Bush - Bronze Type
G80-3	71	Flange Cast Bush - Cast Type
G80-4	71	Flange Cast Bush - Ball Cage Type
G80-5	71	Flange Cast Bush - Self-Lubricating
G81	101	Roller Cage
G82	136	Tapered Locating Unit, Headed
G83	123	Wear Plate, Self-Lubricating
G84	124	Wear Plate
G85	123	Wear Plate, Self-Lubricating
G86	117	Guide Bush, Bronze
G87	124	Wear Plate, Self-Lubricating
G87C	124	Wear Plate, Steel Type
G88	128	Wear Plate
G89	128	Wear Plate, ISO 9183-1

TRADITIONAL GÜVENAL "G" SERIES PRODUCT INDEX

Product Code	Page No	Product Description
G90	125	Wear Plate, Self-Lubricating
G90C	125	Wear Plate, Steel Type
G91	125	Wear Plate, Self-Lubricating
G91C	125	Wear Plate, Steel Type
G92	129	Wear Plate, AFNOR / Self-Lubricating
G92C	129	Wear Plate, AFNOR / Steel Type
G93	129	Wear Plate, CNOMO
G94	130	Wear Plate, Self-Lubricating
G94C	130	Wear Plate, Steel Type
G95	130	Wear Plate, VDI 3357
G96	129	Wear Plate, VDI 3357
G97	148	Slide Stop Block
G97A	148	Slide Stopper
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G98B	149	Cylinder Stopping Block
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G104	122	Wear Plate, "L" Shaped
G105	122	Wear Plate, "L" Shaped
G106	132	Guide Bar, Self-Lubricating
G106C	132	Guide Bar, Steel Type
G107	116	Thrust Washer - Perforated
G108	132	Cam Driver Plate, Self-Lubricating
G108C	132	Cam Driver Plate, Steel Type
G109	131	Cam Driver Plate, Self-Lubricating
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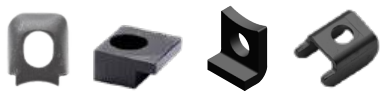

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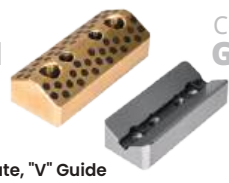
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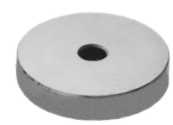
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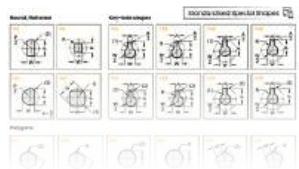

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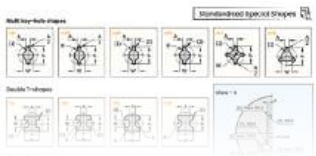

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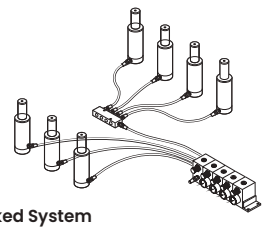
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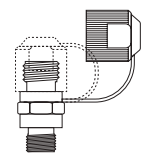
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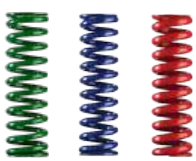

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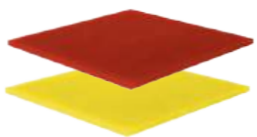

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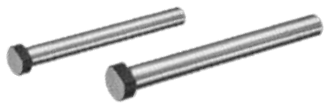

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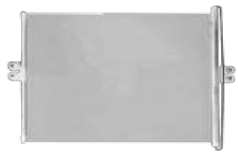

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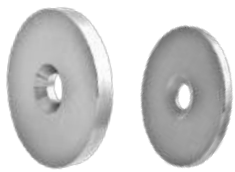

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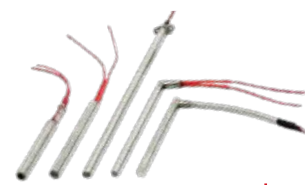

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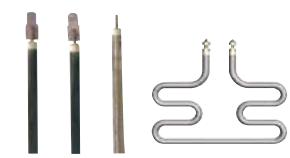

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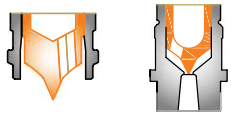

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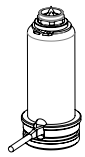

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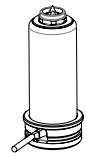

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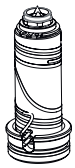

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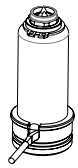

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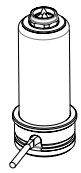

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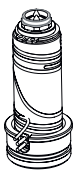

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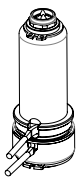

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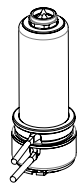

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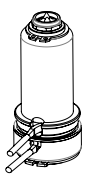

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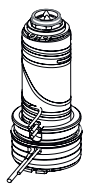

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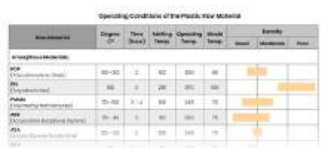

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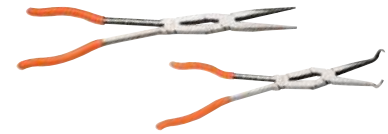

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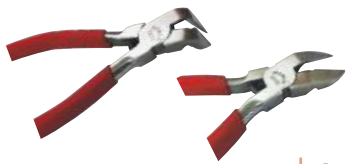

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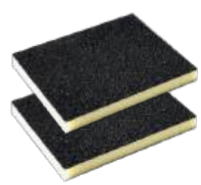

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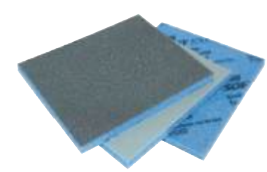

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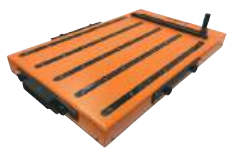

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A

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A26..	490	Connectors
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ACS-BTL	153	Coil Support
ACS-CTJ	153	Coil Support
ACS-CTS	153	Coil Support
ACS-P140	153	Coil Support
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AE..	413	Accelerated Ejector
AFRG	152	Roller Group
AG260	508	Rotary Air Grinder Tool
AG360	508	Rotary Air Grinder Tool
AG45	509	Angled Grinder 45^0
AG460	508	Rotary Air Grinder Tool
AG90	509	Angled Grinder 90^0
AGM	532	Decoilers for Steel Roll
AGS...	224-229	Gas Springs
AGS..	274-275	OV Gas Springs
AHV	364	Gas Venting Filter for Diecasting
AK1018	493	Injection Mould Cooling Manifold Blocks
AK400	164	Double Swivel Ring - Eyebolt
AK450	164	Heavy Tonnage Swivel Ring - Eyebolt
AKH	311	"T" Allen Wrench
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ALCON	503	Valve Grinding Paste
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AP02	266	Control Panel
AP03	267	Control Panel
AP04	267	Control Panel
AP05	268	Control Panel
AP06	268	Control Panel
APM1	269	Modular Control Panel
APM3	269	Modular Control Panel
APVA	276	Control Panel for OV System
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APR02	270	Safety pressure switches
APR12	270	Safety pressure switches
APR..	270	Analog
AR..	509	Air File Tool Operateds
AR...	265	Fittings for AT hoses
AR030	509	Air File Tool
AR070	509	Air File Tool
AR108	510	Ultrasonic Polishing Machine
AR911	509	Air File Tool
ARM000	259	Fittings for ATM Hoses (MINIMESS-type)
ARM090	259	Fittings for ATM Hoses (MINIMESS-type)
ARM270	259	Fittings for ATM Hoses (MINIMESS-type)
ARN..	263	Fittings for ATN hoses
ARNMF	259	Fittings for ATM Hoses (MINIMESS-type)
ARNM..	261	Fittings for ATNM hoses (MICRO-type)
ARSL	152	Roller Strip Lifter
ARU	490	Extension Fitting with Thread
ASK..	516	Wooden Tools
AT..	264	Hoses ø 8 mm and fittings
ATAP01	272	Charging unit
ATN..	262	Hoses ø 5 mm and fittings
ATNM	260	Hoses ø 5 mm and fittings (MICRO-type)
ATM..	258	Hoses ø5 mm and fittings (MINIMESS-type)
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Product Code	Page No	Product Description
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BAF..	195	Ball Lock Stepped Punch with Ejector
BAFZ	195	Ball Lock Punch with Ejector
BAG..	197	Larger Ball Lock Ejector Punch
BAK..	197	Larger Ball Lock Punch
BAPK	199	Ball Lock Pilot - Conical
BAPP	199	Ball Lock Pilot - Parabolic
BAPX	199	Ball Lock Pilot - Spherical
BAZ	194	Ball Lock Punch
BD..	407	Horizontal & Adaptable Base
BF	242	Fixing Base Plate
BF..	193	Ball Lock Stepped Punch with Ejector
BF800	523	Diamond Riffler File Set - 6 pcs.
BFA	243	Fixing Base Plate
BFB	244	Fixing Base Plate
BFZ	193	Ball Lock Punch with Ejector
BG..	196	Larger Ball Lock Ejector Punch
BG...	388	Square Angle Pin Housing
BH..	192	Ball Lock Stepped Punch
BHZ	192	Ball Lock Punch
BK..	196	Larger Ball Lock Punch
BM..A	510	Electrical Spiral Motor
BMS-20	522	Diamond CBN Set - 30 pcs.
BMS-30	522	Diamond CBN Set - 20 pcs.
BOX	351	Latch Lock Unit - Box
BOOSTER	273	Booster for Nitrogen N_2
BPK	198	Ball Lock Pilot - Conical
BPX	198	Ball Lock Pilot - Spherical
BPP	198	Ball Lock Pilot - Parabolic
BRE50	530	Pneumatic Transporter /Air Scrap Remover
BSE06	522	Needle File Set - 6 pcs.
BSE12	522	Needle File Set -12 pcs.
BSL	495	Sintered Muffler
BSM	294	Spring Plunger
BZ	518	Abrasive Cloth Rolls

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C

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CEMBS150	525	Mould Inspection Camera
CF400	521	Diamond Tapered File Set - 12 pcs.
CF500	521	Diamond Tapered File Set - 5 pcs.
CFT-S	259	Fittings for ATM Hoses (Accessories)
CG..	385	Adjustable Wedge Assembly
CHT	238-239	High Performance Gas Spring
CHV	366	Air Venting Valve
CI..	405	Lifter Guide Bushing
CK..	514	Rubber Mounted Polishing Point
CKT	482	Steel Type Screw Plug - Tapered
COMPL	272	Charging and discharging set
CR	436	Flexible Rod Heater
CRP	363	Mini Screwdriver Set
CS..	386	Compact Slide
CS..	512	Fiber Ceramic Polishing Stones Types
CS4200	312	Güvenal Screw Station with Organizer
CSMHT	240-241	High Performance Gas Spring
CTB	309	Bush for Dowel Pin, with Push Fit
CTPC	310	Dowel Pin Extractor - Puller Kit
CTPH7	307	Dowel Pin with Internal Thread
CTPM6	307	Dowel Pin with Internal Thread
CUC01	272	Charging unit
CVPL200	344	Cycle Counter

D

Product Code	Page No	Product Description
DAK02	303	Die Mounted Angular Cam Unit
DCY	293	Disc Springs
DEE	520	Diamond File - Square
DEN	491	Reduction Fitting
DF..	186	Center Dowel Stepped Punch with Ejector
DF...	406	Accelerated Ejector
DFSG	494	Hose Fitting with Valve
DFZ	184	Center Dowel Headed Punch with Ejector
DG..	508	Micro Rotary Air Grinder Tools
DG...	404	Dog Lifter
DHV	366	Double Air Venting Valve
DIN471	96	External Circlip
DK02	302	Die Mounted Cam Unit
DKM	315	Low Head Socket Cap Screw
DKT	363	Multi-Date / Double Date Stamp
DL..	403	Dog Lifter
DPUL	495	"Y" Hose Fitting
DPCF	494	Fitting - Internal Thread
DPCG	494	Fitting - External Thread
DPLG	494	Elbow Fitting - 90^0
DPT	494	"T" Fitting
DPUC	494	Straight Fitting
DPUT	495	"T" Hose Fitting
DPW	495	"Y" Hose Reduction Fitting
DPWT	494	"Y" Fitting
DPY	495	"Y" Hose Fitting
DPZA	495	Pipe Cross Hose Fitting
DR	491	Elbow
DR..	392	Double Rack
DS..	186	Center Dowel Stepped Punch
DSN	491	Cooling Adapter
DSU	485	Cooling Unit - Threaded
DSZ	184	Center Dowel Headed Punch
DTAP	214-215	DTAP In-Die Tapping Machine
DTPH7	306	Dowel Pin
DTPM6	306	Dowel Pin
DX..	409	Superior Double Ejector
DY..	412	Rear Double Ejector
DYF	421	Locating Ring
DZ	517	Self-adhesive Abrasive Disc - Grit
DZL	517	Self-adhesive Abrasive Disc - Skank

E

Product Code	Page No	Product Description
E..	531	Pneumatic Feeder
E08410180	464	Diagonal Side Cutter for Wire
E08410200	464	Diagonal Side Cutter for Wire
E09440140	464	Diagonal Side Cutter for Plastic - 30^0
E09440160	464	Diagonal Side Cutter for Plastic - 30^0
EB	378	Flange
EBM..	437	Hot Runner , Socket & Plug Inserts
ECB..	540	Permanent Magnetic Clamping Block
ECO-316	545	Drill & End Mill Cutter
ED..	401	Double Ejector
EDG..	546	Drill Sharpening Machine
EE..	402	Tulip Ejector
EEPM..	542	Electro-Permanent Magnetic Chuck
EG..	512	EDM Polishing Stones
EGM	462	Magnetic Separator for Injection Machine
EGS	220-221	Nitrogen Gas Ejectors
EKP	56	Standard & Custom-made
EKR	512	Polishing Block Stone
ELE	520	Diamond File - Hand
ELM..	547	Lifting Magnet
EMG..	545	End Mill Sharpening Machine
EP..	409	Plate Accelerator
ESD	524	Plastic Handle for Files
ESM	498	Metal Body Water Regulator
ESP	498	Plastic and Metal Body Water Regulator
ESR	498	Plastic Body Water Regulator
ESSE	524	Plastic Handle for Files

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ESY	524	Plastic Handle for Files
ET-1	508	Micro Rotary Air Grinder Tools
EX..	411	External Superior Plate Separator
EY..	414	External Double Ejection
EYE	520	Diamond File - Round
EYM	421	Sprue Bush - DIN 16752
EYY	520	Diamond File - Half Round
EZ..	518	Foam Abrasive Pads
EZ...	415	External Synchronized Plates Unit

F

Product Code	Page No	Product Description
FA..	416	Date Stamp
FAS100T	523	Diamond Tip File Set
FC..	395	KR Cooling Hose
FK..	514	Rubber Mounted Polishing Point
FL	249-250	Collar Flange
FLA	251	Collar Flange
FLEX	490	Rubber Hose
FLQ	252	Collar Flange
FLQA	253	Collar Flange
FLV..	507	Air File Tool / Vibration Damper
FR..	434	Cartridge Heater with Thermocouple
FT	254	Front Support
FTA	255	Front Support

G

Product Code	Page No	Product Description
GBRT	210	Ball Lock Punch Retainer - Heavy Duty
GCM09	154	Embossing Date Stamp
GCP	483	Sealing Plug with O-ring
GCRT	210	Ball Lock Punch Retainer - Light Duty
GDKA	319	Parallel Key DIN 6885 - A
GDM	362	Recycling Date Stamp
GDM14	362	Date Stamp for Food Legislation
GGA	365	Gas Venting Filter
GH	489	Heat Transfer Pipe
GHV	367	Air Venting Valve +SafeGuard Close
GI..	387	Angle Pin
GKT	483	Sealing Plug
GTK	424	Konturflow - Contourable Gate Insert
GMK	426	Midiflow - Contourable Gate Insert
GPR	208	Punch Retainer
GPRF	209	Heavy Duty Headed Punch Retainers
GPRFS	209	Heavy Duty Headed Punch Retainers
GPRS	208	Punch Retainer
GPLA	371	Friction Puller
GPS	166	Lifting Sling
GR..	387	Angle Pin Housing
GRF-5	425	New - Ringelflow
GSK	484	Cooling Junction
GST..	277	Gas Spring Test Device
GT..	512	EDM Polishing Stone Holders
GTE	422	Standardflow - Gate Insert
GTH	373	Cable Retainer Cap Magnetic
GTH-00..	527	Mould Testing & Assembly Unit
GTH.ALO	531	Part & Scrap Carrier / Pneumatic Ejector
GTH1000	461	Teknoclean Cleaning Compound
GTH1010	502	Industrial Cleaning Sprays - 500 ml.
GTH1020	502	Industrial Cleaning Sprays - 60 Lt.
GTH1400	340	High Temperature Ejector Pin Grease
GTHV	367	Air Venting Valve +SafeGuard Close
GTM	423	Miniflow - Blank Gate Insert
GTR	422	Standardflow - Gate Insert
GVSY	365	Sintered Gas Venting Filter with Steel Casing
GXK	427	Maxiflow - Contourable Gate Insert
GY	284	Ultra Heavy Load Spring
GZSA	207	Ball-lock Special Retainer Insert
GZSH	207	Ball-lock Special Retainer Insert

H

Product Code	Page No	Product Description
H2K	178	Conical Head Punches Stepped
HBZ	179	Conical Head Punch
HBE	491	Hose Fitting
HBF	491	Hose Fitting
HBI	333	Ejector Pin - Conical Head
HBP..	472	Clamping Set for Mould
HCC	438	Hot Runner Temperature Controller
HFK	178	Square Head Punch, Slot Stepped
HFY	178	Conical Head Punch Shaped
HIC	314	Countersunk Head Screw
HKI	491	Hose Clamp (stainless)
HKZ	178	Conical Head Punches Stepped
HRE	490	Hose Fitting
HRD 3633	503	Metal Adhesive
HRD 3701	503	Steel Epoxy Putty
HRD 502	503	Super Glue
HRD-200ML	501	WD-40 Multi-use Spray - 200 ml
HRD-3243	502	Threadlocker Medium Strength (removable)
HRD-3270	502	Threadlocker High Strength (unremovable)
HRD-3542	502	Hydraulic Sealant
HRD-3577	502	Pipe Sealant - Low Viscosity
HRD-400ML	501	WD-40 Multi-use Spray - 400 ml

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HRD-5000ML	501	WD-40 Multi-use Spray - 5 Litre
HRD3611	503	Epoxy Adhesive - Waterproof
HRDTAPPING..	529	King Servo Tapping Machine
HRU	490	Hose Fitting Long Type
HSEP	486	Spiral Baffle - Threaded
HT..	464	Heat Nipper
HVES	495	Fitting with Valve
HVFF	495	Valve for Hose (spherical)
HX4	520	Diamond File with Handle - Flat
HX10	520	Diamond File with Handle - Flat

I

Product Code	Page No	Product Description
IA..	416	Date Insert for "FA"
IBBG	497	Metal Nipple
IBDG	497	Metal, Reduction Fitting
IBP	497	Detent Plug
IBPG	497	Detent Plug with O-ring
ICF	315	Socket Cap Screw Counterbore
IF 500	521	Diamond File Set - 5 pcs.
IF 501	520	Diamond File - Flat
IF 502	520	Diamond File - Half Round
IF 503	520	Diamond File - Round
IF 504	520	Diamond File - Square
IF 505	520	Diamond File - Triangular
IGS	232-235	Gas Springs
IHS	359	Acceleration Rocker for Ejector
IMB	313	Hex-socket Head Cap Screw
IMBF	316	Hex-socket Button Head Screw with Flange
IMBP	316	Inox Hex-socket Head Cap Screw
IPBT	496	Metal, "T" Fitting
IPCT	496	Metal, Fitting External Thread
IPCV	496	Metal, Hose Fitting with Valve
IPET	496	Metal, "T" Hose Fitting
IPHT	494	Manifold Fitting
IPLT	496	Metal, Elbow Fitting - 90°
IPOT	496	Metal, Hose Reduction Fitting
IPU	494	Hose Reduction Fitting
IPUT	496	Metal, Hose Nipple
IPVT	496	Metal, Elbow Hose Fitting
IPZT	496	Metal, Pipe Cross Hose Fitting
ISCG	494	Elbow Fitting with Valve
ISPLG	494	Hose Stop Nipple with Valve
ISPU	494	Hose Stop Nipple
IW3C14	311	Die & Mould Mounting Kit
IYPE	372	Heat Insulation Plates / Economic
IYPA	372	Heat Insulation Plates / High-tech

J

Product Code	Page No	Product Description
J17190	464	Multi-Purpose Scaissors
J17190B	464	Multi-Purpose Scaissors

K

Product Code	Page No	Product Description
KA1000	501	Mould Release Agent Spray
KA2000	501	Mould Release Agent Spray
KAU	350	Latch Lock Unit
KBS	294	Spring Plunger with Bushing
KDR	491	Cooling Fitting Elbow
KHV	368	Air Venting Valve
KHBG 1	374	Mould Alignment - Pressure Monitoring Paper
KKV	491	Mini Ball Valve
KLT	517	Clip-on Abrasive Disc / Mandrel
KMB	504	Mould Marking Paint
KPM	315	Washer - DIN 433
KPR	420	Taper Pin Reamer
KR..	394	Cooled Rack Lifter
KR...	434	Band Heater
KS..	518	Polishing & Cleaner Block
KSM	315	Nut - DIN 934
KT	363	Date Stamp
KTE	524	Engineers File - Square
KY	282	Heavy Load Spring
KYF	421	Locating Ring
KYR	420	Taper Sprue Bush Reamer
KZ2	155	Locating Punch
KZD	517	Clip-on Abrasive Disc / Abrasive Disc
KZG	155	Locating Punch
KZF	155	Locating Punch

L

Product Code	Page No	Product Description
LHE	524	Engineers File - Hand

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M

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M60109	492	Multi Coupling Plate Systems
MAN..	203	Matrix - Tapered Relief
MARPOL	516	Metal Polisher Paste
MB..	206	Ball Lock Matrix
MC..	204	Matrix, Headed - Tapered Relief
MBC	206	Ball Lock Matrix - Blank
MBE	206	Ball Lock Matrix - Blank
MD2	156	Backing Plate for Stamp Retainer
MEG	155	Backing Plate for Stamp Retainer
MEU	155	Backing Plate for Stamp Retainer
MEY..	420	Sprue Bush for Metal Injection
MG	500	Extra Long Drill
MH	457	"MH" Type Manifold for Hot Runner
MHH	459	"MHH" Type Manifold for Hot Runner
MI	456	"MI" Type Manifold for Hot Runner
MK..	201	Matrix - Straight ISO 8977
MK1MIP1	360	Micro Limit Switch
MK1MIP2	360	Micro Limit Switch
MKB	200	Matrix with Counter-bore Relief
ML...	514	Mini Abrasive Roll Set
ML..	202	Matrix - Headed / ISO 8977
MLB	200	Headed Matrix with Counter-bore Relief
MMB	504	Mould Marking Paint
MN2MIM2	360	Micro Limit Switch
MN2MUM3	360	Micro Limit Switch
MP..	204	Matrix, Straight - Tapered Relief
MPY	497	Metal "Y" Hose Fitting
MS..	384	Mini Slide
MT	456	"MT" Type Manifold for Hot Runner
MTA	373	Mould Thermometer
MTB	355	Slide Retainer - Pinned & Lock
MTB	373	Mould Thermometer
MTC	357	Slide Retainer - Round Type
MTF100	523	Diamond Tapered File Set - 12 pcs.
MTG	156	Stamp Retainer
MTK1	356	Slide Retainer
MTK2	356	Slide Retainer
MTC2	373	Mould Thermometer
MTM	355	Slide Retainer with Latch
MTMF	462	Nozzle Filter
MTU	155	Stamp Retainer
MTE	524	Engineers File - Mill Saw
MTS	205	Polyurethane Stripper for Ball Lock
MTS..M	356	Slide Retainer Pinned & Lock
MTY	357	Slide Retainer - Pinned & Round
MY	281	Medium Load Spring
MY	457	"MY" Type Manifold for Hot Runner
MYY	458	"MYY" Type Manifold for Hot Runner
MX	458	"MX" Type Manifold for Hot Runner
MX143662	406	Internal Latch Lock
MXX	459	"MXX" Type Manifold for Hot Runner
MZ..	517	Abrasive Mop Wheels
MZG	155	Marking Stamp

N

Product Code	Page No	Product Description
NAKA45	508	Angled Grinder - 45^0
NAKA90	508	Angled Grinder - 90^0
NCB..	539	Precision Modular Vise
NMMC..	544	Super Permanent Magnetic Chuck

O

Product Code	Page No	Product Description
OKS	482	Headed Screw Plug with O-Ring
OKS	487	Water Flow Cooling Pipe
ONE	491	Cooling Adapter

P

Product Code	Page No	Product Description
P10	431	In-mould Edge Gate Cutting Pin
P12	431	In-mould Edge Gate Cutting Pin
PCAM	463	Precision Deburring Blade with Handle
PCBU	463	Precision Deburring Blade
PCTM	463	Precision Deburring Blade with Handle
PCTU	463	Precision Deburring Blade
PDTA..	290	Compression Piece
PEF	522	CBN Grinding Points
PF..	398	Flexible Sprung
PFL100	521	Diamond Needle File Set - 10 pcs.
PH	495	Air Hose - Polyurethane
PHV	368	Air Venting Valve with Pin
PKM-1	534	Pin Cutting & Face Grinding Machine
PL-M6	259	Fittings for ATM Hoses (MINIMESS-type)
PL-1/8A	259	Fittings for ATM Hoses (MINIMESS-type)
PL-1/8B	259	Fittings for ATM Hoses (MINIMESS-type)
PLS	484	Cooling Cascede
PMK	288	Polyurethane Compression Spring - 90 Shore
PMT	294	Mounting Kit for Spring Plungers
PMS	288	Polyurethane Compression Spring - 80 Shore
PMV	292	Locating Pin for Polyurethane Spring
POLB	497	Air Hose - Polyamide

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POLIN	504	Casting Resin
PPK	291	Polyurethane Plate - 90 Shore
PPS	291	Polyurethane Plate - 80 Shore
PR263230	406	Plate Retainer
PRBP	208	Shim & Backing Plate for Punch Retainer
PRPK	288	Polyurethane Shock Absorbing Washer
PRPS	288	Polyurethane Shock Absorbing Washer
PRSP	208	Shim & Backing Plate for Punch Retainer
PS..	391	Standard Lifter
PS1	295	Spring Plunger
PS2	295	Spring Plunger
PSE	491	Flexible Cooling Hose
PSK	294	Spring Plunger
PSL	495	Plastic Muffler
PSP	292	Locating Bolt for Polyurethane Spring
PSTA..	290	Stripper for Blanking Dies
PTF10T	521	Diamond Tapered File Set - 10 pcs.
PTF100	521	Diamond Tapered File Set - 10 pcs.
PVS	484	Cooling Cascede
PW..	400	Sprunge Core
PX..	399	Xtra Sprung Core
PXG	495	Manifold Fitting (4-Distributor)
PYB	205	Polyurethane Punch Stripper
PYBB	289	Vulkollan Compression Spring - Hollow
PYBD	289	Vulkollan Compression Spring - Solid
PYK	289	Polyurethane Compression Spring - 90 Shore
PYP	292	Guide Bolt for Polyurethane Spring
PYS	289	Polyurethane Compression Spring - 80 Shore

R

Product Code	Page No	Product Description
R-3030	507	Universal Grinding Spindle
RA163812	391	Angle Pin Housing
RC..	390	Slide Retainer
RCM..	390	Slide Retainer
RCP..	466	Sheet / Rib Deburreres
RCP-86909	467	Universal Deburring Kit
RF..	393	Adjustable Fixing
RGV14	270	Safety pressure switches
RK..	514	Rubber Mounted Polishing Point
RKK..	514	Rubber Mounted Polishing Point
RM651608	408	Modular Clip
RO-1785	507	High-speed Grinding Spindle
RT	436	Thermocouples - Type J
RUK..	463	In-Mould Application Mechanical Pliers
RYS	533	Roller Lubricator for Steel Roll
RZ..	517	Tapered Abrasive Cartridge Rolls

S

Product Code	Page No	Product Description
SA	519	Cylinder Type - DIN 8033
SA..	419	Sprue Adjuster
SAR070	509	Air File Tool
SB	519	Cylinder Type with Endcut
SB..	181	Cylinder Head Stepped Punch / ISO 8020
SB..F	185	Heavy Duty Stepped Punch
SB12	431	In-mould Edge Gate Cutting Sprue Bush
SBCP	328	Core Pin / Anti-twist Head
SBD	338	Core Pin - Threaded Head
SBDLC	325	DLC Coated Ejector Pin - Cylinder Head
SBGTP	329	Ejector Pin For Ventilation
SBIAH	335	Ejector Pin - Cylinder Head
SBKDLC	326	DLC Coated Cylinder Head Stepped Ejector Pin
SBKAH	334	Cylinder Head Stepped Ejector Pin
SBMAV03	339	Cylinder Head Ejector Pin / DIN 1530-1
SBS	294	Spring Plunger with Slotted Head
SBW	338	Stepped Ejector Pin - Nitrided, Oxidation Coated
SBZAPM2	180	Cylinder Head Punch Solid Blank - ISO 8020
SBZF	184	Heavy Duty Headed Punch
SC	519	Radius Cylindrical Type
SCPM8	371	Friction Puller
SD	519	Ball Type
SD..	388	Lifter Base Unit
SDP	516	Diamond Compounds
SDIT..	341	Ejector Pin with Locking Head (Anti-Rotating)
SDS200	516	Diamond Compound Moisturiser
SDT	482	Screw Plug - Straight
SE10	522	Needle File Set - 10 pcs.
SE-P	431	In-mould Edge Gate Straight Cutting Pin
SEC	315	Hex-socket Set Screws
SECP	316	Inox Hex-socket Set Screw
SEPM	486	Flat Baffle - Threaded
SF	245	Fixing Half-flanges
SF..	183	Cylinder Head Stepped Punch with Ejector
SF..F	185	Heavy Duty Stepped Punch with Ejector
SFA	246	Fixing Half-flanges
SFZAJM2	182	Cylinder Head Punch with Ejector
SFZF	184	Heavy Duty Headed Punch with Ejector
SG	519	Pointed Tree Type
SGA	365	Sintered Gas Venting Filter
SH	519	Flame Type
SK	519	90^0 Cone Type
SK404	491	Liquid Gasket Sealant - Red
SKE	523	Steel Needle File - Square
SKF..	514	Mounted Hair Brushes
SKT	482	Screw Plug - Tapered
SL	519	Radius Cone Type

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Product Code	Page No	Product Description
SLE	523	Steel Needle File - Hand
SLADLC	327	DLC Coated Blade Ejector Pin - Hardened
SM..	518	Waterproof Abrasive Paper with Sponge
SM404	491	Liquid Gasket Sealant - Blue
SMB	337	Ejector Sleeve - Nitrided / DIN ISO 8405
SMK	187	Pilot - Compact Type
SMX	187	Pilot - Compact & Spherical
SP..	431	Sprue Puller
SPK	187	Pilot with Taper End
SPK	515	Mounted Polishing Felts
SPI	342	Ejector Pin - Stainless / INOX
SPL	514	Holder for Abrasive Rolls
SPLAH	336	Blade Ejector Pin - Hardened / ISO 8693
SPP	187	Pilot - Parabolic Type
SPPAV07	342	Ejector Pin - Copper Alloy
SPT	513	Pink Mounted Points
SPTA	533	Sheet Metal Part Transport Handle
SPWA	340	Blade Ejector Pin - ISO 8693 (DIN 1530 F)
SPX	187	Pilot - Spherical
SPZ	514	Mini Abrasive Rolls
SR	435	Coil Heater
SRD..	506	Rotary Air Grinder Tool
SSY6	499	Manual Pressure Test Pump
ST	247	Fixing Foot Brackets
ST	488	Flat Plastic Baffle - Base
STA	248	Fixing Foot Brackets
STA	488	Spiral Plastic Baffle
STB	488	Spiral Plastic Baffle Without Base
STF..	514	Mounted Wire Brushes
STRONG	510	Corded Rotary Tool
STV	364	Air Venting Valve for Blow Moulding
SUE	523	Steel Needle File - Triangular
SX256062	410	Superior Plate Separator
SY	283	Compact Double Ejection
SY..	413	Extra Heavy Load Spring
SYE	523	Steel Needle File - Round
SYY	523	Steel Needle File - Half Round
SZ	518	Waterproof Abrasive Paper

T

Product Code	Page No	Product Description
T20	522	Diamond CBN Set - Economic
T30	522	Diamond CBN Set - Economic
T365S	506	Rotary Air Grinder Tool / Oil-free
T6-50S	506	Rotary Air Grinder Tool / Oil-free
TBM	285-286	Medium Load Spring - Round Wire
TBTHS	378	Hydraulic Cylinder - Tube Type
TDE	537	Diamond Wheel Dresser
TE	491	TEE
TE186	497	Spiral Air Hose
TEF	497	Air Hose - Teflon
TGS	230-231	Gas Springs
THCF	379	Hydraulic Piston - Square Type
THCS	379	Hydraulic Piston - Square Type
THKS	378	Hydraulic Cylinder Square Type
THS	378	Hydraulic Cylinder - Round Type
TKLN	504	Cold - Curing Tool Repair Set
TKS	487	Flat Baffle with O-Ring
TPS	310	Dowel Pin Retaining Sleeve
TR-1785	507	High-speed Oil-free Spindle
TRK	285-286	Heavy Load Spring - Round Wire
TUSCP	504	Engineer's Marking Blue Paste
TVD3-100	506	Rotary Air Grinder Tool / Oil-free
TVY	285-286	Light Load Spring - Round Wire

U

Product Code	Page No	Product Description
UA..	389	Compact Coring Unit
UBZ	190	Bottle-neck Punch
UBZ..	189	Bottle-neck Stepped Punch
UC..	389	Core Cam
UCBAS	495	Rotary Joint Fitting
UEE	520	Diamond File - Triangular
UFZ	191	Bottle-neck Punch with Ejector
UFZ..	191	Bottle-neck Stepped Punch with Ejector
UFT	188	Piloted Counterbore Punch
UTE	524	Engineers File - Triangular
UU..	385	Undercut Unit

V

Product Code	Page No	Product Description
V-PB	536	Pin & Punch Former Tool
V-PS	536	Pin & Punch Former Tool
VA..	418	Air Poppet Valve
VBS-300	537	Wheel Balancing Stand
VD..	418	Double Valve
VGP	460	Valve Gate Pin & Bushing
VGS	222-223	Gas Springs
VHR	368	Special Reamer for "VHV" Valve
VHV	368	Venting Valve for High Pressure
VKT	362	Date Stamp - Screwed
VPGA	537	Mini Pin & Punch Former Tool
VPG	535	Pin & Punch Former Tool
VPGM	535	Pin & Punch Former Tool

ALPHABETICAL AND NUMERICAL INDEX

Product Code	Page No	Product Description
VSTV..	538	Wire EDM Vise (stainless steel)
VTDB	537	Wheel Dresser Tool
VV	236-237	Gas Springs
VYZ	177	Screw Form Punch & Die Button Unit

W

Product Code	Page No	Product Description
W1231	464	Diagonal Side Cutter for Plastic - 90°
W1233	464	Diagonal Side Cutter for Plastic - 35°
W140601	503	Hand Cleaner - 500 ml.
W140602	503	Hand Cleaner - 3 Lt.
W150154	501	Silicon-free Mould Release Agent Spray
W150170	501	Mould Protective Spray
W150200	502	Anti-seize Ceramic Grease - 1Kg.
W150206	501	Multi-purpose Grease
W160105	501	Food Grade Lubricant Spray
W160106	501	Protective Wax Spray
W160108	502	White Lithium Grease Spray - 400 ml.
W160109	502	MOS2 Dry Lubrication System Spray
W160110	501	Multi-purpose Signum Spray
W160114	502	Liquid Grease Spray
W160170	501	Powerful Rust Remover Spray
W160200	502	Anti-seize Ceramic Grease - 400 ml.
W1701201	502	Universal Bio Cleaning Spray - 1 Lt.
WH..	512	Fiber Ceramic Polishing Stone, Manual Holders
WL..	396	Smart Worm Lifter
WP..	397	Smart Worm Pin
WRD3-85	506	Rotary Angled Air Grinder Tool

Y

Product Code	Page No	Product Description
YTB	309	Bush for Dowel Pin, with Bonding
YTE	524	Engineers File - Round
YY	280	Light Load Spring
YYE	524	Engineers File - Half Round
YYH	287	Round Wire Compression Spring
YYS	287	Round Wire Compression Spring

Z

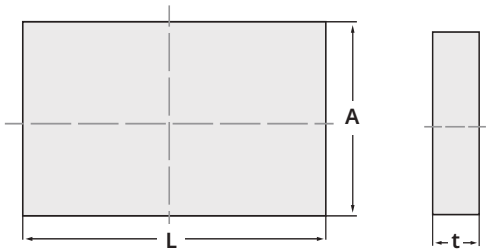
Product Code	Page No	Product Description
ZDP	156	Stamp Retainer
ZLA	525	Table Lamps with Magnifier
ZTF	156	Stamp Retainer
ZTP	156	Stamp Retainer

1 - 2 - 3

Product Code	Page No	Product Description
1024-5006670	528	Die Moving Table (1Ton)
1024-5006671	528	Die Moving Cart (1Ton)
1120-DT	475	Combined Power Sliding Clamp
1120-M	474	Combined Power Sliding Clamp
1120-T	473	Combined Power Sliding Clamp
1130-DT	475	Combined Power Sliding Clamp
1130-M	474	Combined Power Sliding Clamp
1130-T	473	Combined Power Sliding Clamp
1150-DT	475	Combined Power Sliding Clamp
1150-M	474	Combined Power Sliding Clamp
1150-T	473	Combined Power Sliding Clamp
1160-DT	475	Combined Power Sliding Clamp
1160-M	474	Combined Power Sliding Clamp
1160-T	473	Combined Power Sliding Clamp
1330	471	Tapered Clamp with Support Hole
13710	520	Diamond File Set - 10 pcs.
13711	520	Diamond File Set - 5 pcs.
13726	520	Die Sinkers Diamond Riffler File Set - 5 pcs.
1450	471	Cranked Clamp with Support Hole
1490..	470	Support Screw for Clamp
1510..	470	Threaded Lifter Support
1610..	469	T-Slot Bolt Set
1670..	470	Wrench-fit Stud
1690..	468	Threaded Stud - DIN 6379
1710..	318	Long T-Nut
1714	525	Inspection Mirror
1720	522	Needle File Set - 6 pcs.
1750..	318	T-Nut / DIN 508
1790..	317	Hexagon Nut - DIN 6330B
1810..	318	Hex. Nut with Collar - DIN 6331
1830..	317	Extension Nut
1870..	318	Washer - DIN 6340
4549	501	Molykote Longterm Grease
509 SERIES	478	Quick Coupling Systems - USA Series
570 SERIES	479	Quick Coupling Systems - High Flow Series
590 SERIES	476-477	Quick Coupling Systems - EU Series
600 SERIES	480	Quick Coupling Systems - French Series
601 SERIES	481	Quick Coupling Systems - French Series
620 SERIES	479	Quick Coupling Systems - Special Series
6218001001	511	Polishing Kit - Multiple / 190 pcs
6218002001	511	Polishing Kit - Mini / 145 pcs
752410	525	Loupe Magnifier with Illumination

Code: **EKP**

Ground Mould Plates
Standard & Custom-made



Precision machined and grinded plates are prepared as rectangular, square or Upon request in the desired dimensions, also hole, pool, core space and similar processes can be done on plate, the desired precision tolerances excluding standard dimensions are applied. Surfaces are milled / precision perpendicularity and roughness are provided, precision surfaces ground plates with CK45 / tool steel material are available in our stocks normatively or can be supplied in 2-3 working days. In addition, except our standard materials, the production in desired materials (alloy aluminium or quality steel material) is possible. All of these processes are produced within the structure of our company, then they are presented to our customers by providing cost saving.We are an accomplished and dedicated and customer oriented company with our experience and knowledge, advantages of being ahead and with our presentations of Güvenal Components improved by our side and needed by the whole world market and with unquestionable quality.

A	L	Thickness (t)								
		27	37	47	57	67	77	87	97	107
156	156	■	■	■	■	■	■			
	196	■	■	■	■	■	■	■	■	
	246	■	■	■	■	■	■	■	■	■
	296	■	■	■	■	■	■	■	■	■
	346	■	■	■	■	■	■	■	■	■
196	196	■	■	■	■	■	■	■	■	
	246	■	■	■	■	■	■	■	■	■
	296	■	■	■	■	■	■	■	■	■
	346	■	■	■	■	■	■	■	■	■
	396	■	■	■	■	■	■	■	■	■
246	246	■	■	■	■	■	■	■	■	■
	296	■	■	■	■	■	■	■	■	■
	346	■	■	■	■	■	■	■	■	■
	396	■	■	■	■	■	■	■	■	■
	446		■	■	■	■	■	■	■	■
	496		■	■	■	■	■	■	■	■
296	296	■	■	■	■	■	■	■	■	■
	346	■	■	■	■	■	■	■	■	■
	396	■	■	■	■	■	■	■	■	■
	446		■	■	■	■	■	■	■	■
	496		■	■	■	■	■	■	■	■
	546		■	■	■	■	■	■	■	■
346	346	■	■	■	■	■	■	■	■	■
	396	■	■	■	■	■	■	■	■	■
	446		■	■	■	■	■	■	■	■
	496		■	■	■	■	■	■	■	■
	546		■	■	■	■	■	■	■	■
	596		■	■	■	■	■	■	■	■
396	396	■	■	■	■	■	■	■	■	■
	446	■	■	■	■	■	■	■	■	■
	496	■	■	■	■	■	■	■	■	■
	546		■	■	■	■	■	■	■	■
	596		■	■	■	■	■	■	■	■
	646			■	■	■	■	■	■	■
446	446	■	■	■	■	■	■	■	■	■
	496	■	■	■	■	■	■	■	■	■
	546	■	■	■	■	■	■	■	■	■
	596		■	■	■	■	■	■	■	■
	646		■	■	■	■	■	■	■	■
	696			■	■	■	■	■	■	■
496	496	■	■	■	■	■	■	■	■	■
	546		■	■	■	■	■	■	■	■
	596		■	■	■	■	■	■	■	■
	646		■	■	■	■	■	■	■	■
	696		■	■	■	■	■	■	■	■
	746			■	■	■	■	■	■	■
	796			■	■	■	■	■	■	■

Order:
EKP. A x L x t

Material: CK45
(or material upon request)

Custom Mould Base & Die Set Production Services

Our Custom Mould Bases & Die Sets provide comprehensive support for both standard and special mould bases requirements, offering our valued customers reliable and tailored solutions. With our integrated mould base production facility and a flexible, experienced team, we serve as an ideal partner for both standard and custom projects.

For custom mould bases & die sets manufacturing, our services include operations based on customer drawings: mould clamping zones, shot counters, O-ring grooves, cold/hot runner systems, manifold plate machining, cooling/water circuit drilling, deep hole drilling, stepped mould base machining, flange seat operations, angled or flat core pockets, ejector pin holes, and return pin cavities. Depending on your requirements, we deliver the sets with either guide pillar & bush assemblies or in ground plate configurations—always in the fastest possible lead time.

Our facility integrates advanced CNC machining and precision surface grinding techniques, fully aligned with today's design engineering standards. Each mould base is produced with strict attention to perpendicularity and reference accuracy. We use our in-house manufactured Güvenal Guiding Set components to ensure consistency, along with class 12.9 Bolts for structural integrity. Lifting holes 1 or 2 depending on weight) are added for safe handling, and mould locks can be assembled upon request.

We use CK45 steel as the standard material for our mould bases; however, high-quality alloyed aluminum or premium steel grades can be used upon customer request. Standard thickness tolerance is +0.01 mm, and peripheral dimensional tolerance is ±0.1 mm. Alternative tolerances are also available upon request.

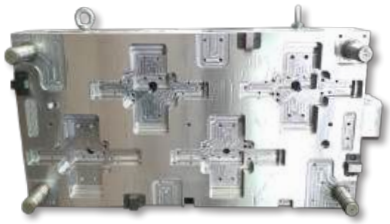
We can manufacture mould bases & die sets up to dimensions of 2000 x 1600 mm quickly and efficiently. To avoid potential discrepancies in custom-made orders, all customer drawings and operations are carefully reviewed by our Engineering Team, and production proceeds following mutual confirmation.

Fast delivery is one of our core commitments. Standard sets can be shipped within 3 to 4 working days, or even immediately from available stock. Custom sets are typically delivered within 3 to 6 weeks, depending on project requirements.

Technical Support and Engineering Services

Perfect Quality Price Combination

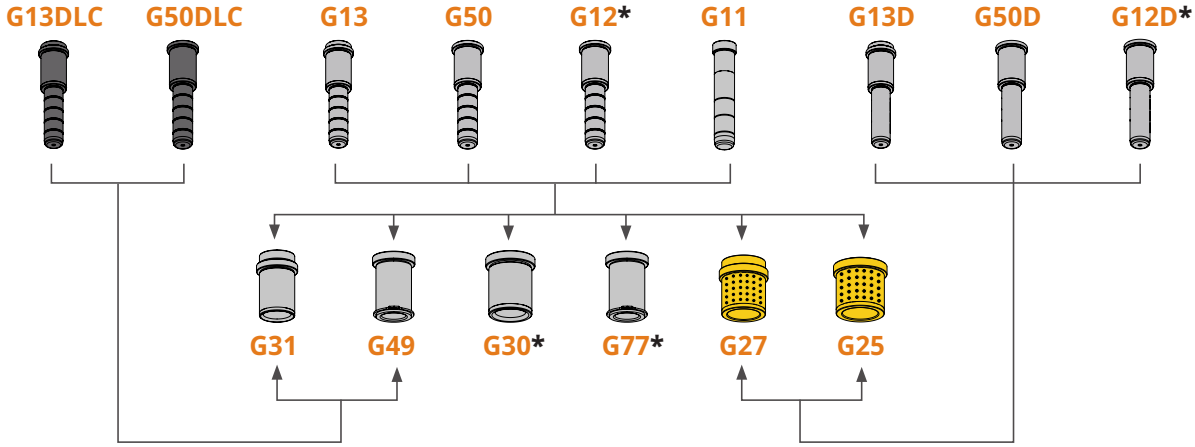
Quality Controlled Fast Delivery



QUICK OVERVIEW of GÜVENAL GUIDING SYSTEMS for MOULD-MAKING

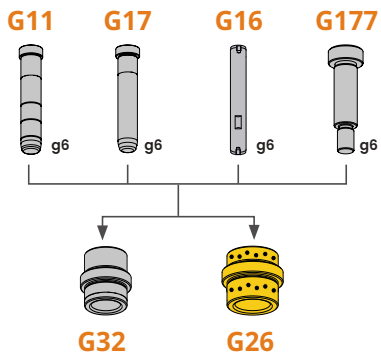
STANDARD GUIDING SYSTEMS

* It refers to products tailored to Turkish market.

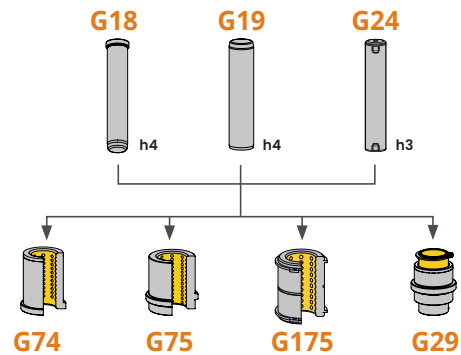


EJECTOR SET GUIDING SYSTEMS

Sliding Guides



Roller Guides



NEW GENERATION of GÜVENAL LINEAR BALL BEARING SYSTEMS

The Güvenal Linear Ball Bearing Bushes have replaced the older ball guide system, which consisted of a bushing and ball cage. These bushes offer significant advantages, including a compact installation size, high load capacity, and unlimited stroke lengths without any movement of the cage. One of the most common applications of the Linear Ball Bearing Bushes is the guidance of ejector plates. The compact design also enables a variety of alternative uses. The circumferential ball tracks, including the moving balls inside the bushing, nearly eliminate the risk of the guide pillar seizing.

Next-Generation "FreeLub"

Graphite deposits within the channels ensure continuous lubrication of the balls. The sealed system prevents both the loss of internal lubricants and the entry of external contaminants. The components are designed to withstand continuous operating temperatures of up to 200°C. The new "FreeLub" types (G74, G75 & G175) come with several improvements. The ball channels have been modified with a slight incline to enhance guidance. Additionally, the newly grouped and divided double contact channels allow up to 25% more load capacity compared to previous models.

SLIDING GUIDE SYSTEMS

From self-lubricating bushes to steel bushes, find the ideal guide pillars and sliding bushes to ensure optimal guidance for your ejector set.

ROLLER GUIDE SYSTEMS

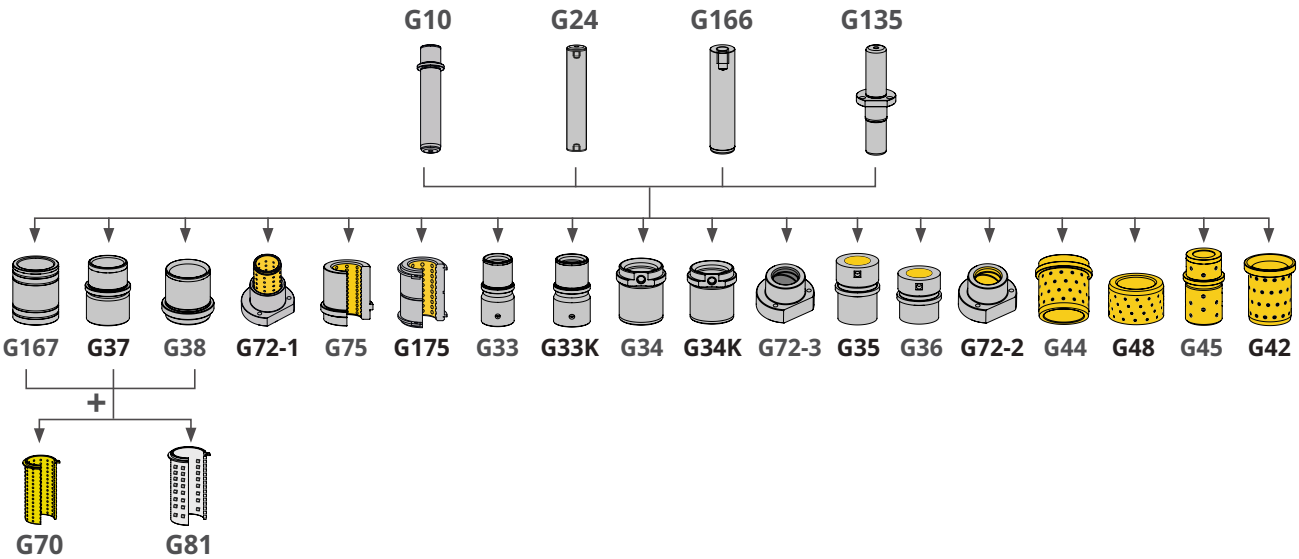
Seeking an ejector set guide for high stroke speeds and maximum precision ?
Explore our smooth-operating ball guides, which offer minimal play due to optimal preload. Additionally, the point contact between the balls and the pillars results in reduced wear.

3+1 Configuration - Three Large and One Small Guide Pillar Principle

Guide pillars are used to align the two mould halves during closing. Typically placed on the nozzle side, they are often installed according to the 3 + 1 specification, which consists of three larger diameter pillars and one smaller diameter pillar to prevent incorrect assembly. The choice of pillars depends on the mould and specific application. Deciding whether to use versions with or without a centring collar or a fitting diameter is typically based on experience. Additionally, Güvenal offers DLC-coated pillars as standard, providing improved performance, particularly for dry running applications.

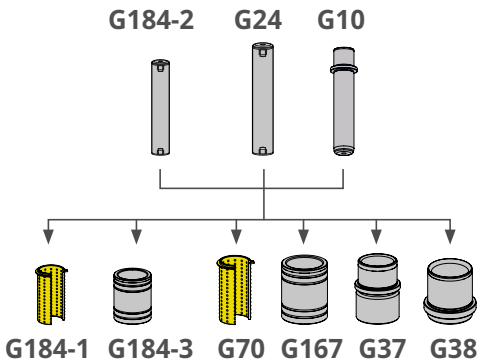
QUICK OVERVIEW of GÜVENAL GUIDING SYSTEMS for DIE-MAKING

STANDARD GUIDING SYSTEMS



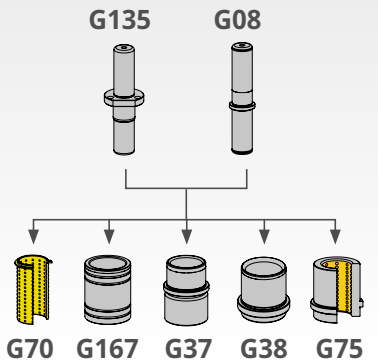
Compact Guiding Systems

Ø= 4 - 19



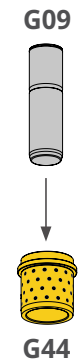
Module Guiding Systems

Ø= 20 - 50



Guiding for Large Die Systems

Ø= 25 - 160



GÜVENAL GUIDE PILLARS: TOLERANCES and SURFACE QUALITY

Guide Pillar	Tolerance		Surface of the guide
	Installation	Guide	
G10	j6	h3	high precision ground + superfinish
G24	h3	h3	high precision ground + superfinish
G166			
G09	r6	f6	ground
G08	js4	h3	high precision-ground + superfinish
G135			

SUPERIOR QUALITY, PROUDLY MADE in GÜVENAL

From raw material to finished product, we guarantee superior Güvenal quality in the production of our guiding elements. These are manufactured at our main facility in Istanbul, where all related processes, from turning to grinding, are carried out with precision. Throughout every stage of production, we use high-precision measuring equipment during our Quality Control processes to ensure the highest quality.

ENGLISH

Güvenal - Guide Pillars & Bushes Compatibility Chart

Guide Pillars			G01	G02	G11	G16	G17	G06	G07	G09	G15	G03	G50DLC	G13DLC	G14	G12D	G13D	G50D	G12	G13	G50	G08	G10	G18	G19	G24	G166	G20	G135	G161	G177
		Diameters	25 / 32 40 / 50 63 / 80	25 / 32 40 / 50 63 / 80 100	10 / 12 / 14 16 / 18 / 20 22 / 24 / 25 30 / 40 / 50	10 / 14 16 / 18 20 / 24 34	10 / 12 / 14 16 / 18 / 20 22 / 24 / 25 30 / 40 / 50	32 / 40 50 / 63 80 / 100 125	80 100 125	25 / 32 / 40 50 / 63 / 80 100 / 125 160	20 25 32	25 / 32 40 / 50 63 / 80 100	14 / 18 22 / 30 40	9 / 14 / 18 22 / 30 / 40	8 / 10 / 12 16 / 20 / 25 30 / 32	12 / 14 / 16 18 / 20 / 25 30 / 40	14 / 15 / 18 20 / 22 / 24 30 / 32 / 40 42	14 / 15 / 18 20 / 22 / 24 30 / 32 / 40 42 / 50 / 60	12 / 14 / 16 18 / 20 / 25 30 / 40	14 / 15 / 18 20 / 22 / 24 30 / 32 / 40 42	14 / 15 / 18 20 / 22 / 24 30 / 32 / 40 42 / 50 / 60	20 / 25 30 / 40	15 / 16 / 19 20 / 24 / 25 32 / 30 / 38 40 / 48 / 50 60 / 63 / 80	12 / 18 20 / 25 30 / 40	12 18 30	10 / 12 / 15 16 / 19 / 20 24 / 25 / 30 32 / 38 / 40 48 / 50 / 60 63 / 80	15 / 16 / 19 20 / 24 / 25 30 / 32 / 38 40 / 48 / 50 60 / 63 / 80	40 / 50 63 / 80	20 / 25 30 / 32 40 / 50	12 / 14 16 / 20 25 / 30	10 / 12 14 / 18
Guide Bushes	Tol.	Tolerances / Diameters	f6	f6	g6	g6	g6	f6	f6	f6	h4	h5	g6	g6	k6	g6	g6	g6	g6	g6	g6	h3	h3	h4	h4	h3	h3	h3	h3	g6	g6
G25	H7	12 / 15 / 16 / 18 / 20 / 22 / 24 25 / 30 / 32 / 40 / 42 / 50 / 60				★	★								★	★	★	★												★	★
G27	H7	14 / 15 / 16 / 18 / 20 / 22 24 / 25 / 30 / 32 / 40 / 42				★	★								★	★	★	★												★	★
G26	H7	10 / 12 / 14 / 16 / 20 22 / 25 / 30 / 40 / 50				★	★								★	★	★	★												★	★
G40	H7	20 / 25 / 30 / 32 / 40 / 50 63 / 80 / 100 / 125	★	★				★	★	★	★	★			★	★	★	★				★	★	★	★	★	★	★	★	★	★
G41	C9	25 / 32 / 40 / 50 / 63 80 / 100 / 125	★	★				★	★	★					★																
G45	H6	19 / 20 / 24 / 25 / 30 32 / 38 / 40 / 48 / 50	★	★				★	★	★	★	★			★	★	★	★				★	★	★	★	★	★	★	★	★	★
G48	F7	8 / 10 / 12 / 15 / 16 / 18 / 20 / 24 25 / 30 / 35 / 38 / 40 / 42 / 45 / 48 50 / 60 / 80 / 100 / 120 / 150 / 160	★	★				★	★	★					★																
G48.1	H5	10 / 12 / 16			★	★	★								★															★	★
G43	G7	20 / 25 / 32 / 40 / 50 / 63 / 80 / 100	★	★				★	★	★	★	★			★	★	★	★				★	★	★	★	★	★	★	★	★	★
G86	G7	20 / 25 / 32 / 40 / 50 / 63 / 80 / 100	★	★				★	★	★	★	★			★	★	★	★				★	★	★	★	★	★	★	★	★	★
G42	H7	20 / 25 / 30 / 32 / 40 / 42 / 50 52 / 63 / 80 / 100	★	★				★	★	★					★																
G44	H7	20 / 25 / 30 / 32 / 40 / 50 63 / 80 / 100 / 125 / 160	★	★				★	★	★					★																
G29		12 / 18 / 30																						★	★						
G30	H7	10 / 12 / 14 /16 / 18 / 20 / 25 / 30 / 40			★								★	★					★	★	★										
G31	H7	14 / 15 / 18 / 20 / 22 24 / 30 / 32 / 40 / 42			★								★	★					★	★	★										
G32	H7	12 / 14 / 16 / 18 / 20 / 24 / 25 / 30			★								★	★					★	★	★										
G33	H7	16 / 20 / 25 / 30 / 40 / 50									★	★										★	★			★	★	★	★		
G34	H7										★	★										★	★			★	★	★	★		
G33K	H6	19 / 20 / 24 / 25 / 30 / 32 / 38 40 / 48 / 50 / 60 / 63 / 80																													
G34K	H6																														
G35	H6																														
G36	H6																														
G37		15 / 16 / 19 / 20 / 24 / 25 / 30 / 32 38 / 40 / 48 / 50 / 60 / 63 / 80									★											★	★			★	★	★	★		
G38											★											★	★			★	★	★	★		
G167	H4	10 / 12 / 15 / 16 / 19 / 20 / 24 / 25 / 30 32 / 38 / 40 / 48 / 50 / 60 / 63 / 80									★											★	★			★	★	★	★		
G70		10 / 12 / 15 / 16 / 18 / 19 / 20 / 24 / 25 30 / 32 / 38 / 40 / 48 / 50 / 60 / 63 / 80									★											★	★			★	★	★	★		
G81		20 / 25 / 30 / 40 / 50 / 63									★											★	★			★	★	★	★		
G49	H7	12 / 14 / 15 / 16 / 18 / 20 / 22 24 / 30 / 32 / 40 / 50 / 60			★								★	★					★	★	★										
G175		12 / 18 / 20 / 25 / 30									★											★	★	★	★	★	★	★	★		
G74		18 / 20 / 30 / 40									★											★	★	★	★	★	★	★	★		
G75		12 / 18 / 20 / 25 / 30 / 40 / 50									★											★	★	★	★	★	★	★	★		
G77	H7	12 / 14 / 16 / 20 / 25 / 30 / 40			★								★	★					★	★	★										
G72.1		19 / 20 / 24 / 25 / 30 / 32 / 38 40 / 48 / 50 / 60 / 63 / 80									★											★	★			★	★	★	★		
G72.2	H7																														
G72.3	H7										★	★										★	★			★	★	★	★		
G79	H6	40 / 50 / 63 / 80																										★			
G80.1	H7										★											★	★			★	★	★	★		
G80.2	H7																														
G80.3	H7										★	★										★	★			★	★	★	★		
G80.4											★											★	★			★	★	★	★		
G80.5	H7		★	★				★	★	★	★	★			★	★	★	★				★	★	★	★	★	★	★	★	★	★
G61	H7	12 / 14 / 16 / 20 / 25 / 30																												★	

Güvenal GTH

Important:

1- The compatibility chart above is designed to facilitate the selection of Güvenal products.
2- Please pay attention to the tolerances given in the catalogue and chart when selecting.
3- Please check the perpendicularity of the die & mould guiding holes to the plate surfaces on the both core and cavity sides.
4- The working tolerances of the matched products in the chart are produced in such a way that they can work without mounted to the die & mould.
5- If there are problems of diameter & coordinate or perpendicularity in the die & mould due to production, the relevant Guide Pillar / Bush shall not work after mounting.
6- Do not use a sledge hammer or heavy hammer in the mounting of the products. If you are having problems with the installation, check the diameters and cleaning of the respective mounting holes.
7- If you have problems, closing the mould after connecting to the injection machine; check the parallelism of the machine columns and the guide pillars of mould.

★ Advised Guiding Combination for Injection Moulds.
Limited Use for Injection Moulds.
Incompatible
★ Advised Guiding Combination for Press Dies.
Limited Use for Press Dies.

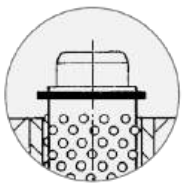
GUIDE BUSH TYPES COMPARISON for DIE-MAKING

PRECISION BALL GUIDES

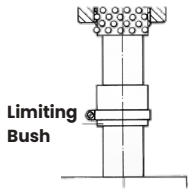
Ball Guides are ideal for axial, radial, and combined movements with normal loads and limited stroke lengths. Their versatility covers a broad range of applications, from die tool and injection mould manufacturing to machine and device construction. This guide system is free from backlash, providing high stability due to pre-tensioned balls. Its design allows for high-speed performance thanks to low rolling friction. The material used for the guide bushings ensures strong guide stability. When paired with hardened precision balls and matching guide pillars, this setup delivers smooth and accurate guidance. The ball cages, made of brass, house a large number of balls, offering a high dynamic load index, which is crucial for extended service life. The precision-ground running surface guarantees superior quality, ensuring tight dimensional and shape tolerances with minimal surface roughness.

Key Features: + High-speed operations. + Maximum precision requirement. + Applications with high radial offset tolerance. + For thin sheet-metals. + Play-free guidance with optimal preload. + Smooth motion from the rolling action of the balls. + Facilitates easy die closure.

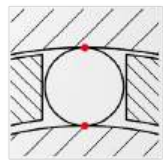
Limitations: - May be overloaded under high shear forces due to point contact. - Stroke/path length is limited.



Standard with Locking Circlip:
As per DIN 471, the locking circlip prevents the cage from slipping through the guide bushing during tool disassembly. During operation, it helps prevent any potential "shifting" of the cage.



Optional – G168:
The Limiting Bush (G168) prevents the cage from shifting. It is positioned over the guide pillar and securely fastened.



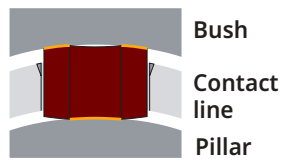
Ball Point

PRECISION ROLLER GUIDES

Precision Roller Guides create a linear contact with the guide bush and guide pillar, resulting in a significantly higher load-carrying capacity for each roller compared to a ball-cage of the same diameter. The profile rollers are arranged in a spiral pattern along the axis, ensuring each roller moves along its own unique path. The cages are designed with grooves to accommodate a DIN 471 circlip.

Key Features: + Ideal for high-speed operations + Suitable for applications requiring maximum precision + Offers greater stiffness compared to ball cages + Well-suited for Fine Blanking due to its ability to withstand high shear forces + Suitable for IML Injection Moulds + Reduced wear due to the axial offset of the rollers + Optimized inlet geometry ensures smooth roller entry + Play-free guidance achieved through optimal preload.

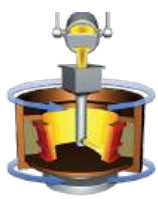
Limitations: - Can be used for axial motions only - Stroke/path length is limited. - More expensive than the ball guides.

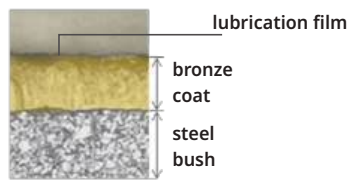


BRONZE COATED SLIDING GUIDES

For long strokes and possible extension of the pillar out of the bush, with a limited sliding speed of 30 m/min (i.e. low to medium stroke frequencies). This guide type features a steel body with a bronze-coated running surface, including a helical oil groove and a lubricating nipple for continuous lubrication. The steel body offers high stability under side and edge loads, thanks to its high tensile strength. The 0.25 to 0.30mm bronze layer ensures optimal running-in, minimal play, and excellent emergency running properties. Continuous lubrication with grease is required for reliable operation. The precision-ground surface offers high dimensional and shape accuracy with minimal roughness.

Key Features: + Ideal for thick sheet-metals due to the high shear forces. + Long lifespan and high load capacity – the use of premium materials and high-precision machining ensures the top quality of the guides. + Stroke/path is not limited / suitable with all large strokes extension of the pillar is possible. + The circumferential oil groove ensures perfect lubrication – also in case of short strokes.





GUIDE BUSH TYPES COMPARISON for DIE-MAKING

STEEL SLIDING GUIDES

Steel sliding guides are designed for long axial or combined oscillating movements (axial/radial) and as locking systems. They are robust, durable, and capable of handling high loads while offering good wear resistance across various conditions.The sliding speed is limited to 30 m/min. Güvenal's high-precision slide guides consist of a guide pillar and corresponding guide bush, with tight manufacturing tolerances ensuring minimal clearance for high-precision guidance. The circumferential oil groove provides optimal lubrication, even with short strokes. After initial lubrication, it gradually enters the sliding zone during operation, with the lubricating rings covering 25-35% of the total guiding surface. **Key Features: +** Suitable for high shear forces. **+** Ideal for short stroke rates.
Limitations: - Steel may generate higher friction compared to other materials.

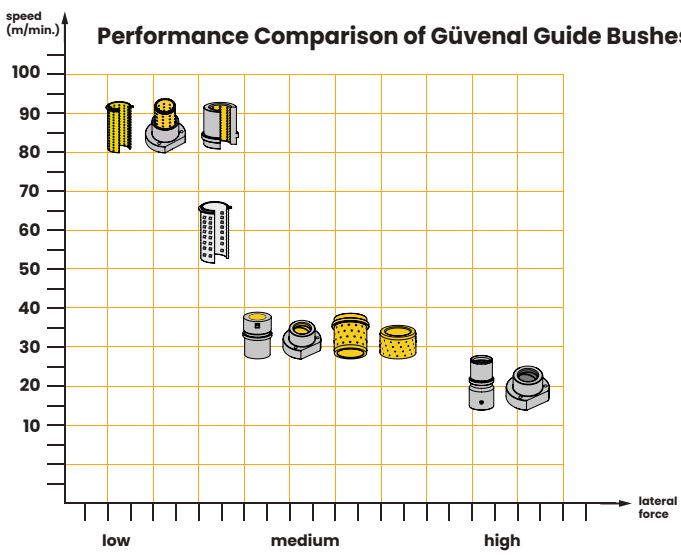
SOLID BRONZE SLIDING GUIDES with GRAPHITE INSERTS

These bushes offer excellent wear and friction resistance, reducing the need for external lubrication. They are ideal for low-speed applications with moderate loads. The graphite contact surface covers 25% to 35% of the total working area. Our maintenance-free sliding elements, used in dies / moulds and machines for linear and rotary movements, provide long-term reliability. The base material is enhanced with solid lubricant depots, ensuring lubrication after a one-time initial application. These sliding elements remain maintenance-free for extended periods. The range of applications for this product is vast, and we can also offer customized designs according to your specific requirements.
Key Features: + Suitable for large sheet-metal thickness. **+** Ideal for moderate stroke rates. **+** Effective for medium shear forces. **+** Optimal self-lubrication through graphite inserts. **+** No stroke/path limitations – pillar extension is possible. **Limitations: -** Continuous wear of the solid lubricant.

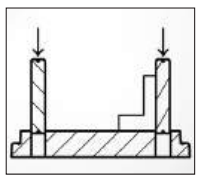
Selecting the Optimal Guide Bush Type for Your Application

Requirements	Guide Bush Type				
	Ball Guides	Roller Guides	Bronze Coated	Steel S. Guides	Bronze + Graphite
Load capacity / heavy loads	+	++	++	+++	+++
Impact load / vibration	-	+	++	++	++
High stroke speed	+++	+++	-	-	-
Large stroke - path	+	+	+++	++	+++
Smooth movement / low friction	+++	++	+	+	+
Wear resistance	+++	+++	+	++	++
Accuracy	+++	+++	+	+	+
Small cutting clearance	+++	++	+	+	+
Dust and contamination resistance	-	-	+	+	++

+++ = excellent ++ = good + = sufficient - = not good

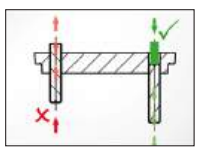


Instructions

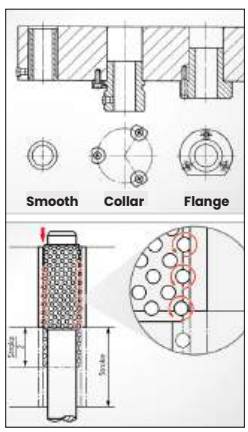


Installation Instructions for Guide Pillars:

1. Clean the boreholes in both the top and bottom parts thoroughly.
2. Apply oil (not grease) to the boreholes.
3. Insert the guide pillars into the top part.
4. Place plane-parallel ground bars between the upper and lower parts.
5. Drive the pillars approximately 3 mm into the bottom part.
6. Use a hydraulic press or manual spindle press to insert the pillars.



Disassembly of Guide Pillars:
To avoid surface damage to both the guide pillars and mounting bores, never eject the pillars via the running surface.



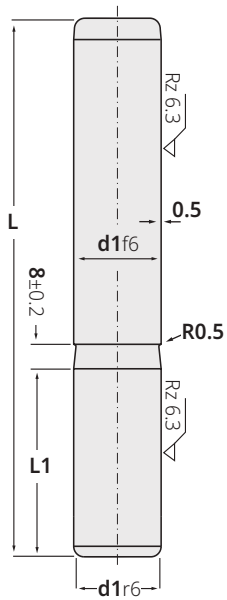
Installation Instructions for Guide Bushes:
Do not press the bushes as this may deform the internal diameter.
For security, smooth bushes should be secured in the mounting bore using Loctite 648 adhesive. Ensure adhesive surfaces are completely free of grease. For flange bushes and guide bushings with collars, press the collar and flange surfaces (rectangularly ground to fit the guide bore) firmly against the plate using clamps or screws. Ensure guides are lubricated with a proper lubricating film. Frame plates must be aligned parallel to each other. When assembling roller guides, ensure that the rollers or balls perform a rolling motion, not sliding.

Tolerance and Hardness Data for Guide Units
Please refer to the Technical Data section at the end of the catalogue for the Tolerances and Hardness Tables of Guide Units. Alternatively, visit the *"Document Centre"* → *"Technical Support Centre"* section at **www.guvenal.net**

Code: **G09**

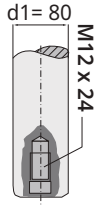
Guide Pillar for Large Dies
DIN 9833

Standard Series
d= 25 - 32 - 40 - 50 - 63

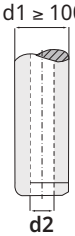


FORM - A
d1= 25 - 63

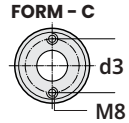
FORM - B
d1= 80



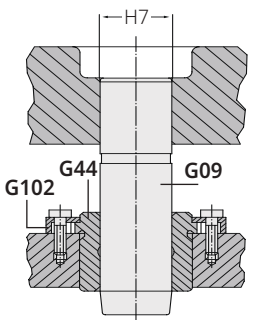
d1 ≥ 100



FORM - C



DIN 9833 / ISO 9182-3



Mounting Example

Heavy Duty Type for Dies

Practises: Ground surface is holeless up to Ø d = 80 and Ø 80 = M12 X 24 mm has one lifting hole. From Ø d100, it has hollow (d2) and have 2 pieces M8 X 24 mm lifting holes.
Note: Hole tolerance should be H7.
It is recommended to use guide pillar only with self-lubricating guide bushes.
Compatible Bushes:
Self-lubricating bronze guide bushes.

d1	L	d2 Hole	d3	L1	Form
25	125	-	-	40	A
	140				
	160				
	180				
	200				
	224				
32	140	-	-	45	A
	160				
	180				
	200				
	224				
	250				
40	140	-	-	56	A
	160				
	180				
	200				
	224				
	250				
	280				
50	160	-	-	70	A
	180				
	200				
	224				
	250				
	280				
	315				
	355				
63	180	-	-	80	A
	200				
	224				
	250				
	280				
	315				
	355				
	400				

d1	L	d2 Hole	d3	L1	Form
80	200	-	-	100	B
	224				
	250				
	280				
	315				
	355				
	400				
	450				
	500				
100	224	50	72	125	C
	250				
	280				
	315				
	355				
	400				
	450				
	500				
	560				
125	315	65	90	140	C
	355				
	400				
	450				
	500				
	560				
160	400	95	132	180	C
	450				
	500				
	560				

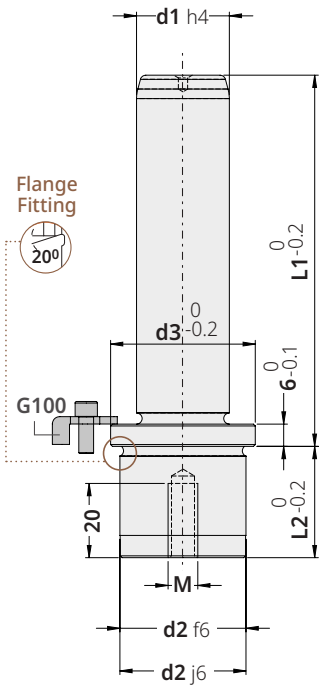
Operating Components:
Self-lubricating guide bushes are recommended.

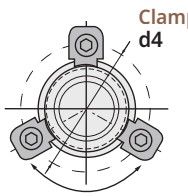
Order: **G09.** d1 x L

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Code: **G15**

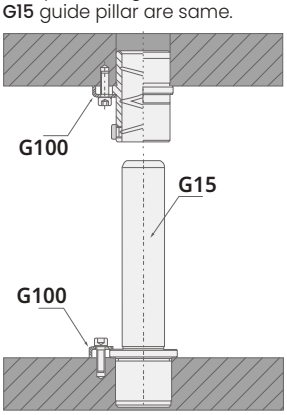
Guide Pillar, Thickbacked





Mounting Example

External diameter of bush and rear positioning diameter of the **G15** guide pillar are same.



d1	L1	d2	d3	L2	d4 Clamp	M
20	100	28	34	23	46.2	M8
	125					
	140					
	160					
	180					
	200					
25	100	34	39	30	51.4	M8
	125					
	140					
	160					
	180					
	200					
	220					
	240					
30	125	39	44	37	56.6	M8
	140					
	160					
	180					
	200					
	220					
	240					
	260					
	315					

Flange Fitting: It is perpendicular angle locating on to die plate surface.

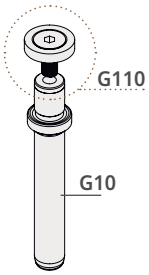
Operating Components: G100
G33- G34 - G35 - G36 - G40 - G42

Order: **G15.** d1 x L1

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Advantageous Product:

It is used as guiding component at dies and blow moulds.
Pillar mounting diameter and bush mounting diameter have the same tolerance value. In machining of guide pillar / bush holes on dies with the advantage of using same cutting tool (drill / reamer) for both guide pillar & bushes hole.
Thus, the necessity of using different cutting tools will disappear.

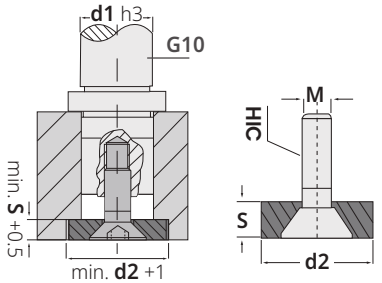


Mounting Flange

Code: **G110**

Guide pillar fixation & Support washer

- Reliable product used for guide pillar with centre collar mountings min. d3 + 1
- It can also be used to support for ejector plates in injection moulds / etc.



d2	d1 Pillar Diameter	S Flange	M Screw
22	Ø 15 / 16	5.5	M8 x 20
25	Ø 19 / 20		
32	Ø 24 / 25		
40	Ø 32 / 30	7.5	
50	Ø 38 / 40	9.5	
60	Ø 48 / 50		
73	Ø 60 / 63		
93	Ø 80	12	M12 x 20

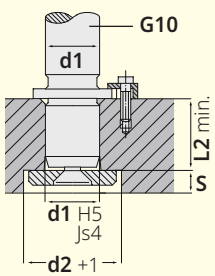
Order: **G110.** d2

Technical Info

Mounting Dimensions and Tolerances of Demountable Die Guide Pillars

Dimensions Given: Recommended (suggestion) for **G10** Guide pillar.

Mounting System: Soft tight fitting system has been selected and determined for **G10** Guide pillar.

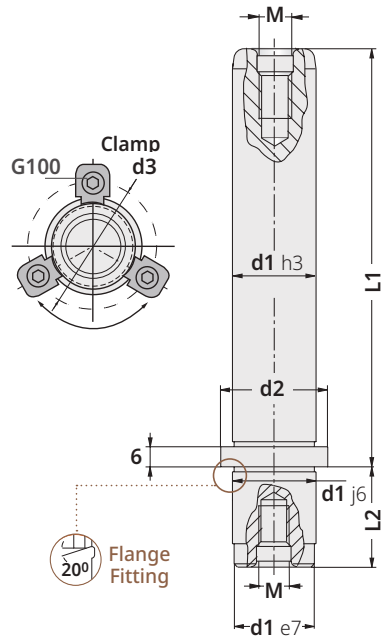


d1	d1 H5	d2 +1	L2	S
15 / 16	+0.008	22	14.5	5.5
19 / 20	+0.009	25	17.5	5.5
24 / 25	+0.009	32	24.5	5.5
30 / 32	+0.011	40	29.5	7.5
38 / 40	+0.011	50	27.5	9.5
48 / 50	+0.013	60	37.5	9.5
60 / 63	+0.013	80	37.5	9.5
80	+0.013	95	48	12

Code: **G10**

Guide Pillar with Centre Collar

DIN 9825 / ISO 9182-5



Flange Fitting: It is perpendicular angle locating on to die plate surface.

Technical Info

It can be inserted directly to the holes which opened on the die plate. During mounting please avoid tight fitting. It can be positioned via soft-tight fitting to the holes and clamps or mounting flange with suitable tolerances or also with chemicals.

* Refer to the mounting measurement tolerance table on the ***Page 58-61*** for correct fitting of guide pillar to the die plate.

Please do not use two products without oil grooved together. One of the products should be with oil grooved.

Die Producers: Should pay attention to choose products suitable to the tolerances / standards in guide pillar & bush selection.
To prevent incorrect closing of dies, three pieces main dimension and one piece auxiliary dimension can be used:
(15 - 19 - 24 - 32 - 38 - 48 - 60)

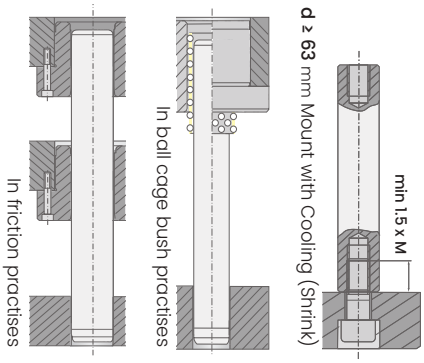
For precision and safe mounting: G110 mounting flange.

d1	L1	L2	d2	d3 Clamp	M
15 **16**	100 112 125 140 160 180 200 220 250 300	20	22	33	M8
19 **20**	100 112 125 140 160 180 200 220 250 300 320	23	25	36.4	M8
24 **25**	100 112 125 140 160 180 200 224 250 320 350	30	32	44	M8
32 **30**	112 125 140 160 180 200 224 250 280 315 350 400	37	40	52.4	M8
38 **40**	125 140 160 180 200 224 250 280 315 355	37	50	62.8	M8
48 **50**	140 160 180 200 224 250 280 315 355 400	47	63	76	M8
60 **63**	160 180 200 224 250 280 315 355 400	47	80	93.2	M8
80	200 224 250 280 315 355 400	60	95	108.4	M 12

Operating Components:
All sliding systems also can be used with ball cage bush.

Order: **G10.** d1 x L1

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC

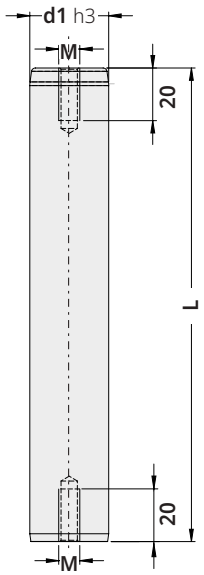


Guide Pillar, Plain & Threaded

Code: **G24**

DIN 9825 / ISO 9182

d1	L	M
NEW 10 12	90 100 112 125 140	-
15 16	90 100 112 125 140 160 180 200	M8
19 20	100 112 125 140 160 180 200 224 250	M8
24 25	100 112 125 140 160 180 200 224 250 280 315	M8
30 32	112 125 140 160 180 200 224 250 280 315	M8
38 40	125 140 160 180 200 224 250 280 315 355 400	M8
48 50	140 160 180 200 224 250 280 315 355 400	M 12
60 63	200 224 250 280 315 355 400	M 12
80	250 280 315 355 400 450 500	M 16



Technical Info

Section (d), two different products are to avoid incorrect closing of die during mounting, three pieces main dimension and one piece auxiliary should be used:
(d= 15 - 19 - 24 - 32 - 38 - 48 - 60 mm).

If extreme lateral forces are occurred at dies, in these cases self-lubricating wear plates should be used with pillars.

Order: **G24.** d1 x L

Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Operating Components:
All sliding systems also can be used with ball cage bush.

3D CAD FILES GUVENAL — Download www.guvenal.net

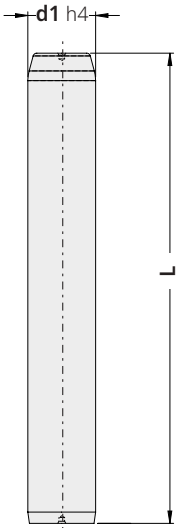
3D CAD - Formats: CATIA, STEP, IGES 3D, X_T

Guide Pillar

Code: **G19**

DIN 9825 / ISO 9182

d1	L
12	100 125
18	125 160
30	160 240

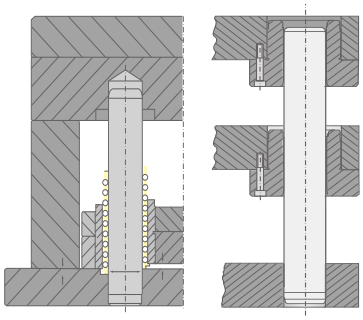


* In-die auxiliary guide pillar

* Guide pillars for ejector plate in injection moulds

Order: **G19.** d1 x L

Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC



Technical Info

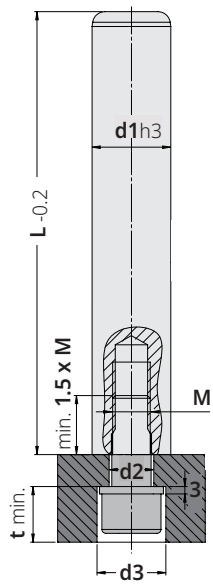
It is used as auxiliary guiding component in dies or progressive die plates. It can be used with all sliding system or ball cage bush tools. When precision and iterative high speeds are required in injection mould ejector plates, it is suitable to use together with ball cage tools and also with sliding and self-lubricating guide bush components.

Code: **G166**

Guide Pillar - Bolted Type

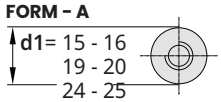
DIN 9825 / ISO 9182 - 2

G166 is supplied with a screw and washer.

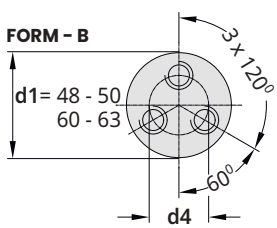


Hole pattern for pillar fastening:

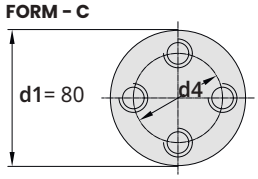
FORM - A



FORM - B



FORM - C



3D CAD FILES GUVENAL — Download www.guvenal.net

3D CAD - Formats: CATIA, STEP, IGES 3D, X_T

d1	d2	d3	d4	t min.	M	L	Screw	Form
15 **16**	9	17	-	12	M8	90 100 112 125 140 160 180 200	M8 x 35	**A**
19 **20**	11	20	-	14	M10	100 112 125 140 160 180 200 224 250 280 315	M10 x 40	**A**
24 **25**	14	22	-	16	M12	100 112 125 140 160 180 200 224 250 280 315	M12 x 40	**A**
30 32	18	28	-	20.5	M16	125 140 160 180 200 224 250 280 315 355	M16 x 40	**A**

Technical Info

Section (d), two different products are to avoid incorrect closing of die during mounting, three pieces main dimension and one piece auxiliary should be used:
(d= 15 - 19 - 24 - 32 - 38 - 48 - 60 mm).

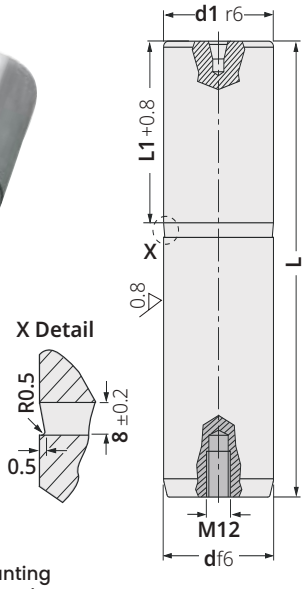
If extreme lateral forces are occurred at dies, in these cases self-lubricating wear plates should be used with pillars.

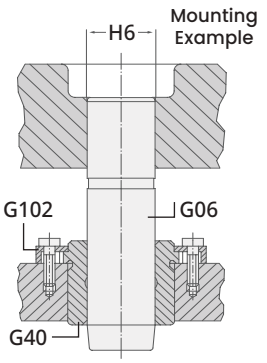
d1	d2	d3	d4	t min.	M	L	Screw	Form
38 **40**	18	28	-	20.5	M16	160 180 200 224 250 280 315 355 400 450	M16 x 40	**A**
48 **50**	14	22	28	16	M12	180 200 224 250 280 315 355 400 450 500	M12 x 50	**B**
60 63	18	28	34	20.5	M16	250 280 315 355 400 450 500	M16 x 60	**B**
80	18	28	54	20.5	M16	280 315 355 400 450 500 550 600	M16 x 60	**C**

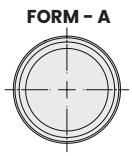
Order: **G166.** d1 x L

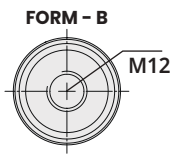
Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Operating Components:
All sliding systems also can be used with ball cage bush.









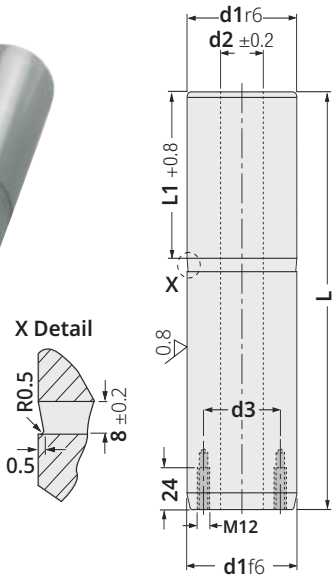
Guide Pillar / DIN 9833

Code: **G06**

d1	L	L1	Form
32	160	45	**A**
	180		
	200		
40	200	56	**A**
	224		
	240		
50	224	70	**A**
	250		
	280		
63	250	80	**A**
	280		
	315		
80	250	100	**A**
	280		
	315		
	355		
100	315	125	**A**
	355		
	400		
125	355	140	**A**
	400		
	450		
	500		
	550		

Order: **G06.** d1 x L

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC



Guide Pillar / DIN 9833

Code: **G07**

d1	L	d2	d3	L1
80	250	40	58	100
	280			
	315			
	355			
100	315	50	72	125
	355			
	400			
125	355	65	90	140
	400			
	450			
	500			
	550			

Order: **G07.** d1 x L

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Customised Guide Units
Upon request, Güvenal manufactures highly complex and precise guide elements based on customer specifications and provides measurement protocols if needed. This includes both the reworking of catalogue products and the production of entirely new items.

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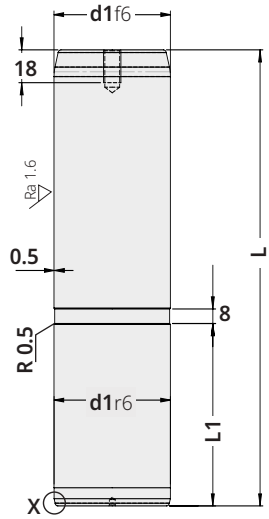
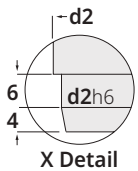
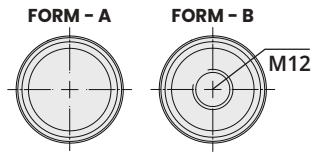
3D CAD - Formats: CATIA, STEP, IGES 3D, X_T







Guide Pillar Reference: WDX

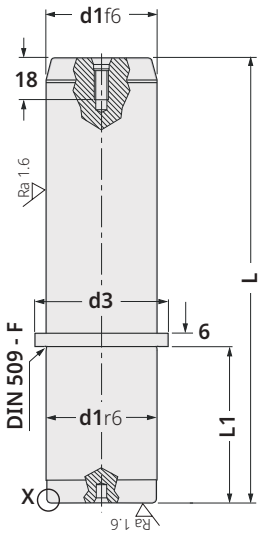
Code: **G02**

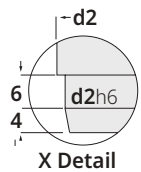
d1	L	L1	Form
25	140	40	A
	160		
	180		
32	140	45	A
	160		
	180		
	200		
40	160	56	A
	180		
	200		
	224		
	250		
50	160	70	A
	180		
	200		
	224		
	250		
	280		
	315		

d1	L	L1	Form
63	220	80	A
	224		
	250		
	280		
	315		
	355		
	400		
80	250	100	B
	280		
	315		
	355		
	400		
	500		
100	315	125	B
	355		
	400		
	500		

Order: **G02.** d1 x L

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC





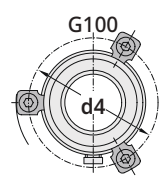
Guide Pillar with Centre Collar

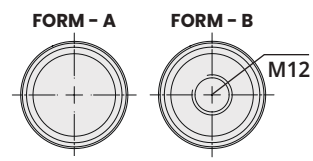
Code: **G01**

Reference: **WDX**

d1	L	d3	L1	Form
25	140	33	40	A
	160			
	180			
32	140	40	45	A
	160			
	180			
	200			
40	160	50	56	A
	180			
	200			
	224			
	250			
50	160	60	70	A
	180			
	200			
	224			
	250			
	280			
	315			

d1	L	d3	L1	Form
63	220	80	80	A
	224			
	250			
	280			
	315			
	355			
	400			
80	250	90	100	B
	280			
	315			
	355			
	400			
	500			
100	315	110	125	B
	355			
	400			
	500			

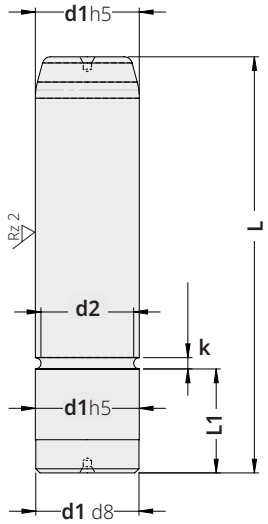




d1	25	32	40	50	63	80	100
d4	45.2	52.4	62.8	73	93.2	103.4	123.4

Order: **G01.** d1 x L

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC



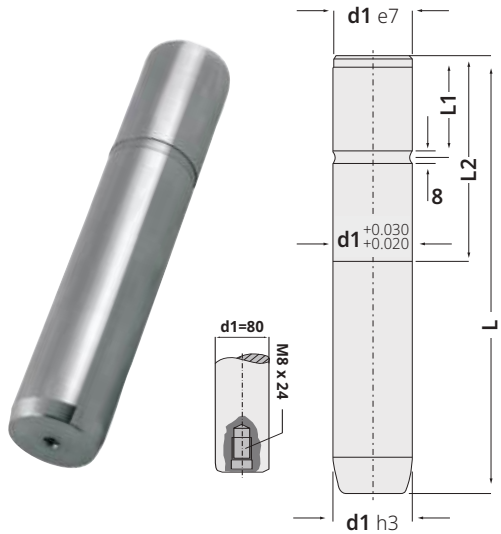
Guide Pillar Reference: **CNOMO** Code: **G03**

Order Code	d1	L	d2	L1	k
G03 25100	25	100	22.3	25	2.7
G03 25125		125			
G03 25140		140			
G03 25160		160			
G03 25180		180			
G03 25200		200			
G03 25224		224			
G03 32125	32	125	27.8	32	4.2
G03 32140		140			
G03 32160		160			
G03 32180		180			
G03 32200		200			
G03 32224		224			
G03 32250		250			
G03 40180	40	180	35.8	63	4.2
G03 40200		200			
G03 40224		224			
G03 40250		250			
G03 40280		280			
G03 40315		315			

Material: 1.1213 (Cf53) / **Hardness:** 58 - 62 HRC

Order Code	d1	L	d2	L1	k
G03 50220	50	220	45.8	80	4.2
G03 50224		224			
G03 50250		250			
G03 50280		280			
G03 50315		315			
G03 50355		355			
G03 50400		400			
G03 63250	63	250	56.8	100	6.2
G03 63280		280			
G03 63315		315			
G03 63355		355			
G03 63400		400			
G03 63450		450			
G03 63500		500			
G03 80315	80	315	73.8	125	6.2
G03 80355		355			
G03 80400		400			
G03 80450		450			
G03 80500		500			
G03 100355	100	355	93.8	160	6.2
G03 100400		400			
G03 100450		450			
G03 100500		500			

For the compatibility chart of Guide Pillars and Bushes, please refer to the "Guiding Components – Technical Information" section at the beginning of Category 2.



Code: **G20**

Guide Pillar for Cast Block Bush

G20 Guide pillar type using with **G80** rectangular flange cast bush. **In progressive form dies, it is reduced disassembly / assembly period of guide pillar & bush. No need to opening of guide pillar & bush holes in die is required.** It reduces labor cost and also saves time by shortening production period of die.
These are die components consisting of guide bush set inserted into lower and upper case.

d1	L	L1	L2
40	180	37	77
	220		
	260		
	300		
	355		
	400		
50	200	47	95
	240		
	280		
	315		
	355		
	400		
	450		

d1	L	L1	L2
63	240	60	120
	280		
	315		
	355		
	400		
	450		
80	240	60	120
	280		
	315		
	355		
	400		
	450		
	500		

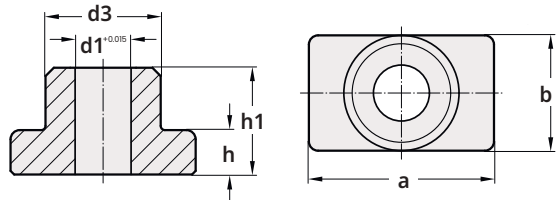
Order: **G20.** d1 x L
Cast Bush: **G79.** d1

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC

IMPORTANT:
Check perpendicularity of guide pillars after mounting.

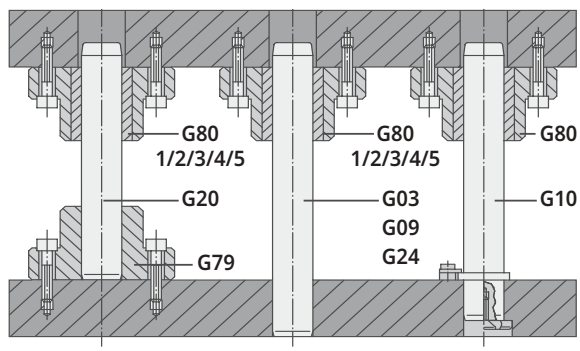
Code: **G79**

Flange Cast Bush - Rectangular



d1	d3	a	b	h	h1
40	80	130	80	30	77
50	96	160	96	35	95
63	110	180	110	35	120
80	130	215	130	40	120

Note: Other guide pillars conforming to rectangular flange cast bush connection.
It can be used with **G03 - G09 - G24 - G10 - G20** in dies.



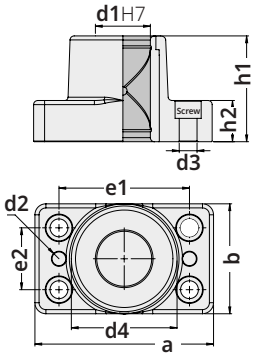
Flange Cast Bush Rectangular
Inner has been honed to Ød +0.015
Dimension details of rectangular flange cast bush are same as other bushes (G80..)

Order: **G79.** d1

d1	a	b	h1	h2	d2	d3	d4	e1	e2	Screw
40	130	80	77	30	10	13	70	95	45	12
50	160	96	95	35	10	15	83	118	55	14
63	180	110	120	35	12	17	94	132	62	16
80	215	130	120	40	14	21	112	160	75	20

Order: **G80-1.** d1

Set Upon request
G20 + G79 + G80.1

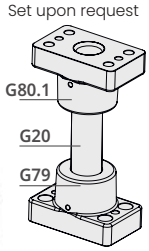


Flange Cast Bush Rectangular

Code: **G80 - 1**

Steel Type

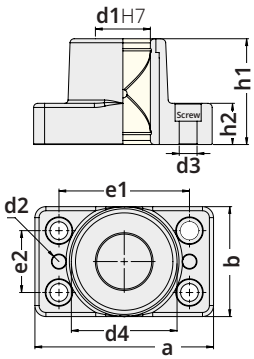
Set upon request



d1	a	b	h1	h2	d2	d3	d4	e1	e2	Screw
40	130	80	77	30	10	13	70	95	45	12
50	160	96	95	35	10	15	83	118	55	14
63	180	110	120	35	12	17	94	132	62	16
80	215	130	120	40	14	21	112	160	75	20

Order: **G80-2.** d1

Set Upon request
G20 + G79 + G80.2

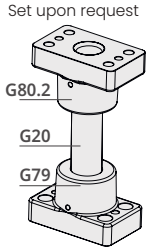


Flange Cast Bush Rectangular

Code: **G80 - 2**

Bronze Type

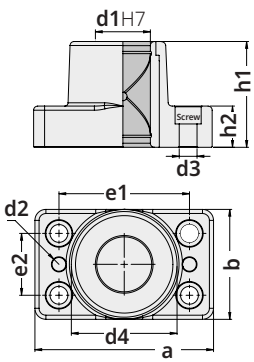
Set upon request



d1	a	b	h1	h2	d2	d3	d4	e1	e2	Screw
40	130	80	77	30	10	13	70	95	45	12
50	160	96	95	35	10	15	83	118	55	14
63	180	110	120	35	12	17	94	132	62	16
80	215	130	120	40	14	21	112	160	75	20

Order: **G80-3.** d1

Set Upon request
G20 + G79 + G80.3

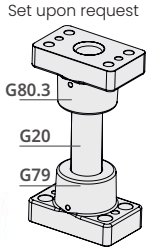


Flange Cast Bush Rectangular

Code: **G80 - 3**

Cast Type

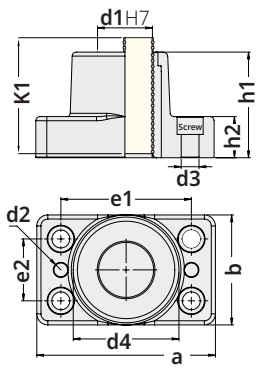
Set upon request



d1	a	b	h1	h2	d2	d3	d4	e1	e2	K1	Screw
40	130	80	77	30	10	13	70	95	45	80	12
50	160	96	95	35	10	15	83	118	55	105	14
63	180	110	120	35	12	17	94	132	62	140	16
80	215	130	120	40	14	21	112	160	75	140	20

Order: **G80-4.** d1

Set Upon request
G20 + G79 + G80.4 + G70

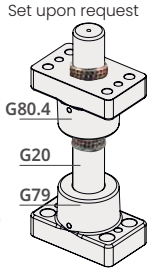


Flange Cast Bush Rectangular

Code: **G80 - 4**

Ball Cage Type

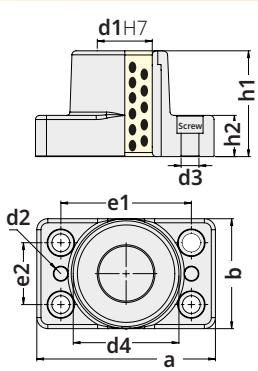
Set upon request



d1	a	b	h1	h2	d2	d3	d4	e1	e2	Screw
40	130	80	77	30	10	13	70	95	45	12
50	160	96	95	35	10	15	83	118	55	14
63	180	110	120	35	12	17	94	132	62	16
80	215	130	120	40	14	21	112	160	75	20

Order: **G80-5.** d1

Set Upon request
G20 + G79 + G80.5

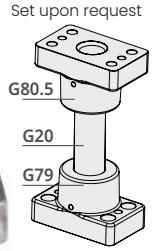


Flange Cast Bush Rectangular

Code: **G80 - 5**

Self-Lubricating Type

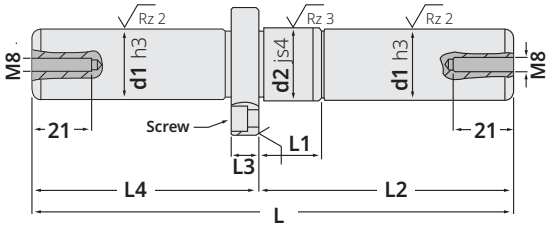
Set upon request

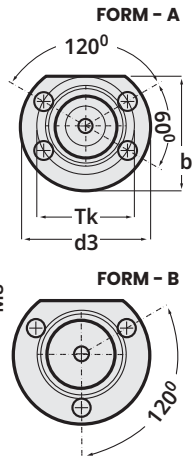


Code: **G135**

Guide Pillar with Centre Flange

(Screw clamping guide pillar with centre collar)





d1	L	L1	L2	L4	L3	d2	d3	b	Tk	Screw	Form
20	150	22	80	70	10	22	44	39	33	M5 4 pcs.	**A**
	160		90	70							
	180		90	90							
	200		90	110							
25	170	22	90	80	10	26	50	45	38	M5 3 pcs.	**B**
	190		110	80							
	210		120	90							
	190		90	100							
	200		100	100							
	260		160	100							
	220		100	120							
30	190	27	100	90	10	32	58	53	46	M5 3 pcs.	**B**
	200		110	90							
	260		160	100							
	220		110	110							
	230		120	110							
	250		120	130							
	260		130	130							
32	190	27	100	90	10	34	60	55	48	M5 3 pcs.	**B**
	200		110	90							
	260		160	100							
	220		110	110							
	230		120	110							
	250		120	130							
	260		130	130							
40	210	27	110	100	12	42	70	65	56	M6 3 pcs.	**B**
	220		120	100							
	240		120	120							
	250		130	120							
	270		130	140							
50	250	36	120	130	15	52	80	75	66	M6 3 pcs.	**B**
	260		110	150							
	270		120	150							

Order: **G135.** d1 x L2 x L

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC

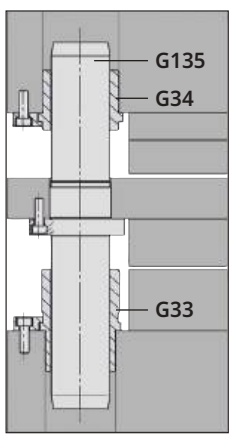
Guide Pillar with Centre Flange

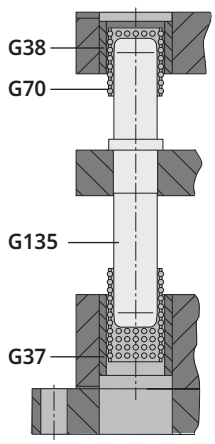
It can be used in standard pillar systems with many bearing bush connections. No clamping is necessary for die mounting position. It is fixed with hexagon socket head cap screws. The feature of centre flange: The protruding parts near the plate is prevented and a partial empty area is obtained in die mounting. It can be directly mounted in slots drilled on die plate. Shrink fit punchdown should not be done during mounting. It can be inserted with compatible tolerances with medium / shrink fit (bushes) and positioned with screws.

Compatible Bushes

Guide Pillar with Centre Flange
(Ball cage bearing unit)

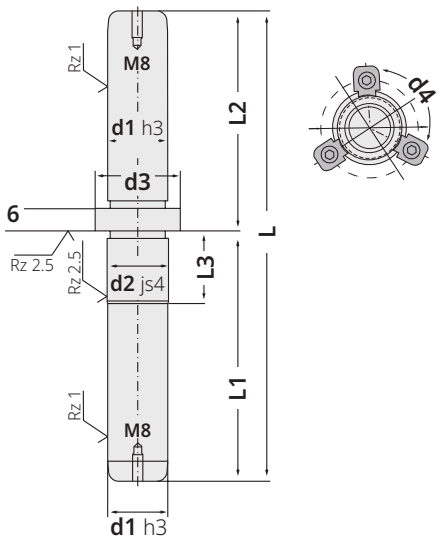
Dies which are designed with this ball cage bush have high speed and rigid connection.
Hole tolerance for shrink fit is N5.
Fixing place of die guide pillar affects securing lateral load resistance of die bushings.
In dies with guide plates or having guide pillar mounted to die from bottom or top, if the distance (L) applying power is equal, bending and rotary values of guide pillars are equal.
By securing die guide pillar to the guide plate there will be important improvements at bending values of pillars. Until the distance (L / 2) between application point of power and fastening surface reduces to half, load lifting capacity is increased 8 times.





Code: **G08**

Guide Pillar with Centre Fixing



Compatible Bushes

d1	L	L1	L2	L3	d2	d3	d4
20	160	90	70	19	20.05	26	37.6
	170	100					
	180		80				
	190	110					
	200		90				
	210		100				
25	180	100	80	22	25.05	32	44
	190	110					
	200		90				
	210	120					
	220		100				
	230		110				
30	180	100	80	25	30.05	38	50.4
	190	110					
	200		90				
	210	120					
	220		100				
	230	130					
	240		110				
	250	140					
40	200	110	90	27	40.05	50	62.8
	210	120					
	220		100				
	230	130					
	240		110				
	250	140					

Order: **G08.** d1 x L

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC

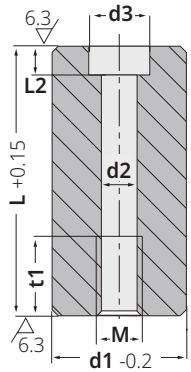
Hole tolerance for shrink fit is N5. Fixing place of die guide pillar affects securing lateral load resistance of die bushings. In dies with guide plates or having guide pillar mounted to die from bottom or top, if the distance (L) applying power is equal, bending and rotary values of guide pillars are equal. By securing die guide pillar to the guide plate, there will be important improvements at bending values of pillars. Until the distance (L / 2) between application point of power and fastening surface reduces to half load lifting capacity is increased 8 times.

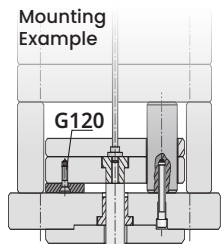
Support Pillar for Injection Mould

(Ejector plate / thrust wedge)

Code: **G21**

d1	L	d2	d3	L2	t1	M
32	47	6.5	11	7.5	15	M8
	57					
	67					
	77					
	87					
	97					
40	47	8.5	15	10	20	M10
	57					
	67					
	77					
	87					
	97					
	117					
50	47	8.5	15	10	20	M10
	57					
	67					
	77					
	87					
	97					
	117					
63	57	8.5	15	10	20	M10
	67					
	77					
	87					
	97					
	117					
	137					
	157					
80	57	10.5	18	12	25	M12
	67					
	77					
	87					
	97					
	117					
	137					
	157					

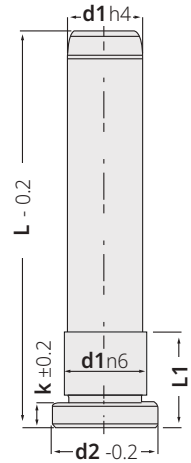




In injection moulds;

The thrust wedge that can be used in order to avoid dent load between support plate (H4) and bottom joint plate (H5A) also can be provided working of ejector plates more rigidly and sensitively. In order to avoid clicking (gap) **G110 mounting flange** can be used.

Order: **G21.** d1 x L



Guide Pillar for Ball Cage

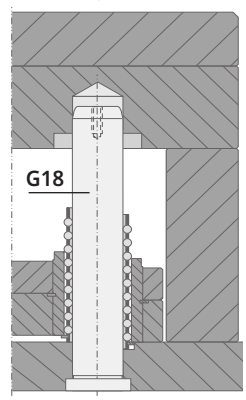
Code: **G18**

It is used in ejector plates of injection moulds and ejector plates with ball cage bush working precision and serially. In addition, it is compatible to work with intermediate plate of progressive dies / dies as auxiliary centering component.

d1	L	L1	d2	k
12	80	17	16	4
	100			
	120			
18	120	22	22	6
	140			
	160			
20	120	22	24	6
	140			
	160			
	200			
25	140	27	28	6
	160			
	200			
	240			
30	160	36	36	6
	200			
	240			
40	180	45	48	10
	200			
	240			
	300			

Compatible Bushes

Mounting Example



Order: **G18.** d1 x L

Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

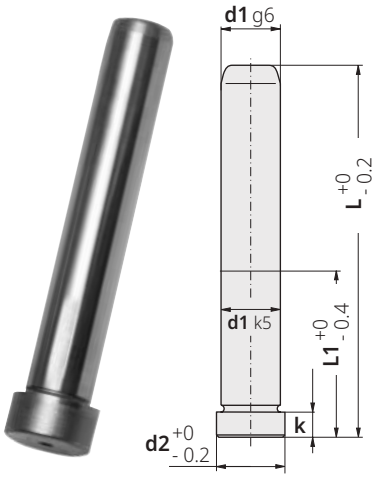
G18 - Areas of Usage:

* In ejector plates, ball cage bush precision ejector systems.
* It is used in dies as intermediate centering components.

3D CAD FILES GUVENAL

Download www.guvenal.net

3D CAD - Formats: CATIA, STEP, IGES 3D, X_T



Guide Pillar
(without oil groove)

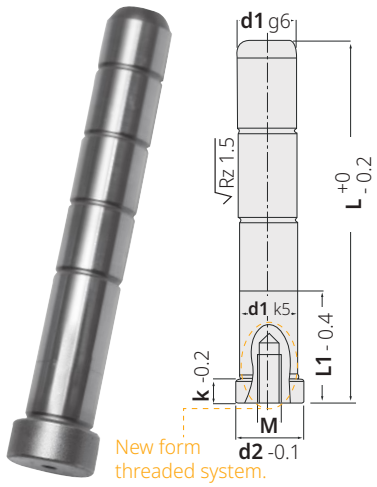
Code: **G17**

d1	L	L1	d2	k
10	40	13	12	3
	60			
	80			
	100	15		
	120			
12	40	18	16	6
	60			
	80			
	100			
	120	22		
	140			
	160			
14	60	22	18	8
	80			
	100			
	120			
	140	26		
	160			
	180			
16	40	16	20	8
	60	24		
	80			
	100			
	120			
	140	26		
	160			
	180			
	200			
18	60	26	22	8
	80			
	100			
	120			
	140	28		
	160			
	180			
	200			
	240			
20	60	28	24	8
	80			
	100			
	120			
	140			
	160	32		
	180			
	200			
	240			
22	80	37	26	15
	100			
	120			
	140	43		
	160			
	180			
	200			
	220			
	240			
	300			
24	80	39	28	15
	100			
	120			
	140	45		
	160			
	180			
	200			
	220			
	240			
	300			
25	80	35	28	15
	100			
	120			
	140			
	160	44		
	180			
	200			
	220			
	240			
	300			
30	100	45	36	15
	120			
	140			
	160			
	180	53		
	200			
	220			
	240			
	300			
40	160	55	48	15
	180			
	200			
	220	63		
	240			
	280			
	300			
	320			
	360			
50	160	65	58	15
	200			
	240			
	300			
	360			

Order: **G17.** d1 x L

Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Operating Components: with all lubricated type bushes in injection moulds /dies.



Guide Pillar
(with oil groove)

Code: **G11**

It can be fixed by thread in cap direction. By disassembling mould / die without dismantling, it provides process iteration advantage. The corners at oil grooves are chamfered (it reduces friction).

d1	L	L1	d2	k	M
10	40	13	12	3	-
	60				
	80				
	100	15			
	120				
12	40	18	16	6	-
	60				
	80				
	100				
	120	22			
	140				
	160				
14	60	22	18	8	-
	80				
	100				
	120				
	140	26			
	160				
	180				

d1	L	L1	d2	k	M
16	40	16	20	8	6
	60	24			
	80				
	100				
	120				
	140	26			
	160				
	180				
	200				
	220				
	250				
	300				
18	60	26	22	8	8
	80				
	100				
	120				
	140	28			
	160				
	180				
	200				
	240				
20	60	28	24	8	8
	80				
	100				
	120				
	140				
	160	32			
	180				
	200				
	220				
	240				
	250				
	300				
	320				
22	80	37	26	15	8
	100				
	120				
	140	43			
	160				
	180				
	200				
	220				
	240				
	300				

d1	L	L1	d2	k	M
24	80	39	28	15	8
	100				
	120				
	140	45			
	160				
	180				
	200				
	220				
	240				
	300				
25	80	35	29	10	8
	100				
	120				
	140				
	160	44			
	180				
	200				
	220				
	250				
	300				
	320				
	350				
30	100	45	36	15	8
	120				
	140				
	160				
	180	53			
	200				
	220				
	240				
	300				
	360				
	400				
40	160	55	48	15	8
	180				
	200				
	220	63			
	240				
	280				
	300				
	320				
	360				
50	160	65	58	15	8
	200				
	240				
	300	73			
	360				

IMPORTANT!

Injection Mould: Our guide pillars & bushes cover standard mould systems. But, guide pillar & bushes with different tolerances should be selected for aluminum injection moulds (high temperature / pressure). It should be requested from our company (production with special materials).

ATTENTION !

Please do not use two products together that have no oil grooves.
One of these products should be oil grooved.

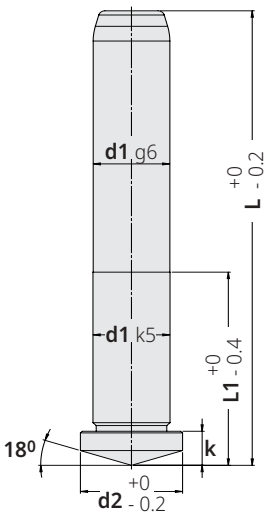
Order: **G11.** d1 x L

Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

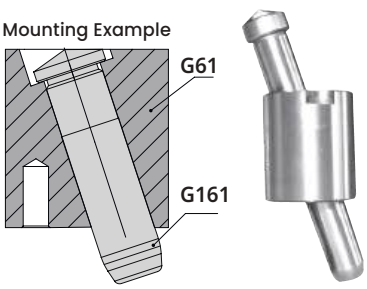
Operating Components:
With all unlubricated steel bushes in injection moulds or dies.

Angled Guide Pillar Code: G161

- **Compatible Guide Bush:** "G61"
- No reworking necessary before mounting.



Mounting Example



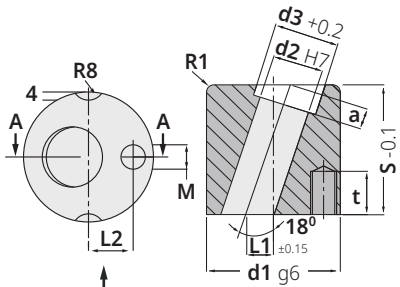
Order: **G161.** d1 x L

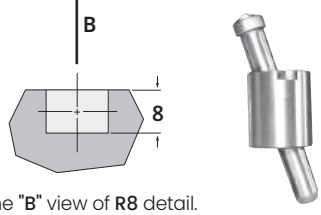
Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

d1	L	L1	d2	k
12	60	34	16	6
	80			
	100			
	120			
	140			
	160			
14	60	34	18	8
	80			
	100			
	120			
	140			
	160			
	180			
16	60	43	20	8
	80			
	100			
	120			
	140			
	160			
	180			
	200			
20	60	43	24	8
	80			
	100			
	120			
	140			
	160			
	180			
	200			
	240			
25	80	52	28	15
	100			
	120			
	140			
	160			
	180			
	200			
	220			
	240			
	300			
30	100	60	36	15
	120			
	140			
	160			
	180			
	200			
	220			
	240			
	300			

Angled Guide Bush Code: G61

(Core pillar holder)





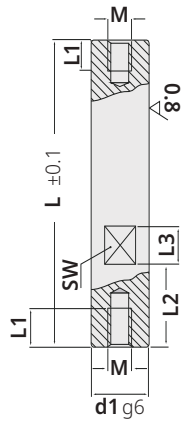
The "B" view of R8 detail.

d2	s	d1	a	d3	L1	L2	M	t
12	36	32	6	17	7	10	M6	11
14	36	36	8	19	7	12	M8	16
16	46	40	8	21	8.5	13.5	M8	16
20	46	45	8	25	8.5	15	M8	16
25	56	50	15	29	10	16	M8	16
30	66	63	15	37	12	21	M10	20

Order: **G61.** d2

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

This unit eliminates angular perforation requirement. To insert this unit, only a hole is perforated at the front of the mould. **Angled guide bush** can be used with **G161, G14** or **G17** guide pillar.



Ejector Rod

Code: **G16**

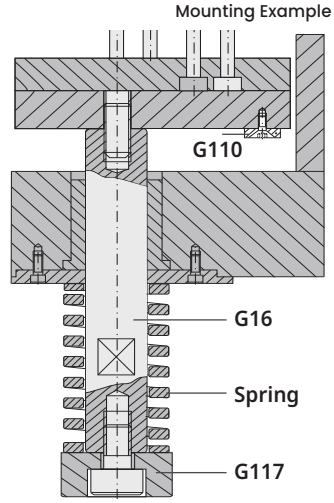
d1	L	M	L1	L2	L3	SW
10	60	M6	10	21	10	8
	70					
	80					
	100					
	140					
14	60	M8	13	21	10	10
	80					
	100					
	120					
	140					
	180					
16	60	M10	16	21	10	12
	70					
	80					
	100					
	120					
	140					
	200					
18	100	M10	20	30	10	14
	120					
	140					
	160					
	180					
	200					
	220					
	240					

d1	L	M	L1	L2	L3	SW
20	120	M12	24	40	16	14
	140					
	160					
	180					
	200					
	240					
24	120	M12	24	40	16	17
	140					
	160					
	180					
	200					
	240					
	260					
34	160	M16	34	50	16	24
	200					
	240					
	260					
	300					

Order: **G16.** d1 x L

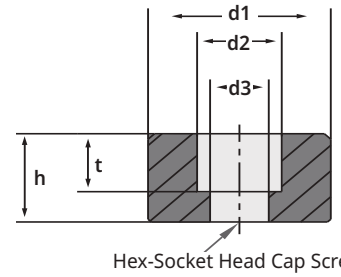
Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Mounting Example



Code: **G117**

Mounting Washer for Ejector Rod



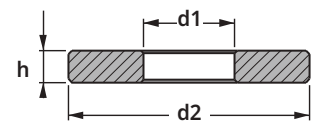
d1	h	t	d2	d3
15	10	8.4	11	6.6
22	14	11	14.5	9
36	20	13.5	17.5	11
46	25	15.5	20	14
56	32	21	26	18

Order: **G117.** d1 x h

Code: **G114**

Thick Mounting Washer

Mould inner mounting washer / thick



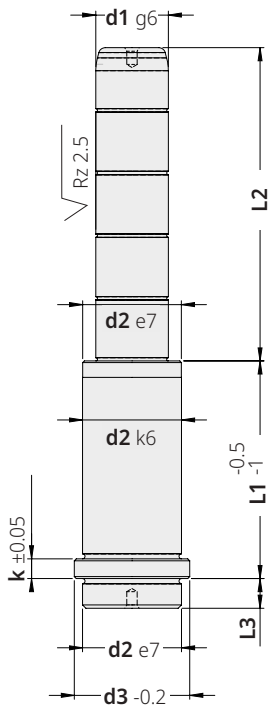
Form	d1	d2	h	weight
M6	6.4	17	3	6 gr.
M8	8.4	23	4	10 gr.
M10	10.5	28	4	16 gr.
M12	13	35	5	32 gr.
M14	15	40	5	40 gr.
M16	17	45	6	60 gr.
M18	19	45	6	60 gr.
M20	21	50	6	75 gr.

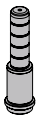
Order: **G114.** Form

Code: **G13D**
(without oil groove)
Upon request

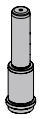
Code: **G13**

Guide Pillar with Centring Collar
(with oil groove & without oil groove)





Code: **G13** (with oil groove)
Guide Pillar with Centring Collar



Code: **G13D** (without oil groove)
Guide Pillar with Centring Collar

d1	L1	L2	L3	d2	d3	k
15 **14**	17	35 55 75 95	9	20	25	6
15 **14**	22	30 50 70 90 110 125 150	9	20	25	6
15 **14**	27	30 45 65 85 105 125 145 165	9	20	25	6
15 **14**	36	35 55 75 95 115 125 145 155	9	20	25	6
15 **14**	46	35 45 65 85 105 125 145	9	20	25	6
15 **14**	56	35 55 75 95 135	9	20	25	6

d1	L1	L2	L3	d2	d3	k
15 **14**	66	55 65 85 95 105 125	9	20	25	6
15 **14**	76	35 55 75 95 125	9	20	25	6
15 **14**	86	55 75 95	9	20	25	6
15 **14**	96	55 75 95	9	20	25	6
15 **14**	116	75	9	20	25	6
18 **20**	17	35 55 75 120	9	26	31	6
18 **20**	22	35 45 65 85 95 115	9	26	31	6
18 **20**	27	35 45 65 85 105 125 165 225 245	9	26	31	6

Compatible Bushes

Note:
To avoid wrong closing of mould holder plates, 2 different products are used.
Main dimensions: 14 - 20 - 24 - 30 - 40
other **auxiliary dimensions:**
15 - 18 - 22 - 32 - 42.
To avoid wrong closing of mould holder plates, can be used at 3 main dimensions guide pillar and 1 auxiliary dimension guide pillars. Our mould pillars were polished with surface polishing machine at final stage of production. The products with oil groove are available in our stocks.

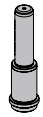
Order: **G13.** d1 x L1 x L2
(with oil groove)

Order: **G13D.** d1 x L1 x L2
(without oil groove)

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Continued on the next page →

Code: **G13** (with oil groove)
Guide Pillar with Centring Collar



Code: **G13D** (without oil groove)
Guide Pillar with Centring Collar

Continued on the next page →

d1	L1	L2	L3	d2	d3	k
18 **20**	36	35	9	26	31	6
		55				
		75				
		95				
		115				
		135				
		165				
		225				
		255				
18 **20**	46	35	9	26	31	6
		45				
		65				
		85				
		105				
		135				
		165				
		245				
18 **20**	56	35	9	26	31	6
		55				
		75				
		95				
		115				
		135				
		155				
18 **20**	66	35	9	26	31	6
		55				
		75				
		95				
		115				
		135				
		145				
18 **20**	76	35	9	26	31	6
		55				
		75				
		95				
		115				
		135				

d1	L1	L2	L3	d2	d3	k
18 **20**	86	55	9	26	31	6
		75				
		95				
		125				
		135				
18 **20**	96	55	9	26	31	6
		75				
		95				
18 **20**	116	75	9	26	31	6
		115				
18 **20**	136	135	9	26	31	6
22 **24**	17	35	9	30	35	6
		55				
		75				
22 **24**	22	35	9	30	35	6
		55				
		75				
		95				
		105				
		130				
22 **24**	27	35	9	30	35	6
		45				
		65				
		85				
		105				
		125				
		165				
		205				
		245				
22 **24**	36	35	9	30	35	6
		55				
		75				
		95				
		115				

d1	L1	L2	L3	d2	d3	k
22 **24**	36	135	9	30	35	6
		165				
		205				
		245				
		285				
22 **24**	46	35	9	30	35	6
		45				
		65				
		85				
		105				
		125				
		165				
		205				
22 **24**	56	35	9	30	35	6
		55				
		75				
		95				
		115				
		135				
		165				
		205				
22 **24**	66	35	9	30	35	6
		55				
		75				
		95				
		115				
		135				
		155				
22 **24**	76	35	9	30	35	6
		55				
		75				
		95				
		115				
		145				
22 **24**	86	55	9	30	35	6
		75				
		95				
		125				
		135				
22 **24**	96	55	9	30	35	6
		75				
		95				
		125				

d1	L1	L2	L3	d2	d3	k
22 **24**	106	55	9	30	35	6
		75				
		95				
		115				
22 **24**	116	75	9	30	35	6
		115				
		155				
22 **24**	136	95	9	30	35	6
		135				
32 **30**	27	35	9	42	47	6
		45				
		65				
		85				
		105				
		125				
		145				
		165				
		185				
		245				
		285				
32 **30**	36	35	9	42	47	6
		55				
		75				
		95				
		115				
		135				
		155				
		245				
		285				
32 **30**	46	45	9	42	47	6
		65				
		85				
		105				
		125				
		145				
		165				
		245				
		285				

IMPORTANT !

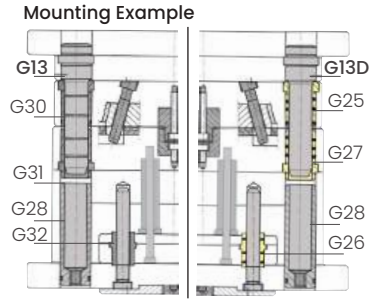
Injection Mould: Our guide pillars & bushes cover standard mould systems. But, guide pillar & bushes with different tolerances should be selected for aluminum injection moulds (high temperature / pressure). It should be requested from our company (production with special materials).

Order: **G13.** d1 x L1 x L2
(with oil groove)

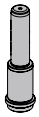
Order: **G13D.** d1 x L1 x L2
(without oil groove)

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Mounting Example



Code: **G13** (with oil groove)
Guide Pillar with Centring Collar



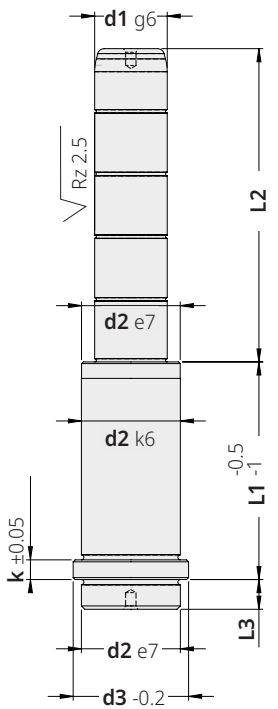
Code: **G13D** (without oil groove)
Guide Pillar with Centring Collar

d1	L1	L2	L3	d2	d3	k
32 **30**	56	45 55 75 95 115 135 155 175 245 295	9	42	47	6
32 **30**	66	45 55 75 95 115 135 155 175 245 295	9	42	47	6
32 **30**	76	55 75 95 115 135 155 225	9	42	47	6
32 **30**	86	55 75 95 115 135 155 225	9	42	47	6
32 **30**	96	55 75 95 115 135 155 205	9	42	47	6
32 **30**	106	75 95 115 125 145 165	9	42	47	6

d1	L1	L2	L3	d2	d3	k
32 **30**	116	75 95 115 135 155	9	42	47	6
32 **30**	136	95 115 135 155	9	42	47	6
32 **30**	156	115 155	9	42	47	6
32 **30**	196	155 195	9	42	47	6
42 **40**	46	95 165	12	54	60	10
42 **40**	56	75 115 155 195	12	54	60	10
42 **40**	66	75 135	12	54	60	10
42 **40**	76	75 115 175	12	54	60	10
42 **40**	86	75 135	12	54	60	10
42 **40**	96	75 115 155	12	54	60	10
42 **40**	116	95 135 195	12	54	60	10
42 **40**	136	95 135 215	12	54	60	10
42 **40**	156	115 155 215	12	54	60	10
42 **40**	196	155 195 235	12	54	60	10
42 **40**	246	165 245	12	54	60	10

Code: **G13D**
(without oil groove)
Upon request

Code: **G13**
Guide Pillar with Centring Collar
(with oil groove & without oil groove)



Order: **G13.** d1 x L1 x L2
(with oil groove)

Order: **G13D.** d1 x L1 x L2
(without oil groove)

Material: 1.1213 (Cf53)
Hardness: 58 - 62 HRC

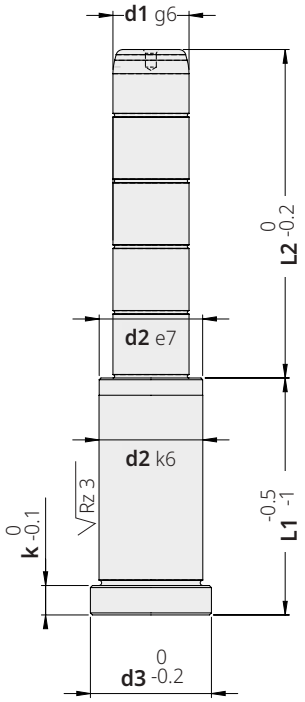
Note: To avoid wrong closing of mould holder plates, 2 different products are used.
Main dimensions: 14 - 20 - 24 - 30 - 40 other **auxiliary dimensions:** 15 - 18 - 22 - 32 - 42. To avoid wrong closing of mould holder plates, can be used at 3 main dimensions guide pillar and 1 auxiliary dimension guide pillars. Our mould pillars were polished with surface polishing machine at final stage of production. The products with oil groove are available in our stocks.

for Turkish Mould Standard

Code: **G12D**
(without oil groove)
Upon request

Code: **G12**

Guide Pillar - Shouldered
(with oil groove & without oil groove)



d1	L1	L2	d2	d3	k
12	26	26 36 46 56	16	19	4
12	36	26 36 46 56	16	19	4
12	46	26 36 46 56 66	16	19	4
14	26	26 36 46 56 66 76	20	25	6
14	36	26 36 46 56 66 86	20	25	6
14	46	26 36 46 56 76 96	20	25	6
14	56	26 36 46 66 86 106	20	25	6
16	26	26 36 46 56 76 96	24	28	6
16	36	26 36 46 56 66 86 106	24	28	6
16	46	26 36 46 56 66 76 96 116	24	28	6
16	56	26 36 46 56 66 76 96 116	24	28	6
16	66	26 36 46 56 66 76 86 106 116	24	28	6
16	76	26 36 46 56 66 76 96 116	24	28	6
16	86	26 36 46 56 66 76 96 116	24	28	6
18	26	26 36 46 56 66 86	26	31	6
18	36	26 36 46 56 66 86 106	26	31	6
18	46	26 36 46 56 66 86 106 126	26	31	6
18	56	26 36 46 56 66 86 106 126	26	31	6
18	66	26 36 56 76 96 116	26	31	6
18	76	26 46 66 86 106 126	26	31	6
18	86	26 46 66 86 106 126	26	31	6
20	26	26 36 46 56 66 86	28	32	6
20	36	26 36 46 56 66 76 96	28	32	6
20	46	26 36 46 56 66 76 86 106	28	32	6
20	56	26 36 46 56 66 76 96 116	28	32	6

Order: **G12.** d1 x L1 x L2
(with oil groove)

Order: **G12D.** d1 x L1 x L2
(without oil groove)

Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Continued on the next page →

Compatible Bushes

IMPORTANT !
Injection Mould: Our guide pillars & bushes cover standard mould systems. But, guide pillar & bushes with different tolerances should be selected for aluminum injection moulds (high temperature / pressure). It should be requested from our company (production with special materials).

Code: **G12** (with oil groove)

Guide Pillar - Shouldered

Code: **G12D** (without oil groove)

Guide Pillar - Shouldered

for Turkish Mould Standard

d1	L1	L2	d2	d3	k
20	66	26	28	32	6
		36			
		46			
		56			
		66			
		76			
		96			
		116			
20	76	26	28	32	6
		36			
		46			
		56			
		66			
		76			
		86			
		106			
		126			
20	86	26	28	32	6
		36			
		46			
		56			
		66			
		76			
		86			
		106			
		126			
20	96	26	28	32	6
		36			
		46			
		56			
		66			
		76			
		86			
		106			
		126			
25	26	26	34	38	8
		36			
		46			
		56			
		66			
		76			
		96			
25	36	26	34	38	8
		36			
		46			
		56			
		66			
		76			
		86			
		106			
25	46	26	34	38	8
		36			
		46			
		56			
		66			
		76			
		96			
		116			
25	56	26	34	38	8
		36			
		46			

d1	L1	L2	d2	d3	k
25	56	56	34	38	8
		66			
		76			
		96			
		116			
25	66	26	34	38	8
		36			
		46			
		56			
		66			
		76			
		86			
		106			
		126			
25	76	26	34	38	8
		36			
		46			
		56			
		66			
		76			
		86			
		106			
		126			
25	86	36	34	38	8
		46			
		56			
		66			
		76			
		86			
		96			
		116			
		136			
25	96	36	34	38	8
		46			
		56			
		66			
		76			
		86			
		96			
		116			
		136			
25	106	46	34	38	8
		56			
		66			
		76			
		86			
		96			
		116			
		136			
30	36	36	39	43	10
		46			
		56			
		66			
		86			
		106			
30	46	36	39	43	10
		46			
		56			

d1	L1	L2	d2	d3	k
30	46	66	39	43	10
		76			
		96			
		116			
30	56	36	39	43	10
		46			
		56			
		66			
		76			
		86			
		106			
		126			
30	66	36	39	43	10
		46			
		56			
		66			
		76			
		86			
		96			
		116			
		136			
30	76	36	39	43	10
		46			
		56			
		76			
		96			
		116			
		136			
30	86	36	39	43	10
		46			
		66			
		86			
		106			
		126			
		146			
30	96	46	39	43	10
		66			
		86			
		106			
		126			
		146			
30	106	56	39	43	10
		76			
		96			
		116			
		136			
30	116	56	39	43	10
		76			
		96			
		116			
		136			
40	56	56	54	58	10
		86			
		106			

d1	L1	L2	d2	d3	k
40	56	126	54	58	10
		156			
		186			
40	66	66	54	58	10
		96			
		116			
		136			
		166			
		196			
40	76	76	54	58	10
		106			
		126			
		146			
		166			
		196			
		216			
40	86	86	54	58	10
		126			
		146			
		176			
		206			
		226			
40	96	96	54	58	10
		136			
		156			
		186			
		216			
		236			
40	106	106	54	58	10
		126			
		156			
		186			
		226			
		246			
40	116	116	54	58	10
		136			
		166			
		196			
		236			
		256			
40	126	126	54	58	10
		166			
		196			
		236			
		266			
40	136	136	54	58	10
		196			
		226			
		266			

Order: **G12.** d1 x L1 x L2
(with oil groove)

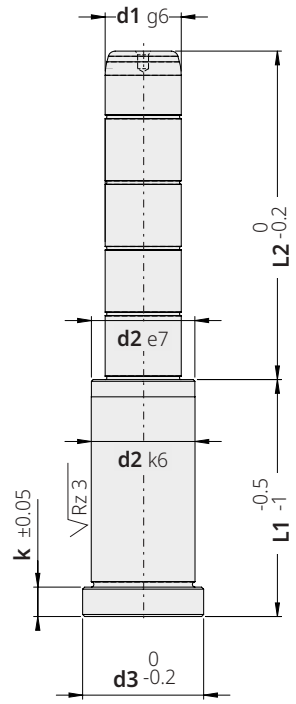
Order: **G12D.** d1 x L1 x L2
(without oil groove)

Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Code: **G50D**
(without oil groove)
Upon request

Code: **G50**

Guide Pillar - Shouldered
(with oil groove & without oil groove)



The tolerances and working space of our products are determined according to **DIN 7161.**

d1	L1	L2	d2	d3	k
14	17	35	20	25	6
		55			
		75			
		95			
14	22	20	20	25	6
		35			
		40			
		45			
		50			
		55			
		65			
		70			
		90			
		110			
14	27	20	20	25	6
		35			
		40			
		45			
		55			
		65			
		85			
		105			
14	36	20	20	25	6
		35			
		40			
		45			
		55			
		65			
		75			
		95			
14	46	20	20	25	6
		35			
		45			
		65			
		85			
		105			
14	56	20	20	25	6
		35			
		55			
		75			
		95			
14	66	55	20	25	6
		65			
		95			
14	76	55	20	25	6
		95			
14	86	55	20	25	6
		95			
14	96	55	20	25	6
		95			
14	116	75	20	25	6

d1	L1	L2	d2	d3	k
15	17	35	20	25	6
		55			
		75			
		95			
15	22	20	20	25	6
		35			
		40			
		45			
		50			
		55			
		65			
		70			
		90			
		110			
15	27	20	20	25	6
		35			
		40			
		45			
		55			
		65			
		85			
		105			
15	36	20	20	25	6
		35			
		40			
		45			
		55			
		65			
		75			
		95			
15	46	20	20	25	6
		35			
		45			
		65			
		85			
		105			
15	56	20	20	25	6
		35			
		55			
		75			
		95			
15	66	55	20	25	6
		65			
		95			
15	76	55	20	25	6
		95			
15	86	55	20	25	6
		95			
15	96	55	20	25	6
		95			
15	116	75	20	25	6

d1	L1	L2	d2	d3	k
18	17	35	26	31	6
		55			
		75			
		95			
18	22	20	26	31	6
		35			
		40			
		45			
		50			
		55			
		60			
		65			
		70			
		80			
		85			
		115			
18	27	20	26	31	6
		35			
		40			
		45			
		50			
		55			
		60			
		65			
		70			
		80			
		85			
		105			
		125			
18	36	20	26	31	6
		35			
		40			
		45			
		50			
		55			
		60			
		65			
		70			
		75			
		80			
		95			
		115			
		135			
18	46	20	26	31	6
		45			
		65			
		85			
		105			
		135			
		165			

Order: **G50.** d1 x L1 x L2
(with oil groove)

Order: **G50D.** d1 x L1 x L2
(without oil groove)

Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Continued on the next page ⟶

Compatible Bushes

IMPORTANT !
Injection Mould: Our guide pillars & bushes cover standard mould systems. But, guide pillar & bushes with different tolerances should be selected for aluminum injection moulds (high temperature / pressure).
It should be requested from our company (production with special materials).

Code: **G50** (with oil groove)
Guide Pillar - Shouldered

Code: **G50D** (without oil groove)
Guide Pillar - Shouldered

Continued on the next page →

d1	L1	L2	d2	d3	k
18	56	20	26	31	6
		35			
		55			
		75			
		95			
18	66	55	26	31	6
		75			
		95			
18	76	55	26	31	6
		75			
		95			
18	86	55	26	31	6
		75			
		95			
18	96	55	26	31	6
		95			
18	116	115	26	31	6
18	136	135	26	31	6
20	17	35	26	31	6
		55			
		75			
		95			
20	22	20	26	31	6
		35			
		40			
		45			
		50			
		55			
		60			
		65			
		70			
		80			
		85			
		115			
20	27	20	26	31	6
		35			
		40			
		45			
		50			
		55			
		60			
		65			
		70			
		80			
		85			
		105			
		125			
20	36	20	26	31	6
		35			
		40			
		45			
		50			
		55			
		60			
		65			
		70			
		75			
		80			
		95			
		115			
		135			

d1	L1	L2	d2	d3	k
20	46	20	26	31	6
		45			
		65			
		85			
		105			
		135			
		165			
20	56	20	26	31	6
		35			
		55			
		75			
		95			
20	66	55	26	31	6
		75			
		95			
20	76	55	26	31	6
		75			
		95			
20	86	55	26	31	6
		75			
		95			
20	96	55	26	31	6
		95			
20	116	115	26	31	6
20	136	135	26	31	6
22	17	35	30	35	6
		55			
		75			
22	22	35	30	35	6
		55			
		75			
		105			
		130			
22	27	25	30	35	6
		45			
		50			
		60			
		65			
		70			
		80			
		85			
		105			
		125			
		165			
22	36	25	30	35	6
		45			
		50			
		55			
		60			
		70			
		75			
		80			
		95			
		115			
		135			
		165			

d1	L1	L2	d2	d3	k
22	46	25	30	35	6
		45			
		50			
		60			
		65			
		70			
		80			
		85			
		105			
		125			
		165			
22	56	25	30	35	6
		45			
		55			
		75			
		95			
		115			
		165			
22	66	55	30	35	6
		75			
		95			
22	76	25	30	35	6
		45			
		55			
		75			
		95			
		115			
22	86	55	30	35	6
		75			
		95			
22	96	55	30	35	6
		75			
		95			
22	116	75	30	35	6
		115			
		155			
22	136	135	30	35	6
22	156	155	30	35	6
24	17	35	30	35	6
		55			
		75			
24	22	35	30	35	6
		55			
		75			
		105			
		130			
24	27	25	30	35	6
		45			
		50			
		60			
		65			
		70			
		80			
		85			
		105			
		125			
		165			

d1	L1	L2	d2	d3	k
24	36	25	30	35	6
		45			
		50			
		55			
		60			
		70			
		75			
		80			
		95			
		115			
		135			
		165			
24	46	25	30	35	6
		45			
		50			
		60			
		65			
		70			
		80			
		85			
		105			
		125			
		165			
24	56	25	30	35	6
		45			
		55			
		75			
		95			
		115			
		165			
24	66	55	30	35	6
		75			
		95			
24	76	25	30	35	6
		45			
		55			
		75			
		95			
		115			
24	86	55	30	35	6
		75			
		95			
24	96	55	30	35	6
		75			
		95			
24	116	75	30	35	6
		115			
		155			
24	136	135	30	35	6
24	156	155	30	35	6

Order: **G50.** d1 x L1 x L2
(with oil groove)

Order: **G50D.** d1 x L1 x L2
(without oil groove)

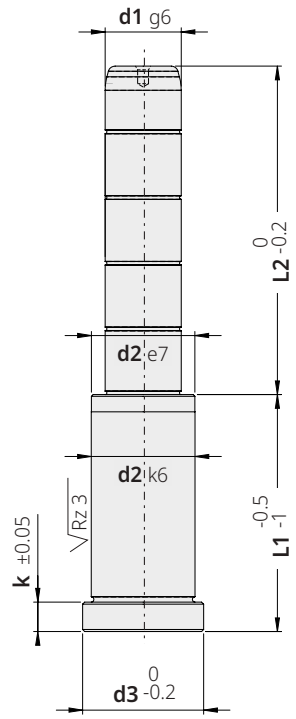
Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

Code: **G50D**
(without oil groove)
Upon request

Code: **G50**

Guide Pillar - Shouldered

(with oil groove & without oil groove)



The tolerances and working space of our products are determined according to **DIN 7161.**

d1	L1	L2	d2	d3	k
30	22	35	42	47	6
		75			
		130			
30	27	45	42	47	6
		65			
		105			
		165			
30	36	55	42	47	6
		75			
		95			
		115			
		155			
30	46	45	42	47	6
		65			
		85			
		105			
		125			
		165			
30	56	55	42	47	6
		75			
		95			
		115			
		135			
		175			
30	66	55	42	47	6
		75			
		95			
		115			
		135			
		175			
30	76	55	42	47	6
		75			
		95			
		115			
		155			
30	86	55	42	47	6
		75			
		95			
		115			
		155			
30	96	55	42	47	6
		75			
		95			
		115			
		155			
30	116	75	42	47	6
		115			
		155			
30	136	95	42	47	6
		115			
		155			
30	156	115	42	47	6
		155			
30	176	135	42	47	6
		175			
30	196	155	42	47	6
		195			
32	22	35	42	47	6
		75			
		130			

d1	L1	L2	d2	d3	k
32	27	45	42	47	6
		65			
		105			
		165			
32	36	55	42	47	6
		75			
		95			
		115			
		155			
32	46	45	42	47	6
		65			
		85			
		105			
		125			
		165			
32	56	55	42	47	6
		75			
		95			
		115			
		135			
		175			
32	66	55	42	47	6
		75			
		95			
		115			
		135			
		175			
32	76	55	42	47	6
		75			
		95			
		115			
		155			
32	86	55	42	47	6
		75			
		95			
		115			
		155			
32	96	55	42	47	6
		75			
		95			
		115			
		155			
32	116	75	42	47	6
		115			
		155			
32	136	95	42	47	6
		115			
		155			
32	156	115	42	47	6
		155			
32	176	135	42	47	6
		175			
32	196	155	42	47	6
		195			
40	36	75	54	60	10
		135			
40	46	95	54	60	10
		165			
40	56	75	54	60	10
		115			
		155			
		195			
40	66	75	54	60	10
		135			

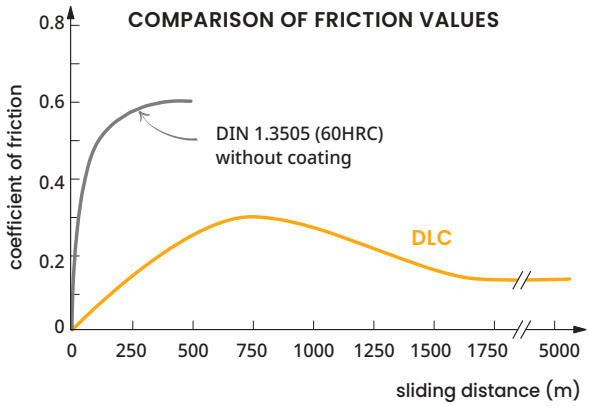
d1	L1	L2	d2	d3	k
40	76	75	54	60	10
		115			
		175			
40	86	75	54	60	10
		135			
40	96	75	54	60	10
		115			
		155			
40	115	95	54	60	10
		135			
		195			
40	136	95	54	60	10
		135			
		215			
40	156	115	54	60	10
		155			
		215			
40	176	135	54	60	10
		155			
		175			
40	196	155	54	60	10
		195			
		235			
42	36	75	54	60	10
		135			
42	46	95	54	60	10
		165			
42	56	75	54	60	10
		115			
		155			
		195			
42	66	75	54	60	10
		135			
42	76	75	54	60	10
		115			
		175			
42	86	75	54	60	10
		135			
42	96	75	54	60	10
		115			
		155			
42	115	95	54	60	10
		135			
		195			
42	136	95	54	60	10
		135			
		215			
42	156	115	54	60	10
		155			
		215			
42	176	135	54	60	10
		155			
		175			
42	196	155	54	60	10
		195			
		235			
50	96	115	66	72	10
	116	135			
	136	135			
	156	155			
	196	175			
60	96	115	80	86	10
	116	135			
	136	135			
	156	155			
	196	175			
	246	195			

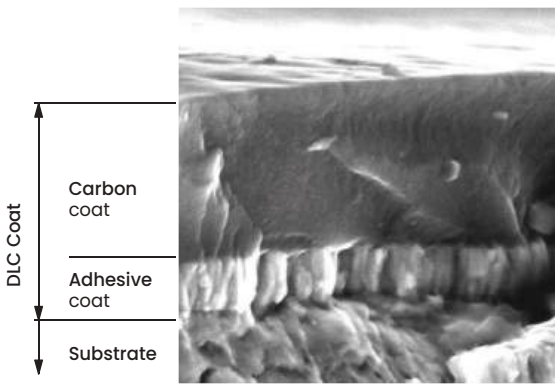
Order: **G50.** d1 x L1 x L2
(with oil groove)

Order: **G50D.** d1 x L1 x L2
(without oil groove)

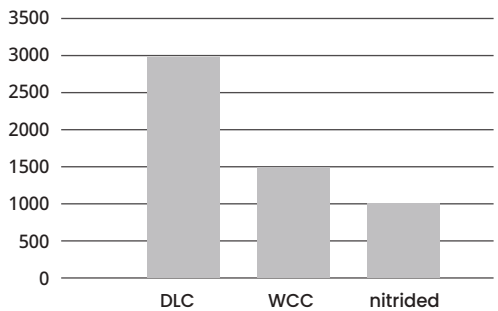
Material: < Ø 20 = 1.7131
> Ø 20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

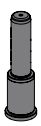
To be continued on the previous page ←





Surface hardness HV



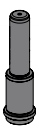


Code: **G50DLC** (DLC Coated)

Guide Pillar - Shouldered

Code: **G13DLC** (DLC Coated)

Guide Pillar with Centring Collar



Customised Guide Units

Upon request, Güvenal manufactures highly complex and precise guide elements based on customer specifications and provides measurement protocols if needed. This includes both the reworking of catalogue products and the production of entirely new items.

NEW

DLC Coated Guide Pillars

What is DLC ?

DLC means: Diamond like carbon.

The DLC coating is a sliding coating applied using the PACVD (Plasma-Enhanced Chemical Vapor Deposition) process. The coating is deposited through a physical and chemical reaction at approximately 180°C, with carbon-containing carrier gases introduced simultaneously. Due to the low coating temperature, DLC is also ideal for materials with a low tempering temperature. It combines excellent hardness with superior tribological properties in terms of friction, anti-adhesion, wear, and lubrication.

DLC coating is especially beneficial for applications involving motion or friction in mould making, such as ejection, guiding, and centering. With the DLC coating, it is possible to operate completely lubricant-free..

Advantages:

- Lubricant-free operation
- Extended maintenance intervals
- Very high abrasion resistance
- No seizing, even when running dry
- Good corrosion resistance

Technical Data:

Coating hardness: 2400 - 3000 HV

Coating thickness: ~ 1.5 - 2 µm

Coating temperature: 180°C

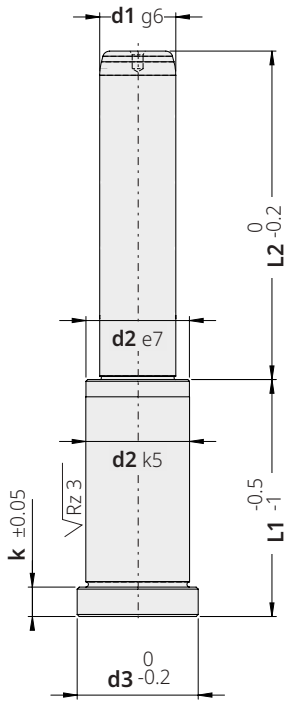
Temperature resistance: 350°C

DLC coated high-quality standard components to ensure a longer service life for your moulds.

NEW

Guide Pillar - Shouldered

Code: **G50DLC** (DLC Coated)



Order:
G50DLC. d1 x L1 x L2

Material: 1.7131
Hardness: 60 HRC

Technical Data:

Coating hardness: 2400 - 3000 HV
Coating thickness: ~ 1.5 µm
Coating temperature: 180°C
Temperature resistance: 350°C

DLC coated high-quality standard components to ensure a longer service life for your moulds.

d1	L1	L2	d2	d3	k
14	22	35	20	25	6
		55			
		75			
		95			
14	27	35	20	25	6
		55			
		75			
		95			
14	36	35	20	25	6
		55			
		75			
		95			
14	46	35	20	25	6
		55			
		75			
14	56	55	20	25	6
		75			
14	66	55	20	25	6
		75			
18	27	35	26	31	6
		55			
		75			
		95			
		115			
		155			
18	36	35	26	31	6
		55			
		75			
		95			
		115			
		155			
18	46	35	26	31	6
		55			
		75			
		95			
18	56	55	26	31	6
		75			
		95			
18	66	55	26	31	6
		75			
		95			

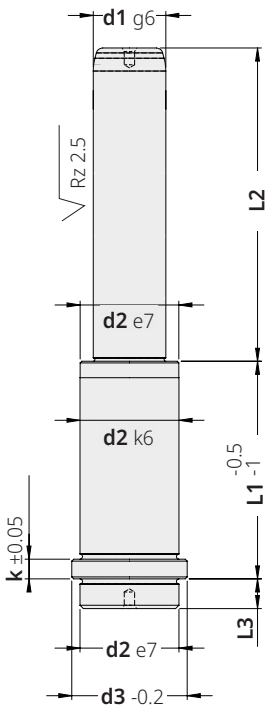
d1	L1	L2	d2	d3	k
18	76	55	26	31	6
		75			
22	36	35	30	35	6
		55			
		75			
		95			
		115			
		155			
		195			
		235			
22	46	35	30	35	6
		55			
		75			
		95			
		115			
		155			
		195			
		235			
22	56	55	30	35	6
		75			
		95			
		115			
		155			
22	66	55	30	35	6
		75			
		95			
		115			
22	76	55	30	35	6
		75			
		95			
		115			
22	86	75	30	35	6
		95			
22	96	75	30	35	6
		95			
30	46	55	42	47	6
		75			
		95			
		115			
		155			
		195			

d1	L1	L2	d2	d3	k
30	56	55	42	47	6
		75			
		95			
		115			
		155			
30	66	55	42	47	6
		75			
		95			
		115			
		155			
30	76	55	42	47	6
		75			
		95			
		115			
		155			
30	86	75	42	47	6
		95			
		115			
30	96	75	42	47	6
		95			
		115			
		155			
30	116	75	42	47	6
		115			
		155			
30	136	95	42	47	6
		115			
		155			
30	156	115	42	47	6
		155			
40	96	75	54	60	10
		95			
		115			
40	116	155	54	60	10
40	136	115	54	60	10
		155			
40	156	195	54	60	10
40	196	155	54	60	10
		195			

NEW

Guide Pillar with Centring Collar

Code: **G13DLC** (DLC Coated)



Order:
G13DLC. d1 x L1 x L2

Material: 1.7131
Hardness: 60 HRC

Continued on the next page ⟶

Technical Data:

Coating hardness: 2400 - 3000 HV
Coating thickness: ~ 1.5 µm
Coating temperature: 180°C
Temperature resistance: 350°C

d1	L1	L2	L3	d2	d3	k
9	22	35	3	14	16	3
	27					
	36					
	46	55				
14	22	25	9	20	25	6
		35				
		55				
		75				
14	27	25	9	20	25	6
		35				
		55				
		75				
		95				
14	36	35	9	20	25	6
		55				
		75				
		95				
		115				
14	46	35	9	20	25	6
		55				
		75				
		95				
14	56	35	9	20	25	6
		55				
		75				
		95				
14	66	35	9	20	25	6
		55				
		75				
		95				
14	76	55	9	20	25	6
		75				
18	22	35	9	26	31	6
		55				
		75				
18	27	35	9	26	31	6
		55				
		75				
		95				
		115				
18	36	35	9	26	31	6
		55				
		75				
		95				
		115				
		135				
18	46	35	9	26	31	6
		55				
		75				
		95				
		115				
		135				

d1	L1	L2	L3	d2	d3	k
18	56	35	9	26	31	6
		55				
		75				
		95				
		115				
18	66	35	9	26	31	6
		55				
		75				
		95				
		115				
18	76	55	9	26	31	6
		75				
		95				
		115				
18	86	55	9	26	31	6
		75				
		95				
		115				
18	96	55	9	26	31	6
		75				
		95				
22	27	55	9	30	35	6
		75				
		95				
		115				
		155				
		195				
22	36	35	9	30	35	6
		55				
		75				
		95				
		115				
		155				
		195				
22	46	35	9	30	35	6
		55				
		75				
		95				
		115				
		155				
		195				
22	56	35	9	30	35	6
		55				
		75				
		95				
		115				
		155				
		195				
22	66	55	9	30	35	6
		75				
		95				
		115				
		155				
		195				

Coating hardness: 2400 - 3000 HV
Coating thickness: ~ 1.5 µm
Coating temperature: 180°C
Temperature resistance: 350°C

NEW

Code: **G13DLC** (DLC Coated)

Guide Pillar with Centring Collar

d1	L1	L2	L3	d2	d3	k
22	76	55	9	30	35	6
		75				
		95				
		115				
		135				
		155				
22	86	55	9	30	35	6
		75				
		95				
		115				
		135				
		155				
		195				
22	96	55	9	30	35	6
		75				
		95				
		115				
		135				
		155				
		195				
22	116	55	9	30	35	6
		75				
		95				
		115				
		135				
		155				
22	136	75	9	30	35	6
		95				
		115				
30	36	55	9	42	47	6
		75				
		95				
		115				
		155				
		195				
30	46	55	9	42	47	6
		75				
		95				
		115				
		155				
		195				
		235				
30	56	55	9	42	47	6
		75				
		95				
		115				
		155				
		195				
		235				

d1	L1	L2	L3	d2	d3	k
30	66	55	9	42	47	6
		75				
		95				
		115				
		155				
		195				
		235				
30	76	55	9	42	47	6
		75				
		95				
		115				
		155				
		195				
		235				
30	86	55	9	42	47	6
		75				
		95				
		115				
		155				
		195				
		235				
30	96	75	9	42	47	6
		95				
		115				
		155				
		195				
		235				
30	116	75	9	42	47	6
		95				
		115				
		155				
		195				
		235				
30	136	95	9	42	47	6
		115				
		155				
		195				
		235				
30	156	95	9	42	47	6
		115				
		155				
30	176	115	9	42	47	6
		155				
		195				

d1	L1	L2	L3	d2	d3	k
30	196	115	9	42	47	6
		155				
		195				
40	66	75	12	54	59	10
		95				
		115				
		155				
40	76	75	12	54	59	10
		95				
		115				
		155				
		195				
40	86	75	12	54	59	10
		95				
		115				
		155				
40	96	95	12	54	59	10
		115				
		155				
		195				
		235				
40	116	95	12	54	59	10
		115				
		155				
		195				
		235				
40	136	95	12	54	59	10
		115				
		155				
		195				
		235				
40	156	95	12	54	59	10
		115				
		155				
		195				
40	176	115	12	54	59	10
		155				
		195				
40	196	155	12	54	59	10
		195				
		235				

Order:
G13DLC. d1 x L1 x L2

Material: 1.7131
Hardness: 60 HRC

NEW

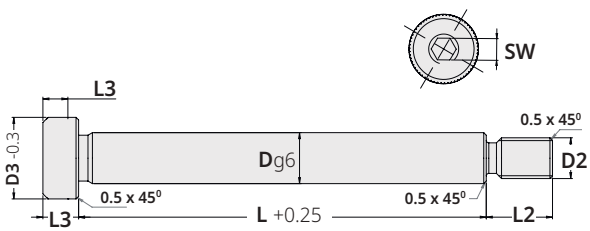
Tolerance
g6

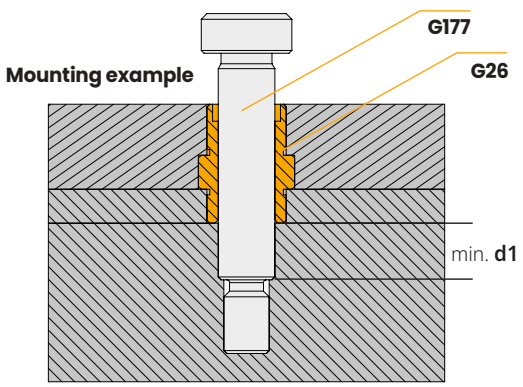
Guiding Shoulder Screw

Code: **G177**

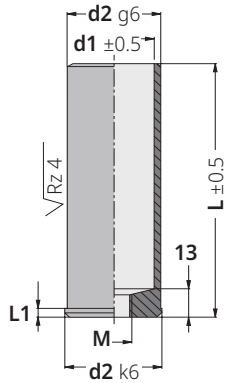
* Can be used as a guide bolt with stopper.

* **g6** tolerance





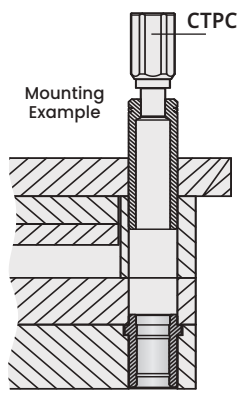
Order Code	D	L	D2	L2	D3	L3	SW
G177.10.25	10	25	M8	13	16	7	5
G177.10.30		30					
G177.10.40		40					
G177.10.50		50					
G177.10.60		60					
G177.10.70		70					
G177.10.80		80					
G177.10.90		90					
G177.10.100		100					
G177.12.25	12	25	M10	16	18	9	6
G177.12.30		30					
G177.12.40		40					
G177.12.50		50					
G177.12.60		60					
G177.12.70		70					
G177.12.80		80					
G177.12.90		90					
G177.12.100		100					
G177.12.120		120					
G177.14.30	14	30	M10	16	21	9	6
G177.14.40		40					
G177.14.50		50					
G177.14.60		60					
G177.14.70		70					
G177.14.80		80					
G177.14.90		90					
G177.14.100		100					
G177.14.120		120					
G177.14.140		140					
G177.18.40	18	40	M12	18	27	11	8
G177.18.50		50					
G177.18.60		60					
G177.18.70		70					
G177.18.80		80					
G177.18.90		90					
G177.18.100		100					
G177.18.120		120					
G177.18.140		140					



Centring Bush

Code: **G28**

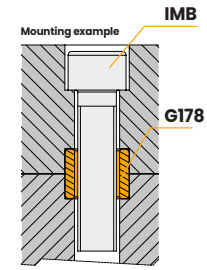
d1	L	d2	M	L1
20	30	16	M8	2.5
	40			
	60			
	80			
	100			
	120			
	140			
	160			
26	30	21	M10	2.5
	40			
	60			
	80			
	100			
	120			
	140			
	160			
	180			
30	40	25	M12	2.5
	60			
	80			
	100			
	120			
	140			
	160			
	180			
	200			
	240			
42	40	33	M12	4.5
	60			
	80			
	100			
	120			
	140			
	160			
	180			
	200			
	220			
	260			
	300			
54	60	43	M12	4.5
	80			
	120			
	160			
	200			
	240			
	280			



Order: **G28.** d1 x L

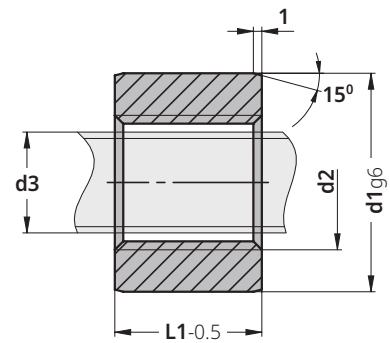
Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

NEW



Centering Sleeve

Code: **G178**



Order Code	d1	d2	d3	L1
G178.12	12	M8	M6	10
G178.14	14	M10	M8	11.5
G178.16	16	M12	M10	13.5
G178.20	20	M16	M12	15.5
G178.26	26	M16	M14	17.5
G178.30	30	M20	M16	19.5
G178.36	36	M24	M20	19.5
G178.42	42	M30	M24	19.5

Güvenal G178 Centering Sleeve facilitates the precise alignment of various plates in relation to each other. Positioned above the screw connection, it helps to save space, offering increased flexibility in mould design. Additionally, the integrated pull-out thread makes disassembly much easier and more efficient.

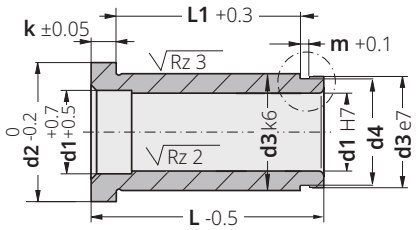
Features:

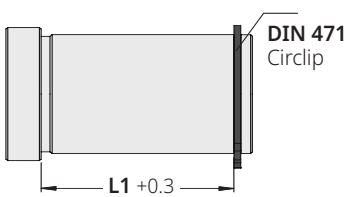
* Pull-out thread for effortless disassembly
* Compact assembly within the build-up screw connection, saving space
* 15° lead-in chamfer for easier and faster mounting
* Highly versatile for a wide range of applications
* Maximum service temperature of 200°C

Guide Bush - Headed

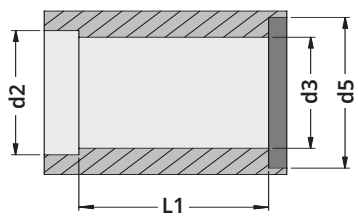
Code: **G49**

(with circlip slotted)





Mounting Dimensions



Order: **G49.** d1 x L

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

Compatible Pillars

For general usage in injection mould guide systems - it prevents the bush protrude in free rotating plates (**H6** centre fixing).

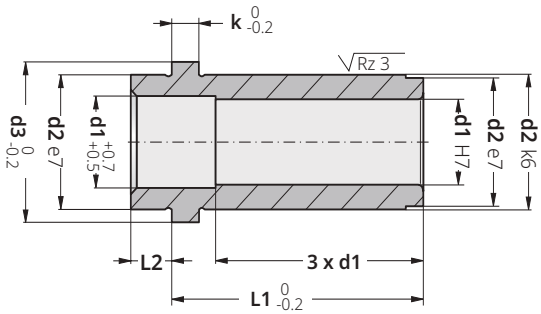
d1	L	d3	d2	k	L1	m	d4	d5	Circlip
12	27	18	25	6	18	1.3	17	27	18
	36				27				
	46				37				
	56				47				
14 15	27	20	25	6	18	1.3	19	30	20
	36				27				
	46				37				
	56				47				
	66				57				
	76				67				
	86				77				
	96				87				
	116				107				
16	27	22	27	6	18	1.3	21	32	22
	36				27				
	46				37				
	56				47				
18 20	27	26	31	6	18	1.3	25	36	26
	36				27				
	46				37				
	56				47				
	66				57				
	76				67				
	86				77				
	96				87				
	116				107				
	136				127				
22 24	27	30	35	6	17	1.6	29	41	30
	36				26				
	46				36				
	56				46				
	66				56				
	76				66				
	86				76				
	96				86				
	116				106				
	136				126				
	156				146				

d1	L	d3	d2	k	L1	m	d4	d5	Circlip
30 32	27	42	47	6	15	1.8	40	44	42
	36				24				
	46				34				
	56				44				
	66				54				
	76				64				
	86				74				
	96				84				
	116				104				
	136				124				
	156				144				
	176				164				
	196				184				
32 40	36	54	60	10	19	2.1	51	67	54
	46				29				
	56				39				
	66				49				
	76				59				
	86				69				
	96				79				
	116				99				
	136				119				
	156				139				
	176				159				
	196				179				
	246				229				
50	76	66	72	10	58	2.6	62	79	65
	96				78				
	116				98				
	136				118				
	156				138				
	196				178				
60	96	80	86	20	68	2.6	77	95	80
	116				88				
	136				108				
	156				128				
	196				168				
	246				218				

The **G49** is delivered with the circlip included - no need to order the circlip separately.

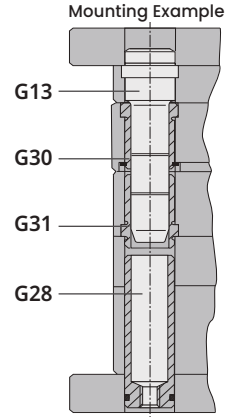
Code: **G31**

Guide Bush with Centring Collar



d1	L1	d2	d3	k	L2
14 15	17 22 27 36 46 56 66 76 86 96 116	20	25	6	9
18 **20**	17 22 27 36 46 56 66 76 86 96 106 116 136	26	31	6	9
22 **24**	17 22 27 36 46 56 66 76 86 96 106 116 136 156	30	35	6	9
30 32	27 36 46 56 66 76 86 96 106 116 126 136 156 196	42	47	6	9
40 42	46 56 66 76 86 96 116 136 156 196 246	54	60	10	12

Mounting Example



3D CAD FILES GUVENAL

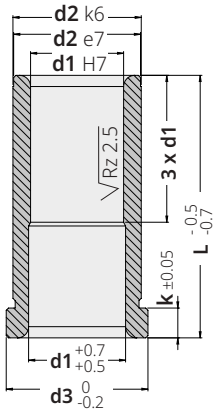
Download www.guvenal.net

3D CAD - Formats: CATIA, STEP, IGES 3D, X_T

Order: **G31.** d1 x L1

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

for Turkish Mould Standard

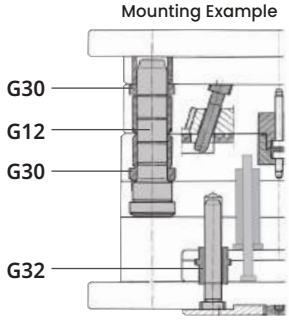


Guide Bush - Headed

Code: **G30**

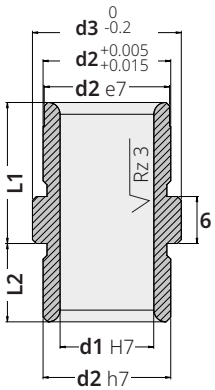
d1	L	d2	d3	k
10	17	14	16	3
	27			
	36			
	46			
	56			
12	26	16	19	4
	36			
	46			
	56			
	66			
14	26	20	25	6
	36			
	46			
	56			
	66			
	76			
16	26	24	28	6
	36			
	46			
	56			
	66			
	76			
	86			
18	26	26	31	6
	36			
	46			
	56			
	66			
	76			
	86			
20	26	28	32	6
	36			
	46			
	56			
	66			
	76			
	86			
	96			
25	26	34	38	8
	36			
	46			
	56			
	66			
	76			
	86			
	96			
	106			
30	36	39	43	10
	46			
	56			
	66			
	76			
	86			
	96			
	106			
	116			
40	46	54	58	10
	56			
	66			
	76			
	86			
	96			
	106			
	116			
	126			
	136			
	146			

Mounting Example



Order: **G30.** d1 x L

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

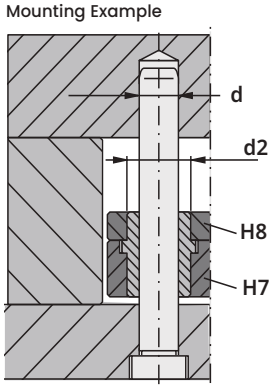


Code: **G32**

Guide Bush with Centre Collar

d1	L1	d2	d3	L2
12	16	16	19	12
14	16	20	25	12
16	16	24	28	12
18	16	26	31	12
20	16	28	32	12
24	21	34	38	16
25	21	34	38	16
30	21	39	43	16

Mounting Example



G32 Bushes ensuring the movements of ejector plates in injection moulds be rigid and precise.

Order: **G32.** d1 x L1

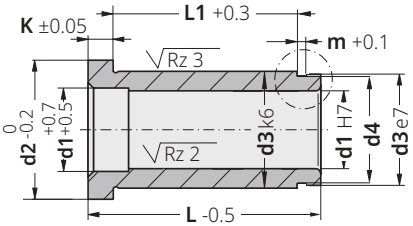
Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

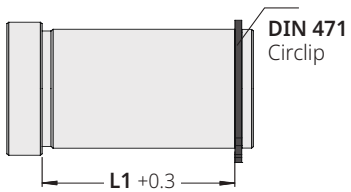
TKS for Turkish Mould Standard

Guide Bush - Headed

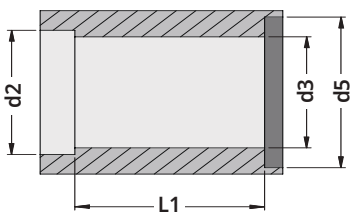
Code: **G77**

(with circlip slotted)





Mounting Dimensions



Order: **G77.** d1 x L

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

Compatible Pillars

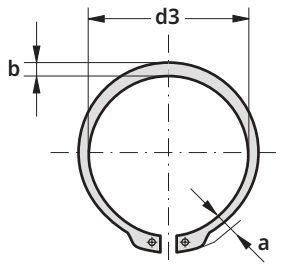
For general usage in injection mould guide systems - it prevents the bush protrude in free rotating plates (**H6** centre fixing).

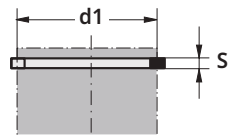
d1	L	d3	d2	k	L1	m	d4	d5	Circlip
12	26	16	19	4	16	1.1	15.2	25	16
	36				26				
	46				36				
	56				46				
	66				56				
14	26	20	25	6	16	1.3	19	30	20
	36				26				
	46				36				
	56				46				
	66				56				
	76				66				
16	26	24	28	6	16	1.3	22.9	34	24
	36				26				
	46				36				
	56				46				
	66				56				
	76				66				
	86				76				
20	26	28	32	6	16	1.6	26.6	38	28
	36				26				
	46				36				
	56				46				
	66				56				
	76				66				
	86				76				
	96				86				
25	26	34	38	8	14	1.6	32.3	45	34
	36				24				
	46				34				
	56				44				
	66				54				
	76				64				
	86				74				
	96				84				
	106				94				
30	36	39	43	10	21	1.8	37	51	39
	46				31				
	56				41				
	66				51				
	76				61				
	86				71				
	96				81				
	106				91				
	116				101				
40	46	54	58	10	28	2.1	51	67	54
	56				38				
	66				48				
	76				58				
	86				68				
	96				78				
	106				88				
	116				98				
	126				108				
	136				118				
	146				128				

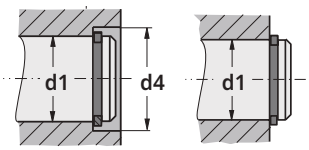
The **G77** is delivered with the circlip included - no need to order the circlip separately.

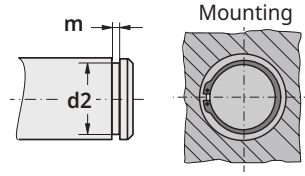
External Circlip

Code: **DIN471**





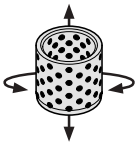




d1	S	a	b	d2	d3	d4	m
16	1	3.5	2.2	15.2	14.7	24.4	1.1
20	1.2	4	2.6	19	18.5	29	1.3
21		4.1	2.7	20	19.5	30.2	
22		4.2	2.8	21	20.5	31.4	
24		4.4	3	22.9	22.2	33.8	
25		4.4	3	23.9	23.2	34.8	
26		4.5	3.1	24.9	24.2	36.1	
28	1.5	4.7	3.2	26.6	25.9	38.4	1.6
29		4.8	3.4	27.6	26.9	39.6	
30		5	3.5	28.6	27.9	41	
34		5.4	3.8	32.3	31.5	45.8	
37	1.75	5.7	4.1	35	34.2	49.4	1.85
39		5.8	4.2	37	35.2	50.6	
45		6.7	4.7	42.5	41.5	59.4	
50	2	6.9	5.1	47	45.8	64.8	2.15
54		7.1	5.3	51	49.8	70	

Order: **DIN471.** d1 x S

"Special Series for Injection Moulds"



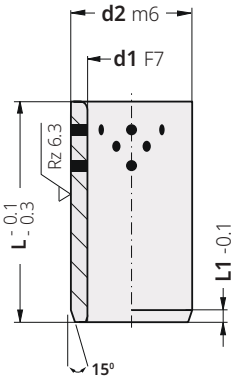
Working Direction

Guide Bush - Plain Self-Lubricating

Code: **G48**

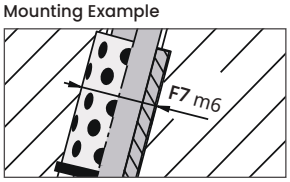
* Hole tolerance for shrink fit: H7

d1	d2	L	L1
8	12	8 10 15	2
10	14	10 12 15 20	2
12	18	10 12 15 20 25 30	2
15 **16**	22	12 16 20 25 30 35 40	2
18 **20**	24 28 30	20 25 30 35 40 50	4
24 **25**	33 35	20 25 30 35 40 50	4
35 **30**	38 40 45	20 25 30 35 40 50 60	4
38 **40**	50 55	25 30 35 40 50 60 80	4
42 **45**	55 60	30 35 40 50 60	4



d1	d2	L	L1
48 **50**	60 62 65	30 40 50 60 70 80 100	4
60	74 75	40 50 60 80 100	4
80	96 100	40 60 80 100 120 140	4
100 **120** **150** **160**	120 140 170 180	50 60 80 100 120 140 160	4

Mounting Example



Order: **G48.** d1 x d2 x L

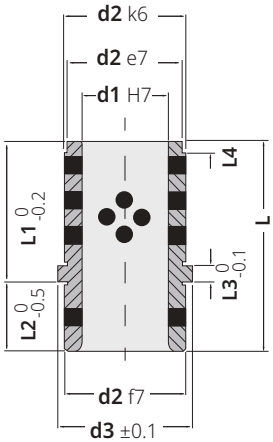
Material: Bronze + graphite inserts

Working Direction

Guide Bush with Centre Collar Self-Lubricating

Code: **G26**

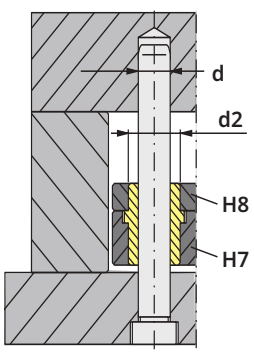
Positioning :
Pls. do not make direct fitting. Precision assembly recommended with bronze / brass.

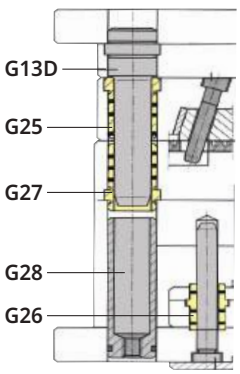


d1	L	d2	d3	L1	L2	L3	L4
NEW **10**	21	14	17	12	9	6	2
NEW **12**	26	16	19	17	9	6	2
14	26	20	25	17	9	6	2
16	26	20	25	17	9	6	2
20	39	26	31	22	17	6	2
22	49	30	35	27	22	6	4
25	49	30	35	27	22	6	2
30	63	42	47	36	27	6	2
40	63	50	60	36	27	8	6
50	92	63	72	55	37	8	6

Especially, it can be used in pillar systems of the ejector plates in injection moulds with Guide Pillar without oil groove (G17) Guide bushes are self-lubricating systems.
Heat Resistance: 150^0 C. It can even work in humid environments.

Mounting Example





Order: **G26.** d1 x L

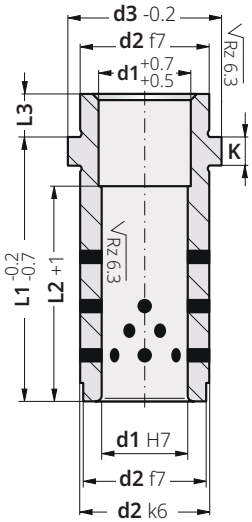
Material: Bronze + graphite inserts

"Special Series for Injection Moulds"

Working Direction

Guide Bush with Collar Self-Lubricating

Code: **G27**



G27 products used in injection moulds with **G13D** guide pillars (without oil groove). Higher stability is achieved with centering of the mould in length. This way, a long-term and precision working environment with other equipment (ejector - core etc.) **H7** tolerance is recommended in guide pillar / bush systems. It is compatible with the sudden movements during working. These products are not affected by vibration / impacts.

Heat resistance: 150^0 c.

d1	L1	d2	d3	K	L3
14	17	20	25	6	6
15	22				
	27				
	36				
	46				
	56				
		L2: > 2 - 3 x d1			
16	17	20	25	6	8
	22				
	27				
	36				
	46				
	56				
	66				
	76				
		L2: > 2 - 3 x d1			
20	17	26	31	6	8
18	22				
	27				
	36				
	46				
	56				
	66				
	76				
	86				
	96				
		L2: > 2 - 3 x d1			

d1	L1	d2	d3	K	L3
25	22	30	35	6	8
22	27				
24	36				
	46				
	56				
	66				
	76				
	86				
	96				
	116				
		L2: > 2 - 3 x d1			
30	27	42	47	6	8
32	36				
	46				
	56				
	66				
	76				
	86				
	96				
	116				
	136				
		L2: > 2 - 3 x d1			
40	46	54	60	10	12
42	56				
	66				
	76				
	86				
	96				
	116				
	136				
	156				
	196				
		L2: > 2 - 3 x d1			

Sliding bushing systems provide higher stability.
These products are lubricated once as a thin layer and this reduces negative effects.

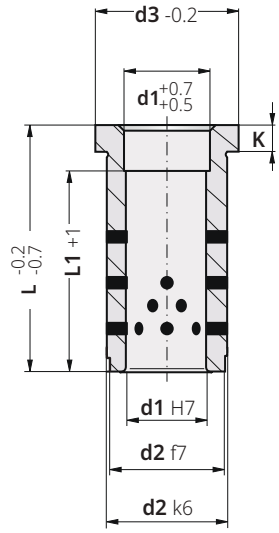
Order: **G27.** d1 x L1

Material: Bronze + graphite inserts

Working Direction

Guide Bush Headed Self-Lubricating

Code: **G25**



G25 products used in injection moulds with **G12D and G50D** guide pillars (without oil groove).
H7 tolerance is recommended in guide bush systems. It is compatible with the sudden movements during working. These products are not affected by vibration / Impacts.

Heat resistance: 150^0 c.
It can even work in humid environments.

d1	L	d2	d3	K
12	16	18	22	4
	21			
	27			
	36			
		L1: 2 - 3 x d1		
16	27	22	27	6
15	36			
	46			
	56			
		L1: 2 - 3 x d1		
20	27	26	31	6
18	36			
	46			
	56			
	66			
	76			
	96			
		L1: 2 - 3 x d1		
25	36	30	35	6
22	46			
24	56			
	66			
	76			
	86			
	96			
		L1: 2 - 3 x d1		

d1	L1	d2	d3	K
30	36	42	47	6
32	46			
	56			
	66			
	76			
	86			
	96			
	116			
		L1: 2 - 3 x d1		
40	36	54	60	10
42	46			
	56			
	66			
	76			
	86			
	96			
	116			
	136			
		L1: 2 - 3 x d1		
50	76	66	72	10
	86			
	96			
	116			
	136			
	156			
	196			
		L1: 2 - 3 x d1		
60	96	80	86	20
	116			
	136			
	156			
	196			
		L1: 2 - 3 x d1		

Order: **G25.** d1 x L

Material: Bronze + graphite inserts

Stable and reliable Die & Mould production is obtained with components having a reliable quality.

Güvenal tends towards the highest quality standards with all development and test efforts.

Güvenal: Reliability and Excellence in the Tooling Industry Güvenal is a well-known manufacturer in the industry, recognized for its wide product range and fast distribution systems. Güvenal's meticulous Quality and Control Processes ensure the highest quality at every stage of the production process. Strict controls are applied at each step, from raw material selection to the final product formation. To ensure precision shaping quality, parameters such as circularity, concentricity, flatness, and perpendicularity are carefully monitored through 3D inspection technology. Additionally, hardness tests, along with hardened and induction parameter records, are conducted at our facility. Thanks to these processes, we continue to offer a wide variety of high-quality, excellent products with the lowest tolerances under the Güvenal Quality Assurance Labels.

NEW

Code: **G184-1**

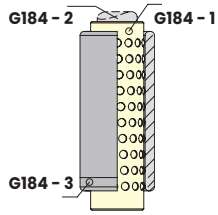
MINI Ball Cage

Code: **G184-2**

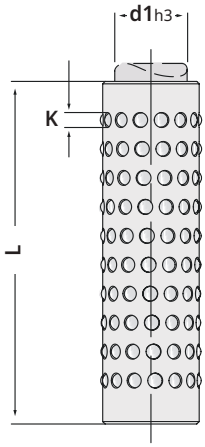
MINI Guide Pillar

Code: **G184-3**

MINI Guide Bush for G184-1



The ball-guiding mini-series enables achieving maximum precision with smooth sliding. They are commonly used in control instruments and other delicate applications. Additionally, we can provide ball cages, bushes, and pillars made to custom specifications based on drawings.



Code: **G184-1**

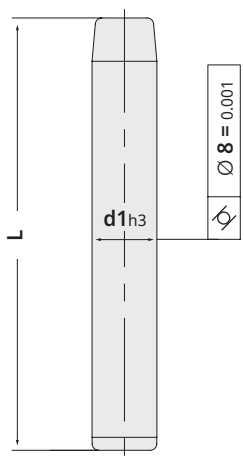
MINI Ball Cage

Material: Bronze Cage B14
Balls: Steel for bearings 100Cr6
Superfinished grade AAA

Order:
G184-1. d1 x L

d1	L	K
4	10	1
	15	
	20	
	25	
5	10	1
	15	
	20	
	25	
	30	

d1	L	K
6	10	1.5
	15	
	20	
	25	
	30	
8	15	1.5
	20	
	25	
	30	
	40	



Code: **G184-2**

MINI Guide Pillar
DIN 9825 / ISO 9182

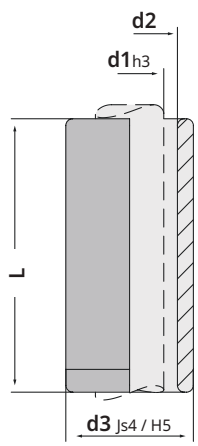
Material: 1.7131
Hardness: 58-62 HRC
Heat treatment: Case-hardening and tempering
Note: Fine grinding and super finishing

Order:
G184-2. d1 x L

d1	L
4	40
	50
	60
	80
	100
5	40
	50
	60
	80
	100

d1	L
6	40
	50
	60
	80
	100
	125
	140
	160

d1	L
8	50
	60
	80
	100
	125
	140
	160



Code: **G184-3**

MINI Guide Bush for Ball Cage

Material: 1.7131
Hardness: 60-64 HRC
Heat treatment: Case-hardening and tempering
Note: Fine grinding and super finishing

Order:
G184-3. d1 x L

d1	d2	d3	L
4	6	8	10
			15
			20
			25
5	7	10	10
			15
			20
			25
			30

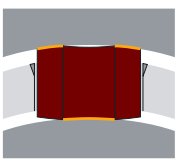
d1	d2	d3	L
6	9	11	15
			20
			25
			30
			35
8	11	14	15
			20
			25
			30
			35
			40

NEW

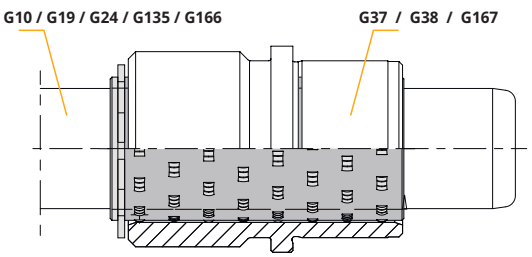
Roller Cage

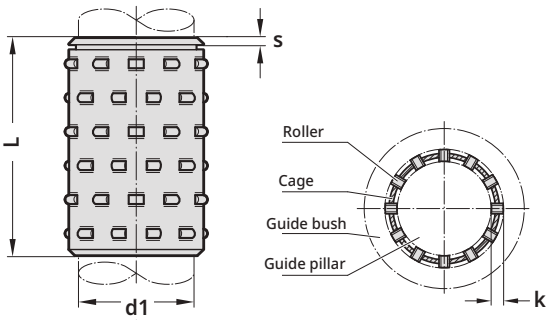
Code: **G81**

G81 Roller Cages create a linear contact with the guide bush and guide pillar, resulting in a significantly higher load-carrying capacity for each roller compared to a ball-cage of the same diameter. The profile rollers are arranged in a spiral pattern along the axis, ensuring each roller moves along its own unique path. The cages are designed with grooves to accommodate a DIN 471 circlip.



- Ideal for high-speed operations
- Suitable for applications requiring maximum precision
- Offers greater stiffness compared to ball cages
- Well-suited for **Fine Blanking & Progressive Dies** due to its ability to withstand high shear forces
- Suitable for **IML Injection Moulds**
- Reduced wear due to the axial offset of the rollers
- Optimized inlet geometry ensures smooth roller entry
- Play-free guidance achieved through optimal preload
- Can be used for axial motions only





d1	L	No. of Rollers	k	s
20	45	32	3	1.6
	55	40		
	65	48		
	75	56		
	85	64		
	95	72		
	105	80		
25	45	40	3	1.6
	55	50		
	65	60		
	75	70		
	85	80		
	95	90		
	105	100		
	115	110		
	125	120		
30	45	48	4	2.1
	55	60		
	65	72		
	75	84		
	85	96		
	95	108		
	105	120		
	115	132		
	125	144		
	135	156		
	145	168		
	155	180		
	165	192		

d1	L	No. of Rollers	k	s
40	55	70	4	2.1
	65	84		
	75	98		
	85	112		
	95	126		
	105	140		
	115	154		
	125	168		
	135	182		
	145	196		
	155	210		
	165	224		
	175	238		
	185	252		
	205	280		
50	65	108	4	2.1
	75	126		
	85	144		
	95	162		
	105	180		
	115	198		
	125	216		
	135	234		
	145	252		
	155	270		
	165	288		
	175	306		
	185	324		
	205	360		
63	75	154	4	2.1
	85	176		
	95	198		
	105	220		
	115	242		
	125	264		
	135	286		
	145	308		
	155	330		
	165	352		
	175	374		
	185	396		
	205	440		

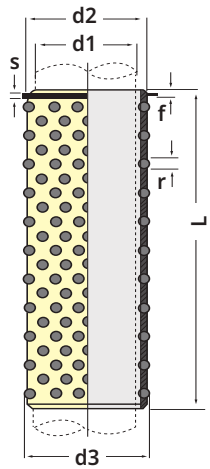
Roller Cage: Aluminium
Rollers: Steel hardened, 100 Cr6, DIN 5402

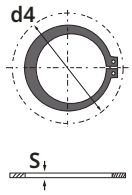
Order: **G81.** d1 x L

Ball Cage

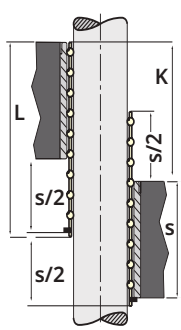
Code: **G70**

Heat resistance of ball cage is 120° C.
Ball cages are presented with circlips.





Mounting Example



L = K + 0.5 x s

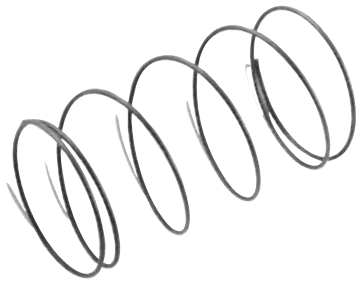
Compatible Bushes

d1	L	d2	Ball		Circlip		
			d3	r	d4	f	s
NEW 10	30	13	14	2	20.6	3.2	1.2
	40						
12	40	15	16	2	22.6	3.2	1.2
	56						
15	45	20	21	3	28.4	5	2
	65						
16	71	21	22		29.6		
18	45	23	24	3	32.2	5	2
	56						
	71						
19	45	24	25	3	33.2	5	2
	56						
	71						
20	80	25	26		34.2		
	95						
24	45	29	30	3	39.1	5	2
	56						
	71						
25	80	30	31		40.5		
	95						
	105						
	120						
30	45	39	40	4	49	5	2
	56						
	75						
32	80	37	38		51.4		
	95						
	105						
	120						
	140						

d1	L	d2	Ball		Circlip		
			d3	r	d4	f	s
38	56	45	46	4	59.1	5	2
	71						
	80						
	95						
40	105	47	48		60.8		
	120						
	140						
	160						
48	71	55	56	4	70.2	5	2
	80						
	95						
	105						
50	120	57	58		72.6		
	140						
	160						
60	85	67	68	4	83.1	5.7	2.7
	95						
	105						
63	120	70	71		87		
	140						
	160						
80	105	90	92	6	108.5	6.7	3.2
	120						
	140						
	160						
	200						

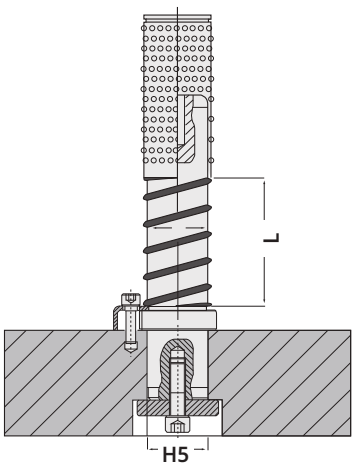
Order: **G70.** d1 x L

Material: Ms58 **Ball:** 100Cr6
Tolerance: +0.001



Code: **G70 - 1**

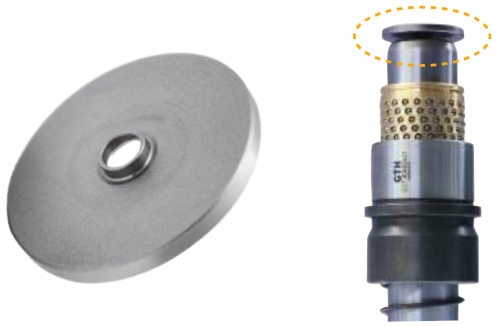
Ball Cage Retaining Spring



d	L	Note
19 **20**	Up to 40 ~ 140	Production in ball systems or other die inner designs Upon request. **L :** 10 mm ranges
24 **25**	Up to 40 ~ 180	
30 32	Up to 50 ~ 230	
38 **40**	Up to 60 ~ 280	
48 **50**	Up to 70 ~ 280	
60 63	Up to 80 ~ 250	

Order: **G70-1.** d x L

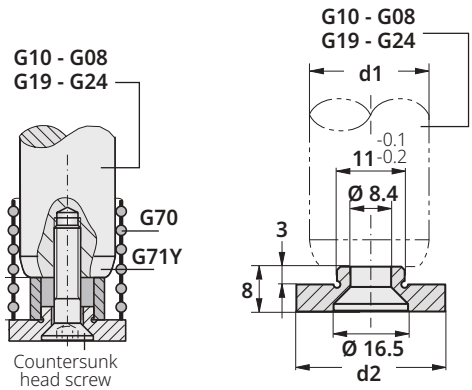
To avoid hanging at usage of ball cage bush, ball cage retaining spring can be used.



Code: **G151**

Ball Cage Holder Flange

(Locking flange for ball cage)



d1	d2	Pillar Dia.
20	25	Ø 20
25	30	Ø 25
30	37	Ø 30
40	47	Ø 40
50	57	Ø 50
60	67	Ø 60
63	71	Ø 63

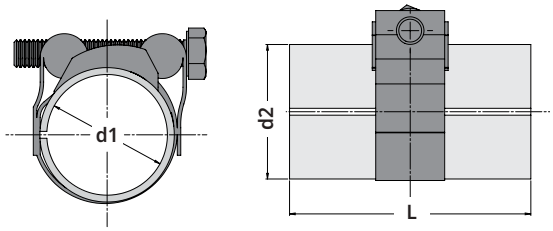
Order: **G151.** d1

Material: 1.7131 (16MnCr5)

Holder Flange / (locking flange for ball cage)
In ball cage bush systems, it prevents detaching of cage **(G70)** from guide pillar during operating. It is practical and provides convenience in die mounting.
In mounting to die: Spacer tube **(G71Y)** of ball cage stroke distance and countersunk head screw **(HIC)** can be adjusted in desired length.

Limiting Bush

Code: **G168**



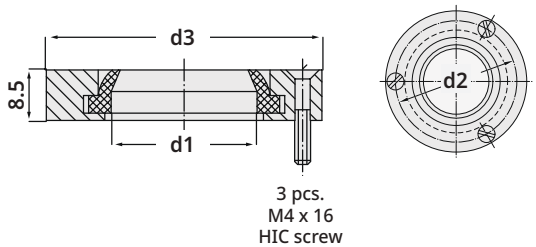
Order Code	d1	Guide Pillar	d2	L
G16816	16	**15 / 16**	20	20
G16820	20	**19 / 20**	30	20
G16825	25	**24 / 25**	30	30
G16832	32	**30 / 32**	40	30
G16840	40	**38 / 40**	50	40
G16850	50	**48 / 50**	60	40
G16863	63	**60 / 63**	70	40

It helps to position the working length of the bushes running on the guide pillars.

Mounting Example

Perforated Flange

Code: **G22**



Order Code	d1	d2	d3
G22 24	**24**	45	55
G22 25	**25**	45	55
G22 32	**32**	55	65
G22 30	**30**	55	65
G22 38	**38**	65	75
G22 40	**40**	65	75
G22 48	**48**	78	94
G22 50	**50**	78	94
G22 60	**60**	92	110
G22 63	**63**	92	110

Material: 1.7131 (16MnCr5)

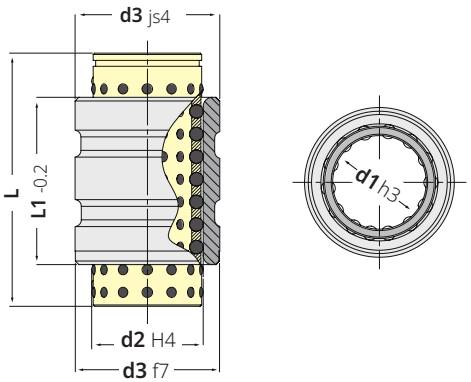
Guide Pillar Protection Flange:

Guide pillar protection flange protects dirt to be occurred at dies or thrust etc. Different various usage areas can be created in dies.

Plain Guide Bush for Ball Cage

Code: **G167**

ISO 9448-3



d1	d2	d3	L1	L
NEW **10**	**14**	22	23	30
			30	40
			37	40
12	**16**	22	23	40
			30	40
			37	40
15 **16**	21 **22**	28	23	45
			30	45
			37	45
			47	56
			60	71

d1	d2	d3	L1	L
19 **20**	25 **26**	32	23	45
			30	45
			37	45
			47	56
			60	71
			77	95
24 **25**	30 **31**	40	23	45
			30	45
			37	45
			47	56
			60	71
			77	95
30 32	**38** 40	48	30	45
			37	50
			47	56
			60	71
			77	95
			95	120
38 **40**	46 **48**	58	30	45
			37	50
			47	63
			60	80
			77	95
			95	120
			120	140
48 **50**	56 **58**	70	37	50
			47	63
			60	80
			77	95
			95	120
			120	140
60 **63**	68 **71**	85	60	95
			77	95
			95	120
			120	140
80	**92**	105	120	140

Note: Ball Cage "G70" must be ordered separately.

Order: **G167.** d1 x L1

Material: 1.7131
Hardness: 60 - 64 HRC

The inner diameter of the products is honed, the outer diameter is precision ground. The grooves on the product are made to provide better adhesion to the hole during mounting. **Advantages of G167:** No problem finding the position when changing the bushes. High accuracy and robustness. **Mounting Instruction:** Please secure with adhesive *(Order Code: GL.64832)* Do not press-fit.

Adhesive / Loctite 648

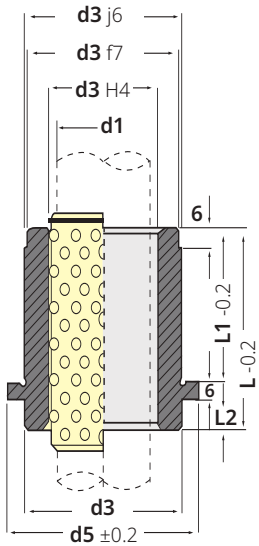
The adhesive provides optimum push retention for **"G167"** bushes. For adhesion of bearings bushes, screws and other machine components. Very fast adhesion to handling strength.

Heat Resistance: -55^0 / +175^0 C **Package:** 50ml / 55 g.

Order: **GL.64832**

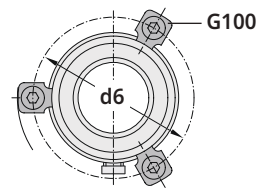
Guide Bush for Ball Cage
(Short type)

Code: **G38**



G38 guide bushes work without problem at dies, cuttings under 0.5 mm sheet metal thickness and where cutting space is low and when 200 stamp per minute are exceeded. It is not resistant to the lateral loads. They are preferred in cases that precison should be increased.

4 pcs. clamp for **d: 38** mm and larger sizes.



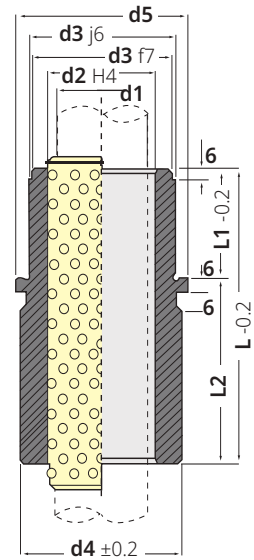
d1	L	d2	d3	d5	d6	L1	L2
15 **16**	35	21 22	30	34	46.2	23	12
19 **20**	35	25 26	32	40	52.4	23	12
24 **25**	35	30 31	40	48	60.8	23	12
30 32	42	37 40	48	56	67.8	30	12
38 **40**	52	46 48	58	66	78	37	15
48 **50**	65	56 58	70	80	93.2	47	18
60 **63**	80	68 71	85	95	108.4	60	20
80	80	92	105	118	131.5	60	20

Order: **G38.** d1 x L x L1

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

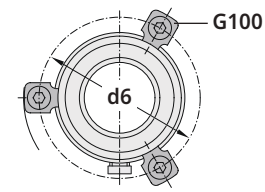
Guide Bush for Ball Cage
(Long type)

Code: **G37**



High precision guide bushes for ball cage: Despite providing high reliability at high speeds, contacting balls from one point, brings the system to precision status against impacts and side loads. This disadvantage is compensated to give product diameters up to a certain point in the upper tolerance, the working surface should be precise.

4 pcs. clamp for **d: 38** mm and larger sizes.



d1	L	d2	d3	d4	d5	d6	L1	L2
15 **16**	43 59	21 22	30	32	34	46.2	23	20 36
19 **20**	43 59	25 26	32	39	40	52.4	23	20 36
24 **25**	59 79	30 31	40	46	48	60.8	23	36 56
30 32	75 93	38 40	48	53	56	67.8	30	45 63
38 **40**	82 108	46 48	58	63	66	78	37	45 71
48 **50**	97 127	56 58	70	77	80	93.2	47	50 80
60 **63**	116 150	68 71	85	92	95	108.4	60	56 90
80	120 150	92	105	115	118	131.5	60	60 90

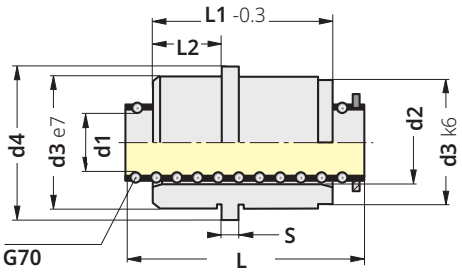
Order: **G37.** d1 x L x L1

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

Note: Two different products in section (d) are to avoid reverse closing of dies during mounting by using three pcs. main dimensions and one pcs. auxiliary **(d= Ø15 -19 - 24 - 32 - 38 - 48 - 60 mm)** dimensions at same die, is avoided reverse closing of die plate. Thus, symmetrical die closure is ensured. **Example:** In the same die (Ø20 x 3 - Ø19 x 1) = 4 pieces **Note:** Should be ordered with G70.

Steel Bush + Ball Cage Bush Set

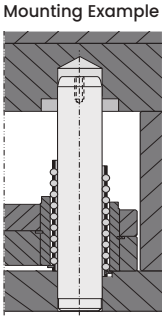
Code: **G29**



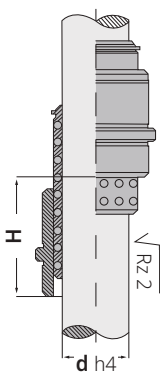
d1	L	L1	L2	d2	d3	d4	S	H
12	40	24	6	16	22	26	6	50
	56							82
18	45	34	11	24	30	35	6	44
	56							66
	71							96
30	56	54	21	38	46	52	6	32
	75							70
	95							110

It provides more precision and rapid motion at ejector plates in injection moulds.

Mounting Example



more precision and rapid motion



Order: **G29.** d1 x L

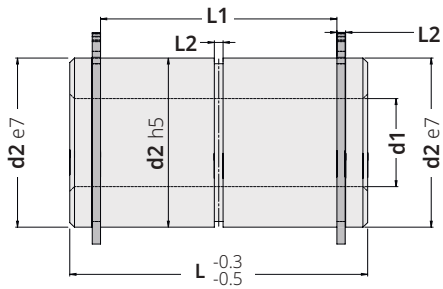
Ball Material: 1.3505 (100Cr6)
Cage: Ms58 **Steel Bush:** 1.7131 (16MnCr5)

NEW

2 pcs. DIN 471

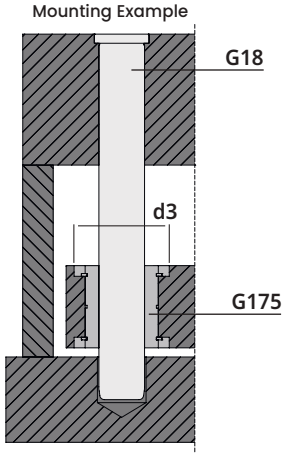
Linear Ball Bearing Bush with Circlips

Code: **G175**



Order Code	d1	L	d2	L1	L2	d3
G1751226	12	26	24	17	1.2	34
G1751834	18	34	30	25	1.5	41
G1751844	18	44	30	35	1.5	41
G1752034	20	34	32	25	1.5	43
G1752044	20	44	32	35	1.5	43
G1752544	25	44	40	30	1.75	51
G1752554	25	54	40	40	1.75	51
G1753054	30	54	48	40	1.75	61
G1753063	30	63	48	50	1.75	61

Mounting Example



Download
www.guvenal.net

3D CAD FILES GUVENAL

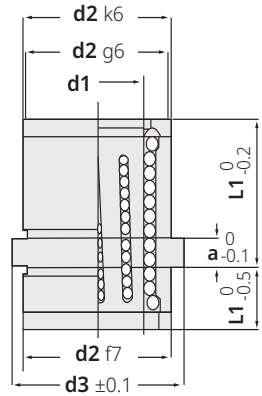
interior view

Linear Ball Bearing Bush

Code: **G75**

Free stroke, rapid and limitless movement.
New for ejector plate.
Operating Temp.: Max. 200⁰

Positioning :
Pls. do not make direct fitting.
Precision assembly recommended with bronze / brass.



d1	L	d2	d3	a	L1	Ball
12	22	24	28	6	8	3
18	26	30	34	6	9	3
20	26	32	36	6	9	3
	36					
25	26	40	45	6	10	3
	36					
	46					
30	46	48	54	8	12	4
	66					
40	46	60	66	8	12	4
	66					
NEW **50**	56	70	76	10	25	4

Order: **G75.** d1 x L

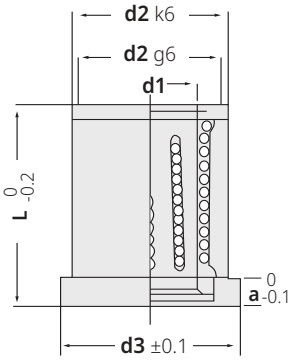
3D CAD FILES GUVENAL

Linear Ball Bearing Bush Headed

Code: **G74**

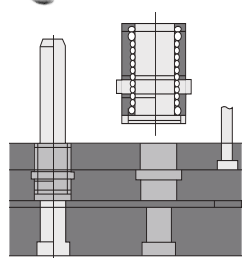
Balls are worked independently by rotating, they are not frictional.
Operating Temp.: Max. 200⁰

Positioning :
Pls. do not make direct fitting.
Precision assembly recommended with bronze / brass.



d1	L	d2	d3	a	Ball	Line Pcs.
18	35	30	34	6	3	6
20	35	32	36	6	3	6
	45					
	55					
30	45	48	54	8	4	8
	63					
40	45	60	66	8	4	8
	63					

G18
Compatible Pillar



Order: **G74.** d1 x L

3D CAD FILES GUVENAL

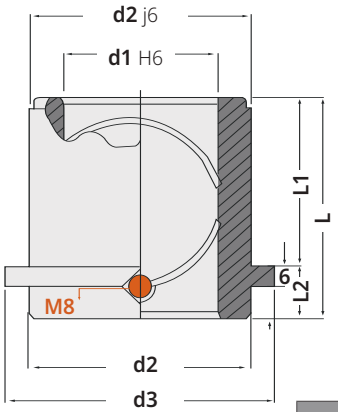
New Linear Ball Bearing Bushes G74 / G75: There are balls at inclined - serial - parallel intermediate channels - lines inside of linear **G74 & G75** bushes (balls move by rotating in slot and frictionless). In this way, axial motion remains limitlessly free. Also, bearing logic is provided to the steel bush. **The advantage of our new product G75 according to other similar product G29:**
Extra stroke distances at unlimited axial direction and robust powerful centering is provided - free motion unlimited with low tolerance absorbs other pinking and tauting. It is presented unlimited motion advantages with compatibility to high speeds.
Linear bush G75: Rigidity in centering with free axial motion at long ejector systems of injection moulds - unlimited frictional motion.
Linear bush G74: Quality control equipment - practical and reliable product for machine and mould production and device design.
For maintenance and cleaning: "Güvenal Signum ***(order code: W160110)***" spray oil is used.

WARNING ! During production stage of **G74 & G75** products ball bearings are positioned at a certain angle.
Other imitation products has no angle and the balls are at a single centre.

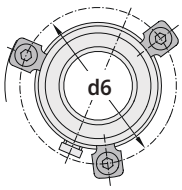
Guide Bush, Thick & Short Type

Code: **G34K**

(with collar & lubricating)

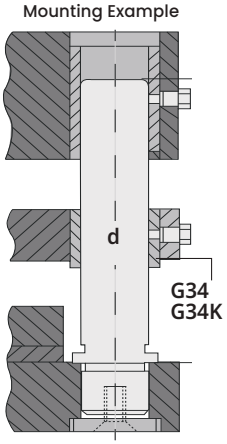


G100
Clamping Detail



4 pcs. clamp for d1 = 38 mm and larger sizes.

Mounting Example



d1	L	d2	d3	L1	L2
19 **20**	35	32	40	23	12
24 **25**	35	40	48	23	12
32 **30**	42	48	56	30	12
38 **40**	52	58	66	37	15
48 **50**	65	70	80	47	18
60 **63**	80	85	95	60	20
80	80	105	118	60	20

Order:
G34K. d1 x L x L1

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

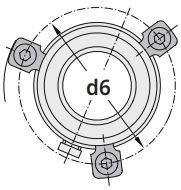
Thick type steel bushes: To provide perpendicularity at bush and guide pillar with new design of **Güvenal Die Components** on product suitable flange fixation (balanced layout) on bearing area is created. During mounting, shrink fit should not be done.
To avoid clamping and surface disorders at products by inserting soft tight products to the slots, mounting can be ensured with clamps.

Guide Bush, Thin & Short Type

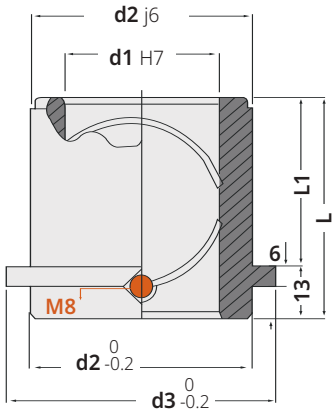
Code: **G34**

(with collar & lubricating)

G100
Clamping Detail



4 pcs. clamp for d1 = 38 mm and larger sizes.



Mounting Details:

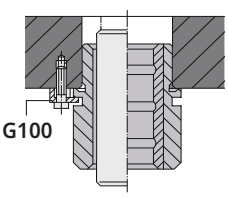
Code: **G34K**

d1	d6
20	52.4
25	60.8
30	69
40	79
50	93.2
63	108.4
80	131.5

Code: **G34**

d1	d6
16	46.2
20	46.2
25	51.4
30	56.4
40	66.8
50	77

d1	L	d2	d3	L1
16	36	28	34	23
20	36	28	34	23
25	36	34	39	23
30	50	39	44	37
40	50	50	54	37
50	60	60	64	47



Order:
G34. d1 x L x L1

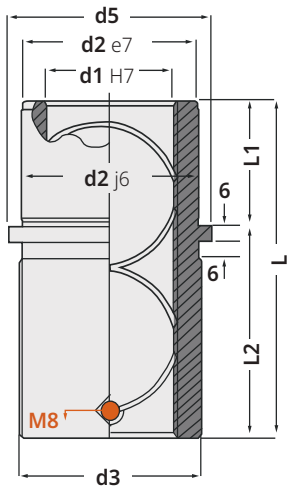
Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

For being **Güvenal Die Components** products having long life and maximum resistance against abrasion, unique precision has provided at surface roughness. This is also created specific bushing system.

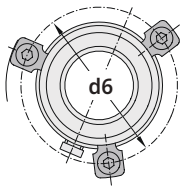
Guide Bush, Thin & Long Type

Code: **G33**

(with collar & lubricating)



G100
Clamping Detail



4 pcs. clamp for d1 = 38 mm and larger sizes.

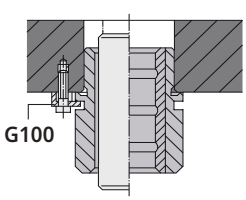
d1	L	d2	d3	L1	L2
16	70	28	34	23	47
20	70	28	34	23	47
25	80	34	39	23	57
30	90	39	44	37	53
40	100	50	54	37	63
50	120	60	64	47	73

Mounting Details:

Code: G33		Code: G33K	
d1	d6	d1	d6
16	46.2	**20**	52.4
20	46.2	**25**	60.8
25	51.4	**30**	69
30	56.4	**40**	79
40	66.8	**50**	93.2
50	77	**63**	108.4
		80	131.5

Order:
G33 d1 x L x L1

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

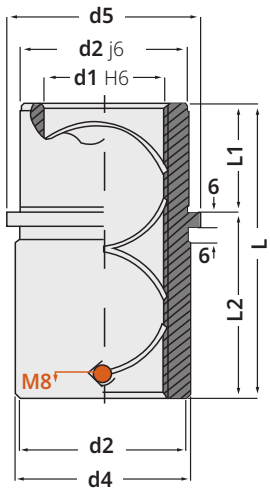


For being **Güvenal Die Components** products having long life and maximum resistance against abrasion, unique precision has provided at surface roughness. This is also created specific bushing system.

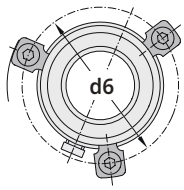
Guide Bush, Thick & Long Type

Code: **G33K**

(for heavy dies / with collar & lubricating)

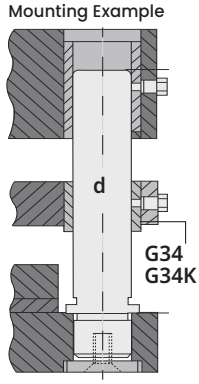


G100
Clamping Detail



4 pcs. clamp for d1 = 38 mm and larger sizes.

Mounting Example

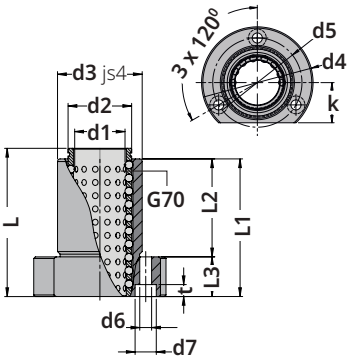


Order:
G33K d1 x L x L1

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

d1	L	d2	d4	d5	L1	L2
19	43	32	39	40	23	20
20	59					36
24	59	40	46	48	23	36
25	79					56
32	75	48	53	56	30	45
30	93					63
38	82	58	63	66	37	45
40	108					71
48	97	70	77	80	47	50
50	127					80
60	116	85	92	95	60	56
63	150					90
80	120	105	115	118	60	60
	150					90

Thick type steel bushes: Please don't use two products without oil groove together. One of product in guide pillar or bushes should be used as set with oil groove. While using guide pillar and bush sets, should be considered that both of them have same brand. Because, grinding tolerance can be different in different guide pillars and bushes. Also, this can be caused big problems during both mounting and operating. The dimensions not giving their tolerance are subjected to general tolerance (production according to standards).



Code: **G72 – 1**

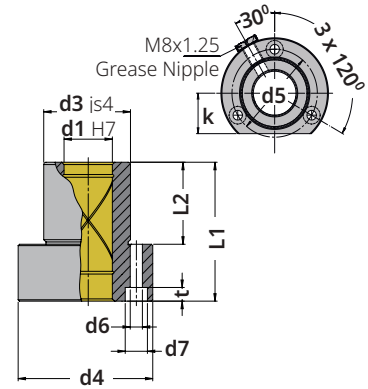
Guide Bush with Flange, for Ball Cage

* 3 pcs **"IMB"** coded screws are used to fixed product.
* Clamping Screws & "G70" coded Ball Cage Bush should be ordered separately.

Order:
G72 – 1. d1 x L1 x L2

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

d1	d2	d3	d4	d5	d6	d7	t	k	L	L1	L2	L3
19	25	32	50	40	4.5	8	5	18	45	38	23	15
20	**26**								56	45	30	
									72	52	37	
24	30	40	63	50	5.5	10	6	23	45	38	23	15
25	**31**								71	55	30	25
									72	62	37	
30	38	48	72	58	5.5	10	6	28	56	45	30	15
32	**40**								71	62	37	25
									80	72	47	
38	46	58	85	70	7	11	7	33	63	55	30	25
40	**48**								80	67	37	30
									95	77	47	
48	56	70	104	86	9	15	9	38	80	62	37	25
50	**58**								95	89	47	42
									120	102	60	
60	68	85	120	100	9	15	9	46	95	89	47	42
63	**71**								120	102	60	
80	**92**	105	148	125	12	18	12	56	140	125	75	50



Code: **G72 – 2**

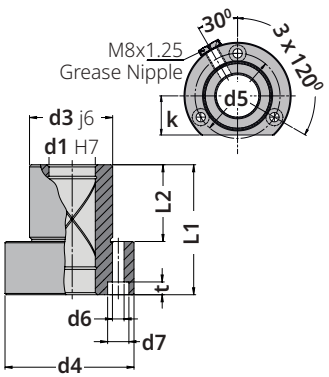
Guide Bush with Flange, Bronze Coated

* 3 pcs **"IMB"** coded screws are used to fixed product.
* Clamping Screws should be ordered separately.

Order:
G72 – 2. d1 x L1 x L2

Material: 1.1213 (Cf53)
Bronze Casting

d1	d3	d4	d5	d6	d7	t	k	L1	L2
19	32	50	40	4.5	8	5	18	38	23
20								45	30
								52	37
24	40	63	50	5.5	10	6	23	38	23
25								55	30
								62	37
30	48	72	58	5.5	10	6	28	45	30
32								62	37
								72	47
38	58	85	70	6.6	11	7	33	55	30
40								67	37
								77	47
48	70	104	86	9	15	9	38	62	37
50								89	47
								102	60
60	85	120	100	9	15	9	46	89	47
63								102	60
80	105	146	125	11	18	12	56	125	75



Code: **G72 – 3**

Guide Bush with Flange, Steel

* 3 pcs **"IMB"** coded screws are used to fixed product.
* Clamping Screws should be ordered separately.

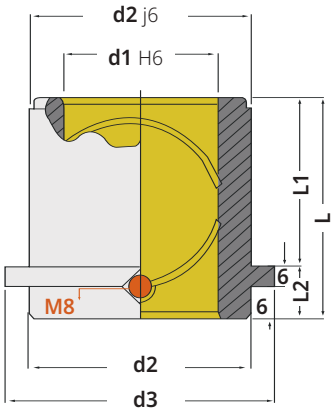
Order:
G72 – 3. d1 x L1 x L2

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

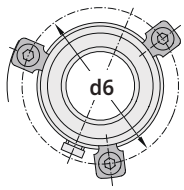
d1	d3	d4	d5	d6	d7	t	k	L1	L2
19	32	50	40	4.5	8	5	18	38	23
20								45	30
								52	37
24	40	63	50	5.5	10	6	23	38	23
25								55	30
								62	37
30	48	72	58	5.5	10	6	28	45	30
32								62	37
								72	47
38	58	85	70	6.6	11	7	33	55	30
40								67	37
								77	47
48	70	104	86	9	15	9	38	62	37
50								89	47
								102	60
60	85	120	100	9	15	9	46	89	47
63								102	60
80	105	146	125	11	18	12	56	125	75

Code: **G36**

Guide Bush, Bronze Coated & Short Type



G100
Clamping Detail



4 pcs. clamp for d1 = 38 mm and larger sizes.

Positioning :
Pls. do not make direct fitting. Precision assembly recommended with bronze / brass.

d1	L	d2	d3	L1	L2
19 **20**	35	32	40	23	12
24 **25**	35	40	48	23	12
32 **30**	42	48	56	30	12
38 **40**	52	58	66	37	15
48 **50**	65	70	80	47	18
60 **63**	80	85	95	60	20
80	80	105	118	60	20

Mounting Details:

Code: G36		Code: G35	
d1	**d6**	**d1**	**d6**
20	48.8	**20**	48.8
25	56.8	**25**	56.8
30	64.8	**30**	64.8
40	74.8	**40**	74.8
50	86.8	**50**	86.8
63	101.8	**63**	101.8
80	121.8	**80**	121.8

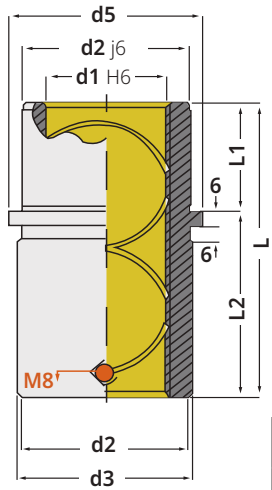
Order: **G36.** d1 x L x L1

Material: 1.1213 (Cf53)
Bronze: SnBz 10 **HB** 160 - 180

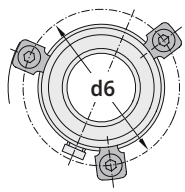
It has helical lubrication and inner lubrication system, its position can be lubricated with grease nipple from outside. Finally, equal distance to all lubrication points is ensured. Due to oil intake feature of bronze coated to inside it, there is no need for frequent lubrication, recommended operating speed is 15-30 mt / min. If some conditions such as lubrication clearance, stroke length, radial load and heat distribution are provided, to reach speed as 600 - 800 stroke per minute is possible.

Code: **G35**

Guide Bush, Bronze Coated & Long Type

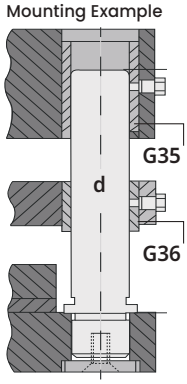


G100
Clamping Detail



4 pcs. clamp for d1 = 38 mm and larger sizes.

Mounting Example



IMPORTANT!
Pls. lubricate from grease nipple on bush occasionally.

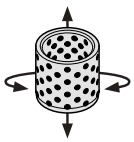
d1	L	d2	d3	d5	L1	L2
19	43	32	39	40	23	20
20	59					36
24	59	40	46	48	23	36
25	79					56
32	75	48	53	56	30	45
30	93					63
38	82	58	63	66	37	45
40	108					71
48	97	70	77	80	47	50
50	127					80
60	116	85	92	95	60	56
63	150					90
80	120	105	115	118	60	60
	150					90

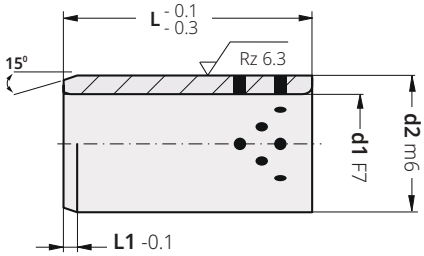
Order: **G35.** d1 x L x L1

Material: 1.1213 (Cf53)
Bronze: SnBz 10 **HB** 160 - 180

In order to avoid reverse closing of die, Ø 19 - 24 - 32 - 38 48 - 60 can be used with 1 Pcs. main dimension.

Hardened steel bushing absorbs strong side thrust. Thus, vibrationless rigid operation is ensured and bronze bush is protected against strong thrust made from end head, inner layer coated bronze with centrifugal technique is resistant against abrasion factor with its high quality. In addition with its excellent heat dissipation feature is ensured rapid distribution of excessive friction temperature.





Guide Bush - Plain / Self-Lubricating

Code: **G48**

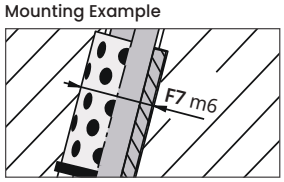
* Hole tolerance for shrink fit: H7

d1	d2	L	L1
8	12	8	2
		10	
		15	
10	14	10	2
		12	
		15	
		20	
12	18	10	2
		12	
		15	
		20	
		25	
		30	
15	22	12	2
		16	
		20	
		25	
		30	
		35	
		40	
16	22	12	2
		16	
		20	
		25	
		30	
		35	
		40	
18	24 28 30	20	4
		25	
		30	
		35	
		40	
		50	
20	24 28 30	20	4
		25	
		30	
		35	
		40	
		50	
24	33 35	20	4
		25	
		30	
		35	
		40	
		50	
25	33 35	20	4
		25	
		30	
		35	
		40	
		50	

d1	d2	L	L1
30	38 40 45	20	4
		25	
		30	
		35	
		40	
		50	
		60	
35	40 45	20	4
		25	
		30	
		35	
		40	
		50	
		60	
38	50 55	25	4
		30	
		35	
		40	
		50	
		60	
		80	
40	50 55	25	4
		30	
		35	
		40	
		50	
		60	
		80	
42	55 60	30	4
		35	
		40	
		50	
		60	
45	55 60	30	4
		35	
		40	
		50	
		60	
48	60 62 65	30	4
		40	
		50	
		60	
		70	
		80	
		100	
50	60 62 65	30	4
		40	
		50	
		60	
		70	
		80	
		100	

d1	d2	L	L1
60	74 75	40	4
		50	
		60	
		80	
		100	
80	96 100	40	4
		60	
		80	
		100	
		120	
		140	
100	120	50	4
		60	
		80	
		100	
		120	
		140	
		160	
120	140	50	4
		60	
		80	
		100	
		120	
		140	
		160	
150	170	50	4
		60	
		80	
		100	
		120	
		140	
		160	
160	180	50	4
		60	
		80	
		100	
		120	
		140	
		160	

Mounting Example



Order:
G48. d1 x d2 x L

Material:
Bronze + graphite inserts

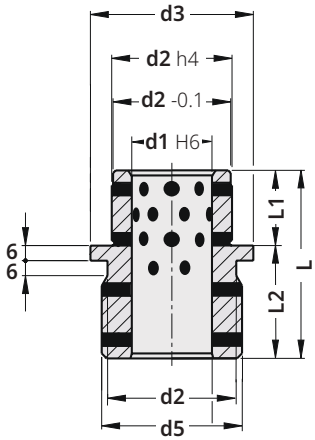
Working Direction

Code: **G45**

Guide Bush with Centre Collar, Self-Lubricating

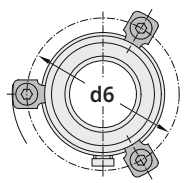
DIN 9834 / ISO 9448

Heat Resistance: < 150°C

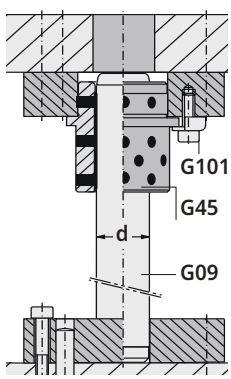


Positioning :
Pls. do not make direct fitting. Precision assembly recommended with bronze / brass.

d1	L	d2	d3	d5	d6	L1	L2
19 **20**	32	32	40	-	57.4	20	12
	50			34			30
	70						50
24 **25**	35	40	48	-	65.4	23	12
	60			42			37
	80						57
32 **30**	42	48	56	-	73.4	30	12
	75			50			45
	95						65
38 **40**	50	58	66	-	83.4	35	15
	80			60			45
	110						75
48 **50**	65	70	80	-	97.4	45	20
	90			74			45
	120						75

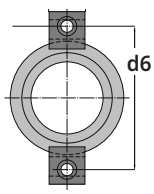


G101A
Clamping Detail



Order: **G45.** d1 x L

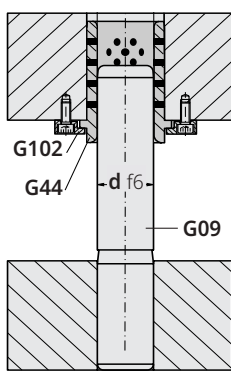
Material:
Bronze + Graphite inserts



G102
Clamping Detail

Order: **G44.** d1 x L

Material:
Bronze + Graphite inserts



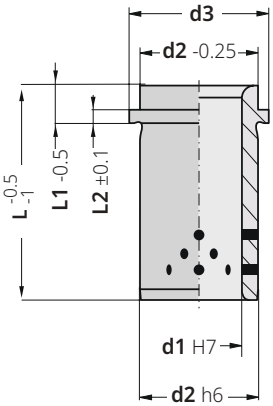
Working Direction

Code: **G44**

Guide Bush with Collar, Self-Lubricating

DIN 9834 / ISO 9448

Heat Resistance: < 150°C



Positioning :
Pls. do not make direct fitting. Precision assembly recommended with bronze / brass.

d1	L	d2	d3	L1	L2	d6
20	32	28	34	12	6.3	53.4 (G102 Form A)
25	40	32	40	10		57.4 (G102 Form A)
30	50	40	50	12		65.4 (G102 Form A)
32	50	40	50	12		65.4 (G102 Form A)
40	63	50	63	15		G102B or G120C
50	71	63	71	17		G102B or G120C
63	80	80	90	19	10	122.4 (G102 Form D)
80	100	100	112	22		142.4 (G102 Form D)
100	125	125	140	21		167.4 (G102 Form D)
125	160	160	180	30		202.4 (G102 Form D)
160	200	200	220	32		242.4 (G102 Form D)

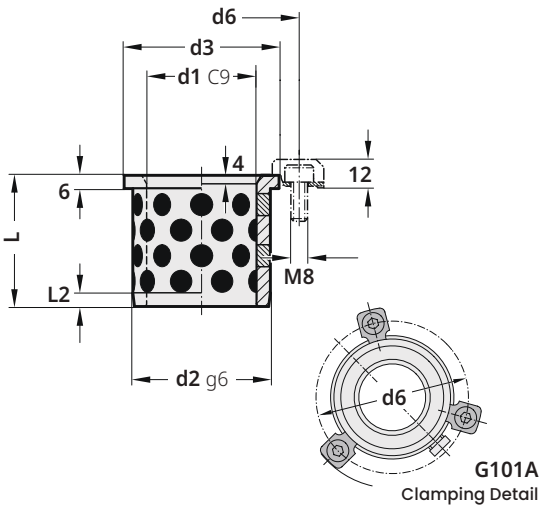
Working Direction

Guide Bush, Headed - NAAMS

Code: **G41**

Self-Lubricating

Heat Resistance: < 150°C



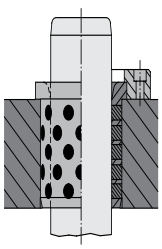
G101A
Clamping Detail

d1	L	d2	d3	L2	d6
25	40	32	40	4	57.4
32	50	40	50	4	67.4
40	55	50	63	5	80.4
50	63	63	71	6	88.4
63	75	80	90	8	107.4
80	90	100	112	10	129.4
100	115	125	140	12	157.4
125	138	160	180	12	197.4

Positioning :
Pls. do not make direct fitting.
Precision assembly recommended with bronze / brass.

Order: **G41.** d1 x L

Material:
Bronze + Graphite inserts



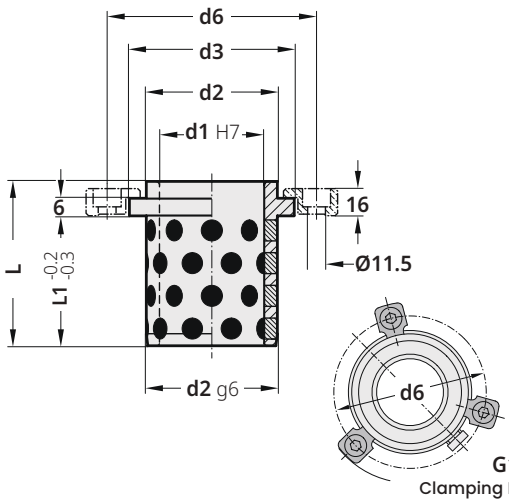
Working Direction

Guide Bush with Collar - NAAMS

Code: **G40**

Self-Lubricating

Heat Resistance: < 150°C



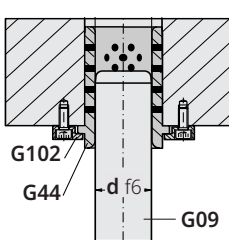
G101A
Clamping Detail

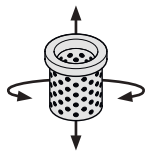
d1	L	d2	d3	d6	L1
20	40	28	34	51.4	30
25	40	32	40	57.4	30
30	50	40	50	67.4	40
32	50	40	50	67.4	40
40	63	50	63	80.4	50
50	71	63	71	88.4	56
63	80	80	90	107.4	63
80	100	100	112	129.4	80
100	125	125	140	157.4	106
125	160	160	180	197.4	132

Positioning :
Pls. do not make direct fitting.
Precision assembly recommended with bronze / brass.

Order: **G40.** d1 x L

Material:
Bronze + Graphite inserts





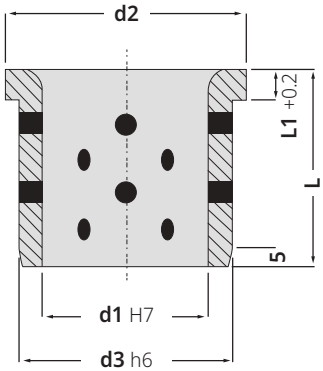
Working Direction

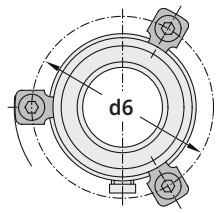
Guide Bush Headed

Code: **G42**

Self-Lubricating

Heat Resistance: < 150°C





G102E
Clamping Detail

d1	L	d3	d2	L1	d6
20	35	28	36	8	49.4
25	40	32	40		53.4
30	55	40	50		63.4
32	55	40	50		63.4
40	70	50	60		73.4
42	70	50	60		73.4
50	75	63	75	12	95.4
52	75	63	75		95.4
63	80	80	90		110.4
80	100	100	110		130.4
100	125	125	135		155.4

G102 E - 40

G102 E - 63

Order: **G42.** d1 x L

Material: Bronze + Graphite inserts

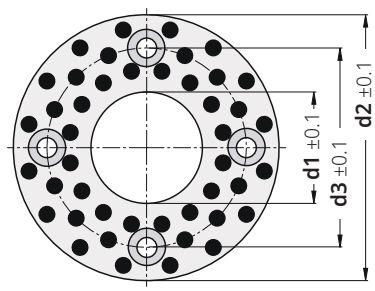
Thrust Washer - Perforated

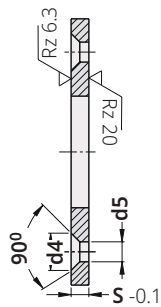
Code: **G107**

Self-Lubricating

Heat Resistance: < 150°C

* Spare part for in-die applications
* Spare part in core systems etc. in injection moulds





d1	d2	d3	S	d4	d5	Hole
12.2	40	28	3	6.9	3	2
16.2	50	28	3	6.9	3	2
20.2	50	35	5	11.5	5.5	2
25.2	55	40	5	11.5	5.5	2
30.2	60	45	5	11.5	5.5	2
35.2	70	50	5	11.5	5.5	2
40.2	80	60	7	13.8	6.6	2
45.3	90	67.5	7	13.8	6.6	2
50.3	100	75	8	13.8	6.6	4
60.3	120	90	8	18.3	9	4
70.3	130	100	10	18.3	9	4
80.3	150	120	10	18.3	9	4

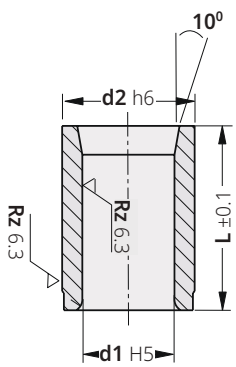
Order: **G107.** d1 x d2

Material: Bronze + Graphite inserts

NEW

Bronze Bush - Plain

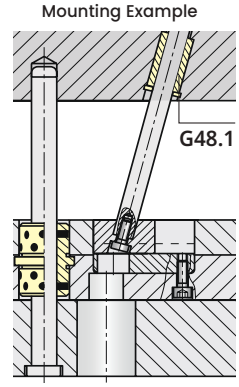
Code: **G48 - 1**



d1	L	d2
10	14	14
	20	
12	20	17
	25	
16	25	22
	32	

Order: **G48 - 1.** d1 x L

Mounting Example

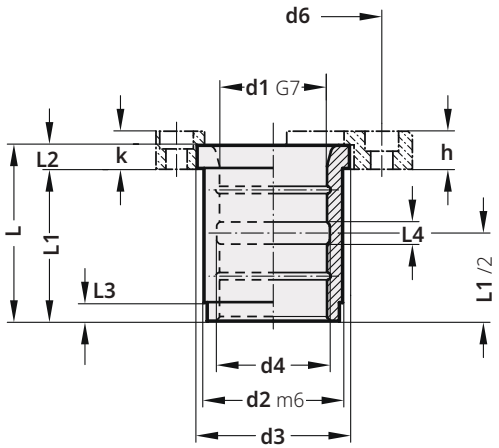


Working Direction

Guide Bush, Bronze

Code: **G86**

Heat Resistance: < 150°C



d1	L	d2	d3	d4	d6	L1	L2	L3	L4	h	k
20	32	28	32	22	-	28	4	3	5	10	-
25	40	35	40	27	-	35	5	5	5	10	-
32	50	44	50	34	-	44	6	8	5	12	-
40	63	52	60	42	73.4	55	8	8	8	12	12
50	80	63	71	52	87.4	70	10	8	10	16	16
63	100	80	90	65	110.4	88	12	10	12	20	20
80	125	100	112	82	132.4	109	16	10	16	25	25
100	160	125	140	102	160.4	140	20	10	20	32	32

Positioning :
Pls. do not make direct fitting.
Precision assembly recommended with bronze / brass.

Order: **G86.** d1 x L

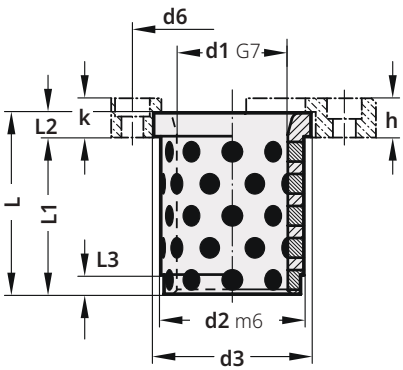
3D CAD FILES GUVENAL

Working Direction

Guide Bush, Headed - CNOMO

Code: **G43**

Self-Lubricating



d1	L	d2	d3	d6	L1	L2	L3	h	k
20	32	28	32	-	28	4	3	10	-
25	40	35	40	-	35	5	5	10	-
32	50	44	50	-	44	6	5	12	-
40	63	52	60	73.4	55	8	8	12	12
50	80	63	71	87.4	70	10	8	16	16
63	100	80	90	110.4	88	12	10	20	20
80	125	100	112	132.4	109	16	10	25	25
100	160	125	140	160.4	140	20	10	32	32

Positioning :
Pls. do not make direct fitting.
Precision assembly recommended with bronze / brass.

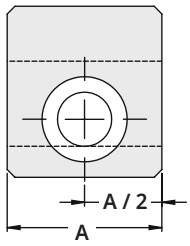
Order: **G43.** d1 x L

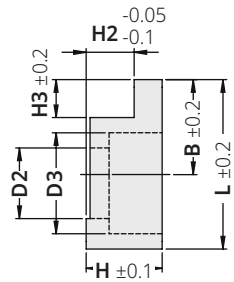
3D CAD FILES GUVENAL

>> Clamps for Guiding Components

Guide Bush Clamp

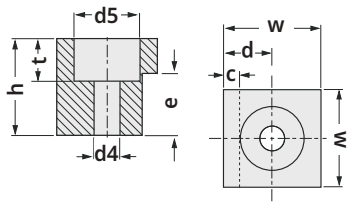
Code: **G102**





Order Code	d - d1 Pillar / Bush	A	B	L	H	H2	H3	D2	D3	Screw
G102A	25 - 32 40 - 50	20	12.5	20	10	6.3	5	7	11	M6x16
G102B	63 - 80 100 - 125 160	20	15	25	12	6.3	5	9	15	M8x20
G102C	63 - 80 100 - 125	25	21	32	16	6.3	10	11	18	M10x20
G102D	63 - 80 100 - 125 160	32	21	32	16	10	10	11.5	17.5	M10x20

It is used to fix from cap or flange portion at guide pillar and self lubricating bush. While using for self-lubricating guide bushes and other bush components with bushes for Ø ≤ 63 - 2 pcs. and for Ø ≥ 80 - 3 pcs. clamps are used. Mounting screws should be supplied separately.



Bush Clamp

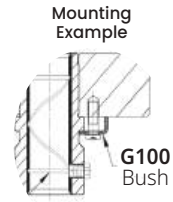
Code: **G102E**

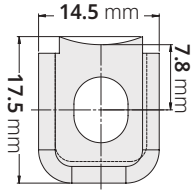
Bush	w	p	h	e	c	t	d4	d5
40	18	9.5	12	8	3	7	6.6	11
50	22	12	16	10	4	9	9	15
63	26	15	20	12	5	11	11	18
80	26	15	25	16	5	11	11	18
100	26	15	32	20	5	11	11	18

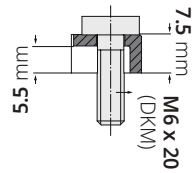
Order: **G102E.** Bush

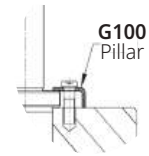
Guide Pillar & Bush Clamp

Order Code: **G100**

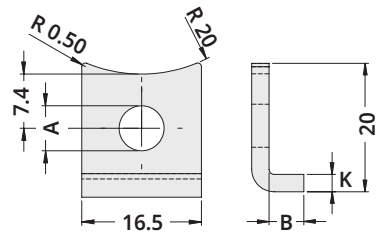








Can be used in clamping of demountable guide pillars **(G10 - G15 - G01 - G08)** in clamping system of guide pillars.

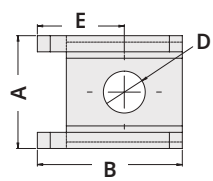


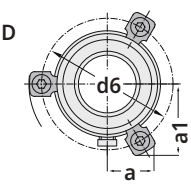
Guide Pillar & Bush Clamp

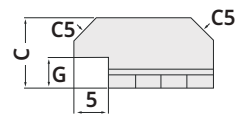
Code: **G143**

Order Code	Form	Screw	A	B	K
G143A	**A**	M6	6.20	4.80	2.5
G143B	**B**	M8	8.40	5.80	4

Thick and walled clamps used in clamping of guide pillar / bush sets in dies.







Screw / Form A
M6 x 20

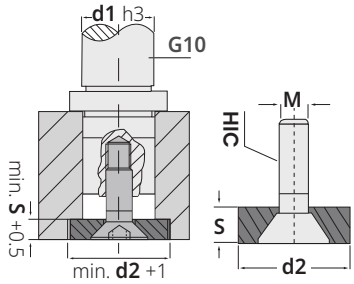
Screw / Form B
M8 x 20

Guide Bush Clamp

Code: **G101**

Order Code	Bush	A	B	C	D	E	G
G101A	32 / 40 50 / 63 63 / 80 100 / 115	17.5	22.5	12	6.5	13.5	6
G101B	32 / 40 50 / 63 63 / 80 100 / 115 125	21	25.5	13.5	8.5	15	5.5

While using for self-lubricating guide bushes and other bush components with bushes for Ø ≤ 63 2 pcs. and for Ø ≥ 80 3 pcs. clamps are used. Mounting screws are supplied separately.

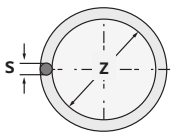


Code: **G110**

Mounting Flange

Guide pillar fixation & Support washer

Order Code	d2	d1 Pillar Diameter	S Flange	M Screw
G11022	22	Ø 15 / 16	5.5	M8 x 20
G11025	25	Ø 19 / 20		
G11032	32	Ø 24 / 25		
G11040	40	Ø 32 / 30	7.5	
G11050	50	Ø 38 / 40	9.5	
G11060	60	Ø 48 / 50		
G11073	73	Ø 60 / 63		
G11093	93	Ø 80	12	M12 x 20



Circlip

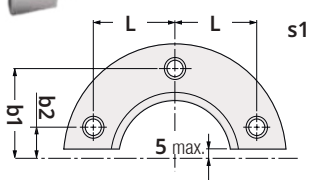
Code: **G112**

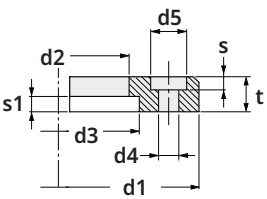
G02 - G03 - G04 - G05 - G06 - G07

G09 - G20 = Compatible Guide Pillars

Order: **G112.** Pillar

Pillar	z	s
25	22.5	2.5
32	28	4
40	36	4
50	46	4
63	57	6
80	74	6
100	94	6





Bush Holder Flange

Code: **G118**

Bush	d1	d2	d3	d4	d5	t	s	s1	L	b1	b2
25	72	12	41	6.6	32	10	7	5	20	-	20
32	80	12	51	6.6	40	12	7	6	25	-	21
40	100	12	61	6.6	50	12	7	8	38.5	41	14
50	125	16	72	9	63	16	9	10	46	49	17
63	140	18	91	11	80	20	11	12	55	57.5	17
80	180	22	113	14	100	25	13	16	70	72	20
100	200	22	141	14	125	32	13	20	81	85	25

Order: **G118.** Bush

Reference: **CNOMO**

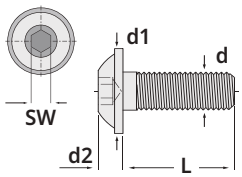
Hex-socket Button Head Screw with Flange

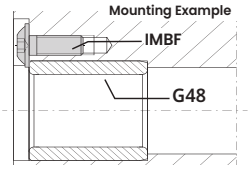
NEW

Code: **IMBF**

ISO 7380-2
10.9 - Zinc Plated

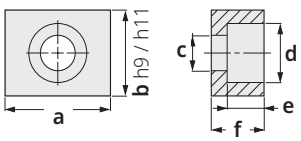
d	L	d1	d2	SW
M6	10	13.6	3.3	4
	12			
	16			
M8	16	17.8	4.4	5
	20			
M10	20	21.9	5.5	6





Order: **IMBF.** d x L

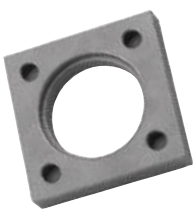
NEW

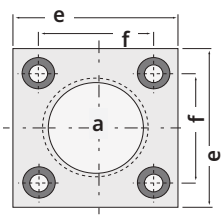


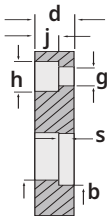
Holder Wedge Block (Ref: TKSKMA)

Code: **G171**

Order Code	b	a	c	d	e	f	Tol.
G171 A	12	16	5.5	10	5	8	h9
G171 B	12	20	5.5	10	5	8	h9
G171 C	16	20	6.6	11	7	10	h9
G171 D	20	60	9	14	10	20	h11
G171 E	25	80	11	20	12	25	h11
G171 F	25	125	11	20	12	25	h11
G171 G	30	80	11	20	12	30	h11
G171 H	30	125	11	20	12	30	h11







Square Flange for Guide Pillar

Code: **G119**

"G03 - G04 - G05" = Compatible Guide Pillars

a Pillar	b	d	e	f	g	h	j	s
25	28	10	45	31	6.6	11	7	2.7
32	37	10	56	36	6.6	11	7	4.2
40	45	12	70	50	6.6	11	7	4.2
50	55	14	80	55	9	16	9	4.2
63	70	18	100	70	11	18	11	6.2
80	87	20	110	80	13	22	14	6.2
100	107	20	140	100	13	22	14	6.2

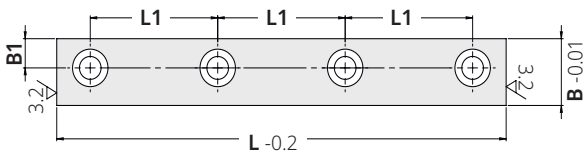
Order: **G119.** a (pillar)

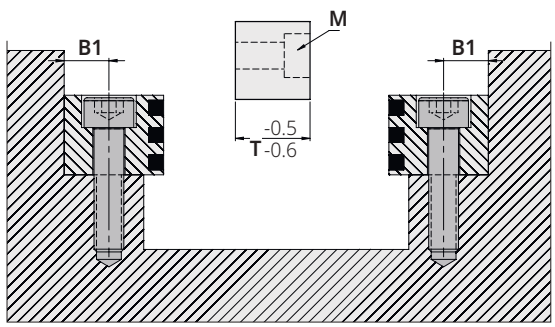
NEW

Wear Plate for Core Side

Code: **G172**

Self-Lubricating - Heat Resistance: 150°C





B	T	L	L1	B1	Hole	M
20	12	80	60	9	2	M6
		125	52.5		3	
	16	100	40			
		160	70			
25	22	125	50.5	11		M8
		200	58		4	
	30	160	68		3	
		250	74		4	
32	38	160	64	14	3	M10
		250	72		4	

Order: **G172.** B x L

Material: Bronze + graphite inserts

3D CAD FILES GUVENAL

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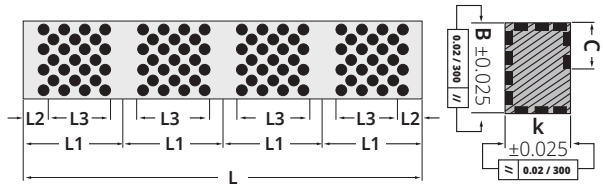
3D CAD - Formats: CATIA, STEP, IGES 3D, X_T

Working Direction

Wear Plate Two-Way Sliding Type

Code: **G123**

Self-Lubricating - Heat Resistance: 150°C

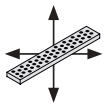


k	B	L	C	L1	L2	L3
10.3	15.3	75	6	25	3	6
		100				
		150				
		200				
		250				
		300				
15.3	25.3	105	8	35	4	8
		140				
		175				
		210				
		245				
		280				
		315				
		350				
		385				
		420				
		455				
		490				
25.3	35.3	135	12	45	5	10
		180				
		225				
		270				
		315				
		360				
		405				
		450				
		496				
35.3	45.3	165	16	55	6	12
		220				
		275				
		330				
		385				
		440				
		495				

Order: **G123.** k x L x B

Material: Bronze + graphite inserts

Die & Mould producers and users can be used by ordering standard product produced in 'L' length and cutting pieces suitable to their needs.



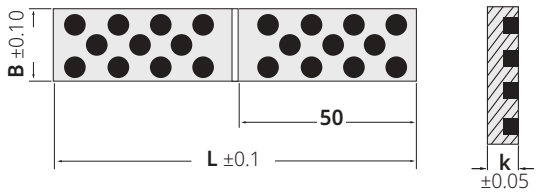
Working Direction

Wear Plate, Plain Type

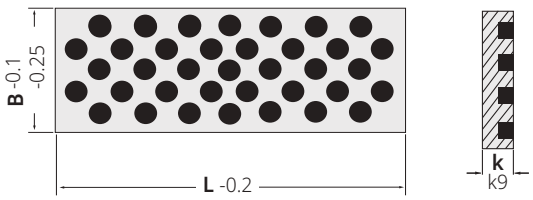
Code: **G122**

Self-Lubricating - Heat Resistance: 150°C

Form A



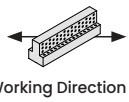
Form B



k	L	B	Form
5.3	302	20	**A**
		35	
		50	
10.3	302	20	**A**
		35	
		50	
5	50	25	**B**
	71		
	90		
5	50	40	**B**
	71		
	80		
	90		
6	100	40	**B**
	125		
	160	63	
	200		

Order:
G122. k x L x B x Form

Long strip wear plates is compatible for use by perforated connection holes and cutting by user (in desired length). Working surfaces should be lubricated for once.

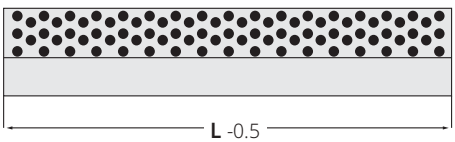


Working Direction

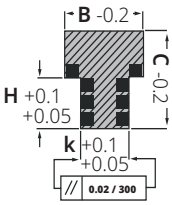
Wear Plate "T" Shaped

Code: **G121**

Self-Lubricating - Heat Resistance: 150°C

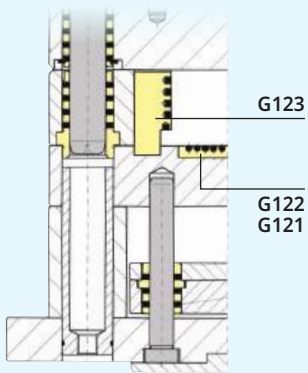


All wear plates friction surfaces are ground and all corners of wear plates are chamfered.



Order:
G121. C x L

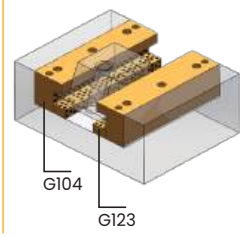
C	L	B	k	H
12	350	18	8	5
25	350	22	12	15
35	350	28	18	20



Usage of self-lub. wear plates on injection moulds:

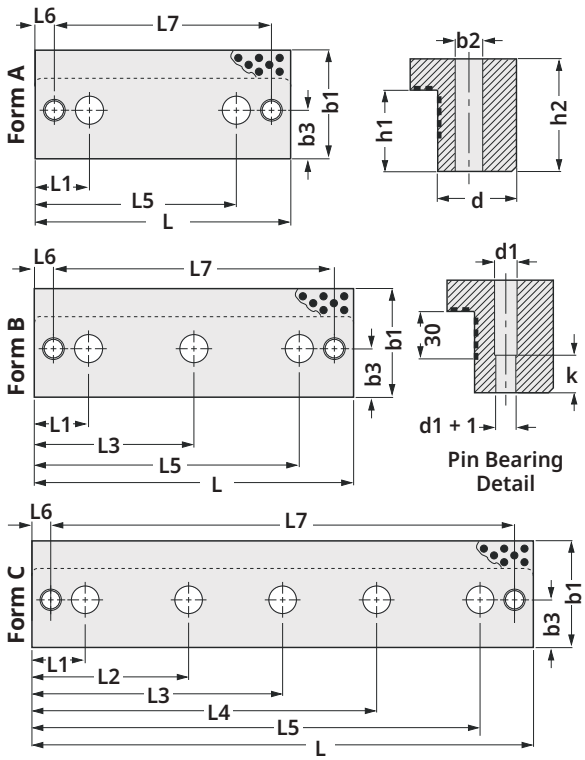
Self-lubricating components provides load carrying capacity beyond expectations in low sliding speeds and a wide temperature range. The graphite inserts are positioned with an appropriate geometric structure. By this means maximum lubricating effect is achieved during sliding. They especially work better with hardened and ground bearings. Sliding surfaces should be slightly lubricated before starting to work.

Mounting example



Wear Plate, "L" Shaped Code: G104

Self-Lubricating & Two-Way Sliding Type



Form	b1	h1	b2	b3	d	d1	k	h2
A	**55**	55	37	20	13.5	10	23	39
A								
A	**70**	75	50	30	17.5	12	35	55
A								
B								
C								
A	**85**	90	63	38	22	16	45	65
A								
B								
C								

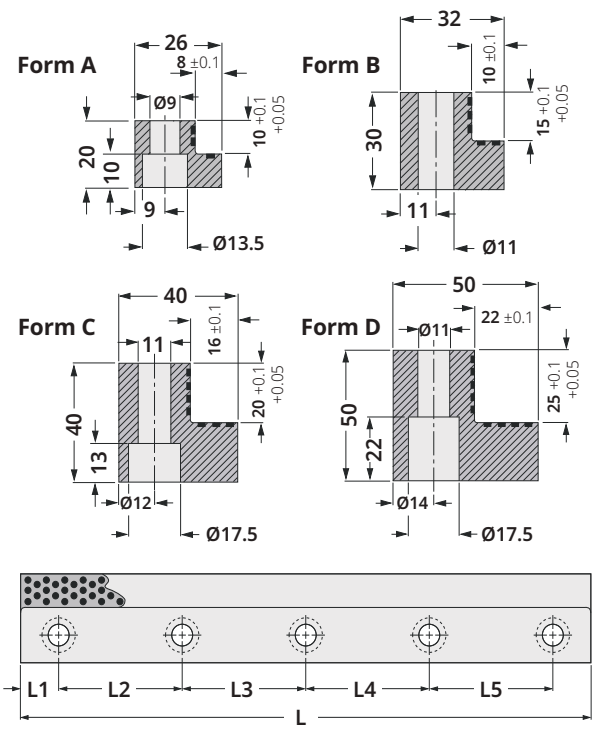
Form	L	L1	L2	L3	L4	L5	L6	L7
A	100	27.5	-	-	-	72.5	10	80
A	160					132.5		140
A	160	35	-	-	-	125	12.5	135
A	200					165		175
B	250			125		215		225
C	400		125	200	275	365		375
A	160	42.5	-	-	-	117.5	15	130
A	200					157.5		170
B	250			125		207.5		220
C	400		125	200	275	357.5		370

Order: **G104.** b1 x h1 x L

Material: Bronze + graphite inserts

Wear Plate, "L" Shaped Code: G105

Self-Lubricating & Two-Way Sliding Type



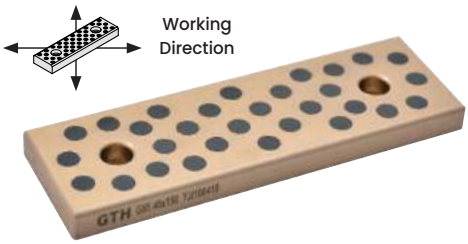
Advantages of Self-Lub. Wear Plate:

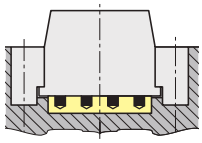
* Highly compatible with sudden movements.
* Maximum load carrying capacity at low speeds.
* Can be used under water or with chemical solutions.
* Wide range of temperature resistance.
* Resistant to impact in case of vibration.

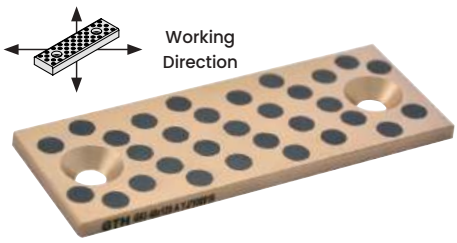
Form	L	L1	L2	L3	L4	L5	Hole
A	100	20	60	-	-	-	2
	150		55	55	-		3
	200		55	50	55		4
B	100	20	60	-	-	-	2
	150		55	55	-		3
	200		55	50	55		4
	250		70	70	70		
C	160	15	130	-	-	-	2
	250			80			3
D	200	20	55	50	55	-	4
	250		70	70	70	-	
	300		65	65	65	65	5
	350		80	75	75	80	

Order: **G105.** Form x L

Material: Bronze + graphite inserts



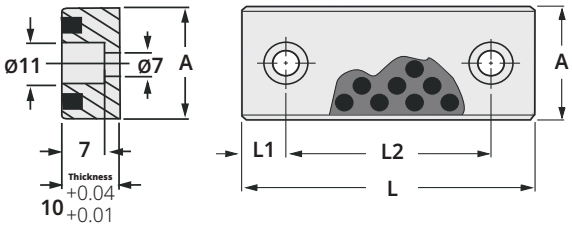




Wear Plate, Self-Lubricating

Code: **G85**

Thickness: 10 mm / with 2 holes



A	L	L1	L2	Hole
18	75	15	45	2 pcs. M6x20
	100	25	50	
	125		75	
	150		100	
28	75	15	45	2 pcs. M6x20
	100	25	50	
	125		75	
	150		100	
38	75	15	45	2 pcs. M6x20
	100	25	50	
	125		75	
	150		100	
48	75	15	45	2 pcs. M6x20
	100	25	50	
	125		75	
	150		100	

Order: **G85.** A x L

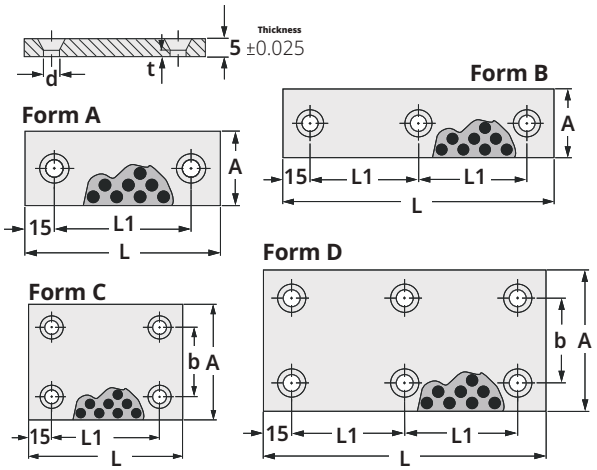
Material:
Bronze + Graphite Inserts

Self-lubricating components provides load carrying capacity beyond expectations in low sliding speeds and a wide temperature range. The graphite inserts are positioned with an appropriate geometric structure. By this means, maximum lubricating effect is achieved during sliding. They especially work better with hardened and ground bearings. Sliding surfaces should be slightly lubricated with lithium grease during mounting before starting to work. 25-30% of the surface in plain, self-lubricating bearings and pillar bearings are formed with graphite inserts. The part corresponding to self-lubricating bearing component should be ground and fixed to the sliding axis in parallel.

Wear Plate, Self-Lubricating

Code: **G83**

Thickness: 5 mm / Form: A - B - C - D

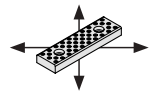


A	L	L1	b	d	t	Form	Screw
18	50	20	-	6.5	1	A	2 pcs. M6x10
	75	45					
	100	70					
	150	60				B	3 pcs.
28	50	20	-	9	0.5	A	2 pcs. M8x10
	75	45					
	100	70					
	150	60				B	3 pcs.
38	50	20	-	9	0.5	A	2 pcs. M8x16
	75	45					
	100	70					
	150	60				B	3 pcs.
48	75	45	-	9	0.5	A	2 pcs. M8x16
	100	70					
	125	95					
	150	60				B	3 pcs.
75	75	45	45	9	0.5	C	4 pcs. M8x16
	100	70					
	125	95					
	150	60				D	6 pcs.
100	100	70	70	9	0.5	C	4 pcs. M8x16
	125	95					
	150	60				D	6 pcs.

Order: **G83.** A x L

Material:
Bronze + Graphite Inserts

Self-lubricating plates are generally preferred because of their strength against lateral loads in large dies or injection moulds. They are maintenance-free, self-lubricating and work long time.

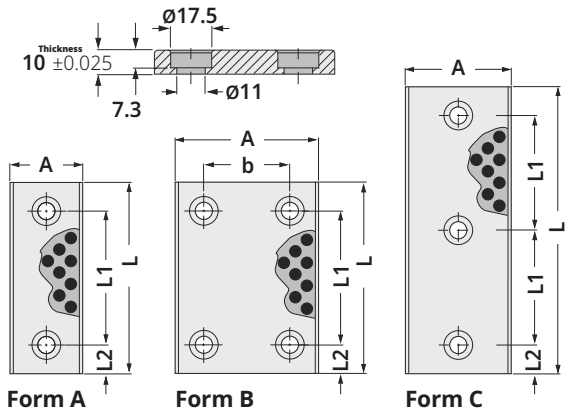


Self-Lubricating
G87

Steel Type
G87C

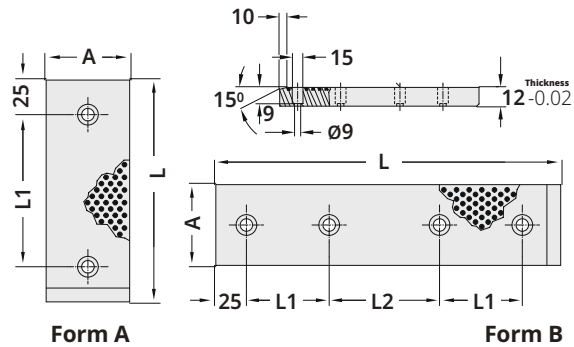
Wear Plate Code: G84

Self-Lubricating, Thickness: 10 mm / Form: A - B - C



Wear Plate, VDI 3357 Code: G87 - G87C

Self-Lubricating, Thickness: 12 mm / Form: A - B



A	L	L1	L2	b	Form
28	75	45	15	-	A
	100	50	25		
	125	75			
	150	100			
38	75	45	15	-	A
	100	50	25		
	125	75			
	150	100			
48	75	45	15	-	A
	100	50	25		
	125	75			
	150	100	50		
	200				
58	75	45	15	-	A
	100	50	25		
	125	75			

A	L	L1	L2	b	Form
58	150	100	25	-	A
	200		50		
75	75	45	15	-	A
	100	50	25		
	125	75			
	150	100			
	200	75			C
100	100	50	25	50	B
	125	75			
	150	100			
	200	150			
	250	200			
125	150	100	25	50	B
	200	150			
	250	200			
150	150	100	25	100	B
	200	150			

A	L	L1	L2	Form
30	80	30	-	A
	100	50		
	125	75		
	160	110		
	200	150		
	225	175		
30	250	60	80	B
	260		90	
	280		110	
	300	80	90	
	320		110	
40	80	30	-	A
	100	50		
	125	75		
	160	110		
	200	150		
50	80	30	-	A
	100	50		
	125	75		
	160	110		
	200	150		
	225	175		
50	250	60	80	B
	300	80	90	
	350	100	100	
	400	120	110	

A	L	L1	L2	Form
60	80	30	-	A
	100	50		
	125	75		
	160	110		
	200	150		
	225	175		
60	240	60	70	B
	250		80	
	260		90	
	280		110	
80	80	30	-	A
	100	50		
	125	75		
	160	110		
	200	150		
	225	175		
80	240	60	70	B
	250		80	
	260		90	
	280		110	
100	260	60	90	B
	280		110	

Order: **G84.** A x L

* Fixing screws: M10x20

Order: **G87.** A x L

for steel type
Order: **G87C.** A x L

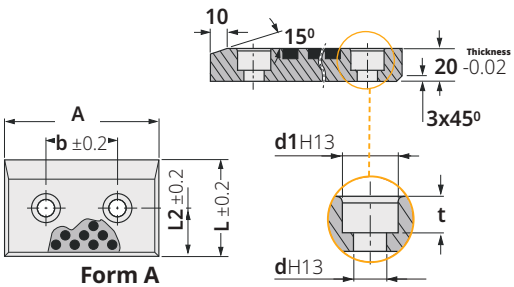
Self-Lubricating
G91

Steel Type
G91C

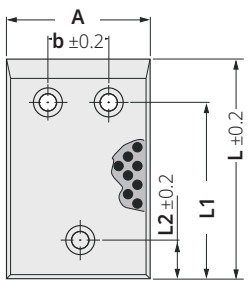
Wear Plate, VDI 3357

Code: **G91 - G91 C**

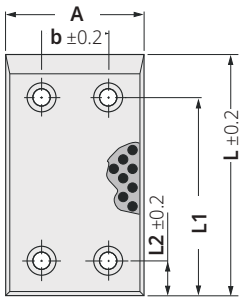
Self-Lubricating, Thickness: 20 mm / Form: A - C - D



Form A



Form C



Form D

A	L	L1	L2	b	d	d1	t	Screw	Form
80	50	-	25	30	9	15	9	M8x25	**A**
100	50	-	25	20	13.5	20	13	M12x25	**A**
	80		40						
125	50	-	25	75	13.5	20	13	M12x25	**A**
	80		40						
	100	75	25	75	13.5	20	13	M12x25	**C**
	125	100							
	160	135							
	200	175							
	250	210	40						
	315	275							
160	50	-	25	110	13.5	20	13	M12x25	**A**
	80		40						
	100	75	25	110	13.5	20	13	M12x25	**C**
	125	100							
	160	135							
	200	175							
	250	210	40						
	315	275							
160	250	210	40	110	13.5	20	13	M12x25	**D**
	315	275							

Order: **G91.** A x L

for steel type
Order: **G91C.** A x L

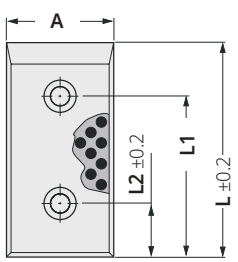
Self-Lubricating
G90

Steel Type
G90C

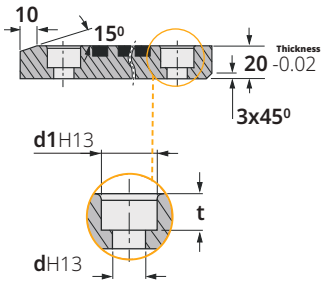
Wear Plate, VDI 3357

Code: **G90 - G90 C**

Self-Lubricating, Thickness: 20 mm



Form B



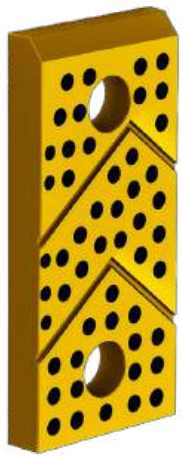
Working Direction
Code: **G91 - G91C / G90 - G90C**

Heat Resistance 150°C
Code: **G91 - G91C / G90 - G90C**

A	L	L1	L2	d	d1	t	Screw	Form
50	80	55	25	9	15	9	M8x25	**B**
	100	75		13.5	20	13	M12x25	
	125	100						
	160	135						
	200	175						
80	80	55	25	13.5	20	13	M12x25	**B**
	100	75						
	125	100						
	160	135						
	200	175						
	250	210	40					
	315	275						
100	100	75	25	13.5	20	13	M12x25	**B**
	125	100						
	160	135						
	200	175						
	250	210	40					
	315	275						

Order: **G90.** A x L

for steel type
Order: **G90C.** A x L



NEW

GLOBAL STANDARD COMPONENTS NAAMS

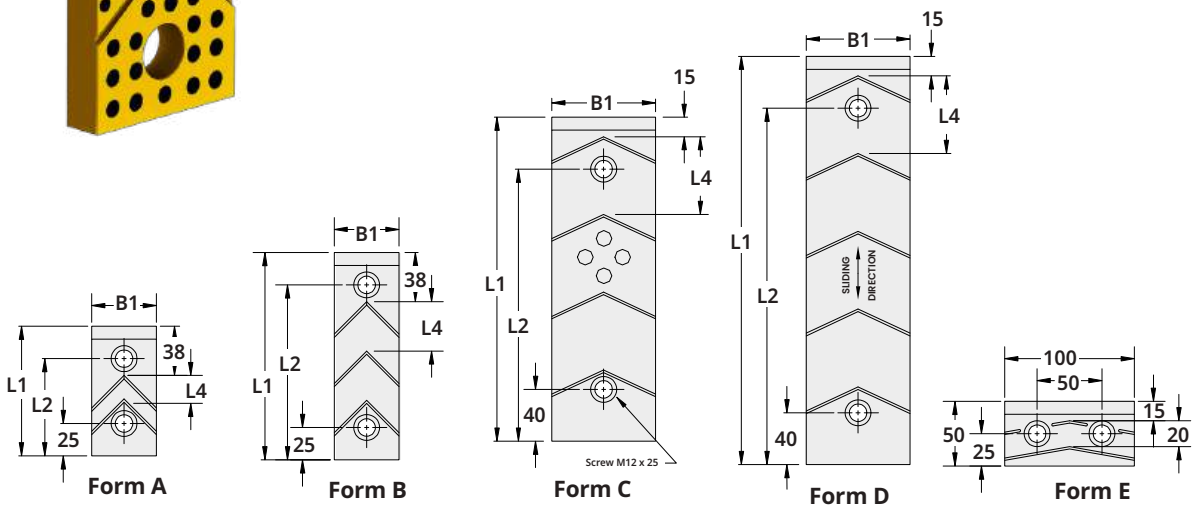
Ford

3D CAD FILES GUVENAL

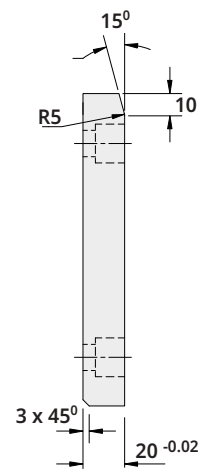
Wear Plate with Visual Wear Indicators, WDX138011

Code: G78

Self-Lubricating, Thickness: 20 mm



Order Code	B1	L1 ±0.2	L2 ±0.2	L4	Form
G7850100A	50	100	75	18	A
G7850125A		125	100	38	
G7850160B	50	160	135	38	B
G7850200B		200	175	50	
G7880100A	80	100	75	20	A
G7880125A		125	100	40	
G7880160B	80	160	135	40	B
G7880200B		200	175	60	
G7880250C	80	250	210	60	C
G7880315D	80	315	275	60	D
G7810050E	100	50	-	-	E
G78100100A	100	100	75	20	A
G78100125A		125	100	40	
G78100160B	100	160	135	40	B
G78100200B		200	175	60	
G78100250C	100	250	210	60	C
G78100315D	100	315	275	60	D



Material:
Bronze + Graphite Inserts

Heat Resistance: 150°C

NEW

GLOBAL STANDARD COMPONENTS NAAMS

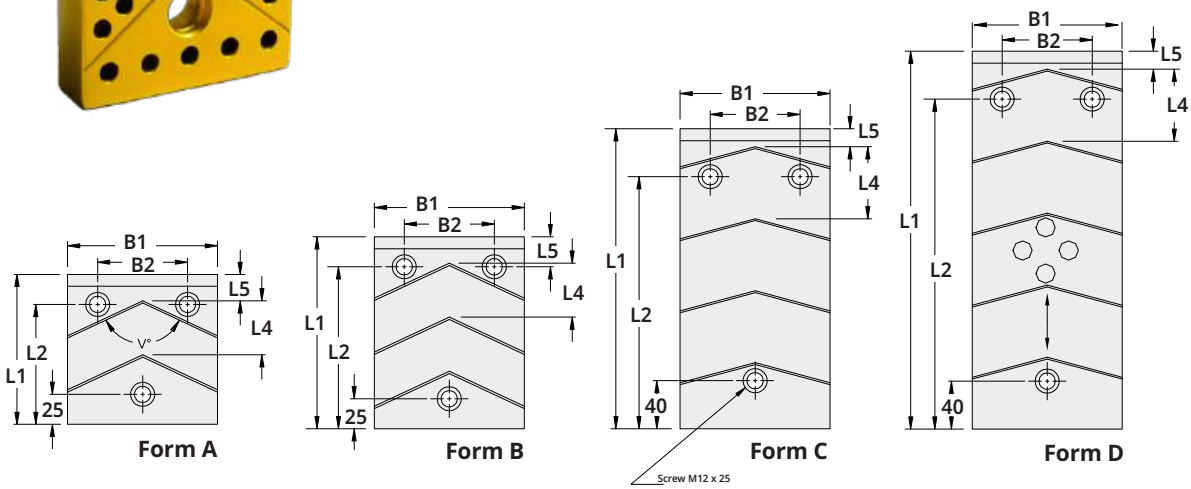
Ford

3D CAD FILES GUVENAL

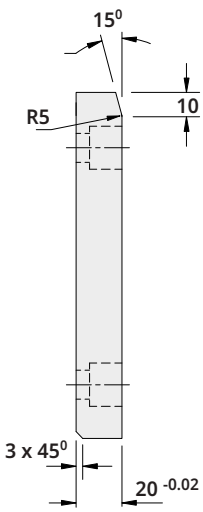
Wear Plate with Visual Wear Indicators, WDX138012

Code: **G78-12**

Self-Lubricating, Thickness: 20 mm

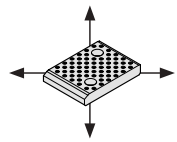


Order Code	B1	B2 ±0.2	L1 ±0.2	L2 ±0.2	L4	L5	Form
G78-12.125100A	125	75	100	75	35	22	A
G78-12.125125A			125	100	45	22	
G78-12.125160B	125	75	160	135	45	22	B
G78-12.125200B			200	175	60	22	
G78-12.125250C	125	75	250	210	60	15	C
G78-12.125315D	125	75	315	275	60	15	D
G78-12.160100A	160	110	100	75	40	15	A
G78-12.160125A			125	100	50	15	
G78-12.160160B	160	110	160	135	50	15	B
G78-12.160200B			200	175	60	15	
G78-12.160250C	160	110	250	210	60	15	C
G78-12.160315D	160	110	315	275	60	15	D



Material:
Bronze + Graphite Inserts

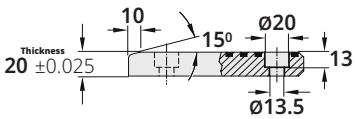
Heat Resistance: 150°C

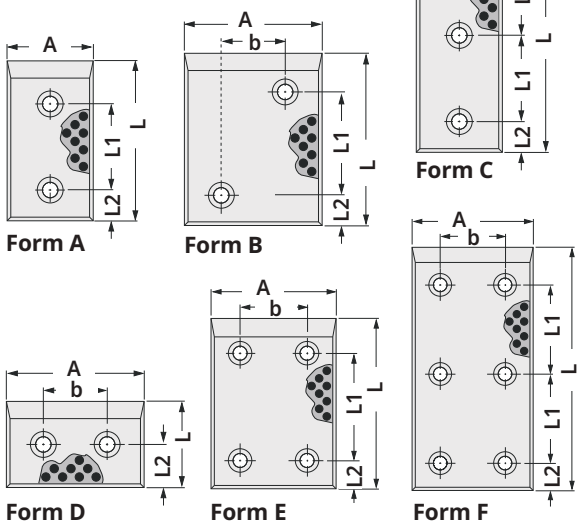


Wear Plate, ISO 9183-1

Code: **G89**

Self-Lubricating, Thickness: 20 mm / Form: A-B-C-D-E-F



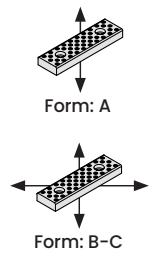


A	L	L1	L2	b	Form
50	80	35	20	-	A
	100	55			
	125	80			
	160	115			
	200	155			
	250	100	20	-	C
80	50	-	25	40	D
	80	35	20	40	B
	100	55			
	125	80			
	160	115	20	40	E
	200	155			
	250	100	20	40	F
	315	132			
100	50	-	25	60	D
	80	35	20	60	B
	100	55			
	125	80	20	60	E
	160	115			
	200	155			
	250	100	20	60	F
	315	132			

A	L	L1	L2	b	Form
125	50	-	25	85	D
	80	35	20	85	B
	100	55	20	85	E
	125	80			
	160	115			
	200	155			
	250	100	20	85	F
	315	132			
160	50	-	25	120	D
	80	35	20	120	E
	100	55			
	125	80			
	160	115			
	200	155			
	250	100	20	120	F
	315	132			

Order: **G89.** A x L

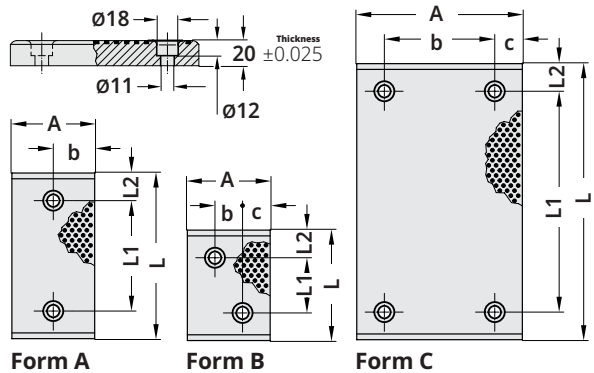
* Fixing screws: **M12 x 25**
* Heat Resistance 150°C.



Wear Plate

Code: **G88**

Self-Lubricating, Thickness: 20 mm / Form: A-B-C



Advantages of Self-Lub. Wear Plate:

* Highly compatible with sudden movements.
* Maximum load carrying capacity at low speeds.
* Can be used under water or with chemical solutions.
* Wide range of temperature resistance.
* Resistant to impact in case of vibration.

A	L	L1	L2	c	b	Form
28	75	45	15	-	14	A
	100	50	25			
	125	75				
	150	100				
38	75	45	15	-	19	A
	100	50	25			
	125	75				
	150	100				
	200	150				
48	75	45	15	-	24	A
	100	50	25			
	125	75				
	150	100				
	200	150				
58	75	45	15	-	29	A
	100	50	25			
	150	100				
75	75	45	15	-	37.5	A
	75	25	25	25	25	B
	100	50	25	-	37.5	A
	100	50	25	25	25	B
	125	75	25	-	37.5	A
	150	100				
	200	150				

A	L	L1	L2	c	b	Form
100	100	50	25	25	50	C
	125	75				
	150	100				
	200	150				
	250	200				
	300	250				
125	125	75	25	37.5	50	C
	150	100				
	200	150				
	250	200				
	300	250				
	350	300				
150	150	100	25	25	100	C
	200	150				
	250	200				
	300	250				
200	200	150	25	25	150	C
	250	200				
	300	250				

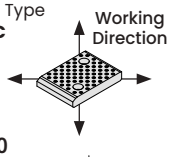
Order: **G88.** A x L x Form

* Fixing screws: **M10 x 25**
* Heat Resistance 150°C.

Self-Lubricating
G92

Steel Type
G92C

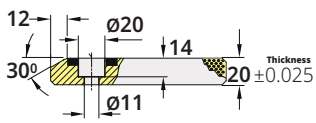
Working Direction

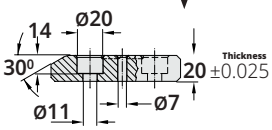


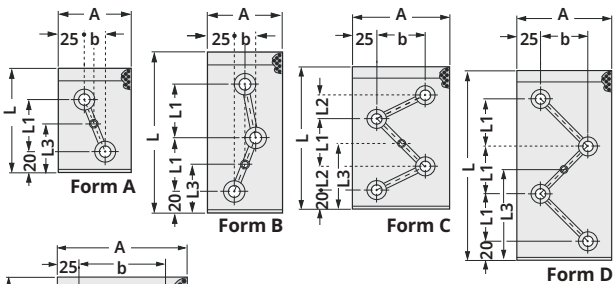
Code: **G92 - G92C**

Wear Plate, AFNOR / ISO 9183-2

Form A - B - C - D - E - F - G - H - I





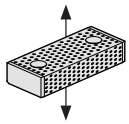


A	L	L1	L2	L3	b	Form
70	100	50	-	45	20	A
	150	50	-	45	10	B
	200	50	-	95	20	D
100	150	50	25	70	50	C
	200	50	-	95	50	D
	250	50	-	145	50	E
150	200	50	-	95	100	D
	250	50	-	145	100	E
100	100	25	25	32.5	30	F
	300	50	-	145	50	G
150	100	50	-	45	25	H
	150	25	50	70	25	I
	300	50	-	145	100	G
200	100	50	-	45	50	H

Order:
G92. A x L

for steel type

Order:
G92C. A x L

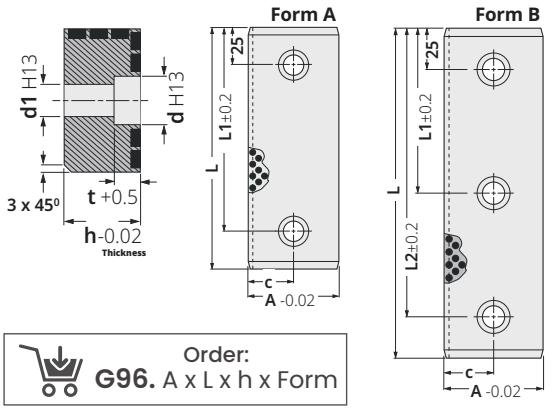


Working Direction

Wear Plate, VDI 3357

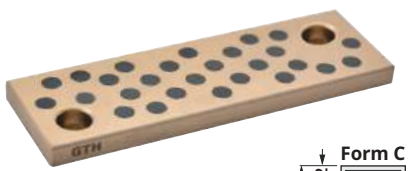
Code: **G96**

Self-Lubricating / Two-Way Sliding Type Form: A - B



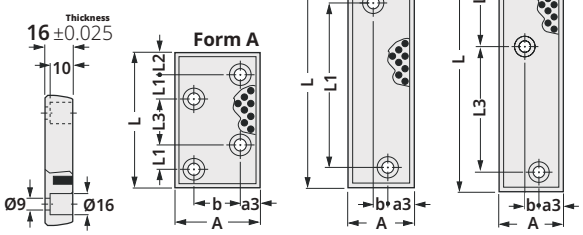
Order:
G96. A x L x h x Form

A	L	L1	L2	c	h	d	d1	t	Form
25	110	85	-	12.5	12	15	9	8.5	A
	120	95							
	110	85			15	18	11	10.5	
	120	95							
60	125	100	-	30	30	20	13.5	13	A
	150	125							
	160	135							
60	200	100	175	30	30	20	13.5	13	B
	125		-		40				A
	150	125							
	160	135							
	200	100	175						B



Code: **G93**

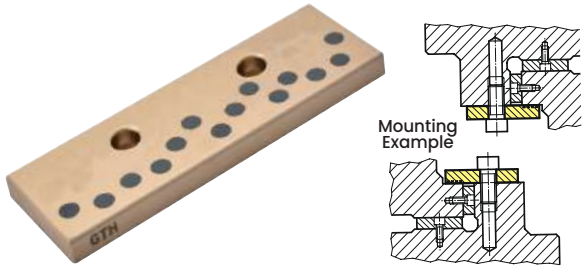
Wear Plate, CNOMO



A	L	L1	L2	L3	b	a3	Form
50	63	39	12	-	20	15	B
50	160	126	21	-	12	19	B
50	250	100	21	116	12	19	C
63	100	18	15	34	39	12	A

Order:
G93. A x L

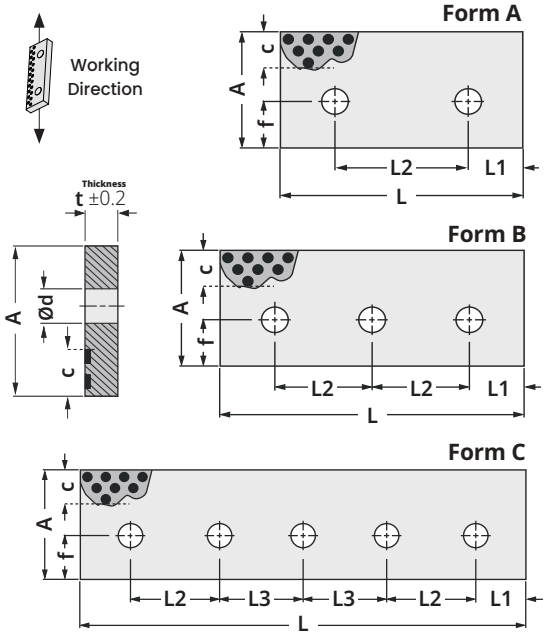
* Fixing screws: M10
* Heat Resistance 150°C.



Wear Plate, VDI 3357

Code: **G95**

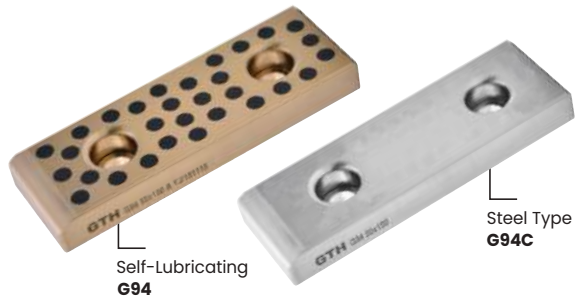
Self-Lubricating



A	L	L1	L2	L3	t	c	f	d	Form
35	160	45	70	-	10	10	15	11	A
	200		110						
	250		80						B
45	160	45	70	-	15	15	15	13.5	A
	200		110						
	250		80						B
55	160	45	70	-	15	20	20	17.5	A
	200		110						
	250		80						B
75	160	45	70	-	25	25	35	17.5	A
	200		110						
	250		80						B
100	160	45	70	-	25	30	40	17.5	A
	200		110						
	250		80						B
	400		80	75					C
	160		70	-	30			22	A
	200		110						
	250		80						B
	400		80	75					C
125	160	45	70	-	30	30	50	22	A
	200		110						
	250		80						B
	400		80	75					C

Order:
G95. A x L x t

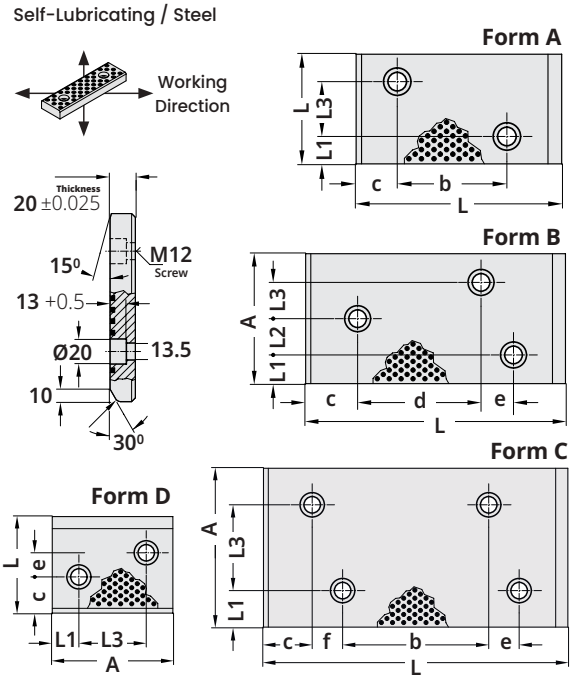
Material:
Bronze + Graphite Inserts



Wear Plate, NAAMS

Code: **G94 - G94C**

Self-Lubricating / Steel

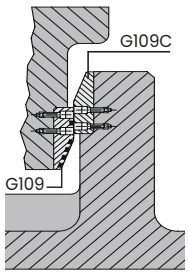


A	L	L1	L2	L3	c	f	b	e	Form
50	100	25	-	-	30	-	30	-	A
	150						80		
	200				40		120		
80	100	20	-	40	30	-	30	-	A
	150						80		
	200						120		
	250				40		170		
	315		20	20			210	25	B
100	50	22	-	56	14	-	-	13	D
	80							20	
	100				30		30	-	A
	150						80		
	200		28	28	40	-	95	25	B
	250						145		
	315						210		
125	80	25	-	75	30	-	-	20	D
	100						30	-	A
	150						80		
	200		37	38	40	-	95	25	B
	250						145		
	315		-	75		25	185		C
160	100	30	-	100	30	-	30	-	A
	150						80		
	200		50	50	40		95	25	B
	250		-	100		25	120		C
	315						185		

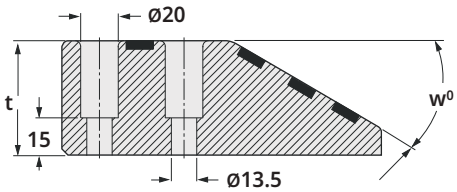
Order:
G94. A x L

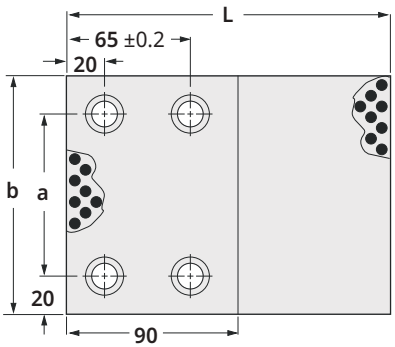
for steel type
Order:
G94C. A x L

Mounting example



Cam Driver Plate, VDI 3357 Code: G109





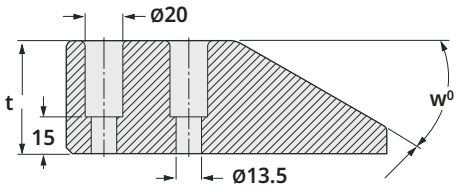
b	L	t	a	w
100	170	45	60	20⁰
125			85	
150			110	
100	150		60	30⁰
100	170	60		
125	150	45	85	
125	170	60		
150	150	45	110	
150	170	60		

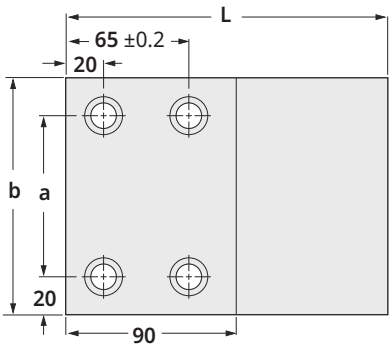
Order: **G109.** b x L x t

Material: Bronze + graphite inserts

Self-Lub. Angular Wear Plates for Upper and Lower Body of Cam Units Tolerance between hole distances is ± 0.25. ± 0.25 is used for all dimensions where tolerance is not specified.

Cam Driver Plate, VDI 3357 Code: G109C





b	L	t	a	w
100	170	45	60	20⁰
125			85	
150			110	
200			160	
100	150		60	30⁰
100	170	60		
125	150	45	85	
125	170	60		
150	150	45	110	
150	170	60		
200	150	45	160	
200	170	60		

Order: **G109C.** b x L x t

Material: Steel, Hardened

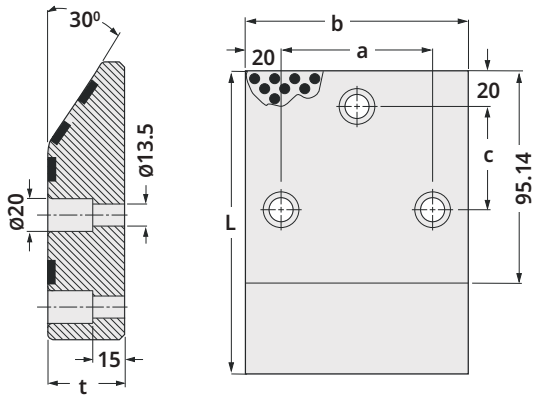
Steel Type, Angular Wear Plates for Upper and Lower Body of Cam Units Tolerance between hole distances is ± 0.25. ± 0.25 is used for all dimensions where tolerance is not specified.

Self-Lubricating
G108

Steel Type
G108C

Cam Driver Plate

Code: **G108 - G108C**



b	L	t	a	c
100	125	30	60	50
	150	45		45
	170	60		
125	125	30	85	50
	150	45		45
	170	60		
160	125	30	120	50
	150	45		45
	170	60		

Order:
G108. b x L

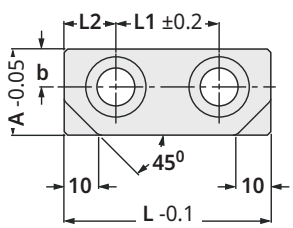
for steel type
Order:
G108C. b x L

Self-Lub. & Steel Angular Wear Plates for Upper and Lower Body of Cam Units
Tolerance between hole distances is ± 0.25. ± 0.25 is used for all dimensions where tolerance is not specified.

Code: **G76**

Return Cam Plate

Order:
G76. A x L



A	L	b	t	L1	L2	d	d1	h
25	60	11	30	30	15	11	17.5	18
32	60	16	38	30	15	13	20	23
32	80	16	38	40	20	13	20	23

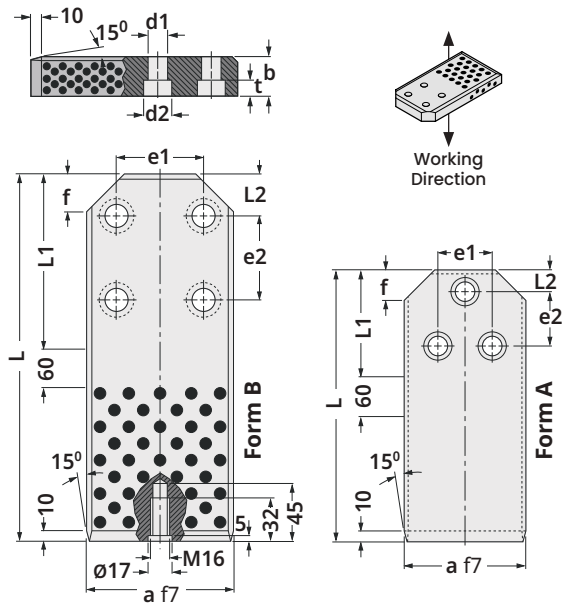
Self-Lubricating
G106

Steel Type
G106C

Guide Bar, VDI 3387

Self-Lubricating & Steel Types

Code: **G106 - G106C**



a	b	L	L1	L2	e1	e2	f	d1	d2	t	Form
63	36	200	90	20	36	50	18	14	20	16	A
71											
90	45		100		50		28	18	26	21	
112											
112		250									
140	45	315	150	40	90	80	36	22	33	25.5	B
140		400									
140	56										
190											
240		500	250		160	160		26	40	30.5	
240		630									

G106
Material:
Bronze + graphite inserts

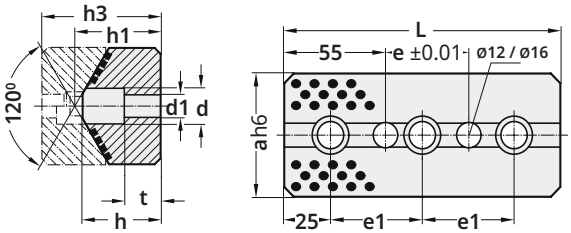
G106C
Material:
Steel, Hardened

Order:
G106. a x b x L

Order:
G106C. a x b x L

G111 Self-Lubricating
Cam Plate, "V" Guide - VDI 3357

Code: **G111**



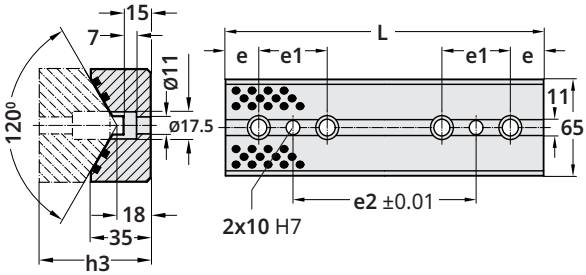
a	L	h1	h	h3	e	e1	d	d1	t	Hole
65	150	47	44	65	45	100	20	13.5	20	2
	200				95	150				
	250				145	100				3
	300				195	125				
125	150	52	47	85	45	100	26	17.5	15	2
	200				95	150				
	250				145	100				3
	300				195	125				

Order:
G111. a x L

There is ± 0.12 tolerance between fixing holes and ± 0.10 tolerance between pin holes.

G139 Self-Lubricating
Cam Plate, "V" Guide

Code: **G139**



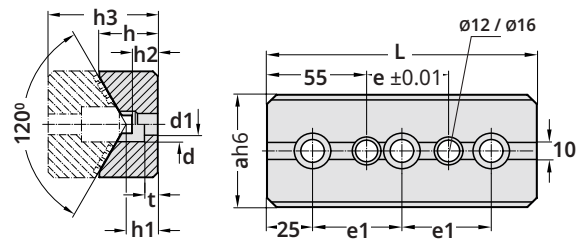
h3	L	e	e1	e2	Hole
65	100	20	60	20	2
	150	25	50	50	3
	200			100	4
	250			150	5
	300			200	6

Order:
G139. h3 x L

Material:
Bronze + graphite inserts

G111C Steel
Cam Plate, "V" Guide - VDI 3357

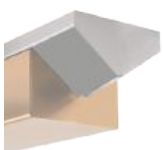
Code: **G111C**



a	L	h1	h	h2	h3	e	e1	d	d1	t	Hole
65	150	18	35	17	65	45	100	20	13.5	8	2
	200					95	150				
	250					145	100				3
	300					195	125				
125	150	33	60	32	85	45	100	26	17.5	15	2
	200					95	150				
	250					145	100				3
	300					195	125				

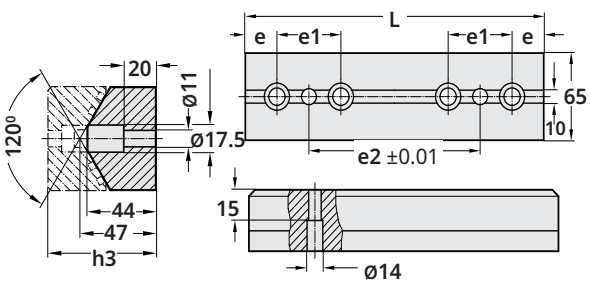
Order:
G111C. a x L

Material:
Steel, Hardened



G139C Steel
Cam Plate, "V" Guide

Code: **G139C**



h3	L	e	e1	e2	Hole
65	100	20	60	20	2
	150	25	50	50	3
	200			100	4
	250			150	5
	300			200	6

Order:
G139C. h3 x L

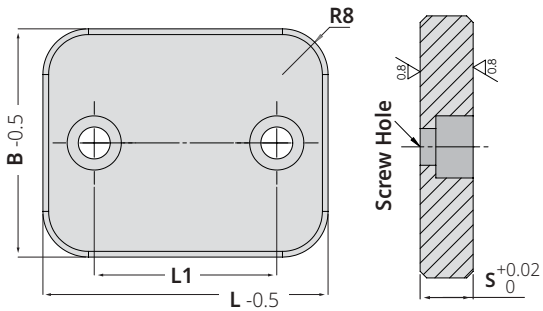
Material:
Steel, Hardened

Wear - Shim Plate

Code: **G155**

(Core bases, for movable or fixed surfaces)

Clamping / locking loads occurred with the support of 1.2842 steel materials and heat treatment during injection and 2nd pressure are equally distributed to mould surfaces except cores, the mould surfaces are protected with this way.
It can be used for both (movable and fixed) surfaces when necessary.



Order Code	B	L	S	L1	Screw Hole
G1552032	20	32	8.1	16	M5
G1552040		40	10.1	24	M5
G1552064		64	12.1	40	M5
G1552532	25	32	8.1	16	M5
G1552540		40	10.1	24	M5
G1552564		64	12.1	40	M5
G1553240	32	40	8.1	24	M5
G1553264		64	8.1	40	M5
G15532100		100	10.1	64	M6
G1554050	40	50	8.1	32	M5
G1554080		80	10.1	52	M6
G15540100		100	12.1	64	M6
G1555064	50	64	10.1	40	M6
G15550100		100	12.1	64	M6
G15550125		125	12.1	80	M6
G1556480	64	80	10.1	52	M6
G15564100		100	12.1	64	M6
G15564125		125	12.1	80	M6
G15564160		160	12.1	100	M6
G1558080	80	80	12.1	52	M6
G15580100		100	12.1	64	M6
G15580125		125	12.1	80	M6
G15580160		160	12.1	100	M6

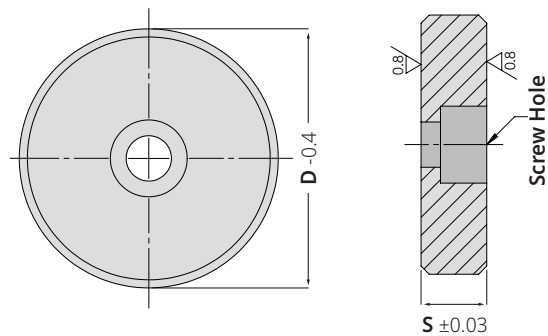
Material: 1.2842 (Heat treated) / **Hardness:** 54 - 56 HRC

Wear - Shim Plate, Round

Code: **G156**

(Core bases, for movable or fixed surfaces)

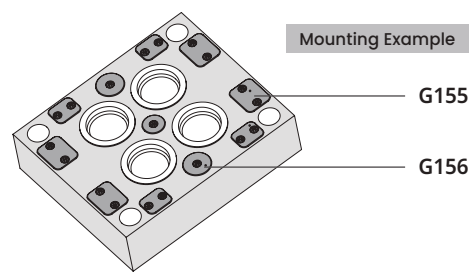
In injection mould designs: Injection pressure on mould separation surfaces should be distributed according to a predefined value. Thus, the mould separation surfaces are aligned correctly and the height differences are easily balanced thanks to innovative Güvenal products such as **G155 / G156 / G157** 1.2842 steel 54 - 56 HRC hardened shim plates are ready to mount with 0.2 mm precision tolerances in embedded mounting holes and round - rectangular versions.



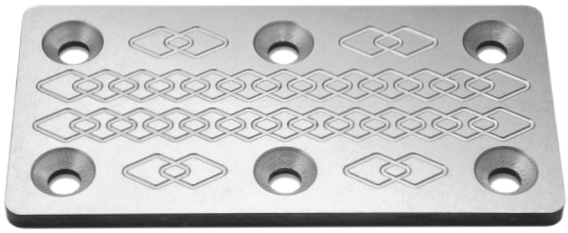
Order Code	D	S	Screw Hole
G15620	20	8.1	M5
G15625	25	8.1	M5
G15632	32	8.1	M5
G15640	40	10.1	M6
G15650	50	10.1	M6
G15664	64	12.1	M6
G15680	80	12.1	M6

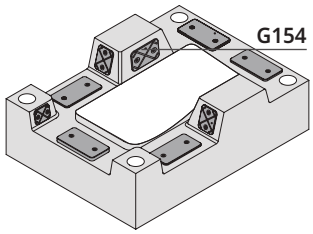
Material: 1.2842 (Heat treated)
Hardness: 54 - 56 HRC

Mounting Example



G155 / G156 - Usage: The necessary thickness should be correctly calculated during mounting. The final thickness is achieved by grinding back surface of the product when necessary. Plate to be used for the same core should be ground together.
The parts to be used in mould locking should be ground together. The cleanliness and measurements of the mounting surfaces are important. Mounting hole sizes should be bigger than 0.2 (minimum) from one side. Hexagon socket head cap screws in 12.9 quality are used for connections. ***Connecting screws are provided separately**

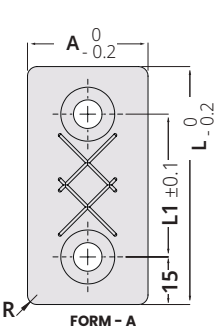


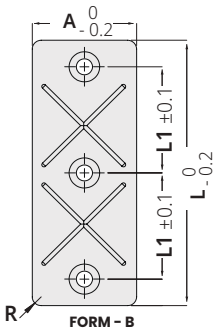


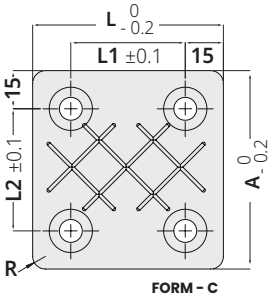
Wear - Shim Plate (with oil grooves) Code: G154

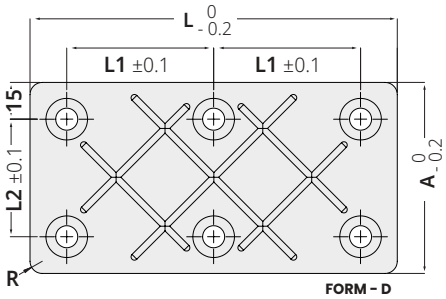
(Hard, heat-treated core bases, for movable or fixed surfaces)

Innovative wear and shim plates The difference of the mould separation surface can be easily offset by grinding back surface of the plate. It minimizes wearings due to friction with the heat treatment hardness and oil accumulated in oil grooves. used as sliding plate. Clamping / locking loads occurred with the support of 1.2842 steel materials and heat treatment during injection and 2nd pressure are equally distributed to mould surfaces except cores, the mould surfaces are protected with this way.
It can be used for both (movable and fixed) surfaces when necessary.



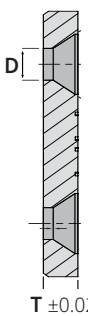






A	L	L1	L2	R	D	T	Form
18	50	20	-	4	6.5	7	A
	75	45					
	100	70					
	150	60					B
28	50	20	-	4	9	7	A
	75	45					
	100	70					
	150	60					B
38	50	20	-	4	9	7	A
	75	45					
	100	70					
	150	60					B

A	L	L1	L2	R	D	T	Form
48	75	45	-	5	9	7	A
	100	70					
	125	95				10	
	150	60					B
58	75	45	-	5	9	7	A
	100	70					
	125	95				10	
	150	60					B
78	75	45	48	5	9	7	C
	100	70					
	125	95				10	
	150	60					D



A: 18 / **L:** 50 - 75 - 100
FORM - A M6 x 20 - 2 Pcs.
A: 18 / **L:** 150
FORM - B M6 x 20 - 3 Pcs.

Countersunk Head Screws with Hex-Socket

FORM - A M8 x 20 - 2 Pcs.
FORM - B M8 x 20 - 3 Pcs.
FORM - C M8 x 20 - 4 Pcs.
FORM - D M8 x 20 - 6 Pcs.

Order: **G154.** A x L x T

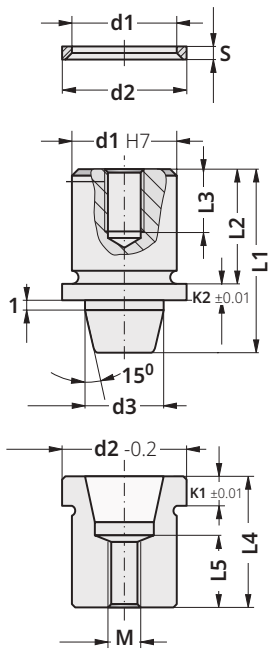
Material: 1.2842 (Heat treated)

Hardness: 54 - 56 HRC

Usage: The necessary thickness should be correctly calculated during mounting. The final thickness is achieved by grinding back surface of the product when necessary. Mounting hole sizes should be bigger than 0.2 (minimum) from one side.

Code: **G82**

Tapered Locating Unit, Headed



d1	d2	d3	M	K1	K2
14	17	12	M8	4	2.5
24	28	20	M8	6	4
34	38	30	M8	8	5
42	46	35	M8	8	5

d1	L1	L2	L3	L4	L5	S
14	24.5	17	15	19.5	13	1.7
24	42	27	20	32	18	2
34	42	28	20	32	18	3
42	48	28	20	47	18	3

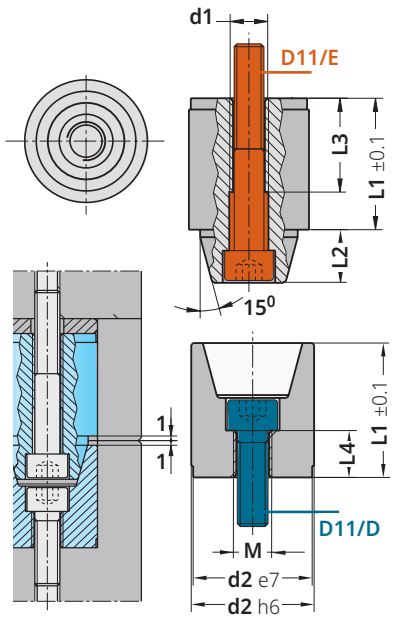
Order: **G82.** d2

Material: 1.7131 (16MnCr5)
Hardness: 60 - 62 HRC

Code: **G60**

Tapered Locating Unit

DIN ISO 8406



d2	L1	L2	L3	L4	M	Screw D11 / D-E
12	16	4.5	9.6	7	M4	M3 x 15 M3 x 28
14	16	6	12.4	6	M5	M4 x 15 M4 x 25
16	16	6	12.4	6	M5	M4 x 15 M4 x 25
20	26	9	19.7	19.7	M8	M6 x 20 M6 x 35
25	26	10	19.7	19.7	M8	M6 x 30 M6 x 40
30	35	14	25	25	M10	M8 x 25 M8 x 50
32	35	14	25	25	M10	M8 x 25 M8 x 50
42	45	18	27	27	M10	M8 x 30 M8 x 70

Note: "D11" bolts are delivered with the product.

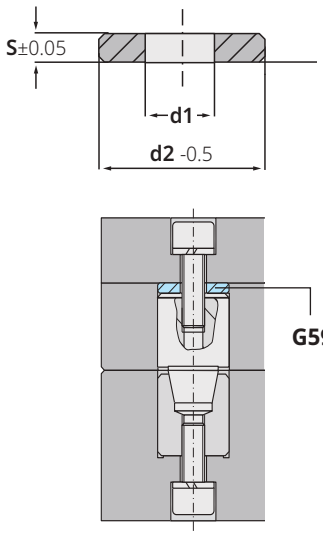
Order: **G60.** d2

Material: 1.7131 (16MnCr5)
Hardness: 60 - 62 HRC

Code: **G59**

Support Washer

Support Washer: Additional lifting part in tapered locating units. It can also be used as in-mould assistive part.



d2	S	d1
12	5	6.5
	10	
14	5	6.5
	10	
16	5	6.5
	10	
17	5	8.5
	10	
20	5	8.5
	10	
	20	
25	5	8.5
	10	
	20	

d2	S	d1
26	5	8.5
	10	
	20	
30	5	10.5
	10	
32	5	10.5
	10	
40	5	10.5
	10	
42	5	10.5
	10	
50	5	13
	10	

Order: **G59.** d2 x S

Tapared Locating Units: They are used to increase speed of repeatability while providing precision centring in dies and moulds.
Mounting screws are provided with products and the support washer **(G59)** can be provided upon request.
Headed Type: It is suitable to be used for centring in female and male plates in moulds (seal-rubber & blowing moulds).

Code: **G152**

Bar Lock System

Material: 1.2379 / **Hardened:** 58 - 60 HRC

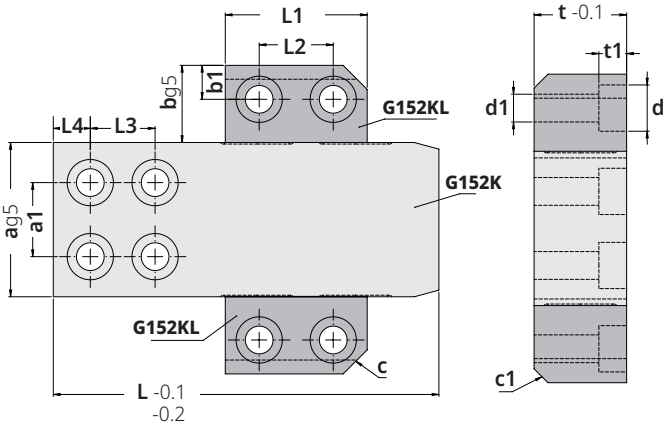
Code: **G152K**

Bar Lock Slide Block

Material: 1.2842 / **Hardened:** 58 - 60 HRC

Code: **G152KL**

Bar Lock Guide Jaw



All parts, including part holder rings, are applied a thin layer of oil (fit for food industry) before all areas dry and get hardened. **G152KL** product can be used in group applications for each mould as 2 pieces and multi bar lock guide jaws can be used in different designs. There are 2 pcs jaws in 1 set.

It provides making selections among ready-made products for wide moulds with movable plates more than one for mould designers. During production, insert locks and only wipe outer surfaces. Please do not touch thin layer of lubrication in joints.

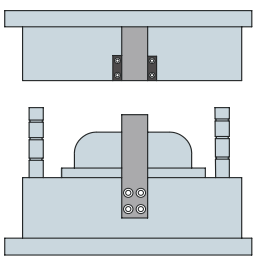
Order: **G152.** t x L

Order: **G152K.** a x L

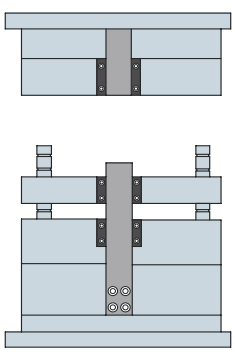
Order: **G152KL.** L1 x b

a	a1	b	b1	c	c1	d	d1	L	L1	L2	L3	L4	t	t1	Screw
32	14	**20**	10	6	6	11	6.6	**70** **90** **112**	**36**	16	18	9	**22**	6.8	**M6**
50	24	**25**	11	8	5	15	9	**90** **125** **150**	**46**	24	21	12	**30**	9	**M8**
60	30	**32**	16	10	10	18	11	**112** **150** **175**	**56**	30	26	15	**32**	11	**M10**
80	44	**35**	16	10	10	18	11	**112** **150** **175**	**56**	30	26	15	**35**	11	**M12**
100	55	**40**	17	10	10	20	13.5	**175** **200** **250**	**76**	40	32	18	**50**	13	**M12**
120	75	**45**	20	12	12	20	13.5	**200** **250** **300**	**86**	50	35	20	**65**	13	**M12**

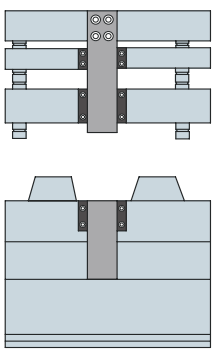
Bar Lock System Contents (G152):
G152K= 1 pcs. + **G152KL**= 1 set (2 pcs).



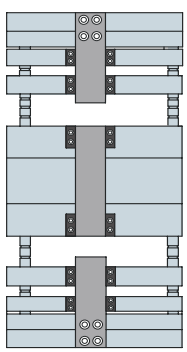
Wide Mould Applications



Stripper Plate Appications



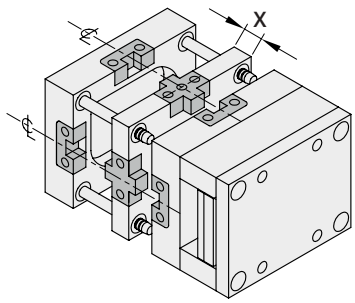
Triple Plate Applications



Sequence Mould Application

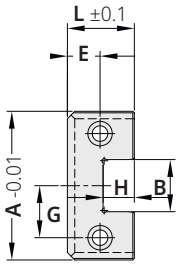
Group Locating - Centring Unit

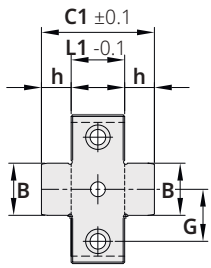
Code: **G127**

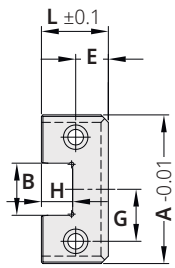


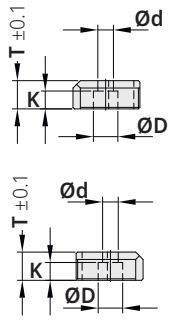
Oil grooves were created on the working surfaces of the products.

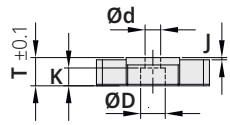
Material: 1.2510
Hardened: 52 - 54 HRC



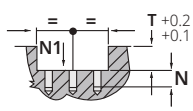


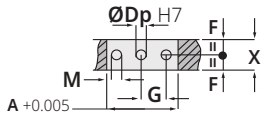


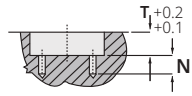


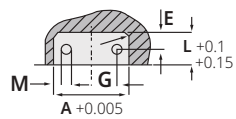


Mounting Mould Application







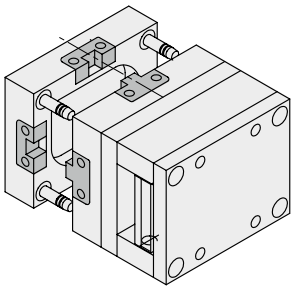


Order Code	A	X	B	C1	D	d	E	F	G	h
G127.5026	50	26	17	43	10.5	6.5	11	13	17	8.5
G127.5036		36		53				18		
G127.7526	75	26	25	54	16.5	10.5	18	13	25	14
G127.7536		36		64				18		
G127.10036	100	36	35	76	16.5	10.5	22	18	35	20
G127.10046		46		86				23		
G127.12536	125	36	45	76	16.5	10.5	22	18	42	20
G127.12546		46		86				23		

Order Code	H	J	K	L	L1	T	M	N	Dp	N1
G127.5026	9.5	1.5	8	21.5	26	16	M6	15	6	17
G127.5036					36					
G127.7526	15	1.5	12	36	26	19	M10	20	10	22
G127.7536					36					
G127.10036	21	1.5	12	45	36	19	M10	20	10	22
G127.10046					46					
G127.12536	21	1.5	12	45	36	25	M10	20	12	22
G127.12546					46					

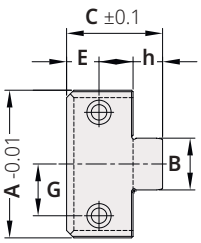
Square Locating - Centring Unit

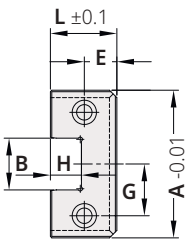
Code: **G128**

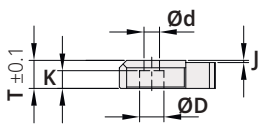


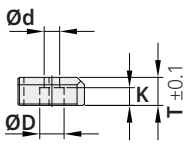
Oil grooves were created on the working surfaces of the products.

Material: 1.2510
Hardened: 52 - 54 HRC

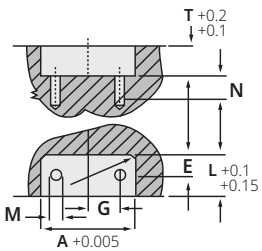








Mounting Mould Application



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Order Code	A	G	E	M	L	T	N	B
G128 38	38	11	7	M5	17	13	15	11
G128 50	50	17	11	M6	21.5	16	15	17
G128 75	75	25	18	M10	36	19	20	25
G128 100	100	35	22	M10	45	19	20	35
G128 125	125	42	22	M10	45	25	20	45

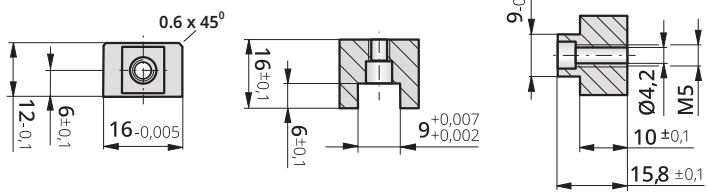
Order Code	C	d	D	h	H	J	K
G128 38	30	5.5	9.5	8	9	1.5	5.5
G128 50	30	6.5	10.5	8.5	9.5	1.5	8
G128 75	50	10.5	16.5	14	15	1.5	12
G128 100	65	10.5	16.5	20	21	1.5	12
G128 125	65	10.5	16.5	20	21	1.5	12

Code: **G131**

Centring Unit - DLC Coated

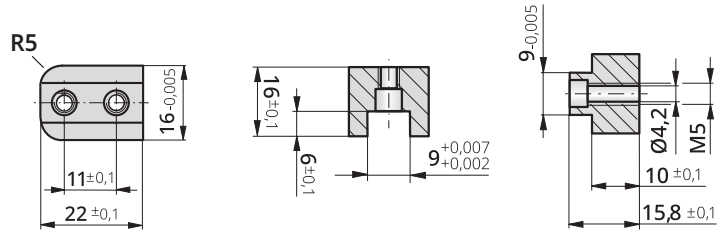
The G131 series is suitable for rotational multi-component moulds.
Material: 1.2344 - DLC Coated / **Hardened:** 52 - 54 HRC

Order Code: G131 - 1



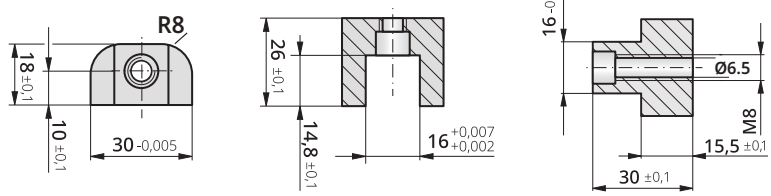
Note: Please use **M4 screws** for proper mounting.

Order Code: G131 - 2



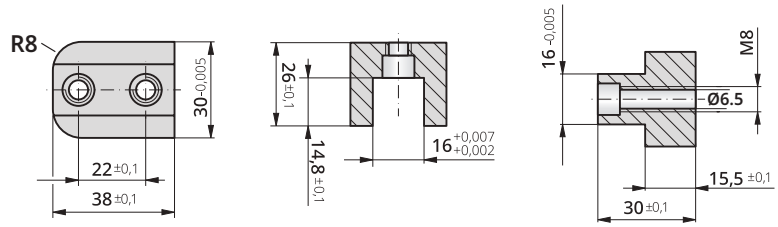
Note: Please use **M4 screws** for proper mounting.

Order Code: G131 - 3



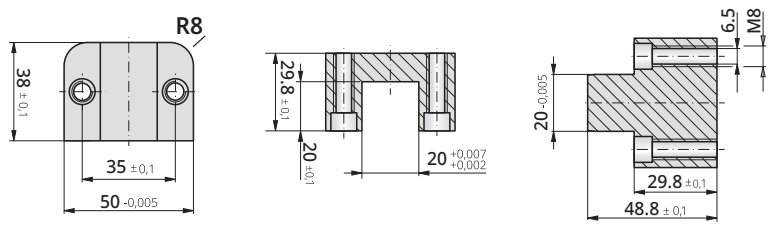
Note: Please use **M6 screws** for proper mounting.

Order Code: G131 - 4



Note: Please use **M6 screws** for proper mounting.

Order Code: G131 - 5

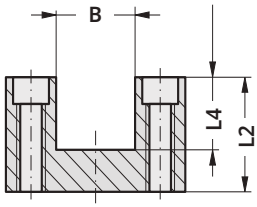


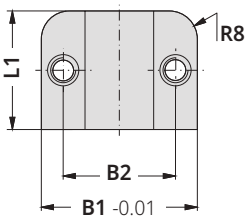
Note: Please use **M6 screws** for proper mounting.

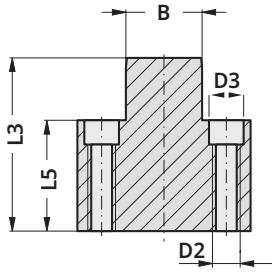
Oil grooves were created on the working surfaces of the products.

Locating - Centring Unit

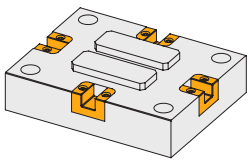
Code: **G129**

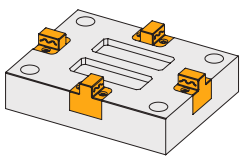






Mounting Example





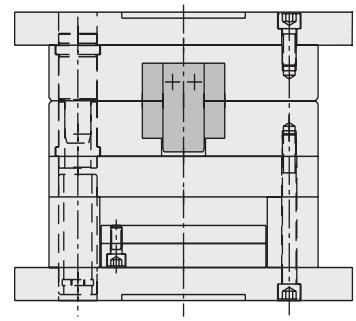
Order Code	B	B1	B2	L1	L2
G129 1	12.7	38.1	25.5	25.4	22.2
G129 2	25.5	63.5	44.5	38.1	34.9
G129 3	36.6	88.9	63.5	50.8	44.5

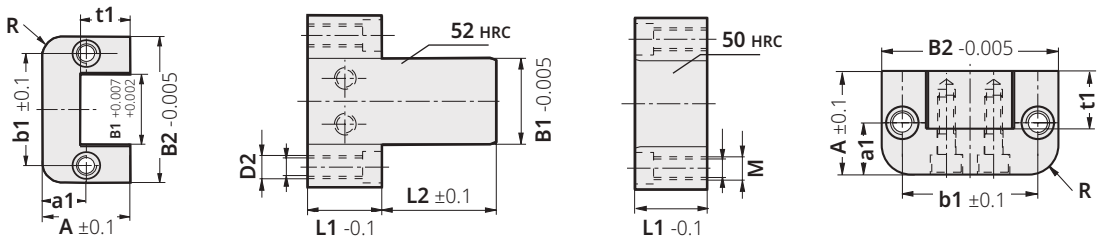
Order Code	L3	L4	L5	D2	D3	Screw
G129 1	22	13.3	9.5	M6	9	M5
G129 2	34.8	19.5	15.9	M8	11	M6
G129 3	44.2	25.7	19	M12	18	M10

Material: 1.2510 / **Hardened:** 52 - 54 HRC

Note: This product is not suitable for the rotational (multi component) moulds. Please use **"G131"** products for the rotational multi component moulds.

Mounting Example





Code: **G130**

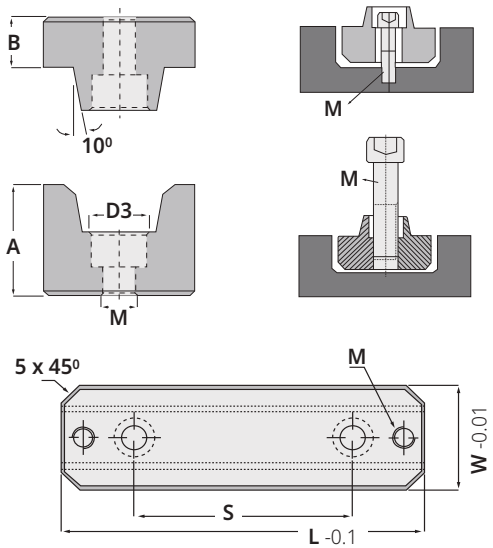
Square Locating - Centring Unit

Material: 1.2510 / **Hardened:** 52 - 54 HRC

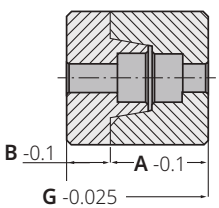
Order Code	B1	L1	L2	A	B2	M	a1	b1	t1	t2	R
G130 16 20 20	**16**	20	20	22	45	M8	11	30	11.5	12	8
G130 16 20 40			40								
G130 30 26 40	**30**	26	40	35	60	M8	17.5	46	19.5	20	10
G130 30 26 63			63								
G130 48 36 32	**48**	36	32	46	100	M12	23	74	25.5	26	12.5
G130 48 36 50			50								
G130 48 36 63			63								
G130 48 36 80			80								
G130 77 56 50	**77**	56	50	60	150	M16	30	114	35.5	36	16
G130 77 56 71			71								
G130 77 56 100			100								

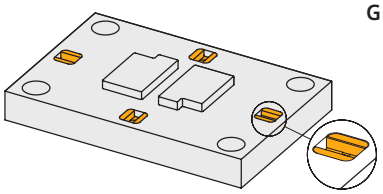
Locating - Centring Unit

Code: **G132**



Oil grooves were created on the working surfaces of the products.





Mounting Example

W	L	A	B	G	S	D3	M
25	50	17.5	8	25.5	-	9.6	M5
30	100	22	10	32	60	11	M6
40	150	25	13	38	100	14	M8

Order: **G132** x W

Material: 1.2510
Hardened: 52 - 54 HRC

"WHY DO OUR BUSINESS PARTNERS PREFER GÜVENAL PRODUCTS? "

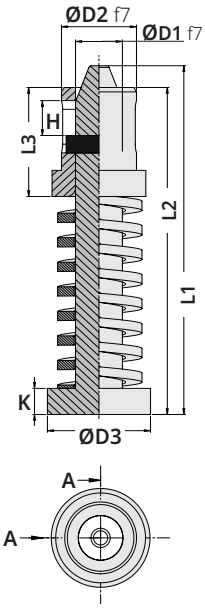
1 "It reduces maintenance losses with lubrication grooves that reduce friction and extend lubrication periods"

2 " Easy traceability even after years with the brand and production tracking number"

3 "When mounted with appropriate criteria, 12.9 grade bolts that do not elongate are included with the product"

4 "The product has been 100% inspected by the Güvenal CMM quality team"

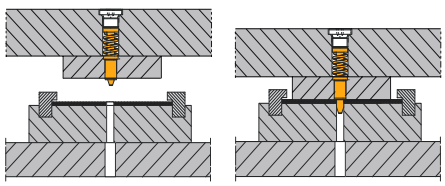
5 "The product is stored and packaged in a climate-controlled stock area, in compliance with precise tolerance requirements"



Pilot Unit

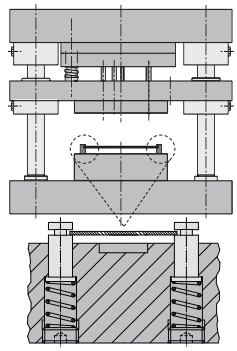
Code: **G165**

"G165" is used for centering of the moving sheet metal in progressive dies in each step. It is a compact and useful product.



1N = 0.1 daN = 0.102 kgf

Order Code	F0 (N) preloaded	F1 (N) pressed	D1	L1	D2	D3	L2	L3	K	H
G165.05401	11	30	5	40	8	11	36	12	3	4.5
G165.05402	25	70								
G165.05403	30	84								
G165.05404	40	112								
G165.05405	55	155								
G165.05441	11	30	5	44	8	11	40	16	3	4.5
G165.05442	25	70								
G165.05443	30	84								
G165.05444	40	112								
G165.05445	55	155								
G165.08481	44	122	8	48	12	16	41	16	4	4.5
G165.08482	58	164								
G165.08483	79	220								
G165.08484	123	346								
G165.08485	165	460								
G165.08486	189	530								
G165.08521	44	122	8	52	12	16	45	20	4	4.5
G165.08522	58	164								
G165.08523	79	220								
G165.08524	123	346								
G165.08525	165	460								
G165.08526	189	530								
G165.10631	140	391	9.8	63.2	15	18	53	28	4	3.5
G165.10632	245	680								
G165.10633	540	1512								

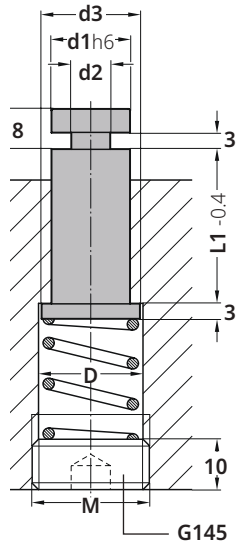


Sheet Lifting Pin

Code: **G23**

It is used to align and lifting sheet in progressive / multi-stage forming dies. **G145** - Compression spring set screw and round steel spring can be used for mounting.

d1	L1	d2	d3	M	D
8	20	5	10	M12 x1.5	10.5
	25				
	32				
	40				
10	25	6	12	M14 x1.5	12.5
	32				
	40				
	50				
13	25	7	16	M18 x1.5	16.5
	32				
	40				
	50				
16	32	8	20	M22 x1.5	20.5
	40				
	50				



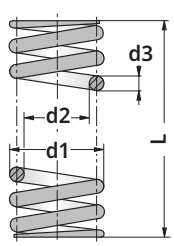
Order: **G23.** d1 x L1

Material: 1.7131 (16MnCr5)
Hardness: 58 - 60 HRC

Round Steel Spring

Code: **G23S**

L: Spring length / die plate selection as per dimension.



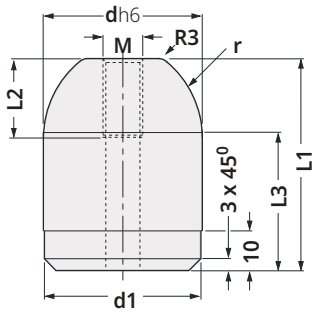
d1	d2	d3	L
10.5	8.5	1.5	40
12.5	10.5	1.5	55
16.5	13	2	40
21	17	2.5	40

Order: **G23S.** d1 x L

Compression Spring Set Screw
Code: **G145** Page: 298

Centring Pin Code: G65

Referance: VW/ AUDI 39V 1205
Referance: BMW B2 4068 2



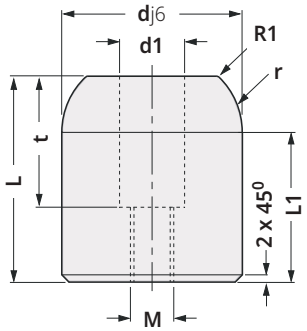
d	L1	L2	L3	d1	M	r
22	45	16	35	21.95	M8	15
22	55	16	45	21.95	M8	15
32	50	20	35	31.95	M10	20
40	55	20	35	39.95	M10	25
40	65	20	45	39.95	M10	25
50	55	20	35	49.95	M10	25

Order: **G65.** d x L1

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

Centring Pin Code: G66

Referance: FCA STQ 40015



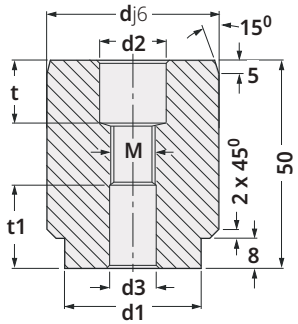
d	L	L1	d1	t	M	r
22	45	37.5	14	25	M10	20
32	50	40	18	35	M12	20
40	55	40	18	35	M12	20
50	55	40	18	35	M12	20

Order: **G66.** d

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

Centring Pin Code: G62

Referance: Mercedes-Benz Standard B8 0602 321 008 801

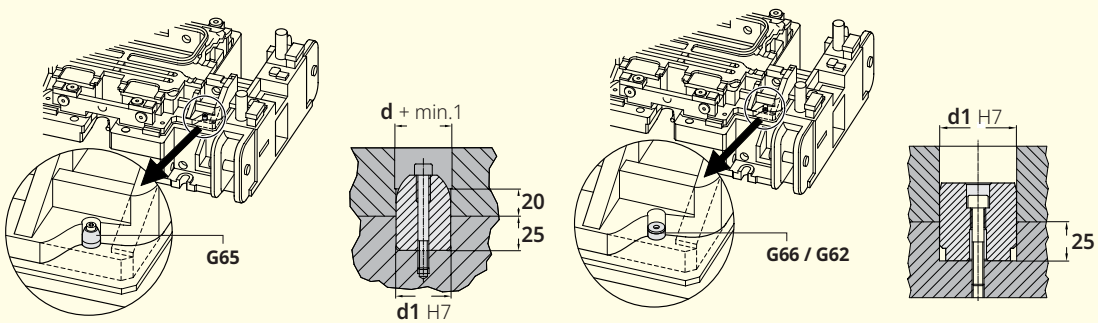


d	d1	d2	d3	M	t	t1
22	16	11	9	M8	13	16
25	18	11	9	M8	13	16
32	25	11	9	M8	13	16
40	32	15	11	M10	16	20
50	42	15	11	M10	16	20

Order: **G62.** d

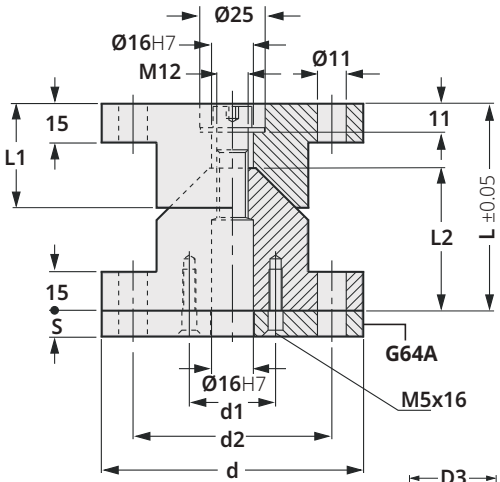
Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

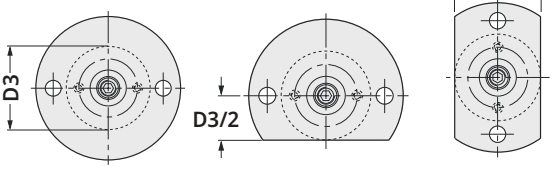
Centring Pins: It is used for centring of perforated parts. Using centring pin provides centring repeatedly with high sensitivity at dies and fixtures. Mounted parts are centered with high sensitivity and quickly. Screws used for mounting of products should be provided by user.
All dimensions without tolerance are in EN 22768 - 1 (m) standards.



Code: **G64**

Locating Cone





Form A **Form B** **Form C**

d	L	D1	D2	D3	L1	L2	t	Form
100	**80**	40.5	76	58	40	55	5.5	**A**
120	**90**	50.5	96	78	50	65		
100	**80**	40.5	76	58	40	55	5.5	**B**
120	**90**	50.5	96	78	50	65		
100	**80**	40.5	76	58	40	55	5.5	**C**
120	**90**	50.5	96	78	50	65		
100	**80**	40.5	76	58	40	55	10	**A**
120	**90**	50.5	96	78	50	65		
100	**80**	40.5	76	58	40	55	10	**B**
120	**90**	50.5	96	78	50	65		
100	**80**	40.5	76	58	40	55	10	**C**
120	**90**	50.5	96	78	50	65		
100	**80**	40.5	76	58	40	55	10.5	**A**
120	**90**	50.5	96	78	50	65		
100	**80**	40.5	76	58	40	55	10.5	**C**
120	**90**	50.5	96	78	50	65		

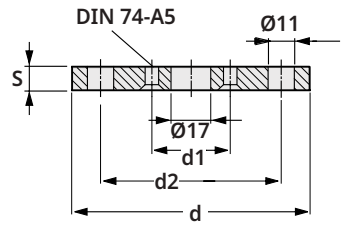
Order: **G64.** d x L x t x Form

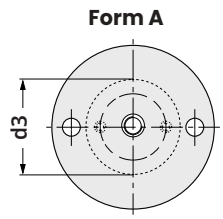
Shim plates are with the unit in thickness (t) specified dimensions as a standard. Except this, other form **(A - B - C)** shim plates can be ordered upon request. Mounting screws are excluded.
Material: 1.7131 (16MnCr5) **/ Hardness:** 60 - 64 HRC

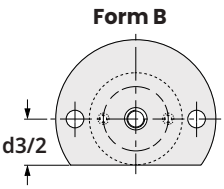
Code: **G64A**

Shim Plate for Locating Cone

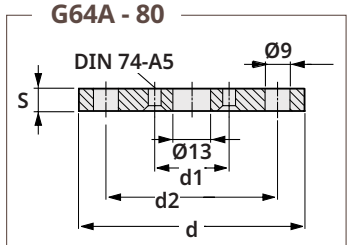
(Custom-made products upon request)

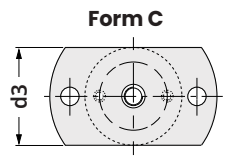






G64A - 80





d	t	d2	d1	d3	Form
80	5	63	32	48	**A**
80	5.5	63	32	48	
80	5	63	32	48	**C**
80	5.5	63	32	48	
100	5.5	76	40.5	58	**A**
120	5.5	96	50.5	78	
100	5.5	76	40.5	58	**B**
120	5.5	96	50.5	78	
100	5.5	76	40.5	58	**C**
120	5.5	96	50.5	78	
100	10	76	40.5	58	**A**
120	10	96	50.5	78	
100	10	76	40.5	58	**B**
120	10	96	50.5	78	
100	10	76	40.5	58	**C**
120	10	96	50.5	78	
100	10.5	76	40.5	58	**C**
120	10.5	96	50.5	78	

Order: **G64A.** d x t x Form

Material: 1.0503 (CK45)

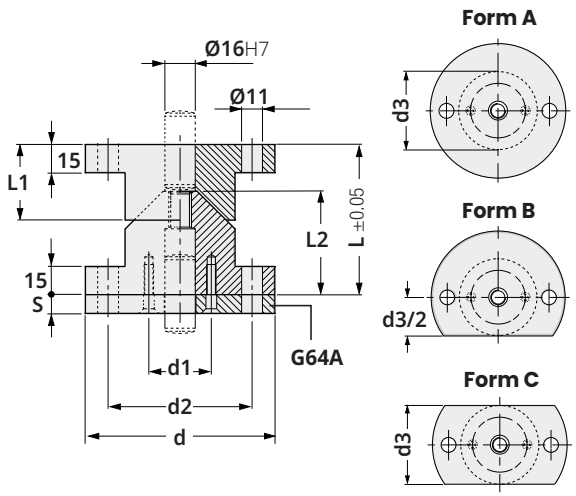
Note: Fixing screws will be provided separately.

Code: **G63**

Locating Cone - NAAMS

Shim Plate (upon request, **Form A - B**)

Reference: NAAMS G91



d	L	L1	L2	d1	d2	d3	S	Form
100	80	40	55	40.5	76	58	10.5	A
							10.5	C
							5.5	A
							10	A
							5.5	B
							10	B
							5.5	C
							10	C
120	90	50	65	50.5	96	78	10.5	A
							10.5	C
							5.5	A
							10	A
							5.5	B
							10	B
							5.5	C
							10	C

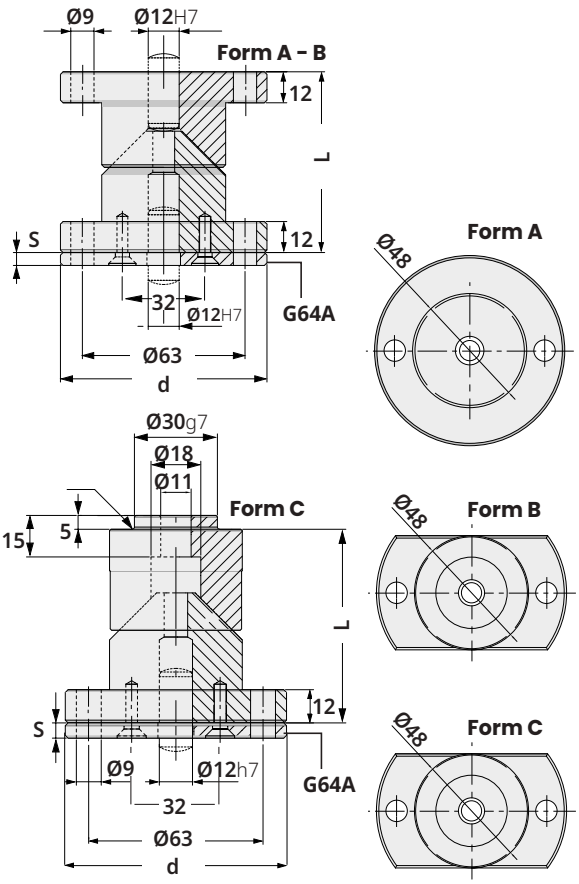
Order: **G63.** d x L x S x Form

Code: **G46**

Locating Cone

Reference: WDX - 14 - 62 - 0175

(Custom-made products upon request)



d	L	S	Form
80	70	5	A
80	70	5.5	
80	70	5	B
80	70	5.5	
80	70	5	C
80	70	5.5	

Order: **G46.** d x L x S x Form

Material: 16MnCr5 (CK45)
Hardened: 60 - 62 HRC

NEW

1 **Material:** 1.6511 / **Screw:** 8.8

2 **Material:** St 37

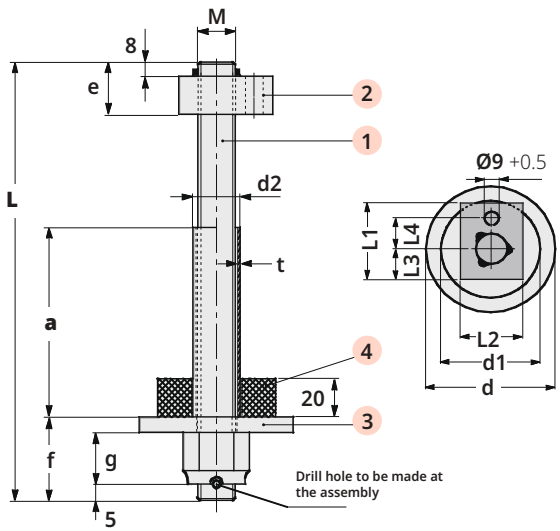
3 **Material:** CK45

4 **Material:** Polyurethane

Retainer Bolt

Code: **G169**

(Ref: FCA - FORD)



M	d	d1	d2	e	f	g
M16	65	50	22	28	30	19
M20	82	63	25	28	35	22
M24	105	80	30	28	42	27
M30	130	100	38	33	50	33

M	L1	L2	L3	L4	t	Max. Load kg.
M16	50	35	20	20	2	250
M20	50	40	20	20	2	450
M24	50	45	20	20	2.5	750
M30	63	50	28	26	2.5	1250

Please pay attention to the Max. Load.

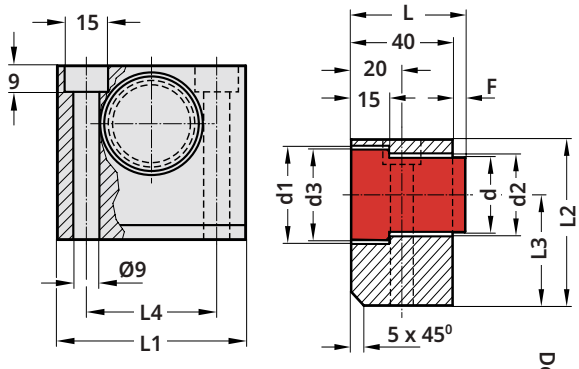
Order: **G169.** M x L x a

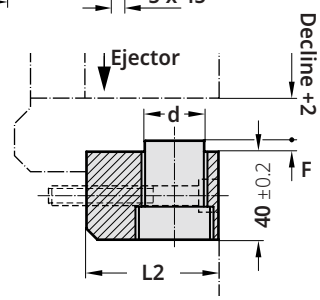
The lengths (**L** and **a**) are specified by the customer.

Slide Stop Block

Code: **G97**

Reference: BMW - Ford - VW - Audi





Note: Fixing screws (M8 cylinder head cap screws) should be provided separately.

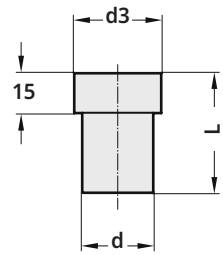
Load N	d	d1	d2	d3	L	L1	L2	L3	L4	F
5200	27	35	30	34	45	**65**	60	40	45	5
9800	36	45	40	44	45	**75**	70	45	55	5

Order: **G97.** L1

Material: CK45 Steel
Polyurethane 90 Shore

Slide Stopper

Code: **G97A**



d	d3	L
27	34	45
36	44	45

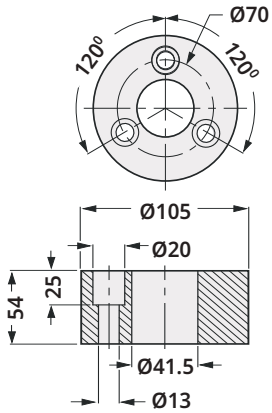
Order: **G97A.** d

Slide stopper for is **90 Shore**. Used with slide stop block.

Code: **G99**

Cylinder Locating Block

(**FCA Code:** CNT_ST_01)



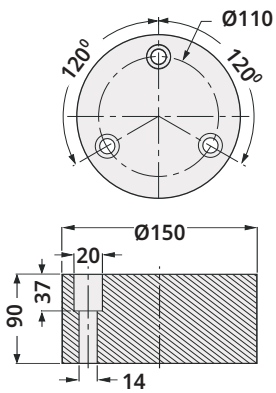
Material: 1.7131 (16MnCr5)
Hardness: 60 - 64 HRC

Order Code: **G99**

Code: **G99B**

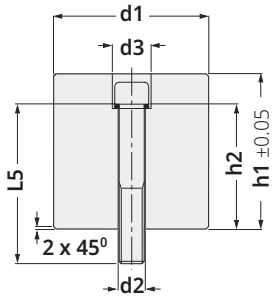
Cylinder Locating Block

Reference: PSA



Material: 1.7131 (16MnCr5)
Hardness: 60 - 64 HRC

Order Code: **G99B**



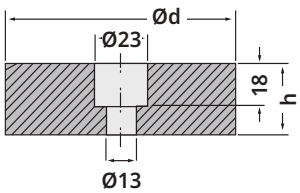
Cylinder Stopping Block

Code: **G98**

Order Code	d1	Screw	d2	d3	h1	h2	L5
G98 40	**40**	M10	11	18	30 ~ 60	20	30 - 40
G98 60	**60**	M12	14	20	40 ~ 80	22	40 - 50
G98 80	**80**	M12	14	20	56 ~ 100	42	50 - 60
G98 100	**100**	M16	18	26	80 ~ 160	62	80
G98 120	**120**	M20	22	33	104 ~ 160	82	100
G98 150	**150**	M20	22	33	124 ~ 160	102	120

Material: 1.7131 (16MnCr5) / **Hardness:** 60 - 64 HRC

Note: Fixing screws should be provided separately.



Cylinder Stopping Block

Code: **G98B**

Reference: FCA

d	h
Diameter **80 mm**	Thickness **25 mm**
Diameter **80 mm**	Thickness **30 mm**
Diameter **100 mm**	Thickness **25 mm**
Diameter **100 mm**	Thickness **30 mm**
Diameter **120 mm**	Thickness **25 mm**
Diameter **120 mm**	Thickness **30 mm**

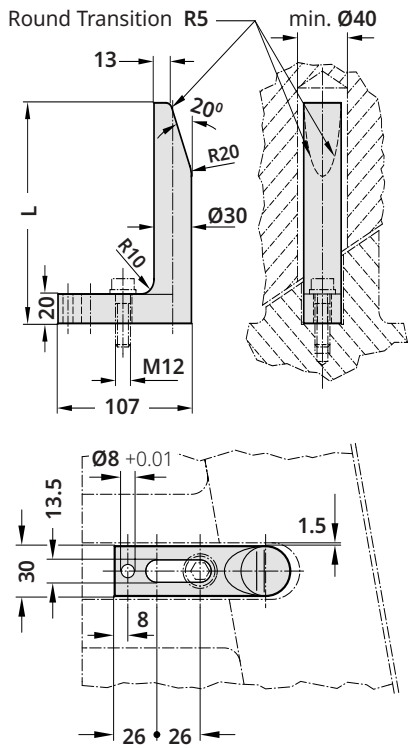
Order:
G98B. d x h

Material: 1.7131 (16MnCr5)
Hardness: 60 - 64 HRC

Guide Code: G67

Guide - Hardened Code: G67S

(Ref: BMW - Mercedes-Benz - FCA - Ford - Opel - VW/AUDI)



Order Code		L
G67 065	G67S 065	65 mm
G67 090	G67S 090	90 mm
G67 120	G67S 120	120 mm
G67 150	G67S 150	150 mm
G67 180	G67S 180	180 mm
G67 250	G67S 250	250 mm
G67 300	G67S 300	300 mm
G67 350	G67S 350	350 mm

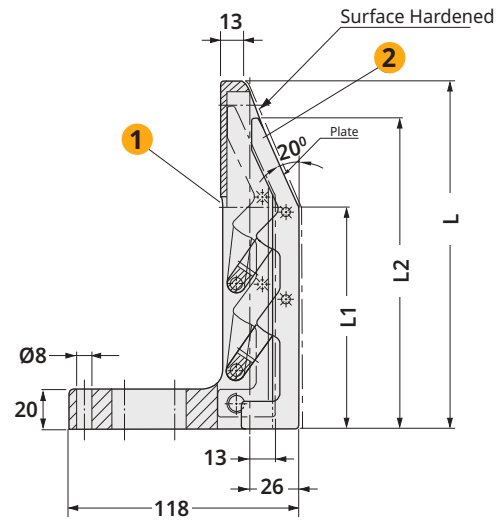
Code: **G67** **Material:** CK 45 Forged

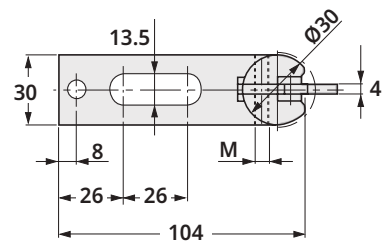
Code: **G67S** **Material:** CK 45 Forged
Hardened: 50 - 55 HRC

NEW

Guide for Sensor - Hardened Code: G68

(Ref: BMW - FCA)

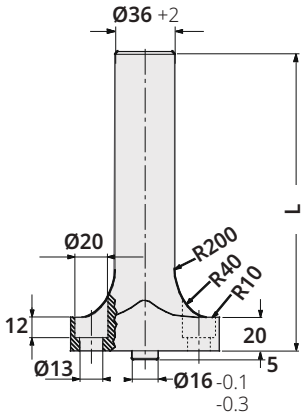




Order Code	L	L1	L2	M
G68 120A	120	78	113	M8x1
G68 120B	120	78	113	M12x1
G68 150A	150	90	130	M8x1
G68 150B	150	90	130	M12x1
G68 180A	180	114	160	M8x1
G68 180B	180	114	160	M12x1
G68 250A	250	114	160	M8x1
G68 250B	250	114	160	M12x1
G68 250C	250	184	230	M8x1
G68 250D	250	184	230	M12x1

1 **Material:** CK 60 Forged
Hardness: 58 - 60 HRC

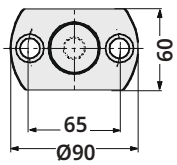
2 **Material:** St37
Hardness: 58 - 60 HRC



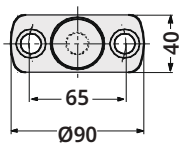
Air Pin VDI 3002

Code: **G69B**

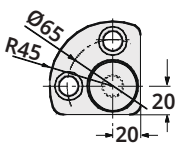
Form A



Form B



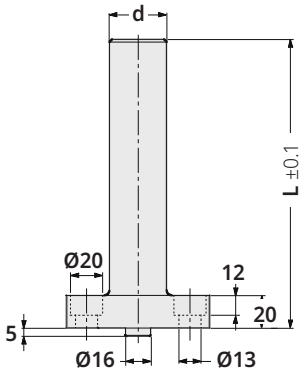
Form C



L	L	L
150 mm	215 mm	275 mm
155 mm	220 mm	280 mm
160 mm	225 mm	285 mm
165 mm	230 mm	290 mm
170 mm	235 mm	295 mm
175 mm	240 mm	300 mm
180 mm	245 mm	310 mm
185 mm	250 mm	320 mm
190 mm	255 mm	330 mm
195 mm	260 mm	340 mm
200 mm	265 mm	350 mm
205 mm	270 mm	360 mm
210 mm		

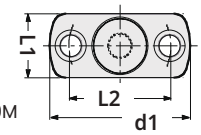
Material: CK 45
800 ÷ 1000 N / mm² Forged

Order: **G69B.** L x Form



Air Pin

Code: **G69**



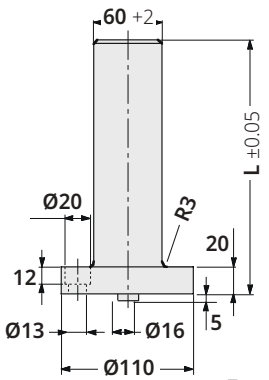
Referans: BMW B2 2615 12 / OPEL F33 15
VW AUDI 39D 638-1 / FORD WVDX 17 - 70M

d	d1	L1	L2	Max. Load	L
36	90	40	65	50	optional
46	100	50	75	70	optional

Material: CK 45
800 ÷ 1000 N / mm² Forged

Order: **G69.** d x L

The length (**L**) is specified by the customer.



Air Pin

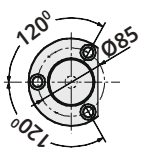
Code: **G69 - 1**

Form	Max. Load	L
A	80	optional
B	80	optional

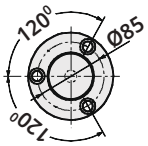
Material: CK 45
800 ÷ 1000 N / mm² Forged

Order: **G69 - 1.** d x L

Form A



Form B



The length (**L**) is specified by the customer.

NEW

Type 1
Steel Roller

Güvenal Order Code	VW/AUDI Code	Roller
ARSL-1-A	39V 1569/1	Steel
ARSL-1-B	39V 1569/2	
ARSL-1-C	39V 1569/3	
ARSL-3-A	39V 1569/20	Steel + Vulkollan
ARSL-3-B	39V 1569/21	
ARSL-3-C	39V 1569/22	

Type 2
Plastic Roller (PP)

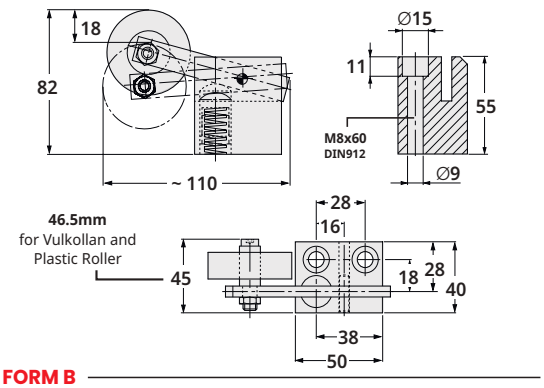
Type 3
Steel + Vulkollan Roller

Roller Strip Lifter

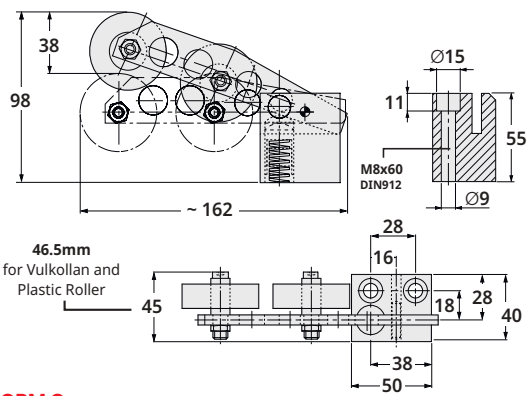
Code: **ARSL..**

Ref: VW/AUDI & FCA

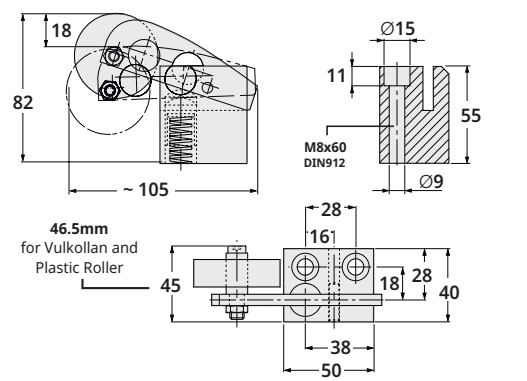
FORM A



FORM B



FORM C



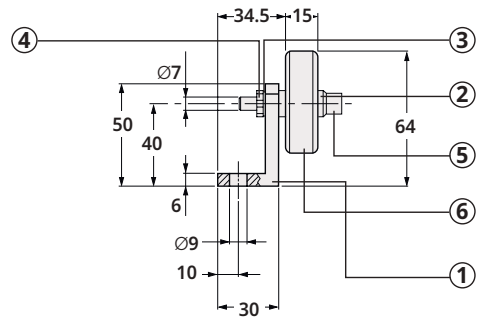
Order: **ARSL - Type - Form**
Order Example: **ARSL-1-A**

NEW

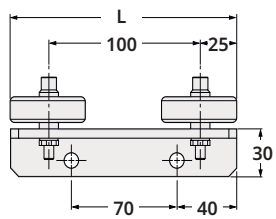
Roller Group

Order Code: **AFRG**

Ref: FCA

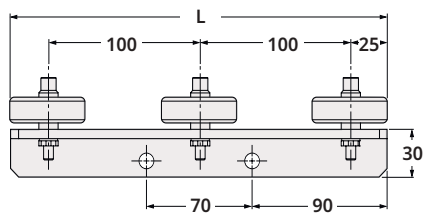


FORM A

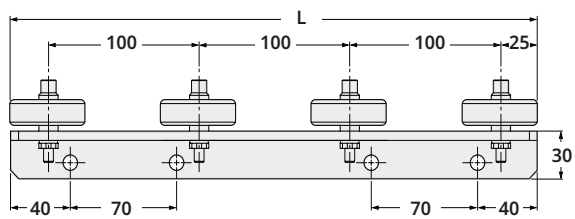


① Material: St 37
② ③ Washers for M6
④ Nut for M6
⑤ Screw M6x40 DIN 912
⑥ Material: Steel Roller

FORM B



FORM C

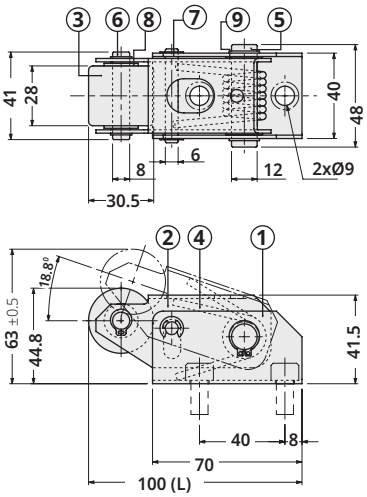


Order Code	Form	L	Max. Load (daN)
AFRG150	A	150	50
AFRG250	B	250	75
AFRG350	C	350	100

NEW COIL SUPPORTS

Order Code: **ACS-S100**

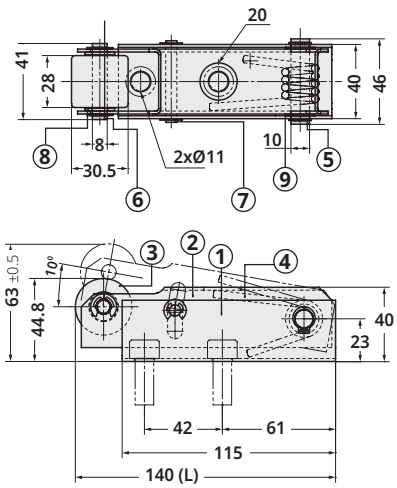
Load (on roller)
Initial pressure:3.0 kgf
Final pressure: 5.0 kgf
Spring Constant
5.2 kgf. mm/deg



① Base
② Tilt Plate
③ Roller
④ Spring
⑤ Hinge Pin A
⑥ Hinge Pin B
⑦ Hinge Pin C
⑧ Washer
⑨ Shim

Order Code: **ACS-P140**

Load (on roller)
Initial pressure:3.3 kgf
Final pressure: 5.0 kgf
Spring Constant
18.84 kgf. mm/deg



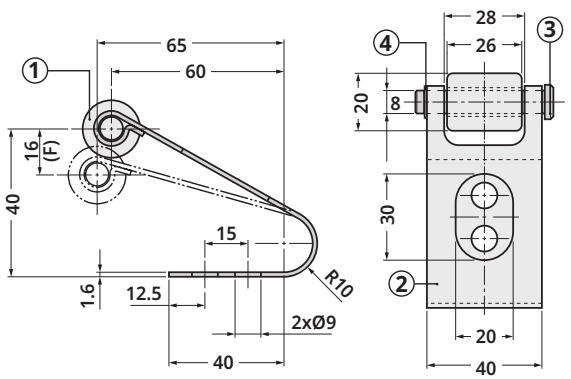
① Base
② Tilt Plate
③ Roller
④ Spring
⑤ Hinge Pin A
⑥ Hinge Pin B
⑦ Hinge Pin C
⑧ Washer
⑨ Shim

Steel Type
Order Code: **ACS-CTS**

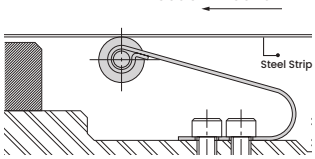
Resin Type
Order Code: **ACS-CTJ**

Order Code	F Max	Spring Constant N/mm (kgf/mm)
ACS-CTS	16	8.43 (0.86)
ACS-CTJ		

Travel F is max. 16mm (durability range)

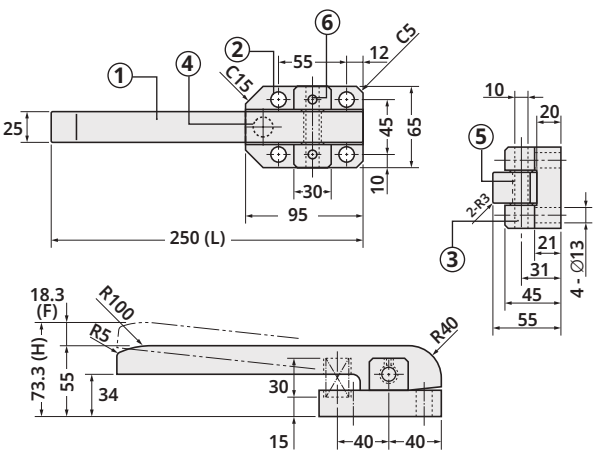


① Roller (Steel)
① Roller (Resin)
② Plate Spring
③ Hinge Pin
④ G Type Reatining Ring
⊕ 2pcs. M8x20 Bolt



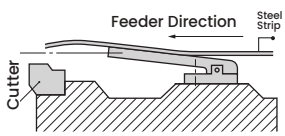
Light Load Type
Order Code: **ACS-BTL**

Heavy Load Type
Order Code: **ACS-BTH**



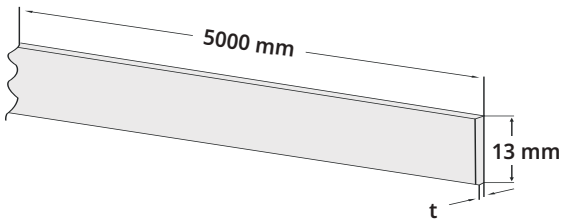
Order Code	L	F	H	Spring Load (N) Initial Load	Spring Load (N) Final Load	Weight Kg.
ACS-BTL	250	18.3	73.3	57	95	2.2
ACS-BTH				240	400	

① Support Bar
② Base Plate
③ Pin
④ Spring
⑤ Bushing with Flange
⑥ Hex. Sock. Set Screw M6x8



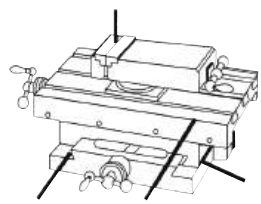
Precision Feeler Gauge Tape

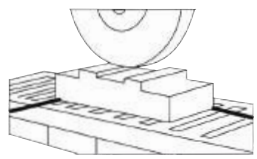
Code: **C318**

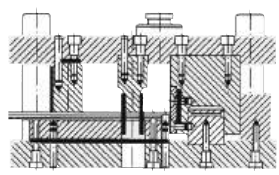


Order Code	Thickness t mm
C318 001	0.01
C318 002	0.02
C318 003	0.03
C318 004	0.04
C318 005	0.05
C318 006	0.06
C318 007	0.07
C318 008	0.08
C318 009	0.09
C318 010	0.10
C318 015	0.15
C318 020	0.20
C318 025	0.25
C318 030	0.30
C318 035	0.35
C318 040	0.40
C318 045	0.45
C318 050	0.50
C318 060	0.60
C318 070	0.70
C318 080	0.80
C318 090	0.90
C318 100	1.00

Some Applied Pictures

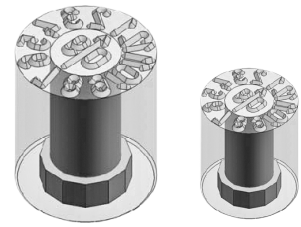






A: 13 mm x **L:** 5 mt.
Tolerance: T.3

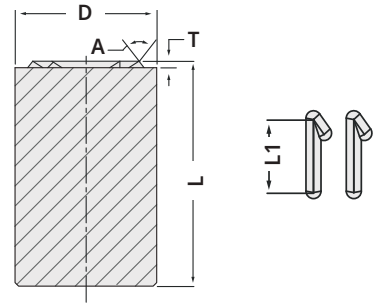
Cold - rolled, spring hardness and high plain precision shim steel strip. Gauge tapes with shiny surface resistant to rust or acid.
Usage: It is used for adjusting machine parts in fixture and set processes, straightening of workpieces as base foil, in all kinds of tolerance dimensions, in controlling of inserts and slides with tolerances, for adjusting of dyeing and stamping rolls and mould / die repairs etc.



Embossing Date Stamp

for sheet metal

Code: **GCM09**

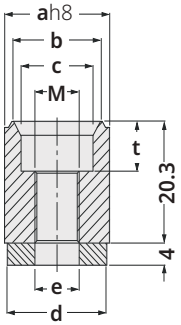


*** Please provide the desired "year" for your GCM09 orders.**

Order Code	D	L	T	L1	A
GCM09 08S	8	12.35	0.35	1.2	76⁰
GCM09 08L		19.05			
GCM09 10S	10	12.35	0.35	1.6	76⁰
GCM09 10L		19.05			
GCM09 12S	12	12.45	0.45	2	76⁰
GCM09 12L		19.05			
GCM09 16S	16	12.55	0.55	2.5	76⁰
GCM09 16L		19.05			
GCM09 20SA	20	12.55	0.55	3	76⁰
GCM09 20SB		12.55		3.5	
GCM09 20LA		19.05		3	
GCM09 20LB		19.05		3.5	
GCM09 24	24	24	0.55	4	76⁰
GCM09 32A	32	32	0.65	5	76⁰
GCM09 32B		32		6	

It is suitable to be used in all die systems. The product specifies 12 months and 1 year.
***** Please provide the desired "year" for your GCM09 orders.
The insert (inner hub) of GCM09 is a replaceable type.
When you need to change the year of insert (inner hub) you can order it separately.

Material: 1.2379
Hardness: 58 - 60 HRC

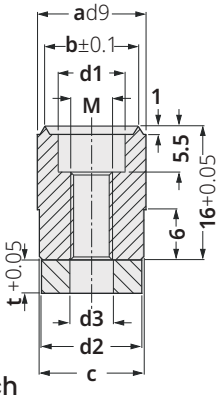


Code: **KZG**

Locating Punch

Reference: FCA / STQ 40007

a	b	c	M	t	d	e
19	16	13	M8	8	18	8
25	18	16	M10	12	24	9



Code: **KZ2**

Locating Punch

Reference: FCA / STQ 40007

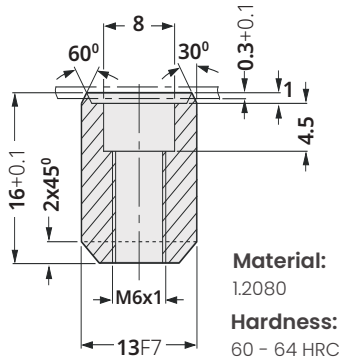
a	b	d1	M	c	d2	d3	t
10	8	6	M4	9.9	9.5	4.2	4
13	11.2	8	M5	12.5	12	5.2	4

Order: **KZG.** a | Order: **KZ2.** a

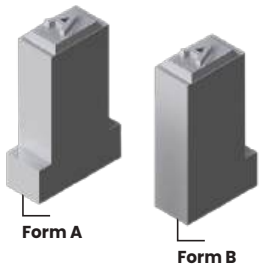
Code: **KZF**

Locating Punch

Reference:
* FORD
* WDX20-70-0101

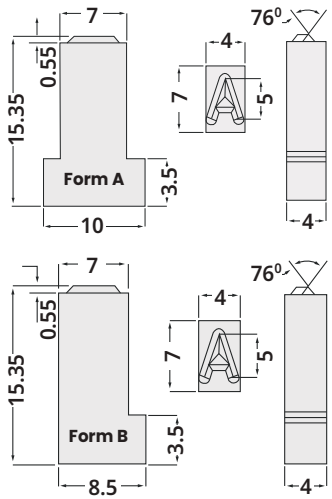


Material: 1.2080
Hardness: 60 - 64 HRC



Marking Stamp

Code: **MZG**



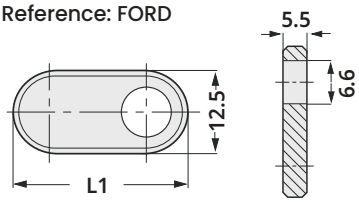
Order: **MZG.** Form x Symbol

Marking Stamps: Symbol and dimensions can be machined upon request.

Backing Plate for Stamp Retainer

Code: **MEG**

Reference: FORD



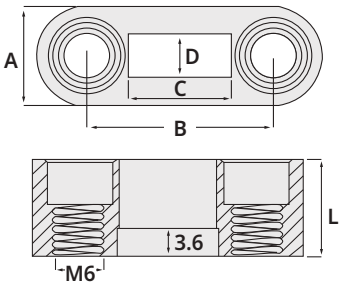
L1	Figure Size
23.5	3.5
27.5	3.5
31.5	3.5

L1	Figure Size
23.5	2
27.5	2
31.5	2

Order: **MEG.** L1 x Figure Size

Code: **MTU**

Stamp Retainer



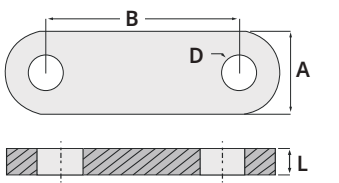
A	B	L	C	D	Pcs.
14.9	**28**	12	16.1	7.1	4
	32	12	20.1	7.1	5
	34	12	24.1	7.1	6
	44	12	32.1	7.1	8
	52	12	40.1	7.1	10

Order: **MTU.** A x B

Polyamide material upon request

Backing Plate for Stamp Retainer

Code: **MEU**



A	B	L	D
15	28	5	6.7
	32		
	36		
	44		
	52		

Order: **MEU.** A x B

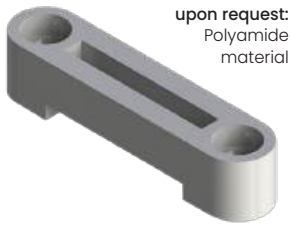
Material: 1.2080
Hardness: 54 - 56 HRC

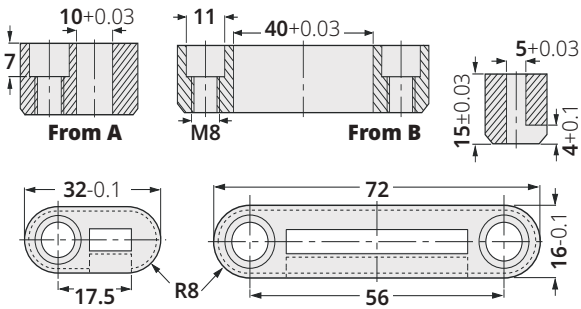
upon request: Polyamide material

Code: **ZTF**

Stamp Retainer

Reference:
FORD / WDX20-70





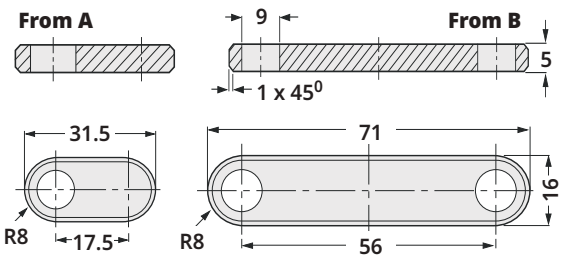
Order: **ZTF.** Form

Material: 1.2379
Hardness: 60 - 62 HRC

Code: **MD2**

Backing Plate for Stamp Retainer

Reference: FORD / WDX20-70



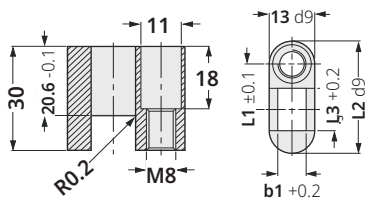
Order: **MD2.** Form

Material: 1.0503
Hardness: 60 - 62 HRC

Stamp Retainer

Code: **MTG**

Reference: FORD / WDX20-66



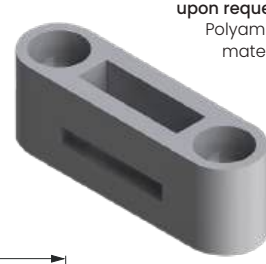
Order Code	L1	L2	L3	b1
MTG 8109	9	24	4.1	8.1
MTG 8111	11	28	8.1	8.1
MTG 8113	13	32	12.1	8.1
MTG 6109	9	24	4.1	6.1
MTG 6111	11	28	8.1	6.1
MTG 6113	13	32	12.1	6.1

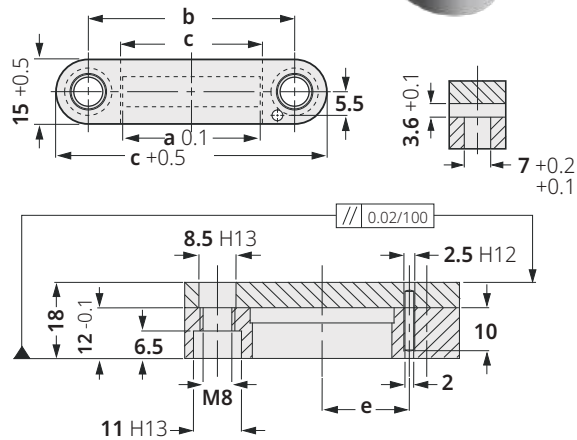
upon request: Polyamide material

Code: **ZTP**

Stamp Retainer

Reference:
PSA E24.64.100.G



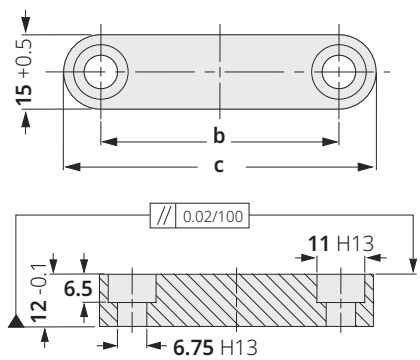


Order Code	Punch Pcs.	a	b	c	d	e
ZTP 47	4	16	32	47	17	12
ZTP 55	6	24	40	55	25	16
ZTP 63	8	32	48	63	33	20
ZTP 71	10	40	56	71	41	24

Code: **ZDP**

Backing Plate

Reference: PSA E24.64.100.G



Order Code	Punch Pcs.	b	c
ZDP 47	4	32	47
ZDP 56	6	40	56
ZDP 63	8	48	63
ZDP 71	10	56	71

Die Spare Parts

Precision machining / Custom-made

Die systems, sheet metal cutting / spinning - bending form dies, complicate dies and progressive dies. In addition, we produce your custom-made parts belonging to other die systems within technical drawing details, as precision heat treated and in desired materials with complete ground operations.
Centering pins, compression and clutch plates, balancing blocks, backing and shim plates, special wedges, matrix holders, special guide shaft coupling nut, separator - holder and adjustor parts, conical centering components, special washers and inserts etc.

Why Güvenal ?

"Equipment for Marking and **Traceability in Compliance** with Standards"

"We manufacture the parts required by companies in the automotive and other industrial sectors to ensure marking and production traceability. Our products are meticulously produced in compliance with the standards set by the main automotive manufacturers and international quality norms."

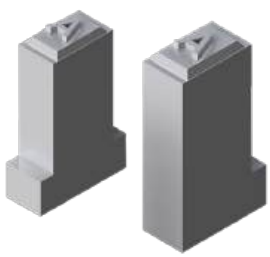
Pantograph

Laser-marking

EDM Die Sinking

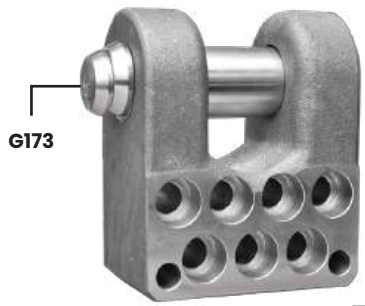
"In addition to our standard products, we also manufacture marking equipment for our customers' special projects.
From the design phase to final inspections and testing, we work meticulously using advanced technology machines and equipment to ensure the highest quality. At every stage, we apply the latest industry methodologies and consider international standards to provide solutions that are fully tailored to our customers' specific needs. Thanks to our innovative approaches and high-tech production processes, we maintain the performance and reliability of our branding equipment at the highest level."

For more information:
info@guvenal.net



CE

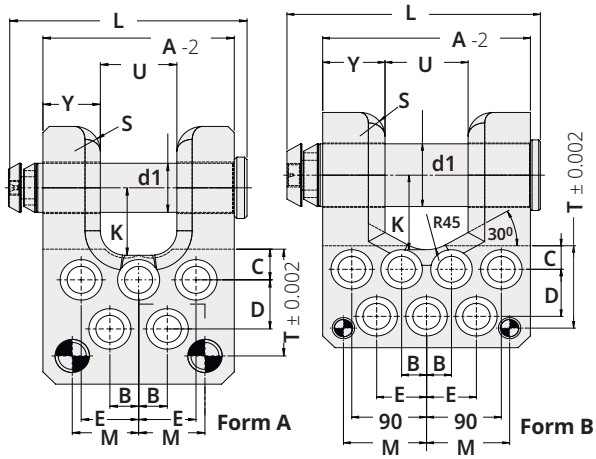
NEW

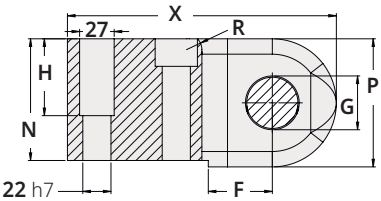


Code: **G53B**

Die Lifting Bracket with Pin - BMW

The **G53B** is shipped with the "**G173** Die Lifting Pin".





d1	L	A	P	X	G	K	S	Max. Load	Max. Capacity	Form
30	158	126	80	185	32	50	16	3.200 kg.	6.400 kg.	A
40	187	150	100	210	42	55	20	5.000 kg.	10.000 kg.	
50	220	175	120	240	52	70	24	8.000 kg.	16.000 kg.	
60	246	200	140	300	62	80	30	12.500 kg.	25.000 kg.	
80	305	250	160	300	82	95	30	18.000 kg.	36.000 kg.	B

R	U	Y	F	T	C	D	M	E	B	N	H	Screw
12	50	38	40	85	35	30	45	40	20	75	40	M16 x 80
12	60	45	50	87	40	25	52	45	22.5	95	60	M20 x 100
16	75	50	60	95	45	35	62.5	50	25	115	80	M24 x 120
20	80	60	65	145	65	60	77.5	65	35	130	95	M36 x 160
20	100	75	90	105	60	30	100	60	30	150	115	M30 x 130

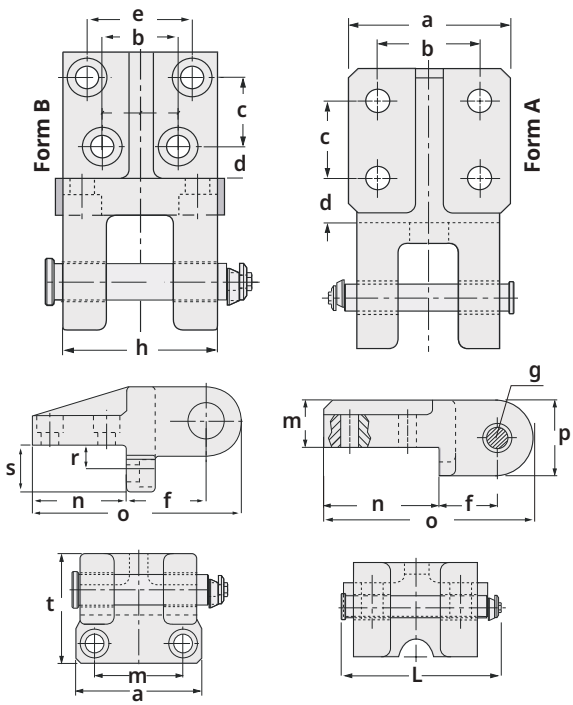
Order: **G53B**. d1

CE

Code: **G53**

Die Lifting Bracket with Pin - FCA

Reference: FCA Norm STQ 40001 04 / 12 / 2014



a	b	c	d	e	f	Max. Load	Max. Capacity	Form
80	50	40	22.5	-	39	600 kg.	1.200 kg.	A
90	60	40	27.5	-	42	1.000 kg.	2.000 kg.	
100	65	65	32.5	-	60	2.000 kg.	4.000 kg.	
135	56	60	20	84	85	4.000 kg.	8.000 kg.	B
180	80	70	30	110	100	7.000 kg.	14.000 kg.	

a	g	h	L	m	n	o	r	s	t	p
80	16	70	102.5	32	80	145	-	-	-	52
90	21	79	113.5	36	90	160	-	-	-	56
100	26	90	128.5	50	120	215	-	-	-	70
135	34	125	166.5	96	100	221	30	50	111	72
180	44	160	210.5	130	125	270	35	60	40	90

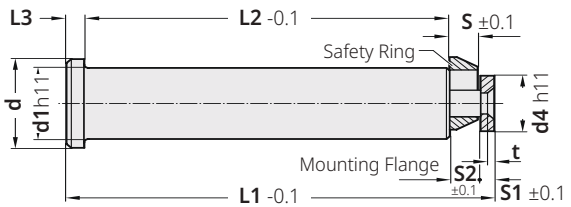
Order: **G53.** a x Form

Due to safety reasons, die weight should not exceed maximum load that 2 lifting pins can bear.

Die Lifting Pin - CNOMO

Code: **G153**

CNOMO Norm EM24.50.4000 02/2014



d1	d	d2	d3	d4	L1	L2	L3	S	S1	S2	t	Max. Cap. 2 Pins
32	40	22	12	25	154	132	6	10	5	11	2.5	12.000 Kg.
40	50	28	16	32	197.75	170	8	12.5	6	13.75	3	18.000 Kg.
50	63	36	20	40	247.6	212	10	16	8	17.6	4	28.000 Kg.
63	80	45	25	50	309	265	12	20	10	22	5	45.000 Kg.

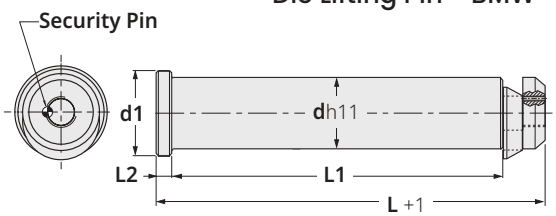
Order: **G153.** d1

Material: CK45

NEW

Code: **G173**

Die Lifting Pin - BMW



d	d1	L	L1	L2	Max. Load kg.	Max. Capacity kg.
30	40	159	129	10	3.200 Kg.	6.400 Kg.
40	50	187	155	10	5.000 Kg.	10.000 Kg.
50	60	220	180	11	8.000 Kg.	16.000 Kg.
60	70	246	205	11	12.500 Kg.	25.000 Kg.
80	90	305	255	12	18.000 Kg.	36.000 Kg.

Order: **G173.** d

Material: CK45

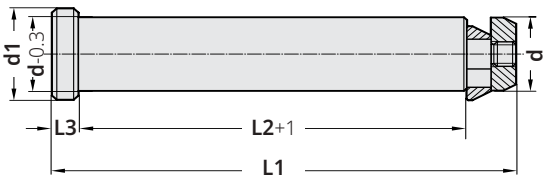
Die Lifting Pin / WDX 22 - 80

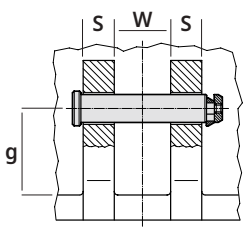
Code: **G51**

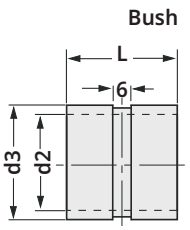
FORD Norm WDX 22 - 80

Bush for Lifting Pin

Code: **G51 - 1**







G51								G51.1		
d	d1	L1	L2	L3	S	W	g	d2	d3	L
35	45	165	124	10	30	50	60	**37**	45	30
50	63	230	189	10	50	70	65	**52**	60	50
63	76	320	279	10	80	100	70	**65**	75	80
80	89	370	319	15	100	100	80	**82**	90	100

Lifting Pin Capacity

d	Max. Load	Max. Capacity
35	1.500 kg.	300 Kg.
50	5.000 kg.	10.000 Kg.
63	20.000 kg.	40.000 Kg.
80	30.000 kg.	60.000 Kg.

***** Due to safety reasons, die weight should not exceed maximum load that 2 lifting pins can bear (max. capacity). Max. load should be considered.
***** Lifting equipment should be correctly mounted on workpieces on which they are used.
***** Damaged - broken parts should not be used.

Order
G51. d - (Pin)
G51-1. d2 - (Bush)

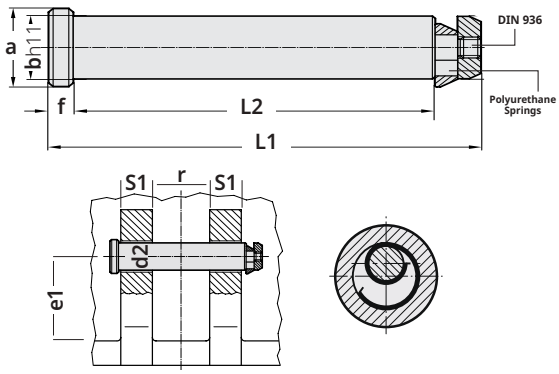
Material: CK45

Die Lifting Pin - FCA

Code: **G55**

1- Reference: FCA Norm STQ4002 04 / 12 / 2014

2- Reference: FCA Norm STQ4001 04 / 12 / 2014



2- Reference: FCA Norm **STQ4001** 04 / 12 / 2014

a	b	d2	e1	f	L1	L2	R	S1	Max. Load kg.	Max. Capacity kg.
25	15.6	16	28	6	102.5	77	11	29.5	600	1.200
30	20.6	21	29	6	113.5	86	13	33	1.000	2.000
35	25.6	26	40	6	128.5	100	20	35	2.000	4.000
43	33	34	55	6	166.5	135	55	35	4.000	8.000
53	43	44	60	8	210.5	175	60	50	7.000	14.000

1- Reference: FCA Norm **STQ4002** 04 / 12 / 2014

a	b	d2	e1	f	L1	L2	R	S1	Max. Load kg.	Max. Capacity kg.
38	29	30	60	6	178.5	150	60	40	2.000	4.000
43	33	35	65	6	200.5	170	60	50	3.200	6.400
53	43	45	85	8	233	195	80	50	5.000	10.000
65	53	55	105	10	282	235	100	60	8.000	16.000
65	53	55	75	10	227	180	65	50	8.000	16.000
78	63	65	130	12	352.5	295	120	80	12.000	24.000
78	63	65	100	12	272.5	215	80	60	13.000	26.000
95	78	81	150	14	421.5	355	140	100	30.000	60.000

Order: **STQ1 G55.** a x L2

Order: **STQ2 G55.** a x L2

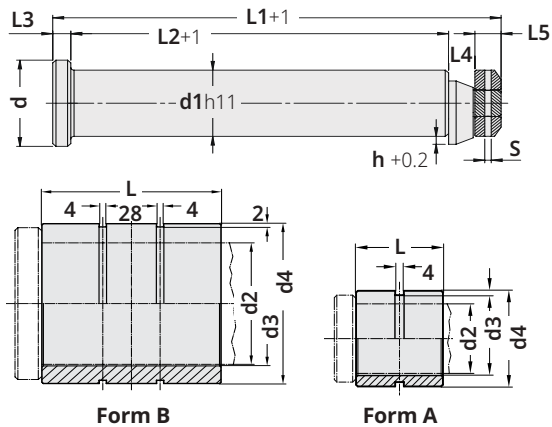
Reference: VDI 3366 Standard 03 / 1997

Die Lifting Pin - VDI 3366

Code: **G52**

Bush for Lifting Pin

Code: **G52 - 1**



d1	d	L1	L2	L3	L4	L5	h	S Safety Pin
32	40	175	145	10	10	10	4	3x30
40	50	225	188	10	14	13	6	4x35
50	65	273	230	11	16	16	6	4x35
63	75	347	295	14	18	20	7.5	5x60
76	95	422	360	15	20	27	8	5x70

Bush for Lifting Pin

Code: **G52 - 1**

d1	Max. Load kg.	Max. Capacity kg.	d2	d3	d4	L	Form
32	3.200	6.400	32	34	44	40	A
40	5.000	10.000	40	42	52	50	
50	8.000	16.000	50	52	62	60	
63	12.500	25.000	63	65	75	80	
76	31.500	63.000	76	78	100	100	B
-	-	-	76	78	105	100	

Order: **G52.** d1 - Pin **G52 - 1.** d2 - Bush

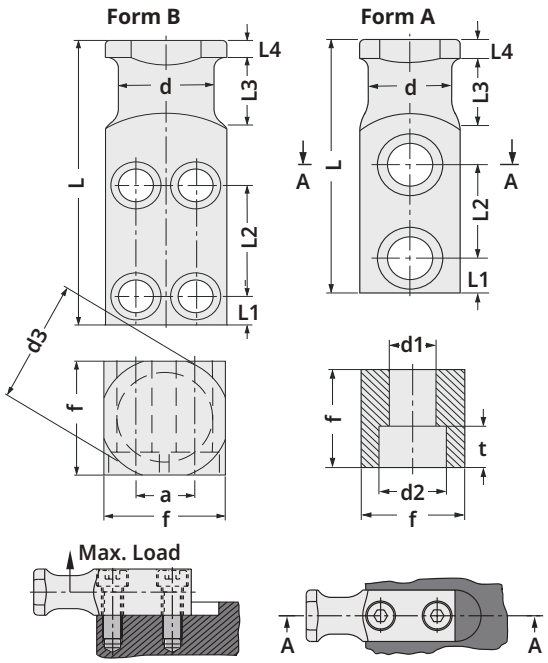
Material: CK45

***** Lifting equipment should be correctly mounted on workpieces on which they are used.
***** Damaged - broken parts should not be used.

Due to safety reasons, die weight should not exceed maximum load that 2 lifting pins can bear.

Die Lifting Lug - VDI 3366

Code: **G134**



f	L	L1	L2	L3	L4	Screw	a	Form
20	80	10	34	20	6	M8 x 25	-	A
25	90	10	37	25	8	M10 x 30	-	
35	100	12	38	30	8	M12 x 40	-	
40	120	16	46	32	10	M16 x 45	-	
50	140	18	54	40	10	M20 x 60	-	
60	160	22	59	45	12	M24 x 70	-	
80	200	20	78	50	12	M20 x 90	40	B
100	250	25	100	65	15	M24 x 110	50	
120	300	30	125	80	15	M30 x 130	60	

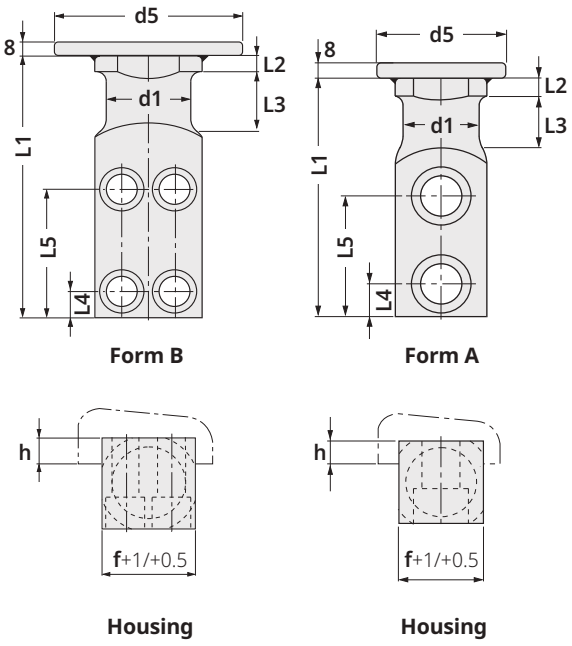
f	d	d1	d2	d3	t	Max. Load	Max. Capacity
20	16	9.5	14.5	24	9	320 kg.	640 kg.
25	20	11.5	17.5	30	11	630 kg.	1.260 kg.
35	25	14	20	40	13	1.250 kg.	2.500 kg.
40	32	18	26	50	17.5	2.000 kg.	4.000 kg.
50	40	23	33	60	21.5	3.200 kg.	6.400 kg.
60	50	27	39	70	25.5	5.000 kg.	10.000 kg.
80	63	23	33	90	21.5	8.000 kg.	16.000 kg.
100	80	27	39	110	25.5	12.500 kg.	25.000 kg.
120	100	23	48	130	32	20.000 kg.	40.000 kg.

Order: **G134.** f

Material: CK45 700 - 800N mm²

Code: **G58**

Die Lifting Lug with Rope Stop Safety



f	h	L1	L2	L3	L4	L5	Screw	Form
20	6	80	6	20	10	44	M8 x 25	A
25	8	90	8	25	10	47	M10 x 30	
35	10	100	8	30	12	50	M12 x 40	
40	10	120	10	32	16	62	M16 x 45	
50	12	140	10	40	18	72	M20 x 60	
60	14	160	12	45	22	81	M24 x 70	
80	16	200	12	50	20	98	M20 x 90	B
100	18	250	15	65	25	125	M24 x 110	
120	20	300	15	80	30	155	M30 x 130	

f	d1	d5	Max. Load	Max. Capacity	Form
20	16	60	320 kg.	640 kg.	A
25	20	70	630 kg.	1260 kg.	
35	25	70	1250 kg.	2500 kg.	
40	32	110	2000 kg.	4000 kg.	
50	40	150	3200 kg.	6400 kg.	
60	50	150	5000 kg.	10000 kg.	
80	63	150	8000 kg.	16000 kg.	B
100	80	150	12500 kg.	25000 kg.	
120	100	150	20000 kg.	40000 kg.	

Order: **G58.** f

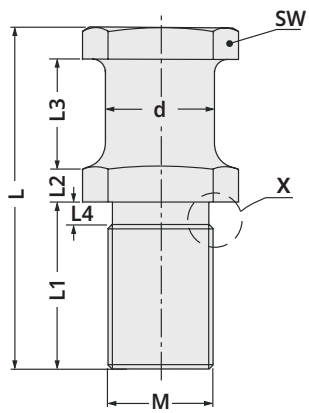
Material: CK45 700 - 800N mm²

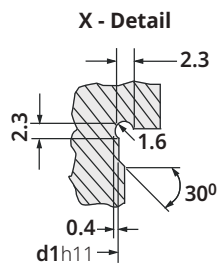
Due to safety reasons, die weight should not exceed maximum load that 2 lifting pins can bear.

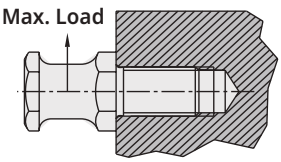
Die Lifting Bolt - Heavy Duty

Code: **G47**

VDI 3366







It can be mounted on lateral surface of die plate.

Reference: VDI 3366

Thread **M**	Max. Load kg. **1 Bolt**	**d**	**d1**	**L**	**L1**	**L2**	**L3**	**L4**	Head **SW**
M16	250	16	12	58	28	5	20	3	24
M20	500	20	16	68	34	6	22	3	30
M24	1000	25	19	78	38	8	25	4	36
M30	1500	32	24	95	45	10	32	5	41
M36	2500	40	30	118	56	12	40	5	50

Order: **G47** x M

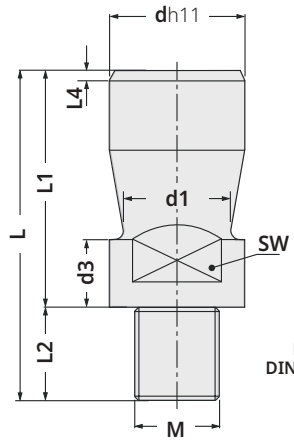
Material: CK45 700 - 800N mm²

When used for transport purpose 4 pcs.
When used for die turning 2 pcs. of bolts are used.
Max. load should not be exceeded during operation.

Die Lifting Bolt

Code: **G54**

DIN ISO 10242-1



Reference: DIN ISO 10242 - 1

Thread **M**	**d**	**d1**	**L**	**L1**	**L2**	**L3**	**L4**	Head **SW**
M16 x 1.5	20	15	58	40	18	12	2	17
	25	20	68	45	23	16	2.5	21
M20 x 1.5	25	20	68	45	23	16	2.5	21
	32	25	79	56	23	16	3	27
M24 x 1.5	32	25	79	56	23	16	3	27
	40	32	93	70	23	26	4	36
M27 x 2	40	32	93	70	23	26	4	36
M30 x 2	40	32	93	70	23	26	4	36
	50	42	108	80	28	26	5	41
M42 x 3	65	53	128	100	28	26	8	55

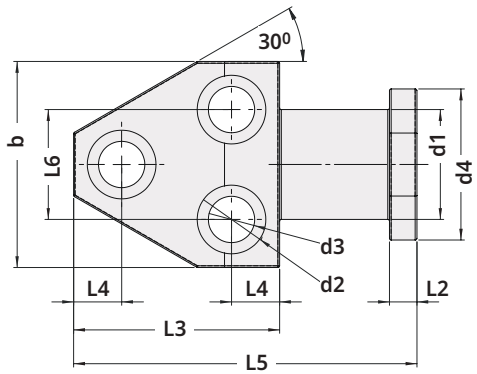
Order: **G54.** M x d

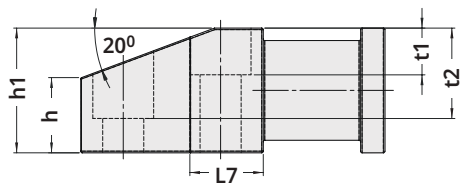
Material: CK45 700 - 800N mm²

Clamping bolts are components providing connection of upper group of die to the ram group of press. Clamping bolt is mounted to the die by the help of threaded, due to exposed forces such as press counting force etc. it should be mounted to the upper plate very well.

Die Lifting Lug

Code: **G160**





d1	b	d2	d3	d4	h	h1	L2	L3
32	60	13.5	20	44	24	40	8	60
40	80	17.5	26	60	32	50	10	70
50	100	22	33	70	40	65	12	88

d1	L4	L5	L6	L7	t1	t2	Max. Load
32	14	100	32	24	15	29	2.000 kg.
40	16	120	44	26	20	35.5	3.500 kg.
50	20	145	56	30	25	46.5	6.000 kg.

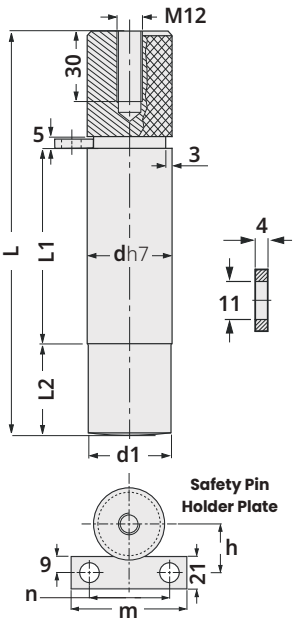
Order: **G160.** d1

Material:
CK45 700 - 800N mm²

Code: **G56**

Safety Pin - FCA

Reference: FCA 230.GSG.16



d	d1	h	m
30	29	4	4
40	29	4	4
50	37	5	5

d	n	L	L1	L2
30	35	155	87	33
40	45	193	109	39
50	50	229	131	43

Order:
G56. d

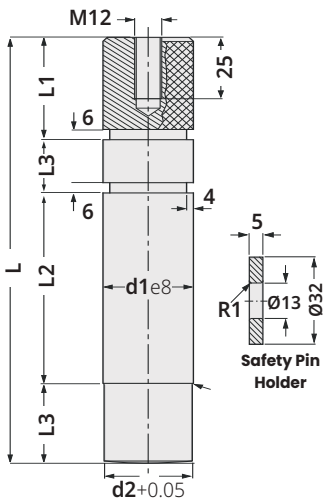
G56 — G57

Material: 1.71131

Code: **G57**

Safety Pin - VDI

Reference: VDI 3365

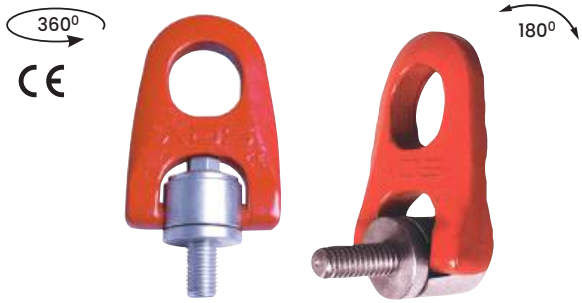


d1	d2	R	Load Capacity
32	29	4	500 Kg.
32	29	4	500 Kg.
40	37	5	750 Kg.
40	37	5	750 Kg.
50	47	6	1.250 Kg.
50	47	6	1.250 Kg.
63	60	6	2.500 Kg.
63	60	6	2.500 Kg.

d1	L	L1	L2	L3
32	130	22	58	25
32	147	22	75	25
40	171	32	75	32
40	191	32	95	32
50	207	32	95	40
50	232	32	120	40
63	252	32	120	50
63	287	32	155	50

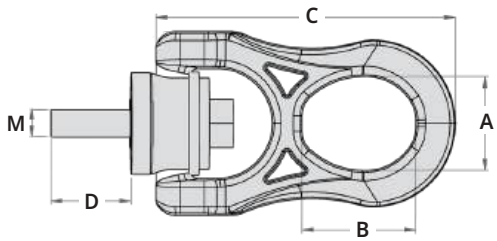
Order:
G57. d1 x L

Note: There is 1 pcs. of holder for each safety pin.



Code: **AK400**

Double Swivel Ring - Eyebolt



Order Code	M	A	B	C	D
AK400 M8	M8	27.5	33.5	88.5	15
AK400 M10	M10	27.5	33.5	88.5	20
AK400 M12	M12	27.5	33.5	88.5	20
AK400 M14	M14	37.5	49	123.5	38
AK400 M16	M16	37.5	49	123.5	38
AK400 M18	M18	37.5	49	123.5	38
AK400 M20	M20	37.5	49	123.5	38
AK400 M24	M24	55.5	73	176.5	50
AK400 M30	M30	55.5	73	176.5	50

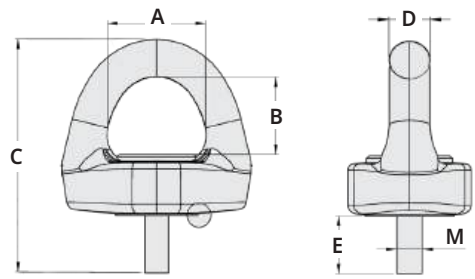
Eyebolt p : Load Capacity - Ton

M	p	p	p	p	p 45°	p 60°	p 45°	p 60°
M8	0.3	0.6	0.3	0.6	0.4	0.3	0.6	0.3
M10	0.6	1.2	0.6	1.2	0.8	0.6	1.3	0.6
M12	1	2	1	2	1.4	1	2.1	1
M14	1.3	2.6	1.3	2.6	1.8	1.3	2.7	1.3
M16	1.6	3.2	1.6	3.2	2.2	1.6	3.4	1.6
M18	2	4	2	4	2.8	2	4.2	2
M20	2.5	5	2.5	5	3.5	2.5	5.3	2.5
M24	4	8	4	8	5.6	4	8.4	4
M30	6.3	12.6	6.3	12.6	8.8	6.3	13.2	6.3

Material: Class > 8CE Safety Certificated

Code: **AK450**

Heavy Tonnage Swivel Ring - Eyebolt



Order Code	M	A	B	C	D	E
AK450 M8	M8	33	27	73	13	20
AK450 M10	M10	33	27	73	13	20
AK450 M12	M12	48	40	105	20	27
AK450 M16	M16	48	40	105	20	27
AK450 M20	M20	48	40	105	20	27
AK450 M24	M24	72	60	145	30	31
AK450 M30	M30	72	60	155	30	39
AK450 M36	M36	103	86	215	44	45
AK450 M42	M42	103	86	225	44	55
AK450 M48	M48	103	86	235	44	65

Eyebolt p : Load Capacity - Ton

M	p	p	p	p	p 45°	p 60°	p 45°	p 60°
M8	0.3	0.6	0.3	0.6	0.4	0.3	0.6	0.3
M10	0.6	1.2	0.6	1.2	0.8	0.6	1.3	0.6
M12	1	2	1	2	1.4	1	2.1	1
M16	1.6	3.2	1.6	3.2	2.2	1.6	3.4	1.6
M20	2.5	5	2.5	5	3.5	2.5	5.3	2.5
M24	4	8	4	8	5.6	4	8.4	4
M30	6.3	12.6	6.3	12.6	8.8	6.3	13.2	6.3
M36	10	20	10	20	14	10	21	10
M42	12.5	25	12.5	25	17.5	12.5	26.3	12.5
M48	15	30	15	30	21	15	31.5	15

Material: Class > 8CE Safety Certificated

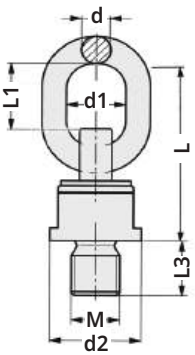
Lifting equipment manufactured as forging in Türkiye, has been registered that its production quality is in European standards with **"Approval of Material Manufacturer"** certificate given by Germanischer Lloyd.

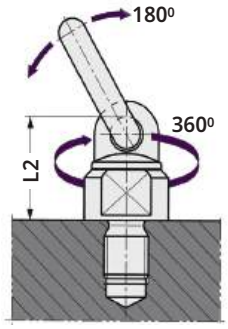
Class > 8CE Safety Factor 5 : 1

Maximum Lifting Load (Safety Factor ≥ 5:1)

GL Germanischer Lloyd PG CE

Rotary Safety Eyebolt Code: **G140**





* Pivot angle **180⁰** degree and **360⁰** degree of rotation

* **45⁰** angle mark works as an angle indicator
* Body engraved with WLL and thread size

* Ball bearing inserted ensures smooth rotation

Mounting Example

Maximum Lifting Load (Safety Factor ≥ 5:1)

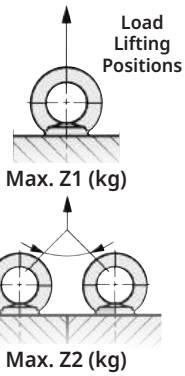
p : Ton

Order Code	M x Thread	d	d1	d2	L	L1	L2	L3	p 0°	p 90°	p 0 - 45°	p 45 - 60°	p 0 - 45°	p 45 - 60°	Weight
G140M8	**M8** x 1.25	12	30	40	98	44	46	12	0.6	0.4	0.4	0.4	0.84	0.6	0.44 kg.
G140M10	**M10** x 1.50	12	30	40	98	44	46	19	0.9	0.6	0.6	0.6	1.26	0.9	0.45 kg.
G140M12	**M12** x 1.75	12	30	40	98	44	46	19	1.2	0.7	0.8	0.7	1.58	1.12	0.45 kg.
G140M14	**M14** x 2.0	12	30	40	98	44	46	31.8	2	1.25	1.25	1.25	2.62	1.87	0.44 kg.
G140M16	**M16** x 2.0	12	30	40	98	44	46	31.8	2.6	1.5	1.4	1.3	3.15	2.25	0.48 kg.
G140M20	**M20** x 2.5	20	40	70	160	67	76	38.1	4	2.5	2.8	2.5	5.25	3.75	2.3 kg.
G140M24	**M24** x 3.0	20	40	70	160	67	76	38.1	7	4	4.9	4	8.4	6	2.35 kg.
G140M30	**M30** x 3.5	22	51	79	206	95	91	50	10	6	7	6	12.6	9	3.75 kg.
G140M36	**M36** x 4.0	22	51	79	206	95	91	54	15	10	14	10	21	15	3.9 kg.
G140M42	**M42** x 4.5	26	65	93	230.5	108	100.5	63	17	13	18.2	13	27.3	19.5	5.9 kg.
G140M48	**M48** x 5.0	26	65	93	230.5	108	100.5	68	18	14	19.6	14	29.4	21	6.15 kg.
G140M56	**M56** x 5.5	32	70	105	278	120	132	84	28	20	28	20	42	30	10 kg.
G140M64	**M64** x 6.0	32	70	105	278	120	132	95	28	20	28	20	42	30	10.7 kg.

Rotary Safety Eyebolt: By absorbing sudden and rigid motion during lifting - bending and breaking of sling / rope / chain that can be occurred due to swinging of load, it will amortise costs above possible damages with safety lifting and carrying. Special forged steel (class 8) product, 4 times safety against fracture in rotation direction of full load, hinged rotary design that can be taken correct position and be turned axially by aligning movable ring 180⁰ in loaded position.

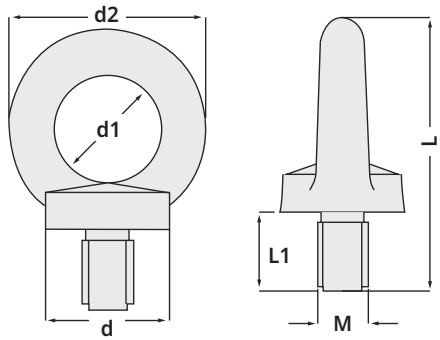
***** 42CrMo High Quality Alloy Steel ***** High precision ISO metric thread tolerances provides a good surface contact

CE



Lifting Eyebolt / DIN 580

Code: **G141**



M x Thread	d	d2	d1	L	L1	Weight	Z1 Ton	Z2 Ton
M8 x 1.25	20	36	20	49	13	70 gr.	0.15	0.09
M10 x 1.50	25	45	25	63	17	100 gr.	0.23	0.15
M12 x 1.75	30	54	30	73.5	20.5	180 gr.	0.34	0.20
M14 x 2.0	30	54	30	73.5	20.5	200 gr.	0.46	0.30
M16 x 2.0	35	63	35	89	27	280 gr.	0.70	0.50
M18 x 2.5	35	63	35	89	27	330 gr.	0.90	0.60
M20 x 2.5	40	72	40	101	30	420 gr.	1.20	0.80
M24 x 3.0	50	90	50	126	36	830 gr.	1.80	1.25
M30 x 3.5	65	108	60	154	45	1.66 kg.	3.60	2.50
M36 x 4.0	75	126	70	182	54	2.65 kg.	5.10	3.60
M42 x 4.5	85	144	80	210	63	4.03 kg.	7.00	4.90
M48 x 5.0	100	166	90	236	68	8.80 kg.	8.60	5.90

Order: **G141.** M

Material: C15 Forged
EYEBOLT: Class > 8
EYENUT: Class > 8

Lifting Eyebolt: It is loaded only with forces making maximum 45^0 angle with vertical or circular plane, not allowed to other loadings however such liftings are oftenly unavoidable. Please plan selection of eyebolt suitable to safety bearing in advance (its safety is provided).

Lifting Sling

Code: **GPS**

(Double-layer, polyester)

Load Capacity	A	L - Sling Length (meter)							
		1	2	3	4	5	6	8	10
Purple - 1 TON	25	■	■	■	■	■	■		
Green - 2 TON	50	■	■	■	■	■	■	■	
Yellow - 3 TON	75		■	■	■	■	■	■	■
Gray - 4 TON	100		■	■	■	■	■	■	■
Red - 5 TON	125			■	■	■	■	■	■
Brown - 6 TON	150			■	■	■	■	■	■
Blue - 8 TON	200			■	■	■	■	■	■
Orange - 10 TON	250			■	■	■	■	■	■

Sling Clour Load	%100	%80	%200	%140 0 - 45⁰	%100 45 - 60⁰
	1 Ton	0.8 Ton	2 Ton	1.4 Ton	1 Ton
	2 Ton	1.6 Ton	4 Ton	2.8 Ton	2 Ton
	3 Ton	2.4 Ton	6 Ton	4.2 Ton	3 Ton
	4 Ton	3.2 Ton	8 Ton	5.6 Ton	4 Ton
	5 Ton	4 Ton	10 Ton	7 Ton	5 Ton
	6 Ton	4.8 Ton	12 Ton	8.4 Ton	6 Ton
	8 Ton	6.4 Ton	16 Ton	11.2 Ton	8 Ton
	10 Ton	8 Ton	20 Ton	14 Ton	10 Ton

Order: **GPS.** Load x Length

Safety coefficient of polyester sling in accordance with **EN1492 -1** is 6 times of each type of slings. It is produced from 100% double layer polyester webbing. Reinforcement lifting eye - colour / load coded low coefficient of elongation - **EN1492-1 : 2000.**

High-Tech 5-Axis Grinding for Premium Güvenal Punches

Quality, Affordability, and Speed Combined

A Quick Look at the Manufacturing Processes for Premium Güvenal Punches

1 --- Planning and Design

Immediately after your order reaches Güvenal, your customer representative opens your order in the system. Then, engineers complete the product design and planning process on the same day.

2 --- Material Preparation

Material for your order is immediately supplied from our raw material stocks, from our ready-made, heat-treated steel bars. One of the most important features of Güvenal for stamping punches is its very strong raw material stocks and all steel bars are ready in our stocks in heat-treated form. After your order is processed by the raw material warehouse, this raw material is delivered to the production facility with a barcoded process document.

3 --- Grinding & Machining Settings

The necessary adjustments are made by the operators on the 5-axis grinding machines. And production is started.

4 --- Manufacturing Phase

Production is completed on our 5-AXIS CNC GRINDING machines with our special prescription and top-class raw materials.

5 --- Quality Control and Inspections

After production is completed, all necessary checks are carried out by QC teams for each piece separately.

6 --- Güvenal's unique DRAG-FINISH process

For each piece - a free and special DRAG-FINISH process, which we code as G-Lap, is performed. Güvenal always guarantees perfect surface quality. If your products have coating, this process is performed again after the coating phase.

7 --- Delivery Phase

After G-Lap, a simplified final QC is done. The product is marked by the delivery team with laser marking. Then, each product is waxed to prevent damage during delivery. After labeling and packing, it is ready for delivery.

Ready Heat-Treated Steel Bars

Ready Solid Blanks

5-Axis Multi-grinding Machines & 6-Axis Wire EDM Machines of Güvenal

DEFENCE and AMMUNITION TOOLING for STAMPING

You can contact us for the most suitable solutions for your punches needs for the defense and ammunition industry. Güvenal is an expert address in grinding the most complex geometries with up to 2 micron precision.

"Turkish-Made / Globally Connected Quality"

We are proud to produce all of our products in our state-of-the-art center in Istanbul, Türkiye. Our facility is continuously updated with the latest advancements in manufacturing, inspection and material technology. The relationships we maintain with material, machine, and tool manufacturers worldwide enable us to stay at the forefront of industry technology ensuring that our facilities are among the most modern and well-equipped.

"The Perfect Combination"

We seamlessly integrate high-quality tool steel with advanced coatings to significantly extend tool service life. This optimal combination minimizes wear and material buildup, reducing your overall tooling costs. With this approach, your tools will deliver exceptional durability and performance, providing value and reliability that you've never experienced before."

ISO Certified:
To ensure the highest quality and meet customer requirements, we continuously improve our Quality Management System in accordance with ISO 9001:2015.

CUSTOM TOOLING and WIRE-EDM PARTS

CUSTOM CAN & END TOOLING SOLUTIONS FOR FOOD AND BEVERAGE

CARBIDE PUNCHES FOR BOLTS, NUTS AND PARTS

CUSTOM-MADE SELF-LUBRICATING COMPONENTS

We produce custom, precise, and in-house tooling parts for industries such as automotive, home appliances defense and aerospace, food and beverage, fasteners, door and window manufacturing, medical, electronic and many other sectors.

High-Performance Special Material Selection for Punches

Our core offering consists of these 4 steels, but we are also capable of providing the specific steel grade (or a close equivalent) you require, as well as Carbide. Unless otherwise specified, all punch and die buttons listed in our catalog and product code system will be manufactured from our M2 material.

Materials marked with * are available in our stock.

Steel Grade				Chemical Composition (%)								Feature (1 → 10 better)			
Güvenal Steel Ref.	Related Standards			C	W	Mo	Mn	Si	Cr	V	Co	Wear Resistance	Hot Hardness	Toughness	Grindability
	AISI	VDEh	JIS												
*M2	M2	1.3343	SKH51	0.88	6.00	5.00	0.40	0.45	4.00	2.00	-	5	5	8	5
*PS (ASP30)	S590	1.3294	SKH40	1.30	6.00	5.00	0.50	0.70	4.00	3.00	8.00	7	9	9	9
*M42	M42	1.3247	SKH59	1.10	1.50	9.50	0.40	0.70	4.00	1.00	8.00	8	9	4	5
V4E	-	-	-	1.40	-	3.50	0.40	0.40	4.70	3.70	-	9	9	7	9

M2 — **M2** is a conventional high-speed steel, hardened and triple tempered to HRC:60-63. It has good toughness, wear resistance and high compression strength. Suitable for stamping thickness less than 5 mm.

PS (ASP30) — **ASP30** PM Steel is an extra-high-performance tool steel, designed for high-speed applications. Manufactured using powder metallurgy (PM) technology, this steel is one of the finest in its category, of ering exceptional properties such as high-temperature resistance, hardness, and wear resistance. This cobalt high-alloyed powder metallurgy steel offers excellent features for machining or cold work. Stable performance that certain grindability and less deformation after heat treatment. Excellent Hot Workability and becoming it is possible a high alloy. Superior wear resistance.

M42 — This material is especially preferred for use in screws, bolts, and fastener punches. **M42** is a high-speed steel alloy from the molybdenum series, containing an additional 8 to 10 percent cobalt. It is widely utilized in the metal manufacturing industry due to its superior red hardness compared to more conventional high-speed steels. This enhanced hardness allows for shorter cycle times in production environments, thanks to its higher cutting speeds and longer intervals between tool changes. **M42** is also less prone to chipping during interrupted cuts and is more cost-effective compared to carbide tools.

V4E — **Vanadis 4 Extra** Super Clean is one of the most versatile PM tool steels available in today's market, combining excellent wear resistance with high resistance to edge chipping and deformation. It offers outstanding machinability in both soft and hardened conditions, providing advantages in both tool manufacturing and tool maintenance.

Our Standard Surface Coatings for Ultimate Punch Life

"To receive the coating service, please add the 'Coating Code' to the end of the punch or order code"

TiN

- *TiN is the most cost-effective and widely used PVD coating.*
- *It offers suitable thermal stability for most cold working metal operations.*
- *TiN is ideal for light stamping processes with stamping lubricants but is not recommended for use with stainless steel, nickel, or copper applications.*

Coating Code: **Tin**

Material: Titanium nitride
Technology: PVD
Thickness Range: 1.3 µm - 3 µm
Colour: Gold

AlCrN Advanced Arc

- *Our most popular coating type.*
- *AlCrN offers excellent wear resistance and extended tool life.*
- *Ideal for stamping, piercing, blanking, and extrusions.*
- *Not recommended for aluminum.*
- *Significantly harder than traditional TiCN.*

Coating Code: **Alcrn**

Material: AlCrN
Technology: PVD Advanced Arc
Thickness Range: 2 - 4 µm
Colour: Grey

DUPLEX-VARIANTIC

- *Excellent results in cutting, forming, stamping and precision cutting.*
- *Low friction.*
- *High oxidation resistance.*
- *Extremely high wear resistance.*
- *Our top-performing premium coating option for durability and performance.*

Coating Code: **Duplex**

Material: TiAlCN
Technology: PVD Advanced Arc
Thickness Range: 4 - 6 µm
Colour: Old Rose

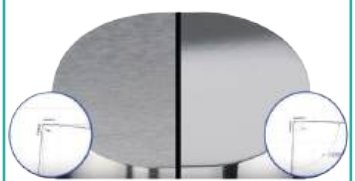
DLC

- *The DLC coating is excellent for stamping non-ferrous metals (aluminum etc.)*
- *Superior resistance to abrasive wear and galling.*
- *DLC performs best when combined with pre and final polishing.*

Coating Code: **Dlc**

Material: DLC
Technology: PACVD
Thickness Range: 2 - 4 µm
Colour: Dark-grey & Black

DRAG-FINISH (G-Lap)



For each piece - a free and special DRAG-FINISH process, which we code as G-Lap, is performed. Güvenal always guarantees perfect surface quality. If your products have coating, G-Lap is performed again after the coating phase.

Güvenal "G-Lap" utilizes a specialized operation containing diamond particles to polish even the most irregular surfaces and hard-to-reach areas.

- Improves the durability of piercing and forming tools.
- Delivers a uniform surface finish without distortion or damage.
- Enhances the finish and increases adhesion for PVD/CVD coatings.
- Virtually no material is removed, ensuring tight tolerances are consistently maintained.

4 KEY BENEFITS OF CHOOSING STANDARD PUNCH AND MATRIX

In industrial metal forming operations, stamping components used for hole punching are often custom-designed for each product, leading to incompatibility with other press operations. Punch and matrix sets are typically one-off components designed specifically for each machine and operation. For instance, a set may be designed for a particular process. Designing custom punch and matrix sets for every product line is not an efficient approach for planning manufacturing equipment and capital. Instead, using standard punch and matrix sets for common manufacturing processes and workpiece materials is a much more efficient strategy. At this point, Güvenal is an ideal partner for your projects, offering products compliant with DIN-ISO standards and fast delivery capabilities.

1. Improved Consistency and Dimensional Accuracy

Standard production tools provide better dimensional accuracy and precision compared to custom dies. Parts made with standardized die sets tend to have fewer defects, which stabilizes the production process.

2. Increased Cost Efficiency

Standard stamping components help reduce scrap and rework costs. Bulk ordering also results in significant savings on capital equipment. Storing a small number of components reduces inventory costs.

3. Simplified Maintenance and Replacement

Standard, interchangeable punch and matrix components simplify maintenance and replacement. When a part breaks, it can be quickly replaced with an existing spare part, eliminating the need for custom part fabrication.

4. Accelerated Design and Prototyping Processes

Standard components speed up the design and prototyping process. CAD models allow engineers to verify component fit early in the design process, reducing prototype production time and accelerating product development. These benefits make the production process much more efficient, resulting in significant cost savings and improved quality.

UNDERSTANDING DIE CLEARANCE FOR PUNCHES AND MATRIX

Punch and die clearance is the distance between the punch's cutting edge and the matrix cutting edge, critical for clean precise cuts in metal punching. This clearance ensures the punch effectively shears the material and creates a clean hole without excessive deformation or burrs.

"Importance of Punch and Die Clearance" Proper clearance ensures high-quality cuts with minimal burrs, reducing rework time and increasing production efficiency. It also minimizes tool wear, extending the lifespan of expensive tooling and reducing maintenance costs. Additionally, optimized clearance improves energy efficiency by requiring less force for cutting.

"Factors Affecting Clearance Selection"

Tooling Condition: The state of the tools impacts the clearance adjustment depending on tool wear.

Material: Harder materials require more clearance than softer ones.

Thickness: Thicker workpieces need more clearance.

Recommended Clearance for Common Materials:

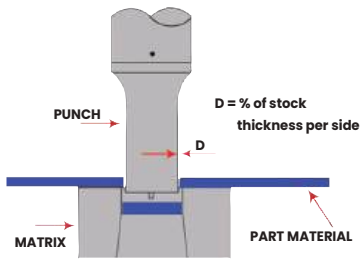
We suggest maintaining a cutting clearance between the matrix and the punch equal to 10% of the sheet thickness being processed. Stronger materials require higher clearances, while precise grades require lower clearances.

"Adjusting Clearance for Special Applications"

Fine Blanking: This technique demands very small clearances for high precision but results in higher tool wear.

Hard/High Tensile Materials: These require more clearance due to their strength, and tighter clearances increase tool wear over time.

In summary, punch and die clearance directly impacts cut quality, tool longevity, and production efficiency. Adjustments based on material and application type are crucial for optimal performance.



Recommended Clearance for Common Materials:

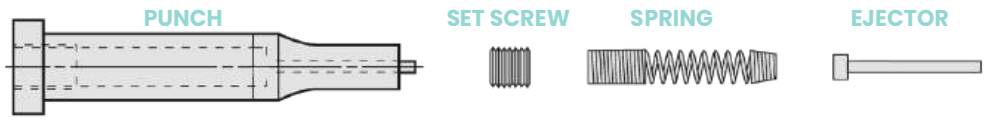
Material	Soft	Hard
Aluminum	% 10	% 12
Brass / Copper	% 6	% 8
Low Carbon Steel	% 10	% 12
High Carbon Steel	% 18	% 20

EXAMPLE: Recommended clearance 10% with 2,0 mm thick material (clearance = 0,20 mm):
Total punch-to-matrix clearance (= clearance per side * 2): 0,40 mm **Punch Point Size:** 12,60 mm & **Matrix Hole Size:** 13,00 mm

ABOUT EJECTOR PUNCHES

"Güvenal Standard Solid Blank - Ejector Punch Series"

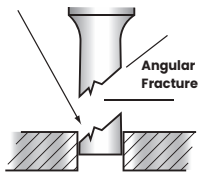
The **Ejector Punches** series, offered by Güvenal as **standard solid blank,** ensures the **ejection of the slug (burr or chip) from the punch point** by integrating the ejector into the punch.
Applicable to **ISO 8020 series,** as well as **Ball Lock, Heavy-Duty Headed, Center-Dowel Headed, and Bottle-Neck** product groups.
All models are in stock and ready for shipment.



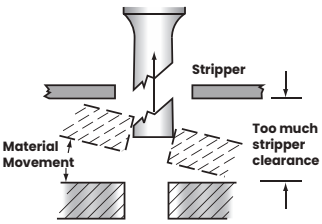
The system is composed of three main parts: **Ejector Pin, Spring, and Set Screw.** The spring on top of the ejector provides the necessary force for its function, while the set screw is tightened into the punch head to secure the entire assembly.
During operation, the punch first contacts the material. At the same time, the ejector pin is pushed back, compressing the spring. The punch then continues its normal function, creating the required hole in the material. Once the slug is separated, the spring expands, pushing the ejector pin outward and releasing the slug from the punch tip.

KEY FACTORS BEHIND PUNCH PROBLEMS

STRIPPING FAILURE



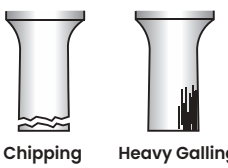
FAILURE:
A portion of the punch is broken off in the material.



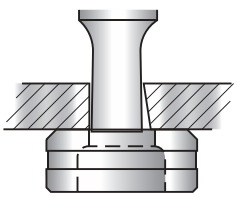
PROBABLE CAUSE:
Too much stripper clearance.

POSSIBLE SOLUTION: *Adjust stripper closer to the material.*

CHIPPING and GALLING



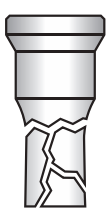
FAILURE:
Punch face chipping or heavy galling on one area of punch.



PROBABLE CAUSE:
Poor alignment between punch and matrix causing the punch to drag.

POSSIBLE SOLUTION: *Adjust alignment between punch and matrix to create equal clearance all around.*

COMPRESSIVE FAILURE

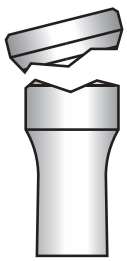


FAILURE: Occurs when the compressive strength of the punch has been exceeded and the entire working end fractures.

PROBABLE CAUSE:
Attempting to punch extremely hard or thick materials, or complete misalignment of the punch and die.

POSSIBLE SOLUTION: *Check the alignment, and if the issue is not with the alignment, consult Güvenal.*

PUNCH HEAD FAILURE

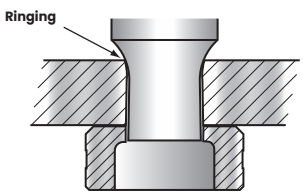


FAILURE: Punch head fractures or breaks off.

PROBABLE CAUSES and EXPLANATIONS:

- The material thickness should not be variable. The reason is that during the punch retraction process, if the punch remains stuck, sudden stress may cause the head to break off.
- For a smoother surface, the minimum step area of the punch should be coated. This smoothness allows the punch to move more easily.
- The head is very hard, and there is no tempering in it.
- Not using a matrix with the punch.
- Mounting the punch onto the plate instead of using a Punch Retainer.
- Using a loose or worn Punch Retainer.

RINGING



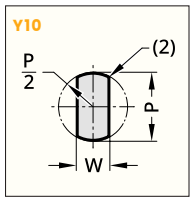
FAILURE: Material being punched is deformed with each stroke of the press.

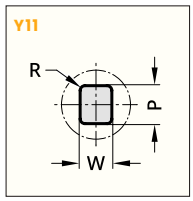
PROBABLE CAUSE:
Material is thicker than the working length of the punch, or the punch is entering into the matrix too far.

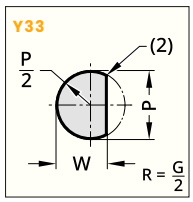
POSSIBLE SOLUTION: *Adjust the stroke length to enter into the matrix a maximum of 6 - 7%.*

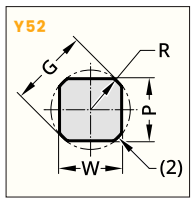
WARNING:
Ensuring the safe use of this tooling is the machine operator's responsibility.

Round, flattened

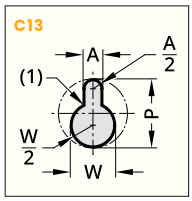


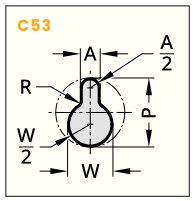


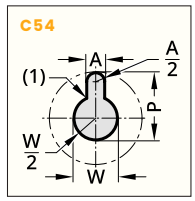


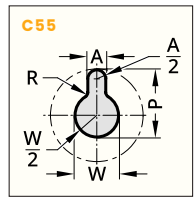


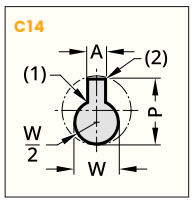
Key-hole shapes

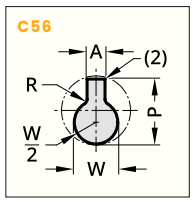


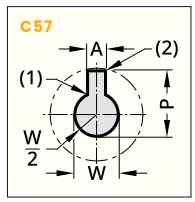


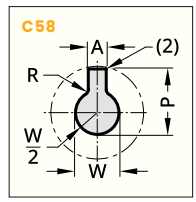




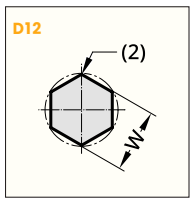


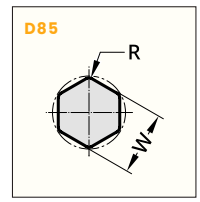


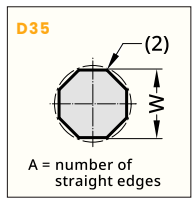


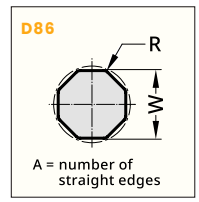


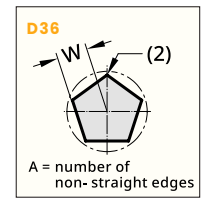
Polygons

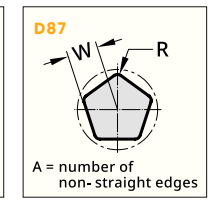


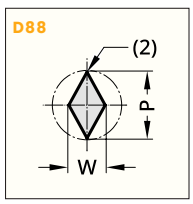


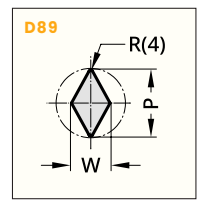


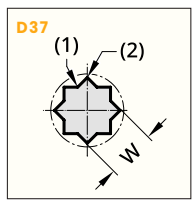


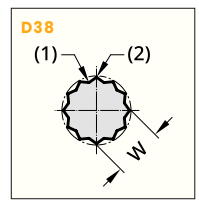


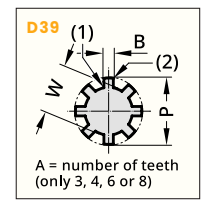


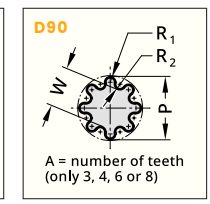




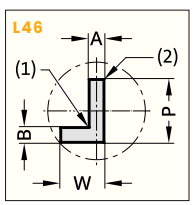


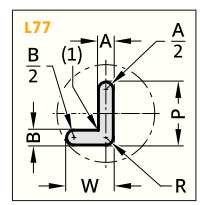


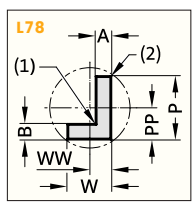


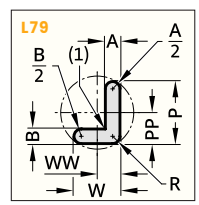


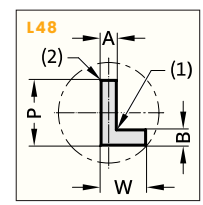
L-shapes

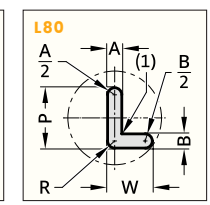


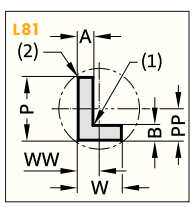


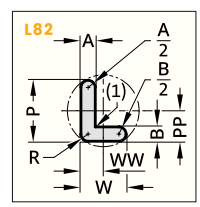


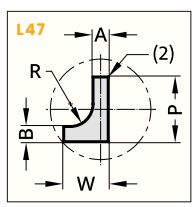


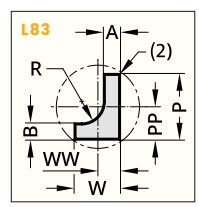


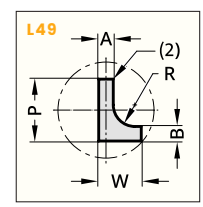


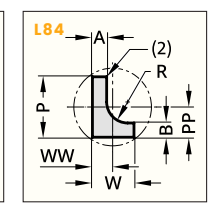




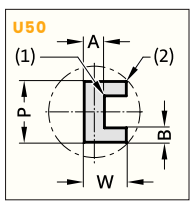


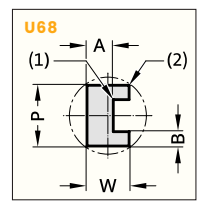


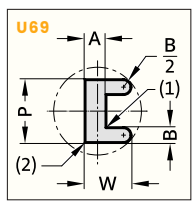


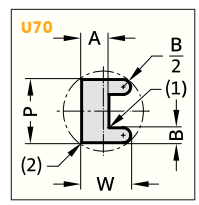


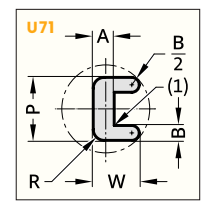
U-shapes

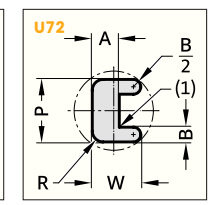


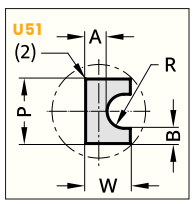


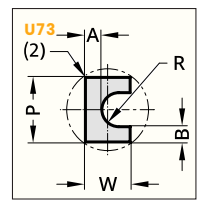


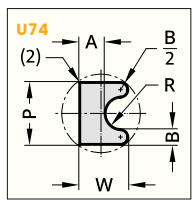


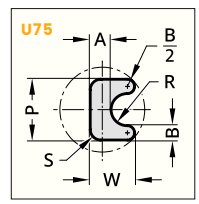


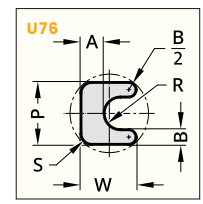


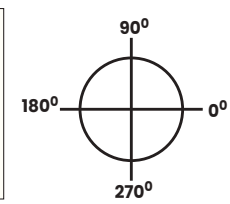






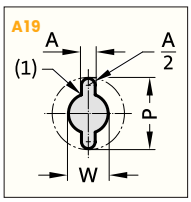




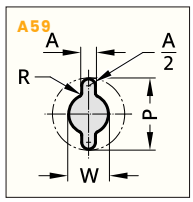


Multi key-hole shapes

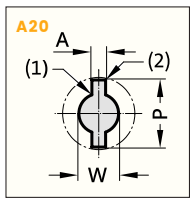
A19



A59



A20



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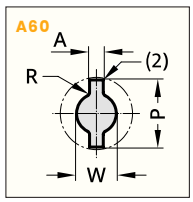

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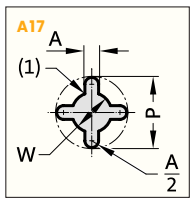

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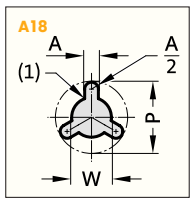
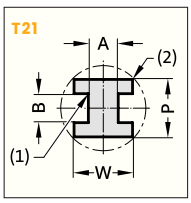
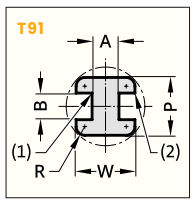


Double T-shapes

T21



T91



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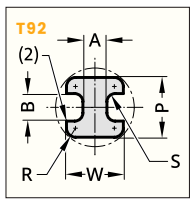

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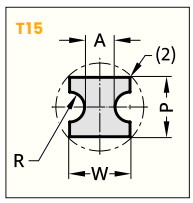
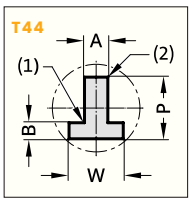
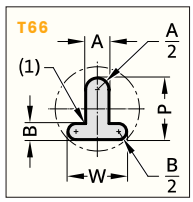


Simple T-shapes

T44



T66



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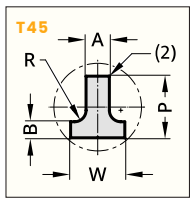
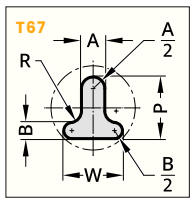
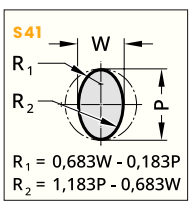


T67



Various

S41



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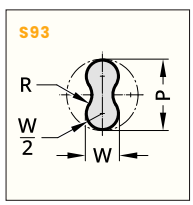

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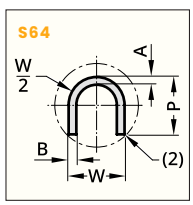

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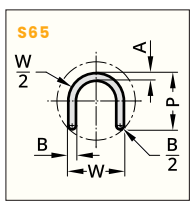

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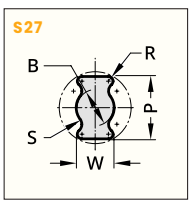

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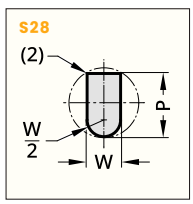
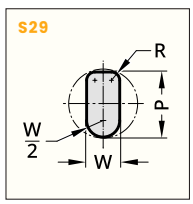


S29



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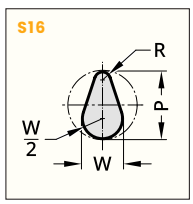

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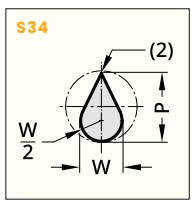
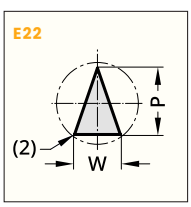
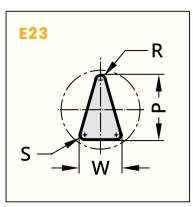


Triangles, trapezes

E22



E23



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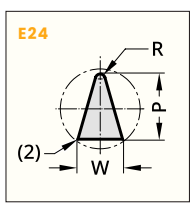

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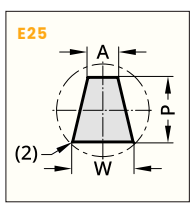

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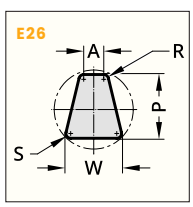
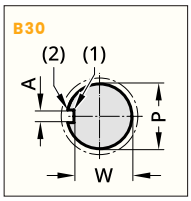
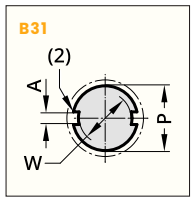


Key-hole

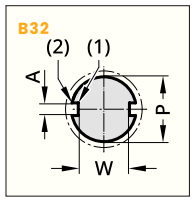
B30



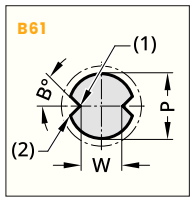
B31



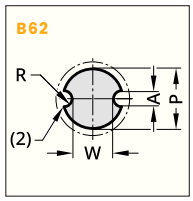
B32



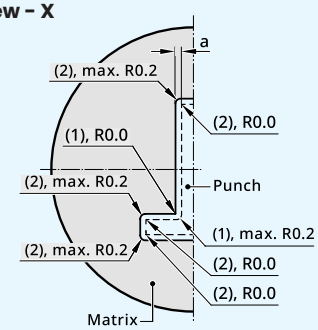
B61



B62

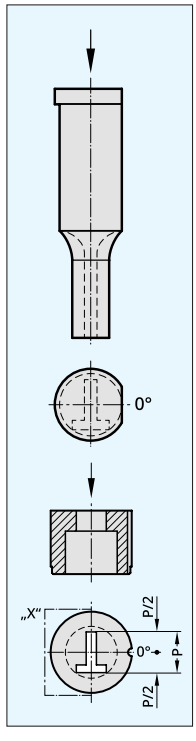


View - X



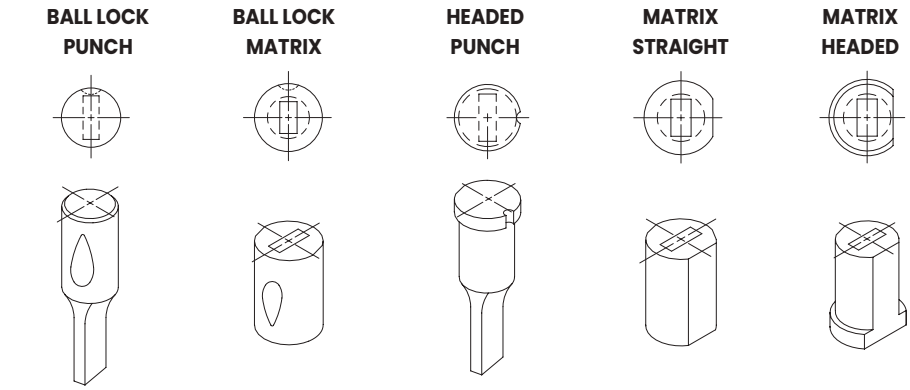
Cutting gap / Clearance (a)
Roundings with the corresponding sharp corners reduce the cutting gap per side **(a)**. If the cutting gap is 0.04 mm **(a)** or less, **Güvenal** will round the sharp edges if the cutting punch and the matrixes are ordered together. This reduces the installation time and the risk of an edge breaking during operation.

Note:
(1) and (2) - roundings and sharp edges
(1) rounding on the cutting punch of max. R0.2, corresponds to a sharp edge on the matrix (2) rounding on the cutting matrix of max. R0.2, corresponds to a sharp edge on the punch



KEYING INFORMATION - OPTIONS (1/2)

STANDARD LOCATION



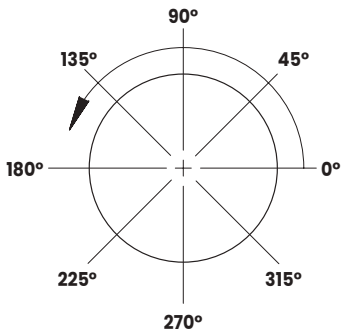
Standard ballseat location for all ball lock products is 90°. Standard flat and dowel groove location is at 0°.

Note: 0° is at 3:00. Alternate no charge locations are 0°, 90°, 180°, 270° (see drawing).

To order alternate locations specify **Keying** type / _ _ _°.

Ball lock punch example: BAO x 13 x P8.2 x W6.1 x 19 x 100 - BS/0° **Matrix Straight example:** MKO25-32 P=13.0 W=10.5 - K1

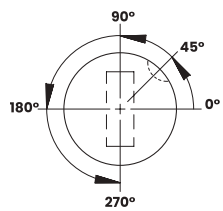
CUSTOM LOCATIONS



TYPICAL EXAMPLES:

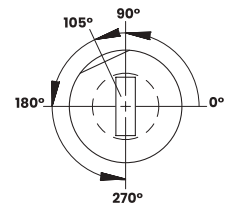
CUSTOM BALL SEAT LOCATION PUNCH

BS/45⁰



CUSTOM FLAT LOCATION MATRIX

K2/105⁰



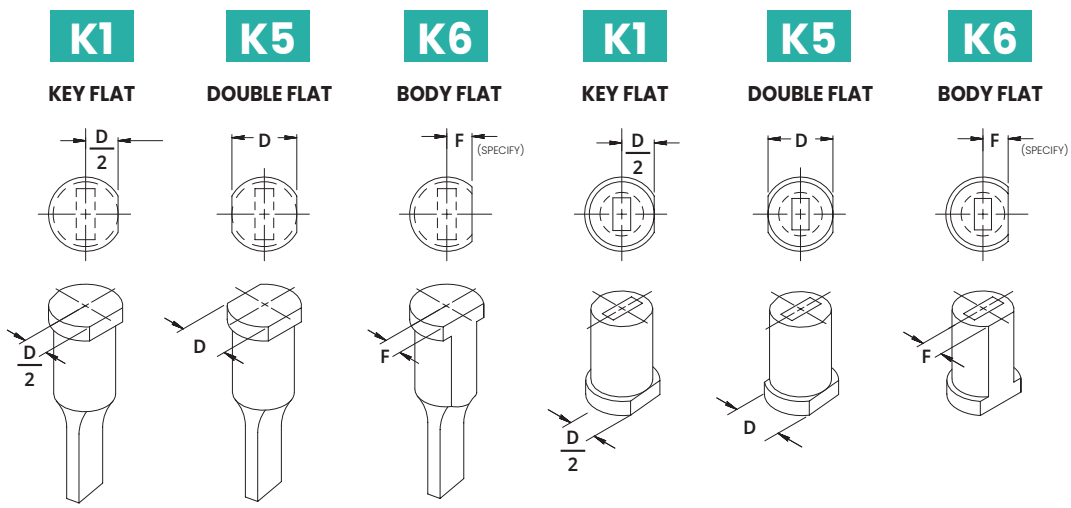
Any Keying Options can be radially positioned by specifying the appropriate keying and it's desired angle.
The appropriate angle is defined by a counter clockwise rotation from 0°.

Note: Parts are viewed in die position looking from above the die. Punches are viewed looking through the shanks. Matrixes are viewed through top face.

FLATS ON HEADED PRODUCTS

K1 and K5 are ground flush to shank. **K6** is a user defined flat and requires an **"F"** dimension specified with order.

K5 flats are standard 180° apart.



KEYING INFORMATION - OPTIONS (2/2)

FLATS ON MATRIX - STRAIGHT

K1 uses **"F"** dimension as defined in chart, unless an alternate **"F"** dimension is specified with order.
K2 and **K3** use **"F"** dimensions as defined in chart. **K4** and **KX** are user defined flats and requires **"F"** and **"U"** dimension specified with order.

K1 KEY FLAT

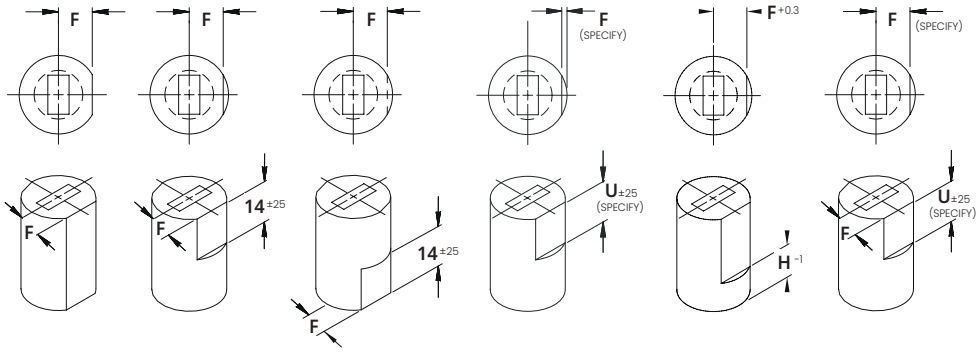
K2 STEP FLAT TOP

K3 STEP FLAT BOTTOM

K4 USER DEFINED FLAT - STYLE 1

K7 STEP FLAT TOP

KX USER DEFINED FLAT - STYLE 2



K1 - K2 - K3		K7	
BODY DIA	"F" +0.02	F	H
8	3.5	-	-
10	4.0	-	-
13	5.5	5.0	9
16	7.0	6.5	9
20	8.5	8.5	9
22	9.5	-	-
25	11.0	10.5	16
32	14.0	14.0	16
38	17.0	-	-
40	18.0	18.0	16
45	20.5	-	-
50	23.0	23.0	16
56	26.0	-	-
63	29.5	29.5	16
71	33.5	-	-
76	35.5	-	-
85	40.0	-	-
90	42.5	-	-
100	47.5	-	-

DOWEL GROOVES

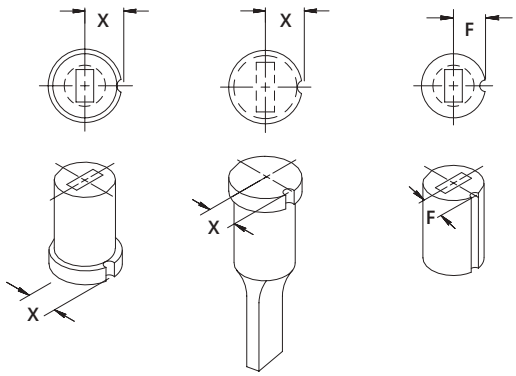
PK3, PK4 and **PK6** are standard **3, 4, 6**, dowel grooves. On Headed products, the groove is positioned tangent to shank. On all other products the dowel is ground to an **"F"** dimension as shown on chart. **PKX** is a user defined dowel groove and requires an **"F"** dimension and dowel size specified with the order.

PK3 - PK4 - PK6

PKX

X= D/2 + DOWEL / 2

X= D/2 + DOWEL / 2



BODY DIA. "D"	PKX SPECIFY DOWEL	PK3 3.0 DOWEL	PK4 4.0 DOWEL	PK6 6.0 DOWEL
	"F" Dimensions			
8	SPECIFY	4.7	5.2	6.2
10	SPECIFY	5.5	6.0	7.0
13	SPECIFY	6.7	7.2	8.2
16	SPECIFY	8.0	8.0	9.0
20	SPECIFY	10.0	10.0	11.0
22	SPECIFY	11.0	11.0	12.0
25	SPECIFY	12.5	12.5	13.5
32 ≥	SPECIFY	D/2	D/2	D/2

SHEAR ANGLES

Angle **"A"** and dimension **"F"** are user defined and must be specified with order.

QS1 BACK TAPER

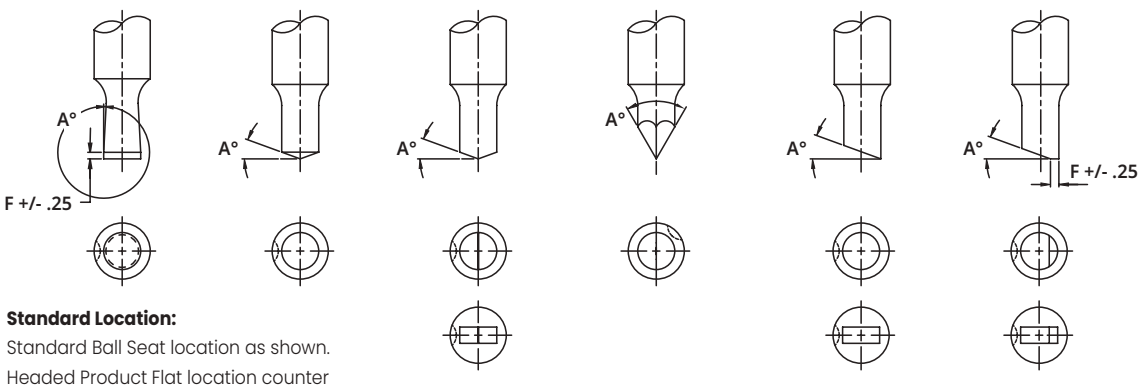
QS2 CONICAL

QS3 ROOF TOP

QS4 NAIL POINT

QS5 SHEAR

QS6 SHEAR WITH FLAT



Standard Location:
Standard Ball Seat location as shown. Headed Product Flat location counter clockwise 90°.

OVERVIEW: PUNCH BLANKS

" Our ready-to-ship solid blanks from stock "

HEAD SHAPE			M2 (1.3343)		ASP30 (PS / PM)	
			without ejector	with ejector	without ejector	with ejector
Conical Head Punch	h6	DIN 9861 ISO 6752	***HBZ***			
Cylinder Head Punch	m5	ISO 8020	***SBZAPM2***	***SFZAJM2***	***SBZ-APPS***	***SFZ-AJPS***
Heavy Duty Headed Punch	m5 (10°, 8 mm)		***SBZF***	***SFZF***		
Center Dowel Headed Punch	m5	ISO 8020 with center dowel	***DSZ***	***DFZ***		
Bottle-neck Punch	h6	DIN 5118	***UBZ***	***UFZ***		
Ball Lock Punch Light Duty	g5	ISO 10071	***BHZ***	***BFZ***		
Ball Lock Punch Heavy Duty	g5	NAAMS	***BAZ***	***BAFZ***		

EDM Matrix Blanks - from stock

HEAD SHAPE	Matrix with Counter-bore Relief	Headed, Matrix with Counter-bore Relief
	n5 j6	m5
	ISO 8977	ISO 8977
M2 (1.3343)	***MKB***	***MLB***

Punch Retainers - from stock

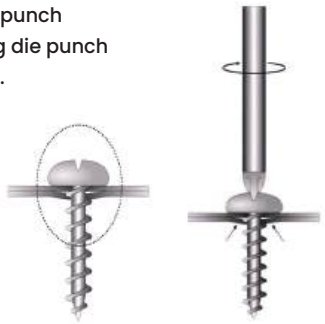
Details			Code
Punch Retainer for Round Punches		ISO 8020	***GPR***
Punch Retainer for Shaped Punches		ISO 8020	***GPRS***
Ball Lock Punch Retainer Light Duty		ISO 10071 – NAAMS	***GCRT***
Ball Lock Punch Retainer Heavy Duty		ISO 10071 – NAAMS	***GBRT***
Heavy Duty Headed Punch Retainer for Round Punches		Head Dia. = Body +5mm, 8±0.01, 10°	***GPRF***
Heavy Duty Headed Punch Retainer for Shaped Punches		Head Dia. = Body +5mm, 8±0.01, 10°	***GPRFS***
Mounting Ring for Bottle-neck Punch		DIN 5118	***G162***

Screw Form Punch & Die Button Unit

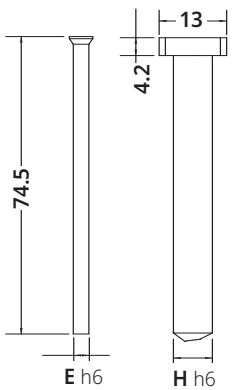
Code: **VYZ**

Consists of 3 basic parts.

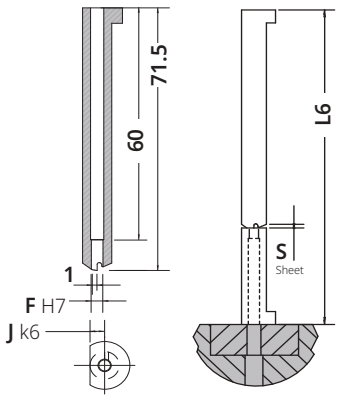
1- Hss pierce punch
2- Embossing die punch
3- Die button.



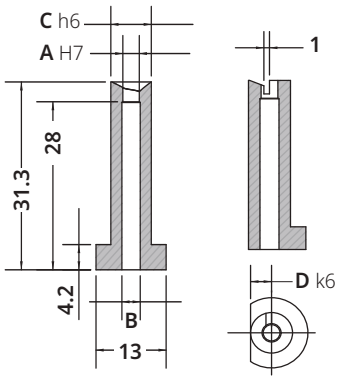
1 - HSS Pierce Punch



2 - Embossing Die Punch



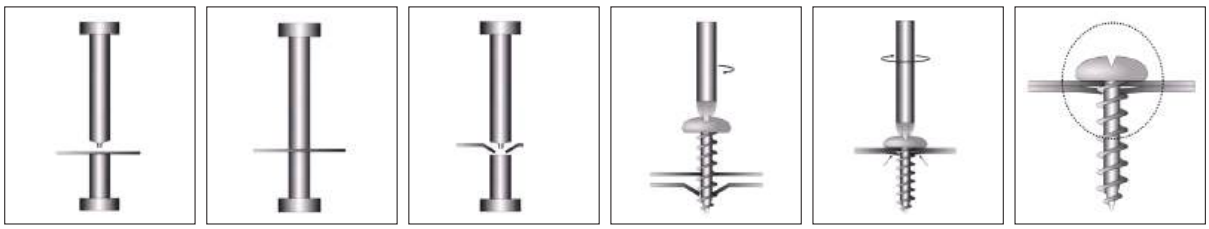
3 -Die Button

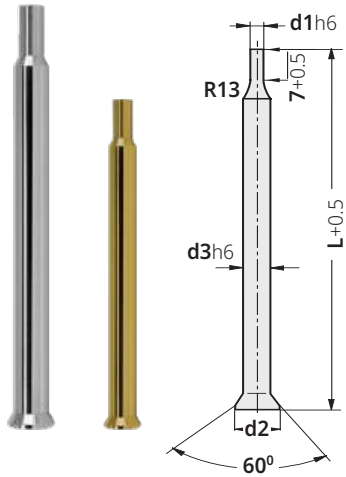


Order Code	Screw	A	B	C	D	E	F	H	J	L6	S Sheet
VYZ B35	B 3.5	2.75	3.2	7.5	3.75	2.7	2.7	7.5	3.75	101.72	0.5
VYZ B39	B 3.9	3.05	3.4	7.5	3.75	3	3	7.5	3.75	101.85	0.63
VYZ B42	B 4.2	3.15	3.5	8.5	4.25	3.1	3.1	8	4	101.97	0.75
VYZ B48	B 4.8	3.85	4.2	9	4.5	3.8	3.8	8	4	102.10	0.88
VYZ B55	B 5.5	4.35	4.8	9	4.5	4.3	4.3	8	4	102.22	1
VYZ B63	B 6.3	4.85	5.3	10.5	5.25	4.8	4.8	10	5	102.42	1.2

In terms of working systematics; in all cutting and forming dies, it creates screw forms with the purpose of connecting two sheet metal strips.
Usage: Hss pierce punch is brought to press operation by inserting in die button. While the embossing on the end of the die button bends and embosses, the HSS pierce punch forms hole. The sheet metals are prepared to be screwed.
The unit forms a hole in screw thread dimension tolerance and helical thread grooves with embossing for screwing and tightening (putting together).
The unspecified tolerances will be according to DIN ISO 2768 T1 (f).

Sheet Metal Thickness: (s)
Screw 3.5mm: Max.0.50 mm. Thickness
Screw 3.9mm: Max.0.63 mm. Thickness
Screw 4.2mm: Max.0.75 mm. Thickness
Screw 4.8mm: Max.0.88 mm. Thickness
Screw 5.5mm: Max.1.00 mm. Thickness
Screw 6.3mm: Max.1.20 mm. Thickness





DIN 9861 **Form C**

Conical Head Punches Stepped

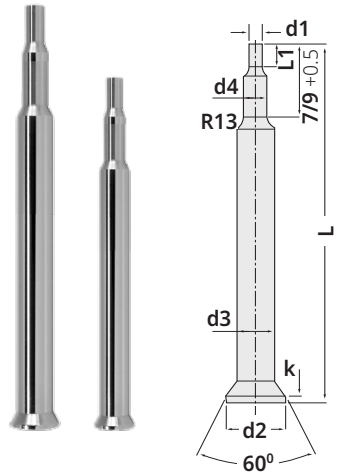
Code: **HKZ**

d1	L	d3	d2
0.8	71	2	3
	80		
1	71		
	80		
1.2	71		
	80		
1.5	71	2.5	
	80		
1.6	71		
	80		
1.8	71		
	80		
1	71	3	4.5
	80		
1.5	71		
	80		
1.8	71		
	80		
2.2	71		
	80		
2.3	71		
	80		
2.6	71		
	80		
2.8	71		
	80		

According to DIN 9861 norm, there is limitation for body and cutting diameter. In this norm, while body diameter for conical head stepped punch is max. 3 mm cutting diameter can be max. 2.95 mm.

Order: **HKZ.** d3 x d1 x L

Material: 1.3343 (M2)
Hardness: 62 - 64 HRC



DIN 9861 **Form E**

Conical Head Punches Stepped

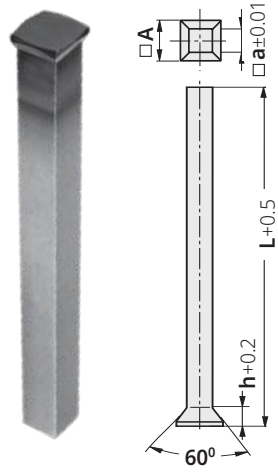
Code: **H2K**

d1	d4	d3	d2	L	L1	k
1	1.4	3	4.5	71 80 100	2	0.5
1.2	1.6					
1.5	1.8					
1.7	2.1					
2.2	2.6					
2.5	2.8					
1.6	2.2	4	5.5	71 80 100	2.5	0.5
1.8	2.3					
2.3	2.8					
2.6	3					
3	3.5					
3.2	3.7					
2.4	3	5	6.5	71 80 100	3	0.5
2.8	3.5					
3.2	4					
3.6	4.2					
4.2	4.6					
4.5	4.8					
2.5	3.2	6	8	71 80 100	3	0.5
3	3.8					
3.5	4.2					
4	4.8					
4.5	5.3					
5	5.5					
5.5	5.8					

It is preferred for thin work pieces and light duty works. Upon request, our punch production is available in the desired material and dimensions and also in shapes.

Order: **H2K.** d1 x d4 x d3 x L x L1

Material: 1.3343 (M2)
Hardness: 62 - 64 HRC



Slot - **Form DA** forged head

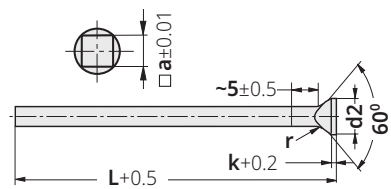
Square Head Punch, Slot Stepped

Code: **HFK**

a	L	A	h
1	71	1.8	1.2
2		3	1.4
3		4.5	1.8
4		5.5	1.8
5		6.5	1.8
6		8	2.2

a	L	A	h
7	71	9	2.8
8		10	
9		11	
10		12	
12		14	

Order: **HFK.** a x L



Conical Head Punch Shaped

Code: **HFY**

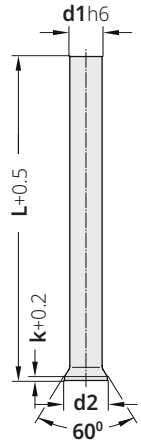
a	L	A	k
1	71	1.8	0.5
2		3	
3		4.5	
4		6	
5		7.5	
6		9	

a	L	A	k
7	71	10.5	1
8		12	
9		13.5	
10		15	
12		18	

Excluding product types in tables, our production such as headless and different slot types, also punches upon request are available.

Order: **HFY.** a x L

HFK **HFY**
Material: 1.3343 (M2)
Hardness: 62 - 64 HRC



Conical Head Punch

DIN 9861 / ISO 6752

Code: **HBZ**

d1	L	d2	k
0.5	71	0.9	0.2
	80		
	100		
0.6	71	1.1	0.2
	80		
	100		
0.7	71	1.3	0.2
	80		
	100		
0.8	71	1.4	0.4
	80		
	100		
0.9	71	1.6	0.4
	80		
	100		
1	71	1.8	0.5
1.1	80		
	100		
1.2	71	2	0.5
1.3	80		
	100		
1.4	71	2.2	0.5
1.5	80		
	100		
1.6	71	2.5	0.5
1.7	80		
	100		
1.8	71	2.8	0.5
1.9	80		
	100		
2	71	3	0.5
	80		
	100		
	125		
	160		
2.1	71	3.2	0.5
2.2	80		
	100		
2.3	71	3.5	0.5
2.4	80		
	100		

d1	L	d2	k
2.5	71	3.5	0.5
	80		
	100		
	125		
	160		
2.6	71	4	0.5
2.7	80		
	100		
2.8	71	4	0.5
2.9	80		
	100		
3	71	4.5	0.5
	80		
	100		
	125		
	160		
3.1	71	4.5	0.5
3.2	80		
	100		
3.3	71	4.5	0.5
3.4	80		
	100		
3.5	71	5	0.5
	80		
	100		
	125		
	160		
3.6	71	5	0.5
3.7	80		
	100		
3.8	71	5	0.5
3.9	80		
	100		
4	71	5.5	0.5
	80		
	100		
	125		
	160		

d1	L	d2	k
4.1	71	5.5	0.5
4.2	80		
	100		
4.3	71	5.5	0.5
4.4	80		
	100		
4.5	71	6	0.5
	80		
	100		
	125		
	160		
4.6	71	6	0.5
4.7	80		
	100		
4.8	71	6	0.5
4.9	80		
	100		
5	71	6.5	0.5
	80		
	100		
	125		
	160		
5.1	71	6.5	0.5
5.2	80		
	100		
5.3	71	6.5	0.5
5.4	80		
	100		
5.5	71	7	0.5
	80		
	100		
	125		
	160		
5.6	71	7	0.5
5.7	80		
	100		
5.8	71	7	0.5
5.9	80		
	100		
6	71	8	0.5
	80		
	100		
	125		
	160		

d1	L	d2	k
6.1	71	8	0.5
6.2	80		
	100		
6.3	71	8	0.5
6.4	80		
	100		
6.5	71	9	1
	80		
	100		
	125		
	160		
6.6	71	9	1
6.7	80		
	100		
6.8	71	9	1
6.9	80		
	100		
7	71	9	1
	80		
	100		
	125		
	160		
7.1	71	9	1
7.2	80		
	100		
7.3	71	9	1
7.4	80		
	100		
7.5	71	10	1
	80		
	100		
	125		
	160		
7.6	71	10	1
7.7	80		
	100		
7.8	71	10	1
7.9	80		
	100		
8	71	10	1
	80		
	100		
	125		
	160		

d1	L	d2	k
8.1	71	10	1
8.2	80		
	100		
8.3	71	10	1
8.4	80		
	100		
8.5	71	11	1
	80		
	100		
	125		
	160		
8.6	71	11	1
8.7	80		
	100		
8.8	71	11	1
8.9	80		
	100		
9	71	11	1
9.9	80		
	100		
	125	12	
	160		
10	71	12	1
	80		
	100		
	125		
	160		
10.5	71	13	1
	80		
	100		
	125		
	160		
11	71	13	1
	80		
	100		
	125		
	160		
11.5	71	14	1
	80		
	100		

d1	L	d2	k
12	71	14	1
	80		
	100		
	125		
	160		
12.5	71	15	1
	80		
	100		
13	71	15	1
	80		
	100		
	125		
	160		
13.5	71	16	1.5
	80		
	100		
14	71	16	1.5
	80		
	100		
	125		
	160		
14.5	71	17	1.5
	80		
	100		
15	80	17	1.5
	100		
	125		
	160		
16	71	18	1.5
	80		
	100		
	125		
	160		
17	80	19	1.5
	100		
18	80	20	1.5
	100		
19	80	21	1.5
	100		
20	71	22	1.5
	80		
	100		
	125		
	160		

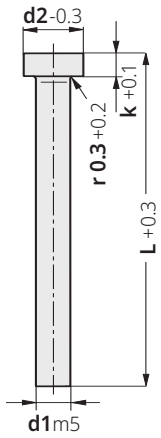
Conical Head Punch - Form D

With our wide range and dimensional products of "Punch and Matrix Sets" from our stocks, we are in top location with our sectoral experience in quality / price formation. In addition, we provide other special requests with the shortest delivery time. Also, full or partial coating can be preferred upon request, by providing resistance against heat and friction on external layer, it solves problems such as winding and cold welding.
For harder work pieces, ASP / PS (powder metal) and for very hard and abrasive work pieces, sintered carbide punches are preferred.

Order:
HBZ. d1 x L

Heat Treated: (60 HRC ± 2)
Surface: ≥ 950 HV 0.3
Head Hardness: (52 ±3 HRC)

Material: < Ø12.5= 1.3343 (M2) Completely ground
≥ Ø12.5= 1.2379 (HWS) Completely ground



Code: **SBZAPM2**

Cylinder Head Punch

Solid Blank - ISO 8020

Order Code	d1	L	d2	k	r
SBZAPM202071	2	71	5	3	0.2
SBZAPM202080		80			
SBZAPM202100		100			
SBZAPM202571	2.5	71	5.5	3	0.2
SBZAPM202580		80			
SBZAPM2025100		100			
SBZAPM203071	3	71	6.5	3	0.2
SBZAPM203080		80			
SBZAPM203100		100			
SBZAPM203571	3.5	71	6	3	0.2
SBZAPM203580		80			
SBZAPM2035100		100			
SBZAPM204071	4	71	7	5	0.3
SBZAPM204080		80			
SBZAPM204100		100			
SBZAPM204571	4.5	71	7.5	5	0.3
SBZAPM204580		80			
SBZAPM2045100		100			
SBZAPM205071	5	71	8	5	0.3
SBZAPM205080		80			
SBZAPM205090		90			
SBZAPM205100		100			
SBZAPM205125		125			
SBZAPM2055100	5.5	100	8.5	5	0.3

Order Code	d1	L	d2	k	r
SBZAPM206071	6	71	9	5	0.3
SBZAPM206080		80			
SBZAPM206100		100			
SBZAPM206125		125			
SBZAPM206160		160			
SBZAPM2065100	6.5	100	9.5	5	0.3
SBZAPM207080	7	80	10	5	0.3
SBZAPM207100		100			
SBZAPM207125		125			
SBZAPM2075100	7.5	100	10.5	5	0.3
SBZAPM208071	8	71	11	5	0.3
SBZAPM208080		80			
SBZAPM208100		100			
SBZAPM208125		125			
SBZAPM208160		160			
SBZAPM208200		200			
SBZAPM2085100	8.5	100	11.5	5	0.3
SBZAPM209080	9	80	12	5	0.3
SBZAPM209100		100			
SBZAPM209125		125			
SBZAPM2095100	9.5	100	12.5	5	0.3
SBZAPM210071	10	71	13	5	0.3
SBZAPM210080		80			
SBZAPM210100		100			
SBZAPM210125		125			
SBZAPM210160		160			
SBZAPM210200		200			
SBZAPM2105100	10.5	100	13.5	5	0.3
SBZAPM211080	11	80	14	5	0.3
SBZAPM211100		100			
SBZAPM211125		125			
SBZAPM2115100	11.5	100	14.5	5	0.3
SBZAPM212071	12	71	15	5	0.3
SBZAPM212080		80			
SBZAPM212100		100			
SBZAPM212125		125			
SBZAPM212160		160			
SBZAPM2125100	12.5	100	15.5	5	0.3
SBZAPM213071	13	71	16	5	0.3
SBZAPM213080		80			
SBZAPM213090		90			
SBZAPM213100		100			
SBZAPM213125		125			
SBZAPM213160		160			
SBZAPM213200		200			
SBZAPM2135100	13.5	100	16.5	5	0.3

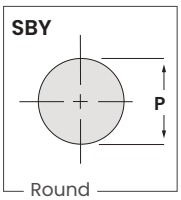
Order Code	d1	L	d2	k	r
SBZAPM214080	14	80	17	5	0.3
SBZAPM214100		100			
SBZAPM214125		125			
SBZAPM2145100	14.5	100	17.5	5	0.3
SBZAPM215100	15	100	18	5	0.3
SBZAPM215125		125			
SBZAPM2155100	15.5	100	18.5	5	0.3
SBZAPM216071	16	71	19	5	0.3
SBZAPM216080		80			
SBZAPM216090		90			
SBZAPM216100		100			
SBZAPM216125		125			
SBZAPM216160		160			
SBZAPM216200		200			
SBZAPM2165100	16.5	100	19.5	5	0.3
SBZAPM217100	17	100	20	5	0.3
SBZAPM2175100	17.5	100	20.5	5	0.3
SBZAPM218100	18	100	21	5	0.3
SBZAPM218125		125			
SBZAPM219100	19	100	22	5	0.3
SBZAPM220071	20	71	23	5	0.3
SBZAPM220080		80			
SBZAPM220090		90			
SBZAPM220100		100			
SBZAPM220125		125			
SBZAPM220160		160			
SBZAPM220200		200			
SBZAPM221100	21	100	24	5	0.3
SBZAPM222100	22	100	25	5	0.3
SBZAPM223100	23	100	26	5	0.3
SBZAPM224100	24	100	27	5	0.3
SBZAPM225071	25	71	28	5	0.3
SBZAPM225080		80			
SBZAPM225090		90			
SBZAPM225100		100			
SBZAPM225125		125			
SBZAPM225160		160			
SBZAPM225200		200			
SBZAPM226100	26	100	29	5	0.3
SBZAPM227100	27	100	30	5	0.3
SBZAPM228100	28	100	31	5	0.3
SBZAPM229100	29	100	32	5	0.3
SBZAPM230100	30	100	33	5	0.3
SBZAPM230125		125			
SBZAPM232080	32	80	35	5	0.3
SBZAPM232090		90			
SBZAPM232100		100			
SBZAPM232125		125			
SBZAPM232160		160			
SBZAPM240100	40	100	43	5	0.3
SBZAPM240125		125			

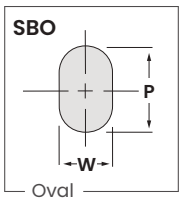
Material: 1.3343 (M2) completely ground
Head Hardness: (52 ±3 HRC)

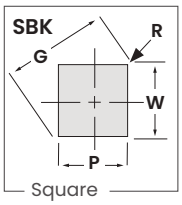
Heat Treated: 62 - 64 HRC **Surface:** ≥ 950 HV 0.3

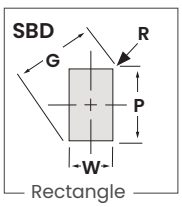
Mounting of cylinder head type punch to the holder plate during usage is planned, guiding process is provided by the stripper plate.
By mounting punches in this style, the elimination of axial errors that resulted from incorrect mounting of die set or press is more easier.
The use of this mounting method provided the alteration between the transmission of punching power and bearing. Also, full or partial coating can be preferred upon request, by providing resistance against heat and friction on external layer, it solves problems such as winding and cold welding.
For harder work pieces, ASP / PS (powder metal) and for very hard and abrasive work pieces, sintered carbide punches are preferred.

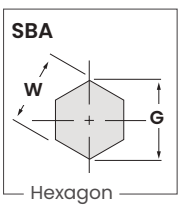
SHAPES

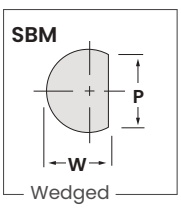


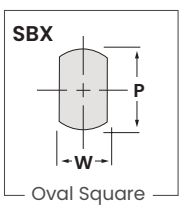


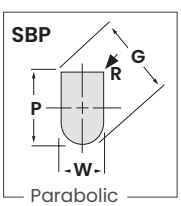


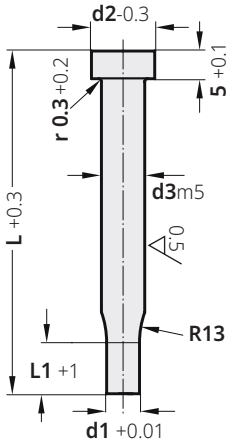




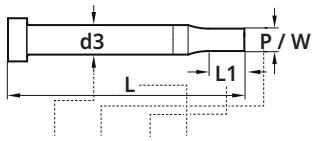








How to order:
Shape
d3
P/W
L1
L
Material



SBY x 10 x P7.0 x 13 x 80 - M2
SBO x 10 x P8.2 x W5.2 x 25 x 100 - M2

Cylinder Head Stepped Punch / ISO 8020

Code: **SB..**

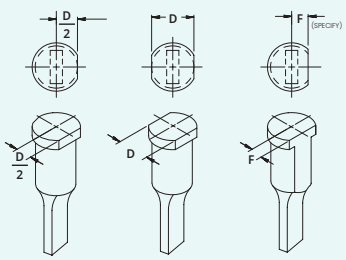
Apart from our standards, special dimensions and complex geometries can be produced according to your technical drawings.

Please refer to the table on the left side

SBY - SBO - SBK - SBD - SBA - SBM - SBX - SBP

Order	d3	Head d2	d1 / Shape (SBY) Round P	d1 / Shape Other Shapes W G/P	Standard L1	Alternative L1 Min. Max.	L
SB.. 04	4	7	1.6 ~ 3.95	1.6 - 4	8	10 - 13	50 63 71 80 90 100 125
SB.. 05	5	8	1.6 ~ 4.95	1.6 - 4.95	13	10 - 19	
SB.. 06	6	9	2.4 ~ 5.95	2.4 - 5.95	13	10 - 19	
SB.. 08	8	11	3.2 ~ 7.95	3.2 - 7.95	19	13 - 25	
SB.. 10	10	13	4.5 ~ 9.95	4.5 - 9.95	19	13 - 25	
SB.. 13	13	16	6 ~ 12.95	6 - 12.95	19	13 - 25	
SB.. 16	16	19	8 ~ 15.95	7.5 - 15.95	19	13 - 25	
SB.. 20	20	23	10 ~ 19.95	8 - 19.95	19	13 - 25	71 80 90 100 125
SB.. 25	25	28	12 ~ 24.95	9 - 24.95	19	13 - 25	
SB.. 32	32	35	16 ~ 31.95	10 - 31.95	25	19 - 30	
SB.. 40	40	43	20 ~ 39.95	14 - 39.95	25	19 - 30	

FLATS ON HEADED PRODUCTS



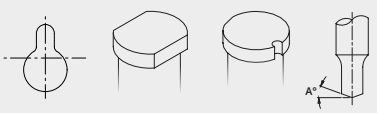
K1 and K5 are ground flush to shank. **K6** is a user defined flat and requires an **"F"** dimension specified with order.
K5 flats are standard 180° apart.

Order Example with Flat:
SBO x 10 x P8.2 x W5.2 x 25 x 100 - **K1** - M2
Keying Info

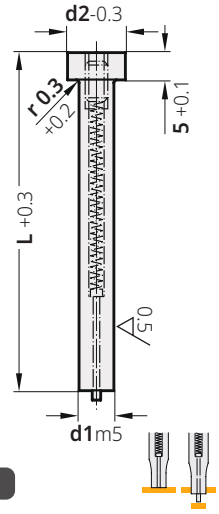
Order Example with Flat and Coating:
SBO x 10 x P8.2 x W5.2 x 25 x 100 - K1 - M2 - **Alcrn**
Coating Info

OPTIONAL FEATURES

COATING



For details on Keying Information / Key Flat Options, More Complex Special Shapes, Shear Angles, and Coatings, please refer to the beginning of Category 6.



Code: **SFZAJM2**

Cylinder Head Punch with Ejector

Solid Blank - ISO 8020

Order Code	d1	L	d2
SFZAJM205050	5	50	8
SFZAJM205063		63	
SFZAJM205071		71	
SFZAJM205080		80	
SFZAJM205090		90	
SFZAJM205100		100	
SFZAJM205125		125	
SFZAJM255100	5.5	100	8.5
SFZAJM206050	6	50	9
SFZAJM206063		63	
SFZAJM206071		71	
SFZAJM206080		80	
SFZAJM206090		90	
SFZAJM206100		100	
SFZAJM206125		125	
SFZAJM2065100	6.5	100	9.5
SFZAJM207100	7	100	10
SFZAJM2075100	7.5	100	10.5
SFZAJM208050	8	50	11
SFZAJM208063		63	
SFZAJM208071		71	
SFZAJM208080		80	
SFZAJM208090		90	
SFZAJM208100		100	
SFZAJM208125		125	
SFZAJM208160		160	
SFZAJM2085100	8.5	100	11.5
SFZAJM209100	9	100	12
SFZAJM2095100	9.5	100	12.5
SFZAJM210050	10	50	13
SFZAJM210063		63	
SFZAJM210071		71	
SFZAJM210080		80	
SFZAJM210090		90	
SFZAJM210100		100	
SFZAJM210125		125	
SFZAJM210160		160	
SFZAJM2105100	10.5	100	13.5
SFZAJM211080	11	80	14
SFZAJM211100		100	
SFZAJM2115100	11.5	100	14.5
SFZAJM212050	12	50	15
SFZAJM212063		63	
SFZAJM212071		71	
SFZAJM212080		80	
SFZAJM212090		90	
SFZAJM212100		100	
SFZAJM212125		125	
SFZAJM212160		160	
SFZAJM2125100	12.5	100	15.5
SFZAJM213050	13	50	16
SFZAJM213063		63	
SFZAJM213071		71	
SFZAJM213080		80	
SFZAJM213090		90	
SFZAJM213100		100	
SFZAJM213125		125	
SFZAJM213160		160	
SFZAJM2135100	13.5	100	16.5
SFZAJM214080	14	80	17
SFZAJM214100		100	
SFZAJM2145100	14.5	100	17.5
SFZAJM215080	15	80	18
SFZAJM215100		100	
SFZAJM2155100	15.5	100	18.5
SFZAJM216050	16	50	19
SFZAJM216063		63	
SFZAJM216071		71	
SFZAJM216080		80	
SFZAJM216090		90	
SFZAJM216100		100	
SFZAJM216125		125	
SFZAJM216160		160	
SFZAJM2165100	16.5	100	19.5
SFZAJM217100	17	100	20
SFZAJM218100	18	100	21
SFZAJM219100	19	100	22
SFZAJM220063	20	63	23
SFZAJM220071		71	
SFZAJM220080		80	
SFZAJM220090		90	
SFZAJM220100		100	
SFZAJM220125		125	
SFZAJM220160		160	
SFZAJM221100	21	100	24
SFZAJM222100	22	100	25
SFZAJM223100	23	100	26
SFZAJM224100	24	100	27
SFZAJM225063	25	63	28
SFZAJM225071		71	
SFZAJM225080		80	
SFZAJM225090		90	
SFZAJM225100		100	
SFZAJM225125		125	
SFZAJM225160		160	
SFZAJM226100	26	100	29
SFZAJM227100	27	100	30
SFZAJM228100	28	100	31
SFZAJM229100	29	100	32
SFZAJM230100	30	100	33
SFZAJM232090	32	90	35
SFZAJM232100		100	
SFZAJM232125		125	
SFZAJM232160		160	
SFZAJM240100	40	100	43
SFZAJM240125		125	

Material: 1.3343 (M2) completely ground
Head Hardness: (52 ±3 HRC)

Heat Treated: 62 - 64 HRC **Surface:** ≥ 950 HV 0.3

Mounting of cylinder head type punch to the holder plate during usage is planned, guiding process is provided by the stripper plate.
By mounting punches in this style, the elimination of axial errors that resulted from incorrect mounting of die set or press is more easier.
The use of this mounting method provided the alteration between the transmission of punching power and bearing. Also, full or partial coating can be preferred upon request, by providing resistance against heat and friction on external layer, it solves problems such as winding and cold welding.
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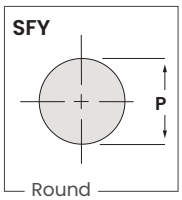
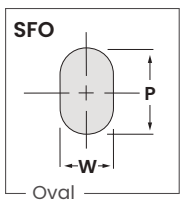
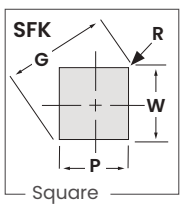
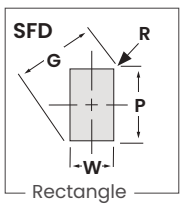
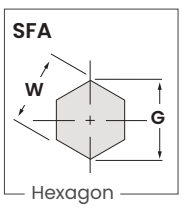
SHAPES

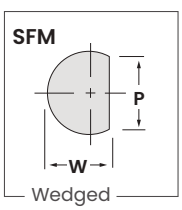


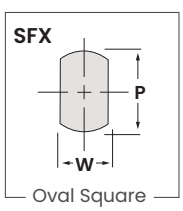


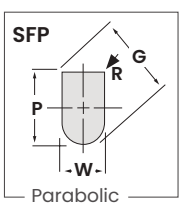


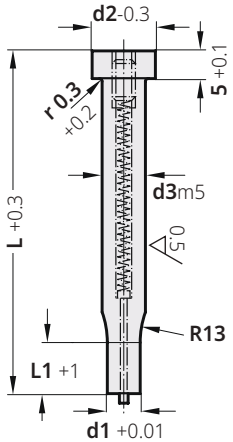




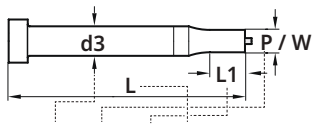








How to order:
Shape
d3
P/W
L1
L
Material

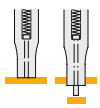


SFY x 10 x P7.0 x 13 x 80 - M2
SFO x 10 x P8.2 x W5.2 x 25 x 100 - M2

Cylinder Head Stepped Punch with Ejector

Code: **SF..**

Apart from our standards, special dimensions and complex geometries can be produced according to your technical drawings.



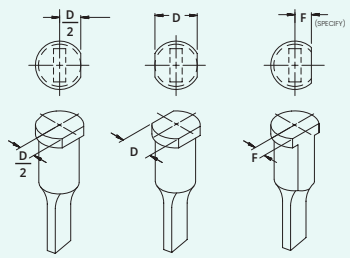
Please refer to the table on the left side

SFY - SFO - SFK - SFD - SFA - SFM - SFX - SFP

Order	d3	Head d2	d1 / Shape		Standard L1	Alternative L1 Min. Max.	L
			(SFY) Round P	Other Shapes W G/P			
SF.. 05	5	8	1.6 ~ 4.95	1.6 - 4.95	13	10 - 19	50
SF.. 06	6	9	2.4 ~ 5.95	2.4 - 5.95	13	10 - 19	
SF.. 08	8	11	3.2 ~ 7.95	3.2 - 7.95	19	13 - 25	63
SF.. 10	10	13	4.5 ~ 9.95	4.5 - 9.95	19	13 - 25	71
SF.. 13	13	16	6 ~ 12.95	6 - 12.95	19	13 - 25	80
SF.. 16	16	19	8 ~ 15.95	7.5 - 15.95	19	13 - 25	
SF.. 20	20	23	10 ~ 19.95	8 - 19.95	19	13 - 25	90
SF.. 25	25	28	12 ~ 24.95	9 - 24.95	19	13 - 25	100
SF.. 32	32	35	16 ~ 31.95	10 - 31.95	25	19 - 30	125
SF.. 40	40	43	20 ~ 39.95	14 - 39.95	25	19 - 30	

FLATS ON HEADED PRODUCTS

K1 KEY FLAT | **K5** DOUBLE FLAT | **K6** BODY FLAT



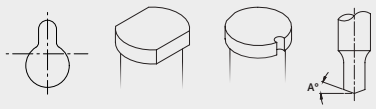
K1 and K5 are ground flush to shank. **K6** is a user defined flat and requires an **"F"** dimension specified with order. **K5** flats are standard 180° apart.

Order Example with Flat:
SFO x 10 x P8.2 x W5.2 x 25 x 100 - **K1** - M2
Keying Info

Order Example with Flat and Coating:
SFO x 10 x P8.2 x W5.2 x 25 x 100 - K1 - M2 - **AlCrN**
Coating Info

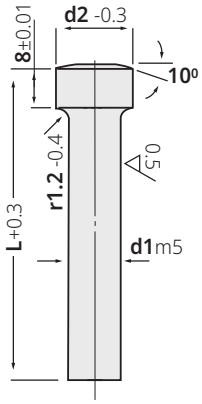
OPTIONAL FEATURES

COATING



For details on Keying Information / Key Flat Options, More Complex Special Shapes, Shear Angles, and Coatings, please refer to the beginning of Category 6.

NEW



Heavy Duty Headed Punch

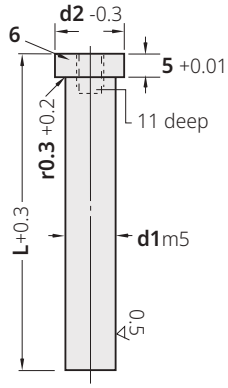
Code: **SBZF**

* Larger-headed

Blank Type

d1	Order			d2
	L: 70	L: 80	L: 100	
6	**SBZF** 6 x 70	**SBZF** 6 x 80	**SBZF** 6 x 100	11
8	**SBZF** 8 x 70	**SBZF** 8 x 80	**SBZF** 8 x 100	13
10	**SBZF** 10 x 70	**SBZF** 10 x 80	**SBZF** 10 x 100	15
12	**SBZF** 12 x 70	**SBZF** 12 x 80	**SBZF** 12 x 100	17
13	**SBZF** 13 x 70	**SBZF** 13 x 80	**SBZF** 13 x 100	18
16	**SBZF** 16 x 70	**SBZF** 16 x 80	**SBZF** 16 x 100	21
20	**SBZF** 20 x 70	**SBZF** 20 x 80	**SBZF** 20 x 100	25
25	**SBZF** 25 x 70	**SBZF** 25 x 80	**SBZF** 25 x 100	30
32	-	-	**SBZF** 32 x 100	37

NEW



Center Dowel Headed Punch

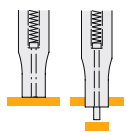
Code: **DSZ**

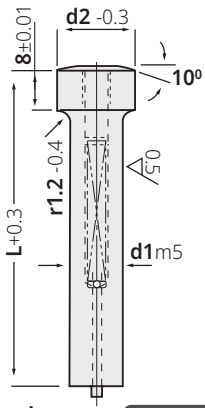
ISO 8020, with center dowel

Blank Type

d1	Order				d2
	L: 71	L: 80	L: 90	L: 100	
10	**DSZ**10 x 71	**DSZ**10 x 80	**DSZ**10 x 90	**DSZ**10 x 100	13
13	**DSZ**13 x 71	**DSZ**13 x 80	**DSZ**13 x 90	**DSZ**13 x 100	16
16	**DSZ**16 x 71	**DSZ**16 x 80	**DSZ**16 x 90	**DSZ**16 x 100	19
20	**DSZ**20 x 71	**DSZ**20 x 80	**DSZ**20 x 90	**DSZ**20 x 100	23
25	**DSZ**25 x 71	**DSZ**25 x 80	**DSZ**25 x 90	**DSZ**25 x 100	28
32	**DSZ**32 x 71	**DSZ**32 x 80	**DSZ**32 x 90	**DSZ**32 x 100	35

NEW





Heavy Duty Headed Punch with Ejector

Code: **SFZF**

* Larger-headed

Blank Type

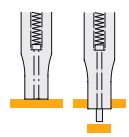
d1	Order			d2
	L: 70	L: 80	L: 100	
8	**SFZF** 8 x 70	**SFZF** 8 x 80	**SFZF** 8 x 100	13
10	**SFZF** 10 x 70	**SFZF** 10 x 80	**SFZF** 10 x 100	15
12	-	-	**SFZF** 12 x 100	17
13	**SFZF** 13 x 70	**SFZF** 13 x 80	**SFZF** 13 x 100	18
16	**SFZF** 16 x 70	**SFZF** 16 x 80	**SFZF** 16 x 100	21
20	**SFZF** 20 x 70	**SFZF** 20 x 80	**SFZF** 20 x 100	25
25	**SFZF** 25 x 70	**SFZF** 25 x 80	**SFZF** 25 x 100	30
32	-	-	**SFZF** 32 x 100	37

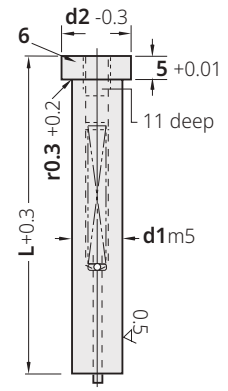
SBZF — **SFZF**

Material: 1.3343 (M2) completely ground

Heat Treated: 60 - 63 HRC / **Head Hardness:** 40 - 55 HRC

NEW





Center Dowel Headed Punch with Ejector

Code: **DFZ**

ISO 8020, with center dowel

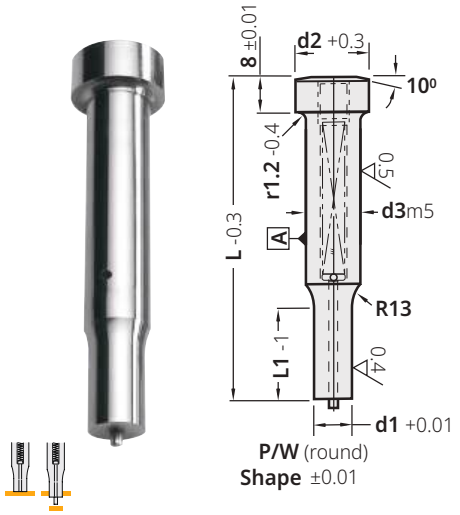
Blank Type

d1	Order				d2
	L: 71	L: 80	L: 90	L: 100	
10	**DFZ**10 x 71	**DFZ**10 x 80	**DFZ**10 x 90	**DFZ**10 x 100	13
13	**DFZ**13 x 71	**DFZ**13 x 80	**DFZ**13 x 90	**DFZ**13 x 100	16
16	**DFZ**16 x 71	**DFZ**16 x 80	**DFZ**16 x 90	**DFZ**16 x 100	19
20	**DFZ**20 x 71	**DFZ**20 x 80	**DFZ**20 x 90	**DFZ**20 x 100	23
25	**DFZ**25 x 71	**DFZ**25 x 80	**DFZ**25 x 90	**DFZ**25 x 100	28
32	**DFZ**32 x 71	**DFZ**32 x 80	**DFZ**32 x 90	**DFZ**32 x 100	35

DSZ — **DFZ**

Material: 1.3343 (M2) completely ground

Heat Treated: 60 - 63 HRC / **Head Hardness:** 40 - 55 HRC



Heavy Duty Stepped Punch with Ejector

* Larger-headed

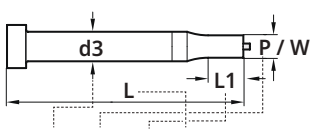
Code: **SF..F**

Please refer to the table on the right side

SFYF-SFOF-SFKF-SFDF-SFAF-SFMF-SFCF-SFPF

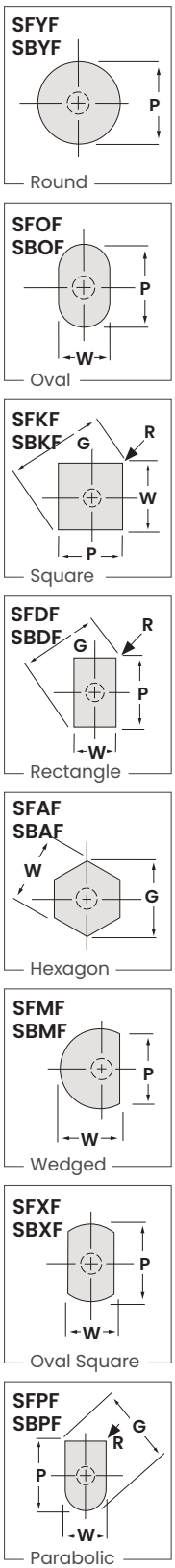
Order d3	Head d2	d1 / Shape (SFYF) Round P	d1 / Shape Other Shapes W G/P	Standard L1	Alternative L1 Min. Max.	L
SF..F08	13	3.2 ~ 7.95	3.2 - 7.95	13	13 25	60 70 80 90 100
SF..F10	15	4.5 ~ 9.95	4.5 - 9.95	13	13 25	
SF..F13	18	6 ~ 12.95	6 - 12.95	13	13 25	
SF..F16	21	8 ~ 15.95	7.5 - 15.95	19	13 25	
SF..F20	25	10 ~ 19.95	8 - 19.95	19	13 25	
SF..F25	30	12 ~ 24.95	9 - 24.95	19	13 25	
SF..F32	37	16 ~ 31.95	10 - 31.95	25	19 30	

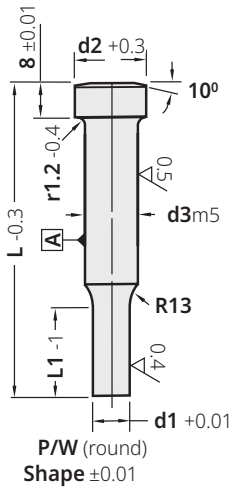
How to order:
Shape
d3
P/W
L1
L
Material



SFYF x 10 x P7.0 x 13 x 80 - M2
SFOF x 10 x P8.2 x W5.2 x 25 x 100 - M2

SHAPES





Heavy Duty Stepped Punch

* Larger-headed

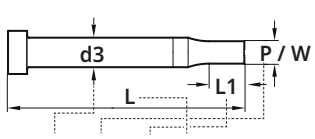
Code: **SB..F**

Please refer to the table on the left side

SBYF-SBOF-SBKF-SBDF-SBAF-SBMF-SBCF-SBPF

Order d3	Head d2	d1 / Shape (SBYF) Round P	d1 / Shape Other Shapes W G/P	Standard L1	Alternative L1 Min. Max.	L
SB..F08	13	3.2 ~ 7.95	3.2 - 7.95	13	13 25	60 70 80 90 100
SB..F10	15	4.5 ~ 9.95	4.5 - 9.95	13	13 25	
SB..F13	18	6 ~ 12.95	6 - 12.95	13	13 25	
SB..F16	21	8 ~ 15.95	7.5 - 15.95	19	13 25	
SB..F20	25	10 ~ 19.95	8 - 19.95	19	13 25	
SB..F25	30	12 ~ 24.95	9 - 24.95	19	13 25	
SB..F32	37	16 ~ 31.95	10 - 31.95	25	19 30	

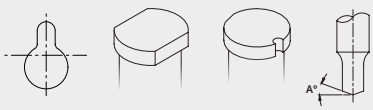
How to order:
Shape
d3
P/W
L1
L
Material



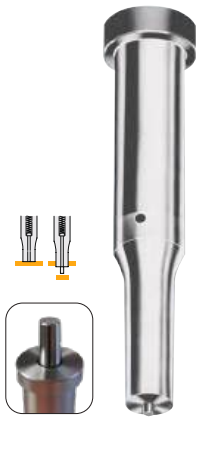
SBYF x 10 x P7.0 x 13 x 80 - M2
SBOF x 10 x P8.2 x W5.2 x 25 x 100 - M2

OPTIONAL FEATURES

COATING



For details on Keying Information / Key Flat Options, More Complex Special Shapes, Shear Angles, and Coatings, please refer to the beginning of Category 6.



Center Dowel Stepped Punch with Ejector

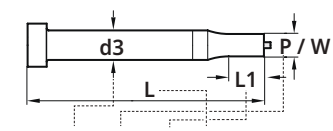
Code: **DF...**

Please refer to the table on the right side

DFY - DFO - DFK - DFD - DFA - DFM - DFX - DFP

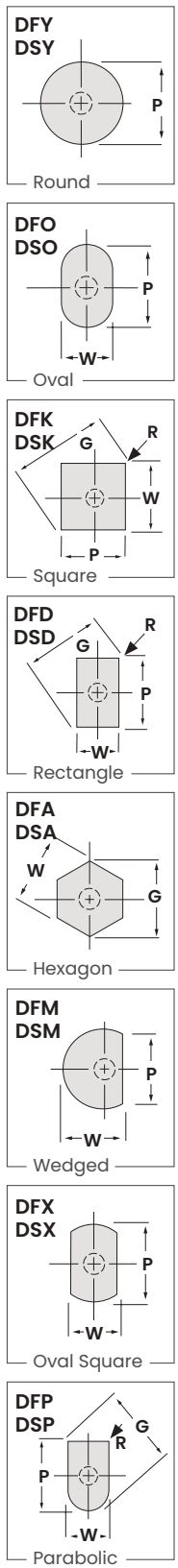
Order d3	Head d2	d1 / Shape (DFY) Round P	d1 / Shape Other Shapes W G/P	Standard L1	Alternative L1 Min. Max.	L
DF.. 10	13	4.5 ~ 9.95	4.5 - 9.95	19	13 25	63
DF.. 13	16	6 ~ 12.95	6 - 12.95	19	13 25	71
DF.. 16	19	8 ~ 15.95	7.5 - 15.95	19	13 25	80
DF.. 20	23	10 ~ 19.95	8 - 19.95	19	13 25	90
DF.. 25	28	12 ~ 24.95	9 - 24.95	19	13 25	100
DF.. 32	35	16 ~ 31.95	10 - 31.95	25	19 30	

How to order:
Shape
d3
P/W
L1
L
Material



DFY x 10 x P7.0 x 13 x 80 - M2
DFO x 10 x P8.2 x W5.2 x 25 x 100 - M2

SHAPES



Center Dowel Stepped Punch

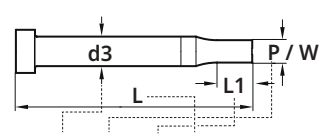
Code: **DS...**

Please refer to the table on the left side

DSY - DSO - DSK - DSD - DSA - DSM - DSX - DSP

Order d3	Head d2	d1 / Shape (DSY) Round P	d1 / Shape Other Shapes W G/P	Standard L1	Alternative L1 Min. Max.	L
DS.. 10	13	4.5 ~ 9.95	4.5 - 9.95	19	13 25	63
DS.. 13	16	6 ~ 12.95	6 - 12.95	19	13 25	71
DS.. 16	19	8 ~ 15.95	7.5 - 15.95	19	13 25	80
DS.. 20	23	10 ~ 19.95	8 - 19.95	19	13 25	90
DS.. 25	28	12 ~ 24.95	9 - 24.95	19	13 25	100
DS.. 32	35	16 ~ 31.95	10 - 31.95	25	19 30	

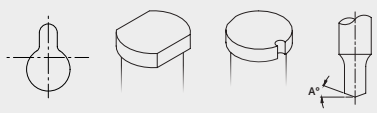
How to order:
Shape
d3
P/W
L1
L
Material



DSY x 10 x P7.0 x 13 x 80 - M2
DSO x 10 x P8.2 x W5.2 x 25 x 100 - M2

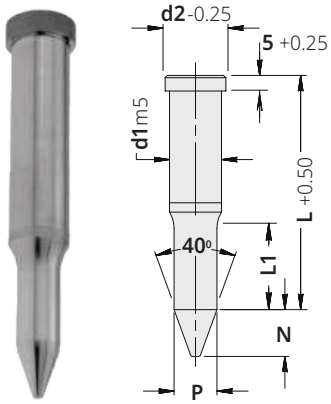
OPTIONAL FEATURES

COATING



For details on Keying Information / Key Flat Options,
More Complex Special Shapes, Shear Angles, and Coatings,
please refer to the beginning of Category 6.

Pilots enter a previously punched hole to accurately position the workpiece and hold it in place before the main punches operate. This ensures precise and repeatable punching operations.

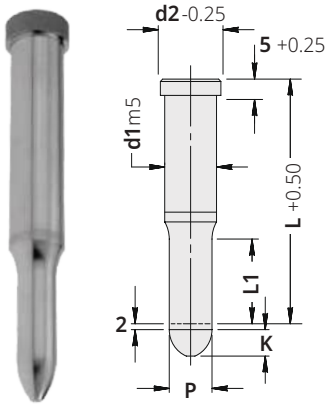


Code: **SPK**

Pilot with Taper End

d1	d2	Taper P	N	Ref P	L1 Standard	L1 Alternative	L
10	13	4.85 ~ 10	8	5.6	19	25	71
13	16	6.30 ~ 13	10	7.1			80
16	19	9.95 ~ 16	15	10.8			100
20	23	13.6 ~ 20	20	14.4			125
25	28	17.3 ~ 25	25	18			140
32	35	20.9 ~ 32	30	21.7	25	30	

Order: **SPK** d1 x P x L1 x L

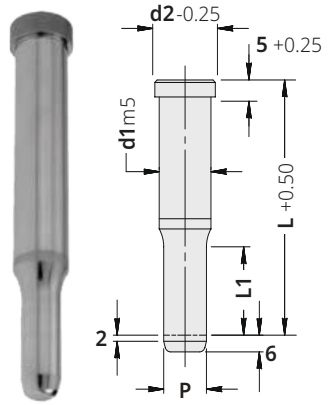


Code: **SPX**

Pilot - Spherical

d1	d2	K	Taper P	Standard L1	Alternative L1 min.	Alternative L1 max.	L
4	7	4	1.55 ~ 4	8	10	-	50
5	8		1.55 ~ 5	13			
6	9		1.55 ~ 6	13			
8	11		2.45 ~ 8	19	13		60
10	13	10	3.15 ~ 10		13	13	71
13	16		4.95 ~ 13				80
16	19		7.95 ~ 16				100
20	23		9.95 ~ 20				
25	28		11.95 ~ 25				
32	35		15.95 ~ 32	25	19	30	

Order: **SPX** d1 x P x L1 x L



Code: **SPP**

Pilot - Parabolic Type

Order: **SPP** d1 x P x L1 x L

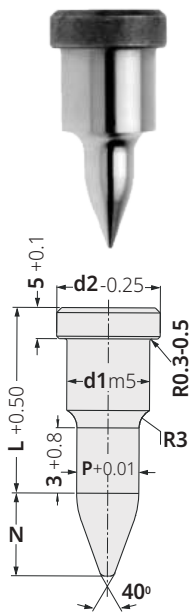
Standard Tolerances

Round / **P** +01 -00 | .01 | From **P** to **d1**

When P = d1, shank / body tolerances apply.

SPK - SPX - SPP

Material: 1.3343 (M2)
Hardness: 62 - 64 HRC



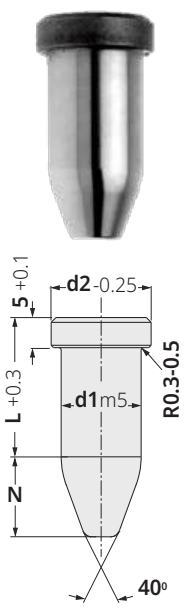
Code: **SMK** **Pointed End**

Pilot - Compact Type

d1	P	N	d2	L
4	1.95 ~ 3.99	4	7	20
5	2.65 ~ 4.99	5	8	22
6	3.3 ~ 5.99	6	9	25
8	4.1 ~ 7.99	7	11	28
10	4.8 ~ 9.99	8	13	35
13	6.25 ~ 12.99	10	16	
16	9.85 ~ 15.99	15	19	
20	13.5 ~ 19.99	20	23	
25	17.2 ~ 24.99	25	28	
32	20.8 ~ 31.99	30	35	

Order: **SMK** d1 x P x N x L

Material: 1.3343 (M2)
Hardness: 62 - 64 HRC



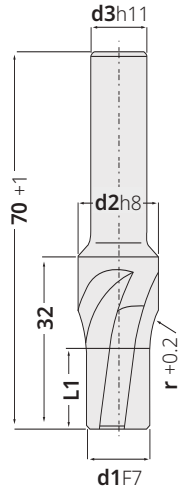
Code: **SMX** **Spherical End**

Pilot - Compact & Spherical

d1	N	d2	L
3.01 ~ 4	4	7	20
4.01 ~ 5	5	8	22
5.01 ~ 6	6	9	25
6.01 ~ 8	7	11	28
8.01 ~ 10	8	13	35
10.01 ~ 13	10	16	
13.01 ~ 16	15	19	
16.01 ~ 20	20	23	

Order: **SMX** d1 x N x L

Material: 1.3343 (M2)
Hardness: 62 - 64 HRC



Code: **UFT**

Piloted Counterbore Punch

(for tapered head)

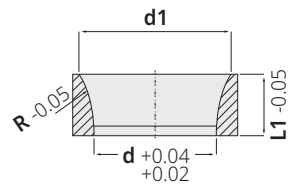
d1	d2	d3	r	L1	x (d1)
2	3.3	3.5	3.5	5	01
2.1 ~ 2.2	3.5	3.5	5	5	01
2.3 ~ 2.5	3.8	4.0	5	5	01
2.6 ~ 2.9	4.3	4.5	6	7	01
3 ~ 3.4	4.9	5.0	6	7	01
3.5 ~ 3.9	5.4	5.5	8	7	01
4 ~ 4.4	5.9	6.0	8	8	01
4.5 ~ 4.9	6.4	6.5	8	8	01
5 ~ 5.4	7.4	7.5	10	10	01
5.5 ~ 5.9	8.5	8.5	10	10	01
6	9.5	10	12	12	05
6.5 ~ 7	10.5	10	12	12	05
7.5 ~ 8	11.5	10	12	12	05
8.5 ~ 9	13.5	10	15	12	05
9.5 ~ 10	14.5	10	15	12	05
10.5 ~ 11	15.5	10	15	15	05
11.5 ~ 12	16.5	10	15	15	05
12.5 ~ 13	17.5	10	15	15	05
13.5 ~ 14	18.5	10	15	15	05
14.5 ~ 15	19.5	10	15	15	05
15.5 ~ 16	20.5	10	15	15	05
16.5 ~ 17	21.5	16	15	15	05
17.5 ~ 18	22.5	16	15	15	05
18.5 ~ 19	23.5	16	15	15	05
19.5 ~ 20	25.5	16	15	15	05

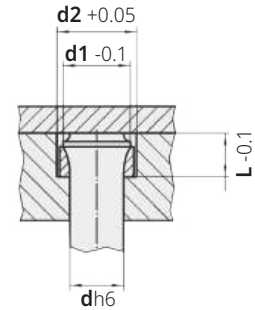
Order: **UFT.** d1

Material: 1.3343 (M2)
Hardness: 62 - 66 HRC

Code: **G162**

Mounting Ring for Bottle-neck Punch

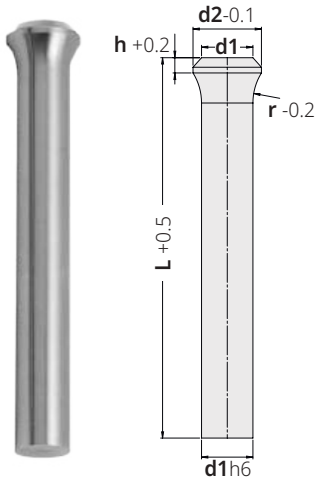




Order Code	d	d1	d2	L	L1	R
G162 30	3	4.5	6	7	4	6.5
G162 35	3.5	5	7	7	4	8
G162 40	4	5.5	7	8	4	8
G162 50	5	7	9	11	7	10
G162 51	5.1	7	9	11	7	10
G162 55	5.5	8	10	11	7	10
G162 60	6	9	11	11	7	10
G162 65	6.5	10	12	11	7	12
G162 70	7	10	12	11	7	12
G162 75	7.5	11	13	11	7	12
G162 80	8	11	13	12	8	12
G162 85	8.5	13	15	12	8	15
G162 90	9	13	15	12	8	15
G162 95	9.5	14	16	12	8	15
G162 100	10	14	16	13	9	15
G162 110	11	15	17	13	9	15
G162 120	12	16	18	13	9	15
G162 130	13	17	19	13	9	15
G162 140	14	18	20	13	9	15
G162 150	15	19	21	13	9	15
G162 160	16	20	22	13	9	15
G162 170	17	21	23	13	9	15
G162 180	18	22	24	13	9	15
G162 190	19	23	25	13	9	15
G162 200	20	25	27	14	10	15

"G162" is used for more practical mounting of Bottle-neck Punches on the retainer plate.
Advantages:
* Cylindrical counter bore in the retainer plate is sufficient.
* Tempered Mounting Ring reduces the shrinking in the untempered retainer plate.
* You can take advantage of the positive features of Bottle-neck Punches without complex installation.

Material: Tempered Steel



Bottle-neck Punch (Blank type)

Code: **UBZ**

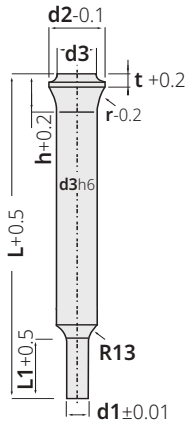
DIN 5118 (Trambone type)

The Güvenal UBZ Series is precisely engineered for high-demand applications where strong retraction force is essential.

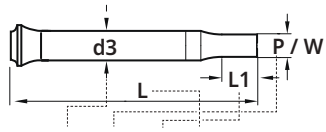
Order Code	d1	L	d2	h	r
UBZ020080	2	80	3	3	3.5
UBZ020100		100			
UBZ021100	2.1	100	3.2	3	5
UBZ022100	2.2	100	3.2	3	5
UBZ023100	2.3	100	3.5	3	5
UBZ024100	2.4	100	3.5	3	5
UBZ025080	2.5	80	3.5	3	5
UBZ025100		100			
UBZ026100	2.6	100	4	3	6.5
UBZ027100	2.7	100	4	3	6.5
UBZ028100	2.8	100	4	3	6.5
UBZ029100	2.9	100	4	3	6.5
UBZ030080	3	80	4.5	3	6.5
UBZ030100		100			
UBZ031100	3.1	100	4.5	3	6.5
UBZ032100	3.2	100	4.5	3	6.5
UBZ033100	3.3	100	4.5	3	6.5
UBZ034100	3.4	100	4.5	3	6.5
UBZ035080	3.5	80	5	3	8
UBZ035100		100			
UBZ036100	3.6	100	5	3	8
UBZ037100	3.7	100	5	3	8
UBZ038100	3.8	100	5	3	8
UBZ039100	3.9	100	5	3	8
UBZ040080	4	80	5.5	4	8
UBZ040100		100			
UBZ041100	4.1	100	5.5	4	8
UBZ042100	4.2	100	5.5	4	8
UBZ043100	4.3	100	5.5	4	8
UBZ044100	4.4	100	5.5	4	8
UBZ045080	4.5	80	6	4	8
UBZ045100		100			
UBZ046100	4.6	100	6	4	8
UBZ047100	4.7	100	6	4	8
UBZ048100	4.8	100	6	4	8
UBZ049100	4.9	100	6	4	8
UBZ050080	5	80	7	4	10
UBZ050100		100			
UBZ051100	5.1	100	7	4	10
UBZ052100	5.2	100	7	4	10
UBZ053100	5.3	100	7	4	10
UBZ054100	5.4	100	7	4	10
UBZ055080	5.5	80	8	4	10
UBZ055100		100			
UBZ056100	5.6	100	8	4	10
UBZ057100	5.7	100	8	4	10
UBZ058100	5.8	100	8	4	10
UBZ059100	5.9	100	8	4	10
UBZ060080	6	80	9	4	10
UBZ060100		100			
UBZ061100	6.1	100	9	4	10
UBZ062100	6.2	100	9	4	10
UBZ063100	6.3	100	9	4	10
UBZ064100	6.4	100	9	4	10
UBZ065100	6.5	100	10	4	12
UBZ070100	7	100	10	4	12
UBZ075100	7.5	100	11	4	12
UBZ080080	8	80	11	4	12
UBZ080100		100			
UBZ085100	8.5	100	13	4	15
UBZ090100	9	100	13	4	15
UBZ095100	9.5	100	14	4	15
UBZ100100	10	100	14	4	15
UBZ105100	10.5	100	15	4	15
UBZ110100	11	100	15	4	15
UBZ115100	11.5	100	16	4	15
UBZ120100	12	100	16	4	15
UBZ125100	12.5	100	17	4	15
UBZ130100	13	100	17	4	15
UBZ135100	13.5	100	18	4	15
UBZ140100	14	100	18	4	15
UBZ150100	15	100	19	4	15
UBZ160100	16	100	20	4	15
UBZ170100	17	100	21	4	15
UBZ180100	18	100	22	4	15
UBZ190100	19	100	23	4	15
UBZ200100	20	100	25	4	15

Material: 1.3343 (M2) **Hardness:** 62 - 66 HRC
Head Hardness: 45 - 55 HRC

NEW



How to order:
Shape
d3
P/W
L1
L
Material



UBZY x 10 x P7.0 x 13 x 80 - M2
UBZO x 10 x P8.2 x W5.2 x 25 x 100 - M2

Bottle-neck Stepped Punch DIN 5118 (Trambone type)

Code: **UBZ..**

The Güvenal UBZ Series is precisely engineered for high-demand applications where strong retraction force is essential. Apart from our standards, special dimensions and complex geometries can be produced according to your technical drawings.

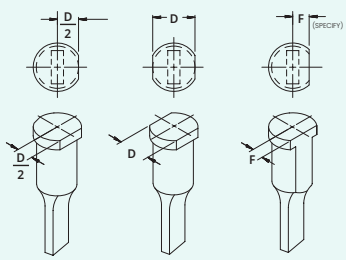
Please refer to the table on the right side

UBZY - UBZO - UBZK - UBZD - UBZA - UBZM - UBZX - UBZP

Order	d3	Head d2	t	h	r	d1 / Shape (UBZY) Round P	d1 / Shape Other Shapes W G/P	Standard L1	Alternative L1 Min. Max.	L
UBZ.. 03	3	4.5	3	6.03	6.5	1.00 ~ 2.95	1.00 ~ 2.95	10	13 - 19	50 63 71 80 90 100
UBZ.. 04	4	5.5	4	7.38	8	1.50 ~ 3.95	1.50 ~ 3.95	13	10 - 19	
UBZ.. 05	5	7	4	8.36	10	1.50 ~ 4.95	1.50 ~ 4.95	13	10 - 19	
UBZ.. 06	6	9	4	9.27	10	1.60 ~ 5.95	1.60 ~ 5.95	13	10 - 19	
UBZ.. 08	8	11	4	9.81	12	2.50 ~ 7.95	2.00 ~ 7.95	19	13 - 25	
UBZ.. 10	10	14	4	11.48	15	3.20 ~ 9.95	3.50 ~ 9.95	19	13 - 25	
UBZ.. 13	13	17	4	11.48	15	5.00 ~ 12.95	4.50 ~ 12.95	19	13 - 25	
UBZ.. 16	16	20	4	11.48	15	8.00 ~ 15.95	6.50 ~ 15.95	19	13 - 25	
UBZ.. 20	20	25	4	12.29	15	10.00 ~ 19.95	8.00 ~ 19.95	19	13 - 25	71 - 80 90 - 100

FLATS ON HEADED PRODUCTS

K1 KEY FLAT **K5** DOUBLE FLAT **K6** BODY FLAT



K1 and K5 are ground flush to shank. **K6** is a user defined flat and requires an **"F"** dimension specified with order.
K5 flats are standard 180° apart.

Order Example with Flat:
UBZO x 10 x P8.2 x W5.2 x 25 x 100 - **K1** - M2
Keying Info

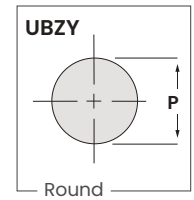
Order Example with Flat and Coating:
UBZO x 10 x P8.2 x W5.2 x 25 x 100 - K1 - M2 - **Duplex**
Coating Info

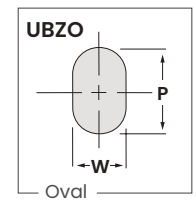
COATING

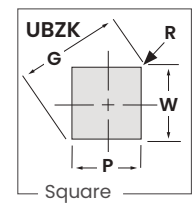
OPTIONAL FEATURES

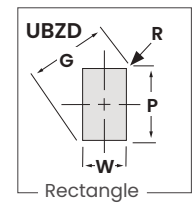
For details on Keying Information / Key Flat Options, More Complex Special Shapes, Shear Angles, and Coatings, please refer to the beginning of Category 6.

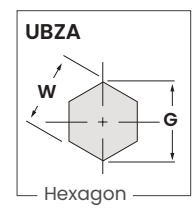
SHAPES

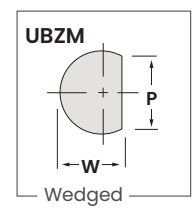


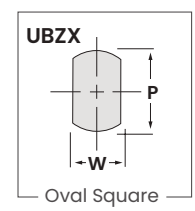


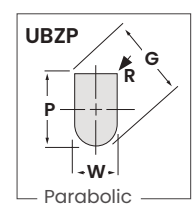


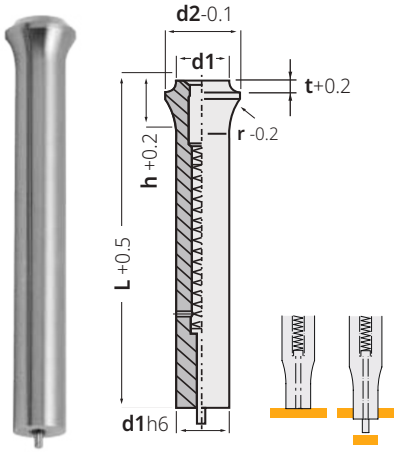












Code: **UFZ** (Blank)

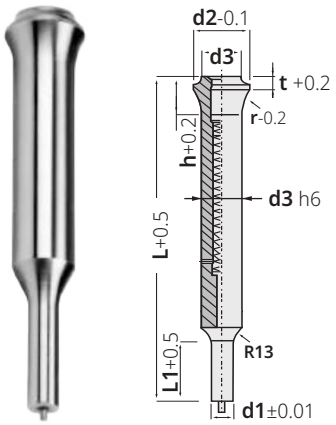
Bottle-neck Punch with Ejector

DIN 5118 (Trambone type)

Order Code	d1	L	d2	t	h	r
UFZ050080	5	80	7	4	8.36	10
UFZ050100		100				
UFZ060080	6	80	9	4	9.27	10
UFZ060100		100				
UFZ070080	7	80	10	4	9.81	12
UFZ070100		100				
UFZ080080	8	80	11	4	9.81	12
UFZ080100		100				
UFZ090100	9	100	13	4	11.48	15
UFZ100100	10	100	14	4	11.48	15
UFZ105100	10.5	100	14.5	4	11.48	15
UFZ110100	11	100	15	4	11.48	15
UFZ120100	12	100	16	4	11.48	15
UFZ130100	13	100	17	4	11.48	15
UFZ150100	15	100	19	4	11.48	15
UFZ155100	15.5	100	19.5	4	11.48	15
UFZ160100	16	100	20	4	11.48	15
UFZ200100	20	100	25	4	12.29	15
UFZ250100	25	100	31	4	13	15

Material: 1.3343 (M2)
Hardness: 62 - 66 HRC
Head Hardness: 45 - 55 HRC

NEW



Code: **UFZ..**

Bottle-neck Stepped Punch with Ejector

DIN 5118 (Trambone type)

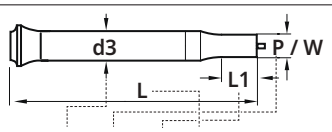
The Güvenal UFZ Series is precisely engineered for high-demand applications where strong retraction force is essential. Apart from our standards, special dimensions and complex geometries can be produced according to your technical drawings.

Please refer to the table on the right side
UFZY - UFZO - UFZK - UFZD - UFZA - UFZM - UFZX - UFZP

Order	d3	d1 / Shape (UFZY) Round P	d1 / Shape Other Shapes W G/P	L1 Standard	L
UFZ.. 05	5	2.00 ~ 4.95	2.00 ~ 4.95	13	80 / 100
UFZ.. 06	6	2.00 ~ 5.95	2.00 ~ 5.95	13	
UFZ.. 08	8	4.00 ~ 7.95	3.00 ~ 7.95	19	
UFZ.. 10	10	5.00 ~ 9.95	3.50 ~ 9.95	19	
UFZ.. 13	13	6.00 ~ 12.95	4.50 ~ 12.95	19	
UFZ.. 16	16	8.00 ~ 15.95	6.50 ~ 15.95	19	
UFZ.. 20	20	10.00 ~ 19.95	8.00 ~ 19.95	19	
UFZ.. 25	25	12.00 ~ 24.95	9.00 ~ 24.95	19	

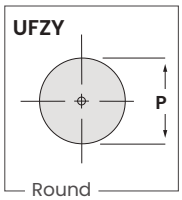
Order	Alternative L1 Min.	Alternative L1 Max.	Head d2	t	h	r
UFZ.. 05	10	19	7	4	8.36	10
UFZ.. 06	10	19	9	4	9.27	10
UFZ.. 08	13	25	11	4	9.81	12
UFZ.. 10	13	25	14	4	11.48	15
UFZ.. 13	13	25	17	4	11.48	15
UFZ.. 16	13	25	20	4	11.48	15
UFZ.. 20	13	25	25	4	12.29	15
UFZ.. 25	13	25	31	4	13	15

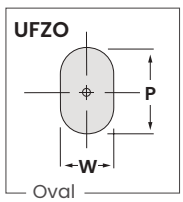
How to order:
Shape
d2
P/W
L1
L
Material

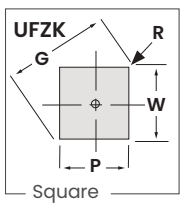


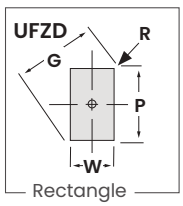
UFZY x 10 x P7.0 x 13 x 80 - M2
UFZO x 10 x P8.2 x W5.2 x 25 x 100 - M2

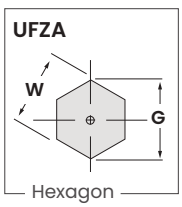
SHAPES

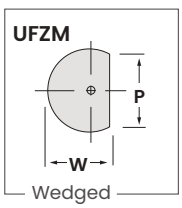


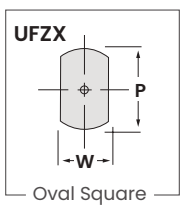


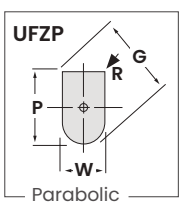


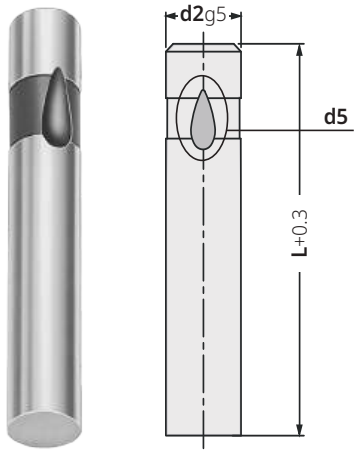












Code: **BHZ** Light Duty

Ball Lock Punch (Blank type)

ISO 10071

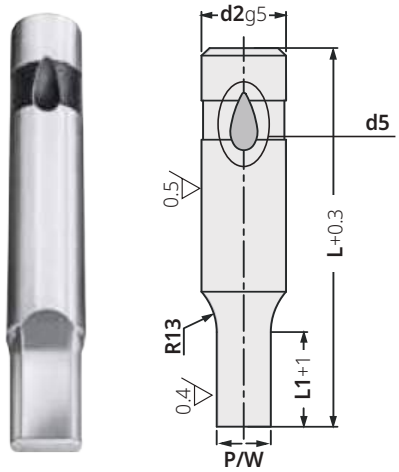
d2	d5	L
6	6	63
		71
		80
		90
		100
		125
10	8	63
		71
		80
		90
		100
		125
13	8	63
		71
		80
		90
		100
		125
16	8	63
		71
		80
		90
		100
		125

d2	d5	L
20	8	63
		71
		80
		90
		100
		125
25	8	63
		71
		80
		90
		100
		125
32	8	71
		80
		90
		100
		125
38	8	80
		90
		100
		125

Order: **BHZ.** d2 x L

Material: 1.3343 (M2)
Hardness: 60-62 HRC

Body and cutting edge are precision ground. Also, full or partial coating can be preferred upon request, by providing resistance against heat and friction on external layer, it solves problems such as winding and cold welding.



Code: **BH...** Light Duty

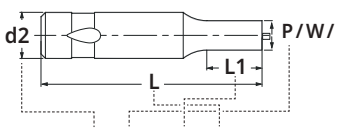
Ball Lock Stepped Punch

Please refer to the table on the right side

BHY - BHO - BHK - BHD - BHA -BHM - BHX - BHP

Order d2	Ball Socket d5	Shape (BHY) Round P	Shape Other Shapes W G/P	Standard L1	Alternative L1 Min. Max.	L
BH.. 06	6	2.2 ~ 5.9	2.2 ~ 5.9	13	10 -	63
BH.. 10	8	2.5 ~ 9.9	2.5 ~ 99	19	10 19	71
BH.. 13	8	5.0 ~ 12.9	4.5~12.9	19	13 25	80
BH.. 16	8	8.0 ~ 15.9	6.0~15.9	19	13 25	90
BH.. 20	8	12 ~ 19.9	8 ~19.9	19	13 25	100
BH.. 25	8	16 ~ 24.9	10~24.9	19	13 25	125
BH.. 32	8	24 ~ 31.9	12.5~31.9	25	25 30	80 90
BH.. 38	8	30 ~ 37.9	14~37.9	25	25 30	100 125

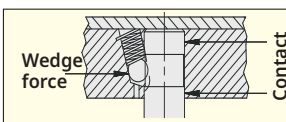
How to order:
Shape
d2
P/W
L1
L
Material



BHY x 10 x P8.2 x 19 x 100 - M2
BHO x 13 x P8.2 x W5.2 x 25 x 100 - M2

- When P = d2 shank / body tolerances apply.

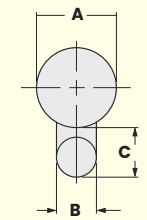
Material: 1.3343 (M2)
Hardness: 60- 62 HRC



Space Requirements of Ball Locking Place

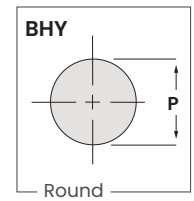
Punch Dia. A	Ball Dia. B	Clearance C
6	6	10
10	8	11
13		
16		
20		
25		
32		
38		

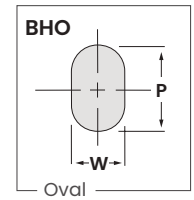
Connecting Punch to Retainer with Ball Socket

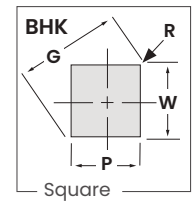


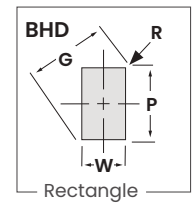
for precise retainers, please add 1.7 to **"C"** dimension

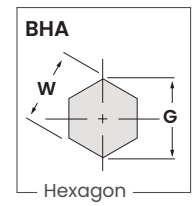
SHAPES

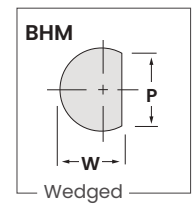


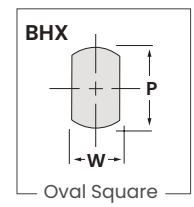


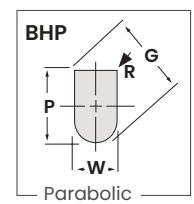


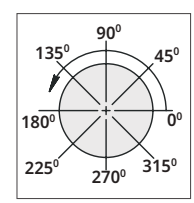


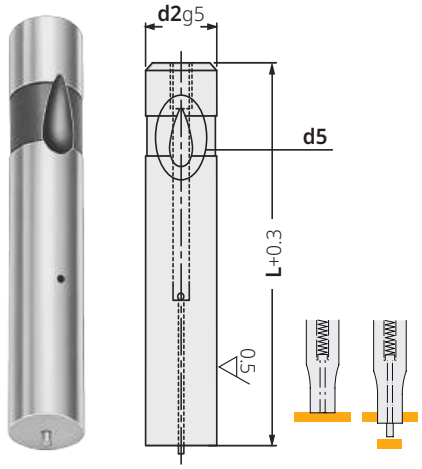












Code: **BFZ** Light Duty

Ball Lock Punch with Ejector

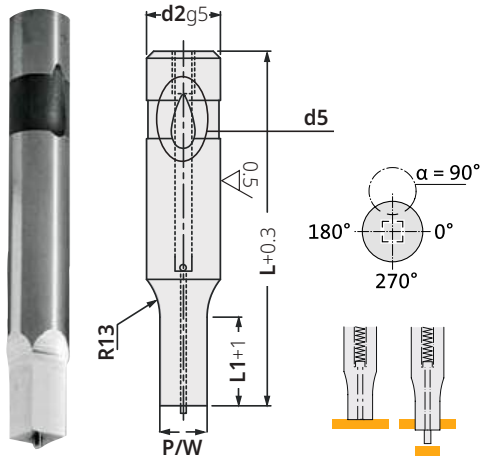
ISO 10071 (Blank type)

d2	d5	L
6	6	63
		71
		80
		90
		100
		125
10	8	63
		71
		80
		90
		100
		125
13	8	63
		71
		80
		90
		100
		125
16	8	63
		71
		80
		90
		100
		125
20	8	63
		71
		80
		90
		100
		125
25	8	63
		71
		80
		90
		100
		125
32	8	71
		80
		90
		100
		125
38	8	80
		90
		100
		125

Order: **BFZ.** d2 x L

Material: 1.3343 (M2)
Hardness: 60-62 HRC

Body and cutting edge are precision ground. Also, full or partial coating can be preferred upon request, by providing resistance against heat and friction on external layer, it solves problems such as winding and cold welding.



Code: **BF...** Light Duty

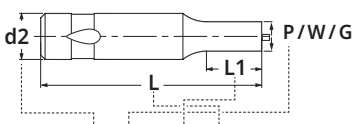
Ball Lock Stepped Punch with Ejector

Please refer to the table on the right side

BFY - BFO - BFK - BFD - BFA -BFM - BFX - BFP

Order d2	Ball Socket d5	Shape (BFY) Round P	Shape Other Shapes W G/P	Standard L1	Alternative L1 Min. Max.	L
BF.. 06	6	2.2 ~ 5.9	2.2 ~ 5.9	13	10 -	63 71 80 90 100 125
BF.. 10	8	2.5 ~ 9.9	2.5 ~ 99	19	10 19	
BF.. 13	8	5.0 ~ 12.9	4.5~12.9	19	13 25	
BF.. 16	8	8.0 ~ 15.9	6.0~15.9	19	13 25	
BF.. 20	8	12 ~ 19.9	8 ~19.9	19	13 25	
BF.. 25	8	16 ~ 24.9	10~24.9	19	13 25	
BF.. 32	8	24 ~ 31.9	12.5~31.9	25	25 30	80 90 100 125
BF.. 38	8	30 ~ 37.9	14~37.9	25	25 30	

How to order:
Shape
d2
P/W
L1
L
Material



BFY x 10 x P8.2 x 19 x 100 - M2
BFO x 13 x P8.2 x W5.2 x 25 x 100 - M2

- When P = d2 shank / body tolerances apply.

Material: 1.3343 (M2)
Hardness: 60- 62 HRC

Round / **P** +01 / -00
.01 From **P** to **d2**

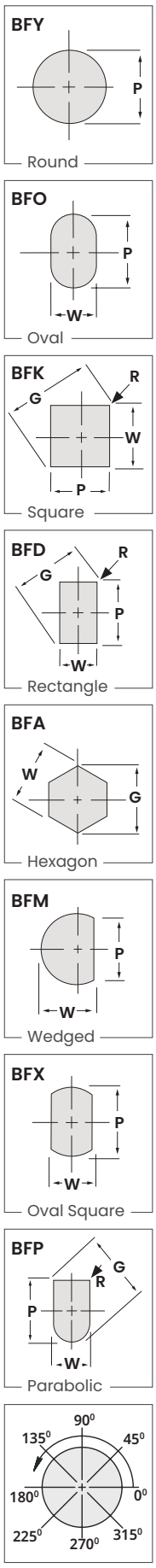
Shape / **P/W/G** ±01
.02 From **P** to **d2**

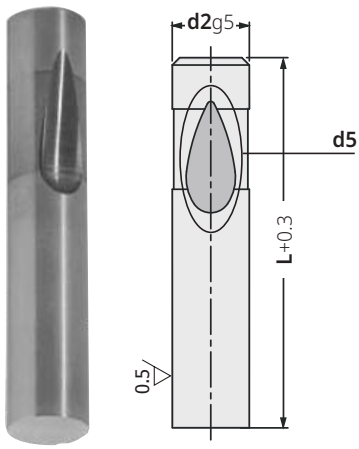
Standard Tolerances

Standard position of ball socket is 90°.
It can be preferred as 0°- 180°- 270°.

Note: Parts are viewed in die position looking from above the die. Punches are viewed looking through the body. Matrixes are viewed through top face.

SHAPES





Code: **BAZ** Heavy Duty

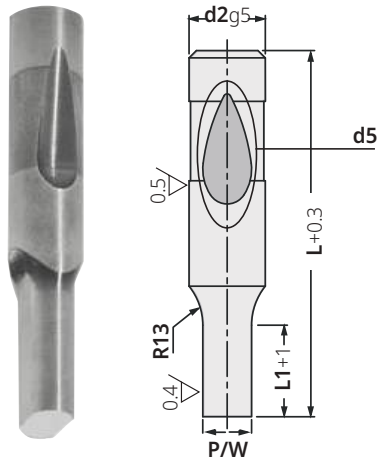
Ball Lock Punch (Blank type)

d2	d5	L
10	10	71
		80
		90
		100
13	12	71
		80
		90
		100
		125
16	12	71
		80
		90
		100
		125
20	12	71
		80
		90
		100
		125
25	12	80
		90
		100
		110
		125
32	12	80
		90
		100
		110
		125
40	12	80
		90
		100
		110
		125

Order: **BAZ.** d2 x L

Material: 1.3343 (M2)
Hardness: 60-62 HRC

Body and cutting edge are precision ground. Also, full or partial coating can be preferred upon request, by providing resistance against heat and friction on external layer, it solves problems such as winding and cold welding.



Code: **BA...** Heavy Duty

Ball Lock Stepped Punch

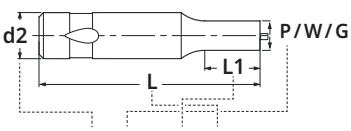
Please refer to the table on the right side

BAY - BAO - BAK - BAD - BAA -BAM - BAX - BAP

Order d3	Ball Socket d5	Shape (BAY) Round P	Shape Other Shapes W G/P	Standard L1	Alternative L1 Min. Max.	L
BA.. 10	10	2.5 ~ 9.8	2.5 ~ 10	19	10 19	71 80 90 100 110 125
BA.. 13	12	5 ~ 12.8	4.5 ~ 13	19	13 25	
BA.. 16	12	8 ~ 15.8	6 ~ 16	19	13 25	
BA.. 20	12	12 ~ 19.8	8 ~ 20	19	13 25	
BA.. 25	12	16 ~ 24.8	10 ~ 25	19	13 25	
BA.. 32	12	24 ~ 31.8	12 ~ 32	19	13 25	
BA.. 40	12	30 ~ 39.8	14 ~ 40	25	19 30	

- BA.. Punches conform to NAAMS standards.

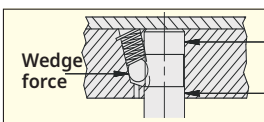
How to order:
Shape
d2
P/W
L1
L
Material



BAY x 10 x P5.5 x 19 x 90 - M2
BAO x 13 x P8.2 x W6.1 x 19 x 100 - M2

- When P = d2 shank / body tolerances apply.

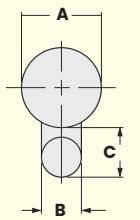
Material: 1.3343 (M2)
Hardness: 60- 62 HRC



Space Requirements of Ball Locking Place

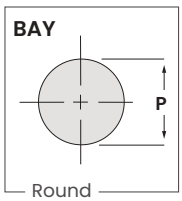
Punch Dia. A	Ball Dia. B	Clearance C
10	10	13
13	12	15
16		
20		
25		
32		
40		

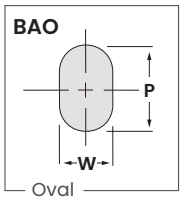
Connecting Punch to Retainer with Ball Socket

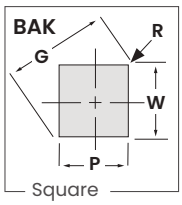


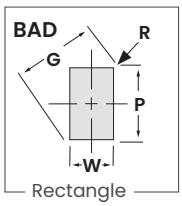
for precise retainers, please add 1.7 to **"C"** dimension

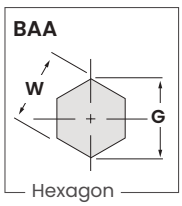
SHAPES

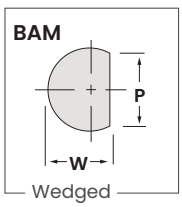


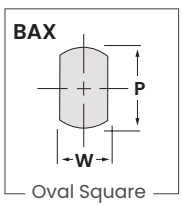


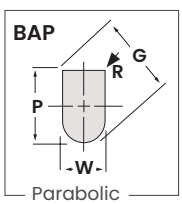


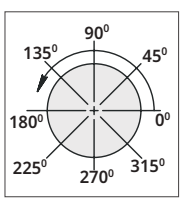


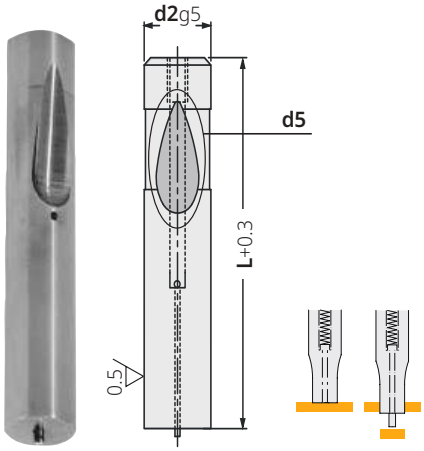












Code: **BAFZ** Heavy Duty

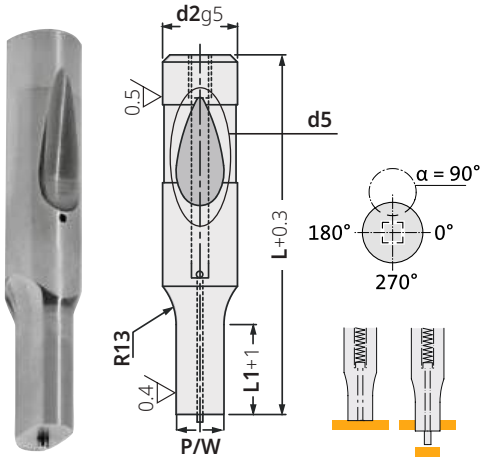
Ball Lock Punch with Ejector
(Blank type)

d2	d5	L
10	10	71
		80
		90
		100
13	12	71
		80
		90
		100
		125
16	12	70
		80
		90
		100
		125
20	12	71
		80
		90
		100
		125
25	12	80
		90
		100
		110
		125
32	12	80
		90
		100
		110
		125
40	12	80
		90
		100
		110
		125

Order: **BAFZ.** d2 x L

Material: 1.3343 (M2)
Hardness: 60-62 HRC

Body and cutting edge are precision ground. Also, full or partial coating can be preferred upon request, by providing resistance against heat and friction on external layer, it solves problems such as winding and cold welding.



Code: **BAF...** Heavy Duty

Ball Lock Stepped Punch with Ejector

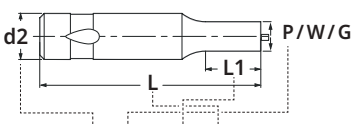
Please refer to the table on the right side

BAFY - BAFO - BAFK - BAFD - BAFA -BAFM - BAFX - BAFP

Order d3	Ball Socket d5	Shape (BAFY) Round P	Shape Other Shapes W G/P	Standard L1	Alternative L1 Min. Max.	L
BAF.. 10	10	2.5 ~ 9.8	2.5 - 10	19	10 19	71 80 90 100 110 125
BAF.. 13	12	5.0 ~ 12.8	4.5 - 13	19	13 25	
BAF.. 16	12	8.0 ~ 15.8	6.0 - 16	19	13 25	
BAF.. 20	12	12 ~ 19.8	8.0 - 20	19	13 25	
BAF.. 25	12	16 ~ 24.8	10 - 25	19	13 25	
BAF.. 32	12	24 ~ 31.8	12 - 32	19	13 25	
BAF.. 40	12	30 ~ 39.8	14 - 40	25	19 30	

- BAF.. Punches conform to NAAMS standards.

How to order:
Shape
d2
P/W
L1
L
Material



BAFY x 10 x P8.2 x 19 x 100 - M2
BAFO x 13 x P8.2 x W5.2 x 25 x 100 - M2

- When P = d2 shank / body tolerances apply.

Material: 1.3343 (M2)
Hardness: 60- 62 HRC

Round / **P** +01 / -00
.01 From **P** to **d2**

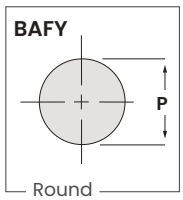
Shape / **P/W/G** ±01
.02 From **P** to **d2**

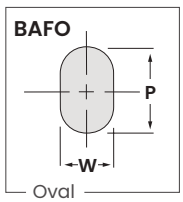
Standard Tolerances

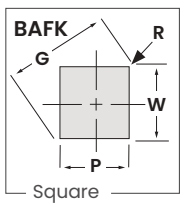
Standard position of ball socket is 90°.
It can be preferred as 0°- 180°- 270°.

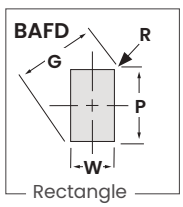
Note: Parts are viewed in die position looking from above the die. Punches are viewed looking through the body. Matrixes are viewed through top face.

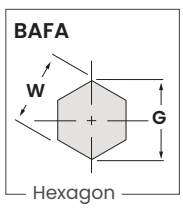
SHAPES

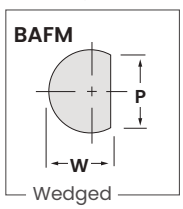


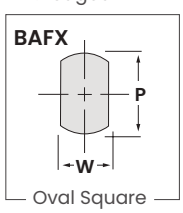


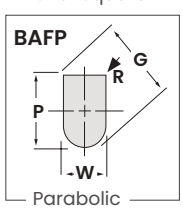


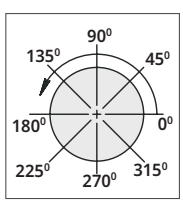


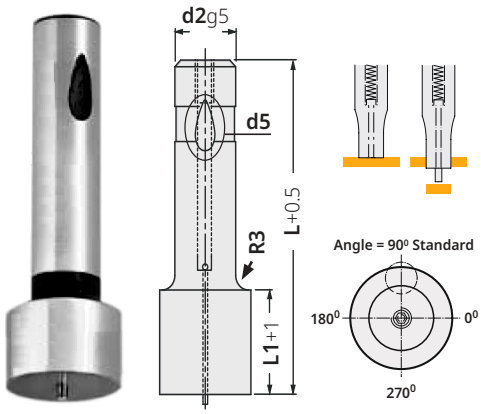












ROUND TYPE PUNCHES

Code: **BG..** Light Duty

Larger Ball Lock Ejector Punch

Body and outer dia. are precision ground.

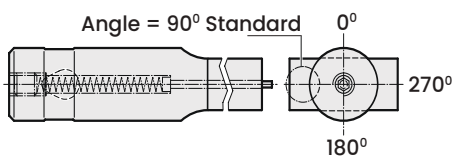
Order d2	Ball Socket d5	P (round) Min. Max.	L1 Min. - Max.	L
BGY. 10	8	10.1 ~ 25	16	
BGY. 13	8	13.1 ~ 32	20	
BGY. 16	8	16.1 ~ 38	25	80
BGY. 20	8	20.1 ~ 40	25	90
BGY. 25	8	25.1 ~ 44	25	100
BGY. 32	8	32.1 ~ 50	32	
BGY. 40	8	40.1 ~ 63	32	

Round Shaped

Order: **BG..**
d2 x P/W/G x L1 x L

Please refer to the table on the right side
BGY - BGO - BGK - BGD - BGA - BGM - BGX - BGP

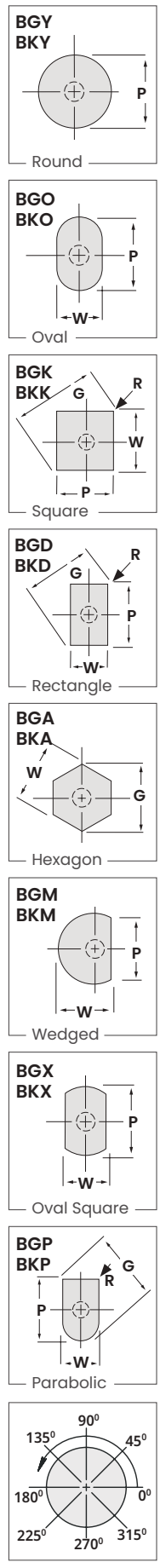
SHAPED TYPE PUNCHES

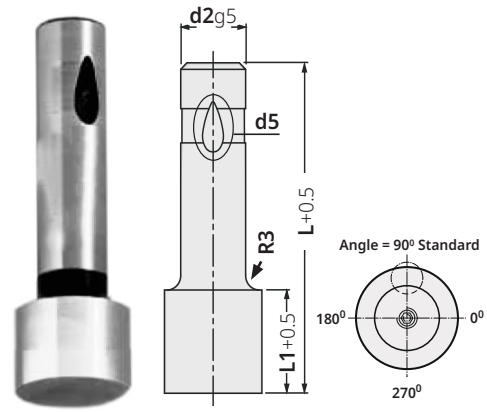


Order d2	Ball Socket d5	P (shape) Min. Max.	L1 Min. - Max.	L
BG.. 10	8	3.0 ~ 25	16	
BG.. 13	8	5.0 ~ 32	20	
BG.. 16	8	6.5 ~ 38	25	80
BG.. 20	8	8.0 ~ 40	25	90
BG.. 25	8	10 ~ 44	25	100
BG.. 32	8	11.5 ~ 50	32	
BG.. 40	8	14 ~ 63	32	

Note: Special dimensions on request.

SHAPES





ROUND TYPE PUNCHES

Code: **BK..** Light Duty

Larger Ball Lock Punch

Body and outer dia. are precision ground.

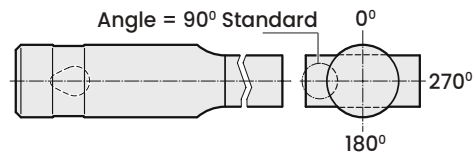
Order d2	Ball Socket d5	P (round) Min. Max.	L1 Min. - Max.	L
BKY. 10	8	10.1 ~ 25	16	
BKY. 13	8	13.1 ~ 32	20	
BKY. 16	8	16.1 ~ 38	25	80
BKY. 20	8	20.1 ~ 40	25	90
BKY. 25	8	25.1 ~ 44	25	100
BKY. 32	8	32.1 ~ 50	32	
BKY. 40	8	40.1 ~ 63	32	

Round Shaped

Order: **BK..**
d2 x P/W/G x L1 x L

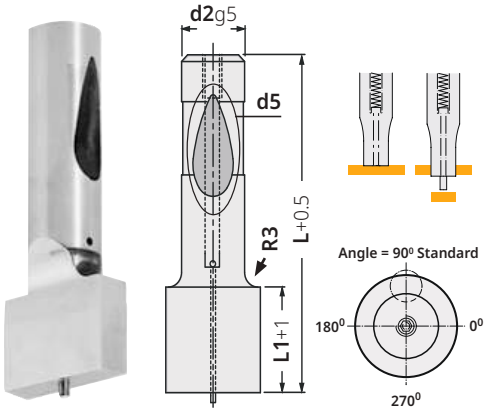
Please refer to the table on the left side
BKY - BKO - BKK - BKD - BKA - BKM - BKX - BKP

SHAPED TYPE PUNCHES

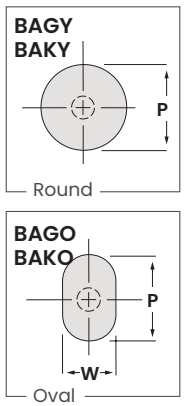


Order d2	Ball Socket d5	P (shape) Min. Max.	L1 Min. - Max.	L
BK.. 10	8	3.0 ~ 25	16	
BK.. 13	8	5.0 ~ 32	20	
BK.. 16	8	6.5 ~ 38	25	80
BK.. 20	8	8.0 ~ 40	25	90
BK.. 25	8	10 ~ 44	25	100
BK.. 32	8	11.5 ~ 50	32	
BK.. 40	8	14 ~ 63	32	

Note: Special dimensions on request.



SHAPES



ROUND TYPE PUNCHES

Code: **BAG..** Heavy Duty

Larger Ball Lock Ejector Punch

Body and outer dia. are precision ground.

Order d2	Ball Socket d5	P (round) Min. Max.	L1 Min. - Max.	L
BAGY. 10	10	10.1 ~ 25	16	
BAGY. 13	12	13.1 ~ 32	20	
BAGY. 16	12	16.1 ~ 38	25	80
BAGY. 20	12	20.1 ~ 40	25	90
BAGY. 25	12	25.1 ~ 47	25	100
BAGY. 32	12	32.1 ~ 63	32	
BAGY. 40	12	40.1 ~ 63	32	

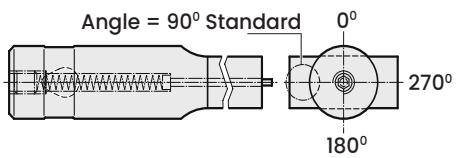
- BAG.. Punches conform to NAAMS standards.

Round Shaped — Order: **BAG..** d2 x P/W/G x L1 x L

Please refer to the table on the right side

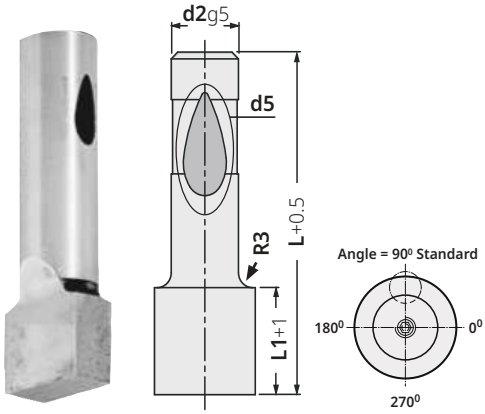
BAGY - BAGO - BAGK - BAGD - BAGA - BAGM - BAGX - BAGP

SHAPED TYPE PUNCHES



Order d2	Ball Socket d5	P (shape) Min. Max.	L1 Min. - Max.	L
BAG.. 10	10	3.0 ~ 25	16	
BAG.. 13	12	5.0 ~ 32	20	
BAG.. 16	12	6.5 ~ 38	25	80
BAG.. 20	12	8.0 ~ 40	25	90
BAG.. 25	12	10 ~ 47	25	100
BAG.. 32	12	11.5 ~ 63	32	
BAG.. 40	12	14 ~ 63	32	

Note: Special dimensions on request.



ROUND TYPE PUNCHES

Code: **BAK..** Heavy Duty

Larger Ball Lock Punch

Body and outer dia. are precision ground.

Order d2	Ball Socket d5	P (round) Min. Max.	L1 Min. - Max.	L
BAKY. 10	10	10.1 ~ 25	16	
BAKY. 13	12	13.1 ~ 32	20	
BAKY. 16	12	16.1 ~ 38	25	80
BAKY. 20	12	20.1 ~ 40	25	90
BAKY. 25	12	25.1 ~ 47	25	100
BAKY. 32	12	32.1 ~ 63	32	
BAKY. 40	12	40.1 ~ 63	32	

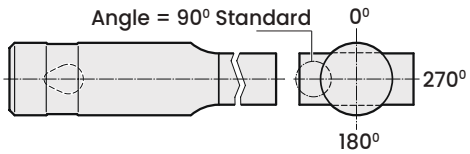
- BAK.. Punches conform to NAAMS standards.

Round Shaped — Order: **BAK..** d2 x P/W/G x L1 x L

Please refer to the table on the left side

BAKY - BAKO - BAKK - BAKD - BAKA - BAKM - BAKX - BAKP

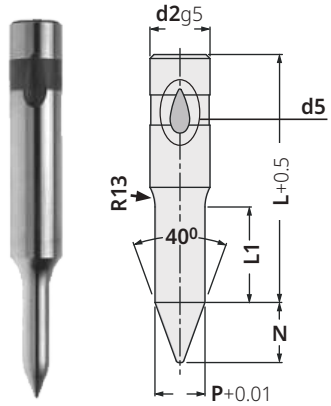
SHAPED TYPE PUNCHES



Order d2	Ball Socket d5	P (shape) Min. Max.	L1 Min. - Max.	L
BAK.. 10	10	3.0 ~ 25	16	
BAK.. 13	12	5.0 ~ 32	20	
BAK.. 16	12	6.5 ~ 38	25	80
BAK.. 20	12	8.0 ~ 40	25	90
BAK.. 25	12	10 ~ 47	25	100
BAK.. 32	12	11.5 ~ 63	32	
BAK.. 40	12	14 ~ 63	32	

Note: Special dimensions on request.

Pilots enter a previously punched hole to accurately position the workpiece and hold it in place before the main punches operate. This ensures precise and repeatable punching operations.



Code: **BPK** Light Duty

Ball Lock Pilot - **Conical**

d2	d5	P	L1	N	L
10	8	5.9 ~ 9.9	19	8	71
13	8	9.9 ~ 12.9	19	10	80
16	8	12.9 ~ 15.9	25	15	100
20	8	15.9 ~ 19.9	25	20	71
25	8	19.9 ~ 24.9	25	25	80
32	8	24.9 ~ 31.9	25	30	100
38	8	31.9 ~ 37.9	30	35	125
					140

Note: P / L selection upon request.
- Special dimensions on request.

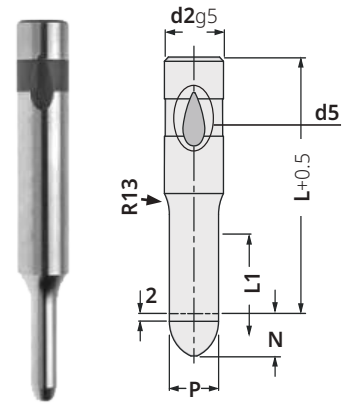
Order: **BPK.** d2 x P x L

Material: 1.3343 (M2)
Hardness: 60-62 HRC

"N" becomes = 1.2 x "P" minimum when "P" is below (see table).

Round / **P** +01 / -00 | .01 | From **P** to **d2**

- When P = d2 shank / body tolerances apply.



Code: **BPX** Light Duty

Ball Lock Pilot - **Spherical**

d2	d5	P	L1	N	L
6	6	2.9 ~ 5.9	13	-	71
10	8	5.9 ~ 9.9	19	8	80
13	8	9.9 ~ 12.9	19	10	100
16	8	12.9 ~ 15.9	25	15	71
20	8	15.9 ~ 19.9	25	15	80
25	8	19.9 ~ 24.9	25	20	100
32	8	24.9 ~ 31.9	25	25	125
					140

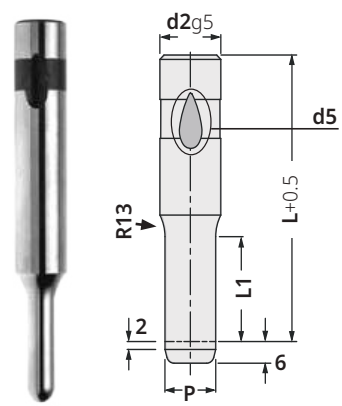
Note: P / L selection upon request.
- Special dimensions on request.

Order: **BPX.** d2 x P x L

Material: 1.3343 (M2)
Hardness: 60-62 HRC

- It is length of "L" pilot except end.
- 2 mm length is guided to punch before punch contacting sheet metal.

	P	N
10.1 mm	≤ 10 mm	8 mm
	- 15 mm	12 mm
	> 15 mm	15 mm



Code: **BPP** Light Duty

Ball Lock Pilot - **Parabolic**

d2	d5	P	L1	L
6	6	2.2 ~ 6.0	13	
10	8	2.5 ~ 10	19	63
13	8	5 ~ 13	19	71
16	8	8 ~ 16	19	80
20	8	12 ~ 20	19	90
25	8	16 ~ 25	19	100

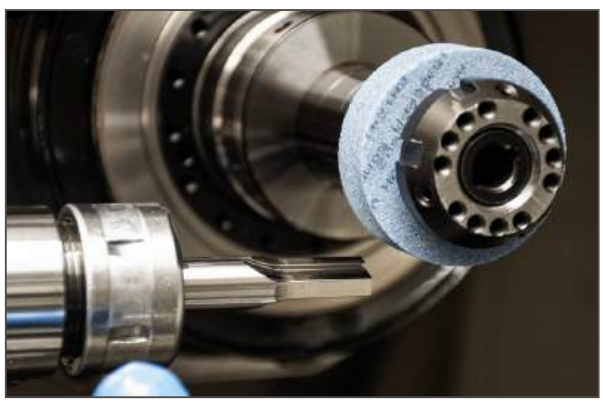
Note: P / L selection upon request.
- Special dimensions on request.

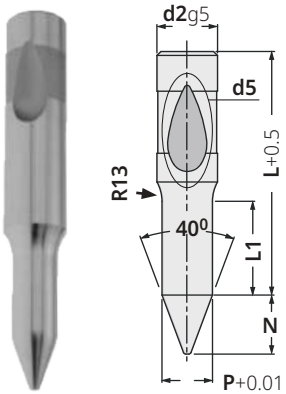
Order: **BPP.** d2 x P x L

Material: 1.3343 (M2)
Hardness: 60-62 HRC

Round / **P** +01 / -00 | .01 | From **P** to **d2**

- When P = d2 shank / body tolerances apply.





Code: **BAPK** Heavy Duty

Ball Lock Pilot - **Conical**

d2	d5	P	L1	N	L
10	10	5.9 ~ 9.9	19	8	80
13	12	9.9 ~ 12.9	19	10	100
16	12	12.9 ~ 15.9	25	15	125
20	12	15.9 ~ 19.9	25	20	80
25	12	19.9 ~ 24.9	25	25	100
32	12	24.9 ~ 31.9	25	30	125
38	12	31.9 ~ 37.9	30	35	140
					150

Note: P / L selection upon request.
- Special dimensions on request.

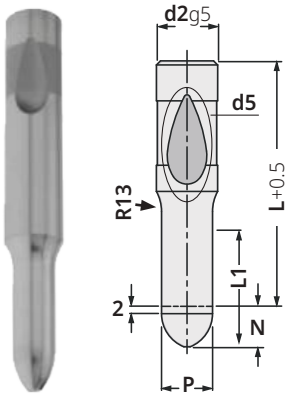
Order: **BAPK.** d2 x P x L

Material: 1.3343 (M2)
Hardness: 60-62 HRC

"N" becomes = 1.2 x "P" minimum when "P" is below (see table).

Round / **P** +01 / -00 | .01 | From **P** to **d2**

- When P = d2 shank / body tolerances apply.



Code: **BAPX** Heavy Duty

Ball Lock Pilot - **Spherical**

d2	d5	P	L1	N	L
10	10	2.5 ~ 10	19	10	71
13	12	5 ~ 13	19	10	80
16	12	8 ~ 16	19	10	100
20	12	12 ~ 20	19	10	71
25	12	16 ~ 25	19	10	80
32	12	24 ~ 32	19	10	100
40	12	30 ~ 40	25	10	125

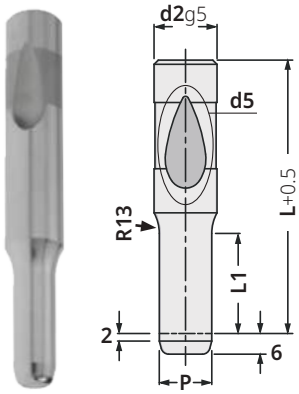
Note: P / L selection upon request.
- Special dimensions on request.

Order: **BAPX.** d2 x P x L

Material: 1.3343 (M2)
Hardness: 60-62 HRC

- It is length of "L" pilot except end.
- 2 mm length is guided to punch before punch contacting sheet metal.

	P	N
10.1 mm	≤ 10 mm	8 mm
	- 15 mm	12 mm
	> 15 mm	15 mm



Code: **BAPP** Heavy Duty

Ball Lock Pilot - **Parabolic**

d2	d5	P	L1	L
10	10	2.5 ~ 10	19	71
13	12	5 ~ 13	19	80
16	12	8 ~ 16	19	100
20	12	12 ~ 20	19	71
25	12	16 ~ 25	19	80
32	12	24 ~ 32	19	100
40	12	30 ~ 40	25	125

Note: P / L selection upon request.
- Special dimensions on request.

Order: **BAPP.** d2 x P x L

Material: 1.3343 (M2)
Hardness: 60-62 HRC

Round / **P** +01 / -00 | .01 | From **P** to **d2**

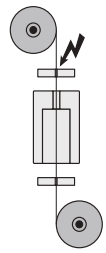
- When P = d2 shank / body tolerances apply.

"GÜVENAL is the right address for high-quality Die & Mould Components, including precision punches and matrix, for all industrial applications."

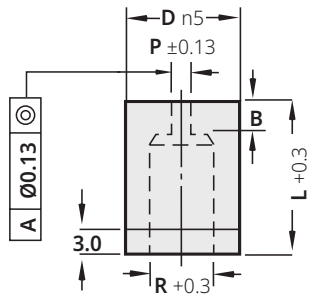
Code: **MKB**

Matrix with Counter-bore Relief

Blank type & with starting holes for wire-edm ISO 8977



With starting holes for "wire-edm".



D	P	B - point length		R	L
		S (standard)	A (optional)		
8	0.8	4	-	4	20
10	0.8	4	8	6	22
13	1.6	5	8	8	25
16	1.6	5	8	9.5	28
20	1.6	5	12	12	30
22	1.6	6	12	15	32
25	1.6	6	12	17.5	35
28	1.6	6	12	17.5	40
30	1.6	6	12	17.5	60
32	1.6	6	12	21	
35	1.6	6	12	21	
38	1.6	8	12	27	
40	1.6	8	12	27	
45	3.2	8	12	36	
50	3.2	8	12	41	

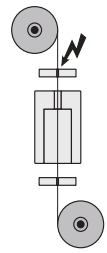
Order: **MKB.** D x L - B

Material: 1.3343 (M2)
Hardness: 60 - 62 HRC

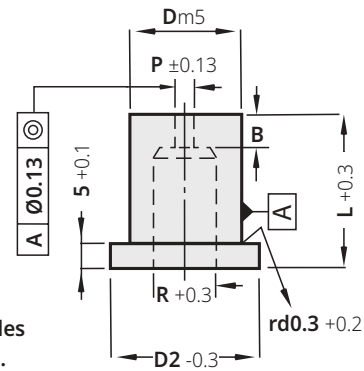
Code: **MLB**

Headed Matrix with Counter-bore Relief

Blank type & with starting holes for wire-edm ISO 8977



With starting holes for "wire-edm".

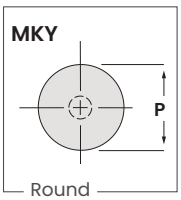


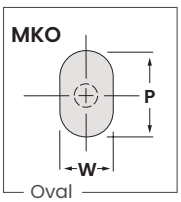
D	D2	P	B - point length		R	L
			S (standard)	A (optional)		
8	11	0.8	4	-	4	20
10	13	0.8	4	8	6	22
13	16	1.6	5	8	8	25
16	19	1.6	5	8	9.5	28
20	23	1.6	5	12	12	30
22	25	1.6	6	12	15	32
25	28	1.6	6	12	17.5	35
28	31	1.6	6	12	17.5	40
30	33	1.6	6	12	17.5	
32	35	1.6	6	12	21	
35	38	1.6	6	12	21	
38	41	1.6	8	12	27	
40	43	1.6	8	12	27	

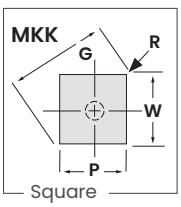
Order: **MLB.** D x L - B

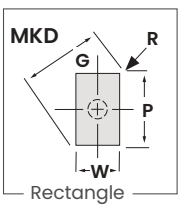
Material: 1.3343 (M2)
Hardness: 60 - 62 HRC

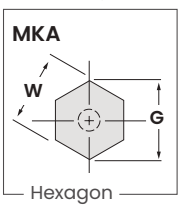
SHAPES

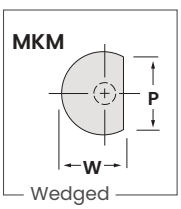


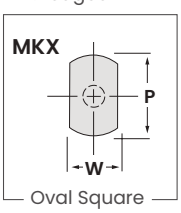


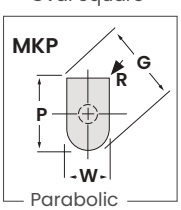


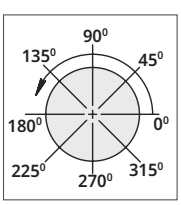


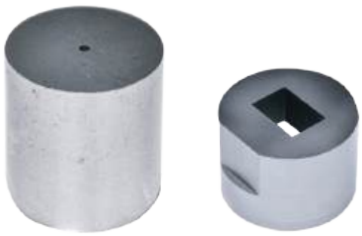


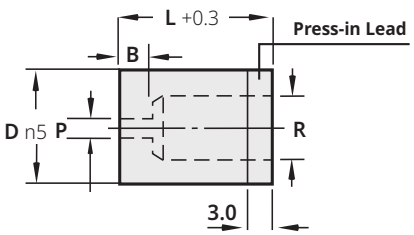












Code: **MK..**

Please refer to the table on the left side

MKY - MKO - MKK - MKD - MKA - MKM - MKX - MKP

Matrix - Straight ISO 8977

Apart from our standards, special dimensions and complex geometries can be produced according to your technical drawings.

Code	D	B - point length		ROUND (MKY)	SHAPE	R	L								
		S (standard)	A (optional)	Range P	Min. W Max. P/G		20	22	25	28	30	32	35	40	60
MK...08	8	4	-	1.50 - 3.20	1.50 - 3.20	4	•	•	•	•	•	•	•		
MK...10	10	4	8	1.60 - 5.00	1.60 - 5.00	6	•	•	•	•	•	•	•		
MK...13	13	5	8	1.80 - 7.20	1.80 - 7.20	8	•	•	•	•	•	•	•		
MK...16	16	5	8	5.00 - 8.80	2.50 - 8.80	9.5	•	•	•	•	•	•	•		
MK...20	20	5	12	5.50 - 11.00	3.20 - 11.00	12	•	•	•	•	•	•	•	•	
MK...22	22	6	12	7.50 - 14.00	4.00 - 14.00	15	•	•	•	•	•	•	•	•	
MK...25	25	6	12	9.50 - 16.50	4.80 - 16.50	17.5	•	•	•	•	•	•	•	•	
MK...28	28	6	12	11.50 - 19.50	4.80 - 20.00	17.5	•	•	•	•	•	•	•	•	
MK...30	30	6	12	11.50 - 20.00	4.80 - 20.00	17.5	•	•	•	•	•	•	•	•	
MK...32	32	6	12	13.00 - 20.00	5.50 - 20.00	21	•	•	•	•	•	•	•	•	
MK...35	35	6	12	13.00 - 23.00	5.50 - 23.00	21	•	•	•	•	•	•	•	•	
MK...38	38	8	12	16.00 - 26.00	6.40 - 26.00	27	•	•	•	•	•	•	•	•	
MK...40	40	8	12	16.00 - 26.00	6.40 - 26.00	27			•	•	•	•	•	•	
MK...45	45	8	12	19.00 - 35.00	8.00 - 35.00	36						•		•	•
MK...50	50	8	12	22.00 - 40.00	9.00 - 40.00	41						•		•	•

Order:
MK (type) D x L x **shape** (P/W/R/G)

Material: 1.3343 (M2)
Hardness: 60 - 62 HRC

Order Example

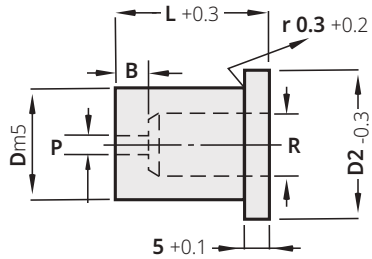
MKO 25- (A) 32 - P=13.0 W=10.5 - K1

Code | *D* | *L* | *Shape* | *Keying Info*

** "B" Point length*

* If you want the **Point Length** to be Optional, add code **(A).** No code is written in the standard.

For details on Keying Information / Key Flat Options, and More Complex Special Shapes, please refer to the beginning of Category 6.



Code: **ML..**

Matrix - Headed ISO 8977

Please refer to the table on the right side

MLY - MLO - MLK - MLD - MLA - MLM - MLX - MLP

Apart from our standards, special dimensions and complex geometries can be produced according to your technical drawings.

Code	D	D2	B - point length		ROUND (MLY)	SHAPE		R	L							
			S (standard)	A (optional)	Range P	Min. W	Max. P/G		20	22	25	28	30	32	35	40
ML...08	**8**	11	4	-	1.50 - 3.20	1.50 - 3.20		4	•	•	•	•	•	•	•	
ML...10	**10**	13	4	8	1.60 - 5.00	1.60 - 5.00		6	•	•	•	•	•	•	•	
ML...13	**13**	16	5	8	1.80 - 7.20	1.80 - 7.20		8	•	•	•	•	•	•	•	
ML...16	**16**	19	5	8	5.00 - 8.80	2.50 - 8.80		9.5	•	•	•	•	•	•	•	
ML...20	**20**	23	5	12	5.50 - 11.00	3.20 - 11.00		12	•	•	•	•	•	•	•	•
ML...22	**22**	25	6	12	7.50 - 14.00	4.00 - 14.00		15	•	•	•	•	•	•	•	•
ML...25	**25**	28	6	12	9.50 - 16.50	4.80 - 16.50		17.5	•	•	•	•	•	•	•	•
ML...28	**28**	31	6	12	11.50 - 19.50	4.80 - 20.00		17.5	•	•	•	•	•	•	•	•
ML...30	**30**	33	6	12	11.50 - 20.00	4.80 - 20.00		17.5	•	•	•	•	•	•	•	•
ML...32	**32**	35	6	12	13.00 - 20.00	5.50 - 20.00		21	•	•	•	•	•	•	•	•
ML...35	**35**	38	6	12	13.00 - 23.00	5.50 - 23.00		21	•	•	•	•	•	•	•	•
ML...38	**38**	41	8	12	16.00 - 26.00	6.40 - 26.00		27	•	•	•	•	•	•	•	•
ML...40	**40**	43	8	12	16.00 - 26.00	6.40 - 26.00		27			•	•	•	•	•	•

Order:
ML (type) D x L x **shape** (P/W/R/G)

Material: 1.3343 (M2)
Hardness: 60 - 62 HRC

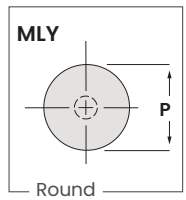
Order Example

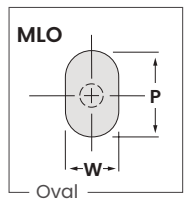
MLY 25- (A) 32 - P=13.0
Code d2 L1 Shape
** "B" Point length*

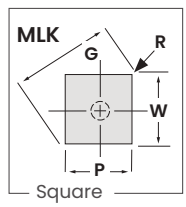
* If you want the **Point Length** to be Optional, add code **(A).** No code is written in the standard.

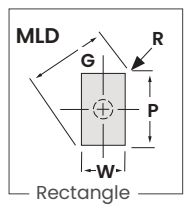
For details on Keying Information / Key Flat Options, and More Complex Special Shapes, please refer to the beginning of Category 6.

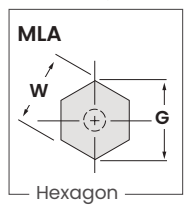
SHAPES

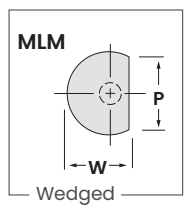


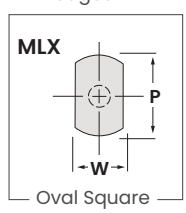


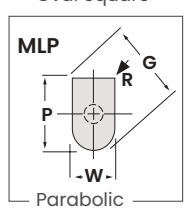


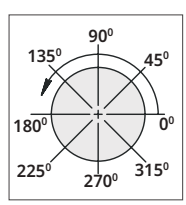




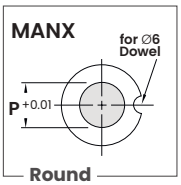


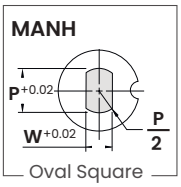


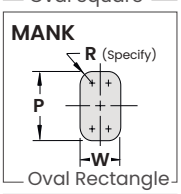


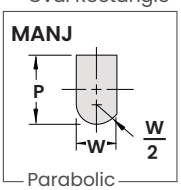


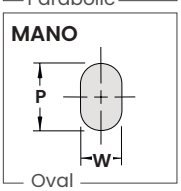
SHAPES

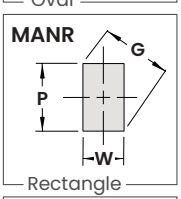


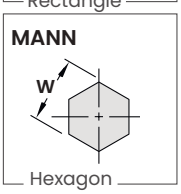


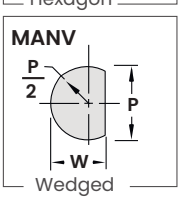


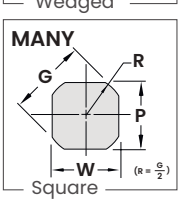


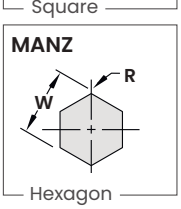




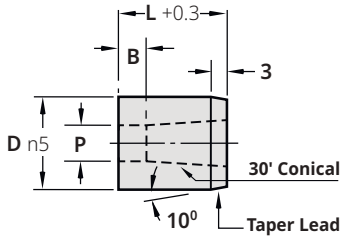








NEW



Code: **MAN..**

Matrix - Tapered Relief **Ref.: NAAMS**

This series of matrix comes standard with the **'PK6' Dowel Grooves** (NAAMS standard) option for Ø6 dowels, unless otherwise specified.

Please refer to the table on the left side

MANX - MANH - MANK - MANJ - MANO - MANR - MANN - MANV - MANY - MANZ

Code	D	B - point length		ROUND	SHAPE		L								
		S (standard)	A (optional)	Range P	Min. W	Max. P/G	13	16	20	22	25	28	30	32	35	40
MAN.. 10	10	4	5	1.60 - 6.80	1.30 - 6.80		•	•	•	•	•	•	•	•	•	
MAN.. 13	13	5	8	3.00 - 8.80	1.90 - 8.80		•	•	•	•	•	•	•	•	•	
MAN.. 16	16	5	8	7.40 - 10.80	1.90 - 10.80				•	•	•	•	•	•	•	
MAN.. 20	20	5	10	9.50 - 13.60	1.90 - 13.60				•	•	•	•	•	•	•	
MAN.. 22	22	6	10	10.50 - 15.00	1.90 - 15.00				•	•	•	•	•	•	•	
MAN.. 25	25	6	10	12.00 - 17.00	1.90 - 17.00				•	•	•	•	•	•	•	
MAN.. 32	32	6	12	16.00 - 22.00	1.90 - 22.00				•	•	•	•	•	•	•	
MAN.. 38	38	8	12	18.00 - 27.00	1.90 - 27.00				•	•	•	•	•	•	•	
MAN.. 40	40	8	12	18.00 - 27.00	1.90 - 27.00				•	•	•	•	•	•	•	
MAN.. 45	45	8	12	18.00 - 35.00	2.40 - 35.00					•	•	•	•	•	•	•
MAN.. 50	50	8	12	18.00 - 40.00	4.00 - 40.00					•	•	•	•	•	•	•

Order:
MAN (type) D x L x **shape** (P/W/G) x PK6

Material: 1.3343 (M2)
Hardness: 60 - 62 HRC

Order Example

MANX 25- (A) 32 - P=13.0 - PK6

Code | *D* | *L* | *Shape* | *Keying Info*

** "B" Point length*

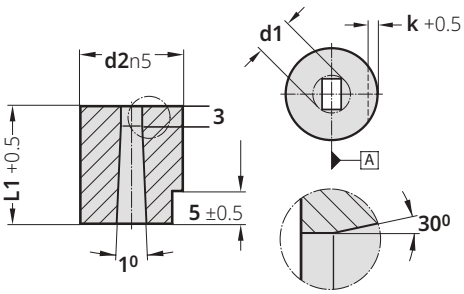
* If you want the **Point Length** to be Optional, add code **(A).** No code is written in the standard.

For details on Keying Information / Key Flat Options, and More Complex Special Shapes, please refer to the beginning of Category 6.

MAN matrixes conform to NAAMS™ standard for Tapered Relief Die Buttons.

Code: **MP..**

Matrix, Straight - Tapered Relief



Please refer to the table on the right side

MPY - MPO - MPK - MPD - MPA - MPM - MPX - MPP

d1 = shape	d2	k	L1
1.6 ~ 3.2	8	1	16
2 ~ 5	10		
3 ~ 7	13	1.5	19
5 ~ 8	16		22
7 ~ 11	20		25
11 ~ 16	25	2.5	28
16 ~ 19	32		32
19 ~ 28	40		

Order: **MP** (type) x d2 x L1
shape (P/W/R/G)

Material: 1.3343 (M2)
Hardness: 60 - 62 HRC

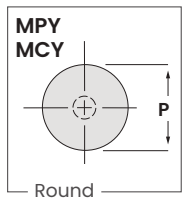
Order Example

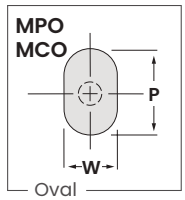
MPX 25-28 P=16.0 W=12.5 - K1/90°

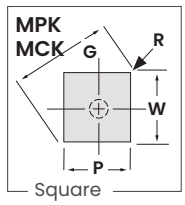
Code d2 L1 Shape Keying Info

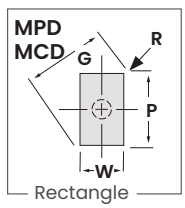
For details on Keying Information / Key Flat Options, please go to the beginning of Category-6.

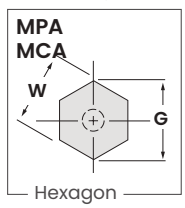
SHAPES

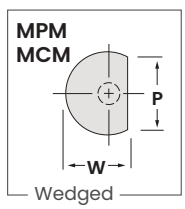


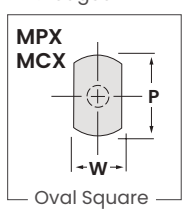


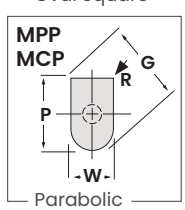


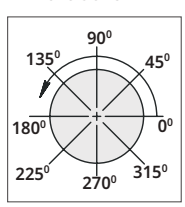






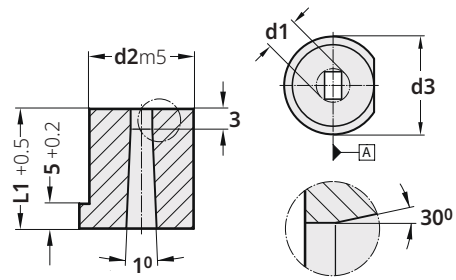






Code: **MC..**

Matrix, Headed - Tapered Relief



Please refer to the table on the left side

MCY - MCO - MCK - MCD - MCA - MCM - MCX - MCP

d1 = shape	d2	d3	k	L1
1.6 ~ 3.2	8	11	1	16
2 ~ 5	10	13		
3 ~ 7	13	16	1.5	19
5 ~ 8	16	19		22
7 ~ 11	20	23		25
11 ~ 16	25	28	2.5	28
16 ~ 19	32	35		32
19 ~ 28	40	43		

Order: **MC** (type) x d2 x L1
shape (P/W/R/G)

Material: 1.3343 (M2)
Hardness: 60 - 62 HRC

Order Example

MCY 16-25 P=8.0

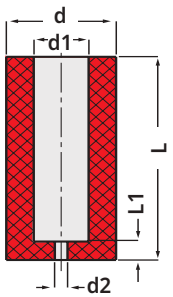
Code d2 L1 Shape

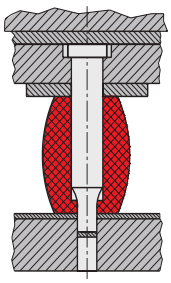
For details on Keying Information / Key Flat Options, please go to the beginning of Category-6.

Polyurethane Punch Stripper

Code: **PYB**

Overspread on punch (shock absorber)





Order Code	d	d1	d2	L1	L	Punch Length
PYB 445	4	17	1.6	5	45	56 / 63
PYB 655	6	19			55	63
PYB 855	8	21	3 Punch Hole			71
PYB 1055	10	23				80
PYB 1355	13	26				90
PYB 1655	16	30				
PYB 2055	20	38				100
PYB 2555	25	50				

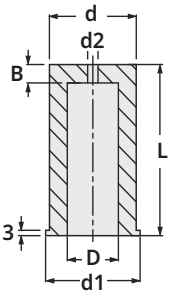
d2: (1.6 - 3.0 mm) (d1) while opening hole diameter / drilling polyurethane (punch) bush should be applied and drilled in pressed (S max) position. Spring load is obtained while extending outwards.

In S. max flexion, load coefficient data daN / Kg.

d	17	19	21	23	26	30	38	50
S daN 3 mm	60	65	70	90	110	140	210	370
S daN 6 mm	115	120	130	160	190	230	360	650
S daN 9 mm	-	180	210	240	300	370	550	1020

S max: Load coefficient daN = Kg. / (10 newton), while polyurethane bush S max in pressed, load data is advisory.

In dies that polyurethane punch stripper is used, there is no need to dismantle stripper plate to make repair whetting and modification on die components, there is not any effect on precise parts, it is excellent for all painted / anodized, plastic plated and polished parts. It is compatible to use with oil and grease. It is overspread on punch. Placement is done according to the stripper hardness. There is no need for extra holder. Stepped-punch hole will be opened at the first stroke of press on stripper edge. **Especially, in large dies requiring very wide stripper plate, this product is very compatible.**



Heavy Duty Light Duty

Code: **MTS**

Polyurethane Stripper for Ball Lock

Exchangeable and compatible with NAAMS standards.

Punch Dia.	D	d	L	d1	d2	B
10	9.75	**18**	44	21	1.6	6
			54			
			64			
			74			
13	12.75	**32**	44	26	3	6
			54			
			64			
			74			
16	15.75	**28**	44	31	3	6
			54			
			64			
			74			
20	19.75	**33**	44	36	3	7
			54			
			64			
			74			
25	24.75	**40**	44	43	3	7
			54			
			64			
			74			
32	31.70	**50**	44	55	3	7
			54			
			64			
			74			
40	39.70	**60**	44	65	3	8
			64			

Order: **MTS.** d x L

Material: Polyurethane / 95 Shore-A

Polyurethane Length for Strippers:

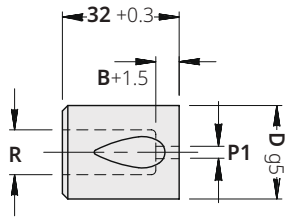
While ordering, please specify punch length.

Heavy Duty Ball Lock Punch Length	Ligth Duty Ball Lock Punch Length	Recommended Stripper Length "L"
80	71	43 (44)
90	80	52 (54)
100	90	63 (64)
110	100	72 (74)

NEW

Ball Lock Matrix - Blank

Blank Type

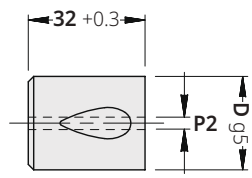


Material:
1.3343 (M2)

Hardness:
60 - 62 HRC

Code: **MBC**

Order Code	D	B	R	P1
MBC 13	13	4	5.8	1.2
MBC 16	16	5	8	1.6
MBC 20	20	5	11.9	2
MBC 25	25	6	16	3.6
MBC 32	32	6	20	4.4



Material:
1.3343 (M2)

Hardness:
60 - 62 HRC

Code: **MBE**

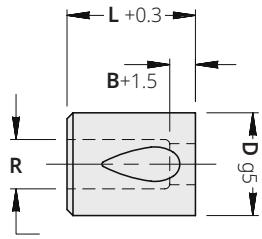
Order Code	D	P2
MBE 13	13	1.2
MBE 16	16	1.6
MBE 20	20	2
MBE 25	25	2.4
MBE 32	32	2.4

NEW

Ball Lock Matrix

Code: **MB..**

Automotive Standard / Shaped Types



Please refer to the table on the right side
MBY - MBO - MBK - MBD - MBA - MBM - MBX - MBP

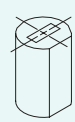
Code	D	B	R	L	ROUND (MBY)	SHAPE	
					Range P	Min. W	Max. G/P
MB.. 13	13	4	6	32	1.6 - 5	1.6	5
MB.. 16	16	5	8	32	3.2 - 7.2	2	7.2
MB.. 20	20	5	12	32	4 - 11	2.5	11
MB.. 25	25	6	16	32	8 - 15	4	15
MB.. 32	32	6	20	32	11 - 19	5	19

Order:
MB. (type) D x L x Shape (P/W/G)

Material: 1.3343 (M2)
Hardness: 60 - 62 HRC

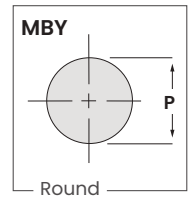
Order Example

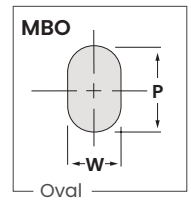
MBY 25-32 P=13.0
Code D L Shape

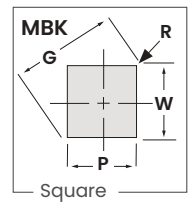


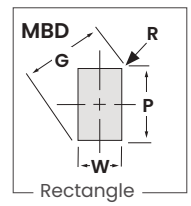
For details on Keying Information / Key Flat Options, please go to the beginning of Category-6.

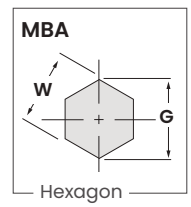
SHAPES

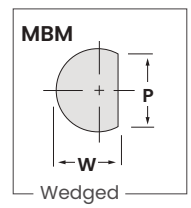


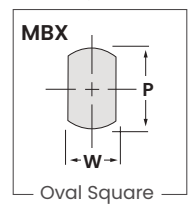


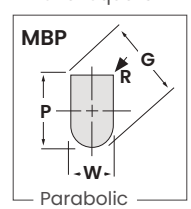


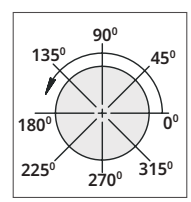








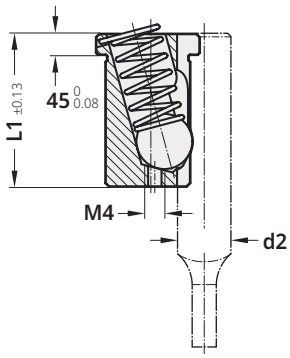


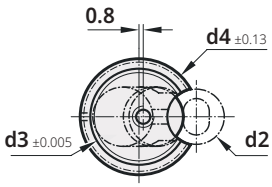


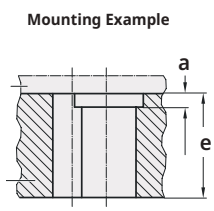
NEW

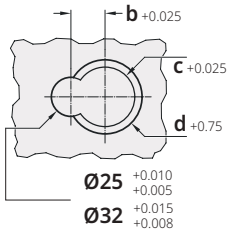
Ball-lock Special Retainer Insert

Code: **GZSH / GZSA**









Code: **GZSH** Light Duty

Order Code	d2	d3	d4	L1	a	b	c	d	e
GZSH 6	6	12	14.6	25.7	6	6.5	12.013	15	25.7
GZSH 10	10	14	16.6		10	9	14.013	17	
GZSH 13	13				13	10.5			
GZSH 16	16				16	12			
GZSH 20	20	16	18.6		20	14	16.013	19	
GZSH 25	25				25	16.5			
GZSH 32	32				32	20			
GZSH 38	38				38	23			

Code: **GZSA** Heavy Duty

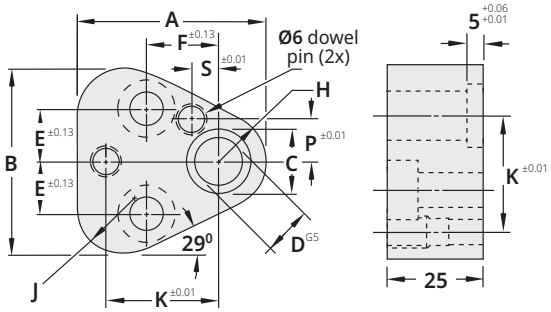
Order Code	d2	d3	d4	L1	a	b	c	d	e
GZSA 10	10	16	19.6	34.7	10	10	16.016	20	34.7
GZSA 13	13	20	24.6		13	11.5	20.013	25	
GZSA 16	16				16	13			
GZSA 20	20				20	15			
GZSA 25	25				25	17.5			
GZSA 32	32				32	21			
GZSA 40	40				40	25			

- The new Ball-lock Special Retainer Insert is much smaller in size and takes up less space.
- Its most important feature is quick assembly. During tool operation, stamping / punching tools that are damaged can be replaced without distributing the tool, by using the ball on the sleeve and applying downward pressure with a screwdriver (removal/installation of the punch).
- The Insert type is selected based on two different products: Light Duty and Heavy Duty.
- The new Inserts are fully compatible with all Güvenal Ball-lock Punches.

Punch Retainer Code: GPR

For round punches / ISO 8020

- Centre of pin holes are reference points for punch hole position.
- Shim and backing plate should be supplied separately.
- Retainer includes 2 dowel pins + 2 screws.

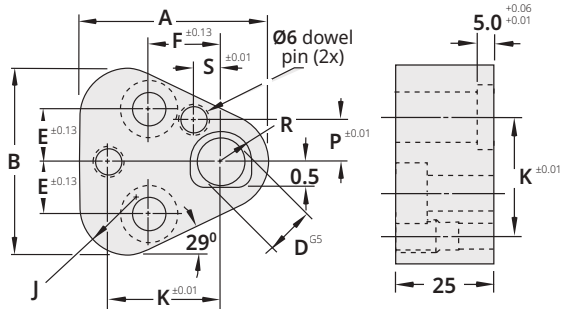


Order Code	GPR 10	GPR 13	GPR 16	GPR 20	GPR 25	GPR 32
D Punch	10	13	16	20	25	32
A	44.5	50.8	54	60.3	69.9	69.9
B	43.7	50	53.2	59.5	69.1	69.1
C	**14**	**17**	**20**	**24**	**29**	**36**
E	11.1	14.3	15.9	17.5	19.8	19.8
F	19	19	19	19	23.8	23.8
H	9.5	12.7	14.3	17.5	22.2	22.2
J	12	15.2	16.8	20	24.7	24.7
K	26.925	29.970	31.750	33.530	40.640	40.640
P	9	12	13.5	16.5	22	22
S	7.5	6.5	6	5	7	7
Screw	M8	M8	M8	M10	M12	M12

Punch Retainer Code: GPRS

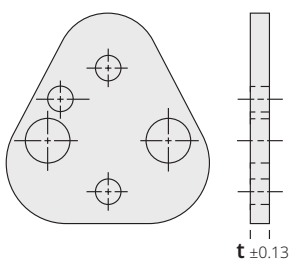
For shaped punches / ISO 8020

- Centre of pin holes are reference points for punch hole position.
- Shim and backing plate should be supplied separately.
- Retainer includes 2 dowel pins + 2 screws.



Order Code	GPRS 10	GPRS 13	GPRS 16	GPRS 20	GPRS 25	GPRS 32
D Punch	10	13	16	20	25	32
A	44.5	50.8	54	60.3	69.9	69.9
B	43.7	50	53.2	59.5	69.1	69.1
E	11.1	14.3	15.9	17.5	19.8	19.8
F	19	19	19	19	23.8	23.8
R	**7**	**8.5**	**10**	**12**	**14.5**	**18**
H	9.5	12.7	14.3	17.5	22.2	22.2
J	12	15.2	16.8	20	24.7	24.7
K	26.925	29.970	31.750	33.530	40.640	40.640
P	9	12	13.5	16.5	22	22
S	7.5	6.5	6	5	7	7
Screw	M8	M8	M8	M10	M12	M12

Shim & Backing Plate for Punch Retainer



Code: PRSP — **Shim Plate - t= 1.8(soft)**

Order Code	Compatible Retainer	D Punch	t
PRSP 1018	GPR / GPRS	10	1.8
PRSP 1318	GPR / GPRS	13	1.8
PRSP 1618	GPR / GPRS	16	1.8
PRSP 2018	GPR / GPRS	20	1.8
PRSP 2518	GPR / GPRS	25	1.8
PRSP 3218	GPR / GPRS	32	1.8

Code: PRBP — **Backing Plate - t= 4.8(55 HRC)**

Order Code	Compatible Retainer	D Punch	t
PRBP 1048	GPR / GPRS	10	4.8
PRBP 1348	GPR / GPRS	13	4.8
PRBP 1648	GPR / GPRS	16	4.8
PRBP 2048	GPR / GPRS	20	4.8
PRBP 2548	GPR / GPRS	25	4.8
PRBP 3248	GPR / GPRS	32	4.8

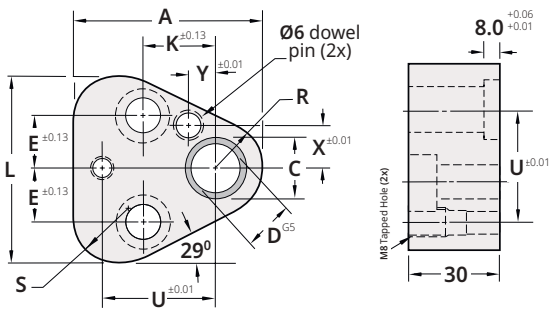
NEW

Code: **GPRF**

Heavy Duty Headed Punch Retainers

For round punches

"Punch Retainers Specifically Designed for Güvenal
"SBZF - SFZF" Type Punches"
- Centre of pin holes are reference points for punch hole position.
- Shim and backing plate should be supplied separately.
- Retainer includes 2 dowel pins + 2 screws.



Order Code	GPRF 10	GPRF 13	GPRF 16	GPRF 20	GPRF 25
D Punch	10	13	16	20	25
A	44.5	50.8	54	60.3	69.9
L	43.7	50	53.2	59.5	69.1
C	15.5	18.5	21.5	25.5	30.5
E	11.1	14.3	15.9	17.5	19.8
K	19	19	19	19	23.8
R	9.5	12.7	14.3	17.5	22.2
S	12	15.2	16.8	20	24.7
U	26.925	29.970	31.750	33.350	40.640
X	9	12	13.5	16.5	22
Y	7.5	6.5	6	5	7
Screw	M8	M8	M8	M10	M12

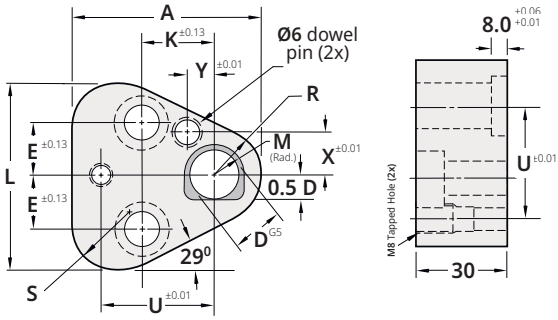
NEW

Code: **GPRFS**

Heavy Duty Headed Punch Retainers

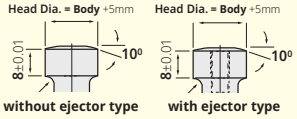
For shaped punches

"Punch Retainers Specifically Designed for Güvenal
"SBZF - SFZF" Type Punches"
- Centre of pin holes are reference points for punch hole position.
- Shim and backing plate should be supplied separately.
- Retainer includes 2 dowel pins + 2 screws.



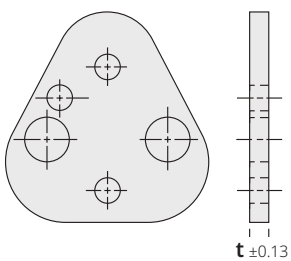
Order Code	GPRFS 10	GPRFS 13	GPRFS 16	GPRFS 20	GPRFS 25
D Punch	10	13	16	20	25
A	44.5	50.8	54	60.3	69.9
L	43.7	50	53.2	59.5	69.1
E	11.1	14.3	15.9	17.5	19.8
K	19	19	19	19	23.8
M	7.75	9.25	10.75	12.75	15.25
R	9.5	12.7	14.3	17.5	22.2
S	12	15.2	16.8	20	24.7
U	26.925	29.970	31.750	33.530	40.640
X	9	12	13.5	16.5	22
Y	7.5	6.5	6	5	7
Screw	M8	M8	M8	M10	M12

Heavy Duty Headed (SBZF & SFZF)



"Punch Retainers Specifically Designed for Güvenal "SBZF - SFZF" Type Punches"
The **GPRF** and **GPRFS** punch retainers are engineered for use with heavy-duty (larger-headed) punches. Round punches only require a single dowel, which can reduce machining time by as much as 50%. The centrally aligned dowel ensures precise punch-to-matrix alignment, resulting in better part quality, longer punch lifespan, and minimized downtime. Shaped punches require an additional dowel for proper alignment.
This punch and retainer combination ensures consistent dimensional accuracy every time.

Shim & Backing Plate for Punch Retainer



Code: **PRSP** **Shim Plate - t= 1.8(soft)**

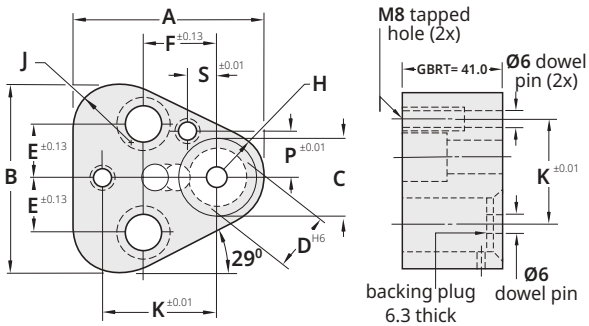
Order Code	Compatible Retainer	D Punch	t
PRSP 1018	GPRF / GPRFS	10	1.8
PRSP 1318	GPRF / GPRFS	13	1.8
PRSP 1618	GPRF / GPRFS	16	1.8
PRSP 2018	GPRF / GPRFS	20	1.8
PRSP 2518	GPRF / GPRFS	25	1.8

Code: **PRBP** **Backing Plate - t= 4.8(55 HRC)**

Order Code	Compatible Retainer	D Punch	t
PRBP 1048	GPRF / GPRFS	10	4.8
PRBP 1348	GPRF / GPRFS	13	4.8
PRBP 1648	GPRF / GPRFS	16	4.8
PRBP 2048	GPRF / GPRFS	20	4.8
PRBP 2548	GPRF / GPRFS	25	4.8

Code: **GBRT** Heavy Duty

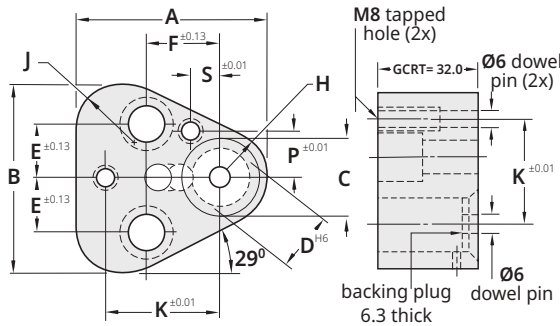
Ball Lock Punch Retainer - Heavy Duty



Order Code	GBRT 13	GBRT 16	GBRT 20	GBRT 25	GBRT 32
D Punch	13	16	20	25	32
A	50.8	54	60.3	69.9	69.9
B	50	53.2	59.5	69.1	69.1
C	17	20	24	29	36
E	14.3	15.9	17.5	19.8	19.8
F	19.0	19.0	19	23.8	23.8
H	12.7	14.3	17.5	22.2	22.2
J	15.2	16.8	20	24.7	24.7
K	29.970	31.750	33.530	40.640	40.640
P	12	13.5	16.5	22	22
S	6.5	6	5	7	7
Screw	M8	M8	M10	M12	M12

Code: **GCRT** Light Duty

Ball Lock Punch Retainer - Light Duty

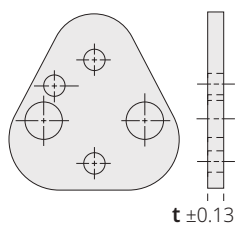


Order Code	GCRT 10	GCRT 13	GCRT 16	GCRT 20	GCRT 25
D Punch	10	13	16	20	25
A	44.5	50.8	54	60.3	69.9
B	43.7	50	53.2	59.5	69.1
C	10	18.5	21.5	25.5	30.5
E	11.1	14.3	15.9	17.5	19.8
F	19	19	19	19	23.8
H	9.5	12.7	14.3	17.5	22.2
J	12	15.2	16.8	20	24.7
K	26.925	29.970	31.750	33.530	40.640
P	9	12	13.5	16.5	22
S	7.5	6.5	6	5	7
Screw	M8	M8	M8	M10	M12

- Centre of pin holes are reference points for punch hole position.
- Shim and backing plate should be supplied separately.
- Shaped punches use the secondary dowel for precise alignment; round punches need only one.
- The precision-ground ball hole assures perfect alignment of any punch shape – even if you replace the retainer.
- **Retainer includes;** 2 dowel pins + 2 screws + 1 ball + 1 spring + 1 ball release screw.

Shim & Backing Plate for Punch Retainer

Please check Code: **PRSP** and **PRBP** for shim and backing plates.



Shim Plate t = 1.8 (soft)

Code: **PRSP**

Backing Plate t = 4.8 (55 HRC)

Code: **PRBP**

*** GBRT retainer is compatible to "NAAMS" standard for ball lock punch retainer.**

NEW

Punch Stripper Unit (For Heavy Duty Ball Lock)

Code: **G184**

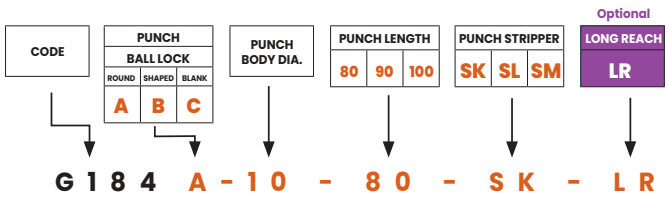
* Compatible with standard Heavy Duty Ball Lock Retainers.
* Features a unique, proprietary single-piece construction.
* One-piece design eliminates stack-up tolerance issues, ensuring accurate punch alignment.
* Eliminates the need for costly custom stripper plates.
* New G184 retainers evenly distribute stamping force across the entire surface, protecting mounting areas.

Notes:

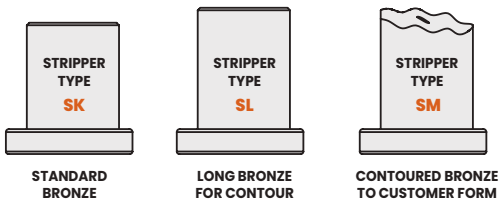
+ If a custom shape is required for the stripper surface, please provide the surface data when placing the order.
+ Specify the dimensions of the punch tip when placing the order.

Product Types:

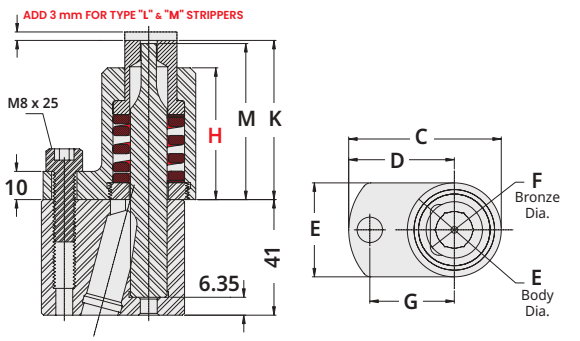
Order Example:



Stripper Types:

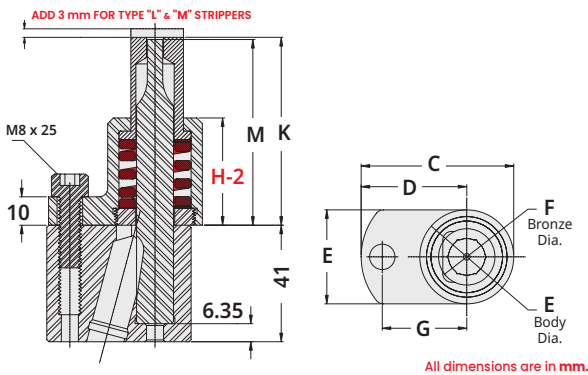


STANDARD UNIT



LR (LONG REACH / COMPACT UNIT)

Note: Only available in 90 mm & 100 mm lengths



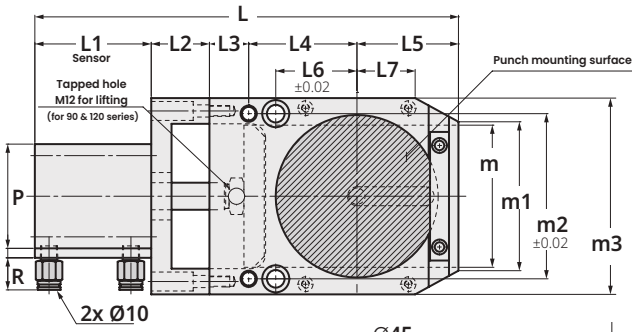
All dimensions are in **mm.**

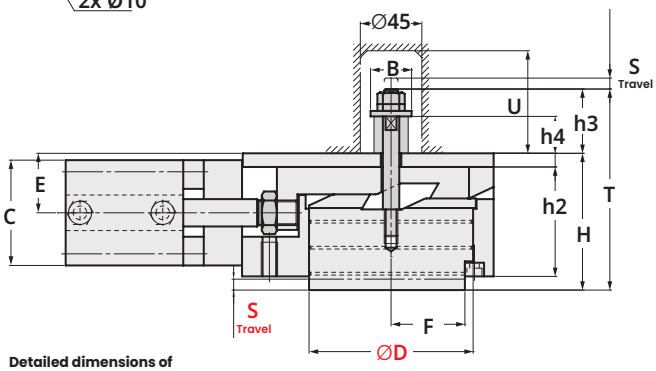
Complete Assembly Order Reference	C	D	E	F	G	H	H-2	K	M	Standard Max. Travel From "K" - Dimension	LR Compact Max. Travel From "K" - Dimension
G184.. 10 - 80 / S..	47.4	33.9	27	15	26.9	37.74	-	45.7	45.1	6.3	-
G184.. 10 - 90 / S..						46.74	37.74	55.7	55.1	6.3	6.3
G184.. 10 - 100 / S..						54.52		65.7	65.1	8.4	6.3
G184.. 13 - 80 / S..	54.1	37.5	33.3	20	30	37.74	-	45.7	45.1	6.5	-
G184.. 13 - 90 / S..						46.74	37.74	55.7	55.1	6.5	6.5
G184.. 13 - 100 / S..						54.52		65.7	65.1	8.5	6.5
G184.. 16 - 80 / S..	58.7	38.7	40	27	31.8	37.74	-	45.7	45.1	7.4	-
G184.. 16 - 90 / S..						46.74	37.74	55.7	55.1	7.4	7.4
G184.. 16 - 100 / S..						54.52		65.7	65.1	9.5	7.4
G184.. 20 - 80 / S..	65.4	42.4	46.1	33	33.5	37.74	-	45.7	45.1	7.4	-
G184.. 20 - 90 / S..						46.74	37.74	55.7	55.1	7.4	7.4
G184.. 20 - 100 / S..						54.52		65.7	65.1	8.9	7.4
G184.. 25 - 80 / S..	74.9	47.1	55.6	42.5	40.6	37.74	-	45.7	45.1	8.4	-
G184.. 25 - 90 / S..						46.74	37.74	55.7	55.1	8.4	8.4
G184.. 25 - 100 / S..						54.52		65.7	65.1	8.9	8.4
G184.. 32 - 80 / S..	78.9	47.1	63.5	50.6	40.6	37.74	-	45.7	45.1	7.6	-
G184.. 32 - 90 / S..						46.74	37.74	55.7	55.1	7.6	7.6
G184.. 32 - 100 / S..						54.52		65.7	65.1	7.7	7.6
G184.. 40 - 80 / S..	90.8	54.5	72.5	59.7	44	37.74	-	45.7	45.1	7.2	-
G184.. 40 - 90 / S..						46.74	37.74	55.7	55.1	7.2	7.2
G184.. 40 - 100 / S..						54.52		65.7	65.1	7.7	7.2

NEW

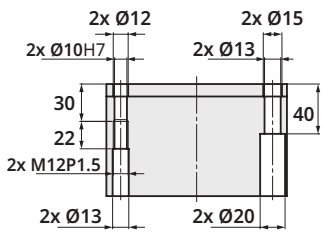
Code: **G186..**

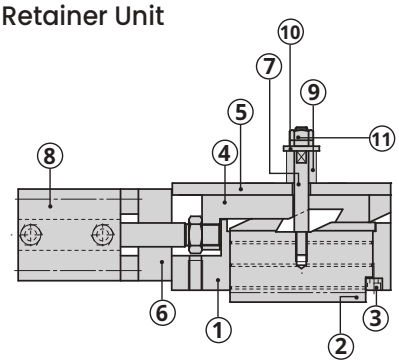
Removable Multi-Change Punch Retainer Unit





Detailed dimensions of dowel and mounting holes:





1. Slide Casing
2. Float Pin
3. Key
4. Slide Plate
5. Backing Plate
6. Block
7. Stud Bolt
8. Air Cylinder
9. Spring
10. Washer
11. Hard Lock Nut

+ Cylinder, driving pressure: Min 0.5 MPa

+ Optional Sensor Specification :
Contact, 2-wire type A93L (SMC)
Operating voltage DC12/24V
Reed length 3 m

Options :

SA - Cylinder Sensor included.

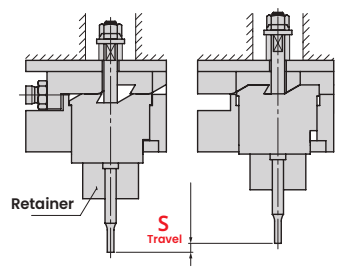
LHC - The accompanying Pipe Joint is changed to L type.

ORDER EXAMPLE G186. 708 x SA
G186. 708 x SA - LHC

Guidelines for Use

+ The air ports can be changed easily by rotating the cylinder mounting position.
+ The maximum number of units for joint operation is 4. If you wish to use the units in joint operation, please contact our sales representative.

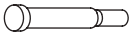
Order Code	ØD	S Travel	h2	h3	h4	H	T	U	B	C	E	F	P	R
G186. 708	70	8	72	35	15	92	127	55	Ø25	52	31	29	52	22
G186. 7012		12	76	42.5	22.5	100	142.5	60						
G186. 908	90	8	80	40	20	100	140	55	Ø25	77	43.5	39	77	24
G186. 9012		12	84	27	27	108	155	60						
G186. 1208	120	8	80	47	27	100	147	60	Ø30	77	43.5	54	77	24.7
G186. 12012		12	84	55	35	108	163	75						

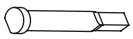


Order Code	m	m1	m2	m3	L	L (with sensor)	L1	L2	L3	L4	L5	L6	L7	Spring		Working Force kN	Tool Installation Weight kg	Weight kg	Air Cylinder
														Initial Load N	Final Load N				
G186. 708	55	60	72	95	212.5	222.5	59.5	21	27	55	50	35	18	96	207	54	5	8.1	SMC Ø40
G186. 7012														97		31		8.4	
G186. 908	75	80	92	110	243	253	66	23	29	65	60	45	28	124	207	64	6	15.2	SMC Ø63
G186. 9012														120	210	47		15.4	
G186. 1208	105	110	122	145	313	323	86	43	29	80	75	60	43	218	392	179	10	21.5	SMC Ø63
G186. 12012														212	408	158		22.1	

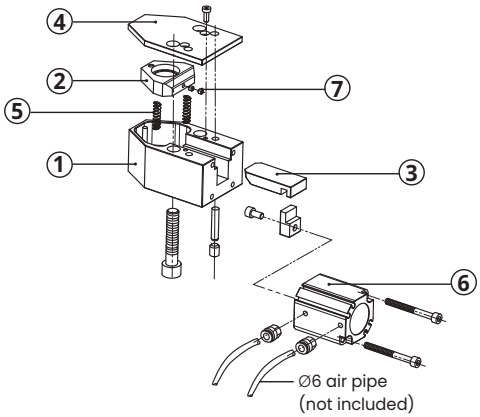
NEW

Pneumatic Retractable Punch Retainer

for round punches Code: **G185** 

for shaped punches Code: **G185S** 

Air Cylinder Change Retainers for Cylinder Head Punches
8 mm Stroke Type / Low Air Pressure Type



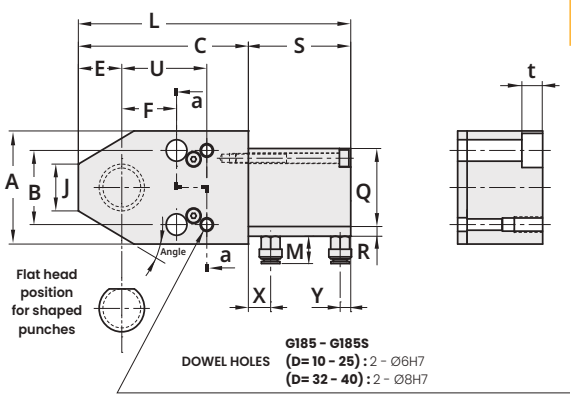
① Retainer (black oxide)
② Ring (black oxide)
③ Cam
④ Backing Plate
⑤ Spring
⑥ Air Cylinder
⑦ Screw Plug

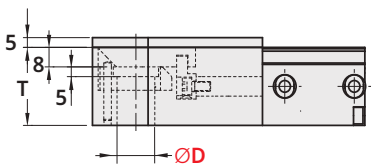
! Recommended air pressure: 0.4MPa - 0.8 MPa

! Supply air continuously while press machining.

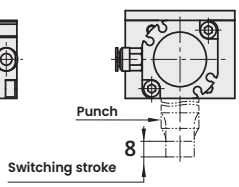
! A large amount of thrust load may cause malfunction.

! Min. air pressure to drive: 0.2 MPa when 10 units are connected





* only 5±0.01 mm head thickness punches are compatible

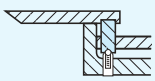


* Güvenal G185 Pneumatic Retainers feature a strong and convenient one- piece body, eliminating the need for a separate safety shield.
+ Punches can be activated or deactivated in seconds.
+ G185 retainers allow for quick changes in hole patterns without the need for multiple dies. Right- and left-hand parts can be produced in a single die setup. Hole pattern changes take only minutes—sometimes just seconds.
+ A locking bar is released, allowing the punch to retract far enough to avoid contact with the material.

* **G185** & **G185S** includes all necessary screws and dowels, air cylinder and fittings. Air pipes are not included.

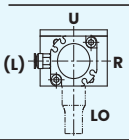
*For options: Add to the end of the order code.

Options :



Code: BP
Attach a ball plunger for camlock.

Code: AS
Change to an air cylinder which has an auto switch (D-A93/SMC). **!** Dimension of **L** and **S** is +10 mm.



Code: U / R / LO
Change the pipe fitting position.
(Standard position: L)

Code: KQL
Change to L shaped one-touch pipe joint. (KQ2L06-M5A/01AS)

D	10-25	32-40
LM	17.4	25.5

Order Code	D	L	A	B	C	E	F	S	Angle	T	U	J	X	Y	Q	t	M	Air Cylinders
G185 10	10	117.2	46	30	73	18	25	44.2	45°	40	41	12	11.8	5.6	40 (R=0)	11	14.7	Specially designed for low air pressure type cylinders
G185 13	13		49															
G185 16	16																	
G185 20	20	144.2	58	38	90	23	29	54.2	30°	40	45	24	11.8	5.6	40 (R=0)	11	14.7	
G185 25	25																	
G185 32	32	198	80	56	125	33	38	73	30°	50	60	27	12	7.5	50 (R=5)	20	18.5	
G185 40	40																	
G185 S 10	10	117.2	46	30	73	18	25	44.2	45°	40	41	12	11.8	5.6	40 (R=0)	11	14.7	Specially designed for low air pressure type cylinders
G185 S 13	13		49															
G185 S 16	16																	
G185 S 20	20	144.2	58	38	90	23	29	54.2	30°	40	45	24	11.8	5.6	40 (R=0)	11	14.7	
G185 S 25	25																	
G185 S 32	32	198	80	56	125	33	38	73	30°	50	60	27	12	7.5	50 (R=5)	20	18.5	
G185 S 40	40																	

NEW

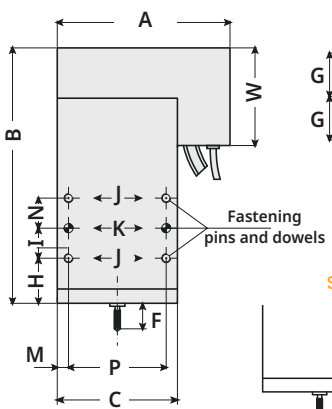
DTAP In-Die Tapping Machine

DTAP Direct Drive

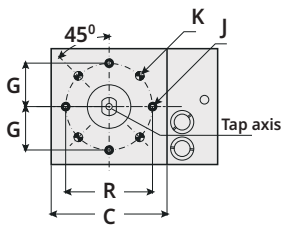
The electronic threading machine DTAP is Bordignon's innovative technology designed to ensure excellent performances in threading operations. Thanks to the direct transmission to the spindle, the Direct Drive system provides greater force and exceptional reverse rotation, at the same time saving space, time and reducing maintenance costs. The absence of the lead screw means great flexibility and simplicity in changing the thread pitch by replacing the tap holder in the machine and setting the new parameters in the panel. Simply operated by an electric impulse (START), DTAP works independently from the die stroke and with any angle, by performing the thread in a fast and precise way in the dies and also in other automation systems. Once a particular thread has been processed, it is possible to memorize the data and parameters in the panel, so that the same operation can be easily repeated in the future. DTAP is resistant to liquids and other substances present in the moulding process, and it is available in three models differentiated by size and force, designed to operate with maximum performance a certain range of threads.

Technical Data

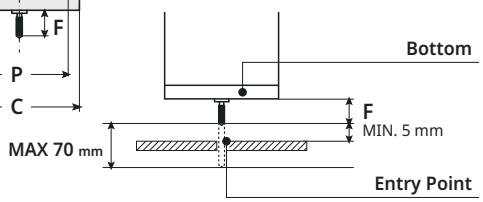
FASTENING PINS AND DOWELS



BOTTOM VIEW



STARTING POSITION



Order Code	A	B	C	G	H	I	N
DTAP 1	100	150	65	25	35	15	15
DTAP 2	115	170	80	30	30	20	20
DTAP 3	125	195	90	35	30	20	20

Order Code	M	P	R	W	J	K
DTAP 1	5	55	50	65	M6	5
DTAP 2	7.5	65	60	65	M6	6
DTAP 3	7.5	75	70	65	M6	6

F	M2	M2.5	M3	M3.5	M4	M5	M6	M8	M10
DTAP 1	12	12	14	16	17	18	20	-	-
DTAP 2	-	-	-	-	17	18	20	22	-
DTAP 3	-	-	-	-	-	-	25	25	30

Control Panel

Control unit is available in 2 models: the single panel and the multiple panel which can control up to 4 threading machines. It is a touch screen unit of the latest generation and it has been designed to operate the threading machine and to ensure an easy control at every stage of the threading process. It is provided with many features which make it an intelligent and intuitive tool. The operator himself, assisted by the indications on the panel, can easily enter all the configuration and control parameters necessary to obtain a perfect thread.

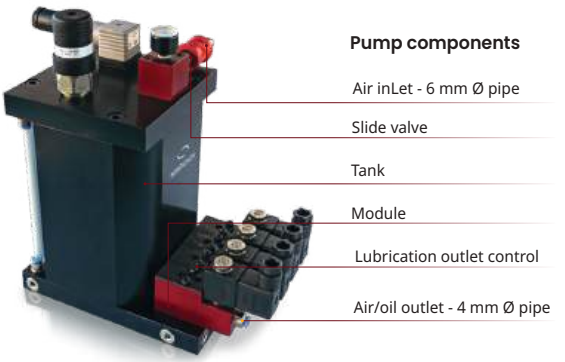
The panel allows the following functions:

- Set up of the thread height
- Set up of the thread speed (revolutions per minute), which remains constant during the execution of the thread The return phase is faster than the threading one, optimizing the time of production
- Automatic and rapid approach of the tap to the hole
- Indicator of process completed
- Control of the wear of the tap
- Control of the minimum and maximum torque
- Change of the thread
- Change to left hand threading
- Storage and backup of threading settings
- Control of the minimal lubrication.

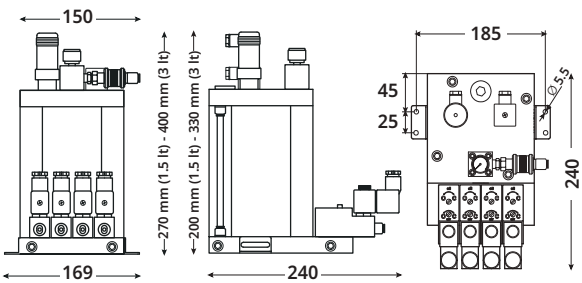
Furthermore, the display indicates possible abnormalities such as:

- Hole not found
- Maximum torque stress
- Minimal torque stress
- Threading process timeout
- Breaking of the tap
- Low oil level.

Minimal lubrification pump



The air-oil lubricating system consists of mainly a pressurised tank and one or more mixing modules. The lubricant, which can be made of a mixture of air and oil or oil only, is pressurized by the air and sent to the mixing modules through a pipe inside the tank. The modules are provided with components that allow them to be controlled independently:
– two screws to adjust oil and air mixture or only oil quantity
– electrovalves which give the impulse and control the starting and the duration time of the lubrication. These electrovalves can be set independently allowing different lubrication times for each module.



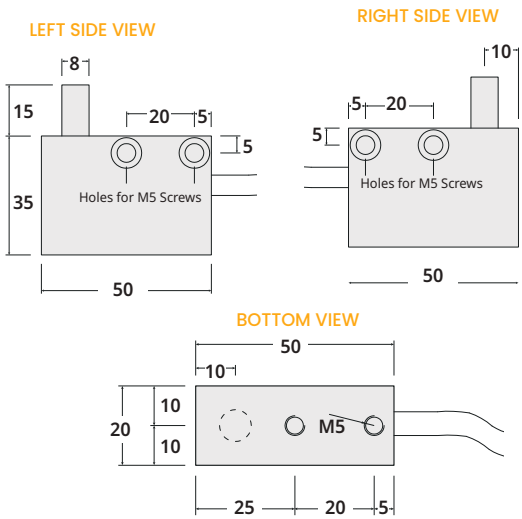
SPECIFICATIONS

Tank capacity: 1.5 / 3.0 lt
Maximum number of modules: 4
Air inlet pressure: 3 bar ÷ 8 bar
Max. air consumption at the outlet of each module: 7.5 l/min.
Air inlet pipe: Ø 6 mm
Air/oil outlet pipe: Ø 4 mm
Oil flow max. rate per module : 0.05 l/min. (olio ÷ 25 cSt)
Lubricating oil: 10cSt ÷ 100cSt
Pressure switch calibration: 3 bar
Pressure switch max. load: 48 Vac - DC 0.5 A
Level max. load: 250 Vdc 1.3 A
Electrovalve power supply: 24 Vdc - 5.5 W
Operating temperature: +5° ÷ +50°C
Net weight: 5.8 kg / 7.2 kg

D-TC Thread Checker

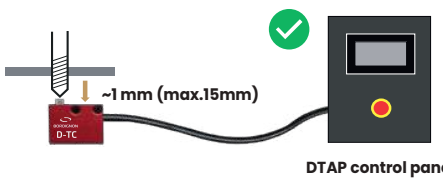
D-TC is a sensor equipped with 5-mt cable and fastener for connection to the DTAP control panel. It is a component supplied upon request with the aim of providing an additional check of successful tapping in through holes.

Technical Data



Functioning

The device, pressed by the tap upon completion of the tapping procedure, descends by about 1mm and sends a signal to the control panel, which registers a successful tapping. If the tapping is not carried out, the sensor is not activated and the control panel reports the anomaly. D-TC also causes the tap die to retract immediately if it descends more than three turns more than is necessary. This ability makes D-TC a useful control instrument in case an excessive number of turns is accidentally programmed



The product form for your Bordignon DTAP In-Die Tapping Machine offers and orders will be filled out by Güvenal engineers and will be checked and processed by Bordignon engineers.

OVERVIEW: GÜVENAL SPRING SYSTEMS

Code	Max. Filling Pressure	Min. Filling Pressure	Temperature Range	The Max. Nr. of Cycles per Minute	Diameter / Thread	Initial Force	Reference
EGS	150 Bar	12 Bar	0 - 80°C	300	M16 x 1.5 / M16 x 2 M24 x 1.5	4 - 170 daN	Ejector Gas Springs
VGS	180 Bar	10 Bar	0 - 80°C	300	Ø12 - 25	13 - 200 daN	Standard and Automotive Line Gas Springs
AGS	180 Bar	150 Bar	0 - 80°C	300	Ø19 - 195	170 - 19910 daN	
TGS	210 Bar	182 Bar	0 - 80°C	300	Ø25 - 120	360 - 12000 daN	
IGS	150 Bar	150 Bar	0 - 80°C	300	Ø32 - 195	170 - 10600 daN	
VV	180 Bar	150 Bar	0 - 80°C	80	Ø19 - 95	170 - 2945 daN	
CHT	"It will be calculated according to the temperature at which the product will be used."		0 - 200°C	"Will vary depending on the features of the product."	Ø19 - 120	100 - 6500 daN	Special Gas Springs for Hot Forming and Injection Moulding
CSMHT			0 - 200°C		Ø19 - 120	100 - 6500 daN	

Code	Series	Wire Section	Colour	Load	Range	
					Diameter	Length
AYY			Purple	Extra Light	10 ~ 63 mm	25 ~ 305 mm
YY	ISO 10243		Green	Light	10 ~ 63 mm	25 ~ 305 mm
MY	ISO 10243		Blue	Medium	10 ~ 63 mm	25 ~ 305 mm
KY	ISO 10243		Red	Heavy	10 ~ 63 mm	25 ~ 305 mm
SY	ISO 10243		Yellow	Extra Heavy	10 ~ 63 mm	25 ~ 305 mm
GY			Brown	Ultra Heavy	10 ~ 63 mm	25 ~ 305 mm
TVY			Green	Light	6 ~ 16 mm	16 ~ 305 mm
TBM			Blue	Medium	6 ~ 16 mm	16 ~ 305 mm
TRK			Red	Heavy	6 ~ 16 mm	16 ~ 305 mm

POLYURETHANE LINE

Polyurethane Compression Springs

Code **PMK** Code **PMS** Code **PYK** Code **PYS**

Polyurethane Shock Absorbing Washer

Code **PRPK** Code **PRPS**

VULKOLLAN Compression Springs

Code **PYBB** Code **PYBD**

Polyurethane Plates

Code **PPK** Code **PPS**

AUTOMOTIVE LINE

Code **PSTA** Code **PDTA**

Shock Absorbers for Safety Pin

Code **G56 - 1** Code **G57 - 2**

Guide Bolts & Locating Pins for Polyurethane Lines

Code **PYP** Code **PSP** Code **PMV**

BORDIGNON | Güvenal GTH

NITROGEN GAS SPRINGS

for DIES and MOULDS

MAXIMUM Safety Performance

FIELDS OF APPLICATION

Die-making
Hot Stamping
Injection Moulding
Die Casting
Forging Processes

EGS - VGS - AGS - TGS - IGS - VV - CHT - CSMHT

We are pleased to announce the launch of our partnership with Bordignon, a company well-known for its superior performance and safety systems in Gas Springs. This valuable collaboration enables us to offer unique performance in terms of sustainable quality, price/performance ratio, and safety with the addition of this new brand to our product range.

As the exclusive distributor and business partner in Türkiye, you can obtain Bordignon Gas Springs from us, either through our extensive stock options or with fast delivery times.

PED certified

All Bordignon gas springs offered by Güvenal comply with the Pressure Equipment Directive ***PED 2014/68/EU,*** which came into force in 2016. This directive defines and regulates high standards and safety requirements for pressure equipment. To ensure maximum safety during operation, the durability and functioning of the safety systems of all gas springs have been tested under both normal and heavy-duty conditions.

USE INSTRUCTIONS

NO

The threaded hole on the piston rod is for transport and maintenance purposes only.
Do not use it for fastening the nitrogen gas spring.

No side forces. Work stroke always perpendicular to the base of the nitrogen gas spring.

Avoid scratching and scoring on the piston rod.

Do not make mechanical work on the nitrogen gas spring.

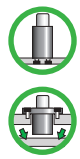
Do not disassemble the nitrogen gas spring.
Maintenance only by authorized people.
The authorization is given only after a class held by Bordignon.

Max impact and max release speed: 1.6 m/s (1 m/s for TGS series). Maximum number of working cycles per minute: see product tables with the technical specifications.

Do not freely release the piston rod.
The piston rod goes up together with the press.
If the screws used for the base-mounting are broken or deformed (stretched), find out the possible causes and eliminate them: there might have been free/uncontrolled releases of the piston rod.

Protect against liquid or solid contaminants.
The nitrogen gas springs are protected against contaminants by wiper ring. Do not use chemical products with low flash point (petrol, solvents alcohol, etc.). Clean only with a dry cloth.

YES



Always fasten the nitrogen gas spring at the base to a flat and clean support surface with high resistance screws. Gas springs with more than one threaded hole at the base: the center hole is for charging/discharging only. Use all the other holes at the base for fixing. Fixing with flange: fasten the flange to a flat and clean support surface with high resistance screws. A safety plate must be present under the gas spring.

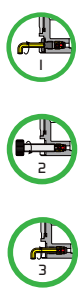
Charge only with NITROGEN (N_2).

Hole for cylinder body Ø +1 mm. Draining hole for liquids.

Lubricate the piston rod with grease with disulfide molybdenum (MoS_2).

Operating temperature: MIN 0°C (32°F) - MAX 80°C (176°F). Do not heat.

Protect against solid contaminants with a metal bellow, liquid contaminants with a polymeric bellow. Fasten the protection bellow to the die plate.



When using nitrogen gas springs in a LINKED SYSTEM, make sure to request/order the gas springs "discharged, without valve" ("L-version").
Otherwise, to adapt a self-contained gas spring for a linked system, BEFORE installing any fittings and hoses: remove the side cap using a flat-end allen key (hexagonal key); discharge the gas spring completely using the proper ADS discharging device; remove the valve cartridge using a flat-end 3 mm allen key (hexagonal key).

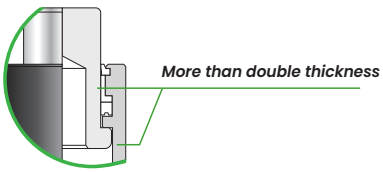
The products in this catalogue are designed for the use in press tools, dies and moulds. We can not take any responsibility for any not proper or different use.

IMPORTANT: periodically check for use instructions updates on our website. For possible additional use instructions not explicitly specified here, refer to the ISO 11901-5 standard. Pass the nitrogen gas springs use instructions to the end-user of the product.

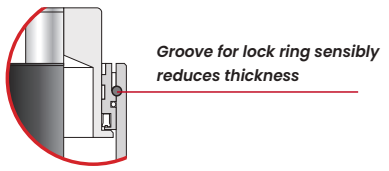
SAFETY & RELIABILITY / Why Bordignon?

Safety: Bordignon nitrogen gas springs have always been built with single ("monolithic") thick mechanical components, in order to ensure product integrity and maximum user's safety even under the most extreme wrong use conditions (collisions, etc.).

Bordignon construction - Single "monolithic" components

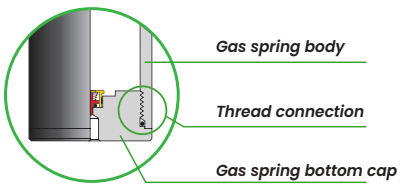


Other constructions - Several assembled components

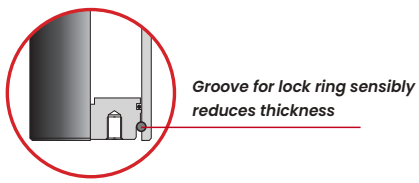


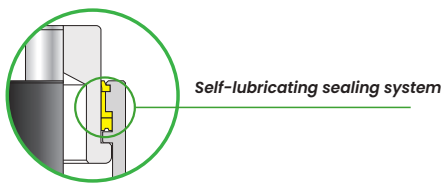
Important: Bordignon gas spring components are coupled through thread connections, for the highest possible safety. Thread connections are standard in high pressure equipment around the world, such as waterjet cutting nozzles and ultra high pressure vessels (~10000 bar).

Bordignon construction - Body/bottom cap threaded junction



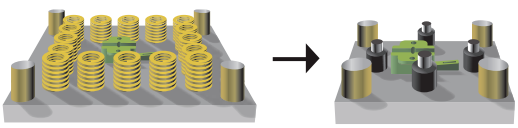
Other constructions - Body/bottom cap junction with lock ring



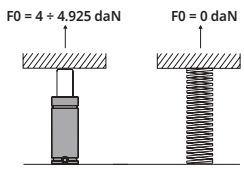


Reliability: All Bordignon nitrogen gas springs are self-lubricated, for millions of cycles, thanks to a solid lubricant.

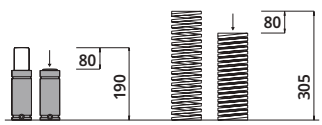
ADVANTAGES of USING GAS SPRINGS



"Less Space Needed for the Same Force"



+ Full initial force at the beginning of the stroke
+ No preload necessary



+ Smaller installation height but same stroke and same force

INFORMATION

- Stroke available at 100 %
- You might adjust the initial force with the charging and discharging set (model COMPL)
- Charging pressure: MIN 20 bar - MAX see table on catalogue
- Initial force increases by ~ 0.34% per each 1°C increase from the reference temperature of 20°C (room temperature, do not heat)
- How to calculate the charging pressure (bar) for initial forces (daN) lower than

• **Please note:** the final forces (forces at full stroke) indicated in the catalogue are reference values measured in static conditions. The actual final forces generated under use conditions may vary, since they depend on the specific parameters of the application, such as the working speed (cycles per minute).

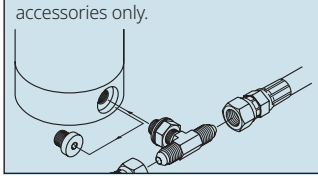
F initial in table:

$$\text{Charging pressure (bar)} = \frac{\text{F (daN) x max charging pressure (bar)}}{\textbf{F} \text{ initial in table}}$$

• How to calculate the force (daN) at intermediate strokes:

$$F = \text{Finitial} + \frac{\text{intermediate stroke}}{\text{max stroke}} \times (\textbf{F}_{\text{final}} - \textbf{F}_{\text{initial}})$$

Gas Spring Accessories Accessories for fixing, charging/discharging, linking to open system, etc. can be found in this catalogue further on.
ATTENTION: use Bordignon nitrogen gas springs with Bordignon accessories only.



2D & 3D Technical drawings Download various 2D & 3D file formats from www.guvenal.net

EGS

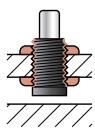
PED in accordance with 2014/68/EU

VDI

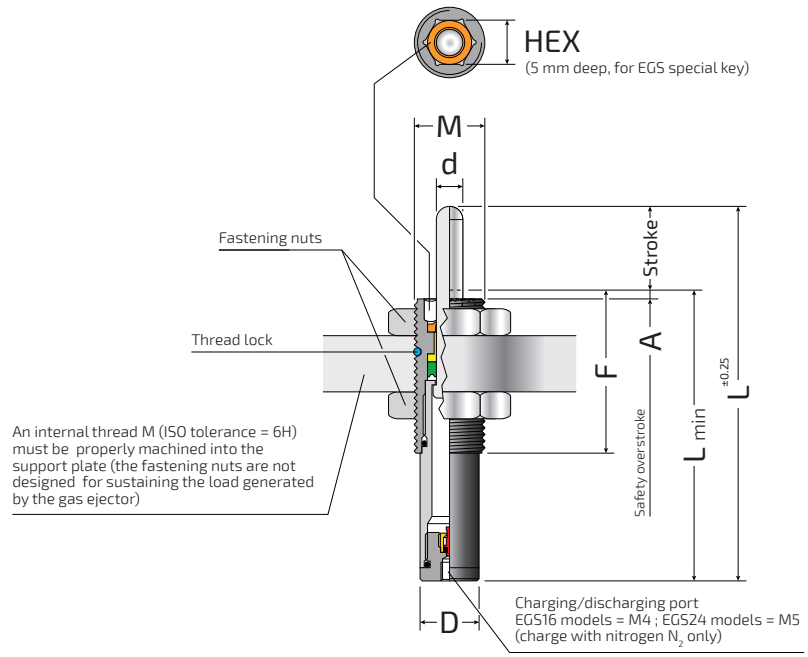
VDI 3004

Nitrogen Gas Ejectors

EGS series nitrogen gas ejectors feature compact length and several standard forces to choose from. **EGS series** nitrogen gas ejectors are self-lubricated.

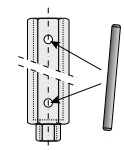


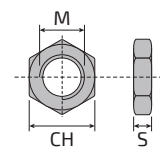
threaded hole on the die plate



Special key for installation

Order Code: **EGS-CH**





Order Code	Description	M	S	CH
EG-D-16	Fastening nut	M16 x 1.5	8	24
EG-D-16-2		M16 x 2	8	24
EG-D-24		M24 x 1.5	10	36

Springs

Safety Protections

UNCONTROLLED RETURN SPEED

OVERSTROKE

OVERPRESSURE

This gas spring series includes the models compliant with automotive standards

Ford	W-DX35-60M
VW	39D 549

Continued on the next page

EGS Nitrogen Gas Ejectors

Order Code	MAX Stroke	L min	L	M	F	A	d	D	HEX	bar (MPa)	daN	daN		Cycles per minute MAX	Gas volume Litres	Weight kg
EGS16x1.5-10-...	10	55	65	M16 x 1.5	35	1	6	13.5	10	See table below		x	1.51	300	0.001	0.05
20-...	20	65	85										1.60	150	0.002	0.06
30-...	30	75	105										1.63	100	0.003	0.07
40-...	40	85	125										1.65	75	0.003	0.07
50-...	50	95	145										1.66	60	0.004	0.08
60-...	60	105	165										1.67	50	0.005	0.08
70-...	70	115	185										1.68	45	0.006	0.09
80-...	80	125	205										1.68	40	0.007	0.10
100-...	100	145	245										1.69	30	0.008	0.11
125-...	125	170	295										1.70	25	0.010	0.12
EGS16x2-10-...	10	55	65	M16 x 2	35	1	6	13.5	10	See table below		x	1.51	300	0.001	0.05
20-...	20	65	85										1.60	150	0.002	0.06
30-...	30	75	105										1.63	100	0.003	0.07
40-...	40	85	125										1.65	75	0.003	0.07
50-...	50	95	145										1.66	60	0.004	0.08
60-...	60	105	165										1.67	50	0.005	0.08
70-...	70	115	185										1.68	45	0.006	0.09
80-...	80	125	205										1.68	40	0.007	0.10
100-...	100	145	245										1.69	30	0.008	0.11
125-...	125	170	295										1.70	25	0.010	0.12
EGS24x1.5-10-...	10	55	65	M24 x 1.5	35	1	12	21.5	17	See table below		x	1.74	300	0.003	0.16
20-...	20	65	85										1.85	150	0.006	0.18
30-...	30	75	105										1.89	100	0.008	0.20
40-...	40	85	125										1.92	75	0.011	0.23
50-...	50	95	145										1.93	60	0.013	0.25
60-...	60	105	165										1.94	50	0.016	0.27
70-...	70	115	185										1.95	45	0.018	0.29
80-...	80	125	205										1.96	40	0.021	0.30
100-...	100	145	245										1.97	30	0.026	0.33
125-...	125	170	295										1.97	25	0.032	0.35

All the gas ejector models in this table are in accordance with Article 4.3 of the 2014/68/EU Pressure Equipment Directive (PED)

Basic code	Force code	bar (MPa)	daN	daN	Label color	How to order
EGS16x1.5-...-	4	12 (1.2)	4	See table above	Purple	**EGS16x1.5-50-42** EGS nitrogen gas ejector with M16x1.5 threaded body,50 mm maximum available stroke length, 42 daN initial force (150 bar / 15.0 MPa charging pressure), yellow label. **EGS24x1.5-80-120** EGS nitrogen gas ejector with M24x1.5 threaded body,80 mm maximum available stroke length, 120 daN initial force (custom), black label.
	6	20 (2.0)	6		Green	
	11	40 (4.0)	11		Blue	
	21	75 (7.5)	21		Red	
	42	150 (15.0)	42		Yellow	
	(other)	10 (1.0)-150 (15.0)	3-42		Black	
EGS16x2-...-	4	12 (1.2)	4	See table above	Purple	
	6	20 (2.0)	6		Green	
	11	40 (4.0)	11		Blue	
	21	75 (7.5)	21		Red	
	42	150 (15.0)	42		Yellow	
	(other)	10 (1.0)-150 (15.0)	3-42		Black	
EGS24x1.5-...-	23	20 (2.0)	23	See table above	Green	
	45	40 (4.0)	45		Blue	
	85	75 (7.5)	85		Red	
	170	150 (15.0)	170		Yellow	
	(other)	10 (1.0)-150 (15.0)	11-170		Black	

ALL EGS MODELS ARE DISPOSABLE (REPAIR KIT NOT AVAILABLE)

VGS

PED in accordance with 2014/68/EU

VDI

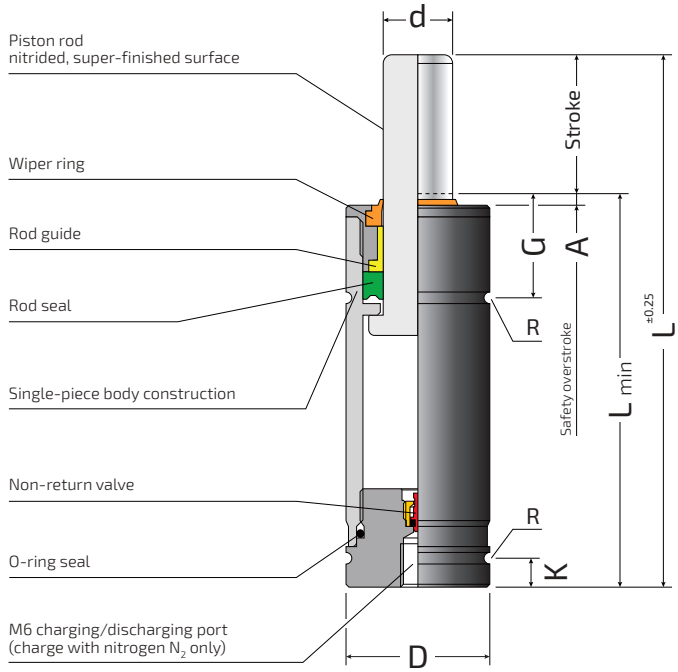
VDI 3003 Part 2

ISO

ISO 11901-1

VGS 50 ~ 200

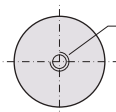
VGS series nitrogen gas springs feature standard dimensions for small diameters. With the VGS series nitrogen gas springs, Bordignon now ensures a great interchangeability and a superior reliability. VGS series nitrogen gas springs are self-lubricated.



COMPACT POWER

COMPACT HEIGHT

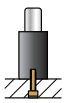
Gas spring base



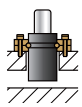
Ma

for charging / discharging for fixing

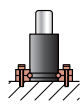
VGS50, VGS70, VGS90, VGS200



at the base with screw



with collar flange - **FL**



with collar flange (base)
FV for VGS90 only
FL for VGS200 only

All the gas ejector models in this table are in accordance with Article 4.3 of the 2014/68/EU Pressure Equipment Directive (PED)

Basic code	Force code	bar (MPa)	daN	daN	Label color	How to order
VGS50-...-	13	45 (4.5)	13	See table on the right page	Green	**VGS90-50-90** VGS nitrogen gas spring with 19 mm body diameter, 50 mm maximum available stroke length, 90 daN initial force (180 bar 18.0 MPa charging pressure), yellow label. **VGS200-80-175** VGS nitrogen gas spring with 25 mm body diameter, 80 mm maximum available stroke length, 175 daN initial force (custom), black label.
	25	90 (9.0)	25		Blue	
	38	135 (13.5)	38		Red	
	50	180 (18.0)	50		Yellow	
	(other)	20 (2.0)-180 (18.0)	6-50		Black	
VGS70-...-	18	45 (4.5)	18	See table on the right page	Green	
	35	90 (9.0)	35		Blue	
	50	135 (13.5)	50		Red	
	70	180 (18.0)	70		Yellow	
	(other)	20 (2.0)-180 (18.0)	8-70		Black	
VGS90-...-	5	10 (1.0)	5	See table on the right page	Orange	
	10	20 (2.0)	10		Purple	
	30	60 (6.0)	30		Green	
	50	100 (10.0)	50		Blue	
	70	140 (14.0)	70		Red	
	90	180 (18.0)	90		Yellow	
	(other)	10 (1.0)-180 (18.0)	5-90		Black	
VGS200-...-	17	15 (1.5)	17	See table on the right page	Orange	
	28	25 (2.5)	28		Purple	
	50	45 (4.5)	50		Green	
	100	90 (9.0)	100		Blue	
	150	135 (13.5)	150		Red	
	200	180 (18.0)	200		Yellow	
	(other)	10 (1.0)-180 (18.0)	11-200		Black	

TABLE 1

Springs

Safety Protections

UNCONTROLLED RETURN SPEED

OVERSTROKE

OVERPRESSURE

This gas spring series includes the models compliant with automotive standards

BMW	B2 4007	**PSA**	E24.54.815.G
FCA	075.90.50	**Renault**	EM24.54.700
MB	B8 3180 220 000 002	**VW**	39D 878
Nissan	K32D2-2400-50		

Continued on the next page ⟶

VGS 50 ~ 200

Order Code	MAX Stroke	L min	L	D	d	G	A	R	K	Ma	bar (MPa)	daN	daN		Cycles per minute MAX	Gas volume Litres	Weight kg
VGS50-07-...	7	49	56	12 ±0.1	6	17	1	0.8	-	M6 x 6	See **Table 1** on the left page		x	1.50	300	0.001	0.03
10-...	10	52	62											1.50	300	0.001	0.03
13-...	12.7	54.7	67.4											1.60	235	0.001	0.03
15-...	15	57	72											1.60	200	0.001	0.03
19-...	19	61	80											1.70	160	0.002	0.03
25-...	25	67	92											1.70	120	0.002	0.03
38-...	38	80	118											1.80	80	0.003	0.04
50-...	50	92	142											1.80	60	0.004	0.05
63-...	63.5	108.5	172											1.80	50	0.005	0.06
75-...	75	120	195											1.80	40	0.005	0.06
80-...	80	125	205											1.80	40	0.006	0.07
100-...	100	145	245											1.90	30	0.007	0.08
125-...	125	170	295											1.90	25	0.008	0.09
VGS70-07-...	7	49	56	15 ±0.1	7	17	1	0.8	-	M6 x 6	See **Table 1** on the left page		x	1.43	300	0.001	0.04
10-...	10	52	62											1.50	300	0.001	0.05
13-...	12.7	54.7	67.4											1.50	235	0.002	0.05
15-...	15	57	72											1.57	200	0.002	0.05
19-...	19	61	80											1.57	160	0.002	0.05
25-...	25	67	92											1.64	120	0.003	0.06
38-...	38.1	80.1	118.2											1.71	80	0.004	0.07
50-...	50	92	142											1.71	60	0.005	0.08
63-...	63.5	108.5	172											1.71	50	0.007	0.09
75-...	75	120	195											1.71	40	0.008	0.10
80-...	80	125	205											1.71	40	0.008	0.10
100-...	100	145	245											1.79	30	0.010	0.12
125-...	125	170	295											1.79	25	0.013	0.14
VGS90-07-...	7	49	56	19 +0/-0.3	8	17	1	1	6	M6 x 8	See **Table 1** on the left page		x	1.39	300	0.002	0.07
10-...	10	52	62											1.39	300	0.002	0.07
13-...	12.7	54.7	67.4											1.44	235	0.003	0.08
15-...	15	57	72											1.44	200	0.003	0.08
25-...	25	67	92											1.50	120	0.005	0.09
38-...	38.1	80.1	118.2											1.50	80	0.007	0.11
50-...	50	92	142											1.50	60	0.009	0.12
63-...	63.5	108.5	172											1.50	50	0.012	0.14
80-...	80	125	205											1.50	40	0.015	0.15
100-...	100	145	245											1.50	30	0.019	0.17
125-...	125	170	295											1.50	25	0.023	0.20
VGS200-07-...	7	49	56	25 +0/-0.3	12	17	1	1	5	M6 x 9	See **Table 1** on the left page		x	1.43	300	0.004	0.12
10-...	10	52	62											1.48	300	0.005	0.13
13-...	12.7	54.7	67.4											1.50	235	0.006	0.13
15-...	15	57	72											1.53	200	0.006	0.14
16-...	16	58	74											1.53	190	0.007	0.14
25-...	25	67	92											1.55	120	0.010	0.16
38-...	38.1	80.1	118.2											1.60	80	0.014	0.19
50-...	50	92	142											1.60	60	0.018	0.20
63-...	63.5	108.5	172											1.60	50	0.024	0.23
80-...	80	125	205											1.60	40	0.029	0.26
100-...	100	145	245											1.60	30	0.036	0.30
125-...	125	170	295											1.63	25	0.044	0.34

REPAIR KIT

VGS50-... and VGS70-... MODELS ARE DISPOSABLE
(REPAIR KIT NOT AVAILABLE)

Gas Spring Code	Repair Kit Code
VGS90 - ...	KR / VGS 90
VGS200 - ...	KR / VGS 200

AGS

PED In accordance with 2014/68/EU

VDI

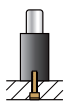
VDI 3003 Part 3

ISO

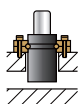
ISO 11901-3

AGS 170 ~ 320

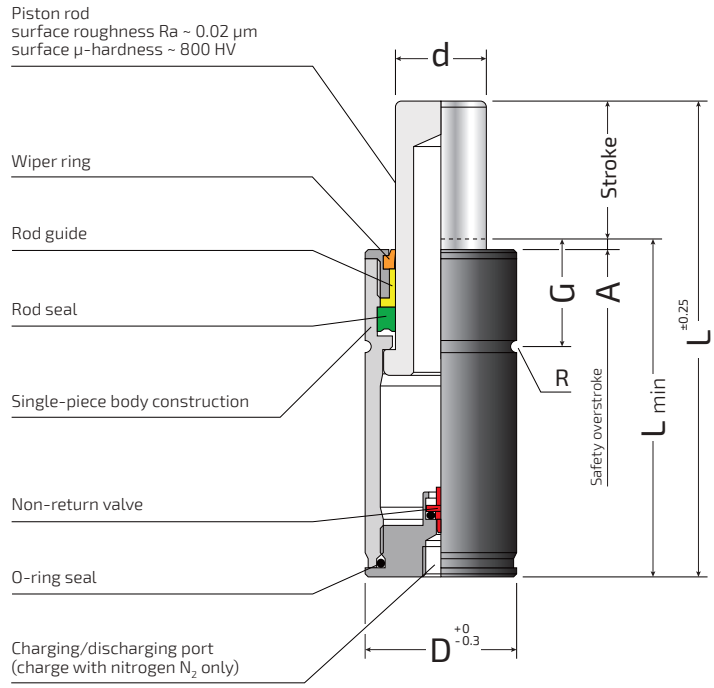
AGS series nitrogen gas springs are highly appreciated in the automotive industry thanks to the compact dimensions, the fixing and linking possibilities. With the AGS series nitrogen gas springs, Bordignon now ensures a great interchangeability and a superior reliability. AGS series nitrogen gas springs are self-lubricated.



at the base with screw



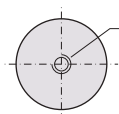
with collar flange - **FL**



COMPACT POWER

COMPACT HEIGHT

Gas spring base



Ma

for charging / discharging for fixing

AGS170, AGS320

Springs

Safety Protections

UNCONTROLLED RETURN SPEED

OVERSTROKE

OVERPRESSURE

This gas spring series includes the models compliant with automotive standards

BMW	B2 4005	**MB**	B8 3180 220 000 004
FCA	075.90.60	**VW**	39D 997

Continued on the next page →

AGS 170 ~ 320

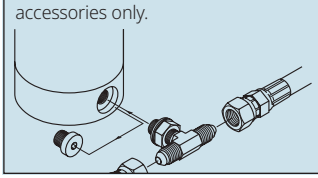
Order Code	MAX Stroke	L min	L	D	d	G	A	R	Ma	bar (MPa)	daN	daN	Cycles per minute max	Gas volume Litres	Weight kg
AGS170-07-A	7	37	44	19	11	17	1	1	M6 x 5	180 (18.0)	170	290	300	0.002	0.06
10-A	10	40	50									295	300	0.003	0.06
13-A	13	43	56									300	230	0.003	0.07
15-A	15	45	60									310	200	0.004	0.07
19-A	19	49	68									320	160	0.005	0.08
25-A	25	55	80									330	120	0.006	0.08
32-A	32	62	94									340	90	0.007	0.09
38-A	38	68	106									340	80	0.009	0.10
50-A	50	80	130									350	60	0.011	0.12
63-A	63	93	156									355	50	0.014	0.14
75-A	75	110	185									360	40	0.017	0.16
80-A	80	115	195									360	40	0.018	0.16
100-A	100	135	235									360	30	0.023	0.19
125-A	125	160	285									360	25	0.028	0.23
AGS320-07-A	7	37	44	25	15	17	1	1	M6 x 5	180 (18.0)	320	490	300	0.004	0.10
10-A	10	40	50									490	300	0.005	0.11
13-A	13	43	56									550	230	0.006	0.12
15-A	15	45	60									550	200	0.007	0.12
19-A	19	49	68									580	160	0.008	0.13
25-A	25	55	80									600	120	0.011	0.14
32-A	32	62	94									630	90	0.013	0.16
38-A	38	68	106									640	80	0.015	0.17
50-A	50	80	130									640	60	0.020	0.20
63-A	63	93	156									640	50	0.025	0.23
75-A	75	110	185									640	40	0.031	0.26
80-A	80	115	195									640	40	0.033	0.27
100-A	100	135	235									650	30	0.040	0.32
125-A	125	160	285									660	25	0.050	0.38

All the gas ejector models in this table are in accordance with Article 4.3 of the 2014/68/EU Pressure Equipment Directive (PED)

REPAIR KIT

Gas Spring Code	Repair Kit Code
AGS170-...-A	KR / AGS170-A
AGS320-...-A	KR / AGS320-A

Gas Spring Accessories Accessories for fixing, charging/discharging, linking to open system, etc. can be found in this catalogue further on.
ATTENTION: use Bordignon nitrogen gas springs with Bordignon accessories only.



2D & 3D Technical drawings Download various 2D & 3D file formats from www.guvenal.net

AGS

PED In accordance with 2014/68/EU

VDI

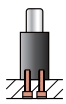
VDI 3003 Part 3

ISO

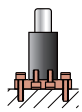
ISO 11901-3

AGS 320 ~ 2400

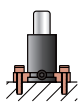
AGS series nitrogen gas springs are highly appreciated in the automotive industry thanks to the compact dimensions, the fixing and linking possibilities. With the AGS series nitrogen gas springs, Bordignon now ensures a great interchangeability and a superior reliability.
AGS series nitrogen gas springs are self-lubricated.



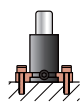
at the base with screws



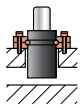
with base-plate **BF, BFA, BFB for AGS750 ~ AGS2400**



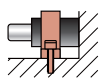
with half-flanges **SF, SFA**



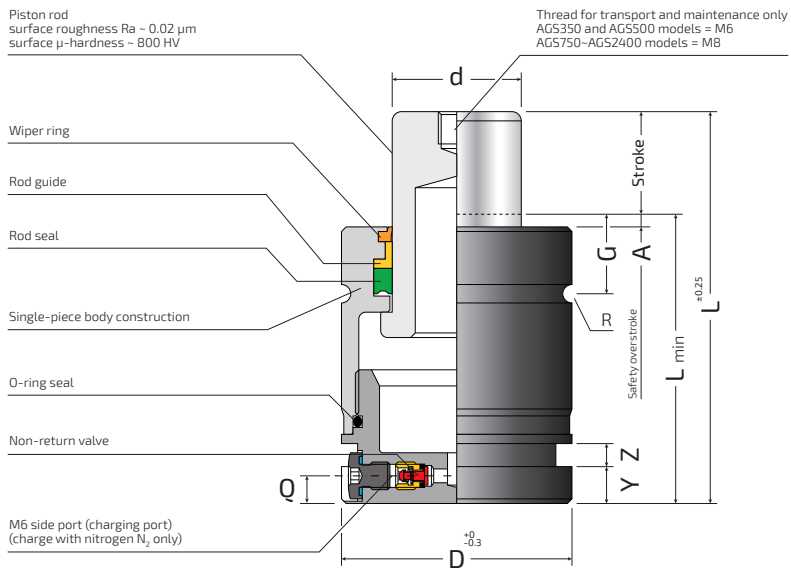
with foot brackets **ST, STA for AGS500 ~ AGS2400**



with collar flange **FL, FLQ**

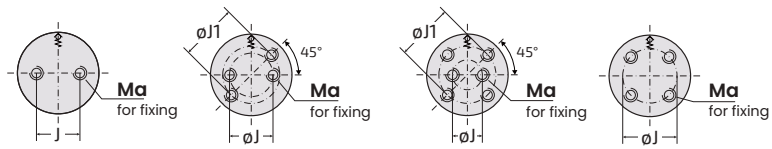


with front support **FT, FTA (Not for all AGS models)**



COMPACT POWER — COMPACT HEIGHT

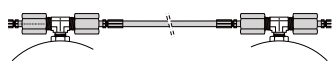
Gas spring base



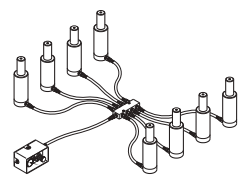
AGS350 AGS750, AGS1000 — **AGS500** — **AGS1500** — **AGS2400**

Linking To Open System

AGS 320 ~ 2400 - (M6 side port)



HOSES	ATM	ATNM
Gas Spring- Hose fittings	ARM	ARNM



ATTENTION! Follow the instructions in the "LINKED SYSTEM" section before connecting the gas springs.

Linking To "OV SYSTEM"

AGS350~AGS2400 models are also available as "OV-version" (without valve, for direct connection to alternative manifold system).

See dedicated catalogue section.

Safety Protections

UNCONTROLLED RETURN SPEED

OVERSTROKE

OVERPRESSURE

This gas spring series includes the models compliant with automotive standards

BMW	B2 4005	**Nissan**	K 32 H
FCA	075.90.60	**PSA**	E24.54.815.G
Ford	W-DX35-6204	**VW**	39D 997
MB	B8 3180 220 000 004		

Continued on the next page

AGS 350 ~ 2400

Order Code	MAX Stroke	L min	L	D	d	G	A	R	Y	Z	Q	Ma	J	J1	bar (MPa)	daN	daN	Cycles per minute MAX	Gas volume Litres	Weight kg
AGS350-10-A	10	40	50														570	300	0.006	0.19
13-A	13	43	56														570	230	0.007	0.20
16-A	16	46	62														580	190	0.009	0.21
19-A	19	49	68														580	160	0.011	0.22
25-A	25	55	80														580	120	0.015	0.24
32-A	32	62	94														590	90	0.019	0.26
38-A	38	68	106	32	16	12.5	2	1	4	4	6	M6 x 6 (2x)	20	-	180 (18.0)	360	590	80	0.022	0.28
50-A	50	80	130														590	60	0.029	0.32
63-A	63	93	156														590	50	0.037	0.36
75-A	75	105	180														590	40	0.044	0.40
80-A	80	110	190														590	40	0.047	0.42
100-A	100	130	230														590	30	0.059	0.49
125-A	125	155	280														610	25	0.074	0.58
AGS500-10-A	10	40	50														720	300	0.009	0.26
13-A	13	43	56														720	230	0.012	0.28
16-A	16	46	62														730	190	0.014	0.29
19-A	19	49	68														730	160	0.017	0.30
25-A	25	55	80														740	120	0.023	0.32
32-A	32	62	94														740	90	0.029	0.35
38-A	38	68	106	38	20	12.5	2	1	4	4	6	M6 x 6 (2x or 2x) *(2x o 2x)*	20	25	150 (15.0)	470	740	80	0.035	0.38
50-A	50	80	130														750	60	0.046	0.43
63-A	63	93	156														750	50	0.059	0.48
75-A	75	105	180														750	40	0.070	0.52
80-A	80	110	190														750	40	0.075	0.55
100-A	100	130	230														750	30	0.094	0.63
125-A	125	155	280														760	25	0.117	0.73
AGS750-10-A	10	42	52														1200	300	0.013	0.40
13-A	13	45	58														1230	230	0.017	0.42
16-A	16	48	64														1230	190	0.021	0.44
19-A	19	51	70														1250	160	0.025	0.45
25-A	25	57	82														1250	120	0.033	0.49
32-A	32	64	96														1250	90	0.042	0.53
38-A	38	70	108	45	25	16.5	2	1	4	4	6	M8 x 6 (2x)	20	-	150 (15.0)	740	1250	80	0.050	0.57
50-A	50	82	132														1250	60	0.066	0.64
63-A	63	95	158														1260	50	0.084	0.72
75-A	75	107	182														1260	40	0.100	0.79
80-A	80	112	192														1260	40	0.106	0.82
100-A	100	132	232														1260	30	0.133	0.95
125-A	125	157	282														1260	25	0.167	1.10
AGS1000-13-A	13	51	64														1540	230	0.02	0.57
16-A	16	54	70														1540	190	0.03	0.59
19-A	19	57	76														1560	160	0.03	0.61
25-A	25	63	88														1580	120	0.04	0.66
32-A	32	70	102														1580	90	0.05	0.71
38-A	38	76	114	50	28	17.5	3	2	8	5	6	M8 x 6 (2x)	20	-	150 (15.0)	920	1580	80	0.06	0.75
50-A	50	88	138														1580	60	0.08	0.84
63-A	63	101	164														1580	50	0.11	0.93
75-A	75	113	188														1580	40	0.13	1.02
80-A	80	118	198														1580	40	0.13	1.06
100-A	100	138	238														1600	30	0.17	1.21
125-A	125	163	288														1600	25	0.21	1.40
AGS1500-10-A	10	54	64														2220	300	0.03	0.96
13-A	13	57	70														2280	230	0.04	0.99
16-A	16	60	76														2300	190	0.05	1.02
19-A	19	63	82														2350	160	0.06	1.06
25-A	25	69	94														2390	120	0.08	1.12
32-A	32	76	108														2450	90	0.10	1.20
38-A	38	82	120	63	36	19	3	2	8	5	6	M8 x 6 (2x or 4x) *(2x o 4x)*	20	40	150 (15.0)	1530	2450	80	0.11	1.26
50-A	50	94	144														2500	60	0.15	1.39
63-A	63	107	170														2510	50	0.18	1.52
75-A	75	119	194														2530	40	0.22	1.65
80-A	80	124	204														2550	40	0.23	1.71
100-A	100	144	244														2580	30	0.29	1.92
125-A	125	169	294														2640	25	0.35	2.24
AGS2400-16-A	16	61	77														3800	190	0.07	1.54
19-A	19	64	83														3850	160	0.08	1.58
25-A	25	70	95														3900	120	0.11	1.68
32-A	32	77	109														4000	90	0.14	1.79
38-A	38	83	121														4050	80	0.16	1.89
50-A	50	95	145	75	45	21	3	2.5	8	5	6	M8 x 6 (4x)	40	-	150 (15.0)	2385	4100	60	0.21	2.09
63-A	63	108	171														4100	50	0.26	2.30
75-A	75	120	195														4150	40	0.31	2.49
80-A	80	125	205														4200	40	0.33	2.57
100-A	100	145	245														4200	30	0.41	2.90
125-A	125	170	295														4200	25	0.51	3.28

REPAIR KIT All the gas ejector models in this table are in accordance with Article 4.3 of the 2014/68/EU Pressure Equipment Directive (PED)

Gas Spring Code	Repair Kit Code
AGS350-...-A	KR / AGS350-A
AGS500-...-A	KR / AGS500-A
AGS750-...-A	KR / AGS750-A

Gas Spring Code	Repair Kit Code
AGS1000-...-A	KR / AGS1000-A
AGS1500-...-A	KR / AGS1500-A
AGS2400-...-A	KR / AGS2400-A

"L-VERSION" (FOR LINKED SYSTEM)

When the AGS gas springs are to be used in a linked system, make sure to order the "L-version" by adding "-L" after the gas spring code. The "L-version" gas springs are supplied already discharged and without valve, ready for the connection to linked system.
Example: "**AGS1000-50-A-L**"

AGS

PED In accordance with 2014/68/EU

VDI

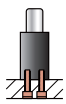
VDI 3003 Part 3

ISO

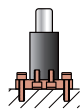
ISO 11901-3

AGS 4200 ~ 20000

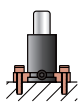
AGS series nitrogen gas springs are highly appreciated in the automotive industry thanks to the compact dimensions, the fixing and linking possibilities. With the AGS series nitrogen gas springs, Bordignon now ensures a great interchangeability and a superior reliability. AGS series nitrogen gas springs are self-lubricated.



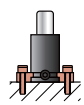
at the base with screws



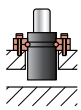
with base-plate **BF, BFA, BFB**



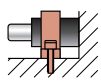
with half-flanges **SF, SFA**



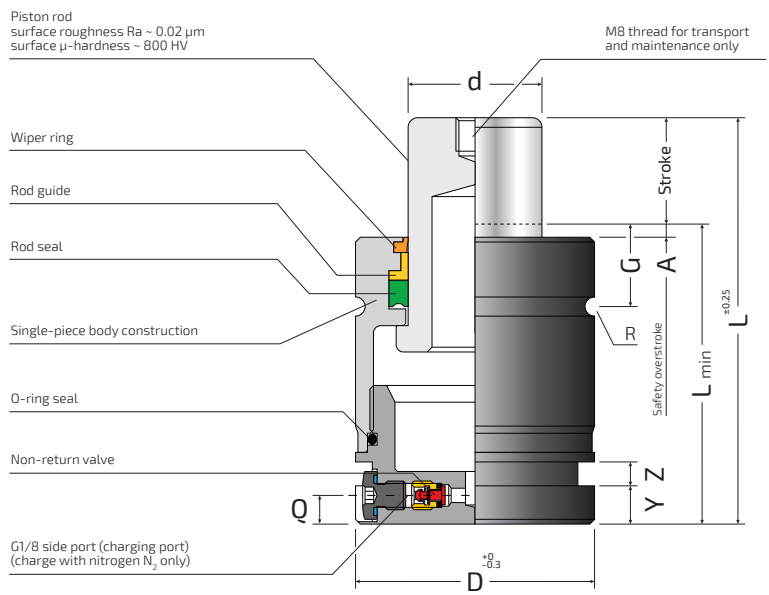
with foot brackets **ST, STA**



with collar flange **FL, FLQ**

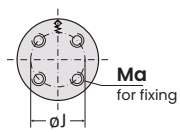


with front support **FT, FTA** **(Not for all AGS models)**



COMPACT POWER — COMPACT HEIGHT

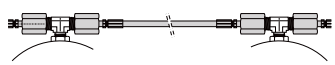
Gas spring base



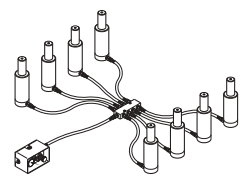
AGS 4200 ~ 20000

Linking To Open System

AGS 4200 ~ 20000 – (G1/8 side port)



HOSES	ATM	ATN	AT
Gas Spring- Hose fittings	ARM	ARN	AR



ATTENTION! Follow the instructions in the "LINKED SYSTEM" section before connecting the gas springs.

Linking To "OV SYSTEM"

AGS4200~AGS20000 models are also available as "OV-version" (without valve, for direct connection to alternative manifold system).
See dedicated catalogue section.

Safety Protections

UNCONTROLLED RETURN SPEED

OVERSTROKE

OVERPRESSURE

This gas spring series includes the models compliant with automotive standards

BMW	B2 4005	**MB**	B8 3180 220 000 004
FCA	075.90.60	**Nissan**	K 32 H
Ford	W-DX35-6204	**PSA**	E24.54.815.G
Mazda	PG 24D	**VW**	39D 997

Continued on the next page →

AGS 4200 ~ 20000

Order Code	MAX Stroke	L min	L	D	d	G	A	R	Y	Z	Q	Ma	J	bar (MPa)	daN	daN	Cycles per minute MAX	Gas volume Litres	Weight kg
AGS4200-16-A	16	74	90	95	60	24	3	2.5	8	5	10.5	M8 x 12 (4x)	60	150 (15.0)	4240	6800	190	0.13	3.13
19-A	19	77	96													6800	160	0.15	3.21
25-A	25	83	108													7000	120	0.19	3.37
32-A	32	90	122													7300	90	0.24	3.55
38-A	38	96	134													7300	80	0.28	3.69
50-A	50	108	158													7500	60	0.36	3.98
63-A	63	121	184													7500	50	0.45	4.30
75-A	75	133	208													7600	40	0.54	4.59
80-A	80	138	218													7700	40	0.57	4.72
100-A	100	158	258													7800	30	0.71	5.22
125-A	125	183	308													7900	25	0.88	5.85
AGS6600-16-A	16	84	100	120	75	25.5	3	2.5	8	5	10.5	M10 x 12 (4x)	80	150 (15.0)	6630	9400	190	0.22	5.67
19-A	19	87	106													9600	160	0.25	5.81
25-A	25	93	118													10100	120	0.31	6.08
32-A	32	100	132													10400	90	0.38	6.39
38-A	38	106	144													10500	80	0.44	6.66
50-A	50	118	168													10700	60	0.56	7.21
63-A	63	131	194													11200	50	0.69	7.79
75-A	75	143	218													11300	40	0.81	8.32
80-A	80	148	228													11300	40	0.86	8.53
100-A CE	100	168	268													11400	30	1.07	9.45
125-A CE	125	193	318													11500	25	1.32	10.57
AGS9500-19-A	19	97	116	150	90	27.5	3	2.5	8	5	10.5	M10 x 16 (4x)	100	150 (15.0)	9540	16000	160	0.35	10.85
25-A	25	103	128													16300	120	0.45	11.23
32-A	32	110	142													16500	90	0.56	11.69
38-A	38	116	154													16600	80	0.65	12.06
50-A	50	128	178													16800	60	0.85	12.84
63-A CE	63	141	204													17000	50	1.05	13.67
75-A CE	75	153	228													17000	40	1.24	14.45
80-A CE	80	158	238													17100	40	1.32	14.77
100-A CE	100	178	278													17100	30	1.64	16.05
125-A CE	125	203	328													17200	25	2.04	17.67
AGS20000-19-A	19	129	148	195	130	33.5	3	2.5	8	8	15	M12 x 18 (4x)	120	150 (15.0)	19910	30400	160	0.90	23.29
25-A CE	25	135	160													31600	120	1.08	23.92
32-A CE	32	142	174													32600	90	1.29	24.66
38-A CE	38	148	186													33300	80	1.47	25.30
50-A CE	50	160	210													34400	60	1.83	26.55
63-A CE	63	173	236													35100	50	2.22	27.91
75-A CE	75	185	260													35600	40	2.58	29.17
80-A CE	80	190	270													35800	40	2.73	29.69
100-A CE	100	210	310													36400	30	3.33	31.80
125-A CE	125	235	360													36900	25	4.08	34.42

CE

The gas spring models for which the CE symbol is indicated have an internal gas volume > 1 litre. They fall into Category II of the 2014/68/EU Pressure Equipment Directive (PED).

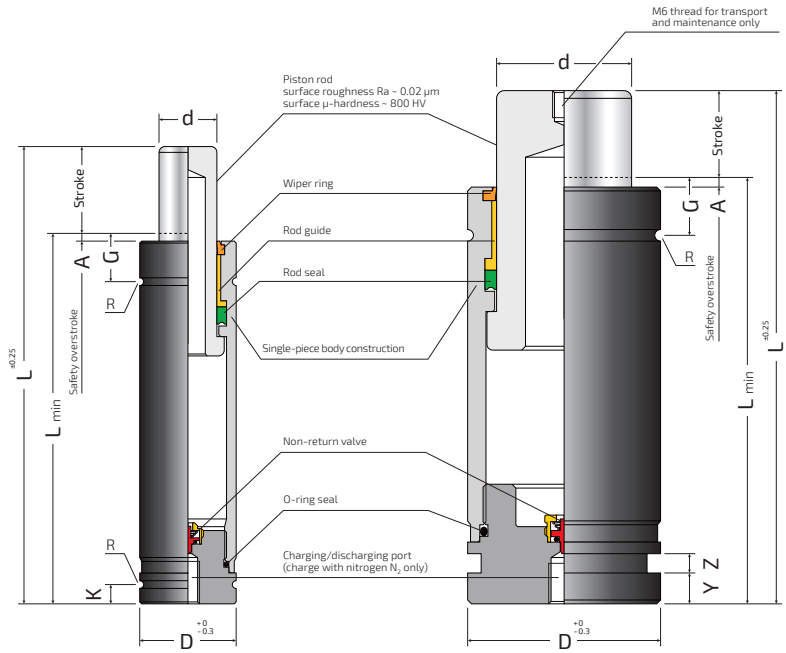
All the gas ejector models in this table are in accordance with Article 4.3 of the 2014/68/EU Pressure Equipment Directive (PED)

REPAIR KIT

Gas Spring Code	Repair Kit Code
AGS4200-...-A	KR / AGS4200-A
AGS6600-...-A	KR / AGS6600-A
AGS9500-...-A	KR / AGS9500-A
AGS20000-...-A	KR / AGS20000-A

TGS

PED In accordance with 2014/68/EU



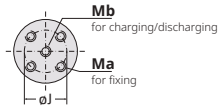
TGS 400 ~ 12000

TGS series nitrogen gas springs feature high forces and compact diameters in a rod seal design. They ensure a great interchangeability (forces, dimensions and fixing possibilities) with the bore seal design nitrogen gas springs commonly available on the market, offering a higher performance (high number of cycles per minute, self-lubrication, better protection against liquid contaminants) and reliability thanks to the rod seal design. TGS series nitrogen gas springs are self-lubricated.

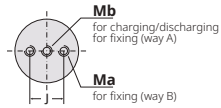
COMPACT POWER

COMPACT HEIGHT

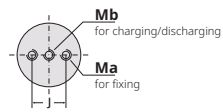
Gas spring base



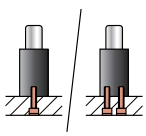
TGS400



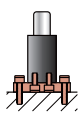
TGS700, TGS1000, TGS2000, TGS3000



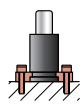
TGS5000, TGS8000, TGS12000



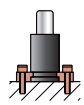
at the base
with screw(s)



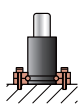
with base-plate
BF, BFA, BFB for TGS5000 only



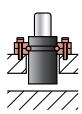
with half-flanges
SF, SFA for TGS700~TGS12000



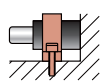
with foot brackets
ST, STA for TGS1000~TGS12000



with collar flange (base)
FL for TGS400 only



with collar flange
FL, FLA, FLQ, FLQA



with front support
FT, FTA (Not for all AGS models)

Springs

Safety Protections

UNCONTROLLED RETURN SPEED

OVERSTROKE

OVERPRESSURE

Continued on the next page

TGS 400 ~ 12000

Order Code	MAX Stroke	L min	L	D	d	G	A	R	K	Y	Z	Ma	J	Mb	bar (MPa)	daN	daN	Cycles per minute MAX	Gas volume Litres	Weight kg
TGS400-10-A	10	60	70			11.5		1		-	-						510	300	0.006	0.18
16-A	16	75	91			11.5		1		-	-						510	190	0.011	0.20
25-A	25	95	120	25	15	11.5	1	1	5	-	-	M5 x 6 (2x)	14	M6 x 11	204 (20.4)	360	520	120	0.018	0.24
32-A	32	108	140			11.5		1		-	-						520	90	0.022	0.26
40-A	40	125	165			11.5		1		-	-						530	75	0.028	0.30
50-A	50	145	195			11.5		1		-	-						530	60	0.035	0.33
TGS700-06-A	● 6	57	63			11.5		1		-	-						840	300	0.008	0.27
10-A	● 10	65	75			11.5		1		-	-						870	300	0.014	0.29
16-A	16	77	93			11.5		1		4	3.5						940	190	0.018	0.33
25-A	25	95	120	32	20	11.5	2	1	-	4	3.5	M6 x 8 (2x)	15	M4	210 (21.0)	660	950	120	0.030	0.38
32-A	32	108	140			11.5		1		4	3.5						950	90	0.038	0.42
40-A	40	125	165			11.5		1		4	3.5						960	75	0.049	0.46
50-A	50	145	195			11.5		1		4	3.5						960	60	0.062	0.51
TGS1000-06-A	● 6	55	61			10.5		1		-	-						1350	300	0.010	0.38
10-A	10	68	78			10.5		1		4	3.5						1400	300	0.016	0.46
16-A	16	84	100			10.5		1		4	3.5						1400	190	0.028	0.52
25-A	25	110	135	38	25	10.5	2	1	-	4	3.5	M6 x 8 (2x)	17	M8	205 (20.5)	1000	1400	120	0.049	0.63
32-A	32	135	167			10.5		1		4	3.5						1450	90	0.068	0.73
40-A	40	155	195			10.5		1		4	3.5						1450	75	0.084	0.81
50-A	50	180	230			10.5		1		4	3.5						1450	60	0.104	0.92
TGS2000-06-A	●● 6	60	66			-		-		-	-						3000	300	0.02	0.74
10-A	●● 10	70	80			-		-		-	-						3100	300	0.03	0.82
16-A	● 16	90	106			14.5		1.5		-	-						3200	190	0.05	1.02
25-A	25	110	135	50	35	14.5	2	1.5	-	8	5	M6 x 8 (2x)	26	M8	209 (20.9)	2000	3300	120	0.07	1.25
32-A	32	130	162			14.5		1.5		8	5						3400	90	0.10	1.39
40-A	40	150	190			14.5		1.5		8	5						3400	75	0.12	1.54
50-A	50	170	220			14.5		1.5		8	5						3400	60	0.15	1.70
65-A	65	206	271			14.5		1.5		8	5						3200	45	0.20	1.99
TGS3000-10-A	●● 10	75	85			-		-		-	-						4600	300	0.05	1.45
16-A	● 16	87	103			19		2		-	-						5000	190	0.07	1.62
25-A	25	105	130			19		2		8	5						5200	120	0.10	1.91
32-A	32	118	150	63	45	19	2	2	-	8	5	M8 x 12 (2x)	34	M8	189 (18.9)	3000	5200	90	0.14	2.07
40-A	40	135	175			19		2		8	5						5300	75	0.18	2.27
50-A	50	155	205			19		2		8	5						5300	60	0.23	2.52
65-A	65	191	256			19		2		8	5						5000	45	0.31	2.97
TGS5000-10-A	●● 10	70	80			-		-		-	-						7400	300	0.08	1.87
16-A	● 16	90	106			18		1.5		-	-						7400	190	0.12	2.33
25-A	25	110	135			18		1.5		8	5						7600	120	0.18	2.74
32-A	32	135	167	75	58	18	2	1.5	-	8	5	M8 x 12 (4x)	40	M8	190 (19.0)	5000	7600	90	0.27	3.05
40-A	40	160	200			18		1.5		8	5						7600	75	0.36	3.38
50-A	50	190	240			18		1.5		8	5						7200	60	0.47	3.78
65-A	65	208	273			18		1.5		8	5						8000	45	0.55	4.12
TGS8000-10-A	●● 10	80	90			-		-		-	-						10500	300	0.17	3.29
16-A	● 16	100	116			21		1.5		-	-						10800	190	0.25	3.94
25-A	25	120	145			21		1.5		8	5						11500	120	0.36	4.50
32-A	32	150	182	95	75	21	2	1.5	-	8	5	M8 x 12 (4x)	52	M8	182 (18.2)	8000	11500	90	0.54	5.05
40-A	40	170	210			21		1.5		8	5						11600	75	0.66	5.46
50-A	50	205	255			21		1.5		8	5						11600	60	0.88	6.14
65-A	65	214	279			21		1.5		8	5						12500	45	0.96	6.46
TGS12000-10-A	●● 10	90	100			-		-		-	-						15500	300	0.25	6.22
16-A	● 16	110	126			22.5		2.5		-	-						16500	190	0.35	7.45
25-A	25	130	155			22.5		2.5		8	5						17000	120	0.49	8.59
32-A	32	155	187	120	90	22.5	2	2.5	-	8	5	M10 x 15 (4x)	68	M8	189 (18.9)	12000	17000	90	0.70	9.48
40-A	40	180	220			22.5		2.5		8	5						17000	75	0.92	10.41
50-A	CE 50	210	260			22.5		2.5		8	5						16500	60	1.19	11.52
65-A	CE 65	255	320			22.5		2.5		8	5						18000	45	1.59	13.27

CE

The gas spring models for which the CE symbol is indicated have an internal gas volume > 1 litre. They fall into Category II of the 2014/68/EU Pressure Equipment Directive (PED).

All the gas ejector models in this table are in accordance with Article 4.3 of the 2014/68/EU Pressure Equipment Directive (PED)

REPAIR KIT

Gas Spring Code	Repair Kit Code
TGS400-...-A	KR / TGS400-A
TGS700-...-A	KR / TGS700-A
TGS1000-...-A	KR / TGS1000-A
TGS2000-...-A	KR / TGS2000-A

Gas Spring Code	Repair Kit Code
TGS3000-...-A	KR / TGS3000-A
TGS5000-...-A	KR / TGS5000-A
TGS8000-...-A	KR / TGS8000-A
TGS12000-...-A	KR / TGS12000-A

● Without lower (square) groove

● Without upper (round) groove

IGS

PED in accordance with 2014/68/EU

VDI

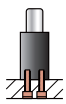
VDI 3003

ISO

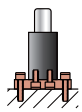
ISO 11901-1

IGS 150 ~ 1500

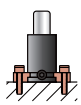
IGS series nitrogen gas springs feature standard dimensions and forces, as well as several fixing and linking possibilities. With the IGS series nitrogen gas springs, Bordignon now ensures a great interchangeability and a superior reliability. IGS series nitrogen gas springs are self-lubricated.



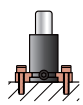
at the base
with screws



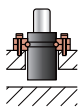
with base-plate
BF, BFA, BFB for IGS500 ~ IGS1500



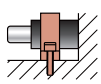
with
half-flanges
SF, SFA



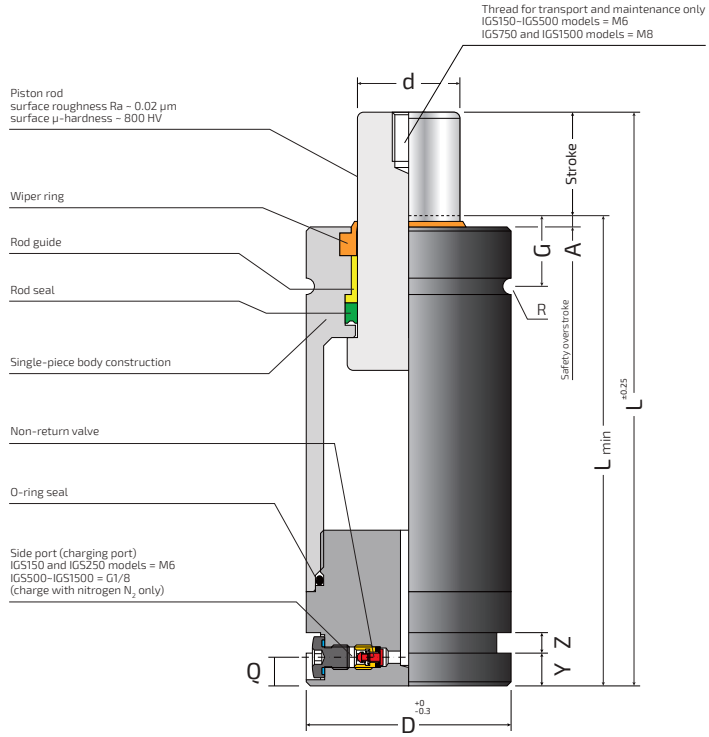
with foot brackets
ST, STA for IGS250 ~ IGS1500



with collar flange
FL, FLQ



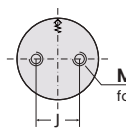
with front support
FT, FTA



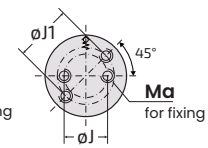
COMPACT POWER

COMPACT HEIGHT

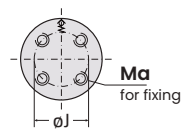
Gas spring base



IGS150,IGS500 IGS750

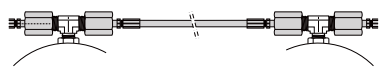


IGS250



IGS1500

Linking To Open System

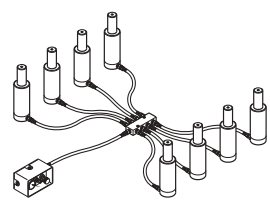


IGS150 ~ IGS250 - (M6 side port)

HOSES	ATM	ATNM
Gas Spring- Hose fittings	ARM	ARNM

IGS500 ~ IGS1500 - (G1/8 side port)

HOSES	ATM	ATN
Gas Spring- Hose fittings	ARM	ARN



ATTENTION! Follow the instructions in the "LINKED SYSTEM" section before connecting the gas springs.

Safety Protections

UNCONTROLLED RETURN SPEED

OVERSTROKE

OVERPRESSURE

This gas spring series includes the models compliant with automotive standards

BMW	B2 4006	**Nissan**	K 32 S
FCA	075.90.55	**PSA**	E24.54.815.G
Ford	W-DX35-6203	**Renault**	EM24.54.700
Mazda	PG23D	**Suzuki**	SES-K 5404e
MB	B8 3180 220 000 001	**VW**	39D 878

Continued on the next page

IGS 150 ~ 1500

Order Code	MAX Stroke	L min	L	D	d	G	A	R	Y	Z	Q	Ma	J	J1	bar (MPa)	daN	daN	Cycles per minute MAX	Gas volume Litres	Weight kg
IGS150-10	10	60	70														215	300	0.009	0.30
13	12.7	62.7	75.4														220	235	0.010	0.32
16	16	66	82														220	190	0.012	0.33
25	25	75	100														225	120	0.017	0.36
38	38.1	88.1	126.2	32	12	12.5	2	1	4	4	6	M6 x 11 (2x)	18	-	150 (15.0)	170	230	80	0.024	0.39
50	50	100	150														230	60	0.030	0.44
63	63.5	113.5	177														230	50	0.037	0.48
80	80	130	210														235	40	0.046	0.54
100	100	150	250														235	30	0.057	0.60
125	125	175	300														235	25	0.070	0.70
IGS250-10	10	60	70														305	300	0.029	0.30
13	12.7	62.7	75.4														310	235	0.031	0.31
16	16	66	82														310	190	0.034	0.33
19	19	69	88														315	160	0.037	0.34
25	25	75	100														320	120	0.042	0.37
38	38.1	88.1	126.2	38	15	12.5	2	1	4	4	6	M6 x 9 (2x or 2x) *(2x o 2x)*	18	25	150 (15.0)	260	330	80	0.052	0.43
50	50	100	150														335	60	0.062	0.48
63	63.5	113.5	177														335	50	0.074	0.54
80	80	130	210														340	40	0.087	0.61
100	100	150	250														345	30	0.104	0.66
125	125	175	300														350	25	0.125	0.83
IGS500-10	10	95	105														570	300	0.033	0.78
13	12.7	97.7	110.4														580	235	0.036	0.87
25	25	110	135														610	120	0.051	0.95
38	38.1	123.1	161.2														630	80	0.066	1.04
50	50	135	185														640	60	0.080	1.12
63	63.5	148.5	212	45	20	16.5	2	1	4	4	10.5	M8 x 13 (2x)	20	-	150 (15.0)	470	660	50	0.095	1.20
80	80	165	245														660	40	0.115	1.30
100	100	185	285														670	30	0.138	1.41
125	125	210	335														680	25	0.167	1.60
160	160	245	405														700	19	0.192	1.93
200	200	285	485														700	15	0.239	2.10
IGS750-13	12.7	107.7	120.4														930	235	0.05	1.16
25	25	120	145														990	120	0.07	1.26
38	38.1	133.1	171.2														1040	80	0.09	1.37
50	50	145	195														1070	60	0.10	1.47
63	63.5	158.5	222														1090	50	0.12	1.59
75	75	170	245														1110	40	0.14	1.70
80	80	175	255														1110	40	0.15	1.74
88	87.5	182.5	270														1120	35	0.16	1.80
100	100	195	295														1130	30	0.17	1.92
113	112.5	207.5	320	50	25	17.5	3	2	8	5	10.5	M8 x 13 (2x)	20	-	150 (15.0)	740	1140	27	0.19	2.03
125	125	220	345														1150	25	0.21	2.13
138	137.5	232.5	370														1210	22	0.21	2.36
150	150	245	395														1210	20	0.22	2.51
160	160	255	415														1220	19	0.24	2.60
175	175	270	445														1220	17	0.26	2.73
200	200	295	495														1220	15	0.30	2.94
225	225	320	545														1220	13	0.33	3.16
250	250	345	595														1220	12	0.37	3.31
275	275	370	645														1230	11	0.40	3.59
300	300	395	695														1230	10	0.44	3.81
IGS1500-13	12.7	122.3	135														1870	235	0.13	3.01
25	25	135	160														1980	120	0.17	3.27
38	38.1	148.1	186.2														2060	80	0.21	3.51
50	50	160	210														2110	60	0.25	3.73
63	63.5	173.5	237														2160	50	0.29	3.97
75	75	185	260														2190	40	0.33	4.18
80	80	190	270														2200	40	0.35	4.27
88	87.5	197.5	285														2220	35	0.37	4.39
100	100	210	310														2240	30	0.41	4.63
113	112.5	222.5	335	75	36	21	3	2.5	8	5	10.5	M8 x 13 (4x)	40	-	150 (15.0)	1530	2260	27	0.45	4.84
125	125	235	360														2270	25	0.49	5.08
138	137.5	247.5	385														2390	22	0.47	5.77
150	150	260	410														2400	20	0.51	5.99
160	160	270	430														2400	19	0.55	6.17
175	175	285	460														2410	17	0.59	6.45
200	200	310	510														2410	15	0.67	6.90
225	225	335	560														2420	13	0.75	7.35
250	250	360	610														2420	12	0.83	7.81
275	275	385	660														2430	11	0.92	8.26
300	300	410	710														2430	10	0.99	8.72

REPAIR KIT All the gas ejector models in this table are in accordance with Article 4.3 of the 2014/68/EU Pressure Equipment Directive (PED)

Gas Spring Code	Repair Kit Code
IGS150-...	KR / IGS150
IGS250-...	KR / IGS250
IGS500-10 / IGS500-63	KR / IGS500-1
IGS500-80 / IGS500-200	KR / IGS500-2

Gas Spring Code	Repair Kit Code
IGS5750-13 / IGS750-50	KR / IGS750-1
IGS5750-63 / IGS750-300	KR / IGS750-2
IGS51500-13 / IGS1500-50	KR / IGS1500-1
IGS51500-63 / IGS1500-300	KR / IGS1500-2

"L-VERSION" (FOR LINKED SYSTEM)

When the IGS gas springs are to be used in a linked system, make sure to order the "L-version" by adding "-L" after the gas spring code. The "L-version" gas springs are supplied already discharged and without valve, ready for the connection to linked system.
Example: "**IGS750-50-L**"

IGS

PED In accordance with 2014/68/EU

VDI

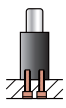
VDI 3003

ISO

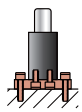
ISO 11901-1

IGS 3000 ~ 10000

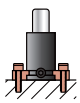
IGS series nitrogen gas springs feature standard dimensions and forces, as well as several fixing and linking possibilities. With the IGS series nitrogen gas springs, Bordignon now ensures a great interchangeability and a superior reliability. IGS series nitrogen gas springs are self-lubricated.



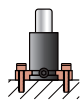
at the base
with screws



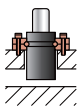
with base-plate
BF, BFA, BFB



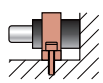
with
half-flanges
SF, SFA



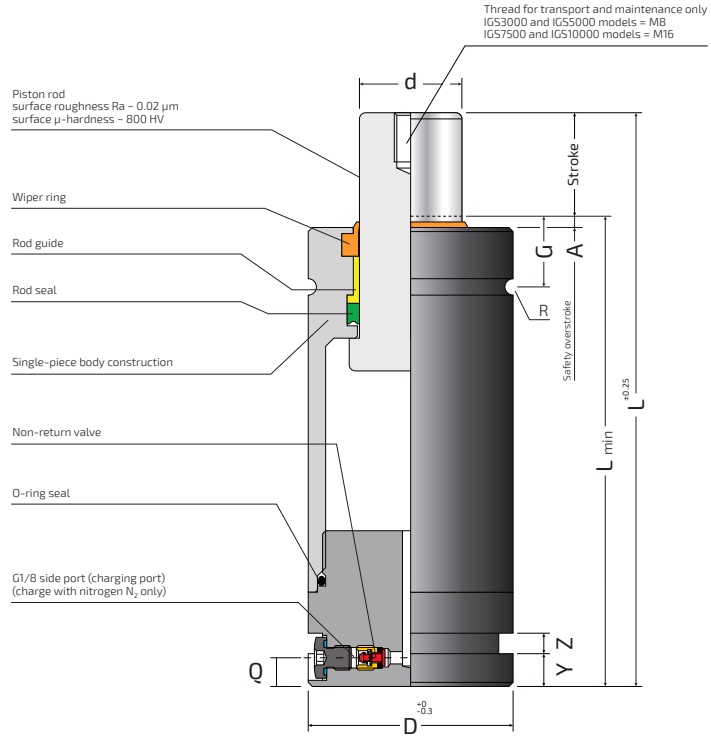
with foot brackets
ST, STA
(Not for all IGS models)



with collar
flange
FL, FLQ



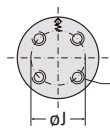
with front
support
FT, FTA
(Not for all IGS models)



COMPACT POWER

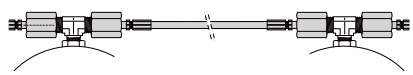
COMPACT HEIGHT

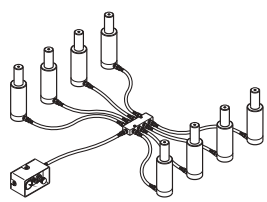
Gas spring base



IGS3000, IGS5000
IGS7500, IGS10000

Linking To Open System





IGS3000 ~ IGS10000 - (G1/8 side port)

HOSES	ATM	ATN	AT
Gas Spring- Hose fittings	ARM	ARN	AR

ATTENTION! Follow the instructions in the "LINKED SYSTEM" section before connecting the gas springs.

Safety Protections

UNCONTROLLED RETURN SPEED

OVERSTROKE

OVERPRESSURE

This gas spring series includes the models compliant with automotive standards

BMW	B2 4006	**Nissan**	K 32 S
FCA	075.90.55	**PSA**	E24.54.815.G
Ford	W-DX35-6203	**Renault**	EM24.54.700
Mazda	PG23D	**Suzuki**	SES-K 5404e
MB	B8 3180 220 000 001	**VW**	39D 878

Continued on the next page

IGS 3000 ~ 10000

Order Code	MAX Stroke	L min	L	D	d	G	A	R	Y	Z	Q	Ma	J	bar (MPa)	daN	daN	Cycles per minute MAX	Gas volume Litres	Weight kg
IGS3000-13	12.7	132.3	145	95	50	24	3	2.5	8	5	10.5	M8 x 13 (4x)	60	150 (15.0)	2945	3650	235	0.24	5.15
25	25	145	170													3850	120	0.30	5.58
38	38.1	158.1	196.2													4050	80	0.37	5.97
50	50	170	220													4200	60	0.43	6.33
63	63.5	183.5	247													4300	50	0.51	6.76
75	75	195	270													4400	40	0.57	7.10
80	80	200	280													4400	40	0.59	7.25
88	87.5	207.5	295													4450	35	0.63	7.49
100	100	220	320													4500	30	0.70	7.83
113	112.5	232.5	345													4550	27	0.76	8.21
125	125	245	370													4600	25	0.83	8.59
138	137.5	257.5	395													4900	22	0.80	9.72
150	150	270	420													4900	20	0.87	10.10
160	160	280	440													4900	19	0.92	10.42
175	175	295	470													4950	17	0.99	10.87
200	CE 200	320	520													4950	15	1.13	11.64
225	CE 225	345	570													5000	13	1.26	12.40
250	CE 250	370	620													5000	12	1.39	13.16
275	CE 275	395	670													5000	11	1.53	13.92
300	CE 300	420	720													5000	10	1.66	14.70
IGS5000-25	25	165	190	120	65	25.5	3	2.5	8	5	10.5	M10 x 16 (4x)	80	150 (15.0)	4980	6600	120	0.48	10.78
38	38.1	178.1	216.2													7000	80	0.58	11.52
50	50	190	240													7300	60	0.67	12.20
63	63.5	203.5	267													7600	50	0.77	13.00
75	75	215	290													7700	40	0.85	13.62
80	80	220	300													7800	40	0.89	13.91
88	87.5	227.5	315													7900	35	0.95	14.27
100	CE 100	240	340													8000	30	1.04	14.98
113	CE 112.5	252.5	365													8200	27	1.14	15.70
125	CE 125	265	390													8300	25	1.23	16.41
138	CE 137.5	277.5	415													8900	22	1.19	18.18
150	CE 150	290	440													8900	20	1.29	18.88
160	CE 160	300	460													9000	19	1.36	19.45
175	CE 175	315	490													9000	17	1.47	20.30
200	CE 200	340	540													9100	15	1.66	21.72
225	CE 225	365	590													9200	13	1.85	23.14
250	CE 250	390	640													9200	12	2.04	24.56
275	CE 275	415	690													9300	11	2.23	25.98
300	CE 300	440	740													9300	10	2.42	27.40
IGS7500-25	CE 25	180	205	150	80	27.5	3	2.5	8	5	10.5	M10 x 16 (4x)	100	150 (15.0)	7540	9300	120	1.15	15.72
38	CE 38.1	193.1	231.2													9700	80	1.32	16.73
50	CE 50	205	255													10000	60	1.47	17.69
63	CE 63.5	218.5	282													10300	50	1.64	18.74
75	CE 75	230	305													10500	40	1.79	19.65
80	CE 80	235	315													10600	40	1.86	20.04
88	CE 87.5	242.5	330													10700	35	1.95	20.52
100	CE 100	255	355													10900	30	2.11	21.55
113	CE 112.5	267.5	380													11000	27	2.27	22.48
125	CE 125	280	405													11200	25	2.43	23.52
138	CE 137.5	292.5	430													11800	22	2.33	26.50
150	CE 150	305	455													11900	20	2.49	27.53
160	CE 160	315	475													12000	19	2.62	28.33
175	CE 175	330	505													12000	17	2.82	29.49
200	CE 200	355	555													12200	15	3.14	31.47
225	CE 225	380	605													12300	13	3.46	33.43
250	CE 250	405	655													12400	12	3.78	35.39
275	CE 275	430	705													12500	11	4.10	37.36
300	CE 300	455	755													12600	10	4.43	39.33
IGS10000-25	CE 25	185	210	195	95	33.5	3	2.5	8	8	15	M12 x 18 (4x)	120	150 (15.0)	10600	12900	120	1.87	28.39
38	CE 38.1	198.1	236.2													13300	80	2.16	29.90
50	CE 50	210	260													13700	60	2.42	31.33
63	CE 63.5	223.5	287													14000	50	2.72	32.92
80	CE 80	240	320													14300	40	3.09	34.87
100	CE 100	260	360													14600	30	3.53	37.22
125	CE 125	285	410													14900	25	4.08	40.17
160	CE 160	320	480													15900	19	4.23	49.23
200	CE 200	360	560													16100	15	5.12	53.95
250	CE 250	410	660													16300	12	6.22	59.84
300	CE 300	460	760													17200	10	6.62	71.32

CE

The gas spring models for which the CE symbol is indicated have an internal gas volume > 1 litre. They fall into Category II of the 2014/68/EU Pressure Equipment Directive (PED).

All the gas ejector models in this table are in accordance with Article 4.3 of the 2014/68/EU Pressure Equipment Directive (PED)

REPAIR KIT

Gas Spring Code	Repair Kit Code
IGS3000-13 ~ IGS3000-50	KR/IGS3000-1
IGS3000-63 ~ IGS3000-300	KR/IGS3000-2
IGS5000-25, IGS5000-38	KR/IGS5000-1
IGS5000-50 ~ IGS5000-300	KR/IGS5000-2

Gas Spring Code	Repair Kit Code
IGS7500-25, IGS7500-38	KR/IGS7500-1
IGS7500-50 ~ IGS7500-300	KR/IGS7500-2
IGS10000-25, IGS10000-38	KR/IGS10000-1
IGS10000-50 ~ IGS10000-300	KR/IGS10000-2

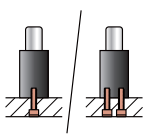
"L-VERSION" (FOR LINKED SYSTEM)

When the IGS gas springs are to be used in a linked system, make sure to order the "L-version" by adding "-L" after the gas spring code. The "L-version" gas springs are supplied already discharged and without valve, ready for the connection to linked system.
Example: "**IGS5000-50-L**"

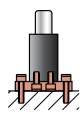
VV

VV 170 ~ 2945

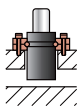
VV series nitrogen gas springs feature different dimensions and forces.
VV series nitrogen gas springs are self-lubricated.



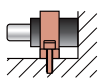
at the base
with screws



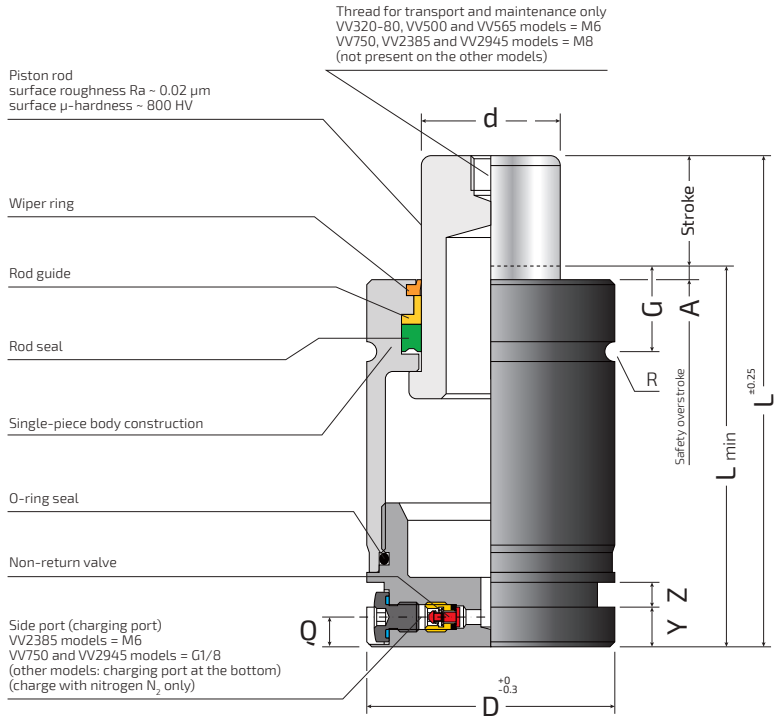
with base-plate
BF, BFA, BFB
for VV750 ~ VV2945



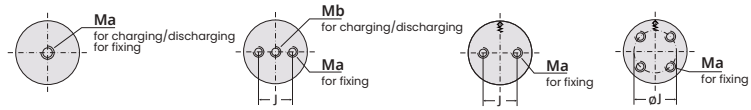
with collar
flange
FL, FLQ
(Not for all VV models)



with front support
FT, FTA
(Not for all VV models)



Gas spring base



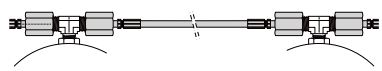
VV170,
VV320-63/63 H

VV320-80,
VV500-63,
VV565-63

VV170

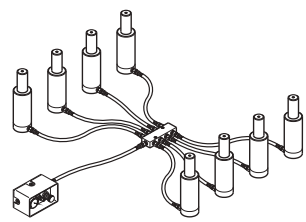
VV2385
VV2495

Linking To Open System



VV2385 - (M6 side port)

HOSES	ATM	ATNM
Gas Spring- Hose fittings	ARM	ARNM



VV750 / VV2945 - (G1/8 side port)

HOSES	ATM	ATN	AT
Gas Spring- Hose fittings	ARM	ARN	AR

ATTENTION! Follow the instructions in the "LINKED SYSTEM" section before connecting the gas springs.

Safety Protections

UNCONTROLLED RETURN SPEED

OVERSTROKE

OVERPRESSURE

Continued on the next page

VV 700 ~ 2945

Order Code	MAX Stroke	L min	L	D	d	G	A	R	Y	Z	Q	Ma	J	Mb	bar (MPa)	daN	daN	Cycles per minute MAX	Gas volume Litres	Weight kg
VV170-38	38	97	135	19	11	17	1	1	-	-	-	M6 x 10	-	-	180 (18.0)	170	275	80	0.011	0.14
50	50	110	160														285	60	0.014	0.17
63	63	127	190														285	50	0.017	0.18
VV320-63	63	127	190	25	15	17	1	1	-	-	-	M6 x 9	-	-	180 (18.0)	320	540	50	0.032	0.31
63H	63	145	208														500	50	0.038	0.33
VV320-80	80	125	205	32	15	-	2	-	-	-	-	M6 x 8 (2x)	18	M6	180 (18.0)	320	520	40	0.044	0.44
VV500-63	63	132	195	32	20	-	2	-	-	-	-	M5 x 8 (2x)	15	M6	160 (16.0)	500	830	50	0.058	0.48
VV565-63	63	142	205	32	20	-	2	-	-	-	-	M5 x 8 (2x)	15	M6	180 (18.0)	565	900	50	0.064	0.50
VV750-63	63	113	176	50	25	-	2	-	-	-	10.5	M8 x 13 (2x)	20	-	150 (15.0)	740	1280	50	0.085	1.40
80	80	130	210														1270	40	0.109	2.00
VV2385-80	80	128	208	75	45	21	3	2.5	-	-	6	M8 x 9 (4x)	40	-	150 (15.0)	2385	4250	40	0.33	2.48
100	100	148	248														4300	30	0.41	2.79
VV2945-63	62.5	182.5	245	95	50	-	3	-	-	-	10.5	M8 x 13 (4x)	60	-	150 (15.0)	2945	3950	50	0.70	5.16
80	80	138	218														4850	40	0.47	5.21
100	100	158	258														4850	30	0.60	5.09
125	125	183	308														4800	25	0.75	7.24

All the gas ejector models in this table are in accordance with Article 4.3 of the 2014/68/EU Pressure Equipment Directive (PED)

"L-VERSION" (FOR LINKED SYSTEM)

When the VV gas springs are to be used in a linked system, make sure to order the "L-version" by adding "-L" after the gas spring code.
The "L-version" gas springs are supplied already discharged and without valve, ready for the connection to linked system.
Example: "**VV750-80-L**"

REPAIR KIT

Gas Spring Code	Repair Kit Code
VV170-...	KR/VV170
VV320-63, VV320-63H	KR/VV320-63-63H
VV320-80	KR/VV320-80
VV500-63	KR/VV500

Gas Spring Code	Repair Kit Code
VV565-63	KR/VV565
VV750-...	KR/VV750
VV2385-...	KR/VV2385
VV2945-...	KR/VV2945

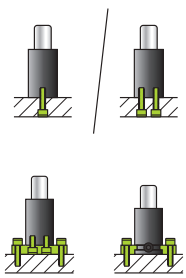
NEW

CHT

HIGH PERFORMANCE GAS SPRING

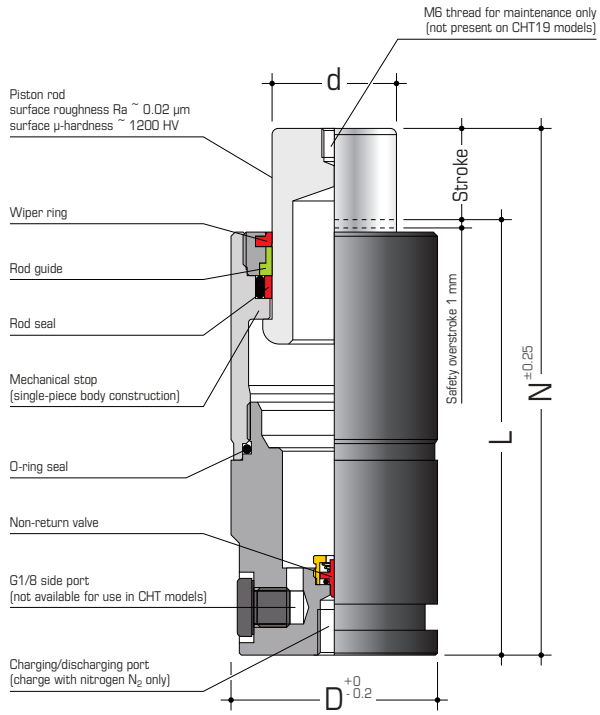
200°C
392°F
MAX TEMPERATURE

CHT series has been developed to work up to 200°C (392°F), for the most demanding high temperature applications.
The piston rod has to be lubricated with grease.



from D=50 mm

"Special Solutions for Hot Forming and Injection Moulding"

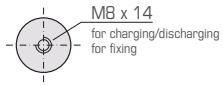
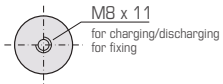
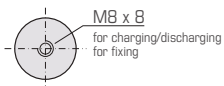
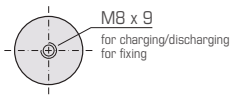
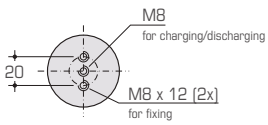
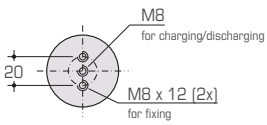
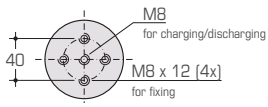
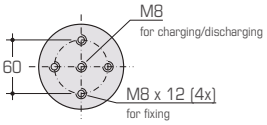
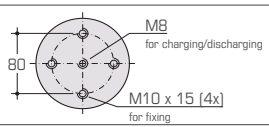


HOW TO ORDER

Important: it is necessary to contact our technical department in order to make sure that **CHT** gas springs are ok for the required application.
Our technical department will send you a dedicated form to be filled with the application data. (*) The maximum charging pressure (bar) depends on the use conditions (declared actual operating temperature). You will be informed about the maximum charging pressure if your application is approved by our technical department.

Please check the "USE INSTRUCTIONS" page.

Continued on the next page

CHT Order Code	MAX Stroke	L	N	D	d	bar (MPa)	daN	daN	Gas Spring Base
●● **CHT19**-10	10	70	80	19	10	"See the note on the previous page."	100	130	
●● 15	15	75	90					135	
●● 25	25	85	110					140	
●● 38	38	98	136					145	
●● 50	50	110	160					155	
●● 80	80	140	220					165	
●● **CHT25**-10	10	70	80	25	14	"See the note on the previous page."	200	250	
●● 15	15	75	90					270	
●● 25	25	85	110					290	
●● 38	38	98	136					320	
●● 50	50	110	160					330	
●● 80	80	140	220					350	
●● 125	125	185	310					370	
●● **CHT32**-10	10	60	70	32	18	"See the note on the previous page."	350	480	
●● 15	15	65	80					490	
●● 25	25	75	100					520	
●● 38	38	88	126					530	
●● 50	50	100	150					540	
●● 80	80	130	210					550	
●● 125	125	175	300					560	
●● 160	160	210	370					570	
●● **CHT38**-10	10	65	75	38	22	"See the note on the previous page."	500	650	
●● 15	15	70	85					700	
●● 25	25	80	105					750	
●● 38	38	93	131					780	
●● 50	50	105	155					800	
●● 80	80	140	220					820	
●● 125	125	185	310					840	
●● 160	160	220	380					860	
●● 200	200	260	460					880	
● **CHT50**-10	10	95	105	50	30	"See the note on the previous page."	1000	1250	
● 25	25	110	135					1400	
● 38	38	123	161					1500	
● 50	50	135	185					1550	
● 63	63	148	211					1600	
● 80	80	165	245					1650	
● 100	100	195	295					1700	
● 125	125	220	345					1720	
● 160	160	255	415					1730	
● 200	200	295	495					1750	
● 250	250	345	595					1770	
● **CHT63**-10	10	95	105	63	40	"See the note on the previous page."	1500	2200	
● 25	25	110	135					2400	
● 38	38	123	161					2500	
● 50	50	135	185					2600	
● 63	63	148	211					2650	
● 80	80	165	245					2700	
● 100	100	185	285					2750	
● 125	125	220	345					2800	
● 160	160	255	415					2850	
● 200	200	295	495					2900	
● **CHT75**-10	10	105	115	75	45	"See the note on the previous page."	2500	3400	
● 25	25	120	145					3800	
● 38	38	133	171					4200	
● 50	50	145	195					4300	
● 63	63	158	221					4400	
● 80	80	175	255					4450	
● 100	100	200	300					4500	
● 125	125	225	350					4550	
● 160	160	265	425					4650	
● 200	200	310	510					4800	
● **CHT95**-25	25	130	155	95	58	"See the note on the previous page."	4000	6200	
● 38	38	143	181					6500	
● 50	50	155	205					6700	
● 63	63	168	231					6800	
● 80	80	190	270					6900	
● 100	100	210	310					7000	
● 125	125	245	370					7150	
● **CHT120**-25	25	140	165	120	75	"See the note on the previous page."	6500	9100	
● 38	38	153	191					9700	
● 50	50	165	215					10000	
● 63	63	178	241					10400	
● 80	80	195	275					10700	

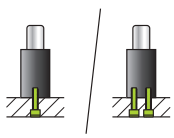
● Without G1/8 side hole and groove ● Available on request

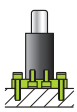
NEW

CSMHT

HIGH PERFORMANCE GAS SPRING

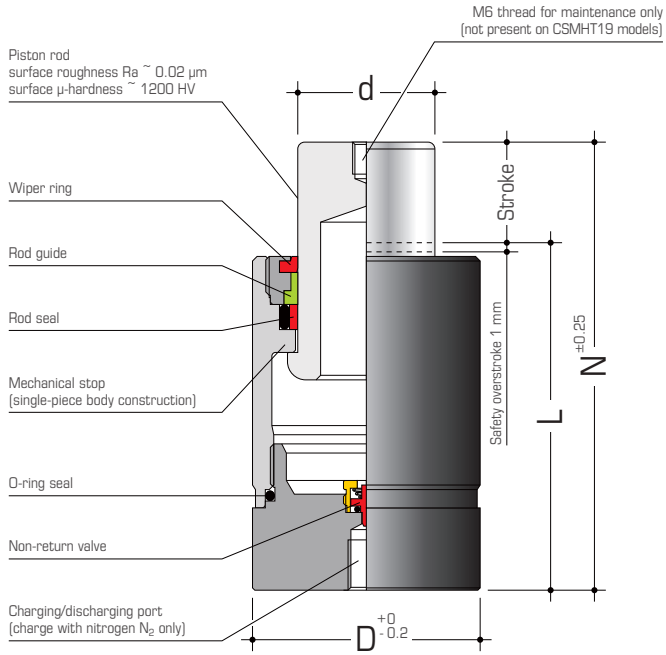
CSMHT compact series has been developed to work up to 200°C (392°F), for the most demanding high temperature applications. The piston rod has to be lubricated with grease.





from D=50 mm

"Special Solutions for Hot Forming and Injection Moulding"

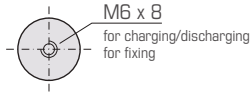
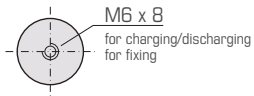
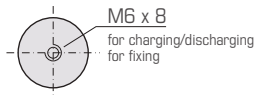
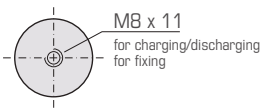
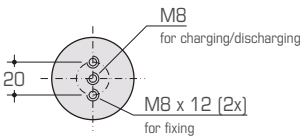
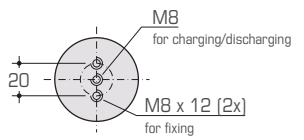
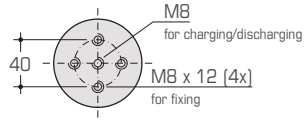
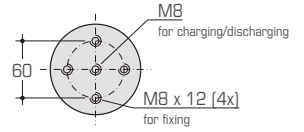
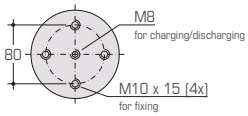


HOW TO ORDER

Important: it is necessary to contact our technical department in order to make sure that **CSMHT** gas springs are ok for the required application. Our technical department will send you a dedicated form to be filled with the application data. (*) The maximum charging pressure (bar) depends on the use conditions (declared actual operating temperature). You will be informed about the maximum charging pressure if your application is approved by our technical department.

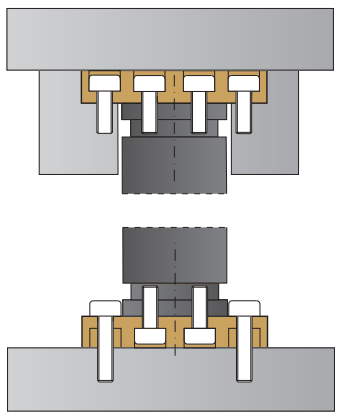
Please check the "USE INSTRUCTIONS" page.

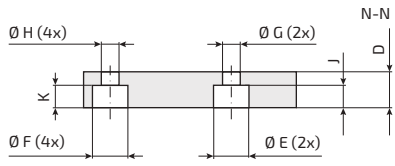
Continued on the next page →

CSMHT Order Code	MAX Stroke	L	N	D	d	bar (MPa)	daN	daN	Gas Spring Base
• **CSMHT19**-10	10	50	60	19	10	"See the note on the previous page."	100	130	
• 15	15	55	70					140	
• 25	25	65	90					150	
• 38	38	78	116					160	
• 50	50	90	140					165	
• 80	80	120	200					170	
• **CSMHT25**-10	10	50	60	25	14	"See the note on the previous page."	200	290	
• 15	15	55	70					340	
• 25	25	65	90					350	
• 38	38	78	116					370	
• 50	50	90	140					380	
• 80	80	120	200					390	
• 125	125	165	290					400	
• **CSMHT32**-10	10	55	65	32	18	"See the note on the previous page."	350	490	
• 15	15	60	75					500	
• 25	25	70	95					530	
• 38	38	83	121					550	
• 50	50	95	145					570	
• 80	80	125	205					580	
• 125	125	170	295					590	
• 160	160	205	365					600	
• **CSMHT38**-10	10	55	65	38	22	"See the note on the previous page."	500	720	
• 15	15	60	75					750	
• 25	25	70	95					780	
• 38	38	83	121					820	
• 50	50	95	145					830	
• 80	80	125	205					850	
• 125	125	170	295					860	
• 160	160	205	365					870	
• 200	200	245	445					880	
• **CSMHT50**-10	10	60	70	50	30	"See the note on the previous page."	1000	1600	
• 25	25	75	100					1630	
• 38	38	88	126					1670	
• 50	50	100	150					1690	
• 63	63	113	176					1700	
• 80	80	130	210					1710	
• 100	100	150	250					1720	
• 125	125	190	315					1730	
• 160	160	235	395					1740	
• 200	200	275	475					1750	
• 250	250	325	575					1760	
• **CSMHT63**-10	10	65	75	63	40	"See the note on the previous page."	1500	2200	
• 25	25	80	105					2400	
• 38	38	93	131					2500	
• 50	50	105	155					2550	
• 63	63	118	181					2600	
• 80	80	135	215					2650	
• 100	100	160	260					2700	
• 125	125	190	315					2750	
• 160	160	235	395					2800	
• 200	200	275	475					2900	
• **CSMHT75**-10	10	65	75	75	45	"See the note on the previous page."	2500	4000	
• 25	25	80	105					4500	
• 38	38	93	131					4650	
• 50	50	105	155					4700	
• 63	63	118	181					4730	
• 80	80	135	215					4740	
• 100	100	155	255					4750	
• 125	125	200	325					4760	
• 160	160	250	410					4800	
• 200	200	300	500					4950	
• **CSMHT95**-25	25	90	115	95	58	"See the note on the previous page."	4000	6900	
• 38	38	103	141					7050	
• 50	50	115	165					7150	
• 63	63	128	191					7180	
• 80	80	155	235					7200	
• 100	100	185	285					7250	
• 125	125	220	345					7400	
• **CSMHT120**-25	25	100	125	120	75	"See the note on the previous page."	6500	10300	
• 38	38	113	151					10900	
• 50	50	125	175					11200	
• 63	63	138	201					11400	
• 80	80	160	240					11500	

• Available on request

Fixing Base Plate **BF**





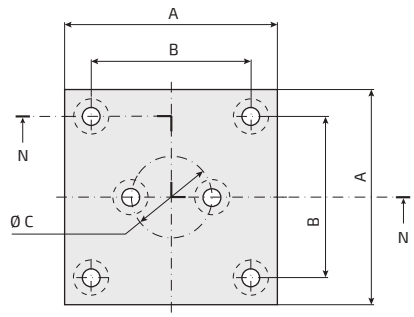
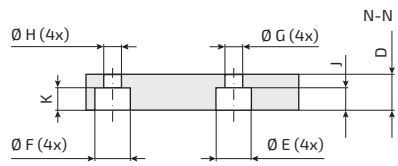


FIG. 1



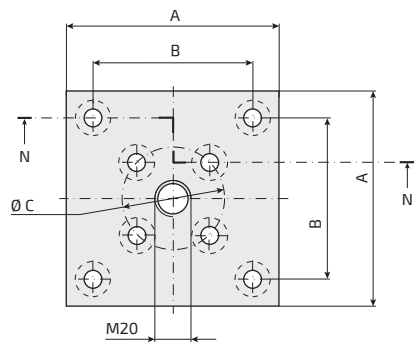


FIG. 2

Order Code	Reference to Standards	For models...	A	B	Ø C	D	Ø E	Ø F	Ø G	Ø H	J	K	FIG.
BF 45	ISO 11901-2, VDI 3003	AGS750, IGS500, LGS500	70	50	20	20	15	15	9	9	14	12	**1**
BF 50	ISO 11901-2, VDI 3003	AGS1000, AGS1500, IGS750, VV750	75	56.5	20	20	15	15	9	9	14	12	**1**
BF 63	ISO 11901-2	AGS1500	100	73.5	20	20	15	18	9	11	14	12	**1**
BF 75	ISO 11901-2, VDI 3003	AGS1500, AGS2400, IGS1500, TGS5000, VV2385	100	73.5	40	20	15	18	9	11	14	12	**2**
BF 95	ISO 11901-2, VDI 3003	AGS4200, IGS3000, VV2945	120	92	60	20	15	20	9	13.5	14	13	**2**
BF 120	ISO 11901-2, VDI 3003	AGS6600, IGS5000	140	109.5	80	20	18	20	11	13.5	15	13	**2**
BF 150	ISO 11901-2, VDI 3003	AGS9500, IGS7500	190	138	100	25	18	26	11	17.5	15	17	**2**
BF 195	ISO 11901-2, VDI 3003	AGS20000, IGS10000	210	170	120	25	20	26	13.5	17.5	13	17	**2**

ISO **ISO 11901-2**

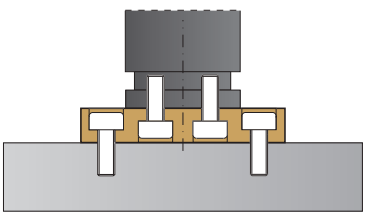
VDI **VDI 3003**

This gas spring series includes the models compliant with automotive standards

General Motors	90.25.04
PSA	E24.54.815.G
Renault	EM24.54.700

BF

Fixing Base Plate **BFA**



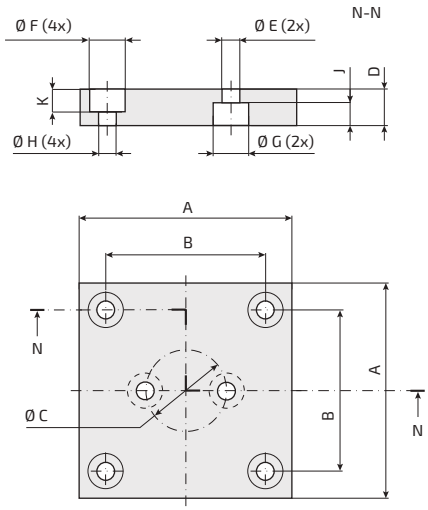


FIG. 1

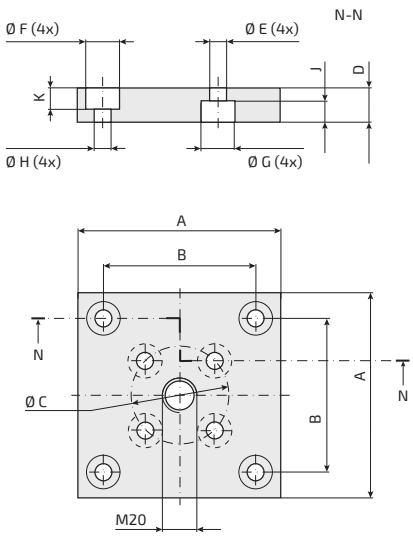


FIG. 2

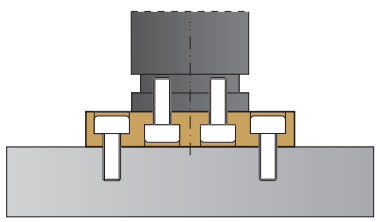
Order Code	Reference to Standards	For models...	A	B	Ø C	D	Ø E	Ø F	Ø G	Ø H	J	K	FIG.
BFA 45	-	AGS750, IGS500, LGS500	70	50	20	20	9	18	15	11	14	12	**1**
BFA 50	-	AGS1000, AGS1500, IGS750, VV750	75	56.5	20	20	9	18	15	11	14	12	**1**
BFA 75	-	AGS1500, AGS2400, IGS1500, TGS5000, VV2385	100	73.5	40	20	9	18	15	11	14	12	**2**
BFA 95	-	AGS4200, IGS3000, VV2945	120	92	60	20	9	20	15	13.5	14	13	**2**
BFA 120	-	AGS6600, IGS5000	140	109.5	80	20	11	20	18	13.5	15	13	**2**
BFA 150	-	AGS9500, IGS7500	190	138	100	25	11	26	18	17.5	15	17	**2**
BFA 195	-	AGS20000, IGS10000	210	170	120	25	13.5	26	20	17.5	15	17	**2**

This gas spring series includes the models compliant with automotive standards

Renault	EM24.54.700

BFA

Fixing Base Plate **BFB**



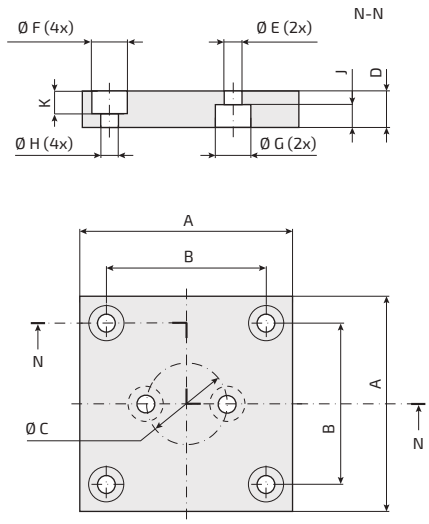


FIG. 1

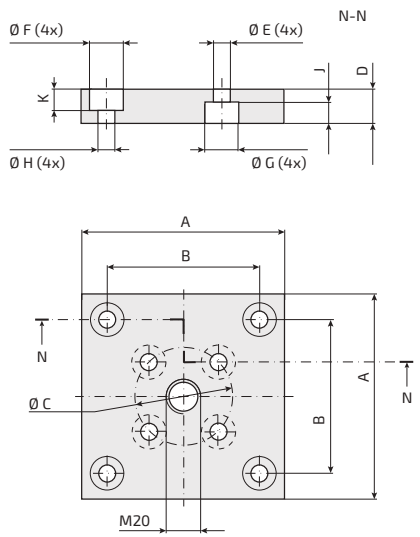


FIG. 2

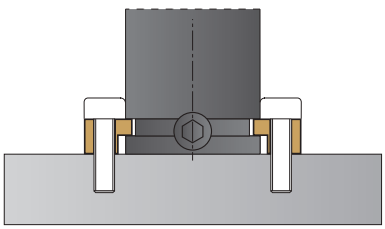
Order Code	Reference to Standards	For models...	A	B	Ø C	D	Ø E	Ø F	Ø G	Ø H	J	K	FIG.
BFB 45	-	AGS750, IGS500, LGS500	70	50	20	20	9	15	15	9	12	12	**1**
BFB 50	-	AGS1000, AGS1500, IGS750, VV750	75	56.5	20	20	9	15	15	9	12	12	**1**
BFB 63	-	AGS1500	100	73.5	20	20	9	18	15	11	12	12	**1**
BFB 75	-	AGS1500, AGS2400, IGS1500, TGS5000, VV2385	100	73.5	40	20	9	18	15	11	12	14	**2**
BFB 95	-	AGS4200, IGS3000, VV2945	120	92	60	20	9	20	15	13.5	14	13	**2**
BFB 120	-	AGS6600, IGS5000	140	109.5	80	20	11	20	18	13.5	15	13	**2**
BFB 150	-	AGS9500, IGS7500	190	138	100	20	11	20	18	13.5	15	13	**2**
BFB 195	-	AGS20000, IGS10000	210	170	120	25	13.5	26	20	17.5	15	17	**2**

This gas spring series includes the models compliant with automotive standards

BMW	B2 4009
MB	B8 0132 110 008 801
Renault	EM24.54.700

BFB

Fixing Half-flanges SF



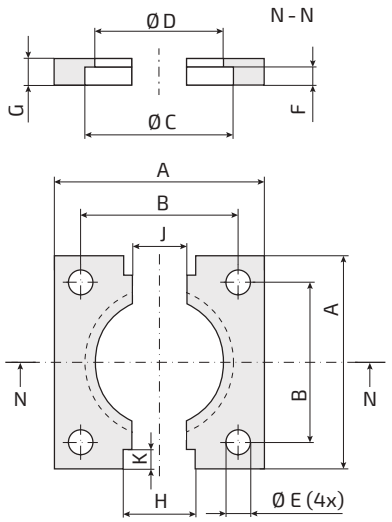


FIG. 1

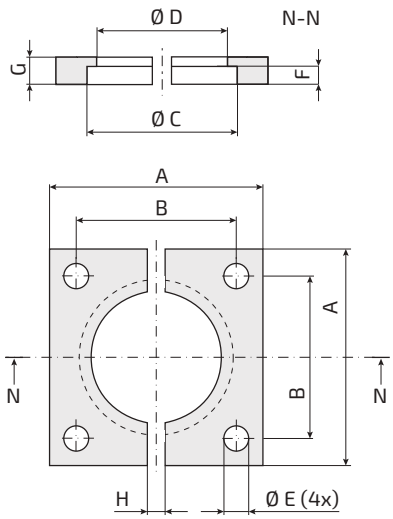


FIG. 2

Order Code	Reference to Standards	For models...	A	B	Ø C	Ø D	Ø E	F	G	H	J	K	FIG.
SF 32	-	AGS350, IGS150, TGS700	50	35	32.5	28.5	6.6	4	7	21	17	6.5	**1**
SF 38	-	AGS500, IGS250, TGS1000	55	40	38.5	34.5	6.6	4	7	21	17	6.5	**1**
SF 45	ISO 11901-2, VDI 3003	AGS750, IGS500, LGS500	70	50	45.5	41.5	9	4	7	20	-	-	**2**
SF 50	ISO 11901-2, VDI 3003	AGS1000, IGS750, TGS2000	75	56.5	50.5	44.5	9	8	12	24	-	-	**2**
SF 63	-	AGS1500, TGS3000	85	63.5	63.5	57.5	11	8	12	24	-	-	**2**
SF 63A	ISO 11901-2	AGS1500, TGS3000	100	73.5	64	57	11	8	12	24	-	-	**2**
SF 75	ISO 11901-2, VDI 3003	AGS2400, IGS1500, TGS5000	100	73.5	75.5	68.5	11	8	12	24	-	-	**2**
SF 95	ISO 11901-2, VDI 3003	AGS4200, IGS3000, TGS8000	120	92	95.5	88.5	13.5	8	12	24	-	-	**2**
SF 120	ISO 11901-2, VDI 3003	AGS6600, IGS5000, TGS12000	140	109.5	120.5	113.5	13.5	8	12	24	-	-	**2**
SF 150	ISO 11901-2, VDI 3003	AGS9500, IGS7500	190	138	150.5	143.5	17.5	8	12	24	-	-	**2**
SF 195	ISO 11901-2, VDI 3003	AGS20000, IGS10000	210	170	195.5	188	17.5	8	13	24	-	-	**2**

ISO 11901-2

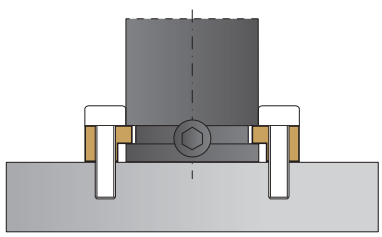
VDI 3003

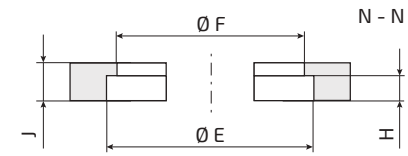
This gas spring series includes the models compliant with automotive standards

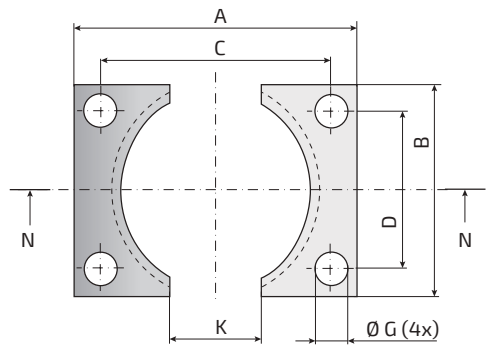
BMW	B2 4009	**MB**	B8 0138 100 000 001
FCA	075.90.90	**Renault**	EM24.54.700
Ford	W-DX35-62M	**VW**	39D 848
General Motors	90.25.01		

SF

Fixing Half-flanges **SFA**

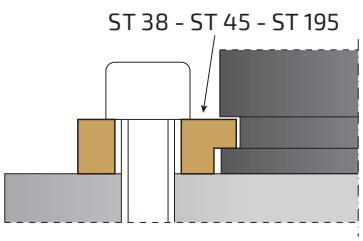


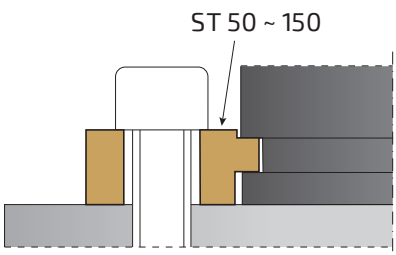


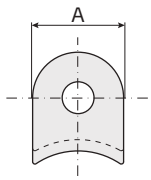


Order Code	Reference to Standards	For models...	A	B	Ø C	D	Ø E	Ø F	Ø G	Ø H	J	K
SFA 32	-	AGS350, IGS150, TGS700	50	27	40	18	32.5	28.5	6.6	4	7	20
SFA 38	-	AGS500, IGS250, TGS1000	55	33	44	20	38.5	34.5	6.6	4	7	20
SFA 45	-	AGS750, IGS500, LGS500	70	40	57	27	45.5	41.5	9	4	7	25
SFA 50	-	AGS1000, IGS750, TGS2000	75	45	62	32	50.5	44.5	9	8	12	25
SFA 63	-	AGS1500, TGS3000	85	58	69	42	63.5	57.5	11	8	12	30
SFA 75	-	AGS2400, IGS1500, TGS5000	100	70	84	54	75.5	68.5	11	8	12	30
SFA 95	-	AGS4200, IGS3000, TGS8000	120	90	100	70	95.5	88.5	13.5	8	12	40
SFA 120	-	AGS6600, IGS5000, TGS12000	140	115	120	95	120.5	113.5	13.5	8	12	50
SFA 150	-	AGS9500, IGS7500	190	145	165	120	150.5	143.5	17.5	8	12	60
SFA 195	-	AGS20000, IGS10000	210	190	185	165	195.5	188	17.5	8	13	80

Fixing Foot Brackets ST







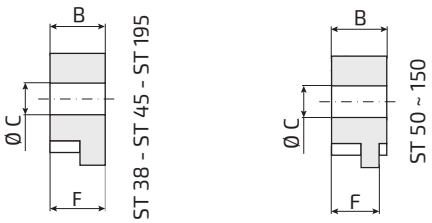


FIG. 1

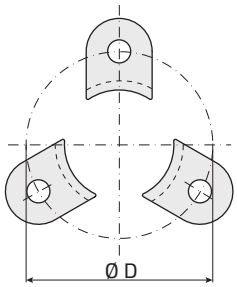
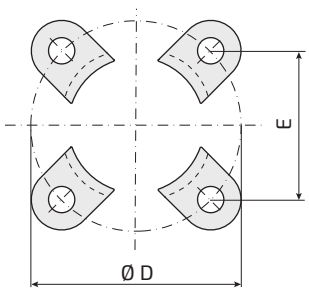
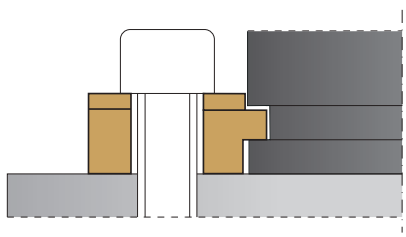


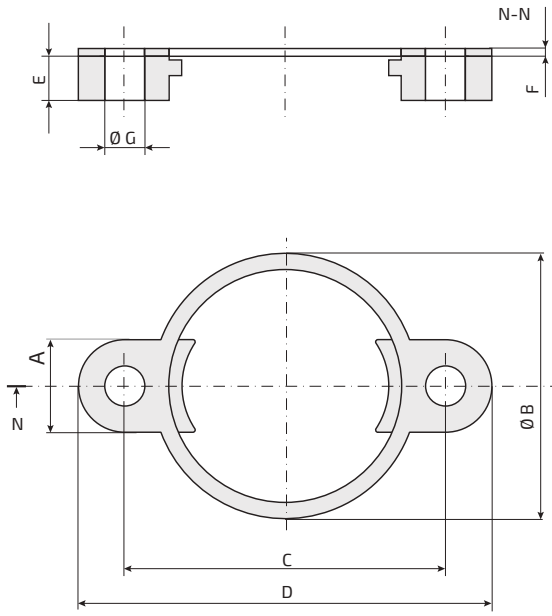
FIG. 2



Order Code	Reference to Standards	For models...	A	B	C	Ø D	E	F	FIG.
ST 38	-	AGS500, IGS250, TGS1000	20	7	7	56.6	-	7	1
ST 45	-	AGS750, IGS500, LGS500	25	7	9	70.7	-	7	1
ST 50	-	AGS1000, IGS750, TGS2000	30	14.2	13	80	-	13	1
ST 63	-	AGS1500, TGS3000	30	14.2	13	92	65	13	2
ST 75	-	AGS2400, IGS1500, TGS5000	30	14.2	13	104	73.5	13	2
ST 95	-	AGS4200, IGS3000, TGS8000	40	14.2	17	130	92	13	2
ST 120	-	AGS6600, IGS5000, TGS12000	50	14.2	17	155	109.5	13	2
ST 150	-	AGS9500, IGS7500	50	14.2	21	195	138	13	2
ST 195	-	AGS20000, IGS10000	58	16	21	240	169	16	2

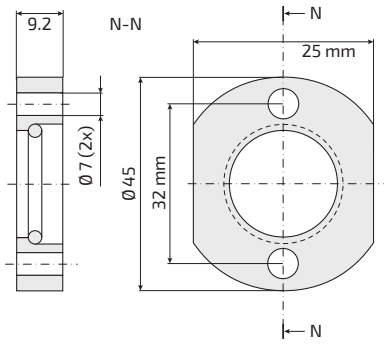
Fixing Foot Brackets STA



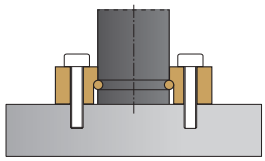


Order Code	Reference to Standards	For models...	A	Ø B	C	D	E	F	Ø G
STA 38	-	AGS500, IGS250, TGS1000	20	48	56.6	76.6	7	2.5	7
STA 45	-	AGS750, IGS500, LGS500	25	56	70.7	95.7	7	2.5	9
STA 50	-	AGS1000, IGS750, TGS2000	30	61	80	110	14.2	2.5	13
STA 63	-	AGS1500, TGS3000	30	73	92	122	14.2	2.5	13
STA 75	-	AGS2400, IGS1500, TGS5000	30	86	104	134	14.2	2.5	13
STA 95	-	AGS4200, IGS3000, TGS8000	40	106	130	170	14.2	2.5	17
STA 120	-	AGS6600, IGS5000, TGS12000	50	131	155	205	14.2	2.5	17
STA 150	-	AGS9500, IGS7500	50	170	195	245	14.2	2.5	21

FV 19 Collar flange (for base-fixing)

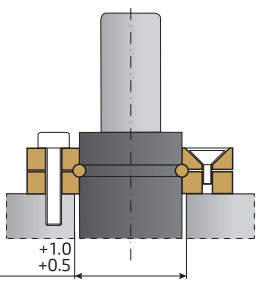


Fixing Possibilities

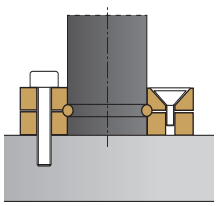


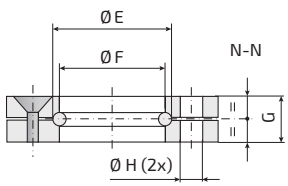
Collar Flange

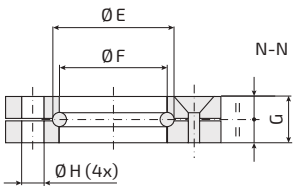
FL 12 ~ 25



Body Ø







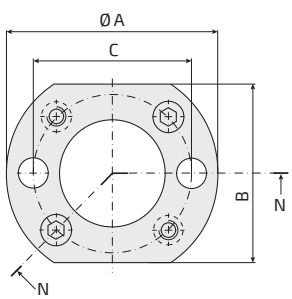


FIG. 1

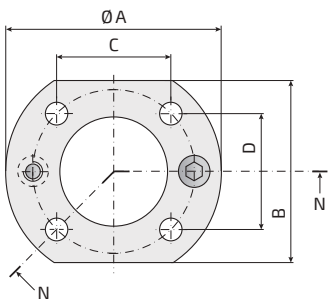


FIG. 2

Order Code	Reference to Standards	For models...	Ø A	B	C	D	Ø E	Ø F	G	Ø H	FIG.
FL 12	-	VGS50	34	21	24	-	13.6	12.5	9	6.6	**1**
FL 15	-	VGS70	37	24	27	-	16.6	15.5	9	6.6	**1**
FL 19 A	VDI 3003	AGS170, VGS90, VV170	44	25	32	-	21	19.5	9	6.6	**1**
FL 19 B	ISO 11901-2	AGS170, VGS90, VV170	44	25	30	12	21	19.5	9	6.6	**2**
FL 25 A	VDI 3003	AGS320, TGS400, VGS200, VV320-63/63H	50	30	38	-	27	25.5	9	6.6	**1**
FL 25 B	ISO 11901-2	AGS320, TGS400, VGS200, VV320-63/63H	50	30	34	18	27	25.5	9	6.6	**2**

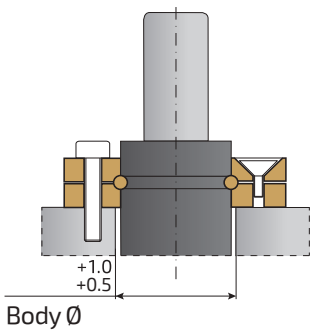
ISO 11901-2 **VDI 3003**

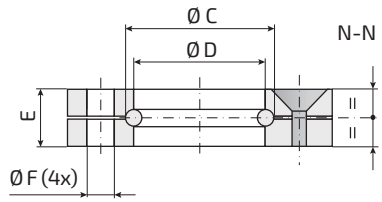
This gas spring series includes the models compliant with automotive standards

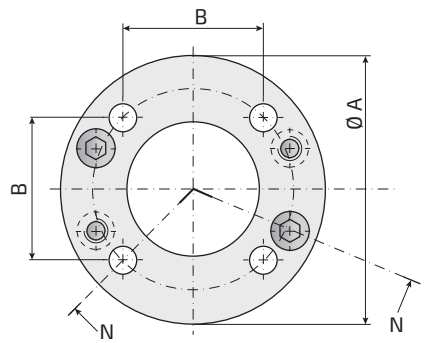
BMW	B2 4009	**MB**	B8 0134 400 008 801
FCA	075.90.75	**PSA**	E24.54.815.G
Ford	W-DX35-80M	**VW**	39D 848

FL

Collar Flange **FL 32 ~ 195**







Order Code	Reference to Standards	For models...	Ø A	B	Ø C	Ø D	E	Ø F
FL 32	ISO 11901-2, VDI 3003	AGS350, IGS150, TGS700	60	35	34	32.5	9	6.6
FL 38	ISO 11901-2, VDI 3003	AGS500, IGS250, TGS1000	68	40	40	38.5	9	6.6
FL 45	ISO 11901-2, VDI 3003	AGS750, IGS500, LGS500	86	50	47	45.5	13	9
FL 50	ISO 11901-2, VDI 3003	AGS1000, IGS750	95	56.5	54	50.5	13	9
FL 63	ISO 11901-2	AGS1500, TGS3000	122	73.5	67	63.5	16	11
FL 75	ISO 11901-2, VDI 3003	AGS2400, IGS1500, VV2385	122	73.5	80	75.5	16	11
FL 95	ISO 11901-2, VDI 3003	AGS4200, IGS3000	150	92	100	95.5	18	13.5
FL 120	ISO 11901-2, VDI 3003	AGS6600, IGS5000, TGS12000	175	109.5	125	120.5	21	13.5
FL 150	ISO 11901-2, VDI 3003	AGS9500, IGS7500	220	138	155	150.5	27	17.5
FL 195	ISO 11901-2, VDI 3003	AGS20000, IGS10000	290	170	200	195.5	27	17.5

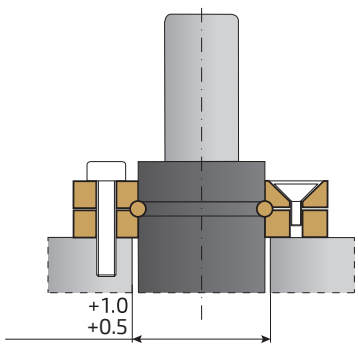
ISO 11901-2 VDI 3003

This gas spring series includes the models compliant with automotive standards

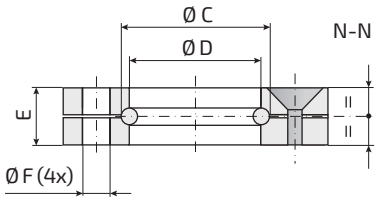
BMW	B2 4009	**MB**	B8 0134 300 000 001
FCA	075.90.80	**Renault**	EM24.54.700
General Motors	90.25.03		

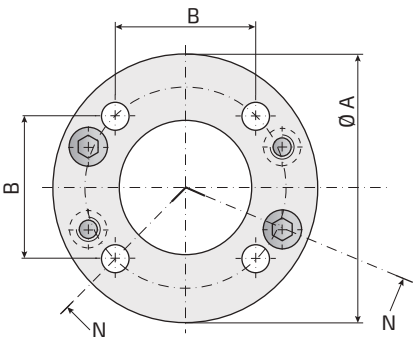
FL

Collar Flange **FLA**



Body Ø





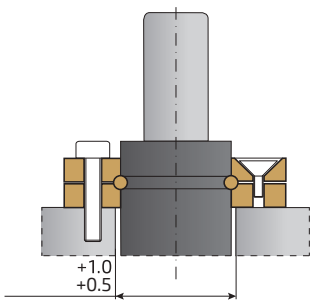
Order Code	Reference to Standards	For models...	Ø A	B	Ø C	Ø D	E	Ø F
FLA 50	-	TGS2000	95	56.5	53	50.5	13	9
FLA 75	-	TGS5000	122	73.5	78	75.5	16	11
FLA 95	-	TGS8000	150	92	98	95.5	18	13.5

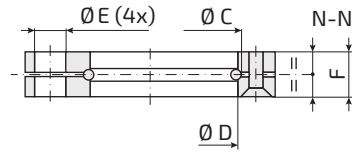
This gas spring series includes the models compliant with automotive standards

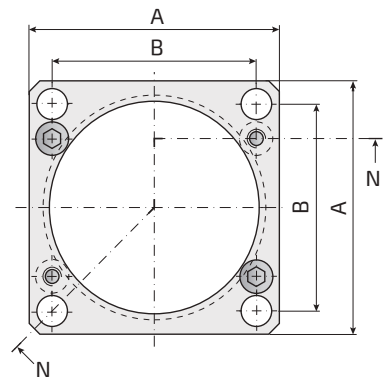
Renault	EM24.54.700

FLA

Collar Flange FLQ







Order Code	Reference to Standards	For models...	A	B	Ø C	Ø D	Ø E	F
FLQ 32	ISO 11901-2, VDI 3003	AGS350, IGS150, TGS700	45	35	34	32.5	6.6	9
FLQ 38	ISO 11901-2, VDI 3003	AGS500, IGS250, TGS1000	52	40	40	38.5	6.6	9
FLQ 45	ISO 11901-2, VDI 3003	AGS750, IGS500, LGS500	64	50	47	45.5	9	13
FLQ 50	ISO 11901-2, VDI 3003	AGS1000, IGS750	70	56.5	54	50.5	9	13
FLQ 63 A	ISO 11901-2, VDI 3003	AGS1500, TGS3000	80	64	67	63.5	11	16
FLQ 63 B	-	AGS1500, TGS3000	90	73.5	67	63.5	11	16
FLQ 75	ISO 11901-2, VDI 3003	AGS2400, IGS1500, VV2385	90	73.5	80	75.5	11	16
FLQ 95	ISO 11901-2, VDI 3003	AGS4200, IGS3000	110	92	100	95.5	13.5	18
FLQ 120	ISO 11901-2, VDI 3003	AGS6600, IGS5000, TGS12000	130	109.5	125	120.5	13.5	21
FLQ 150	ISO 11901-2, VDI 3003	AGS9500, IGS7500	162	138	155	150.5	17.5	27
FLQ 195	ISO 11901-2, VDI 3003	AGS20000, IGS10000	210	170	200	195.5	17.5	27

ISO 11901-2

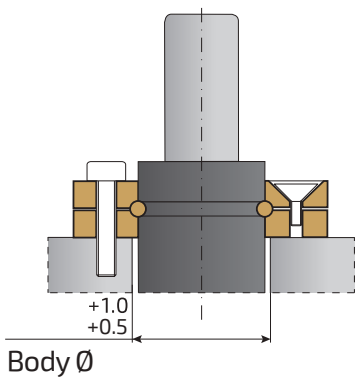
VDI 3003

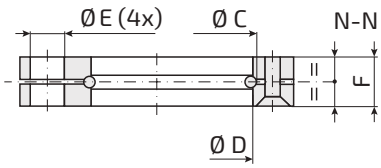
This gas spring series includes the models compliant with automotive standards

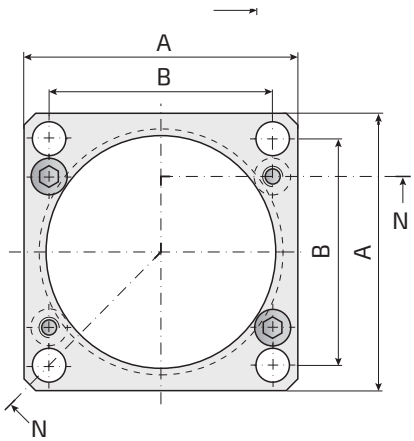
BMW	B2 4009	**General Motors**	90.25.02
FCA	075.90.85	**VW**	39D 848
Ford	W-DX35-62M		

FLQ

Collar Flange **FLQA**

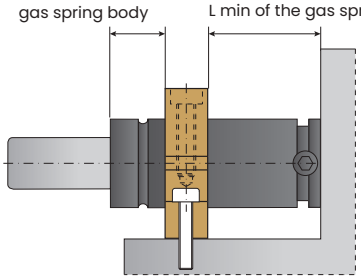




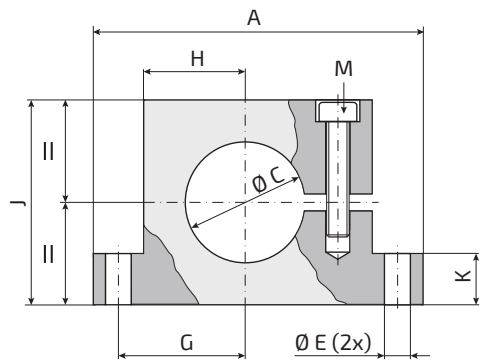


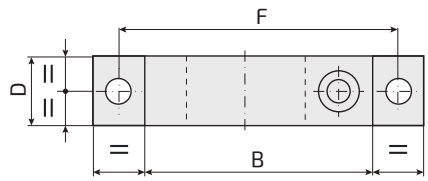
Order Code	Reference to Standards	For models...	Ø A	B	Ø C	Ø D	E	Ø F
FLQA 50	-	TGS2000	70	56.5	53	50.5	9	13
FLQA 75	-	TGS5000	90	73.5	78	75.5	11	16
FLQA 95	-	TGS8000	110	92	98	95.5	13.5	18

Front Support FT



Dimension **MIN** must be respected to allow the over-pressure and over-stroke safety system to work properly (see dedicated catalogue section).





Order Code	Reference to Standards	For models...	A	B	Ø C	D	Ø E	F	G	H	J	K	M
FT 32	VDI 3003	AGS350, IGS150, TGS700, VV320-80, VV500, VV565	90	54	32	20	9	72	31	22	45	15	M8
FT 38	VDI 3003	AGS500, IGS250, TGS1000	95	59	38	20	9	77	34	25	55	15	M8
FT 45	VDI 3003	AGS750, IGS500, LGS500	100	64	45	20	9	82	37	28	60	15	M8
FT 50	ISO 11901-2, VDI 3003	AGS1000, IGS750, TGS2000, VV750	130	90	50	30	9	110	50	40	80	20	M8
FT 75	ISO 11901-2, VDI 3003	AGS2400, IGS1500, TGS5000, VV2385	160	115	75	30	11	137	63.5	52.5	105	20	M10
FT 95	ISO 11901-2, VDI 3003	AGS4200, IGS3000, TGS8000, VV2945	195	145	95	30	13.5	170	80	67.5	125	20	M12
FT 120	ISO 11901-2, VDI 3003	AGS6600, IGS5000, TGS12000	220	165	120	30	13.5	195	92.5	77.5	148	20	M12
FT 150	ISO 11901-2, VDI 3003	AGS9500, IGS7500	260	200	150	30	13.5	230	110	95	200	20	M12

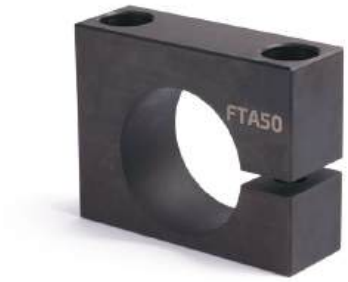
ISO **ISO 11901-2**

VDI **VDI 3003**

This gas spring series includes the models compliant with automotive standards

BMW	B2 4009	**PSA**	E24.54.815.G
General Motors	90.25.455		

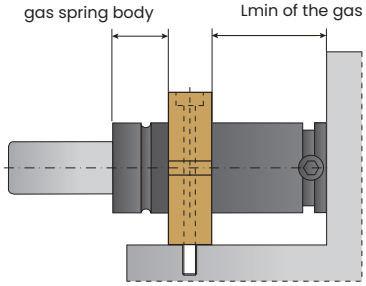
FT



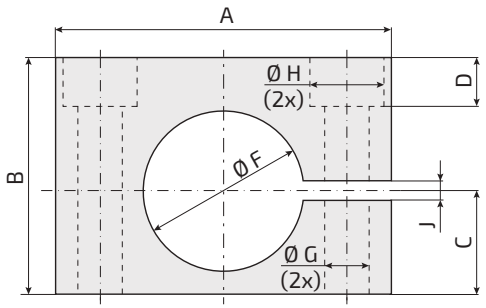
Front Support FTA

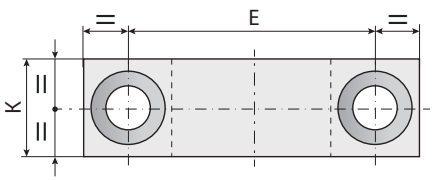
MAX
0.5 x diameter of the gas spring body

MIN
1/3 (one third) of dimension Lmin of the gas spring



Dimension **MIN** must be respected to allow the over-pressure and over-stroke safety system to work properly (see dedicated catalogue section).





Order Code	Reference to Standards	For models...	A	B	C	D	E	ØF	ØG	ØH	J	K
FTA 32	ISO 11901-2, VDI 3003	AGS350, IGS150, TGS700, VV320-80, VV500, VV565	68	48	20.9	10	50	32.5	9	15	4	20
FTA 38	ISO 11901-2, VDI 3003	AGS500, IGS250, TGS1000	74	54	23.9	16	54	38.5	9	15	4	20
FTA 45	ISO 11901-2, VDI 3003	AGS750, IGS500, LGS500	80	60	27.5	22	60	45.5	9	15	4	20
FTA 50	ISO 11901-2, VDI 3003	AGS1000, IGS750, TGS2000, VV750	90	70	30	25	68	50.5	11	18	5	30
FTA 63 A	ISO 11901-2, VDI 3003	AGS1500, TGS3000	108	82	36.5	27	84	63.5	11	18	5	30
FTA 63 B	-	AGS1500, TGS3000	105	80	40	11	80	63	10.5	17	10	30
FTA 75	ISO 11901-2, VDI 3003	AGS2400, IGS1500, TGS5000, VV2385	125	94	42	32	100	75.5	13.5	20	5	30
FTA 95	ISO 11901-2, VDI 3003	AGS4200, IGS3000, TGS8000, VV2945	140	115	52.5	33	115	95.5	13.5	20	5	30
FTA 120	ISO 11901-2, VDI 3003	AGS6600, IGS5000, TGS12000	170	140	65	58	145	120.5	13.5	20	7	30
FTA 150	ISO 11901-2, VDI 3003	AGS9500, IGS7500	200	170	80	68	175	150.5	13.5	20	7	30

ISO 11901-2 **VDI 3003**

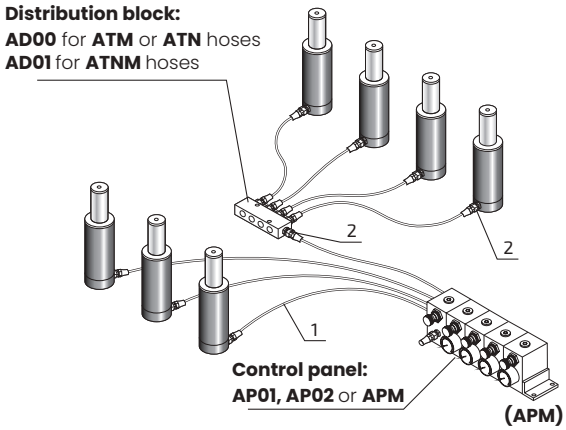
This gas spring series includes the models compliant with automotive standards

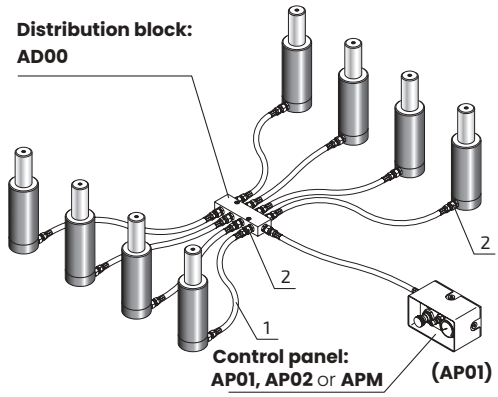
BMW	B2 4009	**General Motors**	90.25.07
FCA	075.90.95	**MB**	B8 ...
Ford	W-DX35-62M	**VW**	39D 848

FTA

LINKED SYSTEM

LINKED SYSTEM EXAMPLES





1- Hoses **ATM** or **ATNM**
2- Fitting **ARM** (for hoses ATM) or **ARN** (for hoses ATN) or **ARNN** (for hoses ATNM)

1- Hoses **AT**
2- Fittings **AR**

1 CHOOSE GAS SPRING MODEL

Gas spring models	Side port
AGS350~AGS2400	M6
IGS150, IGS250	
VV2385	
AGS4200~AGS20000	G1/8
IGS500~IGS10000	
LGS500	
VV750, VV2945	

2 CHOOSE HOSE MODEL

For gas springs with M6 side port

For gas springs with G1/8 side port

ATNM
Hose Ø 5 mm
(Micro-type)

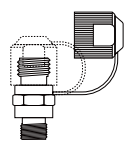
ATM
Hose Ø 5 mm
(Minimess-type)

ATN
Hose Ø 5 mm
(for small available spaces)

AT
Hose Ø 8 mm
(for big available spaces)

3 CHOOSE PROPER FITTINGS

ARNM
For hoses ATNM
Ø 5 mm



ARM
For hoses ATM
Ø 5 mm

ARN
For hoses ATN
Ø 5 mm

AR
For hoses AT
Ø 8 mm

LINKED SYSTEM

4 CHOOSE CONTROL PANEL MODEL

AP01
Standard

AP02
Compact

APM
Modular

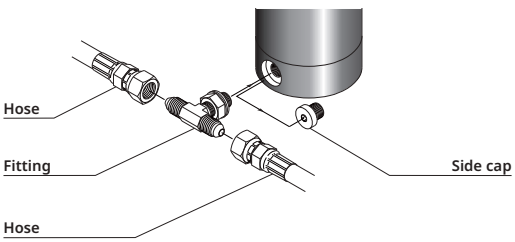
... and other available models

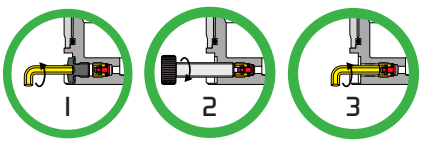
5 DISTRIBUTION BLOCKS (IF NEEDED)

AD01

AD00

6 CONNECTING THE GAS SPRINGS





Discharge the gas spring and remove the valve before connecting to system

ATTENTION !
Follow the "USE INSTRUCTIONS" page before connecting the gas springs

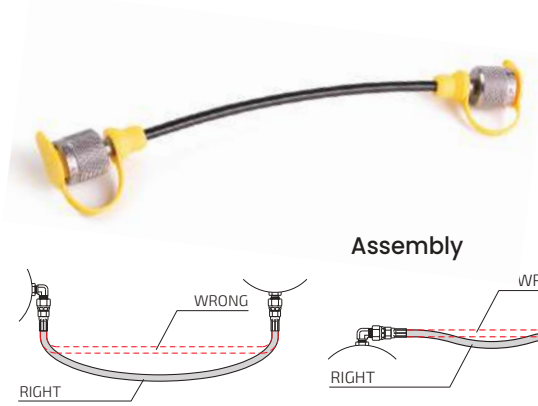
7 CHARGING AND DISCHARGING

COMPL
Charging and discharging set (also for self-contained gas springs)

CUC01
Charging unit (also for self-contained gas springs) included in the complete set COMPL

AN-1/4
Charging adapter for the quick coupling on the control panels

Hoses ø5 mm and fittings (MINIMESS-type)



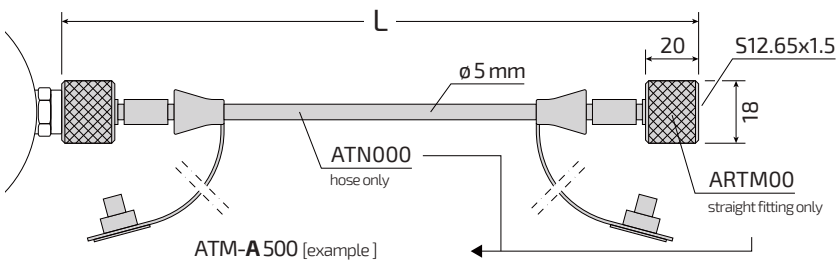
Flexible hose diameter 5 mm with fittings, for connecting nitrogen gas springs and manyother devices.

HOSE Mechanical specifications

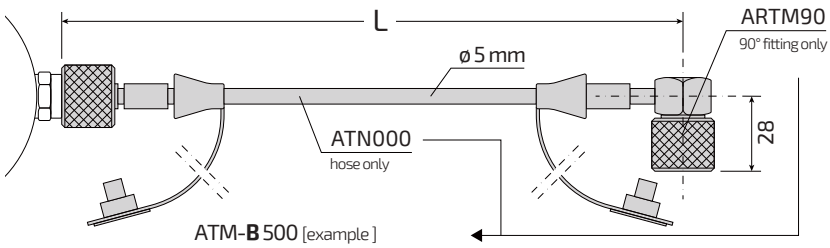
- Working temperature: -40 +100 °C
- Working pressure: max 630 bar
- Minimum bending radius: 20 mm
- Outside diameter: 5 mm

TECHNICAL NOTES

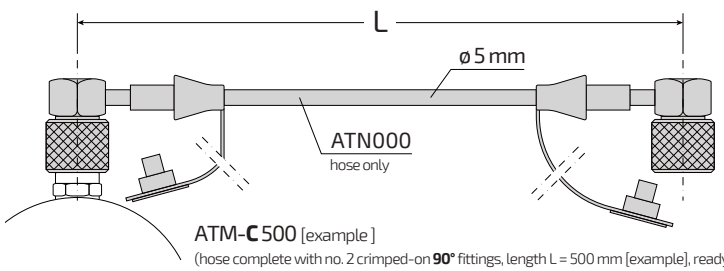
Choose the proper hose length considering the "Assembly" indications.



ATM-**A** 500 [example]
(hose complete with no. 2 crimped-on **straight** fittings, length L = 500 mm [example], ready for use)



ATM-**B** 500 [example]
(hose complete with no. 2 crimped-on fittings (**straight** + **90°**), length L = 500 mm [example], ready for use)



ATM-**C** 500 [example]
(hose complete with no. 2 crimped-on **90°** fittings, length L = 500 mm [example], ready for use)

ORDER HOSE cod. ATN000 (quantity in metres, for example: "ATN000 10 m") and FITTINGS cod. ARTM00/ARTM90 for SELF-CUTTING and SELF-CRIMPING

Length of standard hoses, fittings included (Different lengths can be prepared on request - Minimum lengths: see "L MIN")

Order Code	L
ATM-.... 150	150
ATM-... 175	175
ATM-... 200	200
ATM-... 250	250
ATM-... 300	300
ATM-... 350	350
ATM-.... 400	400
ATM-... 500	500

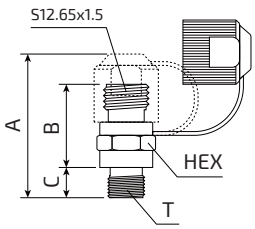
Order Code	L
ATM-... 600	600
ATM-... 700	700
ATM-... 800	800
ATM-... 900	900
ATM-... 1000	1000
ATM-... 1500	1500
ATM-... 2000	2000

Order Code	L
ATM - A	90
ATM - B	95
ATM - C	105

*** No plastic caps for L < 150 mm**

Fittings for ATM Hoses (MINIMESS-type)

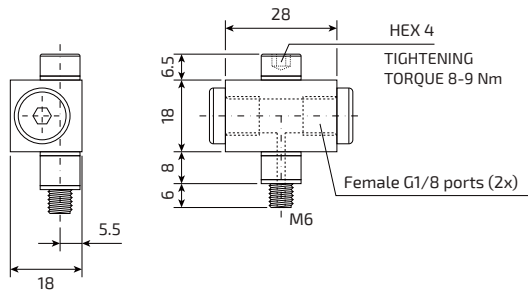
Fittings for linking gas springs, control panels and distribution blocks



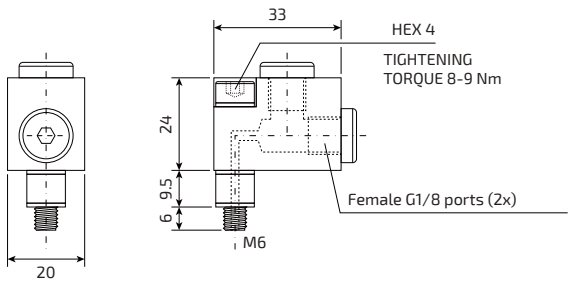
Order Code	A	B	C	T	HEX	Tightening torque	Non-return valve
ARM000-1/8	48	30	8	G1/8	14	ca. 18	NO
ARM000-1/8V	48	30	8	G1/8	14	ca. 18	YES
ARM000-1/4	43	21	12	G1/4	19	ca. 45	NO
ARM000-1/4V	43	21	12	G1/4	19	ca. 45	YES

ATTENTION ! Use fittings without non-return valve when connecting gas springs and other devices to open system (hose system).

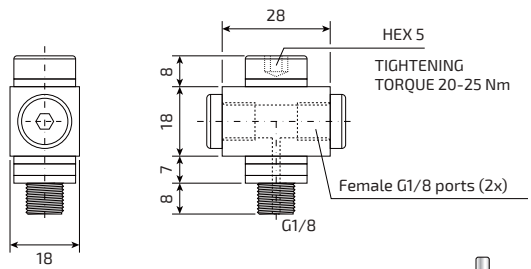
Order Code: ARM270 – M6



Order Code: ARM270R – M6

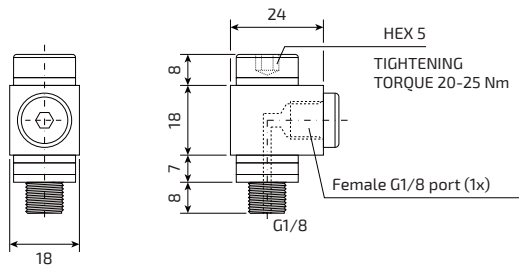


Order Code: ARM270 – 1/8

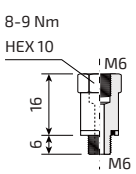


Extension fittings which may be needed in case of fixing with half-flanges

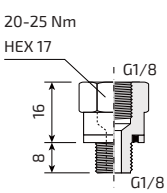
Order Code: ARM090 – 1/8



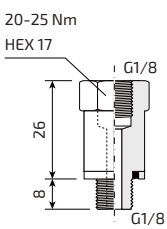
PL – M6



PL-1/8A

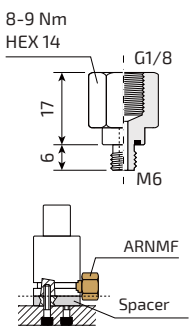


PL-1/8B



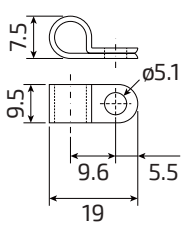
M6 to G1/8 side port converter

ARNMF



OTHER ACCESSORIES

Order Code: CFT-5



HOSE CLIP FOR HOSES Ø5 mm (10 pc. box)

Hoses ø 5 mm and fittings (MICRO-type)

Flexible hose diameter 5 mm with fittings, for connecting nitrogen gas springs and many other devices.

HOSE Mechanical specifications

- Working temperature: -40 +100 °C
- Working pressure: max 630 bar
- Minimum bending radius: 20 mm
- Outside diameter: 5 mm

TECHNICAL NOTES

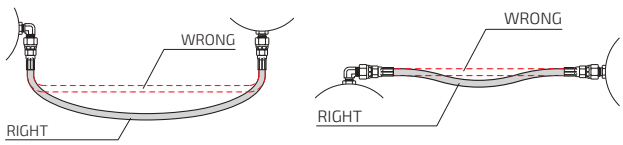
Calculating hose length:

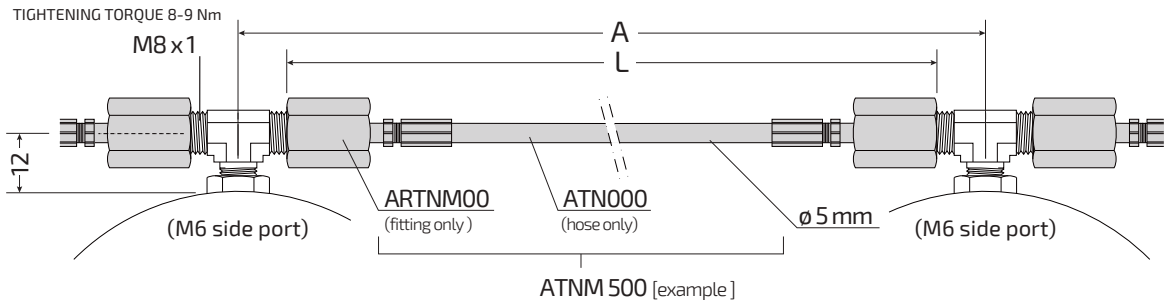
L = (A - 20) x 1.05 (dimensions in millimetres)

L = Hose length (fittings included)

A = Distance between gas springs to be connected

Assembly





ORDER HOSE cod. ATN000 (quantity in metres, for example: "ATN000 10 m") and FITTINGS cod. ARTNM00 for SELF-CUTTING and SELF-CRIMPING

Length of standard hoses, fittings included (Different lengths can be prepared on request - Minimum length L = 90 mm)

Order Code	A	L
ATNM 100	115	100
ATNM 125	139	125
ATNM 150	163	150
ATNM 175	187	175
ATNM 200	210	200
ATNM 250	258	250

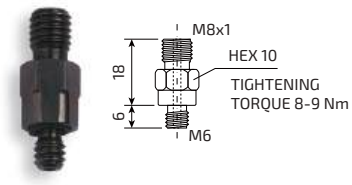
Order Code	A	L
ATNM 300	306	300
ATNM 350	353	350
ATNM 400	401	400
ATNM 500	496	500
ATNM 600	591	600
ATNM 700	687	700

Order Code	A	L
ATNM 800	782	800
ATNM 900	877	900
ATNM 1000	972	1000
ATNM 1500	1449	1500
ATNM 2000	1925	2000

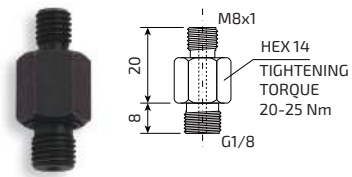
Fittings for ATNM hoses (MICRO-type)

Fittings for linking gas springs, control panels and distribution blocks

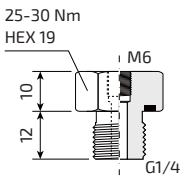
Order Code: ARNM000



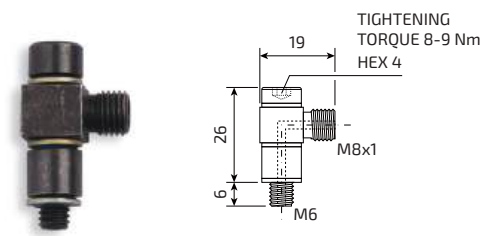
Order Code: ARNM000CP



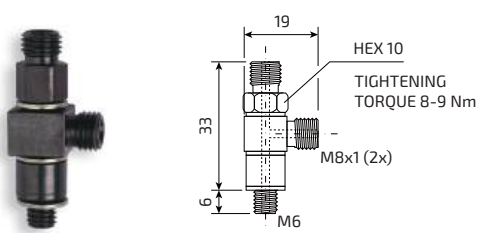
Order Code: ARNM00P



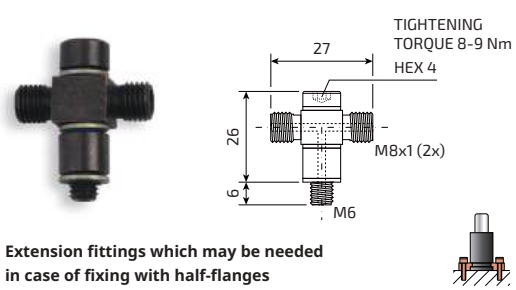
Order Code: ARNM090



Order Code: ARNM270R

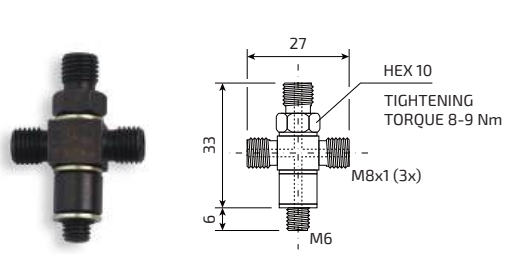


Order Code: ARNM270

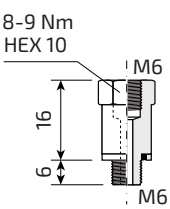


Extension fittings which may be needed in case of fixing with half-flanges

Order Code: ARNM360

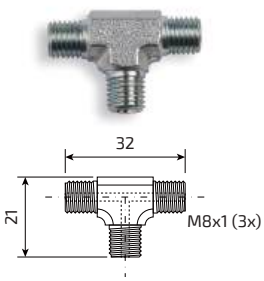


PL – M6

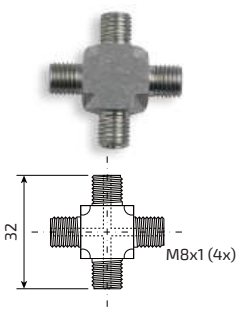


FITTINGS FOR HOSE-HOSE CONNECTION

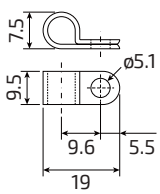
Order: ARNM270T



Order: ARNM360T



OTHER ACCESSORIES



HOSE CLIP FOR HOSES ø5 mm (10 pc. box)

Hoses ø 5 mm and fittings

Flexible hose diameter 5 mm with fittings, for connecting nitrogen gas springs and many other devices.

HOSE Mechanical specifications

- Working temperature: -40 +100 °C
- Working pressure: max 630 bar
- Minimum bending radius: 20 mm
- Outside diameter: 5 mm

TECHNICAL NOTES

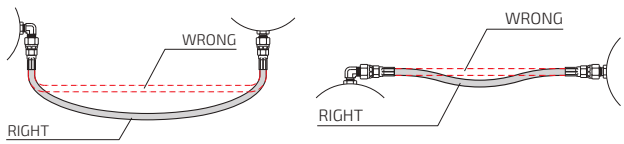
Calculating hose length:

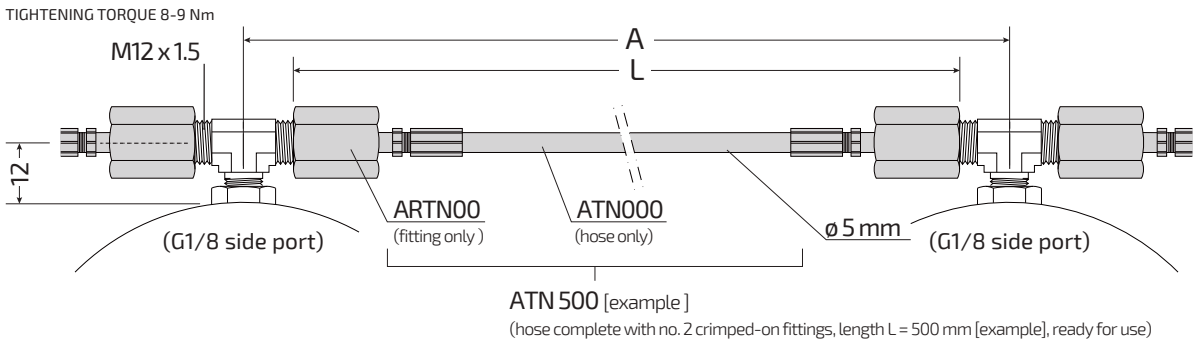
L = (A - 25) x 1.05 (dimensions in millimetres)

L = Hose length (fittings included)

A = Distance between gas springs to be connected

Assembly





ORDER HOSE cod. ATN000 (quantity in metres, for example: "ATN000 10 m") and FITTINGS cod. ARTN00 for SELF-CUTTING and SELF-CRIMPING

Length of standard hoses, fittings included (Different lengths can be prepared on request - Minimum length L = 90 mm)

Order Code	A	L
ATN 100	120	100
ATN 125	144	125
ATN 150	168	150
ATN 175	192	175
ATN 200	215	200
ATN 250	263	250

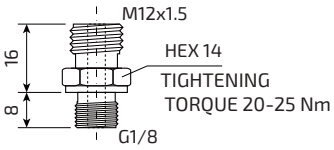
Order Code	A	L
ATN 300	311	300
ATN 350	358	350
ATN 400	406	400
ATN 500	501	500
ATN 600	596	600
ATN 700	692	700

Order Code	A	L
ATN 800	787	800
ATN 900	882	900
ATN 1000	977	1000
ATN 1500	1454	1500
ATN 2000	1930	2000

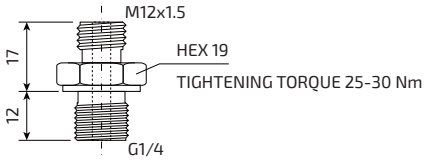
Fittings for ATN hoses

Fittings for linking gas springs, control panels and distribution blocks

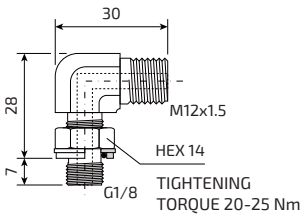
Order Code: ARN000



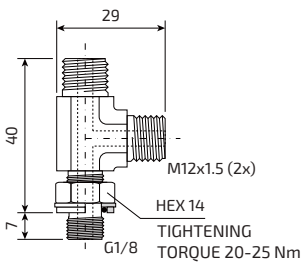
Order Code: ARN000 - 1/4



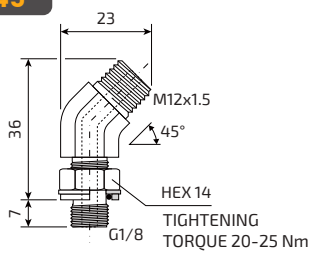
Order Code: ARN090



Order Code: ARN270R

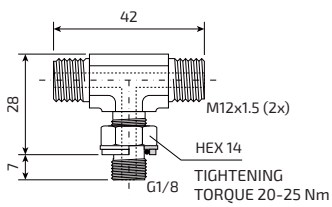


Order Code: ARN045

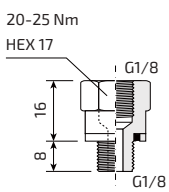


Extension fittings which may be needed in case of fixing with half-flanges

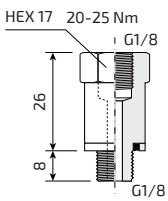
Order Code: ARN270



PL-1/8A

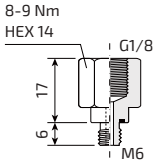


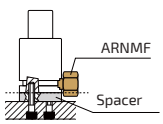
PL-1/8B



ARNMF

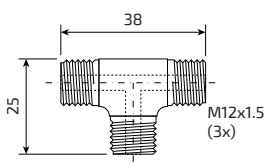
M6 to G1/8 side port converter



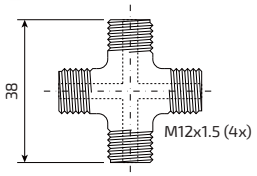


FITTINGS FOR HOSE-HOSE CONNECTION

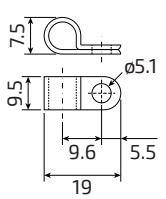
Order Code: ARN270T



Order Code: ARN360T



OTHER ACCESSORIES



HOSE CLIP FOR HOSES ø5 mm (10 pc. box)

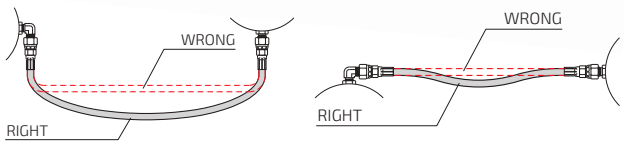
Hoses ø 8 mm and fittings

Flexible hose diameter 8 mm with fittings, for connecting nitrogen gas springs and many other devices.

HOSE Mechanical specifications

- Working temperature: -40 +100 °C
- Working pressure: max 630 bar
- Minimum bending radius: 20 mm
- Outside diameter: 5 mm

Assembly



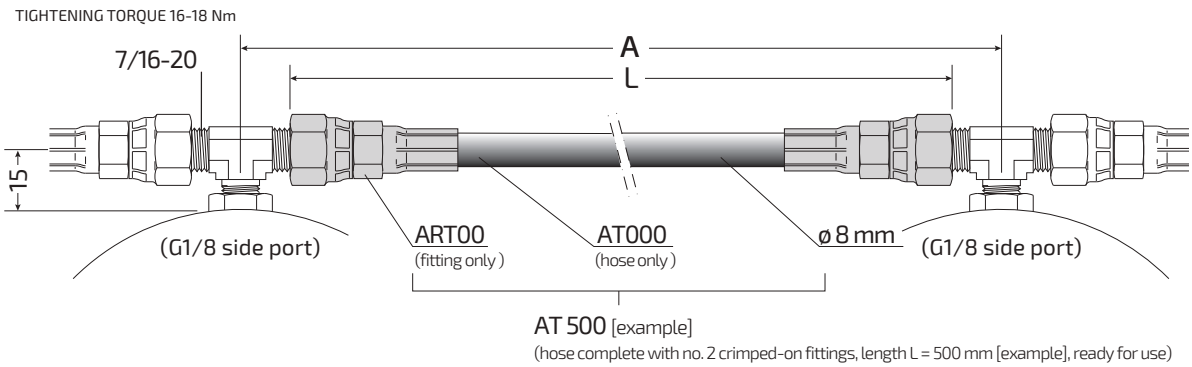
TECHNICAL NOTES

Calculating hose length:

L = (A - 25) x 1.05 (dimensions in millimetres)

L = Hose length (fittings included)

A = Distance between gas springs to be connected



ORDER HOSE cod. AT000 (quantity in metres, for example: "AT000 10 m") and FITTINGS cod. ART00 for SELF-CUTTING and SELF-CRIMPING

Length of standard hoses, fittings included (Different lengths can be prepared on request - Minimum length L = 90 mm)

Order Code	A	L
AT 125	144	125
AT 150	168	150
AT 175	192	175
AT 200	215	200
AT 250	263	250

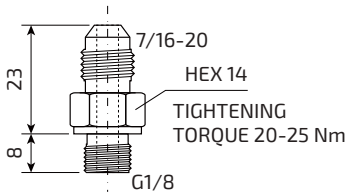
Order Code	A	L
AT 300	311	300
AT 350	358	350
AT 400	406	400
AT 500	501	500
AT 600	596	600
AT 700	692	700

Order Code	A	L
AT 800	787	800
AT 900	882	900
AT 1000	977	1000
AT 1500	1454	1500
AT 2000	1930	2000

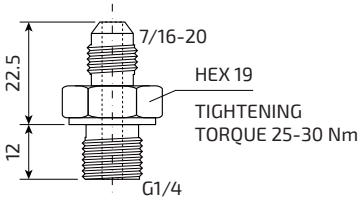
Fittings for AT hoses

Fittings for linking gas springs, control panels and distribution blocks

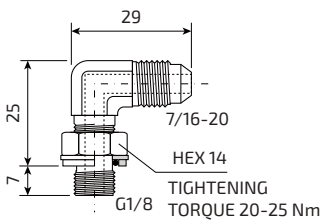
Order Code: AR000



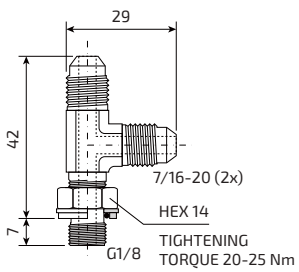
Order Code: AR000 – 1/4



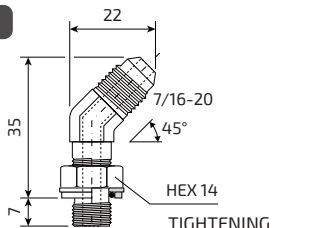
Order Code: AR090



Order Code:AR270R

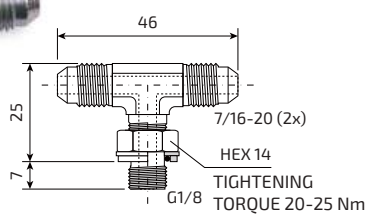


Order Code: AR045

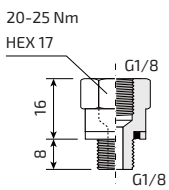


Extension fittings which may be needed in case of fixing with half-flanges

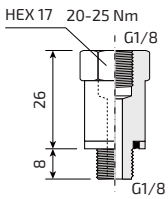
Order Code:AR270



PL-1/8A

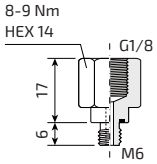


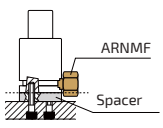
PL-1/8B



ARNMF

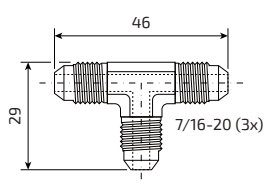
M6 to G1/8 side port converter



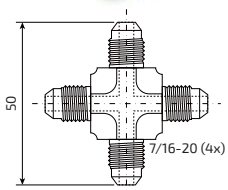


FITTINGS FOR HOSE-HOSE CONNECTION

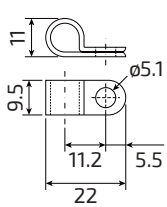
Order Code: AR270T



Order Code: AR360T



OTHER ACCESSORIES



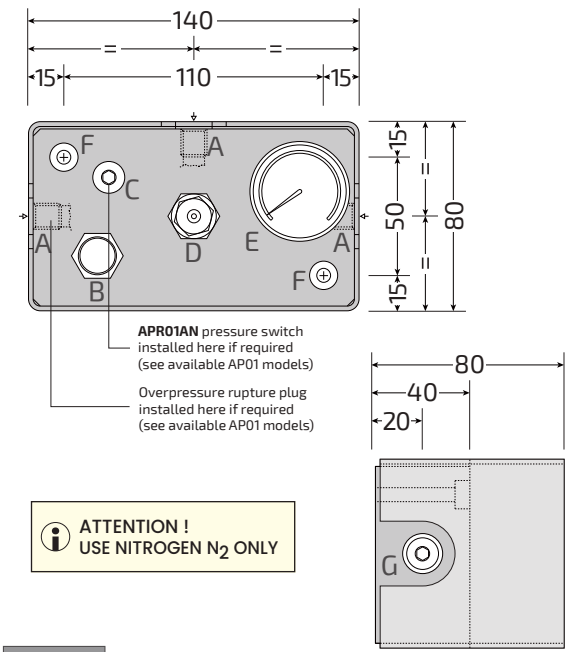
HOSE CLIP FOR HOSES ø8 mm (10 pc. box)

CONTROL PANEL AP01

This panel allows to charge and discharge a nitrogen gas spring or a nitrogen gas springs system, and to monitor the pressure.

TECHNICAL NOTES

A – No. 3 connection ports (G1/8)
B – Discharging valve
C – Plug ready for safety pressure switch
D – Charging valve (use only with CUC01 or COMPL or BOOSTER)
E – Pressure gauge
F – No. 2 fixing holes for M6 hex-socket screws
G – The connection ports are plugged



ATTENTION ! USE NITROGEN N_2 ONLY

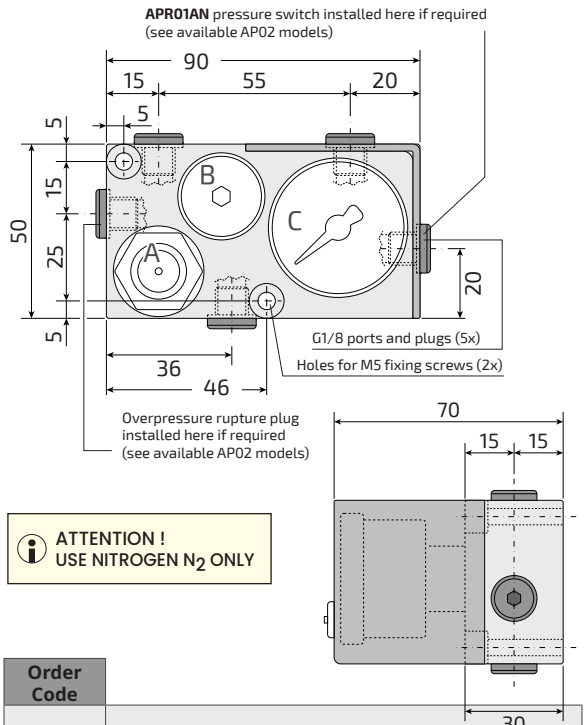
Order Code	
AP01	Control panel
AP01PAN	Control panel with APR01AN pressure switch (50-300 bar normally open)
AP01RP	Control panel with overpressure rupture plug
AP01F	Control panel with APR01AN pressure switch (50-300 bar normally open) and with overpressure rupture plug

CONTROL PANEL (COMPACT) AP02

This compact panel allows to charge and discharge a nitrogen gas spring or a nitrogen gas springs system, and to monitor the pressure.

TECHNICAL NOTES

A – Charging valve (use only with CUC01 or COMPL or BOOSTER)
B – Discharging valve
C – Pressure gauge
***** No. 2 fixing holes for M5 hex-socket screws
***** No. 5 connection ports (G1/8)
***** The connection ports are plugged



ATTENTION ! USE NITROGEN N_2 ONLY

Order Code	
AP02	Control panel
AP02PAN	Control panel (compact version) with APR01AN pressure switch (50-300 bar normally open)
AP02RP	Control panel (compact version) with overpressure rupture plug
AP02F	Control panel (compact version) with APR01AN pressure switch (50-300 bar normally open) and with overpressure rupture plug

Add "LOCK" after the control panel code to receive it with lockable discharging valve for Lockout-Tagout applications.
Order padlock (code: PADLOCK) separately (also usable with BRADY part no. 850821 padlock).
Example: "AP01FLOCK" = control panel AP01F with lockable discharging valve.

All models are available with safety valve VS500 already assembled (on request).

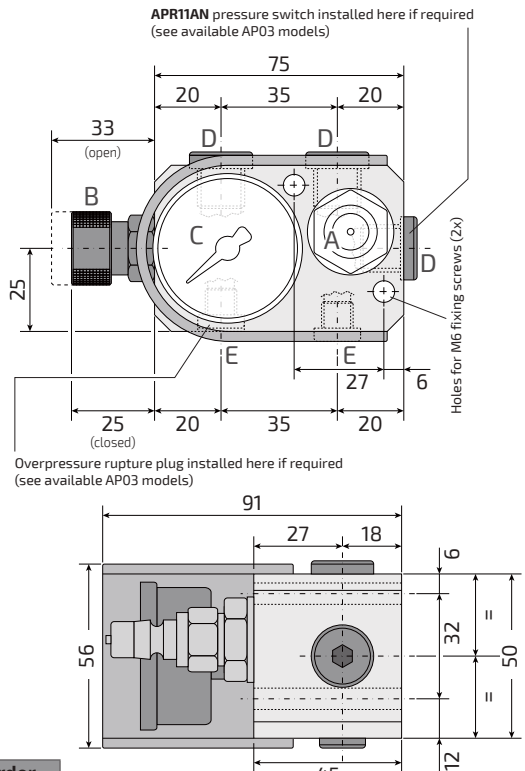
CONTROL PANEL (COMPACT) AP03

This compact panel allows to charge and discharge a nitrogen gas spring or a nitrogen gas springs system, and to monitor the pressure.

TECHNICAL NOTES

A – Charging valve (use only with CUC01 or COMPL or BOOSTER)
B – Discharging valve
C – Pressure gauge
D – No. 3 connection ports G1/4
E – No. 2 connection ports G1/8
***** The connection ports are plugged
***** No. 2 fixing holes for M6 hex-socket screws

ATTENTION ! USE NITROGEN N_2 ONLY



Order Code	
AP03	Control panel (compact version)
AP03PAN	Control panel (compact version) with APR11AN pressure switch (50-300 bar normally open)
AP03RP	Control panel (compact version) with overpressure rupture plug
AP03F	Control panel (compact version) with APR11AN pressure switch (50-300 bar normally open) and with overpressure rupture plug

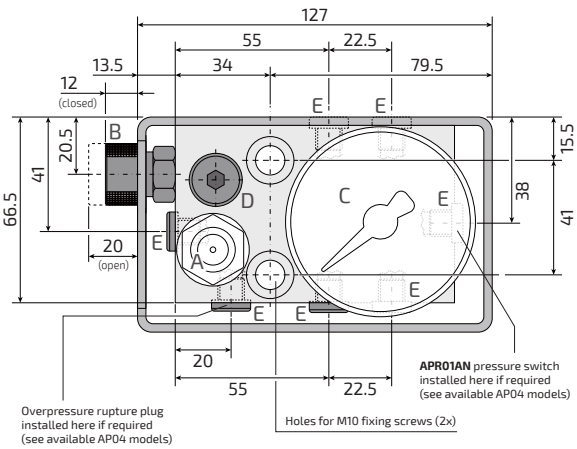
CONTROL PANEL AP04

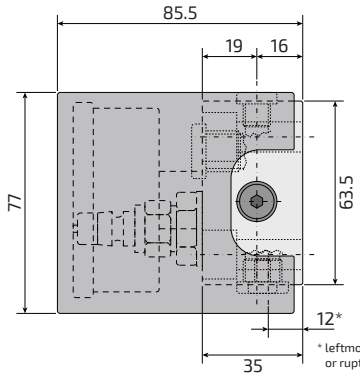
This panel allows to charge and discharge a nitrogen gas spring or a nitrogen gas springs system, and to monitor the pressure.

TECHNICAL NOTES

A – Charging valve (use only with CUC01 or COMPL or BOOSTER)
B – Discharging valve
C – Pressure gauge
D – No. 1 connection port G1/4
E – No. 7 connection ports G1/8
***** The connection ports are plugged
***** No. 2 fixing holes for M10 hex-socket screws

ATTENTION ! USE NITROGEN N_2 ONLY





Order Code	
AP04	Control panel
AP04PAN	Control panel with APR01AN pressure switch (50-300 bar normally open)
AP04RP	Control panel with overpressure rupture plug
AP04F	Control panel with APR01AN pressure switch (50-300 bar normally open) and with overpressure rupture plug

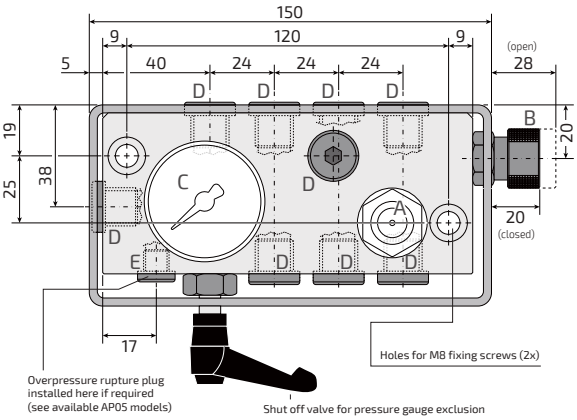
All models are available with safety valve VS500 already assembled (on request).

CONTROL PANEL AP05

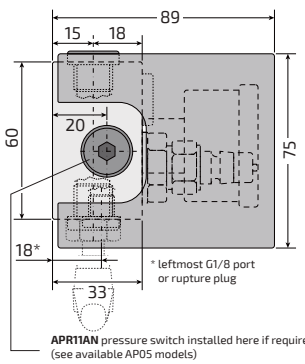
This panel allows to charge and discharge a nitrogen gas spring or a nitrogen gas springs system, and to monitor the pressure.

TECHNICAL NOTES

A – Charging valve (use only with CUC01 or COMPL or BOOSTER)
B – Discharging valve
C – Pressure gauge
D – No. 9 connection ports G1/4
E – No. 1 connection port G1/8
***** The connection ports are plugged
***** No. 2 fixing holes for M8 hex-socket screws
***** Shut off valve for protecting the pressure gauge from pulsating pressure during operation



ATTENTION ! USE NITROGEN N_2 ONLY



Order Code	
AP05	Control panel
AP05PAN	Control panel with APR11AN pressure switch (50-300 bar normally open)
AP05RP	Control panel with overpressure rupture plug
AP05F	Control panel with APR11AN pressure switch (50-300 bar normally open) and with overpressure rupture plug

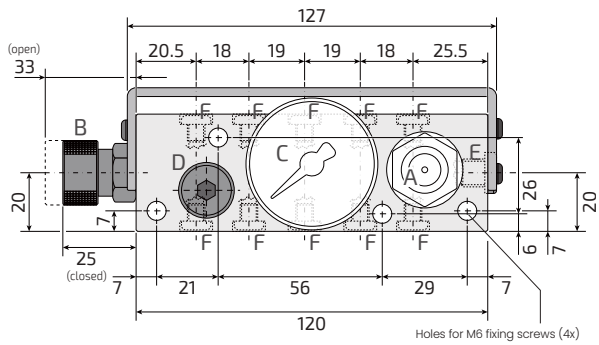
AP06

CONTROL PANEL (MICRO-TYPE PORTS)

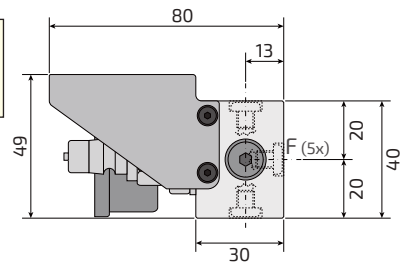
This panel allows to charge and discharge a nitrogen gas spring or a nitrogen gas springs system, and to monitor the pressure.

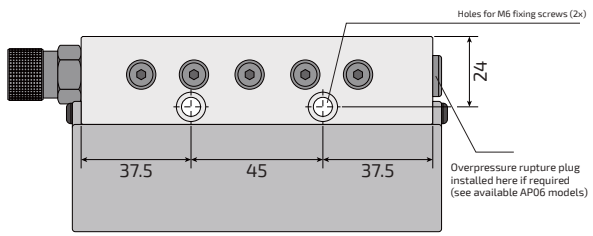
TECHNICAL NOTES

A – Charging valve (use only with CUC01 or COMPL or BOOSTER)
B – Discharging valve
C – Pressure gauge
D – No. 1 connection port G1/4
E – No. 1 connection port G1/8
F – No. 15 connection ports M6 (5x top, 5x bottom, 5x rear)
***** The connection ports are plugged
***** No. 6 (4x + 2x) fixing holes for M6 hex-socket screws



ATTENTION ! USE NITROGEN N_2 ONLY



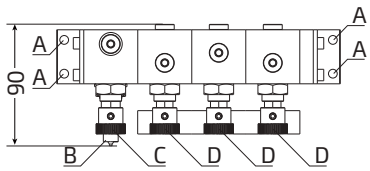


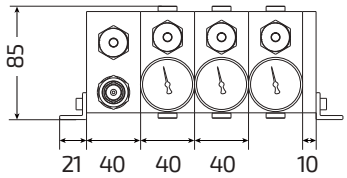
Order Code	
AP06	Control panel (MICRO-type ports)
AP02RP	Control panel (MICRO-type ports) with overpressure rupture plug

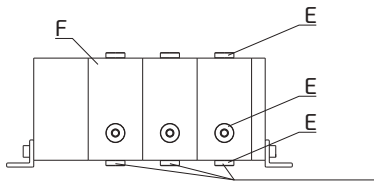
All models are available with safety valve VS500 already assembled (on request).

APM - MODULAR CONTROL PANEL

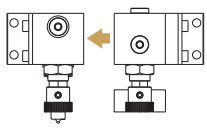
ATTENTION !
USE NITROGEN N_2 ONLY

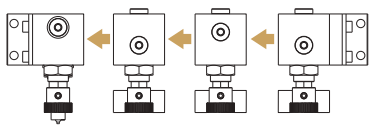






Overpressure rupture plugs (one for each module) installed here if required (see available APM models)





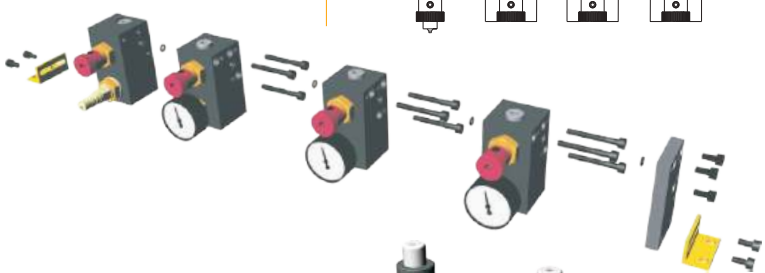
This panel allows to charge and discharge a nitrogen gas spring, or a nitrogen gas springs system, or multiple independent nitrogen gas springs systems, and to monitor the pressure. Each module can be charged at a different pressure.

TECHNICAL NOTES

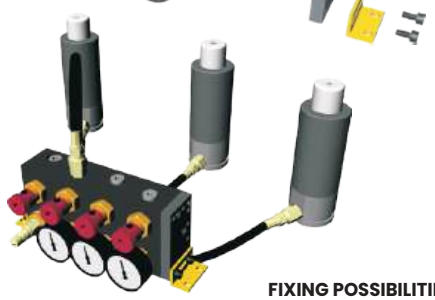
A - M5 fixing hole
B - Quick coupling for nitrogen N2 charging with charging set COMPL or CUC01 or BOOSTER
C - Discharging valve
D - Single-module charging or discharging valve (always turned off during use)
E - Connection ports (G1/8)
F - Each module may be connected with more nitrogen gas springs

It allows to check the pressure of each module separately
No limit as to the quantity of connectible modules

Order Code	EXPLANATION
APM1	Control panel with 1 module
APM2	Control panel with 2 modules
APM3	Control panel with 3 modules
APM4	Control panel with 4 modules
APMX	Control panel with X modules



Order Code	EXPLANATION
APM1RP	Control panel with 1 module, with overpressure rupture plug
APM2RP	Control panel with 2 modules, with 2 pcs. overpressure rupture plugs
APM3RP	Control panel with 3 modules, with 3 pcs. overpressure rupture plugs
APM4RP	Control panel with 4 modules, with 4 pcs. overpressure rupture plugs
APMXRP	Control panel with X modules, with X pcs. overpressure rupture plugs



FIXING POSSIBILITIES

USE INSTRUCTIONS

Nitrogen N_2 charging:
1 - Assemble modular control panel, fix it onto the die and connect the nitrogen gas springs.
2 - Turn off all the valves.
3 - Connect N_2 tank via the quick coupling, and turn it on slowly.
4 - Turn on slowly the valve of the module to be charged and turn it off once the required pressure is reached.
It allows to check the pressure of each module separately No limit as to the quantity of connectible modules
5 - Turn off the N_2 tank, then turn on the discharging valve.
6 - Disconnect the N_2 tank and turn off the discharging valve.
Nitrogen N_2 discharging:
1 - Turn on the discharging valve and then turn on the valve of the module to be discharged.
2 - Once the required pressure is reached, turn off both valves.

Safety pressure switches

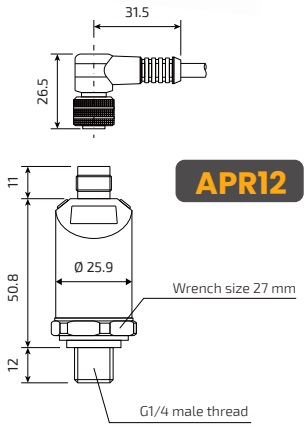
DIGITAL

Digital pressure switch that can be set from 6 to 600 bar, available for the assembly on control panels.

TECHNICAL NOTES

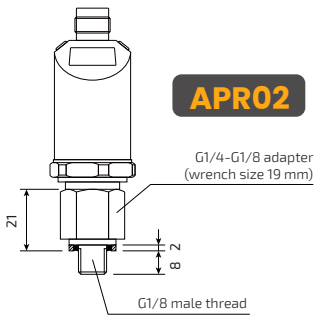
- No. 2 PNP transistor switching outputs
- Switching current: max 250 mA per output
- Technical data sheet on request

Order Code	Thread
APR02	G1/8
APR12	G1/4



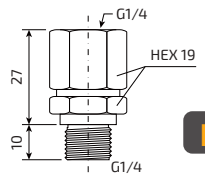
APR12

TIGHTENING TORQUE 25-30 nm



APR02

TIGHTENING TORQUE 20-25 nm



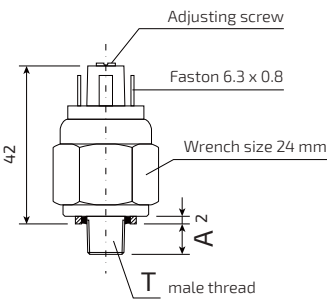
RGV14

Swivel fitting for pressure switch orientation (for APR02 model: install between pressure switch body and G1/4-G1/8 adapter - see drawing

ANALOG

Pressure switches, which can be set from 50 to 150-300 bar depending on model, available for the assembly on control panels.

Order Code	T	Tight. torque Nm	A mm	Range bar	Type	MAX voltage	MAX current
APR01A	G1/8	20-25	8	50-150	Normally open	48V ac/dc	0.5 A
APR01AN	G1/8	20-25	8	50-300	Normally open	48V ac/dc	0.5 A
APR11A	G1/4	25-30	10	50-150	Normally open	48V ac/dc	0.5 A
APR11AN	G1/4	25-30	10	50-300	Normally open	48V ac/dc	0.5 A



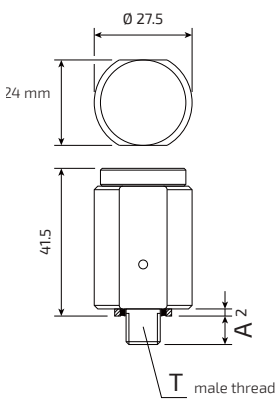
SAFETY VALVE

Overpressure safety valve, available for the assembly on control panels.

TECHNICAL NOTES

- Nominal activation pressure: 500 bar
- In case of valve activation, contact Bordignon for reparation

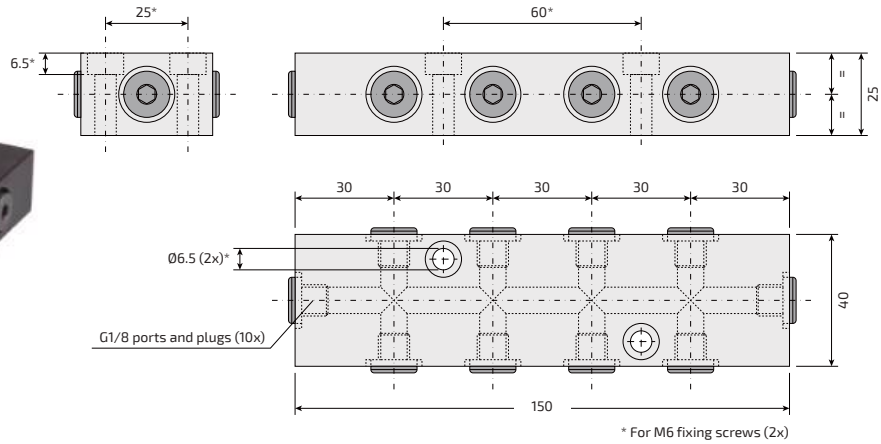
Order Code	T	Tight. torque Nm	A mm
VS500	G1/8	20-25	8
VS500-1/4	G1/4	25-30	10



DISTRIBUTION BLOCKS

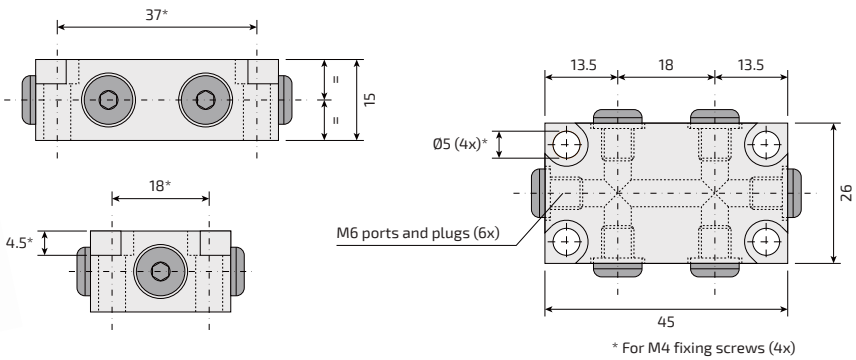
The distribution blocks allow several gas springs to be connected in a battery. Each block can connect several gas springs equipped with side port, and several blocks can be interconnected. Choose the proper fittings for hose connection.

AD00



* For M6 fixing screws (2x)

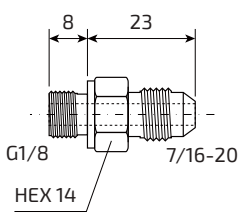
AD01



* For M4 fixing screws (4x)

FITTINGS FOR CONNECTING SEVERAL DISTRIBUTION BLOCKS

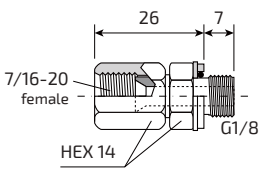
Order Code: **AR000**



TIGHTENING TORQUE 20-25 Nm

(only for AD00 with G1/8 ports)

Order Code: **AR000G**



TIGHTENING TORQUE 20-25 Nm

(only for AD00 with G1/8 ports)

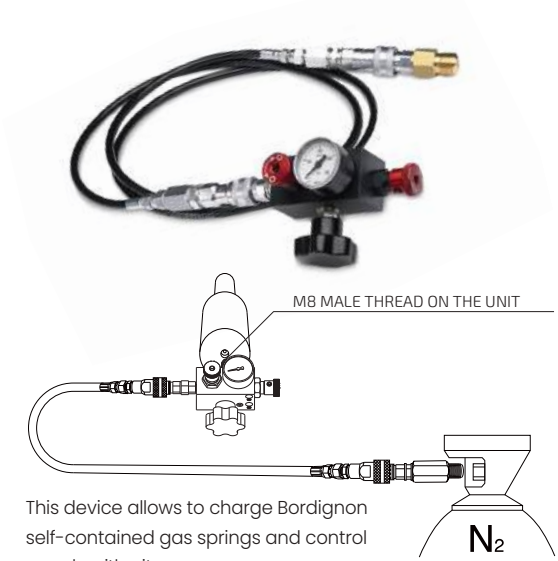
Charging and discharging set

Order Code: **COMPL**

Complete series of charging unit, charging adapters and discharging devices, for both self-contained gas springs and control panels

Charging unit

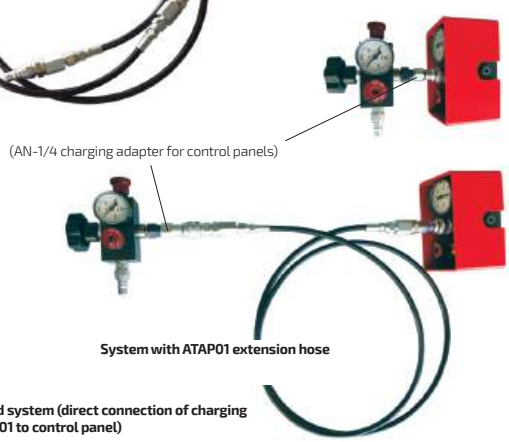
Order Code: **CUC01**



This device allows to charge Bordignon self-contained gas springs and control panels with nitrogen gas.

Order Code: **ATAP01**

Extension hose (length: 2 metres) for an easier charging of control panels



System with ATAP01 extension hose

Standard system (direct connection of charging unit CUC01 to control panel)

Charging adapters

Adapters for the nitrogen gas springs charging unit (only for gas springs with charging hole different from M8). Gas springs with charging hole M8 (not listed in table below) must be charged with CUC01 unit with no adapter.

	Order Coder	For gas spring models...	Control panels
M4 M8	**AN-M4**	EGS16, TGS700	-
M5 M8	**AN-M5**	EGS24	-
M6 M8	**AN-M6**	AGS170-AGS320, TGS400, VGS (all models) VV170, VV320-63/63H VV320-80, VV500, VV565	-
M6 M8	**AN-M6/2**	AGS350~AGS2400 IGS150-IGS250, VV2385	-
G1/8 M8	**AN-1/8**	AGS4200~AGS2000, IGS500~IGS10000 LGS500, VV750, VV2945	-
Quick coupling M8	**AN-1/4**	-	All models

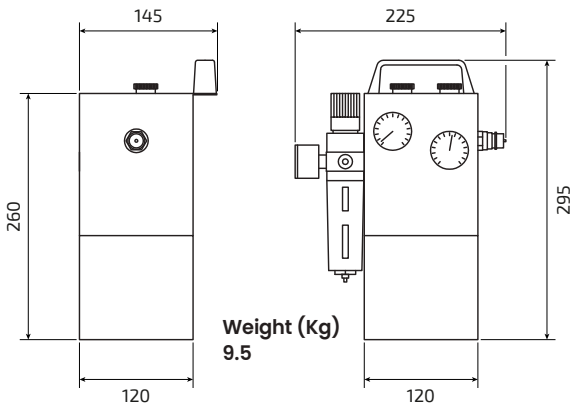
Discharging devices

Devices for discharging the nitrogen gas springs.

	Order Coder	For gas spring models...	Control panels
M4	**ADS-M4/2**	TGS700	-
M4	**ADS-M4/3**	EGS16	-
M5	**ADS-M5/2**	EGS24	-
M6	**ADS-M6**	TGS400	-
M6	**ADS-M6/2**	AGS170-AGS320	-
M6	**ADS-M6/3**	AGS350~AGS20000, IGS (all models) LGS500, VV750, VV2385, VV2945	-
M6	**ADS-M6/4**	VGS (all models), VV170, VV320-63/63H VV320-80, VV500, VV565	-
M8	**ADS-M8**	TGS1000~TGS12000	-

Booster for Nitrogen N_2

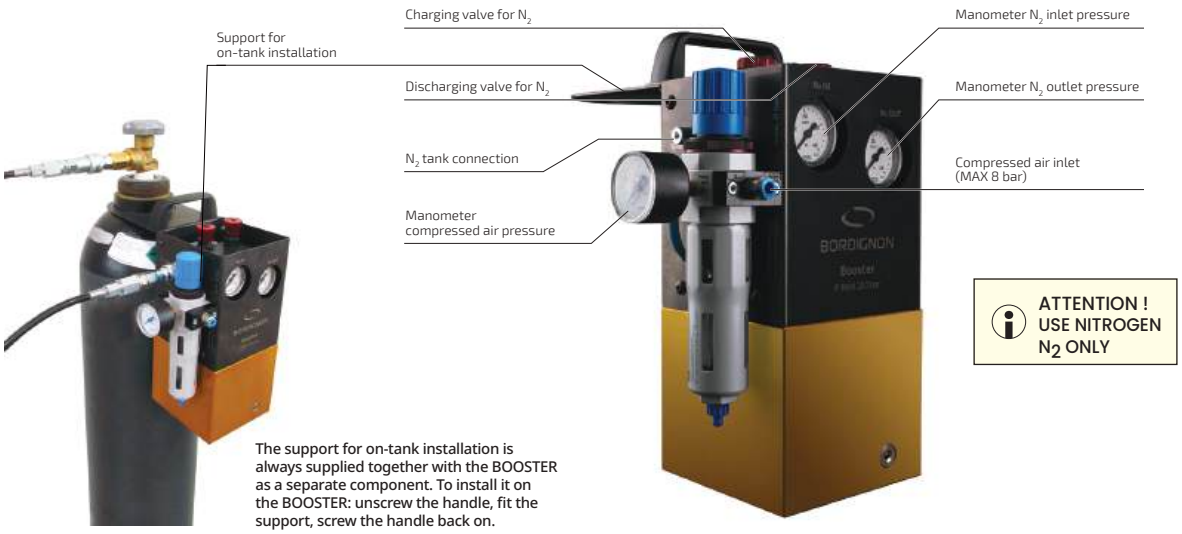
Order Code:
BOOSTER



Weight (Kg)
9.5

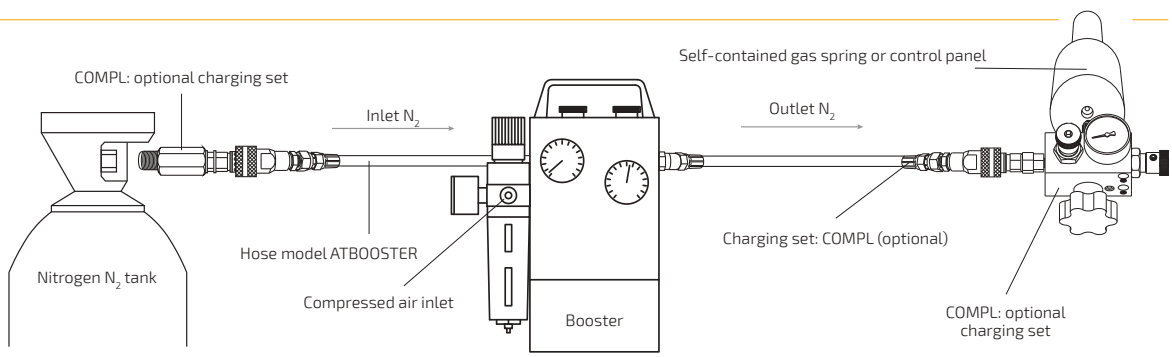
USE INSTRUCTIONS

- Connect nitrogen N_2 tank (with minimum pressure 20 bar) to the Booster.
- Connect Booster to the nitrogen gas spring (it's necessary to have the charging set mod. compl).
- Connect the compressed air (max pressure 8 bar; use lubricatedair when working continuously for more than 30 minutes).
- Turn off the discharging valve. • Turn on the charging valve of the Booster.
- Turn on the compressed air and slowly turn on nitrogen N_2 tank.
- When the nitrogen gas spring has reached the required pressure turn the charging valve off, turn on discharging valve and disconnect the nitrogen gas spring. • Once finished, turn off both the compressed air and the nitrogen N_2 tank.



ATTENTION ! USE NITROGEN N_2 ONLY

The support for on-tank installation is always supplied together with the BOOSTER as a separate component. To install it on the BOOSTER: unscrew the handle, fit the support, screw the handle back on.



Max reachable outlet nitrogen pressure in relation to the compressed air pressure			
Compressed air pressure (bar)	7	4	2
N_2 max outlet pressure (bar)	220	125	60

The Bordignon Booster is a pneumatic pump. By using compressed air, it increases the nitrogen N_2 pressure during the charging operation of gas springs for dies, in a safe and very precise way. Light and compact, the Bordignon Booster has a low compressed air consumption resulting in savings of time and costs.

OV GAS SPRING SYSTEM (ALTERNATIVE MANIFOLD)

Valveless nitrogen gas springs for an **alternative manifold connection ("OV system"):**

- Use of standard gas springs, fast delivery!
- Lower manufacturing and maintenance costs than traditional manifold plates and dedicated manifold gas springs
- More compact plate dimensions
- Simple gas spring fixing with through-plate screws
- OV gas springs available strokes, dimensions, and the other specifications not listed on the next page, are the same as the corresponding standard models.
  (example: the unlisted specifications of model AGS1000-50-A-OV are the same as model AGS1000-50-A)

TECHNICAL NOTES

- **OV gas springs use instructions:**
  - Mounting instructions on the next page
  - Use instructions, information and catalogue help: see dedicated catalogue section
  - Cycles per minute MAX: see specifications tables for the corresponding standard model
- **Plate material requirements:**
  - Resilience KV ≥ 27 J (at 0°C)
  - Elongation at break A ≥ 14%
  - Respect national regulations about pressure equipment
- Minimum plate thickness = 25 mm

A

B

USE EXAMPLES

A OV gas springs and OV control panel fixed on a single low-thickness plate, without connection hoses.

B OV gas springs fixed on smaller plates connected by hoses, and standard control panel connected by hose.

OV CONTROL PANELS & OTHER ACCESSORIES FOR OV SYSTEM

See further on in this catalogue.

PED in accordance with 2014/68/EU

This gas spring series includes the models compliant with automotive standards

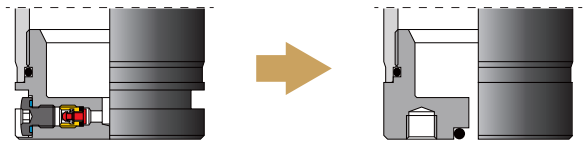
VW	39D 22100

Continued on the next page →

OV GAS SPRINGS

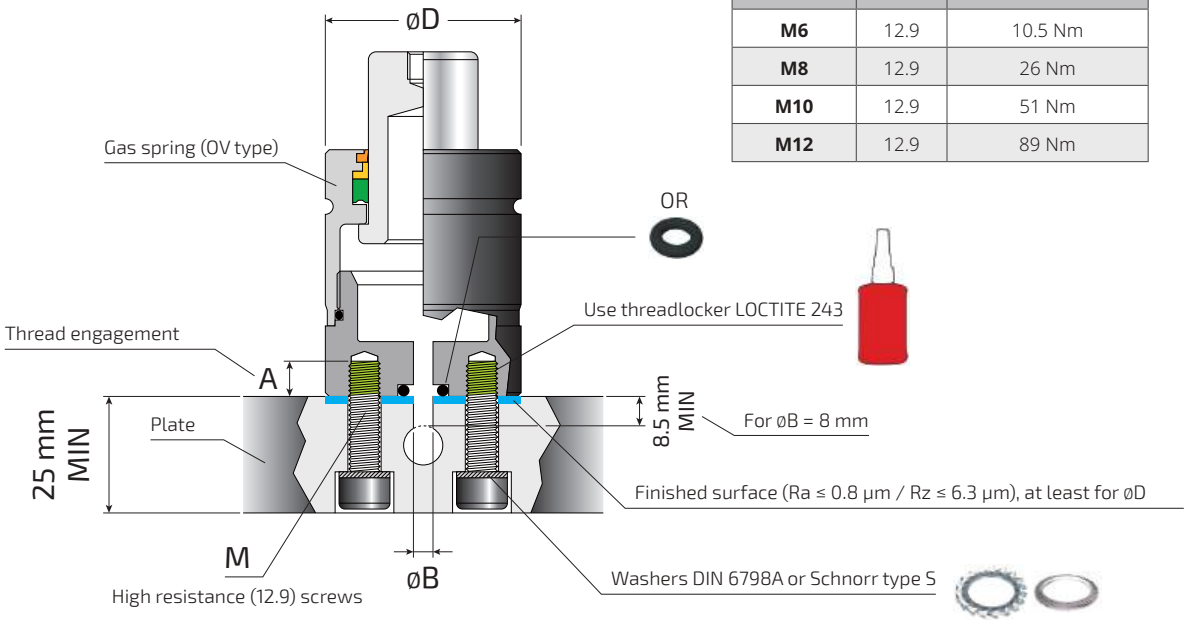
GENERAL FEATURES

In comparison with the corresponding standard models, OV gas springs are valveless (no side port) they have a bottom hole for direct connection (OR-sealed) to manifold plate, and they do not feature the bottom (square) groove.



Standard model — Corresponding OV model

Screw size	Class	Tightening torque
M6	12.9	10.5 Nm
M8	12.9	26 Nm
M10	12.9	51 Nm
M12	12.9	89 Nm



Order Code	Ø D (MIN)	Ø B ± 0.1	M ●	A ●	OR NBR 90 Sh. A ●
AGS 350-...-A-**OV**	32	5	M6	6	2025-010 (6.07 x 1.78)
AGS 500-...-A-**OV**	38	5	M6	6	2025-010 (6.07 x 1.78)
AGS 750-...-A-**OV**	45	5	M8	6	2025-010 (6.07 x 1.78)
AGS 1000-...-A-**OV**	50	5	M8	6	2025-010 (6.07 x 1.78)
AGS 1500-...-A-**OV**	63	5	M8	6	2025-010 (6.07 x 1.78)
AGS 2400-...-A-**OV**	75	5	M8	6	2025-010 (6.07 x 1.78)
AGS 4200-...-A-**OV**	95	8	M8	12	112-613 (9.92 x 2.62)
AGS 6600-...-A-**OV**	120	8	M10	12	112-613 (9.92 x 2.62)
AGS 9500-...-A-**OV**	150	8	M10	16	112-613 (9.92 x 2.62)
AGS 20000-...-A-**OV**	195	8	M12	18	112-613 (9.92 x 2.62)

● The thread engagement length **A** is the maximum available thread depth. Do not use thread engagement lengths < **A** .

● Number and layout of the threaded holes on the gas springs base: see corresponding standard models.

● 1 pc. OR is supplied with each OV gas spring.

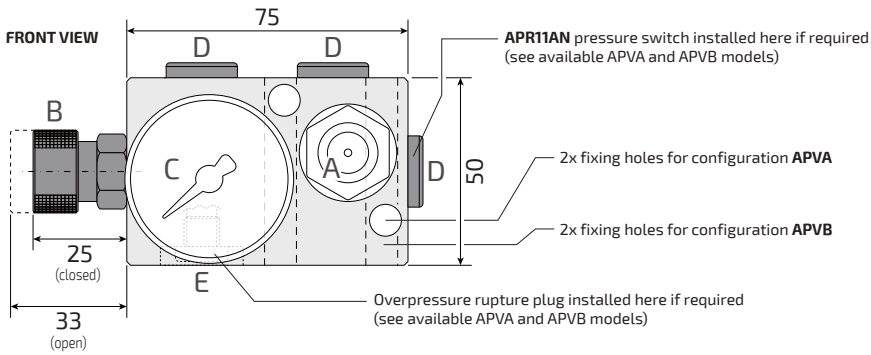
APVA / APVB CONTROL PANEL FOR OV SYSTEM

This panel allows to charge and discharge a manifold plate ("OV system" or other) using a direct-coupling to the plate (no need for hoses).

TECHNICAL NOTES

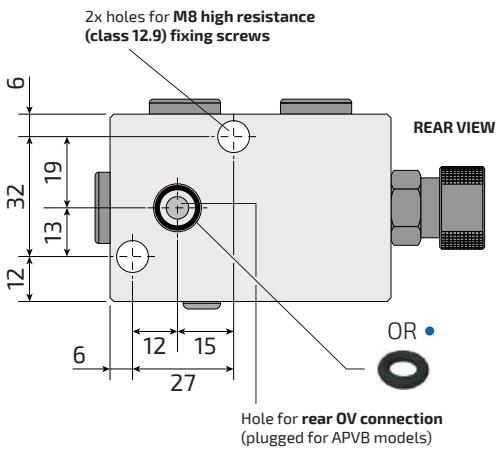
A Charging valve (use only with CUC01 or COMPL or BOOSTER)
B Discharging valve
C Pressure gauge
D No. 3 connection ports G1/4
E No. 1 connection port G1/8
- The connection ports are plugged
- No. 2 fixing holes for M8 high resistance (12.9) hex-socket screws

Configurations and Dimensions

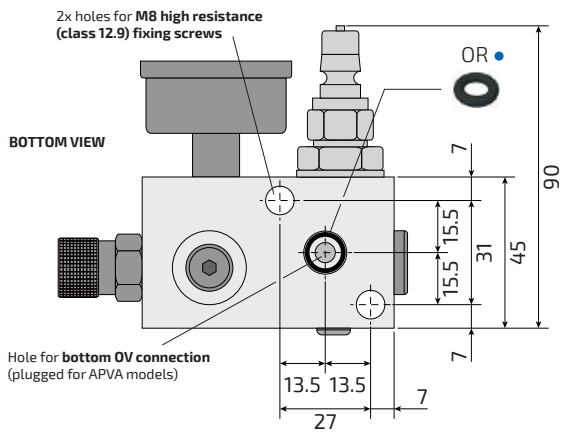


APVA / APVB

Configuration for model **APVA**



Configuration for model **APVB**



Order Code	All models are available with safety valve VS500 already assembled (on request).
APVA	Control panel for OV system with **rear** direct-connection to plate
APVB	Control panel for OV system with **bottom** direct-connection to plate
APVAPAN / APVBPAN	Control panel APVA or APVB with APR11AN pressure switch (50-300 bar normally open)
APVARP / APVBRP	Control panel APVA or APVB with overpressure rupture plug
APVAF / APVBF	Control panel APVA or APVB with APR11AN pressure switch (50-300 bar normally open) and with overpressure rupture plug

GAS SPRING TEST DEVICE

Code: **GST...**

Order Code: GST01	
Measuring range	0 - 10000 daN
Recommended F0 value	0 - 10000 daN
Max. Length	308 mm
Max. Diameter	95 mm
EN ISO 7500-1	CLASS 1 (±1%)
Power supply	100 - 240 VAC 50 - 60 Hz
L x P x H	400 x 250 x 1288
Weight	50 kg.

Order Code: GST02	
Measuring range	0 - 20000 daN
Recommended F0 value	0 - 20000 daN
Max. Length	328 mm
Max. Diameter	150 mm
EN ISO 7500-1	CLASS 1 (±1%)
Power supply	100 - 240 VAC 50 - 60 Hz
L x P x H	400 x 250 x 1309
Weight	103 kg.

The gas spring testing device is specially designed to check the nominal load values of gas springs. It determines whether there is a gas leak in the gas spring's internal mechanism by measuring the applied load and the initial force.
The gas spring is placed on the plate located in the body.
It is compressed with the help of the lifting jack at the bottom. The applied force is measured in "kg" units using the force measuring device located on the compressed gas spring system. If the initial force of the preferred gas spring is suitable according to the catalog, it is then mounted in the area where it will be used.
Note: It is produced as a cabin type if request

Usage Scheme

The Gas spring lower body is placed on the plate

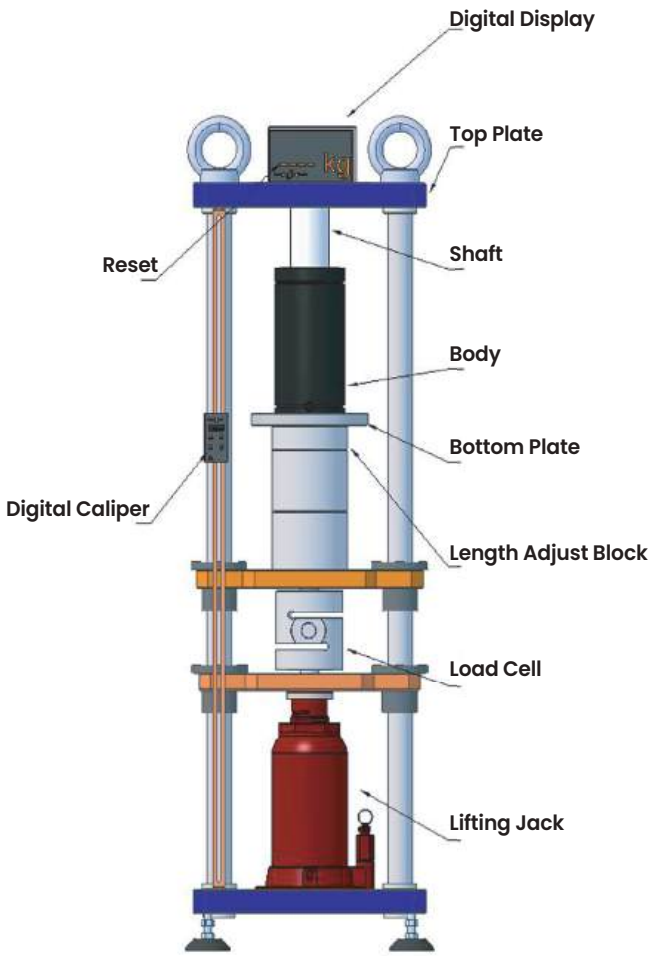
Reset digital display

The shaft is lifted with a lifting jack until it touches the upper plate

Reset is done on the caliper

After reseting 1 mm movement is given to the gas spring with lifting jack

The value on the digital display is considered to be the initial power



Wire Die & Mould Springs

ISO 10243 - Rectangular Section & Round Section

The following main characteristics show the superiority of our springs:

* Special profile / section usage to increase steel characteristics.
* Usage of special wire winding machine.
* Usage of special heat treatment developed by especially spring production.
* Maximum care showing grinding and closing of spring ends in order to warranty optimum vertical and parallel acceleration.
* All springs are coil shaped in order to warranty significant decrease of load losses in working conditions.
* Special remoulding stroke methods in order to increase resistance against metal abrasion.
* Special pretreatment and powder coating applications of our springs in order to ensure the best protection, preservation and completion.
* Intensive control performed during production and final stage in order to warranty dimensional compliance and precision.
* **Spring load coefficient tolerances - nominal rate at all springs is +10%.**

Research & Development ongoing in parallel of quality assurance procedures in compliance with ISO 9001, ensure high sensitivity, durability and reliability criteria. Continuous improvement in our springs performance is monitored directly in the factory through comparative and destructive tests. The excellences of these products are verified with the increasing number of the customers selecting our springs in their dies and moulds.

Code	Colour Series	Wire Section	Colour	Load	*XXL Long Life total deflection	Cycles	*Max. working total deflection	Cycles
AYY			Purple	Extra Light	35%	+3.000.000	50%	200.000
YY			Green	Light	30%	+3.000.000	40%	200.000
MY			Blue	Medium	25%	+3.000.000	37.5%	200.000
KY			Red	Heavy	20%	+3.000.000	30%	200.000
SY			Yellow	Extra Heavy	17%	+5.000.000	25%	300.000
GY			Brown	Ultra Heavy	10%	+5.000.000	15%	500.000

Code	Colour Series	Wire Section	Colour	Load
TVY			Green	Light
TBM			Blue	Medium
TRK			Red	Heavy

Cycles:
Lifetime statistic data based on tests carried out on items with central free lengths under the recommendations specified here below.

* **Total deflection:** preload + working stroke

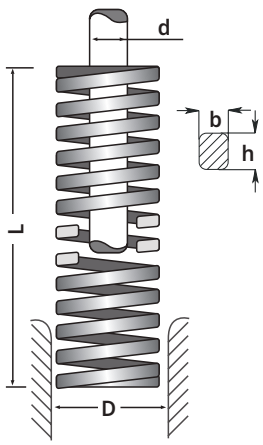
When selecting and using the springs we recommend:

1- Select the lightest and longest springs working requirements allow.
2- Never select total deflections (preload + stroke) that are greater than the maximum deflection indicated in the catalogue. Also check this when sharpening the tools in the die.
3- Preload at least 5% of the free length of each spring, with a minimum of 2 mm.
4- Provide for an even base for each spring.
5- Guide the springs with an internal pin or deep housing to avoid buckling, in particular when **L / D>3.**

* Please select springs carefully during the design period.
* The bigger the guide the longer the lifetime. It is essential to always use guide pin for all springs with a free length / diameter ratio exceeding x3.5.
* Ensure support and perpendicularity of springs to the compression area.
* If possible, use long springs at lower loadings (preloading should be increased properly).
* Please apply minimum preloading of 5% of the free length.
* Never apply pressure to the springs over maximum stroke.
* Tool maintenance can vary the original working deflection of the springs. Always check and re-set the original working stroke. High risk of early failures or damages of the die / mould.
* Please protect springs from abrasive activities.
* In the temperature range of 120 ÷ 250°C consider a loss between 1 to 2% of the load every 40°C.
* Pleases don't change a spring at a time, instead of this, use programmed maintenance procedure that all springs can be changed at the same time.
* Any alteration on the surface of the springs (cutting, grinding, scratches, etc.) may significantly reduce the lifetime. Always replace the damaged springs with new ones.
* Shoulder screw (Güvenal code: G39) should be used in usage of precision mechanical spring.

Code: AYY Colour: Purple

Extra Light Load Spring



D: Outer Diameter
d: Rod Diameter
b x h: Wire Section
L: Length
R: Load Rate (N)
XXL %: Long Life Deflection
Max %: Max. Working Deflection
S1: Deflection
F1: Load N
S2: Defleciton
F2: Load N

N - Newton = (0.102) Kgf
1kg = 9.81 N

Order:
AYY. D x L

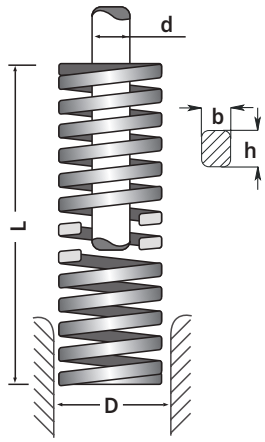
D	d	L	R	XLL 35 %		Max. 50 %	
				S1	F1	S2	F2
10	5	25	8.5	8.8	74	12.5	106
		32	6.5	11.2	73	16.0	104
		38	5.5	13.3	73	19.0	105
		44	5.0	15.4	77	22.01	110
		51	4.5	17.9	80	25.5	115
		64	3.3	22.4	74	32.0	106
		76	3.2	26.6	85	38.0	122
b x h		305	0.6	106.8	64	152.5	92
2.1 x 0.9							
13	6.3	25	15.5	8.8	136	12.5	194
		32	12.2	11.2	137	16.0	195
		38	10.3	13.3	137	19.0	196
		44	8.7	15.4	134	22.0	191
		51	7.5	17.9	134	25.5	191
		64	5.8	22.4	130	32.0	186
		76	4.7	26.6	125	38.0	179
		89	4.1	31.2	128	44.5	182
		102	3.6	35.7	129	51.0	184
b x h		305	1.2	106.8	128	152.5	183
2.5 x 1.2							
16	8	25	20.2	8.8	177	12.5	253
		32	14.4	11.2	161	16.0	230
		38	12.3	13.3	164	19.0	234
		44	10.6	15.4	163	22.0	233
		51	8.9	17.9	159	25.5	227
		64	7.0	22.4	157	32.0	224
		76	5.8	26.6	154	38.0	220
		89	4.8	31.2	150	44.5	214
		102	4.0	35.7	143	51.0	204
		115	3.9	40.3	157	57.5	224
b x h		305	1.5	106.8	160	152.5	229
3.4 x 1.2							
20	10	25	32.1	8.8	281	12.5	401
		32	24.7	11.2	277	16.0	395
		38	20.7	13.3	275	19.0	393
		44	17.8	15.4	274	22.0	392
		51	15.3	17.9	273	25.5	390
		64	12.1	22.4	271	32.0	387
		76	10.2	26.6	271	38.0	388
		89	8.6	31.2	268	44.5	383
		102	7.5	35.7	268	51.0	383
		115	6.7	40.3	270	57.5	385
		127	6.1	44.5	271	63.5	387
		139	5.5	48.7	268	69.5	382
		152	5.1	53.2	271	76.0	388
b x h		305	2.5	106.8	267	152.5	381
4.0 x 1.7							
25	12.5	25	52.7	8.8	461	12.5	659
		32	40.0	11.2	448	16.0	640
		38	33.3	13.3	443	19.0	633
		44	28.6	15.4	440	22.0	629
		51	24.7	17.9	441	25.5	630
		64	19.4	22.4	435	32.0	321
		76	16.3	26.6	434	38.0	619
		89	13.9	31.2	433	44.5	619
		102	12.1	35.7	432	51.0	617
		115	10.8	40.3	435	57.5	621
		127	9.8	44.5	436	63.5	622
		139	8.9	48.7	433	69.5	619
		152	8.1	53.2	431	76.0	616
		178	6.9	62.3	430	89.0	614
b x h		203	6.1	71.1	433	101.5	619
5.4 x 2.2		305	4.0	106.8	427	152.5	610

D	d	L	R	XLL 35 %		Max. 50 %	
				S1	F1	S2	F2
32	16	38	43.8	13.3	583	19.0	832
		44	37.5	15.4	578	22.0	825
		51	32.3	17.9	577	25.5	824
		64	25.4	22.4	569	32.0	813
		76	21.3	26.6	567	38.0	809
		89	18.1	31.2	564	44.5	805
		102	15.8	35.7	564	51.0	806
		115	13.9	40.3	559	57.5	799
		127	12.6	44.5	560	63.5	800
		139	11.4	48.7	555	69.5	792
		152	10.5	53.2	559	76.0	798
		178	8.9	62.3	554	89.0	792
		203	7.8	71.1	554	101.5	792
		254	6.2	88.9	551	127	787
b x h		305	5.2	106.8	555	152.5	793
6.4 x 2.7							
40	20	51	50.8	17.9	907	25.5	1295
		64	39.7	22.4	889	32.0	1270
		76	33.1	26.6	880	38.0	1258
		89	28.1	31.2	875	44.5	1250
		102	24.5	35.7	875	51.0	1250
		115	21.6	40.3	869	57.5	1242
		127	19.5	44.5	867	63.5	1238
		139	17.8	48.7	866	69.5	1237
		152	16.3	53.2	867	76.0	1239
		178	13.8	62.3	860	89.0	1220
		203	12.1	71.1	860	101.5	1220
		254	9.7	88.9	862	127.0	1232
b x h		305	8.0	106.8	854	152.5	1220
7.8 x 3.4							
50	25	64	80.2	22.4	1796	32.0	2566
		76	66.9	26.6	1780	38.0	2542
		89	56.6	31.2	1763	44.5	2519
		102	49.3	35.7	1760	51.0	2514
		115	43.5	40.3	1751	57.5	2501
		127	39.3	44.5	1747	63.5	2496
		139	35.8	48.7	1742	69.5	2488
		152	32.8	53.2	1745	76.0	2493
		178	27.8	62.3	1732	89.0	2474
		203	24.2	71.1	1719	101.5	2456
		254	19.2	88.9	1707	127	2438
b x h		305	16.0	106.8	1708	152.5	2440
10.7 x 4.4							
63	38	76	87.8	26.6	1537	38.0	2196
		89	51.4	31.2	1601	44.5	2287
		102	44.4	35.7	1585	51.0	2264
		115	41.6	40.3	1674	57.5	2392
		127	33.2	44.5	1476	63.5	2108
		152	27.4	53.2	1458	76.0	2082
		178	24.0	62.3	1495	89.0	2136
		203	21.0	71.1	1492	101.5	2132
		254	16.4	88.9	1458	127	2083
b x h		305	13.6	106.8	1452	152.5	2074
11.4 x 5.1							

Code: **YY** Colour: **Green**

Light Load Spring

ISO 10243



D: Outer Diameter
d: Rod Diameter
b x h: Wire Section
L: Length
R: Load Rate (N)
XXL %: Long Life Deflection
Max %: Max. Working Deflection
S1: Deflection
F1: Load N
S2: Defleciton
F2: Load N

N - Newton = (0.102) Kgf
1kg = 9.81 N

Order:
YY. D x L

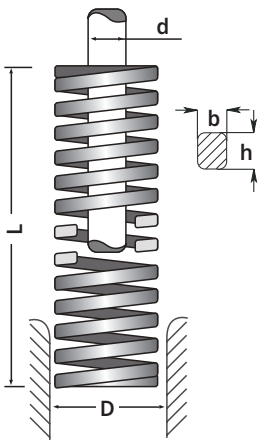
D	d	L	R	XLL 30 %		Max. 40 %	
				S1	F1	S2	F2
10	5	25	11.0	7.5	83	10.0	110
		32	8.5	9.6	82	12.8	109
		38	6.8	11.4	78	15.2	103
		44	6.0	13.2	79	17.6	106
		51	5.0	15.3	77	20.4	102
		64	4.1	19.2	79	25.6	105
		76	3.6	22.8	82	30.4	109
b x h		305	0.9	91.5	82	122	110
1.7 x 1.1							
13	6.3	25	21.0	7.5	158	10.0	210
		32	16.4	9.6	157	12.8	210
		38	13.6	11.4	155	15.2	207
		44	12.1	13.2	160	17.6	213
		51	10.3	15.3	158	20.4	210
		64	7.6	19.2	146	25.6	195
		76	6.3	22.8	144	30.4	192
		89	5.4	26.7	144	35.6	192
b x h		102	4.6	30.6	141	40.8	188
2.3 x 1.5		305	1.6	91.5	146	122	195
16	8	25	29.0	7.5	218	10.0	290
		32	22.9	9.6	220	12.8	293
		38	19.3	11.4	220	15.2	293
		44	17.1	13.2	226	17.6	301
		51	14.0	15.3	214	20.4	286
		64	10.7	19.2	205	25.6	274
		76	9.0	22.8	205	30.4	274
		89	7.3	26.7	195	35.6	260
		102	6.8	30.6	208	40.8	277
		115	7.0	34.5	242	46.0	322
b x h		305	2.3	91.5	210	122	281
3.2 x 1.7							
20	10	25	55.8	7.5	419	10.0	558
		32	45.0	9.6	432	12.8	576
		38	36.0	11.4	410	15.2	547
		44	30.0	13.2	396	17.6	528
		51	24.5	15.3	375	20.4	500
		64	19.2	19.2	369	25.6	492
		76	16.0	22.8	365	30.4	486
		89	14.0	26.7	374	35.6	498
		102	12.0	30.6	367	40.8	490
		115	10.9	34.5	376	46.0	501
		127	9.5	38.1	362	50.8	483
		139	8.4	41.7	350	55.6	467
		152	7.5	45.6	342	60.8	456
b x h		305	4.0	91.5	366	122	488
4.0 x 2.1							
25	12.5	25	105	7.5	788	10.0	1050
		32	80.3	9.6	771	12.8	1028
		38	62.0	11.4	707	15.2	942
		44	52.9	13.2	698	17.6	931
		51	44.0	15.3	673	20.4	898
		64	35.2	19.2	676	25.6	901
		76	28.0	22.8	638	30.4	851
		89	24.0	26.7	641	35.6	854
		102	21.1	30.6	646	40.8	861
		115	18.7	34.5	645	46.0	860
		127	16.7	38.1	636	50.8	848
		139	15.3	41.7	638	55.6	851
		152	14.0	45.6	638	60.8	851
		178	12.5	53.4	668	71.2	890
		203	10.4	60.9	633	81.2	844
b x h		305	7.0	91.5	641	122	854
5.3 x 2.7							

D	d	L	R	XLL 30 %		Max. 40 %	
				S1	F1	S2	F2
32	16	38	98.0	11.4	1117	15.2	1490
		44	79.5	13.2	1049	17.6	1399
		51	67.0	15.3	1025	20.4	1367
		64	53.0	19.2	1018	25.6	1357
		76	44.0	22.8	1003	30.4	1338
		89	37.2	26.7	993	35.6	1324
		102	32.0	30.6	979	40.8	1306
		115	29.0	34.5	1001	46.0	1334
		127	25.0	38.1	953	50.8	1270
		139	23.0	41.7	959	55.6	1279
		152	21.5	45.6	980	60.8	1307
		178	18.2	53.4	972	71.2	1296
		203	15.8	60.9	962	81.2	1283
		254	12.5	76.2	953	101.6	1270
b x h		305	10.3	91.5	942	122	1257
6.7 x 3.3							
40	20	51	92.0	15.3	1408	20.4	1877
		64	73.0	19.2	1402	25.6	1869
		76	63.0	22.8	1436	30.4	1915
		89	51.0	26.7	1362	35.6	1816
		102	45.0	30.6	1377	40.8	1836
		115	39.6	34.5	1366	46.0	1822
		127	36.0	38.1	1372	50.8	1829
		139	32.0	41.7	1334	55.6	1779
		152	28.0	45.6	1277	60.8	1702
		178	25.2	53.4	1346	71.2	1794
		203	21.8	60.9	1328	81.2	1770
		254	17.0	76.2	1295	101.6	1727
b x h		305	14.8	91.5	1354	122	1806
8.0 x 4.0							
50	25	64	156	19.2	2995	25.6	3994
		76	125	22.8	2850	30.4	3800
		89	109	26.7	2910	35.6	3880
		102	94.0	30.6	2876	40.8	3835
		115	81.0	34.8	2795	46.0	3726
		127	71.0	38.1	2705	50.8	3607
		139	66.5	41.7	2773	55.6	3697
		152	60.0	45.6	2736	60.8	3648
		178	52.0	53.4	2777	71.2	3702
		203	44.0	60.9	2680	81.2	3573
		229	38.2	68.7	2624	91.6	3499
		254	35.0	76.2	2667	101.6	3556
b x h		305	28.5	91.5	2608	122.0	3477
11.1 x 5.5							
63	38	76	189	22.8	4309	30.4	5746
		89	158	26.7	4219	35.6	5625
		102	131	30.6	4009	40.8	5345
		115	116	34.5	4002	46.0	5336
		127	103	38.1	3924	50.8	5232
		152	84.3	45.6	3844	60.8	5125
		178	71.5	53.4	3818	71.2	5091
		203	61.7	60.9	3758	81.2	5010
		254	47.0	76.2	3581	101.6	4775
b x h		305	38.2	91.5	3495	122	4660
11.6 x 7.7							

Code: MY Colour: **Blue**

Medium Load Spring

ISO 10243



D: Outer Diameter
d: Rod Diameter
b x h: Wire Section
L: Length
R: Load Rate (N)
XXL %: Long Life Deflection
Max %: Max. Working Deflection
S1: Deflection
F1: Load N
S2: Defleciton
F2: Load N

N - Newton = (0.102) Kgf
1kg = 9.81 N

Order:
MY. D x L

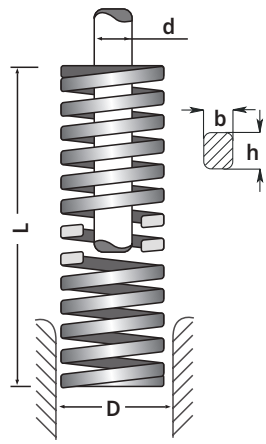
D	d	L	R	XLL 25 %		Max. 37.5 %	
				S1	F1	S2	F2
10	5	25	16.0	6.3	100	9.4	150
		32	13.0	8.0	104	12.0	156
		38	11.9	9.5	113	14.3	170
		44	10.3	11.0	113	16.5	170
		51	8.9	12.8	113	19.1	170
		64	7.5	16.0	120	24.0	180
		76	6.2	19.0	118	28.5	177
b x h		305	1.6	76.3	122	114.4	183
1.8 x 1.2							
13	6.3	25	30.0	6.3	188	9.4	281
		32	24.8	8.0	198	12.0	298
		38	21.4	9.5	203	14.3	305
		44	18.0	11.0	198	16.5	297
		51	15.5	12.8	198	19.1	296
		64	12.1	16.0	194	24.0	290
		76	10.2	19.0	194	28.5	291
		89	8.4	22.3	187	33.4	280
b x h		102	7.1	25.5	181	38.3	272
2.5 x 1.7		305	2.4	76.3	183	114.4	275
16	8	25	49.4	6.3	309	9.4	463
		32	38.5	8.0	308	12.0	462
		38	33.9	9.5	322	14.3	483
		44	30.0	11.0	330	16.5	495
		51	26.4	12.8	337	19.1	505
		64	20.5	16.0	328	24.0	492
		76	17.8	19.0	338	28.5	507
		89	15.2	22.3	338	33.4	507
		102	13.5	25.5	344	38.3	516
b x h		115	12.0	28.8	345	43.1	518
3.2 x 2.0		305	4.3	76.3	328	114.4	492
20	10	25	98.0	6.3	613	9.4	919
		32	72.6	8.0	581	12	871
		38	56.0	9.5	532	14.3	798
		44	47.5	11.0	523	16.5	784
		51	41.7	12.8	5321	19.1	798
		64	32.3	16.0	517	24.0	775
		76	25.1	19.0	477	28.5	715
		89	22.0	22.3	490	33.4	734
		102	19.8	25.5	505	38.3	757
		115	18.1	28.8	520	43.1	781
		127	16.6	31.8	527	47.6	791
		139	15.1	34.8	525	52.1	787
		152	13.2	38.0	502	57.0	752
b x h		305	6.1	76.3	465	114.4	698
4.0 x 2.4							
25	12.5	25	157	6.2	981	9.4	1472
		32	118	8.0	944	12.0	1416
		38	93.0	9.5	884	14.3	1325
		44	80.8	11.0	889	16.5	1333
		51	68.6	12.8	875	19.1	1312
		64	53.0	16.0	848	24	1272
		76	43.2	19.0	821	28.5	1231
		89	38.2	22.3	850	33.4	1275
		102	33	25.5	842	38.3	1262
		115	28	28.8	805	43.1	1208
		127	25.9	31.8	822	47.6	1233
		139	23.2	34.8	806	52.1	1209
		152	20.8	38.0	790	57.0	1186
		178	17.8	44.5	792	66.8	1188
b x h		203	15.8	50.8	802	76.1	1203
5.3 x 3.1		305	10.2	76.3	778	114.4	1167

D	d	L	R	XLL 25 %		Max. 37.5 %	
				S1	F1	S2	F2
32	16	38	185	9.5	1758	14.3	2636
		44	158	11	1738	16.5	2607
		51	134	12.8	1709	19.1	2563
		64	99	16	1584	24	2376
		76	80.5	19	1530	28.5	2294
		89	69.1	22.3	1537	33.4	2306
		102	58.8	25.5	1499	38.3	2249
		115	51.5	28.8	1481	43.1	2221
		127	44.8	31.8	1422	47.6	2134
		139	42.3	34.8	1470	52.1	2205
		152	37.8	38	1436	57	2155
		178	32.5	44.5	1446	66.8	2169
		203	28.9	50.8	1467	76.1	2200
		254	22.2	63.5	1410	95.3	2115
b x h		305	18.3	76.3	1395	114.4	2093
6.8 x 4.0							
40	20	51	181.6	12.8	2315	19.1	3473
		64	140	16	2240	24	3360
		76	108	19	2052	28.5	3078
		89	90.7	22.3	2018	33.4	3027
		102	81	25.5	2066	38.3	3098
		115	71.8	28.8	2064	43.1	3096
		127	62.7	31.8	1991	47.6	2986
		139	57.5	34.8	1998	52.1	2997
		152	51.6	38	1961	57	2941
		160	47.5	40	1900	60	2850
		178	44.1	44.5	1962	66.8	2944
		203	36.7	50.8	1863	76.1	2794
		254	30.1	63.5	1911	95.3	2867
b x h		305	24.6	76.3	1876	114.4	2814
8.1 x 4.8							
50	25	64	209	16	3344	24	5016
		76	168	19	3192	28.5	4788
		89	140	22.3	3115	33.4	4673
		102	119	25.5	3035	38.3	4552
		115	106	28.8	3048	43.1	4571
		127	97	31.8	3080	47.6	4620
		139	87	34.8	3023	52.1	4535
		152	80	38	3040	57	4560
		160	76	40	3040	60	4560
		178	69.5	44.5	3093	66.8	4639
		203	59.8	50.8	3035	76.1	4552
		229	50.9	57.3	2914	85.9	4371
		254	46.0	63.5	2921	95.3	4382
b x h		305	38.6	76.3	2943	114.4	4415
10.9 x 6.0							
63	38	76	320	19	6080	28.5	9120
		89	260	22.3	5785	33.4	8687
		102	221	25.5	5636	38.3	8453
		115	187	28.8	5376	43.1	8064
		127	168	31.8	5334	47.6	8001
		152	136	38	5168	57	7752
		160	128	40	5120	60	7680
		178	114	44.5	5073	66.8	7610
		203	100	50.8	5075	76.1	7613
		229	89.2	57.3	5107	85.9	7660
		254	78.4	63.5	4978	95.3	7468
		305	64.7	76.3	4933	114.4	7400
		315	52.8	78.8	4946	118.1	7418
b x h		400	48.5	100	4850	150	7275
11.5 x 9.3							

Code: **KY** Colour: **Red**

Heavy Load Spring

ISO 10243



D: Outer Diameter
d: Rod Diameter
b x h: Wire Section
L: Length
R: Load Rate (N)
XXL %: Long Life Deflection
Max %: Max. Working Deflection
S1: Deflection
F1: Load N
S2: Defleciton
F2: Load N

N - Newton = (0.102) Kgf
1kg = 9.81 N

Order:
KY. D x L

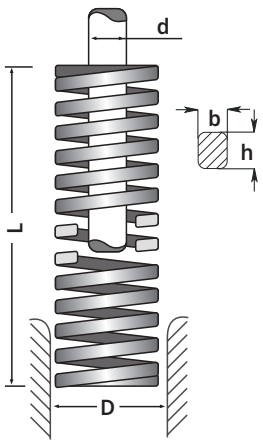
D	d	L	R	XLL 20 %		Max. 30 %	
				S1	F1	S2	F2
10	5	25	23	5.0	115	7.5	173
		32	17.5	6.4	112	9.6	168
		38	14.8	7.6	112	11.4	169
		44	13	8.8	114	13.2	172
		51	11.2	10.2	114	15.3	171
		64	9.2	12.8	118	19.2	177
		76	7.5	15.2	114	22.8	171
b x h							
1.8 x 1.4		305	1.9	61.0	116	91.5	174
13	6.3	25	42.1	5.0	211	7.5	316
		32	33.2	6.4	212	9.6	319
		38	29.3	7.6	223	11.4	334
		44	24.6	8.8	216	13.2	325
		51	19.6	10.2	200	15.3	300
		64	15.0	12.8	192	19.2	288
		76	13.2	15.2	20	22.8	301
		89	11.4	17.8	203	26.7	304
		102	9.4	20.4	192	30.6	288
b x h							
2.4 x 2.0		305	3.2	61.0	195	91.5	293
16	8	25	75.7	5.0	379	7.5	568
		32	60.2	6.4	385	9.6	578
		38	50.8	7.6	386	11.4	579
		44	42.8	8.8	377	13.2	565
		51	37.1	10.2	378	15.3	568
		64	30.3	12.8	388	19.2	582
		76	25.8	15.2	392	22.8	588
		89	21.7	17.8	386	26.7	573
		102	18.9	20.4	386	30.6	578
		115	17.0	23.0	391	34.5	587
b x h							
3.0 x 2.4		305	6.3	61.0	384	91.5	576
20	10	25	216	5.0	1080	7.5	1620
		32	168	6.4	1075	9.6	1613
		38	129	7.6	980	11.4	1471
		44	112	8.8	986	13.2	1478
		51	97	10.21	959	15.3	1438
		64	72.1	12.8	923	19.2	1384
		76	59.7	15.2	907	22.8	1361
		89	50.5	17.8	899	26.7	1348
		102	44.2	20.4	902	30.6	1353
		115	38.4	23.0	883	34.5	1325
		127	34.1	25.4	866	38.1	1299
		139	31.0	27.8	862	41.7	1293
		152	28.2	30.4	857	45.6	1286
b x h							
4.0 x 3.2		305	14.0	61	854	91.5	1281
25	12.5	25	375	5.0	1875	7.5	2813
		32	297	6.4	1901	9.6	2851
		38	219	7.6	1664	11.4	2497
		44	187	8.8	1646	13.2	2468
		51	156	10.2	1591	15.3	2387
		64	123	12.8	1574	19.2	2362
		76	99	15.2	1505	22.8	2257
		89	84	17.8	1495	26.7	2243
		102	73	20.4	1489	30.6	2234
		115	65	23	1495	34.5	2243
		127	57.7	25.4	1466	38.1	2198
		139	52.7	27.8	1465	41.7	2198
		152	47.8	30.4	1453	45.6	2180
		178	41	35.6	1460	53.4	2189
		203	35.8	40.6	1453	60.9	2180
b x h							
5.6 x 4.1		305	22.9	61	1397	91.5	2095

D	d	L	R	XLL 20 %		Max. 30 %	
				S1	F1	S2	F2
32	16	38	388	7.6	2949	11.4	4423
		44	324	8.8	2851	13.2	4277
		51	272	10.2	2774	15.3	4162
		64	212	12.8	2714	19.2	4070
		76	172	15.2	2614	22.8	3922
		89	141	17.8	2510	26.7	3765
		102	122	20.4	2489	30.6	3733
		115	107	23	2461	34.5	3692
		127	93	25.4	2362	38.1	3543
		139	86	27.8	2391	41.7	3586
		152	78	30.4	2371	45.6	3557
		178	67.2	35.6	2392	53.4	3588
		203	59.1	40.6	2399	60.9	3599
		254	46.4	50.8	2357	76.2	3536
b x h							
6.9 x 5.3		305	38	61	2318	91.5	3477
40	20	51	350	10.2	3570	15.3	5355
		64	269	12.8	3443	19.2	5165
		76	219	15.2	3329	22.8	4993
		89	190	17.8	3382	26.7	5073
		102	163	20.4	3325	30.6	4988
		115	142	23	3266	34.5	4899
		127	128	25.4	3251	38.1	4877
		139	115	27.8	3197	41.7	4796
		152	105	30.4	3192	45.6	4788
		178	89	35.6	3168	53.4	4753
		203	77	40.6	3126	60.9	4689
		254	61	50.8	3099	76.2	4648
b x h							
8.4 x 6.2		305	51	61.0	3111	91.5	4667
50	25	64	413	12.8	5286	19.2	7930
		76	339	15.2	5153	22.8	7729
		89	288	17.8	5126	26.7	7690
		102	245	20.4	4998	30.6	7497
		115	215	23	4945	34.5	7418
		127	192	25.4	4877	38.1	7315
		139	168	27.8	4670	41.7	7006
		152	154	30.4	4682	45.6	7022
		178	134	35.6	4770	53.4	7156
		203	117	40.6	4750	60.9	7125
		254	89	50.8	4521	76.2	6782
b x h							
11.3 x 7.4		305	73	61	4453	91.5	6680
63	38	76	630	15.2	9576	22.8	14364
		89	485	17.8	8633	26.7	12950
		102	434	20.4	8854	30.6	13280
		115	384	23	8832	34.5	13248
		127	349	25.4	8865	38.1	13297
		152	276	30.4	8390	45.6	12586
		178	237	35.6	8437	53.4	12656
		203	210	40.6	8526	60.9	12789
		254	165	50.8	8382	76.2	12573
b x h							
11.2 x 12.9		305	134	61	8174	91.5	12261

Code: **SY** Colour: **Yellow**

Extra Heavy Load Spring

ISO 10243



D: Outer Diameter
d: Rod Diameter
b x h: Wire Section
L: Length
R: Load Rate (N)
XXL %: Long Life Deflection
Max %: Max. Working Deflection
S1: Deflection
F1: Load N
S2: Defleciton
F2: Load N

N - Newton = (0.102) Kgf
1kg = 9.81 N

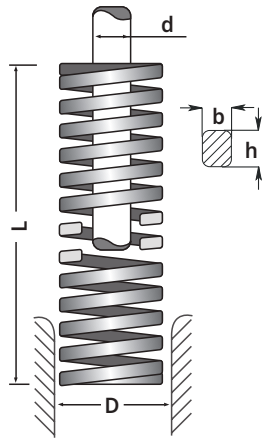
Order:
SY. D x L

D	d	L	R	XLL 17 %		Max. 25 %	
				S1	F1	S2	F2
10	5	25	36.8	4.3	156	6.3	230
		32	27.9	5.4	152	8.0	223
		38	23.7	6.5	153	9.5	225
		44	19.2	7.5	144	11.0	211
		51	16.5	8.7	143	12.8	210
		64	13.2	10.9	144	16	211
		76	10.9	12.9	141	19	207
b x h 1.9 x 1.5		305	2.6	51.9	135	76.3	198
13	6.3	25	58.5	4.3	249	6.3	366
		32	43.9	5.4	239	8.0	351
		38	36.0	6.5	233	9.5	342
		44	30.3	7.5	227	11.0	333
		51	26.2	8.7	227	12.8	334
		64	21.2	10.9	231	16	339
		76	17.1	12.9	221	19	325
		89	14.5	15.1	219	22.3	323
		102	12.5	17.3	217	25.5	319
b x h 2.3 x 2.2		305	4.3	51.9	223	76.3	328
16	8	25	118	4.3	502	6.3	738
		32	89	5.4	484	8.0	712
		38	72.1	6.5	466	9.5	685
		44	60.9	7.5	456	11.0	670
		51	52.3	8.7	453	12.8	667
		64	41.2	10.9	448	16	659
		76	34.1	12.9	441	19	648
		89	29.5	15.1	446	22.3	656
		102	25.6	17.3	444	25.5	653
		115	22.8	19.6	446	28.8	656
b x h 3.2 x 2.7		305	8.4	51.9	436	76.3	641
20	10	25	293	4.3	1245	6.3	1831
		32	224	5.4	1219	8.0	1792
		38	177	6.5	1143	9.5	1682
		44	149	7.5	1115	11	1639
		51	128	8.7	1110	12.8	1632
		64	99	10.9	1077	16	1584
		76	81.7	12.9	1056	19	1552
		89	69.5	15.1	1052	22.3	1546
		102	60.6	17.3	1051	25.5	1545
		115	53	19.6	1036	28.8	1524
		127	47.5	21.6	1026	31.8	1508
		139	43	23.6	1016	34.8	1494
		152	39	25.8	1008	38	1482
b x h 4.1 x 3.7		305	20	51.9	1037	76.3	1525
25	12.5	25	488	4.3	2098	6.3	3074
		32	374.4	5.4	2037	8	2995
		38	346	6.5	2235	9.5	3287
		44	244	7.5	1825	11	2684
		51	207.5	8.7	1799	12.8	2646
		64	161	10.9	1752	16	2576
		76	130.8	12.9	1690	19	2485
		89	110.5	15.1	1672	22.3	2459
		102	96.3	17.3	1670	25.5	2456
		115	85.7	19.6	1675	28.8	2464
		127	76.3	21.6	1647	31.8	2423
		139	69.5	23.6	1642	34.8	2415
		152	63.5	25.8	1641	38	2413
		178	53.9	30.3	1631	44.5	2399
		203	47.0	34.5	1622	50.8	2385
b x h 5.6 x 4.6		305	30.9	51.9	1602	76.3	2356

D	d	L	R	XLL 17 %		Max. 25 %	
				S1	F1	S2	F2
32	16	38	528.2	6.5	3412	9.5	5018
		44	424.4	7.5	3175	11	4668
		51	336	8.7	2913	12.8	4284
		64	269.2	10.9	2929	16	4307
		76	218.5	12.9	2823	19	4152
		89	180.3	15.1	2728	22.3	4012
		102	155	17.3	2688	25.5	3953
		115	140	19.6	2737	28.8	4025
		127	124	21.6	2677	31.8	3937
		139	112	23.6	2647	34.8	3898
		152	102	25.8	2636	38	3876
		178	88.2	30.3	2669	44.5	3925
		203	76	34.5	2623	50.8	3857
		254	60.8	43.2	2625	63.5	3861
b x h 7.2 x 5.6		305	49	51.9	2541	76.3	3736
40	20	51	628	8.7	5445	12.8	8007
		64	487	10.9	5299	16	7792
		76	379	12.9	4897	19	7201
		89	321	15.1	4857	22.3	7142
		102	281	17.3	4873	25.5	7166
		115	245	19.6	4790	28.8	7044
		127	221	21.6	4771	31.8	7017
		139	185	23.6	4372	34.8	6429
		152	168	25.8	4341	38	6384
		178	150	30.3	4539	44.5	6675
		203	132	34.5	4555	50.8	6699
		254	107	43.2	4620	63.5	6795
b x h 8.7 x 7.3		305	87.8	51.9	4552	76.3	6695
50	25	64	709	10.9	7714	16.0	11344
		76	572	12.9	7390	19.0	10868
		89	475	15.1	7187	22.3	10569
		102	405	17.3	7023	25.5	10328
		115	352	19.6	6882	28.8	10120
		127	316	21.6	6822	31.8	10033
		139	289	23.6	6829	34.8	10043
		152	255	25.8	6589	38	9690
		178	216	30.3	6536	44.5	9612
		203	187	34.5	6453	50.8	9490
		254	153	43.2	6607	63.5	9716
b x h 11.4 x 9.1		305	127	51.9	6585	76.3	9684
63	38	76	842	12.9	10879	19	15998
		89	726	15.1	10984	22.3	16154
		102	656	17.3	11375	25.5	16728
		115	534	19.6	10440	28.8	15353
		127	480	21.6	10363	31.8	15240
		152	396	25.8	10233	38	15048
		178	335	30.3	10137	44.5	14908
		203	297	34.5	10249	50.8	15073
		254	235	43.2	10147	63.5	14923
b x h 11.8 x 13.4		305	194	51.9	10059	76.3	14793

Code: **GY** Colour: **Brown**

Ultra Heavy Load Spring



D: Outer Diameter
d: Rod Diameter
b x h: Wire Section
L: Length
R: Load Rate (N)
XXL %: Long Life Deflection
Max %: Max. Working Deflection
S1: Deflection
F1: Load N
S2: Defleciton
F2: Load N

N - Newton = (0.102) Kgf
1kg = 9.81 N

Order: **GY.** D x L

D	d	b x h	L	R	XLL 10 % S1	XLL 10 % F1	Max. 15 % S2	Max. 15 % F2
10	5	2.2 x 2.7	25	167	2.5	418	3.8	626
			32	130	3.2	416	4.8	624
			38	105	3.8	399	5.7	599
			44	86	4.4	378	6.6	568
			51	76	5.1	403	7.7	604
			64	62	6.4	397	9.6	595
			76	51	7.6	388	11.4	581
13	6.3	2.8 x 3.4	25	288	2.5	720	3.8	1080
			32	216	3.2	691	4.8	1037
			38	176	3.8	669	5.7	1003
			44	149	4.4	646	6.6	983
			51	128	5.1	653	7.7	979
			64	100	6.4	640	9.6	960
			76	84	7.6	638	11.4	958
			89	71	8.9	632	13.4	948
			102	61	10.2	622	15.3	933
16	8	3.5 x 4.6	32	449	3.2	1437	4.8	2155
			38	363	3.8	1379	5.7	2069
			44	309	4.4	1360	6.6	2039
			51	256	5.1	1306	7.7	1959
			64	203	6.4	1299	9.6	1949
			76	166	7.6	1262	11.4	1892
			89	139	8.9	1237	13.4	1856
			102	114	10.2	1163	15.3	1744
			115	105	11.5	1208	17.3	1811
			127	94	12.7	1194	19.1	1791
			152	69	15.2	1049	22.8	1573
			305	37	30.5	1129	45.8	1693
20	10	4.1 x 5.9	44	452	4.4	1989	6.6	2983
			51	378	5.1	1928	7.7	2892
			64	301	6.4	1926	9.6	2890
			76	247	7.6	1877	11.4	2816
			89	208	8.9	1851	13.4	2777
			102	188	10.2	1918	15.3	2876
			115	159	11.5	1829	17.3	2743
			127	146	12.7	1854	19.1	2781
			152	121	15.2	1839	22.8	2749
			305	60	30.5	1830	45.8	2745
25	12.5	5.7 x 7.4	44	1158	4.4	5095	6.6	7643
			51	933	5.1	4758	7.7	7137
			64	730	6.4	4672	9.6	7008
			76	556	7.6	4226	11.4	6338
			89	462	8.9	4112	13.4	6168
			102	390	10.2	3978	15.3	5967
			115	360	11.5	4140	17.3	6210
			127	325	12.7	4140	19.1	6210
			152	255	15.2	3876	22.8	5814
			178	230	17.8	4094	26.7	6141
			203	202	20.3	4101	30.5	6151
			305	136	30.5	4148	45.8	6222

D	d	b x h	L	R	XLL 10 % S1	XLL 10 % F1	Max. 15 % S2	Max. 15 % F2
32	16	7.4 x 8.8	44	1300	4.4	5720	6.6	8580
			51	1150	5.1	5865	7.7	8798
			64	887	6.4	5677	9.6	8515
			76	733	7.6	5571	11.4	8356
			89	612	8.9	5447	13.4	8170
			102	544	10.2	5549	15.3	8323
			115	494	11.5	5681	17.3	8522
			127	432	12.7	5486	19.1	8230
			152	356	15.2	5411	22.8	8117
			178	304	17.8	5411	26.7	8117
			203	265	20.3	5380	30.5	8069
			254	214	25.4	5436	38.1	8153
			305	177	30.5	5399	45.8	8098
40	20	8.4 x 10.9	64	1228	6.4	7859	9.6	11789
			76	1017	7.6	7729	11.4	11594
			89	880	8.9	7832	13.4	11748
			102	762	10.2	7772	15.3	11659
			115	679	11.5	7809	17.3	11716
			127	622	12.7	7899	19.1	11849
			152	509	15.2	7737	22.8	11605
			178	429	17.8	7636	26.7	11454
			203	374	20.3	7592	30.5	11388
			254	296	25.4	7518	38.1	11278
			305	246	30.5	7503	45.8	11255
50	25	11.8 x 13.4	64	1980	6.4	12672	9.6	19008
			76	1811	7.6	13764	11.4	20645
			89	1410	8.9	12549	13.4	18824
			102	1215	10.2	12393	15.3	18590
			115	1076	11.5	12374	17.3	18561
			127	968	12.7	12294	19.1	18440
			152	806	15.2	12251	22.8	18377
			178	698	17.8	12424	26.7	18637
			203	612	20.3	12424	30.5	18635
			254	472	25.4	11989	38.1	17983
			305	388	30.5	11834	45.8	17751
63	38	11.8 x 17.8	89	1560	10.0	15600	17.4	27144
			102	1298	12.0	15576	20.9	27128
			115	1078	14.1	15200	25.2	27166
			127	970	15.7	15229	28	27160
			152	801	18.9	15139	33.9	27154
			178	655	23.4	15327	41.4	27117
			203	552	27.0	14904	49	27048
			254	423	35.0	14805	64	27072
			305	349	42.5	14833	77.5	27048

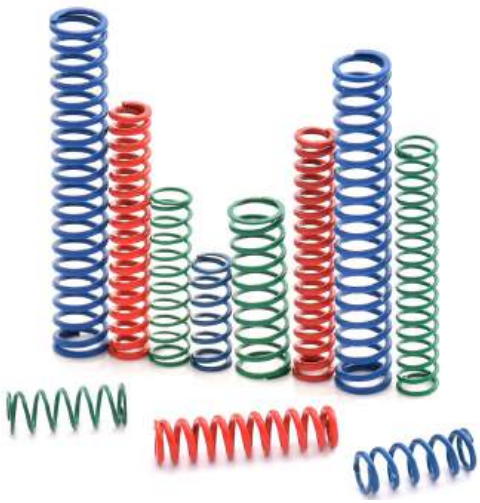
In the GY series diameter 63 mm, XLL % and Max % are different from the standard (10% and 15%) fixed for the other diameters

NEW

Small Series

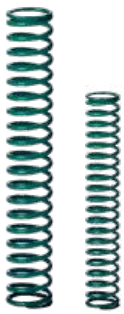
Tolerances:
"R" ± 10% "D" ± 0.5 mm

Mateiral:
UNI EN 10270-1 SH

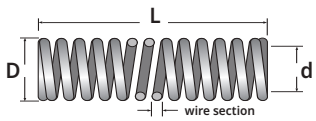


The small springs in this catalogue are made from round crosssection wire and are subdivided in three series. Each series has its own colour which allows easy identification. We make the pressing to solid also on these springs to avoid considerable settlements when the springs work.

D: Outer Diameter
d: Rod Diameter
L: Length
R: Load Rate (N)
S - Max: Stroke
F - Max: Load N



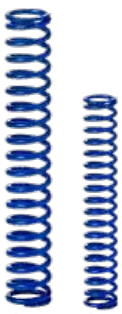
Small Series Green



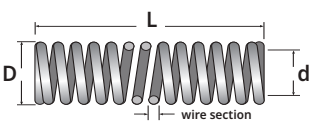
Light Load Spring - Round Wire

Code: **TVY**

Order Code	D	d	L	R	S - Max	F - Max
TVY 0616	6	4.7	16	1.60	10	16
TVY 0625			25	0.86	15	13
TVY 0638			38	0.64	23	15
TVY 0651	wire section 0.6 mm		51	0.38	31	12
TVY 0816	8	6.2	16	2.40	9	22
TVY 0825			25	1.30	14	18
TVY 0838			38	0.82	21	17
TVY 0851	wire section 0.8 mm		51	0.56	28	16



Small Series Blue

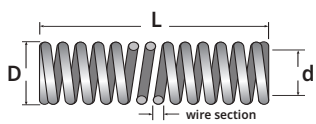


Medium Load Spring - Round Wire

Code: **TBM**

Order Code	D	d	L	R	S - Max	F - Max
TBM 0616	6	4.2	16	5.20	8.5	44
TBM 0625			25	3.06	13	40
TBM 0638			38	1.86	20	37
TBM 0651	wire section 0.8 mm		51	1.56	27	45
TBM 0816	8	5.8	16	7.23	9	65
TBM 0825			25	3.90	13	51
TBM 0838			38	2.36	20	47
TBM 0851	wire section 1 mm		51	1.64	26	43

Small Series Red



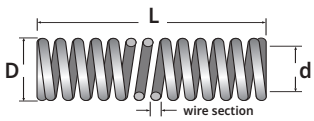
Heavy Load Spring - Round Wire

Code: **TRK**

Order Code	D	d	L	R	S - Max	F - Max
TRK 0616	6	3.9	16	12.78	8	102
TRK 0625			25	6.26	12	75
TRK 0638			38	5.0	19	95
TRK 0651	wire section 1 mm		51	3.64	25	91
TRK 0816	8	5.5	16	16.94	8	136
TRK 0825			25	10.02	11	110
TRK 0838			38	6.24	17	106
TRK 0851	wire section 1.2 mm		51	4.36	22	96

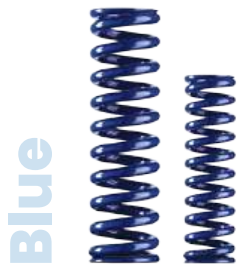
Light Load Spring Round Wire

Code: **TVY**



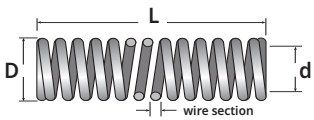
D	d	L	R	XLL 30 %		Max. 40 %	
				S1	F1	S2	F2
10	5	25	4.4	6.3	28	10.0	44
		32	3.4	8.0	27	12.8	44
		38	2.8	9.5	27	15.2	43
		44	2.4	11.0	26	17.6	42
		51	2.1	12.8	27	20.4	43
		64	1.6	16.0	26	25.6	41
		76	1.3	19.0	25	30.4	40
wire section 1.1 mm		305	0.3	76.3	23	122	37
13	6.3	25	8.5	6.3	54	10.0	85
		32	6.5	8.0	52	12.8	83
		38	5.3	9.5	50	15.2	81
		44	4.4	11.0	48	17.6	77
		51	3.8	12.8	49	20.4	78
		64	2.9	16.0	46	25.6	74
		76	2.5	19.0	48	30.4	76
		89	2.1	22.3	47	35.6	75
wire section 1.5 mm		305	0.6	76.3	46	122	73
16	8	25	17.9	6.3	113	10.0	179
		32	13.5	8.0	108	12.8	173
		38	10.5	9.5	100	15.2	160
		44	8.8	11.0	97	17.6	155
		51	7.6	12.8	97	20.4	155
		64	5.9	16.0	94	25.6	151
		76	4.8	19.0	91	30.4	146
		89	4.0	22.3	89	35.6	142
		102	3.5	25.5	89	40.8	143
wire section 2.0 mm		305	1.1	76.3	84	122	134

Order: **TVY.** D x L



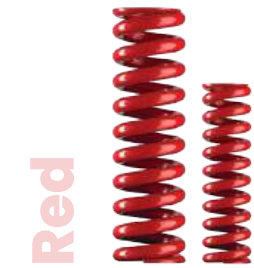
Medium Load Spring Round Wire

Code: **TBM**



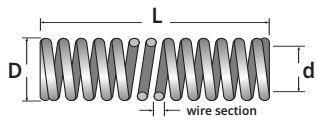
D	d	L	R	XLL 30 %		Max. 40 %	
				S1	F1	S2	F2
10	5	25	12.3	6.3	77	9.4	115
		32	9.5	8.0	76	12.01	114
		38	7.8	9.5	74	14.3	111
		44	6.5	11.0	72	16.5	107
		51	5.6	12.8	71	19.1	107
		64	4.5	16.0	72	24.0	108
		76	3.7	19.0	70	28.5	105
wire section 1.5		305	0.9	76.3	69	114.4	103
13	6.3	25	6.3	6.3	136	9.4	203
		32	8.0	8.0	134	12.0	202
		38	9.5	9.5	131	14.3	197
		44	11.0	11.0	128	16.5	191
		51	12.8	12.8	128	19.1	191
		64	16.0	16.0	125	24.0	187
		76	19.0	19.0	122	28.5	182
		89	22.3	22.3	125	33.4	187
wire section 1.8		305	76.3	76.3	114	114.4	172
16	8	25	6.3	6.3	199	9.4	299
		32	8.0	8.0	192	12.0	288
		38	9.5	9.5	184	14.3	276
		44	11.0	11.0	177	16.5	266
		51	12.8	12.8	176	19.1	264
		64	16.0	16.0	171	24.0	257
		76	19.0	19.0	167	28.5	251
		89	22.3	22.3	167	33.4	250
		102	25.5	25.5	166	38.3	249
wire section 2.2		305	76.3	76.3	160	114.4	240

Order: **TBM.** D x L



Heavy Load Spring Round Wire

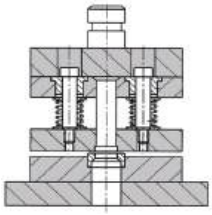
Code: **TRK**



D	d	L	R	XLL 30 %		Max. 40 %	
				S1	F1	S2	F2
10	5	25	20.7	5.0	104	7.5	155
		32	16.1	6.4	103	9.6	155
		38	13.0	7.6	99	11.4	148
		44	10.9	8.8	96	13.2	144
		51	9.6	10.2	98	15.3	147
		64	7.7	12.8	99	19.2	147
		76	6.3	15.2	96	22.8	144
wire section 1.6		305	1.5	61.0	92	91.5	137
13	6.3	25	37.5	5.0	188	7.5	281
		32	28.9	6.4	185	9.6	277
		38	23.5	7.6	179	11.4	268
		44	19.6	8.8	172	13.2	259
		51	17.3	10.2	176	15.3	265
		64	13.5	12.8	173	19.2	259
		76	11.2	15.2	170	22.8	255
		89	9.5	17.8	169	26.7	254
wire section 2.1		305	2.7	61.0	165	91.5	247
16	8	25	81.6	5.0	404	7.5	612
		32	61.3	64	392	9.6	588
		38	49.9	7.6	379	11.4	569
		44	40.8	8.8	359	13.2	539
		51	35.6	10.2	363	15.3	545
		64	27.8	12.8	356	19.2	534
		76	22.8	15.2	347	22.8	520
		89	19.6	17.8	349	26.7	523
		102	17.0	20.4	347	30.6	520
wire section 2.8		305	5.4	61.0	329	91.5	494

Order: **TRK.** D x L

D: Outer Diameter **L:** Length **XXL %:** Long Life Deflection **S1:** Deflection **S2:** Defleciton
d: Rod Diameter **R:** Load Rate (N) **Max %:** Max. Working Deflection **F1:** Load N **F2:** Load N

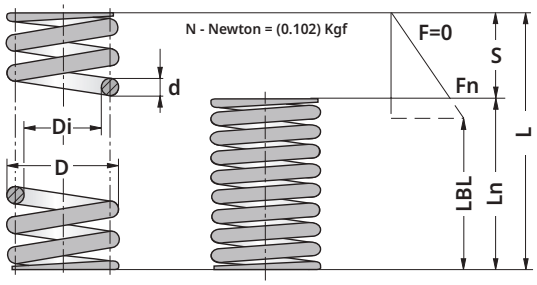


Pre-loading force and deviation should be determined
by the designer. Initially, 5 mm pre-loading should be applied.

Round Wire Compression Spring

Code: **YYH**

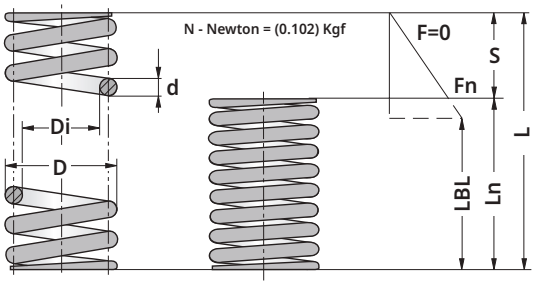
Light Duty & High Stroke



Round Wire Compression Spring

Code: **YYS**

Standard Performance



D: Average outer diameter **/ Di:** Slot diameter **/ d:** Spring wire diameter **/ S:** Total clamping **/ L:** Free length **/ Ln:** Length at load
LBL: Closed spring length **/ F:** Force / Newton **/ Fn:** Pressure force

D	L	Di	d	S	Fn	Ln	LBL
10	40	7.0	1.5	18.9	148	21.1	18.0
12	55	9.0	1.5	30.0	103	25.0	22.0
14	40	10.0	2.0	19.1	243	20.9	18.0
14	50	10.0	2.0	24.0	228	26.0	23.0
15	40	11.0	2.0	19.5	221	20.5	16.0
15	100	11.0	2.0	58.5	245	41.5	39.0
17	85	12.5	2.25	41.0	265	44.0	32.0
17.5	45	11.5	3.0	13.0	422	32.0	30.0
17.5	50	11.5	3.0	15.0	434	35.0	33.0
18	83	10	4.0	18.0	1198	65.0	62.0
19	35	11	4.0	5.0	697	30.0	28.0
19	90	10	4.50	17.0	1669	73.0	70.0
19.5	35	14.5	2.50	14.0	186	21.0	19.0
19.5	40	13.5	3.0	14.0	398	36.0	24.0
20.5	95	15.5	2.50	54.0	262	41.0	39.0
21	40	13	4.0	11.0	1148	29.0	27.0
21.5	45	15.5	3.0	20.0	436	25.0	23.0
21.5	50	13.5	4.0	15.0	1099	35.0	32.0
22	45	16	3.0	21.7	387	23.3	19.5
22	70	16	3.0	29.4	387	40.6	28.5
22	100	16	3.0	38.7	387	61.3	40.5
23	130	16	3.5	43.4	579	86.6	59.5
23	160	16	3.5	54.6	579	105.4	73.3
23	190	16	3.5	64.8	579	125.2	86.0
24	220	16	4.0	62.4	765	157.6	112.0
24	250	16	4.0	71.6	765	178.4	128.0
25	24	17	4.0	7.00	790	17.0	16.0
27.8	70	13.8	7.0	8.00	3014	62.0	62.0
30	70	22.0	4.0	32.5	739	37.5	32.0
30	150	17.0	6.5	34.0	3142	116.0	107.0

Order:
YYH. D x L

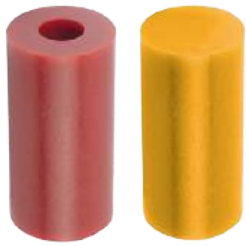
Material:
Spring Steel, Hardened.

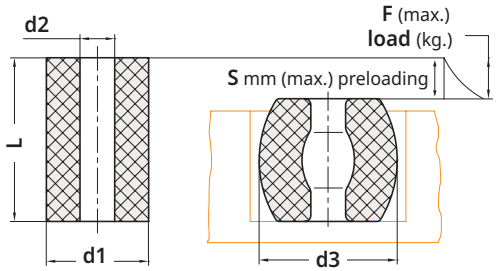
D	L	Di	d	S	Fn	Ln	LBL
13	55	10.0	1.50	25.2	112	25.3	12.0
15	50	11.0	2.00	21.2	250	25.0	9.50
16	40	12.0	2.00	17.0	220	20.0	7.00
18	85	13.4	2.30	37.4	260	41.0	14.0
19	50	13.0	3.00	13.6	480	34.0	8.50
20.5	90	11.5	4.50	15.0	1714	72.4	4.00
21	40	15.0	3.00	11.9	450	26.0	5.50
22	95	17.0	2.50	41.5	200	46.2	17.0
23	50	15.0	4.00	13.3	1160	34.4	6.50
26.5	24	18.5	4.00	6.10	960	16.8	2.00
30	70	16.0	7.00	9.30	3750	59.0	8.00
32	70	24.0	4.00	28.9	822	36.0	6.00
34	125	22.0	6.00	27.2	2150	93.0	11.5
44	130	28.0	8.00	30.6	3895	94.0	10.0
48	67	28.0	10.0	7.60	5760	58.0	3.50
49	50	32.0	8.50	9.30	3707	39.0	2.50
58	50	42.0	8.00	11.9	2117	36.0	2.50
63	180	41.0	11.0	36.6	5203	137	10.0

Order:
YYS. D x L

Material:
Spring Steel, Hardened.

These springs from spring steel as winding / with high tension heat treated are used in table data standards **DIN 2095** or optionally both inactive and oscillatory loads. Optionally, they can be used in cases that are posed due to severe, hard impacts and vibrant load or when there are high expectations from spring life. Both types have flattened, forged coils and their surface are homogenized with shot blasting process. All springs are supplied as lubricated. All these springs can be produced in the desired lengths and diameters. **Maximum working temperature: 200°C.**





Polyurethane Compression Spring

90 SHORE / Red Springs Code: **PMK**

80 SHORE / Yellow Springs Code: **PMS**

Compression (Length)

Red 25% **Yellow 35%**

D = Solid **B =** Hollow

d1	L	d2	d3	25% Max. Force S	25% Max. Force F	35% Max. Force S	35% Max. Force F
16	12	6.5	21	3.6	171	4.3	104
	16			4.8	169	5.6	100
	20			6.0	165	7.0	97
	25			7.5	161	8.7	96
20	16	8.5	26	4.8	265	5.6	156
	20			6.0	260	7.0	154
	25			7.5	258	8.7	153
	32			9.6	255	10.6	152
25	20	10.5	32	6.0	439	7.0	265
	25			7.5	428	8.7	260
	32			9.6	423	10.6	257
	40			12.0	420	14.0	255
32	32	13.5	42	9.6	653	10.6	398
	40			12.0	648	14.0	393
	50			15.0	643	17.5	390
	63			18.9	638	22.0	388
40	32	13.5	52	9.6	1122	10.6	683
	40			12.0	1112	14.0	673
	50			15.0	1101	17.5	668
	63			18.9	1097	22.0	663
	80			24.0	1092	28.0	661
50	32	17	65	9.6	1775	10.6	1102
	40			12.0	1765	14.0	1061
	50			15.0	1734	17.5	1041
	63			18.9	1698	22.0	1020
	80			24.0	1683	28.0	1015
	100			30.0	1673	35.0	1010
63	32	17	81	9.6	3070	11.2	1902
	40			12.0	3009	14.0	1836
	50			15.0	2947	17.5	1785
	63			18.9	2856	22.0	1734
	80			24.0	2805	28.0	1683
	100			30.0	2784	35.0	1652
	125			37.5	2733	43.7	1632
80	32	21	104	9.6	5406	11.2	3213
	40			12.0	5151	14.0	3070
	50			15.0	4896	17.5	3049
	63			18.9	4743	22.0	2937
	80			24.0	4641	28.0	2886
	100			30.0	4579	35.0	2866
	125			37.5	4488	43.7	286
100	32	21	130	9.6	9180	11.2	5712
	40			12.0	8649	14.0	5304
	50			15.0	8262	17.5	5100
	63			18.9	7956	22.0	4845
	80			24.0	7650	28.0	4590
	100			30.0	7446	35.0	4416
	125			37.5	7242	43.7	4233
125	32	27	160	9.6	15300	11.2	9384
	40			12.0	14535	14.0	8670
	50			15.0	13464	17.5	8160
	63			18.9	12750	22.0	7650
	80			24.0	12036	28.0	7242
	100			30.0	11730	35.0	7191
	125			37.5	11526	43.7	7140
	160			48.0	11352	56.0	6936

Order:
Code. D or **B** x d1 x L

Order Example:
PMS. B x 25 x 40

Plates - Cylinder - Discs - Pipes - Square - Formed Moulding

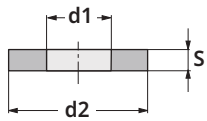
In special forms are produced as per request!

They do not create any problem at water / oil emulsions (resistance to thermal shock). They do not have any abrasion effects that can be distinguished with fixed and high load under normal temperature and environmental conditions at serial motion dies. Especially, they are efficient in ambient that do not require magnetization. Polyurethane springs can be machining with ordinary machine tools (such as lathe) as well as can be machining with traditional cutting tools (with sharp cutting edge). Polyurethane compression spring is incompressible material, spring load is obtained by extending outwards. Most of the expansion is reflected outwards. When desired higher flexion, selected spring is cut into two pieces from centre, then metal thick washer is inserted, thus flexion is increased two times. Pin diameter of polyurethane compression springs should be less than the inner diameter of spring.

90 SHORE Code: **PRPK**

80 SHORE Code: **PRPS**

Polyurethane Shock Absorbing Washer



Compression (Length)

Red 25%

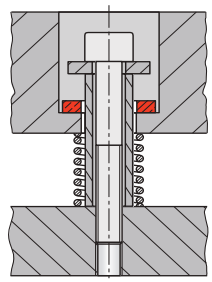
Yellow 35%

d2	d1	S mm
Ø16	6.5	3 4
	11	
Ø20	8.5	3 4 5
	11	
	13	
Ø25	10.5	3 4 5
	12	
	14	
Ø32	13.5	3 4 5 6 7
	18	
	21	
	23.5	
	25	

d2	d1	S mm
Ø40	13.5	5 6 7 8
	17	
	21	
	32	
Ø50	17	6 7 8 10
	26	
	32	
	37	
Ø63	17	6 10
	32	
Ø80	21	8 10
	42	
Ø100	21	10

Order:
Code. d1 x d2 x S

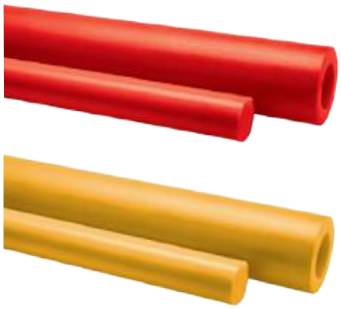
Order Example:
PRPS. 11 x 20 x 4



Mounting Example

NEW

Vulkollan Springs



90 SHORE
Code: **PYK**

80 SHORE
Code: **PYS**

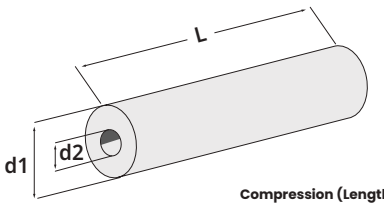
Hollow
Code: **PYBB**

Solid
Code: **PYBD**

Polyurethane Compression Spring

D = Solid

B = Hollow



Compression (Length)

Red 25%

Order Code		d1	d2 Hollow	L Length
Type / Solid	Type / Hollow			
PYKD 16	PYKB 16	16	6.5	310 mm
PYKD 20	PYKB 20	20	8.5	310 mm
PYKD 25	PYKB 25	25	10.5	310 mm
PYKD 32	PYKB 32	32	13.5	310 mm
PYKD 40	PYKB 40	40	13.5	310 mm
PYKD 50	PYKB 50	50	17	310 mm
PYKD 63	PYKB 63	63	17	310 mm
PYKD 80	PYKB 80	80	21	310 mm
PYKD 100	PYKB 100	100	21	310 mm
PYKD 125	PYKB 125	125	27	310 mm

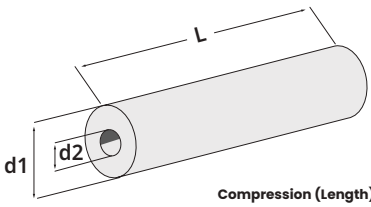
Yellow 35%

Order Code		d1	d2 Hollow	L Length
Type / Solid	Type / Hollow			
PYSD 16	PYSB 16	16	6.5	310 mm
PYSD 20	PYSB 20	20	8.5	310 mm
PYSD 25	PYSB 25	25	10.5	310 mm
PYSD 32	PYSB 32	32	13.5	310 mm
PYSD 40	PYSB 40	40	13.5	310 mm
PYSD 50	PYSB 50	50	17	310 mm
PYSD 63	PYSB 63	63	17	310 mm
PYSD 80	PYSB 80	80	21	310 mm
PYSD 100	PYSB 100	100	21	310 mm
PYSD 125	PYSB 125	125	27	310 mm

Vulkollan Compression Spring

D = Solid

B = Hollow



Compression (Length)

92 SHORE / 30%

Order Code		d1	d2 Hollow	L Length
Type / Solid	Type / Hollow			
PYBD 16	PYBB 16	16	6.5	310 mm
PYBD 20	PYBB 20	20	8.5	310 mm
PYBD 25	PYBB 25	25	10.5	310 mm
PYBD 32	PYBB 32	32	13.5	310 mm
PYBD 40	PYBB 40	40	13.5	310 mm
PYBD 50	PYBB 50	50	17	310 mm
PYBD 63	PYBB 63	63	17	310 mm
PYBD 80	PYBB 80	80	21	310 mm
PYBD 100	PYBB 100	100	21	310 mm
PYBD 125	PYBB 125	125	27	310 mm

- Sealing
- Abrasion resistance
- Tear resistance
- Shock and impact resistance
- Resistance to chemical products
- Bend restrictor
- Sound insulation

Advantages of **Vulkollan** Over Polyurethane

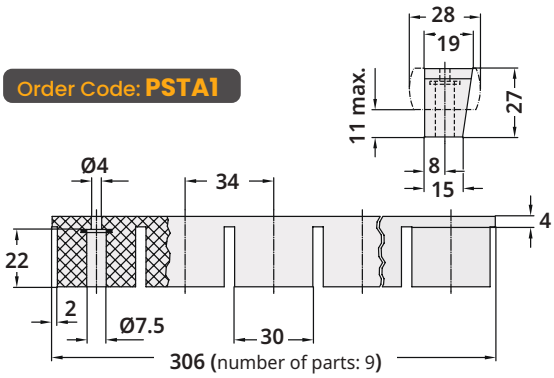
NEW

Stripper for Blanking Dies

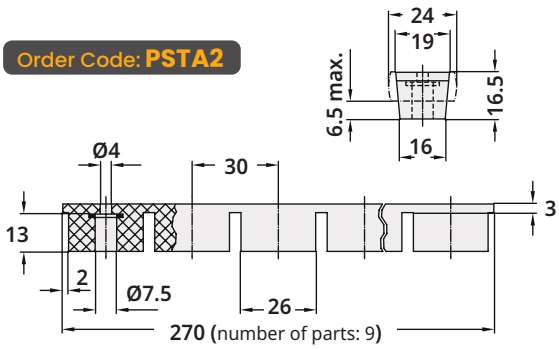
Code: **PSTA..**

Material: Polyurethane / 70 Shore

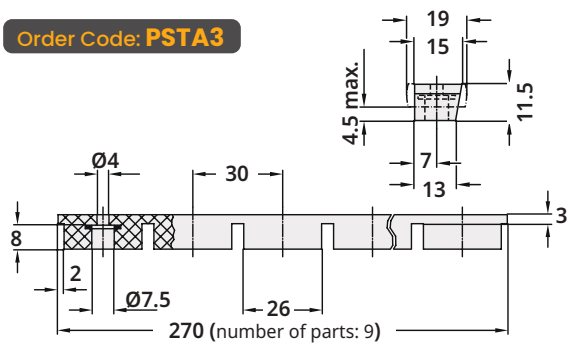
Order Code: **PSTA1**



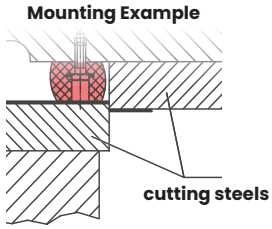
Order Code: **PSTA2**



Order Code: **PSTA3**



Mounting Example



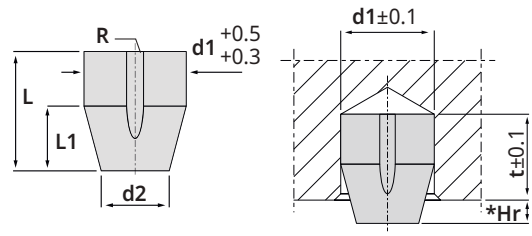
Referance: **VDI 3362**
Mercedes-Benz VW

NEW

Compression Piece

Code: **PDTA..**

Material: Polyurethane / 90 Shore

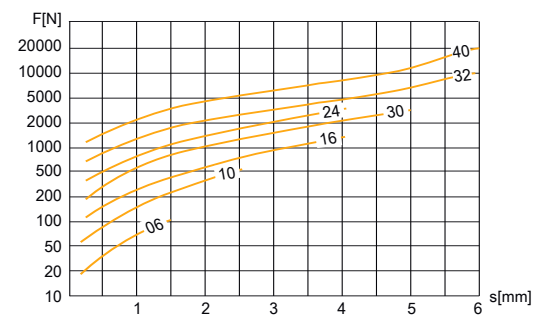


Movement Distance Force (F) Diagram

***Hr:** Max. movement distance

1N = 0.1 daN = 0.102 kg.

Order Code	d1	L	d2	L1	t	R	*Hr	Max. Force
PDTA 06	6	9.5	3.6	4.5	8	-	1.5	100 N
PDTA 10	10	15.5	6	7.5	13	1	2.5	450 N
PDTA 16	16	25	9.5	12	21	1.5	4	1500 N
PDTA 24	24	25	18	10	21	2	4	3000 N
PDTA 30	30	35	20	19	30	2.5	5	3000 N
PDTA 32	32	32	24	14	26	3	6	12000 N
PDTA 40	39.5	40	30	16	34	3	6	25000 N

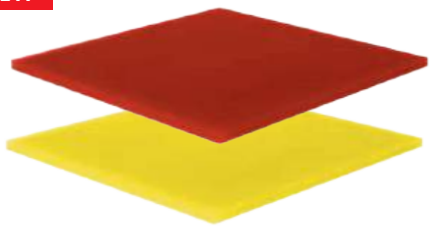


Compression Pieces are used for the removal and extraction of parts stamped in press/die tools. A blind hole is sufficient fo placing the product. The ventilation channel has been designed to facilitate pressing (assembly).

+ The use of the "PDTA" prevents damage to the surface of the stamped part.
+ It has a compact design, and the assembly process is quite simple.
+ It significantly contributes to the reduction of noise
+ It is highly resistant to wear and guarantees a long service life.

Hardness: 90 Shore

NEW

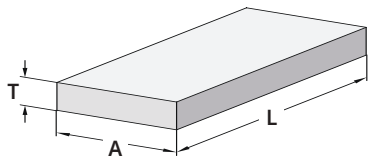


Polyurethane Plate

Note: Custom size orders are made upon request.

90 SHORE / Red Plate Code: **PPK**

80 SHORE / Yellow Plate Code: **PPS**



A	L	T
250	250	3
		4
		5
		6
		7
		8
		10
		12
		15
		20
		25
		30
		40
		50
		60
		70
		80

A	L	T
250	500	3
		4
		5
		6
		7
		8
		10
		12
		15
		20
		25
		30
		40
		50
		60
		70
		80

A	L	T
500	500	3
		4
		5
		6
		7
		8
		10
		12
		15
		20
		25
		30
		40
		50
		60
		70
		80

A	L	T
500	1000	3
		4
		5
		6
		7
		8
		10
		12

A	L	T
500	1000	15
		20
		25
		30
		40
		50
		60
		70
		80

A	L	T
1000	1000	10
		12
		15
		20
		25
		30
		40
		50

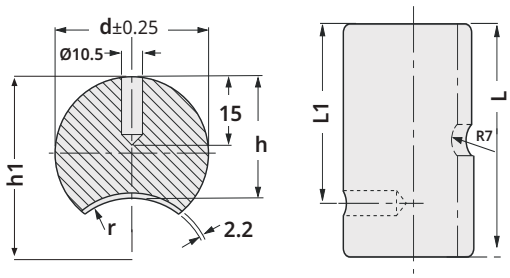
Order:
PP.. x A x L x T

Order Example:
PPK x 250 x 250 x 5

Shock Absorber for Safety Pin

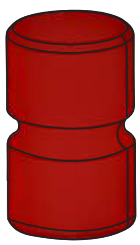
Code: **G57.2**

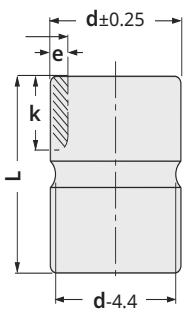
Material: Polyurethane 90 Shore



Order Code	d	L	L1	h	h1	r
G57.2 40	40	60	45	32	50	18
G57.2 50	50	80	60	40	63	23
G57.2 63	63	80	60	51	86	35

* It should be used with safety pins. **G57.2** product is compatible with the product code **G57.**
* It is an impact and speed retarder product.
* Hardness of polyurethane material is 90 shore.
* All dimensions without tolerance are in EN 22 768-1 mm standards.



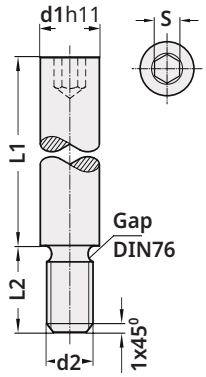


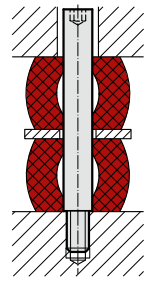
Shock Absorber for Safety Pin

Code: **G56.1**

Material: Polyurethane 90 Shore

Order Code	Pin Diameter	d	L	e	k	Max. Press
G56.1 50	40	50	70	8	25	16%
G56.1 63	50	63	80	8	30	12%





Polyurethane bolt mounting drawing

Code: **PYP**

Guide Bolt for Polyurethane Spring

During guiding of polyurethane springs, countersunk allen head metric thread connected guide bolts can be used as single spring as well as cluster by dividing springs.

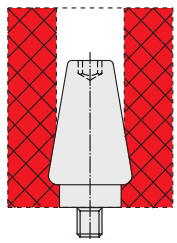
d	L1	d2	l2	S	Spring Ø
Ø 6 mm	20	M4	6 mm	3	Ø 16 x 6.5
	25				
	32				
Ø 8 mm	25	M6	9 mm	4	Ø 20 x 8.5
	32				
	40				
	50				
Ø 10 mm	25	M8	15 mm	5	Ø 25 x 10.5
	32				
	40				
	50				
	63				
Ø 13 mm	32	M10	15 mm	6	Ø 32 /40 x 13.5
	40				
	50				
	63				
	80				
	95				
Ø 16 mm	32	M12	18 mm	8	Ø 50 /63 x 17
	40				
	50				
	63				
	80				
	95				
	118				
	140				
Ø 20 mm	40	M16	25 mm	10	Ø 80 /100 x 21
	50				
	63				
	80				
	95				
	118				
	140				
	180				

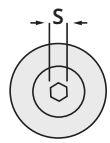
Order: **PYP.** d1 x L1

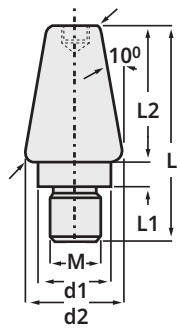
Material: CK45

Code: **PSP**

Locating Bolt for Polyurethane Spring







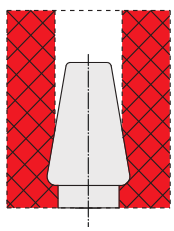
M	L	d1	d2	L1	L2	SW	Spring Ø
M12	56	19	28	8	30	6	63
M16	74	22	32	10	40	8	80 - 100
M20	100	28	38	15	55	10	125 - 140

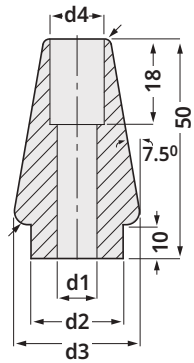
Order: **PSP.** M x L

Material: 1.7131 (16MnCr5)

Code: **PMV**

Locating Pin for Polyurethane Spring



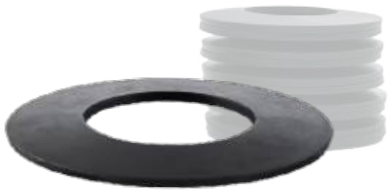


M	d1	d2	d3	d4	Spring Ø
M10	11	18	28	17	63
M12	13.5	22	32	19	80 - 100
M16	17.5	28	38	25	125

Connection screws as per request:
M10 x 50
M12 x 50
M16 x 60

Order: **PMV.** M

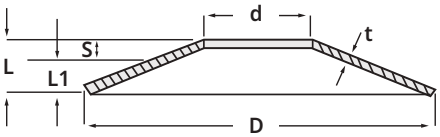
Material: 1.7131 (16MnCr5)



Disc Springs

Code: **DCY**

DIN 2093



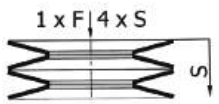
Disc Springs: It provides resistance to higher forces at very short working strokes.
The advantage of springs with very short spring is that when the pressure is applied, it produces high power with less motion.
Disc springs sometimes can be used alone and also as stacked array sets.

Tension Resistance N: 25 / + 200 50 CrV
Heat Resistance: -15 / +150^0

Disc Spring Working Strokes: Applied forces (F / N) should be designed according to the working strokes. Specifying the working strokes should be according to the hole thickness (t) internal wall. L: 0.25 (1/4) or 0.50 (1/2) of free length. In addition, with motion up to 0.75 (3/4), different forces (F/N) per each stroke value may be applied. F=N / S = mm / stroke

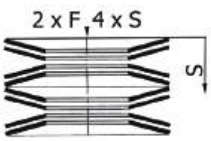
Disc Spring Array (load application)

Light Duty



1 F (force / N) in application
0.25 4 times S (stroke)

Heavy Duty



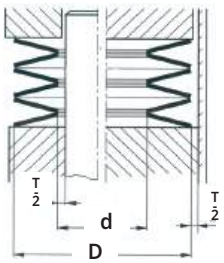
2 F (force / N) in application
0.50 4 times S (stroke)

Extra Heavy Duty

3 F (force / N) in application
0.75 4 times S (stroke)

Fixing Disc Spring with Shaft

T = working space



D	T
> 8 - 16	0.2
> 16 - 20	0.3
> 20 - 26	0.4
> 26 - 34	0.5
> 34 - 50	0.6
> 50 - 100	0.8

d: Inner hole diameter / **D:** Outher diameter / **t:** Thickness / **L:** Free length
L1: Loading length / **F max:** Flex force / **S:** Flex length stroke / motion

d	D	t	L	L1	F Nw
3.2	8	0.3	0.55	0.36	104
		0.5	0.70	0.55	357
4.2		0.4	0.60	0.45	209
3.2	10	0.3	0.65	0.39	98
		0.4	0.70	0.48	179
4.2		0.5	0.75	0.56	294
		0.6	0.85	0.66	502
5.2		0.4	0.70	0.48	209
		0.5	0.75	0.56	325
4.2	12	0.4	0.80	0.50	178
		0.5	0.85	0.59	284
5.2		0.5	0.90	0.60	349
		0.6	0.95	0.69	506
6.2		0.5	0.85	0.59	326
		0.6	0.95	0.69	551
6.2	12.5	0.5	0.85	0.59	293
		0.7	1.00	0.78	659
7.2	14	0.5	0.90	0.60	279
		0.8	1.10	0.87	796
5.2	15	0.4	0.95	0.54	175
		0.6	1.05	0.71	407
6.2		0.5	1.00	0.63	289
		0.7	1.10	0.80	577
8.2		0.7	1.10	0.80	665
		0.8	1.20	0.90	982
8.2	16	0.4	0.90	0.53	154
		0.6	1.05	0.71	410
		0.9	1.25	0.99	1012
6.2	18	0.5	1.10	0.65	245
		0.7	1.25	0.84	552
8.2		0.8	1.30	0.92	582
		1.0	1.40	1.10	1181
9.2		0.7	1.20	0.83	566
		1.0	1.40	1.10	1253
8.2	20	0.6	1.30	0.77	412
		0.8	1.40	0.95	751
		1.0	1.55	1.14	1294
10.2		0.8	1.35	1.94	748
		1.0	1.55	1.14	1414
8.2	23	0.8	1.55	0.99	718
		0.9	1.60	1.07	918
10.2		1.0	1.70	1.17	1315

d	D	t	L	L1	F Nw
12.2	25	0.7	1.60	0.92	599
		0.9	1.60	1.07	862
10.2	28	0.80	1.75	1.04	661
		1.00	1.90	1.23	1129
14.2		0.80	1.80	1.05	801
		1.00	1.80	1.20	1107
16.3	31.5	1.25	2.15	1.48	1912
		1.50	2.40	1.73	3228
12.3	34	1.25	2.35	1.53	1814
		1.50	2.50	1.75	2719
14.3		1.25	2.40	1.54	1988
		1.50	2.55	1.76	2982
16.3		1.50	2.55	1.76	3153
		2.00	2.85	2.21	5779
14.3	40	1.50	2.75	1.81	2544
		2.00	3.05	2.26	4766
16.3		1.50	2.80	1.83	2748
		2.00	3.10	2.28	5166
20.4		2.00	3.10	2.28	5698
		2.50	3.45	2.74	9384
22.4	45	1.75	3.05	2.08	3644
		2.50	3.50	2.75	7712
20.4	50	2.00	3.50	2.38	4685
		2.50	3.85	2.84	7915
25.4		2.00	3.40	2.35	4760
		2.50	3.90	2.85	9058
		3.00	4.10	3.28	11970
20.5	60	2.50	4.70	2.95	7293
		3.00	5.20	3.42	11563
30.5		3.00	4.70	3.42	13219
		3.50	5.00	3.88	18143
40.5	70	4.00	5.70	4.04	23338
		5.00	6.40	5.30	33653
31	80	4.00	6.10	4.50	19384
41		3.00	5.30	3.58	10512
		5.00	6.70	5.42	33541
41	100	5.00	7.75	5.69	32344
51		6.00	8.20	6.55	47995

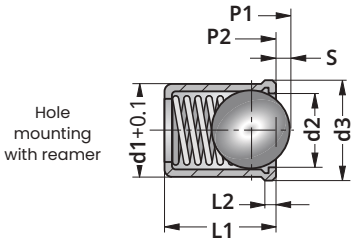
1 Newton : 0.102 Kg.

Order: **DCY.** d x D x t

Code: **KBS**

Spring Plunger with Bushing

For systems such as elevator and sliding etc.



d1	L1	d2	d3	L2	S	P1(N)	P2(N)
4	5	3	4.6	1	0.9	2	5
5	6	4	5.6	1	1.0	4	7
6	7	5	6.5	1	1.5	6	12
8	9	6.5	8.5	1	1.8	6	12

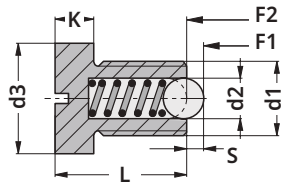
Order: **KBS.** d1

Material: Steel quality 5.8

Code: **SBS**

Spring Plunger with Slotted Head

Mounting: Fixing with screwdriver.



d1	L	S	d2	d3	K	F1(N)	F2(N)
M6	14	1	3.5	10	5	11	18
M8	16.5	1.5	4.5	13	5	18	31
M10	20	2	6	16	6	24	45
M12	22	2.5	8	18	7	24	49

It is for locking, compressing upwards and downwards. Fixable with screwdriver.
Heat Resistance Maximum: 250⁰C.

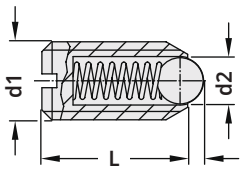
Order: **SBS.** d1

Material: Steel quality 5.8

Code: **BSM**

Spring Plunger

Mounting: Fixing with screwdriver.

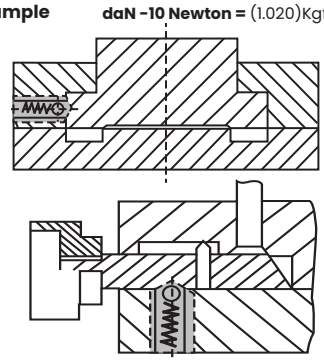


Usage Area:
- Locating
- Pulling, pushing
- Extractor
- Clamping

d1	L	S	d2	Initial Force	Final Force
M4	9	0.8	2.5	6 Nw	12 Nw
M5	12	0.9	3.0	7 Nw	13 Nw
M6	14	1.0	3.5	9 Nw	15 Nw
M8	16	1.5	5.0	20 Nw	35 Nw
M10	19	2.0	6.0	25 Nw	45 Nw
M12	22	2.5	8.0	35 Nw	60 Nw
M16	24	3.5	10	65 Nw	110 Nw

Mounting Example

N - Newton = (0.102)Kgf
daN -10 Newton = (1.020)Kgf

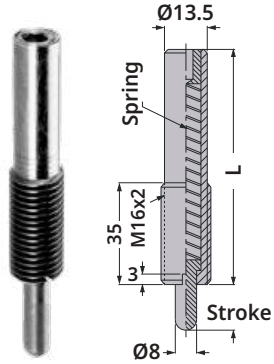


*** Please don't exceed the force values.**

Order: **BSM** x d1

Material: Steel quality 5.8

It is used as core / slide lock etc. in injection mould. As stamp extractor in die and also can be used for bushing of threaded shafts, limiting the torque tools and positioning of level adjuster. Material structure; machinable steel bushing - hardened bearing steel ball - winding steel spring.
Heat Resistance Maximum: 250⁰C.



Spring Plunger

Code: **PSK**

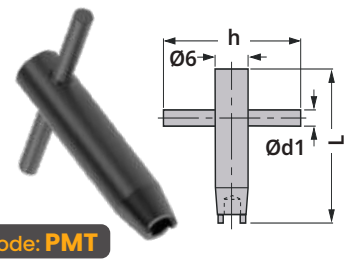
Mounting: Fixing with **"PMT"** mounting kit.

Stroke	L	Initial Force	Final Force
20	80	24 Nw	186 Nw
40	150	59 Nw	177 Nw
60	150	11 Nw	45 Nw
80	200	2 Nw	38 Nw

Material: Pin 1.1273 **/ Hardness:** 40 HRC

Order: **PSK.** Stroke

Protective plating that prevents oxidation on the part surface is available. The ball is from steel material and is hardened and polished.
*** Please don't exceed the force values.**



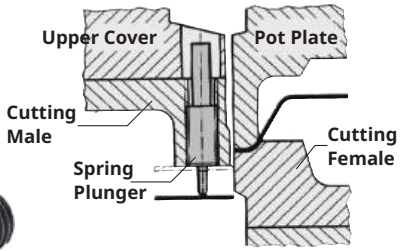
Code: **PMT**

Mounting Kit for Spring Plungers

Spring Plunger (M)	h	d	d1	L
M5 - M6	40	6	3	40
M8	45	8	4	45
M10	45	10	4	45
M12	80	12	5	50
M16	70	16	8	52
M24	80	24	12	62
M30	100	30	15	73

Material: Steel 5.8 **/ Hardness:** 36-40 HRC

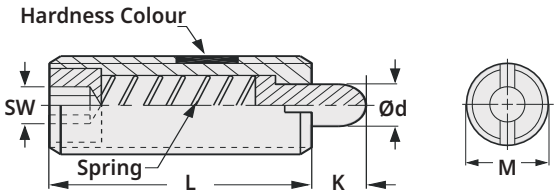
Order: **PMT.** d



Spring plunger can be used in many designs such as die and equipment production. Especially, it is operated as extractor - dampener - stabilizer and retaining pin.
*** Please don't exceed the force values.**

Spring Plunger Code: PS1

Mounting: Fixing with "PMT" mounting kit.
It is for locking, compressing upwards and downwards. The lock prevents the reaching of liquids and oils to the pin.
Working Temperature: Between -30 C and +80 C
Pin: Polished steel + Protective coating

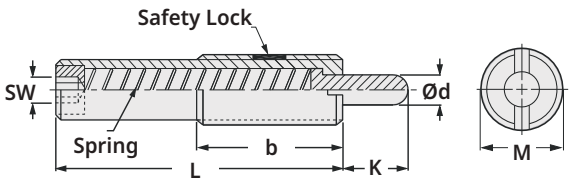


Series	M Thread	K	L	d	SW	Initial Force N (kgf)	Final Force N (kgf)
1	**M3** x 0.5	1.5	10	1	0.8	0.4 (0.05)	2.9 (0.3)
2	**M4** x 0.7	2	12	1.6	0.8	1.9 (0.2)	9.8 (1.0)
3	**M5** x 0.8	3	20	2	1.5	3.9 (0.4)	19.6 (2.0)
4	**M5** x 0.8	3	13	2	1.5	1.9 (0.2)	7.8 (0.8)
5	**M5** x 0.8	3	20	2	1.5	1.9 (0.2)	9.8 (1.0)
6	**M6** x 1.0	3	25	2.5	2	2.9 (0.3)	9.8 (1.0)
7	**M6** x 1.0	3	25	2.5	2	7.8 (0.8)	29.4 (3.0)
8	**M8** x 1.25	3	25	3.1	2.5	2.9 (0.3)	9.8 (1.0)
9	**M8** x 1.25	3	25	3.1	2.5	7.8 (0.8)	29.4 (3.0)
10	**M10** x 1.5	5	30	3.8	3	2.9 (0.3)	14.7 (1.5)
11	**M10** x 1.5	5	30	3.8	3	9.8 (1.0)	49.0 (5.0)
12	**M12** x 1.75	5	30	5.5	4	1.9 (0.2)	9.8 (1.0)
13	**M12** x 1.75	5	30	5.5	4	9.8 (1.0)	49.0 (5.0)

*** Red products are high force in the table.**
*** Blue products are medium force in the table.**

Spring Plunger Code: PS2

Mounting: Fixing with "PMT" mounting kit.
It is for locking, compressing upwards and downwards. The lock prevents the reaching of liquids and oils to the pin.
Working Temperature: Between -30 C and +80 C
Pin: Polished steel + Protective coating



Series	M Thread	K	L	b	d	SW	Initial Force N (kgf)	Final Force N (kgf)
14	**M12** x 1.75	10	43	35	5.5	4	3.9 (0.4)	19.6 (2)
15	**M12** x 1.75	10	43	35	5.5	4	6.8 (0.7)	39.2 (4)
16	**M16** x 2.0	10	50	35	8	5	9.8 (1)	49.0 (5)
17	**M16** x 2.0	10	50	35	8	5	19.6 (2)	98.0 (10)
18	**M16** x 2.0	10	60	35	8	5	12.7 (1.3)	39.2 (4)
19	**M16** x 2.0	10	60	35	8	5	26.4 (2.7)	78.4 (8)
20	**M16** x 2.0	15	60	35	8	5	9.8 (1)	39.2 (4)
21	**M16** x 2.0	15	60	35	8	5	14.7 (1.5)	78.4 (8)
22	**M16** x 2.0	20	60	35	8	5	12.7 (1.3)	39.2 (4)
23	**M16** x 2.0	20	85	35	8	5	16.6 (1.7)	78.4 (8)
24	**M16** x 2.0	30	125	35	8	5	17.6 (1.8)	39.2 (4)
25	**M16** x 2.0	30	125	35	8	5	19.6 (2)	78.4 (8)
26	**M16** x 2.0	50	155	35	8	8	19.6 (2)	49.0 (5)
27	**M16** x 2.0	50	155	35	8	8	29.4 (3)	98.0 (10)
28	**M24** x 3.0	15	60	45	10	8	19.6 (2)	98.0 (10)
29	**M24** x 3.0	15	60	45	10	8	39.2 (4)	196.1 (20)
30	**M30** x 3.5	20	70	45	15	12	29.4 (3)	147.0 (15)
31	**M30** x 3.5	20	70	45	15	12	49.0 (5)	294.1 (30)

*** Red products are high force in the table.**
*** Blue products are medium force in the table.**

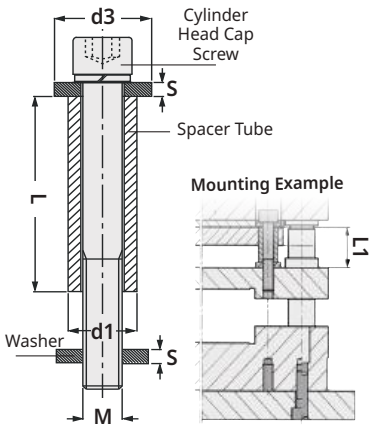
Order: **PS1.** Series

Material: Case 1.7220
Pin: 1.1273 / HRC 36 - 40

Order: **PS2.** Series

Code: **G71**

Spring and Spacer Unit

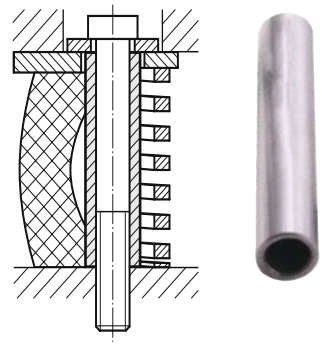


d1	L1	d3	L	S	M
13	33	18	29	4	M8 x 50
	43		39		M8 x 60
	53		49		M8 x 70
	63		59		M8 x 80
	73		69		M8 x 90
15	33	20	29	4	M10 x 60
	43		39		M10 x 70
	53		49		M10 x 80
	63		59		M10 x 90
	73		69		M10 x 100

Order:
G71. d1 x L1

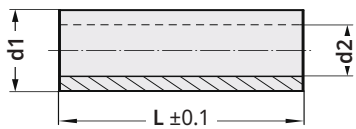
Material: 1.7131
Hardness: 58±2 HRC

Assembly of Spring and Spacer Unit:
Spring and Spacer Units are ground equally after mounted to punch retainer plate. When punches are ground due to abrasion, for loosing unit as 0.1 mm the length of junction should adjust.
Note: This product is with o-ring and o-ring should be removed before mounting.

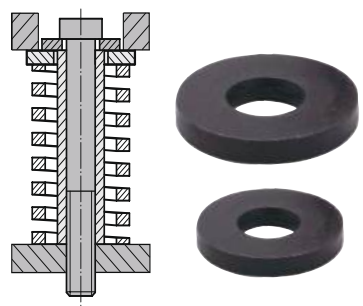


Spacer Tube

Code: **G71B**

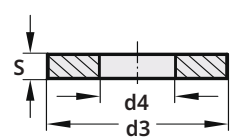


Order Code	d1	L	d2
G71B 1329	13	29	8.2
G71B 1339		39	8.2
G71B 1349		49	8.2
G71B 1359		59	8.2
G71B 1369		69	8.2
G71B 1529	15	29	10.2
G71B 1539		39	10.2
G71B 1549		49	10.2
G71B 1559		59	10.2
G71B 1569		69	10.2

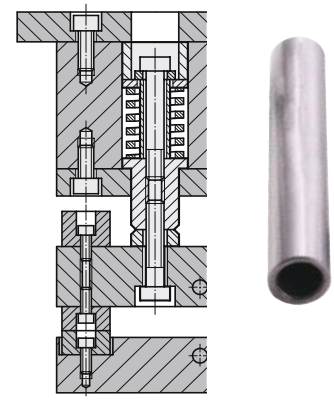


Washer

Code: **G71P**

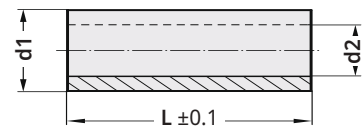


Order Code	d1	L	d2
G71P 18	18	8.4	4
G71P 20	20	10.5	4



Spacer Tube

Code: **G71Y**



d1	L	d2
10 (Spring Ø 20)	20	6.5
	25	
	30	
	32	
	40	
	50	
	63	
	80	
	100	
12 (Spring Ø 25)	20	8.5
	25	
	30	
	40	
	50	
	63	
	80	
	100	
	125	
	140	
16 (Spring Ø 32)	30	11
	40	
	50	
	63	
	80	
	100	
	125	
	140	
	160	

d1	L	d2
20 (Spring Ø 40)	30	13
	40	
	50	
	63	
	80	
	100	
	125	
	140	
	160	
	200	
25 (Spring Ø 50)	40	17
	50	
	63	
	80	
	100	
	125	
	140	
	160	
	200	
	250	
38 (Spring Ø 63)	63	25
	80	
	100	
	125	
	140	
	160	
	200	
	250	

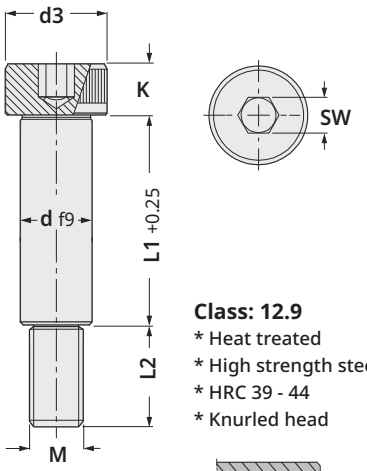
Order:
G71Y. d1 x L

Material: 1.7131
Hardness: 58±2 HRC

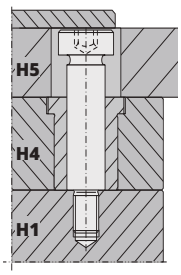
Shoulder Screw

ISO 7379 / Class: 12.9

Code: **G39**

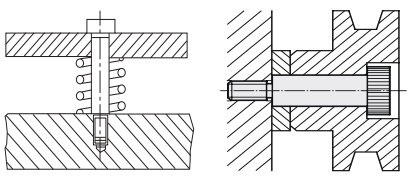


Class: 12.9
* Heat treated
* High strength steel
* HRC 39 - 44
* Knurled head



Impact test:
KCU 15 J Min.
Elasticity:
A = 8% Min.
Tensile stress:
Rm= 1200 N / mm^2

Mounting Example



Order:
G39. M x d x L1

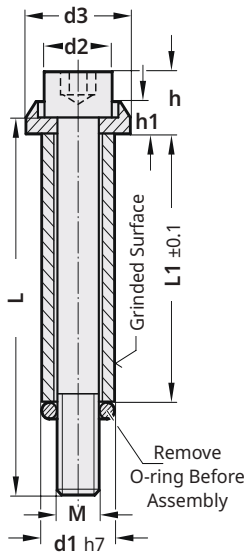
In Spring Use (steel / polyurethane spring):
For precise and secure placement in spring use, also suitable to setting position to injection mould plates.Our production is available in desired dimensions materials and lengths.
Spring working area: h8
Yield stress: Rp = 1080 N / mm^2

d	L1	M	d3	L2	K	SW
6	10	M5	10	9.5	4.5	3
	12					
	16					
	20					
	25					
	30					
	35					
	40					
	45					
	50					
	55					
	60					
8	10	M6	13	11	5.5	4
	12					
	16					
	20					
	25					
	30					
	35					
	40					
	45					
	50					
	55					
	60					
	65					
	70					
	80					
	90					
	100					
10	16	M8	16	13	7	5
	20					
	25					
	30					
	35					
	40					
	45					
	50					
	55					
	60					
	65					
	70					
	80					
	90					
	100					

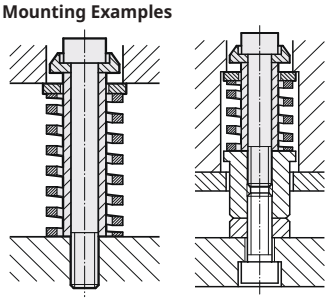
d	L1	M	d3	L2	K	SW
12	16	M10	18	16	9	6
	20					
	25					
	30					
	35					
	40					
	45					
	50					
	55					
	60					
	65					
	70					
	80					
	90					
	100					
	120					
16	30	M12	24	18	11	8
	35					
	40					
	45					
	50					
	55					
	60					
	65					
	70					
	80					
	90					
	100					
	120					
20	40	M16	30	22	14	10
	45					
	50					
	55					
	60					
	65					
	70					
	80					
	90					
	100					
	120					
24	50	M20	36	27	16	12
	55					
	60					
	65					
	70					
	80					
	90					
	100					
	120					

Code: **G146**

Spring and Spacer Unit



Mounting Examples



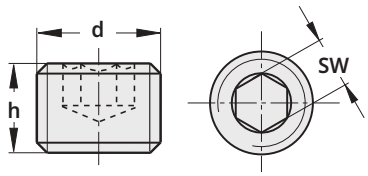
Order:
G146. M x d1 x L1

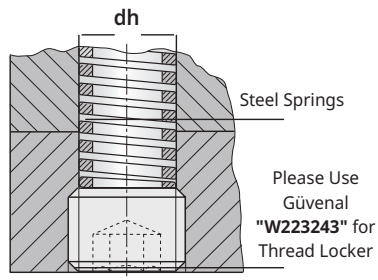
Spring and Spacer Unit: Since it is ground, it provides very precision length setting that can be adjusted. Different usage types can be created (reference: mounting examples). External diameter is ground at h7 tolerance. It is with cylinder head cap screw. O-ring should be removed before mounting.
Tensile Force: 1200 -1300 n / mm²
Material: Cyl.Head Cap Screw / 12.9
Tube: 1.7131 (58 HRC)

d1	M	L1	L	d2	d3	h	h1
10	M6	20	35	10	15	10	5.5
		25	40				
		30	45				
		35	50				
		40	55				
		45	60				
		50	65				
		55	70				
		60	80				
		70	90				
		80	100				
		90	110				
12.5	M8	30	45	13	19	13	6.5
		35	50				
		40	55				
		45	60				
		50	65				
		55	70				
		60	80				
		70	90				
		80	100				
		90	110				
		100	120				
15	M10	30	50	16	23	15	7.5
		35	55				
		40	60				
		45	65				
		50	70				
		55	75				
		60	80				
		70	90				
		80	100				
		90	110				
		100	120				
		120	140				
17.5	M12	40	60	18	27	18	9
		45	65				
		50	70				
		55	80				
		60	90				
		70	100				
		80	110				
		90	120				
		100	130				
		110	140				
		120	150				
		140	180				
23	M16	50	80	24	34	24	11
		60	90				
		70	100				
		80	110				
		90	120				
		100	130				
		110	140				
		120	150				
		140	180				
		150	180				
		160	200				

Code: **G145**

Compression Spring Set Screw





d (thread)	Spring Dia.	dh (slot)	h	SW
M12 x 1.5	10	10.5	10	6
M14 x 1.5	12.5	12.5	10	6
M18 x 1.5	16	16.5	10	8
M22 x 1.5	20	20.5	10	8
M28 x 1.5	25	26.5	12	10
M35 x 1.5	32	33.5	12	10
M42 x 1.5	40	40.5	12	10

Order:
G145. d

Material: 1.0503 (C45)

These products can be used as adjustable spring stoppers. Spring tension can be adjusted from bottom plug (set screw) with allen without doing any dismantles process. Steel springs can be changed from bottom plug (set screw) slot without dismantling die / mould. Open hole should be created instead of blind hole to place spring.

Some Images from GÜVENAL Production Facilities

In our facilities, thousands of Güvenal components with quality assurance labels are meticulously produced every day with our passion and 49 years of experience.

→ Punch Production Facility
- 5 Axis Multi- grinding Machines

- In your custom size and standard punch orders, we ensure perfection with a precision of up to 2 microns.

→ Punch Production Facility
- 6 Axis Wire EDM Machine / 5 axis Multi-grinding

→ Punch, Die & Mould Components Production Facility
- Robot Automations

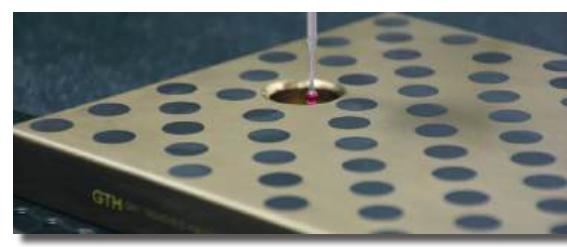
→ CNC Grinding Facility
- Ejector Blades Manufacturing

→ Die & Mould Components Production Facility
- High-tech Grinding Machines

→ Die & Mould Components Production Facility
- Precise Honing Machines with Pneumatic

- Our Components are Polished with Surface Polishing Machine at Final Stage of Production (after grinding)

→ Die & Mould Components Production Facility
- In-house Heat Treatment



→ Quality Department

Cam Units Short Definitions

Cam Units: In dies, by turning vertical motion of press to horizontal motion within the die, drilling - cutting - form processes are provided in dies. These cam units are standard compact design components, and grouped as die mounted / angular or aerial cam types. As well as standard cam models are suitable to many general usages, also special models are produced upon request. Also, upper casing holes can be finished (with reamer / H7). Also, plate lock systems or gas spring options may be selected. **Cam Units:** They can be connected to different angles - they can be worked at wide force and stroke ranges. **Giving 10% stroke tolerance is recommended.**

In Steel Casing Cam Unit:
Heat treatment is applied in shaded areas (HRC 45-55).

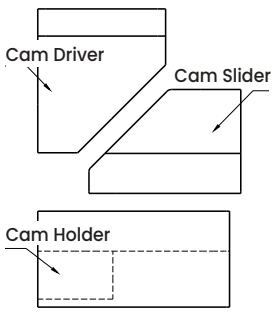
Safety and Working Conditions

Lateral loads should be avoided. Cam unit should not be exposed to dirt and burrs (friction surfaces may get damaged).

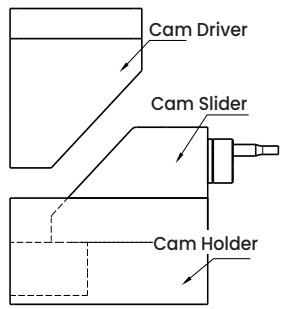
* To maintain repeated operation of cam unit, it should be secured to the die robustly.
* Steel or die gas spring used at cam units are nnsured to bring cam to same starting point at every turn at returns.
* In case of any adhesion, side guide arms are with safety system to provide bringing cam to starting point.
* When cam units are mounted with replaceable self-lubricating wear plates, they should be lubricated with thin oil regularly.
* In case of replacement of worn plates, you should be sure that all and centering elements are in their right position.
* If necessary, technical setting should be remade and fixed.
* For technical service, you can contact with our company.

Cam Units Group and Types:

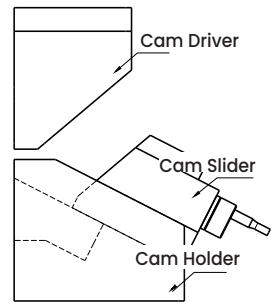
Cam Definition



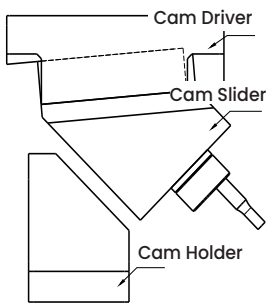
1 - Die Mounted Cams



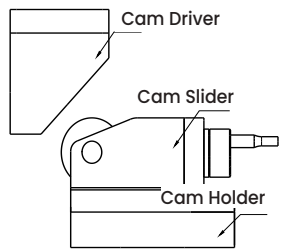
2 - Angular Cams



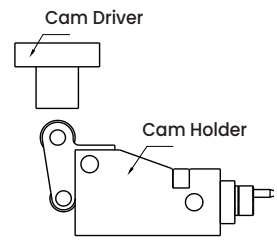
3 - Aerial Cams



4 - Roller Cams



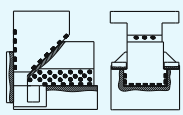
5 - Jointed Cams



Cam products selection: You can select cam products from our catalogue according to the feature of sheet metal used in your dies in production and load calculations or you can use our technical support service for this matter. The main purpose in die production is to minimize die production process in terms of time and cost and to simplify the die. This simplification can only be ensured by using standard products as far as possible. In some cases, cam units may be customized according to the operation conditions they will be used. In such cases, if you contact us about product selection or design, we can offer solutions for you.

Cast casing cam type (DK02): Standard (delivery from stock). GGG60 cast casing cam units. There are 2 models: Heat-treated and non-heat-treated cams. Standard series is non-heat-treated. **Heat-treated cams:** Are produced from hardenable steel cast. These are cams of which friction surfaces (cam holder - slider) are heat-treated.
300 - 500 grade is suitable for sheet metals press.

Steel casing cam type (DK01) : Order upon request. Cams with mono block steel casing, of which friction surfaces (lower casing and driver) are applied heat treatment. It has a feature to be used in die 400 - 650 grade and over. They work efficiently in performance 1.5 - 2 times better than load values specified in catalogue in proportion to the normal cast type cams and they give better results in high quantity productions (150.00 - 200.00 pieces / year). If periodic maintenance cleaning and lubrication is done, cams can press 1.000.000 pieces and over.

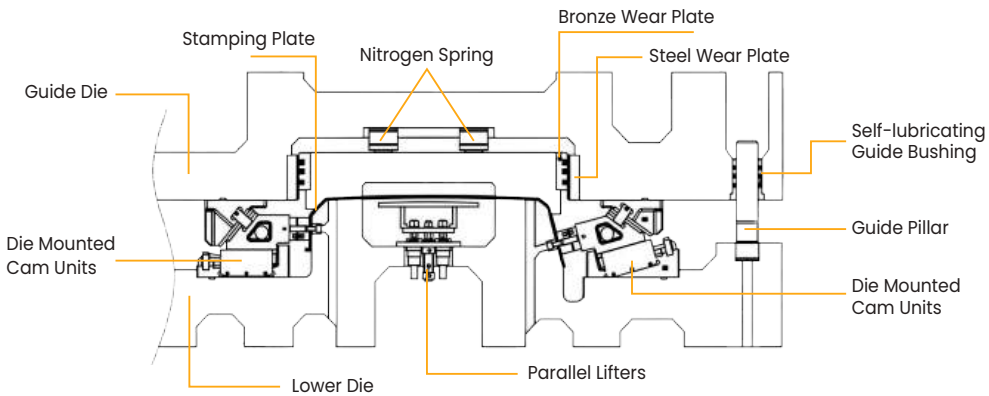


In Steel Casing Cam Unit: Heat treatment is applied in shaded areas (HRC 45-55).

Our company, which offers advanced die component solutions, manufactures **Cam Units** in the category of Die-making Components through reliable, ISO 9001-certified partners in the subcontracting industry. We ensure high-quality standards throughout all production processes. After comprehensive quality control checks are conducted at the production facilities, the products undergo a detailed final inspection by **Güvenal CMM control teams** before shipment.

Our standard Die-mounted **DK02 Cam Units** are kept in stock and are ready for immediate shipment. In addition, we offer a wide range of standard and custom-made cam units with different reference codes from the industry. All we need from you is your reference code or technical drawing / 3D model. Our expert team is happy to provide the most suitable solutions for your needs.

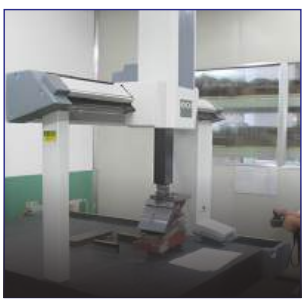
Die Mounted Cam Unit - Position Scheme

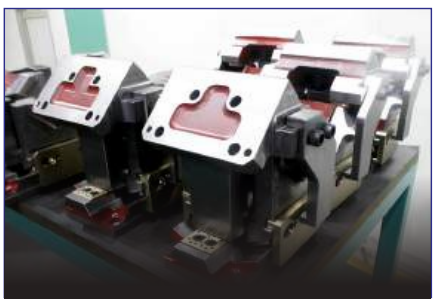
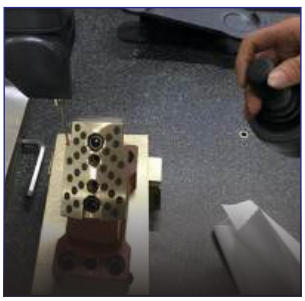


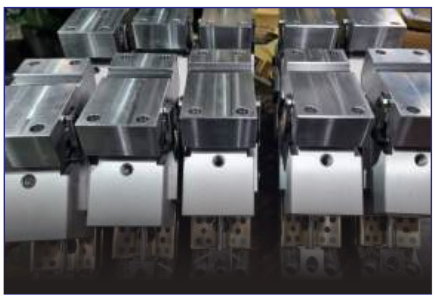
Cam Unit Types you can request quotes for

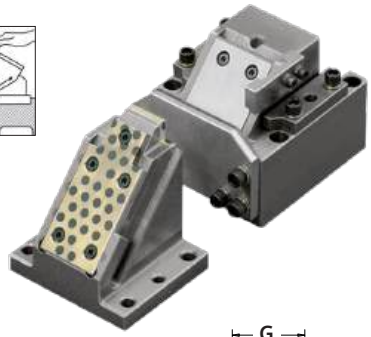
- Die Mounted Cams
- Aerial Cams
- Roller Cams
- Counter Cams
- Jointed Cams
- Non-standard Custom - Cams

From our Projects



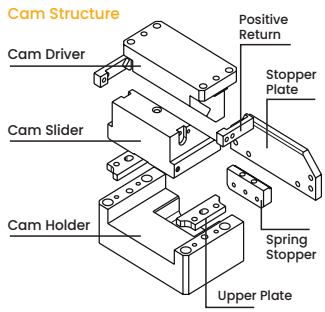


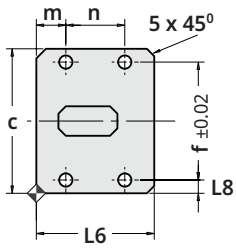


Code: **DK02**

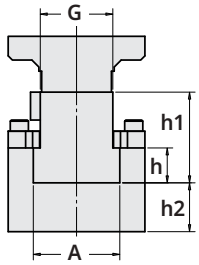
Die Mounted Cam Unit

(Ref.: SKC)

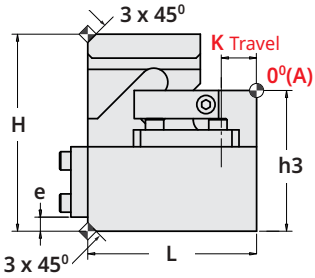




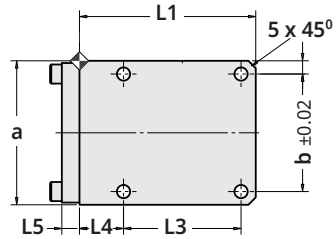
Cam Driver



Front View of Cam

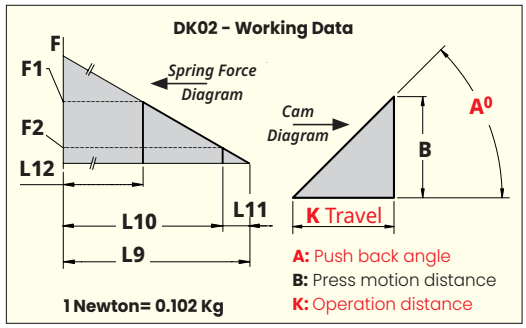


Side View of Cam



Cam Holder

"Order" DK02	Working & Spring Force							Cam Diagram		
	F N/mm	F1 kg.	F2 kg.	L9 mm	L11 mm	L10 mm	L12 mm	A⁰ Angle	B mm	K Travel
52 25	9	60.7	14.7	70	8	62	37	45⁰	25	25
52 40	6.3	61.4	10.2	100	8	92	52		40	40
52 60	4.2	62.8	11.2	150	13	137	77		60	60
65 40	7.8	76.8	12.8	100	8	92	52	45⁰	40	40
65 60	5.2	77.4	13.8	150	13	137	77		60	60
100 40	11.8	115	19	100	8	92	52	45⁰	40	40
100 60	7.8	116.8	20.8	150	13	137	77		60	60
100 80	7.1	132.5	17.3	200	12	188	108		80	80
150 40	19.2	188	32	100	8	92	52	45⁰	40	40
150 60	12.7	190	34	150	13	137	77		60	60
200 40	19.2	282	47	100	8	92	52	45⁰	40	40
200 60	12.7	285	51	150	13	137	77		60	60
250 40	25.1	369	62	100	8	92	52	45⁰	40	40
250 60	16.7	372	66	150	13	137	77		60	60
300 40	25.1	369	62	100	8	92	52	45⁰	40	40
300 60	16.7	372	66	150	13	137	77		60	60



Spring Diagram (Technical Drawing) Detail

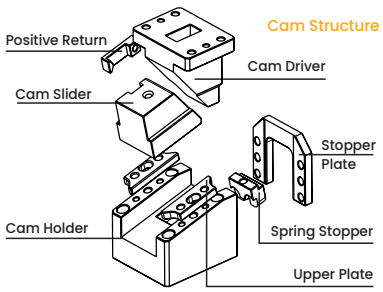
F: Load = N / mm (Final load)
F1: Final load = (Process pressure spring force)
F2: Initial load N = Spring initial loading
L1: Spring free length mm = Open spring length
L2: Spring initial loading mm = Clamping
L3: Spring length under first load mm
L4: Spring length under last load

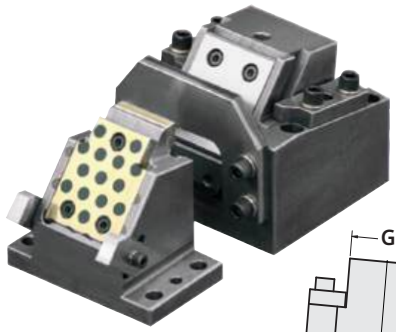
Optional (Upon request)

P: Self-lubricating wear plate model
F8: Front Holes Ø 8 H7 finish pin hole may be changed
GY: Gas spring may be used.
I: Heat treatment may be applied.

Order Example: DK02.65 40

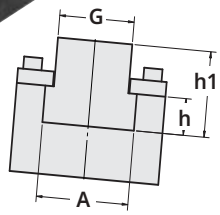
"Order" DK02	Working Force		Cam W kg.	Cam Front View					Cam Side View					Cam Driver						Cam Holder					
	Standard	Allowble		G	A	h	h1	h2	K	L	H	h3	e	c	f	m	n	L6	L8	a	b	L1	L3	L4	L5
52 25	1.5 Ton	3 Ton	8	52	62	25	65	35	25	120	140	100	10	98	80	20	40	80	9	98	80	120	80	30	12
52 40			8						40	135							50	90				135	95		
52 60			14						60	180							70	110				180	140		
65 40	2 Ton	4 Ton	20	65	80	30	70	45	40	140	160	115	25	130	105	20	60	100	12.5	130	105	145	100	30	12
65 60			21						60	190							70	110				180	125	40	
100 40	3 Ton	6 Ton	37	100	120	40	100	50	40	190	200	150	30	165	140	20	80	120	12.5	175	150	190	130	45	16
100 60			38						60	210							100	140							
100 80			44						80	250			10				110	150				220	160		15
150 40	6 Ton	9 Ton	63	150	180	40	100	70	40	190	220	170	45	230	200	20	80	120	15	260	220	190	125	45	19
150 60			69						60	210							100	140				200	135		
200 40	8 Ton	12 Ton	82	200	230	40	110	70	40	200	240	180	40	280	250	20	90	130	15	310	270	200	135	45	20
200 60			84						60	220							110	150				210	145		
250 40	10 Ton	15 Ton	106	250	280	50	130	80	40	210	270	210	50	330	300	20	100	140	15	360	320	200	135	45	20
250 60			127						60	230							120	160				220	155		
300 40	12 Ton	18 Ton	106	300	330	50	130	80	40	210	270	210	50	380	350	20	100	140	15	410	370	200	135	45	20
300 60			128						60	230							120	160				220	155		



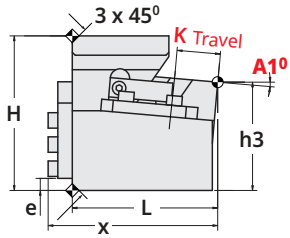


Code: **DAK02**

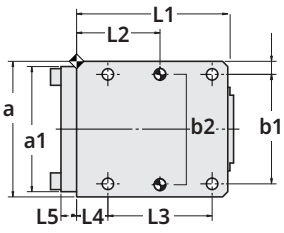
Die Mounted Angular Cam Unit



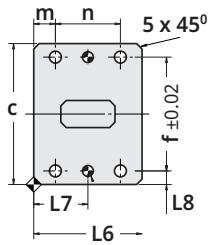
Front View



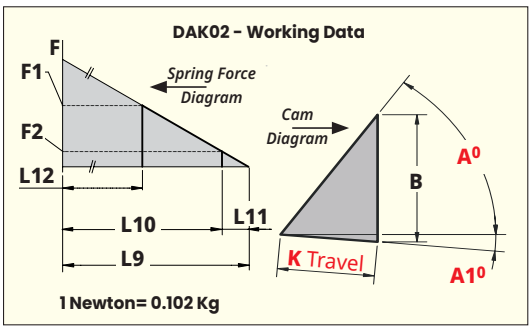
Side View



Cam Holder



Cam Driver



"Order" DAK02	Working & Spring Force							Cam Diagram			
	F N/mm	F1 kg.	F2 kg.	L9 mm	L11 mm	L10 mm	L12 mm	A⁰ Angle	A1⁰ Angle	B mm	K Travel
65 05 45	6.3	75.5	18	125	14	111	66	55⁰	5⁰	67.9	45
65 05 70	5.6	99	19.4	175	17	158	88			105.7	70
65 10 45	6.3	75.5	18	125	14	111	66	50⁰	10⁰	60.6	45
65 10 70	5.6	99	19.4	175	17	158	88			94.3	70
65 15 45	6.3	75.5	18	125	14	111	66	45⁰	15⁰	55.1	45
65 15 70	5.6	99	19.4	175	17	158	88			85.7	70
65 20 45	6.3	75.5	18	125	14	111	66	40⁰	20⁰	50.8	45
65 20 70	5.6	99	19.4	175	17	158	88			79.1	70
100 05 45	9.4	113	27	125	14	111	66	55⁰	5⁰	67.9	45
100 05 70	6.8	117	20	175	14.5	161	91			105.7	70
100 10 45	9.4	113	27	125	14	111	66	50⁰	10⁰	60.6	45
100 10 70	6.8	117	20	175	14.5	161	91			94.3	70
100 15 45	9.4	113	27	125	14	111	66	45⁰	15⁰	55.1	45
100 15 70	6.8	117	20	175	14.5	161	91			85.7	70
100 20 45	9.4	113	27	125	14	111	66	40⁰	20⁰	50.8	45
100 20 70	6.8	117	20	175	14.5	161	91			79.1	70
150 05 45	15.3	184	44	125	14	111	66	55⁰	5⁰	67.9	45
150 05 70	11	188	32	175		161	91			105.7	70
150 10 45	15.3	184	44	125	14	111	66	50⁰	10⁰	60.6	45
150 10 70	11	188	32	175		161	91			94.3	70
150 15 45	15.3	184	44	125	14	111	66	45⁰	15⁰	55.1	45
150 15 70	11	188	32	175		161	91			85.7	70
150 20 45	15.3	184	44	125	14	111	66	40⁰	20⁰	50.8	45
150 20 70	11	188	32	175		161	91			79.1	70

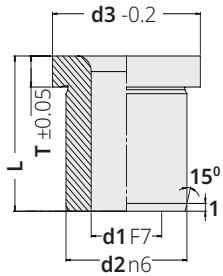
"Order" DAK02	Working Force		Cam W	Cam Front View				Cam Side View						Cam Driver							Cam Holder								
	Standard	Allowble	kg.	G	A	h	h1	K	L	x	H	h3	e	c	f	m	n	L6	L7	L8	a	a1	b1	b2	L1	L2	L3	L4	L5
65 05 45	2 Ton	4 Ton	19	65	80	30	70	45	151	176	160	112	12.5	130	105	20	60	100	50	12.5	130	120	105	105	145	80	100	30	15
65 05 70			22.2					70	195	220	170	123	25												180	65	125	40	
65 10 45	2 Ton	4 Ton	20	65	80	30	70	45	155	180	160	109	25	130	105	202	60	100	50	12.5	130	120	105	105	145	79	100	30	15
65 10 70			20.5					70	199	224	170	111													180	65	125	40	
65 15 45	2 Ton	4 Ton	22	65	80	30	70	45	158	183	170	105	25	130	105	20	60	100	50	12.5	130	120	105	105	145	80	100	30	15
65 15 70								70	202	227		104	40				70	110	55						180	65	125	40	
65 20 45	2 Ton	4 Ton	22	65	80	30	70	45	160	185	170	101	30	130	105	20	60	100	50	12.5	130	120	105	105	145	80	100	30	15
65 20 70			21					70	203	228		96	40				70	110	55						180	65	125	40	
100 05 45	4 Ton	8 Ton	33	100	120	40	90	45	172	199	200	145	27.5	165	140	20	60	100	50	12.5	175	165	150	140	160	90	105	40	15
100 05 70			38					70	207	234		147	30				80	120	60					150	190	70	130	45	
100 10 45	4 Ton	8 Ton	33	100	120	40	90	45	178	205	200	135	30	165	140	20	60	100	50	12.5	175	165	150	140	160	90	105	40	15
100 10 70			38					70	213	240		134					80	120	60					150	190	70	130	45	
100 15 45	4 Ton	8 Ton	33	100	120	40	90	45	183	210	200	129	32.5	165	140	20	70	110	55	12.5	175	165	150	140	160	90	105	40	15
100 15 70			38					70	217	244		130	35				90	130	65					150	190	70	130	45	
100 20 45	4 Ton	8 Ton	32	100	120	40	90	45	186	213	200	118	35	165	140	20	70	110	55	12.5	175	165	150	140	160	90	105	40	15
100 20 70			39					70	219	246		121	45				90	130	65					150	190	70	130	45	
150 05 45	6.6 Ton	10 Ton	62	150	180	40	100	45	193	229	220	159	30	230	200	20	70	110	55	15	260	240	220	210	190	105	125	45	20
150 05 70			73					70	218	254		167	40				90	130	65						200	120	135		
150 10 45	6.6 Ton	10 Ton	63	150	180	40	100	45	200	236	220	152	40	230	200	20	70	110	55	15	260	240	220	210	190	105	125	45	20
150 10 70			73					70	224	260		153					90	130	65						200	120	135		
150 15 45	6.6 Ton	10 Ton	65	150	180	40	100	45	205	240	220	144	40	230	200	20	80	120	60	15	260	240	220	210	190	105	125	45	20
150 15 70			77					70	229	265	230	153	55				100	140	70						200	120	135		
150 20 45	6.6 Ton	10 Ton	66	150	180	40	100	45	208	244	220	136	40	230	200	20	80	120	60	15	260	240	220	210	190	105	125	45	20
150 20 70			75					70	232	268	230	137	55				100	140	70						200	120	135		

Large Stock Availability

Code: **G163**

Drill Bush - Headed

DIN 172, Form A



d1	L	d2	d3	T
0.5	6	3	6	2
1	6	3	6	2
	9			
1.1	6	4	7	2
	9			
1.2	6	4	7	2
	9			
1.3	6	4	7	2
	9			
1.4	6	4	7	2
	9			
1.5	6	4	7	2
	9			
1.6	6	4	7	2
	9			
1.7	6	4	7	2
	9			
1.8	6	4	7	2
	9			
1.9	6	5	7	2
	9			
2	6	5	8	2
	9			
2.1	6	5	8	2
	9			
2.2	6	5	8	2
	9			
2.3	6	5	8	2
	9			
2.4	6	5	8	2
	9			
2.5	6	5	8	2
	9			
2.6	6	5	8	2
	9			
2.7	8	6	9	2.5
	12			
2.8	8	6	9	2.5
	12			
2.9	8	6	9	2.5
	12			
3	8	6	9	2.5
	12			
	16			
3.1	8	6	9	2.5
	12			
	16			
3.2	8	6	9	2.5
	12			
	16			
3.3	8	6	9	2.5
	12			
	16			
3.4	8	7	10	2.5
	12			
	16			
3.5	8	7	10	2.5
	12			
	16			
3.6	8	7	10	2.5
	12			
3.7	8	7	10	2.5
	12			
3.8	8	7	10	2.5
	12			
3.9	8	7	10	2.5
	12			
4	8	7	10	2.5
	12			
	16			
4.1	8	8	11	2.5
	12			
4.2	8	8	11	2.5
	12			
4.3	8	8	11	2.5
	12			
4.4	8	8	11	2.5
	12			
4.5	8	8	11	2.5
	12			
4.6	8	8	11	2.5
	12			
4.7	8	8	11	2.5
	12			
4.8	8	8	11	2.5
	12			
5	8	8	11	2.5
	12			
	16			
5.1	10	10	13	3
	16			
5.2	10	10	13	3
	16			
5.3	10	10	13	3
	16			
5.4	10	10	13	3
	16			
5.5	10	10	13	3
	16			
	20			
5.6	10	10	13	3
	16			
5.7	10	10	13	3
	16			
5.8	10	10	13	3
	16			
5.9	10	10	13	3
	16			
6	10	10	13	3
	16			
	20			
6.1	10	12	15	3
	16			
	20			
6.2	10	12	15	3
	16			
	20			
6.3	10	12	15	3
	16			
	20			
6.4	10	12	15	3
	16			
	20			
6.5	10	12	15	3
	16			
	20			
7	10	12	15	3
	16			
	20			
7.5	10	12	15	3
	16			
	20			
8	10	12	15	3
	16			
	20			
8.5	12	15	18	3
	20			
	25			
9	12	15	18	3
	20			
	25			
9.5	12	15	18	3
	20			
	25			
10	12	15	18	3
	20			
	25			
10.2	12	18	22	4
	20			
	25			
10.5	12	18	22	4
	20			
	25			
11	12	18	22	4
	20			
	25			
12	12	18	22	4
	20			
	25			
13	16	22	26	4
	28			
	36			
14	16	22	26	4
	28			
	36			
15	16	22	26	4
	28			
	36			
16	16	26	30	4
	28			
	36			
17	16	26	30	4
	28			
	36			
18	16	26	30	4
	28			
	36			
19	20	30	34	5
	36			
	45			
20	20	30	34	5
	36			
	45			
22	20	30	34	5
	36			
	45			
25	20	35	39	5
	36			
	45			

Order:
G163. d1 x L

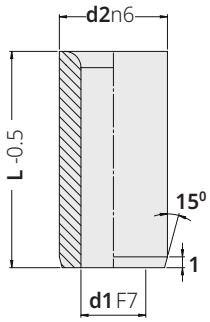
Material: 1.5715
Hardness: 60±2 HRC

Large Stock Availability

Code: **G164**

Drill Bush - Plain

DIN 179, Form A

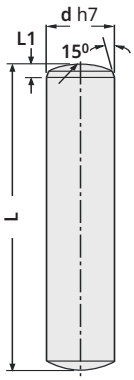


d1	L	d2
0.5	6	3
0.6	6	3
0.7	6	3
0.8	6	3
0.9	6	3
1	6	3
	9	
1.1	6	4
	9	
1.2	6	4
	9	
1.3	6	4
	9	
1.4	6	4
	9	
1.5	6	4
	9	
1.6	6	4
	9	
1.7	6	4
	9	
1.8	6	4
	9	
1.9	6	5
	9	
2	6	5
	9	
2.1	6	5
	9	
2.2	6	5
	9	
2.3	6	5
	9	
2.4	6	5
	9	
2.5	6	5
	9	
2.6	6	5
	9	
2.7	8	6
	12	
2.8	8	6
	12	
2.9	8	6
	12	
3	8	6
	12	
	16	
3.1	8	6
	12	
	16	
3.2	8	6
	12	
	16	
3.3	8	6
	12	
	16	
3.4	8	7
	12	
	16	
3.5	8	7
	12	
	16	
3.6	8	7
	12	
3.7	8	7
	12	
3.8	8	7
	12	
3.9	8	7
	12	
4	8	7
	12	
	16	
4.1	8	8
	12	
4.2	8	8
	12	
4.3	8	8
	12	
4.4	8	8
	12	
4.5	8	8
	12	
4.6	8	8
	12	
4.7	8	8
	12	
4.8	8	8
	12	
5	8	8
	12	
	16	
5.1	10	10
	16	
5.2	10	10
	16	
5.3	10	10
	16	
5.4	10	10
	16	
5.5	10	10
	16	
	20	
5.6	10	10
	16	
5.7	10	10
	16	
5.8	10	10
	16	
5.9	10	10
	16	
6	10	10
	16	
	20	
6.1	10	12
	16	
	20	
6.2	10	12
	16	
	20	
6.3	10	12
	16	
	20	
6.4	10	12
	16	
	20	
6.5	10	12
	16	
	20	
7	10	12
	16	
	20	
7.5	10	12
	16	
	20	
8	10	12
	16	
	20	
8.5	12	15
	20	
	25	
9	12	15
	20	
	25	
9.5	12	15
	20	
	25	
10	12	15
	20	
	25	
10.2	12	18
	20	
	25	
10.5	12	18
	20	
	25	
11	12	18
	20	
	25	
12	12	18
	20	
	25	
13	16	22
	28	
	36	
14	16	22
	28	
	36	
15	16	22
	28	
	36	
16	16	26
	28	
	36	
17	16	26
	28	
	36	
18	16	26
	28	
	36	
19	20	30
	36	
	45	
20	20	30
	36	
	45	
22	20	30
	36	
	45	
25	20	35
	36	
	45	

Order:
G164. d1 x L

Material: 1.5715
Hardness: 60±2 HRC

Tolerance **h7**



Dowel Pin Code: DTPH7

Straight - DIN 6325 / ISO 8734

d	L	L1	r
Ø 5	10	1.2	5
	16		
	20		
	24		
	30		
	36		
	40		
	45		
	50		
	55		
	60		
	70		
	80		
Ø 6	10	1.5	6
	16		
	20		
	24		
	30		
	36		
	40		
	45		
	50		
	55		
	60		
	70		
	80		
	90		
	100		
Ø 8	10	2.0	8
	16		
	20		
	24		
	30		
	36		

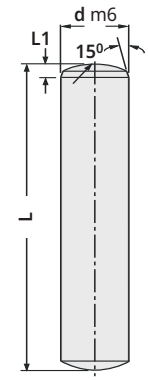
d	L	L1	r
Ø 8	40	2.0	8
	45		
	50		
	55		
	60		
	70		
	80		
	90		
	100		
	120		
Ø10	20	2.5	10
	24		
	30		
	36		
	40		
	45		
	50		
	55		
	60		
	70		
	80		
	90		
	100		
	120		
	140		
Ø12	20	3.0	12
	24		
	30		
	36		
	40		
	45		
	50		
	55		
	60		
	70		
	80		
	90		
	100		
	120		
	140		

d	L	L1	r
Ø14	30	3.5	14
	36		
	40		
	45		
	50		
	60		
	70		
	80		
	90		
	100		
	120		
	140		
Ø16	30	4.0	16
	36		
	40		
	45		
	50		
	60		
	70		
	80		
	90		
	100		
	120		
	140		
Ø20	30	5.0	20
	36		
	40		
	45		
	50		
	55		
	60		
	70		
	80		
	90		
	100		
	120		
	140		
	150		

Order: **DTPH7.** d x L

Material: Steel
Hardness: 58 - 62 HRC

Tolerance **m6**



Dowel Pin Code: DTPM6

Straight - DIN 6325 / ISO 8734

d	L	L1	r
Ø 3	10	0.8	3
	16		
	20		
	24		
	30		
	36		
Ø 4	10	1.0	4
	16		
	20		
	24		
	30		
	36		
	40		
	45		
	50		
	55		
	60		
Ø 5	10	1.2	5
	16		
	20		
	24		
	30		
	36		
	40		
	45		
	50		
	55		
	60		
	70		
	80		
Ø 6	10	1.5	6
	16		
	20		
	24		
	30		
	36		
	40		
	45		
	50		
	55		
	60		
	70		
	80		
	90		
	100		

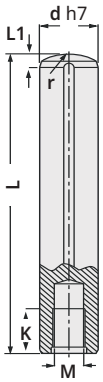
d	L	L1	r
Ø 8	10	2.0	8
	16		
	20		
	24		
	30		
	36		
	40		
	45		
	50		
	55		
	60		
	70		
	80		
	90		
	100		
	120		
Ø10	20	2.5	10
	24		
	30		
	36		
	40		
	45		
	50		
	55		
	60		
	70		
	80		
	90		
	100		
	120		
	140		
Ø12	20	3.0	12
	24		
	30		
	36		
	40		
	45		
	50		
	55		
	60		
	70		
	80		
	90		
	100		
	120		
	140		

d	L	L1	r
Ø14	30	3.5	14
	36		
	40		
	45		
	50		
	60		
	70		
	80		
	90		
	100		
	120		
	140		
Ø16	30	4.0	16
	36		
	40		
	45		
	50		
	60		
	70		
	80		
	90		
	100		
	120		
	140		
Ø20	30	5.0	20
	36		
	40		
	45		
	50		
	55		
	60		
	70		
	80		
	90		
	100		
	120		
	140		
	150		

Order: **DTPM6.** d x L

Order Example: **DTPM6.** 10 x 30

Tolerance
h7



Code: **CTPH7**

Dowel Pin with Internal Thread

with Air Channel - DIN 7979 / ISO 8735

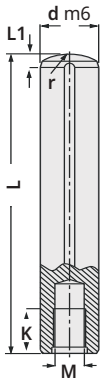
d	L	L1	K	M	r
Ø 6	20	2.1	6	M4	6
	24				
	30				
	36				
	40				
	45				
	50				
	55				
	60				
	70				
	80				
	90				
	100				
Ø 8	20	2.6	8	M5	8
	24				
	30				
	36				
	40				
	45				
	50				
	55				
	60				
	70				
	80				
	90				
	100				
	120				
Ø10	20	3	10	M6	10
	24				
	30				
	36				
	40				
	45				
	50				
	55				
	60				
	70				
	80				
	90				
	100				
	120				

d	L	L1	K	M	r
Ø12	20	3.8	10	M6	12
	24				
	30				
	36				
	40				
	45				
	50				
	55				
	60				
	70				
	80				
	90				
	100				
	120				
Ø14	30	4	12	M8	14
	36				
	40				
	45				
	50				
	60				
	70				
	80				
	90				
	100				
	120				
	140				
Ø16	30	4.7	12	M8	16
	36				
	40				
	45				
	50				
	60				
	70				
	80				
	90				
	100				
	120				
	140				
Ø20	30	6	16	M10	20
	36				
	40				
	50				
	60				
	70				
	80				
	90				
	100				
	120				
	150				

Material: Steel
Hardness: 58 - 62 HRC

Order:
CTPH7. d x L

Tolerance
m6



Code: **CTPM6**

Dowel Pin with Internal Thread

with Air Channel - DIN 7979 / ISO 8735

d	L	L1	K	M	r
Ø 5	20	1.7	6	M3	5
	24				
	30				
	36				
	40				
	45				
	50				
	55				
	60				
	70				
	80				
Ø 6	20	2.1	6	M4	6
	24				
	30				
	36				
	40				
	45				
	50				
	55				
	60				
	70				
	80				
	90				
	100				
Ø 8	20	2.6	8	M5	8
	24				
	30				
	36				
	40				
	45				
	50				
	55				
	60				
	70				
	80				
	90				
	100				
	120				
Ø10	20	3	10	M6	10
	24				
	30				
	36				
	40				
	45				
	50				
	55				
	60				
	70				
	80				
	90				
	100				
	120				

d	L	L1	K	M	r
Ø12	20	3.8	10	M6	12
	24				
	30				
	36				
	40				
	45				
	50				
	55				
	60				
	70				
	80				
	90				
	100				
	120				
Ø14	30	4	12	M8	14
	36				
	40				
	45				
	50				
	60				
	70				
	80				
	90				
	100				
	120				
	140				
Ø16	30	4.7	12	M8	16
	36				
	40				
	45				
	50				
	60				
	70				
	80				
	90				
	100				
	120				
	140				
Ø20	30	6	16	M10	20
	36				
	40				
	50				
	60				
	70				
	80				
	90				
	100				
	120				
	150				

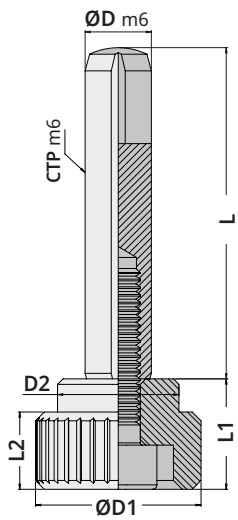
Order:
CTPM6. d x L

NEW

Positioning Unit

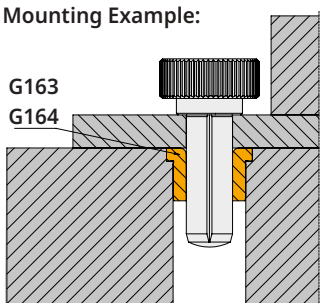
Code: G174

"Positioning Units" are cylindrical machine components used for pivoting and centering purposes in the mould-making industry, machine manufacturing, and mechanical assemblies. Depending on the assembly, they can be either a loose or tight fit. The handle located on the top of the pin allows for quick and practical assembly (disassembly / installation).



3D CAD FILES GUVENAL
Download
www.guvenal.net

Mounting Example:

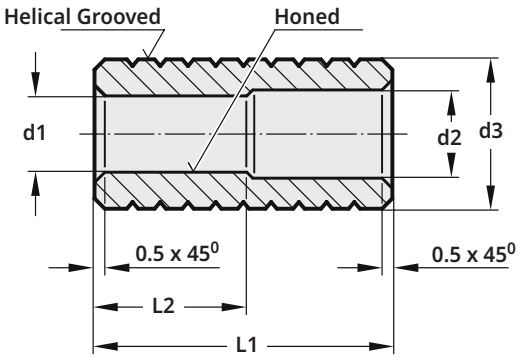


Order Code	D	L	D1	L1	D2	L2
G174.6.20	6	20	15	10	11	7
G174.6.24		24				
G174.6.30		30				
G174.6.40		40				
G174.6.50		50				
G174.6.60		60				
G174.8.20	8	20	20	12	14	8
G174.8.24		24				
G174.8.30		30				
G174.8.36		36				
G174.8.40		40				
G174.8.50		50				
G174.8.60		60				
G174.8.70		70				
G174.8.80		80				
G174.10.20	10	20	24	14	16	10
G174.10.24		24				
G174.10.30		30				
G174.10.40		40				
G174.10.45		45				
G174.10.50		50				
G174.10.60		60				
G174.10.70		70				
G174.10.80		80				
G174.10.100		100				
G174.12.24	12	24	24	14	16	10
G174.12.30		30				
G174.12.40		40				
G174.12.50		50				
G174.12.60		60				
G174.12.70		70				
G174.12.80		80				
G174.12.100		100				
G174.14.40	14	40	30	17	20	12
G174.14.50		50				
G174.14.60		60				
G174.14.70		70				
G174.14.80		80				
G174.14.100		100				
G174.16.30	16	30	30	17	20	12
G174.16.40		40				
G174.16.45		45				
G174.16.50		50				
G174.16.60		60				
G174.16.70		70				
G174.16.80		80				
G174.16.100		100				
G174.16.120		120				

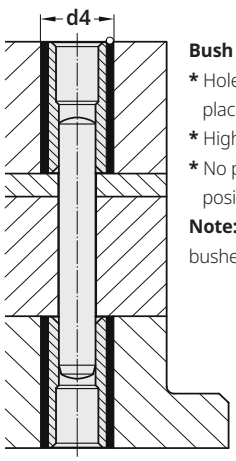
Bush for Dowel Pin, with Bonding

Code: **YTB**

*** YTB products are suitable for "m6 tolerance dowel pins".**



Order Code	d1	d2	d3	d4	L1	L2
YTB625	**6**	7	10	12	25	12
YTB830	**8**	9	12	14	30	16
YTB1036	**10**	11	16	18	36	20



Bush for Dowel Pin, with Bonding:

***** Hole tolerance "D" gives extraction fit of bush place and provides best bush retaining.

***** High precision and hardness.

***** No problem is encountered for finding positions when replacing bushes.

Note: We do not recommend press-fit for bushes.

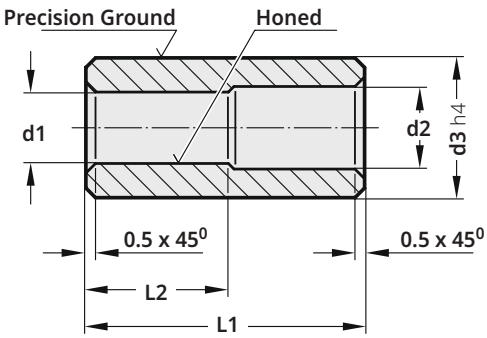
Material: 1.7131 (16MnCr 5)
Hardness: 54 - 58 HRC

Hardened liner bushes solves friction problems in soft / unhardened parts which are frequently removed and changed. They are aligned in a mutual axis with close pin fixture and bonded (with Superglue) to cutting gaps roughly opened and inserted. Liner bushes for dowel pins in hardened parts helps eliminating failure caused by heat-treatment. Retainer holes for liner dowel pin bushes should be 2 mm larger in diameter than the bush outer diameter, a rough finish is desired. Following exact positioning, a superglue is used for bonding and bush mounting is completed.

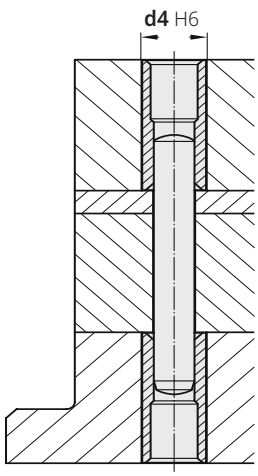
Bush for Dowel Pin, with Push Fit

Code: **CTB**

*** CTB products are suitable for "m6 tolerance dowel pins".**



Order Code	d1	d2	d3	d4	L1	L2
CTB625	**6**	7	10	10	25	12
CTB830	**8**	9	12	12	30	16
CTB1036	**10**	11	16	16	36	20



Material: 1.7131 (16MnCr 5)
Hardness: 54 - 58 HRC

Bush position is given by push fit hole tolerance H6, thus high precision is provided.

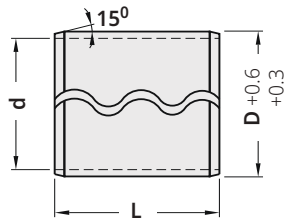
***** High precision and hardness.

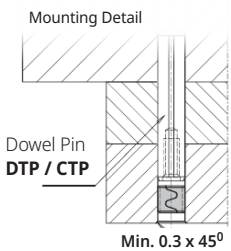
***** No problem is encountered for finding positions when replacing bushes.

Note: We do not recommend press-fit for bushes.

Dowel Pin Retaining Sleeve Code: TPS

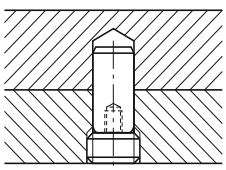
Used for positioning of dowel pins in hole at the desired level or as a dowel pin stopper preventing extraction.





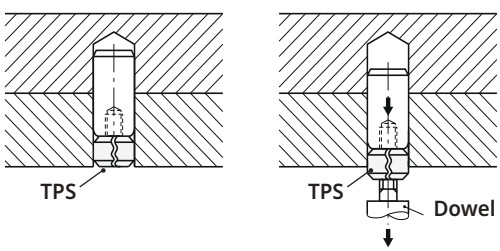
Order Code	D	d	L	Kgf	Pull-out Strength
TPS06	6	4.4	6	40	392 N
TPS08	8	5.6	8	140	1373 N
TPS10	10	6.4	12	240	2354 N
TPS12	12	8.0	12	180	1765 N
TPS16	16	11.0	12	145	1422 N

When "hex-socket set screw" is used:



The advantage of **"TPS"** product when compared with usage of hex-socket set screw:
* Tapping is not necessary.
* It is possible to extract the dowel pins directly when required.

When "dowel pin retaining sleeve" is used:

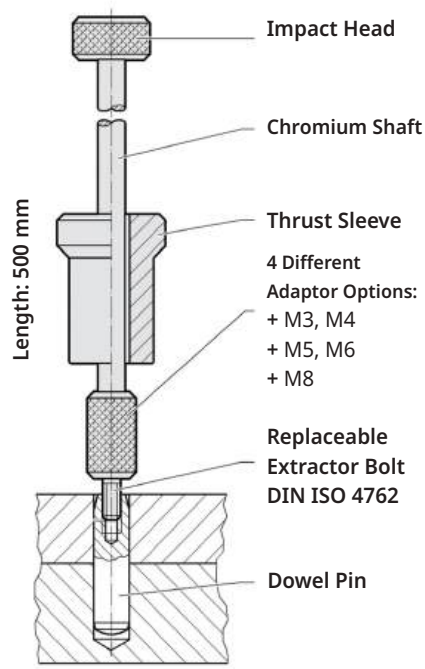


Parts are centered with dowel pins in dies & moulds.
After inserting / removing processes, these dowel pins creates gaps and they can be easily inserted / removed. This situation may cause the pin be removed and fall into the die / mould and damage to die / mould parts.
In order to avoid such situations, after inserting dowel pin in mounting place, the dowel pin retaining sleeve is attached. It provides safety against falling of pin. It is used as ring in the hole for dowel pins.
Pull-out Strength: Pull-out strength is the average value of 10 time repeated pull-outs from a H7 hole. Pull-out strength will vary depending on factors and these factors include "D" measurement tolerance of retaining sleeve, surface roughness and press-fit tolerances.

Order Code: CTPC

Dowel Pin Extractor - Puller Kit

DIN EN ISO 8735 - ISO 8735 **Manual Type**



This product is designed to dismantle threaded dowel pins quickly and safely. In addition, it can be used on other threaded machine components. This extractor tool is supplied in plastic bag with adaptors between M3-M8.

Order Code: **IW3C14**

Die & Mould Mounting Kit

1 PCS. - 1/2" Air Nutrunner Tool

5 PCS. - 1/2" Allen End

Explanation	Technical Specification
Housing Material	Composit
Square Drive	1/2"
Max. Torque	1200 nm
Impact Mechanism	Twin hammer
Free Speed	7500 rpm
Standart Screw Size	19 mm
Length	185 mm
Weight	2.00 kg
Recommended Air Pressure	6.3 bar
Minimum Hose Size	10 mm
Air Consumption	184 l/min.

One of each size, a total of x5 free Allen End, are included in the kit. For additional orders, you can use the table below.

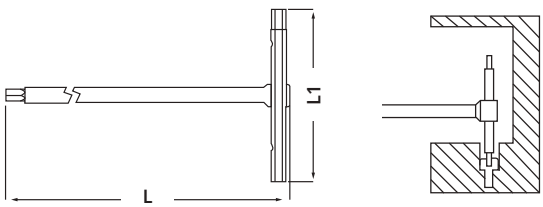
Order Code	Dimensions	Pcs.
SAPGN 06	6	1
SAPGN 08	8	1
SAPGN 10	10	1
SAPGN 12	12	1
SAPGN 14	14	1

Video

"T" Allen Wrench

Code: **AKH**

Functional use with strong steel thick body and sleeve system on it



Order Code	Dia.	L	L1
AKH 03	3	125	63
AKH 04	4	180	87
AKH 05	5	180	90
AKH 06	6	210	105
AKH 08	8	250	125
AKH 10	10	300	145
AKH 12	12	320	160
AKH 14	14	340	165

"T" Type Triple Hexagon Head Allen Wrench:
Free / quick rotating via cold-rolled hexagon profile and sleeve on it and it is ready to process with robust and free insert handle. Chrome vanadium steel and black ends are suitable for screws in depth under high torques.
Thanks to its handle, screwdriver set can be optimally adapted according to the position of the screw.

Video

NEW *"Workshop Organizer – A Practical and Cost-Effective Storage Solution"*

Güvenal Screw Station with Organizer - 4200 pcs.

Order Code: **CS4200**

Hex-socket Head Cap Screws:
DIN 912 / ISO 4762 - Class: 12.9

M4 Series
+ 100 Pcs. M4 x 10 mm
+ 100 Pcs. M4 x 16 mm
+ 100 Pcs. M4 x 20 mm
+ 100 Pcs. M4 x 25 mm
+ 100 Pcs. M4 x 30 mm

Total: 500 Pieces

M5 Series
+ 100 Pcs. M5 x 10 mm
+ 100 Pcs. M5 x 16 mm
+ 100 Pcs. M5 x 20 mm
+ 100 Pcs. M5 x 25 mm
+ 100 Pcs. M5 x 30 mm
+ 100 Pcs. M5 x 40 mm

Total: 600 Pieces

M6 Series
+ 100 Pcs. M6 x 16 mm
+ 100 Pcs. M6 x 20 mm
+ 100 Pcs. M6 x 25 mm
+ 100 Pcs. M6 x 30 mm
+ 100 Pcs. M6 x 35 mm
+ 100 Pcs. M6 x 40 mm
+ 100 Pcs. M6 x 50 mm
+ 50 Pcs. M6 x 60 mm

Total: 750 Pieces

M8 Series
+ 100 Pcs. M8 x 16 mm
+ 100 Pcs. M8 x 20 mm
+ 100 Pcs. M8 x 25 mm
+ 100 Pcs. M8 x 30 mm
+ 100 Pcs. M8 x 40 mm
+ 100 Pcs. M8 x 50 mm
+ 50 Pcs. M8 x 60 mm
+ 50 Pcs. M8 x 80 mm
+ 50 Pcs. M8 x 100 mm

Total: 750 Pieces

M10 Series
+ 100 Pcs. M10 x 20 mm
+ 100 Pcs. M10 x 25 mm
+ 100 Pcs. M10 x 30 mm
+ 100 Pcs. M10 x 40 mm
+ 100 Pcs. M10 x 50 mm
+ 100 Pcs. M10 x 60 mm
+ 50 Pcs. M10 x 80 mm
+ 50 Pcs. M10 x 100 mm
+ 30 Pcs. M10 x 120 mm

Total: 730 Pieces

M12 Series
+ 50 Pcs. M12 x 20 mm
+ 100 Pcs. M12 x 30 mm
+ 100 Pcs. M12 x 40 mm
+ 100 Pcs. M12 x 50 mm
+ 100 Pcs. M12 x 60 mm
+ 50 Pcs. M12 x 70 mm
+ 50 Pcs. M12 x 80 mm
+ 50 Pcs. M12 x 100 mm
+ 30 Pcs. M12 x 120 mm

Total: 630 Pieces

M16 Series
+ 50 Pcs. M16 x 40 mm
+ 50 Pcs. M16 x 60 mm
+ 50 Pcs. M16 x 80 mm
+ 30 Pcs. M16 x 100 mm
+ 30 Pcs. M16 x 120 mm
+ 30 Pcs. M16 x 150 mm

Total: 240 Pieces

52 Pcs. - Boxes
4200 Pcs. - Screws

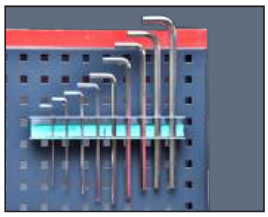
Stand Content - Standard Accessories:

A150 Equipment Box: 28 pcs.
A200 Equipment Box: 24 pcs.

K9 Short Allen Wrench Stand
2/2.5/3/3.5/4/5/6/8/10 mm

K21 Towel Stand

K17 Stand :
x1 WD 40 - **x1** Lubricating Oil
x1 Industrial Cleaning Spray



K13 Long Allen Wrench Stand
2/2.5/3/3.5/4/5/6/8/10 mm

K6 Set Hanging Stand
K14 Assembly Tool Tray

Steel Stand : Colour - Gray
(Length: 1000 Width: 400 Height: 1800 mm)

Steel Panel / Perforated Tool Hanger:
(Width: 980 Length: 450 mm)

x52 Boxes:
Plastic Box **x28** A150 - **x24** A200

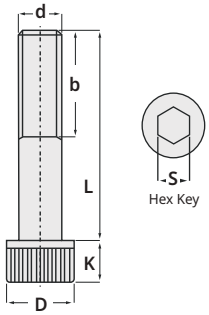
DIN 912 / ISO 4762 - Class: 12.9 Screws: x4200

Steel Hook:
Tool Hanging Accessories / 6 pcs.

Code: **IMB**

Hex-socket Head Cap Screw

DIN 912 ISO 4762 **Class: 12.9**



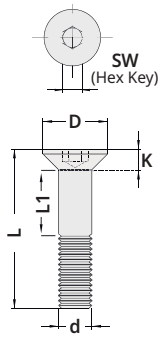
D	L	b	D	K	S
M3 x 05	6	6	5.5	3	2.5
	8	8			
	10	8.5			
	12	12			
	15	15			
	16	16			
	20	18			
	25	23			
	30	20			
	35	20			
	40	20			
	50	20			
	60	20			
M4 x 07	6	6	7	4	3
	8	8			
	10	8			
	12	12			
	15	14			
	20	18			
	25	23			
	30	20			
	35	20			
	40	20			
	45	20			
	50	20			
	60	20			
	70	20			
	80	20			
	90	20			
	100	20			
M5 x 08	8	8	8.6	5	4
	10	8			
	12	12			
	15	14			
	16	16			
	20	18			
	25	23			
	30	22			
	35	22			
	40	22			
	45	22			
	50	22			
	60	22			
	70	22			
	80	22			
	90	22			
	100	22			
	110	22			
	120	22			
	130	22			
	150	22			

D	L	b	D	K	S
M6 x 1	10	7	10	6	5
	12	12			
	16	16			
	15	13			
	20	17			
	25	22			
	30	27			
	35	24			
	40	24			
	45	24			
	50	24			
	55	24			
	60	24			
	70	24			
	80	24			
	90	24			
	100	24			
	110	24			
	120	24			
	130	24			
	150	24			
	160	24			
M8 x 1.25	10	8	13	8	6
	12	12			
	15	13			
	16	16			
	20	17			
	25	22			
	30	27			
	35	32			
	40	28			
	45	28			
	50	28			
	55	28			
	60	28			
	65	28			
	70	28			
	80	28			
	90	28			
	100	28			
	110	28			
	120	28			
	130	28			
	140	28			
	150	28			
	160	28			
	180	28			
	200	28			
M10 x 1.50	16	16	16	10	8
	20	16			
	25	21			
	30	26			
	35	31			
	40	36			
	45	32			
	50	32			
	55	32			
	60	32			
	65	32			
	70	32			
	80	32			
	90	32			
	100	32			
	110	32			
	120	32			
	130	32			
	140	32			
	150	32			
	160	32			
	170	32			
	180	32			
	190	32			
	200	32			
	240	32			
	260	32			
	300	32			

D	L	b	D	K	S
M12 x 1.75	20	15	18	12	10
	25	20			
	30	25			
	35	30			
	40	35			
	45	40			
	50	45			
	55	36			
	60	36			
	65	36			
	70	36			
	80	36			
	90	36			
	100	36			
	110	36			
	120	36			
	130	36			
	140	36			
	150	36			
	160	36			
	170	36			
	180	36			
	200	36			
	260	36			
	300	36			
M14 x 2	30	24	21	14	12
	35	29			
	40	34			
	45	39			
	50	44			
	55	44			
	60	44			
	65	44			
	70	44			
	80	44			
	90	44			
	100	44			
	110	44			
	120	44			
	130	44			
	140	44			
	150	44			
	160	44			
	170	44			
	180	44			
	200	44			
	240	44			
	260	44			
	300	44			
M16 x 2	30	24	24	16	14
	35	29			
	40	34			
	45	39			
	50	44			
	55	49			
	60	54			
	65	44			
	70	44			
	80	44			
	90	44			
	100	44			
	110	44			
	120	44			
	130	44			
	140	44			
	150	44			
	160	44			
	170	44			
	180	44			
	190	44			
	200	44			
	220	44			
	240	44			
	260	44			
	300	44			

D	L	b	D	K	S
M18 x 2.50	40	34	27	18	14
	50	43			
	60	53			
	70	52			
	80	52			
	90	52			
	100	52			
	110	52			
	120	52			
	130	52			
	140	52			
	150	52			
	160	52			
	180	52			
	200	52			
	220	52			
	240	52			
	260	52			
	300	52			
M20 x 2.50	40	34	30	20	17
	45	45			
	50	43			
	55	52			
	60	53			
	70	52			
	80	52			
	90	52			
	100	52			
	110	52			
	120	52			
	130	52			
	140	52			
	150	52			
	160	52			
	170	52			
	180	52			
	190	52			
	200	52			
	220	52			
	240	52			
	260	52			
	280	52			
	300	52			
	340	52			
M24 x 3	50	50	36	24	19
	60	52			
	70	61			
	80	71			
	90	60			
	100	60			
	110	60			
	120	60			
	130	60			
	140	60			
	150	60			
	160	60			
	180	60			
	200	60			
	220	60			
	240	60			
	260	60			
	300	60			

Order:
IMB. D x L



Countersunk Head Screw

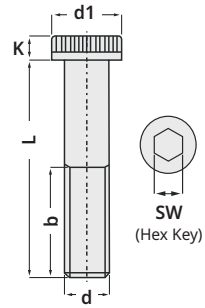
Code: **HIC**

Class: 10.9 DIN 7991

d	L	L1	D	K	SW
M3 x 05	8	3.2	6	1.7	2
	10				
	15				
M4 x 07	10	4.4	8	2.3	2.5
	15				
	20				
	25				
	30				
M5 x 08	10	5.2	10	2.8	3
	15				
	20				
	25				
	30				
	35				
	40				
M6 x 1	10	6.3	12	3.3	4
	15				
	20				
	25				
	30				
	35				
	40				
M8 x 1.25	10	8.2	16	4.4	5
	15				
	20				
	25				
	30				
	35				
	40				
	50				

d	L	L1	D	K	SW
M10 x 1.50	15	10	20	5.5	6
	20				
	25				
	30				
	35				
	40				
	50				
	60				
M12 x 1.75	20	11.8	24	6.5	8
	25				
	30				
	35				
	40				
	50				
	60				
M16 x 2	25	15.4	30	8.5	10
	30				
	35				
	40				
	50				
	60				
	70				

Order: **HIC.** d x L



Low Head Socket Cap Screw

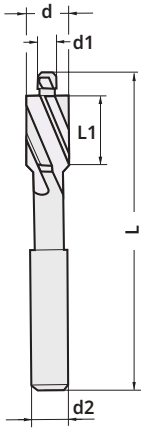
Code: **DKM**

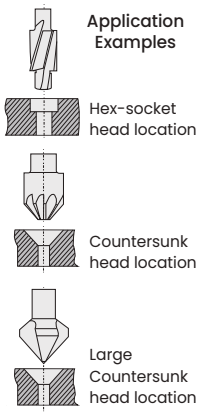
Class: 8.8 DIN 7984

d	L	b	d1	K	SW
M4	10	8	7	2.8	2.5
	12	10			
	16	14			
	20	14			
	25	14			
M5	10	8	8.5	3.5	3
	12	10			
	16	14			
	20	16			
	25	16			
	30	16			
	35	16			
	40	16			
	50	16			
M6	10	8	10	4	4
	12	10			
	16	14			
	20	18			
	25	18			
	30	18			
	35	18			
	40	18			
	50	18			

d	L	b	d1	K	SW
M8	16	14	13	5	5
	20	18			
	25	22			
	30	22			
	35	22			
	40	22			
	50	22			
	60	22			
M10	16	14	16	6	7
	20	18			
	25	22			
	30	26			
	35	26			
	40	26			
	50	26			
	60	26			
M12	20	18	18	7	8
	25	23			
	30	28			
	35	30			
	40	30			
	50	30			
	60	30			

Order: **DKM.** d x L

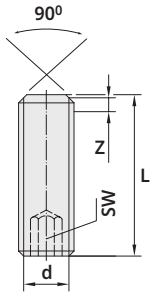




Socket Cap Screw Counterbore

Code: **ICF**

Order Code	M	d	d1	d2	L	L1
ICF M3	M3	6	3.2	5	71	14
ICF M4	M4	8	4.3			
ICF M5	M5	10	5.3	8	80	18
ICF M6	M6	11	6.4			
ICF M8	M8	15	8.4	12.5	100	22
ICF M10	M10	18	10.5			
ICF M12	M12	20	13			
ICF M14	M14	24	15			
ICF M16	M16	26	17			
ICF M18	M18	30	19			
ICF M20	M20	33	20			



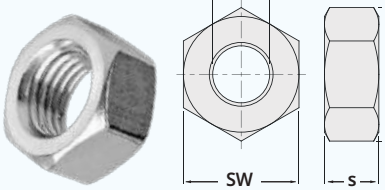
Hex-socket Set Screws

DIN 913 / ISO 4026

Code: **SEC**

d	L	Z	SW
M3 x 05	8	0.5	1.5
	10		
	15		
M4 x 07	8	0.7	2
	10		
	15		
	20		
M5 x 08	10	0.75	2.5
	15		
	20		
	25		
	30		
M6 x 1	10	1.0	3.0
	15		
	20		
	25		
	30		
	35		
	40		

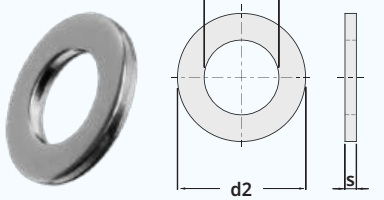
d	L	Z	SW
M8 x 1.25	10	1.2	4.0
	15		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
M10 x 1.50	10	1.5	5.0
	15		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
M12 x 1.75	10	2.0	6.0
	15		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
	55		
	60		
M14 x 2	20	2	7
	25		
	30		
	35		
	40		
	50		
	60		
M16 x 2	20	2	8
	25		
	30		
	35		
	40		
	50		
	60		



Nut - DIN 934

Code: **KSM**

Order Code	d1	SW	s
KSM3	M3	5.5	2.4
KSM4	M4	7	3.2
KSM5	M5	8	4
KSM6	M6	10	5
KSM8	M8	13	6.5
KSM10	M10	17	8
KSM12	M12	19	10
KSM14	M14	22	11
KSM16	M16	24	13
KSM18	M18	27	15
KSM20	M20	30	16
KSM24	M24	36	19



Washer - DIN 433

Code: **KPM**

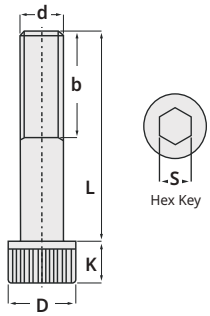
Order Code	d1	d2	s
KPM3	M3	6	0.5
KPM4	M4	8	0.5
KPM5	M5	9	1
KPM6	M6	11	1.6
KPM8	M8	15	1.6
KPM10	M10	18	1.6
KPM12	M12	20	2
KPM14	M14	24	2.5
KPM16	M16	28	2.5
KPM18	M18	30	2.5
KPM20	M20	34	3
KPM24	M24	39	4.5

Order: **SEC.** d x L

Code: **IMBP**

Inox Hex-socket Head Cap Screw

DIN 912 ISO 4762, A2-A4



D	L	b	D	K	S
M3 x 05	6	6	5.5	3	2.5
	8	8			
	10	8.5			
	12	12			
	15	15			
	16	16			
	20	18			
	25	23			
	30	20			
	35	33			
	40	20			
M4 x 07	8	6	7	4	3
	10	8			
	12	10			
	16	15			
	20	18			
	25	23			
	30	20			
	35	20			
	40	20			
	45	20			
	50	20			

D	L	b	D	K	S
M5 x 08	8	6	8.5	5	4
	10	8			
	12	12			
	16	15			
	20	18			
	25	23			
	30	22			
	35	22			
	40	22			
	45	22			
	50	22			
	60	22			
	70	22			
	80	22			
	90	22			
	100	22			
M6 x 1	10	7	10	6	5
	12	12			
	16	16			
	20	17			
	25	22			
	30	27			
	35	24			
	40	24			
	45	24			
	50	24			
	60	24			
	70	24			
	80	24			
	90	24			
	100	24			
	110	24			
	120	24			
	130	24			
M8 x 1.25	10	8	13	8	6
	15	13			
	20	17			
	25	22			
	30	27			
	35	32			
	40	28			
	45	28			
	50	28			
	60	28			
	70	28			
	80	28			
	90	28			
	100	28			
	110	28			
	120	28			
	130	28			
	140	28			
	150	28			
M10 x 1.50	16	16	16	10	8
	20	16			
	25	21			
	30	26			
	35	31			
	40	36			
	45	32			
	50	32			
	60	32			
	70	32			
	80	32			
	90	32			
	100	32			
	110	32			
	120	32			
	130	32			
	140	32			
	150	32			

D	L	b	D	K	S
M12 x 1.75	20	15	18	12	10
	25	20			
	30	25			
	35	30			
	40	35			
	45	40			
	50	45			
	60	36			
	70	36			
	80	36			
	90	36			
	100	36			
	110	36			
	120	36			
	130	36			
	140	36			
	150	36			

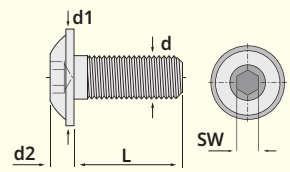
Order: **IMBP.** D x L

NEW

Code: **IMBF**

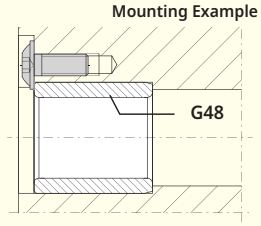
Hex-socket Button Head Screw with Flange

ISO 7380-2 10.9 Zinc Plated



d	L	d1	d2	SW
M6	10	13.6	3.3	4
	12			
	16			
M8	16	17.8	4.4	5
	20			
M10	20	21.9	5.5	6

Mounting Example

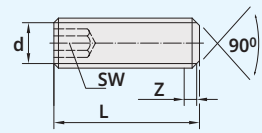


Order: **IMBF.** d x L

Code: **SECP**

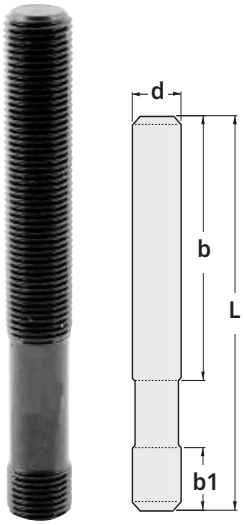
Inox Hex-socket Set Screw

DIN 916 ISO 4029, A2-A4



d	L	Z	SW
M3 x 05	8	0.5	1.5
	10		
	16		
M4 x 07	8	0.7	2
	10		
	16		
	20		
M5 x 08	10	0.75	2.5
	16		
	20		
	25		
	30		
M6 x 1	10	1.0	3.0
	16		
	20		
	25		
	30		
	35		
	40		
M8 x 1.25	10	1.2	4.0
	16		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
M10 x 1.50	10	1.5	5.0
	16		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
M12 x 1.75	10	2.0	6.0
	16		
	20		
	25		
	30		
	35		
	40		
	45		
	50		
	55		
	60		

Order: **SECP.** d x L

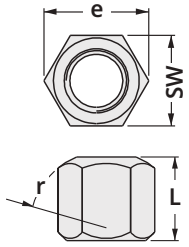


Threaded Stud - DIN 6379

Class: 10.9

Order Code	d	L	b1	b	Weight
1690.08040	M8	40	11	20	10 gr.
1690.08063		63		40	15 gr.
1690.08080		80		50	20 gr.
1690.08100		100		63	30 gr.
1690.08125		125		75	35 gr.
1690.08160		160		100	45 gr.
1690.10050	M10	50	13	25	20 gr.
1690.10063		63		32	25 gr.
1690.10080		80		50	35 gr.
1690.10100		100		63	45 gr.
1690.10125		125		75	55 gr.
1690.10160		160		100	70 gr.
1690.10200		200		125	95 gr.
1690.12050	M12	50	15	25	35 gr.
1690.12063		63		32	40 gr.
1690.12080		80		50	55 gr.
1690.12100		100		63	70 gr.
1690.12125		125		75	90 gr.
1690.12160		160		100	115 gr.
1690.12200		200		125	140 gr.
1690.14063	M14	63	17	32	60 gr.
1690.14080		80		50	75 gr.
1690.14100		100		63	95 gr.
1690.14125		125		75	120 gr.
1690.14160		160		100	150 gr.
1690.14200		200		125	195 gr.
1690.14250		250		160	240 gr.
1690.16063	M16	63	19	32	85 gr.
1690.16080		80		50	105 gr.
1690.16100		100		63	130 gr.
1690.16125		125		75	160 gr.
1690.16160		160		100	205 gr.
1690.16200		200		125	260 gr.
1690.16250		250		160	325 gr.
1690.16315		315		180	405 gr.
1690.16500		500		315	650 gr.

Order Code	d	L	b1	b	Weight
1690.18080	M18	80	23	50	130 gr.
1690.18100		100		60	160 gr.
1690.18125		125		75	200 gr.
1690.18160		160		100	260 gr.
1690.18200		200		125	320 gr.
1690.18250		250		150	400 gr.
1690.18315		315		180	510 gr.
1690.20080	M20	80	27	32	155 gr.
1690.20100		100		60	200 gr.
1690.20125		125		70	250 gr.
1690.20160		160		100	330 gr.
1690.20200		200		125	400 gr.
1690.20250		250		160	510 gr.
1690.20315		315		200	640 gr.
1690.20400		400		250	815 gr.
1690.20500		500		315	1020 gr.
1690.22100	M22	100	31	45	250 gr.
1690.22125		125		70	305 gr.
1690.22160		160		100	400 gr.
1690.22200		200		125	500 gr.
1690.22250		250		160	620 gr.
1690.22315		315		180	780 gr.
1690.22400		400		250	1010 gr.
1690.24100	M24	100	35	45	290 gr.
1690.24125		125		70	365 gr.
1690.24160		160		100	470 gr.
1690.24200		200		125	580 gr.
1690.24250		250		160	730 gr.
1690.24315		315		200	920 gr.
1690.24400		400		250	1170 gr.
1690.24500		500		315	1470 gr.
1690.24630		630		315	1860 gr.
1690.30125	M30	125	43	56	570
1690.30200		200		125	910
1690.30250		250		160	1150
1690.30315		315		200	1435
1690.30500		500		315	2315
1690.30700		700		400	3215
1690.301000		1000		400	4700
1690.36160	M36	160	51	80	1100
1690.36200		200		125	1340
1690.36250		250		160	1710
36315		315		200	2150
36400		400		250	2700
36500		500		315	3450
36700		700		400	4750
42315	M42	315	59	200	2950
42400		400		250	3750
42500		500		315	4690

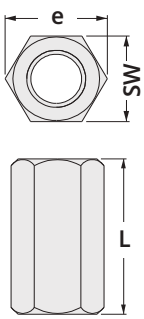


Class: 10

Hexagon Nut - DIN 6330B

+ Flat surface is used with **DIN 6340** Washer.
+ This nut is used with Rad-top surface **DIN 6319D** and **DIN 6319G** washers.

Order Code	M	SW	e	L	r	Weight
1790.06	M6	10	11.5	9	9	5 gr.
1790.08	M8	13	15	12	12	9 gr.
1790.10	M10	17	19.6	15	15	20 gr.
1790.12	M12	19	21.9	18	17	25 gr.
1790.14	M14	22	25.4	21	20	40 gr.
1790.16	M16	24	27.7	24	22	55 gr.
1790.18	M18	27	31.2	27	24	80 gr.
1790.20	M20	30	34.6	30	27	110 gr.
1790.22	M22	32	36.9	33	30	130 gr.
1790.24	M24	36	41.5	36	32	190 gr.
1790.30	M30	46	53.1	45	41	400 gr.
1790.36	M36	55	63.5	54	50	680 gr.
1790.42	M42	65	75	63	58	1150 gr.



Class: 10

Extension Nut

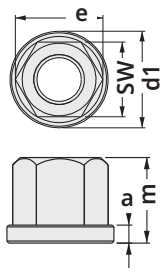
+ It is used in **DIN 787** T-Studs and **DIN 6379** Straight Studs as extension.

Order Code	M	SW	e	L	Weight
1830.06	M6	10	11.7	18	8 gr.
1830.08	M8	13	15	24	19 gr.
1830.10	M10	17	19.6	30	40 gr.
1830.12	M12	19	21.6	36	55 gr.
1830.14	M14	22	25.4	42	90 gr.
1830.16	M16	24	27.7	48	115 gr.
1830.18	M18	27	31.2	54	165 gr.
1830.20	M20	30	34.6	60	230 gr.
1830.22	M22	32	36.9	66	245 gr.
1830.24	M24	36	41.5	72	400 gr.
1830.30	M30	46	53.1	90	840 gr.
1830.36	M36	55	63.5	108	1430 gr.
1830.42	M42	65	75	126	2330 gr.

Washer - DIN 6340

Order Code	M	Inch.	d1	d2	s	Weight
1870.06	M6	1/4	6.4	17	3	6 gr.
1870.08	M8	5/16	8.4	23	4	10 gr.
1870.10	M10	3/8	10.5	28	4	16 gr.
1870.12	M12	1/2	13	35	5	30 gr.
1870.14	M14	-	15	40	5	40 gr.
1870.16	M16	5/8	17	45	6	60 gr.
1870.18	M18	-	19	45	6	60 gr.
1870.20	M20	3/4	21	50	6	70 gr.
1870.22	M22	7/8	23	50	8	90 gr.
1870.24	M24	7/8	25	60	8	140 gr.
1870.30	M30	11/8	31	68	10	215 gr.
1870.36	M36	11/4	38	80	12	360 gr.
1870.42	M42	11/2	44	98	15	640 gr.

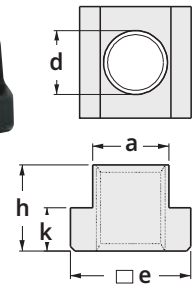
Class: 10



Hex. Nut with Collar - DIN 6331

Order Code	M	SW	e	m	a	d1	gr.
1810.08	M8	13	14.7	12	3.5	18	12
1810.10	M10	17	19.2	15	4	22	25
1810.12	M12	19	21.5	18	4	25	30
1810.14	M14	22	24.9	21	4.5	28	50
1810.16	M16	24	27.2	24	5	31	65
1810.18	M18	27	30.6	27	5	34	90
1810.20	M20	30	34	30	6	37	130
1810.22	M22	32	36.3	33	6	40	155
1810.24	M24	36	40.8	36	6	45	220
1810.30	M30	46	52.3	45	8	58	465
1810.36	M36	55	62	54	10	68	500
1810.42	M42	65	75	63	12	80	1340

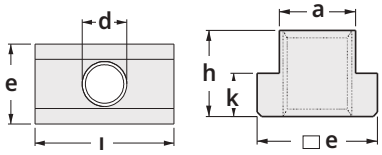
Class: 10



T-Nut / DIN 508

The full load capacity can only be achieved if the screw connection is applied over the entire length **"h"** of the thread.

Order Code	d x a	a	e	h	k
1750.0506	M5 x 6	5.7	10	8	4
1750.0608	M6 x 8	7.7	13	10	6
1750.0810	M8 x 10	9.7	15	12	6
1750.0812	M8 x12	11.7	18	14	7
1750.1012	M10 x12				
1750.0814	M8 x14	13.7	22	16	8
1750.1014	M10 x14				
1750.1214	M12 x14				
1750.0816	M8 x16	15.7	25	18	9
1750.1016	M10 x16				
1750.1216	M12 x16				
1750.1416	M14 x16				
1750.0818	M8 x18	17.7	28	20	10
1750.1018	M10 x18				
1750.1218	M12 x18				
1750.1418	M14 x18				
1750.1618	M16 x18				
1750.1620	M16 x20	19.7	32	24	12
1750.1820	M18 x20				
1750.1622	M16 x22	21.7	35	28	14
1750.1822	M18 x22				
1750.2022	M20 x22				
1750.1624	M16 x24	23.7	40	32	16
1750.2024	M20 x24				
1750.2224	M22 x24				
1750.1628	M16 x28	27.7	44	36	18
1750.2028	M20 x28				
1750.2228	M22 x28				
1750.2428	M24 x28				
1750.2436	M24 x36	35.6	54	44	22
1750.3036	M30 x36				
1750.3642	M36 x42	41.6	65	52	26
1750.4248	M42 x48	47.6	75	60	30



Long T-Nut

Class: 10

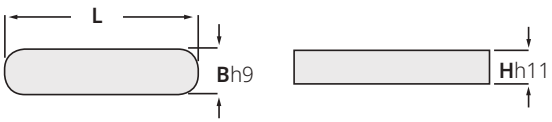
Protects the T-slot on precision machine plates.

Order Code	d x a	a	e	l	h	k
1710.0608	M6 x 8	7.7	13	26	10	6
1710.0810	M8 x 10	9.7	15	30	12	6
1710.1012	M10 x 12	11.7	18	36	14	7
1710.1214	M12 x 14	13.7	22	44	16	8
1710.1416	M14 x 16	15.7	25	50	18	9
1710.1618	M16 x 18	17.7	28	56	20	10
1710.1820	M18 x 20	19.7	32	64	24	12
1710.2022	M20 x 22	21.7	35	70	28	14
1710.2224	M22 x 24	23.7	40	80	32	16
1710.2428	M24 x 28	27.7	44	88	36	18
1710.3036	M30 x 36	35.6	54	108	44	22

For a wider range of products in Standard Clamping Elements, please check the **BLUE GÜVENAL CATALOGUE**

Parallel Key DIN 6885 - A

Code: **GDKA**



Parallel Keys **Form A** are available from our stocks at economic prices as standard.
All of our Parallel Keys are produced in accordance with **DIN 6885** norm.

Material: CK45 **Surface Roughness:** Ra 0.36 - Rt. 2.6 **Tensile Strength (N / mm2):** 850 **Yield Strength (N / mm2):** 750

Order Code	B	H	L
GDKA.0202006	2	2	6
GDKA.0202008			8
GDKA.0202010			10
GDKA.0202012			12
GDKA.0202014			14
GDKA.0202015			15
GDKA.0202016			16
GDKA.0202018			18
GDKA.0202020			20
GDKA.0202022			22
GDKA.0202025			25
GDKA.0303006	3	3	6
GDKA.0303008			8
GDKA.0303010			10
GDKA.0303012			12
GDKA.0303014			14
GDKA.0303015			15
GDKA.0303016			16
GDKA.0303018			18
GDKA.0303020			20
GDKA.0303022			22
GDKA.0303024			24
GDKA.0303025			25
GDKA.0303026			26
GDKA.0303030			30
GDKA.0404010	4	4	10
GDKA.0404012			12
GDKA.0404014			14
GDKA.0404015			15
GDKA.0404016			16
GDKA.0404020			20
GDKA.0404024			24
GDKA.0404025			25
GDKA.0404030			30
GDKA.0404033			33
GDKA.0404035			35
GDKA.0404040			40
GDKA.0505010	5	5	10
GDKA.0505012			12
GDKA.0505014			14
GDKA.0505015			15
GDKA.0505016			16
GDKA.0505018			18
GDKA.0505020			20
GDKA.0505022			22
GDKA.0505024			24
GDKA.0505025			25
GDKA.0505028			28
GDKA.0505030			30
GDKA.0505032			32
GDKA.0505035			35
GDKA.0505040			40
GDKA.0505045			45
GDKA.0505050			50
GDKA.0505060			60

Order Code	B	H	L
GDKA.0606010	6	6	10
GDKA.0606012			12
GDKA.0606014			14
GDKA.0606015			15
GDKA.0606016			16
GDKA.0606020			20
GDKA.0606022			22
GDKA.0606025			25
GDKA.0606028			28
GDKA.0606030			30
GDKA.0606032			32
GDKA.0606035			35
GDKA.0606036			36
GDKA.0606040			40
GDKA.0606045			45
GDKA.0606050			50
GDKA.0606055			55
GDKA.0606060			60
GDKA.0807015	8	7	15
GDKA.0807016			16
GDKA.0807018			18
GDKA.0807020			20
GDKA.0807022			22
GDKA.0807025			25
GDKA.0807028			28
GDKA.0807030			30
GDKA.0807032			32
GDKA.0807033			33
GDKA.0807035			35
GDKA.0807036			36
GDKA.0807040			40
GDKA.0807045			45
GDKA.0807050			50
GDKA.0807055			55
GDKA.0807060			60
GDKA.0807065			65
GDKA.0807070			70
GDKA.0807075			75
GDKA.0807080			80
GDKA.0807085			85
GDKA.0807090			90
GDKA.0807100			100
GDKA.0807110			110
GDKA.0807120			120

Order Code	B	H	L
GDKA.1008020	10	8	20
GDKA.1008022			22
GDKA.1008025			25
GDKA.1008030			30
GDKA.1008035			35
GDKA.1008040			40
GDKA.1008045			45
GDKA.1008050			50
GDKA.1008055			55
GDKA.1008060			60
GDKA.1008065			65
GDKA.1008070			70
GDKA.1008075			75
GDKA.1008080			80
GDKA.1008085			85
GDKA.1008090			90
GDKA.1008100			100
GDKA.1008120			120
GDKA.1208020	12	8	20
GDKA.1208025			25
GDKA.1208030			30
GDKA.1208032			32
GDKA.1208035			35
GDKA.1208036			36
GDKA.1208040			40
GDKA.1208045			45
GDKA.1208050			50
GDKA.1208055			55
GDKA.1208060			60
GDKA.1208065			65
GDKA.1208070			70
GDKA.1208075			75
GDKA.1208080			80
GDKA.1208090			90
GDKA.1208100			100
GDKA.1208110			110
GDKA.1208120			120
GDKA.1409030	14	9	30
GDKA.1409035			35
GDKA.1409040			40
GDKA.1409045			45
GDKA.1409050			50
GDKA.1409060			60
GDKA.1409065			65
GDKA.1409070			70
GDKA.1409075			75
GDKA.1409080			80
GDKA.1409090			90
GDKA.1409100			100
GDKA.1409110			110
GDKA.1409120			120

SECTIONS: Standard Parts for Injection Moulds

We can supply thousands of **Mould-making Standard Components with "Güvenal quality assurance labels"** from our stock.

These products are based on five key principles:

- Lots of experience and know-how
- Highest product and service quality
- Full-range supplier
- Reasonable prices
- Short delivery times

10. EJECTOR PINS

EJECTOR PINS

11. STD. PARTS FOR MOULD-MAKING

STANDARD PARTS for MOULD-MAKING

12. CUMSA MOULD SYSTEMS

CUMSA MOULD SYSTEMS

13. INJECTION RUNNER SYSTEMS

INJECTION RUNNER SYSTEMS

14. INJECTION EQUIPMENT

INJECTION EQUIPMENT

15. DIE & MOULD LUBRICANTS

DIE & MOULD LUBRICANTS - CHEMICALS

16. COOLING SYSTEMS

COOLING SYSTEMS

17. POLISHING EQUIPMENT

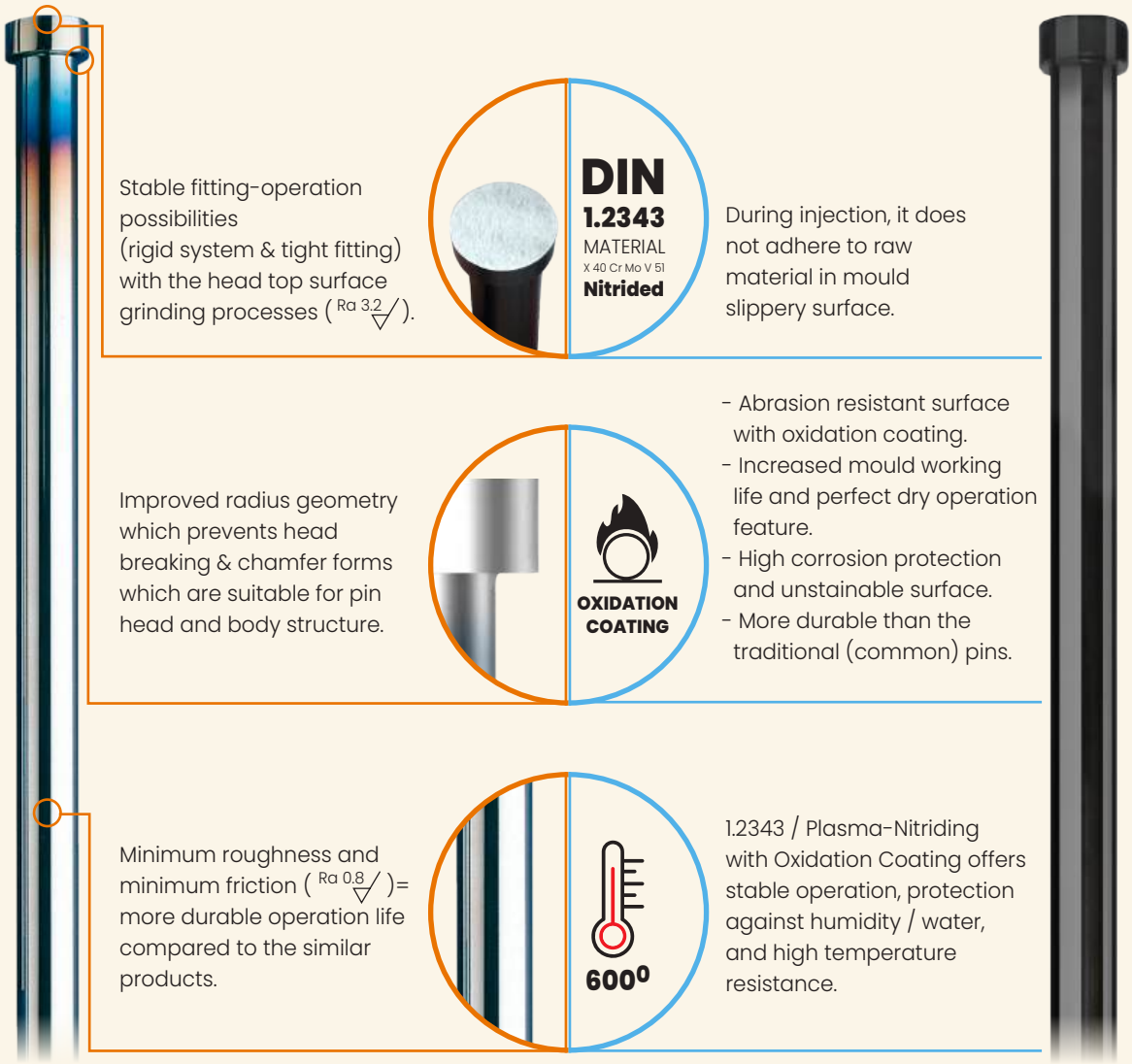
POLISHING EQUIPMENT

18. TOOLROOM EQUIPMENT

DIE & MOULD TOOLROOM EQUIPMENT

Why Güvenal

Features that Distinguish Güvenal Ejector Pins from its Counterparts



Stable fitting-operation possibilities (rigid system & tight fitting) with the head top surface grinding processes (Ra 3.2).

DIN
1.2343
MATERIAL
X 40 Cr Mo V 51
Nitrided

During injection, it does not adhere to raw material in mould slippery surface.

Improved radius geometry which prevents head breaking & chamfer forms which are suitable for pin head and body structure.

OXIDATION COATING

- Abrasion resistant surface with oxidation coating.
- Increased mould working life and perfect dry operation feature.
- High corrosion protection and unstainable surface.
- More durable than the traditional (common) pins.

Minimum roughness and minimum friction (Ra 0.8)= more durable operation life compared to the similar products.

600⁰

1.2343 / Plasma-Nitriding with Oxidation Coating offers stable operation, protection against humidity / water, and high temperature resistance.

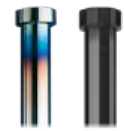
Type: Plastic Injection

Type: Metal and Plastic Injection

As Güvenal we use our missions in favour of our customers by adding value and try to meet their expectations best. We always aim better for you with our team which works customer oriented, our innovative and efficient business approach. **ATTENTION:** Each black looking pins are not plasma nitriding + oxidation coating pins (like cheap series from Far East). You can use Güvenal **"SBMAV03"** with confidence.

info@guvenal.net - www.guvenal.net

OVERVIEW: GÜVENAL EJECTORS AND CORE PINS



Material / Type	1.2516 WS	1.2516 WS DLC	1.2343 Nitrided	1.2343 Plasma Nitrided + Oxidation Coated	1.2343	1.2344	1.4125 INOX	Copper
Ejector pin, straight and cylinder head	SBIAH	SBDLC		SBMAV03			SPI	SPPAV07
Ejector pin, conical head	HBI							
Ejector pin with locking head	SDIT 1			SDIT 2				
Stepped ejector pin	SBKAH	SBKDLC		SBW				
Ejector sleeve			SMB					
Blade ejector pin	SPLAH	SLADLC		SPWA				
Blade ejector pin with x2 r	SPLBH	SLBDLC		SPWB				
Blade ejector pin with x4 r	SPLCH	SLCDLC		SPWC				
Core pin with locking head					SBD	SBCP		
Ejector pin for ventilation				SBGTP				
Sprue puller pin form A				G179A				
Sprue puller pin form B				G179B				
Sprue puller pin form C				G179C				

GÜVENAL EJECTOR PINS - SELECTION GUIDE

Code	Material	Surface Optimization	Hardness	Heat Resistance (max.)	Wear Resistance	Non-lubricated Performance	Corrosion Resistance	Cleanroom Compatibility	Technical Advice
SBIAH - HBI - SDIT 1 SBKAH - SPLAH SPLBH - SPLCH	1.2516 WS	-	60 HRC	220^0	●●○○	–	●○○○	-	Standard ejector material offering the ideal balance of hardness, increased wear resistance, and durability.
SBDLC - SBKDLC SLADLC - SLBDLC SLCDLC	1.2516 WS	DLC	60 HRC DLC: 3000 HV	220^0	●●●●	●●●●	●●●●	✓	Ideal for long service life with glass fibre-reinforced plastics and also well-suited for clean-room applications due to their lubricant-free dry cycle properties. Leaves no stains on plastic parts.
SMB	1.2343	Nitrided	60 HRC	550^0	●●●○	–	●●○○	-	For extremely high mould temperatures, such as when working with advanced plastics.
SBMAV03 - SDIT 2 SBW - SPWA - SPWB SPWC - SBGTP - G179A G179B - G179C	1.2343	Plasma Nitrided + Oxidation Coated	70 HRC Core: 44 HRC	650^0 (with Güvenal GTH1400= 1400^0)	●●●○	●●○○	●●●○	-	For extremely high mould temperatures, such as when working with advanced plastics. Designed specifically for die casting, the oxide layer prevents molten metal from sticking to the surface.
SBD	1.2343	-	45-48 HRC	550^0	●○○○	–	●○○○	-	Resistant to hot cracking, making it an ideal choice for core pins in die casting.
SBCP	1.2344	-	52 HRC	500^0	●○○○	–	●○○○	-	Making it an excellent option for core pins in die casting. Perfect for core pins requiring mirror polishing.
SPI	1.4125 (INOX)	-	56 HRC	180^0	●●○○	–	●●●●	✓	For processing chemically aggressive plastics that generate gas.
SPPAV07	Copper (Cu)	-	650 N/mm^2	300^0	–	●●○○	●○○○	-	Rapid and precise cooling of mould cores using a special high-resistance copper alloy.

– **Very Poor** ●○○○ **Poor** ●●○○ **Moderate** ●●●○ **Good** ●●●● **Excellent**

Ejector Pins

18 17 16 15 14 13 12 11 **10** 9 8 7 6 5 4 3 2 1

New Ejector Pins with Diamond-like Carbon (DLC) Coating

The new DLC ejector pins are particularly well-suited for high mould temperatures in die casting and injection moulding, ensuring an extended service life.
Thanks to the DLC coating, they are also ideal for clean-room applications. The DLC coating significantly enhances the service life of the ejector pins, even when used with abrasive glass fibre-reinforced plastics.
Additionally, their lubricant-free dry cycle properties make them perfect for clean-room environments.
Güvenal ejector pins provide excellent demoulding assistance for all applications, ensuring reliable and efficient demoulding of even the most complex product batches.

DLC coating is especially beneficial for applications involving motion or friction in mould making, such as ejection, guiding, and centering. With the DLC coating, it is possible to operate completely lubricant-free..

ADVANTAGES OF THE NEW GÜVENAL DLC COATED EJECTOR PINS:

- High corrosion resistance and long service life.
- Ideal for long service life with glass fibre-reinforced plastics and also well-suited for clean-room applications due to their lubricant-free dry cycle properties.
- Minimizes wear due to excellent sliding properties.
- Leaves no stains on plastic parts.

Coating Data:

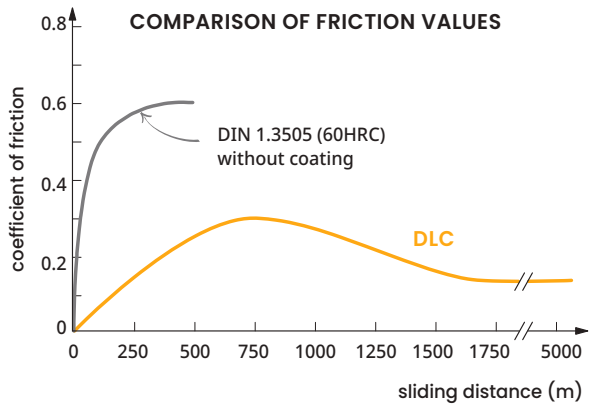
Hardness: 2400 - 3000 HV

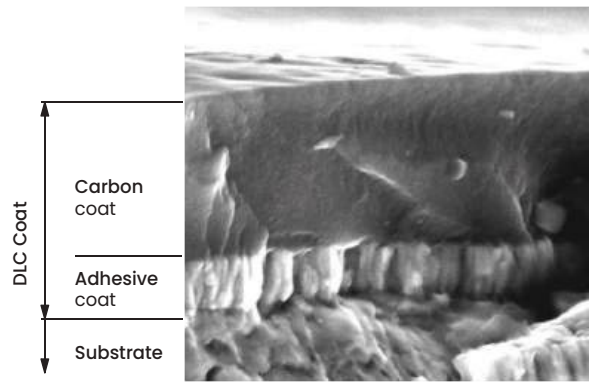
Thickness: ~ 1.5 - 2 µm

Coefficient of friction against steel: 0.1 - 0.15

Temperature resistance: 220^{0}C

DLC coated high-quality standard components to ensure a longer service life for your moulds.





NEW SERIES

DLC Coated Ejector Pin - Cylinder Head

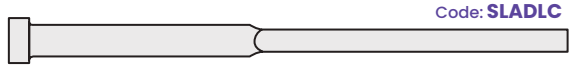
Code: **SBDLC**

DLC Coated Cylinder Head Stepped Ejector Pin

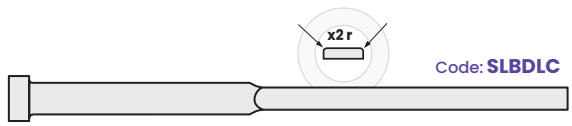
Code: **SBKDLC**

DLC Coated Blade Ejector Pin - Hardened

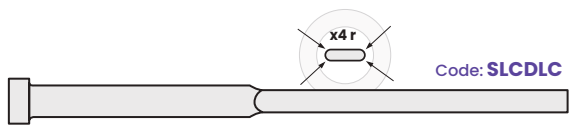
Code: **SLADLC**



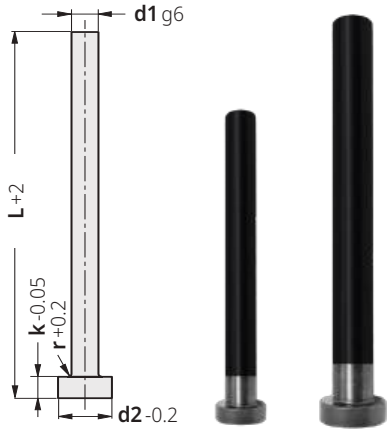
Code: **SLBDLC**



Code: **SLCDLC**



d1	L	d2	k
1	100, 125, 160, 200, 250, 315	2.5	1.2
1.1	100	2.5	1.2
1.2	100, 160	2.5	1.2
1.3	100, 160	3	1.5
1.4	100, 160	3	1.5
1.5	100, 125, 160, 200, 250, 315	3	1.5
1.6	100, 160	3	1.5
1.7	100, 160	3	1.5
1.8	100, 160	3	1.5
1.9	100, 160	3	1.5
2	100, 125, 160, 200, 250, 315, 400, 500	4	2
2.2	100, 160	4	2
2.3	100	4	2
2.4	100, 160	4	2
2.5	100, 125, 160, 200, 250, 315, 400, 500	5	2
2.7	100, 160	5	2
3	100, 125, 160, 200, 250, 315, 400, 500, 630	6	3
3.2	100, 160, 200	6	3
3.5	100, 125, 160, 200, 250, 315, 400, 500	7	3
3.7	100, 160	7	3
4	100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000	8	3
4.1	100	8	3
4.2	100, 160, 200	8	3
4.5	100, 125, 160, 200, 250, 315, 400, 500	8	3
5	100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000	10	3
5.2	100, 200, 250, 315, 400	10	3
5.5	100, 125, 160, 200, 250, 315, 400, 500	10	3
6	100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000	12	5
6.2	100, 160, 250	12	5
6.5	100, 125, 160, 200, 250, 315, 400, 500, 630	12	5
7	100, 125, 160, 200, 250, 315, 400, 500, 1000	12	5



NEW DLC

Lubricant-free

CLEANROOM

DLC Coated Ejector Pin - Cylinder Head

Code: **SBDLC**

ISO 6751, DIN 1530 - Form: AH

d1	L	d2	k
7.5	100, 125, 160, 200, 250, 315, 400	12	5
8	100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000	14	5
8.2	100, 160, 250	14	5
8.5	100, 125, 160, 200, 250, 315, 400, 500, 630	14	5
9	100, 125, 160, 200, 250, 315, 400, 500, 630	14	5
10	100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000	16	5
10.2	125, 250	16	5
10.5	100, 125, 160, 200, 315, 400	16	5
11	100, 125, 160, 200, 250, 315, 400	16	5
12	100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000	18	7
13	100, 125, 160, 200, 250, 315, 400	18	7
14	100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000	22	7
16	100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000	22	7
18	100, 125, 160, 200, 250, 315, 400, 500, 630, 1000	24	7
20	125, 160, 200, 250, 315, 400, 500, 630, 800, 1000	26	8
25	100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1000	32	10

Heat Resistance:
220⁰ max.

Tensile Resistance:
1300 N / mm²

d1 ~	r
1.5 ~ 2	0.2
2.5 ~ 5.5	0.3
6 ~ 11	0.5
12 ~ 18	0.8
20 ~ 25	1

Order: **SBDLC.** d1 x L

Material: 1.2516 WS
Hardness: 60 ± 2 HRC

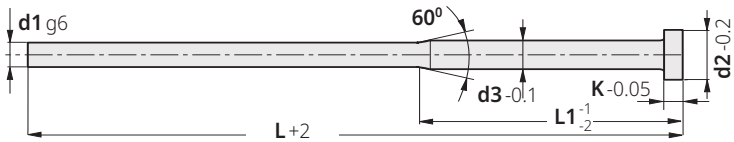
NEW DLC

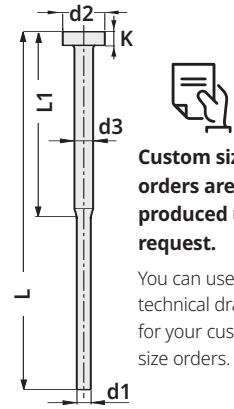
Lubricant-free

CLEANROOM

Code: **SBKDLC**

DLC Coated Cylinder Head Stepped Ejector Pin / DIN ISO 8694





Custom size orders are produced upon request.

You can use the technical drawing for your custom size orders.

d1	L	L1	d3	d2	k
0.8	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			
1	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			
	200				
1.1	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			
1.2	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			
1.3	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			

d1	L	L1	d3	d2	k
1.4	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			
1.5	63	25	3	6	3
	80	35			
	100	50			
	125				
	150				
	160	75			
	200				
1.6	80	35	3	6	3
	100	50			
	125				
	150				
	160	75			
	200				
1.7	80	35	3	6	3
	100	50			
	125				
	150				
	160	75			
	200				
1.8	80	35	3	6	3
	100	50			
	125				
	150				
	160	75			
	200				

d1	L	L1	d3	d2	k
2	80	35	3	6	3
	100	50			
	125				
	150				
	160	75			
	200				
2.2	80	35	3	6	3
	100	50			
	125				
	150				
	160	75			
	200				
2.5	100	50	3	6	3
	125				
	150				
	160	75			
	200				
2.6	100	50	3	6	3
	125				
	150				
	160	75			
	200				
2.7	100	50	3	6	3
	125				
	150				
	160	75			
	200				
2.8	100	50	3	6	3
	125				
	150				
	160	75			
	200				

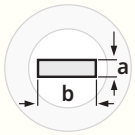
Order: **SBKDLC.** d1 x d3 x L1 x L

Material: 1.2516 WS
Head Hardness: 45 ± 2 HRC
Body Hardness: 60 ± 2 HRC

Heat Resistance: 220⁰ max.
Tensile Resistance: 1300 N / mm²

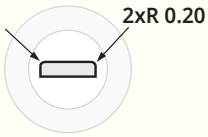
Custom size orders are produced upon request.

Code: **SLADLC**



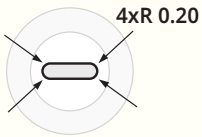
Type: **A**

Code: **SLBDLC**



Type: **B**
with 2-corner radius

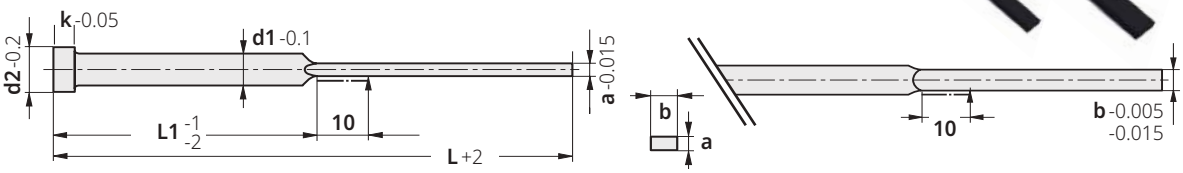
Code: **SLCDLC**



Type: **C**
with 4-corner radius

NEW DLC

Lubricant-free



DLC Coated Blade Ejector Pin - Hardened / ISO 8693 - DIN 1530 F

Code: **SLADLC**

Our standard stocks are created from Type-A. Type-B & Type-C are upon request.

Form: FAH

a	b	d1	d2	k	L	L1
0.5	2.8	3	6	3	80	40
					100	50
					125	60
					160	80
0.6	2.8	3	6	3	80	40
					100	50
					125	60
					160	80
0.8	2.8	3	6	3	80	40
					100	50
					125	60
					160	80
0.8	3.5	4	8	3	80	40
					100	50
					125	60
					160	80
0.8	3.8	4.2	8	3	80	40
					100	50
					125	60
					160	80
0.8	4.5	5	10	3	100	50
					125	60
					160	80
					200	100
					250	125
0.8	5.5	6	12	5	100	50
					125	60
					160	80
					200	100
					250	125

a	b	d1	d2	k	L	L1
1	3.8	4.2	8	3	80	40
					100	50
					125	60
					160	80
1	4.5	5	10	3	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1	5.5	6	12	5	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1	7.5	8	14	5	100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1.2	3.5	4	8	3	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
1.2	3.8	4.2	8	3	80	40
					100	50
					125	60
					160	80

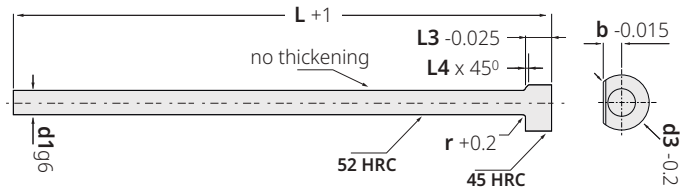
a	b	d1	d2	k	L	L1
1.2	4.5	5	10	3	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1.2	5.5	6	12	5	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1.2	7.5	8	14	5	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
					315	160
					400	200
1.5	4.5	5	10	3	100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1.5	5.5	6	12	5	100	50
					125	60
					160	80
					200	100
					250	125
					315	160

a	b	d1	d2	k	L	L1
1.5	7.5	8	14	5	100	50
					125	60
					160	80
					200	100
					250	125
					315	160
					400	200
1.5	9.5	10	16	5	160	80
					200	100
					250	125
					315	160
					400	200
2	5.5	6	12	5	100	50
					125	60
					160	80
					200	100
					250	125
					315	160
2	7.5	8	14	5	125	60
					160	80
					200	100
					250	125
					315	160
					400	200
2	9.5	10	16	5	160	80
					200	100
					250	125
					315	160
					400	200
2	11.5	12	18	7	160	80
					200	100
					250	125
					315	160
2.5	11.5	12	18	7	200	100
					250	125
					315	160

(Standard Type-A)

Order:
SLADLC. a x b x d1 x L

Material: 1.2516 WS (Hardened)
Head Hardness: 45 ± 2 HRC
Body Hardness: 60 ± 2 HRC
Heat Resistance: 220° max.
Tensile Resistance: 1300 N / mm²



NEW

Core Pin / Anti-twist Head

Code: **SBCP**

DIN 1530 - 1 A

- Precise anti-twist lock on head.
- Made of high-quality, thermal shock-resistant hot work steel 1.2344.
- High core hardness makes it ideal for use in pressure **die casting** and at high temperatures.
- No thickening on the shank, complete grinding after compression.

d1	L	b	r	L3	L4	d3
1.5	125	1.05	0.2	1.5	0.15	3
	200					
1.6	125	1.1	0.2	1.5	0.15	3
1.8	125	1.2	0.2	1.5	0.15	3
2	125	1.5	0.2	2	0.25	4
	200					
2.2	125	1.6	0.2	2	0.25	4
2.5	125	1.75	0.3	2	0.25	5
	200					
2.7	125	1.85	0.3	2	0.25	5
	200					
3	125	2	0.3	3	0.25	6
	200					
3.2	125	2.1	0.3	3	0.25	6
	200					
3.5	125	2.25	0.3	3	0.25	7
	200					
3.7	125	2.35	0.3	3	0.25	7
	200					
4	125	2.5	0.5	3	0.25	8
	200					
4.2	125	2.6	0.5	3	0.25	8
	200					
4.5	125	2.75	0.5	3	0.25	8
	200					

d1	L	b	r	L3	L4	d3
5	125	3.5	0.5	3	0.25	10
	200					
5.2	125	3.6	0.5	3	0.25	10
	200					
5.5	125	3.75	0.5	3	0.25	10
	200					
6	125	4	0.5	5	0.5	12
	200					
6.2	125	4.1	0.5	5	0.5	12
	200					
6.5	125	4.25	0.5	5	0.5	12
	200					
7	125	4.5	0.5	5	0.5	12
	200					
8	125	5	0.5	5	0.5	14
	200					
8.2	125	5.1	0.5	5	0.5	14
	200					
8.5	125	5.25	0.5	5	0.5	14
	200					

d1	L	b	r	L3	L4	d3
9	125	5.5	0.5	5	0.5	14
	200					
10	125	6	0.5	5	0.5	16
	200					
10.2	125	6.1	0.5	5	0.5	16
	200					
10.5	125	6.25	0.5	5	0.5	16
	200					
11	125	6.5	0.5	5	0.5	16
	200					
11.5	125	6.75	0.5	5	0.5	16
	200					
12	125	7	0.8	7	0.5	18
	200					
12.5	125	7.25	0.8	7	0.5	18
	200					
14	125	8.5	0.8	7	0.5	22
	200					
16	125	9.5	0.8	7	0.5	22
	200					

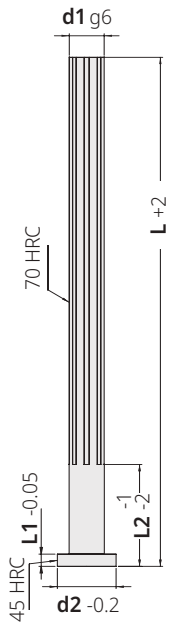
Order:
SBCP. d1 x L

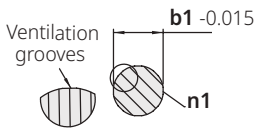
Tensile Resistance: 1400 N / mm²
Heat Resistance: 500⁰ max.

Material: 1.2344
Hardness: 45 ± 52 HRC

NEW

3D CAD FILES GUVENAL





Code: **SBGTP**

Ejector Pin For Ventilation

Function of Ejector Pin for Ventilation:
Melted plastic during the plastic injection process is injected into the mould. Meanwhile, air trapped inside the mould and gases arising from the plastic are optimally evacuated thanks to "SBGTP".

Field of Application:
· Plastic injection moulds
· Diecasting moulds

Regular Maintenance & Correct Placement:
Regular cleaning of "SBGTP" should be maintained. Otherwise it may become clogged and its efficiency may decrease.

Appearance of the part after injection:

Problem
Burn marks are visible surrounding the struts.

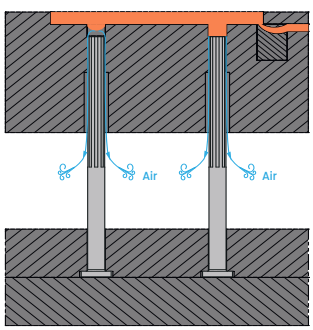
With SBGTP

d1	L	d2	L1	L2	b1	n1
2	100	4	2	30	1.96	4
	160					
	200					
	250			75		
2.5	100	5	2	30	2.46	4
	200					
3	100	6	3	30	2.96	6
	160					
	200					
	250			75		
	315					
3.5	100	7	3		3.46	6
	200					
4	100	8	3	30	3.96	6
	160					
	200					
	250			75		
	315					
4.5	100	8	3	30	4.46	6
	200					
5	100	10	3	30	4.96	8
	160					
	200					
	250			75		
	315					

d1	L	d2	L1	L2	b1	n1
5.5	100	10	3	30	5.46	8
	200					
6	100	12	5	30	5.96	8
	160					
	200					
	250			75		
	315					
6.5	100	12	5	30	6.46	8
	200					
7	100	12	5	30	6.96	8
	200					
8	100	14	5	30	7.96	8
	160					
	200					
	250			75		
	315					
10	100	16	5	30	9.96	8
	160					
	200					
	250			75		
	315					
12	100	18	7	30	11.96	8
	160					
	200					
	250			75		
	315					

Güvenal "SBGTP" ejector pins are produced by high level / special Plasma Nitriding + Oxidation Coating methods.

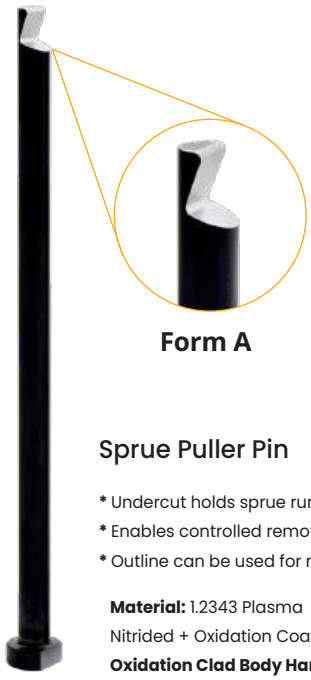
Mounting example :



Placing the pins in the correct places in the mould it is important. Incorrect placement may result in inadequate air discharge and quality problems.

Order:
SBGTP. d1 x L

Material: 1.2343 Plasma Nitrided + Oxidation Coated
Oxidation Clad Body Hardness: 70 HRC



NEW

3D CAD FILES GUVENAL

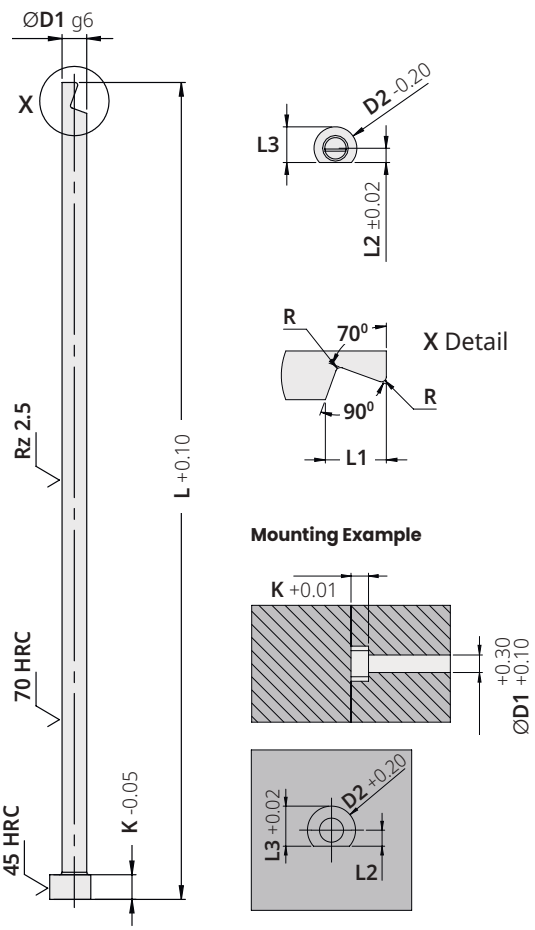
Form A

Sprue Puller Pin

Code: **G179A**

* Undercut holds sprue runners in position
* Enables controlled removal
* Outline can be used for many plastics

Material: 1.2343 Plasma Nitrided + Oxidation Coated
Oxidation Clad Body Hardness: 70 HRC



D1	D2	L	L1	L2	L3	K	R
3	6	125 160 200 250 315	3.8	2	5	3	0.3
4	8	125 160 200 250 315	5	2.5	6.5	3	0.5
5	10	125 160 200 250 315	6.2	3.5	8.5	3	0.5
6	12	125 160 200 250 315	7.5	4	10	5	1
8	14	125 160 200 250 315	10	5	12	5	1
10	16	125 160 200 250 315	12.5	6	14	5	1
12	18	125 160 200 250 315	15	7	16	7	1

Order: **G179A.** D1 x L

Heat Resistance with Güvenal "GTH1400": 1400° max.

Tensile Resistance: 1450 N / mm²
Heat Resistance: 650° max.

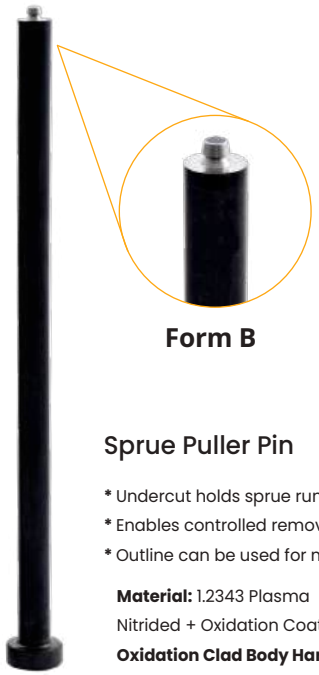
Head Hardness: 45 ± 5 HRC
Body Hardness: 70 HRC

Material: 1.2343 Plasma Nitrided + Oxidation Coated
Oxidation Clad Body Hardness: 70 HRC

Güvenal "G179" ejector pins are produced by high level / special Plasma Nitriding + Oxidation Coating methods.

NEW

3D CAD FILES GUVENAL



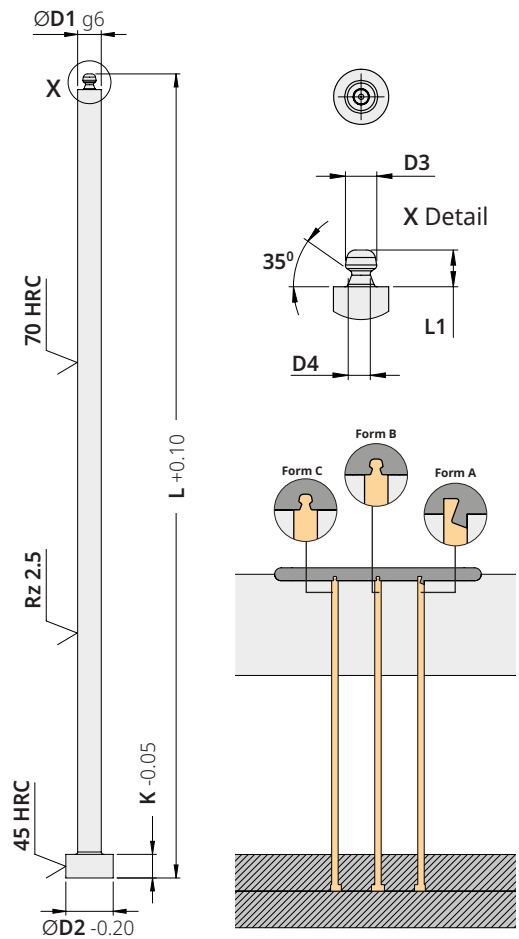
Form B

Sprue Puller Pin

Code: **G179B**

* Undercut holds sprue runners in position
* Enables controlled removal
* Outline can be used for many plastics

Material: 1.2343 Plasma Nitrided + Oxidation Coated
Oxidation Clad Body Hardness: 70 HRC



Güvenal "G179" ejector pins are produced by high level / special Plasma Nitriding + Oxidation Coating methods.

D1	D2	D3	D4	L	L1	L2	K
3	6	1.7	1	**125**	2	2	3
				160			
				200			
				250			
				315			
4	8	2	1.3	**125**	2	2.5	3
				160			
				200			
				250			
				315			
5	10	2.4	1.7	**125**	2	3.5	3
				160			
				200			
				250			
				315			
6	12	2.8	2	**125**	3	4	5
				160			
				200			
				250			
				315			
8	14	3.5	2.7	**125**	3	5	5
				160			
				200			
				250			
				315			
10	16	4.4	3.3	**125**	4	6	5
				160			
				200			
				250			
				315			
12	18	5	4	**125**	4	7	7
				160			
				200			
				250			
				315			

Order: **G179B.** D1 x L

Heat Resistance with Güvenal "GTH1400": 1400⁰ max.

Tensile Resistance: 1450 N / mm²
Heat Resistance: 650⁰ max.

Head Hardness: 45 ± 5 HRC
Body Hardness: 70 HRC

Material: 1.2343 Plasma Nitrided + Oxidation Coated
Oxidation Clad Body Hardness: 70 HRC

NEW

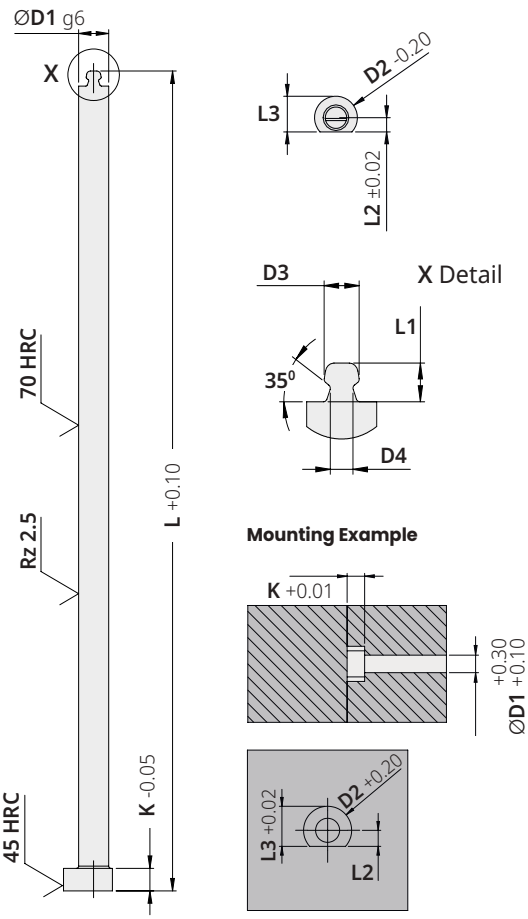
3D CAD FILES GUVENAL

Form C

Sprue Puller Pin

Code: **G179C**

* Undercut holds sprue runners in position
* Enables controlled removal
* Outline can be used for many plastics



D1	D2	D3	D4	L	L1	L2	L3	K
3	6	1.7	1	125 160 200 250 315	2	2	5	3
4	8	2	1.3	125 160 200 250 315	2	2.5	6.5	3
5	10	2.4	1.7	125 160 200 250 315	2	3.5	8.5	3
6	12	2.8	2	125 160 200 250 315	3	4	10	5
8	14	3.5	2.7	125 160 200 250 315	3	5	12	5
10	16	4.4	3.3	125 160 200 250 315	4	6	14	5
12	18	5	4	125 160 200 250 315	4	7	16	7

Order: **G179C.** D1 x L

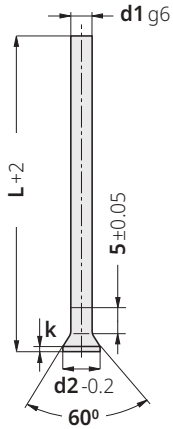
Heat Resistance with Güvenal "GTH1400": 1400⁰ max.

Tensile Resistance: 1450 N / mm²
Heat Resistance: 650⁰ max.

Head Hardness: 45 ± 5 HRC
Body Hardness: 70 HRC

Material: 1.2343 Plasma Nitrided + Oxidation Coated
Oxidation Clad Body Hardness: 70 HRC

Güvenal "G179" ejector pins are produced by high level / special Plasma Nitriding + Oxidation Coating methods.



Ejector Pin - Conical Head

Code: **HBI**

DIN 1530-D

d1	L	d2	k
1	100	1.8	0.5
	125		
	160		
	200		
1.1	100	1.8	0.5
	125		
	160		
1.2	100	2	0.5
	125		
	160		
1.3	100	2	0.5
	125		
	160		
1.4	100	2.2	0.5
	125		
	160		
1.5	100	2.2	0.5
	125		
	160		
	200		
	250		
1.6	100	2.5	0.5
	125		
	160		
1.7	100	2.5	0.5
	125		
	160		
1.8	100	2.8	0.5
	125		
	160		

d1	L	d2	k
1.9	100	2.8	0.5
	125		
	160		
2	100	3	0.5
	125		
	160		
	200		
	250		
	315		
2.1	100	3.2	0.5
	125		
	160		
2.2	100	3.2	0.5
	125		
	160		
2.3	100	3.5	0.5
	125		
	160		
2.4	100	3.5	0.5
	125		
	160		
2.5	100	3.5	0.5
	125		
	160		
	200		
	250		
	315		
2.6	100	4	0.5
	125		
	160		

d1	L	d2	k
2.7	100	4	0.5
	125		
	160		
2.8	100	4	0.5
	125		
	160		
2.9	100	4	0.5
	125		
	160		
3	100	4.5	0.5
	125		
	160		
	200		
	250		
	315		
3.1	100	4.5	0.5
	125		
	160		
3.2	100	4.5	0.5
	125		
	160		
	200		
3.3	100	4.5	0.5
	125		
	160		
3.4	100	4.5	0.5
	125		
	160		
3.5	100	5	0.5
	125		
	160		
	200		
	250		
	315		
3.6	100	5	0.5
	125		
	160		

d1	L	d2	k
3.7	100	5	0.5
	125		
	160		
3.8	100	5	0.5
	125		
	160		
3.9	100	5	0.5
	125		
	160		
4	100	5.5	0.5
	125		
	160		
	200		
	250		
	315		
4.1	100	5.5	0.5
	125		
	160		
4.2	100	5.5	0.5
	125		
	160		
4.3	100	5.5	0.5
	125		
	160		
4.4	100	5.5	0.5
	125		
	160		
4.5	100	6	0.5
	125		
	160		
	200		
	250		
	315		
4.6	100	6	0.5
	125		
	160		
4.7	100	6	0.5
	125		
	160		
4.8	100	6	0.5
	125		
	160		
4.9	100	6	0.5
	125		
	160		
5	100	6.5	0.5
	125		
	160		
	200		
	250		
	315		

d1	L	d2	k
5.1	100	6.5	0.5
	125		
	160		
5.2	100	6.5	0.5
	125		
	160		
5.3	100	6.5	0.5
	125		
	160		
5.4	100	6.5	0.5
	125		
	160		
5.5	100	7	0.5
	125		
	160		
	200		
	250		
	315		
5.6	100	7	0.5
	125		
	160		
5.7	100	7	0.5
	125		
	160		
5.8	100	7	0.5
	125		
	160		
5.9	100	7	0.5
	125		
	160		
6	100	8	0.5
	125		
	160		
	200		
	250		
	315		
6.5	100	9	1
	125		
	160		
	200		
	250		
7	100	9	1
	125		
	160		
	200		
	250		
	315		
7.5	100	10	1
	125		
	160		
	200		
	250		

d1	L	d2	k
8	100	10	1
	125		
	160		
	200		
	250		
	315		
8.5	100	11	1
	125		
	160		
	200		
	250		
	315		
9	100	11	1
	125		
	160		
	200		
	250		
9.5	100	12	1
	125		
	160		
	200		
	250		
10	100	12	1
	125		
	160		
	200		
	250		
	315		
10.5	100	13	1
	125		
	160		
	200		
11	100	13	1
	125		
	160		
	200		
	250		
12	100	14	1
	125		
	160		
	200		
	250		
	315		
13	100	15	1
	125		
	160		
	200		
	250		
14	100	16	1.5
	125		
	160		
	200		
	250		
	315		
16	100	18	1.5
	125		
	160		
	200		
	250		
	315		

Order: **HBI.** d1 x L

Material: 1.2516 WS
Head Hardness: 45 ± 2 HRC
Body Hardness: 60 ± 2 HRC

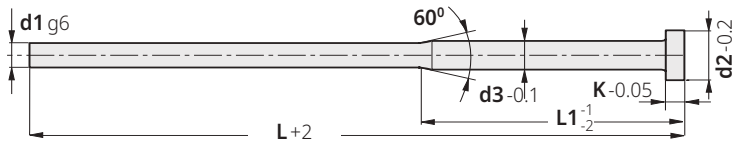
Heat Resistance:
220° max.

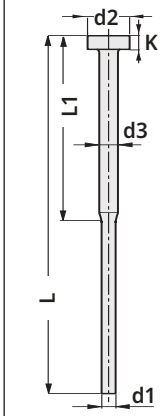
Tensile Resistance:
1300 N / mm²

Cylinder Head Stepped Ejector Pin

Code: **SBKAH**

DIN ISO 8694





Custom size orders are produced upon request.

You can use the technical drawing for your custom size orders.

d1	L	L1	d3	d2	k
0.8	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			
1	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			
	200				
1.1	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			
1.2	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			
1.3	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			

d1	L	L1	d3	d2	k
1.4	63	25	2	4	2
	80	35			
	100	50			
	125				
	150				
	160	75			
1.5	63	25	3	6	3
	80	35			
	100	50			
	125				
	150				
	160	75			
	200				
1.6	80	35	3	6	3
	100	50			
	125				
	150				
	160	75			
	200				
1.7	80	35	3	6	3
	100	50			
	125				
	150				
	160	75			
	200				
1.8	80	35	3	6	3
	100	50			
	125				
	150				
	160	75			
	200				

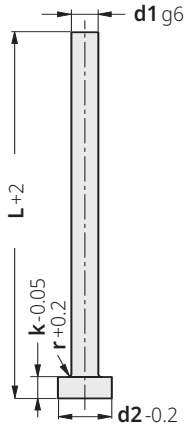
d1	L	L1	d3	d2	k
2	80	50	3	6	3
	100				
	125				
	150				
	160	75			
	200				
2.2	80	50	3	6	3
	100				
	125				
	150				
	160	75			
	200				
2.5	100	50	3	6	3
	125				
	150				
	160	75			
	200				
2.6	100	50	3	6	3
	125				
	150				
	160	75			
	200				
2.7	100	50	3	6	3
	125				
	150				
	160	75			
	200				
2.8	100	50	3	6	3
	125				
	150				
	160	75			
	200				

Order: **SBKAH.** d1 x d3 x L1 x L

Material: 1.2516 WS
Head Hardness: 45 ± 2 HRC
Body Hardness: 60 ± 2 HRC
Heat Resistance: 220° max.
Tensile Resistance: 1300 N / mm²

d1	L		d2	k
1	100	200	2.5	1.2
	125	250		
	160	315		
1.1	100		2.5	1.2
1.2	100		2.5	1.2
	160			
1.3	100		3	1.5
	160			
1.4	100		3	1.5
	160			
1.5	100	200	3	1.5
	125	250		
	160	315		
1.6	100		3	1.5
	160			
1.7	100		3	1.5
	160			
1.8	100		3	1.5
	160			
1.9	100		3	1.5
	160			
2	100	250	4	2
	125	315		
	160	400		
	200	500		
2.2	100		4	2
	160			
2.3	100		4	2
2.4	100		4	2
	160			
2.5	100	250	5	2
	125	315		
	160	400		
	200	500		
2.7	100		5	2
	160			
3	100	315	6	3
	125	400		
	160	500		
	200	630		
	250			
3.2	100		6	3
	160			
	200			
3.5	100	250	7	3
	125	315		
	160	400		
	200	500		

d1	L		d2	k
3.7	100		7	3
	160			
4	100	400	8	3
	125	500		
	160	630		
	200	800		
	250	1000		
	315			
4.1	100		8	3
4.2	100		8	3
	160			
	200			
4.5	100	250	8	3
	125	315		
	160	400		
	200	500		
5	100	400	10	3
	125	500		
	160	630		
	200	800		
	250	1000		
	315			
5.2	100	315	10	3
	200	400		
	250			
5.5	100	250	10	3
	125	315		
	160	400		
	200	500		
6	100	400	12	5
	125	500		
	160	630		
	200	800		
	250	1000		
	315			
6.2	100		12	5
	160			
	250			
6.5	100	315	12	5
	125	400		
	160	500		
	200	630		
	250			
7	100	315	12	5
	125	400		
	160	500		
	200	1000		
	250			



Ejector Pin - Cylinder Head

ISO 6751, DIN 1530 - Form: AH

Code: SBIAH

d1	L		d2	k
7.5	100	250	12	5
	125	315		
	160	400		
	200			
8	100	400	14	5
	125	500		
	160	630		
	200	800		
	250	1000		
	315			
8.2	100		14	5
	160			
	250			
8.5	100	315	14	5
	125	400		
	160	500		
	200	630		
	250			
9	100	315	14	5
	125	400		
	160	500		
	200	630		
	250			
10	100	400	16	5
	125	500		
	160	630		
	200	800		
	250	1000		
	315			

d1	L		d2	k
10.2	125		16	5
	250			
10.5	100	200	16	5
	125	315		
	160	400		
11	100	250	16	5
	125	315		
	160	400		
	200			
12	100	400	18	7
	125	500		
	160	630		
	200	800		
	250	1000		
	315			
13	100	250	18	7
	125	315		
	160	400		
	200			
14	100	400	22	7
	125	500		
	160	630		
	200	800		
	250	1000		
	315			

d1	L		d2	k
16	100	400	22	7
	125	500		
	160	630		
	200	800		
	250	1000		
	315			
18	100	315	24	7
	125	400		
	160	500		
	200	630		
	250	1000		
20	125	400	26	8
	160	500		
	200	630		
	250	800		
	315	1000		
25	100	400	32	10
	125	500		
	160	630		
	200	800		
	250	1000		
	315			

Heat Resistance:
220⁰ max.

Tensile Resistance:
1300 N / mm²

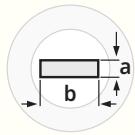
Order: **SBIAH.** d1 x L

Material: 1.2516 WS
Hardness: 60 ± 2 HRC

d1 ~	r
1.5 ~ 2	0.2
2.5 ~ 5.5	0.3
6 ~ 11	0.5
12 ~ 18	0.8
20 ~ 25	1

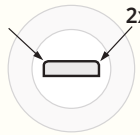
Custom size orders are produced upon request.

Code: **SPLAH**



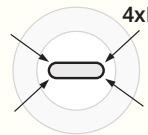
Type: **A**

Code: **SPLBH**

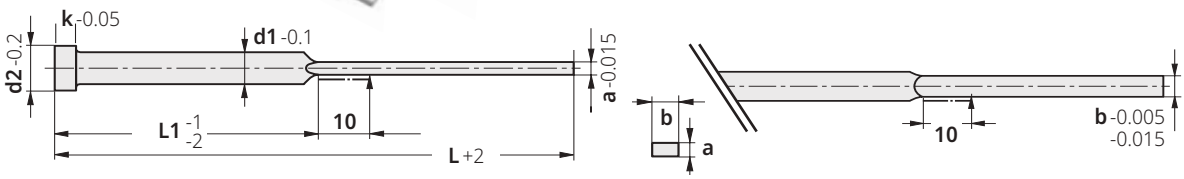


Type: **B**
with 2-corner radius

Code: **SPLCH**



Type: **C**
with 4-corner radius



Blade Ejector Pin - Hardened / ISO 8693 - DIN 1530 F

Code: **SPLAH**

Our standard stocks are created from Type-A. Type-B & Type-C are upon request.

Form: FAH

a	b	d1	d2	k	L	L1
0.5	2.8	3	6	3	80	40
					100	50
					125	60
					160	80
0.6	2.8	3	6	3	80	40
					100	50
					125	60
					160	80
0.8	2.8	3	6	3	80	40
					100	50
					125	60
					160	80
0.8	3.5	4	8	3	80	40
					100	50
					125	60
					160	80
0.8	3.8	4.2	8	3	80	40
					100	50
					125	60
					160	80
0.8	4.5	5	10	3	100	50
					125	60
					160	80
					200	100
					250	125
0.8	5.5	6	12	5	100	50
					125	60
					160	80
					200	100
					250	125

a	b	d1	d2	k	L	L1
1	3.8	4.2	8	3	80	40
					100	50
					125	60
					160	80
1	4.5	5	10	3	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1	5.5	6	12	5	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1	7.5	8	14	5	100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1.2	3.5	4	8	3	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
1.2	3.8	4.2	8	3	80	40
					100	50
					125	60
					160	80

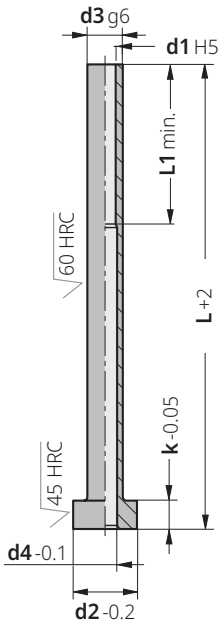
a	b	d1	d2	k	L	L1
1.2	4.5	5	10	3	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1.2	5.5	6	12	5	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1.2	7.5	8	14	5	80	40
					100	50
					125	60
					160	80
					200	100
					250	125
					315	160
					400	200
1.5	4.5	5	10	3	100	50
					125	60
					160	80
					200	100
					250	125
					315	160
1.5	5.5	6	12	5	100	50
					125	60
					160	80
					200	100
					250	125
					315	160

a	b	d1	d2	k	L	L1
1.5	7.5	8	14	5	100	50
					125	60
					160	80
					200	100
					250	125
					315	160
					400	200
1.5	9.5	10	16	5	160	80
					200	100
					250	125
					315	160
					400	200
2	5.5	6	12	5	100	50
					125	60
					160	80
					200	100
					250	125
					315	160
2	7.5	8	14	5	125	60
					160	80
					200	100
					250	125
					315	160
					400	200
2	9.5	10	16	5	160	80
					200	100
					250	125
					315	160
					400	200
2	11.5	12	18	7	160	80
					200	100
					250	125
					315	160
2.5	11.5	12	18	7	200	100
					250	125
					315	160

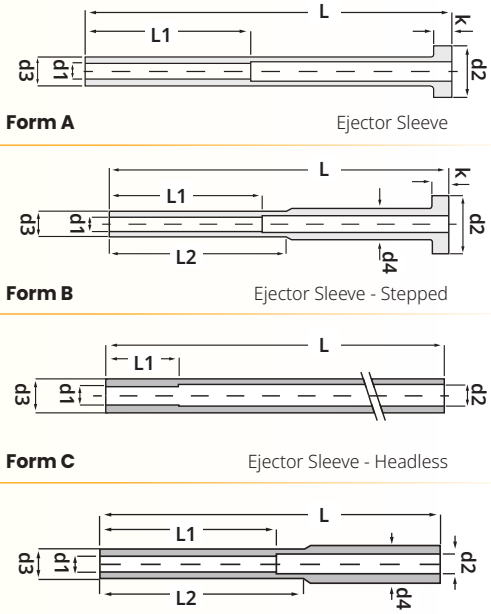
(Standard Type-A)

Order:
SPLAH. a x b x d1 x L

Material: 1.2516 WS (Hardened)
Head Hardness: 45 ± 2 HRC
Body Hardness: 60 ± 2 HRC
Heat Resistance: 220° max.
Tensile Resistance: 1300 N / mm²



Custom size orders are produced upon request.
You can use the technical drawing for your custom size orders.



Ejector Sleeve - Nitrided / DIN ISO 8405

Code: **SMB**

The inner hole at the rear of the Ejector Sleeves has been precision ground within the 30 - 45 mm ejector pin operating tolerance.

d3	L	d1	L1	d4	d2	k
4	75	2	35	2.3	8	3
	100					
	125					
	150					
	160					
	175					
	200					
	250					
5	75	2.5	35	3	10	3
	100					
	125					
	150					
	160					
	175					
	200					
	250					
5	75	3	45	3.3	10	3
	100					
	125					
	150					
	160					
	175					
	200					
	250					
	300					

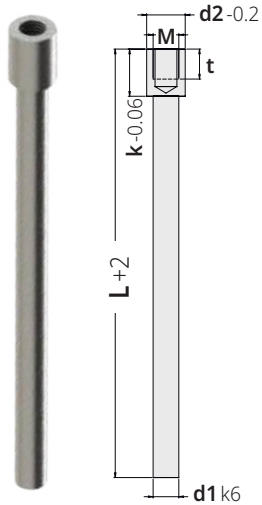
d3	L	d1	L1	d4	d2	k
6	75	3.5	45	4	12	5
	100					
	125					
	150					
	160					
	175					
	200					
	250					
	300					
6	75	4	45	4.3	12	5
	100					
	125					
	150					
	160					
	175					
	200					
	250					
	300					
	350					
	400					
	450					
	500					

d3	L	d1	L1	d4	d2	k
8	75	5	45	5.3	14	5
	100					
	125					
	150					
	160					
	175					
	200					
	250					
	300					
	350					
	400					
	450					
	500					
10	75	6	45	6.3	16	5
	100					
	125					
	150					
	160					
	175					
	200					
	250					
	300					
	350					
	400					
	450					
	500					
12	75	8	45	8.3	20	7
	100					
	125					
	150					
	160					
	175					

d3	L	d1	L1	d4	d2	k
12	200	8	45	8.3	20	7
	250					
	300					
	350					
	400					
	450					
	500					
14	75	10	50	10.3	22	7
	100					
	125					
	150					
	160					
	175					
	200					
	250					
	300					
	350					
	400					
	450					
	500					
16	75	12	50	12.3	22	7
	100					
	125					
	150					
	160					
	175					
	200					
	250					
	300					
	350					
	400					
	450					
	500					

Order: **SMB.** d1 x d3 x L

Material: 1.2343
Head Hardness: 45 ± 2 HRC
Body Hardness: 60 ± 2 HRC
Heat Resistance: 500 - 550⁰ max.
Tensile Resistance: 1450 N / mm²



Code: **SBD**

Core Pin - Threaded Head

DIN 1530 - A / ISO 6751

d1	L	M	t	k	d2
3	63	M4	5	10	6
	125				
4	63	M5	7	12	8
	125				
5	80	M6	9	14	9
	160				
6	80	M6	9	14	10
	160				
8	80	M6	10	16	13
	160				
10	100	M10	12	18	15
	200				
12	100	M12	14	22	18
	200				
14	100	M12	14	22	20
	200				

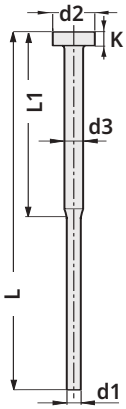
Material: 1.2343
Tensile Resistance: 1400 N / mm²

Order:
SBD. d1 x L x M

In-mould (ejector plate & core/lifter) usage. Can be exchanged without dismantling the mould. Threaded head for easy disassembly.
Custom size orders are produced upon request.

Heat Resistance with Güvenal "GTH1400":
1400⁰ max.

Heat Resistance:
650⁰ max.
(without lub. grease)



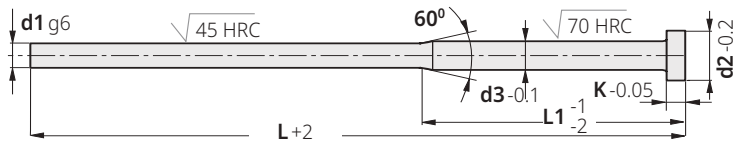
Custom size orders are produced upon request.

You can use the technical drawing for your custom size orders.

Stepped Ejector Pin - Nitrided and Oxidation Coated

ISO 8694 / DIN 1530 Form C

Code: **SBW**



d1	L	L1	d3	d2	k
0.8	100	50	2	4	2
	125	50			
	160	75			
0.9	100	50	2	4	2
	125	50			
	160	75			
1	100	50	2	4	2
	125	50			
	160	75			
	200	75			
1.1	100	50	2	4	2
	125	50			
	160	75			
1.2	100	50	2	4	2
	125	50			
	160	75			
1.3	100	50	2	4	2
	125	50			
	160	75			

d1	L	L1	d3	d2	k
1.4	100	50	2	4	2
	125	50			
	160	75			
1.5	100	50	3	6	3
	125	50			
	160	75			
	200	75			
2	100	50	3	6	3
	125	50			
	160	75			
	200	75			
2.5	100	50	3	6	3
	125	50			
	160	75			
	200	75			

Order:
SBW. d1 x d3 x L1 x L

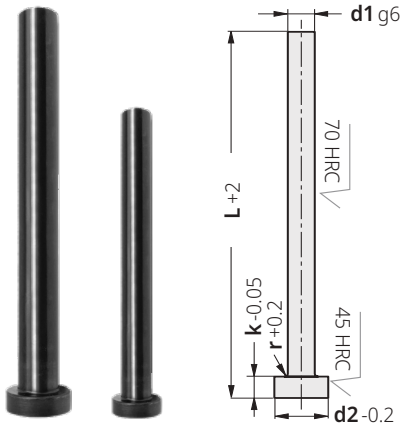
Material: 1.2343
Plasma Nitrided + Oxidation Coated

d1	L		d2	k
1.5	100	160	3	1.5
	125	200		
2	100	315	4	2
	125	400		
	160	500		
	200	630		
	250			
2.2	100		4	2
	160			
2.5	100	250	5	2
	125	315		
	160	400		
	200	500		
2.7	100		5	2
	160			
3	100	315	6	3
	125	400		
	160	500		
	200	630		
	250			
3.2	100		6	3
	160			
3.5	100	315	7	3
	125	400		
	160	500		
	200	630		
	250			
3.7	100		7	3
	160			
4	100	315	8	3
	125	400		
	160	500		
	200	630		
	250	800		
4.2	100		8	3
	200			
4.5	100	315	8	3
	125	400		
	160	500		
	200	630		
	250			
5	100	315	10	3
	125	400		
	160	500		
	200	630		
	250	800		

d1	L		d2	k
5.2	100		10	3
	200			
5.5	100	315	10	3
	125	400		
	160	500		
	200	630		
	250			
6	100	400	12	5
	125	500		
	160	630		
	200	800		
	250	1000		
	315			
6.2	100	160	12	5
	125	250		
6.5	100	250	12	5
	125	315		
	160	400		
	200	500		
7	100	315	12	5
	125	400		
	160	500		
	200	630		
	250	800		
7.5	100	315	12	5
	125	400		
	160	500		
	200	800		
	250			
8	100	400	14	5
	125	500		
	160	630		
	200	800		
	250	1000		
	315			
8.2	100		14	5
	160			
	250			
8.5	100	315	14	5
	125	400		
	160	500		
	200	630		
	250			

Güvenal "SBMAV03" ejector pins are produced by high level / special Plasma Nitriding + Oxidation Coating methods.

DIN 1530-1 Form: A



Cylinder Head Ejector Pin

Code: **SBMAV03**

Plasma Nitrided and Oxidation Coated / DIN 1530-1

d1	L		d2	k
9	100	315	14	5
	125	400		
	160	500		
	200	630		
	250	800		
9.5	100	250	14	5
	125	315		
	160	400		
	200			
10	100	400	16	5
	125	500		
	160	630		
	200	800		
	250	1000		
	315			
10.2	125		16	5
	250			
	500			
10.5	100	250	16	5
	125	315		
	160	400		
	200	500		
11	100	250	16	5
	125	315		
	160	400		
	200	500		
11.5	100		16	5

d1	L		d2	k
12	100	400	18	7
	125	500		
	160	630		
	200	800		
	250	1000		
	315			
13	100	250	18	7
	125	315		
	160	400		
	200	500		
14	100	400	22	7
	125	500		
	160	630		
	200	800		
	250	1000		
	315			
16	100	400	22	7
	125	500		
	160	630		
	200	800		
	250	1000		
	315			

d1	L		d2	k
18	100	315	24	7
	125	400		
	160	500		
	200	630		
	250			
20	125	400	26	8
	160	500		
	200	630		
	250	800		
	315	1000		
25	125	400	32	10
	160	500		
	200	630		
	250	800		
	315			

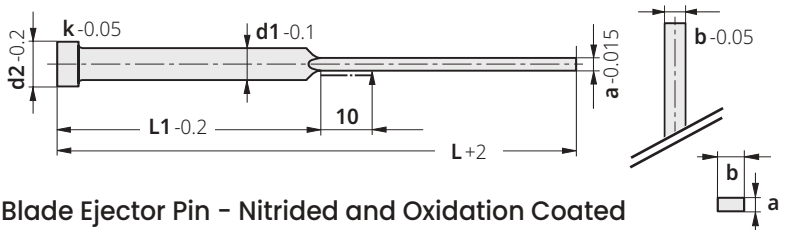
d1 ~	r
1.5 ~ 2	0.2
2.5 ~ 5.5	0.3
6 ~ 11	0.5
12 ~ 18	0.8
20 ~ 25	1

Order: **SBMAV03.** d1 x L

Material: 1.2343 Plasma Nitrided + Oxidation Coated
Oxidation Clad Body Hardness: 70 HRC

Heat Resistance with Güvenal "GTH1400": 1400⁰ max.
Tensile Resistance: 1450 N / mm²
Heat Resistance: 650⁰ max.
Head Hardness: 45 ± 5 HRC
Body Hardness: 44 HRC

3D CAD FILES GUVENAL www.guvenal.net



Blade Ejector Pin - Nitrided and Oxidation Coated

ISO 8693 (DIN 1530 F) Code: **SPWA** Form: A

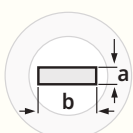
Our standard stocks are created from Type-A. Type-B & Type-C are upon request.

a	b	d1	d2	k	L	L1
0.8	3.5	4	8	3	80	40
					100	50
					125	60
1	4.5	5	10	3	80	40
					100	50
					125	60
					160	80
1	5.5	6	12	5	80	40
					100	50
					125	60
					160	80
1.2	3.5	4	8	3	80	40
					100	50
					125	60
					160	80
1.2	4.5	5	10	3	80	40
					100	50
					125	60
					160	80
1.2	5.5	6	12	5	80	40
					100	50
					125	60
					160	80
1.2	7.5	8	14	5	80	40
					100	50
					125	60
					160	80
					200	100
1.5	4.5	5	10	3	100	50
					125	60
					160	80
					200	100

a	b	d1	d2	k	L	L1
1.5	5.5	6	12	5	100	50
					125	60
					160	80
					200	100
1.5	7.5	8	14	5	125	60
					160	80
					200	100
					250	125
1.5	9.5	10	16	5	160	80
					200	100
					250	125
					315	160
2	5.5	6	12	5	100	50
					125	60
					160	80
					200	100
2	7.5	8	14	5	160	80
					200	100
					250	125
					315	160
2	9.5	10	16	5	200	100
					250	125
					315	160
					400	200
2	11.5	12	18	7	200	100
					250	125
					315	160
					400	200

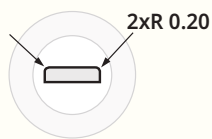
Custom size orders are produced upon request.

Code: **SPWA**



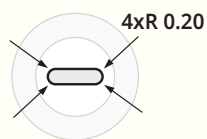
Type: **A**

Code: **SPWB**



Type: **B**
with 2-corner radius

Code: **SPWC**



Type: **C**
with 4-corner radius

(Standard Type-A)

Order:
SPWA. a x b x d1 x L

Material: 1.2343 Plasma Nitrided + Oxidation Coated
Heat Resistance with Lubricating Grease: 1400^0 max.
Heat Resistance: 650^0 max. (without lub. grease)

NEW

Order Code: **GTH1400**

High Temperature Ejector Pin Grease

Custom-engineered Grease

Resistant to: 1400^{0}C

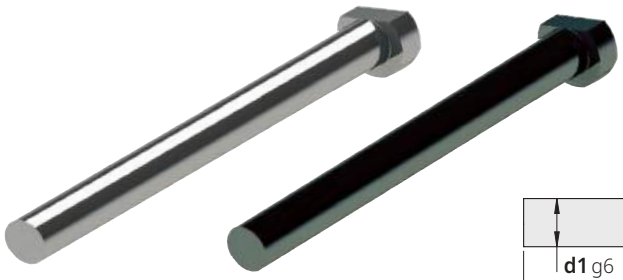
Specially Developed Formula

High temperature lubricating greases for Ejector Pins & Core Systems.

Our special greases are consists well refined mineral oils and EP additives providing lubricity as film strip between other mould parts and mould parts that do not affect from high temperature of ejector systems and core systems in working mould in high temperature such as metal injection. Thanks to solid lubricants and additives, it has comfortable operation (working without load). It has high heat insulation and provides resistance up to 1400°C. It is in film strip position of surfaces between parts. Even at very high temperature, it prevents sticking each other. It is produced from vegetable oils and not harmful to the health.

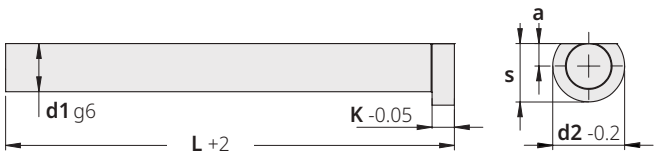
Advantage of using GTH1400 lubricating greases:

* It is resistant against oxidization and friction.
* It is resistant to corrosion and abrasion.
* It is silicium and white (it does not make any contamination on mould).
* It Is resistant against water and humidity (water proof).
* Due to dust atmosphere as casting moulds, the user's hands are not painted black. It is a very good protector.
* It does not cause any reaction on surfaces.



SDIT 1 SDIT 2

Note: Custom size orders are produced upon request.



Ejector Pin with Locking Head (Anti-Rotating)

Code: **SDIT..**

SDIT 1

Material: 1.2516 WS
Head Hardness: 45 ± 2 HRC
Body Hardness: 60 ± 2 HRC
Heat Resistance: 2200 max.
Tensile Resistance: 1300 N / mm²

SDIT 2

Material: 1.2343 Plasma Nitrided + Oxidation Coated
Heat Resistance with Lubricating Grease: 1400⁰ max.
Heat Resistance: 650⁰ max. (without lub. grease)
Head Hardness: 45 ± 5 HRC / **Body Hardness:** 44 HRC
Oxidation Clad Body Hardness: 70 HRC / **Tensile Resistance:** 1450 N / mm²

d1	L	d2	K	a	s
3.0	100	6	3	1.5	4.5
	125				
	160				
	200				
	250				
	315				
	400				
	500				
3.5	100	7	3	1.75	5.25
	125				
	160				
	200				
	250				
4.0	100	8	3	2	6
	125				
	160				
	200				
	250				
	315				
	400				
4.5	100	8	3	2.25	6.25
	125				
	160				
	200				
	250				
5.0	100	10	3	2.5	7.5
	125				
	160				
	200				
	250				
	315				
	400				
	500				

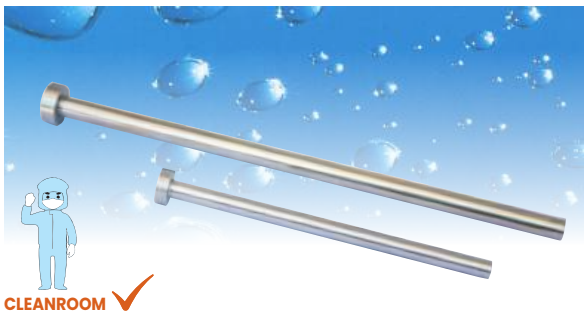
d1	L	d2	K	a	s
5.5	100	10	3	2.75	7.75
	125				
	160				
	200				
	250				
6.0	100	12	5	3	9
	125				
	160				
	200				
	250				
	315				
	400				
7.0	100	12	5	3.5	9.5
	125				
	160				
	200				
	250				
	315				
7.5	100	12	5	3.75	9.75
	125				
	160				
	200				
	250				
	315				
8	100	14	5	4	11
	125				
	160				
	200				
	250				
	315				
	400				
	500				

d1	L	d2	K	a	s
8.5	100	14	5	4.25	11.2
	125				
	160				
	200				
	250				
	315				
9	100	14	5	4.5	11.5
	125				
	160				
	200				
	250				
	315				
10	100	16	5	5	13
	125				
	160				
	200				
	250				
	315				
	400				
	500				
11	100	16	5	5.5	13.5
	125				
	160				
	200				
	250				
	315				
	400				
12	100	18	7	6	15
	125				
	160				
	200				
	250				
	315				
	400				
	500				

d1	L	d2	K	a	s
14	100	22	7	7	18
	125				
	160				
	200				
	250				
	315				
16	100	22	7	8	19
	125				
	160				
	200				
	250				
	315				
	400				
	500				
20	100	26	8	10	23
	125				
	160				
	200				
	250				
	315				
	400				
	500				
25	100	32	10	12.5	28.5
	125				
	160				
	200				
	250				
	315				
	400				
	500				

The new generation of ejector pins with locking head allows the precise centring of individually contoured ejector or core pins in the mould. The centring ensures a precise mounting position within the mould.

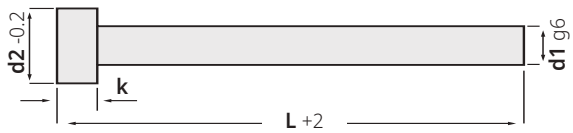
Order:
SDIT(1 or 2). d1 x L



Ejector Pin - Stainless / INOX

Code: **SPI**

ISO 6751, DIN 1530 Form: AH



d1	L	d2	k
2	100	4	2
	160		
	200		
	250		
2.5	100	5	2
	160		
	200		
	250		
3	100	6	3
	160		
	200		
	250		
3.5	100	7	3
	160		
	200		
	250		
4	100	8	3
	160		
	200		
	250		

d1	L	d2	k
4.5	100	8	3
	160		
	200		
	250		
5	100	10	3
	160		
	200		
	250		
5.5	100	10	3
	160		
	200		
	250		
6	100	12	5
	160		
	200		
	250		
8	100	14	5
	160		
	200		
	250		

Order: **SPI.** d1 x L

Material: 1.4125 INOX
Heat Resistance: 180⁰ max.
Body Hardness: 56 + 2 HRC
Head Hardness: 45 ± 5 HRC

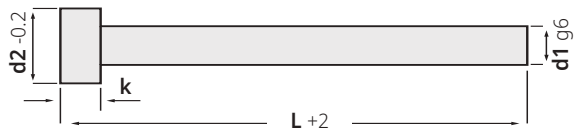
"SPI" Ejector Pins are compatible with medicine and food industry standards. The ejector pins has been produced to avoid corrosion problems. They are anti-magnetic products resistant to corrosion and acids for production in severe climate conditions in chemistry / medicine and food industry, also in hygienic places.

Material: Copper Alloy
Surface Roughnes: Ra <0.8 Micron
Body Hardness: HRC min. 180 HB
Head Hardness: HRC min. 180 HB
Tensile Resistance: ~650 N/mm²
Heat Conductivity: ~200 W/mK

Ejector Pin - Copper Alloy

Code: **SPPAV07**

ISO 6751, DIN 1530 Form: AH



d1	L	d2	k
2	100	4	2
	160		
2.5	100	5	2
	160		
3	100	6	3
	160		
	250		
3.5	100	7	3
	160		
4	100	8	3
	160		
	250		
4.5	100	8	3
	160		
5	100	10	3
	160		
	250		

d1	L	d2	k
6	100	12	5
	160		
	250		
	315		
7	100	12	5
	160		
	250		
8	100	14	5
	160		
	250		
	315		
10	100	16	5
	160		
	250		
	315		
	400		

d1	L	d2	k
12	100	18	7
	160		
	250		
	315		
	400		
14	160	22	7
	250		
	400		
16	160	22	7
	250		
	400		
	500		

Order: **SPPAV07.** d1 x L

"SPPAV07" Ejector Pins are produced with added copper Cbn (nickel bornite) into material during production. Considerably higher heat conductivity. The cooling for the desired area of mould is provided very quickly without deviating the targeted area. Due to thermal optimisation, very high quality product is obtained from moulds under optimum temperature. Also, due to thermal optimisation again, production time per part is shortened as 30%. By changing according to the material, the heat conductivity is x6 times higher than standard ejector pins. There is no need to use pin lubricating oil for Copper Ejector Pins. Even after cooling, it does not lose its conductivity, does not deform, it can be welded, soldered, ground and polished. However, coated products cannot be machining on the lathe or milling machine.

HIGH-PERFORMANCE CUSTOM-MADE PARTS DESIGNED TO YOUR NEEDS WITH OUR EXTENSIVE MANUFACTURING CAPABILITIES

"Turkish-Made / Globally Connected Quality"

We offer customized production solutions for a wide range of industries, tailored to your specific design needs. With unlimited production options, you can rely on Güvenal for not only tooling but also similar products, providing cost-effective prices and fast delivery for all your projects.

ISO Certified:
To ensure the highest quality and meet customer requirements, we continuously improve our Quality Management System in accordance with ISO 9001:2015.

Custom-made Self-lubricating Components

Die Casting Parts

Cavity - Core Pins

Parts for Medical Industry

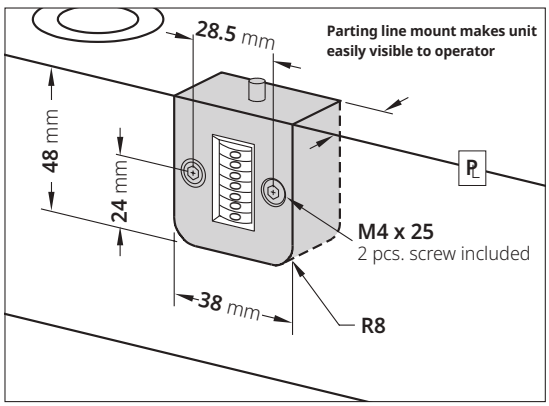
Cap Closure & Pet Bottle Parts

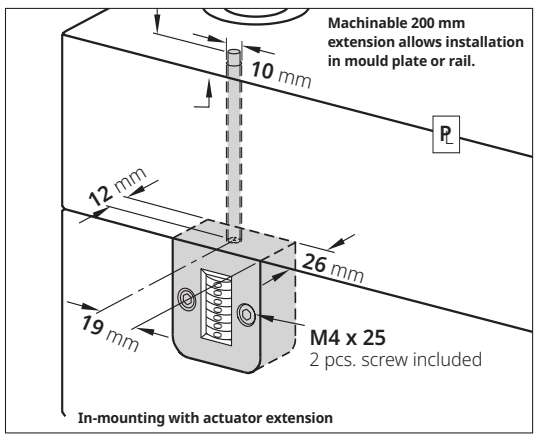
Hot Runner Parts

Cycle Counter

Order Code: **CVPL200**

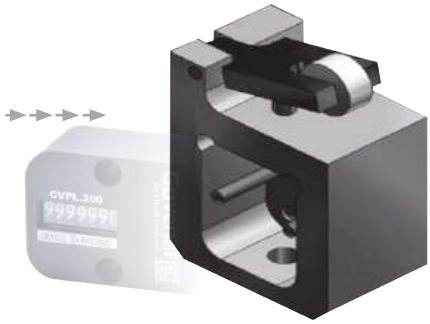
* Maximum operating temperature is 120^{0}C.
* Non-resettable, 7-digit mechanical counter.
* Material: Glass fibre reinforced polyester casing.





Advantages of product:

* The product has a non-resettable 7-digit mechanical counter.
* It provides creating or developing protective maintenance programs by evaluating process follow-up systems and confirming records kept manually.
* Mould producers and authorized sellers can keep permanent records related to cycle status of the moulds out of the working area.
* It is very important for mould producers to communicate correctly in situations where especially cycle guarantee is given.

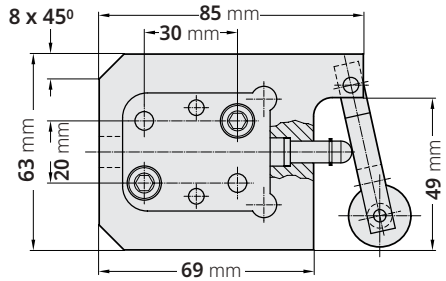


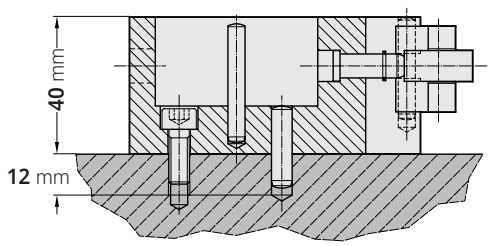
Installation Socket for Cycle Counter

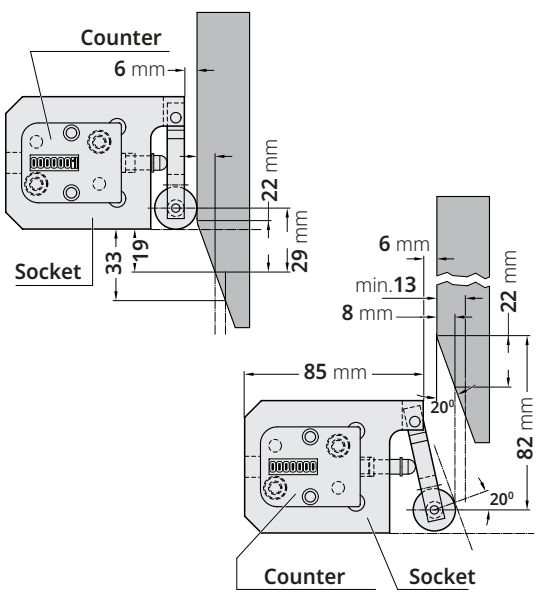
Order Code: **G124.1**

Operation Mode: The Cycle Counter cannot be removed after installation (to prevent tampering with the production count).

Mounting:
Please fix cycle counter in the hole of socket and use of 2x cylinder head cap screws (M6-16) and 2x dowel pins.



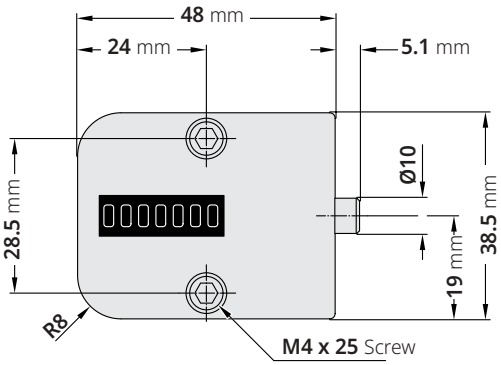


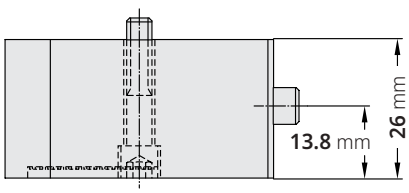


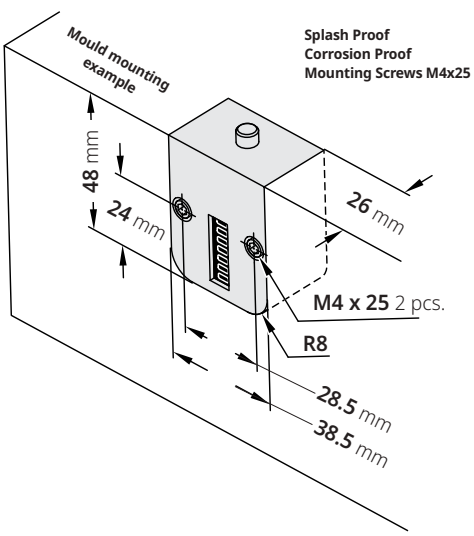
Cycle Counter (economic type)

Order Code: **G124**

* Maximum operating temperature is 120^{0}C.
* Non-resettable, 7-digit mechanical counter.
* Cycle counter can record until 9.999.999.



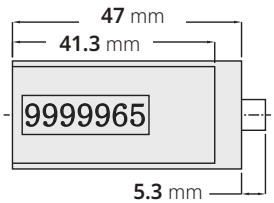


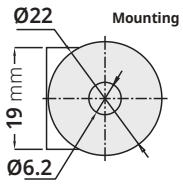


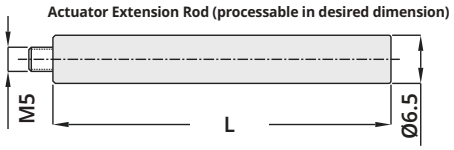
Cycle Counter - Round Type (economic type)

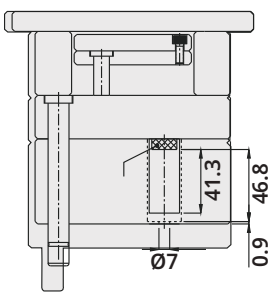
Order Code: **G142**

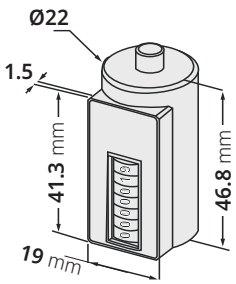
* Maximum operating temperature is 120^{0}C.
* Non-resettable, 7-digit mechanical counter.
* Cycle counter can record until 9.999.999.

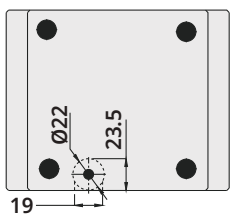












Round Cycle Counter: Production counter / unite has round (cylindrical structure and can be mounted inside of support plate according to the following drawings (if your mould support / holder is in suitable position). In case your support / holder is high / long, additional operation can be provided with extension rod.
Machining Advantage: During mounting of round cycle counter to mould, only mounting slot is opened with drill (22,5 mm), (42 x 17) housing is generated. According to the standard model, it is provided mounting practicability at application.

NEW

Two-stage Ejector System

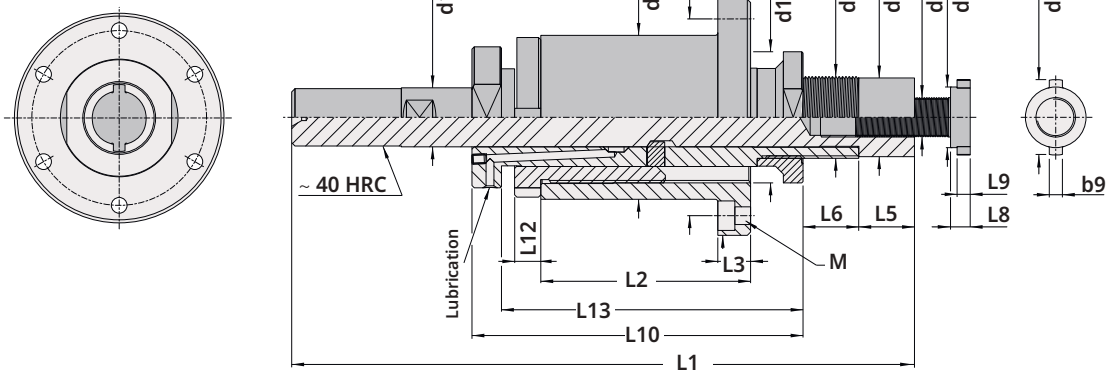
Code: **G182**

Extended forward movement - DLC coated guiding surfaces

+ Precision standard component, for reliable movement control
+ Optimized positive interlocking mechanism
+ Suitable for cleanroom use

Two-stage Ejector Systems are units used in injection moulding to optimize and make the part ejection process more efficient. This system is particularly preferred in moulds that produce complex-shaped parts. In a two-stage system, the movement of the ejector plate is divided into two stages. In the first stage, an initial separation movement is made to release the part from the mould. In the second stage, the part is pushed further outward and fully ejected from the mould. This two-stage movement carefully separates the connection between the part and the mould, ensuring a precise and smooth ejection process. The Güvenal G182 system, by dividing the part ejection process into two stages, applies equal pressure to the part during ejection. This is especially useful for producing small and delicate parts without defects.

Max. operating temperature: 180°C

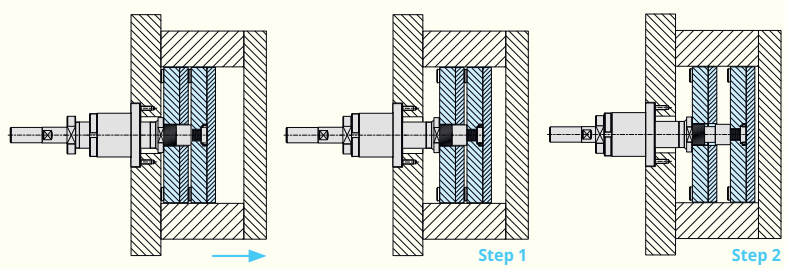


Order Code	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	b9	M	L1	L2	L3	L5
G182 15	15	38	55	46	18.7	M20 x 1	M9 x 1	15.5	20	M31 x 1.25	3.5	M4	157	54	8	19
G182 18	18	50	72	60	24	M26 x 1.5	M12 x 1	18.5	23	M40 x 1.5	4	M5	190	64	10	17
G182 25	25	64	90	76	33	M35 x 1.5	M16 x 1	24	30	M52 x 1.5	5	M6	241	84	12	27
G182 33	33	80	114	96	43	M45 x 1.5	M20 x 1.25	29	37	M66 x 1.5	6	M8	315	111	13	32
G182 44	44	100	138	118	56	M58 x 1.5	M28 x 1.5	40	48	M84 x 2	7	M10	428	156	16	41

L6	L8	L9	L10	L12	L13	d11	d12	d13	SW1	SW2	SW3	Max. Mould Size	Hub1	Hub2 max.	Fs Max. (kN)	Fd Max. (kN)
12	5	3.6	90	10	82	10	M4	33	12	27	27	156 x 156	5 - 30	50	6	1
17	6	4	101	8	92	13	M5	42	14	36	34	246 x 246	6 - 40	62	10	2
17	7	5	129	10	119	17	M6	54	20	50	46	346 x 346	7 - 50	82	20	4
22	9	5	170	15	156	22	M8	68	27	60	60	446 x 446	8 - 71	110	35	8
27	11	6	236	20	220	30	M10	86	36	75	75	696 x 696	10 - 100	160	50	10

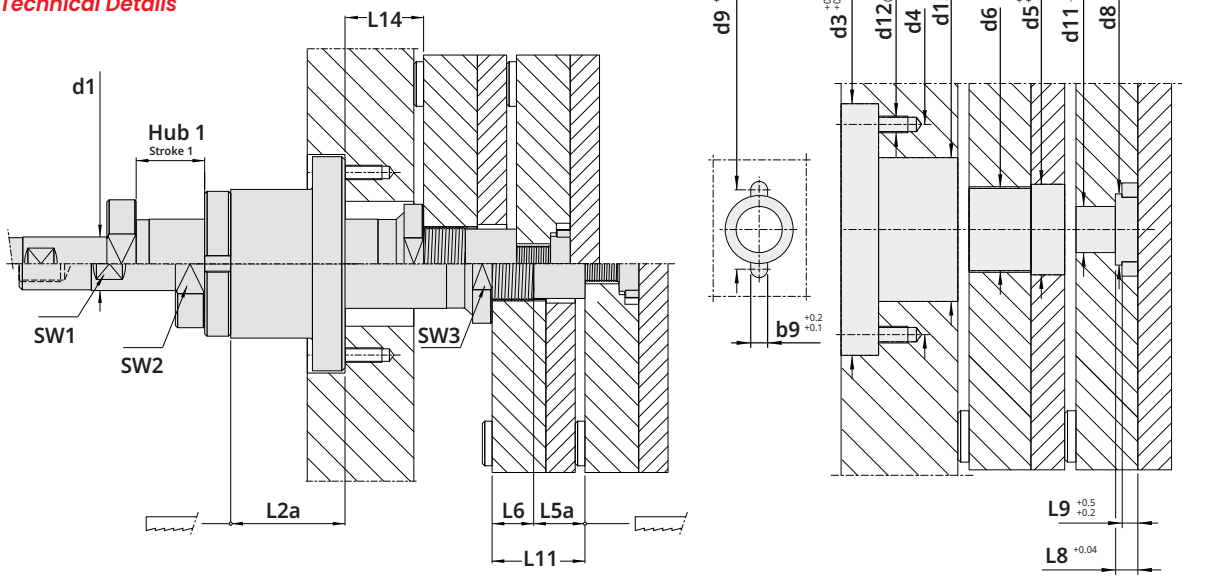
L2a	L5a	Wrench DIN 1810 A
L13 L14 L12 Hub1	L11 L6	-
		45-50
		58-62
		80-90
		98-105

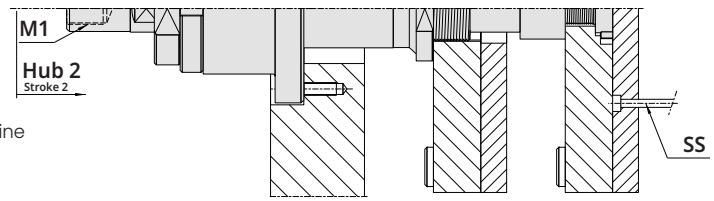
Operating Principle:



NEW Two-stage Ejector System Code: G182

Technical Details





Hub1: Cut body to L2a

L11 / L14: Measure according to design

L2a: Cut body to length

L5a: Cut push bolt to length

Hub2: To be controlled via the injection moulding machine (do not exceed maximum stroke "Hub2 max")

SS: In the case of mechanical return, return pins should be installed in the ejector set.

M1: Cut a thread for connecting to the injection moulding machine

Fs: max. static load (force that may act on the two-stage ejector during the injection moulding process)

Fd: max. dynamic load (force that the two-stage ejector can apply for the movement)

Installation Instructions

Preparation

1. Machine **L2a** and **L5a**
2. Secure the adjusting sleeve
3. Install the screw in the ejector set

Pre-installation

4. Loosely mount all fastening elements

   Note: nut **SW3** cannot be loosened (high-strength glue)

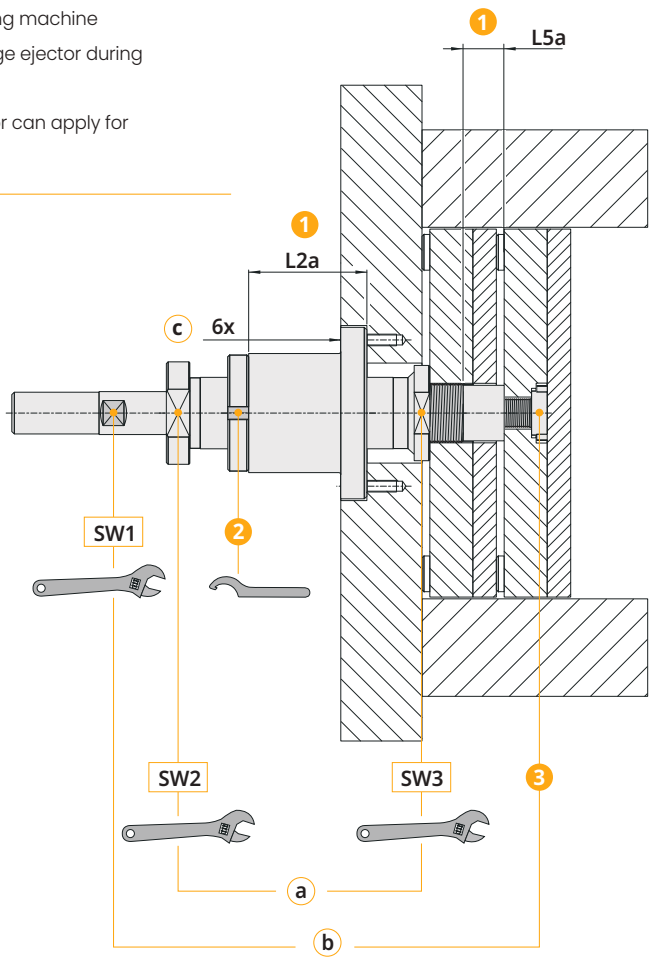
Installation

5. Fix all fastening elements

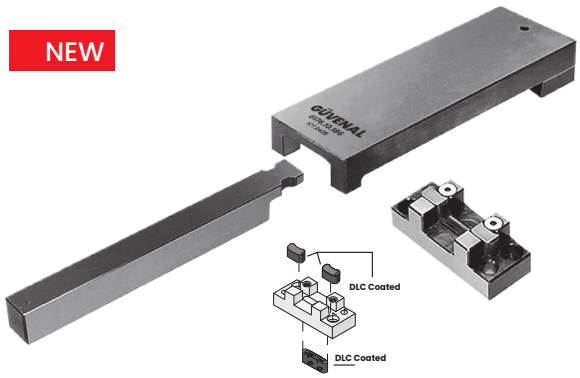
   Note the tightening sequence

   a b c

6. Check if the ejector sets run smoothly



NEW



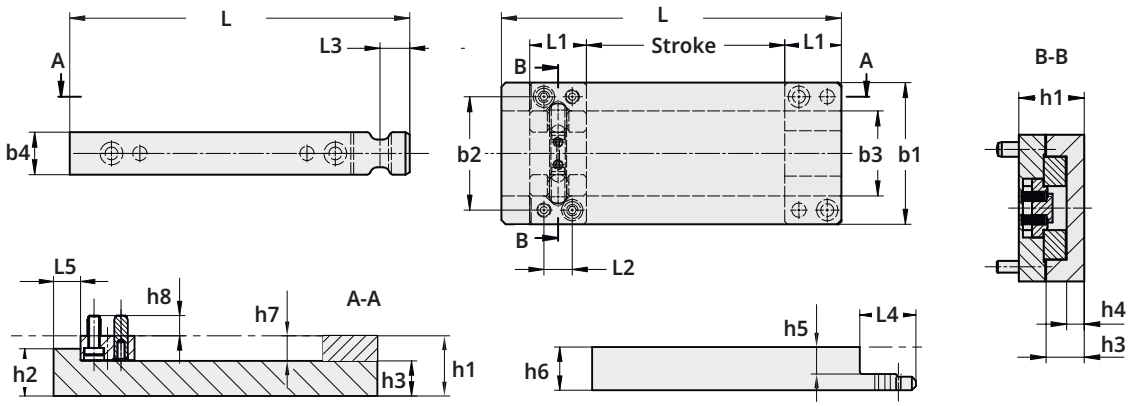
- ✓ Highly Compact Design
- ✓ Various Mounting Options
- ✓ Easy and Quick İnstallation
- ✓ Increased Production & Safe Operation

Güvenal Latch Lock - G176 enable precise control of movement sequences in moulds with multiple parting lines, playing a crucial role in the demoulding process. The compact, pre-assembled unit allows for quick and easy installation on the injection mould and ensures reliable opening of a second parting line. Durable materials and DLC-coated components reduce wear, extend service life, and lower maintenance costs. The fast opening and closing of the mould minimizes cycle time, boosting efficiency. The locking system ensures the intermediate plate remains correctly positioned, preventing potential collisions and supporting a stable production process.

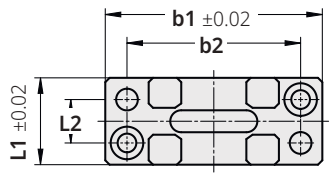
Latch Lock Unit - Flat

DLC Coated

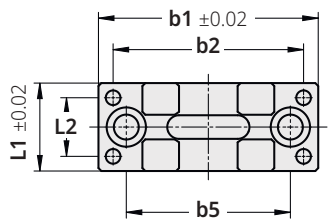
Code: **G176**



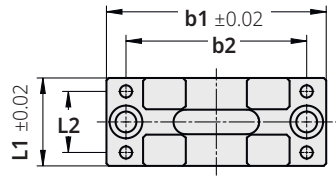
Type A



Type B



Type C



Two units must always be installed opposite each other on the mould.

Max. operating temperature: 160°C

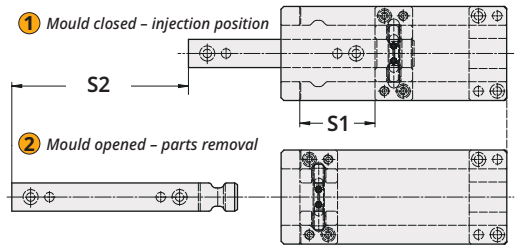
Order Code	L	L1	L2	L3	L4	L5	b1	b2	b3	b4	b5	h1	h2	h3	h4	h5
G176.A.146	146	20	10	10.4	20.7	10	50	40	30	15	-	22.3	17.5	13	6	10
G176.A.186	186															
G176.B.196	196	30	20	15.5	30.7	15	75	65	45	20	56	30.3	23.5	18	9	13
G176.B.246	246															
G176.C.246	246	36	25	18.5	36.7	15	90	74	60	25	-	37.5	29	22	10	16
G176.C.296	296															

Advisory Guidelines

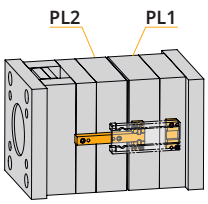
Order Code	h6	h7	h8	Stroke	Type	Mould Size	Stroke - mm		Force - kg	
							Min.	Max.	Max. tensile	Max. locking
G176.A.146	16	9.3	7.5	96	A	≤ 196 x 196	4	96	1000 kg.	100 kg.
G176.A.186				136				136		
G176.B.196	21	12.3	10	121	B	≤ 296 x 296	5.5	121	3000 kg.	300 kg.
G176.B.246				171				171		
G176.C.246	27	15.5	11	159	C	≤ 596 x 596	7	159	4000 kg.	400 kg.
G176.C.296				209				209		

NEW Latch Lock Unit - Flat *Technical Details* Code: G176

LATCH LOCK OPERATING PRINCIPLE

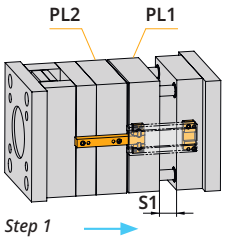


1. The Notches are positively connected to the Notch Housing and the Latch Bar.
2. The Notches recess in the clearance of the Fixing Bracket, unlocking the Latch Bar and thereby releasing it.
   The Notch Housing is now positively connected to the Fixing Bracket. The spring-loaded stop locks the 2 Notches.



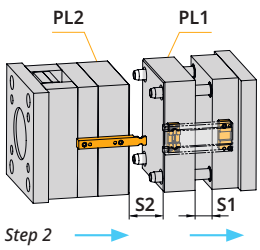
Injection Position

When the injection mould opens, the plates **PL1** and **PL2** move by stroke "**S1**". Once the defined opening stroke is reached, the Notch Housing contacts the shoulder of the Fixing Bracket. The tool continues to open by stroke "**S2**". The Notch Housing locks to the Fixing Bracket, securing **PL1** in place.

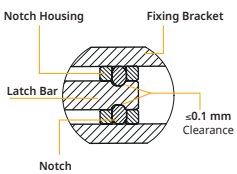


Step 1

The mould closes in the reverse order. First, the Latch Bar unlocks the two Notches in the Notch Housing by pushing back the Stopper. **PL2** contacts **PL1** and pushes it back by stroke "**S1**". The Notches then retract into the Latch Bar.



Step 2



LOCKING FUNCTION

The locking mechanism secures the Notches, which firmly attach the Notch Housing to the Fixing Bracket. This ensures that the drawn mould plate (**PL1**) cannot return uncontrolled.

LOCKING FORCE

The locking force refers to the amount of force required to push the drawn Mould Plate (**PL1**) back into place.

MOULD SAFETY DEVICE

The locked Mould Plate (**PL1**) must be safeguarded against excessive closing forces in stroke "**S2**" by the safety mechanism of the injection mould. This occurs before the Latch Bar releases the lock. If the stroke range "**S2**" contains slides with inclined surfaces, the safety device must engage prior to the inclined slides entering the slide mechanism.

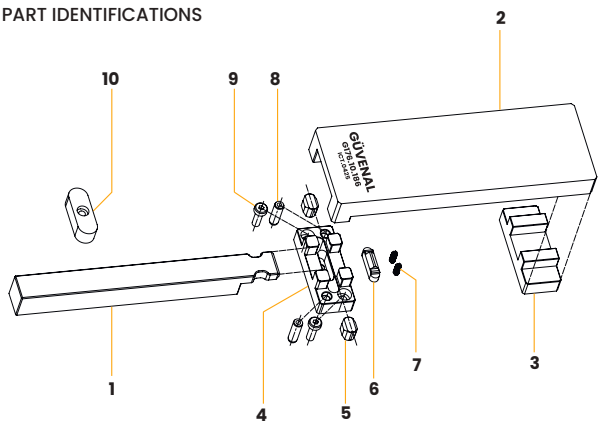
MAINTENANCE

Fastening screws should be secured with spring washers or adhesive, and their tightness should be checked periodically. No lubrication is necessary for the components due to the DLC coating.

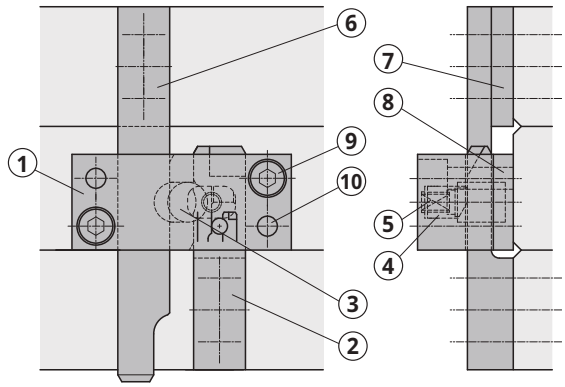
MOUNTING AND ADJUSTMENT ON THE ASSEMBLED TOOL

Both the Latch Bar and Fixing Bracket are nitrided to ~57 HRC.
The case hardening depth is between 0.4 – 0.6 mm. If required, shorten the parts before assembly. First, pin and screw the Notch Housing in place, then insert the Latch Bar, positioning it onto the Notches. Lightly screw it parallel to the tool guide. Pin and secure the Fixing Bracket together with the Support Bar. Pull the Movable Plate (**PL1**) up to the stop of the Fixing Bracket and lock it (stroke "**S1**"). Ensure the Notches are free of play by pulling the Latch Bar back further.
Finally, tighten the screws and pin the Latch Bar in place.

PART IDENTIFICATIONS

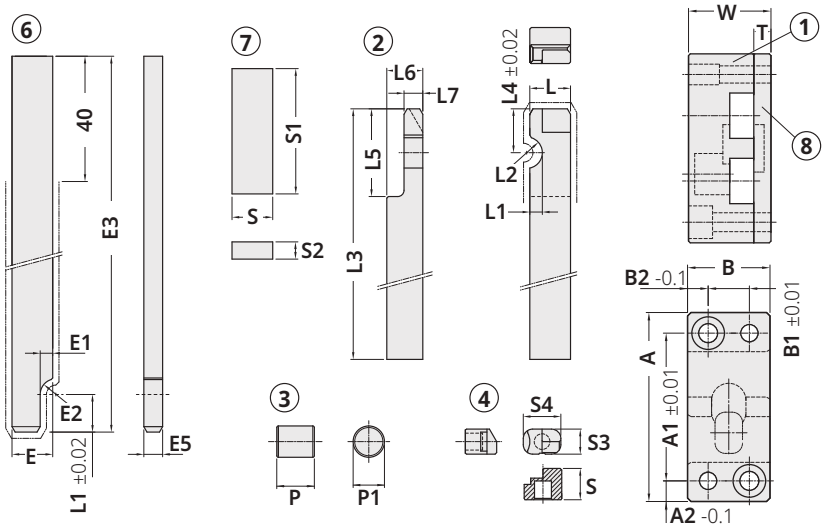


No	Part	Material
1	Latch Bar	1.2162 / 56 HRC
2	Fixing Bracket	1.2162 / 56 HRC
3	Support Bar	1.1730
4	Notch Housing	1.2312 / 52 HRC
5	Notch **(DLC)**	DLC Coated - 1.2767 / 51 HRC
6	Stopper **(DLC)**	DLC Coated - 1.2767 / 54 HRC
7	Compression Spring	EN 10270-1
8	Dowel Pin	1.3505 / 60 HRC
9	Cylinder Head Screw	DIN 7984 - 8.8
10	Fitting Key	C45



Latch Lock Unit

Code: KAU



No	Product	Hardness
1	Cam Holder	50 - 55 HRC
2	Lock Bar	58 HRC
3	Lock Pin	58 - 60 HRC
4	Slide Lock	58 - 60 HRC
5	Spring	-
6	Release Bar	58 HRC
7	Spacer	-
8	Backing Plate	50 HRC
9	Screw	38 - 43 HRC
10	Dowel Pin	45 - 50 HRC

Mounting

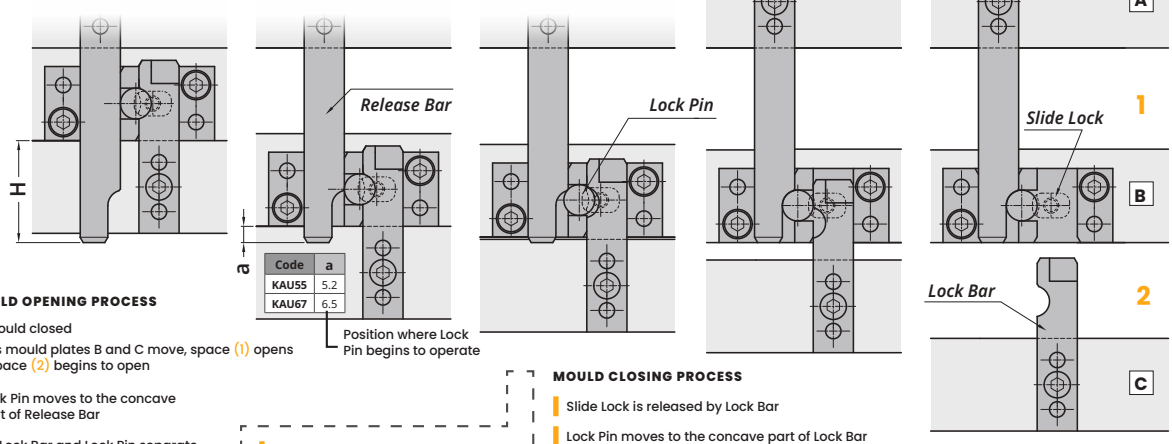
(1) Mount 2 or more parting lock sets at symmetrical positions of the mould.
KAU55 : 10KN or less for 1 mould / when mounting 2 sets.
KAU67: 20KN or less for 1 mould/when mounting 2 sets
(2) Form bolt holes and reamer holes using NC machining, and install the Cam Holder parallel to the **P** face.
(3) Cut the Lock Bar to the necessary length, form the bolt holes and reamer pilot holes, tighten the cam lock with the bolts while pulling it, carry out position adjustment by matching with the actual part, form the dowel holes, and fix the cam lock. (4) Cut the Release Bar to the necessary length, and install it perpendicularly to the mould.
Make the overhang length **H** of each Release Bar the same in order to equalize the release points. (Maintain proper alignment of the release points to avoid uneven contact and resultant breakage.)

Order Code	① Cam Holder / ⑧ Backing Plate								② Lock Bar							
	A	A1	A2	B	B1	B2	W	T	L	L1	L2	L3	L4	L5	L6	L7
KAU55	55	43	6	24	12	6	24	5	13	4	5	100	14	28	11.5	6
KAU67	67	53	7	32	16	8	32.5	6	18	5	6	150	18	36	16.5	10

Order Code	③ Lock Pin		④ Slide Lock			⑥ Release Bar						⑦ Spacer		
	P1	P	S4	S3	S	E	E1	E2	E3	E4	E5	S	S1	S2
KAU55	10	12	12	8	10	13	4	5	150	12	6	13	40	5.5
KAU67	12	17	16	10	13	16	5	6	200	16	10	16	50	6.6

OPERATION FLOW

* The Lock Bar is long, allowing it to also be used for ejecting the stripper plate.
* Facilitates precise mould opening and closing movements without any backlash.



MOULD OPENING PROCESS

* Mould closed
* As mould plates B and C move, space (1) opens
* Space (2) begins to open

Lock Pin moves to the concave part of Release Bar

As Lock Bar and Lock Pin separate, mould plates **B** and **C** become apart

Slide Lock holds down Lock Pin, and mould plate **B** keeps Space (1)

MOULD CLOSING PROCESS

Slide Lock is released by Lock Bar

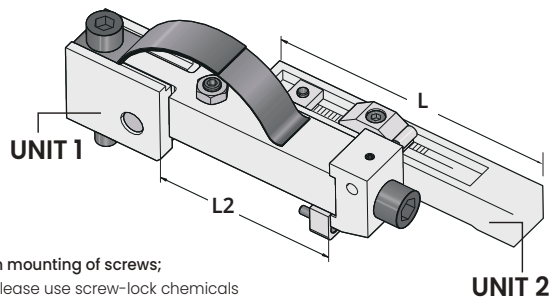
Lock Pin moves to the concave part of Lock Bar

* Space (1) closes after Space (2) closes

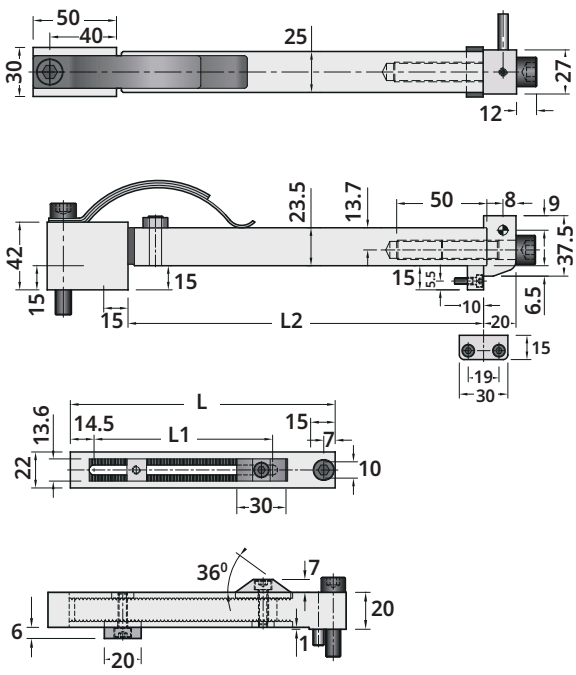
Code: **BOX**

Latch Lock Unit - Box

(Mould Plate Parting Combination)

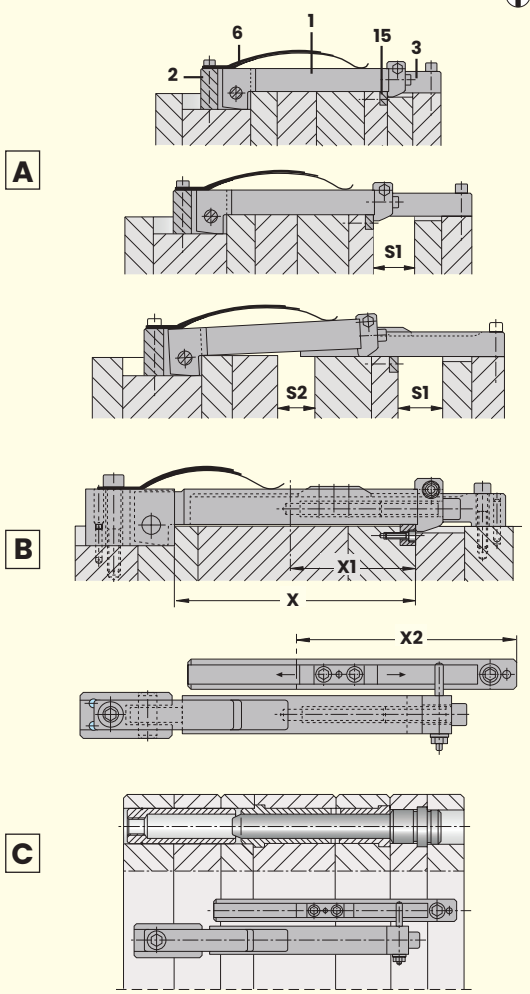


In mounting of screws;
please use screw-lock chemicals
and spring washer.



Advisory Guidelines

Order Code	L	L1	L2	Stroke min. (mm)	Tensile force max. (kN)
BOX 460 140	140	83.5	90	7	6
BOX 460 204	204	152	170	10	10
BOX 460 254	254	194.5	220	14	20



1. Selection:
The selection of latch locks depends not only on the mould size but also on the expected stripping forces, the weight of the stripper plate, and the opening and closing speeds. Refer to the Advisory Guidelines section in the table for further details.

2. Principle of Operation:
The latch locks the mould plate in the selected mould half. When the desired opening stroke **(S1)** is reached, the latch is released by the cam plate. The cam plate is adjustable within the housing and determines the unlocking point. The mould then moves in the parting plane **(S2).** Once the mould is closed again, the leaf springs push the latch lever back to its original position.

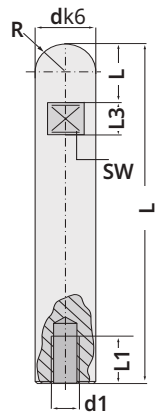
3. Mounting and Assembling Instructions:
The latch lever length and side track are predefined dimensions. If these dimensions do not match the intended design, they must be shortened accordingly **(see fig. B)**

BOX 460 140 = limit dimension for X1 – 75 mm, X2 – 80 mm.
BOX 460 204 = limit dimension for X1 – 90 mm, X2 – 80 mm.
BOX 460 254 = limit dimension for X1 – 150 mm, X2 – 130 mm.

The bearing support **(2)**, wear plate **(15),** and, for the Güvenal BOX Series, the side track **(3)** must be incorporated into the mould plates according to the dimensions shown in the catalogue. Ensure adequate clearance for the latch lever. After determining the desired mould opening stroke **(S1),** bolt the cam plate **(5)** into place and, after fine adjustments of all latch locks, secure with pins **(see fig. A+B).**

4. Points to Note:
If the latch lever **(1)** is shortened by more than X/2, one of the shorter leaf springs **(6)** should be removed. Mount the latch locks symmetrically, parallel, and at right angles to the mould guide **(see fig. C).** Ensure uniform adjustment of all latch locks and consistent drawing of the moving plate. Perform mounting and adjustment on the assembled mould. Use spring washers to secure the mounting bolts.

5. Maintenance:
Grease all moving parts of the latch locks at regular intervals and check the springs for correct operation. Inspect the tightness of the mounting bolts regularly.



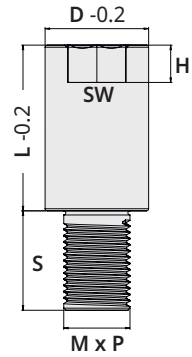
Core Guide Pillar
(Inclined & Threaded)

Code: **G14**

Order Code	d	L	L1	L2	L3	d1	R	SW
G140840	8	40	10	10	8	M5	4	7
G140850		50						
G140863		63						
G140880		80						
G1408100		100						
G141050	10	50	12	10	9	M6	5	8
G141063		63						
G141080		80						
G1410100		100						
G141250	12	50	12	12	9	M6	6	10
G141263		63						
G141280		80						
G1412100		100						
G1412125		125						
G141663	16	63	15	15	12	M8	8	13
G141680		80						
G1416100		100						
G1416125		125						
G1416160		160						
G1416200		200						
G142063	20	63	20	16	15	M10	10	16
G142080		80						
G1420100		100						
G1420125		125						
G1420160		160						
G1420200		200						
G1420250		250						
G142580	25	80	20	20	15	M12	12.5	21
G1425100		100						
G1425125		125						
G1425160		160						
G1425200		200						
G1425250		250						
G1425100	30	100	25	25	18	M16	15	27
G1425125		125						
G1425160		160					16	
G1425200	32	200						
G1425250		250						

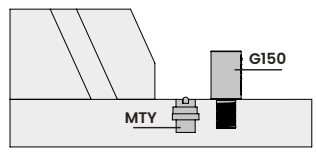
Material: <Ø20 = 1.7131 / >Ø20 = 1.1213 (Cf53)
Hardness: 58 - 62 HRC

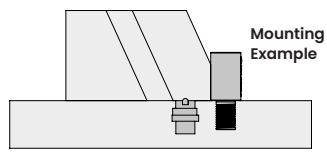
It is compatible to use at injection moulds, angled guide pillar positioning, core systems as cam pin. **Güvenal** mould pillars are polished with surface polishing machine at final stage of production (after grinding).



Stopping Pin for Core Slide

Code: **G150**

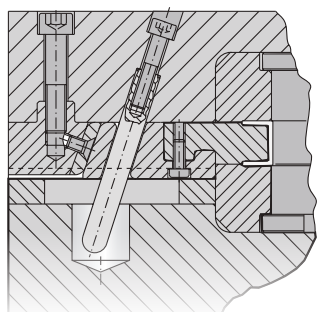




Order Code	M x P	SW	D
G150M6	M6 x 1.0	5	10
G150M10	M10 x 1.5	8	16
G150M12	M12 x 1.75	10	20
G150M16	M16 x 2.0	14	25

L	H	S	P
40	4	10	15
40	5	15	15
40	6	28	15
40	9	24	15

Injection Mould Mounting Example



It can be used with **G61** Angled Guide Bush

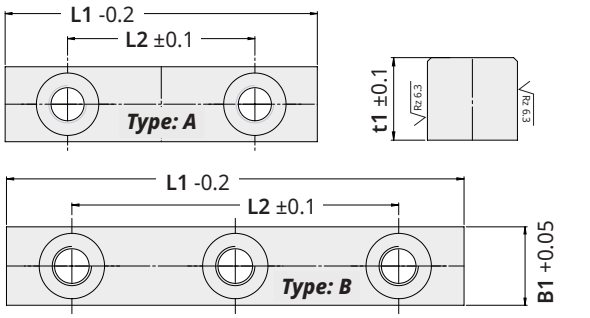
Stopping Pin is a product which is pratical and easy to mount.

Large Stock Availability

Positioning Wedge

Code: G147

Material: 1.2842 / Hardness: 58±2 HRC

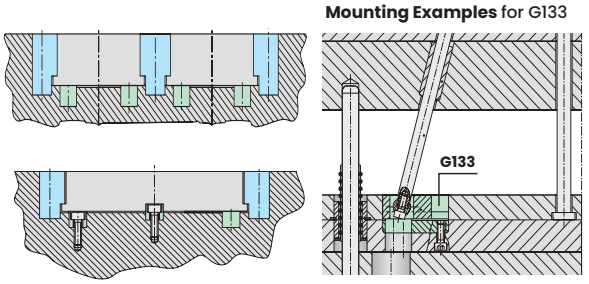


Order Code	B1	t1	L1	t3	L2	D1	D2	D3	Tip
G147.1250	12	11	50	5.7	30	10	5.3	M6	A
G147.1260			60		40				
G147.1270	12	11	70	5.7	50	10	5.3	M6	B
G147.1275			75		60				
G147.1280			80		60				
G147.1290			90		70				
G147.12100		16	100		80				
G147.12120			120		100				
G147.12140			140		120				
G147.12160			160		140				
G147.12180			180		160				
G147.18100	18	16	100	6.8	76	11	6.4	M8	A
G147.18120			120		96				
G147.18140	18	16	140	6.8	116	11	6.4	M8	B
G147.18160			160		136				
G147.18180			180		156				
G147.24140	24	21	140		116				
G147.24160			160		136				
G147.24180			180		156				
G147.24200			200		176				
G147.24220			220		196				

Additionally, the **G147** product can also be used as a guide block for the Güvenal **G133** Ejector Pin Unit.

- Positioning and securing of the mould insert
- Simplified assembly and disassembly of the mould insert
- One or two pull-out threads (depending on length)

Mounting Examples for G133

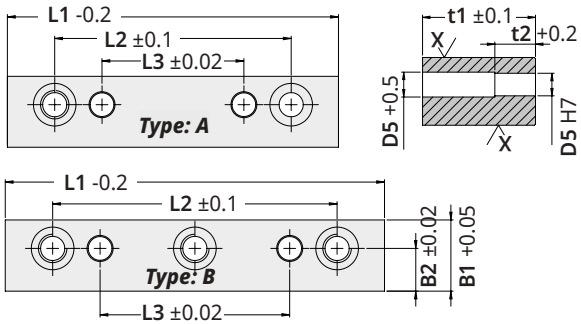


Large Stock Availability

Positioning Wedge (side guide)

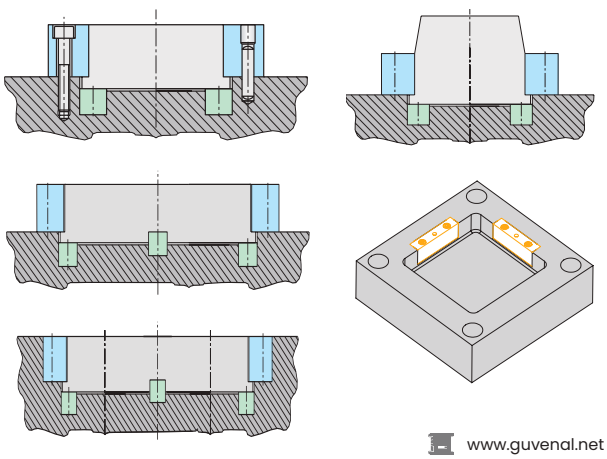
Code: G148

Material: 1.2842 / Hardness: 58±2 HRC



Order Code	B1	t1	L1	B2	t2	t3	L2	L3	D1	D2	D3	D4	D5	Type
G148.1550	15	11	50	9	-	5.7	30	10	10	5.3	M6	4	-	A
G148.1560			60				40	20						
G148.1570	15	11	70	9	-	5.7	50	30	10	5.3	M6	4	-	B
G148.1575			75				60	40						
G148.1580			80				60	40						
G148.1590			90				70	50						
G148.1880	18	22	80	11	12	6.8	56	32	11	6.4	M8	6	7	A
G148.18100	18	22	100	11	12	6.8	76	52	11	6.4	M8	6	7	B
G148.18120			120				96	72						
G148.18140			140				116	92						
G148.18160			160				136	112						
G148.24100	24	36	100	15	12	9	68	36	15	8.5	M10	8	9	A
G148.24120			120				88	56						
G148.24140	24	36	140	15	12	9	108	76	15	8.5	M10	8	9	B
G148.24160			160				128	96						
G148.24180			180				148	116						
G148.30120	30	50	120	18	18	11	80	40	18	10.2	M12	10	11	A
G148.30140			140				100	60						
G148.30160	30	50	160	18	18	11	120	80	18	10.2	M12	10	11	B
G148.30180			180				140	100						
G148.30200			200				160	120						

Mounting Examples



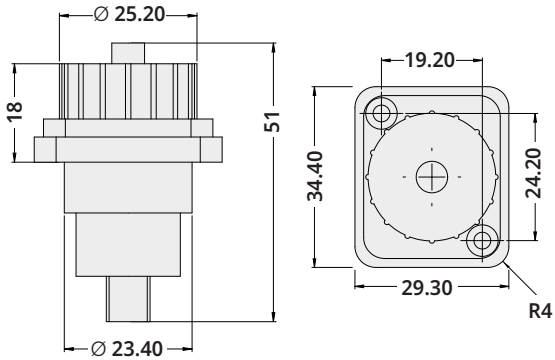
NEW

80°C
Max. service temperature

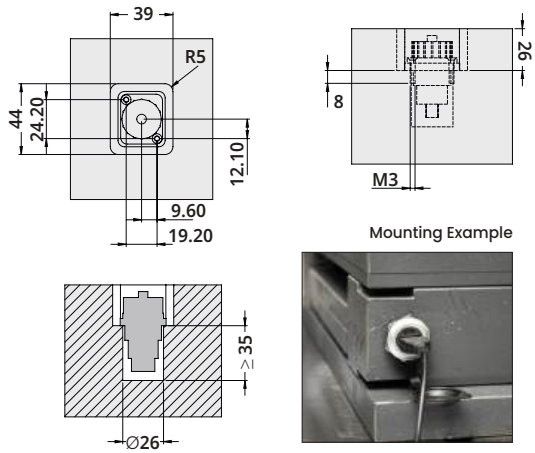
16GB
Storage capacity

Mould Id Memory

Order Code: **G181**



Mounting



Mounting Example

In today's world, data management is more critical than ever. The Güvenal "G181" series, with its specially designed structure and innovative technology, helps meet these needs. This system allows you to securely store mould data, leaving behind intensive email and paper based management methods. It provides a more corporate and practical delivery solution for your mould projects. The "G181," mounted directly onto the mould, saves space. Your mould-related data is always at your fingertips without wasting time. The G181 comes with a 16GB capacity memory stick, and higher capacity options are available upon request.

Set Contents

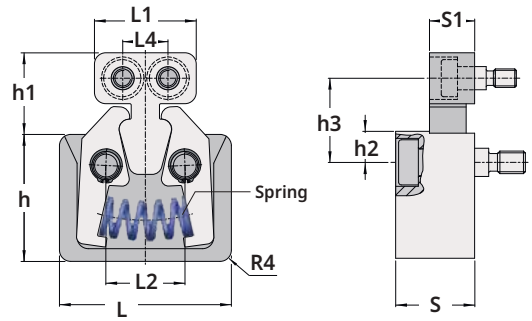
Mould ID memory device & 16GB memory stick (USB3.0) **x1**
USB data transfer cable – 3mt. **x1**
Liquid-proof protective cover **x1**
Mounting screws **x2**

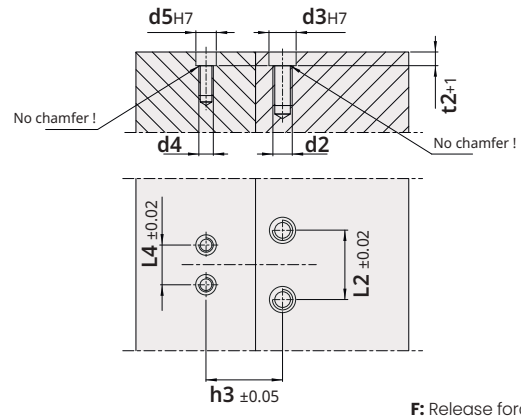
Injection settings, raw material details, 3D/2D drawings of the mould, mould material list, periodic maintenance information, and processes are always accessible together with your mould.

NEW

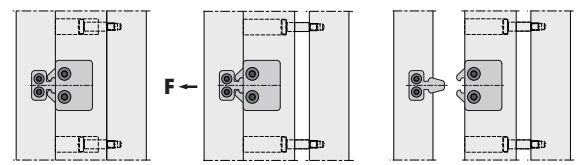
Jaw Puller

Code: **G183**





F: Release force



- Compact and cost-effective puller for stripper plates and 3-plate moulds.
- Three release force options, controlled by standardized system pressure springs.
- Easy and straightforward assembly.
- Lubricating sliding surfaces enhances durability.

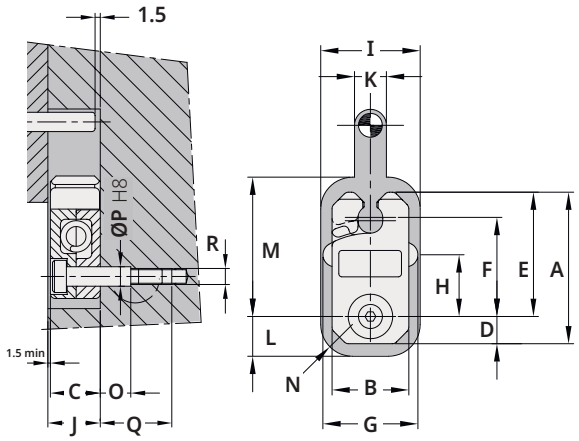
Order Code	h	s	L1	H1	S1	d2	h2	L2	t2	d3
G183 400	45	28	36	29	14.4	M8	11	28	6	10
G183 700										
G183 1050										

Order Code	System Spring	d4	L4	d5	L	h3	F(N)
G183 400	YY1632	M6	16	8	62	31	400
G183 700	MY1632						700
G183 1050	KY1632						1050

Slide Retainer - Pinned & Lock

Code: **MTB**

Precise, with lock, align, pin and spring



The body of "MTB" can not be deadlock with retainer screws, need some hole or cavity to limitless motions. This unit is for limitless motions. It can be mounted with 90⁰ dowel pin. The pin position and opening side of slide block must be in the same direction. MTB can be used as "Latch Lock" mentality if there is no any special request on the system of the mould closing.

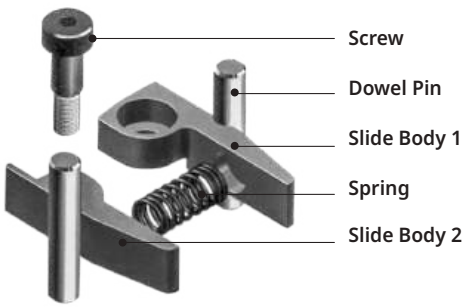
Order Code	A	B	C	D	E	F	G	H
MTB38	38	19	16	7	31.5	**24.89**	24	15.5
MTB54	54	32	20	11	43	**34.93**	36.5	22.5
MTB86	86	45	30	19	67	**53.98**	49.5	40

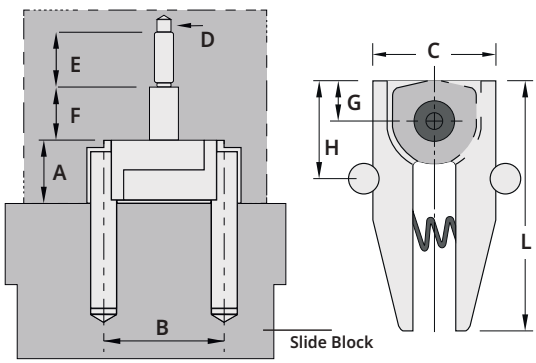
I	J	K	L	M	N	O	P	Q	R	Max. Slide Weight (kg)
25.5	17.5	8	10	34.5	8	8.5	6	20	M5	10
38	21.5	10	14.5	46	10	10.5	8	25	M6	20
51	31.5	12	22.5	70	12	17	10	35	M8	40

Practice: When slide / core is opened, pin gets into the retainer. "MTB" designed with over-travel, to avoid the damage by the wrong settle of the travel. Operation continues even though there are mistakes (misalignments).
Important: The distance from the center of the dowel pin to the center of the shoulder screw is crucial / critical. The dowel pin installed in the slide positively locks into the retainer until disengaged by the mould closing motion. Designed with a efficient lead-in at the housing opening so the dowel pin will lead-in the housing even if there is a slight misalignment between the retainer and the pin.

Slide Retainer with Latch

Code: **MTM**





"MTM" is especially suitable for use in alloy material moulds.

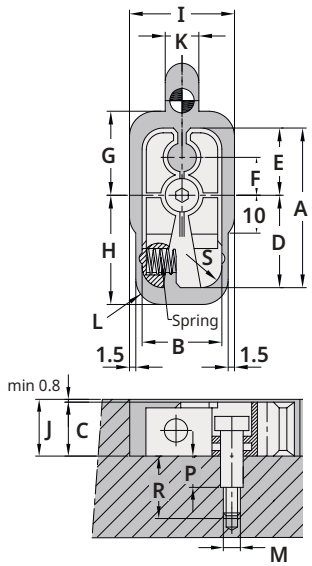
Order Code	A	B	C	E	F
MTM1040	10	21.5	18	9.5	5.1
MTM1243	12	25.5	22	11	6.1
MTM1650	16	31.5	28	11	8.1

G	H	L	D	Max. Retaining	Dowel Pin
7	17.5	40	M5	Ø6 - 30	10
7.5	18	43	M6		15
9.5	20.5	50	M6		25

Screw **(F)** added to hole should not be in too deep. After slide body locks itself, it should be operated smoothly. Therefore, don't tight the screw too much. When dowel pin is on core / slide, the body is fixed on mould, also core sliding distance should be calculated precisely and then should be mounted.

Slide Retainer Pinned & Lock

Code: **MTS..M**



Order Code	A	B	C	D
MTS10M	38	19	16	22
MTS20M	54	32	20	33
MTS40M	86	45	30	53

E	F	S	G	H	I
16	9.1	5	19	26	25
21	12.7	6	24	36	38
33	20.3	10	36	56	51

J	K	L	M	P	R
17	8	6	M5	6	15.5
21	10	8	M6	8.5	20.5
31	12	11	M8	10	25.0

Mounting Procedure:

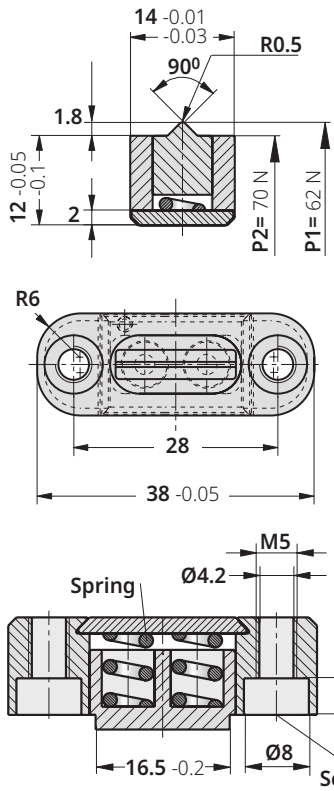
1. To remove Slide Retainer body from housing again, a dowel pin (extractor) hole should be opened on mould.

2. The distance between pin centre on the Slide Retainer and screw centre on Slide Retainer during mounting are precise **(F)**, it should be calculated and adjusted well (must be in the same direction).

3. Please prefer a model with more force than the ultimate load requires for **MTS..M / M** that is suitable for your mould, this is important for safety.

Slide Retainer

Order Code: **MTK.1**

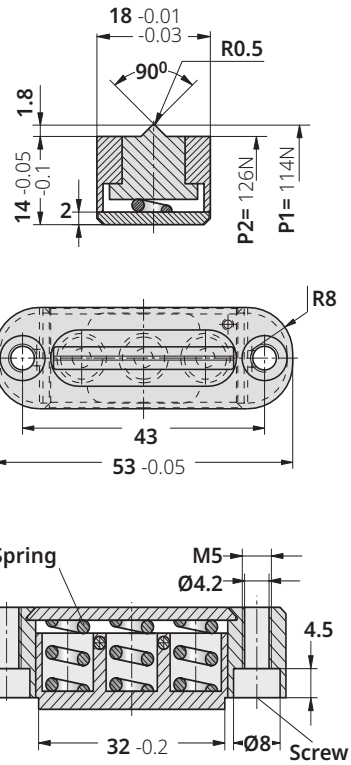


Material: 1.2343
Hardness: 54 ± 2 HRC
Maximum temperature: 100°C

Contact linkage line in core / slide systems

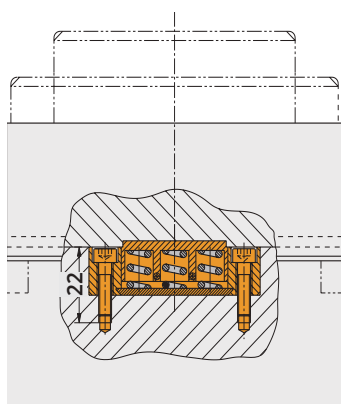
Slide Retainer

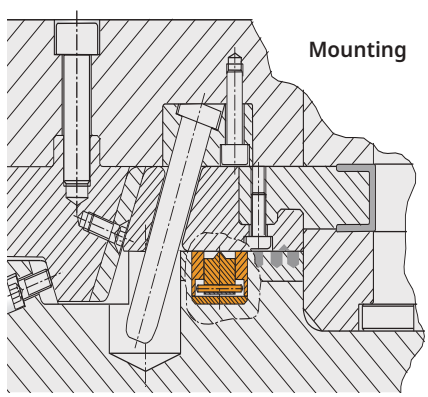
Order Code: **MTK.2**



Material: 1.2343
Hardness: 54 ± 2 HRC
Maximum temperature: 100°C

It lifts the core / slide without the holder in slide system, self - contained unit

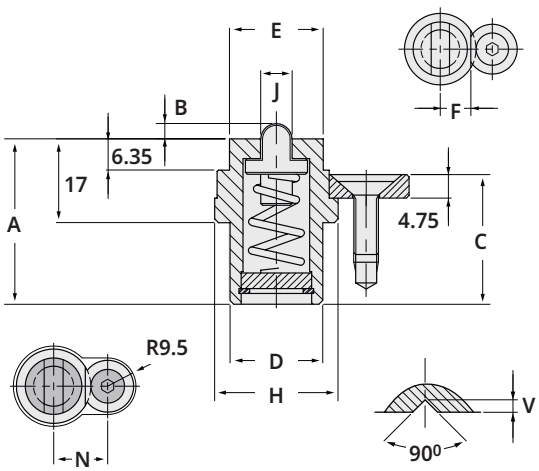




Slide Retainer - Pinned & Round

Code: **MTY**

Precise, with lock, align, pin and spring



Order Code	A	B	C	D	E
MYT100	27.43	1.83	20.2	15.75	16
MYT200	33.53	3.07	26.29	18.8	19
MYT400	32	3.78	24.76	22.1	22

F	H	J	V	N	kgf.
9.52	22	4.8	2.3	17	4.5
10.67	25	6.35	3.9	18.2	9
11.86	28	7.92	4.9	19.4	18

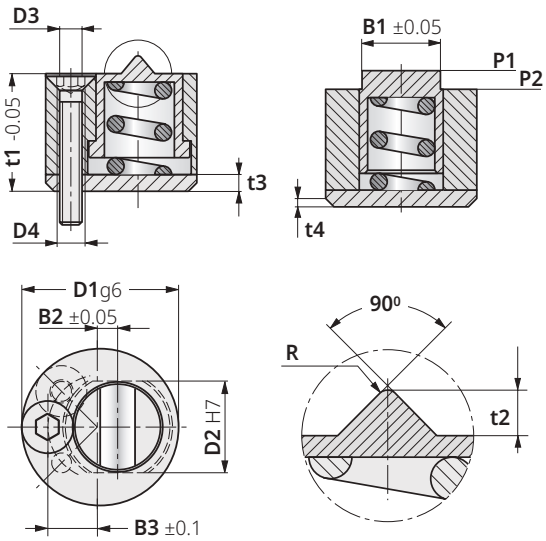
Note: It provides mounting facility to mould, thanks to its robust, small and round structure.

Material: 1.2767
Hardness: 52 HRC

Small, round, easy to mount, self-contained design and line contact engagement. - Three different sizes with retaining ratings loadings for 48, 88 and 176 N. Dowel pin is locked completely inside of retainer. While mould closing, pin is entered inside when retainer is opened even though there is misalignment.

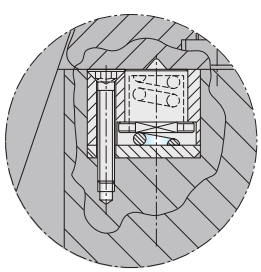
Slide Retainer - Round Type

Code: **MTC**



Order Code	D1	B1	B2	B3	t1	t2	t3
MTC13	13	6.6	1.4	4.3	10	1	1.6
MTC18	18	9.6	2	6	14	1.8	2
MTC27	27	14.4	3	9	21	2.8	3

t4	D2	D3	D4	R	P1	P2	Screw (DIN7991)
0.35	7	2.2	M3	0.35	28 Nw	34 Nw	M2 x 16
0.50	10	3.2	M4	0.50	38 Nw	42 Nw	M3 x 50
0.50	15	4.3	M5	0.75	38 Nw	92 Nw	M4 x 25



Material: 1.2767
Hardness: 52 HRC

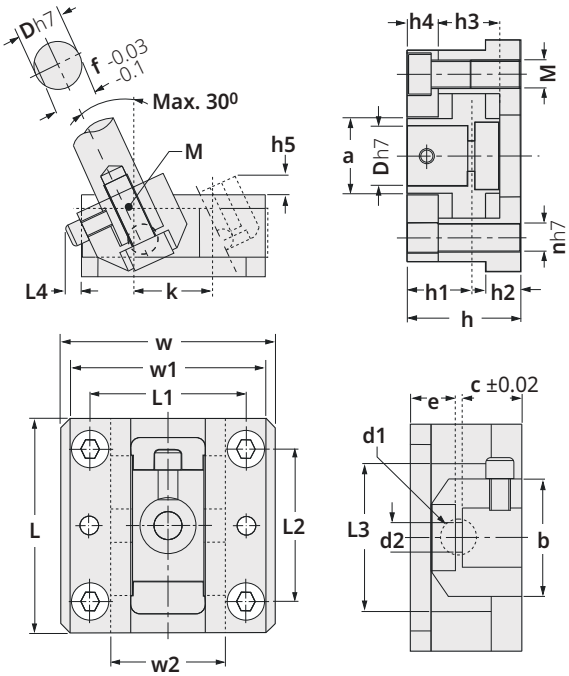
Self-Contained Design and Line Contact Engagement

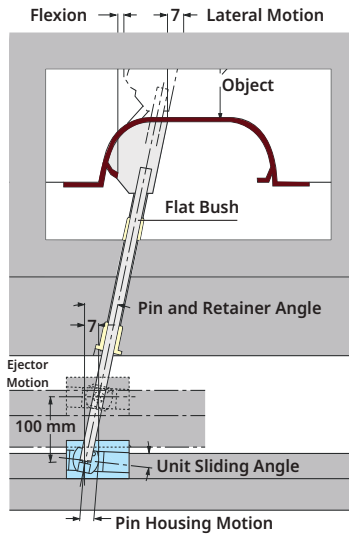
MTC Slide Retainers are operated without Dowel Pin and also can lift the core / slide without Slide Retainer. Easy mounting due to round structure.

Large Stock Availability

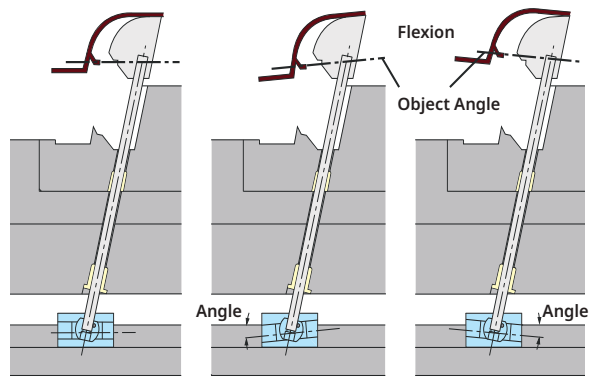
Inclined Ejector Pin Unit

Code: **G133**





Angle can be adjusted from 10^0 by increasing 1^0 at a time.



The angle of ejector pin should be determined according to the angle of the product in mould.

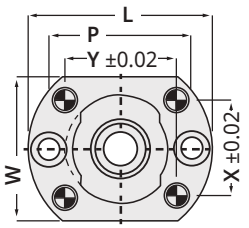
Order Code	D	d1	d2	a	b	c	e	f	M	k	h	h1	h2	h3	h4	h5	L	L1	L2	L3	L4	w
G133.08	8	7	4.5	11	20	8	10	7	M3	10	22	12.5	5	11	7	10.5	32	24	20	20	3.6	33
G133.10	10	7	5.5	15	25	10	12.5	9	M4	18	27	15.5	5	15	8	11.3	45	32	30	25	4.5	45
G133.12	12	10	7	17	25	12	15	11	M6	20	32	18	7	16	10	4	50	39	35	30	5	57
G133.16	16	12	9	22	30	16	15	14.5	M6	25	36	20	8	20	10	5	65	46	40	40	5	65
G133.20	20	14	11	26	40	20	16	18	M8	30	42	23	11	22	12	8	80	56	55	50	5	80
G133.25	25	16	14	32	45	25	17	22.5	M10	35	50	28	15	26	15	8	90	66	65	55	6	93
G133.30	30	18	14	38	50	30	17	27	M10	40	55	30	15	30	15	9	100	74	70	60	7	101
G133.35	35	20	14	45	60	35	18	32	M12	45	62	35	15	34	18	10	120	85	80	75	8	120
G133.40	40	25	18	55	70	40	19	36	M12	50	70	40	15	44	18	12	135	95	90	85	8	130
G133.45	45	30	18	60	80	45	24	40	M12	55	80	45	15	50	20	14	150	105	110	95	10	140

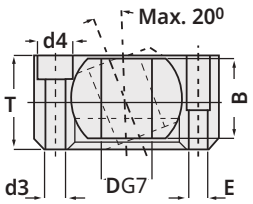
Order Code	w1	w2	n	M
G133.08	30	19	3	M4 x 8
G133.10	40	25	4	M5 x 9
G133.12	51	31	6	M6 x 10
G133.16	58	38	6	M8 x 12
G133.20	72	44	8	M10 x 16
G133.25	85	52	10	M12 x 20
G133.30	93	60	10	M12 x 25
G133.35	110	70	10	M12 x 30
G133.40	120	80	10	M16 x 35
G133.45	130	90	10	M16 x 40

It moves the Inclined / Angle Pin Systems in the desired angle.
It provides important contribution to production period. The product parting from moulds with this unit is more economical compared with similar systems. - The heat resistance of unit in mould is 30^0c (with self lubricating bearing system), unit can lubricate itself. - Operating angle of ejector pin can be inclined up to 10^0 - 20^0 - 30^0C. - It can be fastened to ejector plates via dowel pins and screws during mounting.
The position of the centre block can be adjusted according to the length of pin specified. Please make this adjustment when centre block and pin are attached and removed easily. **For the precise bottom support of unit, G147 product can be used.**

Spherical Guide Bush for Inclined Pin

Code: **G133K**



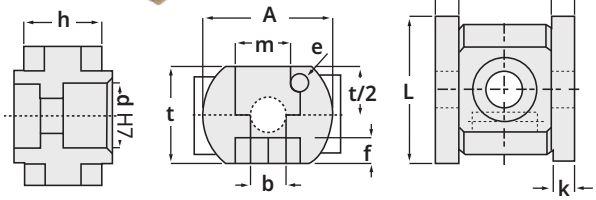


Order Code	D	L	W	T	B	P	E	X	Y	d3	d4	M
G133K.08	8	44	28	17	14	32	5	20	28	6	10	M5
G133K.10	10	46	30	20	16	34	5	22	28	6	10	M5
G133K.12	12	50	32	22	18	36	6	22	30	7	11	M6
G133K.16	16	58	45	29	25	45	6	30	35	7	11	M6
G133K.20	20	65	50	33	28	52	6	35	40	7	11	M6
G133K.25	25	78	57	38	33	62	8	40	50	9	15	M8
G133K.30	30	86	65	43	37	70	8	48	55	9	15	M8
G133K.35	35	96	72	49	40	78	8	52	60	11	18	M10
G133K.40	40	106	77	53	44	84	8	55	65	11	18	M10
G133K.45	45	118	85	57	48	96	8	59	72	11	18	M10

Guide Bush unit transmitting angle motion. It offers easy installation for desired Inclined Pin design in large moulds. Angle adjustment can be done between 0⁰ and 20⁰.
Max. operating temp.: 170⁰

Inclined Pin Holder Unit

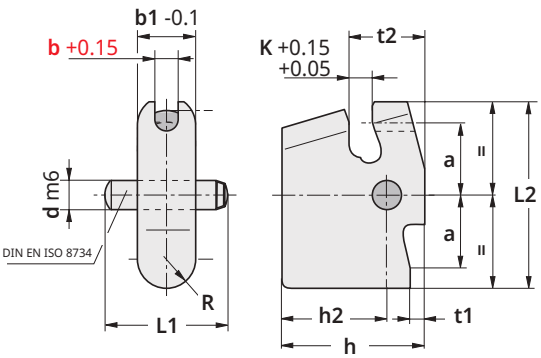
Code: **G133E**

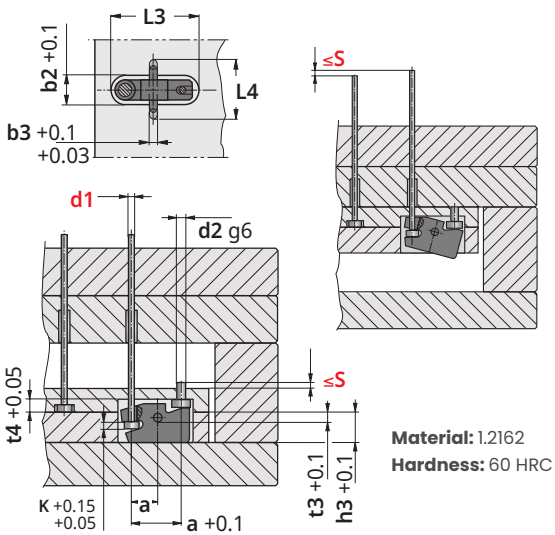


Order Code	d	w	L	wa	k	h	A	t	f	m	b	e
G133E.08	8	24	25	12	6	13	20	16	5	7.5	5	3
G133E.10	10	28	32	14	7	17	20	16	4	8.5	6	3
G133E.12	12	31	40	17	7	20	25	20	5	10	7	4
G133E.16	16	36	45	21	7.5	24	30	24	6	13	9	6
G133E.20	20	43	45	28	7.5	24	40	30	8	17	11	6
G133E.25	25	48	50	33	7.5	26	45	35	9.5	22	14	6
G133E.30	30	55	60	38	8.5	30	50	38	9	27	14	6
G133E.35	35	64	70	44	10	34	55	40	10	31	14	8
G133E.40	40	72	80	50	11	38	60	43	11.5	36	18	8

Acceleration Rocker for Ejector

Code: **IHS**





Material: 1.2162
Hardness: 60 HRC

Order Code	d1	b	b1	b2	b3	a	a1	d	d2	h	k	h2
IHS 3	3	3	8	8.5	4	10	20	4	4	19	3	14
IHS 6	6	6	16	16.5	8	21	42	8	8	34	5	23
IHS 8	8	8	16	16.5	8	21	42	8	8	34	5	23

Order Code	h3	L1	L2	L3	L4	t1	t2	t3	t4	R	S
IHS 3	16	16	26	31	23	2	10	4	4	4	2.5
IHS 6	27	36	56	63	45	4	21	8	8	8	7.6
IHS 8	27	36	56	63	45	4	21	8	8	8	7.6

- It is used in case that Ejector Plate requires stroke more than normal stroke distance.
- By fitting an Ejector Pin to the product **(IHS)**, repulsion / ejection can be extended during injection. Acceleration Rocker (mechanical swing system) increasing stroke distance of ejector that it is fastened.

Long Roller

Code: **MN2MIM2**

Dome Roller

Code: **MN2MUM3**

Short Plastic Roller

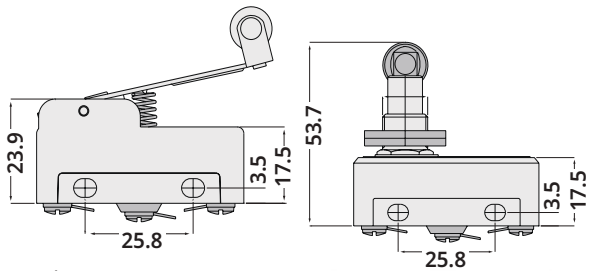
Code: **MK1MIP1**

Long Plastic Roller

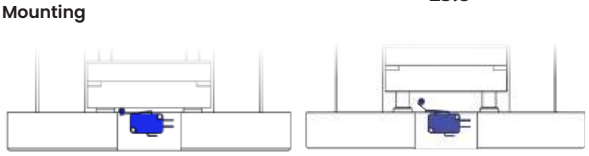
Code: **MK1MIP2**

Micro Limit Switch

Movement Limit Switches for Ejector Plate, Stripper Plate and Side Lifters



Mounting



Sensor Type: Lever Roller **Sensor Material:** Plastic

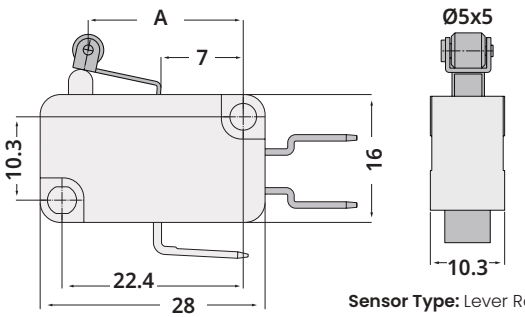
Order Code	Contact Structure	Contact Scheme
MN2MIM2	Changable Contact	COM 1 — 2 NC / 3 NO
MN2MUM3		

Technical Specifications / Both "MN2" types have similar specifications:

Mechanical Life ..... : 500.000 Opening-Closing min.(60rpm)
Electrical Life ..... : 100.000 Opening-Closing min.(30rpm)
Operating Temperature ..... : - 15 / +125^{0}C
Protection Class ..... : IP20 - IP40
Operating Voltage (Ue) ..... : 440V AC
Operating Current (Ie) ..... : 10 A
Isolation Voltage (Ui) ..... : 660V
Impact Resistance Voltage ..... : 2.5kV
Short Circuit Breaking Capacity . : 1 kA
Operating Frequency (f) ..... : 50 Hz.
Isolation Resistance ..... : 10 MΩ min. (500V DC)
Usage Class ..... : AC15
Dielectric Resistance ..... : 1.500V AC (for 1 minute)
Pollution Degree ..... : 3
Connection Cable Section ..... : 1.5 - 2.5 mm^{20}
Standard ..... : TS EN 60947-5-1

Both "MN2" types have similar specifications:

- Product variety for wide application areas.
- Long life and high contact reliability.
- Standard mounting holes.
- It ensures all movable parts such as Ejector Group / Ejector Plate, Stripper Plate, Side Lifters etc. operating with injection machine in a harmony.
- Switch cables will be provided by the user.
- Min. 8 x 8mm cable slots are recommended.
- Please do switch connection according to the contact scheme specified in the catalogue.



Sensor Type: Lever Roller
Sensor Material: Plastic

Order Code	Contact Structure	Contact Scheme	A
MK1MIP1	Changable Contact	NO 4 / NC 2 — 1 COM	19
MK1MIP2			34.5

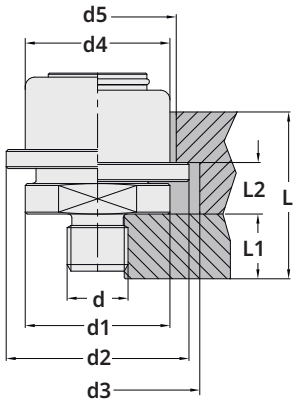
Technical Specifications / Both "MK1MIP" types have similar specifications:

Mechanical Life ..... : 10.000.000 Opening-Closing min.(60rpm)
Electrical Life ..... : 100.000 Opening-Closing min.(30rpm)
Operating Temperature ..... : - 15 / +125^{0}C
Protection Class ..... : IP20
Operating Voltage (Ue) ..... : 250V AC
Operating Current (Ie) ..... : 10 (4) A
Isolation Voltage (Ui) ..... : 660V
Impact Resistance Voltage ..... : 2.5kV
Short Circuit Breaking Capacity . : 1 kA
Operating Frequency (f) ..... : 50 / 60 Hz.
Isolation Resistance ..... : 10 MΩ min. (500V DC)
Usage Class ..... : AC15 - AC3
Dielectric Resistance ..... : 1.500V AC (for 1 minute)
Pollution Degree ..... : 3
Standard ..... : TS EN 60947-5-1

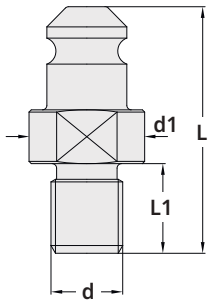
Both "MK1MIP" types have similar specifications:

- Compact design.
- Product variety for wide application areas.
- Long life switches & high contact reliability.
- Material having **"VO"** feature which increases product reliability.
- It ensures all movable parts such as Ejector Group / Ejector Plate, Stripper Plate, Side Lifters etc. operating with injection machine in a harmony.
- Switch cables will be provided by the user.
- Min. 8 x 8mm cable slots are recommended.
- Please do switch connection according to the contact scheme specified in the catalogue.

Socket



Plug



Automatic Ejector Coupling **Socket**

Code: **G115..**

Code: **G1151** Pull Force: **1500 kg.**

Order Code	d	d1	d2	d3	d4	d5	L	L1	L2
G1151.M12175	M12 x 1.75	32	39	43	32	34	42.5	15	10
G1151.M1615	M16 x 1.5								

Code: **G1152** Pull Force: **2400 kg.**

Order Code	d	d1	d2	d3	d4	d5	L	L1	L2
G1152.M1615	M16 x 1.5	38	43	53	38	40	52	15	13
G1152.M1620	M16 x 2.0								

Code: **G1153** Pull Force: **3200 kg.**

Order Code	d	d1	d2	d3	d4	d5	L	L1	L2
G1153.M1615	M16 x 1.5	52	65	70	56	58	68	18	17
G1153.M1815	M18 x 1.5								
G1153.M2015	M20 x 1.5								
G1153.M2415	M24 x 1.5								
G1153.M2715	M27 x 1.5								
G1153.M3015	M30 x 1.5								

Automatic Ejector Coupling **Plug**

Code: **G116..**

Code: **G1161** Pull Force: **1500 kg.**

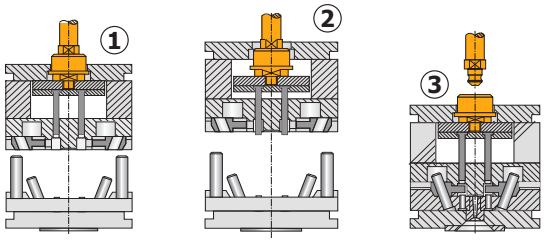
Order Code	d	d1	L	L1
G1161.M10	M10 x 1.5	22.8	45.5	20
G1161.M12	M12 x 1.75			
G1161.M14	M14 x 2.0			
G1161.M16	M16 x 2.0			

Code: **G1162** Pull Force: **2400 kg.**

Order Code	d	d1	L	L1
G1162.M10	M10 x 1.5	22.8	45.5	20
G1162.M12	M12 x 1.75			
G1162.M14	M14 x 2.0			
G1162.M16	M16 x 2.0			

Code: **G1163** Pull Force: **3200 kg.**

Order Code	d	d1	L	L1
G1163.M16	M16 x 2.0	34.3	68	20
G1163.M18	M18 x 2.5			
G1163.M20	M20 x 2.5			
G1163.M24	M24 x 3.0			
G1163.M27	M27 x 3.0			
G1163.M30	M30 x 3.5			



1) The ejector plate is returned to the stop. Return screw and ejector screw disengage. Over the remainder of the closure movement, the jaws move without obstacle.

2) Mould in ejector position. The side splits are extended, the return pin is latched to the return coupling by means of balls.

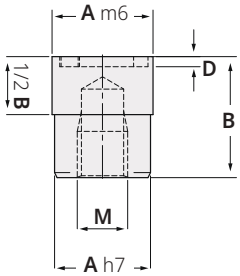
3) Mould closed. The injection operation begins.

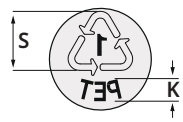
+ Rapid and simple mounting (even within existing moulds).
+ Engages in any position and disengages only after ejection has taken place.
+ Can be used on any injection moulding machine with a hydraulic or mechanical ejector.
+ Mounting times are very short, since the mould can be adjusted before it is fitted into the machine.
+ For rapid and economic operation, up to 30 strokes per minute.

Recycling Date Stamp

Code: **GDM**

(Plastic raw material data, definition & recycling stamps)





A	B	D	K	S	M
6	10	0.3	1.2	4	M4
8	10		1.4	4	M4
10	12		1.6	5.6	M5
12	12		2	6.8	M6
16	14		2.6	9	M6
20	16		3.2	11.5	M6

Order:
GDM Type. A

Material: 1.2083 - INOX
Hardness: 48-52 HRC

Order Example:
GDM05. 10

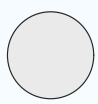
Date Stamp for Food Legislation

Code: **GDM14**

Order Code	A	B	D	S	M
GDM1410	10	12	0.3	6.1	M5
GDM1416	16	14		9.08	M6
GDM1420	20	16		12.3	

TYPES

GDM01 (LOGO)


GDM02 (BLANK)

GDM03 (PET)

GDM04 (HDPE)

GDM05 (PE-HD)

GDM06 (PVC)

GDM07 (LDPE)

GDM08 (PE-LD)

GDM09 (PE - BD)

GDM10 (PP)

GDM11 (PS)

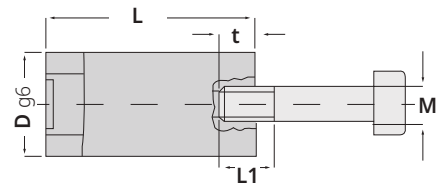
GDM12 (OTHER)

GDM13 (0)

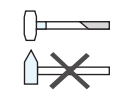
GDM14 (FOODMARK)

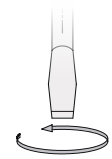
Date Stamp - Screwed

Code: **VKT**



D	L	t	L1	M
4	12.5	3	4	M2
5	14	3	4	M2.5
6	16	3	4	M3
8	18	4	4	M3
10	22	4	4	M3
12	25	6	6	M4





Order:
VKT Type. D x L

Material: 1.2083 - INOX
Hardness: 48 - 52 HRC

TYPES

VKT01 (Month)

VKT02 (Month + Year)

VKT03 (Year)

VKT04 (Weekly)

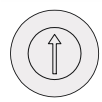
VKT05 (Daily)

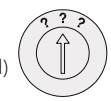
VKT06 (Shift)

VKT07 (Number)

VKT08 (Letter from **A** to **M**)

VKT09 (Letter from **N** to **Z**)

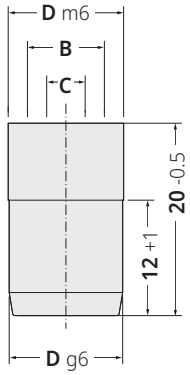

VKT10 (Arrowed)

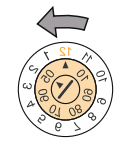

VKT11 (Custom-Made)

The Date Stamps which are mostly preferred for medium and small dimensional moulds. **Easy to mount and can be mounted on tools such as Ejector Pins.** Rotary inner hub of Date Stamps can be adjusted as limitless (worm gear). Mounting is completed by pressing on inner hub arrow and pulling with screw from lower part. **We offer wide range of options with our affordable prices.**

Multi-Date / Double Date Stamp Code: DKT

Two different Date Stamps, with a unit as months + years.





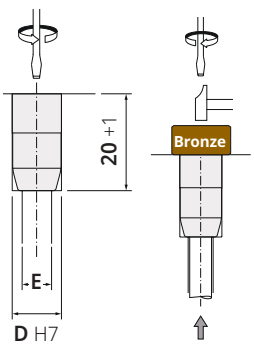
Anti-clockwise
(month + year)

Clockwise
(year + month)

N: (number of years)

Max. 150°C

Order Code	D	B	C	E	N
DKT 08	8	5.5	3	6	5
DKT 10	10	6	3	10	6
DKT 12	12	8	4	10	6
DKT 16	16	10.5	5.3	12	10
DKT 20	20	12	6	16	12



Important:
To change the month; the hub arrow on the unit is turned counter clockwise (anti-clockwise) and the inner two parts are rotated.
To change the year; please turn it clockwise.
Material: 1.2083 - INOX
Hardness: 48 - 52 HRC

This Güvenal product reducing needs and area required for cost and two different Date Stamp, shows two different criteria on one unit. Its standard model is as 12 month + 6 year, in other words is not required any change along 6 years. The length of all Date Stamps are same (20 mm).

Mini Screwdriver Set

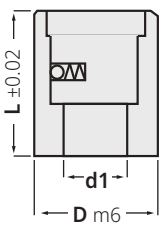
Date Stamp Adjusting Kit

Order Code: CRP

6 pcs. rotary head set;
+ 4 pcs, 1.5 - 2 - 2.5 - 3 head mini screwdriver.
+ 2 pcs, PH0 - PH1 phillips head mini screwdriver.

Date Stamp Code: KT

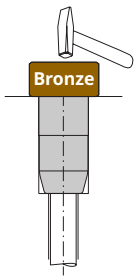
Standard Models



E / S = Size / Depth

Only inner hub part is rotated with screwdriver.

Mounting



Max. 150°C

D	L	d1	S	E
3	6	1.6	-	-
4	6	2	0.2	3.5
4	8	2	0.2	3.5
5	8	2.5	0.2	3.5
6	8	3.5	0.2	4
8	10	4.5	0.2	6
10	10	4.8	0.2	8
12	12	6.0	0.25	10
16	14	7.8	0.35	12
20	14	9.7	0.35	14
25	25	12.7	0.35	16

Order:
KT Type. D x L

Material: 1.2083 - INOX
Hardness: 48-52 HRC

Order Example:
KT01. 4 x 8

TYPES

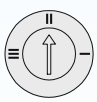
KT01 (Month)

KT02 (Month + Year)

KT03 (Year)

KT04 (Weekly)

KT05 (Daily)


KT06 (Shift)

KT07 (Number)

KT08 (Letter from **A** to **M**)

KT09 (Letter from **N** to **Z**)

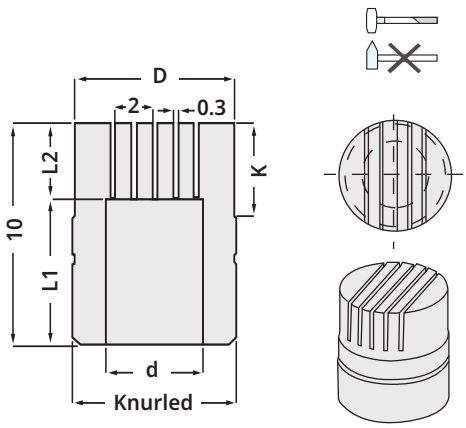
KT10 (Arrowed)

KT11 (Custom-Made)

It is suitable to be used in all injection mould systems. Only a hole as product diameter (H7 - Reamed) is sufficient for mounting to mould. **Mounting:** Drill a suitable hole in the desired part of mould and place Date Stamp into it (with bronze or rubber hammer). Making a tight hole (not to rotate date stamp) is useful.
A wide range of options are available at affordable prices.

Code: **STV**

Air Venting Valve for Blow Moulding



Order Code	D	d	K	L1	L2	Knurled
STV06	6	4.3	4	7	3	6.1
STV08	8	5.7	4.5	6.5	3.5	8.1
STV10	10	6.1	4.5	7	3	10.1
STV12	12	8.1	4.5	8	3	12.1

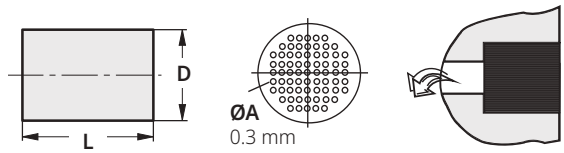
It is used in blow mouldings for optimum ventilation to mould cavity. Due to the air channels of valve being parallel and wide, it drains the air in mould rapidly, also air chamber inside of the unit acts as a pool in drainage of the air. If the burrs become on the product that should be cleaned instantly. Those burrs causes adhesion to pores. For cleaning, the compressed air or cleaning spray can be used. **(Güvenal Cleaning Spray Code: GTH1010)**.

Mounting: It provides tight keep and inside the safe of hole thanks to its knurled outer part.

Code: **AHV**

Gas Venting Filter for Diecasting

(for aluminium & zamak moulds)



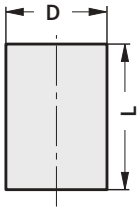
Order Code	D	L	A Pore Pcs.
AHV03	3	10	40
AHV04	4	10	40
AHV05	5	10	90
AHV06	6	10	90
AHV08	8	10	200
AHV10	10	10	340
AHV12	12	10	340
AHV16	16	15	340
AHV20	20	15	550

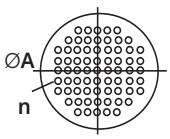
It is resistant to high temperature and pressure.

It is designed / produced with heat treated and large discharge poles. It is a specially designed and highly productive product for Diecasting Moulds & Injection Moulds. The service life of the product is longer than the equivalent products. You can minimize product replacement times by increasing productivity levels.

Sintered Gas Venting Filter

Code: **SGA**





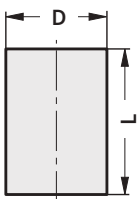
n: number of holes

Order Code	D	L	A	n
SGA165	1.6	5	0.03	250 400
SGA205	2	5		
SGA255	2.5	5		
SGA365	3.6	5		
SGA419	4.1	9		880
SGA5010	5	10		
SGA6510	6.5	10	0.05	880
SGA9010	9	10		
SGA1010	10	10		
SGA12510	12.5	10		
SGA1510	15	10		1200
SGA2010	20	10		

With its sintered & multi-pores structure, it is a special product which discharges compressed gas in injection moulds. Sintered Gas Venting Filters are used for optimum venting of the mould cavity. It is a high quality, stainless product which does not leave marks on injected objects and can resist high pressures.

Code: **GVSY**

Sintered Gas Venting Filter with Steel Casing



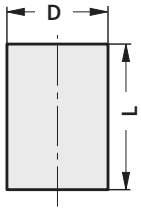
- External surface grinded.
- Sintered structure.
- It is offered as an economical option compared to the "SGA" model.

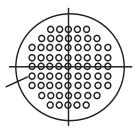
Material:
Stainless Sintered Steel
Filter Fineness: 10 Microns
Tension: 300 N / mm²
Resistance: Weak bases
Organic acids, Plastic melts
Synthetic resins

Order Code	D	L
GVSY04	4	10
GVSY06	6	10
GVSY08	8	10
GVSY10	10	12
GVSY12	12	12
GVSY16	16	14
GVSY20	20	15
GVSY28	28	15

Gas Venting Filter

Code: **GGA**



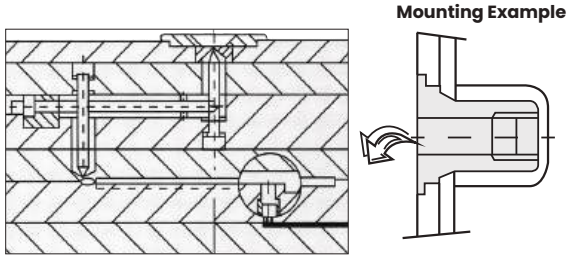


Wide Channels

Order Code	D	L
GGA03	3	8
GGA04	4	10
GGA05	5	10
GGA06	6	10
GGA08	8	10
GGA10	10	10
GGA12	12	10
GGA16	16	10

Use a rubber hammer

Mounting Example



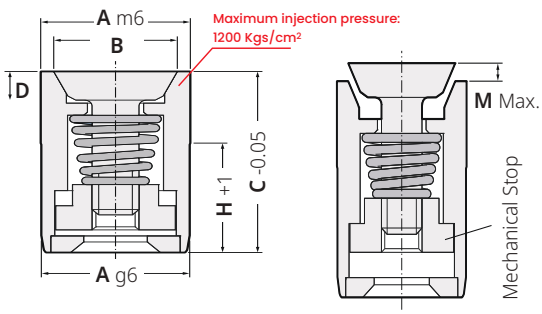
In injection moulds, it drains unwanted gas created by melted raw material fast via wide channels.
Does not resist to very high pressures, can dent and leave a mark on objects in stamp. It is mostly suitable to be used inner parts. It can be used in metal injection moulds which do not require very high temperature.
It is an economical product.

In Mounting: Please use copper / rubber hammer. Do not make any mechanic or polishing / levelling process on filter unit, since this would clog up the pores.

In Production: Never touch Venting Filters on operating moulds by hand.

Air Venting Valve

Code: **CHV**



Order Code	A	B	C	D	H	M
CHV05	5	3	12	1.5	7	2.5
CHV06	6	5.2	12	1.5	7	0.95
CHV08	8	6.5	12	1.5	7	0.95
CHV10	10	8	12	2	7	0.95
CHV12	12	10	12	2.5	7	0.95
CHV16	16	13	20	3	12	1.55
CHV20	20	17	20	3.5	12	1.55

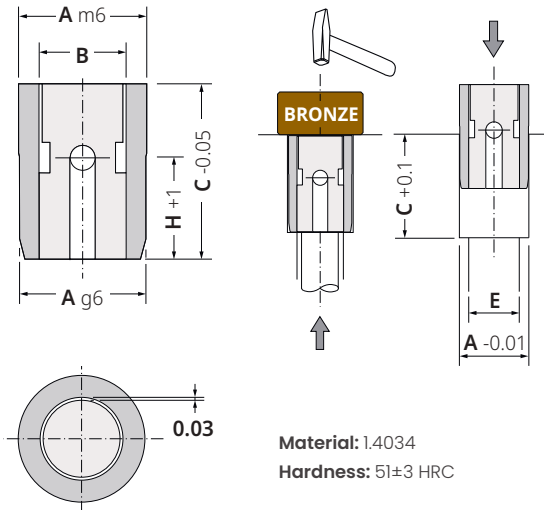
"CHV" Air Venting Valves produced from stainless steel. It provides high air discharge. Also, the conical ejector rises and helps the product exit from mould. CHV valves are used to release the vacuum created during the moulding of thin-walled or deep-drawn parts, such as flower pots, trays, and containers. The operating temperature under 150°C is recommended.

In higher temperature than 150°C; steel starts to expand and melt plastic raw material gets into valve and prevents operation.

Operating air pressure: 1.5-6 Bar **/ Material:** 1.4034

Double Air Venting Valve

Code: **DHV**

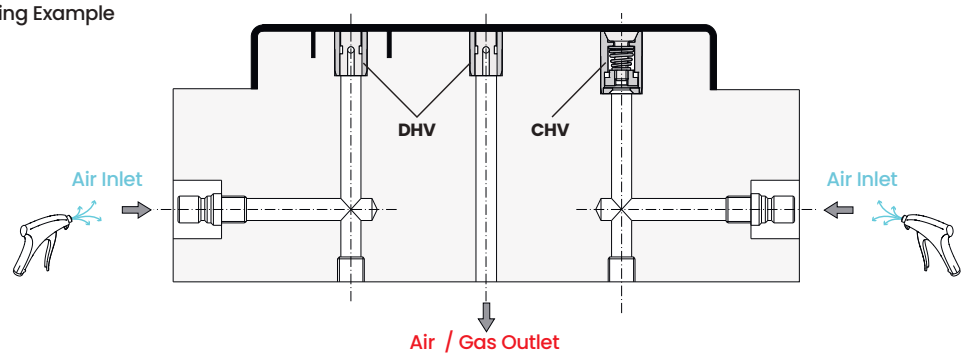


Material: 1.4034
Hardness: 51±3 HRC

Order Code	A	B	C	E	H
DHV08	8	5	12	6	7
DHV10	10	6	12	8	7
DHV12	12	8	12	10	7
DHV16	16	10	20	12	12

"DHV" Double Air Venting Valves produced from stainless steel. The product is effective for the semi-pneumatic ejection method. It is effective in discharging gas and air trapped in the final filling areas of deep details in the moulds or in other possible areas and it helps the product exit from mould. **In mounting;** please use the copper or rubber hammer and bronze wedge.

Mounting Example

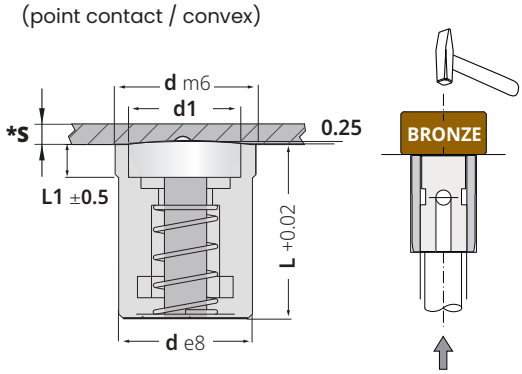


NEW

Code: **GTHV**

Air Venting Valve +SafeGuard Close

(point contact / convex)



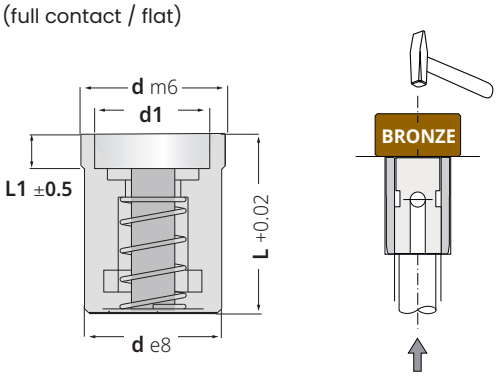
Order Code	d	d1	L	L1	*S
GTHV06	6	4	12	4	1
GTHV08	8	5			
GTHV10	10	6		5	1.5
GTHV12	12	7	14		
GTHV16	16	10	20	6	2.5

NEW

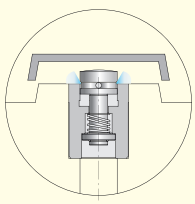
Code: **GHV**

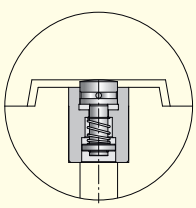
Air Venting Valve +SafeGuard Close

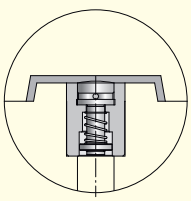
(full contact / flat)



Order Code	d	d1	L	L1
GHV06	6	4	12	4
GHV08	8	5		
GHV10	10	6		5
GHV12	12	7	14	
GHV16	16	10	20	6







"GTHV and GHV" are products specially developed for moulds with high pressure and fast operation, such as IML - Thin-walled moulds.

Compared to the traditional Güvenal CHV series, material leakage is minimized.

With new Valve design, the issue of material leakage is eliminated. For high-speed and efficient operation, routine cleaning can be done using only air assistance. The most common problem with Air Venting Valves is valve jamming and material filling the air holes. These issues lead to long production downtimes and additional costs for mould repairs. In our new products, during injection moulding, a limited amount of air is initially released through the gap between the valve body and mechanism, followed by a quick discharge of the trapped air into the mould cavity, thanks to the valve's convex structure.

To mount the Valves securely, do not move it from the mechanism, move it from the outer part.

- Locking is guaranteed even if the valve jams.
- **Material:** Stainless Steel 1.4021 / 50-55 HRC.
- Fully grinded.
- Maximum air pressure: 10 bar.
- Valve-seat interference: 0.01-0.02 mm.

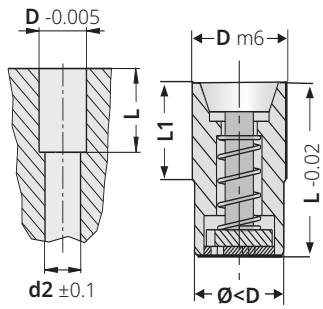
Use a rubber hammer

Compressor air pressure min: 3-10 Bar
Material: 1.4034
Hardness: 52-55 HRC
Max. temp.: 150⁰

Air Venting Valve

Code: **KHV**

Order Code	D	L	L1	d2
KHV06	6	12	7	3.5
KHV08	8	15	9	5
KHV10	10	20	13	6
KHV12	12	25	15	8
KHV16	16	30	17.5	8
KHV20	20	30	19	10
KHV25	25	30	19	12
KHV30	30	30	27.5	15



It is the most suitable method for dissolving vacuum during injection. **In wide and narrow walled objects;** it continues to discharge compressed air by vacuum in mould. All casing and machined surfaces have been produced from stainless steel. **In comparison with PHV (pinned type), the shorter length is advantageous.**

Use a rubber hammer

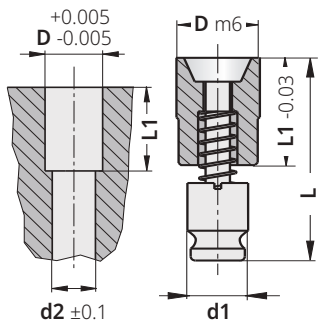
Compressor air pressure min: 2-9 Bar
Material: 1.4034
Hardness: 52-55 HRC
Max. temp.: 150⁰

Air Venting Valve with Pin

Code: **PHV**

Order Code	D	L	L1	d1	d2
PHV08	8	28	11	6	7
PHV10	10	28	11	7	8
PHV12	12	30	11	8	9
PHV16	16	43	20	10	14
PHV18	18	43	20	10	14
PHV20	20	43	20	10	16
PHV25	25	60	20	16	16

"in high and deep objects"

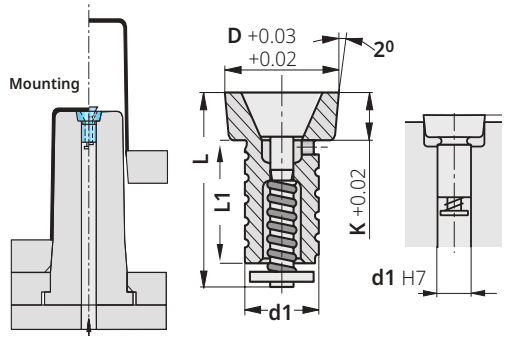


It is the most efficient air venting product. It is especially ideal for deep and large moulds. **In mounting;** please use the copper or rubber hammer and bronze wedge.

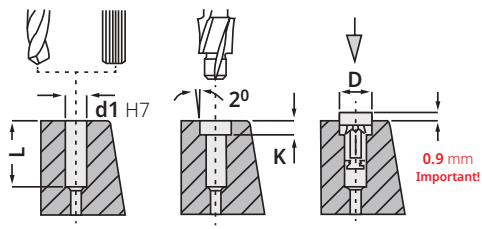
Compressor air pressure min: 2-9 Bar
Material: 1.4031 INOX
Max. temp.: 250⁰

Venting Valve for High Pressure

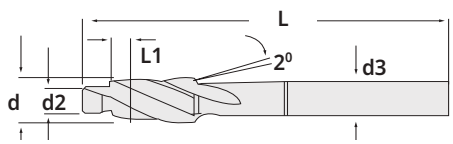
Code: **VHV**



Order Code	D	d1	K	L	L1
VHV08	8	6	5	16	8
VHV12	12	8	5	21	13
VHV16	16	10	6	22	14



Mounting: It should be provided with special reamer (VHR) and should be approx. **0.9mm** out / above from mould parting line. It is compatible with metal injection moulds. **Metal Injection gas venting and pneumatically activated ejector. 2⁰ conical head / mounting with special reamer.**



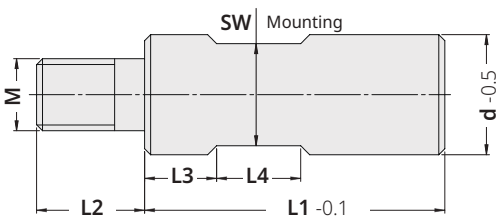
Special Reamer for "VHV" Valve

Code: **VHR**

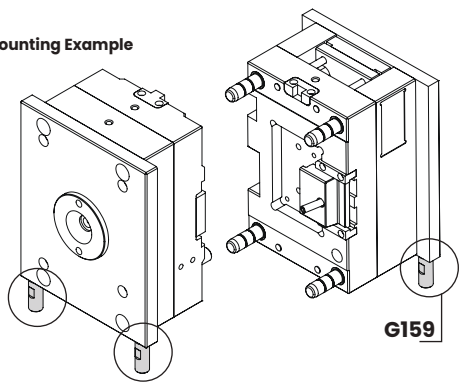
Order Code	d	d2	d3	L	L1
VHR08	8	6	10	69	5
VHR12	12	8	12	100	5
VHR16	16	10	12	122	6

Support Bolt

Code: **G159**



Mounting Example



d	M Metric	L1	L2	L3	L4	SW Mounting
20	M12	35	18	14	12	17
		50				
		80				
32	M16	35	24	18	12	27
		50				
		80				
		120				
39	M20	80	30	24	16	32
		120				

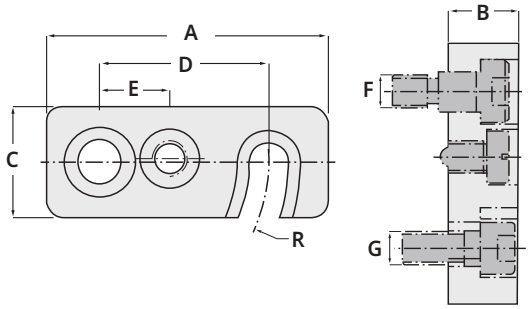
Order: **G159.** d x L1

Material: CK45

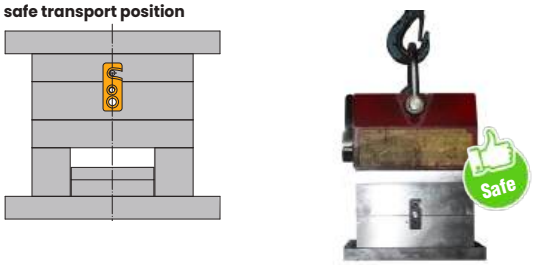
These bolts form a gap on mould surfaces in order to prevent damage to water unions and cooling hose systems protruding on injection mould surfaces and hydraulic - pneumatic core systems. Minimum four bolts should be used according to each mould size. Especially, it is used to protect protruding parts of moulds during shelf forming.

Mould Safety Latch

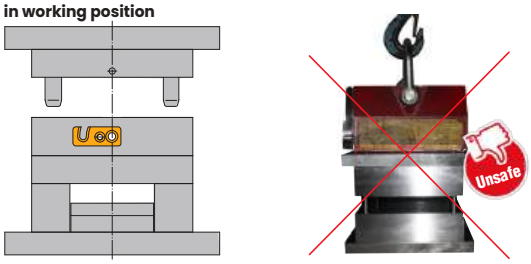
Code: **G103**



safe transport position



in working position



A	B	C	D	E	F	G	R
50	12	20	30	14	M6	M6	30
63	16	25	38	17	M8	M8	38
80	20	32	48	20	M10	M10	48

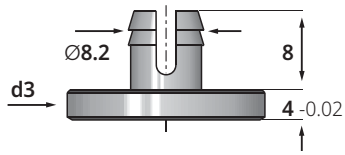
Order: **G103.** A

Material: 1.0503 Steel Forging Sandblasting

Mould Safety Latch: This system is mounted outside of the mould. It is used to carry the mould safely. It is fixed on the mould with a cylinder head cap screw. Other cylinder head cap screw hole is drilled at the opposite party. Mounting or demounting can be easily done with spring plunger. It is a compact product having no loose parts. It has no protruding parts as a clamping lock.

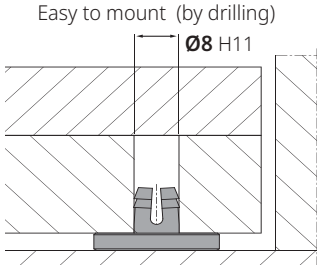
Ejector Plate Thrust - Support

Code: **G144**



Order Code	d3
G14420	20
G14430	30

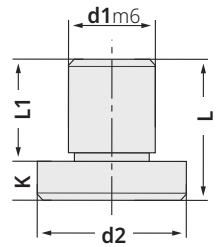
Easy to mount (by drilling)



For using inside of the mould, this supports can be put under the plates. By drilling a hole (8mm / H11), flexible claws on product are opened inside of the hole and is retained. It can be easily removed during an impact. Thus, symmetry is provided in mounting and repetition of plates.

Thrust Pin

Code: **G120**



Order Code	d1	L	L1	d2	K
G120817	**8**	17	12	16	5
G1201421	**14**	21	15	24	6

Stop / Thrust Pin: It is compatible to use between holder plates of injection moulds or dies.

Material: 1.7131 (16MnCr5)
Hardness: 58 - 62 HRC

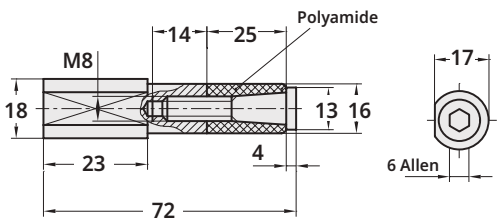
3D CAD FILES GUVENAL

Download
www.guvenal.net

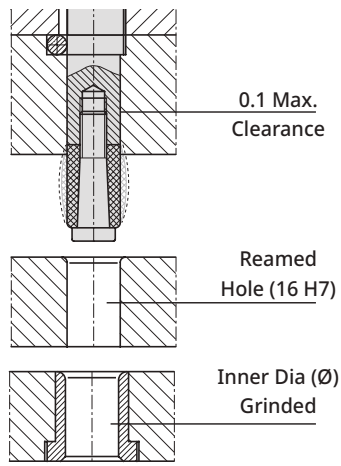
3D CAD - **Formats:** CATIA, STEP, IGES 3D, X_T

Friction Puller
(Parting Locks)

Order Code: SCPM8



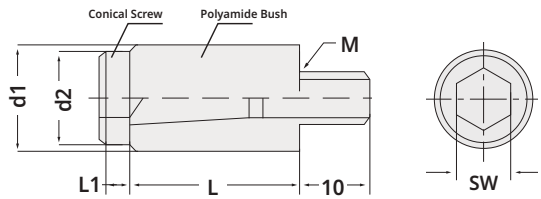
Mounting Example



This simple friction puller provides great benefit in "3-plate moulds" that average gravitation force and plate accuracy are sufficient. Similarly, it can be used as brake with stopping purpose between plates.
For example; if it is desired to wait or postpone opposite / counter parts motions or to avoid collision of hard detrimental plates, it provides suitability for use.
Maximum operating temperature: 120^{0}C Polyamide extrusion (tightening) holes ends should be left with radius. Please do not lubricate the extrusion surfaces.

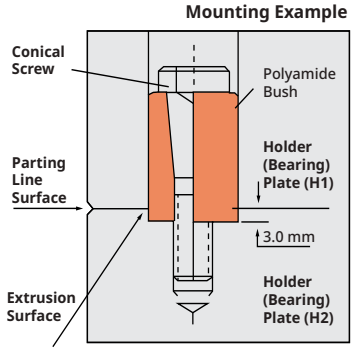
Friction Puller
(Parting Locks)

Code: GPLA



Order Code	d1	d2	M	SW	L	L1
GPLA10	10	8.5	M5	4	3	18
GPLA12	12	11	M6	5	3.5	20
GPLA13	13	11	M6	5	3.5	20
GPLA16	16	14	M8	6	4	25
GPLA20	20	16	M10	8	5	30

Mounting Example



You can provide optimal parting line control to desired plate group in mould with this simple part. Life time is approx. 50.000 stamps. It provides mounting and dismantling easiness and being cost effective.
It is also used in small / medium dimensional moulds, beside two stepped moulds or side cores.

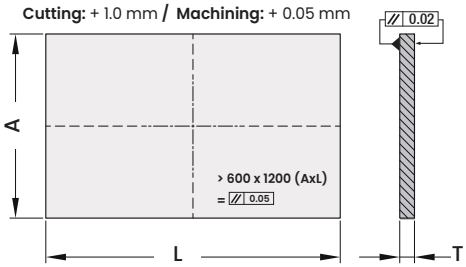
According to Mould Weights:
- GPLA.12 - 4pcs / up to 100 kg.
- GPLA.16 - 4pcs / up to 500 kg.
- GPLA.20 - 4pcs / up to 1000 kg.
- Over 1000 kg; GPLA.20 - 6pcs should be used minimum.

Product holes in moulds should be reamed and hole tolerance should be ±0.1mm. Polyamide extrusion (tightening) holes ends should be left with radius. Please do not lubricate the extrusion surfaces.
Maximum operating temperature: 80^{0}C

Maximum precision through 0.02 mm parallelism

Heat Insulation Plates / High-tech Code: IYPA

Tolerance = Thickness: ± 0.02 mm
Cutting: + 1.0 mm / **Machining:** + 0.05 mm

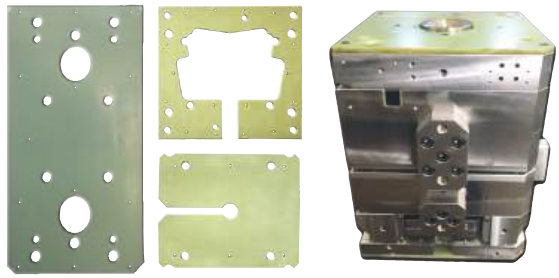


"IYPA" is preferred to use in applications in the mould and tool making industry where a excellent insulation effect and a high mechanical strength is required. It has no harm to human health and the environment. Our products are safety certified.

- High continuous usage temperature.
- Superior mechanical strength.
- Excellent insulation effect.

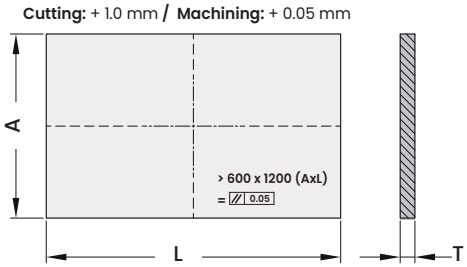
Material: Glassfibre reinforced thermosetting plastic with filler content.
Recommended Operating Temp.: Max. 200°C
Recommended Operating Temp. - Continuous Exposure: Max. 180°C
Compressive Strength - Room Temp.: 340 N/mm²
Compressive Strength - at 200°C: 130 N/mm²
Thermal Conductivity: 0.18 W/mK
Flexural Strength: 115 N/mm² / at 200°C = 55 N/mm²
Density: 1.70 g/cm³

Economic Type



Heat Insulation Plates / Economic Code: IYPE

Tolerance = Thickness: +0.50 mm
Cutting: + 1.0 mm / **Machining:** + 0.05 mm



Impact and heat insulation processes of injection moulds.

Heat Insulation Plates help reduce heat loss between the mould and the plate. They are preferred in order to avoid heat dissipation clearance among mould plates or between machine clamping block plate and mould upper plates, especially in moulds produced with thermoplastic and thermosets raw material.

- They are not affected by impacts, water, friction and electricity.
- Heat Insulation Plates also raise the view standards of moulds used.

Material: Glassfibre and an impact resistant, thermosetting resinbonded mix.
Recommended Operating Temp.: Max. 120°C (continuous exposure)
Compressive Strength: Temperature at 120°C = 160 N / mm²
Thermal Conductivity: Temperature at 200°C = 3.0 x 10⁻³ W/mK
Moisture Absorption: 0.06 %

**** Dimension tables are valid for both products (IYPA & IYPE).***

A	L	T
156	156	6
	196	8
	206	10
	246	
	296	
	346	
196	196	6
	206	8
	246	10
	296	
	346	
	396	
246	246	6
	266	8
	296	10
	346	
	396	
	446	
	496	

A	L	T
296	296	6
	346	8
	396	10
	446	
	496	
	546	
	596	
346	346	6
	366	8
	396	10
	446	
	496	
	546	
	596	
	646	
	696	
	796	

A	L	T
396	396	6
	446	8
	496	10
	546	
	596	
	646	
	696	
	796	
446	446	6
	496	8
	546	10
	596	
	646	
	696	
	796	
	896	

A	L	T
496	496	6
	546	8
	596	10
	646	
	696	
	796	
	896	
	996	
546	546	6
	596	8
	646	10
	696	
	796	
	896	
	996	
596	596	6
	646	8
	696	10
	796	
	896	
	996	

A	L	T
646	646	6
	696	8
	796	10
	896	
	996	
	1096	
	1196	
696	696	6
	746	8
	796	10
	896	
	996	
	1096	
	1196	
746	746	6
	796	8
	896	10
	996	
	1096	
	1196	

A	L	T
796	796	6
	846	8
	896	10
	996	
	1096	
	1196	
846	896	6
	996	8
	1096	10
	1196	
896	896	6
	946	8
	996	10
	1096	
	1196	
946	996	6
	1096	8
996	996	10
	1096	
	1196	
1096	1096	
	1196	

Order: **IYPA.** A x L x T

Order Example:
IYPA 196 x 246 x 6 **or** IYPE 196 x 246 x 6

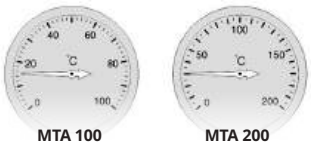
Order: **IYPE.** A x L x T

NEW

Code: **MTA**

Mould Thermometer

Magnetic Backed



MTA 100 MTA 200

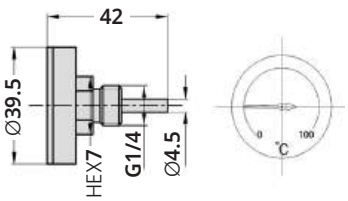
Order Code	∅	Temperature Range
MTA100	40	0 - 100°C
MTA200	40	0 - 200°C

NEW

Order Code: **MTB**

Mould Thermometer

Temperature Range / 0 - 100°C

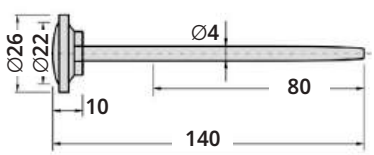


NEW

Order Code: **MTC2**

Mould Thermometer

Temperature Range / 0 - 200°C

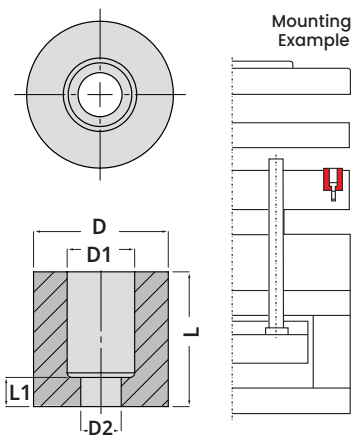


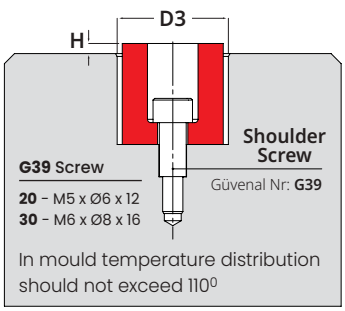
Code: **G157**

Urethane Spring for Mould Closing

(Cushioning purpose)

Product: Urethane shore hardness 90A.
Usage: All plates / side cores working by clashing each other in injection mould system start mould opening during mould opening before the m achine. During closing, cushioning is used and a soft opening is achieved. This way, it reduces practice surface damages and provides cushioning for high speed operations.





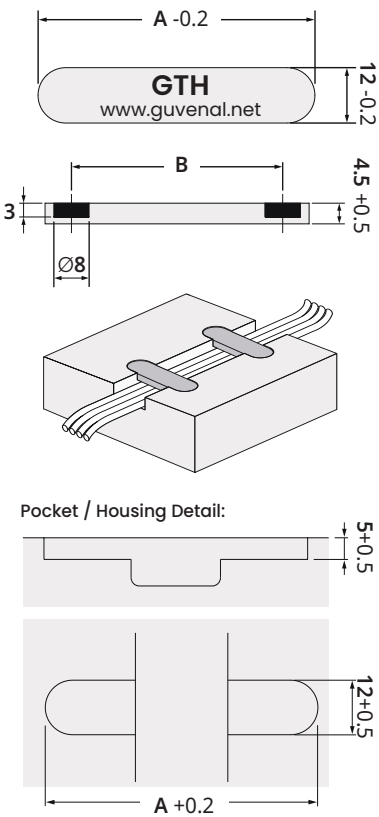
D	L	D1	D2	D3	L1	H
20	25	11	6.5	22	6.5	**3**
30	30	15	9	33	6.5	**3**

Order: **G157.** D x L

Cable Retainer Cap Magnetic Code: GTH

(Magnetic & does not require extra hole)

Especially in hot runner moulds, it keeps the diffused cables clean and smooth in channel. The product is a magnetic material, it is self adhesive, and there is no need to drill and tap extra holes. We recommend keeping max. mould temperature under 80°C. Because, plastic and even magnets can be affected and broke down due to high temperature.



Order Code	A	B
GTH40	40	28
GTH60	60	48

Order Code	Material	Max. Temp.
GTH40	ABS+ NfFeB	80°C
GTH60	ABS+ NfFeB	80°C

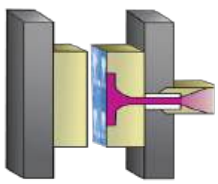
NEW

Sizes (width x length)
26.7 cm x 1 metre

Order Code: **KHBG1**

Mould Alignment - Pressure Monitoring Paper

① Cut the paper to the desired size.



② Place it on the parting line and clamp the mould.

③ Pressure ratios between mould halves, cores and cavities are precisely observed.

Specifications:

Usable humidity range: 10-90% RH **/ Pressure:** 1,000 - 6,000 PSI
Paper thickness: 0.1016 mm **/ Temperature limit:** Max. 93°C

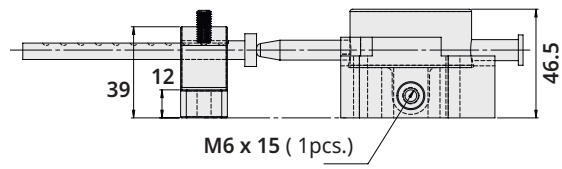
Unlike traditional methods such as bluing agents, clay and carbon papers, it instantly changes colour when placed between the mould halves to reveal how the pressure is distributed between the mould halves. Whenever bluing agents are applied to one half of the mould, they are transferred to the other if there is any contact in the parting line, but cannot distinguish between high and low pressures.

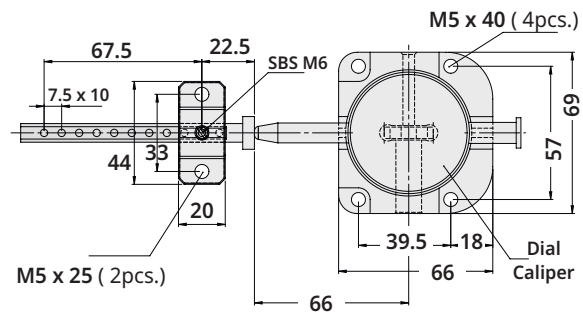
Mould Alignment - Pressure Monitoring Paper is placed between the mould halves on the parting line and then sealed using the minimum closing/clamping tonnage. It is then removed and inspected for image and point pressure distribution and space. In this way, the detection is successful. It offers a very effective solution for detecting parallelism in mould parting lines.
It provides significant savings from unnecessary maintenance costs with pre-determined determinations. Thanks to this new solution; the quality of the parts can be increased by detecting the possibility of any burr formation in the produced part. It guarantees higher accuracy than conventional methods due to the visual detection and identification of various different pressure forces.

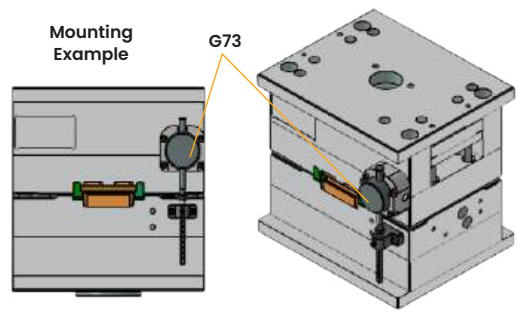
Dial Caliper for Load Control Monitoring with Mounting Body

Order Code: **G73**

It shows the opening distance, caused by the over pressure or other reasons, untill in min. 0.01mm while mould trials or production.







Main reasons of the mould openings (spacing) while running;

Max. Operating Temp.: 80°C

Body Material: POM

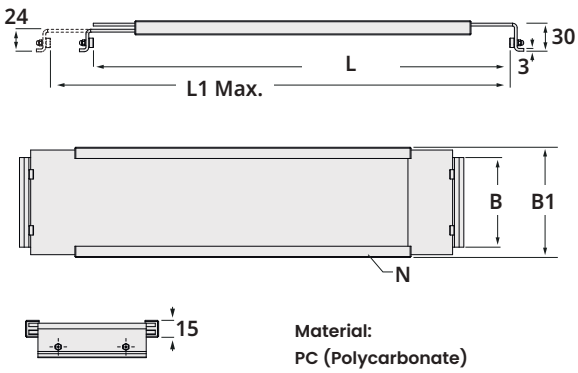
* 2nd pressure is too high.
* Machine shut power is not enough.
* Too much resin sent into the mould.
* Problem with the mould adjustment so that the mould can not be closed completely.
* Not returned ejector.
* Broken insert.
* Unwanted resin, left from the previoun shut.

Note: Please make the mounting holes according to the drawing.

Adjustable Ejector Plate Cover

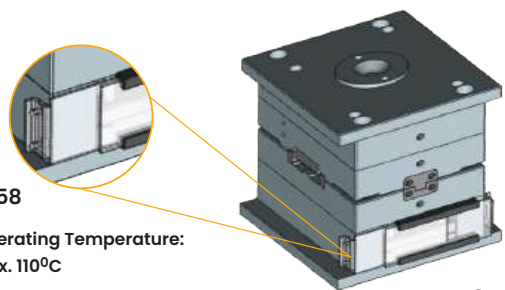
Code: **G158**

Security and Protection Mechanism for Ejector Plate



Material:
PC (Polycarbonate)

Order Code	L - L1 Max. (mm)	N	B1	B
G158.156218.56	156 - 218	2	78	56
G158.156218.76			98	76
G158.156218.96			118	96
G158.246396.66	246 - 396	2	88	66
G158.246396.76			98	76
G158.246396.86			108	86
G158.246396.96			118	96
G158.246396.116			138	116
G158.446596.96	446 - 596	2	118	96
G158.446596.116			138	116
G158.446596.136			158	136
G158.446596.156			178	156

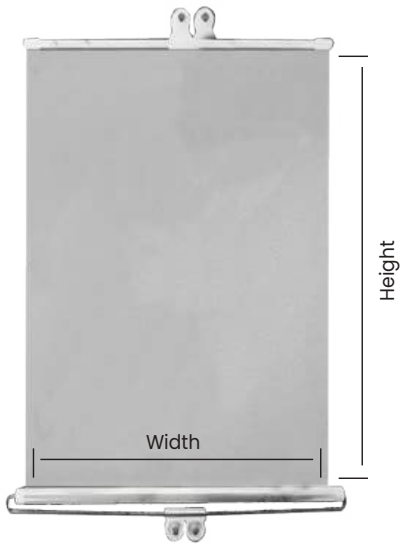


G158

Operating Temperature:
Max. 110^{0}C

* Adjustable to suit the requirements of your mould widths.
* Efficient and reliable protection againts pollution or falling plastic parts.
* Consider sizes (L - L1 max.) specified in the table for safety.

NEW



Mould Curtains

Code: **G180**

Order Code	Mould Height (mm)	Max. Width (mm)
G180250	250	750
G180300	300	750
G180350	350	750
G180400	400	750
G180450	450	750
G180500	500	750
G180550	550	750
G180600	600	750
G180650	650	750

The four strong magnetic suction cups of Mould Curtains are respectively attached to the movable platen and the fixed platen of the mould. The protective curtain will automatically stretch and close with the opening and closing of the platen. The transparent Mould Curtains when stretched can effectively prevent the plastic products from falling and splashing everywhere.

Features:

- Ultra Low Profile Design
- Crystal Clear Mould Screen
- Reduce Scrap Eliminate Contamination
- Ideal for Cleanroom Applications Increase Profits

Kit Includes :

2 x Scatterguard Mould Screens and Mounting Magnets

Video

3D CAD FILES GUVENAL www.guvenal.net

External Side Lifter Unit with Hydraulic Piston

Code: **G136 / HPM..**

Güvenal Patented System: **TR2016 06729B**

One of the important sections in mould design and production is Lifter / Core Systems. Many practical product range related to these complicated systems is presented in our catalogue. **Güvenal** engineers will develop a new and standard product which is more clear and impress mould makers in Lifter / Core Creations and provide advantages in terms of time and cost.

If we consider **Lifter / Core Systems** as pouches of moulds by imagining their positions in injection moulds, mould producers make this system in moulds traditionally with high costs and efforts. As innovative **Güvenal**, we have planned this system out of the mould. Easy to mount and without other instruments which may cause additional costs. Also, our External Side Lifter Unit with Hydraulic Piston which are offered ready and with economic prices and structure without protruding part (compact design). We convert traditional mechanical system into a new system with hydraulic support by combining movable unit with hydraulic piston (today, hydraulic distributor is available in all injection machines). **Our new product apply linear movement taken from hydraulic piston into mould perpendicularly.** Thus, all details of Lifter / Core formation in moulds which is hard are carried out. Namely, easy Lifter / Core System is completed with minimized position. Now, moulds with Lifter Systems will be produced fastly with low cost by you. In this way, it will provide shorter time in press / stamp durations - production possibility with less machine options by minimizing moulds and longer mould lifetimes.

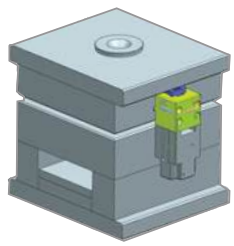
It is a practical system, it will be easily interfered with quick processes and the most important feature will be your economic price offers and fast mould deliveries. It will also provide different applications on mould for users.
Güvenal - G136 "External Side Lifter Unit with Hydraulic Piston: We plan to increase difference with competitors by performing our R & D studies. In a different way, adding mould design & production methods consultancy to our products and job family. We expect important support of mould sector for these developments.

Hydraulic Piston; with special viton felt set (resistant to 180° temperature).

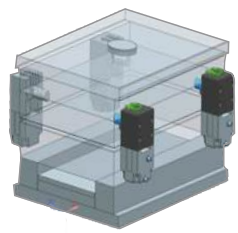
Güvenal standard side lifter systems can be used with working distance of stroke settings from 7mm up to 20mm.

Design Application Examples

Pos. - 1

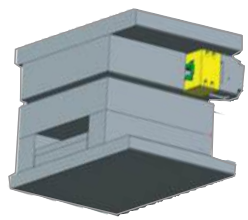


Pos. - 2

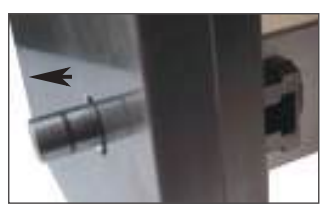


Pos. - 3

Pos. - 4



Lifter, Backward / Close Position



Lifter, Forward / Open Position

External Side Lifter with Hydraulic Piston

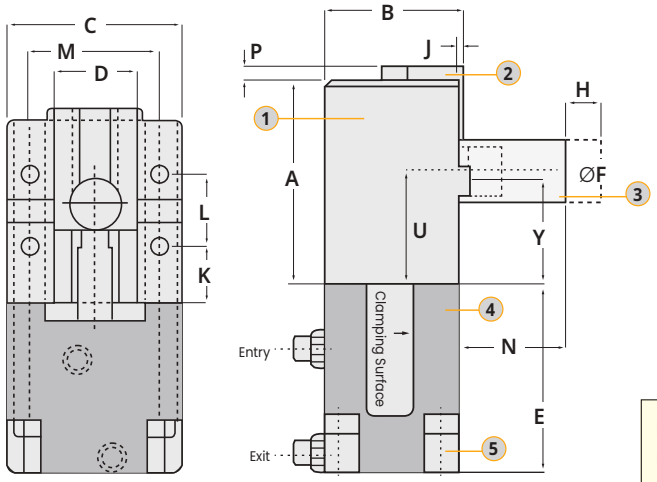
IMPORTANT: In mounting position 1 / 2 / 4 etc. applications a clearance of 1.5mm should be left in mould base in order to prevent hydraulic cylinder bumping into mould steel.

External Side Lifter Unit with Hydraulic Piston

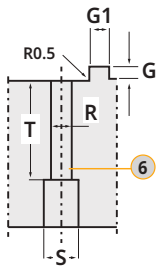
Code: G136 / HPM..

Güvenal Patented System: **TR2016 06729B**

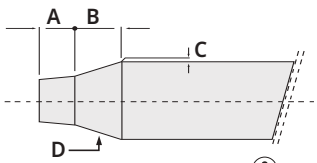
Hydraulic piston app. pressure: Max. 160 Bar
Max. temp.: 160°C



V = Hydraulic Cylinder Ø x Stroke



"Lifter Slide Pin" Recommended Practice Area



During application, in order to provide the correct combination, do not hesitate to contact engineers in our company.
info@guvenal.net

If **J>0:** On mould surface which system will be mounted: A discharge will be performed in dimensions of **"D+2mm x (A+P)+3mm x J+1mm".**

Material List:

1	**Lifter Body**	: 1.2312 / HRC 44-46
2	**Inner Lifter Body**	: 1.2312 / HRC 40-42
3	**Sliding Pin**	: 1.2344 / Nitrided
4	**Hydraulic Cylinder**	: Standard Type
5	**Screw**	: DIN ISO 4762 (4 pcs)
6	**Screw**	: DIN ISO 4762 (4 pcs)

(3) **Note:** Sliding pin with number in Lifter System will be formed upon request by user.

Model	HPM.050	HPM.070		HPM.096		HPM.126	
Dim. \ Type	300	100	300	100	300	100	300
A	48	64		86		126	
B	40	60		70		86	
C	47	70		96		126	
D	23.2	32.6		40.6		60.6	
E	76	106		118		118	
F	16	20		25		38	
G	3	4		6		8	
G1	8.0	7.9		9.9		15.9	
H (max)	10	7.5	12.7	10.7	17.9	13.	22.6
J	J<0	J<0		J<0		J<0	1.37
K	17	21		33		39	
L	-	24		30		50	
M	37	50		74		94	
N (*)	80	92.5	87.4	90.3	82.1	78	69
P (*)	8	10		1.5	2.0	9	
R	6.5	8.5		10.5		13	
S	11	15		17		20	
T	31	48		48		61	
U	27.3	33.5		43.5		69.5	
V	25 x 25	32 x 30		40 x 40		40 x 50	
Y	26	33		48		64	

H (max): Lever movement of External Lifter with Hydraulic Piston.
(*) : Values given on table are approximate values.

Order:
G136/HPM ... x Type

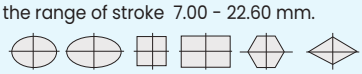
Order Example: If "H" (max.) 7.5mm is suitable for the product, your order code should be **G136. HPM.070 x 100.**

Hydraulic Piston Order: If Hydraulic Pistons in the system are ordered, **Example:** G136. HP x "External Lifter dimension" is enough.

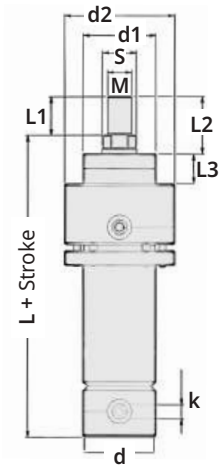
"Lifter Slide Pin" Recommended Practice Dimensions:

Dim.	Descriptions	Min.	Max.
A	Form Depth	< 5	> 20
B	Burr Cutting Practice Length	5	12
C	Form Pin Bearing Clearance	0.03	0.1
D	Burr Cutting Practice Angle	5	10

Definition & Purpose: It is an important support component which contribute mould production process in order to obtain details in type of round, square etc. on plastic part with Side Lifter. According to Side Lifter with Cam System and Ejector Group supported (jiggle) Lifter designs:
*It reduces design process. *Material cost decreases because it gives steel size advantage from 50mm min. up to 250mm in mould sizes according to the product design.*Since detail machining of Side Lifter is reduced to 90%, it provides advantage from CNC machining duration. *It supports mould assembly / practice process. *Thanks to its automatic locking design, reverse resistance is in maximum level during 2nd press of injection. * Die marking problem is minimum or none with the feature of using as a hidden lifter / core.
Terms of Use: According to the details and sizes of moulds;
1 - It is used to obtain one or more similar profiles which are specified with examples below to be obtained male or female side of the mould as blind or full hole within the range of stroke 7.00 - 22.60 mm.



2 - While lifter / core hydraulic working stroke distance is not interfered, in obligatory cases, it should be made without distributing hydraulic.
3 - Mounting details of system should be process according to the dimensions specified in the catalogue, +0,05 / +0,1 maximum.
4 - When vibration occurs in hydraulic during mould trials, system should be fixed to the mould by using details on hydraulic side surfaces and Güvenal clamps.
5- During trials and production phases, before opening injection machine clamp, form slide pin or steel should be separated from plastic detail by pulling back hydraulic.



Standard Strokes:
50
100
160
200
250
300

Motion Type:
Double Action
Sealing:
Polyurethane + NBR

Hydraulic Cylinder - Round Type

Code: **THS**

Order	d	d1	d2	S	M	k	L	L1	L2	L3
THS40	50	50	80	22	M.16 x 1.5	1/4	160	22	35	20
THS50	60	60	95	28	M.20 x 1.5	1/4	194	31	46	25
THS63	75	70	125	36	M.27 x 2.0	3/8	208	39	55	25
THS80	95	85	130	45	M.33 x 2.0	3/8	235	47	65	30
THS100	115	109	160	56	M.42 x 2.0	1/2	244	60	80	30
THS125	145	130	195	70	M.48 x 2.0	1/2	276	67	90	37

Dimension	Formula	Unit
Force (Newton)	**F**	N
Length	**S**	m
Speed (Stroke)	**v**	m/s
Pressure	**p**	bar
Area (Piston)	**A**	m^2
Volume	**V**	m^3
Flow Rate	**Q**	m^2/s
Efficiency	**ή**	-
Performance	**P**	kW

The information is advisory.

Cylinder Force:
F (N) = p (bar) x A (cm^2) x 10
A = Effective piston area

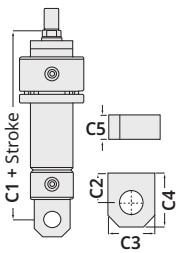
Required Flow Rate:
$Q\ (L / min.) = A\ (cm^2) \times v(\frac{m}{s}) \times 6$

Repulse and Return Speed:
$v(\frac{m}{s}) = \frac{Q\ (L / min.)}{A\ (cm^2)} \times \frac{1}{6}$
Q = Flow Rate

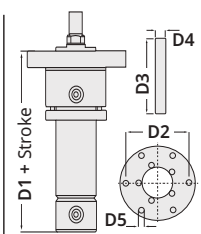
Required Pump Capacity:
$P\ (kW) = \frac{Q\ (L / min.) \times p\ (bar)}{ή} \times \frac{1}{600}$
ή = Pump Efficiency

Hydraulic Cylinders: Used in injection moulds for waste water and for other cores / lifters. Piston motion is provided with joints in injection machine.
Operating: Hydraulic Oil **Max. Operating Pressure:** 160 Bar
Operating Temp.: -20 / $+80^0$ **Stroke Inaccuracy :** ± 0.3mm
Shaft: C45 / Hard Chrome Coated

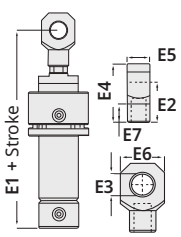
Hydraulic Cylinders Joint Types:



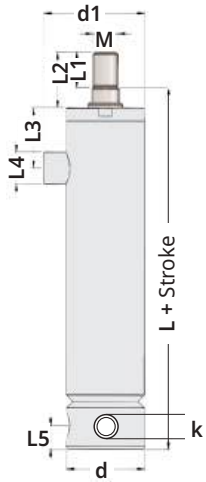
Order : EB
Flange



Order : FB
Flange



Order : MB
Connector



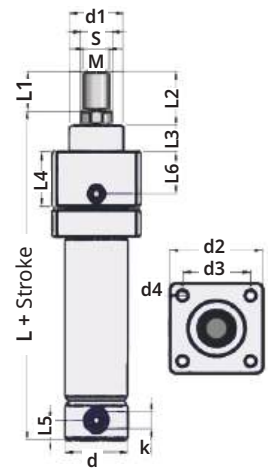
Flange joint upon request **(Code: EB)**

Hydraulic Cylinder - Tube Type

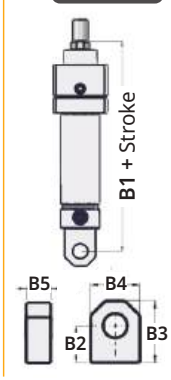
Code: **TBTHS**

Order	d	d1	M	k	L	L1	L2	L3	L4	L5
TBTHS40	50	65	M.16 x 1.5	1/4	125	22	35	40	20	15
TBTHS50	60	75	M.20 x 1.5	1/4	152	31	46	43	20	21
TBTHS63	75	90	M.27 x 2.0	3/8	163	39	55	50	25	23
TBTHS80	95	110	M.33 x 2.0	3/8	209	47	65	60	20	29
TBTHS100	115	135	M.42 x 2.0	1/2	211	60	80	82	30	27
TBTHS125	145	165	M.48 x 2.0	1/2	229	67	90	82	30	30

Custom-made Production (for all Hydraulic Cylinders):
- For too hot environments, special piston with Viton Felt (180ºC).
- Single action (spring converter).
- Shaft material & dimensions can be produced acc.. to your demand.



Flange
Code: **EB**

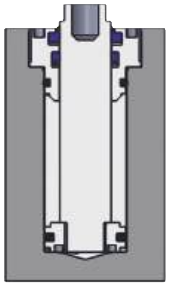


Hydraulic Cylinder Square Type

Code: **THKS**

Order	d	d1	d2	d3	d4	S	M	k
THKS40	50	43	70	51	M.10	25	M.20 x 1.5	1/4
THKS50	60	62	78	56	M.10	28	M.20 x 1.5	1/4
THKS63	75	70	95	70	M.10	36	M.27 x 2.0	3/8
THKS80	95	85	115	90	M.12	45	M.33 x 2.0	3/8

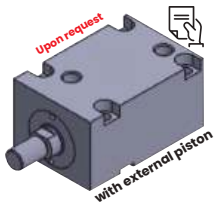
L	L1	L2	L3	L4	L5	L6	B1	B2	B3	B4	B5
170	30	41	20	41	15	31.5	200	30	50	40	20
178	26	39	25	37	21	26	208	30	55	50	25
189	39	51	30	41	22.5	28	229	40	70	60	30
235	47	65	30	68	29	41	280	45	80	70	35



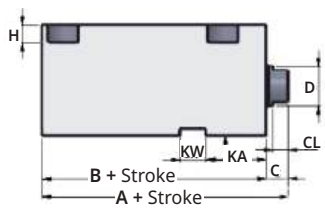
Hydraulic Piston - Square Type — Code: THCS

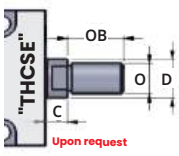
Bottom Slotted (KW type) & with 4-Fastening Holes from Upper Side

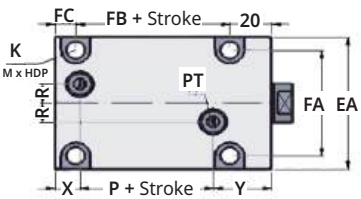
"THCS" Series Ø 32 - Ø 80

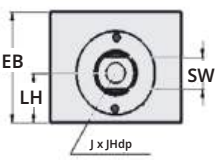


"THCSE" Series Ø 32 - Ø 80









Order	A	B	C	CL	D	EA	EB	FA	FB
THCS.32	64	54	10	7	20	70	56	56	24
THCS.40	65	55	10	7	25	80	62	62	23
THCS.50	71	60	11	8	28	94	74	74	27
THCS.63	80	67	13	10	36	114	89	90	32

FC	H	J	JH	K	KA	KW	KT	LH	M
10	9	M12 x1.75	15	9	28	12	3.5	25	14
12	11	M16 x 2	20	11	28	12	3.5	29	18
13	13	M20 x 2.5	25	14	29	14	4	34	20
15	15	M27 x 3	35	16	31	16	4.5	42	23

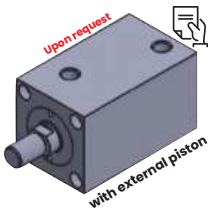
OB	O	P	PT	R	SW	X	Y
25	M16 x 1.5	14	1/4"	10	17	12	28
30	M20 x 1.5	15	1/4"	10	22	12	28
35	M20 x 1.5	18	1/4"	10	22	12.5	29.5
40	M27 x 2	20	3/8"	10	30	16	31

It has a compact design. It is at the forefront with strong bearing system. **Upon request:** For too hot environments special piston with Viton Felt (180°C).

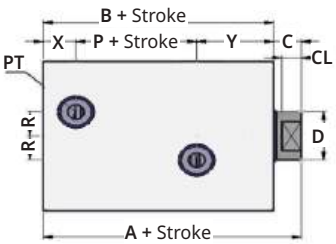
Hydraulic Piston - Square Type — Code: THCF

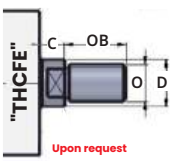
Compact Design & with 4-Fastening Holes from Front Side

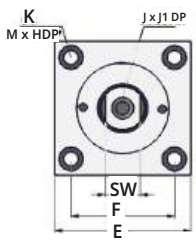
"THCF" Series Ø 32 - Ø 63

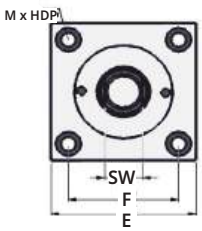


"THCFE" Series Ø 32 - Ø 63









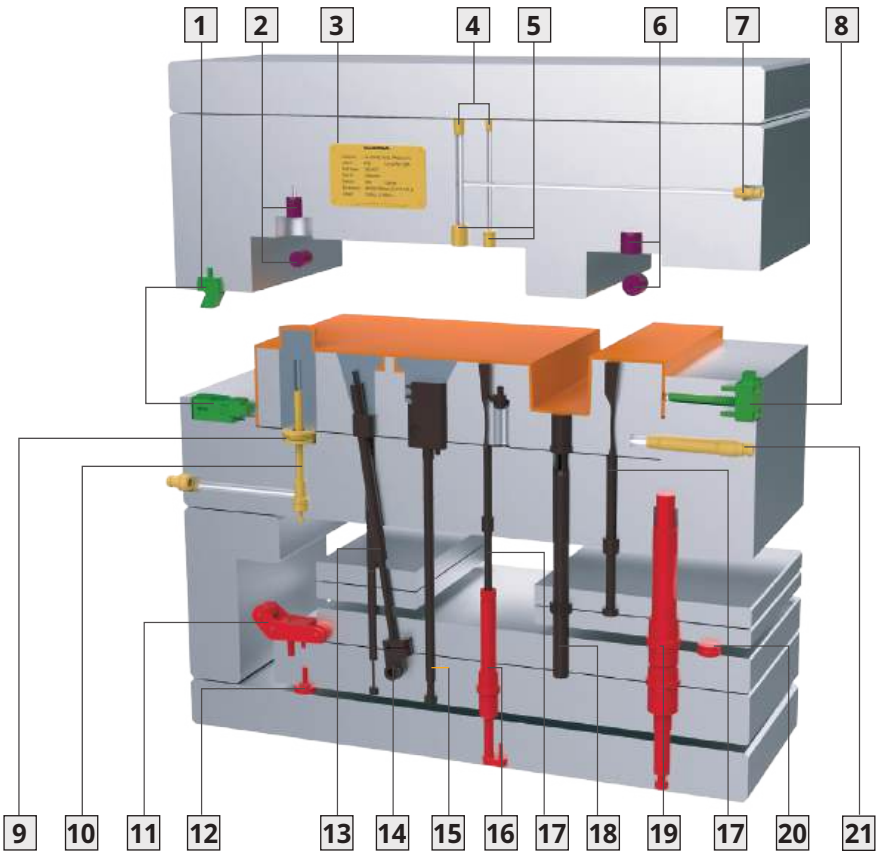
Operating: Hydraulic Oil / **Max. Operating Temp.:** -20 / +80°
Max. Operating Pressure: 140 Bar / **Stroke Inaccuracy:** ± 0.3mm
Shaft: C45 / Hard Chrome Coated / **Piston Tube:** Nodular Cast Iron
Sealing: Polyurethane + NBR

Order	A	B	C	CL	D	E	F	H	J
THCF.32	64	54	10	7	20	62	47	6.5	M12 x 1.75
THCF.40	65	55	10	7	25	70	52	9	M16 x 2
THCF.50	71	60	11	8	28	80	58	11	M20 x 2.5
THCF.63	80	67	13	10	36	94	69	13	M 27 x 3
THCF.80	95	78	17	14	45	114	86	15	M 30 x 3.5

J1	K	M	O	OB	P	PT	R	SW	X	Y
15	6.5	11	M16 x 1.5	25	14	1/4"	10	17	12	28
20	9	14	M20 x 1.5	30	15	1/4"	10	22	12	28
25	11	18	M20 x 1.5	35	18	1/4"	10	22	12.5	29.5
35	14	20	M27 x 2	40	20	3/8"	10	30	16	31
35	16	23	M33 x 2	45	27	3/8"	15	36	18	33

Upon request: For too hot environments, special piston with Viton Felt (180°C).

Standard Injection Mould Systems / Innovative Solutions for Your Moulds



1 Mini Slide Code: **MS**	8 Compact Coring Unit Code: **UA**	16 Threaded Limiter Code: **LR**
1 Compact Slide Code: **CS**	9 Water Retention Code: **JR**	17 Sprung Core Code: **PW**
2 Double Date Stamp Code: **FD**	10 Seal Bearing Tube Code: **TB**	18 Tulip Ejector Code: **EE**
3 Identification Plate Code: **PI**	11 Plate Accelerator Code: **EP**	19 Superior Double Ejector Code: **DX**
4 Water Plug for Ins. Faces Code: **TO**	12 Shock Absorber Code: **TA**	20 Magnetic Safety Stopper Code: **TM**
5 Air Poppet Valve Code: **VA**	13 Cooled Rack Lifter Code: **KR**	21 Hex Key Ext. Tube Code: **TH**
6 Date Stamp Plus Code: **FP**	14 KR Cooling Hose Code: **FC**	
7 Hex Key Conector Plug Code: **BR**	15 Dog Lifter Code: **DL**	

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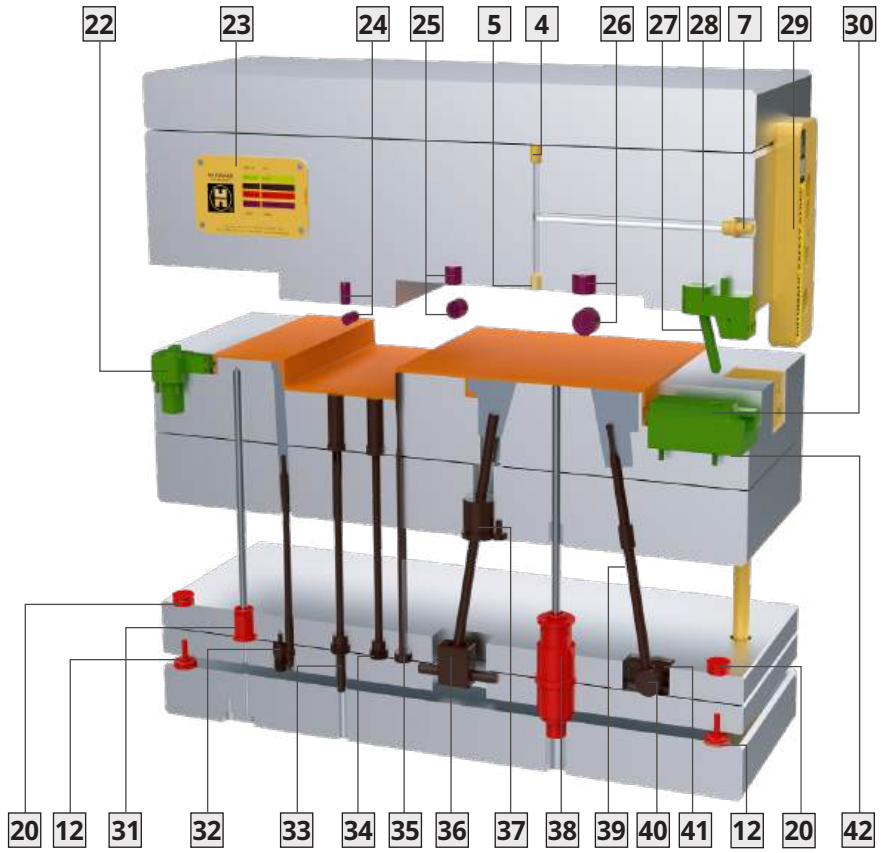

22 Core Cam Code: **UC**	28 Adjustable Wedge Code: **CG**	36 Lifter Base Unit 32 Graphite Code: **SD**
23 Color Plate Code: **CP**	29 Automatic Safety Strap Code: **AS**	37 Lifter Guide Bushing Code: **CI**
24 Date Stamp Code: **FA**	30 Adjusted Slide Code: **CA**	38 Accelerated Ejector Code: **AE**
24 Center Insert Code: **IA**	31 Ejector Pin Base Code: **BA**	39 Lifter Shaft Code: **VI**
25 Recycling Insert Code: **IR**	32 Smart Worm Pin Code: **WP**	40 Fixed Lifter Base Code: **DF**
26 Block Base Code: **BM**	33 Double Ejector Code: **ED**	41 Horizontal Base Code: **BD**
26 Block Insert Code: **PM**	34 Standard Lifter Code: **PS**	42 Slide Base Code: **BC**
27 Angle Pin Code: **GI**	35 Flexible Sprung Code: **PF**	

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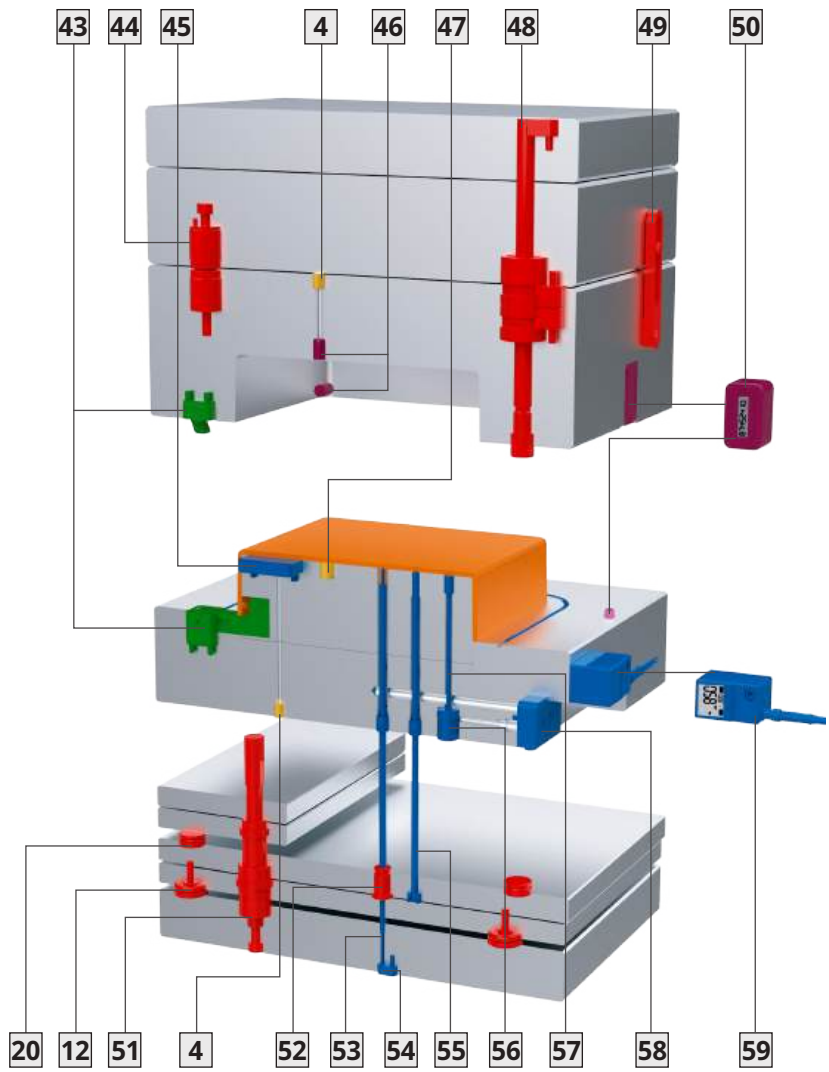
Standard Injection Mould Systems / Innovative Solutions for Your Moulds



43 Undercut Unit Code: **UU**	49 Stroke Limiter Code: **SL**	55 Keyed Tubular Base Code: **NR**
44 Plate Retainer Code: **PR**	50 High Speed Cycle Counter Code: **CC**	56 Pneumatic Piston Code: **PT**
45 Laminar Gas Vent Code: **LV**	51 Rear Double Ejector Code: **DY**	57 Vacuumjet Valve Tube Code: **VT**
46 Xtra Date Stamp Code: **FX**	52 Ejector Pin Base Code: **BT**	58 Vacuumjet Unit Code: **VJ**
47 Double Air Valve Code: **VD**	53 Ejector Code: **PH**	59 Vacuum Control Code: **VM**
48 Internal Latch Lock Code: **MX**	54 Non-rotating head for Ejec Code: **NP**	

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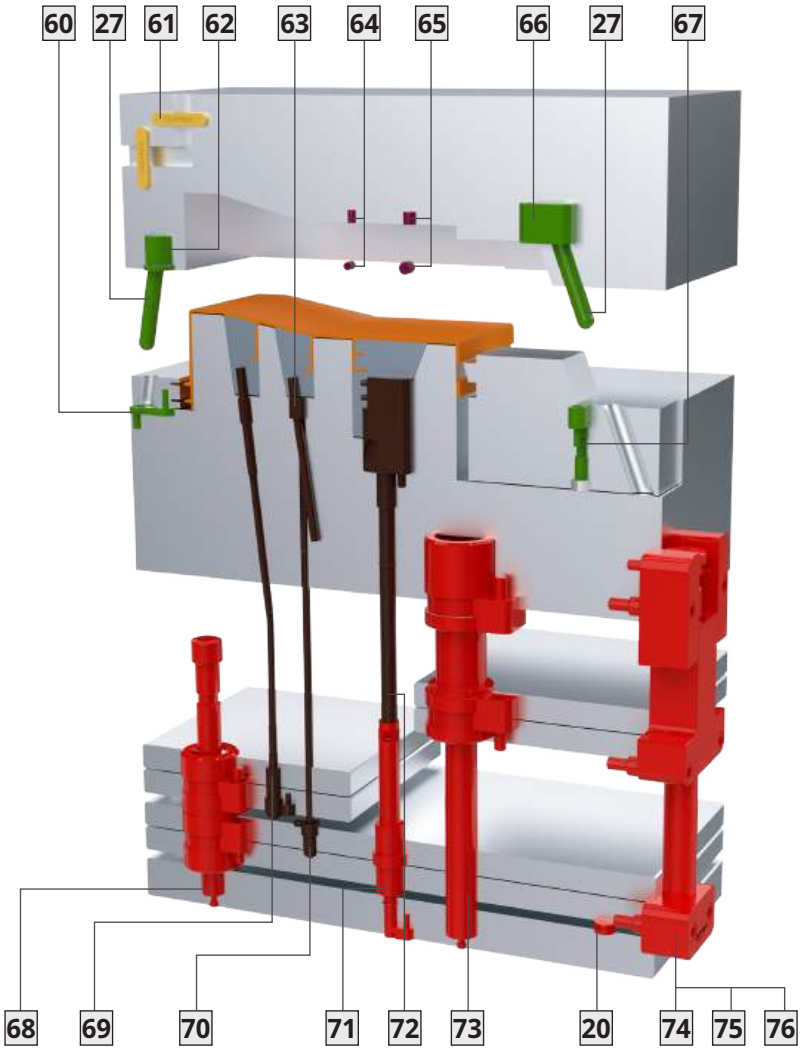

60	Slide Retainer Code: **RC**	65	Interchangeable Insert Code: **II**	71	Dog Lifter Limiter Code: **LD**
61	Cable Retainer Code: **SC**	66	Square Angle Pin Housing Code: **BG**	72	Dog Lifter Code: **DG**
62	Round Angle Pin Hous. Code: **GR**	67	Automatic Retainer Code: **RA**	73	Compact Double Ejection Code: **SY**
63	Double Rack Code: **DR**	68	Superior Plate Separator Code: **SX**	74	External Superior Plate Separator Code: **EX**
64	Mark Insert Code: **IM**	69	Smart Worm Lifter Code: **WL**	75	External Double Ejection Code: **EY**
65	Base Insert Code: **BI**	70	Adjustable Fixing Code: **RF**	76	External Synchro-nized Plates Code: **VM**

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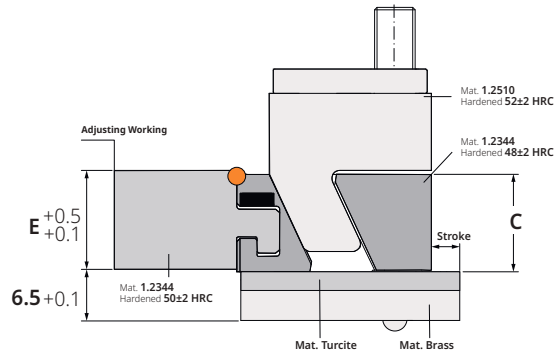
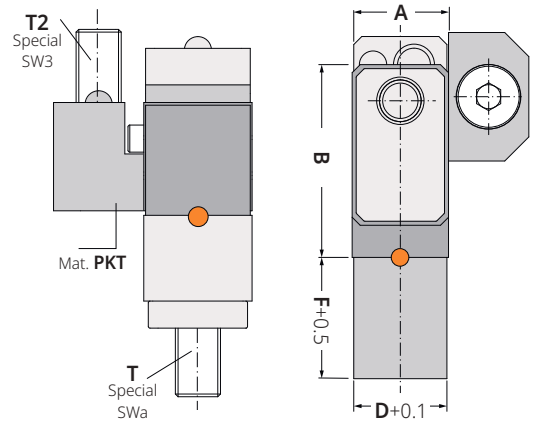
Mini Slide

Code: **MS..**

Cad Insertion Point



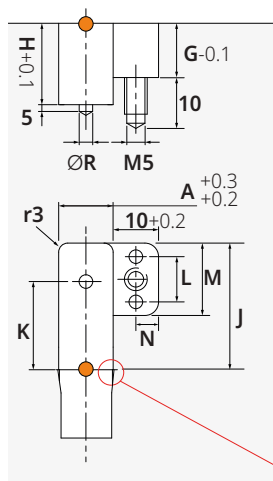


Order Code	A	B	C	D	E	F
MS 121503	12	24	12	11.6	12.2	15
MS 182006	18	41	16	17.6	16.5	20
MS 242608	24	45	20	23.6	20.5	26

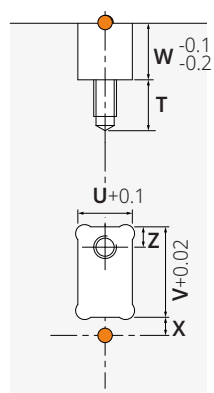
G	H	J	K	L	M	N	R	Stroke
12.5	18.5	28	19.5	10	16	5	3	3
16.5	22.5	47	32.5	16	28	4.5	5	6
16.5	26.5	53	38.5	16	28	4.5	5	8

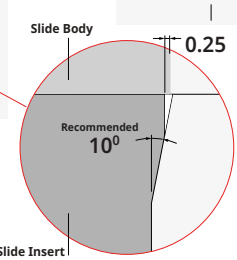
T	T2	U	V	W	X	Z	SWa
M5 x 20	M5 x 20	12	20	12.5	4	4.5	3
M6 x 40	M5 x 25	12	26	15.5	7	13	4
M6 x 45	M5 x 25	17	30	16.5	7	15	4

Core Housing

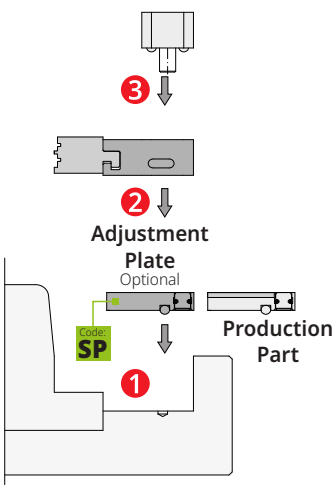


Cavity Housing

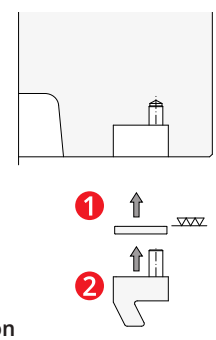




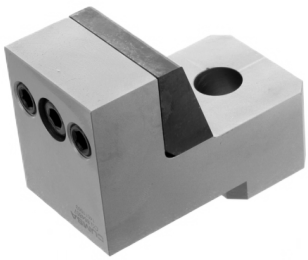
Core Slide Installation



Cavity Slide Installation



Its innovative floating insert, perfectly fits on the cavity due to the 10° cone mechanized by the customer and its ±0.5mm. horizontal and vertical movement. Just needs 1 screw on the ejection side of the mould and 2 on the injection side, which simplifies and make the installation and also the maintenance really fast.
The moulding insert is easily disassembled so that the customer can simply machine it. The Turcite® wear plate eliminates the need to use lubricants, allowing its use in all types of moulds including clean room ones. Also offers and extensive durability due to its low friction wear.
Very compact product enables its use in really small places.
No need of precision mechanized, just on the insert area. Without angle pins, lateral sliding guides and external retainer, and the cost of the standard unit, could easily represents a 50% savings among other slides on the market.



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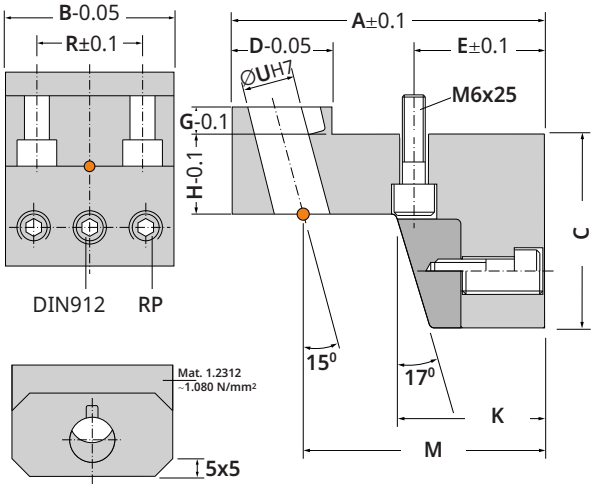
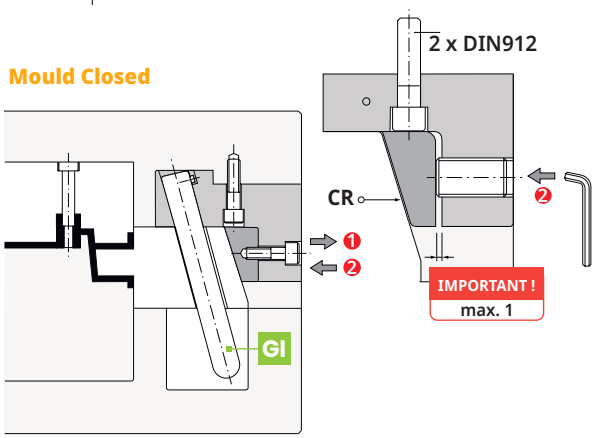
Adjustable Wedge Assembly

Code: CG..

Cad Insertion Point



Mould Closed



Order Code	A	B	C	D	E	G	H	K	M	R
CG 603035	60	30	35	25	23	6	17	29	43.7	17
CG 604035	60	40	35	25	23	6	17	29	43.7	22
CG 754049	75	40	49	30	32	7	20	39	58	22
CG 864857	86	48	57	35	36	8	24	44	65	28

Order Code	T	U	RP	CR (N)	SWa	SWb	SWc
CG 603035	M6 x 25	10	081015	180.000	5	3	4
CG 604035	M6 x 25	10	101015	320.000	5	4	5
CG 754049	M8 x 30	12	101020	320.000	6	5	5
CG 864857	M8 x 35	16	121025	480.000	6	6	6

It incorporates a pre-machined hole for the angle pin and the heel for the adjustment; as shown in the Standard Heel Unit (CR).
Two outer screws force the heel against the slide forming the shut off, while the central screw locks it into position.

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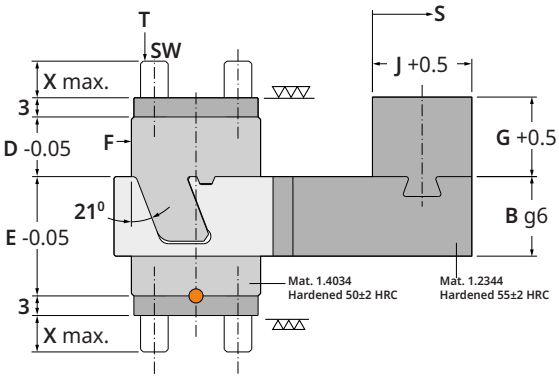
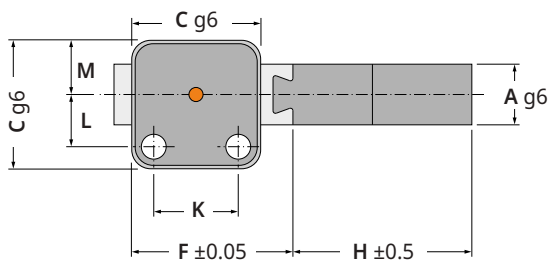
Undercut Unit

Code: UU..

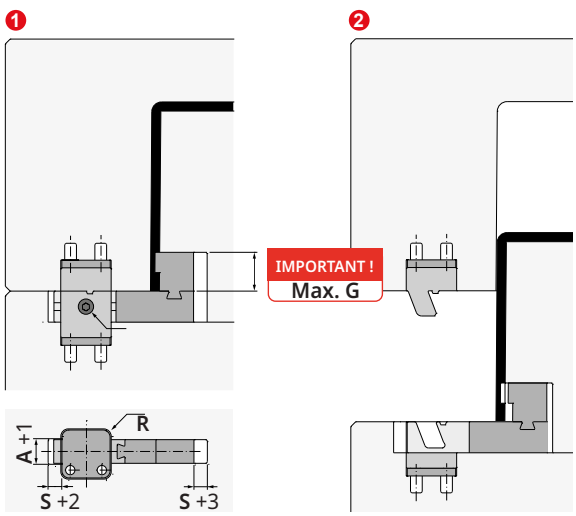
Cad Insertion Point





Order Code	A	B	C	D	E	F	G	H
UU 081220	8.2	12	20	10	18	24.5	12	32
UU 121626	12.2	16	26	12	24	32.5	16	36
UU 162032	16.2	20	32	16	30	41	20	50

Order Code	J	K	L	M	R	S	T	X	SW
UU 081220	16	12.5	8.25	8	3.75	3	M4	6.2	2.5
UU 121626	20	17	10.5	11	4.5	4	M5	7.2	3
UU 162032	25	22	13	14	5	5	M6	9.2	4



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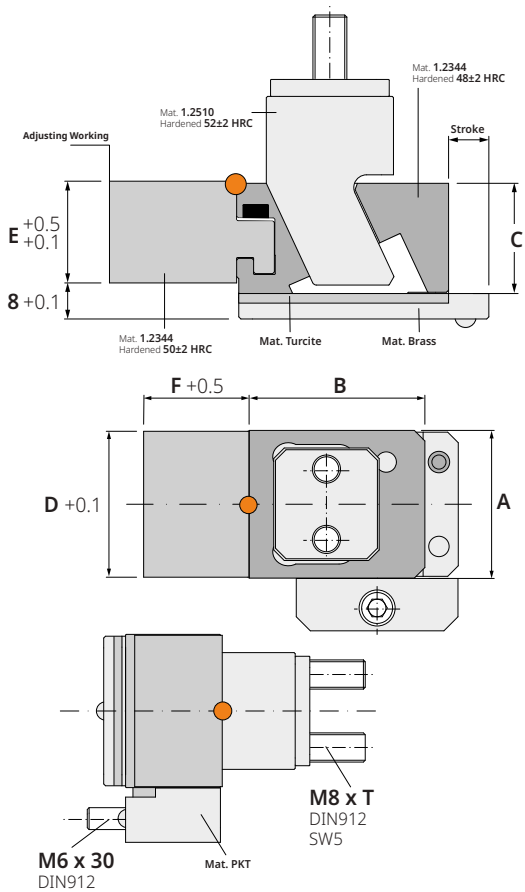
Compact Slide

Code: **CS..**

Cad Insertion Point

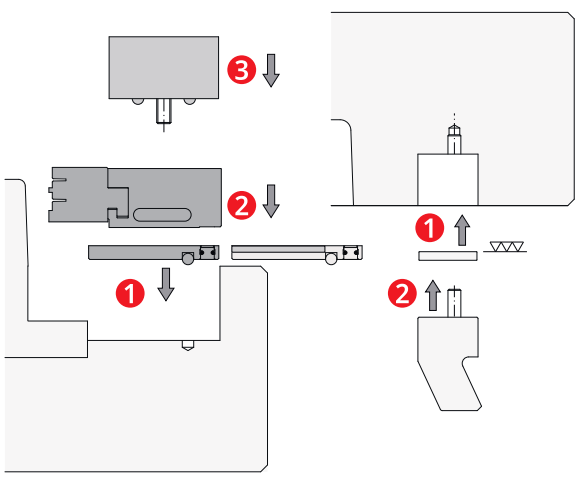


Order Code	A	B	C	D	E	F	H
CS 423009	42	50	26	41.5	24	30	32.5
CS 423017	42	50	26	41.5	24	30	32.5
CS 523511	52	56	32	51.5	30	35	38.5
CS 523519	52	56	32	51.5	30	35	38.5
CS 624014	62	62	38	61.5	36	40	44.5
CS 624022	62	62	38	61.5	36	40	44.5

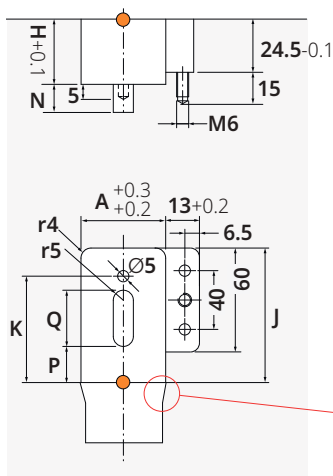
J	K	P	Q	N	Stroke	T	U	V	W	Z
60	54	-	-	-	9	55	32	30	24	20
68.5	62.5	17	34	12	17	55	32	30	24	20
69	63	-	-	-	11.5	55	38	34	26	20
76	70	20	35	9	19	55	38	34	26	20
77	72	-	-	-	14	60	44	38	28	24
85	81	23	39	11	22	60	44	38	28	24

Core Slide Installation

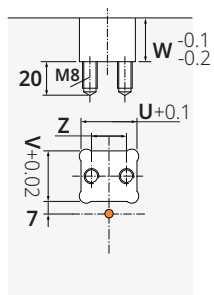
Cavity Slide Installation

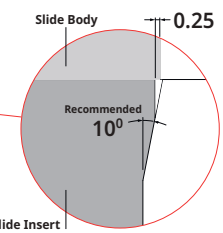


Core Housing



Cavity Housing





Its innovative floating insert, perfectly fits on the cavity due to the 10° cone mechanized by the customer and its ±0.5mm. horizontal and vertical movement. Just needs 1 screw on the ejection side of the mould and 2 on the injection side, which simplifies and make the installation and also the maintenance really fast. The moulding insert is easily disassembled so that the customer can simply machine it. The Turcite® wear plate eliminates the need to use lubricants, allowing its use in all types of moulds, including clean room ones. Also offers and extensive durability due to its low friction wear. Very compact product enables its use in really small places. No need of precision mechanized, just on the insert area. Without angle pins, lateral sliding guides and external retainer, and the cost of the standard unit, could easily represents a 50% savings among other slides on the market.

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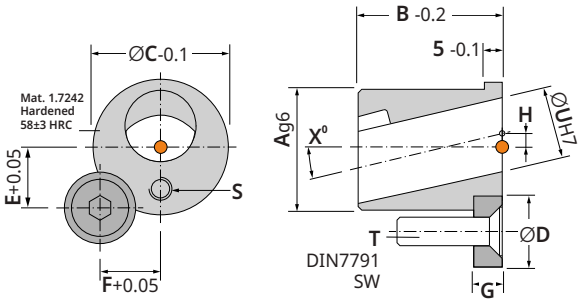
Angle Pin Housing

Code: GR..

Cad Insertion Point



Order Code	A	B	C	D	E
GR 182622 -..	18	26	22	12	10.8
GR 222826 -..	22	28	26	16	11
GR 283432 -..	28	34	32	16	13
GR 344038 -..	34	40	38	20	17
GR 424546 -..	42	45	46	20	19.5
GR 465050 -..	46	50	50	20	21

Order Code	F	G	H	S
GR 182622 -..	7.5	6	3.8	M5 x 5
GR 222826 -..	11	6	4	M6 x 6
GR 283432 -..	13	6	5	M6 x 6
GR 344038 -..	17	8	5.5	M8 x 6
GR 424546 -..	19.5	8	6	M8 x 6
GR 465050 -..	21	8	7	M8 x 6

Order Code	T	U	X°		SW
GR 182622 -..	M5 x 16	10	10	15	3
GR 222826 -..	M6 x 16	12	10	15	4
GR 283432 -..	M6 x 16	16	10	15	4
GR 344038 -..	M8 x 20	20	10	15	5
GR 424546 -..	M8 x 20	24	10	15	5
GR 465050 -..	M8 x 20	28	10	15	5

This unit incorporates a predrilled hole for the angle pin which eliminates the need to angularly drill the die set. The die set only needs to be drilled from the front to accept this unit.
The unit comes in either 10°or 15°.

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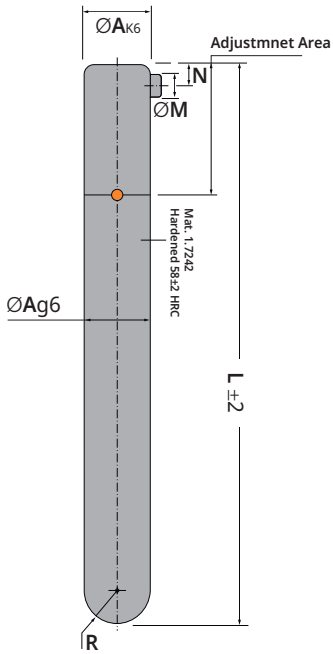
Angle Pin

Code: GI ..

Cad Insertion Point



Order Code	A	Adjustament Area	M
GI 010	10	~ 25	4
GI 012	12	~ 30	4
GI 016	16	~ 35	4
GI 020	20	~ 40	6
GI 024	24	~ 45	6
GI 028	28	~ 50	6

Order Code	N	L			R
GI 010	4	075	090	105	5
GI 012	4	095	110	130	6
GI 016	4	115	135	160	8
GI 020	6	140	165	190	10
GI 024	6	170	195	220	12
GI 028	6	200	225	250	14

Indicate the desired **L** dimension after the reference.

This item can be fitted to any of the corresponding Cumsa sets (CG, GR & BG).

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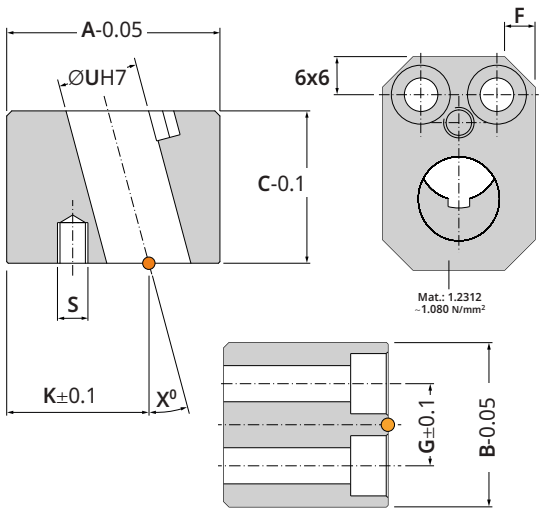
Square Angle Pin Housing

Code: **BG..**

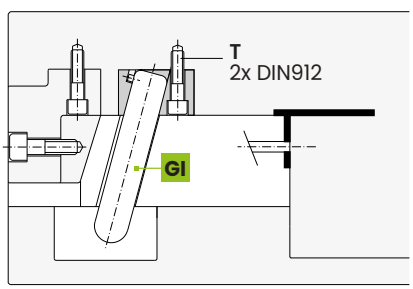
Cad Insertion Point



Order Code	A	B	C	F	G	K	S
BG 423016 - ...	42	30	30	7.5	15	28	M6
BG 504020 - ...	50	40	36	9	22	34	M8
BG 554024 - ...	55	40	40	9	22	38	M8
BG 655028 - ...	65	50	45	12	26	45	M10

Order Code	T	U	X	
BG 423016 - ...	M6 x 35	16	15	20
BG 504020 - ...	M8 x 40	20	15	20
BG 554024 - ...	M8 x 45	24	15	20
BG 655028 - ...	M10 x 50	28	15	20

Indicate the desired **X** dimension after the reference.



This is similar to the round Angle Pin Housing (GR) but allows the fitting of angle pins from 15°or 20°. This unit is bigger than the GR to allow for the greater angles and it requires a square pocket to be machined in the die set.

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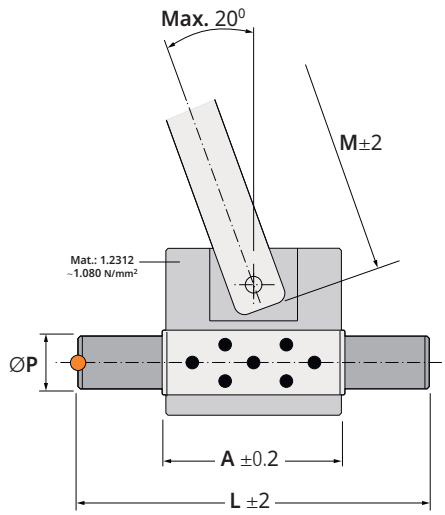
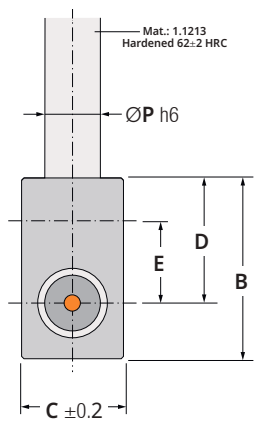
Lifter Base Unit

Code: **SD..**

Cad Insertion Point





Order Code	A	B	C	D	E	L	M	P
SD 3220GR	32	37	20	27	18	80	180	10
SD 3824GR	38	40	24	28	19	80	210	12
SD 4528GR	45	44	28	30	21	100	250	16

IMPORTANT !

Longer **M** available as special.

The unit and the rod are delivered separately.

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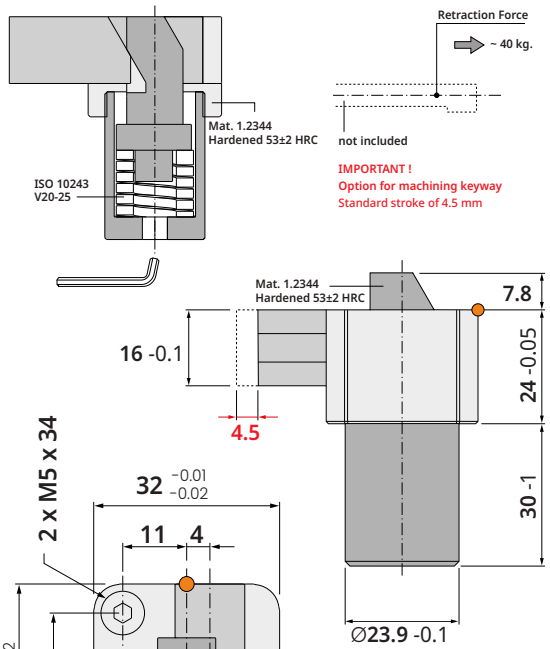
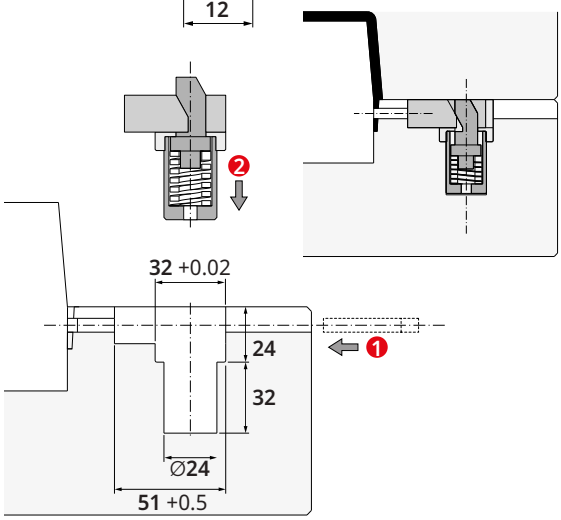
Core Cam

Order Code: UC

● Cad Insertion Point





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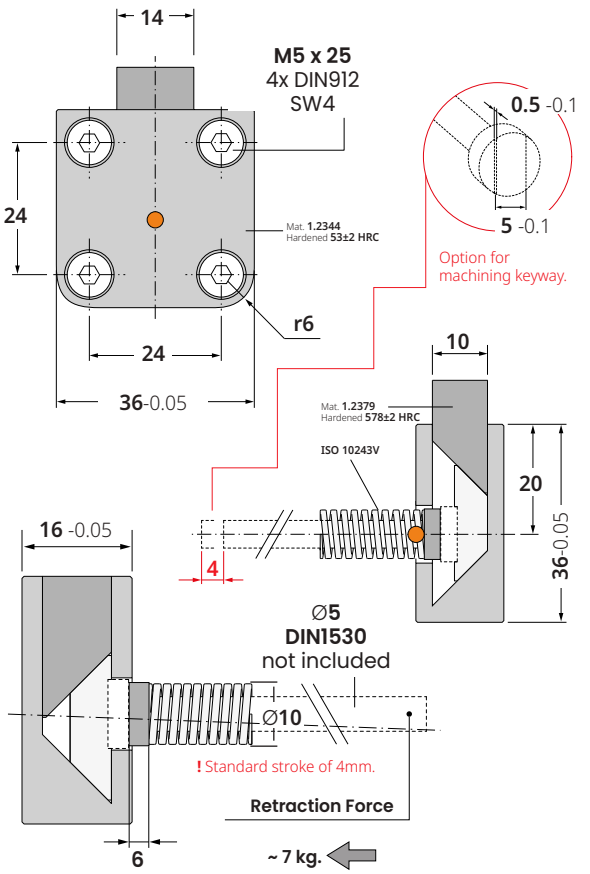
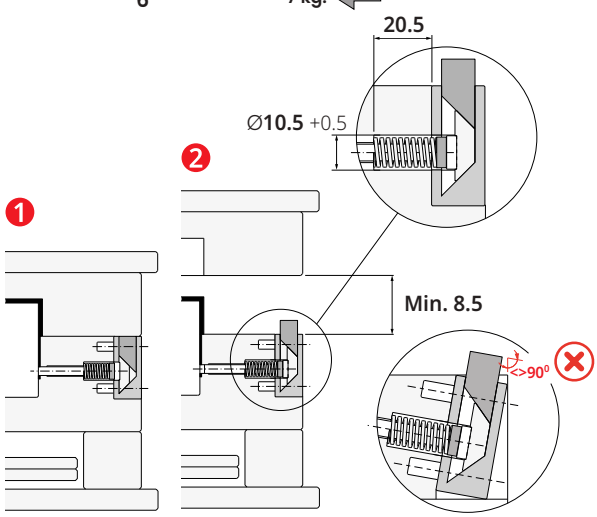
Compact Coring Unit

Order Code: UA

● Cad Insertion Point





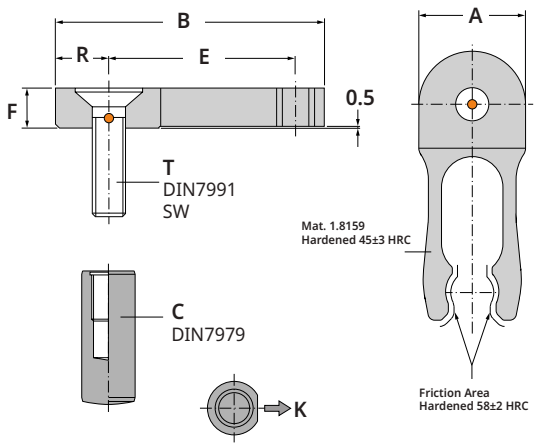
This unit uses the open and close movement of the mould to make lateral holes in wall sections of plastic parts. Easy to assemble and remove from the mould.

3D CAD FILES GUVENAL

Slide Retainer

Code: **RC..**

Cad Insertion Point



K= Force to release the retainer.

Order Code	A	B	C	E	F
RC 123006	12	30	6 x 20	21	4.7
RC 164008	16	40	8 x 20	28	5.7
RC 205010	20	50	10 x 24	34	7.7
RC 246012	24	60	12 x 32	42	9.7
RC 328012	32	80	16 x 40	56	11.7
RC 328016	32	80	16 x 40	56	15.7

Order Code	G	H	K	R	T	SW
RC 123006	4	16	5 kg.	6	M5 x 16	3
RC 164008	5	15	7 kg.	8	M6 x 20	4
RC 205010	6	17	14 kg.	10	M8 x 25	5
RC 246012	7	23	21 kg.	12	M10 x 30	6
RC 328012	9	27	28 kg.	16	M12 x 35	8
RC 328016	9	25	38 kg.	16	M12 x 50	8

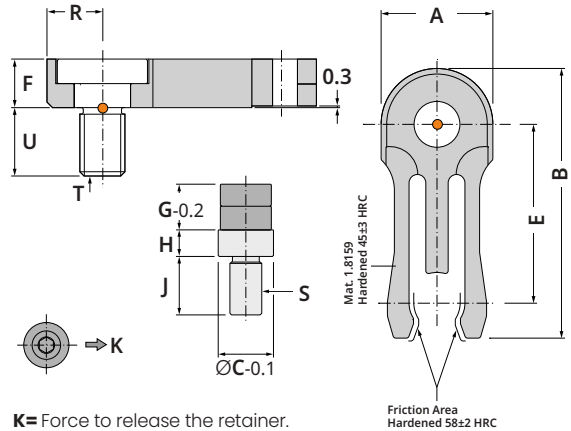
Easy and useful, this unit needs minimum space for installation and access.

3D CAD FILES GUVENAL

Slide Retainer

Code: **RCM..**

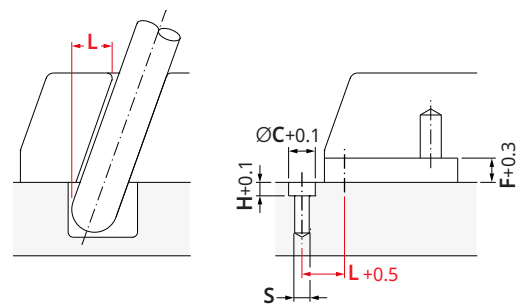
Cad Insertion Point



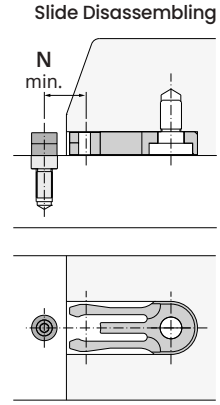
K= Force to release the retainer.

Order Code	A	B	C	E	F	G	H
RCM 163808	16	38	8	25	7.6	7.6	4
RCM 204810	20	48	10	32	8.7	8.6	5
RCM 245712	24	57	12	37.5	9.6	9.6	6

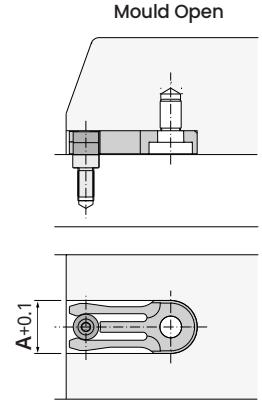
Order Code	J	K	N	R	S	T	U
RCM 163808	10	10 kg.	7	8	M5	M6	9
RCM 204810	11	14 kg.	8	10	M6	M8	12
RCM 245712	12	18 kg.	9	12	M8	M10	15



Slide Disassembling



Mould Open



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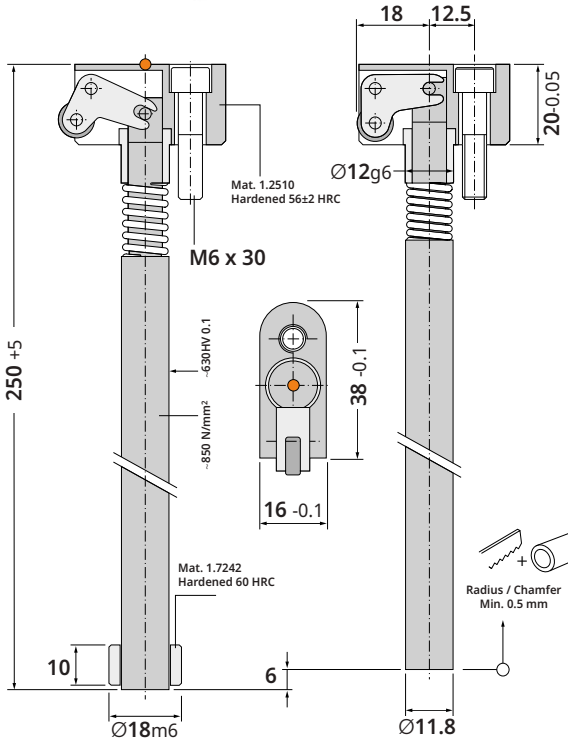
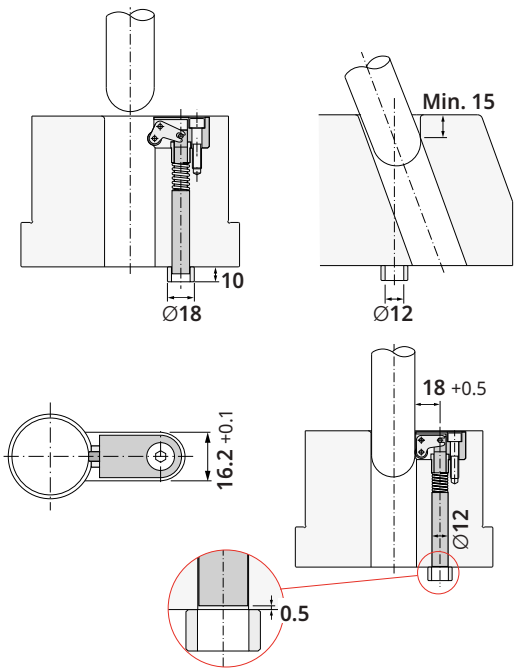
Angle Pin Housing

Order Code: RA 163812

Cad Insertion Point





This retainer for large slides is actuated by the angle pin, ensuring smooth and easy movement with no excess force required.

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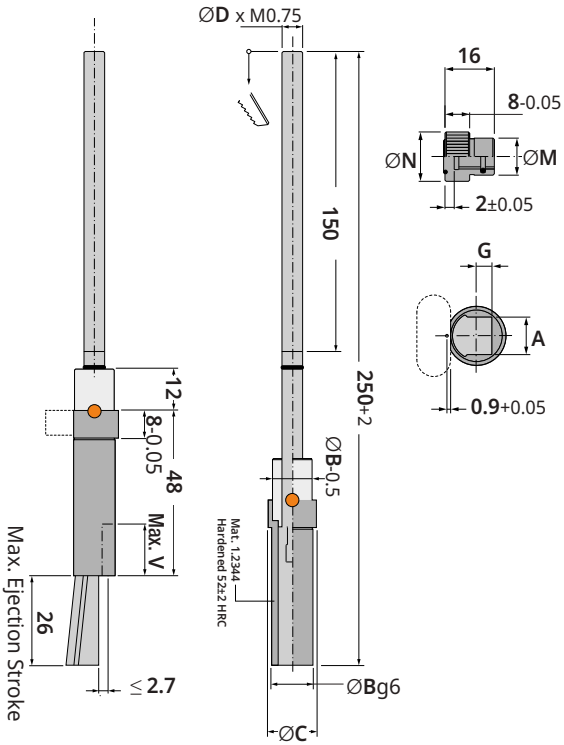
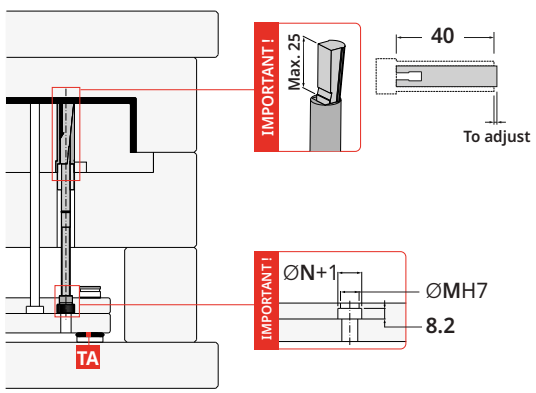
Standard Lifter

Code: PS..

Cad Insertion Point





Order Code	A	B	C	D	G	M	N	V
PS 062250	6.2	10	12	6	3.4	12	16	8
PS 082250	8.2	12	14	6	4	12	16	15
PS 102250	10.2	14	16	8	4.2	14	18	15
PS 122250	12.2	16	18	8	4.2	14	18	20

Compact unit for the release of small undercuts.
The unit is completely pre adjusted and easy to install.
The space required for installation is reduced due to the vertical movement perpendicular to the ejector plates.

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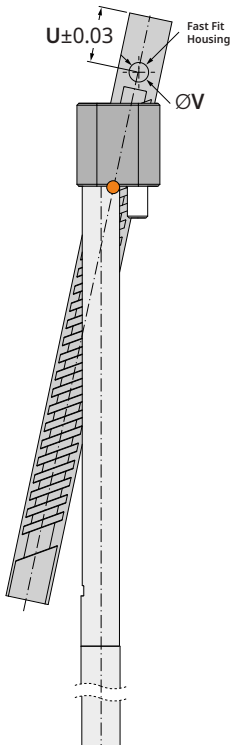
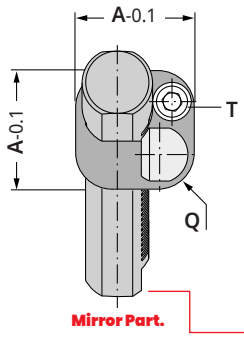
Double Rack

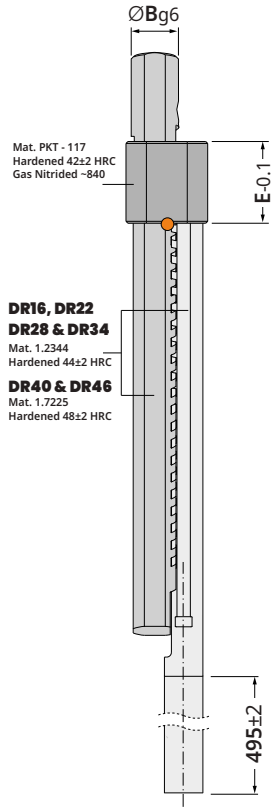
Code: **DR..**

Cad Insertion Point





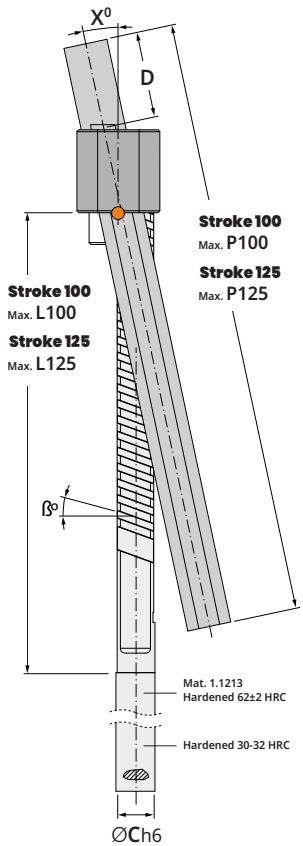
Mirror Part.

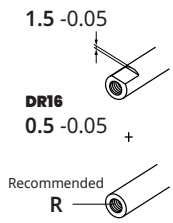


Fast Fit
Both Included

Magnetic

Threaded





Order Code	Order Code	X⁰				A	B	C	D	E	L100	P100	L125	P125
DR.16100 L - x	-	8	12	16	-	16	9	8	20	20	142	178	-	-
DR.22100 L - x	DR.22125 L - x	8	12	16	20	22	12	12	30	22	148	202	202	261
DR.28100 L - x	DR.28125 L - x	8	12	16	20	28	16	14	36	28	152.5	214	194.5	266
DR.34100 L - x	DR.34125 L - x	8	12	16	20	34	20	16	36	34	160.5	227	188.5	264
DR.40100 L - x	DR.40125 L - x	8	12	16	20	40	22	20	36	40	170	244	204	284
DR.46100 L - x	DR.46125 L - x	8	12	16	20	46	24	24	42	46	175	258	201	289

Order Code	Order Code	Q	R	T	U	V	Swa	Stroke 100 - S	Stroke 125 - S
DR.16100 L - x	-	4	M5	M5	10	6	3	DR.16100 L - x - S	-
DR.22100 L - x	DR.22125 L - x	6.5	M6	M6	17	8	4	DR.22100 L - x - S	DR.22125 L - x - S
DR.28100 L - x	DR.28125 L - x	8.5	M8	M8	23	8	5	DR.28100 L - x - S	DR.28125 L - x - S
DR.34100 L - x	DR.34125 L - x	10.5	M8	M8	23	8	5	DR.34100 L - x - S	DR.34125 L - x - S
DR.40100 L - x	DR.40125 L - x	10.5	M10	M10	20	10	6	DR.40100 L - x - S	DR.40125 L - x - S
DR.46100 L - x	DR.46125 L - x	10.5	M10	M12	26	10	8	DR.46100 L - x - S	DR.46125 L - x - S

Fast delivery of required angle. Vertical function maximizing strength. Customized drafts. Big savings in time & cost for machining and adjustments. Smaller and less expensive injection machine required. WARNING: Please note that the 3D drawings only include one positioning tooth, and the vertical and inclined shaft's section dimensions shown do not correspond with the real machined shafts due to confidentiality issues.

3D CAD FILES GUVENAL
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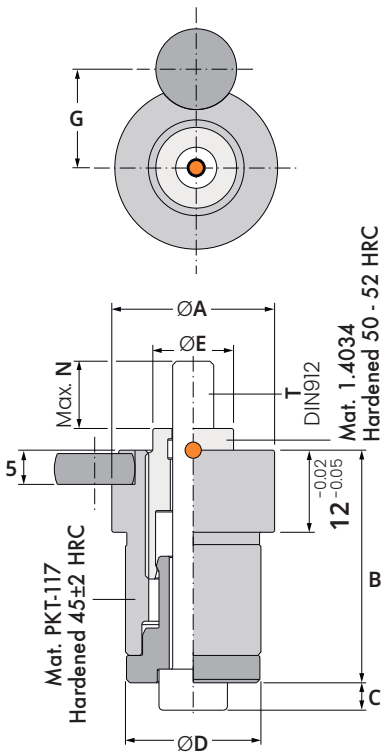
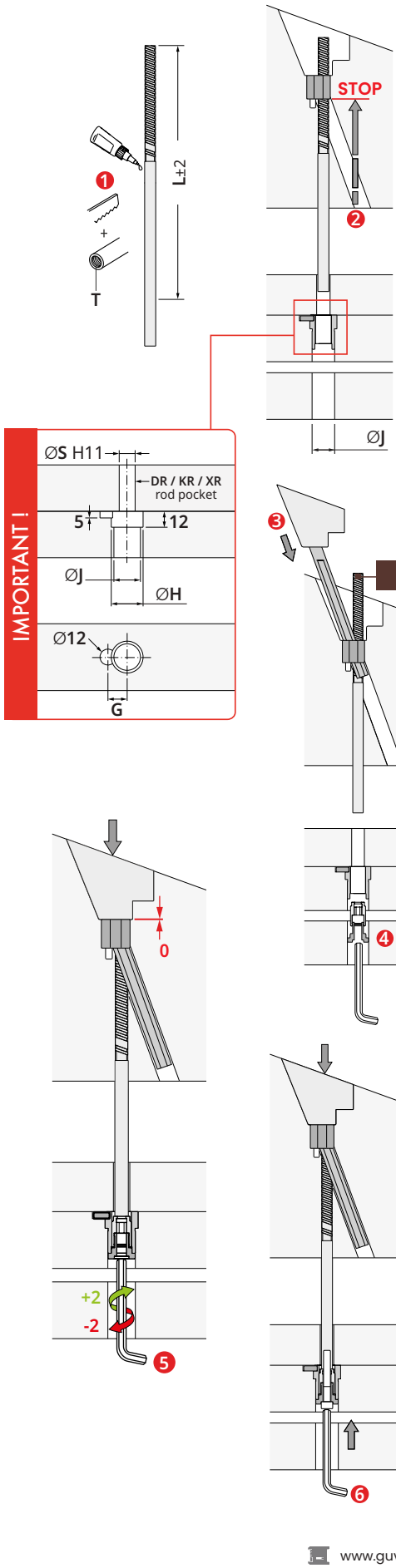
Adjustable Fixing

Code: RF..

Cad Insertion Point





Order Code	A	B	C	D	E	G	H	J	N
RF 161605	19.8	34	3	15.8	7.8	12.5	20	16	18
RF 222006	23.8	34	4	19.8	11.8	14.5	24	20	18
RF 282408	27.8	42	0	23.8	13.8	16.5	28	24	20
RF 403210	35.8	42	0	31.8	19.8	20.5	36	32	24

Order Code	S	T	Compatible with
RF 161605	8	M5 x 45	DR16
RF 222006	12	M6 x 45	DR22 / KR22
RF 282408	14 - 16	M8 x 50	DR28 / DR34 / KR28 / KR34
RF 403210	20 - 24	M10 x 50	DR40 / DR46 / KR40 / KR46

Placed in the ejector plate, this unit allows adjustments to the DR/KR rod height approximately ±2mm, before its fixing. Enables fine tuning of the DR/KR head with the ejection mounted. Permits item replacement without having to disassemble the ejector plates. Compact unit helps to make the installation of any vertical mechanisms easier.

Cooled Rack Lifter

Code: **KR..**

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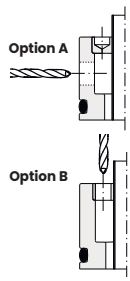
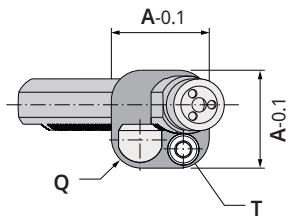
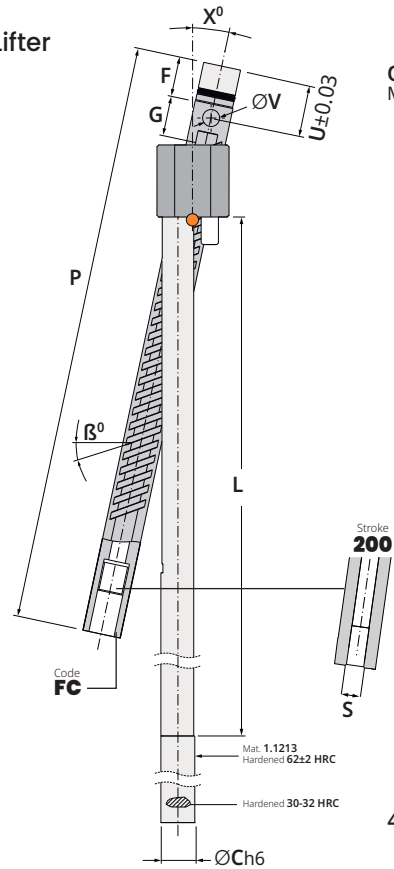
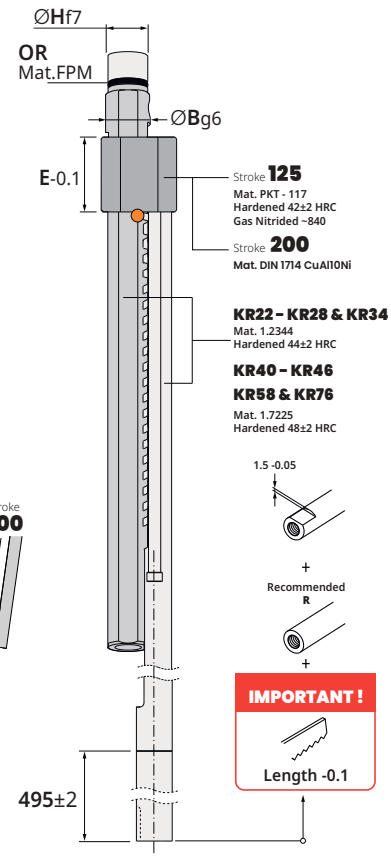
COOLING CONNECTION OPTIONS
Only for Stroke 125







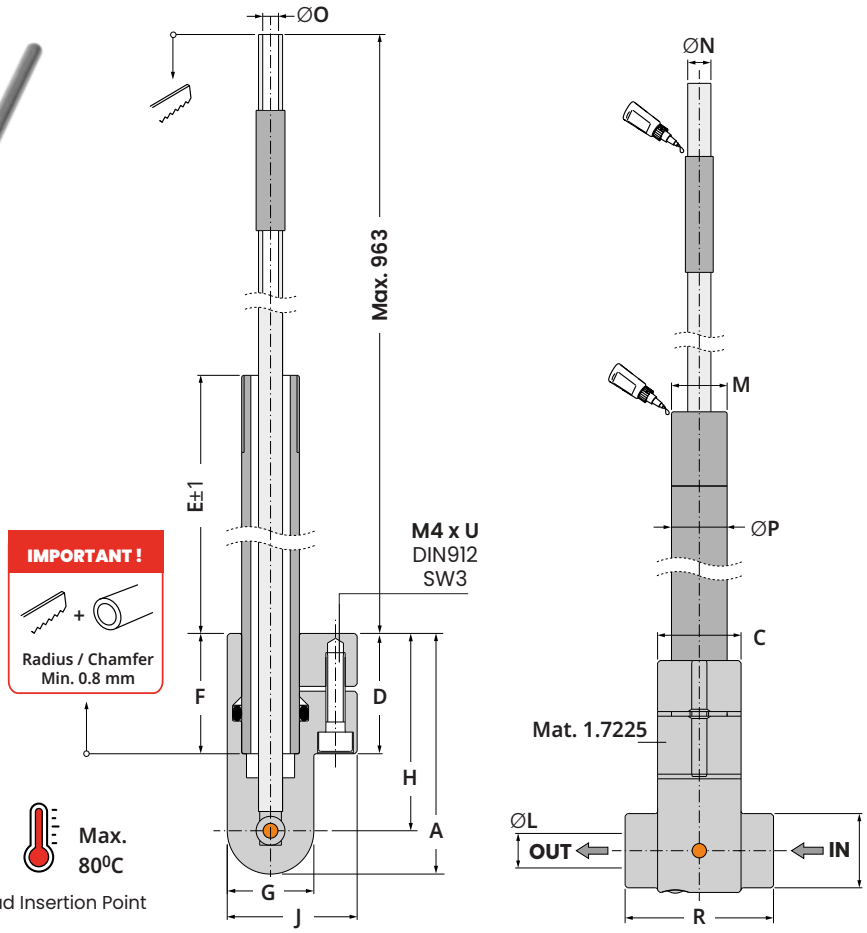
Cad Insertion Point



	Order Code	X⁰				A	B	C	E	F	G	H	L	P	Q
STROKE 125	KR 22125 L - x	8	12	16	20	22	12	12	22	16	20	10.8	282	260	6.5
	KR 28125 L - x	8	12	16	20	28	16	14	28	16	20	13.8	294.5	272	8.5
	KR 34125 L - x	8	12	16	20	34	20	16	34	18	20	17.8	311.5	275	10.5
	KR 40125 L - x	8	12	16	20	40	22	20	40	20	25	19.8	342	350	10.5
	KR 46125 L - x	8	12	16	20	46	24	24	46	22	25	21.8	361	350	10.5
200	KR 58200 L - x	8	12	16	-	58	30	30	66	55	55	26	362	430	13.5
	KR 76200 L - x	8	12	16	-	76	40	40	80	60	60	34	392	470	17

	Order Code	R	S	T	U	V	OR	Mirror Ref. - S	SW
STROKE 125	KR 22125 L - x	M6	-	M6	23	8	8 x 1.25	KR.22125L-x-S	4
	KR 28125 L - x	M8	-	M8	23	8	11 x 1.3	KR.28125L-x-S	5
	KR 34125 L - x	M8	-	M8	25	8	14 x 1.78	KR.34125L-x-S	5
	KR 40125 L - x	M10	-	M10	28	10	16 x 2	KR.40125L-x-S	6
	KR 46125 L - x	M12	-	M12	30	10	18 x 2	KR.46125L-x-S	8
200	KR 58200 L - x	M20	1/4"	M14	60	12	21 x 2.5	KR.58200L-x-S	12
	KR 76200 L - x	M24	3/8"	M18	70	12	28 x 3	KR76200L-x-S	14

Compact solution for a water fountain. Water goes up from the centre tube of the fountain and is collected by the external tube. Both the water inlet and outlet are on the same level, saving space in the mould. Unique fixing system allowing the external tube to be hermetically sealed preventing water leakages.



3D CAD FILES GUVENAL

KR Cooling Hose

Code: **FC..**

Max. 80°C

Cad Insertion Point

Order Code	A	C	D	E	F	G	H	J	K
FC 220500	40	15	18	483.5	16.5	18	31	27	16
FC 280500	50	18	25	475	25	18	41	27	16
FC 340500	50	18	25	475	25	18	41	27	16
FC 400500	54	20	25	475	25	20	44	30	18

Order Code	L	M	N	O	P	R	U	Compatible With
FC 220500	1/8" GAS	M8 x 1	3.5	3	8	32	10	KR 22125L
FC 280500	1/8" GAS	M10 x 1	4.5	4	10	32	16	KR 28125L
FC 340500	1/8" GAS	M12 x 1	5	4.5	12	32	16	KR 34125L
FC 400500	1/4" GAS	M14 x 1	7	6.5	14	40	16	KR 40125L / 46125L

Compact solution for a water fountain. Water goes up from the centre tube of the fountain and is collected by the external tube. Both the water inlet and outlet are on the same level, saving space in the mould. Unique fixing system allowing the external tube to be hermetically sealed preventing water leakages.

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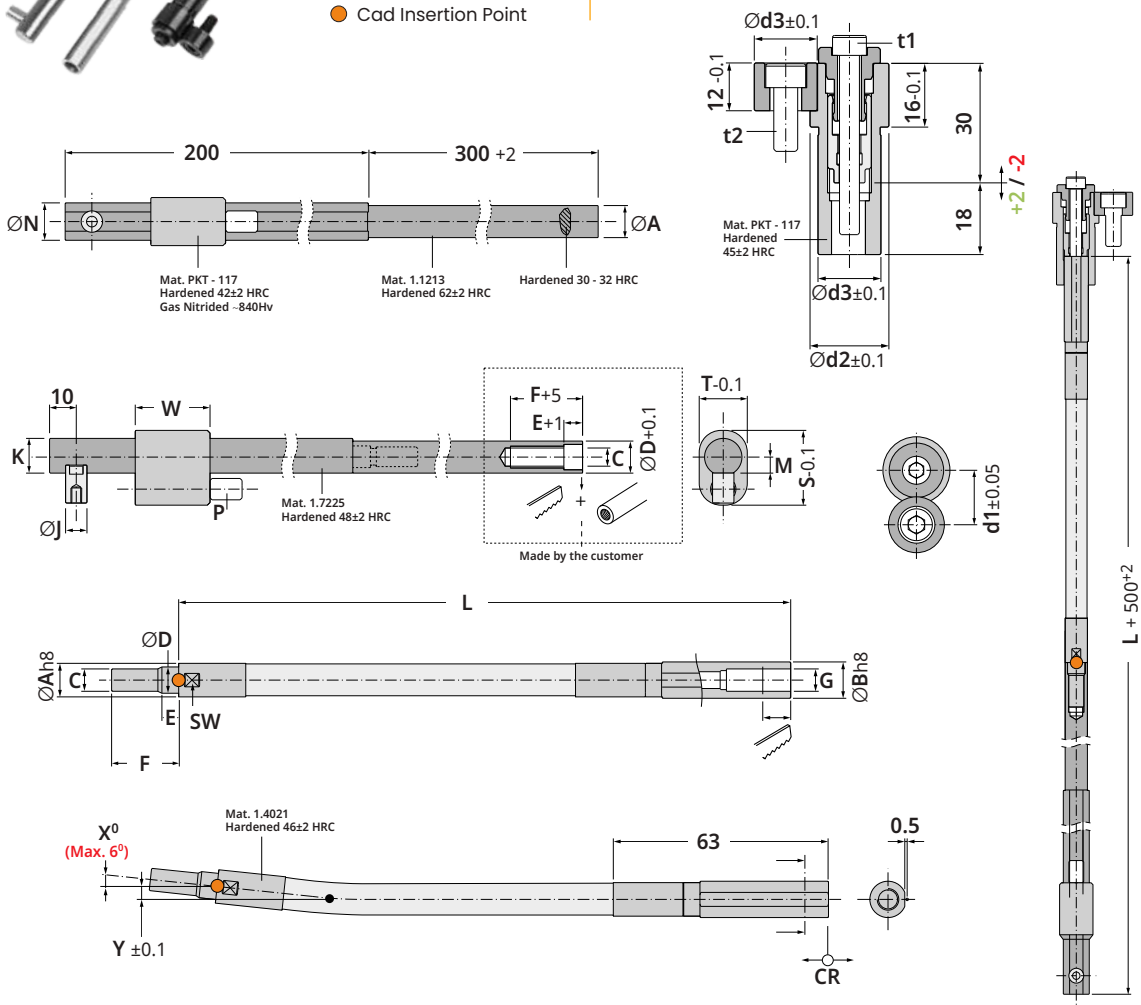
Smart Worm Lifter

Code: WL ..

Cad Insertion Point

Release small undercuts within 100 or 125mm of ejection stroke. Allows angles up to 6 degrees. Customizable insert gives freedom to mouldmaker. Supplied extension and guiding base avoid undesired unscrewing. Good addition to Cumsa DR system. Easy assembly and installation. Fixing system simplifies installation and allows ±2mm lifter height adjustment.



Order Code	A	B	C	D	d1	d2	d3	E	F	G	J	K	L	M	N	P	S
WL 080100	8	9	M5	5.5	16	19.8	15.8	3.5	18	M5	6	9.5	205	4.5	10	M6	22
WL 080125	8	9	M5	5.5	16	19.8	15.8	3.5	18	M5	6	9.5	240	4.5	10	M6	22
WL 120100	12	13	M8	9.4	19.5	23.8	19.8	6	24	M6	8	13	205	6.2	14	M8	28
WL 120125	12	13	M8	9.4	19.5	23.8	19.8	6	24	M6	8	13	240	6.2	14	M8	28

Order Code	SW	T	t1	W	d4	d5	R	t2	U	V	Z	CR(N)	Stroke	SWa	SWb
WL 080100	7	13	M5 x 45	26	20	16	6	M6	4.5	5.5	40	1.500	100	5	4
WL 080125	7	13	M5 x 45	26	20	16	6	M6	4.5	5.5	50	1.500	125	5	4
WL 120100	11	18	M6 x 45	28	24	20	8	M8	4	8	40	2.500	100	6	5
WL 120125	11	18	M6 x 45	28	24	20	8	M8	4	8	50	2.500	125	6	5

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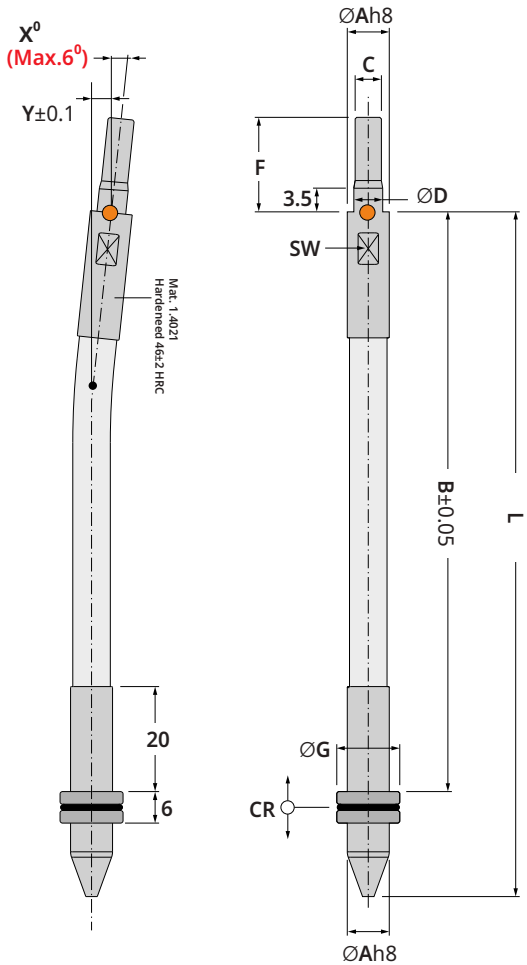
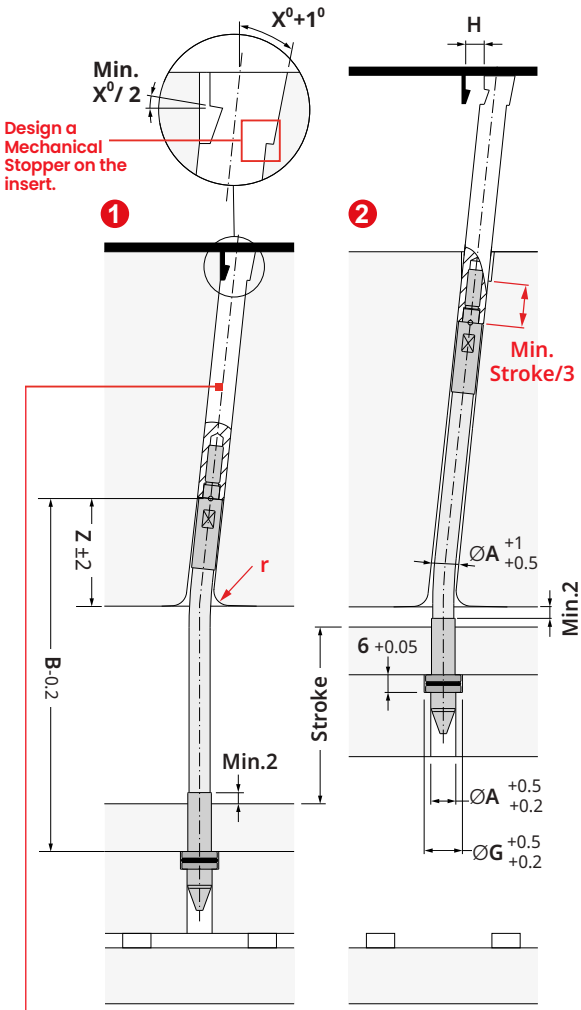
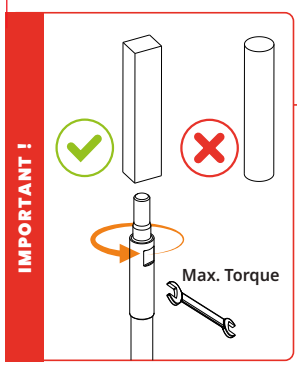
Smart Worm Pin

Code: **WP ..**

Cad Insertion Point







Max. 120⁰C

Order Code	A	B	C	D	F	G	L	Z
WP 060030	6	90	M4	4.5	12	10	108	30
WP 060060	6	120	M4	4.5	12	10	138	35
WP 080030	8	90	M5	5.5	18	12	110	30
WP 080060	8	120	M5	5.5	18	12	140	35

Order Code	CR (N)	Max. Stroke	Max. Torque
WP 060030	1.000	30	8 N / m
WP 060060	1.000	60	8 N / m
WP 080030	1.500	30	12 N / m
WP 080060	1.500	60	12 N / m

X⁰	Y	WP xx0030	WP xx0060
		H	H
1⁰	0.6	0.52	1.04
2⁰	1.2	1.05	2.09
3⁰	1.8	1.57	3.14
4⁰	2.4	2.10	4.19
5⁰	3	2.63	5.25
6⁰	3.5	3.15	6.31

Release small undercuts within 30 or 60mm of ejection stroke. Allows angles up to 6 degrees. Customizable insert gives freedom to mouldmaker. Fully mechanical solution. Easy assembly and installation.

Flexible Sprung

Code: PF ..

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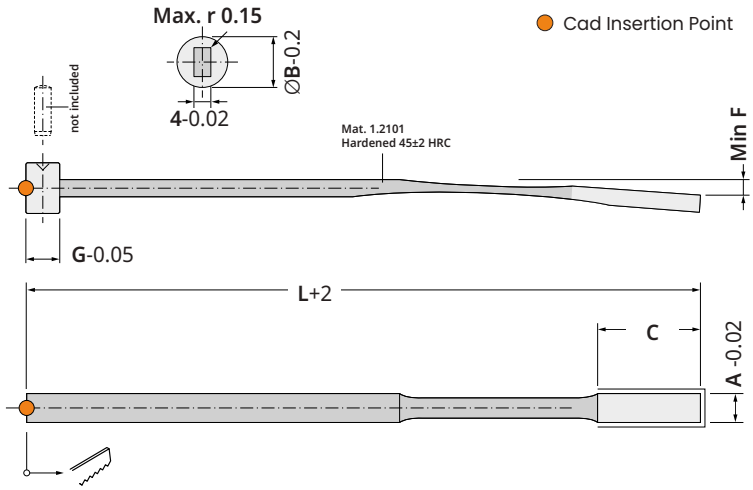

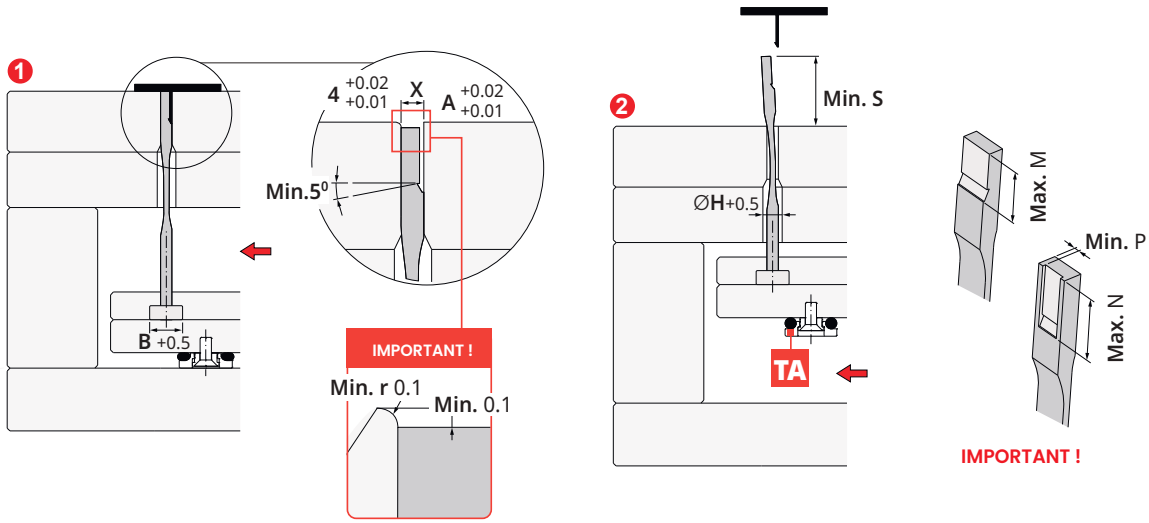

Order Code	A	B	C	F	G	H	L	M	N	P	S	Balinit C	Hardened
PF 044150	4	8	24	2.5	6	6	150	12	14	0.8	30	+	56±2 HRC
PF 0441 WB	4	8	24	2.5	6	6	150	12	14	0.8	30	-	56±2 HRC
PF 054150	5	8	24	2.5	6	6.5	150	12	14	0.8	30	+	56±2 HRC
PF 0541WB	5	8	24	2.5	6	6.5	150	12	14	0.8	30	-	56±2 HRC
PF 064200	6	12	30	2.8	8	7.5	200	18	20	1	36	+	56±2 HRC
PF 0642WB	6	12	30	2.8	8	7.5	200	18	20	1	36	-	56±2 HRC
PF 084200	8	14	30	2.8	8	9	200	18	20	1	36	+	56±2 HRC
PF 0842WB	8	14	30	2.8	8	9	200	18	20	1	36	-	56±2 HRC
PF 104200	10	16	30	2.8	8	11	200	18	20	1	36	+	56±2 HRC
PF 1042WB	10	16	30	2.8	8	11	200	18	20	1	36	-	56±2 HRC
PF 124200	12	18	30	2.8	8	13	200	18	20	1	36	+	56±2 HRC
PF 1242WB	12	18	30	2.8	8	13	200	18	20	1	36	-	56±2 HRC

Thanks to its parallel walls, this core allows undercuts to be released in compact areas (only 4mm. thickness). Include a simple system for adjustment. A Balinit C® coating ensures smooth movement and reduced wear. A new feature to this product is that it ejects first then releases the undercut.

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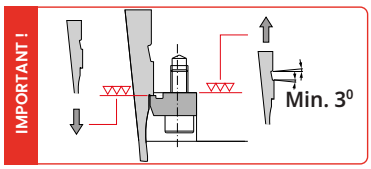
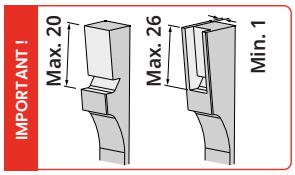
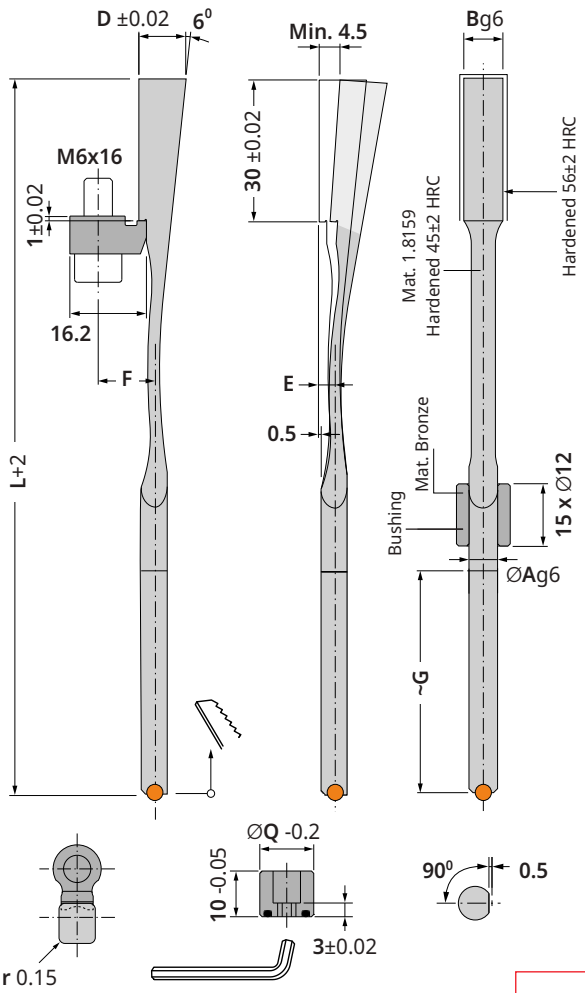
Xtra Sprung Core

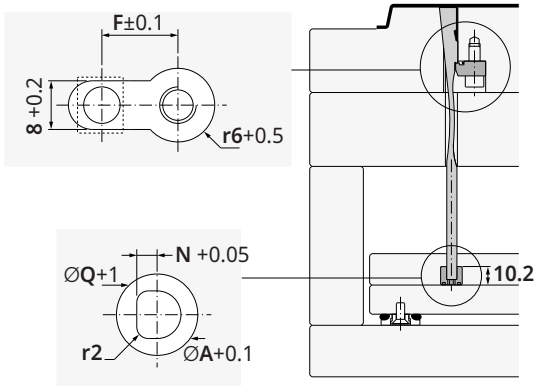
Code: **PX ..**

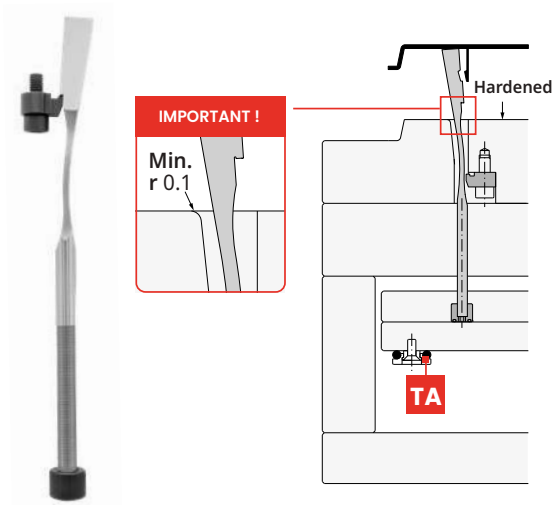
Cad Insertion Point











Order Code	A	B	D	E	F	L - 175		L - 250		L - 325		N	Q
						~G	Bushing	~G	Bushing	~G	Bushing		
PX 060630 - ...	6	6.2	10	3.5	12.5	60	-	80	•	80	•	2.5	12
PX 060830 - ...	6	8.2	10	3.5	12.5	60	-	80	•	80	•	2.5	12
PX 081030 - ...	8	10.2	11.2	4.5	13.5	60	-	80	•	80	•	3.5	14
PX 081230 - ...	8	12.2	11.2	4.5	13.5	60	-	80	•	80	•	3.5	14

Indicate the desired **L** dimension after the reference.

The stopper simplifies the adjustment and allows a longer lifetime guarantee. Completely adjusted to fit an H7 housing, radiuses already made on the head of the sprung core. Simple fixing system due to its external thread. Available in three lengths. Jig to guarantee the part is cut at the exact length (supplied separately)

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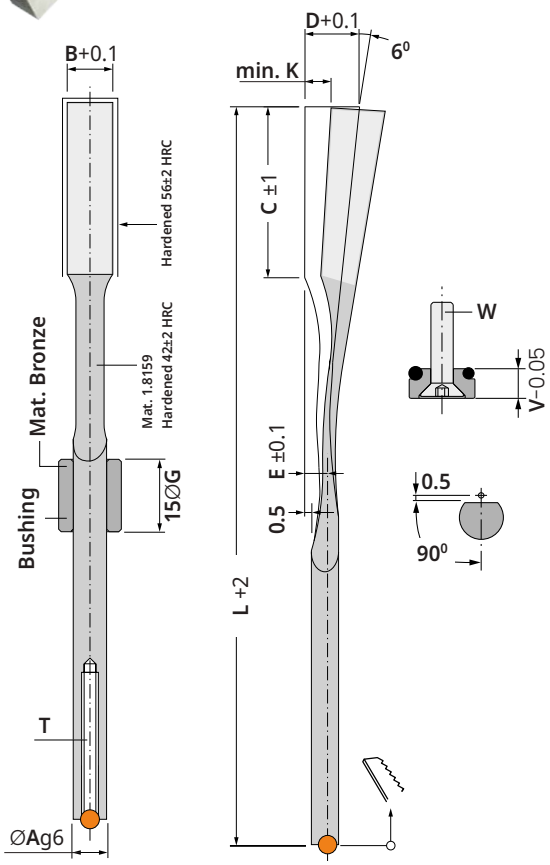
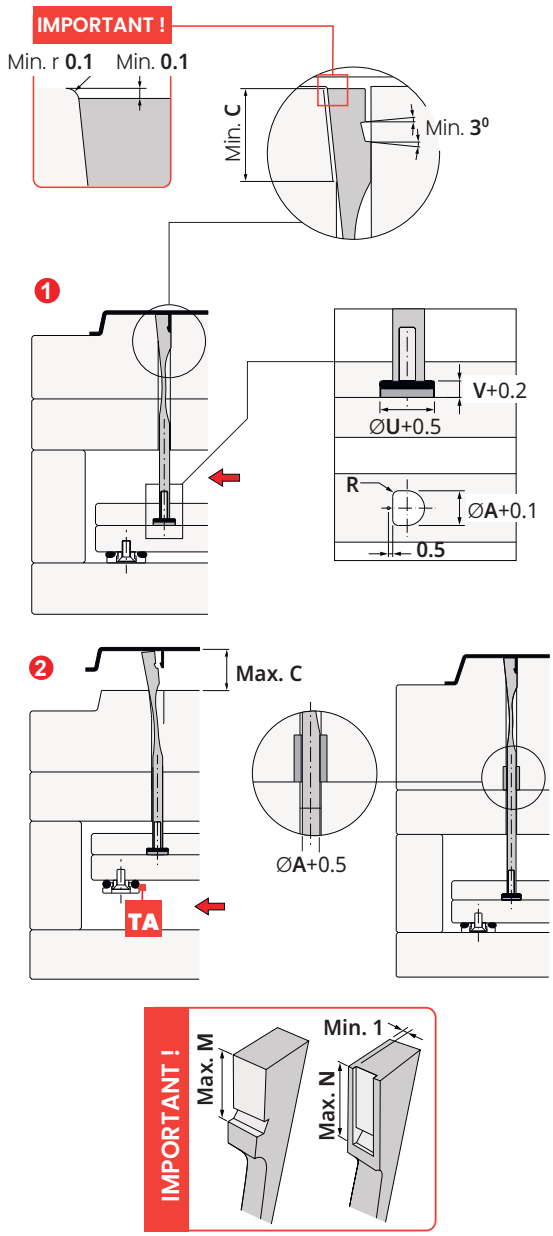
Sprunge Core

Code: **PW..**

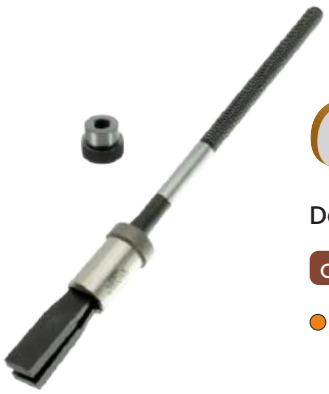
Cad Insertion Point





Order Code	A	B	C	D	E	G	K	L	M	N	R	T	U	V	W	Bushing
PW 060622	6	6.2	22	9	3.5	-	3.5	125	16	18	1.25	M4 x 36	12	5	M4 x 16	-
PW 060630	6	6.2	30	10	3.5	12	4.5	175	20	26	1.25	M4 x 36	12	5	M4 x 16	+
PW 060822	6	8.2	22	9	3.5	-	3.5	125	16	18	1.25	M4 x 36	12	5	M4 x 16	-
PW 060830	6	8.2	30	10	3.5	12	4.5	175	20	26	1.25	M4 x 36	12	5	M4 x 16	+
PW 080825	8	8.2	25	11.5	4.5	-	4.5	140	18	21	2	M5 x 36	14	6	M5 x 16	-
PW 081025	8	10.2	25	11.5	4.5	-	4.5	140	18	21	2	M5 x 36	14	6	M5 x 16	-
PW 081030	8	10.2	30	11.2	4.5	12	4.5	175	20	26	2	M5 x 36	14	6	M5 x 16	+
PW 081225	8	12.2	25	11.5	4.5	-	4.5	140	18	21	2	M5 x 36	14	6	M5 x 16	-
PW 081230	8	12.2	30	11.2	4.5	12	4.5	175	20	26	2	M5 x 36	14	6	M5 x 16	+
PW 101430	10	14.2	30	13.6	5.5	16	5.5	175	20	26	2.5	M6 x 36	18	8	M6 x 16	+
PW 101630	10	16.2	30	13.6	5.5	16	5.5	175	20	26	2.5	M6 x 36	18	8	M6 x 16	+
PW 101830	10	18.2	30	13.6	5.5	16	5.5	175	20	26	2.5	M6 x 36	18	8	M6 x 16	+

Minimum space required for installation, only needs the space of an ejector. No milling, grinding or hardening other than the machining of detail needed. Machining for installation is easier due to always being at 90º to parting line. No need for complex mechanical systems.



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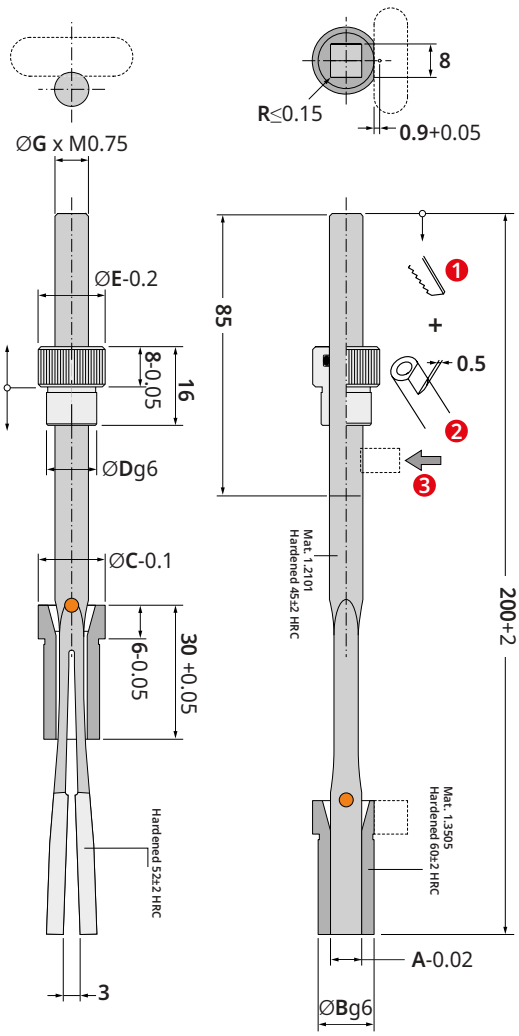
Double Ejector

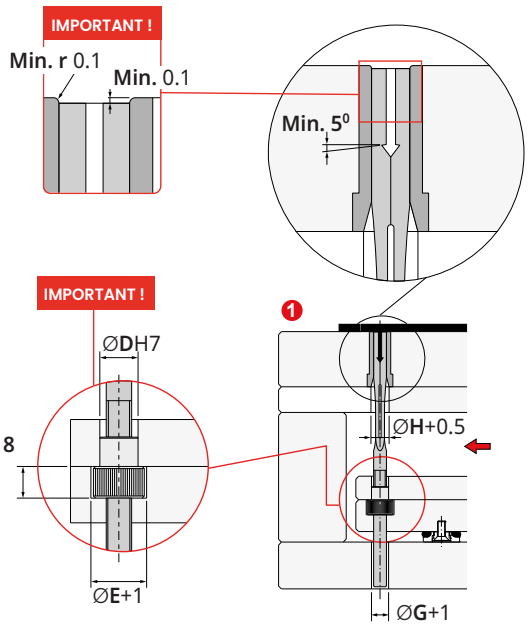
Code: ED..

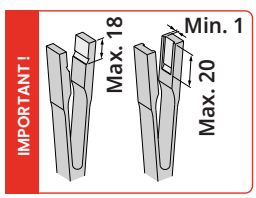
Cad Insertion Point

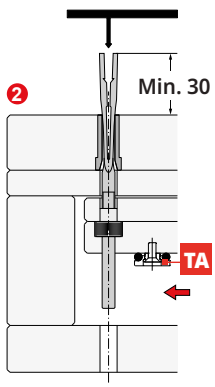


Order Code	A	B	C	D	E	G	H
ED 068200	6	12	14	10	14	6	10
ED 088200	8	14	16	12	16	8	12
ED 108200	10	16	18	14	18	8	14
ED 128200	12	16	18	16	20	8	15

Installation Guidelines





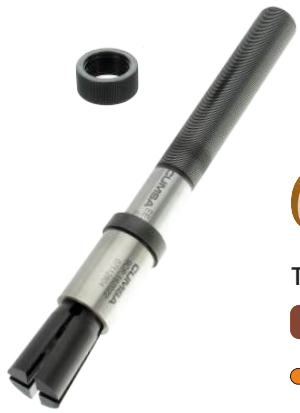


Max. 150⁰C

Special lengths of 275 and 350mm. upon request.

Useful to release small undercuts, this ejector is pre-adjusted and height adjustable. Easy to install, machining is 90° to parting line. The Balinit C® coating offers smooth action.

Cumsa Mould Systems



3D CAD FILES GUVENAL www.guvenal.net

Tulip Ejector

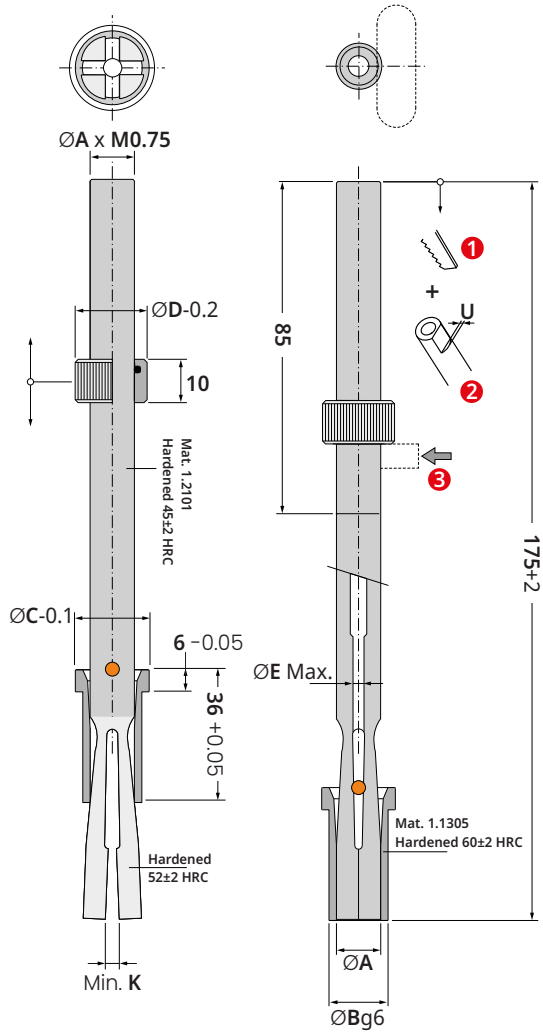
Code: **EE ..**

Cad Insertion Point

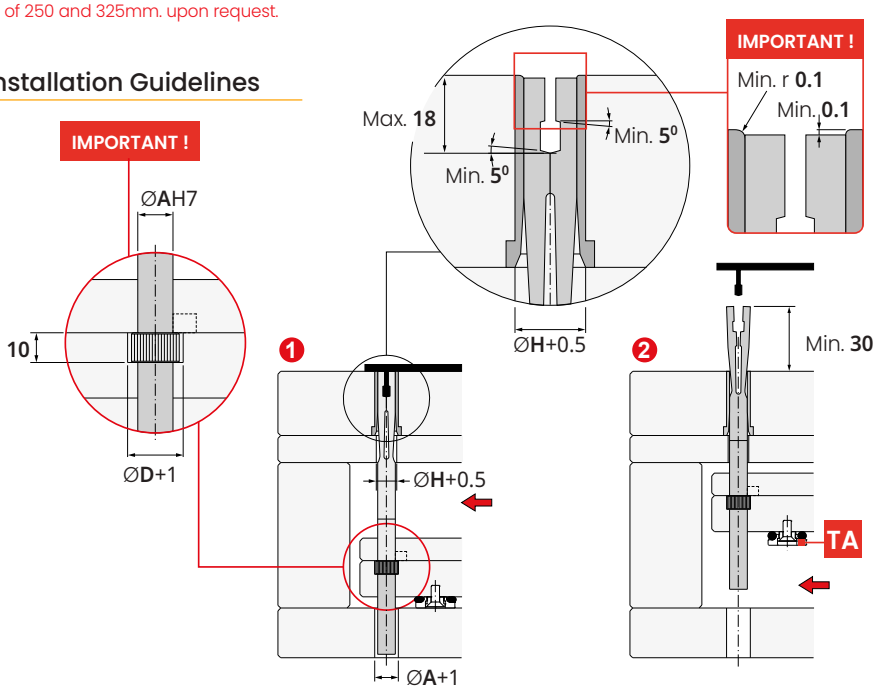
Order Code	A	B	C	D
EE 060175	6	10	12	12
EE 082175	8	12	14	14
EE 103175	10	14	16	16
EE 124175	12	16	18	18
EE 168175	16	20	22	22

Order Code	E	H	K	U	Balinit C
EE 060175	-	9	2.8	0.5	+
EE 082175	2	11	2.8	0.5	+
EE 103175	3	13	2.8	0.5	+
EE 124175	4	15	3	0.5	+
EE 168175	8	19	3	1	+

+ Special lengths of 250 and 325mm. upon request.



Installation Guidelines



Useful to release small undercuts, this ejector is pre-adjusted and height adjustable. Easy to install, machining is 90° to parting line.
The Balinit C® coating offers smooth action.

3D CAD FILES GUVENAL

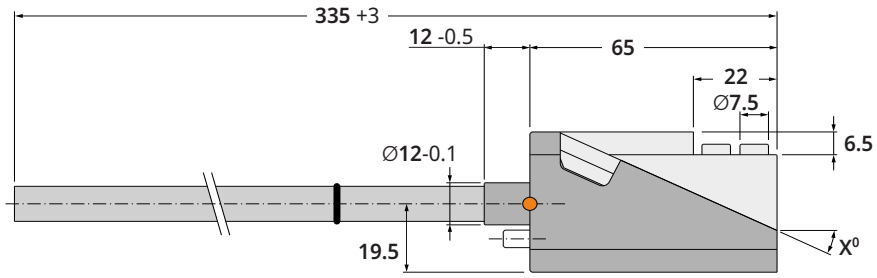
Dog Lifter

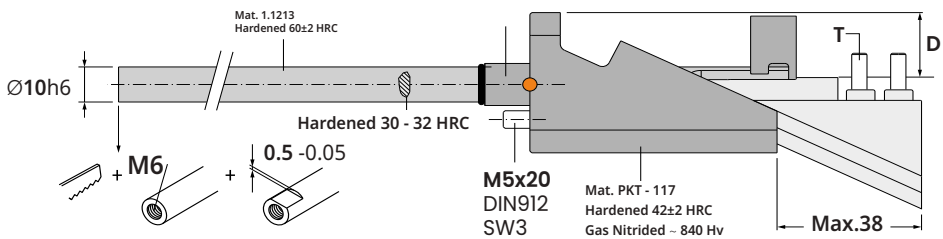
Code: **DL ..**

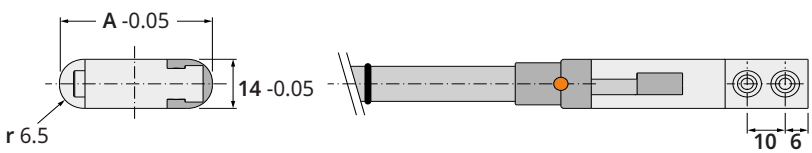
Cad Insertion Point

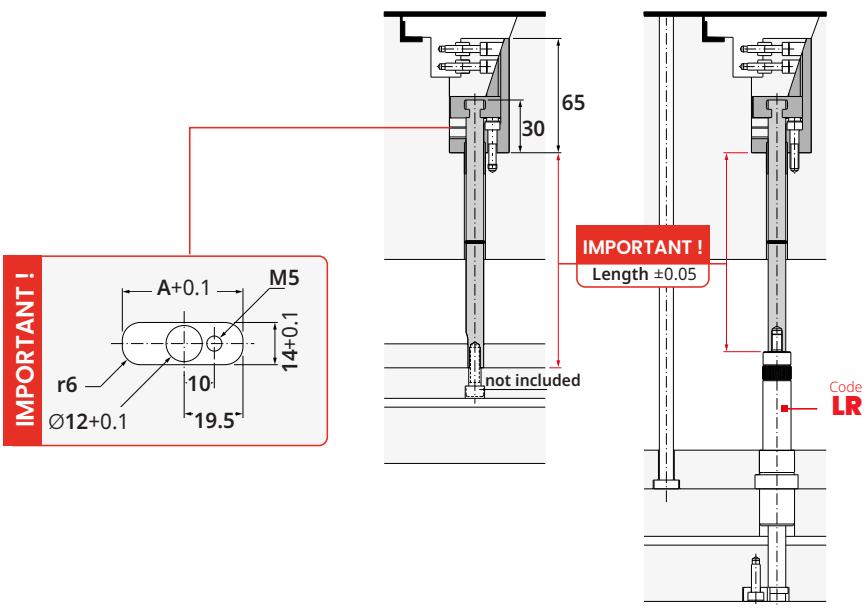
Special angles available upon request, please contact: info@guvenal.net

Order Code	A	D	T	X
DL 143465	34	12	M4 x 20	18
DL 144065	40	18	M4 x 25	26
DL 144665	46	22	M4 x 30	31









3D CAD FILES GUVENAL www.guvenal.net

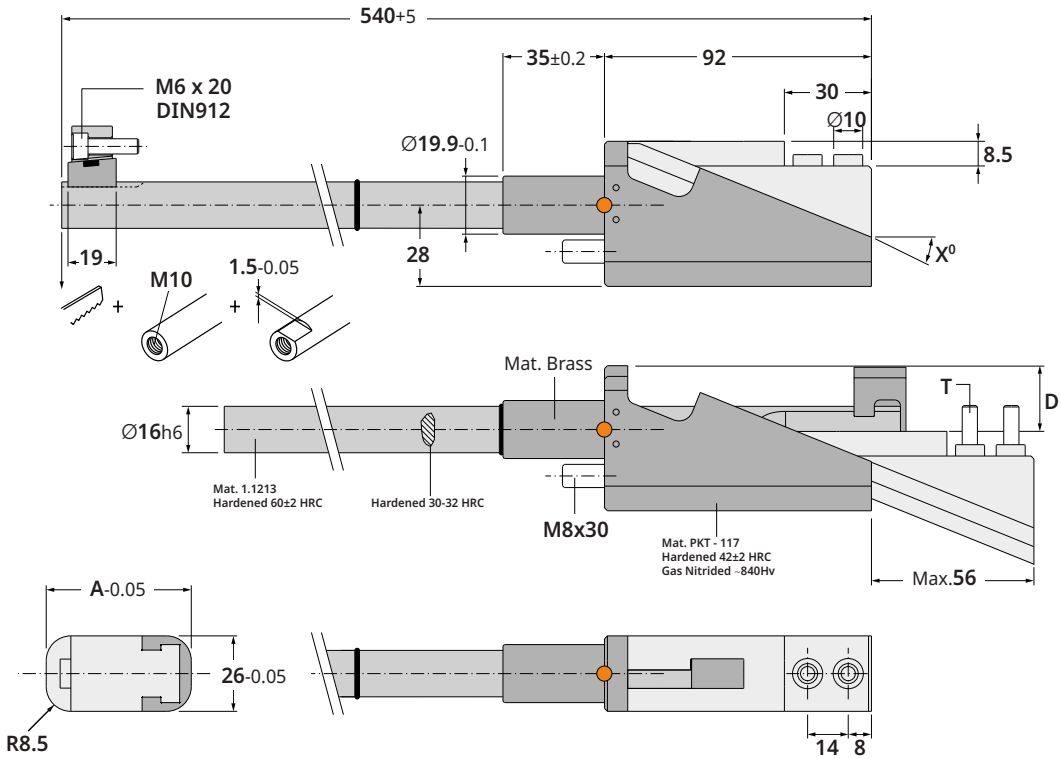
Dog Lifter

Code: **DG ..**

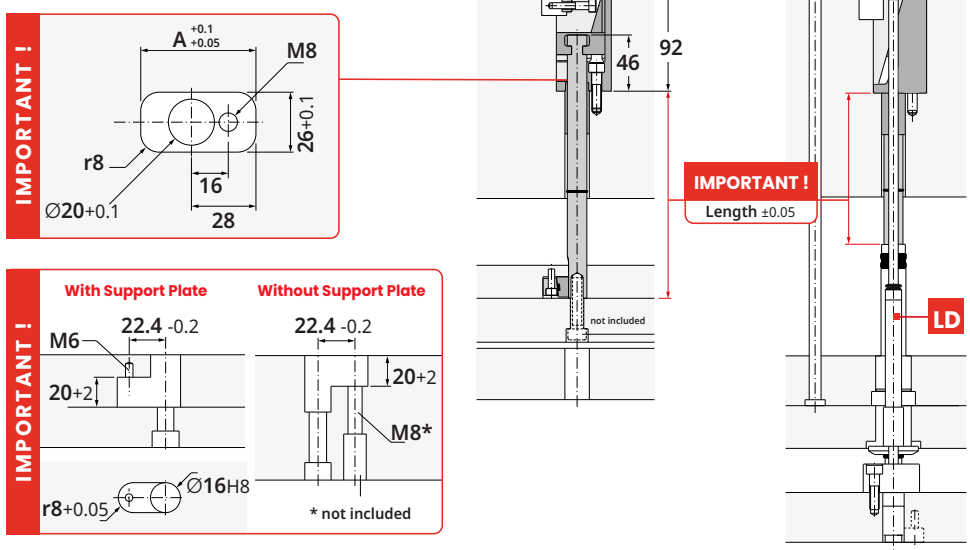
Cad Insertion Point

Order Code	A	D	T	X
DG 264592	45	16	M6 x 30	16
DG 265092	50	22	M6 x 30	22
DG 265592	55	26	M6 x 35	26

Compact and robust design, incorporating a 16mm shaft with just a 26mm width base and insert. Customized moulding insert enables wider range of applications. Due to the design of the lifter base, housings can be machined simply, without the need of EDM.



Installation Guidelines



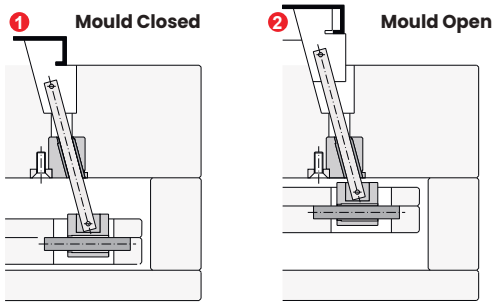
3D CAD FILES GUVENAL

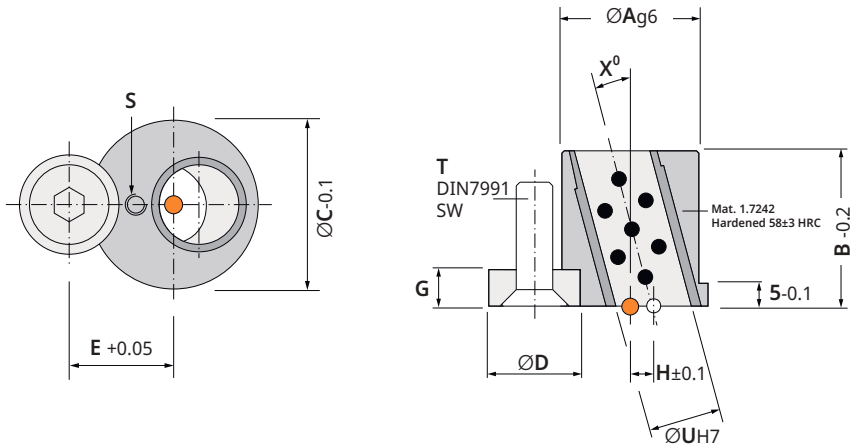
Lifter Guide Bushing

Code: CI ..

Cad Insertion Point

Installation Guidelines





Order Code	A	B	C	D	E	G	H	S	T	U	X	SW
CI 3034 GR-5	30	34	34	16	20	6	0	M4 x 6	M6 x 16	10	5	4
CI 3438 GR-5	34	38	38	20	24	8	0	M6 x 6	M8 x 20	12	5	5
CI 4040 GR-5	40	40	44	20	27	8	0	M6 x 6	M8 x 20	16	5	5
CI 3034 GR-10	30	34	34	16	20	6	7	M6 x 6	M6 x 16	10	10	-
CI 3438 GR-10	34	38	38	20	24	8	8.5	M8 x 6	M8 x 20	12	10	-
CI 4040 GR-10	40	40	44	20	27	8	8.5	M8 x 6	M8 x 20	16	10	-
CI 3034 GR-15	30	34	34	16	20	6	7	M6 x 6	M6 x 16	10	15	-
CI 3438 GR-15	34	38	38	20	24	8	8.5	M8 x 6	M8 x 20	12	15	-
CI 4040 GR-15	40	40	44	20	27	8	8.5	M8 x 6	M8 x 20	16	15	-
CI 3034 GR-20	30	34	34	16	20	6	7	M6 x 6	M6 x 16	10	20	-
CI 3438 GR-20	34	38	38	20	24	8	8.5	M8 x 6	M8 x 20	12	20	-
CI 4040 GR-20	40	40	44	20	27	8	8.5	M8 x 6	M8 x 20	16	20	-

This unit is a guide bush for angled undercut blocks, which only requires a straight drilled hole for fitting. It does not require oil grooves due to the graphite-bronze insert.

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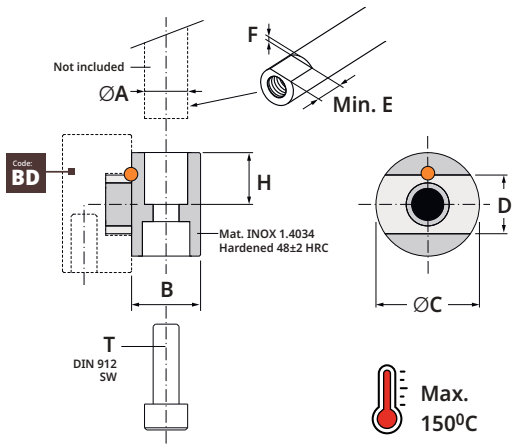
Accelerated Ejector

Code: DF..

Cad Insertion Point



Order Code	A	B	C	D	E	F	H	T	SW
DF 061220	6	12	20	11.5	12	0.5	10	M4 x 12	3
DF 081220	8	12	20	11.5	12	0.5	10	M5 x 12	4
DF 101624	10	16	24	13.5	14	0.5	12	M6 x 16	5
DF 121624	12	16	24	13.5	14	1	12	M8 x 16	6
DF 162032	16	20	32	19	18	1.5	16	M8 x 25	6
DF 202538	20	25	38	21	21	1.5	19	M10 x 25	8
DF 253148	25	31	48	28	26	2	24	M12 x 35	10

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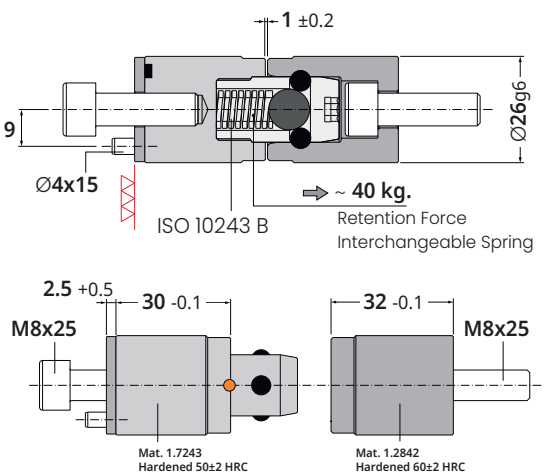
Plate Retainer

Order Code: PR263230

Cad Insertion Point

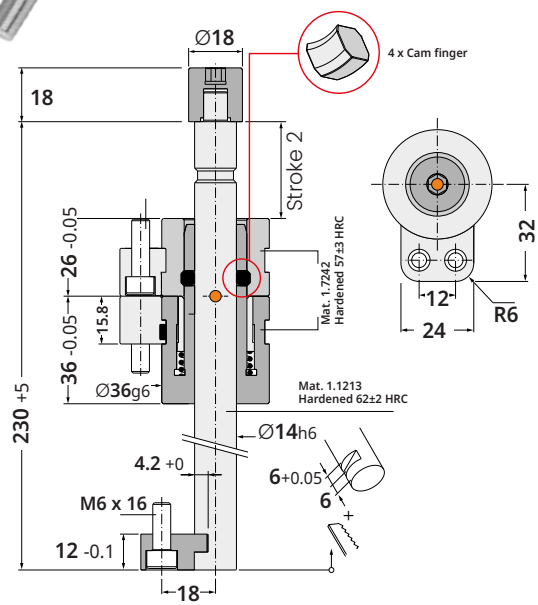


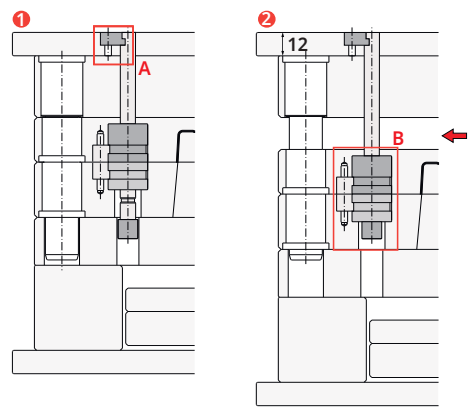
3D CAD FILES GUVENAL www.guvenal.net

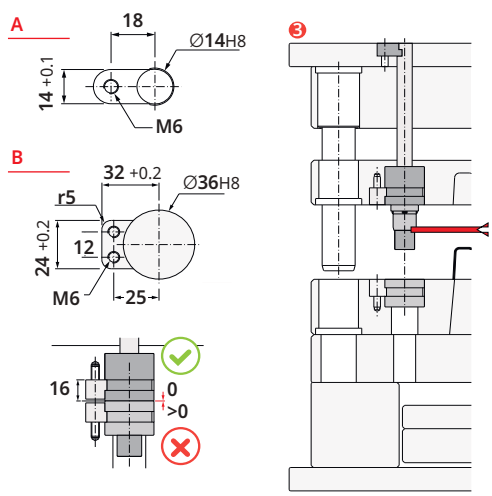
Internal Latch Lock

Order Code: MX143662

Cad Insertion Point







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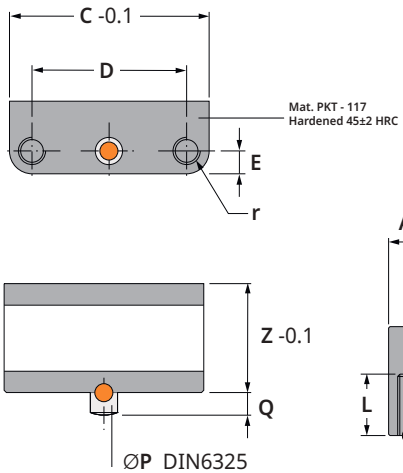
Horizontal Base

Code: **BD..**

Cad Insertion Point



Order Code	A	C	D	E	F	G
BD 122036	12	36	28	4	4.8	11.5
BD 142266	14	66	42	4	6.3	11.5
BD 162440	16	40	30	5	6.3	13.5
BD 203260	20	60	44	5	8.3	19
BD 253872	25	72	56	7	10.3	21
BD 314890	31	90	74	8	13.3	28

Order Code	L	P	Q	R	T	Z
BD 122036	10	5	5	4	M5	20
BD 142266	10	5	5	4	M5	22
BD 162440	12	6	5	5	M6	24
BD 203260	15	6	5	5	M6	32
BD 253872	18	8	5	6	M8	38
BD 314890	18	10	9	8	M10	48

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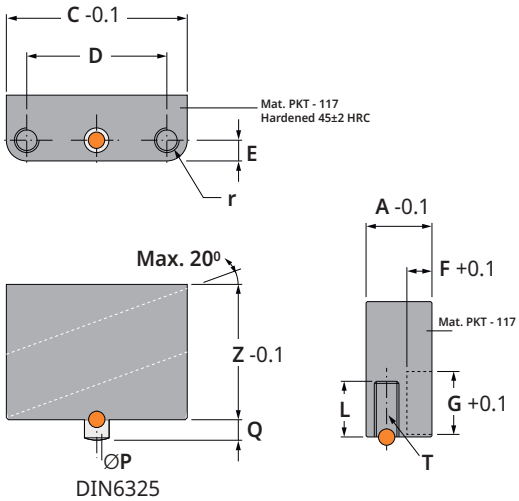
Adaptable Base

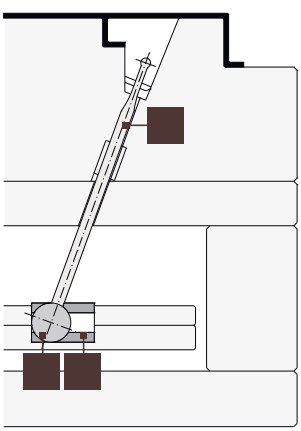
Code: **BD..**

Cad Insertion Point



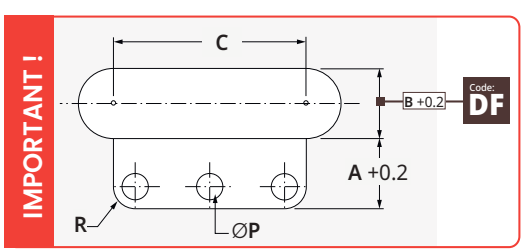
Order Code	A	C	D	E	F	G
BD 122836	12	36	28	4	4.8	11.5
BD 143866	14	66	42	4	6.3	11.5
BD 163240	16	40	30	5	6.3	13.5
BD 204060	20	60	44	5	8.3	19
BD 254672	25	72	56	7	10.3	21
BD 315890	31	90	74	8	13.3	28

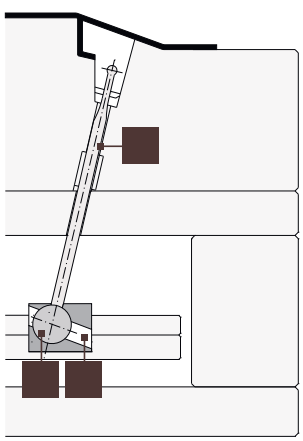
Order Code	L	P	Q	R	T	Z
BD 122836	10	5	5	4	M5	28
BD 143866	10	5	5	4	M5	38
BD 163240	12	6	5	5	M6	32
BD 204060	15	6	5	5	M6	40
BD 254672	18	8	5	6	M8	46
BD 315890	18	10	9	8	M10	58



Max. 150ºC

Max. 150ºC





Cam slide for internal lifters. Different hardness and materials between base and limiter guarantees smooth movements.
Minimum space required for installation

3D CAD FILES GUVENAL www.guvenal.net

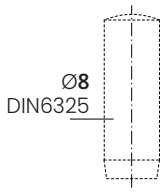
Modular Clip

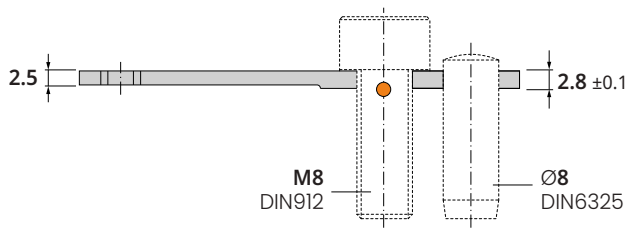
Order Code: RM 651608

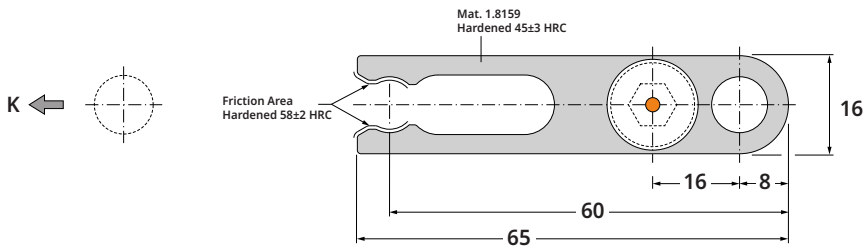
Cad Insertion Point

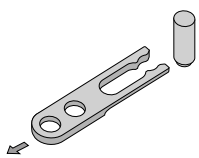
Useful for moulds that require delayed opening of parting line. Resistance can be increased by adding clips.

K= Approximate resistance value that can be obtained by grouping clips.

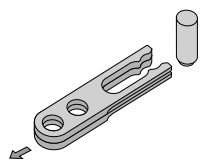




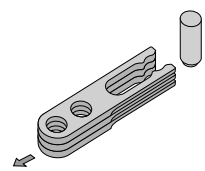




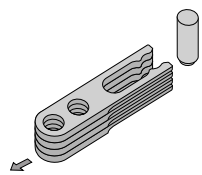
K*1 RM= 7.5 kg.



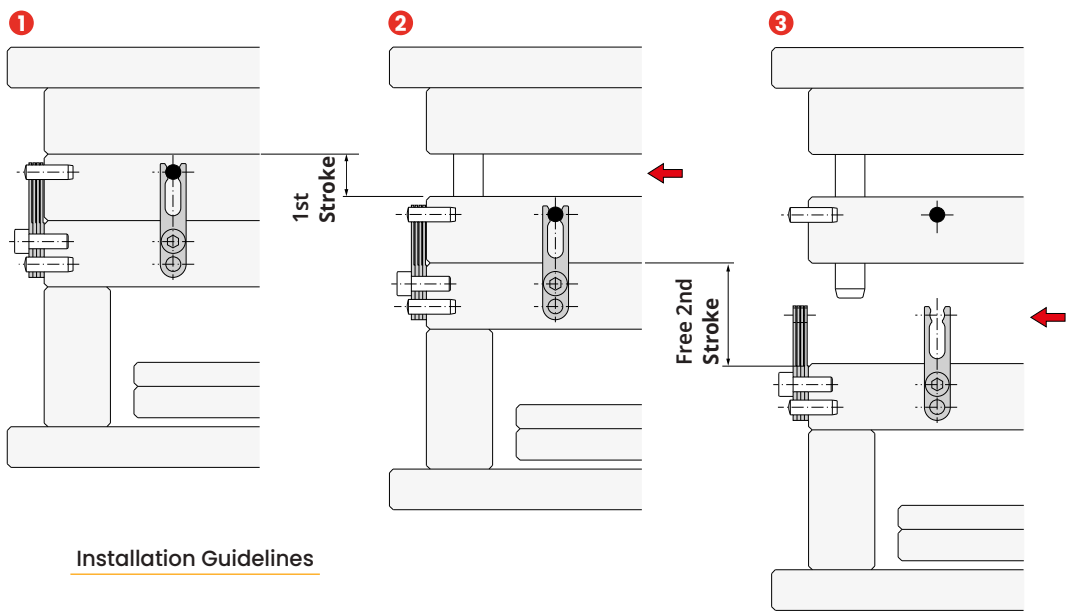
K*2 RM= 15 kg.



K*3 RM= 22.5 kg.



K*4 RM= 30 kg.

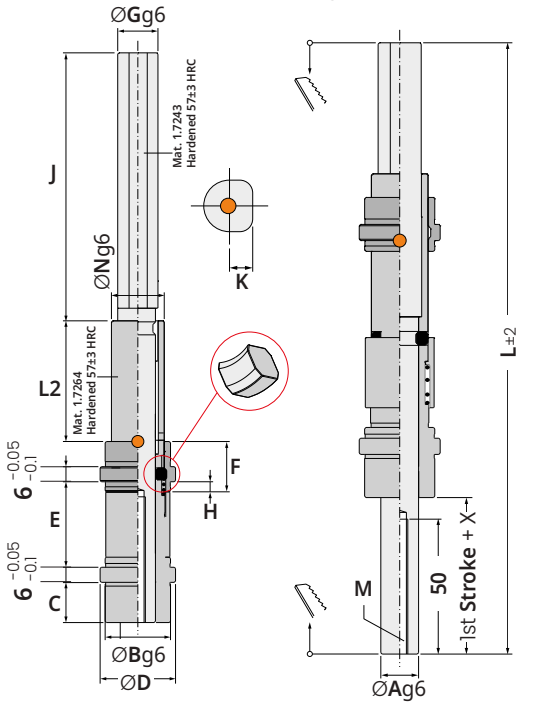


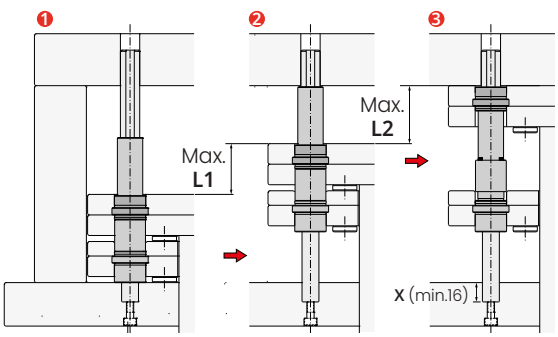
Installation Guidelines

Superior Double Ejector

Code: DX..

Cad Insertion Point





Order Code	A	B	C	D	E	F	G	H
DX 142622	14	26	16	30	34	20	16	4
DX 163027	16	30	21	34	44	23	18	6

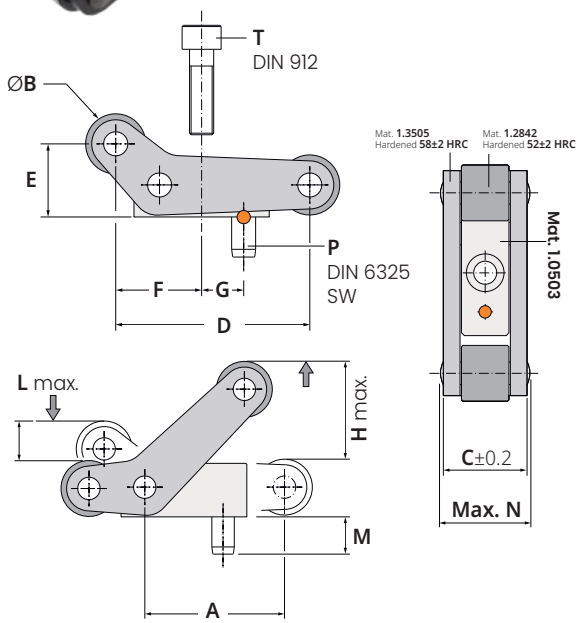
Order Code	J	K	L	M	N	L1	L2
DX 142622	125	7.2	243	M6	21	42	48
DX 163027	152	8	314	M8	24	54	80

The rear plates stops and the upper plate continues for the full ejection stroke. Thanks to the assembly of the units away from the center of mould but within the ejector frame the space required for installation is drastically reduced leaving more space for other mechanisms.

Plate Accelerator

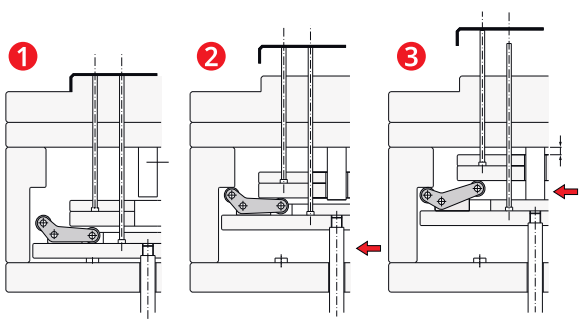
Code: EP..

Cad Insertion Point



Order Code	A	B	C	D	E	F	G	H max.
EP 200813	20	8	13.2	25.8	9.4	11.4	5.9	11.6
EP 251016	25	10	16	32.3	11.8	14.3	7	15
EP 371522	37.5	15	22	48.5	17.7	21.5	10.5	23.5
EP 502030	50	20	30	64.6	23.6	28.6	14	32

L max.	M	N	P	T	Max. Force	SW
4.4	5	15	Ø2.5 x 10	M3 x 12	125 kg.	2.5
5.7	6	18.5	Ø3 x 12	M4 x 16	250 kg.	3
9.1	8	25	Ø4 x 16	M6 x 25	350 kg.	5
12.5	10	34	Ø5 x 20	M8 x 30	800 kg.	6



This item allows increased movement of a second ejector plate within a normal ejector stroke.

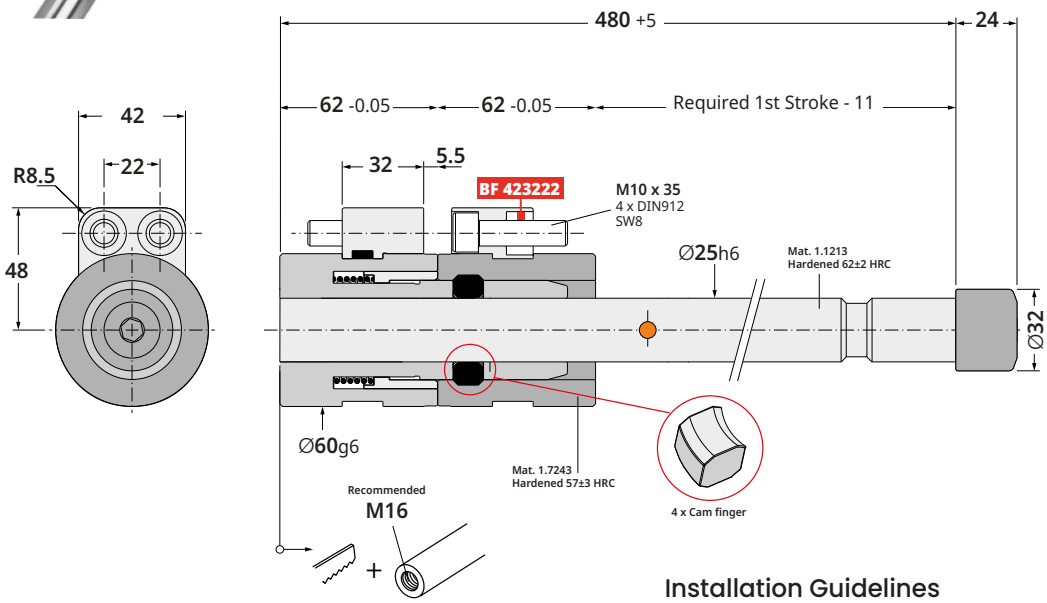
3D CAD FILES GUVENAL www.guvenal.net

Superior Plate Separator

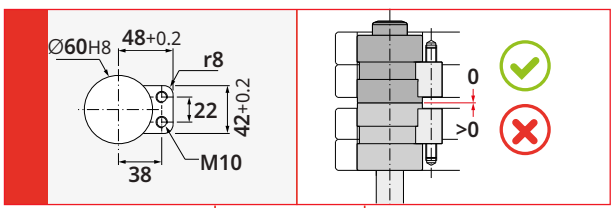
Order Code: SX 256062

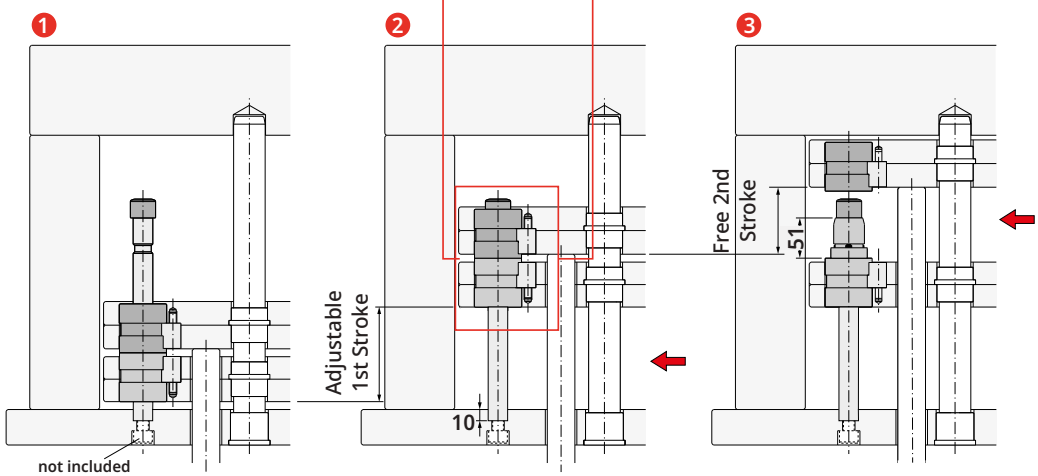
Cad Insertion Point

* 2x BF.423222 units included.
More units can be ordered separately.



Installation Guidelines





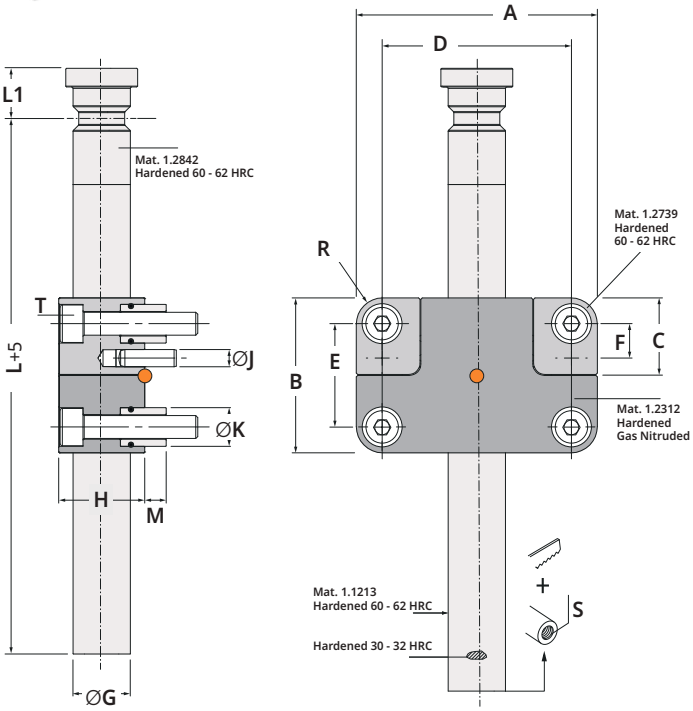
The rear plates stop and the upper plates continue to the full ejection stroke. As the assembly of the units is not in the center of the mould, but within the ejector frame, the space required for installation is drastically reduced. Developed for medium / large tools. Can also be used to control two stage opening of the tool.

3D CAD FILES GUVENAL www.guvenal.net

External Superior Plate Separator

Code: **EX...**

Cad Insertion Point



Order Code	A	B	C
EX 140600	62	40	20
EX 200800	84	54	27
EX 321200	126	84	42
EX 501600	174	120	60

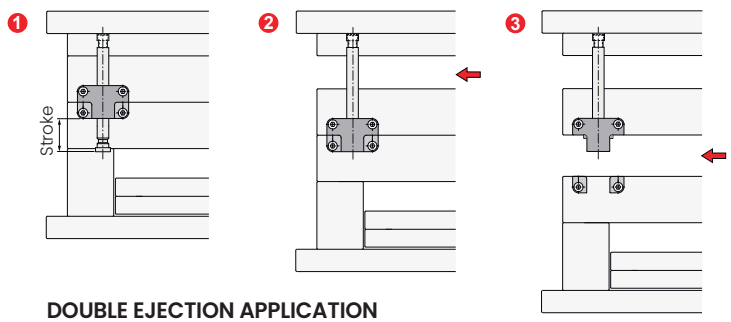
D	E	F	G	H
48	26	9	14	22
66	36	12	20	30
102	60	20	32	46
140	86	26	50	64

J	K	L	L1
Ø4 x 14	10.5	348	13
Ø6 x 20	13.5	348	17.5
Ø10 x 30	18.5	530	27
Ø12 x 40	25	530	40

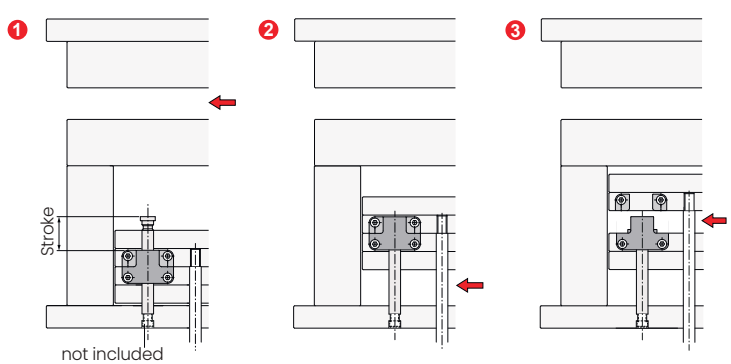
M	R	S	T
5.5	7.2	M8	M6 x 30
7.5	9.2	M12	M8 x 40
11.5	12.5	M16	M12 x 65
15.5	17	M24	M16 x 90

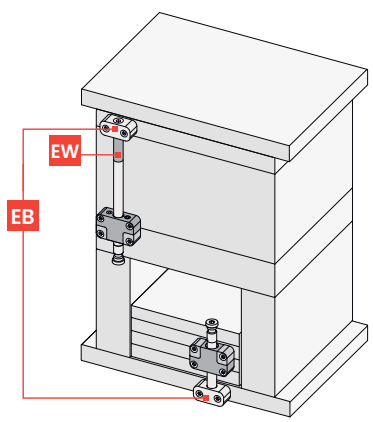
Min. Stroke	Max. Stroke	RF(N)	SW
4	250	4.000	5
5	250	9.000	6
8	375	20.000	10
10	375	40.000	14

THREE PLATE MOULD APPLICATION



DOUBLE EJECTION APPLICATION

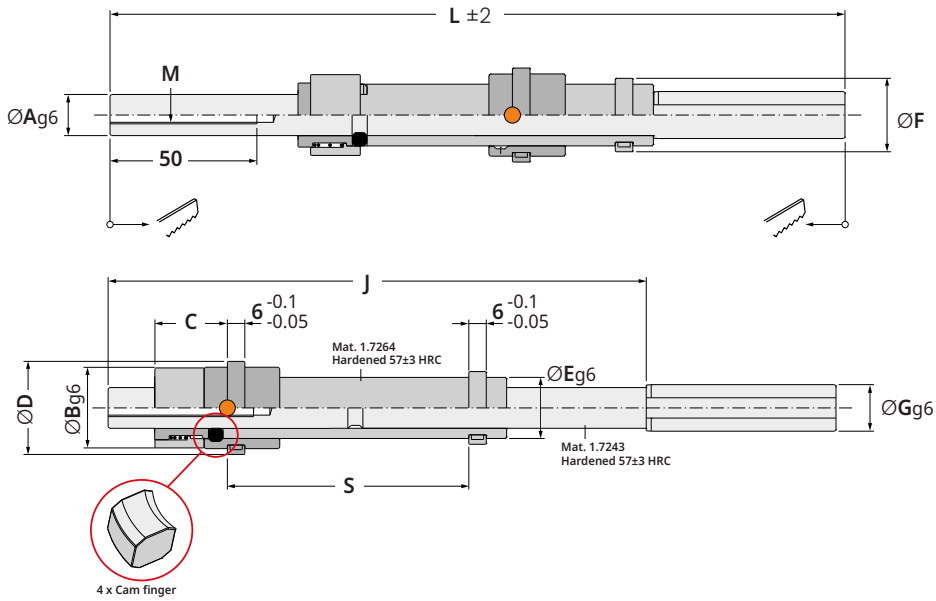




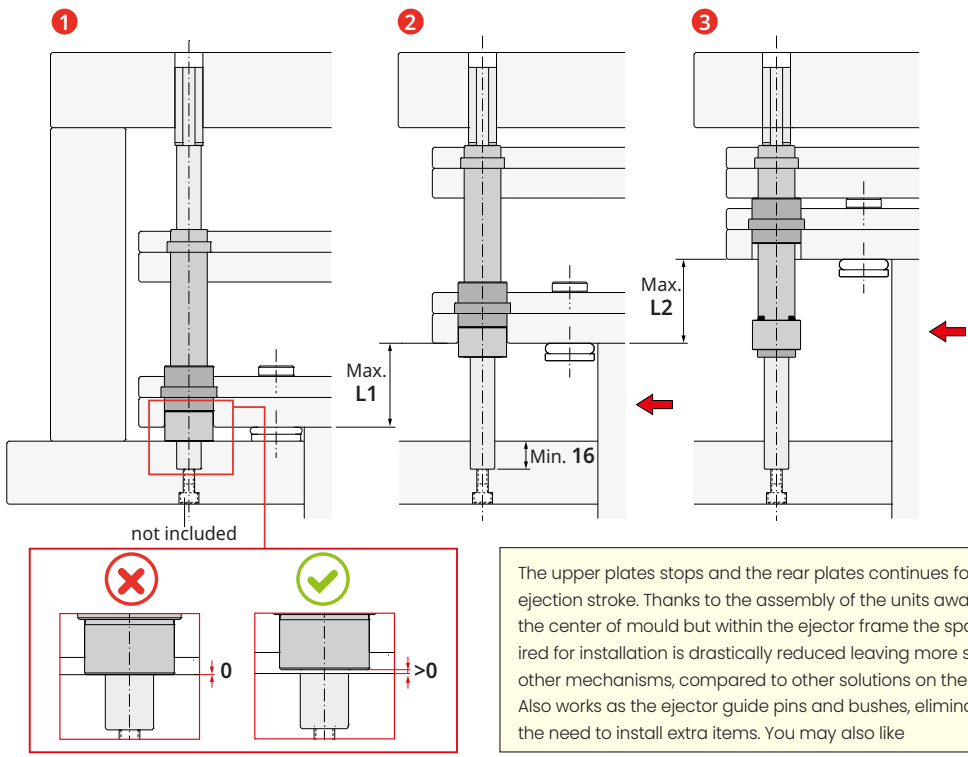
Two different options: as a pre-opening plate movement of the mould , or as a double ejection system, controlling 2 sets of ejector plates when the machine actuates the upper ejector plates set. Simple external installation, enables easy adjusting and maintenance.

Rear Double Ejector Code: DY..

Cad Insertion Point



Order Code	A	B	C	D	E	F	G	J	K	L	M	L1	L2	S
DY 142825	14	28	25	32	21	25	16	185	7.2	270	M6	48	49	83
DY 163230	16	32	30	36	24	28	18	252	8	337	M8	60	89	123



The upper plates stops and the rear plates continues for the full ejection stroke. Thanks to the assembly of the units away from the center of mould but within the ejector frame the space required for installation is drastically reduced leaving more space for other mechanisms, compared to other solutions on the market. Also works as the ejector guide pins and bushes, eliminating the need to install extra items. You may also like

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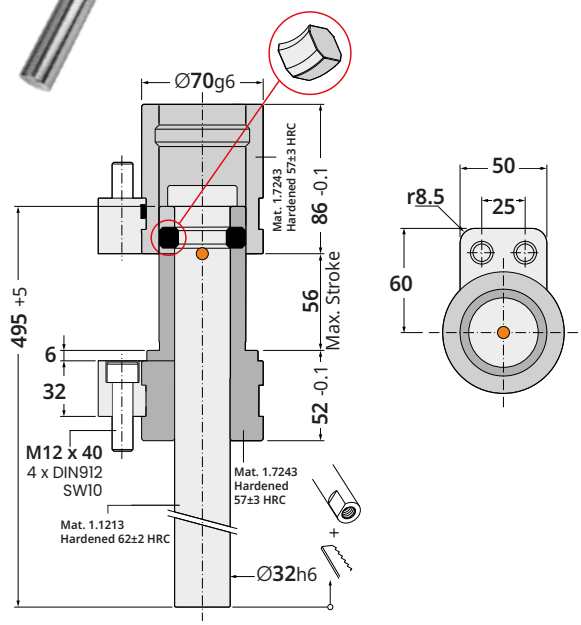
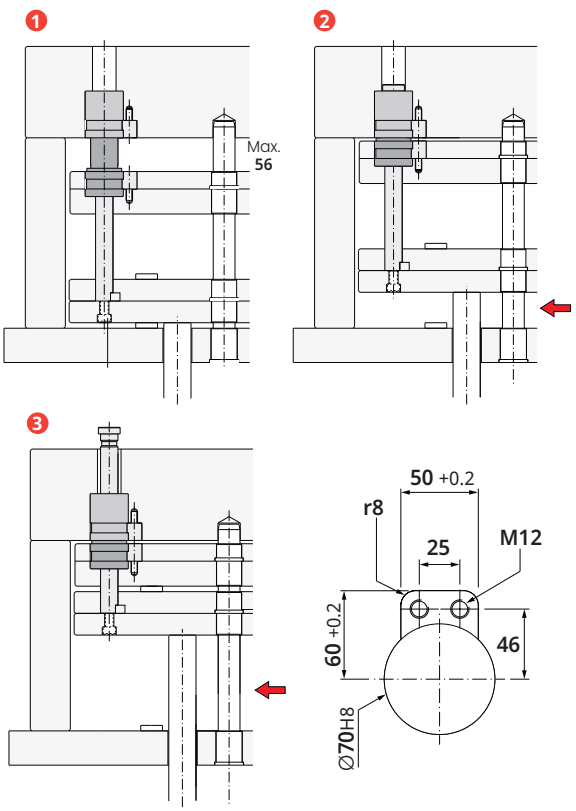
Compact Double Ejection

Order Code: SY

Cad Insertion Point



Installation Guidelines



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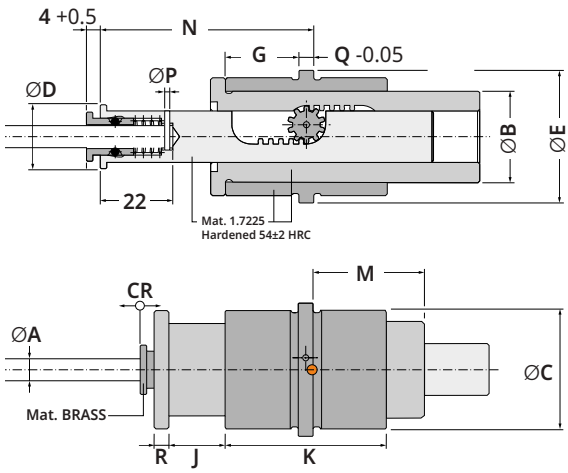
Accelerated Ejector

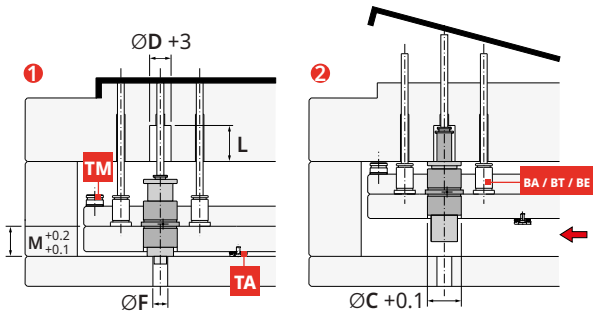
Code: AE..

Cad Insertion Point



Order Code	A	B	C	D	E	F	G	J
AE 031620	3	16	20	12.5	22	13	14	8
AE 141620	4	16	20	12.5	22	13	14	8
AE 052430	5	24	30	16	34	16	20	15
AE 062430	6	24	30	16	34	16	20	15
AE 082430	8	24	30	17	34	17	20	15
AE 103036	10	30	36	21.5	40	21	28	20
AE 123036	12	30	36	21.5	40	21	28	20

Order Code	K	L	M	N	P	Q	R	CR (N)
AE 031620	32	22	17	37	-	4	3	1.800
AE 141620	32	22	17	37	-	4	3	1.800
AE 052430	44	36	27	57	2	4	3	2.800
AE 062430	44	36	27	57	2	4	3	3.800
AE 082430	44	36	27	57	2	4	3	4.700
AE 103036	62	46	34	78	2	6	4	6.400
AE 123036	62	46	34	78	2	6	4	7.600



Allows to increase the stroke of selected ejectors within the mould. It is easy to install due to its cylindrical shape and possible to automate conventional mould.

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External Double Ejection

Code: **EY...**

Cad Insertion Point

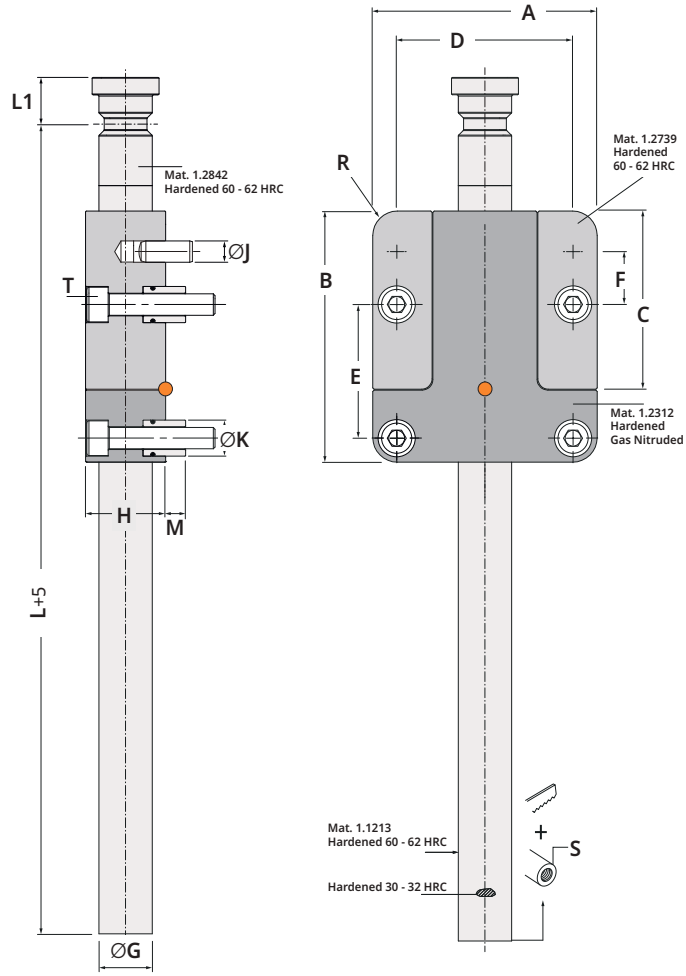
Order Code	A	B	C
EY 140600	62	70	50
EY 200800	84	94	67
EY 321200	126	144	102
EY 501600	174	200	140

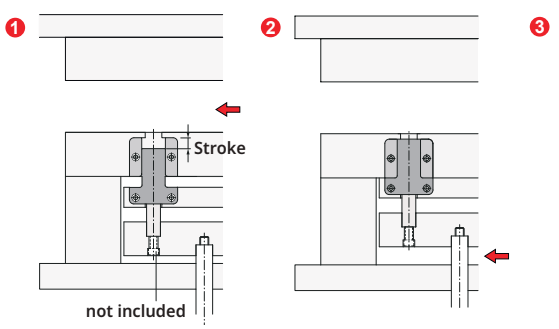
D	E	F	G	H
48	38	18	14	22
66	50	26	20	30
102	82	38	32	46
140	113	53	50	64

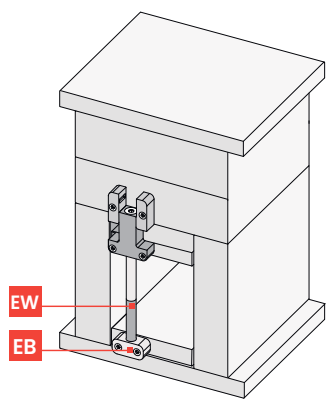
J	K	L	L1
Ø6 x 20	10.5	348	13
Ø8 x 20	13.5	348	17.5
Ø10 x 30	18.5	530	27
Ø12 x 40	25	530	40

M	R	S	T
5.5	7.2	M8	M6 x 30
7.5	9.2	M12	M8 x 40
11.5	12.5	M16	M12 x 65
15.5	17	M24	M16 x 90

Min. Stroke	Max. Stroke	RF(N)	SW
6	30	4.000	5
8	40	9.000	6
14	60	20.000	10
20	80	40.000	14







The ejector plates are separated, the machine actuates the lower set of ejector plates. The upper set stops at the core plate, and the rear plate continues to travel until it reaches the upper plate. Simple external installation, enables easy adjusting and maintenance.

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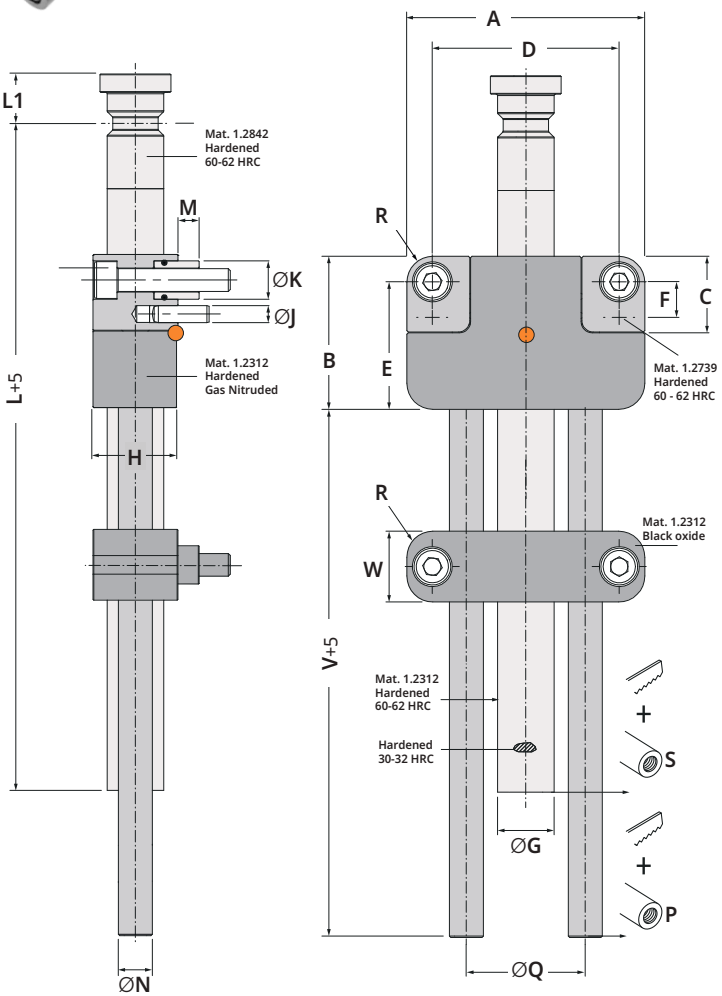
External Synchronized Plates Unit

Code: EZ...

Cad Insertion Point



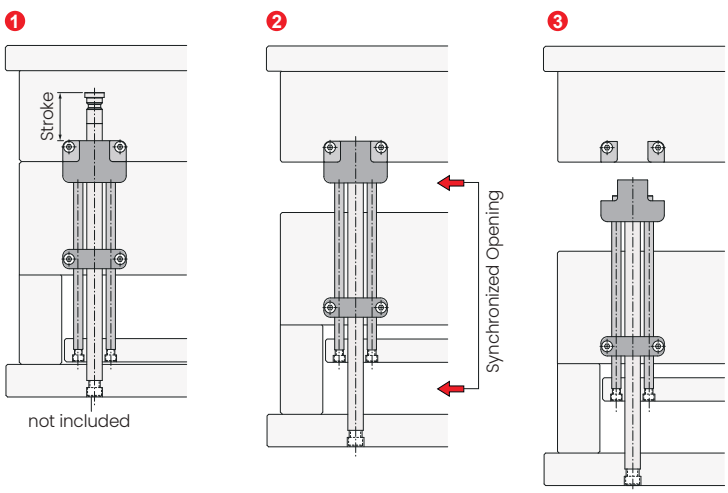
Order Code	A	B	C	D
EZ 140608	62	40	20	48
EZ 200812	84	54	27	66
EZ 321220	126	84	42	102
EZ 501625	174	120	60	140

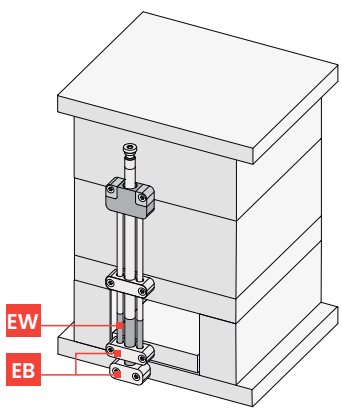
E	F	G	H	J
33	9	14	22	Ø4 x 14
45	12	20	30	Ø6 x 20
72	20	32	46	Ø10 x 30
103	26	50	64	Ø12 x 40

K	L	L1	M	N	P
10.5	348	13	5.5	8	M5
13.5	348	17.5	7.5	12	M8
18.5	530	27	11.5	20	M12
25	530	40	15.5	25	M16

Q	R	S	T	V	W
30	7.2	M8	M6 x 30	300	20
42	9.2	M12	M8 x 40	300	25
65	12.5	M16	M12 x 65	450	42
92	17	M24	M16 x 90	450	60

Min. Stroke	Max. Stroke	RF(N)	SW
4	250	4.000	5
5	250	9.000	6
8	375	20.000	10
10	375	40.000	14





Allow synchronized mould plates openings regardless of their location. Simple external installation, enables easyadjusting and maintenance.

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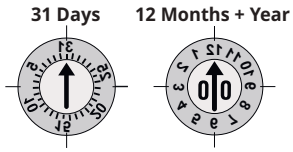
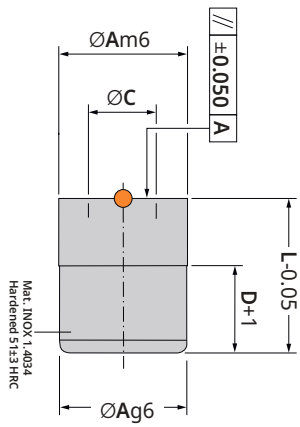
Date Stamp

Code: FA ..

Cad Insertion Point

Max. 150ºC





A	31 Days	12 Months	12 Months + Year	Years
4	-	FA 0422 SF	FA 042212 - ..	FA 042204 - ..
5	-	FA 0530 SF	FA 053012 - ..	FA 053004 - ..
6	FA 063231	FA 0632 SF	FA 063212 - ..	FA 063205 - ..
8	FA 084731	FA 0847 SF	FA 084712 - ..	FA 084705 - ..
10	FA 105731	FA 1057 SF	FA 105712 - ..	FA 105706 - ..
12	FA 126731	FA 1267 SF	FA 126712 - ..	FA 126708 - ..
16	FA 168731	FA 1687 SF	FA 168712 - ..	FA 168710 - ..
20	FA 200731	FA 2007 SF	FA 200712 - ..	FA 200710 - ..

Blank Code	A	C	D	E	L	N
FA 042200	4	2.2	6	3.5	12	4
FA 053000	5	3	6	3.5	12	4
FA 063200	6	3.2	12	4	20	5
FA 084700	8	4.7	12	6	20	5
FA 105700	10	5.7	12	8	20	6
FA 126700	12	6.7	12	10	20	8
FA 168700	16	8.7	12	12	20	10
FA 200700	20	10.7	12	14	20	10

This is a permanent date stamp where only the central year insert is changed. The month is changed by using a screwdriver. Completely stainless.

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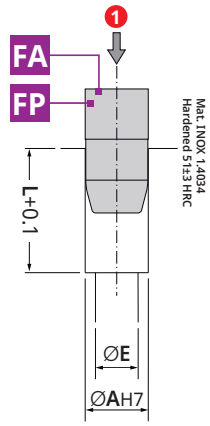
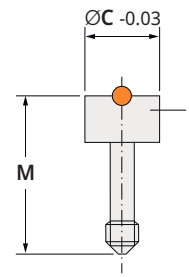
Date Insert for "FA"

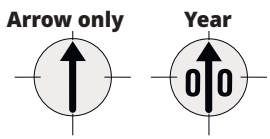
Code: IA..

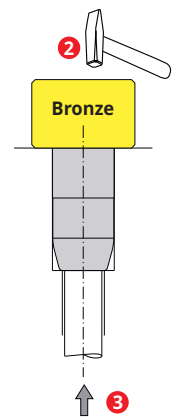
Cad Insertion Point

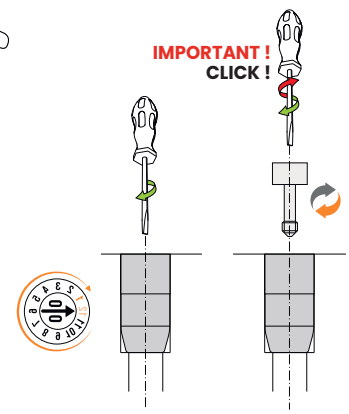
Max. 150ºC











Arrow Only	Year	C	M
IA 2275SF	IA 2275..	2.2	8.1
IA 3075SF	IA 3075 ..	3	8.1
IA 3217SF	IA 3217 ..	3.2	17
IA 4717SF	IA 4717 ..	4.7	17
IA 5717SF	IA 5717 ..	5.7	17
IA 6717SF	IA 6717 ..	6.7	17
IA 8717SF	IA 8717 ..	8.7	17
IA 1007SF	IA 1007 ..	10.7	17

Due to fact that the insert is adjustable / removable from the front of the mould, there is no need to remove the tool from the machine or disassemble the mould.

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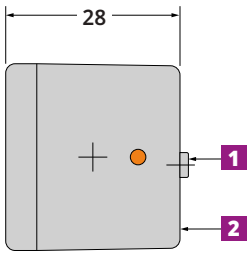
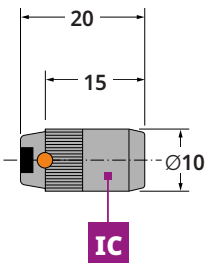
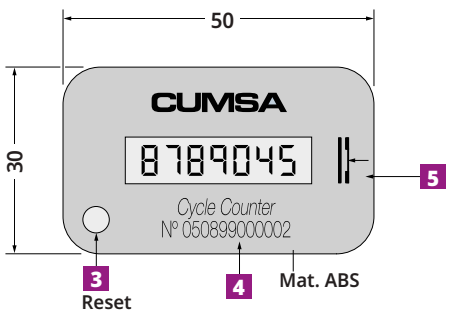
High Speed Cycle Counter

Order Code: CC HS5328

Cad Insertion Point







1. Security Switch
2. Magnetic Fixing
3. Total + Partial
4. Unique Part Number
5. IC Position Indicator

Cycles / Min.
Up to 500

Replaceable Battery
ER 14250 1/2 AA

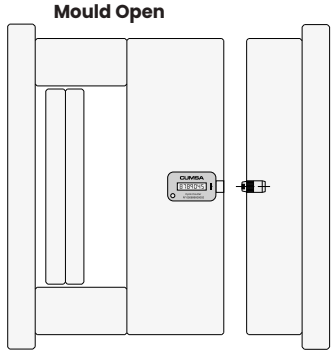
Recommended max. operating temperature: 60 °C

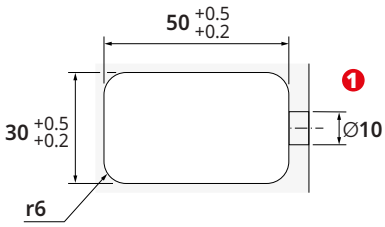
Battery life – under continuous operation (24h, 7d, 12m): 3 to 5 years

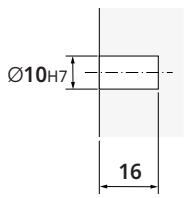
This unit contains an electronic circuit which counts the number of cycles made by the mould. To check exact total life time of the mould. To ensure that how many shots a determined mould made when our sourced.
To predict preventive maintenance. Available with partial reset. The unique part nº for each counter gives a guarantee to the mouldmaker, and a planning aid for maintenance to the moulder. Any tampering with the unit is shown in the screen.

Installation Guidelines

Mould Open

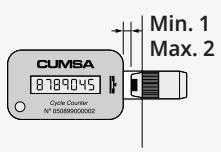


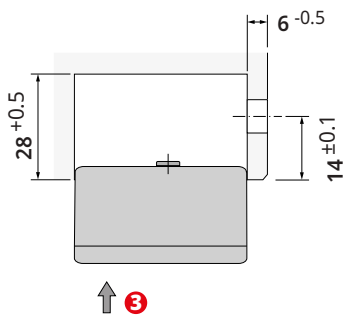


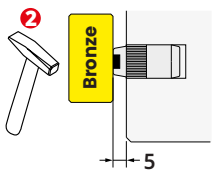


IMPORTANT !

Mould Closed







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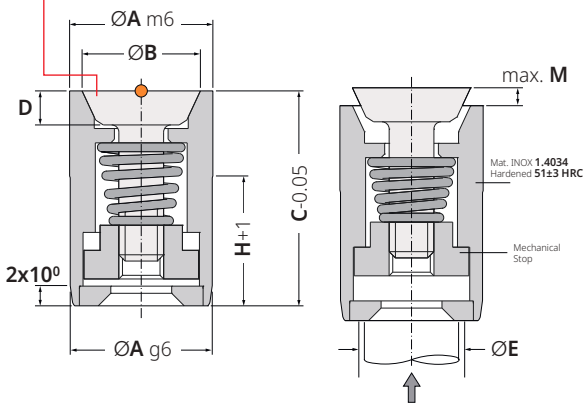
Air Poppet Valve

Code: **VA..**

Cad Insertion Point

Maximum Injection Pressure: 1200 Kgs/cm2 (1BAR ~ 1kg/cm2)



Max. 150⁰C

Min. 3 Bars

Order Code	A	B	C	D	E	H	M
VA 030312	3	2.6	12	2	2	7	0.7
VA 050412	5	3.4	12	2.1	4	7	2.5
VA 065212	6	5.2	12	1.8	4	7	0.95
VA 086512	8	6.6	12	1.9	6	7	0.95
VA 100812	10	8.2	12	2.7	8	7	0.95
VA 121012	12	9.7	12	2.7	10	7	0.95
VA 161320	16	12.6	20	4	12	12	1.55
VA 201720	20	16.9	20	4	16	12	1.55

Reference VA.030312 and VA.050412, do not include mechanical stop.

Manufactured completely from stainless steel this unit has the advantage of high airflow. It is manufactured in seven standard dimensions.

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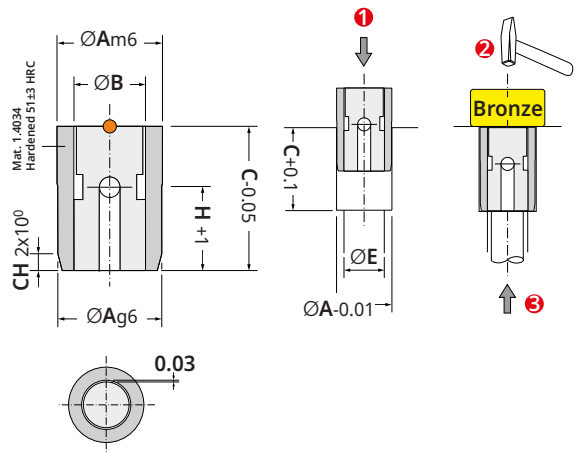
Double Valve

Code: **VD..**

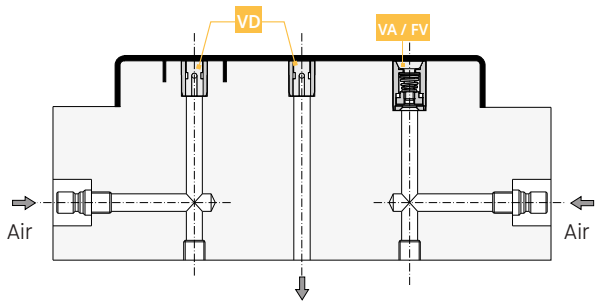
Cad Insertion Point



Max. 150⁰C

Min. 3 Bars

Order Code	A	B	C	E	H
VD 080512	8	5	12	6	7
VD 100612	10	6	12	8	7
VD 120812	12	8	12	10	7
VD 161020	16	10	20	12	12



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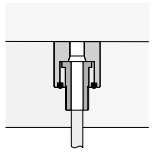
Sprue Adjuster

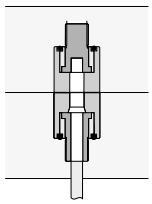
Code: **SA...**

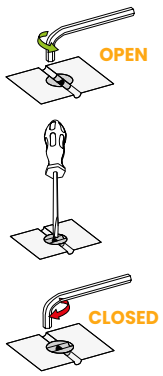
Cad Insertion Point

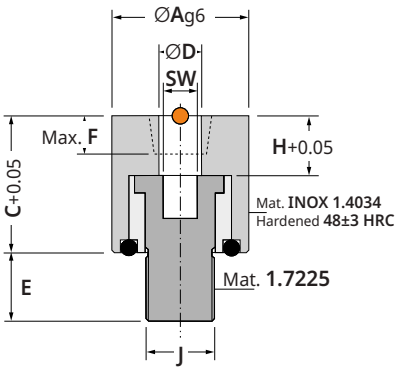
Trapezoidal Runner



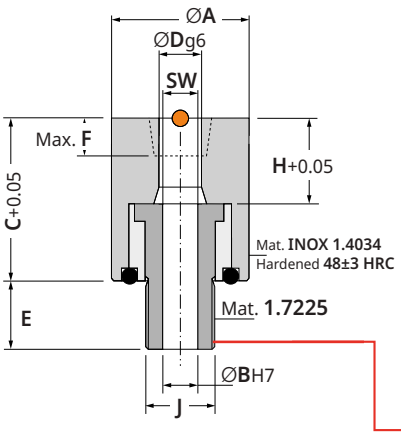
Full Round Runner







Order Code	A	C	D	E	F	H	J	SW
SA 120014	12	14	4.1	6	3	7	M6	3
SA 160016	16	16	5.1	8	5	8.5	M8	4
SA 200018	20	18	6.1	10	6	11	M10	5
SA 240022	24	22	9.5	12	10	14.5	M14	8

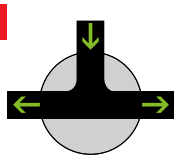


Order Code	A	B	C	D	E	F	H	J	SW
SA 120314	12	3	14	4.1	6	3	7	M6	3
SA 160416	16	4	16	5.1	8	5	8.5	M8	4
SA 200518	20	5	18	6.1	10	6	11	M10	5
SA 240822	24	8	22	9.5	12	10	14.5	M14	8

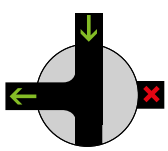
This unit allows runner shut off directly from the parting line. Two models are available, depending if an ejector pin is required or not. It can be installed in the cavity or in the core, allowing trapezoidal or full round runners.

Possible Configurations

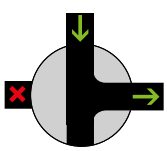
1



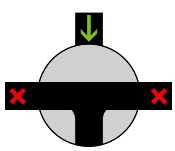
Open



Left Cavity

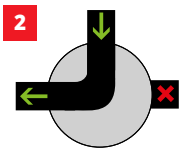


Right Cavity

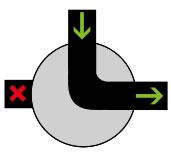


Closed

2

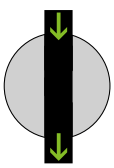


Left Cavity



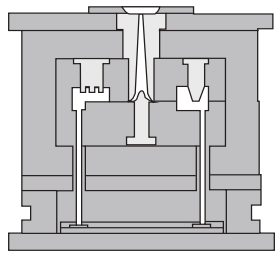
Right Cavity

3



Open

Closed

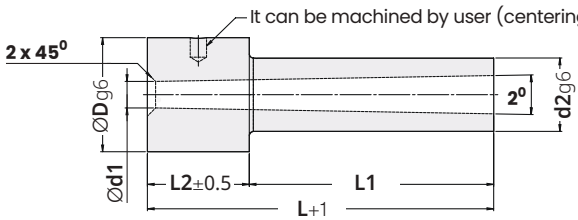


Max. Temperature: 500°C

Sprue Bush for Metal Injection

Code: **MEY**

Highly heat resistant / Hot-work tool steel / Cold runners.



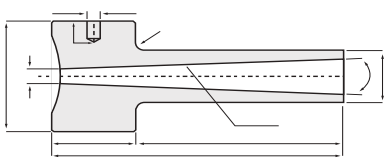
d2	L	d1	D	L1	L2
12	55	6.2	20	35	20
	65			45	
	75			55	
12	55	6.2	28	30	25
	65			40	
	75			50	
	85			60	
	95			70	
	105			80	
	115			90	
14	55	6.5	28	30	25
	65			40	
	75			50	
	85			60	
	95			70	
	105			80	
	115			90	

d2	L	d1	D	L1	L2
16	55	6.5	28	30	25
	65			40	
	75			50	
	85			60	
	95			70	
	105			80	
	115			90	
18	55	6.5	28	30	25
	65			40	
	75			50	
	85			60	
	95			70	
	105			80	
	115			90	
20	55	9.0	28	30	25
	65			40	
	75			50	
	85			60	
	95			70	
	105			80	
	115			90	

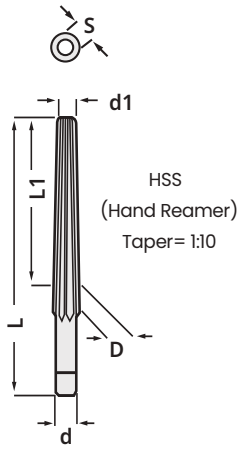
Order:
MEY. d2 x L x D

Material: 1.2344
Hardness: 48 - 50 HRC

Upon request / Custom-made orders.
For your order of special dimensions, technical drawing can be used:



We produce Special Nozzles Runners & Sprue Bushes as per request.



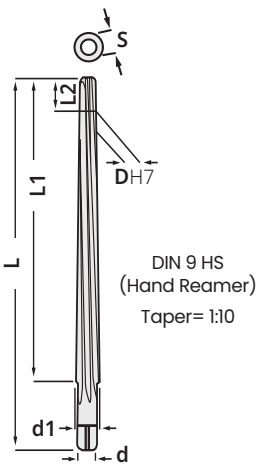
HSS
(Hand Reamer)
Taper= 1:10

Code: **KYR**

Taper Sprue Bush Reamer

d1	D	d	L	L1	S
4	10	10	100	70	8
9	16	12.5	120	80	10
14	24	20	160	110	16
20	32	25	200	140	20

Order:
KYE. d1 x D x L



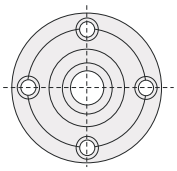
DIN 9 HS
(Hand Reamer)
Taper= 1:10

Code: **KPR**

Taper Pin Reamer

D	d1	d	L	L1	S
3	4.06	4	80	58	3.15
4	5.26	5	93	68	4
5	6.36	6.3	100	73	5
6	8.0	8	135	105	6.3
8	10.8	10	180	145	8
10	13.4	12.5	215	175	10
12	16	14	255	210	11.2
14	18	14	255	210	11.2
16	20.4	18	280	230	14

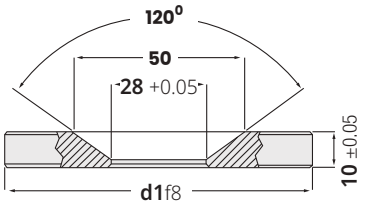
Order:
KPR. D x L



Locating Ring

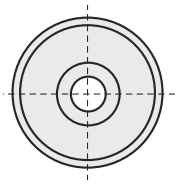
Code: **DYF**

Material: CK45 (ground)



Order Code	d1	Order Code	d1
DYF60	60	DYF125	125
DYF70	70	DYF150	150
DYF80	80	DYF175	175
DYF90	90	DYF200	200
DYF100	100		

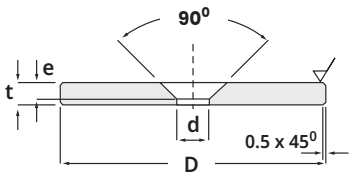
Note: Fitting holes can be machined upon request.



Locating Ring

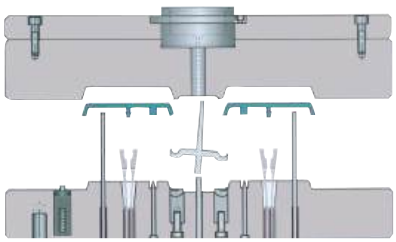
Code: **KYF**

Material: CK45 (ground)



Order Code	D	d	t	e
KYF60	60	28	15	8
KYF80	80	28	15	8
KYF100	100	28	20	10
KYF125	125	28	20	10
KYF150	150	28	20	10
KYF160	160	28	20	10
KYF175	175	28	20	10
KYF200	200	28	20	10

Note: Fitting holes can be machined upon request.

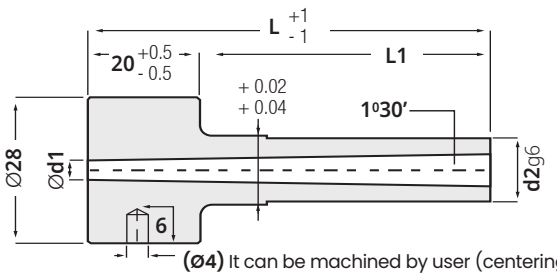


Sprue Bush - DIN 16752

Code: **EYM**

Two Different Angle Options

Standard Angle: d1 3.3 / angle 1.5⁰ - **Wide Angle:** d1 4.3 / angle 2⁰



(ø4) It can be machined by user (centering information).

d2	L	d1	L1
12	50	3.3	30
	65		45
	75		55
	85		65
	95		75
	105		85
	115	4.3	95
	125		105
	135		115
	150		130
	200		180
14	50	3.3	30
	65		45
	75		55
	85		65
	95		75
	105		85
	115	4.3	95
	125		105
	135		115
	150		130
	200		180

d2	L	d1	L1
16	50	3.3	30
	65		45
	75		55
	85		65
	95		75
	105		85
	115	4.3	95
	125		105
	135		115
	150		130
	200		180
18	50	3.3	30
	65		45
	75		55
	85		65
	95		75
	105		85
	115	4.3	95
	125		105
	135		115
	150		130
	200		180

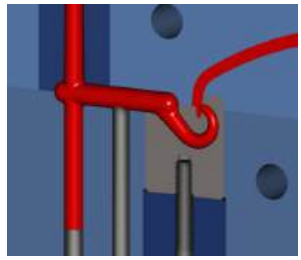
Order:
EYM. d2 x L x d1

Material: 1.2826
Hardness: 50 - 55 HRC

Tunnel Gate Inserts

EXAflow®

- **Benefits of Exaflow Tunnel Gate Inserts:**
- Perfect surface quality and concealed gate marks through tunnel gating, even on rear moulding wall thanks to innovative Ringelflow technology.
- Variable gate diameters from 0,5 to 3,5 mm.
- Clearly defined separating edge for precise degating.
- Save time and cost through fast & easy interchangeability.
- High wear resistance.
- Compact dimensions due to single-part design.
- Enhances moulding process reliability.
- Unsurpassed balance in multiple gating applications.



Code: **GTR**

Code: **GTE**

Code: **GTM** - Blank Gate

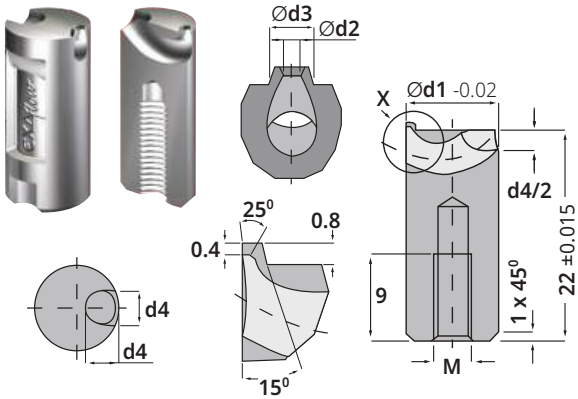
Code: **GTK**

NEW

Code: **GRF-5**

Code: **GMK**

Code: **GXK**



Standardflow - Gate Insert

Code: **GTR**

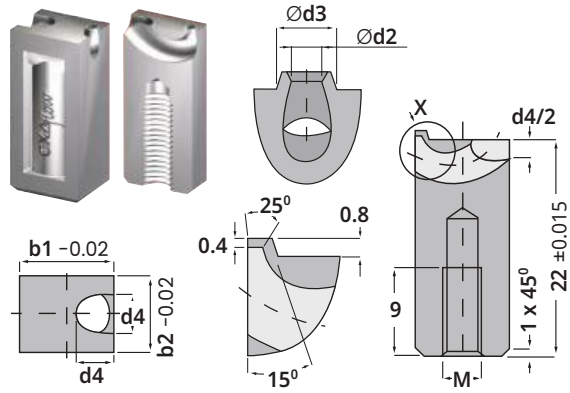
For tunnel gating of small to medium-sized mouldings along a flat separating plane. The projecting calotte ensures concealed degating.

- Available gate diameters from 0,8 to 2,4 mm.
- Usable for all thermoplastics including fillers up to 50 % glass fibre.

Order Code	d1	d2	d3	d4	M	Viscosity - Grams		
						High	Regular	Low
GTR10 - 08	10	0.8	2.1	4	4	8	7	5
GTR10 - 12		1.2	2.5			20	16	10
GTR10 - 14		1.4	2.7			30	23	15
GTR10 - 16		1.6	2.9			40	30	20

Order Code	d1	d2	d3	d4	M	Viscosity - Grams		
						High	Regular	Low
GTR12 - 08	12	0.8	2.1	5	5	8	7	5
GTR12 - 10		1.0	2.3			14	12	9
GTR12 - 12		1.2	2.5			20	16	10
GTR12 - 14		1.4	2.7			30	23	15
GTR12 - 16		1.6	2.9			40	30	20
GTR12 - 18		1.8	3.1			54	40	27
GTR12 - 20		2.0	3.3			68	52	34

Order Code	d1	d2	d3	d4	M	Viscosity - Grams		
						High	Regular	Low
GTR14 - 12	14	1.2	2.5	6	6	20	16	10
GTR14 - 14		1.4	2.7			30	23	15
GTR14 - 16		1.6	2.9			40	30	20
GTR14 - 18		1.8	3.1			54	40	27
GTR14 - 20		2.0	3.3			68	52	34
GTR14 - 22		2.2	3.5			85	65	43
GTR14 - 24		2.4	3.7			100	80	50



Standardflow - Gate Insert

Code: **GTE**

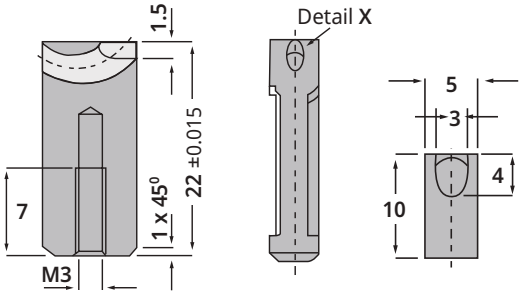
For tunnel gating of small to medium-sized mouldings along a flat separating plane. The projecting calotte ensures concealed degating.

- Available gate diameters from 0,8 to 2,4 mm.
- Usable for all thermoplastics including fillers up to 50 % glass fibre.

Order Code	d1	d2	d3	d4		M	Viscosity - Grams		
							High	Regular	Low
GTE10 - 08	10	8	0.8	2.1	4	4	8	7	5
GTE10 - 10			1.0	2.3			14	12	9
GTE10 - 12			1.2	2.5			20	16	10
GTE10 - 14			1.4	2.7			30	23	15
GTE10 - 16			1.6	2.9			40	30	20

Order Code	d1	d2	d3	d4		M	Viscosity - Grams		
							High	Regular	Low
GTE12 - 08	12	10	0.8	2.1	5	5	8	7	5
GTE12 - 10			1.0	2.3			14	12	9
GTE12 - 12			1.2	2.5			20	16	10
GTE12 - 14			1.4	2.7			30	23	15
GTE12 - 16			1.6	2.9			40	30	20
GTE12 - 18			1.8	3.1			54	40	27
GTE12 - 20			2.0	3.3			68	52	34

Order Code	d1	d2	d3	d4		M	Viscosity - Grams		
							High	Regular	Low
GTE14 - 12	14	12	1.2	2.5	6	6	20	16	10
GTE14 - 14			1.4	2.7			30	23	15
GTE14 - 16			1.6	2.9			40	30	20
GTE14 - 18			1.8	3.1			54	40	27
GTE14 - 20			2.0	3.3			68	52	34
GTE14 - 22			2.2	3.5			85	65	43
GTE14 - 24			2.4	3.7			100	80	50



Miniflow - Blank Gate Insert

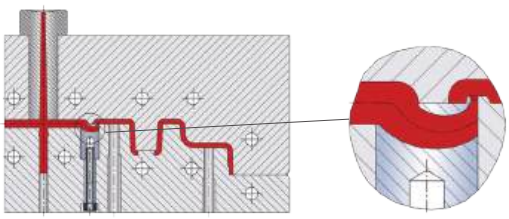
Order Code: **GTM**

For tunnel gating of small, thin-walled mouldings. This gate insert has a closed gate diameter and is therefore suitable for the use of low article weight and for very thin-walled mouldings.

- The closed surface enables the creation of individual gate diameter.
- Usable for all thermoplastics including fillers up to 50 % glass fibre.

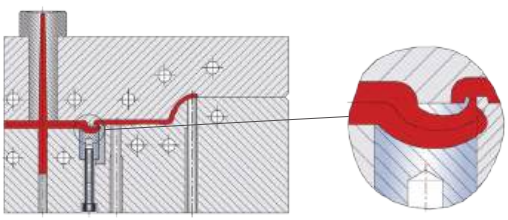
Installation Examples "GTR - GTE - GTM"

Standard



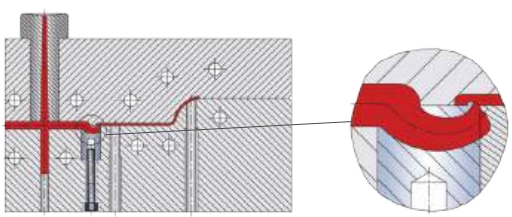
The front of the gate insert is sealed off by the mould cavity.
- to reduce pressure loss. / - to avoid jetting.

Flat Parts



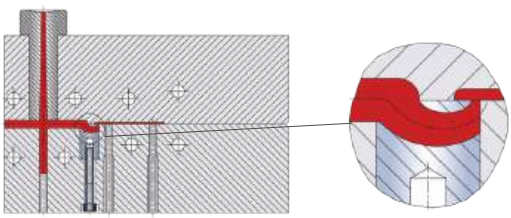
The front of the gate insert is fully sealed off by a companion calotte (baffle) on the cavity or by an auxiliary insert. - to reduce pressure loss. / - to minimize shear.

Thin-walled Parts Standardflow



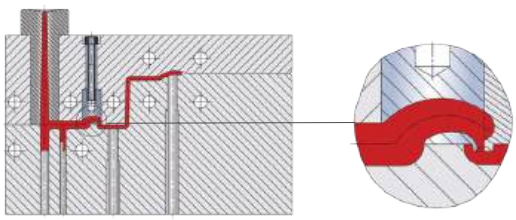
The calotte height can be reduced to a minimum of 0,4 mm. This is the height defined by the cutting edge. The front of the gate insert is sealed off by the cavity to the height of the parting line. - to reduce pressure loss. / - to minimize shear.

Thin-walled Parts Miniflow



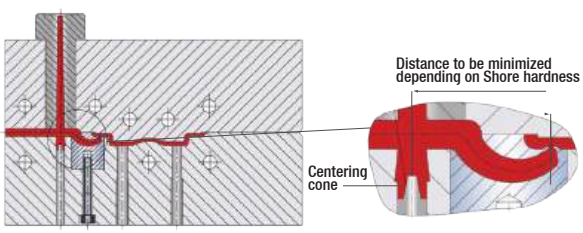
Designed for particularly thin-walled Parts (0,5 to 1,2 mm wall thickness). The tunnel gate insert has no calotte. Gating will occur flush with the moulding.
- The gating point will be flush with, or slightly projecting from, the bottom surface depending on plastic used.

Nozzle-side Installation



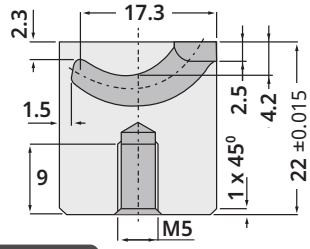
The gate insert is screwed into the nozzle side of the mould. The front of the gate insert is sealed off by the cavity.
- to reduce pressure loss. / - to minimize shear.

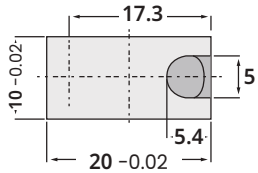
Thermoplastic Elastomers



When processing thermoplastic elastomers, please observe the following recommendations to ensure reliable demoulding: - The distance "L" should decrease with the Shore hardness value. / - A centering cone should be provided. / - This application instruction applies to elastomers in the medium Shore hardness range up to 100 Shore A.

EXAflow®



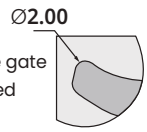


Konturflow - Contourable Gate Insert

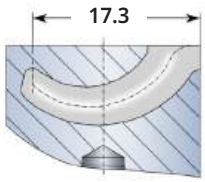
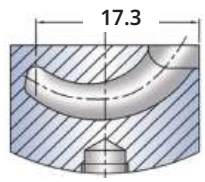
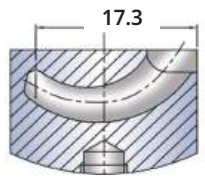
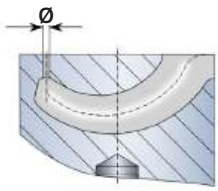
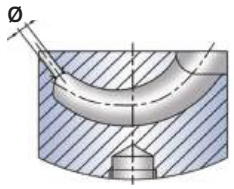
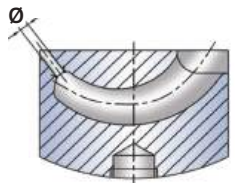
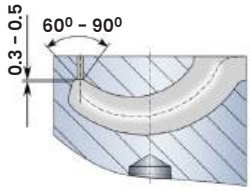
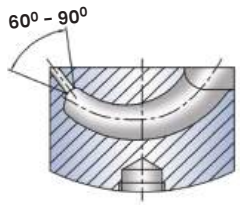
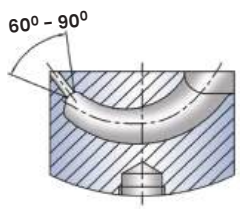
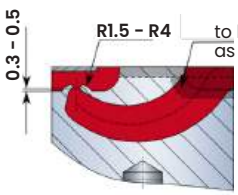
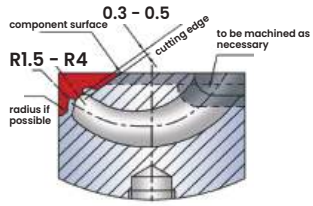
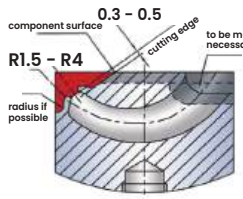
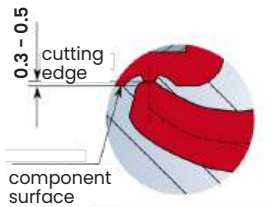
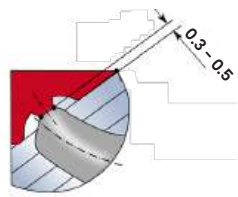
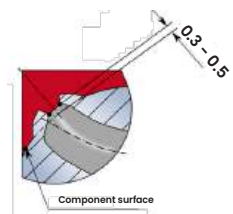
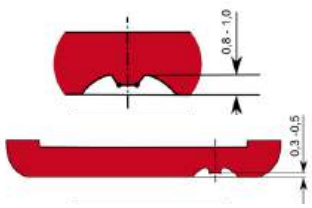
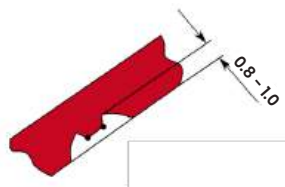
Order Code: **GTK**

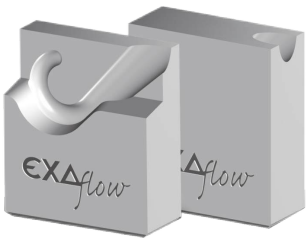
For tunnel gating of small to medium sized mouldings contoured in the gate area.

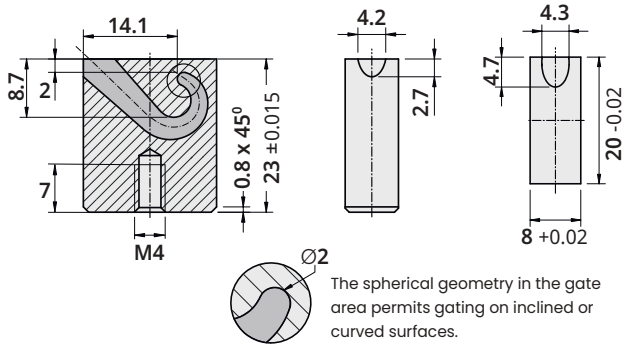
- Maximum gate diameter (pointed tunnel) up to 1,7 mm.
- Contourable up to 3 mm depth.
- Usable for all thermoplastics including fillers up to 50 % glass fibre.



The spherical geometry in the gate area permits gating on inclined or curved surfaces.

Calotte Design: Standard	Calotte Design: Inclined Surface	Calotte Design: Curved Surface
 Contourable insert in unfinished state	 Contourable insert in unfinished state	 Contourable insert in unfinished state
 Diameter to be defined in accordance with the table	 Diameter to be defined in accordance with the table	 Diameter to be defined in accordance with the table
 Define 60⁰ to 90⁰ angle at bore / tunnel intersection point	 Define 60⁰ to 90⁰ angle at bore / tunnel intersection point	 Define 60⁰ to 90⁰ angle at bore / tunnel intersection point
 to be machined as necessary		 Calotte wall thickness to be between 0.5 and 0.7 mm
		
		Height of the calotte





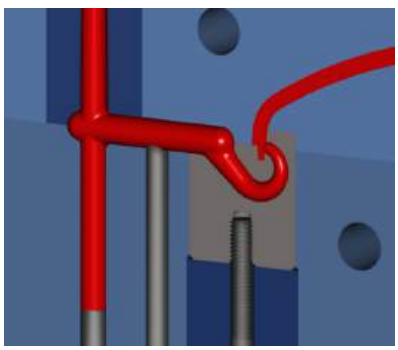
The spherical geometry in the gate area permits gating on inclined or curved surfaces.

New - Ringelflow

Order Code: **GRF-5**

For rear surface gating of small-to-medium sized mouldings. Supports gate diameters up to 1.8 mm and shot weights up to 100 g per insert. The GRF-5 from EXAflow® can be used to process all common non reinforced plastic types. For filled and brittle plastics please contact us beforehand!

Installation Examples "GRF-5"

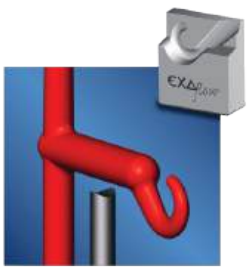


For best operating results the Ringelflow insert requires one central ejector and one supporting ejector. Please ensure that all sharp edges in the runner are thoroughly rounded. For reliable demoulding, the diameter of the runner must exceed that of the curved tunnel.

Contouring of a supporting ejector

Optimum gate geometry, with edges rounded

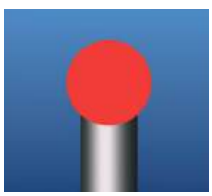
Runner and Supporting Ejector



Example of a **Ringelflow GRF-5** gate configuration

Example of a **Maxiflow GXK** gate configuration

In these examples the contoured supporting ejector is shown displaced towards the bottom for the sake of clarity. For reliable demoulding, the diameter of the runner must exceed that of the curved tunnel.



The supporting ejector, locked against rotation, ends flush with the runner.

Machine the runner contour into the supporting ejector.

Ringelflow GRF-5 and **Maxiflow GXK** inserts must be used in conjunction with a supporting ejector. The contoured supporting ejector, locked against rotation, should end flush with the runner so that the runner can slide over the ejector's supporting face

- **Ringelflow "GRF-5" Benefits**
- Optimum solution to prevent jetting.
- No gate marks on visible external surfaces and bottom wall.
- Ideal for fully rounded edges.
  Example; toys, mouldings with sealing edges and joints.
- Permits internal gating of 2-component mouldings.

Technical Support for Tunnel Gate Inserts

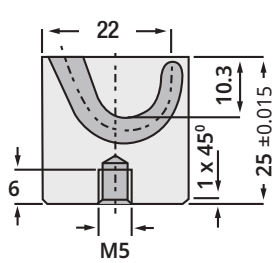
You can request the "Tunnel Gate Inserts Information Form" from us. The form filled by you will be examined by our engineers and the most suitable method will be produced for you.

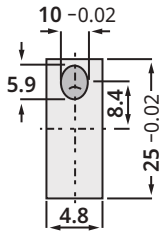
* * *

We are supporting you with customizable offers about technical and costing issues of your projects and we are producing the best solutions.

info@guvenal.net • www.guvenal.net

EXAflow®

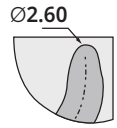




Midiflow - Contourable Gate Insert

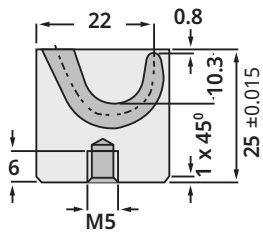
Code: **GMK**

For bottom (submarine) gating of medium components. Supports contouring to a depth of 8 mm. Suitable for gate diameters up to 2 mm and shot weights up to 200 g per insert. Suitable for all common plastics, including reinforced types.



The spherical geometry in the gate area permits gating on inclined or curved surfaces.

Order Code: GMK - 1

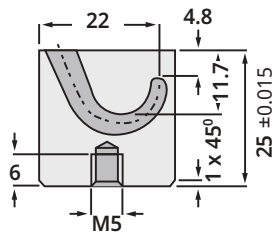


Installation Example:
Below the parting line

Installation Example:
Above the parting line

Midiflow "GMK-1" Benefits
- Gating point may be located up to 8 mm above the parting line.
- Permits gating immediately behind projecting ribs.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.

Order Code: GMK - 2

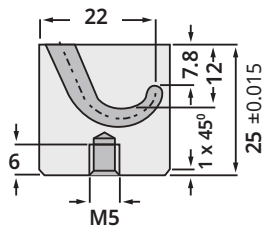


Installation Example:
Below the parting line

Installation Example:
Above the parting line

Midiflow "GMK-2" Benefits
- Gating point may be located up to 5 mm below or above the parting line.
- Permits gating immediately behind projecting ribs.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.

Order Code: GMK - 3

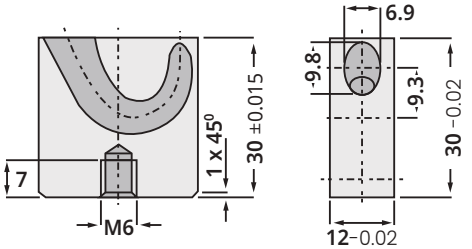


Installation Example:
Below the parting line

Installation Example:
Above the parting line

Midiflow "GMK-3" Benefits
- Gating point may be located up to 8 mm below the parting line.
- Permits gating immediately behind projecting ribs.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.

EXAflow®

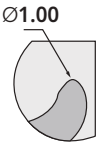


Maxiflow - Contourable Gate Insert

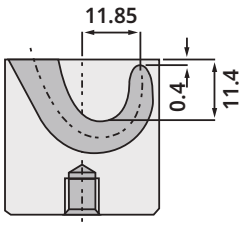
Code: **GXK**

For bottom (submarine) gating of medium to large components. Supports contouring to a depth of 11,5 mm. Suitable for gate diameters up to 3,5 mm and shot weights up to 1,200 g per insert. Suitable for all common plastics, including reinforced types.

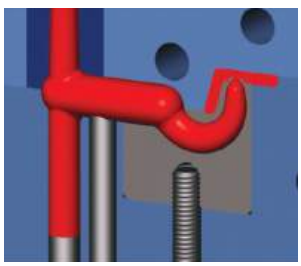
The spherical geometry in the gate area permits gating on inclined or curved surfaces.



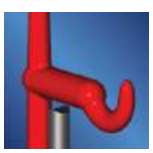
Order Code: GXK - 1



Installation Example



For best operating results the Maxiflow insert requires one central ejector and one supporting ejector. Please ensure that all sharp edges in the runner are thoroughly rounded. For reliable demoulding, the diameter of the runner must exceed that of the curved tunnel.

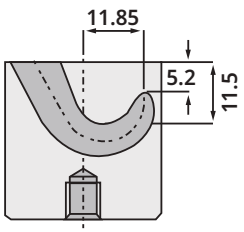


Contouring of a supporting ejector

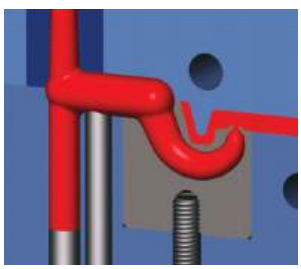
Optimum gate geometry, with edges rounded

Maxiflow "GXK-1" Benefits
- Gating point may be located up to 10 mm above the parting line.
- Permits gating immediately behind projecting ribs.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.

Order Code: GXK - 2



Installation Example



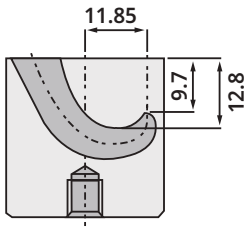
For best operating results the Maxiflow insert requires one central ejector and one supporting ejector. Please ensure that all sharp edges in the runner are thoroughly rounded. For reliable demoulding, the diameter of the runner must exceed that of the curved tunnel.

Contouring of a supporting ejector

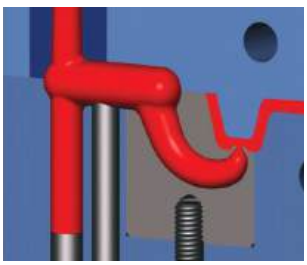
Optimum gate geometry, with edges rounded

Maxiflow "GXK-2" Benefits
- Gating point may be located up to 5 mm above or below the parting line.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.

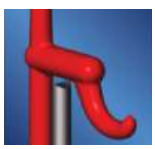
Order Code: GXK - 3



Installation Example



For best operating results the Maxiflow insert requires one central ejector and one supporting ejector. Please ensure that all sharp edges in the runner are thoroughly rounded. For reliable demoulding, the diameter of the runner must exceed that of the curved tunnel.



Contouring of a supporting ejector

Optimum gate geometry, with edges rounded

Maxiflow "GXK-3" Benefits
- Gating point may be located up to 10 mm below the parting line.
- Gate may be remote from moulding wall.
- The spherical geometry in the gate area permits gating on inclined or curved surfaces.

GTM - GTR / GTE - GTK

Plastic Group	GTM	GTR/GTE	GTK
HD-PE, LD-PE PET, PP, PA PC, PVC. (L)	>15	>20	>25
Runner design	round	round	round
Ejector depth (AT)	>11	>16	>20
ABS, M ABS, ASA PS, PC-ABS POM, PBT. (L)	>20	>25	>30
Runner design	round	round	round
Ejector depth (AT)	>14	>20	>24
Elastomere TPE TPU, TPP, TPA.(L)	>15	>15	>20
Runner design	arbitrary	arbitrary	arbitrary
Ejector depth (AT)	>11	>11	>16
Brittle Plastics	>25	>30	>40
Runner design	half-round	half-round	half-round
Ejector depth (AT)	>18	>24	>32

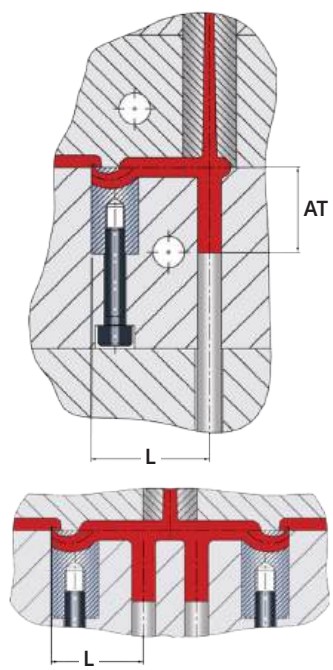
GXK - GMK

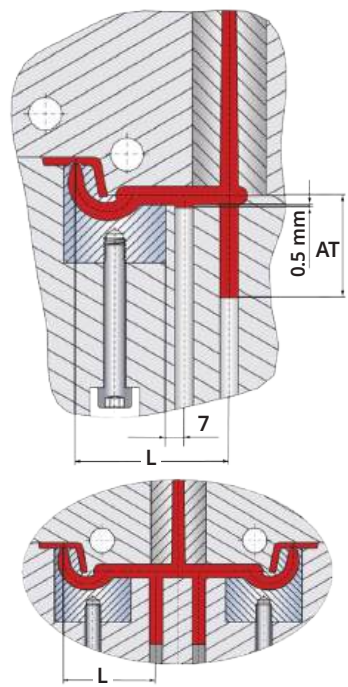
Plastic Group	GXK	GMK
HD-PE, LD-PE PET, PP, PA PC, PVC. (L)	>35	>30
Runner design	round	round
Ejector depth (AT)	>35	>30
ABS, M ABS, ASA PS, PC-ABS POM, PBT. (L)	>40	>35
Runner design	round	round
Ejector depth (AT)	>40	>35
Elastomere TPE,TPU, TPP, TPA. (L)	>30	>25
Runner design	arbitrary	arbitrary
Ejector depth (AT)	>30	>16
Brittle Plastics	on request	on request
Runner design	half-round	half-round
Ejector depth (AT)	on request	on request

GRF-5

Plastic Group	GRF-5
HD-PE, LD-PE PET, PP, PA PC, PVC. (L)	>35
Runner design	round
Ejector depth (AT)	>35
ABS, M ABS, ASA PS, PC-ABS POM, PBT. (L)	>40
Runner design	round
Ejector depth (AT)	>40
Elastomere TPE TPU, TPP, TPA. (L)	>30
Runner design	arbitrary
Ejector depth (AT)	>35
Brittle Plastics	on request
Runner design	half-round
Ejector depth (AT)	on request

Recommended distances "L" from the injection point to the sprue ejector are given above for the various material groups.
The distance "AT" describes the correlated ejector depth.





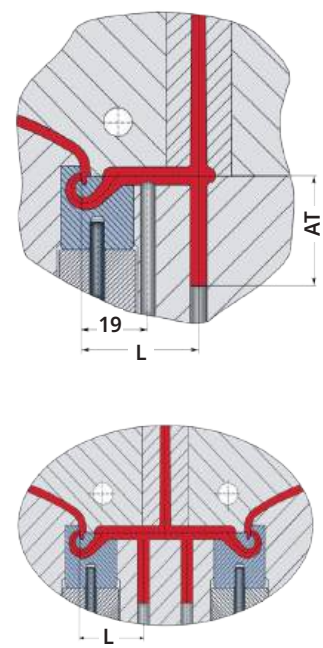
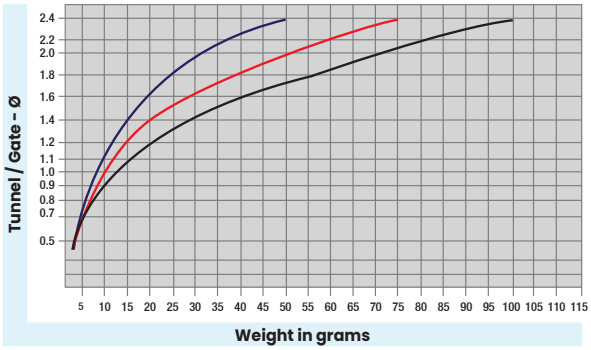


Table of Viscosity "GTR - GTE - GTM"



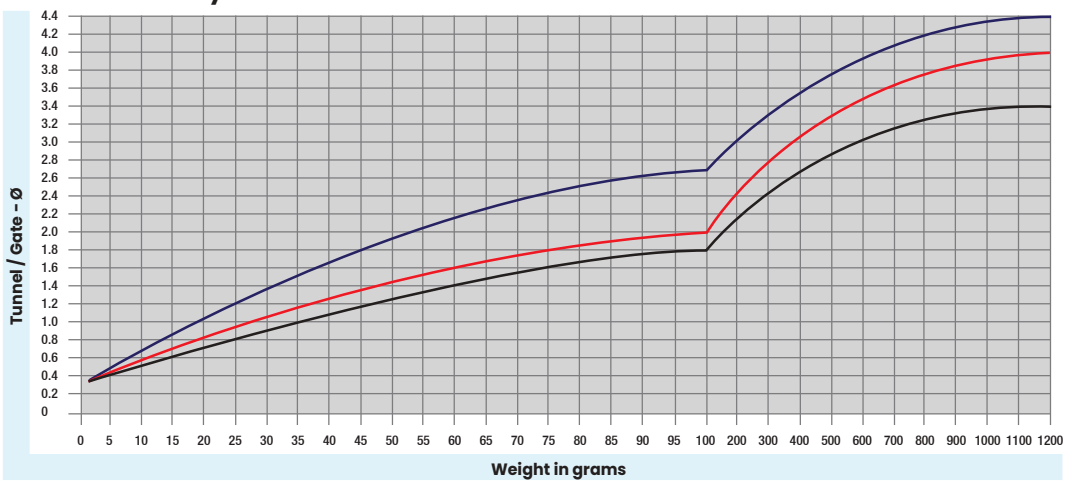
EXAflow®

Low Viscosity:
PA, PE, PC, PP, PET, PVC, PS, SB, TPA, TPE, TPU

Medium Viscosity:
ABS, ASA, PS, PC-ABS, PBT, SAN

High Viscosity:
PC, PPS, PSU, POM-H, PES, PPO, PEI, PC-ABS
PC-PBT, PMMA, PVC

Table of Viscosity "GTK - GMK - GXK - GRF"



Frequently asked questions and answers about Tunnel Gate Inserts

+ What's the ideal distance between injection point and ejector ? - For the choice of the distance (L) we provide you with a spreadsheet in the support section. You can read about the distances depending on the type of Exaflow gate inserts and materials there. In sp cial cases please get in touch with our application engineers.

+ How can you prevent open jet formations ? - An open jet formation can be prevent by following parameters:
* Use of a higher gate insert diameter * Install dead-end recess * Graduated injection profile (reduce injection speed)
* Increase mass temperature * Increase screw back pressure * Increase tool temperature around the area of the injection point.

+ Can Exaflow gate inserts be used for mouldings with a wall th ckness below 1,2mm ? - For the production of mouldings with a thin wall thickness we recommend our Miniflow (without head). If a 100 % unk gate must be warranted it's possible to grind down the head of our standard Exaflow up to 0.4 mm (please attend our application ex mples).

+ Can terpolymeres be processed (PEI) ? - Terpolymeres can be processed without any problems, however the gate diameter and the distance between gate and ejector should be designed as big as possible.

+ Can Liquid crystal polymers be processed (LCP) ?- LCP's can be processed without any problems, however the cold runner cross section and the gate cross section should be as small as possible since the material "lives by the shearing".

+ How are the gating properties for polyolefins (PE,PP) ? - Polyolefins tend to thread forming (during the demoulding pro ess) thus during the injection moulding of flat components an impact wall around the area of the head should be installed (please attend our application examples).

+ What does the dead-end recess do ? - The dead-end recess has several influences on the injection p ocess: * Decrease of shearing * Reduction of pressure loss (up to 33 % in the injection region) * Improves the laminar flow * Prevents open jet formations due to improved laminar flow and the flow front gets an unsymmetrical velocity ofile which results in a spin that makes the flow front attach the interior wall of the moulding during the ejection process and brakes the following molten mass.

+ What is the right cross-section of the gate ? - The cross-section of the gate depends on the processed materials, shot weight and the proportion of flow path and wall thickness. (please look at the spreadsheet in our support section). The recommended distance between gate and ejection can't be adhered. In general, Exaflow recommends a full-round cold runner cross-section. If the recommended distance can't be adhered we recommend a half-round cold runner cross-section to ensure the necessary deflection

+ Is a trapezoidal shaped cold runner distributor possible ? - A trapezoidal shaped cold runner distributor is possible in general but due to the result of it's geometry it's the most constrained variant of a cold runner. For an unproblematic demoulding process a long distance between gate and ejector should be picked.

+ How can you prevent the rough spot around the gate area ? - Problems usually occur with high-viscosity materials (PC, PMMA, ABS). Solution: * Graduated injection profile (fills the gate region slowly * Increase cylinder temperature, increase back pressure * Increase tool temperature * Increase gate diameter * Inject the moulded part at a different spot.

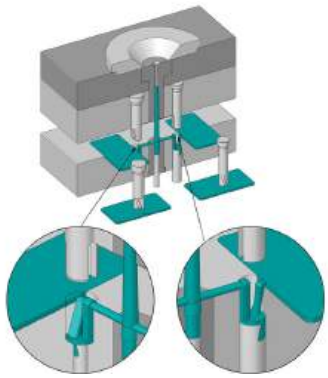
+ Is it possible to process thermoplastic elastomers? (TPU,TPE,TPA....) - Processing thermoplastic elastomeres is possible without any problems. However you should focus, in coherence with the shore hardness, the design of the cold runner connection. You can find assistance for this in the support section

In-mould Edge Gate Cutting Components (automation systems)

- The Cutting Pin provides automation in cutting edge gates.
- The large gate enables a reduction in injection pressure and improves packing and part quality.
- The trouble-free runner is ejected from below.
- Drawings and 3D CAD Datas can be downloaded from our website **www.guvenal.net**

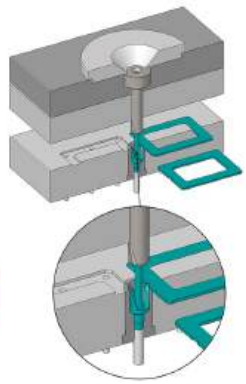
Straight Edge Cutting

Semi Circle Edge Cutting



Straight Edge Cutting Pin

Round Cutting Pin



Edge Gate Cutting Sprue Bush

Cutting Pins are particularly effective and reliable in cutting hard engineering materials filled or unfilled as well as commodity plastics.

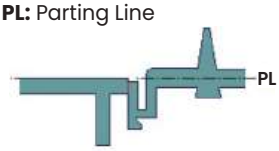
The Main Benefits:

+ A gentle cutting so effective for hard engineering materials.
+ Large gate improves packing and the quality of the part.
+ Reliable ejection of cold runner system.
+ Simple and interchangeable.

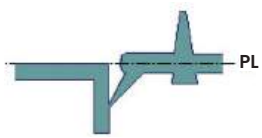
The main reason for this claim is that the cutting action of the pins is spread along the full length of the cutting edge as well as the cutting action is like slicing with a knife. The cut is performed against the plastic part so there is no wear on the mould metal part.

Cutting Pins are designed to feed the edge of the plastic part positioned at the parting line of the mould.

PL: Parting Line

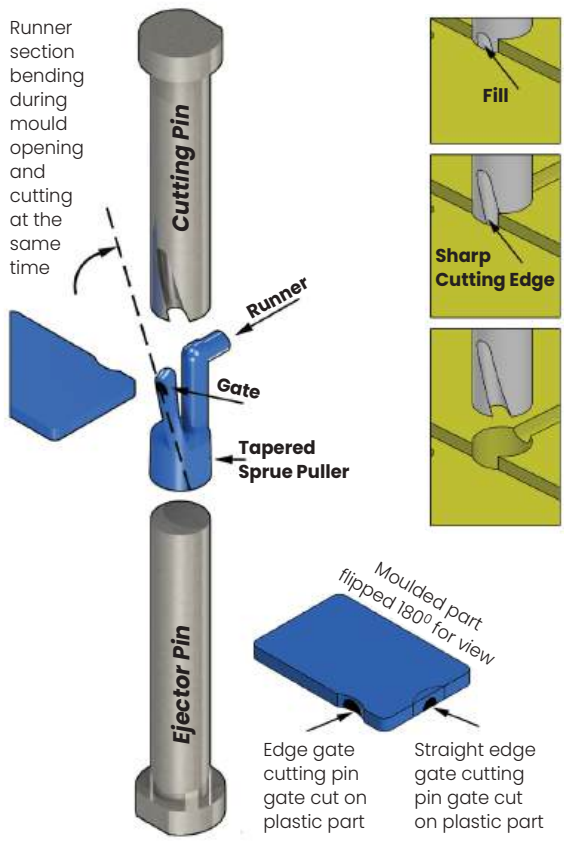


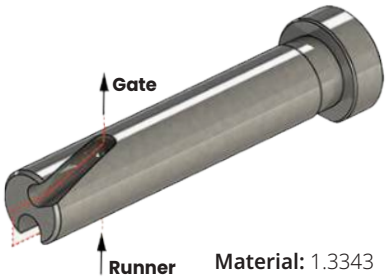
Edge Gate Cutting



Submarine Gate Cutting

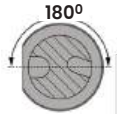
Submarine gates are designed to feed the part further up/down on the side wall of the plastic part. With a submarine gate the cutting action is hard, and the full cutting happens inside the size of the gate and it is cutting against the metal part of the mould.



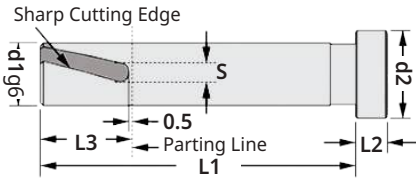


Material: 1.3343
Hardness: 62 HRC

P10.50.1 & P12.60.1:



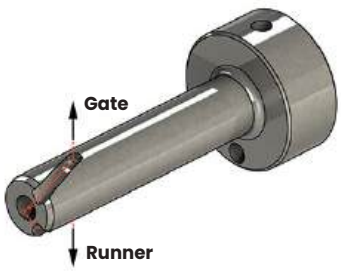
P12.60.2.90:



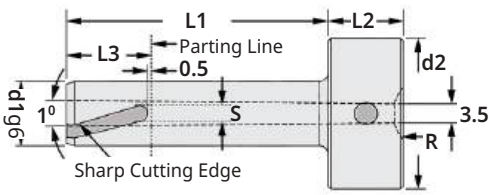
P10.50.2.120 & P12.60.2.120:

In-mould Edge Gate Cutting Pin

Order Code	d1	d2	L1	L2	L3	S	Gates
P10.50.1	10	13.7	50	5	14.5	3	1 / 180⁰
P10.50.2.120	10	13.7	50	5			2 / 120⁰
P12.60.1	12	16.5	60	7			1 / 180⁰
P12.60.2.90	12	16.5	60	7			2 / 90⁰
P12.60.2.120	12	16.5	60	7			2 / 120⁰

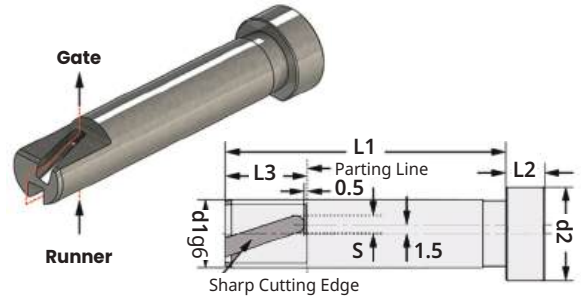


Material: 1.2826
Hardness: 54 HRC



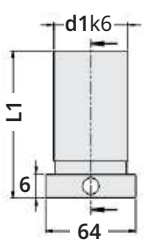
In-mould Edge Gate Cutting Sprue Bush

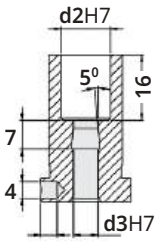
Order Code	d1 mm	d2 mm	L1 mm	L2 mm	L3 mm	S mm	R
SB12.56.2.RF	12	28	56	13	14.5	3	Flat
SB12.76.2.RF			76				Flat
SB12.56.2.RF155			56				15.5
SB12.76.2.RF155			76				15.5



In-mould Edge Gate Straight Cutting Pin

Order Code	d1	d2	L1	L2	L3	S	Gates
SE-P.12.60.1	12	16.5	60	7	14.5	3	1 / 180⁰

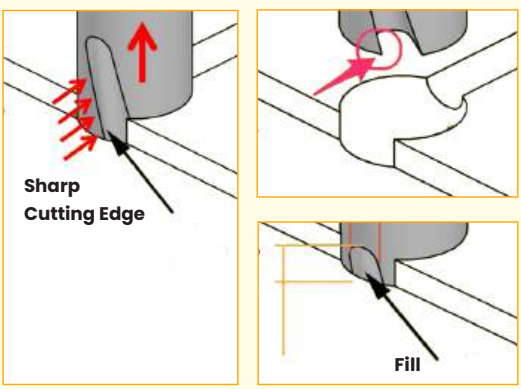




Sprue Puller
Material: 1.2510
Hardness: 58-60 HRC

Order Code	d1	d2	d3	d4	L1
SP16.36	16	10	6	20	36
SP18.36	18	12	6	22	36

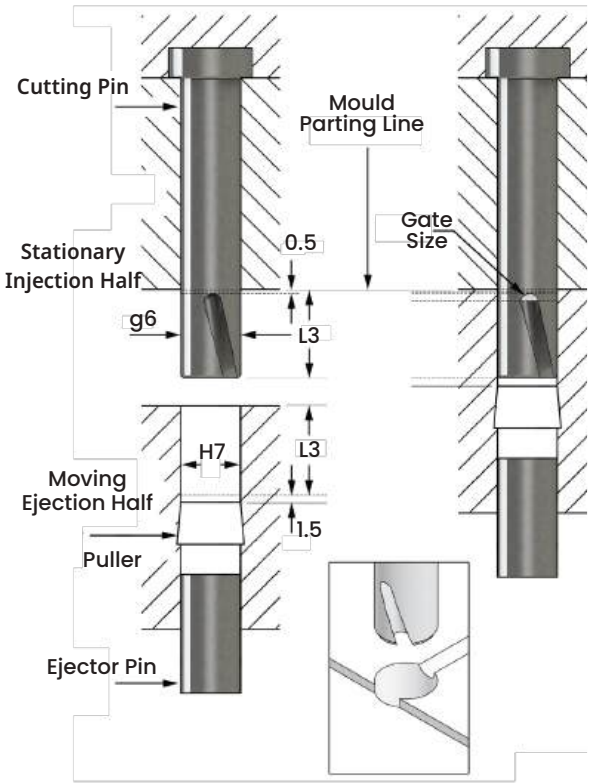
The Cutting Pins cut along the full length of the cutting edge.



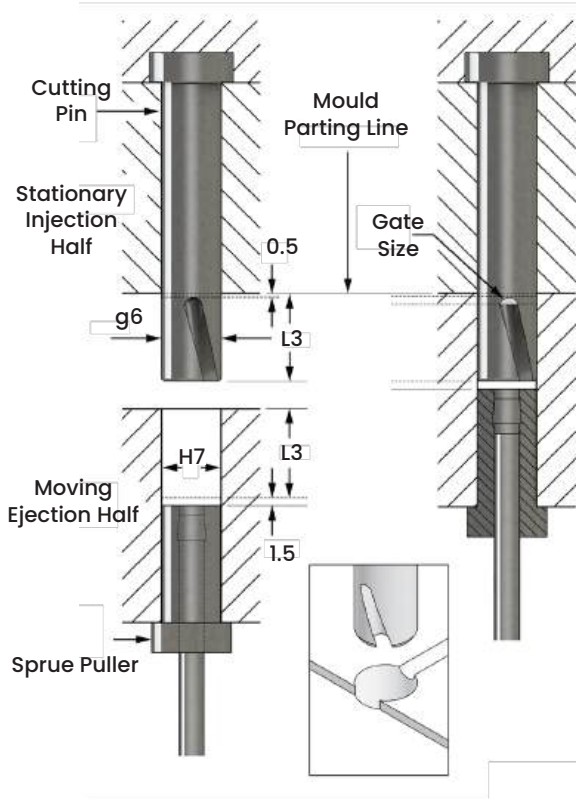
The Cutting Pins also enable a large gate opening to improve the mould fill and packing, keeping the gate open for the longest possible time and so improving the quality of the plastic part.

The Cutting Pins ejecting arrangement is reliable and does not leave the possibility of plastic remnants sticking to the mould. The installation arrangement of the cutting pin in the injection side creates a cold well for plastic material.

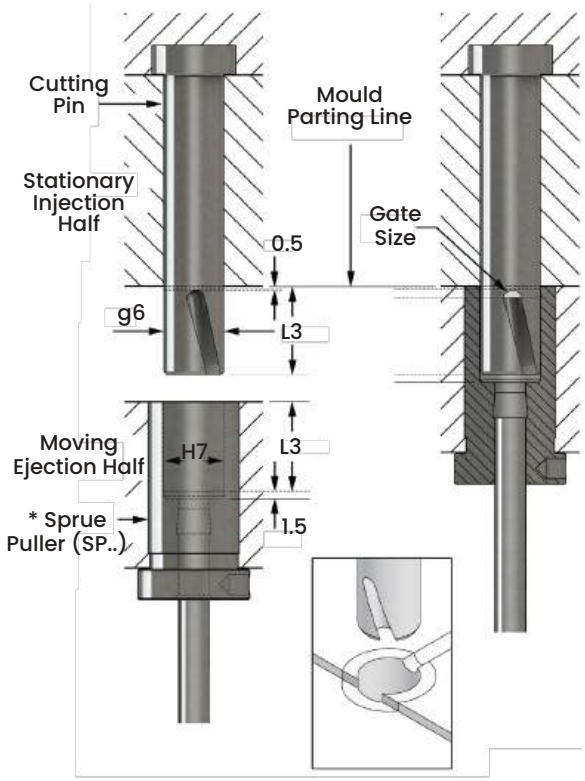
Cutting Pin / Installation Info - 1 :



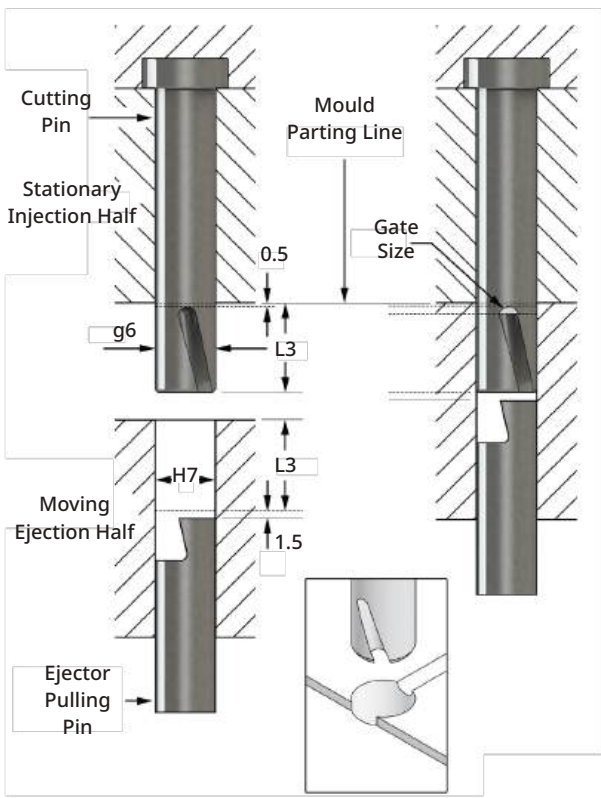
Cutting Pin / Installation Info - 2 :



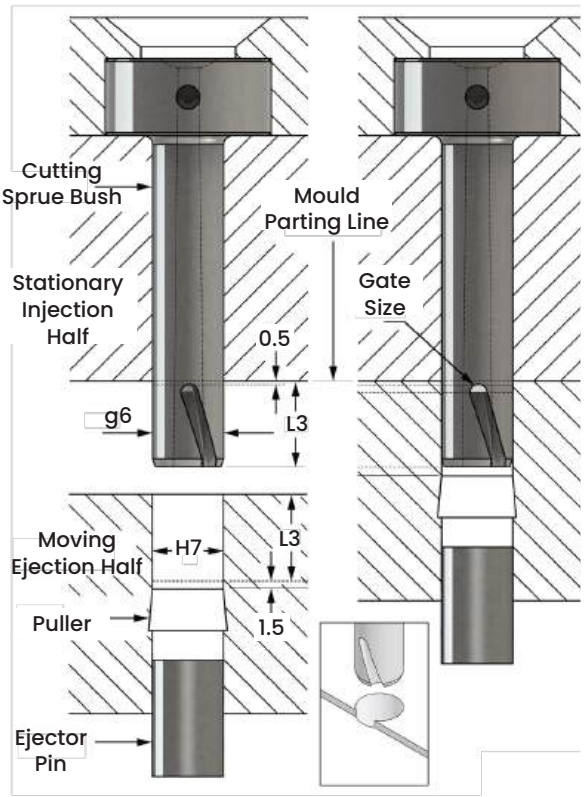
Cutting Pin / Installation Info - 3 :



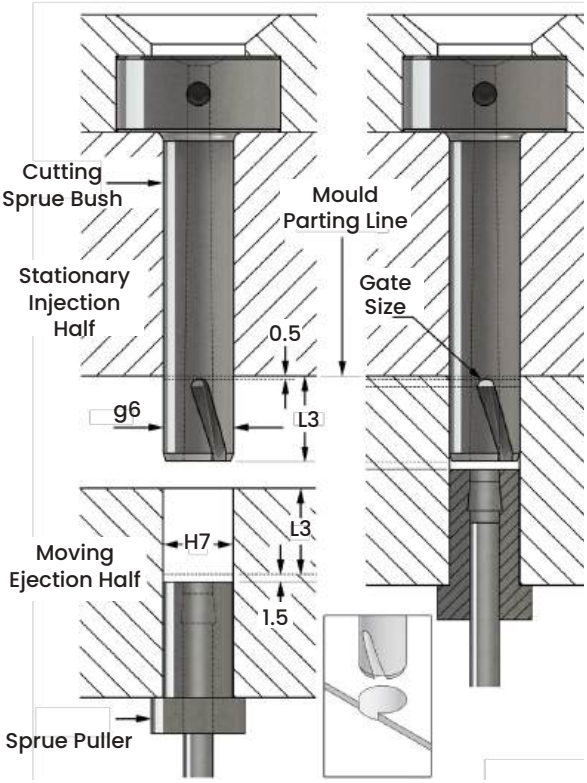
Cutting Pin / Installation Info - 4 :



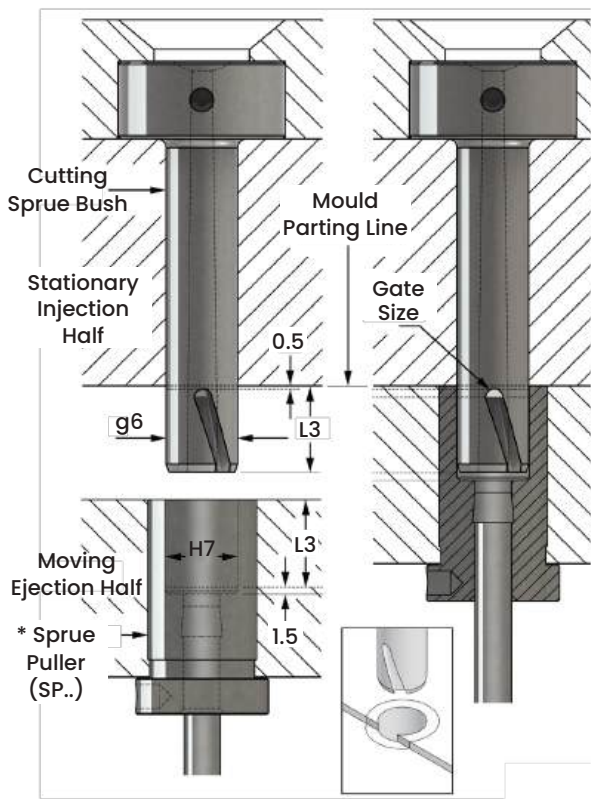
Cutting Sprue Bush / Installation Info - 1:



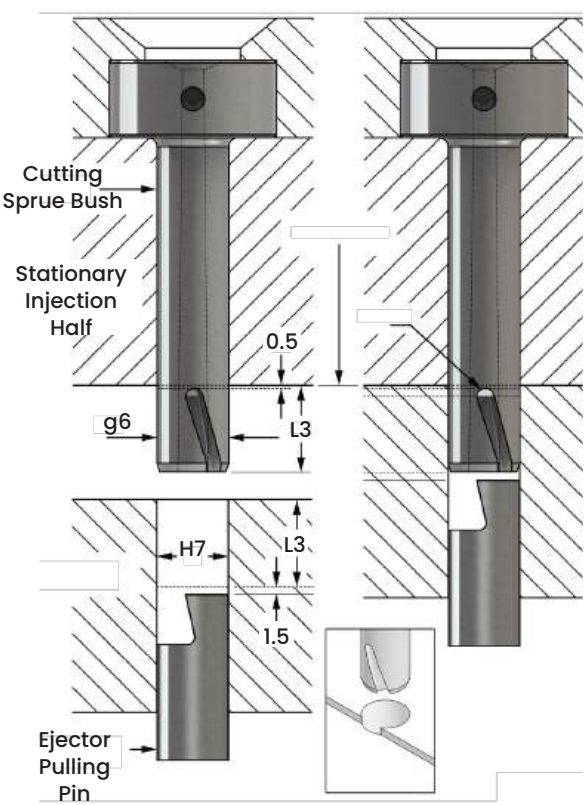
Cutting Sprue Bush / Installation Info - 2:

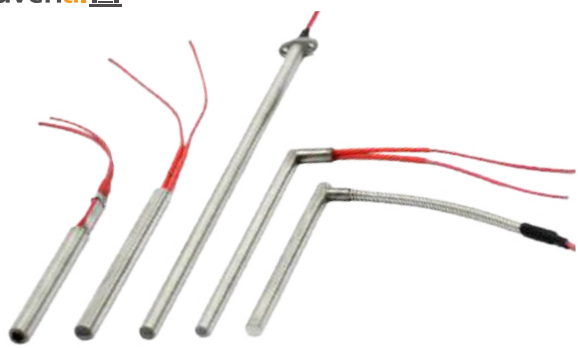


Cutting Sprue Bush / Installation Info - 3:

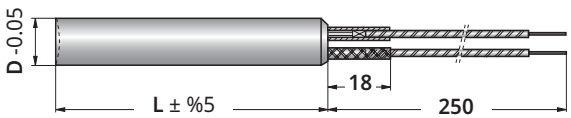


Cutting Sprue Bush / Installation Info - 4:





Cartridge Heater with Thermocouple Code: FR



D	WATT (230V)										
L	40	50	60	80	100	130	160	200	250	300	400
6.5 -0.02 -0.04	80 100 125 160 200	125 160 200 250 315	125 160 200 250 315	160 200 250 315	200 250 315 400	250 315 400 500	250 315 400 500	-	-	-	-
8.0 -0.03 -0.05	125 160 200	125 160 200 250	160 200 250 315	200 250 315 400	200 250 315 400	250 315 400 500	250 315 400 500	-	-	-	-
10 -0.03 -0.06	125 160 200 250 315	160 200 250 315 400 500	160 200 250 315 400 500	200 250 315 400 500 630	250 315 400 500 630 800	315 400 500 630 800 1000	400 500 630 800 1000	-	-	-	-
12.5 -0.04 -0.07	160 200 250 315	160 200 250 315 400	200 250 315 400 500	200 250 315 400 500 630	315 400 500 630 800 1000	315 400 500 630 800 1000	400 500 630 800 1000 1250	500 630 800 1000 1250 1600	630 800 1000 1250 1600 2000	630 800 1000 1250 1600 2000	-
16 -0.05 -0.08	-	200 250 315 400	200 250 315 400 500	250 315 400 500 630 800	315 400 500 630 800 1000	400 500 630 800 1000 1250	500 630 800 1000 1250 1600	630 800 1000 1250 1600 2000	630 800 1000 1250 1600 2000	800 1000 1250 1600 2000 2500	800 1000 1250 1600 2000 2500
20 -0.06 -0.10	-	-	-	400 500 630	400 500 630	500 630 800 1000	630 800 1000 1250	800 1000 1250 1600	1000 1250 1600 2000	1000 1250 1600 2000	1250 1600 2000 2500

Standard Type with Thermocouple
The hot junction of the thermocouple is grounded to the lower washer and guarantees a rapid response of the temperature.

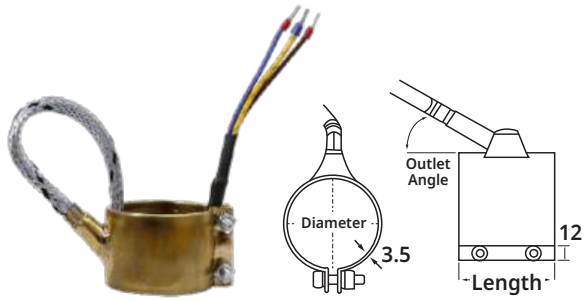
Optional Type-2
The hot junction of the thermocouple is located in the center of the lenght in non-heating zone and ground to the casing.

Cartridge Heaters, with advanced technology, offer high performance in tough conditions and small spaces. The resistance wire, wrapped around ceramic with magnesium oxide powder, is placed close to the stainless steel tube for efficient heat transfer.

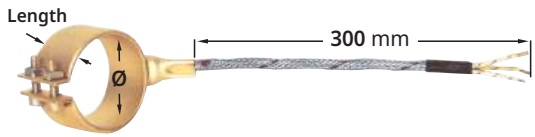
* Slot/housing must be smooth and even.
* Proper temperature control extends heater life.
* Custom orders available.

Order: **FR.** D x L x watt

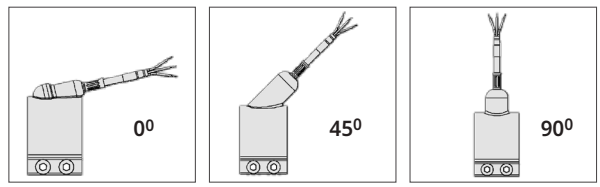
Order Example: **FR.** 10 x 50 x 250



Band Heater Code: KR



Outlet - Angle Options:



Ø	Length	Watt
25	30	120
30	25	120
	30	140
	35	165
	40	185
35	25	135
	30	165
	35	190
	40	220
	45	235
40	25	155
	30	190
	35	220
	40	250
	45	280
42	25	165
	30	200
	35	230
	40	265
45	25	175
	30	210
	35	250

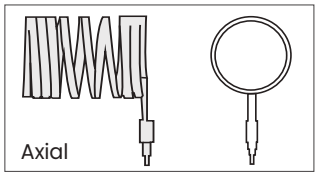
Ø	Length	Watt
45	40	280
	45	320
	50	350
50	25	195
	30	235
	35	275
	40	315
	50	390
55	25	215
	30	260
	35	300
	40	345
	50	430
60	25	235
	30	280
	35	330
	40	375
	50	470
	60	565
65	25	255
	35	355
	50	510

Ø	Length	Watt
70	25	270
	30	330
	35	385
	40	440
	50	550
	60	660
75	30	355
	40	470
	50	590
	60	705
80	25	310
	30	375
	35	440
	40	500
	50	630
	60	750
100	25	390
	30	470
	35	550
	40	630
	50	785
	60	940

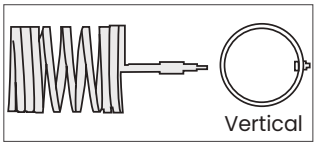
With its economical prices, excellent insulation, outlets reinforced for long use, inner sleeve rolling it is excellent.
It can be produced as thermocouple as per request.
Standard 300mm wire is used, it can be extended as per request. Also, as per request special production can be made.
Power: 5 W/cm² - 230V
Sleeve / Band Material: Copper, tin alloy / Cr - Ni wire in brass.
Energy Wire: Pure nickel 300mm length, glassfiber fireproof wire outside, external armour 304 stainless steel mesh wire.
Fasteners: Stainless, cylinder head cap screw - M5 x 30.

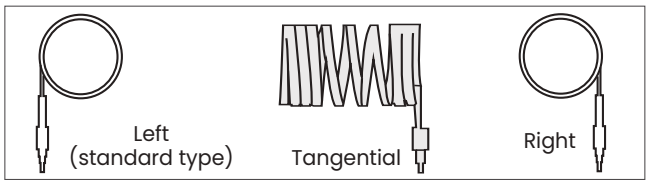
Order: **KR.** Ø x Length x Angle

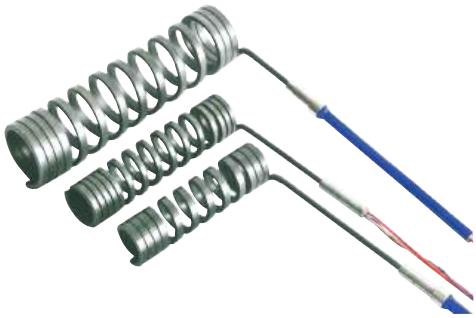
Order Example: **KR.**30 x 30 x 45



Outlet Options:

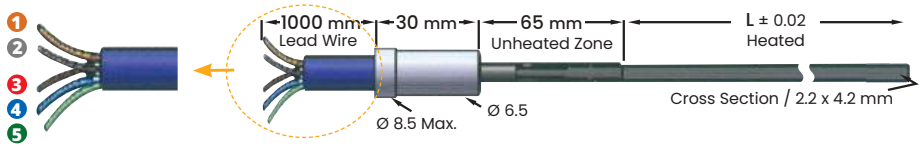


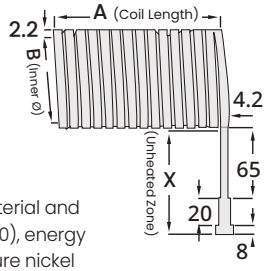




Coil Heater

Code: **SR**





Lead Wire Definitions:

1 – Orange (thick) Phase
2 – Gray (thick) Neutral
3 – Red (thin) + Thermocouple
4 – Blue (thin) – Thermocouple
5 – Green (thick) Earthing

Coil Heaters of Nozzle Used in Hot Runner Systems:
In Coil Heaters, coiled section is from 321 quality stainless steel material and heater wires inside the tube is from 8020 chrome nickel (Cr-Ni 8020), energy wires are prepared and delivered by coiling as per request with pure nickel conductive, high quality fireproof cable resistant to 400°C and teflon coated insulation.

Wattage (W)	200	225	250	290	350	400	470	620	690	850	950	1100	1200	1400	1600
Heated Length L (mm)	250	280	335	385	460	520	600	760	900	110	1200	1400	1550	1750	1950

Heated (coiled) Zone / "A" Length and Wattage Values:

A (coil)	20	40	60	80	100	120	140	160	180	200	220	240	260
B (inner Ø)	Heated Zone Wattage Values												
10 mm	-	200	250	350	350	350	400	470	470	620	-	-	-
12 mm	-	225	290	400	400	400	470	620	620	620	-	-	-
12.5 mm (1/2")	-	225	290	400	400	400	470	620	620	690	-	-	-
14 mm	-	250	350	400	400	470	620	620	690	690	-	-	-
15 mm	-	250	400	470	470	620	620	620	690	-	-	-	-
16 mm (5/8")	-	250	400	470	470	620	620	690	690	-	-	-	-
18 mm	-	290	400	620	620	620	690	690	-	-	-	-	-
19 mm (3/4")	-	290	470	620	620	620	690	850	950	950	1100	1200	1200
20 mm	-	290	470	620	620	690	690	850	950	1100	1100	1200	1200
22 mm (7/8")	200	350	620	690	690	690	850	950	1100	1100	1200	1200	-
24 mm	200	400	620	690	690	850	950	950	1100	1200	1200	1200	-
25 mm (1")	225	400	620	690	690	850	950	1100	1100	1200	1200	-	-
28 mm	225	470	690	850	850	950	1100	1200	1200	1200	-	-	-
30 mm	250	470	690	950	950	1100	1200	1200	1200	-	-	-	-
32 mm (1 1/4")	250	470	690	950	950	1100	1200	-	-	-	-	-	-
35 mm	290	620	690	950	950	1100	1200	-	-	-	-	-	-
38 mm (1 1/2")	290	620	850	1100	1100	1200	-	-	-	-	-	-	-
40 mm	290	620	850	1100	1100	1200	-	-	-	-	-	-	-
42 mm	350	620	950	1200	1200	1200	-	-	-	-	-	-	-
45 mm	350	690	950	1200	1200	1200	-	-	-	-	-	-	-
48 mm	400	690	1100	1200	-	-	-	-	-	-	-	-	-
50 mm (2")	400	690	1100	1200	-	-	-	-	-	-	-	-	-

Total Length Straight Include Unheated Zone (65 mm):	
P at 230 V	2.2 x 4.2 mm 2.5 x 4.5 mm with and without TC J
200 Watt	315
225 Watt	345
250 Watt	400
290 Watt	450
330 Watt	-
350 Watt	525
400 Watt	585
470 Watt	665
550 Watt	-
620 Watt	825
690 Watt	965
700 Watt	-
800 Watt	-
850 Watt	1165
950 Watt	1265
1000 Watt	-
1100 Watt	1465
1200 Watt	1615
1400 Watt	1750
1600 Watt	1950
1800 Watt	-
2000 Watt	-
2200 Watt	-

Standard Series: It is produced up to 1200 wattage and has 1000 mm lead wire. Standard "J" Type Thermocouple is used in our products.
Upon request; N Type & K Type Thermocouple options can be produced for precision works.
Custom-made close fit heaters / coiling formula; ***Inner Ø x "P" number (3.14) x Coil number = ...***

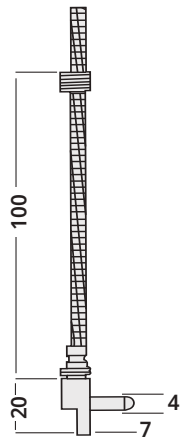
Order: **SR. B. A. Outlet**
(pls. specify used raw mat.)

Order Example:
SR. 20 x 100 x Left

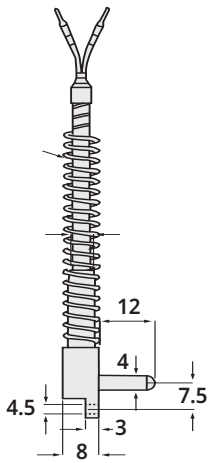
Thermocouples - Type J

Code: **RT**

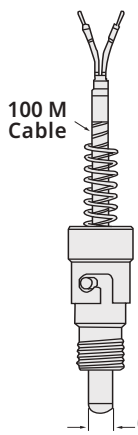
Angle Thermocouple
Sensor Point: 4 mm
Order Code: **TEWSH17**



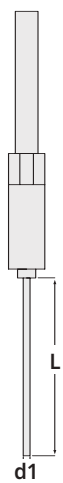
Angle Thermocouple
Sensor Point: 4 mm
Order Code: **RT1**



Bayonet Thermocouple
Adapters: 6 and 8 mm
Order Code: **RT2**

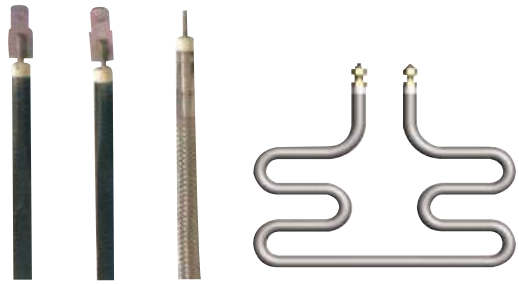


Mantle Thermocouple
Order Code: **MT015**



Note:
" **d1** " and " **L** " dimensions can be proaduced as per request.

The thermocouples (type J) makes measurement as mini volt from contact surface, sends values to the screen. Thus, it maintains heat measurement. Cables are isolated with glassfiber coating.
Thermocouples are the first component sensors of heat measurement from -200°C up to +800°C.
Thermocouples are produced in various types as "Type J", "Type K" and "PT100". "Type J" standard type thermocouples that we produce are shown below. Except these, we produce thermocouple according to the different special type samples.

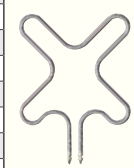


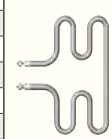
Flexible Rod Heater

Code: **CR**

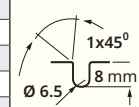
Cross Section ▭	6 x 6 mm	8 x 8 mm	10 x 10 mm
Cross Section ○	5.0 mm	8.0 mm	8.5 mm
Flex Type	Base-flex	Base-flex	Base-flex
Min. Bending Radius	12 mm	15 mm	20 mm
Unheated Length	25 mm	30 mm	40 mm
Total Length	Power (W) 230 V		
250 mm	200 W	-	-
300 mm	250 W	-	-
350 mm	300 W	550 W	-
400 mm	350 W	650 W	-
450 mm	400 W	750 W	-
500 mm	450 W	800 W	-
550 mm	500 W	900 W	-
600 mm	550 W	1000 W	-
650 mm	600 W	1100 W	-
700 mm	650 W	1200 W	-
750 mm	700 W	1300 W	-
800 mm	750 W	1350 W	-
850 mm	800 W	1450 W	-
900 mm	850 W	1550 W	2100 W
950 mm	900 W	1650 W	-
1000 mm	950 W	1750 W	2300 W
1050 mm	1000 W	1850 W	-
1100 mm	-	1950 W	2500 W
1150 mm	-	2000 W	-
1200 mm	-	2100 W	2700 W
1250 mm	-	2200 W	-
1300 mm	-	2300 W	2900 W
1350 mm	-	2400 W	-
1400 mm	-	2500 W	3100 W
1450 mm	-	2600 W	-
1500 mm	-	2700 W	3300 W
1550 mm	-	2800 W	-
1600 mm	-	-	3500 W
1700 mm	-	-	3700 W
1800 mm	-	-	3900 W
1900 mm	-	-	4100 W
2000 mm	-	-	4300 W

Bendable Type according to Manifold Shape:





Manifold Housing Detail:



Mounting Example:

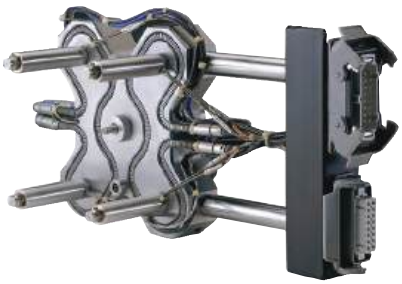
Round Cross-section:
Ø 5 - 8.0 - 8.5

Square Cross-section:
▱ 6 x 6 - 8 x 8 - 10 x 10 mm

Order:
CR. Cross Section x Total Length

Flexible Rod Heaters can be produced up to 4400 mm length. They can be delivered straight, bentable annealed or to bent according to customer drawing. In heating of liquid and air flow, especially is used as resistance to manifold channels (by closing with resin), it can be mounted to hexagon flange.

It is presented in two different types;
1 - in round cross-section **2-** in square cross-section.
Energy cables are from pure nickel and covered by fire proof glass fibre cable.



Definitions

EB	M	32	FD	4	4
Product	Body Material	Poles Qty	Type	Entry	Locking

Body Material
- M — Metal
- 0 — Insert

Poles Qty
- 05
- 10
- 16
- 24
- 32
- 48

Type
- CF — Plug Insert
- CP — Socket Insert
- FD — Wall Housing with Plug Insert
- FU — Hood with Plug Insert
- PM — Housing with Socket Insert
- PU — Hood with Socket Insert

Entry
- 1 — Side Entry
- 2 — Double Side Entry
- 4 — Bottom Entry

Locking
- 4 — Four Latch Roller

Hot Runner , Socket & Plug Inserts

Code: **EBM..**

5 Poles - 10 Amperage

- Socket Insert
- 5 Poles

Order Code: **EB0 05CP**

- Plug Insert
- 5 Poles

Order Code: **EBM 05CF**

- Hood with Socket Insert
- 5 Poles

Order Code: **EBM 05PU**

- Hood with Plug Insert
- 5 Poles

Order Code: **EBM 05FU**

- Socket Insert with Latch
- 5 Poles

Order Code: **EBM 05PM**

16 Poles - 16 Amperage

- Socket Insert
- 16 Poles

Order Code: **EB0 16CP**

- Plug Insert
- 16 Poles

Order Code: **EB0 16CF**

- Hood with Socket Insert
- 16 Poles

Order Code: **EBM 16PU**

- Hood with Plug Insert
- 16 Poles

Order Code: **EBM 16FU**

- Wall Housing with Plug Insert
- 16 Poles

Order Code: **EBM 16FD14**
Order Code: **EBM 16FD24**

32 Poles - 16 Amperage

- Socket Insert
- 32 Poles (1-16 & 17-32)

Order Code: **EB0 32CP**

- Plug Insert
- 32 Poles (1-16 & 17-32)

Order Code: **EB0 32CF**

- Hood with Socket Insert
- 32 Poles

Order Code: **EBM 32PU**

- Hood with Plug Insert
- 32 Poles

Order Code: **EBM 32FU**

- Wall Housing with Plug Insert
- 32 Poles

Order Code: **EBM 32FD44**

10 Poles - 16 Amperage

- Socket Insert
- 16 Poles

Order Code: **EB0 10CP**

- Plug Insert
- 10 Poles

Order Code: **EB0 10CF**

- Hood with Socket Insert
- 10 Poles

Order Code: **EBM 10PU**

- Hood with Plug Insert
- 10 Poles

Order Code: **EBM 10FU**

- Wall Housing with Plug Insert
- 10 Poles

Order Code: **EBM 10FD14**
Order Code: **EBM 10FD24**

24 Poles - 16 Amperage

- Socket Insert
- 24 Poles

Order Code: **EB0 24CP**

- Plug Insert
- 24 Poles

Order Code: **EB0 24CF**

- Hood with Socket Insert
- 24 Poles

Order Code: **EBM 24PU**

- Hood with Plug Insert
- 24 Poles

Order Code: **EBM 24FU**

- Wall Housing with Plug Insert
- 24 Poles

Order Code: **EBM 24FD14**
Order Code: **EBM 24FD24**

48 Poles - 16 Amperage

- Socket Insert
- 48 Poles (1-24 & 24-48)

Order Code: **EB0 48CP**

- Plug Insert
- 48 Poles (1-24 & 24-48)

Order Code: **EB0 48CF**

- Hood with Socket Insert
- 48 Poles

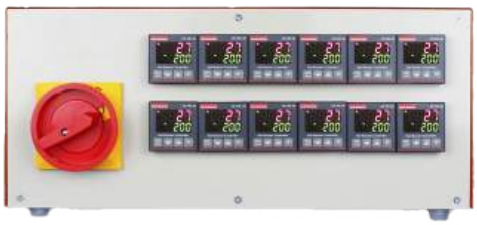
Order Code: **EBM 48PU**

- Hood with Plug Insert
- 48 Poles

Order Code: **EBM 48FU**

- Wall Housing with Plug Insert
- 48 Poles

Order Code: **EBM 48FD44**



Order:
HCC (zone qty)

Order Example:
HCC 12
(it means the HCC controller has 12 zones)

Hot Runner Temperature Controller

Code: **HCC**

"HCC" Hot Runner Temperature Controllers have been produced from microprocessor - based devices and specially designed for Hot Runners.

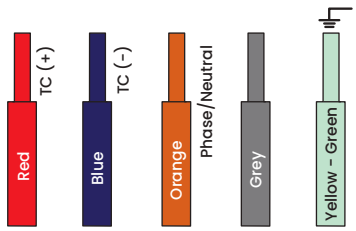
Specifications:

* 1.0° controlling accuracy.
* PID Control System.
* Soft Start Mode (working system increases resistance mode up to 8 times with soft start mode).
* Standby Mode; provides electricity saving.
* Proportional working mode (without thermocouple).
* Compatible with "J/K or B Type Thermocouples".
* 0-600 degree operation scale.
* Structure not requiring calibration / ability to restore factory calibration settings.
* Automatic parameter settings with Auto Tuning.
* Warning alarm output for over and under values.
* 25A Solid State Relay (ssr) output for each channel.
* Siemens 10A rapid fuse for each channel.
* With standard 3-meter connecting cable.
* 4-meter power cable with 5-unit feeder plug.
* Stranded and specially alloyed thermocouple cable in cable line (Fe-Const).
* It provides easy installation and use thanks to its "plug and go" structure.

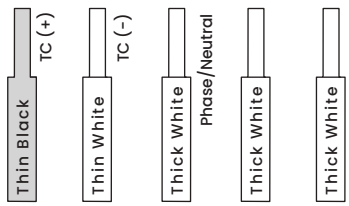
Cable Selection and its Importance:

The device / controller and cables used here are very important in terms of mould, the colors that are used are also important. It should be inserted to the device / controller by considering these colours.

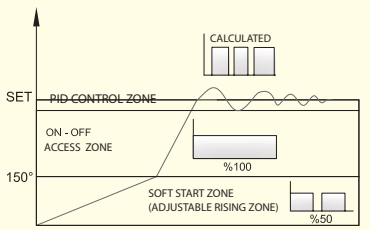
Heaters Cable Connection of Nozzles:

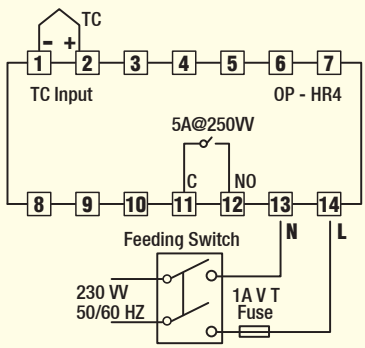


Heaters Cable Connection of Manifold:



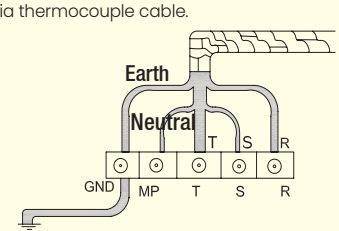
Temperature Control Technique:





Warnings (things to do before operation):

Before fastening "HCC" Controller to the mould, ensure that the network is grounded and your mould is connected to the earth connection. Electrical leakages which may occur in heaters in mould due to that there is no earth connection may pose risk for human health. Also, this leakage will damage the heater and thermocouple. The occurring leakages can be misread of temperature value or damage the device by transferring via thermocouple cable.



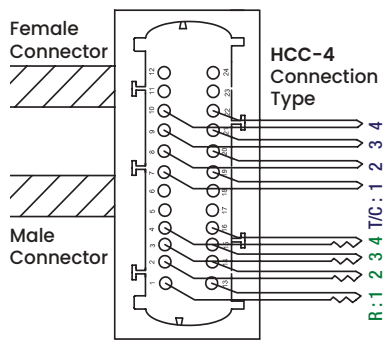
Attention!!

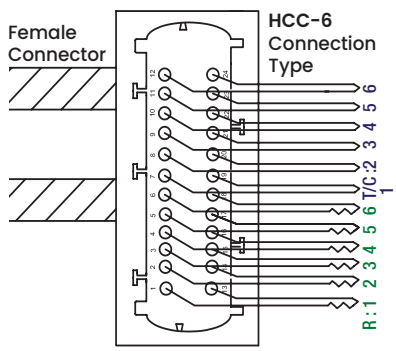
Neutral (N) and Earth (GND) are different than each other. Due to current switching from neutral line, please do not use this line for earthing. In order not to pose risk for human health and to operate your device normally, the earth terminal at power cable absolutely should be connected to actual earth line in your mains.

"HCC" Operation Procedure:

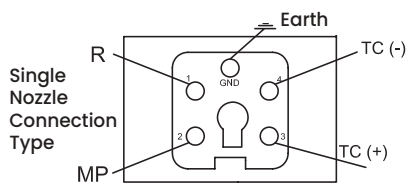
Before operating, make connection of heater and thermocouple in accordance with socket connection diagram given to you. After ensuring that socket connection is applied in accordance with the diagram, insert connecting cable into sockets on mould. Before giving energy to controller, switch rear fuses to off position, set pacco switch to zero position, plug power plug into appropriate socket and set pacco switch to position-1, then open the fuses in order, make sure that the temperature in zones opened its fuses is increased. By entering program menu, you can adjust the desired temperature values.

Example: Cable / Plug Connection Series





* For other connection types, pls. request info from our company (8 - 12 - 16 - 32).



Multiple of Clamping Force Viscosity

Table: **A**

Raw Material	Factor for Clamping Force - ton / cm²	Viscosity
GPPS	0.155 - 0.31	1
GPPS (x)	0.465 - 0.62	1
HIPS (+)	0.155 - 0.31	1
HIPS (+) (x)	0.388 - 0.543	1
ABS	0.388 - 0.62	1.3 - 1.5
SAN (AS)	0.388 - 0.465	1.3 - 1.5
SAN (AS) (*)	0.465 - 0.62	1.3 - 1.5
LDPE	0.155 - 0.31	1.0 - 1.3
HDPE	0.233 - 0.388	1.0 - 1.3
HDPE (*)	0.388 - 0.543	1.0 - 1.3
PP	0.233 - 0.388	1.0 - 1.2
PP (*)	0.388 - 0.543	1.0 - 1.2
PPVC	0.233 - 0.388	2
UPVC	0.31 - 0.465	2
PA6,PA66	0.62 - 0.775	1.2 - 1.4
PMMA	0.31 - 0.62	1.5 - 1.7
PC	0.465 - 0.775	1.7 - 2.0
POM	0.465 - 0.775	1.2 - 1.4
PET	0.31 - 0.388	1.7 - 2.0
PET	0.62 - 0.93	1.7 - 2.0
PBT	0.465 - 0.62	1.7 - 2.0
CA	0.155 - 0.31	1.3 - 1.5

Table: **A**

(*): Bang Flow / **(x):** Wall Thickness < 1mm / **(+):** Anti Shock

Right clamping forces block the overflow on products. For sure, it depends on various parameters but we try to help you by a smart method to calculate the forces approximately.

Practical Method:

Min. Clamping Force = Cavity Projection Area x Multiple of Raw Material

Cavity Projection Area: It is the largest vertical projection area seen when looked cavity from injection side.

Multiple (coefficient): It is given on Table - A general using raw materials .

Example: A GPPS glass having 40 mm radius will be produced.
The thinnest wall thickness of glass is 0.6 mm.
Please find clamping force required for this production.
Projection Area: pi (3.1416) x r2 = 50 cm2
Multiple of GPPS = 0.62 (from Table - A)
Clamping Force is = 50 x 0.62 = 31 Ton

In order to avoid surface quality problems on injected parts, drying the raw material before injection is priority according to test form. Drought injection is required.

Solution Methods for Injection Problems

Problems	Following of Solution Methods							
Very Fragile Parts	M1 E6	E6 4/6	E8	M2	M3 M1	M3		
Short Shot	E9	E11	E1	E3	E6	K1	4/5	K7
Entrapped Air	E9 E2	E11	E5 3/5	E3 E6	E6 K1	K5 E10	K7	K5
Burn Marks	E6 E7	E2	E4 M3	K7	M3 K5	E8	K5 K6	K8
Warpage	K3	M3 E11	E11 3/4	3/4 E5	E5 E2	4/5 K2	K6 E6	K8 5/6
Weld Lines	M1 K7 E1	E1 E3	E3 E11	E11 K1	K1 E6	E6 M1 K7	K6 4/6	K8
Sink Marks	E9	E5 E3	E11	K2 E6	K5	K6	M6	K8
Plate Out (parts are sticking to mould)	K3	K9 4/5	E11	E4 M6	E5 K9	M6 K8	K8	
Surface Appearance Damaged	M1 K1	E11	E6	E3 E4	K7	K4 K5	K6	
Plastic Deformation	E6	E10	E8	E12				
Burr or Overflow	E2	E13	E4 E5	K8	E6	M4 M6		
Flash / Jetting	E2	E7	K1	E6	K5	K6	K8	
Wrinkles on Surface	E1	E6	K1	M5	4/5			

Solutions > Injection Machine

- **E1** Increase injection velocity / pressure.
- **E2** Decrease injection velocity / pressure.
- **E3** Increase velocity / pressure of pack-hold.
- **E4** Decrease velocity / pressure of pack-hold.
- **E5** Optimize the pack-hold time.
- **E6** Optimize the melt / area temperature.
- **E7** Control the nozzle heater and its temperature.
- **E8** Control the suitability of part weight to machine capacity.
- **E9** Control the packing / injection weight ratio.
- **E10** Control the back pressure / pack-hold ratio.
- **E11** Control the pass point of injection to pack-hold.
- **E12** Control the range of getting material time.
- **E13** Increase the clamping force.

Solutions > Raw Material

- **M1** Optimize the drying of raw material.
- **M2** Check the ratio of recycle raw material.
- **M3** Check the ratio of master batches.
- **M4** Decrease the viscosity of raw material.
- **M5** Increase the viscosity of raw material.
- **M6** Check the type of raw material.

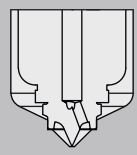
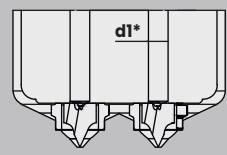
Solutions > Mould

- **K1** Increase mould temperature.
- **K2** Decrease mould temperature.
- **K3** Control the cooling channels & cooling balancing.
- **K4** Control the runner length.
- **K5** Control the runner diameters.
- **K6** Control the runner injection.
- **K7** Check the air - gas vents / outs.
- **K8** Review your mould design and change it if necessary.
- **K9** Control your part extractor design.

Thermoplastics Raw Materials Melting & Drawing Ratios:

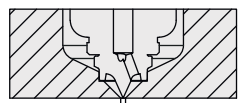
Material Type		Melting Temp. Range °C	Draw Ratio in Mould %
Amorphous Thermoplastics	ABS	170 - 200	0.4 - 0.7
	PS	130 - 160	0.3 - 0.6
	SB	130 - 160	0.3 - 0.6
	SAN	140 - 170	0.4 - 0.6
	CA	130 - 170	0.3 - 0.7
	CAB	130 - 170	0.3 - 0.7
	CP	130 - 170	0.3 - 0.7
	PC	220 - 260	0.5 - 0.8
	PMMA	150 - 180	0.4 - 0.8
	PPO	240 - 270	0.5 - 0.8
	PVC	130 - 160	0.4 - 0.8
Crystalline Thermoplastics	PE	~ 110	1 - 3
	PE	~ 130	1.5 - 4
	PP	~ 165	1 - 2.5
	PA66	~ 255	1.2 - 2.5
	PA6	~ 220	0.8 - 2
	PA610	~ 220	0.8 - 2
	POM	~ 175	1.5 - 3.5
	POM	~ 165	1.5 - 3.5
	PBTP	~ 225	1.2 - 2.8
	PETP	~ 255	1.2 - 2
	FEP	~ 270	3.5 - 5
	ETFE	~ 270	3.5 - 5

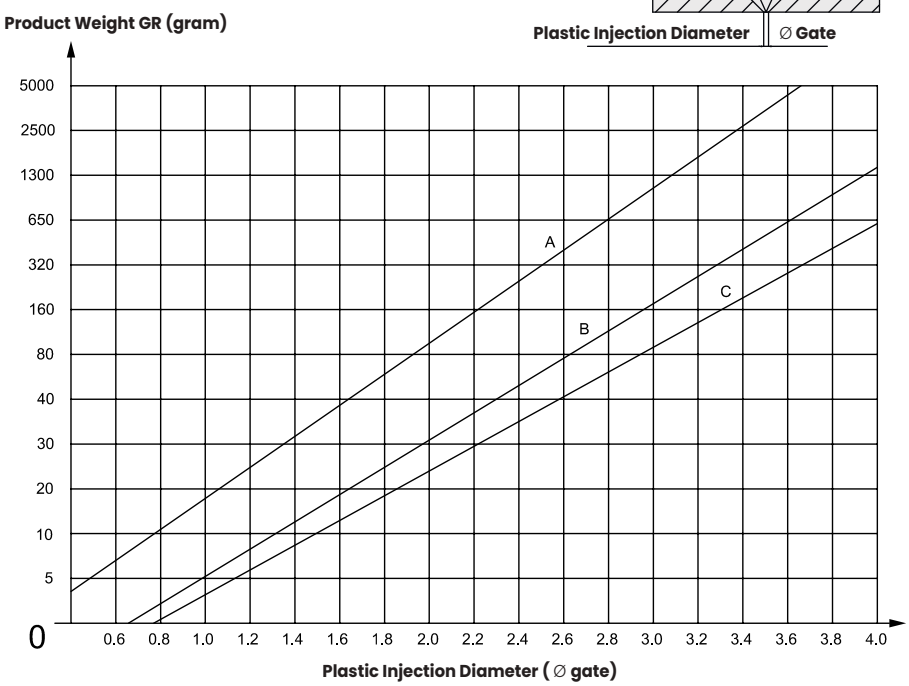
SELECT / ON TABLE OF NOZZLE TIP DIAMETERS

NOZZLE TIP		RUNNER SERIES						RUNNER MULTINOZZLE SERIES						
														
Ø		13	15	17	19	25	25	16	22	28	28	34	34	34
PLASTIC RAW MATERIALS	PE PP PS SB	15	40	150	300	1200	4000	40	40	40	150	40	150	300
	ABS ASA PA POM SAN	○	32	100	250	1000	3500	32	32	32	100	32	100	250
	PBTP PC PES PMMA PPO PPS PSU TPU	○	15	60	200	800	3000	15	15	15	60	15	60	200
								d1 (mm)						
								5	5	5	7	5	7	9

✚ The values in the table are in grams (gr.). ✚ In the case of special (○) gram calves, please contact us.

NOZZLE GATE SELECTION GUIDE





A	B	C
Low Density Plastics	**Medium** Density Plastics	**High** Density Plastics
PE	PA11	ABS
PP	PA6.6	PC
PS	HDPE	PMMA
SB	PA	POM
TPE	TPE	SAN
PUR		PET
LOPE		PVC
TPO		PPS

HOT RUNNER NOZZLES

	NOZZLE TIP													
		B 01	B 04	B 01(S)	B 04(S)	B 02(1)	B 02(4)	B 03(1)	B 03(4)	B 05(1)	B 05(4)	B 01(GF)	B 04(GF)	Mini Multi
PLASTIC RAW MATERIALS	ABS	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼
	PC	○	☼	○	☼	△	△	☼	☼	△	△	△	○	○
	PMMA	○	☼	○	☼	△	△	☼	☼	△	△	△	○	○
	PS	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼
	PUR	○	☼	○	☼	○	☼	○	☼	○	☼	○	☼	○
	PVC	△	△	△	△	×	×	○	○	×	×	△	△	×
	SAN	○	☼	○	☼	△	△	☼	☼	△	△	△	○	○
	PA	☼	☼	☼	☼	△	△	☼	☼	△	△	☼	☼	○
	PBT	○	○	○	○	△	△	☼	☼	△	△	○	○	×
	PE	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼
	PET	×	△	×	△	×	×	○	○	×	×	×	△	×
	POM	△	☼	☼	☼	△	△	☼	☼	△	△	△	☼	△
	PP	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼	☼
ADDITIVES & SPECIAL CASES	Glass Fibre	×	×	×	×	×	×	○	○	×	×	☼	☼	×
	Flame Proof	○	○	○	○	△	△	☼	☼	△	△	○	○	○
	Clour Change	×	○	☼	☼	☼	☼	☼	☼	☼	☼	×	○	△
	Regrind Mat.	△	○	△	○	△	○	△	○	△	○	△	○	△
	Cosmetic Surface	☼	△	☼	△	○	△	×	×	○	△	☼	△	☼
	Low Pressure Loss	△	☼	△	☼	△	☼	△	☼	△	☼	△	☼	△

☼ Good ○ Suitable △ Contact Us × Not Suitable

Note: The following table is provided for informational purposes for our partners. Actual working conditions may vary depending on part volume, average wall thickness, viscosity, machine capacity, and gate diameter.

TYPES OF NOZZLE TIPS

B01
* Minimum runner mark

B04
* Suitable for recycled materials
* No runner mark on wider surfaces

* Monoblock all CuBe2 with plating options
* Improved thermal profile

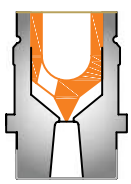
B01 (S)
* Minimum runner mark
* Adjustable raw material exit number based on print geometry

B04 (S)
* Suitable for recycled materials
* No runner mark on wider surfaces

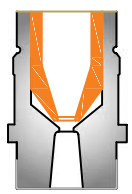
* Fast color change
* Excellent leakproof design
* Bi-metal adapter and tip

B02 (01 Torpedo)
* Easy nozzle slot processing
* Fast color change
* Improved thermal profile
* Reduced renovation cost (2 piece tip)

B02 (04 Torpedo)



B03 (01 Torpedo)
* Production without leak



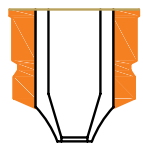
B03 (04Torpedo)
* Suitable for recycled materials

* Easy nozzle slot processing
* Extended nozzle model for hot halves
* Best fit for tunnel gate for optic parts
* Flawless injection in engineering plastics
* Reduced renovation cost (2 piece tip)

B05 (01 Torpedo)
* Excellent Finish for runner marks

B05 (04 Torpedo)
* Suitable for recycled materials

B01 (GF)



B04 (GF)
* Bi-meterial for heat efficiency and saving on parts
* Works well with engineering plastics

NOZZLE EXIT OPTIONS

OPTION 1 : Raw Material Runner Exit Path

Order Code: 11

Order Code: 13

Order Code: 19

OPTION 2 : Material and Coating Options

Order Code: 200
Material: CuBe2

Order Code: 220
Material: Steel

Order Code: 201
Material: CuBe2

Order Code: 221
Material: Steel

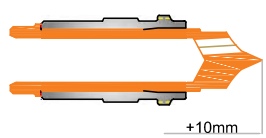
Order Code: 230
Material: Tungsten Carbide

Order Code: 240
Material: TZM

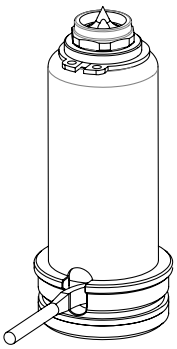
Order Code: 231
Material: Tungsten Carbide

Order Code: 241
Material: TZM

OPTION 3 : Extra Long Nozzles



Best for reaching the cavity in narrow space geometry design

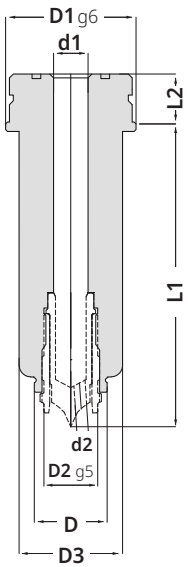


Runner Series - **Basic**

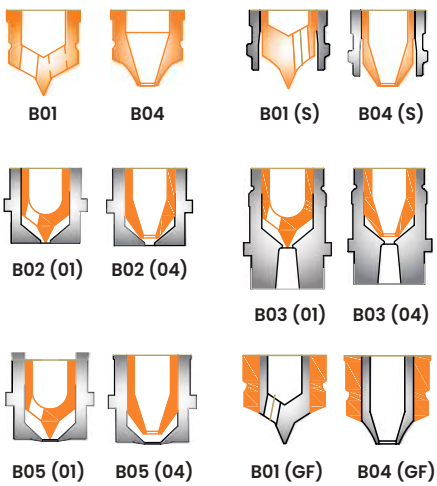
Order Code:

R - ØD - L1 - B0X (Optional)

- Nozzle Tip Type
- Nozzle Length
- Nozzle Ø
- RUNNER



Runner Series (Basic)

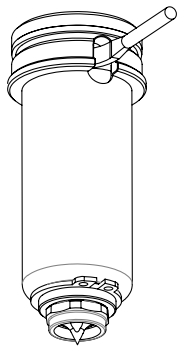


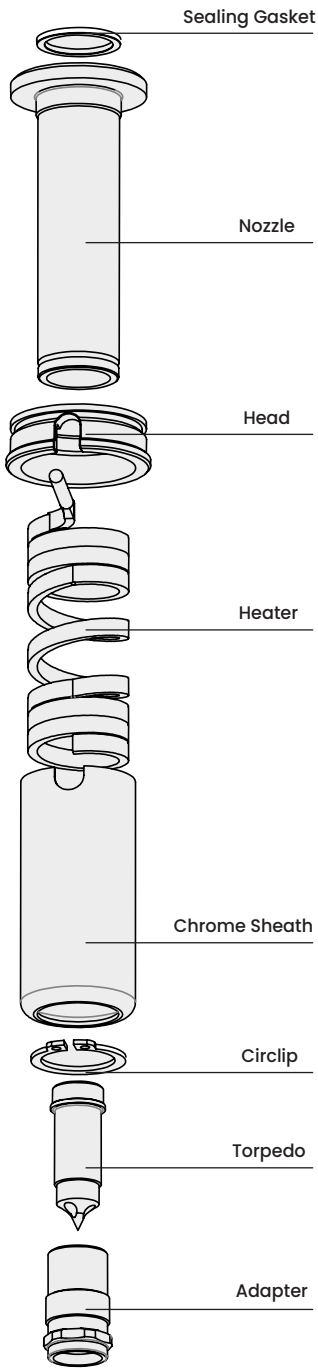
Runner	D	D1	D2	D3	d1	d2	L1	L2	Capacity
R13	13	28	10	18	4	2	49 - 159	13,18,20	15 gr.
R15	15	30	10	22	5	2	49 - 199	13,18,20	40 gr.
R17	17	32	12	25	7	2.5	49 - 249	13,18,20	150 gr.
R19	19	34	14	27	9	3	49 - 249	13,18,20	300 gr.
R25	Embedded Heaters								
R32	Embedded Heaters								

Please create your orders with form on page .....

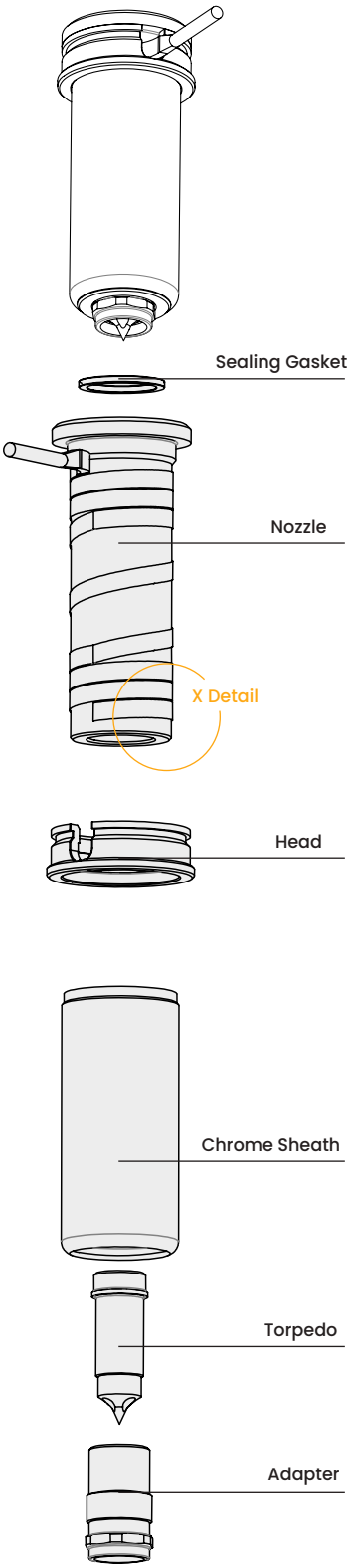
- When ordering, pocket / machining detail will be presented with technical data.
- Wattage of heater depends on the flow characteristics of the material.
- Gate diameters will be determined in accordance with the order information.

Parts of the Hot Runner Nozzle



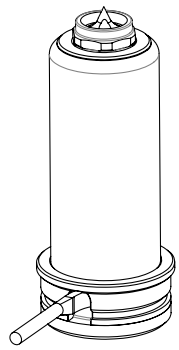


Parts of the Hot Runner Nozzle



Advantages of Embedded Heaters

- Long heater lifespan
- Precise temperature control
- Up to %50 energy saving on engineering plastic injection

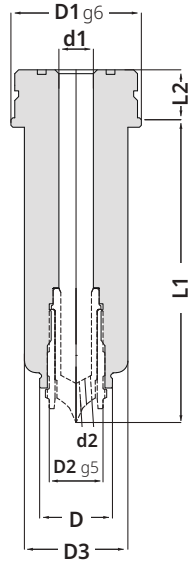


Runner Series - **Embedded Heater**

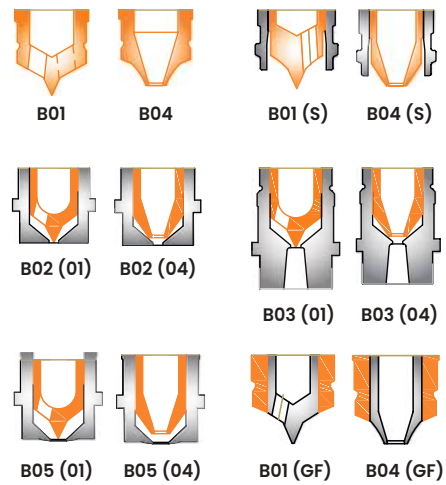
Order Code:

R - ØD - L1 - B0X (**G** Optional)

- Embedded Heaters
- Nozzle Tip Type
- Nozzle Length
- Nozzle Ø
- RUNNER



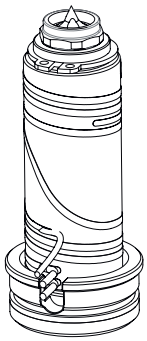
Runner Series (Embedded Heater)



Runner	D	D1	D2	D3	d1	d2	L1	L2	Capacity
R13	13	28	10	18	4	2	49 - 159	13,18,20	15 gr.
R15	15	30	10	22	5	2	49 - 199	13,18,20	40 gr.
R17	17	32	12	25	7	2.5	49 - 249	13,18,20	150 gr.
R19	19	34	14	27	9	3	49 - 249	13,18,20	300 gr.
R25	25	43	20	35	13	4	49 - 449	20	1200 gr.
R32	32	50	25	42	16	5	49 - 699	20	4000 gr.

Please create your orders with form on page .....

- When ordering, pocket / machining detail will be presented with technical data.
- Wattage of heater depends on the flow characteristics of the material.
- Gate diameters will be determined in accordance with the order information.

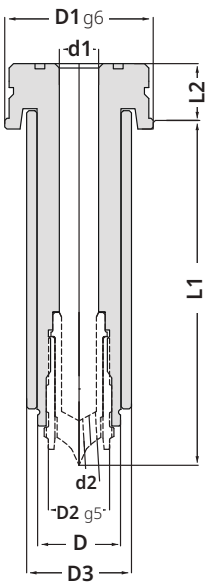


Runner Series
Brass & Microcoil Heaters

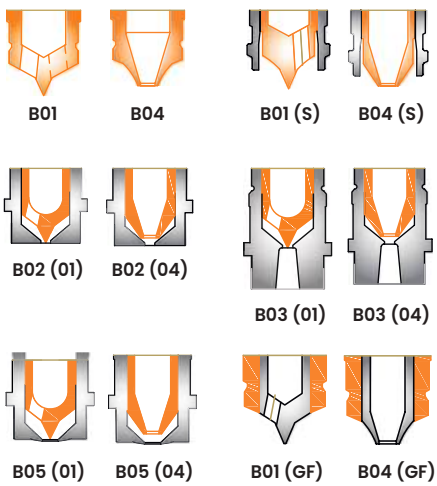
Order Code:

R - ØD - L1 - B0X (**BR_MC** Optional)

- Brass & Microcoil
- Nozzle Tip Type
- Nozzle Length
- Nozzle Ø
- RUNNER



Runner Series (Brass & Microcoil Heaters)

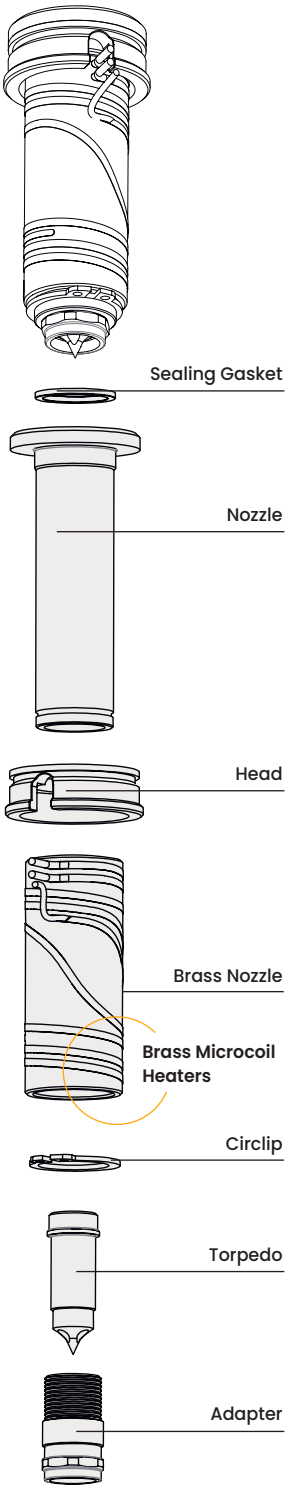


Runner	D	D1	D2	D3	d1	d2	L1	L2	Capacity
R13	13	28	10	18	4	2	49 - 159	13,18,20	15 gr.
R15	15	30	10	20	5	2	49 - 199	13,18,20	40 gr.
R17	17	32	12	22	7	2.5	49 - 249	13,18,20	150 gr.
R19	19	34	14	24	9	3	49 - 249	13,18,20	300 gr.
R25	25	43	20	30	13	4	49 - 449	20	1200 gr.
R32	32	50	25	38	16	5	49 - 699	20	4000 gr.

Please create your orders with form on page .....

- When ordering, pocket / machining detail will be presented with technical data.
- Wattage of heater depends on the flow characteristics of the material.
- Gate diameters will be determined in accordance with the order information.

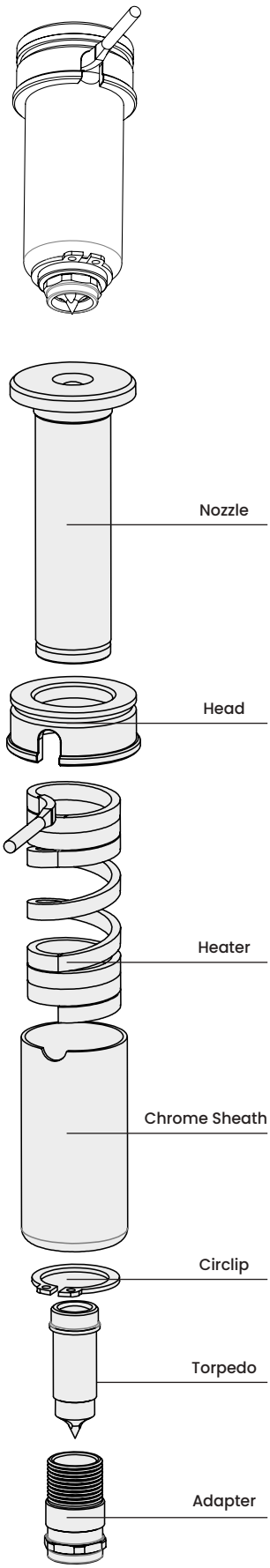
Parts of the Hot Runner Nozzle

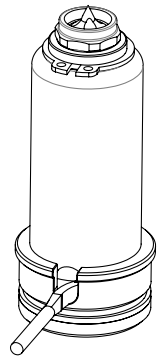


Advantages of Brass Microcoil Heaters

- Long heater lifespan
- Precise temperature control (with external embedded thermocouple)
- Easy heater replacement even when on the tool
- Easy access to spare parts Up to %50 energy saving on engineering plastic injection

Parts of the Hot Runner Nozzle



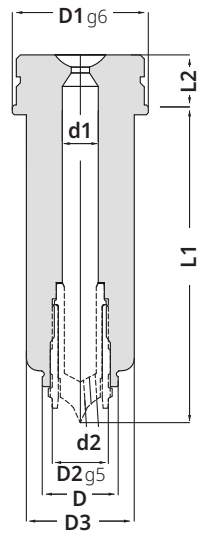


Single Hot Runner Nozzle - **Basic**

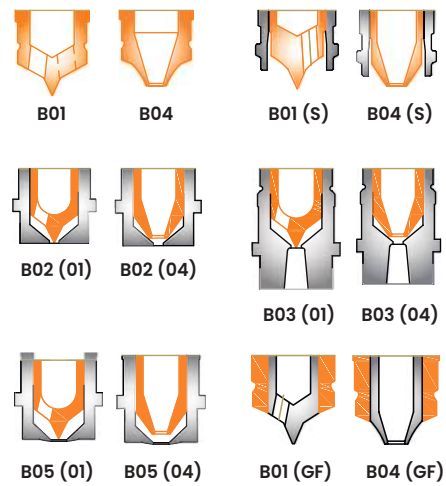
Order Code:

R - ØD - L1 - B0X (**Single** Optional)

- Single Nozzle
- Nozzle Tip Type
- Nozzle Length
- Nozzle Ø
- RUNNER



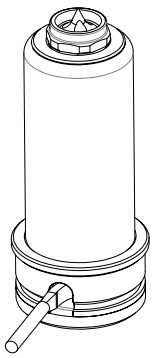
Runner Series (Embedded Heaters)



Runner	D	D1	D2	D3	d1	d2	L1	L2	Capacity
R13	13	28	10	18	4	2	49 - 159	13,18,20	15 gr.
R15	15	30	10	22	5	2	49 - 199	13,18,20	40 gr.
R17	17	32	12	25	7	2.5	49 - 249	13,18,20	150 gr.
R19	19	34	14	27	9	3	49 - 249	13,18,20	300 gr.
R25	Embedded Heaters								
R32	Single Hot Runner Nozzle with Head Heaters								

Please create your orders with form on page .....

- When ordering, pocket / machining detail will be presented with technical data.
- Wattage of heater depends on the flow characteristics of the material.
- Gate diameters will be determined in accordance with the order information.

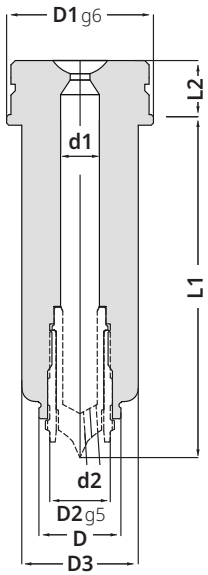


Single Hot Runner Nozzle
Embedded Heater

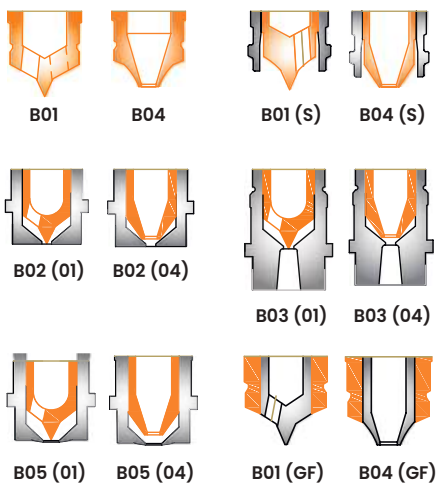
Order Code:

R - ØD - L1 - B0X (**G_Single** Optional)

- Single Nozzle
- Embedded Heater
- Nozzle Tip Type
- Nozzle Length
- Nozzle Ø
- RUNNER



Runner Series (Embedded Heaters)

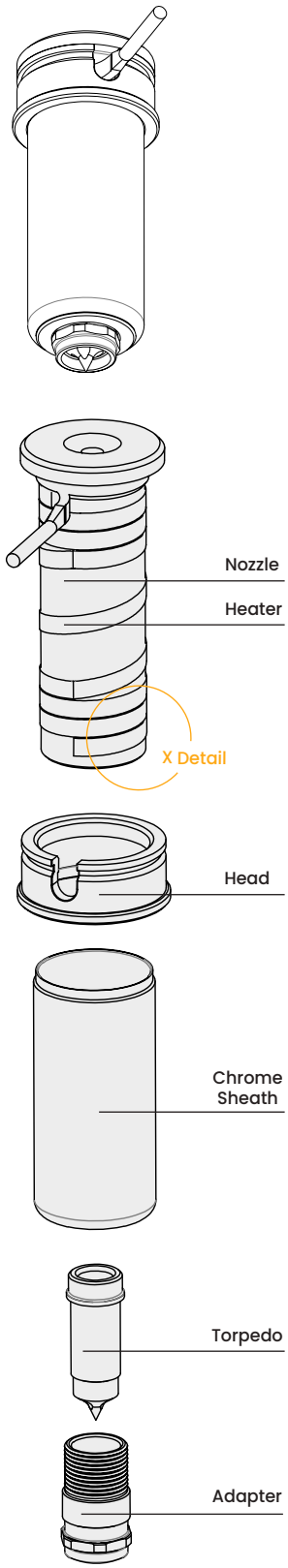


Runner	D	D1	D2	D3	d1	d2	L1	L2	Capacity
R13	13	28	10	18	4	2	49 - 159	13,18,20	15 gr.
R15	15	30	10	22	5	2	49 - 199	13,18,20	40 gr.
R17	17	32	12	25	7	2.5	49 - 249	13,18,20	150 gr.
R19	19	34	14	27	9	3	49 - 249	13,18,20	300 gr.
R25	25	43	20	35	13	4	49 - 449	20	1200 gr.
R32	Single Hot Runner Nozzle with Head Heaters								

Please create your orders with form on page .....

- When ordering, pocket / machining detail will be presented with technical data.
- Wattage of heater depends on the flow characteristics of the material.
- Gate diameters will be determined in accordance with the order information.

Parts of the Hot Runner Nozzle

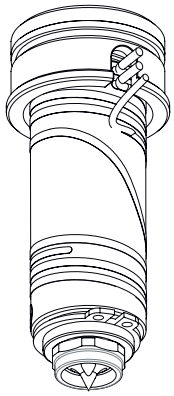


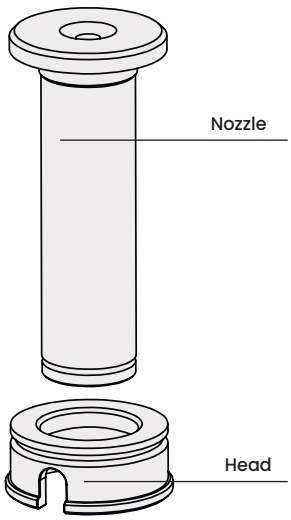
X Detail

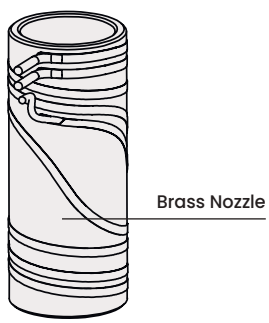
Advantages of Embedded Heaters

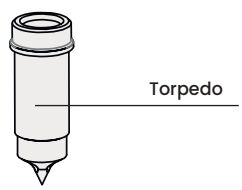
- Long heater lifespan
- Precise temperature control
- Up to %50 energy saving on engineering plastic injection

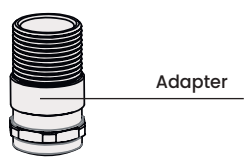
Parts of the Hot Runner Nozzle

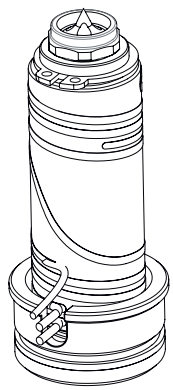










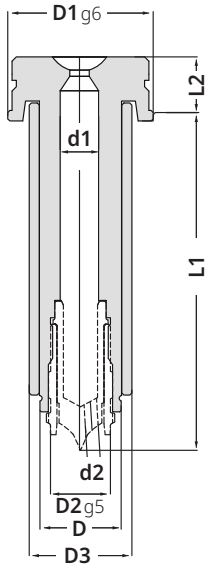


Single Hot Runner Nozzle
Brass & Microcoil Heater

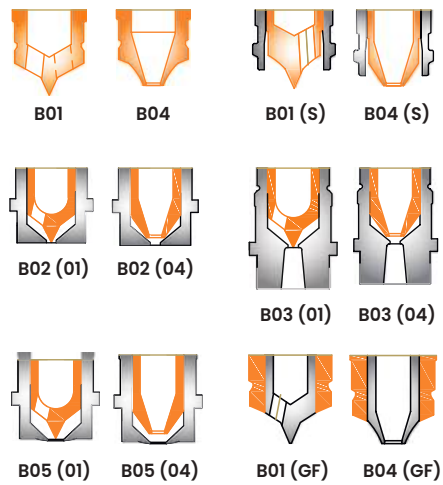
Order Code:

R - ØD - L1 - B0X (**BR_MC_Single** Optional)

- Single Nozzle
- Brass & Microcoil
- Nozzle Tip Type
- Nozzle Length
- Nozzle Ø
- RUNNER



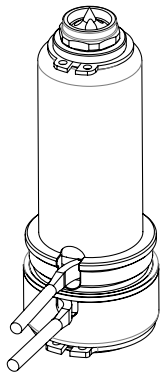
Runner Series (Brass & Microcoil Heaters)



Runner	D	D1	D2	D3	d1	d2	L1	L2	Capacity
R13	13	28	10	18	4	2	49 - 159	13,18,20	15 gr.
R15	15	30	10	22	5	2	49 - 199	13,18,20	40 gr.
R17	17	32	12	25	7	2.5	49 - 249	13,18,20	150 gr.
R19	19	34	14	27	9	3	49 - 249	13,18,20	300 gr.
R25	25	43	20	30	13	4	49 - 449	20	1200 gr.
R32	Single Hot Runner Nozzle with Head Heaters								

Please create your orders with form on page .....

- When ordering, pocket / machining detail will be presented with technical data.
- Wattage of heater depends on the flow characteristics of the material.
- Gate diameters will be determined in accordance with the order information.

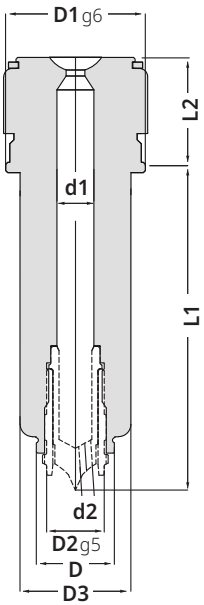


Single Hot Runner Nozzle With Head Heaters - **Basic**

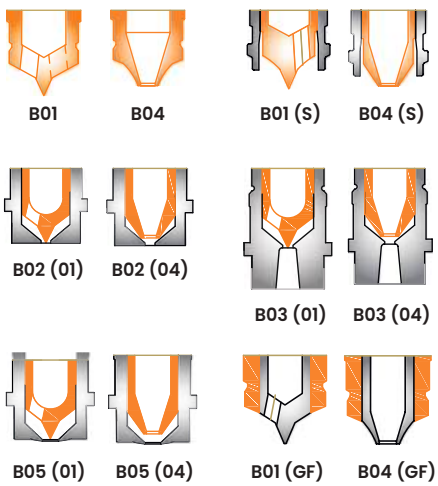
Order Code:

R - ØD - L1 - B0X (**R** Optional)

- Head Heaters
- Nozzle Tip Type
- Nozzle Length
- Nozzle Ø
- RUNNER



Runner Series (Basic)

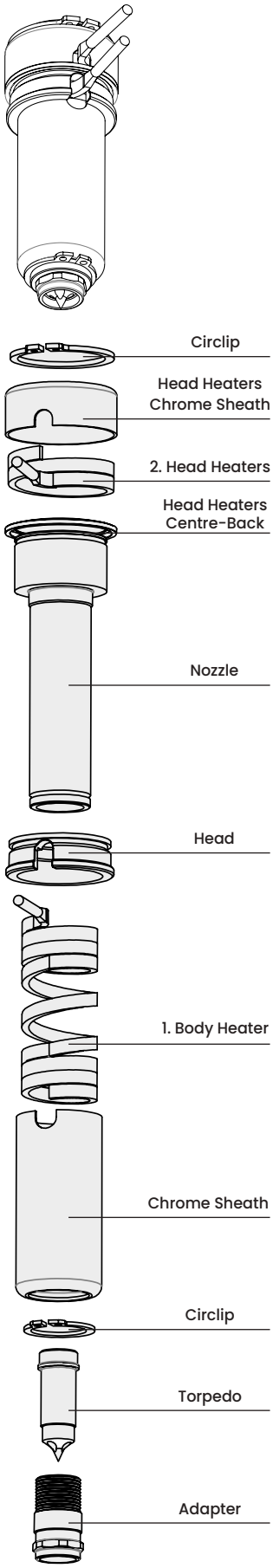


Runner	D	D1	D2	D3	d1	d2	L1	L2	Capacity
R13	13	28	10	18	4	2	49 - 159	25	15 gr.
R15	15	30	10	22	5	2	49 - 199	25	40 gr.
R17	17	32	12	25	7	2.5	49 - 249	25	150 gr.
R19	19	34	14	27	9	3	49 - 249	25	300 gr.
R25	Embedded Heaters								
R32	Embedded Heaters								

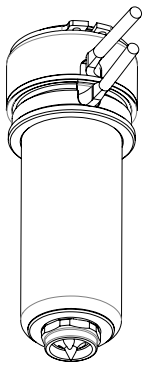
Please create your orders with form on page .....

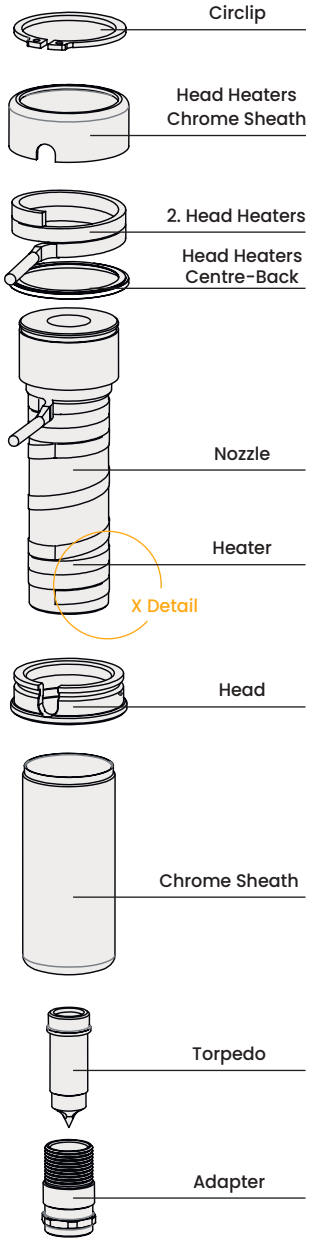
- When ordering, pocket / machining detail will be presented with technical data.
- Wattage of heater depends on the flow characteristics of the material.
- Gate diameters will be determined in accordance with the order information.

Parts of the Hot Runner Nozzle



Parts of the Hot Runner Nozzle

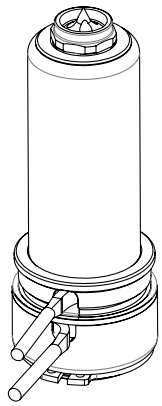




X Detail

Advantages of Embedded Heaters

- Long heater lifespan
- Precise temperature control
- Up to %50 energy saving on engineering plastic injection

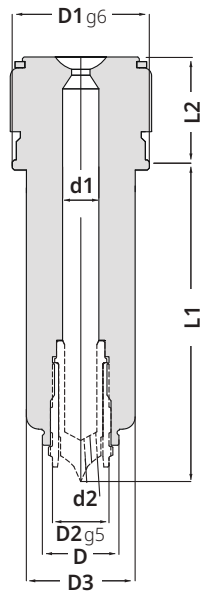


Single Hot Runner Nozzle with Head Heaters - **Embedded Nozzle Heaters**

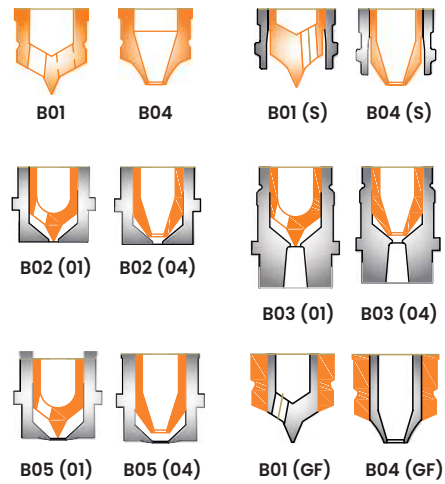
Order Code:

R - ØD - L1 - B0X (**G_R** Optional)

- Head Heaters
- Embedded Heaters
- Nozzle Tip Type
- Nozzle Length
- Nozzle Ø
- RUNNER



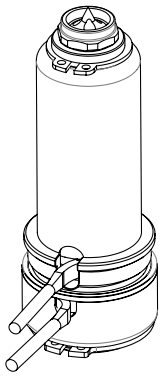
Runner Series (Embedded Heaters)



Runner	D	D1	D2	D3	d1	d2	L1	L2	Capacity
R13	13	28	10	18	4	2	49 - 159	25	15 gr.
R15	15	30	10	22	5	2	49 - 199	25	40 gr.
R17	17	32	12	25	7	2.5	49 - 249	25	150 gr.
R19	19	34	14	27	9	3	49 - 249	25	300 gr.
R25	25	43	20	35	13	4	49 - 449	25	1200 gr.
R32	32	50	25	42	16	5	49 - 699	35	4000 gr.

Please create your orders with form on page .....

- When ordering, pocket / machining detail will be presented with technical data.
- Wattage of heater depends on the flow characteristics of the material.
- Gate diameters will be determined in accordance with the order information.

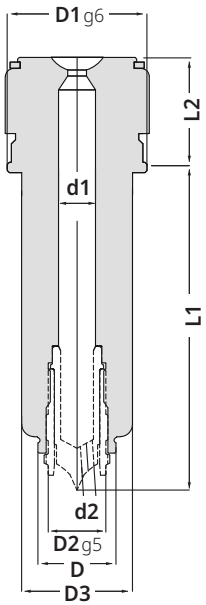


Single Hot Runner Nozzle With Head Heaters - **Basic**

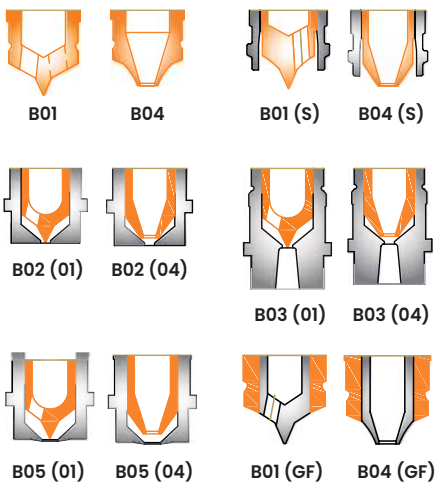
Order Code:

R - ØD - L1 - B0X (**R** Optional)

- Head Heaters
- Nozzle Tip Type
- Nozzle Length
- Nozzle Ø
- RUNNER



Runner Series (Basic)

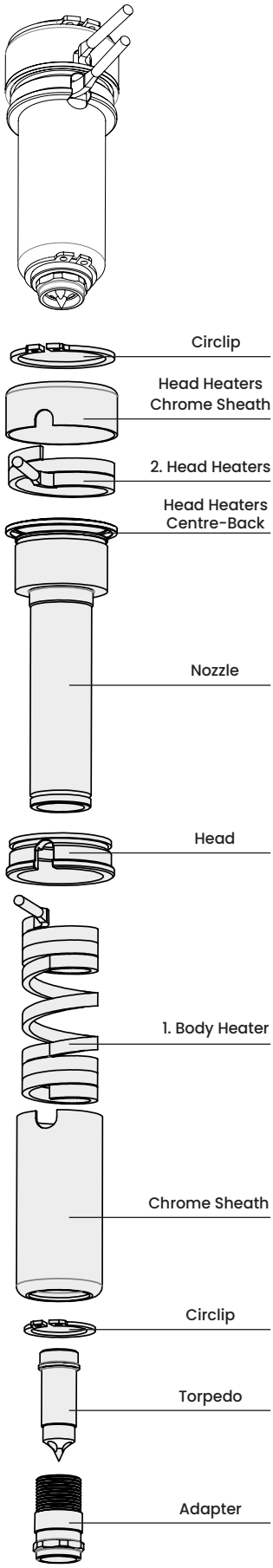


Runner	D	D1	D2	D3	d1	d2	L1	L2	Capacity
R13	13	28	10	18	4	2	49 - 159	25	15 gr.
R15	15	30	10	22	5	2	49 - 199	25	40 gr.
R17	17	32	12	25	7	2.5	49 - 249	25	150 gr.
R19	19	34	14	27	9	3	49 - 249	25	300 gr.
R25	Embedded Heaters								
R32	Embedded Heaters								

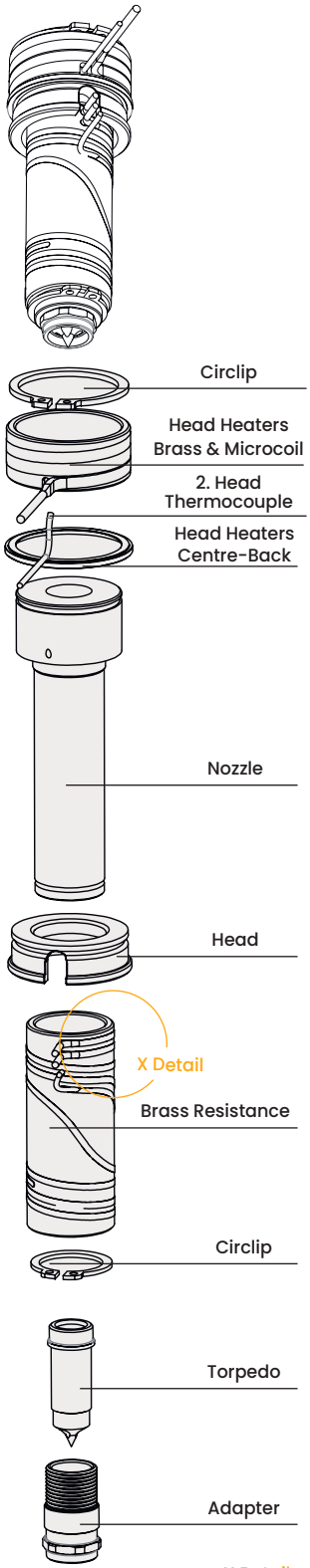
Please create your orders with form on page .....

- When ordering, pocket / machining detail will be presented with technical data.
- Wattage of heater depends on the flow characteristics of the material.
- Gate diameters will be determined in accordance with the order information.

Parts of the Hot Runner Nozzle

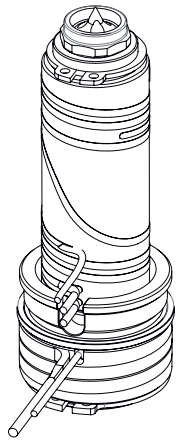


Parts of the Hot Runner Nozzle



Advantages of Brass Microcoil Heaters

- Long heater lifespan
- Precise temperature control (with external embedded thermocouple)
- Easy heater replacement even when on the tool
- Easy access to spare parts up to %50 energy saving on engineering plastic injection

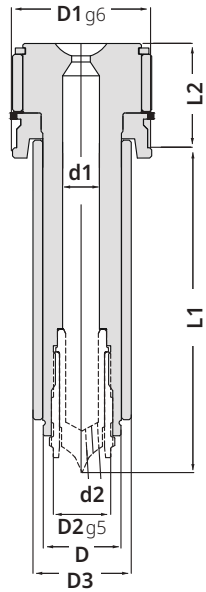


Single Hot Runner Nozzle with Head Heaters - **Brass & Microcoil Heater**

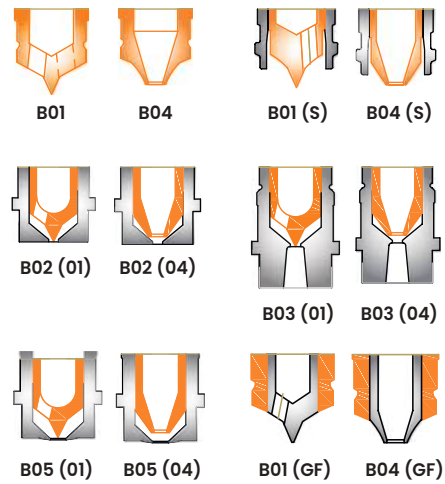
Order Code:

R - ØD - L1 - B0X (**R_BR_MC** Optional)

- Brass & Microcoil
- Head Resistance
- Nozzle Tip Type
- Nozzle Length
- Nozzle Ø
- RUNNER



Runner Series (Brass & Microcoil)



Runner	D	D1	D2	D3	d1	d2	L1	L2	Capacity
R13	13	28	10	18	4	2	49 - 159	25	15 gr.
R15	15	30	10	22	5	2	49 - 199	25	40 gr.
R17	17	32	12	25	7	2.5	49 - 249	25	150 gr.
R19	19	34	14	27	9	3	49 - 249	25	300 gr.
R25	25	43	20	35	13	4	49 - 449	25	1200 gr.
R32	32	50	25	42	16	5	49 - 699	35	4000 gr.

Please create your orders with form on page .....

- When ordering, pocket / machining detail will be presented with technical data.
- Wattage of heater depends on the flow characteristics of the material.
- Gate diameters will be determined in accordance with the order information.

Operating Conditions of the Plastic Raw Material

Raw Material	Degree C⁰	Time (hour)	Melting Temp.	Operating Temp.	Mould Temp.	Density		
						Good	Moderate	Poor
Amorphous Materials:								
POP (Polycehenylene Oxide)	80 -120	2	120	300	80			
PEI (Polyetherimide)	150	4	215	370	100			
PMMA (Polymethyl Methacrylate)	70 -100	2 - 4	100	245	70			
ABS (Acrylonitrile Butadiene Styrene)	70 - 80	2	110	250	75			
ASA (Acrylic Styrene Acrylonitrile)	80 - 90	2	105	245	75			
SAN (Styrene Acrylonitrile)	85	2 - 4	115	255	80			
PS (Polystyrene)	-	-	100	225	45			
SB (Styrene Butadiene)	-	-	100	225	70			
PES (Polyethersulfone)	135-150	3 - 4	230	350	150			
PSU (Polysulfone)	135-150	3 - 4	200	315	150			
PVC (Polyvinyl Chloride)	-	-	100	195	35			
PC (Polycarbonate)	120	46	220	300	90			
CAB (Cenlulose Acetate Butyrate)	50	3	140	215	55			
TPU (Thermoplastic Urethanes)	100-110	2	150	210	35			
Crystalline Materials:								
PE (Polyethylene)	-	-	140	250	25			
PP (Polypropylene)	-	-	165	255	35			
LCP (Liquit - Crystal Polymer)	150-160	4	330	400	175			
PA 11 (Polyamide 11)	70 -80	8 -15	175	230	60			
PA 12 (Polyamide 12)	70 -80	8 -15	175	230	60			
PET (Polyethylene Terephthalate)	75 -90	3 -4	245	285	140			
PBT (Polybutadiene Terephthalate)	120	4	225	265	60			
PPS (Polyphenylene Sulfide)	150-170	4	290	330	110			
PEEK (Polyetheretherketone)	150	3	335	370	160			
PA610 (Polyamide 610)	70 -80	8 -12	215	250	90			
PA 6 (Polyamide 6)	80	8 -15	220	250	90			
PA 66 (Polyamide 6.6)	80	8 -15	255	285	90			
POM (Polyacetal)	110	2	180	200	100			

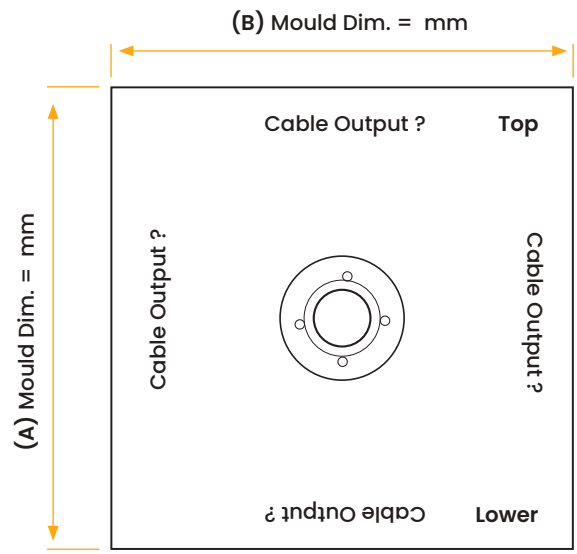
Information - Inquiry & Order Form

Company:	Date:
Contact Person:	Tel.:
E-Mail:	
Address:	
Subject:	

- Raw Material Type: - Additive:	Mould Dimensions: A ..... x B .....

Cavity Qty:	Product Grammage:	Wall Thickness:
Nozzle Ø:	Nozzle Type:	Colour Change: ☐ YES ☐ NO
Nozzle Length:	Heat Ins. Plate: ☐ YES ☐ NO	Group Radius / R= .....

Cavity Zones



View from Injection Surface

Other Required Products:
Notes:

☐ INFO ☐ INQUIRY ☐ ORDER	Approved By: Sign & Stamp:

For your Hot Runner component orders; if you fill order form above and contact with our Hot Runner Department, details complying with your mould and production / usage of a correct product will be followed by Güvenal. For information: info@guvenal.net

DIGITAL FORM

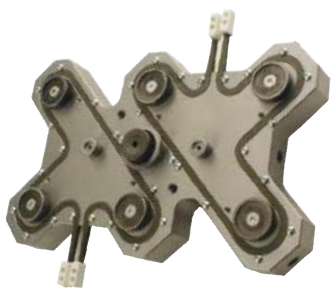
Hot Runner Manifold Systems

Hot Runner System is the continuation of injection group. It is an independent system in mould, its design and engineering requires special knowledge and experience. The system equipments are relevant to each other from tip to toe. Hot Runner Systems are Manifold, Hot Runner Nozzle, Heater and Thermocouple in base. The equipment contacting with products directly and affecting the result is Hot Runner Nozzle. To give desired performance by hot runner nozzle, the production of all equipment should be correct. Manifold works as a casing / body in system. Also, it is an important element that collects and distributes material. The system is heated via Heaters placed on it. The equipments that keep the heaters temperature in specified range and measure the temperature are Thermocouples. The Thermocouples that detect the temperature decrease, allow Heaters to work by triggering electric energy.

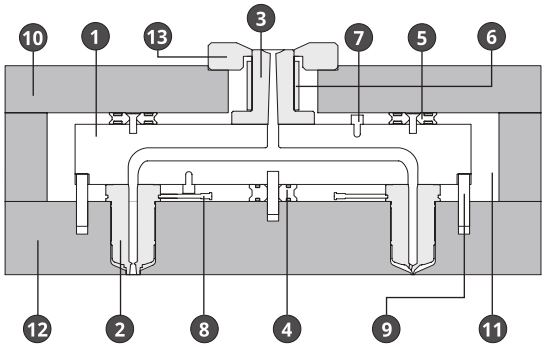
Inlet is the first element that provides the start of distribution of melt raw material into Manifold.
To reach melt raw material into Manifold with the same pressure and temperature, Band Heaters (Güvenal product code: "KR") is inserted around Inlet.

Other Equipment with Important Roles in System:
Hub Disc, Distance Disc and Fasteners. They are used to mount system to Mould in the most correct way.
Another section that is effective in working of Hot Runner Systems continuously and smoothly are Mould Plates and Manifold Cavity. As well as system and labour, also precision machining of the Mould should be in the desired values.

All of our Hot Runner Systems & Components are produced in Türkiye. We present spare parts, services and maintenance guarantee. In selection and installation of all these systems, we will help together with our technical team. In addition, we will continue to follow it.

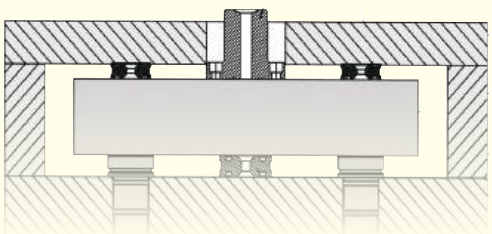


Hot Runner Manifold Equipment

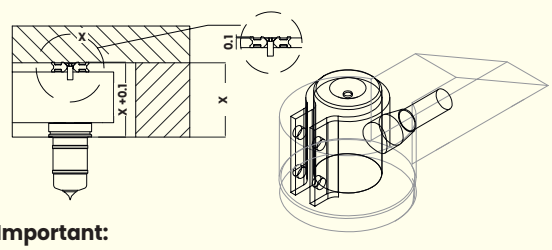


1. Manifold
2. Nozzle
3. Inlet
4. Hub Disc
5. Distance Disc
6. Band Heater for Inlet
7. Thermocouple
8. Heater for Nozzle
9. Centering Pin
10. Top Plate
11. Manifold Cavity
12. Nozzle / Cavity Plate
13. Centering Flange

Recommended Assembly Process of Hot Runner Manifold

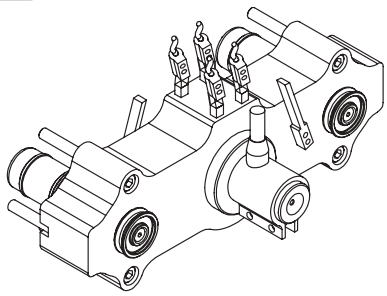


* Ensure that manifold is clean and dry.
* Place the Hub Disc and fasten Centering Pins to mould.
* Use Centering Pins between Top Plate and Nozzle / Cavity Plate. All plates on the fixed side should be centered by pins.
* Ensure that Distance Discs are 0.2 mm above from Manifold Cavity. This measurement is important for sealing, as specified in X detail.
* Ensure that Inlet Drain / Discharge on Top Plate does not contact with Band Heater and the necessary channel is drilled for Band Heater Cable, otherwise you may damage Heater.

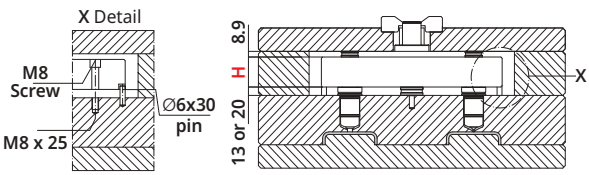


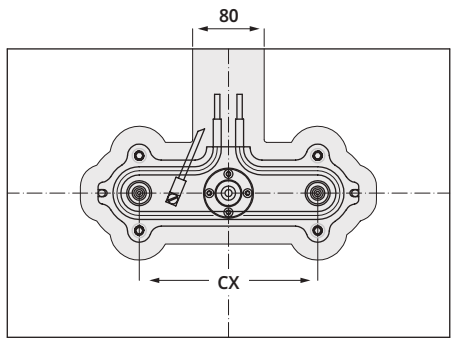
Important:
Assembling screws (fasteners) are used to fix Manifold during mounting, they do not meet forces occurring during injection, therefore do not remove Distance Discs on manifold, do not tighten screws excessively.

Code: **MI**



"MI" Type Manifold for Hot Runner





Manifold Type	Nozzle Diameter	Number of Nozzle				Axis Range
MI	18	02	04	08	16	CX
	22					
	25					
	32					
	40					

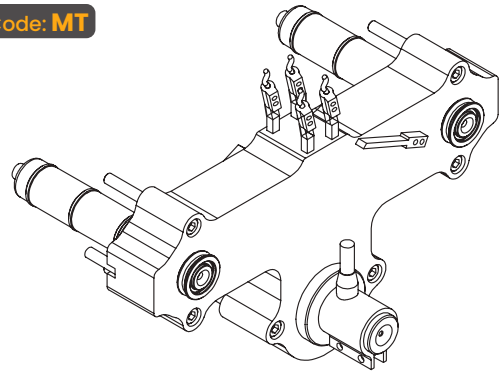
Order Code:

MI - XX - KA - CX

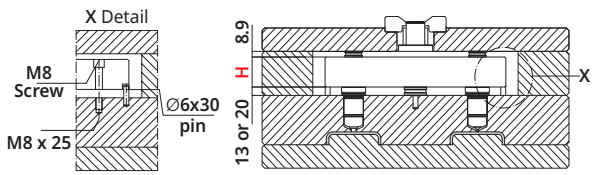
- CX: "X" Axis Range
- KA: Nozzle Number
- XX: Nozzle Diameter
- MI: Manifold Type

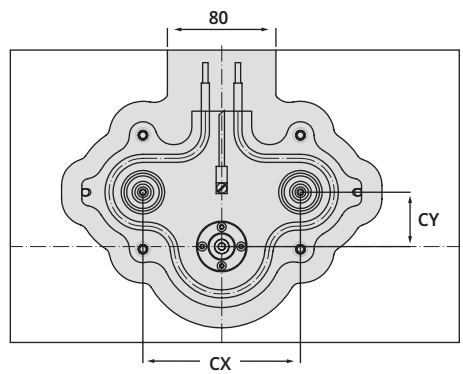
* "H" height is calculated according to the material type, weight and number of Nozzle used in Manifold.

Code: **MT**



"MT" Type Manifold for Hot Runner





Manifold Type	Nozzle Diameter	Number of Nozzle			Axis Range
MT	18	02	04	08	CX x CY
	22				
	25				
	32				
	40				

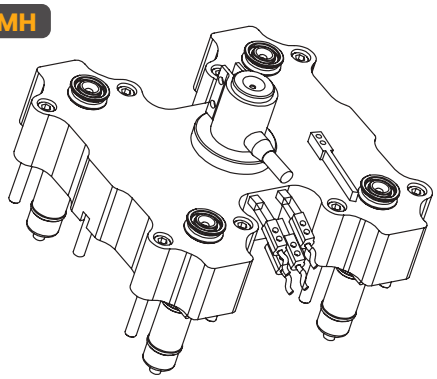
Order Code:

MT - XX - KA - CX - CY

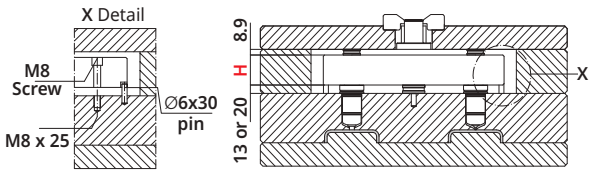
- CY: "Y" Axis Range
- CX: "X" Axis Range
- KA: Nozzle Number
- XX: Nozzle Diameter
- MT: Manifold Type

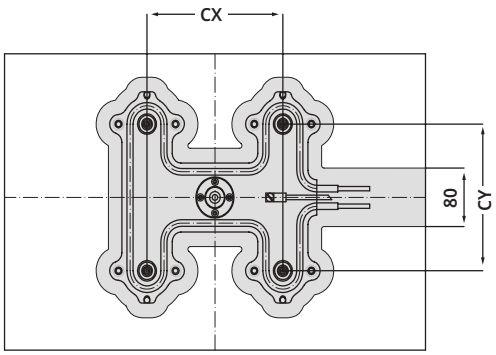
* "H" height is calculated according to the material type, weight and number of Nozzle used in Manifold.

Code: **MH**



"MH" Type Manifold for Hot Runner





Manifold Type	Nozzle Diameter	Number of Nozzle				Axis Range
MH	18	04	08	16	32	CX x CY
	22					
	25					
	32					
	40					

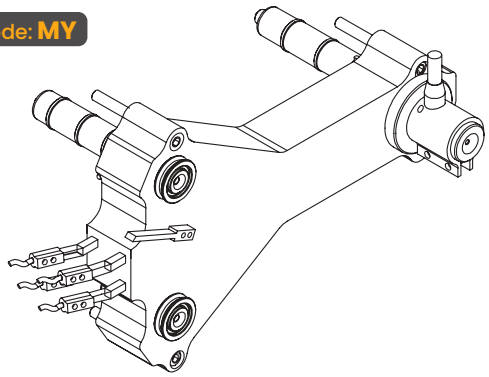
Order Code:

MH - XX - KA - CX - CY

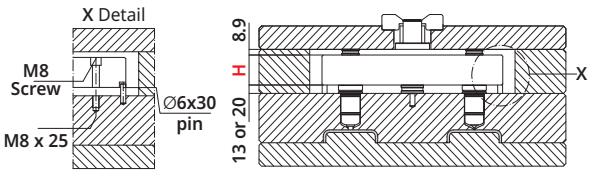
- "Y" Axis Range
- "X" Axis Range
- Nozzle Number
- Nozzle Diameter
- Manifold Type

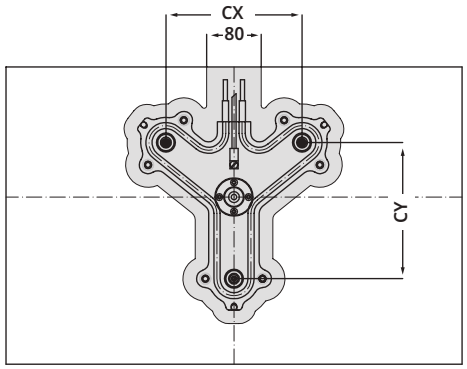
* "H" height is calculated according to the material type, weight and number of Nozzle used in Manifold.

Code: **MY**



"MY" Type Manifold for Hot Runner





Manifold Type	Nozzle Diameter	Number of Nozzle			Axis Range
MY	18	03	06	12	CX x CY
	22				
	25				
	32				
	40				

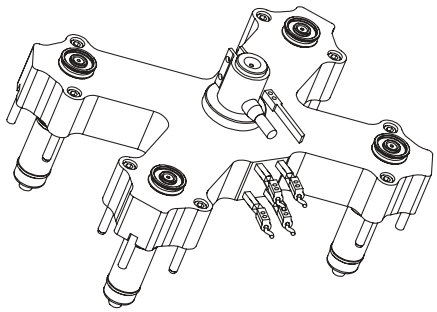
Order Code:

MY - XX - KA - CX - CY

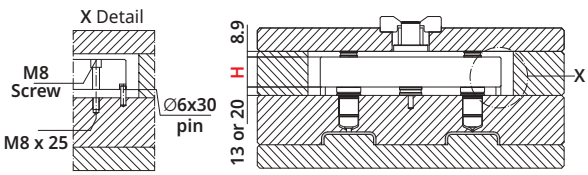
- "Y" Axis Range
- "X" Axis Range
- Nozzle Number
- Nozzle Diameter
- Manifold Type

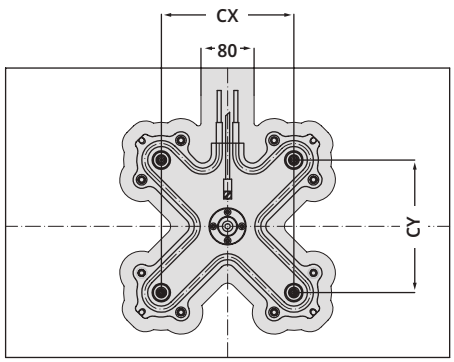
* "H" height is calculated according to the material type, weight and number of Nozzle used in Manifold.

Code: **MX**



"MX" Type Manifold for Hot Runner





Manifold Type	Nozzle Diameter	Number of Nozzle			Axis Range
MX	18	04	08	16	CX x CY
	22				
	25				
	32				
	40				

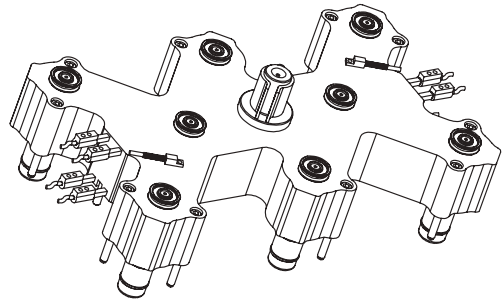
Order Code:

MX - XX - KA - CX - CY

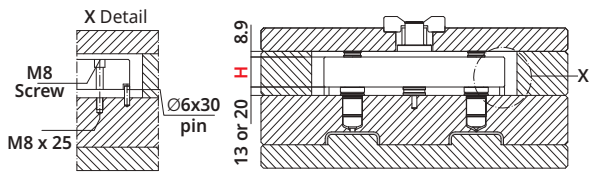
- "Y" Axis Range
- "X" Axis Range
- Nozzle Number
- Nozzle Diameter
- Manifold Type

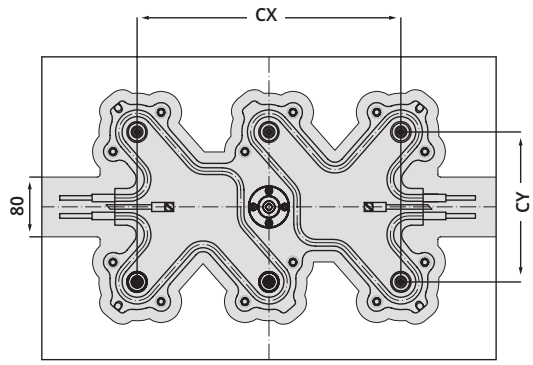
* "H" height is calculated according to the material type, weight and number of Nozzle used in Manifold.

Code: **MYY**



"MYY" Type Manifold for Hot Runner





Manifold Type	Nozzle Diameter	Number of Nozzle			Axis Range
MYY	18	06	12	24	CX x CY
	22				
	25				
	32				
	40				

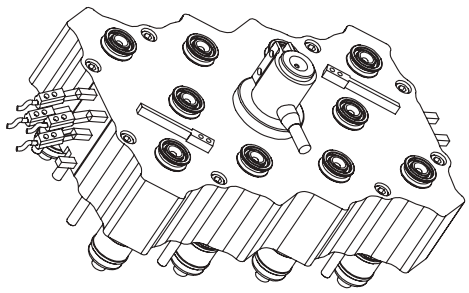
Order Code:

MYY - XX - KA - CX - CY

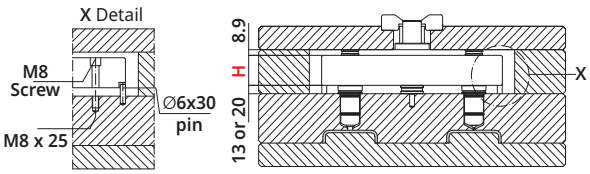
- "Y" Axis Range
- "X" Axis Range
- Nozzle Number
- Nozzle Diameter
- Manifold Type

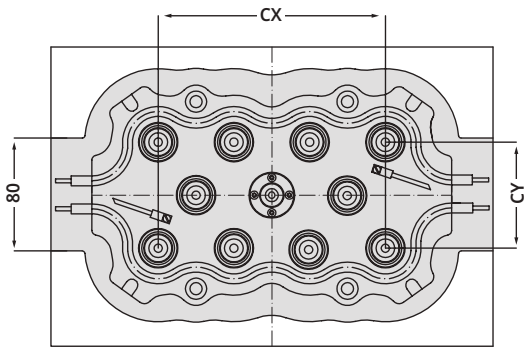
* "H" height is calculated according to the material type, weight and number of Nozzle used in Manifold.

Code: **MXX**



"MXX" Type Manifold for Hot Runner





Manifold Type	Nozzle Diameter	Number of Nozzle			Axis Range
MXX	18	08	16	32	CX x CY
	22				
	25				
	32				
	40				

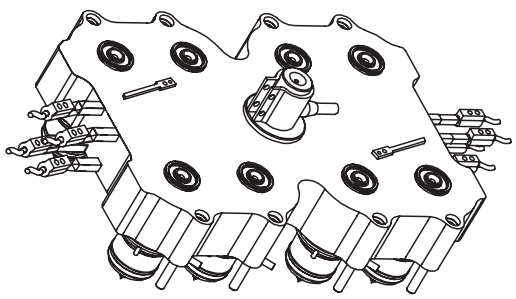
Order Code:

MXX - XX - KA - CX - CY

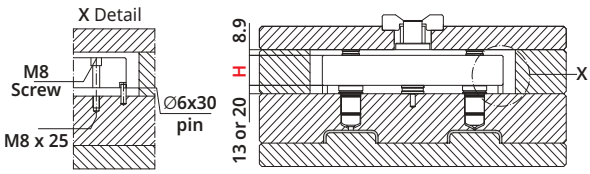
- MXX — Manifold Type
- XX — Nozzle Diameter
- KA — Nozzle Number
- CX — "X" Axis Range
- CY — "Y" Axis Range

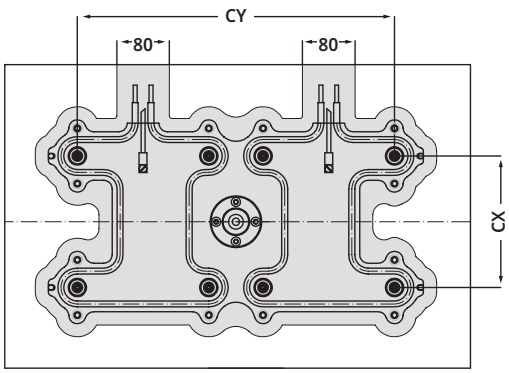
* "H" height is calculated according to the material type, weight and number of Nozzle used in Manifold.

Code: **MHH**



"MHH" Type Manifold for Hot Runner





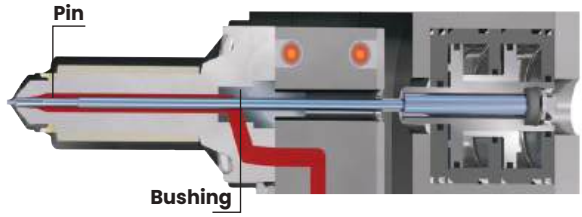
Manifold Type	Nozzle Diameter	Number of Nozzle			Axis Range
MHH	18	08	16	32	CX x CY
	22				
	25				
	32				
	40				

Order Code:

MHH - XX - KA - CX - CY

- MHH — Manifold Type
- XX — Nozzle Diameter
- KA — Nozzle Number
- CX — "X" Axis Range
- CY — "Y" Axis Range

* "H" height is calculated according to the material type, weight and number of Nozzle used in Manifold.

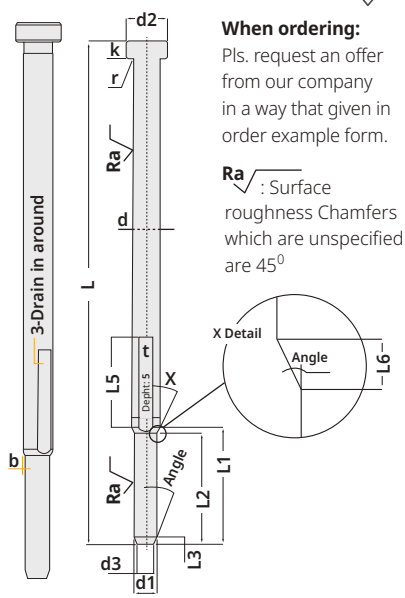


Valve Gate Pin & Bushing (custom-made production)

Code: VGP

Valve Gate Pin: Mounting and demounting of Valve Gate Pin are such as the sectional view, they will be produced in desired material and dimensions.
Valve Gate Pin Bushing: The seconds Bushing in nozzle is to avoid expansion and bending of movable pin under load and heat. It can be change by demounting. As per request in order, technical drawing or sample is required. The products will be produced in precision and faithfully.

Valve Gate Pin - Order Example:



When ordering: Pls. request an offer from our company in a way that given in order example form.

Ra : Surface roughness Chamfers which are unspecified are 45^0

Geometrical Production Tolerances:

Perpendicularity	Concentricity	Parallelism
0.02 Axis	0.02 Axis	0.02

Tolerance before TiN coating can be; -0.008 After coating it can be; +0.01
Step chamfer dimensions:
Groove slotted machining dimensions:
TiN coating area & its length:
Full length & tolerance:
Material / Hardness: 1.2344 or HSS
Quantity:
General tolerance values ±:

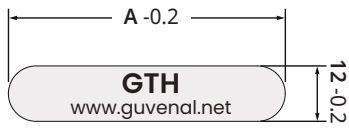
Important: For precision production of Valve Gate Pin, sending the previous existing pin or bushing sample offers good production.

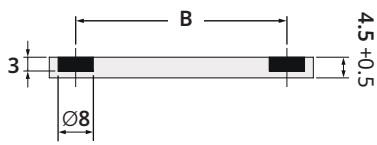
Cable Retainer Cap Magnetic

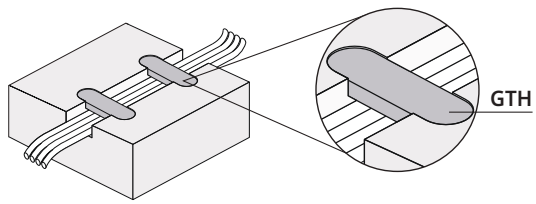
Code: GTH

(Magnetic & does not require extra hole)

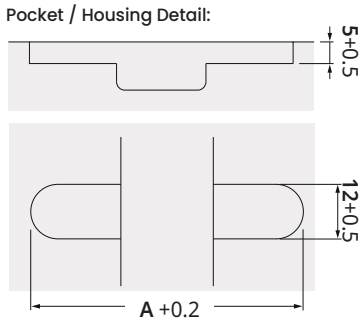
Especially in hot runner moulds, it keeps the diffused cables clean and smooth in channel. The product is a magnetic material, it is self adhesive, and there is no need to drill and tap extra holes.
We recommend keeping max. mould temperature under 80ºC. Because, plastic and even magnets can be affected and broke down due to high temperature.







Pocket / Housing Detail:



Order Code	A	B	Material	Max. Temp.
GTH40	40	28	ABS+ NfFeB	80ºC
GTH60	60	48	ABS+ NfFeB	80ºC

HIGHLY
PRODUCTIVE
GÜVENAL
PRODUCT

Package:
1 kg.

USER MANUAL

VİDEO

Order Code: **GTH1000**

Teknoclean Cleaning Compound
(Cleaning & Colour Changing Compound)

Colour changeovers can be time-consuming, especially when transitioning from dark to light colours. Contamination occurs when residual resins build up in the machine and affect future parts. Both colour changeovers and contamination are common challenges that can be a significant headache.

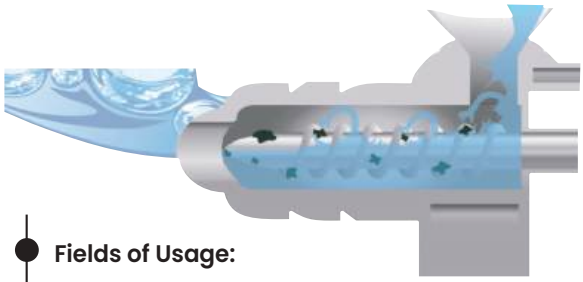
Most plastic manufacturers face colour change issues daily. Moulders, extruders, and blow-moulders all struggle with transitioning from dark to light colours and often experience frustrations with blues, reds, and yellows. Regardless of your process or end product, one thing is clear: Time is money when it comes to colour changeovers.

If your team can reduce changeover time and lower scrap rates, your profitability will increase significantly.

Güvenal Teknoclean® Compounds offer the best solution for faster and more efficient colour changeovers.

Teknoclean Specifications: It provides quick and efficient transition in thermoplastic raw material and colour changing. It also cleans extruder area of injection machine. Less raw material consumption in raw material colour changing process. It easily cleans oxidized, burnt and stubborn dirts in injection machine extruder, thus it provides economical profit. It is efficient in colour changing processes of raw materials such as P and C, PP, TPU, PPS, PA6, PA66, POM, HDPE, LDPE, EVA, PS, ABS, PMMA, PC, SAN, SBS, SEBS, CA, PBT, PET and in injection machines, all hot and cold runner systems. It can be safely used during machine cleaning and colour changing process in extrusion machines (compounding, metal sheet, profile, cable and pipe) and blowing machines (packaging, film).

You can obtain the full user manual from our technical department or your sales representative.



Fields of Usage:

1
* Decrease the injection / screw temperatures 20-30° from the current temperatures. Please check temperature / proportion table.
* Nozzle area temperature should be normal processing temperature (don't decrease 20-30°C).
* Hotrunner and nozzle temperatures should be increased 50°C above normal.

2
* Shake Teknoclean bottle well before use.
* Put %4-5 Teknoclean into natural color PP granules and mix very well. To adjust total amount please check screw diameter/mixture amount table.

3
* Decrease the screw speed up to %50 or lower and let the cleaning mixture go through from feed hopper to machine.
* Increase back pressure slightly.
* Use total injection stroke for cleaning.
* This compound can also be injected into opened mould to clean tooling cold runner & hot runner system to clean dirty channels.

4
* Use pure PP natural for rinsing machine, the raw material you added is purely sprayed out of the machine.

Traditional Method:
Causes more consumption

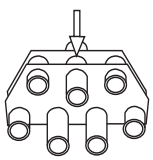
"Teknoclean" usage according to injection machine screw diameter:

Screw Diameter mm	Carrier Polymer PP Kg.	Teknoclean Amount Gram
20 - 40	0.5 - 1	25 - 50
40 - 50	1 - 3	50 - 150
50 - 60	3 - 5	150 - 250
60 - 80	5 - 10	250 - 500
80 - 100	10 - 25	500 - 1250
100 - 120	25 - 35	1250 - 1750
120 - 150	35 - 70	1750 - 3500
175 - 100	70 - 90	3500 - 4500
100 - 120	90 - 150	4500 - 7500

Magnetic Separator for Injection Machine

Code: **EGM**

It keeps unwanted metal particles in raw material.
Especially in your injection machine, the unwanted metal particles mixed in the raw material damages the extruder of injection machine. This is for screening / elimination process at the bottom of fluid raw material. Stainless magnetic rods are excellently powerful in keeping metal particles and cylindrical magnetic rods can be used in liquids since they are compatible with fluidity compliance of raw material. **Additionally / Example:** Its also keeping metal particles in liquid tank of Spark Erosion EDM.

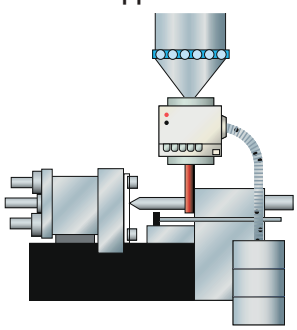


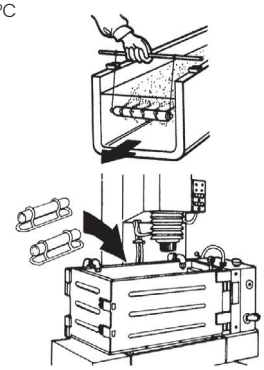
"EGM" Magnetic Separator is the lowest cost insurance of your injection machine.

Order Code	Width	Length	Height	Weight	Gauss
EGM20C	170 mm	180 mm	75 mm	2.7 Kg.	3600 Gauss
EGM25C	220 mm	230 mm		4 Kg.	

It is for raw material feed hopper of injection machines.
It is quick and practical in all metal screening / eliminating processes, a toolkit which should be used.
Usage: It is inserted to raw material feed hopper of injection machine. It is equipped with very powerful neodymium (Nd Fe B) magnets and materials are from stainless steel, also can keep very thin metal particles. When "EGM" Magnetic Separator is used, the extruder life of injection machine is prolonged considerably. The main advantage of magnetic magnet is its demagnetization opportunity. The cleaning of metal particles on stainless rods can be done rapidly and comfortably. **Heat Resistance:** 60°C

*** Injection Machine Applications**

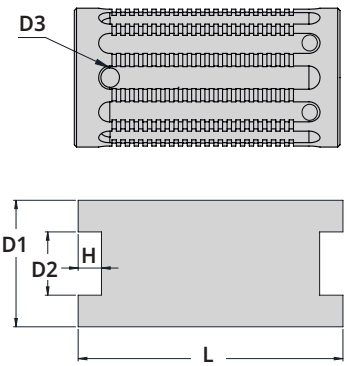




*** Spark Erosion "EDM" Applications**

Nozzle Filter

Code: **MTMF**



Order Code	D1	L	D2	H	D3	Max. Ton
MTMF14	Ø14	44	8	5	3	120
MTMF20	Ø20	45	14	4	3	250
MTMF30	Ø30	60	20	9	4	380
MTMF40	Ø40	70	30	8	5	450
MTMF50	Ø50	80	40	8	5	530

Recommended for use whenever a high quality filtered melt is desired, for example; whenever processing with a hot-runner system. Also, the use of this filter is especially for smaller gate diameters and when processing regrind materials.

"MTMF" Nozzle Filters offer a simple, effective and economic way of preventing metal particles and other contaminants from clogging gates or entering the mould. The channel and groove forms of the filter cartridge have been optimized for maximum flow at minimum pressure loss.

Order Code: **PCAM**

Order Code: **PCTM**

Precision Deburring Blade with Handle

Handle: Zinc compression moulding robust body; handle with non-slip plastic structure and mounting holes with two screws for blade. Non-slip plastic protection cover and one piece of blade.

TiN coated cutting end; it reduces the time which spent for deburring in objects with its sharp blade for low cutting end wearing and long life. It provides easy and precise deburring for curved contours and thin protrusions.
*** It is designed only for deburring.**

Order Code: **PCBU**

Order Code: **PCTU**

Precision Deburring Blade

Blade Kit (1 blade or 100 blades in safe dispenser):
It provides high operation safety thanks to its angled cutting end, it is strongly positioned with two screws. The specified blade order codes are for a single piece. However, you can also purchase 100 pieces in the form of a safe dispenser.

GERMANY
Solingen

In-Mould Application Mechanical Pliers

Hot object holding tools for machines & moulds.

Extra Long Needle Nose Pliers — Order Code: **RUK1300**

Long & Flat Nose

It is for object removing processes from moulds such as tongs. In deep zones of long and thin jaw mould or product holding operation in hot stamped moulds. Also during repair / maintenance, in places that can be difficult to reach.
Length: 300 mm / **Body:** Vanadium Steel / **Hadnle:** PVC - Isolated

Extra Long Needle Nose Pliers — Order Code: **RUK1345**

Long & Curve Nose

It is used to remove smaller parts from the mould with the help of curve nose. In deep zones of long and thin jaw mould or product holding operation in hot stamped moulds. Also during repair / maintenance, in places that can be difficult to reach.
Length: 300 mm / **Body:** Vanadium Steel / **Hadnle:** PVC - Isolated

Extra Long Needle Nose Pliers — Order Code: **RUK0360**

Long, Round & Grab Nose

It is used in deep areas, for pipes and round workpieces. In deep zones of long and thin jaw mould or product holding operation in hot stamped moulds. Also during repair / maintenance, in places that can be difficult to reach.
Length: 300 mm / **Body:** Vanadium Steel / **Hadnle:** PVC - Isolated

Extra Long Needle Nose Pliers — Order Code: **RUK2345**

Long & Combination

In workpieces requiring deep repair, clamping, holding and removing. In deep zones of long and thin jaw mould or product holding operation in hot stamped moulds. Also during repair / maintenance, in places that can be difficult to reach.
Length: 300 mm / **Body:** Vanadium Steel / **Hadnle:** PVC - Isolated

Diagonal Side Cutter for Plastic - 90⁰ Order Code: W1231

In plastic parts, especially in deburring processes. Serial usage thanks to spring mechanism. For zero / sharpest cuts.
Attention: It is not used in metal cutting (wire etc.).

Straight Cutting **Length:** 150 mm **Handle:** PVC - Dipped

Diagonal Side Cutter for Plastic - 35⁰ Order Code: W1233

In plastic parts, especially in deburring processes. Serial usage thanks to spring mechanism. For zero / sharpest cuts.
Attention: It is not used in metal cutting (wire etc.).

Straight Cutting **Length:** 165 mm **Handle:** PVC - Dipped

Diagonal Side Cutter for Plastic - 30⁰

In plastic parts, especially in deburring processes. Serial usage thanks to spring mechanism. For zero / sharpest cuts.
Attention: It is not used in metal cutting (wire etc.).

Order Code: **E09440160** Length: **160 mm**
Order Code: **E09440140** Length: **140 mm**

Diagonal Side Cutter for Wire

Cutting edges for very hard (such as piano wires) wires. Extra hardened special tool steel with indiction technique, high perfomance cutting edges and ergonomical handle.

Order Code: **E08410180** Length: **180 mm** Wire Cutting: Ø**2 mm**
Order Code: **E08410200** Length: **200 mm** Wire Cutting: Ø**2.2 mm**

Straight Cutting
J17190

Curve Cutting
J17190B

Multi-Purpose Scissors

Straight cutting stainless steel blades with spring mechanism for cutting light metal folios, fabrics, cardboards and plastic etc, Ergonomical handle with fixing mechanism.

Order Code: **J17190** Length: **190 mm** Cutting Length: **40 mm**
Order Code: **J17190B** Length: **190 mm** Cutting Length: **40 mm**

Nipper with Heat Control Unit for Plastic Code: HT..

It can be performed applications for cutting plastic and other resin material, hard and thick plastic materials that are hard to cut with special cutting blades by without cracking, breaking and by heating (heat controlled). You can obtain clean cutting surface.
Especially; in cutting operations of plastic materials of engineering (autolamps etc.) for precise, rapid and quality surfaces.
The cutting blade is heated by a heat control unit for cutting, due to adjustable heat, degree of heat can be selected according to the material. This nippers are also with aluminium base plate as burning inhibitor base plate.

Heat Nipper Code: HT160

For cutting narrow spaces

Round Type

Length	Body	Cutting	Capacity	Heater
150 mm	with Heating Unit	25°, Length: 16 mm	Ø4.0 mm	W19

Heat Nipper Code: HT170

Angle blade type

Flat Taype

Length	Body	Cutting	Capacity	Heater
150 mm	with Heating Unit	25°, Length: 22 mm	Ø4.0 mm	W19

Heat Nipper Code: HT180

Standard type

Round Type

Length	Body	Cutting	Capacity	Heater
190 mm	with Heating Unit	25°, Length: 16 mm	Ø4.0 mm	W19

Heat Nipper Code: HT200

Heavy-duty type

Round Type

Length	Body	Cutting	Capacity	Heater
190 mm	with Heating Unit	25°, Length: 23 mm	Ø7.0 mm	W29

Heat Control Unit Code: TRF25

* Suitable for HT160, HT170, HT180 and HT200 heat nippers.

! Heat control unit must be ordered separately.

Spare Heater

Order Code: **W19**
Order Code: **W29**

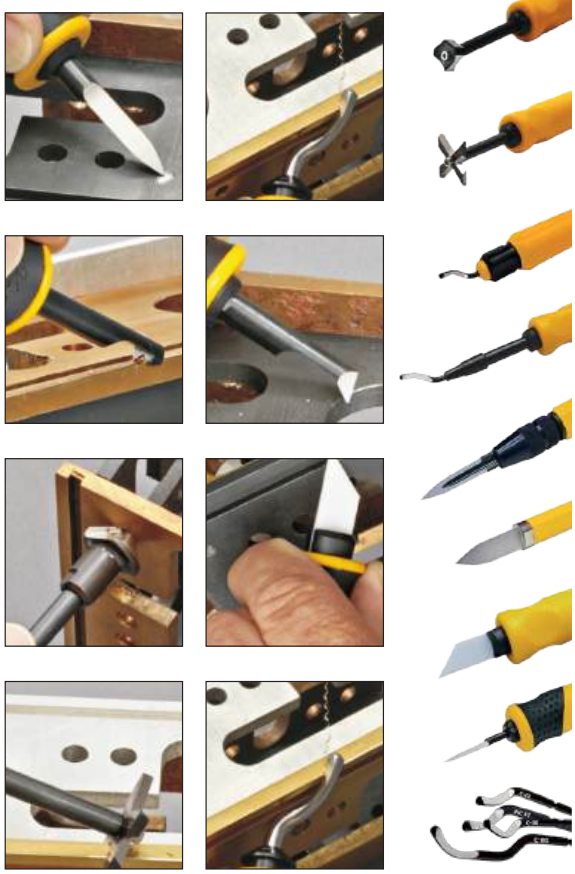
Continue on next page

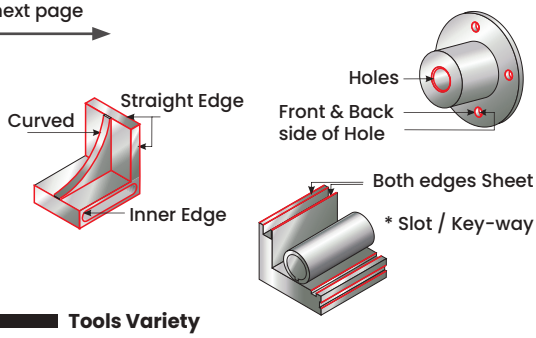
New Cost-effective Deburring Tools

Deburring Info

* Burrs are the unwanted portion of metal which remain at the edges of the components after machining.
* Hand Deburring Tools offer Fast, Efficient & Economical solutions for removal of burrs.
* Tools / Blades of different shapes & cutting angles are suitable for different component materials such as Steel, Aluminium Copper, Zinc, Brass, Cast iron, Stainless Steel, Alloy Steels Variety of Plastics & 3D printed parts.

Application Examples

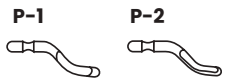




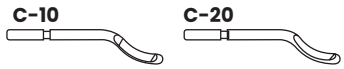
Tools Variety

For straight, curved & inner edge

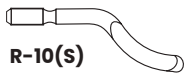
Light duty
Ø 2.6 mm



Heavy duty
Ø 3.2 mm



Extra Heavy duty
Ø 6 mm



For Slot/Key Way, Sheet / Rib. Corners & Surface

For Holes Front, Back or both Sides

Blades / Tools to Deburr on:

* Materials with spiral chips such as steel, aluminium, copper, zinc, acrylic, plastic & 3D printed parts.
* Material with brittle burr such as cast iron, brass, soft plastics & 3D printed parts.
* Holes, slots, ribs, sheets one or 2 edges, corners surfaces etc.

Selection Guidance

Blades Type	To Deburr / Use	Direction of use
P-1 / C-10 / R-10(S)	Material with Spiral Chips	
P-2 / C-20	Material with Brittle Burr	
C-15	Stainless Steel	
C-101	Small hole & Fine edges	
C-30 / C-60	Both side or back side of sheet metal hole	
S-12 / V-2 / V-4	Sheet / Rib - single or both sides	
KW-9 / KW-16	Key-way / Slot both sides	
SCR-3 / SCR-8	Surface finishing / corner cleaning	
SCR-6	Double ended & Internal scraper	

DT-2

Order Code: **RCP - 31024**

Works best on metals forming spiral chips such as Steel, Aluminum and Copper. Can also be used on all other metals (hardness<35 HRC) and plastics.

Blade:
RCP - 26120

Sheet / Rib Deburrer

Order Code: **RCP - 34084**

Deburring Tool with Poly Acetal Body Handle & Protection Guard to deburr one or both edges of sheets / ribs up to 12 mm thickness . The width between the 2 round blades mounted on the holder can be adjusted from 0.5 to 12 mm. Works best for deburring both edges on Steel and Aluminum sheets.
Can also be used on all other metals (hardness<35 HRC) and plastics.

Blade:
RCP - 26040

Sheet / Rib Deburrer

Order Code: **RCP - 34094**

Includes Polyacetal Body T-SD Handle with a unique tool having 4 'V' shaped cutting edges mounted on a Telescopic Holder. 2 'V' Shaped edges cover width up to 12 mm & 2 edges cover width up to 4 mm. Works best for deburring both edges on Steel and Aluminums sheets. Can also be used on all other metals (hardness<35 HRC) and plastics.

Blade:
RCP - 23020

Sheet / Rib Deburrer

Order Code: **RCP - 34104**

With Telescopic handle. The Tool has 'V' Cut on one side to deburr sheet / rib up to 4 mm width & round edge on the other side to deburr single edge. Works best for deburring both edges on Steel and Aluminum sheets. Can also be used on all other metals (hardness<35 HRC) and plastics.

Blade:
RCP - 74060

Sheet / Rib Deburrer

Order Code: **RCP - 74064**

Telescopic Handle with Collet Action. The tool has a 6mm A/F Triangular Scraper on one side & Internal Scraper on the other side. Works best for heavy duty scraping/deflashing on Steel, Aluminium and Copper. Can also be used on all other metals (hardness<35 HRC) and plastics.

Order Code:
RCP - 77104

Order Code:
RCP - 77204

CT Ceramic Tool

Multi edge Ceramic scraper mounted in a Poly Acetal Body handle with Ball End Cap. Works best for heavy duty scraping deflashing on Steel and Plastics. Can also be used on all other metals (hardness<35 HRC) and plastics.

Order Code: **RCP - 48034**

Countersink Set-Revolving

Includes the R-SD Handle, CS-R Revolving Holder and CS-20 Single Flute Countersink for hole sizes from Ø 4 to 19mm. Suitable for chamfering/deburring holes on Steel, Aluminum and Copper. Can also be used on all other metals (hardness<35 HRC) and plastics.

Blade:
RCP - 48200
20 mm

Blade:
RCP - 48300
30 mm

Order Code: **RCP - 86909**

Universal Deburring Kit

All in one 'Universal Deburring Tool Kit' to fulfill all your Deburring needs. Tools suitable for Deburring, Chamfering and Scraping on Steel, Aluminum and Copper, Cast Iron Brass & Stainless Steel components. Can also be used on all other metals (hardness<35 HRC) and plastics.

Pack Size = 240 x 270 x 56mm

Weight = 1.3 kg

Included Contents:

Handles: D-SD, T-SD (2 Nos.), R-SD & SD-1

Deburring Blades: 5 pcs. each of C-10 & C-20; 2 pcs. each of C-30, C-15, C-101, C-10(C), C-20 (C); 1 pc. of C-60 blade; 5 Nos. 6 mm Ø blades – 3 pcs. of R-10(S) & 2 pcs. of R-15(S)

Sheet/Rib Deburring Blades: V-2 & V-4

Key-Way/Slot Blades: KW-16

Holders: VT, KW, DT(C) & CS-Long

Countersink: CS-20

Promo Deburring Set-1

(Telescopic Handle)

Order Code: **RCP - 84059**

Suitable for deburring on Steel, Aluminum, Copper, Cast Iron, Brass, Stainless Steel etc. Can also be used on all other metals (hardness<35 HRC) and plastics. Deburring Set with Polyacetal handle and x10 C-20 Universal Deburring Blades.

Promo Deburring Set-2

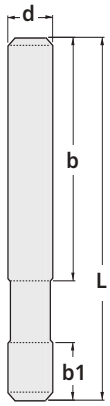
(Classic Handle)

Order Code: **RCP - 84069**

Suitable for deburring on Steel, Aluminum, Copper, Cast Iron, Brass, Stainless Steel etc. Can also be used on all other metals (hardness<35 HRC) and plastics. Deburring Set with Polyacetal handle and x10 C-20 Universal Deburring Blades.

Table for Spare Blade Orders

Code		Applications	Pcs.
P-1 RCP-11010		Works best on metals forming spiral chips such as Steel, Aluminum and Copper. Can also be used on all other metals.	10
P-2 RCP-11020		Works best on metals forming spiral chips such as Cast Iron, Brass, Copper etc. Can also be used on all other metals.	10
C-10 RCP-12100		Works best on metals forming spiral chips such as Steel, Aluminum and Copper. Can also be used on all other metals	10
C10 (L+R) RCP-12400		Works best on metals forming spiral chips such as Steel, Aluminum and Copper. Can also be used on all other metals.	10
C-15 RCP-12151		Ideally suited for deburring on Stainless Steel. Can also be used on all other metals (hardness<35 HRC) and plastics.	10
C-20 RCP-12200		Works best on metals having brittle burr such as C.I. & Brass.	10
C-30 RCP-12300		Suitable for simultaneously deburring inner and outer edges of sheet metal holes up to 10mm thickness on all metals.	10
C-30 TIN RCP-12302		TiN (Titanium Nitride) coating on C-30 blade for deburring on hard metals and longer life.	10
C-101 RCP-12110		Suitable for deburring small and micro holes from Ø1.5mm on all kinds of all kinds of metals.	10
C-60 RCP-12600		Suitable for backside deburring up to 20mm sheet thickness on all metals.	5
C-OR RCP-12610		Suitable for backside deburring up to sheet thickness on all metals.	5
R-10(S) RCP-13100		For extra-heavy duty burr removal on metals forming spiral chips such as Steel, Aluminum and Copper.	5
R-15 (S) RCP-13151		For extra-heavy duty burr removal on Stainless Steel.	5
KW-9 RCP-27090		Deburring Blade for deburring both sides/edges on slots. Suitable for deburring slots on Aluminum and Steel jobs.	1
KW-16 RCP-27160		Deburring Blade for deburring both sides/edges on slots. Suitable for deburring slots on Aluminum and Steel jobs.	1
S-12 RCP-26120		Cutting edge along the full circle and on 2 sides of the blade for a longer life. Suitable for deburring Aluminium and Steel sheets.	1
V-2 RCP-23020		Deburring Blade for both sides/edges of sheets. The Blade can be easily Resharpened Suitable for deburring Aluminum and Steel sheets.	1
V-4 RCP-26040		Deburring Blade for deburring both sides/edges on sheets. Suitable for deburring Aluminum and Steel sheets.	1
SCR-3 (75) RCP-72750		Works best for light duty scraping/deflashing on Steel, Aluminum and Copper. Can also be used on all other metals.	1
SCR-6 RCP-74060		Double ended Triangular Scraper. Works best for heavy duty and internal scraping/deflashing on Steel, Aluminum and Copper.	1
SCR-8 RCP-75080		To be mounted in a 'Polyacetal Body handle'. Works best for heavy duty scraping/deflashing on Steel, Aluminum and Copper.	1



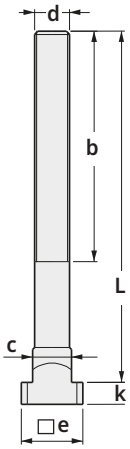
Code: **1690..**

Straight Stud

DIN 6379

Class: 10.9

Order Code	d	L	b1	b	Tightening Torques		Weight (gr.)
					Nm	kN	
169008040	M8	40	11	20	36 Nm	27 kN	10
169008063		63		40			15
1690.08080		80		50			20
1690.08100		100		63			30
1690.08125		125		75			35
1690.08160		160		100			45
169010050	M10	50	13	25	67 Nm	43 kN	20
169010063		63		32			25
169010080		80		50			35
169010100		100		63			45
169010125		125		75			55
169010160		160		100			70
169010200		200		125			95
169012050	M12	50	15	25	120 Nm	63 kN	35
169012063		63		32			40
169012080		80		50			55
169012100		100		63			70
169012125		125		75			90
169012160		160		100			115
169012200		200		125			140
169014063	M14	63	17	32	191 Nm	86 kN	60
169014080		80		50			75
169014100		100		63			95
169014125		125		75			120
169014160		160		100			150
169014200		200		125			195
169014250		250		160			240
169016063	M16	63	19	32	302 Nm	118 kN	85
169016080		80		50			105
169016100		100		63			130
169016125		125		75			160
169016160		160		100			205
169016200		200		125			260
169016250		250		160			325
169016315		315		180			405
169016500		500		315			650
169018080	M18	80	23	50	405 Nm	144 kN	130
169018100		100		60			160
169018125		125		75			200
169018160		160		100			260
169018200		200		125			320
169018250		250		150			400
169018315		315		180			510
169020080	M20	80	27	32	580 Nm	184 kN	155
169020100		100		60			200
169020125		125		70			250
169020160		160		100			330
169020200		200		125			400
169020250		250		160			510
169020315		315		200			640
169020400		400		250			815
169020500		500		315			1020
169022100	M22	100	31	45	772 Nm	228 kN	250
169022125		125		70			305
169022160		160		100			400
169022200		200		125			500
169022250		250		160			620
169022315		315		180			780
169022400		400		250			1010
169024100	M24	100	35	45	994 Nm	265 kN	290
169024125		125		70			365
169024160		160		100			470
169024200		200		125			580
169024250		250		160			730
169024315		315		200			920
169024400		400		250			1170
169024500		500		315			1470
169024630		630		315			1860
169030125	M30	125	43	56	1930 Nm	421 kN	570
169030200		200		125			910
169030250		250		160			1150
169030315		315		200			1435
169030500		500		315			2315
169030700		700		400			3215
1690301000		1000		400			4700
169036160	M36	160	51	80	3378 Nm	614 kN	1100
169036200		200		125			1340
169036250		250		160			1710
169036315		315		200			2150
169036400		400		250			2700
169036500		500		315			3450
169036700		700		400			4750
169042315	M42	315	59	200	5415 Nm	843 kN	2950
169042400		400		250			3750
169042500		500		315			4690



Code: **1610..**

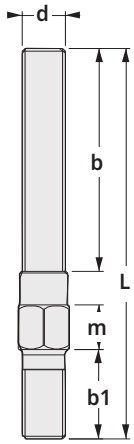
T-Slot Bolt Set

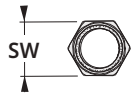
With DIN 787 screws for T-slots, hexagon nut DIN 6330B and washer DIN 6340.

Class: 12.9
Forged & Black Coating

Order Code	d x a	L	b	c	e	k	Tightening Torques		Weight (gr.)
							Nm	kN	
16100606025	M 6 x 6	25	15	5.7	10	4	17 Nm	17 kN	19
16100606040		40	28						25
16100606063		63	40						36
16100808032	M 8 x 8	32	22	7.7	12	6	43 Nm	32 kN	39
16100808050		50	35						45
16100808080		80	50						56
16101010040	M 10 x 10	40	23	9.7	15	6	79 Nm	51 kN	65
16101010063		63	45						80
16101010080		80	50						90
16101010100		100	60						110
16101012050	M 10 x 12	50	35	11.7	18	7	79 Nm	51 kN	85
16101012063		63	40						95
16101012080		80	55						100
16101012100		100	60						110
16101012125		125	75						125
16101012160		160	90						140
16101012200		200	120						160
16101212050	M 12 x 12	50	35	11.7	18	7	141 Nm	74 kN	120
16101212063		63	40						128
16101212080		80	55						140
16101212100		100	60						160
16101212125		125	75						170
16101212160		160	100						195
16101212200		200	120						220
16101214050	M 12 x 14	50	35	13.7	22	8	141 Nm	74 kN	140
16101214063		63	40						150
16101214080		80	55						155
16101214100		100	60						175
16101214125		125	75						195
16101214160		160	100						200
16101214200		200	120						240
16101416063	M 14 x 16	63	45	15.7	25	9	223 Nm	101 kN	200
16101416080		80	55						230
16101416100		100	65						245
16101416125		125	75						270
16101416160		160	100						310
16101416200		200	120						340
16101416250		250	150						390
16101616063	M 16 x 16	63	45	15.7	25	9	354 Nm	138 kN	260
16101616080		80	55						285
16101616100		100	65						310
16101616125		125	85						345
16101616160		160	100						385
16101616200		200	120						435
16101616250		250	150						505

Order Code	d x a	L	b	c	e	k	Tightening Torques		Weight (gr.)
							Nm	kN	
16101618063	M16 x 18	63	45	17.7	28	10	354 Nm	138 kN	290
16101618080		80	55						305
16101618100		100	65						340
16101618125		125	85						370
16101618160		160	100						415
16101618200		200	120						460
16101618250		250	150						525
16101820080	M 18 x 20	80	55	19.7	32	12	474 Nm	169 kN	405
16101820100		100	65						435
16101820125		125	85						480
16101820160		160	110						535
16101820200		200	125						610
16101820250		250	150						680
16101820315		315	190						790
16102020080	M20 x 20	80	55	19.7	32	12	679 Nm	215 kN	480
16102020100		100	65						515
16102020125		125	85						570
16102020160		160	110						635
16102020200		200	125						725
16102020250		250	160						820
16102020315		315	190						950
16102022080	M20 x 22	80	55	21.7	35	14	679 Nm	215 kN	530
16102022100		100	65						565
16102022125		125	85						620
16102022160		160	110						690
16102022200		200	125						775
16102022250		250	150						880
16102022315		315	190						1050
16102224080	M22 x 24	80	55	23.7	40	16	903 Nm	266 kN	700
16102224100		100	65						740
16102224125		125	85						805
16102224160		160	110						890
16102224200		200	125						1000
16102224250		250	150						1115
16102224315		315	190						1280
16102424100	M24 x 24	100	70	23.7	40	16	1163 Nm	310 kN	885
16102424125		125	85						970
16102424160		160	110						1060
16102424200		200	125						1180
16102424250		250	150						1320
16102424315		315	190						1515
16102424400		400	240						1750
16102428100	M24 x 28	100	70	27.7	44	18	1163 Nm	310 kN	1000
16102428125		125	85						1065
16102428160		160	110						1150
16102428200		200	125						1280
16102428250		250	150						1425
16102428315		315	190						1640
16102428400		400	240						1870
16102428500		500	290						2170
16103036125	M30 x 36	125	80	35.6	54	22	2258 Nm	493 kN	1900
16103036160		160	110						2065
16103036200		200	135						2250
16103036250		250	150						2500
16103036315		315	200						2770
16103036500		500	300						3630
16103642160	M36 x 42	160	100	41.6	65	26	3953	719	3310
16103642250		250	175						3930
16103642400		400	250						5010
16103642600		600	340						6900
16104248160	M42 x 48	160	100	47.6	75	30	6337	986	4600
16104248250		250	175						5600
16104248400		400	250						7200





Code: **1670..**

Wrench-fit Stud

Class: 10.9

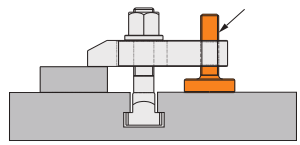
Area of Use:

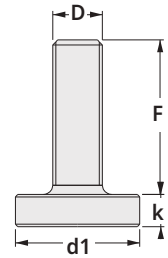
This stud is used in injection machines and in plates tapped with M12, M14, M16, M18, M20, M22, M24, and M30 threads.

Order Code	d	L	b	b1	m	SW	Tightening Torques		Weight (gr.)
							Nm	kN	
167012130	M12	130	65	24	14	14	120 Nm	63 kN	160
167012160		160	90						185
167014130	M14	130	65	28	15	15	191 Nm	86 kN	216
167014160		160	90						246
167016140	M16	140	70	32	16	17	302 Nm	118 kN	310
167016160		160	95						340
167018150	M18	150	70	35	19	19	405 Nm	144 kN	395
167018180		180	95						450
167020150	M20	150	70	40	22	22	580 Nm	184 kN	520
167020180		180	95						575
167022150	M22	150	70	40	22	24	772 Nm	228 kN	610
167022180		180	95						705
167024170	M24	170	75	47	22	27	994 Nm	265 kN	875
167024205		205	105						990
167024250		250	140						1125
167030250	M30	250	135	55	32	36	1930 Nm	421 kN	1950
167030315		315	195						2260

Code: **1490..**

Support Screw for Clamp

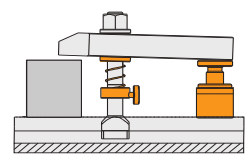


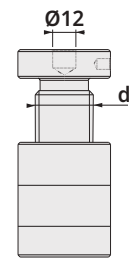


Order Code	D x F	d1	k	Weight (gr.)
149008032	M8 x 32	25	8	40
149010042	M10 x 42	30		60
149012050	M12 x 50	36	10	110
149012095	M12 x 95			150
149016062	M16 x 62	45	13	240
149016097	M16 x 97			285
149016117	M16 x 117			310
149020062	M20 x 62	50	13	320
149020097	M20 x 97			390
149020117	M20 x 117			430
149024081	M24 x 81	50	14	445
149024116	M24 x 116			555
149030180	M30 x 180	70	24	1650

Code: **1510..**

Threaded Lifter Support



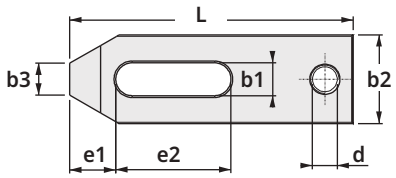


1510 Lifter supports are used in DIN 6314-6315-6316 clamps as the lifter support.

Order Code	h / H	d			kgf	Weight (gr.)
1510023030	23 - 30	M16	34	32	1000	140
1510040060	40 - 60				1800	250
1510042052	42 - 52	Tr 30x4	50	50	6000	570
1510050070	50 - 70					680
1510070100	70 - 100					960
1510100140	100 - 140					1395
1510140220	140 - 220		54	54		2285
1510210330	210 - 330	Tr 30x6	58	58	8000	3950
1510260430	260 - 430		68	68		7250

Code: **1330..**

Tapered Clamp with Support Hole



Hardened Black Coating

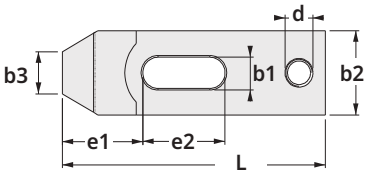
Order Code	L	b1		a	b2	b3	e1	e2	d	Weight (gr.)
133006050	50	6.6	M6	10	20	8	10	20	M8	50
133008060	60	9	M8	12	25	10	13	22	M8	105
133010080	80	11	M10	15	30	12	15	30	M10	210
133012100	100	14.5	M12 M14	20	40	14	21	40	M12	465
133012125	125							50		590
133016125	125	18.5	M16 M18	25	50	18	26	45	M16	930
133016160	160							65		1200
133020160	160	22.5	M20 M22	30	60	22	30	60	M20	1710
133020200	200							80		2170
133020250	250			35	70	30		100		3885
133024160	160	26	M24	30	70	26	35	60	M24	1965
133024200	200			35				80		2920
133024250	250							100		3720
133024315	315			40	80	35				6435
133030250	250	33	M30	40	80	34	45	100	M24	4825
133030315	315			50				130		7665
133036400	400	43	M36	58	100	43	100	150	M30	14490

Code: **1450..**

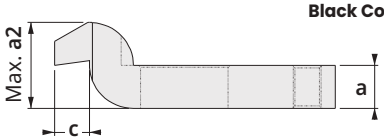
Cranked Clamp with Support Hole

DIN 6316

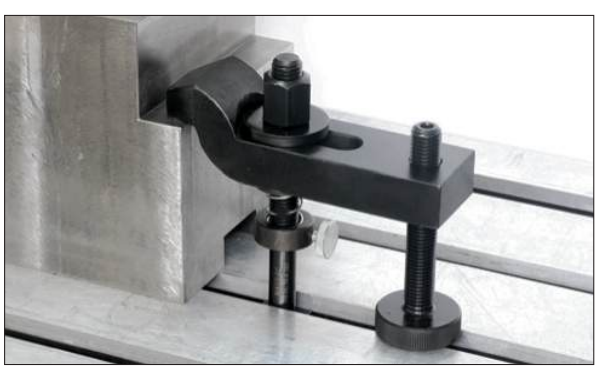
Provides advantages in height optimization and nut clearance.



Hardened Black Coating



Order Code	L	b1		a	a2	b2	b3	c	e1	e2	d
145006060	60	6.6	M6	10	20	20	10	8	20	20	M8
145008080	80	9	M8	12	24	25	12	9	25	25	M8
145010100	100	11	M10	15	30	30	15	12	32	32	M10
145012125	125	14.5	M12 M14	19	40	38	20	16	40	40	M12
145016125	125	18.5	M16 M18	24	50	48	25	20	49	40	M16
145016160	160									50	
145020160	160	22.5	M20 M22	29	58	58	30	24	55	55	M20
145020200	200									70	
145024160	160	26	M24	33	70	70	35	28	53	55	M24
145024200	200								72	60	
145024250	250									80	
145030250	250	33	M30	38	80	77	40	40	91	80	M24
145030315	315			48	100					100	



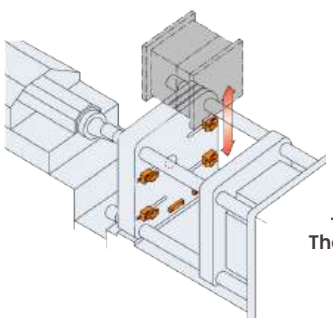
NEW

Clamping Set for Mould

Code: **HBP..**

Thanks to the shape of the clamps, it offers the advantage of use without requiring additional spacers or supports (there are no loose parts). It is especially used for the safe and quick clamping of moulds in injection and press machines, as well as heavy workpieces on milling machines.

Material: Forged Steel + Hardened



HAITIAN

These models are compatible with Haitian machines.

This is a set of products sold together!

Order Code: **HBP16130**

M16 x 130 mm / 1 Set

Clamp: 16 x 130 mm
T-Nut: 18 mm
Wrench-fit Stud: M16 x 150
Washer Nut: M16

Order Code: **HBP16150**

M16 x 150 mm / 1 Set

Clamp: 16 x 150 mm
T-Nut: 18 mm
Wrench-fit Stud: M16 x 150
Washer Nut: M16

Order Code: **HBP20170**

M20 x 170 mm / 1 Set

Clamp: 20 x 170 mm
T-Nut: 22 mm
Wrench-fit Stud: M20 x 175
Washer Nut: M20

Order Code: **HBP20190**

M20 x 190 mm / 1 Set

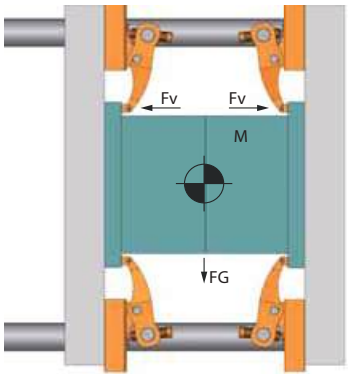
Clamp: 20 x 190 mm
T-Nut: 22 mm
Wrench-fit Stud: M20 x 175
Washer Nut: M20

Order Code: **HBP24220**

M24 x 220 mm / 1 Set

Clamp: 24 x 220 mm
T-Nut: 28 mm
Wrench-fit Stud: M24 x 200
Washer Nut: M24

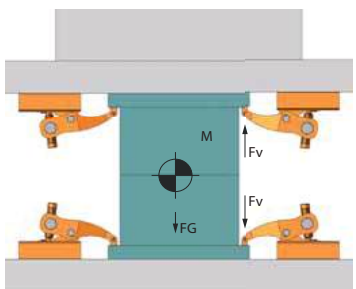
Clamping Templates



For Injection Moulds:

Formula Calculator

$\frac{M \times FG}{1000}$ = kN	$\frac{2500 \times 9.81}{1000}$ (kg)	= 24.52 kN
$\frac{kN}{\mu}$ = Result	$\frac{24.52}{0.14}$	= 175.14 kN
$\frac{Result}{Fv}$ = Number of Clamp	$\frac{175.14\ kN}{25\ kN}$	= 7 Clamp Use 8 pcs.



For Press Dies:

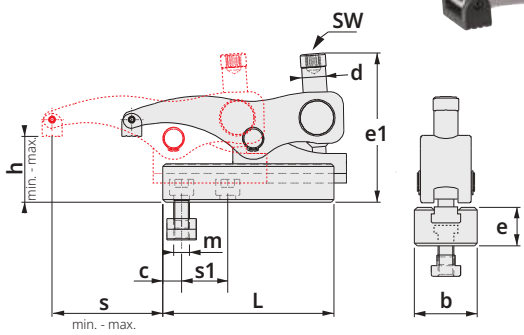
Formula Calculator

$\frac{M \times FG}{1000}$ = kN	$\frac{5000 \times 9.81}{1000}$ (kg)	= 49.050 kN
$\frac{kN}{\mu}$ = Result (Upper Die 60 %) (Lower Die 40 %)	$\frac{49.05}{0.14}$	= 350.35 kN (60 % Upper Die = 210.21) (40 % Lower Die = 140.14)
$\frac{Result_{(Upper\ Die)}}{Fv}$ = Number of Clamp	$\frac{210.21\ kN_{(Upper\ Die)}}{25\ kN}$	= 8 Number of Clamp
$\frac{Result_{(Lower\ Die)}}{Fv}$ = Number of Clamp	$\frac{140.14\ kN_{(Lower\ Die)}}{25\ kN}$	= 5.6 Clamp Use 6 pcs.

Code: 1120 / 1130 / 1150 / 1160 - T

Combined Power Sliding Clamp

(**Type: T** & for T-Slots)



Area of Usage:
Injection machines, presses, milling machines, drilling machines and various industrial machines.

Code: 1120 - T / Standard Type (t-slot: 14-16-18)
* M12 hex-socket screw is used with DIN 508 T-Nut.
* **Height Clamping Gap of Part:** 0 - 50 mm
* **Back and Forth Movement Distance:** 54 mm
* **Clamping Force:** 1600 Kgf

Code: 1130 - T / Standard Type (t-slot: 14-16-18-20-22)
* M12 hex-socket screw is used with DIN 508 T-Nut.
* **Height Clamping Gap of Part:** 0 - 60 mm
* **Back and Forth Movement Distance:** 68 mm
* **Clamping Force:** 2000 Kgf

Code: 1150 - T / Heavy Duty Type (t-slot: 18-20-22-24-28)
* M16 hex-socket screw is used with DIN 508 T-Nut.
* **Height Clamping Gap of Part:** 0 - 65 mm
* **Back and Forth Movement Distance:** 78 mm
* **Clamping Force:** 2500 Kgf

Code: 1160 - T / Heavy Duty Type (t-slot: 22-24-28-36)
* M20-24 hex-socket screw is used with DIN 508 T-Nut.
* **Height Clamping Gap of Part:** 20 - 80 mm
* **Back and Forth Movement Distance:** 75 mm
* **Clamping Force:** 5500 Kgf

Order Code	T-Slot a	m	h	s	s1	e1	d	SW	L	e	b	c	gr.
1120014T	14	M12	Min. - Max. 0 - 50	12 - 66	25	100	M14	8	104	35.5	38	13	1740
1120016T	16												1755
1120018T	18												1785
1130014T	14	M12	Min. - Max. 0 - 60	15 - 83	30	113	M18	10	130	39	48	17.5	3040
1130016T	16												3055
1130018T	18												3085
1130020T	20												3135
1130022T	22												3150

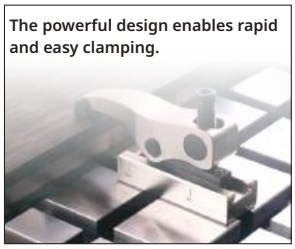
Heavy Duty Types

1150118T	18	M16	Min. - Max. 0 - 65	18 - 96	35	125	M20	12	140	43	55	19.5	4410
1150120T	20												4460
1150122T	22												4515
1150124T	24												4620
1150128T	28												4725
1160222T	22	M20	Min. - Max. 20 - 80	17 - 92	41.5	175	M24	12	178	55	74	24	9030
1160224T	24												9120
1160228T	28	M24											9180
1160236T	36												9600

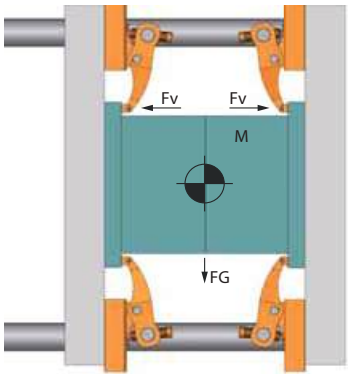
Position and fasten carrier component on the tool table.

Push the base component into the desired position on the carrier component.

Adjust the height of the bar with the adjusting screw and clamp the workpiece.


The powerful design enables rapid and easy clamping.

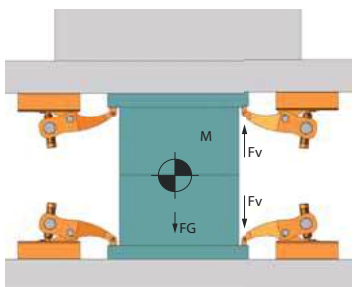
Clamping Templates



For Injection Moulds:

Formula Calculator

$\frac{M \times FG}{1000}$	= kN	$\frac{2500 \times 9.81\ kg}{1000}$	= 24.52 kN
$\frac{kN}{\mu}$	= Result	$\frac{24.52}{0.14}$	= 175.14 kN
$\frac{Result}{Fv}$	= Number of Clamp	$\frac{175.14\ kN}{25\ kN}$	= 7 Clamp Use 8 pcs.



For Press Dies:

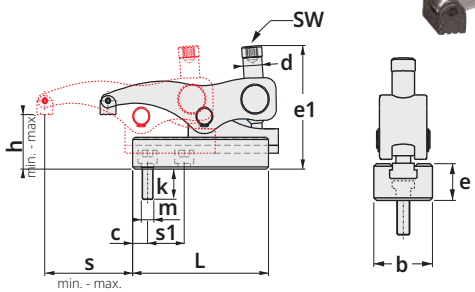
Formula Calculator

$\frac{M \times FG}{1000}$	= kN	$\frac{5000 \times 9.81\ kg}{1000}$	= 49.050 kN
$\frac{kN}{\mu}$	= Result (Upper Die 60 %) (Lower Die 40 %)	$\frac{49.05}{0.14}$	= 350.35 kN (60 % Upper Die = 210.21) (40 % Lower Die = 140.14)
$\frac{Result\ (Upper\ Die)}{Fv}$	= Number of Clamp	$\frac{210.21\ kN\ (Upper\ Die)}{25\ kN}$	= 8 Number of Clamp
$\frac{Result\ (Lower\ Die)}{Fv}$	= Number of Clamp	$\frac{140.14\ kN\ (Lower\ Die)}{25\ kN}$	= 5.6 Clamp Use 6 pcs.

Code: 1120 / 1130 / 1150 / 1160 - M

Combined Power Sliding Clamp

(**Type: M** / for Threaded Holes & T-Slots)



Area of Usage:
Injection machines, presses, milling machines, drilling machines and various industrial machines.

Advantages:
"11..-M" offers a clamping force between 1600 - 5500 Kgf. Using in hole and T-Slot. Ability to be fixed in various positions by sliding on the tool table. It cla ps high and low distances without support with hex-socket screw. It provides rapid and easy clamping due to it's practical structure.

Code: 1120 - M / Standard Type (hole: M10-M12)
* In the threaded holes M10 / M12 are used with the "order codes: 1120-310 / 1120-312" screws.
* **Height Clamping Gap of Part:** 0 - 50 mm
* **Clamping Force:** 1600 Kgf

Code: 1130 - M / Standard Type (hole: M12-M16)
* In the threaded holes M12 / M16 are used with the "order codes: 1130-412 / 1130-416" screws.
* **Height Clamping Gap of Part:** 0 - 60 mm
* **Clamping Force:** 2000 Kgf

Code: 1150 - M / Heavy Duty Type (hole: M16-M18-M20)
* In the threaded holes M16 / M18 / M20 are used with the "order codes: 1150-516 / 1150-518 / 1160-520" screws.
* **Height Clamping Gap of Part:** 0 - 65 mm
* **Clamping Force:** 2500 Kgf

Code: 1160 - M (hole: M20-M22-M24-M30)
* In the threaded holes M20 / M22 / M24 / M30 are used with the "order codes: 1160-620 / 1160-622 / 1160-624 / 1160-724 / 1160-730 " screws.
* **Height Clamping Gap of Part:** 20 - 80 mm
* **Clamping Force:** 5500 Kgf

Order Code	m	h	s	s1	e1	d	SW	L	e	b	c	k	gr.
1120010M	M10	Min. - Max. 0 - 50	12 - 66	25	100	M14	8	104	35.5	38	13	20	1700
1120012M	M12												
1130012M	M12	Min. - Max. 0 - 60	15 - 83	30	113	M18	10	130	39	48	17.5	22	3000
1130016M	M16											26	3030

Heavy Duty Types

1150116M	M16	Min. - Max. 0 - 65	18 - 96	35	125	M20	12	140	43	55	19.5	26	4340
1150118M	M18											30	4360
1150120M	M20											30	4370
1160220M	M20	Min. - Max. 20 - 80	17 - 92	41.5	175	M24	12	178	55	74	24	34	8880
1160222M	M22											38	8900
1160224M	M24											44	8920
1160230M	M30											51	9110

Position and fasten carrier component on the tool table.

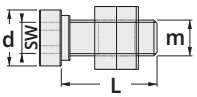
Push the base component into the desired position on the carrier component.

Adjust the height of the bar with the adjusting screw and clamp the workpiece.

The powerful design enables rapid and easy clamping.

Accessories for Power Clamps

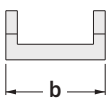
For 14-28 T-Slots.
T-Nut DIN 508.



Fixing Screw and T-Nut

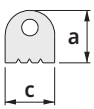
Order Code	a	m	L	d	sw
1120512	12	M10	29	16.5	8
1120514	14	M12			
1130614	14	M12	30	20.5	10
1130616	16				
1130618	18				
1130620	20		36		
1130622	22				
1150718	18	M16	34	24.5	12
1150720	20				
1150722	22		42		
1150724	24				
1150728	28				
1160822	22	M20	45	34	12
1160824	24				
1160826	28	M24			
1160828	28		55		
1160832	32		61		
1160836	36		66	38.5	

DP
Straight part clamping.



BSP
Lengthwise cylinder clamping.

ESP
Transverse cylinder clamping.



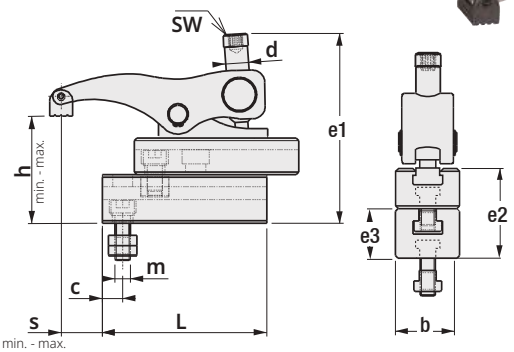
Pressure Pad

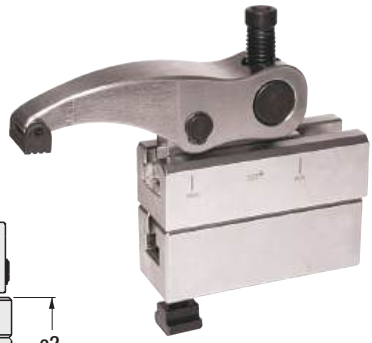
Order Code	a	b	c	gr.
1120DP	13.5	26.5	12	15
1120BSP	15.5			18
1120ESP	18			21
1130DP	17	32	15	20
1130BSP	19			30
1130ESP	22			30
1150DP	19	38	18	40
1150BSP	21			40
1150ESP	25			50
1160DP	22	44	22	55
1160BSP	25			70
1160ESP	28			80

Code: 1120 / 1130 / 1150 / 1160 - DT

Combined Power Sliding Clamp

(**Type: DT** / with Base Support & for T-Slots)





Area of Usage:
Injection machines, presses, milling machines, drilling machines and various industrial machines.

Code: 1120 - DT / Standard Type
(t-slot: 14 - 16 - 18)
* M12 hex-socket screw is used with DIN 508 T-Nut.
* **Height Clamping Gap of Part:** 36 - 86 mm
* **Back and Forth Movement Distance:** 54 mm
* **Clamping Force:** 1600 Kgf

Code: 1130 - DT / Standard Type
(t-slot: 14 - 16 - 18 - 20 - 22)
* M12 hex-socket screw is used with DIN 508 T-Nut.
* **Height Clamping Gap of Part:** 45 - 105 mm
* **Back and Forth Movement Distance:** 68 mm
* **Clamping Force:** 2000 Kgf

Code: 1150 - DT / Heavy Duty Type
(t-slot: 18 - 20 - 22 - 24 - 28)
* M16 hex-socket screw is used with DIN 508 T-Nut.
* **Height Clamping Gap of Part:** 48 - 113 mm
* **Back and Forth Movement Distance:** 78 mm
* **Clamping Force:** 2500 Kgf

Code: 1160 - DT / Heavy Duty Type
(t-slot: 22 - 24 - 28 - 36)
* M20-24 hex-socket screw is used with DIN 508 T-Nut.
* **Height Clamping Gap of Part:** 79 - 139 mm
* **Back and Forth Movement Distance:** 75 mm
* **Clamping Force:** 5500 Kgf

Order Code	T-Slot a	m	h	s	e1	e2	d	SW	L	b	e3	c	gr.
1120014DT	14	M12	Min. - Max. 36 - 86	12 - 66	136	71.5	M14	8	104	38	38	13	2540
1120016DT	16												
1120018DT	18												
1130014DT	14	M12	Min. - Max. 45 - 105	15 - 83	158	83	M18	10	130	48	45	17.5	4750
1130016DT	16												4775
1130018DT	18												4805
1130020DT	20												4855
1130022DT	22												4905

Heavy Duty Types

1150118DT	18	M16	Min. - Max. 48 - 113	18 - 96	173	90	M20	12	140	55	48	19.5	6625
1150120DT	20												6690
1150122DT	22												6750
1150124DT	24												6840
1150128DT	28												6960
1160222DT	22	M20	Min. - Max. 79 - 139	17 - 92	235	114	M24	12	178	74	59	24	13330
1160224DT	24												13465
1160228DT	28	M24											13580
1160236DT	36												13890

Position and secure the base support on the tool table.

Desired distance is reached by increasing base supports.

Base support is applied in T-Slot with hex-socket screw against T-Nut.

Workpiece is fixed with the hex-socket screw of the clamp.

INJECTION MOULD COOLING COMPONENTS

Series 590

Quick Coupling Systems - EU Series

Fields of Usage: It is used in cooling systems of plastic, zinc - aluminium diecasting moulds and steam lines - hot oil circuits, water washing & cooling systems of machines.

Material Info:

Body & Cover Valve = Brass / **O-Ring =** Viton
Spring - Ring & Ball = Stainless / **Coupling Fitting =** Brass
Operating Pressure = 0 - 15 bar / **Flow Capacity =** 9 mm
Operating Temperature = -5 / +180°

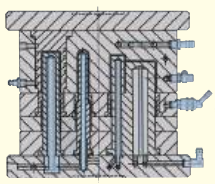
Valved: Controlled water flow is provided. When fitting is removed, water flow is closed in coupling. Both sides are with valve.

Non-valved: When fitting is removed, open circuit. Both sides are without valve.

Injection Mould Cooling Components / Systems:
Cooling of Moulds; for providing suitable cooling, features of moulded material, material shape, mould structure and quantity of heat to be transfered should be known. In cooling with water, cooling channels should not be very close to mould surface. Otherwise, temperature changes can cause thermal shocks on mould surface. Cooling channels should not be so far from mould surface, because in this case, heat transfer should not be provided sufficiently. Cooling channels may be created 2/3 times far of mould plate channel diameters. Water flowing should be provided to keep mould in certain temperature.

Effect of Cooling Time on Mould:

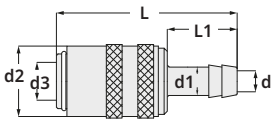
Injection Errors:	Solution Methods:
- Tensile - Distortion - Sinking - Fragility - Cracking - Shrinkage - Visible ejector traces - Tension whitening	Cooling period should be increased and cooling system / channels should be controlled.



Quick-release Couplings:
Quick-release Couplings and fittings compatible with mould cooling systems and injection machines are commonly used in plastic - metal injection moulds. To use in water - air and oil flowing, different types are available and when desired mounting / demounting facilities on mould, Quick-release Couplings should be used.

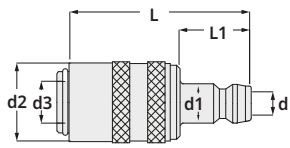
For accurate and efficient cooling in mould cooling system, to choose Coupling / Fitting System to be most suitable to the temperature of your mould and mounting area in the correct way is important. Wide options related to this systems are presented at following pages. We have custom-made production service in all our Cooling Components.

Hose Coupling



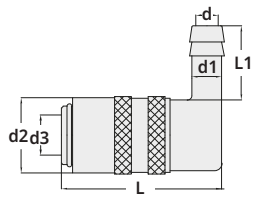
Order Code	Order Code	d	d1	d2	d3	L	L1
590HGB10	590HG10	10	7.5	23	13	59	23
590HGB13	590HG10	13	10	23	13	59	23

Adapter Coupling



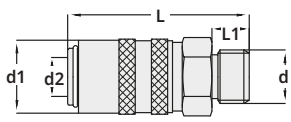
Order Code	Order Code	d	d1	d2	d3	L	L1
590AUB560	590AU560	5.5	9	23	13	58	45
590AUB590	590AU590	8	13	23	13	58	45

90° Hose Coupling



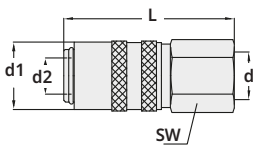
Order Code	Order Code	d	d1	d2	d3	L	L1
590LGB10	590LG10	10	7.5	23	13	52	29
590LGB13	590LG13	13	10	23	13	52	29

Male Coupling



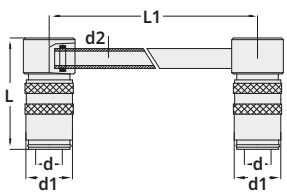
Order Code	Order Code	d	d1	d2	d3	L	L1
590EGB13	590EG10	1/4"	23	13	52	9	21
590EGB17	590EG17	3/8"	23	13	52	9	21
590EGB21	590EG21	1/2"	23	13	52	9	21
590EGBM16	590EGM16	M16	23	13	52	10	21

Female Coupling



Order Code	Order Code	d	d1	d2	L	SW
590DGB13	590DG10	1/4"	23	13	9	21
590DGB17	590DG17	3/8"	23	13	9	21
590DGB21	590DG21	1/2"	23	13	9	21
590DGBM16	590DGM16	M16	23	13	10	21

Bridge Couplings



Order Code	Order Code	d	d1	d2	L	L1
590KGB125	590KG125	13	23	10x1	52	125
590KGB250	590KG250	13	23	10x1	52	250
590KGB500	590KG500	13	23	10x1	52	500

Series 590

Fittings - EU Series

Compatible with Series-590 Quick-release Couplings

Material = Brass

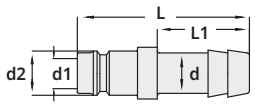
Operating Pressure = 0 - 15 bar

Flow Capacity = 9 mm

Operating Temperature = -5 / +180°

Hose-tail Fitting

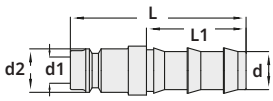
Non-valved



Order Code	d	d1	d2	L	L1
590HR10	10	9	13	40	23
590HR13	13	9	13	42	25

Push-lock Hose Fitting

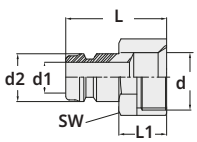
Non-valved



Order Code	d	d1	d2	L	L1
590FHR10	10	9	13	43	28
590FHR13	13	9	13	47	28

Female Fitting

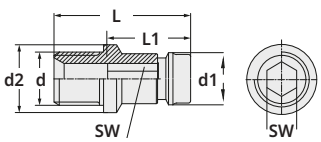
Non-valved



Order Code	d	d1	d2	SW	L	L1
590DR13	G1/4"	9	13	16	28	9
590DR17	G3/8"	9	13	19	28	9

Male Fitting with Inner Hex.

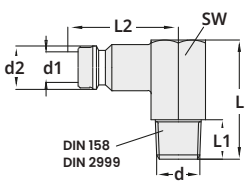
Non-valved



Order Code	d	d1	d2	SW	L	L1
590AER13	G1/4"	13	13.5	8	26	17
590AER17	G3/8"	13	17	8	26	17
590AERM14	M14	13	14.5	8	26	17

Fitting 90⁰ Male Threaded

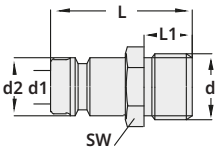
Non-valved



Order Code	d	d1	d2	SW	L	L1
590ER1390	G1/4"	13	34	15	10	25
590ER1790	G3/8"	13	34	17	10	25
590ERM1490	M14	13	34	15	10	25

Male Fitting

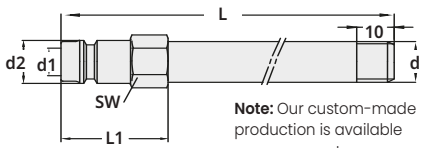
Non-valved



Order Code	d	d1	d2	SW	L	L1
590ORE10	G1/8"	9	13	14	29	10
590ORE13	G1/4"	9	13	14	29	10
590ORE17	G3/8"	9	13	17	29	10
590ORE21	G1/2"	9	13	21	29	10
590OREM8	M8 x 1.25	9	13	14	29	10
590ORE101	M10 x 1.5	9	13	14	29	10
590OREM10	M10 x 1.0	9	13	14	29	10
590OREM12	M12 x 1.75	9	13	14	29	10
590OREM14	M14 x 1.5	9	13	21	29	10
590OREM16	M16 x 1.5	9	13	21	29	10

Male Fitting Long Type

Non-valved



Note: Our custom-made production is available as per request.

Order Code	d	d1	d2	SW	L	L1
590OREM860	M8 x 1.25	9	13	14	60	20
590OREM880					80	
590OREM8100					100	
590OREM8120					120	
590OREM8150					150	
590OREM8200					200	
590OREM1060	M10 x 1.5	9	13	14	60	20
590OREM1080					80	
590OREM10100					100	
590OREM10120					120	
590OREM10150					150	
590OREM10200					200	
590OREM1260	M12 x 1.75	9	13	14	60	20
590OREM1280					80	
590OREM12100					100	
590OREM12120					120	
590OREM12150					150	
590OREM12200					200	
590ORE1060	G1/8"	9	13	14	60	20
590ORE1080					80	
590ORE10100					100	
590ORE10120					120	
590ORE10150					150	
590ORE10200					200	
590ORE1360	G1/4"	9	13	14	60	20
590ORE1380					80	
590ORE13100					100	
590ORE13120					120	
590ORE13150					150	
590ORE13200					200	

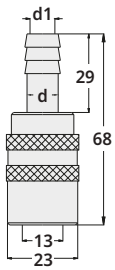
Quick Coupling Systems - USA Series

Series 509

Body & Cover Valve = Brass **/ O-Ring =** Viton
Spring - Ring & Ball = Stainless **/ Coupling Fitting =** Brass
Operating Pressure = 0 - 15 bar **/ Flow Capacity =** 9 mm
Operating Temperature = -5 / +180°

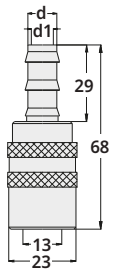
Fields of Usage: It is used in cooling systems of plastic, zinc - aluminium diecasting moulds and steam lines - hot oil circuits, water, washing & cooling systems of machines.

Quick-release Coupling



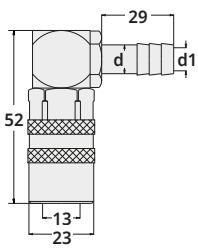
Order Code	Order Code	d	d1
509HGB10	509HG10	10	8
509HGB11	509HG11	11	9
509HGB13	509HG13	13	10

Quick-release Coupling



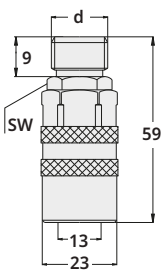
Order Code	Order Code	d	d1
509FGB10	509FG10	10	8
509FGB13	509FG13	11	9

Quick-release Coupling 90°



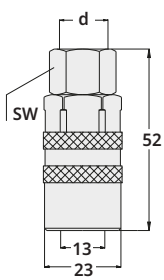
Order Code	Order Code	d	d1
509HGB1090	509HG1090	10	8
509HGB1190	509HG1190	11	9
509HGB1390	509HG1390	13	10

Quick-release Coupling - Male



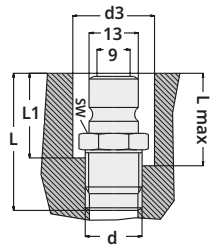
Order Code	Order Code	d	SW
509EGB13	509EG13	G1/4"	17
509EGBM16	509EGM16	M16	17
509EGB17	509EG17	G3/8"	19
509EGBM18	509EGM18	M18	19
509EGB21	509EG21	G1/2"	24

Quick-release Coupling - Female



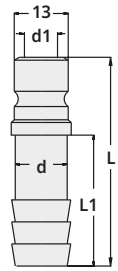
Order Code	Order Code	d	SW
509DGB13	509DG13	G1/4"	17
509DGB17	509DG17	G3/8"	21
509DGB12	509DG12	G1/8"	24

Male Plug



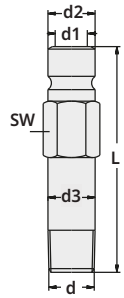
Order Code	d	d3	L1	L max.	L	SW
509ER10	G1/8"	26	25	26	30	14
509ER13	G1/4"	30	25	22	33	14
509ER17	G3/8"	30	26	22	33	17
509ER21	G1/2"	32	26	26	37	22
509ERM14	M14	28	25	26	33	14

Hose Plug



Order Code	d	d1	L	L1
509HR06	6	4	45	26
509HR08	8	6	45	26
509HR09	9	7	45	26
509HR10	10	8	45	26
509HR13	13	9	45	26

Extension Plug

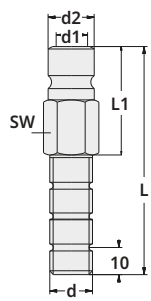


Code	d	d1	d2	d3	SW
509TU13	G1/4"	9	13	14	15
509TU17	G3/8"	9	13	17	17
506ERM14	M14	14	13	9	15

L: 50 / 100 / 150 / 200 / 250

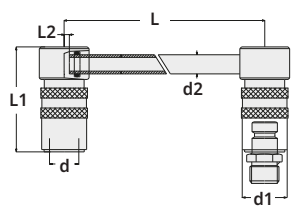
Order: **Code** x L

Long Thread Plug



Order Code	d	d1	d2	L	L1	SW
509BLM10100	M10x1	9	13	100	40	14
509BL10100	G1/8"	9	13	100	40	14
509BL13100	G1/4"	9	13	100	40	14
509BL14100	M14x1.5	9	13	100	40	14
509BL16100	M16x1.5	9	13	100	40	14
509BL17100	G1/8"	9	13	100	40	14

Bridge Couplings



Order Code	Order Code	d1	L
509KGB125	509KG125	8x1	125
509KGB250	509KG250	8x1	250
509KGB500	509KG500	8x1	500

Quick Coupling Systems - High Flow Series

Valved: Controlled water flow is provided. When fitting is removed, water flow is closed in coupling. Both sides are with valve.

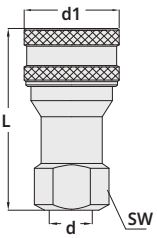
Non-valved: When fitting is removed, open circuit. Both sides are without valve.

Series 570

Material Info:
Body & Cover Valve = Brass
O-Ring = NBR
Spring - Ring & Ball = Stainles
Coupling Fitting = Brass
Operating Pressure = 0 - 35 bar
Flow Capacity = NW19 / (Ø4 - 50)
Operating Temperature = -20 / +110°

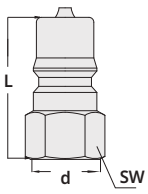
✓ **Hydraulic Circuits**
✓ **Aluminium Die Casting**

Female Coupling



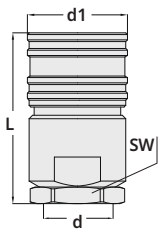
Order Code	Order Code	d	d1	L	SW
570DGB10	570DG10	G1/8"	25	49	14
570DGB13	570DG13	G1/4"	29	58	19
570DGB17	570DG17	G3/8"	35	64	24
570DGB21	570DG21	G1/2"	44	74	29
570DGB26	570DG26	G3/4"	53	94	36
570DGB33	570DG33	G1"	60	106	41

Female Plug



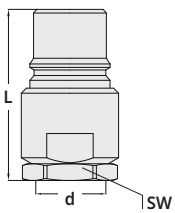
Order Code	Order Code	d	L	SW
570DRB10	570DR10	G1/8"	30	14
570DRB13	570DR13	G1/4"	35	19
570DRB17	570DR17	G3/8"	39	24
570DRB21	570DR21	G1/2"	46	29
570DRB26	570DR26	G3/4"	60	36
570DRB33	570DR33	G1"	65	41

Female Coupling



Order Code	Order Code	d	d1	L	SW
57032DGB42	57032DG42	1 - 1/4"	70	114	60
57038DGB48	57038DG48	1 - 1/2"	75	126	65
57050DGB60	57050DG60	2"	105	142	90
57050DGB75	57050DG75	2 - 1/2"	110	167	100

Female Plug



Order Code	Order Code	d "BSP"	L	SW
57032DRB42	57032DR42	1 - 1/4"	114	60
57038DRB48	57038DR48	1 - 1/2"	126	65
57050DRB60	57050DR60	2"	142	90
57050DRB75	57050DR75	2 - 1/2"	167	100

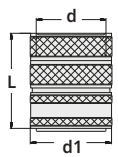
Series 620

Quick Coupling Systems - Special Series for Extrusion Moulding

Material Info:
Body & Cover Valve = Brass
O-Ring = NBR
Spring - Ring & Ball = Stainles
Coupling Fitting = Brass
Operating Pressure = 0 - 15 bar
Flow Capacity = 13 mm
Operating Temperature = -5 / +180°

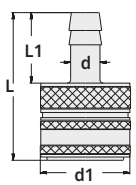
✓ **Extrusion Moulding**

Female Coupling



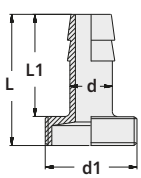
Order Code	Order Code	d "BSP"	d1	L
620DGB26	620DG26	3/4"	30	45
620DGB21	620DG21	1/2"	30	45

Hose Coupling



Order Code	d	d1	L	L1
620HG09	9	30	55	23
620HG13	13	30	55	23
620HG16	16	30	55	23
620HG19	19	30	55	23

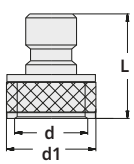
Hose Plug



Order Code	d	d1 "BSP"	L	L1
620GR09	9	3/4"	31	23
620GR13	13	3/4"	31	23
620GR16	16	3/4"	31	23
620GR19	19	3/4"	31	23

Female Plug (Hex.)

Non-valved

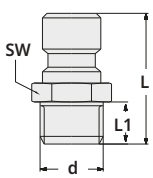


* d = "BSP"

Order Code	d	d1	L
620DR13	1/4"	19	27
620DR17	3/8"	19	27
620DR21	1/2"	24	27
620DRM22	M22	25	27
620DR26	3/4"	30	27

Male Plug

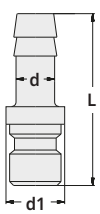
Non-valved



Order Code	d	L	L1	SW
620ER13	1/4"	33	9	19
620ER17	3/8"	33	9	19
620ER21	1/2"	36	12	22
620ER26	3/4"	41	14	30
620ER33	1"	44	15	34

Hose Plug

Non-valved



Order Code	d	d1	L
620HR09	9	19	47
620HR13	13	19	47
620HR16	16	19	47
620HR19	19	23	47

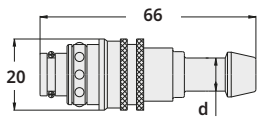
Quick Coupling Systems - French Series With Colour Ring

Series 600

Body & Cover = Nickel Plated Brass **/ O-Ring =** NBR
Spring - Ring & Ball = Stainless **/ Coupling Fitting =** Nickel Plated Brass
Operating Pressure = 0 - 10 bar **/ Flow Capacity =** 8 mm
Operating Temperature = -20 / +90⁰

Colour Rings: In order to prevent confusion of lines (hot / cold) during usage.
Fields of Usage: It is used in cooling systems of plastic, zinc - aluminium diecasting moulds and water, washing - cooling systems of machines.

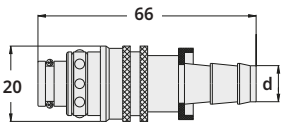
Quick-release Coupling



Non-valved

Order Code	d
60008HG06	G1/8"
60008HG08	G1/4"
60008HG10	G3/8"
60008HG12	G1/2"
60008HG13	G3/4"

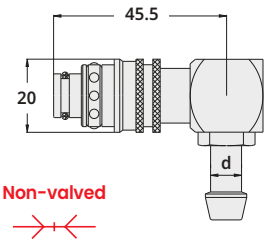
Quick-release Coupling



Non-valved

Order Code	d
60008FG10	G3/8" - 10
60008FG13	G1/2" - 13

Quick-release Coupling / 90⁰

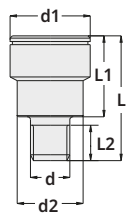


Non-valved

Order Code	d
60008HG0690	1/4" - 06
60008HG0890	5/16" - 08
60008HG1090	3/8"- 10
60008HG1290	15/32" - 12
60008HG1390	1/2"- 13

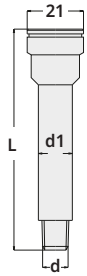
Male Plug

Non-valved

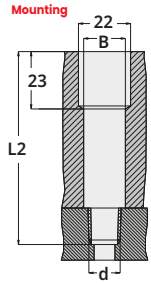


Order Code	d	d1	L1	L2	d2	L
60008ER10	G1/8"	21	21	8	17.5	31
60008ER13	G1/4"	21	21	10	17.5	33
60008ER17	G3/8"	21	21	11	-	24
60008NR10	N1/8"	21	21	7	17.5	31
60008NR13	N1/4"	21	21	10	17.5	33
60008NR17	N3/8"	21	21	11	-	24
60008ERM10-1	M10 x 1"	21	21	10	17.5	31
60008ERM10	M10 x 1.5"	21	21	10	17.5	31
60008ERM12	M12 x 1.75"	21	21	11	17.5	31
60008ERM14	M14 x 1.5"	21	21	11	17.5	31

Fittings with Colour Ring Long Type

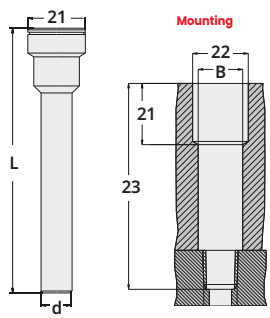


Mounting



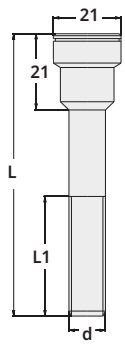
Order Code	d	L Min./Max.	L2	B	d1
60008ER10100	G1/8"	33/100	L -5.5	11	10.2
60008ER10150	G1/8"	100/150	L -5.5	11	10.2
60008ER10200	G1/8"	150/200	L -5.5	11	10.2
60008ER10250	G1/8"	200/250	L -5.5	11	10.2
60008NR10100	N1/8"	33/100	L -5.5	11	10.2
60008NR10150	N1/8"	100/150	L -5.5	11	10.2
60008NR10200	N1/8"	150/200	L -5.5	11	10.2
60008NR10250	N1/8"	200/250	L -5.5	11	10.2
60008ER13100	G1/4"	33/100	L -7.5	14	13.5
60008ER13150	G1/4"	100/150	L -7.5	14	13.5
60008ER13200	G1/4"	150/200	L -7.5	14	13.5
60008ER13250	G1/4"	200/250	L -7.5	14	13.5
60008NR13100	N1/4"	33/100	L -5.5	14	13.5
60008NR13150	N1/4"	100/150	L -5.5	14	13.5
60008NR13200	N1/4"	150/200	L -5.5	14	13.5
60008NR13250	N1/4"	200/250	L -5.5	14	13.5

Extension Fitting with Colour Ring



Order Code	d	L	B
60008BU1050	10.2	50	11
60008BU10100	10.2	100	11
60008BU10150	10.2	150	11
60008BU10200	10.2	200	11
60008BU10250	10.2	250	11
60008BU1350	13.5	50	14
60008BU13100	13.5	100	14
60008BU13150	13.5	150	14
60008BU13200	13.5	200	14
60008BU13250	13.5	250	14

Extension Fitting with Colour Ring



Order Code	d	L	L1
60008UR1050	G1/8"	50	26
60008UR10100	G1/8"	100	60
60008UR10150	G1/8"	150	60
60008UR1350	G1/4"	50	27
60008UR13100	G1/4"	100	60
60008UR13150	G1/4"	150	60
60008UR13200	G1/4"	200	60

Pls. add the colour code to the end of the order code if you request colour ring.

Cold→Blue = B
Hot→Red = R

Order Example:
600HG10B or 600HG10R

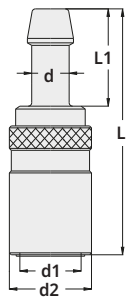
Quick Coupling Systems - French Series

Series 601

Body = Brass / **Cover Valve =** 420 Stainless
O-Ring = Viton / **Coupling Fitting =** Brass
Spring - Ring & Ball = Stainless
Operating Pressure = 16 bar / **Flow Capacity =** 6 -9-10-12-16 mm
Operating Temperature = -20 / +200°

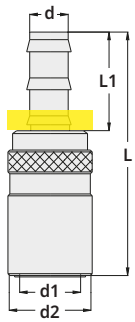
Fields of Usage: It is used in cooling systems of plastic, zinc - aluminium diecasting moulds and steam lines - hot oil circuits, water, washing & cooling systems of machines.

Hose Coupling



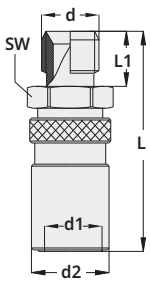
Order Code	Order Code	d	d1	d2	L	L1
60106HGB08	60106HG08	08	9.5	19	60	23
60109HGB12	60109HG12	12	14	25	69.5	28
60112HGB13	60112HG13	13	18	31	82	28
60112HGB16	60112HG16	16	18	31	82	28
60116HGB16	60116HG16	16	22.5	32	109	28
60116HGB19	60116HG19	19	22.5	38	114	33

Hose Coupling for Self-Locking



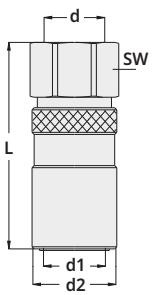
Order Code	Order Code	d	d1	d2	L	L1
60106HGB08	60106HG08	10	9.5	19	60	24
60109HGB12	60109HG12	10	14	25	69.5	24
60112HGB13	60112HG13	13	18	25	69.5	28
60112HGB16	60112HG16	13	18	31	92	38
60116HGB16	60116HG16	16	22.5	38	109	38
60116HGB19	60116HG19	19	22.5	38	109	38

Male Coupling



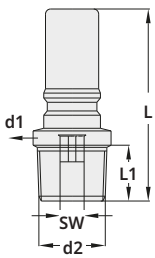
Order Code	Order Code	d	d1	d2	L	L1	SW
60106EGB13	60106EG13	9.5	19	19	55	10	17
60109EGB17	60109EG17	14	25	25	61	11	22
60112EGB21	60112EG21	18	31	31	72	14	27
60116EGB26	60116EG26	22.5	38	38	115.5	14	32

Threaded Female Coupling



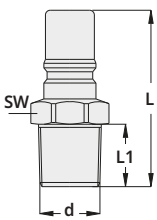
Order Code	Order Code	d	d1	d2	L	L1
60106DGB13	60106DG13	G1/4"	9.5	19	46	17
60106DGBN13	60106DGN13	N1/4"	9.5	19	46	17
60109DGB17	60109DG17	G3/8"	14	25	53	22
60109DGBN17	60109DGN17	N3/8"	14	25	53	22
60112DGB21	60112DG21	G1/2"	18	31	67	27
60112DGBN21	60112DGN21	N1/2"	18	31	67	27
60116DGB26	60116DG26	G3/4"	22.5	38	90	35
60116DGBN26	60116DGN26	N3/4"	22.5	38	90	35

Internal Hex Male Plug



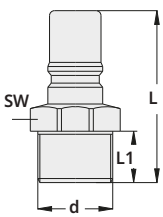
Order Code	d	d1	L	L1	SW
60606ER10	G1/8"	10	31	7.5	5
60606ER13	G1/4"	13	35	13	5
60606ERN10	N1/8"	10	31	10	5
60606ERN13	N1/4"	13	35	13	5
60609ER13	G1/4"	13	34	10	8
60609ER17	G3/8"	17	36	11	8
60609ERN13	N1/4"	13	34	11	8
60609ERN17	N3/8"	17	36	11	8
60612ER17	G3/8"	17	39	13	10

Male Plug



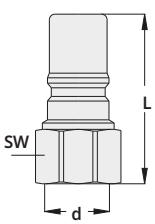
Order Code	d	L	L1	SW
60106ER21	G1/2"	41	13	24
60109ERN17	N3/8"	44	16	22
60112ERN21	N1/2"	44	16	27
60116ER21	G1/2"	63	16.5	22
60116ER26	G3/4"	63	16.5	27

Male Plug

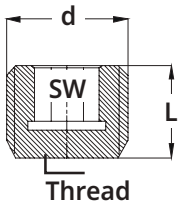


Order Code	d	L	L1	SW
60106ER21	G1/2"	41	13	22
60112ER26	G3/4"	63	16	27
60112ER33	G1"	63	16	35
60116ERM24	M24 x 1.5	63	16	27

Male Plug



Order Code	d	L	SW
6010DR13	G1/4"	34	17
60106DRN13	N1/4"	47	17
60109DR13	G3/8"	37	22
60109DRN13	N3/8"	38	22
60112DR17	G1/2"	45	27
60112DRN21	N1/2"	67	27
60116DR26	G3/4"	58	32
60116DRN26	N3/4"	80	32



Screw Plug - Straight

Code: **SDT**

It is to plug / close unwanted cooling holes in injection moulds.

Mounting: It is inserted acc. to the product diameter by threading.

Material: MS58 Brass **Max. Temp.:** 135^0

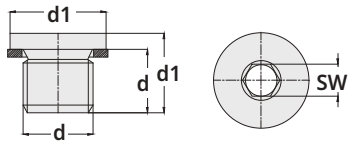
Order Code	Thread	d	L	SW
SDT 18	G1/8"	9.4	11.2	5
SDT 14	G1/4"	12.8	12.5	7
SDT 38	G3/8"	15.9	14.1	8
SDT 12	G1/2"	20.5	17.8	10
SDT M06	M6 x 0.75	-	7	3
SDT M08	M8 x 0.75	-	8	4
SDT M10	M10 x 1.0	-	10	5
SDT M12	M12 x 1.5	-	10	6
SDT M14	M14 x 1.5	-	10	7

Material:
Nickel Plated
Brass NBR O-ring

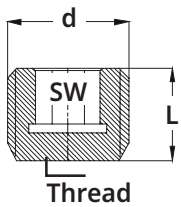
Max.
Temperature:
200^0

Headed Screw Plug with O-Ring

Code: **OKS**



Order Code	d	d1	L	L1	SW
OKS 10	G1/8"	14	10	7	5
OKS 13	G1/4"	18	11	8	7
OKS 17	G3/8"	22	12	9	8
OKS 21	G1/2"	24	13	9.5	10
OKS 26	G3/4"	32	15	11.5	12
OKSM10	M10x1	14	10	7	5
OKSM12	M12x1.5	17	11	8	6
OKSM14	M14x1.5	19	12	9	8
OKSM16	M16x1.5	21	12	9.5	10

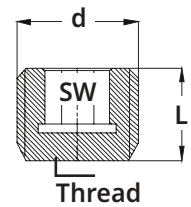


Screw Plug - Tapered

Code: **SKT**

Material: MS58 Brass **Max. Temp.:** 135^0

Order Code	Thread	d	L	SW
SKT 18	NPT 1/8"	9.4	11.2	5
SKT 14	NPT 1/4"	12.8	12.5	7
SKT 38	NPT 3/8"	15.9	14.1	8
SKT 12	NPT 1/2"	20.5	17.8	10
SKT M06	M6 x 0.75	-	7	3
SKT M08	M8 x 0.75	-	8	4
SKT M10	M10 x 1.0	-	8	5
SKT M12	M12 x 1.5	-	10	6
SKT M14	M14 x 1.5	-	10	7



Steel Type Screw Plug - Tapered

Code: **CKT**

Material: Steel + Black Coating **Max. Temp.:** 160^0

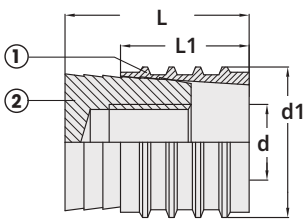
Order Code	Thread	d	L	SW
CKT 18	NPT 1/8"	9.4	11.2	5
CKT 14	NPT 1/4"	12.8	12.5	7
CKT 38	NPT 3/8"	15.9	14.1	8
CKT 12	NPT 1/2"	20.5	17.8	10

Sealing Plug Code: GKT

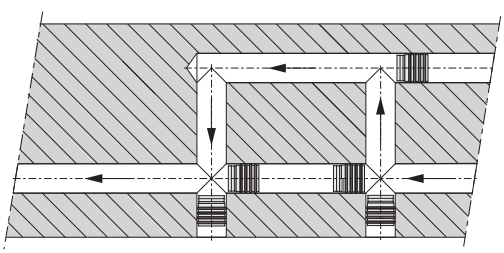
Durable and resistant to pressure and corrosion.

Material

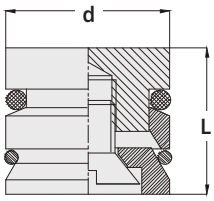
① 2.0401 / Brass
② 1.4105 / Stainless Steel

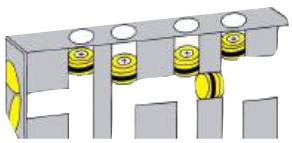


Order Code	d	d1	L1	L
GKT 06	M3	6	8	12
GKT 08	M4	8	8	12
GKT 10	M6	10	10	14
GKT 12	M6	12	10	14
GKT 14	M8	14	12	17
GKT 15	M8	15	12	17
GKT 16	M8	16	12	17
GKT 20	M8	20	12	17



Sealing Plug with O-ring Code: GCP



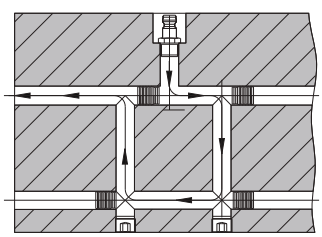


Order Code	d	L	Mounting Dia.
GCP 06	Ø6	10	6.1 mm
GCP 08	Ø8	10	8.1 mm
GCP 10	Ø10	10	10.1 mm
GCP 12	Ø12	10	12.1 mm
GCP 14	Ø14	12	14.1 mm
GCP 16	Ø16	12	16.1 mm
GCP 20	Ø20	12	20.1 mm

Mounting:
The diameter of cooling channel should be at least 0.1 mm larger than **"GCP product".** Any machining (threading etc.) on channel mounting and any mechanical process on product should not be done. "GCP" is never rusting. The wall thickness of diameter on unit can be adjusted via O-ring.

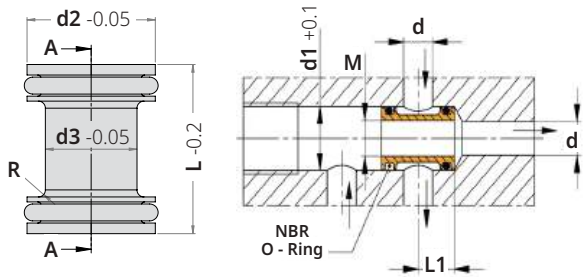
Operating Temperature Range: 10 - 200^0
Compressive Strength:
Ø 6 - 8 mm = 16 Kg. / cm^2
Ø 10 - 12 mm = 18 Kg. / cm^2
Ø 14 - 16 mm = 25 Kg. / cm^2

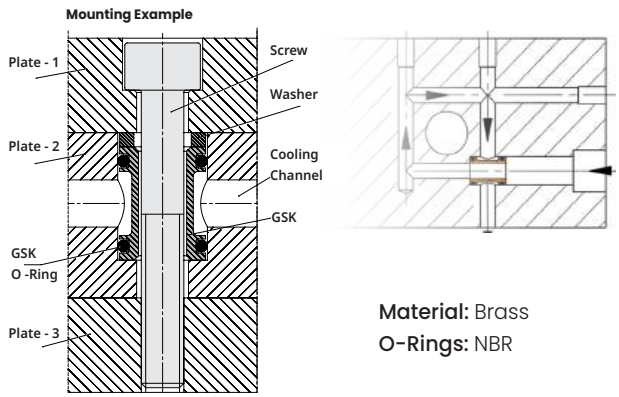
It is adjusted fixing plug in order to use canceling (inactive) of unwanted holes in cooling channel of injection moulds or to direct flow motions of cooling water.



Cooling Junction Code: GSK

It reduces number of cooling channels and improves your designs.





Material: Brass
O-Rings: NBR

Order Code	d	d1	d2	d3	L1	L	M	O-Ring
GSK 06	6	11.5	11.1	9	10	20	M8	Ø8 x 1.5
GSK 08	8	15	14.6	11	10	20	M10	Ø11 x 2
GSK 10	10	18.5	18.2	13	12	24	M12	Ø13.9 x 2.4

It is a system which will ensure circulation of water under a certain pressure and speed in water circulation channel arrangements and creating of entries / exits in mould cooling system.

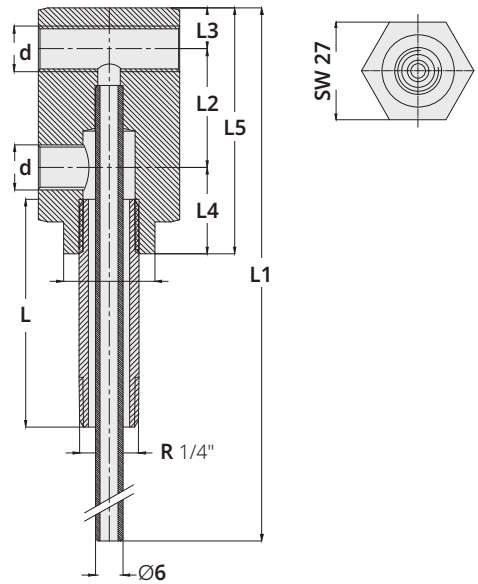
Features:

- It provides homogeneous temperature distribution.
- It provides quick mounting and facilitates demounting.
- It saves time and cost.
- Minimum pressure loss in water flow rate.
- No rust in cooling channels.
- "NBR O-ring" is used (resistant to temperature).
  Please check O-rings in mountings and demountings.
  Do not use damaged and torn / worn O-Rings.

NEW

Cooling Cascede Code: PVS / PLS

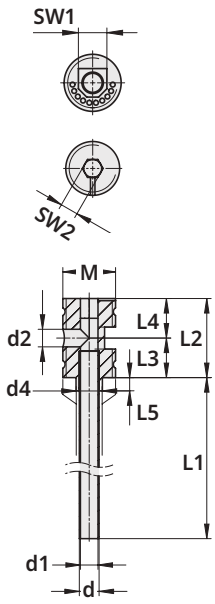
Material: MS58 Brass



Order Code	d	L	L1	L2	L3	L4	L5
PVS 10.50	1/8"	50	356	19	9	9	42
PVS 10.100		100					
PVS 10.150		150					
PVS 10.200		200					
PVS 13.50	1/4"	50	356	19	9	9	42
PVS 13.100		100					
PVS 13.150		150					
PVS 13.200		200					

Order Code	d	L	L1	L2	L3	L4	L5
PLS 10.50	1/8"	50	362	26	9	12	54
PLS 10.100		100					
PLS 10.150		150					
PLS 10.200		200					
PLS 13.50	1/4"	50	362	26	9	12	54
PLS 13.100		100					
PLS 13.150		150					
PLS 13.200		200					

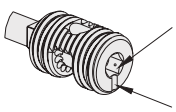
NEW



Code: **DSU**

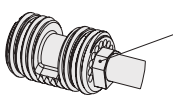
Cooling Unit - Threaded

Installation Examples



Installation from the bottom side with a socket wrench

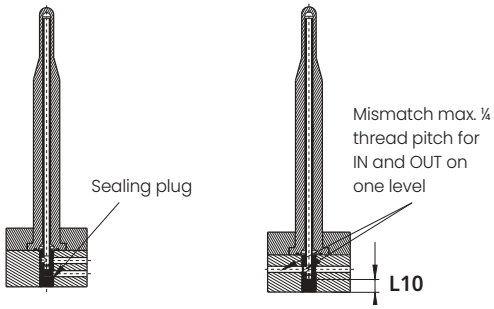
The groove functions as a directional guide for the flow.



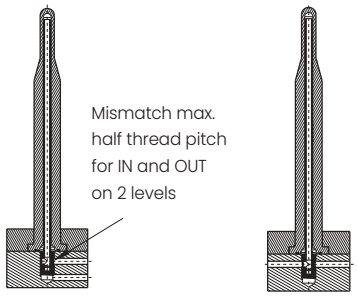
Installation from the top by using an open-end or installation wrench

d4= recommended cooling hole

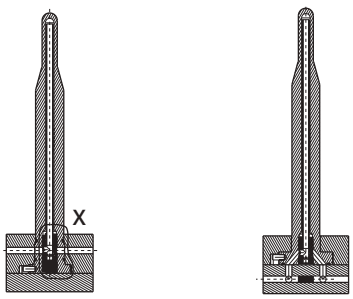
Installation from the bottom side of the plate



Installation from the top of the plate



Installed in mould core pin

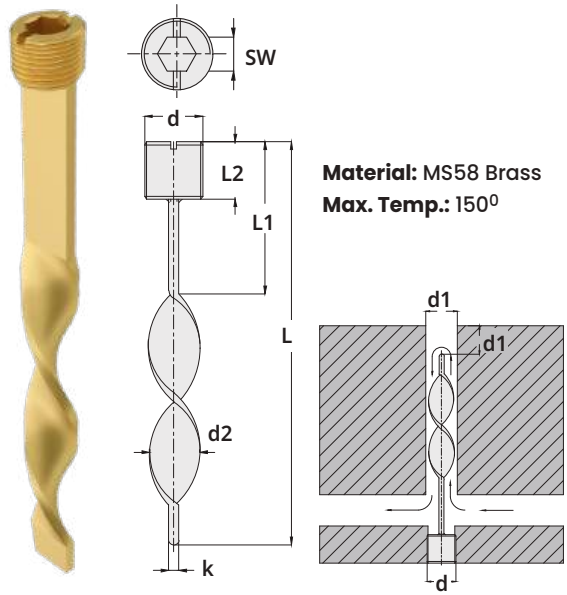


Material: 2.0401 and 1.4301
Max. Temperature: 150⁰ max.

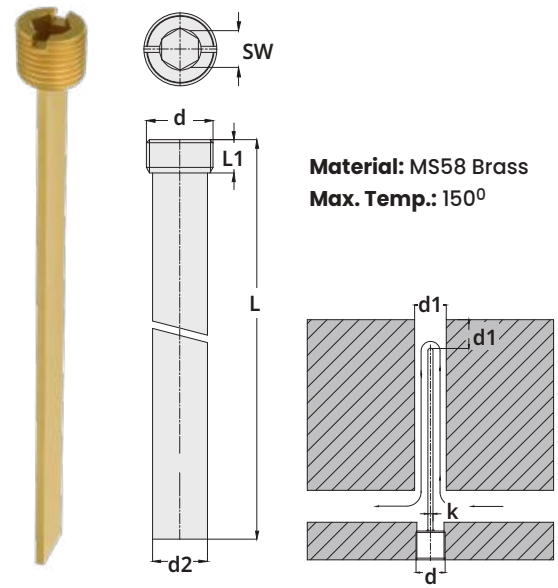
Order Code	d	d1	d2	d4	L1	L2	L3	L4	L5	SW1	SW2	M
DSU008	0.8	0.6	1	1	220	15	7	8	3	4	3	M8 x 0.75
DSU012	1.2	0.9	1.2	1.5	220	15	7	8	3	4	3	M8 x 0.75
DSU016	1.6	1.2	1.5	2	245	15	7	8	3	4	3	M8 x 0.75
DSU019	1.9	1.5	2	2.5	245	15	7	8	3	5	3	M10 x 1
DSU023	2.3	1.9	2	3	247	15	7	8	3	5	3	M10 x 1
DSU030	3	2.5	2.5	4	247	15	7	8	3	5	3	M10 x 1
DSU038	3.8	3.3	3.5	5	325	18	9	9	3	6	4	M12 x 1.5
DSU045	4.5	4	4	6	325	18	9	9	3	6	4	M12 x 1.5
DSU060	6	5.2	5.2	8	324	20	10	10	3	7	5	M14 x 1.5
DSU074	7.4	6.5	6.5	10	323	24.5	12	12.5	3.5	9	6	G3/8"
DSU090	9	8	8	12	323	30	14	16	4	11	7	G1/2"
DSU100	10	9	9	13-14	323	30	14	16	4	11	8	G1/2"

Cooling Baffles & Water Flow Pipes

Baffles are used to direct the flow of water or cooling liquid within the mould. They are allows machined water-lines to be separated into multiple channels.



Material: MS58 Brass
Max. Temp.: 150^0



Material: MS58 Brass
Max. Temp.: 150^0

Spiral Baffle - Threaded

Code: **HSEP**

Order Code	d	SW	d1	d2	L	L1	L2	k
HSEP 10 100	1/8"	5	8.5	8.2	100	8	51	1.6
HSEP 10 120					120		102	
HSEP 10 150					150			
HSEP 10 200					200			
HSEP 13 100	1/4"	7	11.5	11.2	100	10	51	2.4
HSEP 13 120					120		102	
HSEP 13 150					150			
HSEP 13 200					200			
HSEP 13 250					250			
HSEP 17 150	3/8"	10	15	14.7	150	10	51	2.4
HSEP 17 175					175		102	
HSEP 17 200					200			
HSEP 17 250					250			
HSEP 17 300					300			
HSEP 21 200	1/2"	12	18.5	18.2	200	12	76	2.4
HSEP 21 400					400		127	
HSEP 26 500	3/4"	12	23.5	23.2	500	12	153	3.2

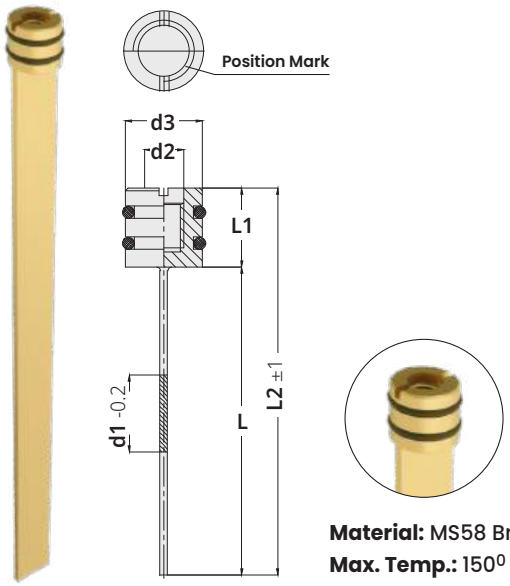
Flat Baffle - Threaded

Code: **SEPM**

Order Code	d	SW	d1	d2	L	L1	k
SEPM 08 100	M8 x 0.75	4	6	5.8	100	8	1.6
SEPM 08 200					200		
SEPM 10 100	M10 x 1.0	5	8	7.8	100	8	1.6
SEPM 10 125	M10 x 1.5				125		
SEPM 10 200	M10 x 1.0				200		
SEPM 10 300					300		
SEPM 12 125	M12 x 1.5	6	10	9.8	125	8	2.0
SEPM 12 250					250		
SEPM 16 150	M16 x 1.5	8	14	13.8	150	10	2.4
SEPM 16 300					300		
SEPM 20 150	M20 x 1.5	10	18	17.8	150	10	2.4
SEPM 20 200					200		
SEPM 20 300					300		
SEPM 20 400					400		
SEPM 24 150	M24 x 2.0	10	20	19.8	150	12	2.4
SEPM 24 300					300		

Cooling Baffles & Water Flow Pipes

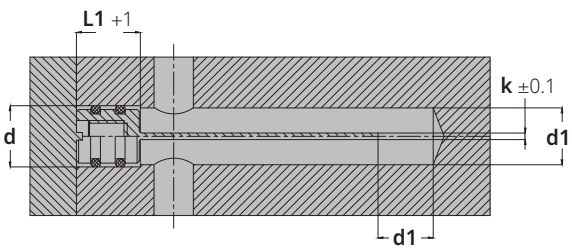
Baffles are used to direct the flow of water or cooling liquid within the mould. They are allows machined water-lines to be separated into multiple channels.



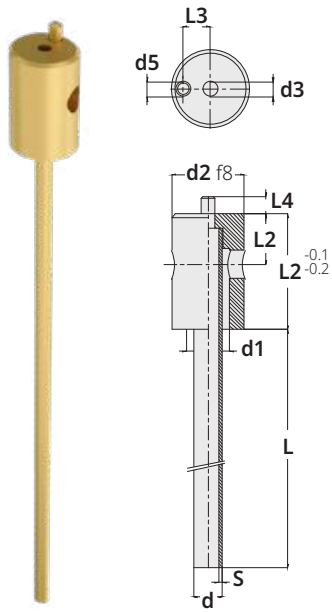
Material: MS58 Brass
Max. Temp.: 150⁰

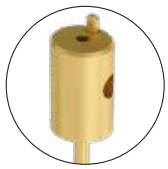
Flat Baffle with O-Ring

Code: **TKS**



Order Code	d1	d	d2	d3	L	L1	L2	k
TKS 10 180	10	12	M6	11.7	180	13	193	2
TKS 15 150	15	16	M8	11.7	150	16	166	2.4
TKS 15 250	15	16	M8	11.7	250	16	266	2.4
TKS 15 300	15	16	M8	11.7	300	16	316	2.4
TKS 15 350	15	16	M8	11.7	350	16	366	2.4
TKS 20 150	20	22	M12	21.7	150	20	170	2.4
TKS 20 300	20	22	M12	21.7	300	20	320	2.4
TKS 25 150	25	26	M16	25.7	150	22	172	2.4
TKS 25 390	25	26	M16	25.7	390	22	412	2.4





Material: MS58 Brass
Max. Temp.: 150⁰

Water Flow Cooling Pipe

Code: **OKS**

d2	d	L	L1	L2	L3	L4	d1	d3	d4	d5	S
10	2.6	100 200	16	9	3.5	2.5	4	2	4	2	0.3
10	3	100 200	16	9	3.5	2.5	5	2.4	4	2	0.3
10	4	100 200	16	9	3.5	2.5	6	3	4	2	0.5
12	5	160 315	18	9	4.5	2.5	8	4	6	2	0.5
16	6	160 315	18	9	6	2.5	12	5	6	2	0.5
18	8	160 315	18	9	7	2.5	14	6	6	2	1
20	10	160 315	20	10	8	2.5	16	8	8	3	1
25	12	160 315	25	13	9.5	3	20	10	10	3	1

Order: **OKS.** d2 x d x L

Plastic Baffles for Injection Mould Cooling

It provides effective flow opportunity by creating balanced turbulent in fluid flow hole.
The cooling water flows by following Baffles helixes (such as cascade). Since Plastic Baffle material is Fibreglass reinforced, it always remains cold, it never causes clogging and corrosion in cooling channels.

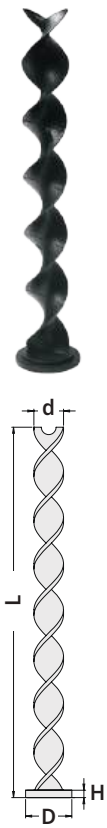
Material:
Fibreglass Reinforced Plastic

Max temperature: 200⁰

"Fast Cooling System Flow Method"

Code: STA
Spiral Plastic Baffle

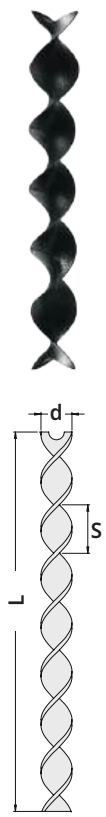
d	L	D	H
8	100	15	4
	200		
	300		
10	100	18	4
	200		
	300		
12	100	22	4
	200		
	300		
16	100	25	4
	200		
	300		
20	100	30	4
	200		
	300		
	400		
25	100	35	4
	200		
	300		
	400		



Order: **STA.** d x L

Code: STB
Spiral Plastic Baffle Without Base

d	L	S
8	96	20
	196	
	296	
10	96	20
	196	
	296	
12	96	25
	196	
	296	
16	96	25
	196	
	296	
20	96	25
	196	
	296	
	396	
25	96	25
	196	
	296	
	396	

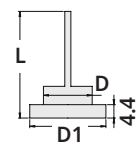


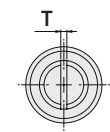
Order: **STB.** d x L

Code: ST
Flat Plastic Baffle - Base

D	L	D1	T
8	25	15	1.2
	30		
	35		
	40		
10	25	18	1.5
	30		
	35		
	40		
12	25	22	1.6
	30		
	35		
	40		
16	25	25	2.0
	30		
	35		
	40		
20	25	30	2.0
	30		
	35		
	40		
25	30	35	2.4
	35		
	40		

O-Ring



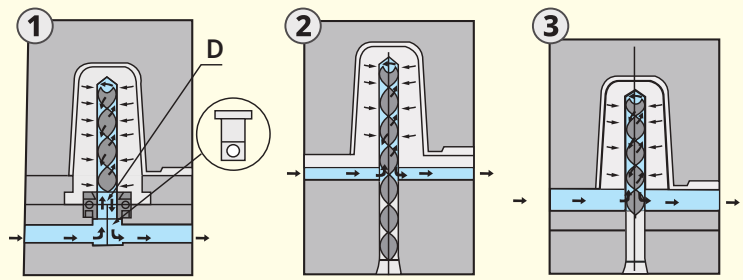


Order: **ST.** d x L

Usage Information:

1 - At technical drawing in Figure ① and Figure ③ if cooling water flow enters by striking at the entrance of Baffle or to the close area, Based or Base Reinforced model should be selected (**STA** or **ST** models).

2 - If cooling water flow enters by striking at the medium or top side of Baffle, don't use Based model. Because; water flow continues its turbulent flow by exiting from the level it entered, in such cases in Figure ② , **STB** model is selected.

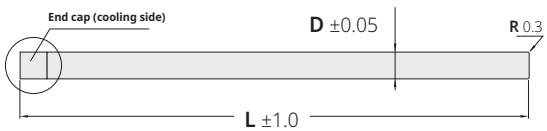


Code: **GH**

Heat Transfer Pipe

In Cores, Core Slides, Cavities & Other Areas of Injection Mould:
The cooling process is formed by rising heat to the upper sides via compressed gas in pipe quickly. In mounting, at least 70% of Heat Transfer Pipe remains inside the core, 30% of Heat Transfer Pipe should remain in cooling channel.

Advantages of this System:
It minimizes the number of defective final products during production resulting from shrinkage or cold deformation. Because it provides fast control of temperature, very high product precision is obtained.
Thus, pore formation inside the produced product is avoided. During the injection, it ensures obtaining products in right colours. By ensuring mould life longer, it lowers main costs.



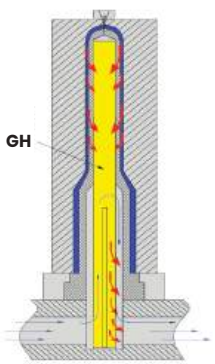
D	L
Ø3	40
	60
	80
	100
	120
	150
Ø4	40
	60
	80
	100
	120
	150
	185
	200

D	L
Ø5	60
	80
	100
	120
	150
	200
Ø6	60
	80
	100
	120
	150
	185
	200
	250

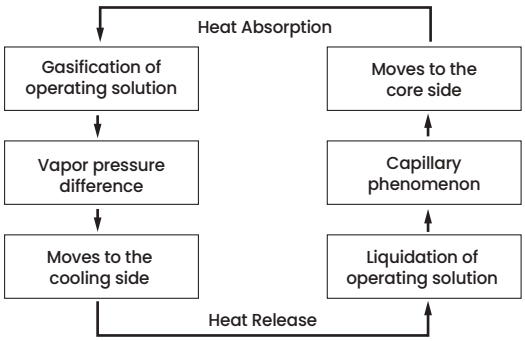
D	L
Ø8	80
	100
	120
	150
	185
	200
	250
Ø10	100
	120
	150
	185
	200
	220
	250
	300

Order: **GH.** D x L

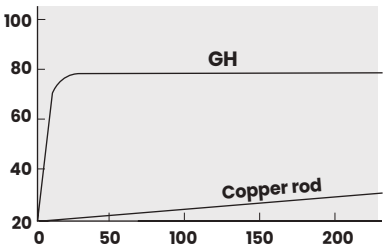
Mounting:
Cooling channel should be 0.2 / 0.4 mm larger than diameter of heat trasnfer pipe After mounting, open holes should be filled with repair paste.



Operating Cycle of the "GH" Heat Transfer Pipe



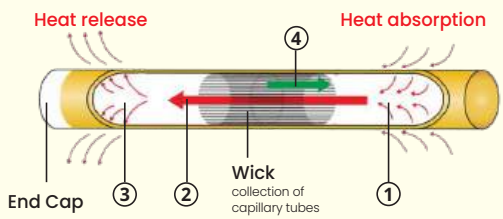
Thermal Response Property



Testing Conditions
Heating Medium: Hot Water 80°C
Cooling Medium: Air (room temperature)
Heating / Cooling Section Size: 1 vs. 1 (equal)
Measured Location: Cooling Section
Pipe Size: Ø4 L100

Note:
1- Use under a temperature of 200°C or lower. (Burst temperature 250°C) It is designed to withstand an internal pressure up to 20kgf/cm²(For example, the internal pressure rises to 16kgf/cm² at 200°C).
2- If the cooling section area is insufficient, proper cooling effects may not be obtained. Provide a water cooling jacket referring to mounting method, and secure the cooling section area.
3- Do not cut or disassemble.
4- Bending or squashing the heat transfer pipe hampers its cooling function.
5-Do not use oil for cooling.

GH - Exploded View



① **Excellent Cooling Efficiency**
"GH Pipes" do not rely on metal thermal conductivity alone; instead, they use refrigerant-based heat transfer.
Their thermal conductivity is 200 times greater than that of brass pipes and they offer superior thermal responsiveness.

② **Stable Cooling Performance**
Unlike traditional methods, **GH** heat pipes are less prone to rust, scaling, or other deposits that reduce water flow and heat transfer efficiency over time.

③ **Simplified Cooling Circuit**
GH systems reduce the complexity of cooling water circuits, helping to minimize the overall mold volume.

④ **Quick Installation**
No screws are required for installation, making the process fast and easy.

2 Way Connector

Code: **A26 2G..**

Option:
G1/4" - G3/8" - G1/2"

3 Way Connector

Code: **A26 3G..**

Option:
G1/4" - G3/8" - G1/2"

2 Way Coupling

Code: **A26 2GD..**

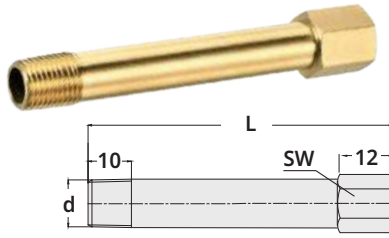
Option:
G1/4" - G3/8" - G1/2"

3 Way Coupling

Code: **A26 3GD..**

Option:
G1/4" - G3/8" - G1/2"

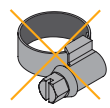
Order:
Code x Option



Code: **ARU**

Extension Fitting with Thread

Order Code	d	L	SW
ARU1460	G1/4"	60	16
ARU1480		80	
ARU14100		100	
ARU14150		150	
ARU1860	G1/8"	60	14
ARU1880		80	
ARU18100		100	
ARU18150		150	



Rubber Hose

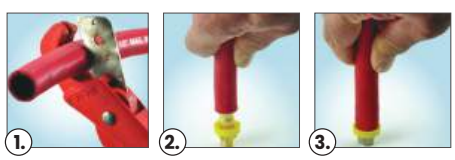
Code: **FLEX**

It is resistant to bending with its flexible structure reinforced with polyester for hot and cold water. It is suitable to be used according to fitting feature / with our without clamp.

Order Code	Inner Ø	Outer Ø	Operating Pressure
FLEX10B	9.5	15.4	28 Bar
FLEX10R	9.5	15.4	
FLEX13B	12.5	18.5	
FLEX13R	12.5	18.5	

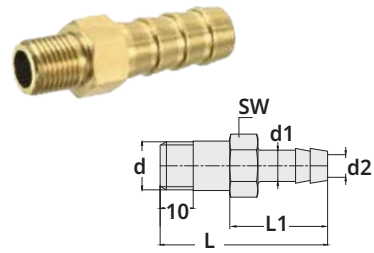
Order Code	Blast Pressure	Roll Length	Colour
FLEX10B	60 Bar	20 Metre	Blue
FLEX10R			Red
FLEX13B			Blue
FLEX13R			Red

Operating Temp. = -20 / +90°
Flow Capacity = 9.5 / 12.5 mm



1. Cut hose end straightly in desired length.
2. Insert hose into fitting.
3. Insert hose into plastic yellow slot by pushing hose settled on fitting.

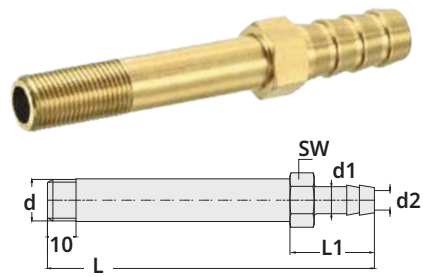
There is no need to insert clamp in this way. You need to cut hose end in order to remove hose from fitting.



Hose Fitting

Code: **HRE**

Order Code	d	d1	d2	L	L1	SW
HREM8	M8 x 1.25	12	7	36	28	13
HREM10	M10 x 1.5			36		
HREM12	M12 x 1.75			40		14
HREM14	M14 x 2.0			40		16
HREM16	M16 x 2.0			40		
HRE1/8	G 1/8"	12	7	36	28	13
HRE1/4	G 1/4"			40		14
HRE3/8	G 3/8"			40		17



Hose Fitting Long Type

Code: **HRU**

Order Code	d	d1	d2	L	L1	SW
HRUM08060	M8 x 1.25	12	7	60	28	13
HRUM08080				80		
HRUM08100				100		
HRUM08120				120		
HRUM08150				150		
HRUM10060	M10 x 1.5	12	7	60	28	13
HRUM10080				80		
HRUM10100				100		
HRUM10120				120		
HRUM10150				150		
HRUM12060	M12 x 1.75	12	7	60	28	13
HRUM12080				80		
HRUM12100				100		
HRUM12120				120		
HRUM12150				150		
HRU10060	G1/8"	12	7	60	28	13
HRU10080				80		
HRU10100				100		
HRU10120				120		
HRU10150				150		
HRU13060	G1/4"	12	7	60	28	14
HRU13080				80		
HRU13100				100		
HRU13120				120		
HRU13150				150		

Material: Brass **Flow Capacity:** 8 mm
Operating Pressure: 0 - 15 bar
Operating Temperature: -5 / +180°

Flexible Cooling Hose

Code: **PSE**

Even at high pressures, it guarantees the directional stability. Resistant to all chemicals. Combine system with modular passing feature.

1/4" Operating Pressure:
6 Bar / Flow Rate 15 l. / min.

3/8" Operating Pressure:
6 Bar / Flow Rate 25 l. / min.

Order Code	Thread	Length
PSE14	1/4"	280 mm
PSE38	3/8"	320 mm

It can be supported with "Ball Valve" as per request.

Liquid Gasket Sealant

* 300⁰ Heat Resistance Sealing.

Order Code: **SK404** Red

Order Code: **SM404** Blue

Package : 45 gr.

Code: **HKI**

Hose Clamp (stainless)

Order Code	Capacity
HKI 1016	10 x 16
HKI 1220	12 x 20
HKI 1319	13 x 19
HKI 1623	16 x 23
HKI 2032	20 x 32

Cooling Adapter

Code: **DSN**

Order Code	Thread	Length	Hexagon
DSN02	1/8"	22	14
DSN03	1/4"	26	17
DSN04	3/8"	26	22
DSN05	1/2"	30	27

Cooling Adapter

Code: **ONE**

Order Code	Thread	Length
ONE01	G1/8" - 1/8"	21
ONE02	G1/8" - 1/4"	23
ONE03	G1/4" - 1/4"	23
ONE04	G1/4" - 3/8"	23
ONE05	G1/4" - 1/2"	29
ONE06	G3/8" - 3/8"	23
ONE07	G3/8" - 1/2"	29

Mini Ball Valve

Code: **KKV**

* Manual controlled.
* Button type ball valves.
* 1/4 male threaded regulator.

Order Code	Female	Male
KKV13	G1/4"	G1/4"
KKV17	G3/8"	G3/8"
KKV21	G1/2"	G1/2"
KKV26	G3/4"	G3/4"
KKV33	G1"	G1"

Elbow

Code: **DR**

TEE

Code: **TE**

Reduction Fitting

Code: **DEN**

Order Code	Female	Male
DEN01	G1/8"	G1/4"
DEN02	G3/8"	G1/4"
DEN03	G1/8"	G3/8"
DEN04	G1/8"	G1/2"
DEN05	G1/4"	G3/8"
DEN06	G1/4"	G1/2"
DEN07	G3/8"	G1/2"

Cooling Fitting Elbow

Code: **KDR**

Order Code	Male
KDR10	G1/8"
KDR13	G1/4"
KDR17	G3/8"
KDR21	G1/2"
KDR26	G3/4"
KDR33	G1"

Hose Fitting

Code: **HBF**

Code: **HBE**

Order Code	Order Code	Male
HBE6	HBF6	6 mm
HBE9	HBF9	9.5 mm
HBE13	HBF13	12.5 mm
HBE16	HBF16	13.5 mm
HBE19	HBF19	18.5 mm

Order Code	Order Code	Connection
DR10	TE10	G1/8"
DR13	TE13	G1/4"
DR17	TE17	G3/8"
DR21	TE21	G1/2"
DR26	TE26	G3/4"
DR33	TE33	G1"

Multi Coupling Plate Systems for Injection Moulds

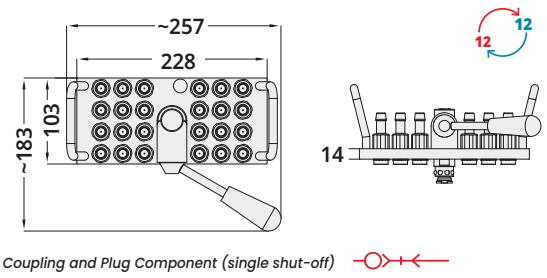
They are used in Injection Mould Cooling Systems. These complicated sets prevent faulty and incorrect fastening and arrange complicated fastening system. It reduces mould changing time minimum and enables simple / easy fastening. Our systems provide from 3 inlets - 3 outlets up to 12 inlets - 12 outlets according to the requirement of users. Your Guvenal support assistant will assist you in order formation. High quality Viton O-rings are used in our products.

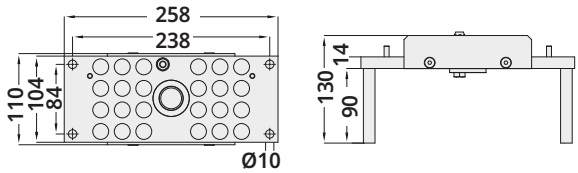
They can be operated at 10 Bar & 180°C.

Series M60109

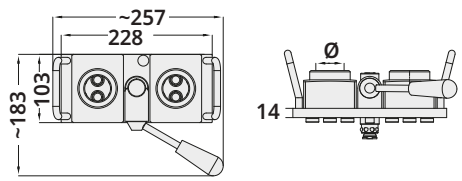
Profile Type				
Machine Side	HGB	FGB	DGB	EGB
Mould Side	HRB	FRB	DRB	ERB

Hose Tail: 10 mm / 12 mm
Push-Lock Hose Tail: 10 mm / 13 mm
Female: BSP 3/8" - NPT 3/8"
Male: BSP 3/8" - NPT3/8"

Machine Side	Profile Type	Order Code	Ø
 *Coupling and Plug Component (single shut-off)*		M6010924HGB10	Hose Tail 10 mm
		M6010924HGB12	Hose Tail 12 mm
		M6010924FGB10	Push-Lock Hose Tail 10 mm
		M6010924FGB13	Push-Lock Hose Tail 13 mm
		M6010924DGB17	Female BSP 3/8"
		M6010924DGBN17	Female NPT 3/8
		M6010924EGB17	Male BSP 3/8"
		M6010924EGBN17	Male NPT3/8

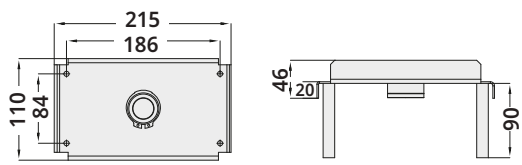
Mould Side	Profile Type	Order Code	Ø
		M6010924HRB10	Hose Tail 10 mm
		M6010924HRB12	Hose Tail 12 mm
		M6010924FRB10	Push-Lock Hose Tail 10 mm
		M6010924FRB13	Push-Lock Hose Tail 13 mm
		M6010924DRB17	Female BSP 3/8"
		M6010924DRBN17	Female NPT 3/8
		M6010924ERB17	Male BSP 3/8"
		M6010924ERBN17	Male NPT3/8

Machine Side with Collector



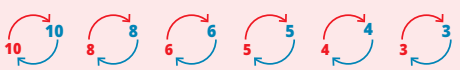
Order Code	Ø
MT6010924C42	BSP 1 1/4"
MT6010924CN42	NPT 1 1/4"

Parking Plate



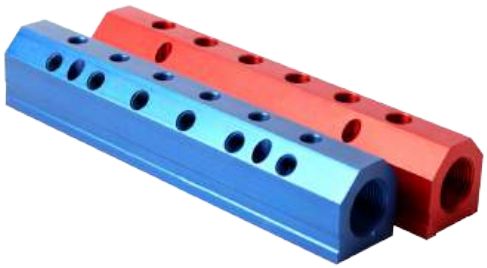
Order Code
MPP6010924

With Multi Coupling Plates & Manifold Blocks, undesired miscibility on machine and mould can be avoided.



For technical details and specifications of the 10-10, 8-8, 6-6, 5-5, 4-4, 3-3 connections of the "M60109" product, please contact our company.

Manifold Blocks for Injection Mould Cooling Systems



Thread Size Explanations

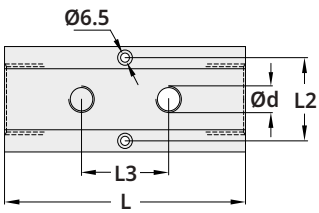
BSP=G NPT=N (1/4" = 13) (3/8"=17) (1/2"=21)
(3/4" =26) (1"=33) (1-1/4"=42) (1-1/2"=48) (2"=60)

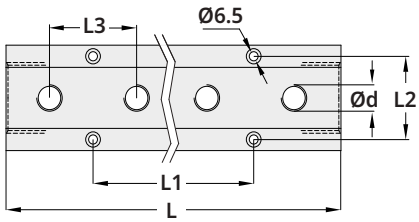
Series AK 1018

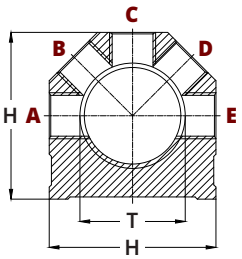
Max. Temperature =
-50°C / + 400°C (-58°F +752°F)

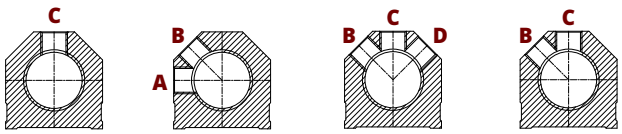
Max. Working Pressure = 40 Bar (580PSI)

Surface Colour = Red / Blue / Blue & Red









Order: **AK1018**
T x d x L x Hole x Colour

Order Example:
AK1018 3/4 x 1/4 x BD194 x 6 x Blue

T Inlet Thread	d Outlet Thread	Number of **Holes** on one Surface	L								L1								L2	L3	H
			A	C	AC	BD	ACE	ABC	BCD	ABCDE	A	C	AC	BD	ACE	ABC	BCD	ABCDE			
3/4"	1/4"	2	74		74		74	74		74	0		0		0	0		0	35	31	44.5
		4	132		132		132	132		132	62		62		62	62		62			
		6	194		194		194	194		194	124		124		124	124		124			
		8	256		256		256	256		256	186		186		186	186		186			
3/4"	3/8"	2	90		90		90	110		110	0		0		0	0		0	35	40	44.5
		4	165		165		165	190		200	80		80		80	100		100			
		6	245		245		245	270		290	160		160		160	180		180			
		8	325		325		325	350		350	240		240		240	260		260			
1"	1/4"	2	103		103		103	103		103	0		0		0	0		0	38	40	51
		4	183		183		183	183		183	80		80		80	80		80			
		6	263		263		263	263		263	160		160		160	160		160			
		8	343		343		343	343		343	240		240		240	240		240			
1"	3/8"	2	103		103		103	123		123	0		0		0	0		0	38	40	51
		4	183		183		183	210		210	80		80		80	100		100			
		6	263		263		263	290		290	160		160		160	180		180			
		8	343		343		343	370		370	240		240		240	260		260			
1-1/4"	1/4" 3/8" 1/2"	2	152		152		152	152		152	0		0		0	0		0	50	51	66
		4	254		254		254	254		254	101.6		101.6		101	101.6		101.6			
		6	355		355		355	355		355	203.2		203.2		203	203.2		203.2			
		8	457		457		457	457		457	304.8		304.8		304	304.8		304.8			
1-1/2"	1/4" 3/8" 1/2"	2	152		152		152	152		152	0		0		0	0		0	57	51	76
		4	254		254		254	254		254	101.6		101.6		101	101.6		101.6			
		6	355		355		355	355		355	203.2		203.2		203	203.2		203.2			
		8	457		457		457	457		457	304.8		304.8		304	304.8		304.8			
1-1/2"	3/4"	2	164.5		164.5		164.5	164.5		164.5	0		0		0	0		0	57	63.5	76
		4	270		270		270	354.5		354.5	101.6		101.6		101	191		191			
		6	417.5		417.5		417.5	481.5		481.5	254		254		254	318		318			
		8	554.5		554.5		554.5	608.5		608.5	381		381		381	445		445			
2"	3/8" 1/2" 3/4"	2	178		178		178	178		178	0		0		0	0		0	72.5	63.5	89
		4	305		305		305	305		305	127		127		127	127		127			
		6	432		432		432	432		432	254		254		254	254		254			
		8	559		559		559	559		559	381		381		381	381		381			

Quick Connect Pneumatic Fittings - Plastic Models

Plastic structure, quick connect and for pneumatic / air distribution mounting systems. Max. Temperature: 40°C. Quick Connect Pneumatic Fittings also can be used in cooling system of Injection Moulds, it is recommended to keep the environment temperature and water temperature circulating - max. 40°C.

Attention: Possible temperature increases (over 40°C. max.) may cause water leakages in time !

"PH" Air Hose is recommended for installation of cooling system.

Fitting - Internal Thread — DPCF

Order: DPCF. d x d1

d	d1
1/8"	4
	6
	8
1/4"	4
	6
	8
	10

Fitting - External Thread — DPCG

Order: DPCG. d x d1

d x d1	d x d1
1/8" x 4	12-1.5 x 6
1/8" x 6	10-1.5 x 8
1/8" x 8	12-1.5 x 8
1/8" x 10	10-1.5 x 10
1/4" x 6	12-1.5 x 10
1/4" x 8	16-1.5 x 10
1/4" x 10	10-1.5 x 12
3/8" x 10	16-1.5 x 12
3/8" x 12	

Elbow Fitting with Valve — ISCG

Order: ISCG. d x d1

d	d1
1/8"	4
	6
	8
1/4"	4
	6
	8
	10
3/8"	10
	12

Hose Fitting with Valve — DFSG

Order: DFSG x d1

d x d1
4
6
8
10
12

Elbow Fitting - 90° — DPLG

Order: DPLG. d x d1

d	d1
1/8"	4
	6
	8
1/4"	4
	6
	8
	10
3/8"	10
	12

Manifold Fitting — IPHT

Order: IPHT. d x d1

d	d1
1/8"	4
	6
	8
1/4"	4
	6
	8
	10
3/8"	10
	12

"T" Fitting — DPT

Order: DPT. d x d1

d	d1
1/8"	4
	6
	8
1/4"	4
	6
	8
	10
3/8"	10
	12

"Y" Fitting — DPWT

Order: DPWT. d x d1

d	d1
1/8"	6
	8
1/4"	6
	8
	10

Straight Fitting — DPUC

Order: DPUC x d1

d1
4
6
8
10
12
14
16

Hose Reduction Fitting — IPU

Order: IPU. d1 x d2

d1 - d2
6 - 4
8 - 4
8 - 6
10 - 6
10 - 8
12 - 8
12 - 10

Hose Stop Nipple with Valve — ISPLG

Order: ISPLG. d x d1

d x d1
1/8" x 4
1/8" x 6
1/4" x 6
1/4" x 8

Hose Stop Nipple — ISPU

Order: ISPU. d1

d1 - Stop
4
6
8
10

Quick Connect Pneumatic Fittings - Plastic Models

Plastic structure, quick connect and for pneumatic / air distribution mounting systems. Max. Temperature: 40°C. Quick Connect Pneumatic Fittings also can be used in cooling system of Injection Moulds, it is recommended to keep the environment temperature and water temperature circulating - max. 40°C.

Attention: Possible temperature increases (over 40°C. max.) may cause water leakages in time !

"PH" Air Hose is recommended for installation of cooling system.

"T" Hose Fitting — DPUT

Order: DPUT. d1

d1
4
6
8
10
12
14
16

"Y" Hose Fitting — DPY

Order: DPY. d1

d1
4
6
8
10
12

"Y" Hose Reduction Fitting — DPW

Order: DPW. d1 x d2

d1 - d2
6 - 4
8 - 6
10 - 8
12 - 10

Elbow Hose Fitting — DPUL

Order: DPUL. d1

d1
4
6
8
10
12
14
16

Pipe Cross Hose Fitting — DPZA

Order: DPZA. d1

d1
4
6
8
10
12

Manifold Fitting (4-Distributor) — PXG

Order: PXG. d1 x d2

d1 - d2
6 - 4
8 - 6
10 - 8
12 - 10

Fitting with Valve — HVES

Order: HVES. d x d1

d	d1
1/8"	6
	8
1/4"	6
	8
3/8"	8

Valve for Hose (spherical) — HVFF

Order: HVFF. d1

d1
4
6
8
10
12

Sintered Muffler — BSL

Order: BSL. d1

d1
1/8"
1/4"
3/8"
1/2"
3/4"
1"

Plastic Muffler — PSL

Order: PSL. d1

d1
1/8"
1/4"
3/8"
1/2"

Rotary Joint Fitting — UCBAS

Order Code : UCBAS

Thread
1/4"

Shaft
8 x 5 mm

Air Hose - Polyurethane — PH

Max. 60°C

* When ordering, pls. specify the desired metre.

Order	In / Out
PH4	Ø 2 x 4
PH6	Ø 4 x 6
PH8	Ø 6 x 8
PH10	Ø 7 x 10
PH12	Ø 9 x 12

Quick Connect Pneumatic Fittings - Metal Models

Plastic structure, quick connect and for pneumatic / air distribution mounting systems. Max. Temperature: 40°C. Quick Connect Pneumatic Fittings also can be used in cooling system of Injection Moulds, it is recommended to keep the environment temperature and water temperature circulating - max. 40°C.

Attention: Possible temperature increases (over 40°C. max.) may cause water leakages in time !

"PH" Air Hose is recommended for installation of cooling system.

Metal, Fitting External Thread — IPCT

Order: IPCT. d x d1

d	d1
1/8"	4
	6
	8
1/4"	6
	8
	10
	12
3/8"	10
	12

Metal, Elbow Fitting - 90° — IPLT

Order: IPLT. d x d1

d	d1
1/8"	4
	6
	8
1/4"	6
	8
	10
	12
3/8"	10
	12

Metal, "T" Fitting — IPBT

Order: IPBT. d x d1

d	d1
1/8"	4
	6
	8
1/4"	6
	8
	10
	12
3/8"	10
	12

Metal, Hose Nipple — IPUT

Order: IPUT. d

d1
4
6
8
10
12
14
16

Metal, "T" Hose Fitting — IPET

Order: IPET. d1

d1
4
6
8
10
12
14
16

Metal, Hose Reduction Fitting — IPOT

Order: IPOT. d1 x d2

d1	d2
8	6
10	8

Metal, Hose Fitting with Valve — IPCV

Order: IPCV. d x d1

d	d1
1/8"	6
1/4"	8
	10
3/4"	12

Metal, Elbow Hose Fitting — IPVT

Order: IPVT. d1

d1
4
6
8
10
12
14
16

Metal, Pipe Cross Hose Fitting — IPZT

Order: IPZT. d1

d1
4
6
8
10
12
14
16

Quick Connect Pneumatic Fittings - Metal Models

Plastic structure, quick connect and for pneumatic / air distribution mounting systems. Max. Temperature: 40°C. Quick Connect Pneumatic Fittings also can be used in cooling system of Injection Moulds, it is recommended to keep the environment temperature and water temperature circulating - max. 40°C.

Attention: Possible temperature increases (over 40°C. max.) may cause water leakages in time !

"PH" Air Hose is recommended for installation of cooling system.

Metal "Y" Hose Fitting — MPY

Order: MPY. d1

d1
4
6
8
10
12
14
16

Metal, Reduction Fitting — IBDG

Order: IBDG. d x d3

d	d1
1/8"	1/4"
	3/8"
	1/2"
1/4"	3/8"
	1/2"
3/8"	1/2"

Metal Nipple — IBBG

Order: IBBG. d x d3

d	d1
1/8"	1/4"
	3/8"
1/4"	3/8"
	1/2"
3/8"	1/2"

Detent Plug — IBP

Order: IBP. d

d	d1
1/8"	8
1/4"	10
3/8"	10
1/2"	10

Detent Plug with O-ring — IBPG

Order: IBPG. d

d	d1
1/8"	10
1/4"	11
3/8"	12
1/2"	13

Spiral Air Hose — T186

Order	In / Out	Mt. Length
T18604	4 - 6	4
T18605	5 - 8	5
T18607	5 - 8	7.5
T18615	5 - 8	15
T18610	12 - 8	10

Air Hose - Polyamide — POLB

Max. 100°C

Order	In / Out
POLB04	Ø2 x 4
POLB06	Ø4 x 6
POLB08	Ø6 x 8
POLB10	Ø8 x 10
POLB12	Ø10 x 12

* When ordering pls. specify the desired metre.

Air Hose - Teflon — TEF

Max. 180°C

Order	In / Out
TEF04	Ø2 x 4
TEF06	Ø4 x 6
TEF08	Ø6 x 8
TEF10	Ø8 x 10
TEF12	Ø10 x 12

* When ordering pls. specify the desired metre.

Air Hose - Polyurethane — PH

Max. 60°C

Order	In / Out
PH4	Ø 2 x 4
PH6	Ø 4 x 6
PH8	Ø 6 x 8
PH10	Ø 7 x 10
PH12	Ø 9 x 12

* When ordering pls. specify the desired metre.

Code: **ESR**

Plastic Body Water Regulator

Made of plastic material, this water regulator offers long-lasting use with its light weight and resistance to corrosion. It is ideal for applications that seek cost-effective solutions. It regulates the water flow in cooling systems and ensures safe and accurate flow rates.

Code: **ESP**

Plastic and Metal Body Water Regulator

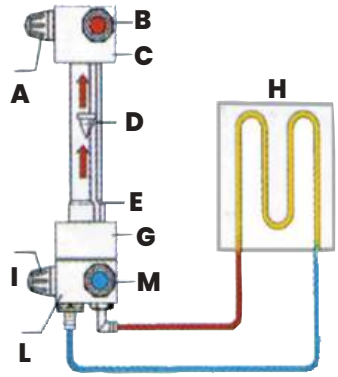
Manufactured using both plastic and metal materials, this regulator combines durability with aesthetic appeal. The metal body provides strength and longevity, while the plastic parts offer lightness and resistance to corrosion. It ensures safe and efficient water flow management in various industrial applications.

Code: **ESM**

Metal Body Water Regulator

Fully made of metal, this water regulator provides high durability and reliability. It is suitable for use in industrial systems under high pressure and harsh conditions. The metal structure offers superior protection against wear and ensures long-term, secure water flow control.

Water Flow Regulator

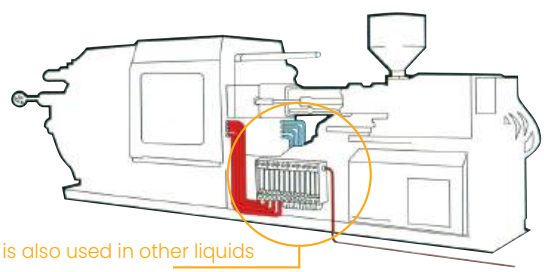


A: Adjusting Valve
B: Water Outlet
C: Flow Manifold
D: Float
E: Flow Tube
G: Receiver Section
H: Mould
I: Cut-Off Valve
L: Supply Manifold
M: Water Inlet

Flow Rate: 0-18 L / min.
Inlet - Outlet: R 3/8
Max. Temperature: 95°C

It is used as Water Flow Regulator / Indicator of cooling water in injection systems. It is designed to control circulation flow and to repeat settings regularly. Measurement scale of tubes is monitored at desired level, accurate / safe flow is supplied with monitoring the deviation status and on-off valves.

Order	Number of Tubes	Widht x Length (mm)
ESR 04	4	280 x 280
ESR 05	5	340 x 280
ESR 06	6	400 x 280
ESR 08	8	520 x 280
ESR 10	10	640 x 280
ESR 12	12	760 x 280
ESP 04	4	280 x 280
ESP 05	5	340 x 280
ESP 06	6	400 x 280
ESP 08	8	520 x 280
ESP 10	10	640 x 280
ESM 04	4	280 x 280
ESM 06	6	400 x 280
ESM 08	8	520 x 280
ESM 10	10	640 x 280
ESM 12	12	760 x 280



It is also used in other liquids or lubricating systems.

NEW

Video

Test Kit For Mould Cooling Channels

Order Code: **G170**

Why test with compressed air?

G170 is used to detect water leakages that may occur during assembly and trials after new mould production / modification. Test with compressed air; it is cleaner and faster than test methods with a water pump, etc. Air has a higher fluidity of x15/20 than warm water (80°C). For this reason, the high fluidity of air shows even leaks that are sealed when tested with water.

Operating instructions:

1- Connect the pressure gauge to the inlet of the cooling circuit.
2- Connect the valve to the circuit outlet and close the valve.
3- Using the air gun to the unit with the pressure gauge, pump air until the arrow reaches the maximum level. For test pressure max. 4 bar of air is sufficient.
4- The test time can be between 90 - 180 seconds depending on the size of the injection mould volume. If the arrow is still in its initial position at the end of the test, there is no problem and the test is successful.
5- If the arrow has decreased, necessary corrections should be made.

*It is sold as a kit in a plastic box.

Kit contents:

- Pressure gauge
- Relief valve
- Automatic fittings – 1/4" (2 pcs)
- Fittings – 1/4" (4 pcs)

Note: You can purchase fittings with different threads from our company.

Operating Pressure
6.3 Mpa

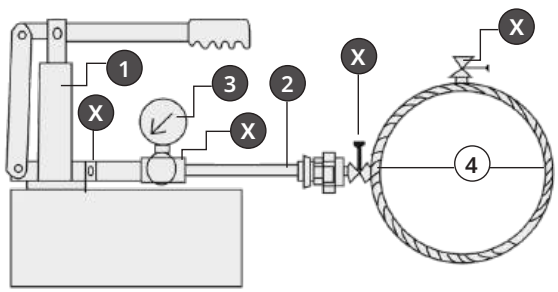
Flow Rate
25 ml / s.

Manual Pressure Test Pump

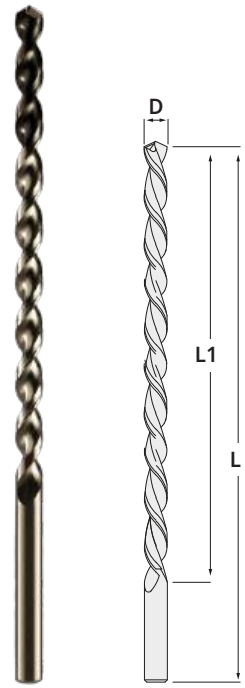
Order Code: **SSY6**

Testing of System with Manual Pressure Test Pump:

Complete the mounting of Tie Bar (handle) with screw and screwdriver involved in product that you purchased. Fill Test Hose **(2)** with water (air inside the hose should be discharged). Close Valve **(1)** on the tie bar (handle), connect testing hose to the mould (ensure that system is closed completely). Fill the tank with water and run pump by pushing keep Valve **(1)** open, continue to pumping. When Manometer **(3)** pressures is reached to desired level, close the Valve **(1).** If the pressure does not fall, the result is positive. If the pressures fall, there is a leak.



1 - ON - OFF Valve
2 - Testing Hose
3 - Manometer / Pressure Indicator
4 - Water Circuit of Mould
X - Upon request, Mini Ball Valve can be added.



Extra Long Drill

Code: **MG**

GT 100 type & for cooling channels

Order Code	D	L	L1
MG35165	3.5 mm	165	115
MG35210		210	145
MG35265		265	180
MG04175	4 mm	175	120
MG04220		220	150
MG04280		280	190
MG05198	5 mm	198	135
MG05245		245	170
MG05315		315	210
MG55205	5.5 mm	205	140
MG55260		260	180
MG55330		330	225
MG06205	6 mm	205	140
MG06260		260	180
MG06330		330	225
MG65215	6.5 mm	215	150
MG65275		275	190
MG65350		350	235
MG07225	7 mm	225	155
MG07290		290	200
MG07370		370	250
MG75225	7.5 mm	225	155
MG75290		290	200
MG75370		370	250
MG08240	8 mm	240	165
MG08305		305	210
MG08390		390	265
MG85240	8.5 mm	240	165
MG85305		305	210
MG85390		390	265
MG09250	9 mm	250	175
MG09320		320	220
MG09410		410	280
MG95250	9.5 mm	250	175
MG95320		320	220
MG95410		410	280
MG10265	10 mm	265	185
MG10340		340	235
MG10430		430	295
MG105265	10.5 mm	265	185
MG105340		340	235
MG105430		430	295
MG11280	11 mm	280	195
MG11365		365	250
MG11455		455	310
MG115280	11.5 mm	280	195
MG115365		365	250
MG115455		455	310
MG12295	12 mm	295	205
MG12375		375	260
MG12480		480	330
MG125295	12.5 mm	295	205
MG125375		375	260
MG125480		480	330
MG13295	13 mm	295	205
MG13375		375	260
MG13480		480	330

It is a long chip channel drill bit having great helix angle than normal. Especially, "10XD" perforation machining is provided on the deep surfaces. Due to its helix structure, it works comfortably and does not sticking into the middle hardened steel and aluminium materials by evacuating chip outside during drilling.

CONSUMABLES / DIE & MOULD LUBRICANTS

Protective & Maintenance Lubricants

Eco Friendly Products

Mould Protective Spray

It creates optimal, long term protection layer on the surfaces. It dries quickly. It provides protection against corrosion and rust. It creates long term dry non-aqueous protection layer. It protects as white powder.

Usage Area:
It is a sealant product used as long term protector on steel, ceramic, glass and injection moulds, machines and pipe lines.

Order Code: **W150170** Package: **400 ml.**

Multi-purpose Signum Spray

This spray maintains 5 functions together, it protects the steel against corrosion, it removes rust, greases, cleans the product and prevents the dirt. It is resistant to -30°C / 100°C temperature. It is vanilla scented. Economical product.

Usage Area:
It is used to protect and to lubricate the steels in mould industry for short term. It is water repellent. It can be used in the inner parts of CNC system machines easily.

Order Code: **W160110** Package: **400 ml.**

Mould Release Agent Spray

In injection machines, it helps to release products from mould. KA2000 & KA1000 contains a light duty silicone that is ideal for moulds. Does not contain any Cfc's or Hcfc's. Heat resistant: 250°C.
KA2000: Silicone based
KA1000: Silicone based, oil-free and non-flammable.

Order Code: **KA2000 or KA1000** Package: **400 ml.**

Molykote Longterm Grease

It is used for lubricating machine and mould components exposed to low and medium pressures, approaching high-speed limits, in environments where cleanliness is important and there is a risk of water contact and friction-induced rust. Its lack of oxidation tendency makes it suitable for long-term lubrication. The integrated adhesion promoter helps prevent friction-induced corrosion. It is ideal for the molding industry, especially in pin, pillar, bushing, and punch systems.

Order Code: **4549** Package: **1 kg.**

Multi-purpose Grease

High-performance grease for multi-purpose application in moulds & dies. Ideal for lubricating moving and sliding components (guide pillar, bushes, wear plates etc.) and for servicing machines. It is a specially formulated product with lithium additivies. It is resistant againts pressure and water. Long-term lubrication. High corrosion and wear protection.

Order Code: **W150206** Package: **1 kg.**

Powerful Rust Remover Spray

It is a rust remover with superior features and advanced technology. It has very good processing surface to the surface. It loosens the tightened bolts and nuts immediately. It removes rust by entering even the thinnest spaces. Eco-friendly product.

Usage Area:
It is used at all kinds of maintenance and repair, cleaning of die & mould equipment, loosening the rusted bolts and surfaces. Also, it is anti corrosive.

Order Code: **W160170** Package: **400 ml.**

Protective Wax Spray

It protects all steels, machines and equipment against corrosion. It creates a thin wax layer on the surface and the contact of the product with air is cut off. It is resistant to water and salty water vapours. It is an ideal protector at blowing moulds.

Usage Area:
It provides protection against corrosion during long term transports of moulds, especially in ship transports. It is also appropriate for long term machine and tool storage.

Order Code: **W160106** Package: **400 ml.**

Food Grade Lubricant Spray

It is used at machine and equipment making food production or contacting the food. It is tasteless and odourless. It is Food Grade LFGB approved. It is white coloured liquid grease. It is used at moulds related to the food.

Usage Area:
It is used at food and bottling machines, milk, mineral water, beer factories and lubricating of various parts of meat, vegetable, fruit and fish.

Order Code: **W160105** Package: **400 ml.**

Silicon-free Mould Release Agent Spray

In injection machines, it helps to release products from mould. Very good releasing action. Does not contain silicon or acid. Ensures easy releasing by lubricating steel and plastic. Shake well and spray a thin layer of 25-30 cm distance from the mould before use. **Heat resistant:** 200°C

Order Code: **W150154** Package: **400 ml.**

WD-40 Multi-use Spray

Proven product in the world. It is used effectively as rust remover, stops squeaks, drives out moisture, cleans, protects, loosens rusted parts and frees sticky mechanisms.

Usage Area:
At cleaning and lubricating of ejector pins, guiding components etc. in moulds, long-term precision tool protections and all other operations.

Order Code: **HRD-200ML** Package: **200 ml.**
Order Code: **HRD-400ML** Package: **400 ml.**
Order Code: **HRD-5000ML** Package: **5 Litre**

Lubricating Greases and Sprays

Liquid Grease Spray

It is lubricating material resistant against high pressure. It is resistant to water, 180°C temperature and corrosion, its adhesive feature is very high. It does not flow and drop, it has transparent colour and makes permanent lubricating.

Usage Area:
It is long term protective lubricant at moulds, ejector pins, cores and guide pillars. Also, it is used at parts such as chain, apparatus etc. It also can be applied at dies.

Order Code: **W160114** Package: **500 ml.**

Anti-seize Ceramic Grease

It is a mounting paste that does not consist metal and graphite. It is ceramic structured with advanced technology and lubricant providing high efficient on parts resistant to high temperature. It is resistant to -20°C / 1500°C temperature and also 220 N / mm² pressure.

Usage Area:
It is used at all mould components working under high temperature, metal injection moulds and dies.

Order Code: **W160200** Package: **400 ml.**

Order Code: **W150200** Package: **1 kg.**

MOS2 Dry Lubrication System Spray

It is used at places that lubricating with grease is not possible. It decreases friction between metals. It prevents corrosion between different metals. It has very good thermal conductivity. It is resistant against high pressure. It makes dry graphite lubricating.

Usage Area:
It prevents the adhesion of product to the mould and vibration during injection at aluminium extrusion and metal injection moulds.

Order Code: **W160109** Package: **400 ml.**

White Lithium Grease Spray

It is waterproof and prevents friction, provides permanent lubricating by penetrating steel quickly. It is resistant to -40°C / 140°C temperature. It provides protection against corrosion. It is white colour and for moulds & dies.

Usage Area:
It is used for mould & die maintenance, repair and lubricating purposes in the environment contacting with water. It decreases friction. It is applied at sintered / bronze + graphite wear plates.

Order Code: **W160108** Package: **400 ml.**

Sealing Compounds

3243 Threadlocker Medium Strength (removable)

Ideal for screw parts of (6-20 mm) or less in radius that come loose under vibration. Used in fasteners and screws with improved oil resistance, to fix nuts and provide sealing. **Properties:** Threadlockers lubricate the threads for proper installation and torque-stress ratio. Threadlockers reduce the risk of rupture and breakage and provide the required torque resistance. Threadlockers secure and seal the parts against potential corrosion and leaks.

Order Code: **HRD-3243** Package: **250 ml.**

3270 Threadlocker High Strength (unremovable)

It cannot be removed with any tools. It can be removed by heating if desired. Lock fasteners against vibration and thermal expansion. Seal against corrosion and leakage. Suitable for all shapes of fasteners. High chemical resistance. Excellent performance on greasy surfaces. Can be used in the joining of vibrating machines and moving components.

Order Code: **HRD-3270** Package: **250 ml.**

3542 Hydraulic Sealant

Ideal for locking and sealing metal pipe joints. The high lubricating properties of this compound prevent galling on stainless steel, aluminum and all other metal pipe threads and fittings. **Properties:** Properly tightened connections give instant sealing against moderate pressures. For maximum pressure and solvent resistance, allow the product to cure for at least 24 hours after closing the connection. Low viscosity, medium strength.

Order Code: **HRD-3542** Package: **250 ml.**

3577 Pipe Sealant - Low Viscosity

- Ideal for locking and sealing of threaded metal pipes and fittings.
- Designed for coarse threads. Suitable for stainless steel surfaces without the need of surface activation.
- Ideal to seal against gases, water, LPG, hydrocarbons, oils and other chemicals.
- Excellent thixotropic property prevents migration of the sealant before or during curing.

Order Code: **HRD-3577** Package: **50 ml.**

Industrial Cleaning Sprays

NEW

Güvenal - General Cleaning Spray

It is a high-performance and cost-effective product from Güvenal. It removes dirt, oil and resin from all metals quickly and without leaving a trace. It especially cleans excellently all dirts and chemicals on the surfaces from surface to downward / outwards with volatile feature at mould polishing / cleaning works.

Usage Area: - Mould polishing **-** Mould cleaning **-** Metal parts of machines

Order Code: **GTH1010** Package: **500 ml.**

Order Code: **GTH1020** Package: **60 Lt.**

Universal Bio Cleaning Spray

Usage Area:
- In machine cleaning
- Tool and mould parts cleaning in the workshop
- Plastic and upholstery cleaning
- Ideal for external cleaning and maintenance of the machine
- It does not cause staining and dullness
- Food industry-approved, concentrated product
- It provides freshness with lemon essence

Order Code: **W1701201** Package: **1 Lt.**

NEW

High Temperature Ejector Pin Grease

Order Code: **GTH1400**

HIGHLY PRODUCTIVE GÜVENAL PRODUCT

High temperature lubricating greases for Ejector Pins & Core Systems.

Our special greases are consists well refined mineral oils and EP additives providing lubricity as film strip between other mould parts and mould parts that do not affect from high temperature of ejector systems and core systems in working mould in high temperature such as metal injection. Thanks to solid lubricants and additives, it has comfortable operation (working without load).
It has high heat insulation and provides resistance up to 1400°C. It is in film strip position of surfaces between parts. Even at very high temperature, it prevents sticking each other. It is produced from vegetable oils and not harmful to the health.

Advantage of using GTH1400 lubricating greases:

* It is resistant against oxidization and friction.
* It is resistant to corrosion and abrasion.
* It is silicium and white (it does not make any contamination on mould).
* It Is resistant against water and humidity (water proof).
* Due to dust atmosphere as casting moulds, the user's hands are not painted black. It is a very good protector.
* It does not cause any reaction on surfaces.

1400°C Temperature Durable Product

Specially Developed Formula

Two grades pastes in one box / Thick & Thin

Order Code: **ALCON**

Package: **100 gr.**

Valve Grinding Paste (lapping compound)

It gives the best results in the operation of the intake and exhaust valves of the engines, blasting, polishing and polishing works for the highest performance, eliminating and correcting the metal deformations caused by heavy usage conditions on the metal floor.

Thanks to its special formula, it provides reliable, high performance abrasion, correction, leveling, honing, cleaning and polishing. For the best results, it is important to choose the appropriate thickness of sand and it is recommended to first adjust the abrasion-level with thick putty and then smooth-finish-polish with fine putty.

Metal Adhesive

Metal Adhesive 5 min is a fast curing two component steel-filled (steel alloy that does not rust) epoxy for repairs and quick maintenance work. It can be drilled and reprocessed after fully cured. Extremely strong and adhesion Dispenses equal amounts of each component every time.

Order Code: **HRD - 3633**

Package: **28 gr.**

Epoxy Adhesive - Waterproof

Epoxy Adhesive 5 min is a two-part adhesive consisting of an epoxy resin and a hardener. It is mixed in equal volumes, the resin and hardener, resulting a tough, rigid, high strength bond in 5 minutes. It does not shrink. It is resistant to water and the most common solvents. It can be tinted with earth pigments, cement or sand for color matching. It can be sanded and drilled.

Order Code: **HRD - 3611**

Package: **28 gr.**

Steel Epoxy Putty

Steel Epoxy Putty is a two-component adhesive. Consists of epoxy resin and hardener.

Order Code: **HRD - 3701**

Package: **57 gr.**

Super Glue

It is suitable for steel, metal, plastic, and rubber. Provides adhesion in 8 - 10 seconds. It has medium viscosity.

Order Code: **HRD - 502**

Package: **20 gr.**

Hand Cleaner

It does not contain any petroleum additives. It is an alkali and solvent-free hand cleaner with dermatologically safe ingredients. The processed fine grainy abrasives in the product, provide cleaning and protection on hand pores thoroughly. It is extremely effective on all dirty, rusty, painted and sticky dirt.

Order Code: **W140602**

Package: **3 Lt.**

Order Code: **W140601**

Package: **500 ml.**

Engineer's Marking Blue Paste

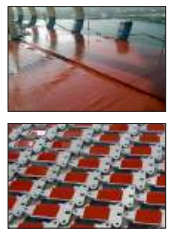
Order Code: **TUSCP**

Blue colour limiting paint in remarkable density and fast drying is used for test surface quality.

Blue oily mix liquid leaves a clear sign on any kind of metal. Tuschierpaste is indicated blue, bright sign on all metal parts that can be seen easily, this is coupled to show transfers and defects from another surface, it is ideal for marking surface. Due to its high cohesion feature, It can be easily transferred from one surface to another one. It can be used by mixing water. It can be cleaned from surfaces easily. Before using, should be shake well and protect from cold.

Application: It is applied with a lint-free brush. It is fast-drying and protects the surface against rust. A small amount of product, wide surfaces are applied. It has high coating feature and it is easily wiped and solvent based.

Package: 225 g.



Casting Resin

Order Code: **POLIN**

Our Casting Resin is two component not-solvent, polyurethane based electrical insulation and casting resin.

Specifications: Electrical imperviousness and dielectric constant number is high in different terms and various temperatures. It is resistant to abrasion, acid alkaline and other chemical or corrosive materials. It is hardened in low temperatures without any significant volume change. Thanks to catalysts, drying time can be shortened.

Usage Fields: It is suitable to complete filling in casting works in die/mould and machine sectors. It can be machining with turning leveling easily. It is used in electric cable industry, casting of head and additional joints, insulating of end fasteners, plunger pump, insulator, transformers and various electrical component productions. In addition, it is used in all kinds of high voltage devices transformers, television broadcast lines, telephone cord fasteners and rollers, to prevent flowing and leading in all kinds of condensers as well as to prevent noise that can be occurred through resonance and vibration in devices such as ballast, regulator.

Usage: 2nd component in upper section of box is emptied into main material in large box. Then, it is mixed until obtaining homogeneous mixture. The surface to be applied is decontaminated from oil, dirt, rust and burrs, prepared mixture should be used in 30 - 40 minutes. If all of material is not used, sufficient mixture should be done.

Package: 1 kg.

Mould Marking Paint

Order Code: **KMB or MMB**

Mould marking and exercise paints are sold in 110 ml package. It is quick dried in applied surfaces. After dried, it is not affected from oil, and drawing or exercise processes are continued on applied surfaces. The metal is also resistant to corrosion (it prevents external contact of surface). Attention: Flammable!!

KMB (110 ml marking paint - red)
MMB (110 ml exercise paint - blue)

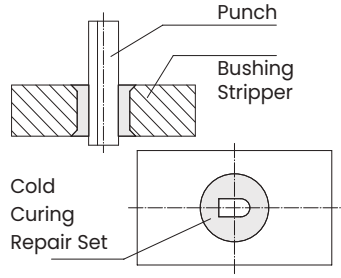
Powder Liquid

Cold - Curing Tool Repair Set

Code: **TKLN**

It is self hardening repair acrylic that is used in stripper and bearing plates of the dies, spinning / forming gaps, cancelling of undesired holes as well as used for punch bushing in simple cutting and punching dies. Providing suitability at drilling and levelling processes done on filled surfaces.

Mixing Ratio: 5 unit powder - 3.5 unit liquid. Dosing without measuring tank (as per request).
Mixing: 30 - 35 seconds (yoghurt consistency). Working Time: At the end of 2 - 2.5 minutes.
Hardening Time: In 15 minutes.
Application: It should be castable consistency. Specified data are in 23°C room temperature and from the beginning of mixing.



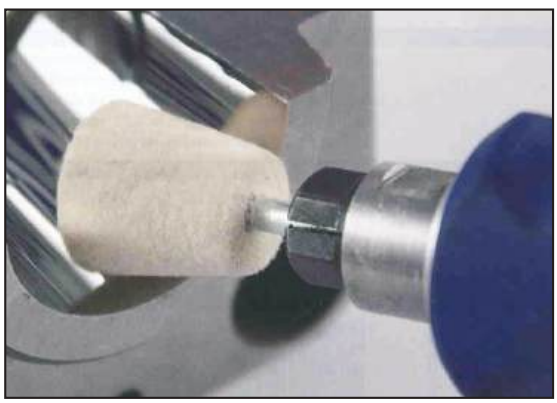
Any oil on the stripper plate should be removed. Use solvent (release agent silicon) to avoid sticking. Place the stripper and the matrix correctly and connect to each other. The correct alignment is important for the operation. Using magnetic 'V' block for this operation guarantees perpendicularity. Or setting shims can be used to ensure the alignment for punch bushing / matrix. Later, the surface finish works are done. The mixture solidifies and spoils if it is kept for too long.

Small model

Order Code: **TKLN.100**
100g. Powder & 50 ml. Liquid

Large model

Order Code: **TKLN.500**
500 g. Powder & 250 ml. Liquid



Mould *Polishing & Finishing*

Rotary Air Grinder Tool

Made In GERMANY

For fine grinding, milling and engraving works.
- Light and practical, like a pen.

Rpm: 85.000
Power: 80 watt
Valve: Rotary Valve
Exhaust Air Direciton: Backwards
Collet / Max. Tool Shank Ø: ZG5 - 3 mm
Hose Unit: Not inclusive **- Weight:** 130 g.

Order Code:
SRD3-85
150 001 060

Rotary Air Grinder & Deburring Tool

Made In GERMANY

For fine grinding, milling and engraving works.
- Light and practical, like a pen.

Rpm: 55.000
Power: 60 watt
Valve: Rotary Valve
Exhaust Air Direciton: Backwards
Collet / Max. Tool Shank Ø: ZG5 - 3 mm
Hose Unit: Inclusive **- Weight:** 95 g.

Order Code:
SRD3-55
150 000 965

Rotary Air Grinder Tool

Made In GERMANY

For fine - rough grinding, milling and engraving works.
- Light and practical.

Rpm: 45.000
Power: 260 watt
Valve: Rotary Valve
Exhaust Air Direciton: Backwards
Collet / Max. Tool Shank Ø: ZG4 - 6 mm
Hose Unit: Not inclusive **- Weight:** 310 g.

Order Code:
SRD6-45
150 010 750

Rotary Angled Air Grinder Tool

Made In GERMANY

These small-powerful angle grinders have a flat head, robust gears and, with their double bearing sets, are superbly suited to transferring high torque.

Rpm: 20.000
Power: 300 watt
Valve: Rotary Valve
Exhaust Air Direciton: Backwards
Collet / Max. Tool Shank Ø: ZG4 - 6 mm
Hose Unit: Not inclusive **- Weight:** 730 g.

Order Code:
SRD6-20
150 123 475

Rotary Air Grinder Tool / Oil-free

Made In GERMANY

Oil-free grinders - for finest deburring operations.
- Light and practical

Rpm: 100.000
Power: 80 watt
Valve: Rotary Valve
Exhaust Air Direciton: Forwards
Collet / Max. Tool Shank Ø: ZG5 - 3 mm
Hose Unit: inclusive **- Weight:** 250 g.

Order Code:
TVD3-100
150 149 906

Rotary Air Grinder Tool / Oil-free

Made In GERMANY

Thanks to the double support, clean surfaces can be achieved quickly and easily.
- Oil-free, stable and silent.

Rpm: 65.000
Power: 80 watt
Valve: Rotary Valve
Exhaust Air Direciton: Backwards
Collet / Max. Tool Shank Ø: ZG5 - 3 mm
Hose Unit: Inclusive **- Weight:** 390 g.

Order Code:
T3-65S
150 149 810

Rotary Air Grinder Tool / Oil-free

Made In GERMANY

Oil-free and silent pneumatic actuator. Developed specifically for use with shaft diameters up to 6 mm.
- Oil-free, versatile and silent.

Rpm: 50.000
Power: 150 watt
Valve: Rotary Valve
Exhaust Air Direciton: Backwards
Collet / Max. Tool Shank Ø: ZG4 - 6 mm
Hose Unit: Inclusive **- Weight:** 400 g.

Order Code:
T6-50S
150 149 820

Rotary Angled Air Grinder Tool

Made In GERMANY

Angle head of this machine is very small. Carrying out good work in very inaccessible places is now much easier.

Rpm: 85.000
Power: 100 watt
Valve: Rotary Valve
Exhaust Air Direciton: Backwards
Collet / Max. Tool Shank Ø: ZG5 - 3 mm
Hose Unit: Inclusive **- Weight:** 260 g.

Order Code:
WRD3-85
150 100 315

Air File Tool / Vibration Damper

Made In GERMANY

Extremely low-vibration machine. Convenient deburring file for small components that have to be held by hand while being deburred.

Stroke Length: 4 mm
Strokes per Minute: 9.000
Power: 80 watt - **Max. Tool Shank Ø:** 3 mm
Exhaust Air Direciton: Backwards
Air Consumption: 80 l/min. - **Weight:** 260 g.

Order Code: **FLV-9** 150 322 785

Air File Tool / Vibration Damper

Made In GERMANY

Designed for fine polishing of moulds. High stroke speed combined with short strokes enable controlled machining of surfaces. The tool is also suitable for the most delicate deburring work.

Stroke Length: 0.8 mm
Strokes per Minute: 17.000
Power: 80 watt - **Max. Tool Shank Ø:** 3 mm
Exhaust Air Direciton: Backwards
Air Consumption: 80 l/min. - **Weight:** 260 g.

Order Code: **FLV1-20** 150 322 780

"RSC" Modular System

For various CNC machining processes.

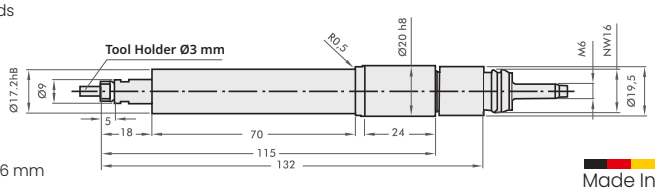
Please ask for information from our company.

High-speed Grinding Spindle

Order Code: **RO-1785** 150 401 202

The high speed and concentricity of this spindle produces a very clean grinding pattern and it is therefore ideally suited for fine grinding, milling and engraving. The paired heavy duty bearings ensure long service life.

Rpm: 85.000 - **Power:** 100 watt
Collet / Max. Tool Shank Ø: ZG5 / 3 mm
Engine Type: Vane
Front Bearing Set: Paired
Exhaust Air Direciton: Backwards
Air Consumption: 180 l/min.
Hose Unit: Inclusive
Hose Connection: M6
Noise Level: 70 db.
Max. Carbide Tool Ø: 4 mm
Max. Profile Grinding Wheel Ø: 6 mm
Weight: 200 g.



Made In GERMANY

"RWA" Pneumatic Spindles

Pneumatically controlled, operation with lubricated compressed air 6 bar.

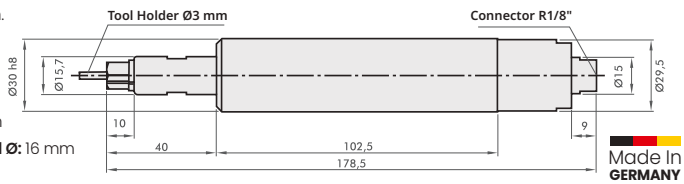
Please ask for information from our company.

Universal Grinding Spindle

Order Code: **R-3030** 150 414 110

This spindle is designed to be very compact, yet it is equipped with a powerful motor for grinding and milling. Also available: Splash guard and spindle with counterclockwise rotation.

Rpm: 30.000 - **Power:** 240 watt
Collet / Max. Tool Shank Ø: ZG7-6 mm / 8 mm
Engine Type: Vane
Front Bearing Set: Paired
Exhaust Air Direciton: Backwards
Air Consumption: 400 l/min.
Hose Unit: Not inclusive
Hose Connection: R 1/8"
Noise Level: 75 db.
Max. Carbide Tool Ø: 10 mm
Max. Profile Grinding Wheel Ø: 16 mm
Weight: 420 g.



Made In GERMANY

"BWS 2-22" Quick change System

This change system enables fast replacement of spindles in robot cells.

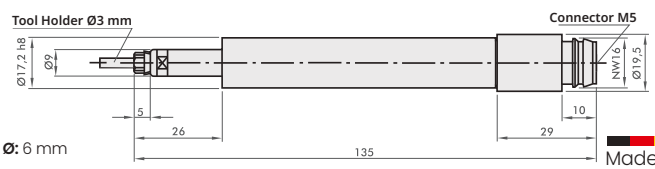
Please ask for information from our company.

High-speed Oil-free Spindle

Order Code: **TR-1785** 150 401 400

The oil-free drive of this grinding spindle based on a vane motor is unique and patented. Its great advantage: It provides the high performance of a vane motor and can still work completely oil-free.

Rpm: 85.000 - **Power:** 100 watt
Collet / Max. Tool Shank Ø: ZG5 / 3 mm
Engine Type: Vane
Front Bearing Set: Paired
Exhaust Air Direciton: Backwards
Air Consumption: 170 l/min.
Hose Unit: Inclusive
Hose Connection: M5
Noise Level: 70 db.
Max. Carbide Tool Ø: 4 mm
Max. Profile Grinding Wheel Ø: 6 mm
Weight: 130 g.



Made In GERMANY

Rotary Air Grinder Tool — Order Code: AG260

(Standard Model)

For applications such as grinding, milling, brushing and polishing with felts.

Rpm: 60.000
Collet Ø: 3.0 mm
Dimensions: Ø 20
Length: 160 mm
Hose Unit: Inclusive
Weight: 140 g.

Rotating Tip

Standard Accessories

During Operation:

Please operate with 2–3 drops of oil per minute.

Please use protective goggles, masks and ear plugs.

Rotary Air Grinder Tool — Order Code: AG360

(Premium Model)

High torque, silent and well balance. Ideal for precision grinding and finishing works. For applications such as grinding, milling, brushing and polishing with felts.

Rpm: 60.000
Collet Ø: 3.0 mm
Dimensions: Ø 17
Length: 159 mm
Hose Unit: Inclusive
Weight: 130 g.

Rotating Tip

Standard Accessories

During Operation:

Please operate with 2–3 drops of oil per minute.

Please use protective goggles, masks and ear plugs.

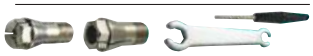
Rotary Air Grinder Tool — Order Code: AG460

High torque, heavy-duty, general purpose applicable on deburring, chamfering, milling, pre-polishing and finishing. Compact design and comfortable usage.

Rpm: 35.000
Collet Ø: 3.0 mm - 6.0 mm
Dimensions: Ø 22
Length: 180 mm
Hose Unit: Inclusive
Weight: 170 g.

Rotating Tip

Standard Accessories



During Operation:

Please operate with 2–3 drops of oil per minute.

Please use protective goggles, masks and ear plugs.

Micro Rotary Air Grinder Tools

Micro Types: Composite coated Air Tools, aluminium body, non-skid coating, strong engine, high-speed and adjustable speed. In mould workshops and general grinding processes.

Order: **ET-1**

Order: **DG..**

Order Code	Technical Information / 6.3 Bar
DG - M5	**Rpm:** 54.000 / **Collet** Ø : 3 mm / **Length:** 134 mm **Air Hose** Ø : 8 mm / **Weight:** 200 g.
DG - M	**Rpm:** 70.000 / **Collet** Ø : 3 mm / **Length:** 134 mm **Air Hose** Ø : 8 mm / **Weight:** 200 g.
DG - M8	**Rpm:** 82.000 / **Collet** Ø : 3 mm / **Length:** 134 mm **Air Hose** Ø : 8 mm / **Weight:** 200 g.
ET - 1	**Rpm:** 3.800 / **Collet** Ø : 6 mm / **Length:** 171 mm **Air Hose** Ø : 8 mm / **Weight:** 200 g.

During Operation:
Please operate with 2–3 drops of oil per minute.

Accessories for Rotary Air Grinder Tool

Ø2.35 Ø3.0 Ø6.0
Spare Collets

Ø30 Wheel — Ø30 Rubber — Ø30 Abrasive

Collet Type	Order Code
Ø2.35	AG 672
Ø3.0	AG 673
Ø6.0	AG 676

Suitable Tools	Spare Part	Order Code
Ø2.35	Ø30 Whell	AGC 01
Ø3.0	Ø30 Rubber	AGS 01
Ø6.0	Ø30 Abrasive	AGP 01

Rotary Air Grinder Tools (for mounted points)

Angled Grinder 90⁰
Order: **NAKA90**
Rotating Tip

Angled Grinder 45⁰
Order: **NAKA45**
Rotating Tip

Rpm: 35.000 / **Collet Ø:** 3.0 mm / **Hose Unit:** Inclusive
Dimensions: (NAK-A90) Ø 19 **x Length:** 158 mm **Weight:** 220 g.
Dimensions: (NAK-A45) Ø 19 **x Length:** 162 mm **Weight:** 250 g.

During Operation:
Please operate with 2–3 drops of oil per minute.

Air File Tool

Order Code: **AR030**

Extra High-speed

Suitable for details / narrow area's and deep grooves polishing. Extra high-speed, adjustable power, low noise & vibration and robust tool life.

Stroke Length: 0.3 mm
Rpm: 40.000
Dimensions: Ø 28
Length: 200 mm
Hose Unit: Inclusive
Weight: 200 g.

Forward and Backward Movement

Standard Accessories

During Operation:

Please operate with 2–3 drops of oil per minute.

Please use protective goggles, masks and ear plugs.

Air File Tool

Order Code: **AR070**

Long Stroke

Suitable for general polishing and finishing.
Long stroke, adjustable power, low noise & vibration and robust tool life.

Stroke Length: 0.7 mm
Rpm: 35.000
Dimensions: Ø 28
Length: 200 mm
Hose Unit: Inclusive
Weight: 200 g.

Forward and Backward Movement

Standard Accessories

During Operation:

Please operate with 2–3 drops of oil per minute.

Please use protective goggles, masks and ear plugs.

Air File Tool

Order Code: **SAR070**

Up & Down Motion

Side to side stroke. Suitable for deburring, chamfering, narrow area's and deep grooves polishing.

Stroke Length: 0.7 mm
Rpm: 15.000
Dimensions: Ø 18
Length: 180 mm
Hose Unit: Inclusive
Weight: 250 g.

Moving Up and Down

Standard Accessories

During Operation:

Please operate with 2–3 drops of oil per minute.

Please use protective goggles, masks and ear plugs.

Air File Tool

Order Code: **AR991**

Heavy Duty

Low speed, high torque and 0.6 mm stroke. It provides high grinding with rigid and stable power. Suitable for details / narrow area's and deep grooves polishing.

Stroke Length: 0.6 mm **/ Hose Unit:** Inclusive
Rpm: 4.500 **/ Weight:** 660 g.
Dimensions: Ø 30 x 140 x 206 mm

Standard Accessories

Forward and Backward Movement

During Operation:

Please operate with 2–3 drops of oil per minute.

Please use protective goggles, masks and ear plugs.

Rotary Air Grinder Tools

Angled Grinder 90⁰

Order: **AG90**

Rotating Tip

Angled Grinder 45⁰

Order: **AG45**

Rotating Tip

Rpm: 23.500 **/ Hose Unit:** Inclusive **/ Grinding / Abrasive Dics Ø:** 30 mm
Dimensions: (AG-90) Ø 17 **x Length:** 140 mm **/ Weight:** 170 g.
Dimensions: (AG-45) Ø 17 **x Length:** 153 mm **/ Weight:** 180 g.

During Operation:
Please operate with 2–3 drops of oil per minute.

Accessories for Air File Tool

	3 mm 1 mm Split	Flat 1 mm Split	Flat 3.2 x 13	Flat 3.2 mm Split	Flat 6.3 x 13	Adjustable Holder (wide)
Order Code	**AR - 664**	**AR - 665**	**AR - 661**	**AR - 662**	**AR - 667**	**AR - 666**
AR - 030	●	●	○	●	○	●
AR - 070	●	●	○	●	○	●
SAR - 070	●	◐	●	◐	○	●
AR - 991	●	●	◐	◐	◐	●

● **Standard Holder** (available in box) ◐ **Optional Holder** ○ **Incompatible**

Ultrasonic Polishing Machine

Order Code: AR108

"AR108" can assist in reducing finishing time by up to 50% on hardened tools steel working on very small mould cavity & core details, extrusion dies and more. It is an advanced technological product realizing all diffucult works.

Main Supply: AC 90V - 250V

Ultrasonic Oupput: 40 watss

Vibration Frequency: 18 - 25 kHz

Stroke Amplitude: 10 - 35 µm

Power Consumption: 46 watts

Dimensions: 192 x 156 x 96 mm

Weight: 0.7 kg

HANDPIECE

Dimensions: 30 x 130 mm

Weight: 175 gr.

SET CONTENT:

* Ultrasonic Handpiece
* Power Cord
* Handpiece Cord
* Wrench (HEX)
* Handpiece Rest
* Tool Changing Rack
* Wrench
* 2x Holder (Ø3 & 1 mm)
* Foot Switch

Video

Electrical Spiral Motor

Code: BM...A

Economical and modular for levelling and polishing. Powerful motors provide facilities for users in levelling and polishing processes. Rotary spiral spring in Spiral Rod is only for tool to be used with 2.35 - 3 & 4 mm collets. However, in some cases, 6 mm collet also can be used softly / without pressing. To avoid rising heat at long uses, waiting at short intervals can be required. To provide continuance of work in uses a spare Spiral Rod can be kept.

Note: Spiral Rod should be ordered separately.

Order Code	Specifications
BM21A	**Rpm:** 15.000 **/ Power:** 125 Watt
BM23A	**Rpm:** 25.000 **/ Power:** 200 Watt
BM26A	**Rpm:** 25.000 **/ Power:** 300 Watt
BM24A	**Rpm:** 22.500 **/ Power:** 500 Watt

Motor Accessories

Order Code	Specifications
M19KK	Spiral Rod / 1040 mm
M19FTK	Spiral Rod with Latch / 1000 mm
YP..Ø	Spare Collets / 2.35 - 3 - 4 - 6 mm
BM..W	Foot Switch for Spiral Motor when ordering: specify current motor watt

Motor Hanger

Order Code: M18A

Foot Switch and cable connections of Electrical Spiral Motors are presented in packing. To use motor stably, we recommended you to use Hanger. With the help of the hanger spring, it absorbs the vibrations caused by the motor and prevents the vibrations from passing to the workbench.

Corded Rotary Tool

Order Code: STRONG

+ Compact Design

+ Ergonomic Design

+ Non Stage Speed System

+ High Torque

With electronic cycle adjusted control unit, it starts with micro motor rotary tool at desired speed. It can work faster and serially with foot switch, desktop precision operations can be done with practical and powerful electronic machine. It is economical.

Technical Details

Rpm: 35.000

Torque: 280 gf.cm

Collet: Ø 3mm

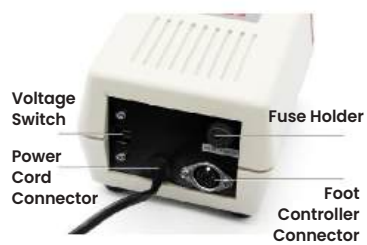
Input: 100 V / 230 V (50/60Hz)

Output: DC 0-32V

Weiht: Control Box 1.7 kg.

* Hand / Foot speed control system
* Foot Speed Pedal or Foot
  ON - OFF Pedal - Option

Buttons Function



NEW

PERFECT Price Performance

☑ Fast ☑ Compact ☑ Universal

Polishing Kit - Multiple / **190 pcs**

Order Code: **6218001001**

Kit Contents - 190 pcs:

- **1x** Electrical Rotary Tool
- **1x** Flexible Driver
- **1x** Mini Plastic Drawer
- **4x** Collets
- **16x** Abrasive Rolls
- **10x** Mounted Points
- **2x** Mandrel for Cutting Discs
- **1x** Mandrel for Felt Discs
- **2x** Mandrel for Abrasive Rolls
- **10x** Grinder Discs
- **1x** Polishing Stone
- **5x** Fiberglass Cutting Discs
- **1x** Polishing Rubber
- **1x** Wrench
- **1x** Diamond Compound
- **30x** Cutting Discs Heavy-duty
- **36x** Cutting Discs Regular
- 40x Abrasive Papers
- **7x** Felt Discs
- **1x** Tapered Pointed Felt
- **1x** Abrasive Mop Wheel
- **2x** HSS End-mills
- **6x** CBN Grinding Points
- **6x** HSS Drills
- **3x** Mounted Hair Brushes
- **3x** Mounted Wire Brushes
- **1x** Pointed Felt

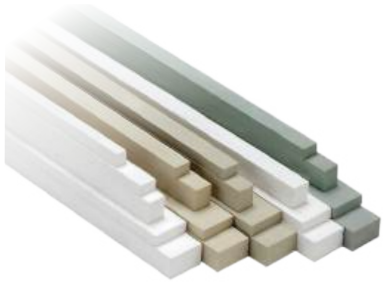
W 135 W | 10.000 32.000 | 230 V 50 Hz | CE

Polishing Kit - Mini / **145 pcs**

Order Code: **6218002001**

Kit Contents - 145 pcs:

- **3x** Collets
- **16x** Abrasive Rolls
- **1x** Tapered Pointed Felt
- **1x** Felt Disc
- **4x** Felt Discs
- **1x** Wrench
- **40x** Abrasive Papers
- **5x** Fiberglass Cutting Discs
- **12x** Grinder Discs
- **1x** Polishing Stone
- **2x** Mandrel for Abrasive Rolls
- **1x** Mounted Hair Brush
- **6x** Mounted Points
- **2x** Mandrel for Cutting Discs
- **1x** Mandrel for Felt Discs
- **1x** HSS End-mill
- **5x** CBN Grinding Points
- **4x** HSS Drills
- **36x** Cutting Discs / Regular
- **1x** Mounted Wire Brush
- **1x** Polishing Rubber
- **1x** Cloth Felt



Grit	Operation
#120	Levelling
#150	
#180	
#220	Pre Polishing
#280	
#320	
#400	
#600	Finishing
#800	
#1000	

Code: **EG..**

EDM Polishing Stones

Type: **EGK**	Type: **EGD**	Type: **EGY**	Type: **EGU**
width x length	width x length	diameter x length	width x length
4 x 4 x 100	6 x 3 x 150	6 x 150	8 x 8 x 150
6 x 6 x 150	13 x 3 x 150	8 x 150	10 x 10 x 150
8 x 8 x 150	13 x 6 x 150	10 x 150	-
10 x 10 x 150	-	12 x 150	-

EDM Polishing Stones are produced to make excellent levelling / polishing on rough surfaces. It takes the shape of the surface it works with by making fast cutting. It works precisely on figured surfaces. EDM Polishing Stones are suitable for manual and Air File Tool use. Hard and complex, especially in deep areas, long polishing stones can be selected. At flat and wide areas, short polishing stones can be less fragile by avoiding skidding.

When using by hand, use a holder. Different type holders at our Air File Tools present extensive usage opportunity. For softer and clean polishing stone usage, you can use your polishing stone by steeping in low oil liquid etc. To use right graduation from coarse polishing stone to fine one on surface is important. Cleaning of operation area is also important.

Order: **Type. Dimension. Grit**

EDM Polishing Stone Holders

Manually Operated

Capacity: 6 x 3 / 13 x 3
Order Code: GT - 613

Capacity: Ø4 - 6 / Ø8 - 10
Order Code: GT - 468

Air File Tool Operated

Capacity: 13 x 3 / 13 x 6
Order Code: GT - 133

Order Code: AR 661

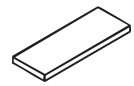
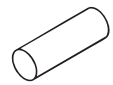
Order Code: AR 662

Order Code: AR 666

Order Code: AR 667

Code: **CS...**

Fiber Ceramic Polishing Stones Types

Grit Code			
CSC	#180		
CSO	#250		
CSD	#280	Thickness: 1 mm	Diameter: 3 mm
CSN	#360	Width x Length	Diameter
CSB	#400	1 x 4 x 100	Ø3 x 100
CSY	#700	1 x 6 x 100	
CSR	#1200	1 x 10 x 100	

"CS" Fiber Ceramic Polishing Stones are the excellent stones for detail polishing. They preparead by pressing with resin binder spraying screened, gauged micron diamond particles on powerful fiber textured ceramic, "CS" Ceramic Stones have the feature of resistance with flexible structure againts breakage.

Optimal for premium polishing of flat surfaces, hard to reach slots, ribs and corners. High polishing productivity can be obtain without clogging. "CS" Ceramic Stones can be used in our Air File Tools or by hand (please see below for manual holders).

Order: **Grit Code. Dimension**

Fiber Ceramic Polishing Stone, Manual Holders

Order Code: WH041
1 x 4 x 100

Order Code: WH061
1 x 6 x 100

Order Code: WH101
1 x 10 x 100

Order Code: WH22K
Ø 3 x 100

SCG: Hard Steel

EKR: General Steel

Polishing Block Stone

For wide surface levelling and chamfering / deburring.

Order Code	A	H	L
BG100 x EKR or SCG	16	25	100
BG125 x EKR or SCG	20	40	125
BG150 x EKR or SCG	25	50	150
BG200 x EKR or SCG	25	50	200

Pink Mounted Points Code: SPT

Mounted Points - **Shank Diameter: 3 mm**

Form - A - R	D L							
Type:	256 A	308 A	410 A	510 A	612 A	816 A	1016 A	813 R
D x L	2.5 x 6	3 x 8	4 x 10	5 x 10	6 x 12	8 x 16	10 x 16	8 x 13

Form - B - R								
Type:	30 B	40 B	50 B	60 B	80 B	100 B	120 B	1224 R
D x L	Ø 3	Ø 4	Ø 5	Ø 6	Ø 8	Ø 10	Ø 12	12 x 24

308 T	310 T	412 T	710 T	412 J	616 J	816 J	1016 J	609 S
3 x 8	3 x 10	4 x 12	7 x 10	4 x 12	6 x 16	8 x 16	10 x 16	6 x 9

612 P	815 P	1018 P	412 K	515 K	816 K	132 E	133 E	162 E
6 x 12	8 x 15	10 x 18	4 x 12	5 x 15	8 x 16	13 x 2	13 x 3	16 x 2

Shank 3 mm

Order: **SPT.** Type

Pink Mounted Points Code: SPT

Mounted Points - **Shank Diameter: 6 mm**

Form A	D L							
Type:	1608 A	2008 A	2016 A	2510 A	2520 A	3220 A	4025 A	5030 A
D x L	16 x 8	20 x 8	20 x 16	25 x 10	25 x 20	32 x 20	40 x 25	50 x 30

Form B								
Type:	1015 B	1620 B	2020 B	2030 B	2040 B	2525 B	2532 B	3040 B
D x L	10 x 15	16 x 20	20 x 20	20 x 30	20 x 40	25 x 25	25 x 32	30 x 40

Form - C - D - F								
Type:	2508 C	3208 C	4010 C	1220 D	2035 D	0816 F	1320 F	2032 F
D x L	25 x 8	32 x 8	40 x 10	12 x 20	20 x 35	8 x 16	13 x 20	20 x 32

Form E								
Type:	0816 E	1230 E	1640 E	2030 E	2040 E	2525 E	2540 E	3240 E
D x L	8 x 16	12 x 30	16 x 40	20 x 30	20 x 40	25 x 25	25 x 40	32 x 40

Form - G - H - J								
Type:	2016 G	2520 G	10 H	15 H	20 H	1225 J	1632 J	2040 J
D x L	20 x 16	25 x 20	Ø 10	Ø 15	Ø 20	12 x 25	16 x 32	20 x 40

Shank 6 mm

Order: **SPT.** Type

"SPT" Mounted Points are suitable to soft and hard surfaces. With formation of aluminium oxide & ceramic grain textured in fast material removal feature, the mounted points provide the desired performance on all kinds of surfaces. After process, it can be ready for polishing by cleaning off point traces on surface with Rubber Mounted Polishing Points. There should be at least 10 mm fastening length at collet. Operation should be soft without pressing.

Cutting speed max.: 25 m / s. Calculation: $\frac{n = V\ (m/s) \times 60.000}{D = (mm) \times 3.14}$

Shank: 3 mm

Mounted Wire Brushes

These brushes are very successful in cleaning EDM and deep burrs traces (especially with "Diamond Compound 14/7" Order Code: SDP14).

Conical & Brass Wired
Ø 15 x 10 mm
Order Code: **STF158**

Conical & Inox Wired
Ø 15 x 10 mm
Order Code: **SMF158**

Disc & Brass Wired
Ø 22 x 2 mm
Order Code: **STF222**

Disc & Inox Wired
Ø 22 x 2 mm
Order Code: **SMF222**

Flat & Brass Wired
Ø 8 x 14 mm
Order Code: **STF148**

Flat & Inox Wired
Ø 8 x 14 mm
Order Code: **SMF148**

Shank: 3 mm

Mounted Hair Brushes

Mounted Hair Brushes facilitating polishing process and not requiring extra tool. These brushes form the perfect surface with fine micron Diamond Compounds at final polishing. *The black brush is made of nylon and is classified as medium-hard, while the white brushes are made of goat hair and fall into the softer category.*

Conical Brush
Ø 16 x 8 mm
Order Code: **SKFS 16**

Conical Brush
Ø 16 x 8 mm
Order Code: **SKF 16**

Disc Brush
Ø 22 x 2 mm
Order Code: **SKFS 25**

Disc Brush
Ø 22 x 2 mm
Order Code: **SKF 25**

Conical Brush
Ø 8 x 14 mm
Order Code: **SKF 168**

Upon request:
Shank 2.35 mm is available.

Code: **ML..**

Shank: 3 mm

Mini Abrasive Roll Set

Mini Abrasive Rolls & Holder Set.
It is sold in package: 5 + 5 coarse - fine grit and holder (10 pcs abrasive + 1 pcs holder).

Order Code	Abrasive	Grit
ML04	Ø 4 x 15 mm	# 120 5pcs.
ML05	Ø 5 x 15 mm	
ML06	Ø 6 x 15 mm	
ML08	Ø 8 x 20 mm	# 320 5pcs.
ML10	Ø 10 x 20 mm	

Mini Abrasive Rolls

Code	Abrasive	Grit
SPZ12	Ø 12 x 30 mm	
SPZ15	Ø 15 x 30 mm	
SPZ20	Ø 20 x 30 mm	# 80
SPZ25	Ø 25 x 30 mm	# 100
SPZ30	Ø 30 x 30 mm	# 120
SPZ40	Ø 40 x 30 mm	# 220
SPZ50	Ø 50 x 50 mm	
SPZ60	Ø 60 x 35 mm	

Order:
Code x Grit

Holder for Abrasive Rolls

Order Code	Abrasive	Shank - Length
SPL12	Ø 12	Ø 6 - 60
SPL15	Ø 15	Ø 6 - 60
SPL20	Ø 20	Ø 6 - 60
SPL25	Ø 25	Ø 6 - 60
SPL30	Ø 30	Ø 6 - 60
SPL40	Ø 40	Ø 6 - 65
SPL50	Ø 50	Ø 6 - 65
SPL60	Ø 60	Ø 6 - 65

Shank: 3 mm

Rubber Mounted Polishing Point

Ceramic, Hard Type & Pre-polishing

Form CK							
Order:	CK 03	CK 04	CK 05	CK 06	CK 08	CK 10	CK 12
D x L	3 x 13	4 x 13	5 x 15	6 x 17	8 x 20	10 x 20	12 x 20

Form FK							
Order:	FK 03	FK 04	FK 05	FK 06	FK 08	FK 10	FK 12
D x L	3 x 13	4 x 13	5 x 15	6 x 17	8 x 20	10 x 20	12 x 20

Rubber Mounted Polishing Point

Rubber, Soft Type & Finishing

Form RK Shank 3 mm					
Order:	RK 04	RK 06	RK 08	RK 10	RK 12
D x L	4 x 13	6 x 17	8 x 20	10 x 20	12 x 20

Form RKK Shank 6 mm					
Order:	RKK 10	RKK 12	RKK 16	RKK 20	RKK 25
D x L	10 x 20	12 x 20	16 x 25	20 x 25	25 x 25

Mounted Polishing Felts

Code: SPK

Mounted Felts - **Shank Diameter: 3 mm**

Form A	D L							
Type:	0410 A	0509 A	0610 A	0810 A	1014 A	1220 A	1520 A	2020 A
D x L	4 x 10	5 x 9	6 x 10	8 x 10	10 x 14	12 x 20	15 x 20	20 x 20

Form - C - H								
Type:	0408 C	0509 C	0610 C	0810 C	1013 C	1214 C	1520 C	1218 H
D x L	4 x 8	5 x 9	6 x 10	8 x 10	10 x 14	12 x 14	15 x 20	20 x 20

0410 J	0512 J	0616 J	0817 J	1014 J	1020 J	1220 J	1225 J	1218 T
4 x 10	5 x 12	6 x 16	8 x 17	10 x 14	10 x 20	12 x 20	12 x 25	12 x 18

08 B	10 B	12 B	18 B	1014 R	1225 R	2505 L	2207 L	2210 L
Ø 8	Ø 10	Ø 12	Ø 18	10 x 14	12 x 25	25 x 5	22 x 7	22 x 10

Shank 3 mm

Order: **SPK.** Type

Mounted Polishing Felts

Code: SPK

Mounted Felts - **Shank Diameter: 6 mm**

Form - A - B	D L						
Type:	1520 A	2020 A	2025 A	2530 A	3040 A	14 B	20 B
D x L	15 x 20	20 x 20	20 x 25	25 x 30	30 x 40	Ø 14	Ø 20

Form - E - C							
Type:	2110 E	3015 E	4020 E	5030 E	1520 C	2025 C	2530 C
D x L	25 x 10	30 x 15	40 x 20	50 x 30	15 x 20	20 x 25	25 x 30

Form - K - H - G							
Type:	1018 K	1220 K	1525 K	2025 K	2530 K	1530 H	1030 G
D x L	10 x 18	12 x 20	15 x 25	20 x 25	25 x 30	15 x 30	10 x 30

It is used at finishing with Diamond Compounds. Also, it can be applied with other polishers. Even it is used at very high cycles, it does not burn. Our felts are produced as double layer fired. In operation, avoid extreme high pressing.

Shank 6 mm

Order: **SPK.** Type

Adhesive Felt Discs

Order: Y18D - Ø 18 x 4 mm
Order: Y30D - Ø 30 x 4 mm
Order: Y45D - Ø 45 x 4 mm

Mounted Felt Sticks

Usage with Electrical or Air Tools.

Order: S06D - 6 x 6 x 25 mm
Order: S10D - 10 x 10 x 35 mm
Order: S12D - 12 x 12 x 45 mm

Polishing Felt Sheets

It can be adhered to your tool by cutting.

Order: P325 - 6 x 250 x 250 mm
Order: P625 - 10 x 250 x 250 mm
Order: P1025 - 12 x 250 x 250 mm

Felt Polishing Sticks

Suitable for manual usage.

Order: E06K - 6 x 6 x 150 mm
Order: E10K - 10 x 10 x 150 mm
Order: E12K - 12 x 12 x 150 mm

Wooden Tools

Code: **AC ..** Code: **ASK ..**

It is suitable to polish with Wooden Felts at narrow and radius areas of moulds, areas unsuitable to use polishing stones.

Order Code	Dimension
ASK 06	Ø 6 x 15
ASK 10	Ø 10 x 20
ASK 15	Ø 15 x 25
ASK 20	Ø 20 x 30
ASK 010S	Ø 10

Order Code	Dimension	Type
AC 06	6 x 6 x 150	Square
AC 10	10 x 10 x 150	Square
AC 12	12 x 12 x 150	Square
AC 03	6 x 3 x 150	Rectangular
AC 13	13 x 6 x 150	Rectangular
AC 20	20 x 8 x 150	Rectangular
ACS 6	Ø 6 x 150	Round
ACS 8	Ø 8 x 150	Round

GT-133

Plexiglass Polishing Sticks

It becomes a precision Diamond File when used with Diamond Compounds. GT-133 is a suitable holder for tool usage.

Order Code
PC 08 - 8 x 8 x 150 / Square
PC 10 - 10 x 6 x 150 / Rectangular
PC 13 - 13 x 6 x 150 / Rectangular

Order Code
PC 06 - 6 x 150 / Round
GT 133 - Holder (suitable for tool usage)

Mini Cutting Disc

It is used in cutting operation of all metals including hard steels at Rotary Tools.

Order	Dia.	Length	Mandrel
KS 25	25	0.65	Ø 2.35
KS 40	40	1.0	Ø 3
KS 60	60	1.5	

Ø 25 x 3.2
80 Grit

Grinder Disc

Because it is circular, it is mostly used at thread ranges, cutting tool edges and mould machine production.

Order	Specification
DP 25	Disc
VM 03	Mandrel

Polishing Rubbers

Cylinder (Ø6 x 22)	Order Code:
Red (medium)	KK 06
Black (hard)	KS 06
Mandrel	DM 03

Disc (Ø20 x 3)	Order Code:
Red (medium)	DK 06
Black (hard)	DS 06
Mandrel	VM 03

Diamond Compounds

Code: **SDP**

Our Diamond Compounds have been formulated using a blend of high quality diamond grit, polisher chemical mixture and herbal oil. It is highly concentrated. Reasonable price and in box packaged as 20 g. syringe. From rapid stock removal process to final polishing process, it cleans EDM traces in hard areas by removing burrs (stock removal). Our Diamond Compounds are soluble in both oil and water. During operation, the compound may get lumpy / dry, in this case, it can be moisturised with 1-2 drops of Diamond Compound Moisturiser **(order code: SDS200). Package 20 gr.**

Order Code	Micron (µm)	Approx. Mesh	Application
SDP 01	0 / 1	#60.000	Final Polishing
SDP 02	2 / 1	#14.000	
SDP 03	3 / 2	#8.000	
SDP 05	5 / 3	#4.000	
SDP 07	7 / 5	#3.000	Pre Polishing
SDP 10	10 / 7	#1.700	
SDP 14	14 / 17	#1.500	
SDP 20	20 / 14	#1.100	
SDP 28	28 / 20	#800	Rapid Stock Removal
SDP 40	40 / 28	#550	
SDP 60	60 / 40	#500	

Application: Application is usually done with circular movements. During operation, cleaning is very important and it absolutely should be done at every stage. The sequence should be followed from coarse to fine micron. Polishing tools for each micron compound should be specified and should be used only at that micron, absolutely don't mix with other micron compounds. For cleaning of mould surface, our "Cleaning Spray" (order code: GTH1010) is an effective, economic and provide easiness. As a surface protector, you can choose our "Protective Wax Spray" (order code: W160106).

Diamond Compound Moisturiser

Order Code: **SDS200**

During operation, the compound may get lumpy / dry, in this case, it can be moisturised with 1-2 drops of Diamond Compound Moisturiser.
Package: 200 g.

Metal Polisher Paste

Order Code: **MARPOL**

Metal work pieces lose their gloss in time and can be oxidized. In this case, Metal Polisher Paste cleans surfaces and purifies from rust and dirt's. It is a very good dirt remover, it does not remove burrs and only cleans and polishes. **Package: 200 g.**

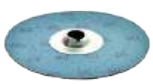
Code: **DZ**

Code: **DZL**

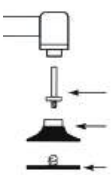
Self-adhesive Abrasive Disc

Order	Abrasive	Grit	Holder	Shank
DZ12 or DZL12	Ø 12	# 60 # 80 # 100 # 120 # 180 # 220 # 320 # 400 # 500 # 600	Ø 12	**3 mm** **6 mm**
DZ20 or DZL20	Ø 20		Ø 20	
DZ30 or DZL30	Ø 30		Ø 30	
DZ40 or DZL40	Ø 40		Ø 40	
DZ50 or DZL50	Ø 50		Ø 50	

Order: **DZ..** x Grit | Order: **DZL..** x Shank



Clip-on Abrasive Disc



Abrasive Disc

Code: **KZD**

Order	Disc	Grit
KZD 38	Ø 38	# 36
KZD 51	Ø 51	# 80
KZD 76	Ø 76	# 120

Mandrel

Code: **KLT**

Order	Shank	Rubber
KLT 63	6 mm	38 mm
KLT 65	6 mm	51 mm
KLT 67	6 mm	76 mm

Tapered Abrasive Cartridge Rolls

Code: **RZ..**

It is ideal for grinding in limited and narrow areas. When the outermost abrasive is worn down, non-worn abrasive found is lower layers appears.

Application: Please always grind by using tip instead of surface. During operation, wear protective goggles. Cutting speed: 11 m / s max.

Code	Abrasive	Grit
RZ 06	6 x 38	# 80 # 120 # 220
RZ 10	10 x 38	
RZ 13	13 x 38	
RZ 16	16 x 38	
RZ 20	20 x 38	
TM 03	3 x 30	Mandrel
TM 06	6 x 60	Mandrel

Order: **Code** x Grit

Order Example: RZ16 x 220

Abrasive Mop Wheels

Code: **MZ**

During operation, wear protective goggles. **Cutting speed:** 15 - 20 m / s max.

Code	D	L	d	L1	Grit
MZ3 1515	15	15	3	40	# 40
MZ3 2020	20	20			
MZ6 2015	20	15	6	40	# 60
MZ6 2020		20			
MZ6 2515	25	15	6	40	# 80
MZ6 2525		25			# 100
MZ6 3015	30	15	6	40	
MZ6 3025		25			# 120
MZ6 4020	40	20	6	40	# 180
MZ6 4030		30			
MZ6 5020	50	20	6	40	# 220
MZ6 5030		30			
MZ6 6020	60	20	6	40	# 320
MZ6 6040		40			# 400
MZ6 8040	80	40	6	40	

Order: **Code** x Grit

Order Example: MZ6 2515 x 80

Abrasive Cloth Rolls

Code: **BZ**

Order Code	Grit	Operation	Width	Package
BZ 40	# 40	Coarse	150 mm	1 Metre
BZ 60	# 60			
BZ 80	# 80			
BZ 100	# 100			
BZ 120	# 120			
BZ 150	# 150	Medium		
BZ 180	# 180			
BZ 220	# 220			
BZ 280	# 280			
BZ 320	# 320			
BZ 400	# 400	Fine		
BZ 600	# 600			
BZ 800	# 800			

Waterproof Abrasive Paper

Code: **SZ**

Order Code	Grit	Operation	Dimension	Package
SZ 40	# 40	Coarse	230 x 280 mm	1 Pcs.
SZ 60	# 60			
SZ 80	# 80			
SZ 100	# 100			
SZ 120	# 120			
SZ 150	# 150	Medium		
SZ 180	# 180			
SZ 220	# 220			
SZ 280	# 280			
SZ 320	# 320			
SZ 400	# 400	Fine		
SZ 600	# 600			
SZ 800	# 800			
SZ 1000	# 1000			
SZ 1200	# 1200			

Polishing & Cleaner Block

Code: **KS..**

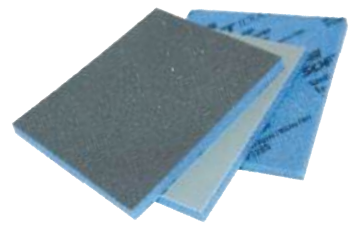
It is for lapping, polishing and cleaning. Polishing & Cleaner Block is a multi-purpose abrasive cleaner, impregnated throughout with sharp abrasive grit. Removes light rust or tarnish restoring a bright metal finish. Suitable for dry or wet use. **Block Dimension:** 80 x 50 x 20 mm.

Order Code: HRD - KST36
Extra Coarse - 36 grit (burgundy)

Order Code: HRD - KST60
Coarse - 60 grit (blue)

Order Code: HRD - KST120
Medium - 120 grit (grey)

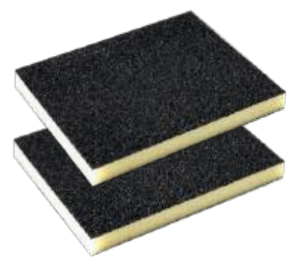
Order Code: HRD - KST240
Fine - 240 grit (brown)



Code: **SM..**

Waterproof Abrasive Paper with Sponge

Order Code	Grit	Width	Package
SM 150	# 150	115 mm	1 Metre
SM 220	# 220		
SM 280	# 280		
SM 320	# 320		
SM 400	# 400		

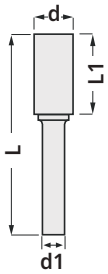


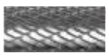
Code: **EZ..**

Foam Abrasive Pads

All sides of the pad can be used.
Easy to clean and you can use repeatedly.

Order Code	Grit	Dimension	Package
EZ 60	# 60	100 x 68 x 27 mm	1 Pcs.
EZ 100	# 100		
EZ 150	# 150		
EZ 220	# 220		
EZ 320	# 320		



A B  C D

Shape A: Standard cut for general operations.
Shape B: Double cut for general purpose use. Improves control and reduces chips.
The cross toothing provides a higher cutting capacity compared with the simple toothing.
Shape C: Diamond cut for hardest materials and finest finishes.
Shape D: Aluminium toothing.
Usage area; non-ferrous metals, aluminium, brass, copper, diecasts, zinc and plastics.
To debur, break edges, trim and surface machining.

During Operation: Please use protective goggles, masks and ear plugs.

Order: **Code.** Shape | Order Example: **SA14. B**

Carbide Rotary Burrs

Cylinder Type - DIN 8033

Code	d	d1	L	L1	Shape
SA 42	2.5	3	38	11	B
SA 43	3		38	14	
SA 14	5	6	50	16	A
SA 01	6		50	16	C
SA 03	9.5		63	19	D
SA 05	12.7		69	25	

Cylinder Type with Endcut

Code	d	d1	L	L1	Shape
SB 42	2.5	3	38	11	B
SB 43	3		38	14	
SB 14	5	6	50	16	A
SB 01	6		50	16	C
SB 03	9.5		63	19	D
SB 05	12.7		69	25	

Radius Cylindrical Type

Code	d	d1	L	L1	Shape
SC 42	3	3	38	14	B
SC 422	3		50	14	
SC 14	5	6	50	16	A
SC 01	6		50	16	C
SC 03	9.5		63	19	D
SC 05	12.7		69	25	

Ball Type

Code	d	d1	L	L1	Shape
SD 41	2.5	3	38	2.3	B
SD 42	3		38	2.5	
SD 14	5	6	50	4.0	A
SD 01	6		50	5.0	C
SD 02	8		50	6.4	D
SD 03	9.5		52	8.0	

Pointed Tree Type

Code	d	d1	L	L1	Shape
SG 41	3	3	38	6.0	B
SG 43	3		38	9.5	
SG 01	6	6	50	16	A
SG 02	8		63	19	C
SG 05	12.7		69	25	D
SG 06	16		69	25	

Flame Type

Code	d	d1	L	L1	Shape
SH 41	3	3	38	6.3	B
SH 411	3		50	6.3	
SH 01	6	6	50	9.5	A
SH 02	8		63	19	C
SH 05	12.7		76	32	D
SH 06	16		80	36	

Radius Cone Type

Code	d	d1	L	L1	Shape
SL 41	3	3	38	9.5	B
SL 42	3		38	12.7	
SL 01	6	6	50	16	A
SL 02	8		69	22	C
SL 04	12.7		76	28	D
SL 06	16		80	33	

90⁰ Cone Type

Code	d	d1	L	L1	Shape
SK 42	3	3	38	1.5	B
SK 01	6	6	50	3.0	A
SK 03	9.5		52	4.7	C
SK 06	16		57	8	D

Economic Series

Diamond File Set - 10 pcs.

Order Code: **TPF10E**

Grit:
150
200
400

Contains one file each of:
Hand, flat, triangular, square, half round crossing, round, knife, barrette and slitting.
Cross Section: 3 x 140 mm

Diamond File Set - 10 pcs.

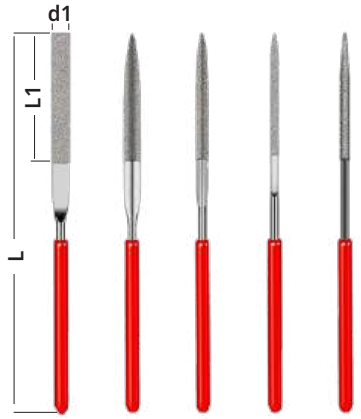
Order Code: **13710** **4 x 160 mm**

Diamond File Set - 5 pcs.

Order Code: **13711** **4 x 160 mm**

Die Sinkers Diamond Riffler File Set - 5 pcs.

Order Code: **13726** **3 x 140 mm**



Diamond Files

Diamond File - Hand

Order Code	Shank	d1 x L1 x L
ELE 140	Ø 4	5 x 70 x 140
ELE 160	Ø 5	8 x 50 x 160
ELE 200	Ø 5.5	8 x 70 x 200

Diamond File - Half Round

Order Code	Shank	d1 x L1 x L
EYY 140	Ø 4	5 x 70 x 140
EYY 160	Ø 5	8 x 50 x 160
EYY 200	Ø 5.5	8 x 70 x 200

Diamond File - Round

Order Code	Shank	d1 x L1 x L
EYE 140	Ø 4	Ø 3 x 70 x 140
EYE 160	Ø 5	Ø 4 x 50 x 160
EYE 200	Ø 5.5	Ø 4 x 70 x 200

Diamond File - Square

Order Code	Shank	d1 x L1 x L
DEE 140	Ø 4	3 x 70 x 140
DEE 160	Ø 5	3.6 x 50 x 160
DEE 200	Ø 5.5	3.6 x 70 x 200

Diamond File - Triangular

Order Code	Shank	d1 x L1 x L
UEE 140	Ø 4	3.7 x 70 x 140
UEE 160	Ø 5	5 x 50 x 160
UEE 200	Ø 5.5	5 x 70 x 200

Premium Series

Diamond Tapered Files - Hand

Order Code	Cross Section	Diamond Length	Total Length
CF 503	6.1 / 2.4 / 0.6	60	180 mm
CF 502	8.2 / 2.4 / 0.6	60	
CF 501	10.2 / 2.6 / 0.7	70	

Diamond File - Round

Order Code: **IF503**

Shank: 5 x 5
Diamond: 80 mm / **Total:** 215 mm

Diamond File - Half Round

Order Code: **IF502**

Shank: 11 x 4
Diamond: 80 mm / **Total:** 215 mm

Diamond File - Flat

Order Code: **IF501**

Shank: 11 x 4
Diamond: 80 mm / **Total:** 215 mm

Diamond File - Triangular

Order Code: **IF505**

Shank: 11 x 4
Diamond: 80 mm / **Total:** 215 mm

Diamond File - Square

Order Code: **IF504**

Shank: 6 x 6
Diamond: 80 mm / **Total:** 215 mm

Diamond File with Handle - Flat

Order Code: **HX4**

Cross Section: 12.2 x 3.5 mm / **Total:** 100 mm

Diamond File with Handle - Flat

Order Code: **HX10**

Cross Section: 18.5 x 4.5 mm / **Total:** 250 mm

Diamond Tapered File Set - 5 pcs.

Order Code: **CF 500** **Length: 180 mm**

Grit: #150 #200

Set Content:

Width: 2.8 / **Diamond Length:** 70

Width: 2.5 / **Diamond Length:** 60

Width: 2.5 / **Diamond Length:** 60

Width: 2.0 / **Diamond Length:** 50

Width: 2.2 / **Diamond Length:** 50

Diamond Tapered File Set - 12 pcs.

Order Code: **CF 400**

4 different model

4 different model & 12 pcs.

2 — 2.0 / 0.3
Hand: #150 #200 #400 Grit **Length:** 180 mm

4 — 2.0 / 0.3
Hand: #150 #200 #400 Grit **Length:** 180 mm

6 — 2.0 / 0.3
Hand: #150 #200 #400 Grit **Length:** 180 mm

8 — 2.0 / 0.3
Hand: #150 #200 #400 Grit **Length:** 180 mm

Diamond Tapered File Set - 10 pcs.

(with extension bar)

Order Code: **PTF 10T**

4 different model

4 different model, 10 pcs. & with extension bar.

2 — 1.4 / 0.3
Hand: #200 #400 #600 Grit **Length:** 130 mm

4 — 1.4 / 0.3
Hand: #200 #400 #600 Grit **Length:** 130 mm

6 — 1.1 / 0.3
Hand: #200 #400 #600 Grit **Length:** 130 mm

Round: #600 Grit **Length:** 140 mm Ø 3.0 mm

Diamond Needle File Set - 10 pcs.

Order Code: **PFL 100** **Shank: Ø3 / Length: 180 mm**

Set Content:

Flat: #200 Grit 5.5 x 1.5 mm

Half Round: #200 Grit 5.5 x 2.0 mm

Round: #200 Grit Ø3.0 mm

Square: #200 Grit 2.5 mm

Triangular: #200 Grit 3.5 mm

Crossing: #200 Grit 5.5 x 1.0 mm

Flat: #400 Grit 5.5 x 0.5 mm

Flat: #600 Grit 5.5 x 0.8 mm

Round: #400 Grit Ø2.0 mm

Riffler: #200 Grit 5.5 x 1.5 mm

Diamond File Set - 5 pcs.

Order Code: **IF 500**

Total Length: 215 mm
Diamond Length: 80 mm

Ø5.2 | 9 x 4 | 11 x 4 | 8 mm | 6 mm

Grit: #100

Round - Half Round - Flat - Triangular - Square

Diamond Tapered File Set - 10 pcs.

Order Code: **PTF 100**

4 different model

2 — 1.4 / 0.3
Hand: #200 #400 #600 Grit **Length:** 130 mm

4 — 1.4 / 0.3
Hand: #200 #400 #600 Grit **Length:** 130 mm

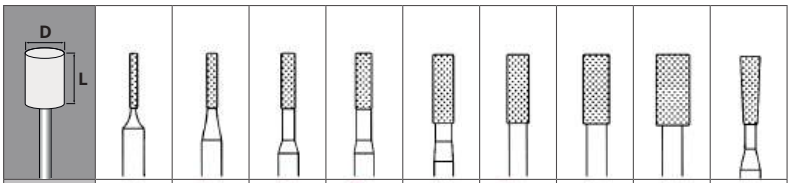
6 — 1.1 / 0.3
Hand: #200 #400 #600 Grit **Length:** 130 mm

Round: #600 Grit **Length:** 140 mm Ø 3.0 mm

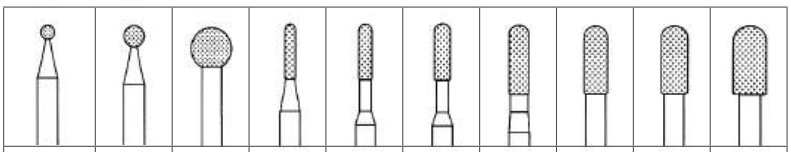
CBN Grinding Points

Code: **PEF**

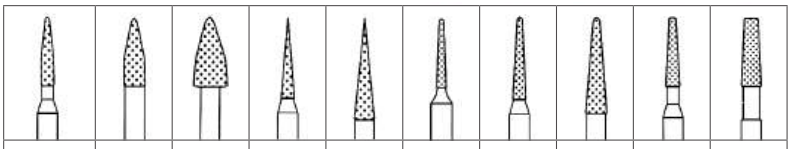
These grinding points produced with electroplated method. They are designed for shaping and finishing hard materials including Tungsten Carbide and Ceramics. It is used at mould processing, mostly polishing runners or lapping other channels / holes areas making burrs and finishing.



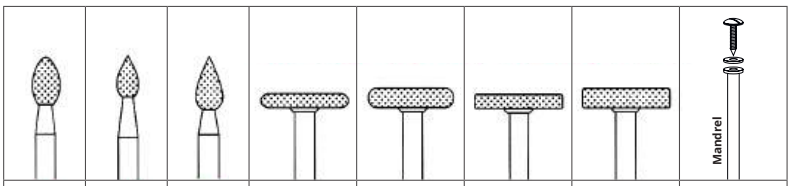
Type:	10 A	15 A	20 A	25 A	30 A	35 A	40 A	50 A	30 V
D x L	1 x 8	1.5 x 8	2 x 8	2.5 x 8	3 x 10	3.5 x 10	4 x 10	5 x 10	3 x 10



20 B	30 B	50 B	15 C	20 C	25 C	30 C	35 C	40 C	50 C
Ø 2	Ø 3	Ø 5	1.5 x 8	2 x 8	2.5 x 8	3 x 10	3.5 x 10	4 x 10	5 x 10



20 F	30 F	50 F	20 P	30 P	15 R	20 R	30 R	20 T	30 T
2 x 10	3 x 10	5 x 10	2 x 12	3 x 15	1.5 x 10	2 x 12	3 x 14	2 x 10	3 x 10



40 Q	30 S	40 S	SPR 16	SPR 20	SPR 22	SPR 25	SPR
4 x 7	3 x 6	4 x 8	16 x 0.5	20 x 0.5	22 x 0.5	25 x 0.6	Ø 3

Order: **PEF.** Type

Shank: Ø3 mm
Full Length of Products: 45 mm

Diamond CBN Set - 30 pcs.

Order Code: **BMS - 30**

Contains one each of below:
PEF.10A, 15A, 20A, 25A, 30A, 35A, 40A, 50A, 20B 30B, 50B, 15C, 20C, 25C, 30C, 35C, 40C, 50C 20P, 30P, 15R, 20R, 30R, 30S, 20F, 30F, 50F, 20T 30T and 30V.

Diamond CBN Set - 20 pcs.

Order Code: **BMS - 20**

Contains one each of below:
PEF.10A, 15A, 20A, 25A, 30A, 35A, 15C, 20C, 25C 30C, 20P, 30P, 15R, 20R, 30R, 20B, 30B, 20F 30F and 20T.

Diamond CBN Set - Economic

*** Contents are the same as the BMS set.**

Order Code: **T20** **20 pcs.**

Order Code: **T30** **30 pcs.**

Diamond CBN Set - 50 pcs.

Order Code: **C280300**

Needle File Set -12 pcs.

Order Code: **BSE12** BAHCO

Contains one file each of:
Hand, flat, triangular, square, half round, crossing, round, knife, barrette, slitting, round-edge joint and marking. **Type of cut:** Fine, medium & coarse. *** 3 x 160 mm**

Needle File Set - 6 pcs.

Order Code: **BSE06** BAHCO

Contains one file each of:
Hand, flat, half round, round, triangular and square.
Type of cut: Medium *** 3 x 160 mm**

Needle File Set - 6 pcs.

Order Code: **1720** BETA

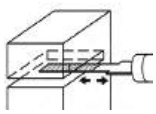
Contains one file each of:
Hand, flat, half round, round, triangular and square.
Type of cut: Medium *** 3 x 160 mm**

Needle File Set - 10 pcs. Economic

Order Code: **SE10**

Type of cut: Medium
*** 3 x 140 mm**

5 different model



Diamond Tip File Set

Order Code: **FAS 100T**

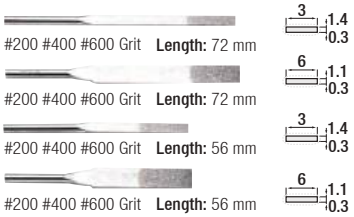
10 pcs. & with extension bar.
Suitable for hand-held and Air File Tools.

* **Length:** 60 • **Width:** 4 ~ 2 • **Grit:** #150 #200
* **Length:** 60 • **Width:** 4 • **Grit:** #150 #200
* **Length:** 70 • **Width:** 6 • **Grit:** #150 #200
* **Length:** 90 • **Width:** 8 • **Grit:** #150 #200
* **Length:** 90 • **Width:** 10 • **Grit:** #150 #200

Diamond Tapered File Set - 12 pcs.

Order Code: **MTF 100**

4 different model



For Air File Tools.
Shank: Ø 3.0 mm

Diamond
Length: 15 mm

Diamond Riffler File Set - 6 pcs.

Order Code: **BF 800**

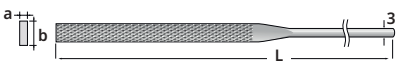
Shank: Ø 3.0 mm
Total Length: 155 mm

Contains one riffler file each of:
Crossing, hand, round, riffler, square and triangular.

Steel Needle Files

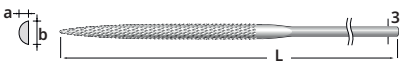
It is ideal to work in the smallest surfaces, profiles and angles.
It can be used with or without handles.

Steel Needle File - Hand Code: **SLE**



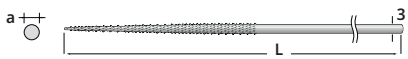
Order Code	Shank	a x b	L	Operation
SLE 140	Ø 3	5.5 x 1.35	140	4 cut
SLE 160		6.2 x 1.45	160	

Steel Needle File - Half Round Code: **SYY**



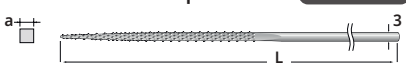
Order Code	Shank	a x b	L	Operation
SYY 140	Ø 3	5.0 x 1.75	140	3 cut
SYY 160		5.5 x 2.0	160	

Steel Needle File - Round Code: **SYE**



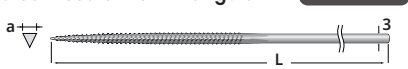
Order Code	Shank	a (tapered)	L	Operation
SYE 140	Ø 3	1.1 x 2.8	140	all sides
SYE 160		1.2 x 3.0	160	

Steel Needle File - Square Code: **SKE**



Order Code	Shank	a (tapered)	L	Operation
SKE 140	Ø 3	1.3 x 2.5	140	4 cut
SKE 160		1.4 x 2.7	160	

Steel Needle File - Triangular Code: **SUE**

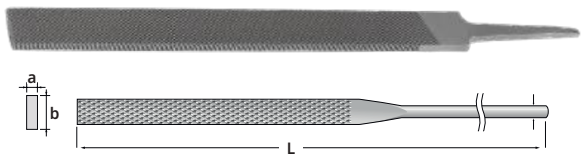


Order Code	Shank	a (tapered)	L	Operation
SUE 140	Ø 3	1.0 x 3.2	140	3 cut
SUE 160		1.3 x 3.4	160	

File Cleaning Brushes

Order Code	Product
1737	145 mm / Brass Wire
1737 BA	294 mm / Soft Brass Wire
1737 NX	270 mm / Steel Wire

Coarse: For material removing and deburring.
Medium: For general purpose and levelling.
Fine: Precision filling and smoothing.

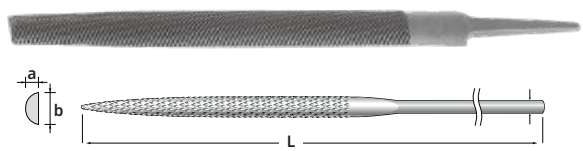


Engineers File - Hand

Code: **LHE**

Order Example: **LHE100.** Medium

Code	Inch	Cut	a	b	L
LHE 100	4"	Coarse	10	2.5	100
LHE 150	6"		16	4.0	150
LHE 200	8"	Medium	20	5.0	200
LHE 250	10"		25	6.5	250
LHE 300	12"	Fine	30	7.0	300

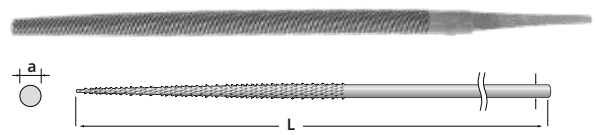


Engineers File - Half Round

Code: **YYE**

Order Example: **YYE300.** Coarse

Code	Inch	Cut	a	b	L
YYE 100	4"	Coarse	10	3.3	100
YYE 150	6"		16	5.0	150
YYE 200	8"	Medium	20	6.0	200
YYE 250	10"		25	7.0	250
YYE 300	12"	Fine	30	9.0	300

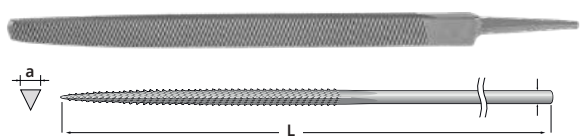


Engineers File - Round

Code: **YTE**

Order Example: **YYE200.** Medium

Code	Inch	Cut	a	L
YTE 100	4"	Coarse	Ø 4	100
YTE 150	6"		Ø 6	150
YTE 200	8"	Medium	Ø 8	200
YTE 250	10"		Ø 10	250
YTE 300	12"	Fine	Ø 12	300

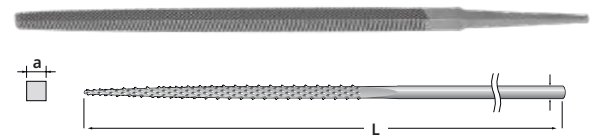


Engineers File - Triangular

Code: **UTE**

Order Example: **UTE300.** Medium

Code	Inch	Cut	a	L
UTE 100	4"	Coarse	7	100
UTE 150	6"		9	150
UTE 200	8"	Medium	11	200
UTE 250	10"		14	250
UTE 300	12"	Fine	17	300

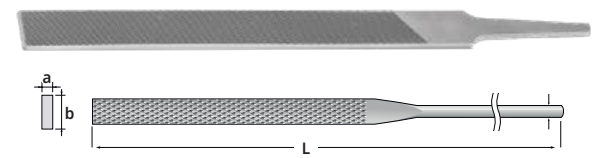


Engineers File - Square

Code: **KTE**

Order Example: **KTE250.** Fine

Code	Inch	Cut	a	L
KTE 100	4"	Coarse	4	100
KTE 150	6"		5	150
KTE 200	8"	Medium	6	200
KTE 250	10"		8	250
KTE 300	12"	Fine	10	300

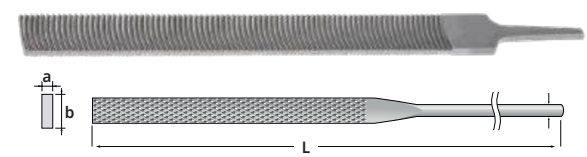


Engineers File - Mill Saw

Code: **MTE**

Order Example: **MTE150.** Fine

Code	Inch	Cut	a	b	L
MTE 100	4"	Coarse	10	2.5	100
MTE 150	6"		16	3.0	150
MTE 200	8"	Medium	20	4.0	200
MTE 250	10"		25	5.0	250
MTE 300	12"	Fine	30	6.5	300



Engineers File - Aluminium

Code: **ALE**

Order Code	Inch	Cut	a	b	L
ALE 250	10"	Coarse	25	6.0	250
ALE 300	12"		30	6.5	300

Plastic Handle for Files

Order Code	Type	Inch	Order Code	Type	Inch
ESY 04		4"	**ESD 04**		4"
ESY 06		6"	**ESD 06**		6"
ESY 08	⊖	8"	**ESD 08**	○	8"
ESY 10		10"	**ESD 10**		10"
ESY 12		12"	**ESD 12**		12"
ESSE	**Product:** Handle for Needle Files				

▸ LCD Screen

Mould Inspection Camera

Order Code: **CEMBS150**

Contains of Product Box:

* Software CD
* USB Cable
* Carrier Bag
* Video Output Line
* DC Power Adapter
* Inspection Camera
* User Manual
* 3.7 Lithium Battery
* Mirror, Magnet & Hook

Specification:

+ With the help of a waterproof gooseneck camera, it can easily take photos and videos.
+ On-site inspection by photos and videos.
+ Image rotation by pressing up and down buttons under video mode and images display with current time / date.

Gooseneck Length: ..... 1 Metre
Display Screen - LCD: ..... 3.2" Colour TFT
Display Resolution: ..... 320 x 240
Photosensitive Devices: ..... 1/4 Inch CMOS
Sensor Pixel: 300.000
Max. (FPS): ..... 30 FPS / S (max.)
Memory: ..... Internal / SD Card up to 32GB
Viewing Angle: ..... 0 to 180⁰
Power Supply : ..... Li Battery 3.7V / 2000mA
LED Lighting: ..... 100 Adjustable
TV Out: ..... PAL / NTSC System
Languages: ..... English, German, Spanish, French & Turkish

In-Mould Monitoring

Machine Repair

Car Repair & Maintenance

Table Lamps with Magnifier

Order Code: **ZLA**

Diopter: 5
Glass Lens Dimension: 190 x 157 mm
Light Source: 2x led lamp
Voltage: 220V - 240V

Magnifier with Illumination

+ Glass Lens
+ Powered by 3 x AAA batteries (included)

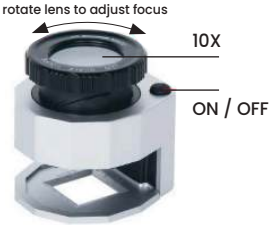
Order Code	Lens Diameter	Magnification	Dimension
75132	75 mm	2X	170 x 90 mm
75134	50 mm	4X	145 x 90 mm

Inspection Mirror

Order Code: **1714**

It is used to get images from areas that are hard to see.
Light and impact resistant plastic frame.
Diameter: 25 mm / **Length:** 155 mm / **Weight:** 6 g.

base with scale



Loupe Magnifier with Illumination

Order Code: **752410**

+ Magnification 10X
+ Glass Lens
+ Powered by 3 x AG7 batteries
+ 3 pcs LED and 3 pcs UV
+ Base with scale, graduation: 0.5 mm, 1/16"
+ Lens Diameter: 30 mm

Mould Testing & Assembly Unit

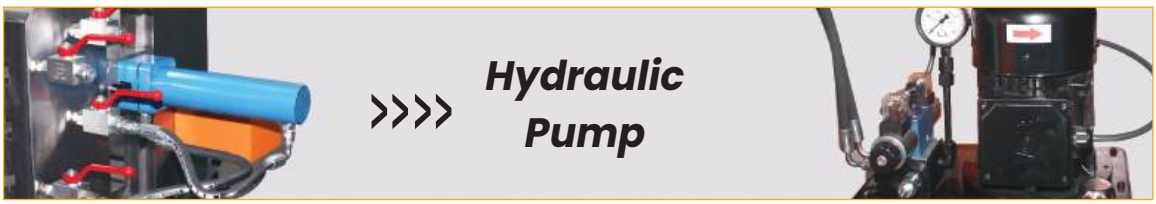
Mould Delivery: No problem / successful

CE

We maintain our innovative investments with the force we have taken from mould masters. We also present **"Mould Testing & Assembly Unit"** and **"Core System with Hydraulic Piston"** which we hope that they support mould production with proud. We are sure that these products will be useful for mould collection and offer you a joyful working environment with quick and easy mounting.

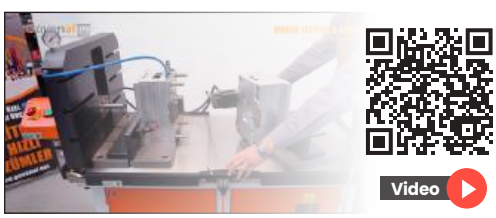
Mould Testing Unit: It provides easy mounting and control possibility for your moulds with its suitable sizes and durable steel construction in anywhere of your workshop (by forklift). It enables to open your mould bases / to separate plates easily by providing sliding motions with air cushions on the table of the unit. In this way, the plates can be moved forward - backward easily (with the logic of cnc machine) and your operations on moulds are ready.

Hydraulic Power is mounted in the unit; the controls of Hydraulic System which can be mounted to the mould if required and Injection Motion controls, especially Ejector Motions and Other Lifter / Slide Systems are monitored. And their adjustments may be done in precision position on the unit. All these motions can also be monitored.



Compressed Air Energy: The air equipment on the unit enables you to test water/cooling channels in your moulds with a Manometer (air bar measuring) by installing it in your existing air system in the workshop. It provides support for you to detect leakages and problems in the water cooling channels with the pressure monitored in Manometer counter. This system prevents corrosion in your new moulds because it does not use water. The existing air energy will make contribution to your other mounting works.

Except above mentioned important working possibilities of mould testing unit, it is a compact (with no effusing part) and innovative product equipped with table safety retainers / supports, mould angulation thrusts - electrical panel, air control buttons - hydraulic unit control counter - hydraulic valve - hydraulic piston tool - moving piston slot and holder - fixed plate and pins - moving plate control - mould ejector and connection plates. All spare part and services are given by our company.

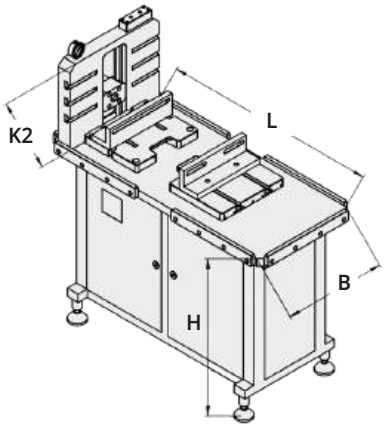


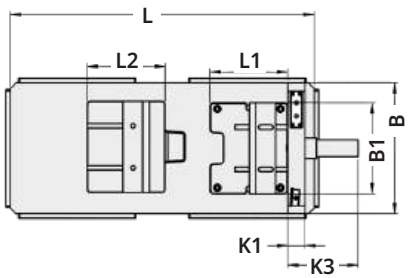
Mould Testing & Assembly Unit

Code: GTH - 00...

CE

Only at Güvenal sales points.

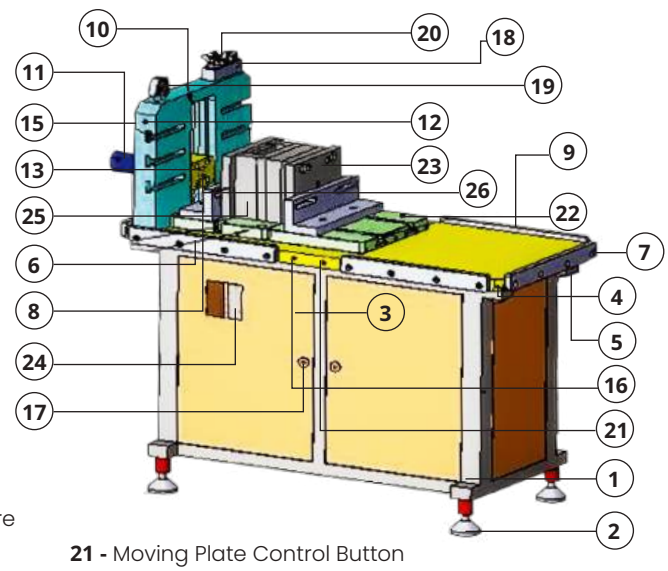




Perfect mould table that enables fast / easy opening and closing of moulds in accordance with the occupational safety principles and carrying out repair and mounting works on moulds and monitoring precision and performing many tests.

Order Code	Max. Capacity Loading	Air Power	Electrical Motor Power	Unit Weight	L mm	H mm	L1 mm	L2 mm	B mm	B1 mm	K1 mm	K2 mm	K3 mm
GTH - 002	3000 Kg.	6 Bar	3 Kw	730 Kg.	1346	854	346	346	636	526	76	500	280
GTH - 003	4000 Kg.	8 Bar	5 Kw	1050 Kg.	1470	876	386	386	740	590	86	640	290

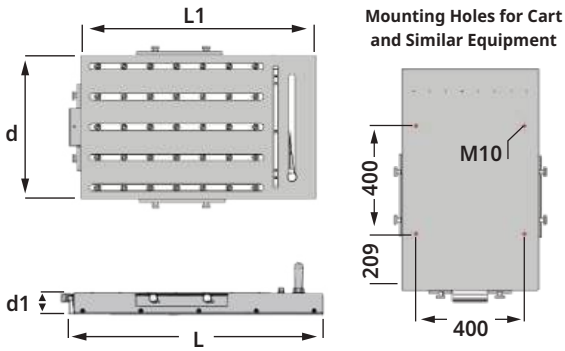
Mould Testing Unit Schema / Descriptions:



1 - Steel Profile (60 x 40 x 3) Chassis
2 - Powerful Metal Screw Pressing Feet
3 - Hydraulic Pressure Plexy Transparent Indicator
4 - Moving (precision ground) Unit Table
5 - Table Chassis Skid Plates
6 - Fixed Plate Pins
7 - Table Safety Side Holders
8 - Fixed (precision ground) Plate for Mould
9 - Chuck "T" Channels
10 - Moving Piston Slot
11 - Hydraulic Piston Arm
12 - Air Outlet for Water / Cooling Channel Test
13 - Moving, Hydraulic Piston Holder
14 - Precision Ground (for small moulds) Set Square
15 - Electrical Panel
16 - Air Control Button
17 - Openable Unit Cover
18 - Extra Hydraulic Distribution Control Button
19 - Air Control / Manometer
20 - Hydraulic Distribution Valves
21 - Moving Plate Control Button
22 - Air Cushioned Moving Plates
23 - Precision Ground Mould Ejector Plate
24 - Hydraulic Unit
25 - Precision Ground Mould Connection Plates
26 - Hydraulic Piston Extension Tool

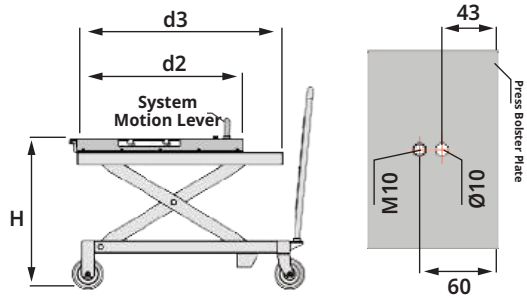
Code: **1024 - 500670**

Die Moving Table (1Ton)



Code: **1024 - 500671**

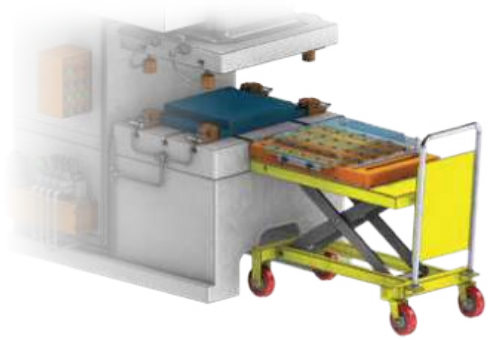
Die Moving Cart (1Ton)



Order Code	d	d1	d2	d3	L	L1	H Min. - Max.	Type	Capacity
1024 - 500670	500	71	-	-	1015	670	-	Table	1 Ton
1024 - 500671	500	-	818	1015	-	670	480 - 1050	Cart	1 Ton

***** Dies up to "1 ton" weight, it reduces surface contact when it desired to be moved during changing to be placed on the press bolster plate or shelves. Thus, it provides the possibility of changing the dies easily and quickly without the need for much power.

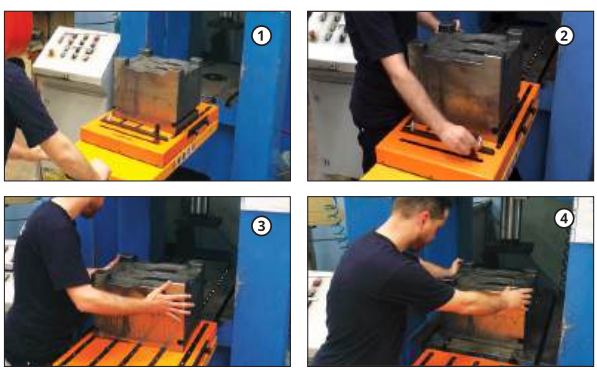
***** It can be mounted on pallet truck or forklifts and can be easily used.



Advantages:

***** Time-saving
***** Flexible application-possibilities
***** Gentle transport
***** Exact positioning
***** Safe positioning of the cart by parking brake

Some Applications:



KING workholding tools

At very affordable prices

Certified with Güvenal Quality Assurance Label

NEW

KING TAPPING
SERVO TAPPING MACHINE

- ☑ PLC, HD touch screen
- ☑ Easy to use flexible arm
- ☑ Powerfull servo motor
- ☑ Adjustable guide diameter, pitch, length and speed
- ☑ Torque adjustment and smart torque protection system
- ☑ The operation table and all accessories are included in the package

Technical Specifications:

Tapping Capacity:

M3 - M16 / M4 - M24 / M6 - M36

Motor Power: 2000 W

Spindle Rotation: 200 Rpm

Arm Length: 1100 mm

Table Dimension: 900 x 600 x 750 mm

Weight for M4 - M24: 120 Kg.

Weight for M6 - M36: 130 Kg.

M3 - M16
KING SERVO TAPPING MACHINE

Order Code: **HRD - TAPPING316**

M4 - M24
KING SERVO TAPPING MACHINE

Order Code: **HRD - TAPPING424**

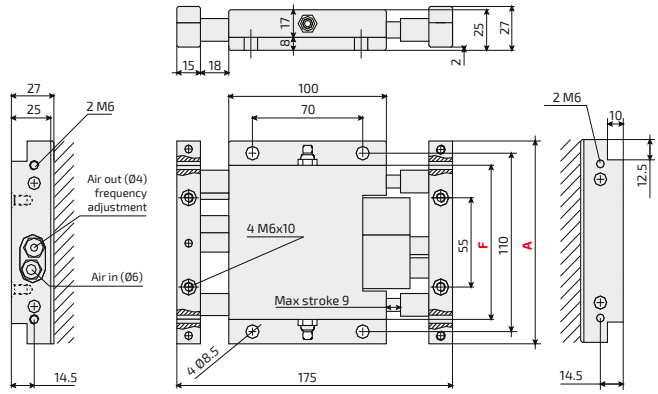
M6 - M36
KING SERVO TAPPING MACHINE

Order Code: **HRD - TAPPING636**

Video

NEW

BORDIGNON



Order Code	A	F	Weight
BRE50 - 125	125	95	2.6 kg
BRE50 - 145	145	105	2.7 kg
BRE50 - 195	195	155	3.0 kg

Code: **BRE50**

Pneumatic Transporter /Air Scrap Remover

The BRE50 is operated with compressed air only. The scrap shooter, moving slowly forward and fast backward, causes the scrap to move forward. Born to evacuate the scrap on the blanking dies and to transport metal components, it has found many sectors of application: metal dies in general, plastic moulds, mechanical, food, pharmaceutical, and assembly industries.

Features

+ Compact dimensions.
+ Only 27 mm height.
+ Minimum compressed air consumption.
+ Strong against uneven loads.
+ Max load (scrap shooter included): 50 kg.
+ Supply fluid: filtered compressed air, not lubricated, not damp.
+ Working pressure (bar): Min 3 / Max 6.
+ Working temperature: Min 0°C (32°F) / Max 60°C (140°F).
+ Mounting inclination: Min 0° / Max -45°.
+ Sound level dB (A): 60.

Benefits of BRE50

Extra powerfull and super compact, the scrap remover has many advantages in technical aspects and in convenience of use. It combines superior performance, versatile application and great reliability.

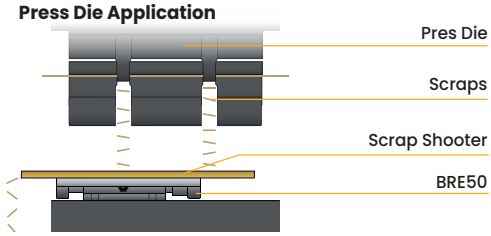
+ Minimal air consumption.
+ Resistance to uneven loads.
+ Capable of transportation on downhill and even surfaces.
+ Easy assembly and use.
+ Easy frequency regulation in small spaces.
+ One scrap remover unit can support multiple scrap shooters.
+ Low initial cost.
+ No electricity required.

Fields of application

The technical characteristics of the BRE50 make it suitable for a wide range of use:

+ Removing scraps from stamping dies.
+ Metal components transport.
+ Separation and sieving of different elements (e.g. small metal parts).
+ Mechanical, food, pharmaceutical and automation industries.

Press Die Application



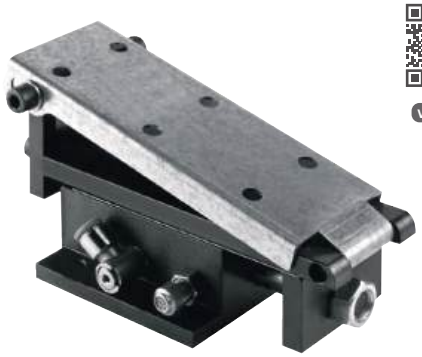
Fixing:

+ Fix the scrap remover with 4 screws on a solid base. On the special models BRE50 130-..., disassemble the side brackets to reach the fixing holes.
+ Connect the inlet pipe of the compressed air (ø 6 mm).
+ Fix the scrap shooter on the scrap remover. The greater the inclination of the scrap shooter or scrap remover, the lower the air comsumption.
+ The scrap remover begins to move when the compressed air is on.
+ Adjust the pressure of the compressed air (3-6 bar). Lower pressure will lead to lower air consumption.
+ Adjust the frequency. Lower frequency will lead to lower air consumption.
+ Note: air pressure reducer, air inlet pipe, fixing screws and scrap shooter are not included.

Use Instructions:

+ Use filtered dry air, without oil.
+ Use a suitable scrap shooter (embossing shooting plate) for oily scraps.
+ Lubricate every month, when working 24 hours per day.
+ Lubricate every 3 months, when working 8 hours per day.
+ Use a lubricant grease for bearings.
+ Put lubricant into the 2 grease fittings until it is full.

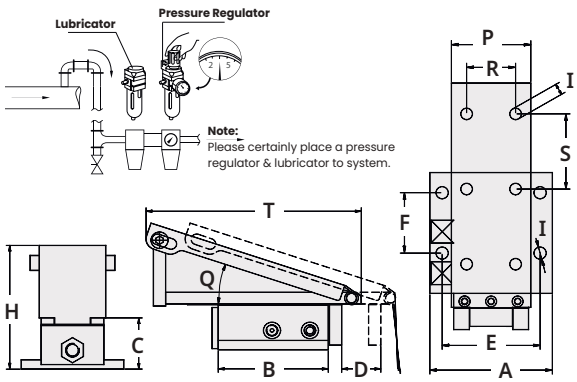
Video



Video

Code: **GTH.ALO**

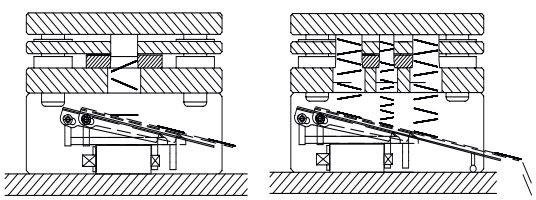
Part & Scrap Carrier / Pneumatic Ejector



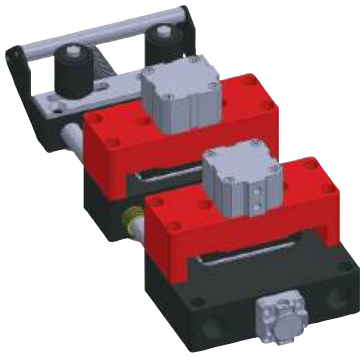
Order Code	Bar	A	B	C	D	E	F	H
GTH.ALO 05	2/5	90	90	29	20	72	45	83
GTH.ALO 10	2/5	90	90	52	35	72	45	105
GTH.ALO 25	2/5	100	106	63	36	82	55	125
GTH.ALO 50	2/5	120	120	72	46	102	96	140

Order Code	I	P	Q	R	S	T	Max. Load
GTH.ALO 05	8.5	58	Max.18^0 ~ Min. 7^0	36	56	180	5 kg
GTH.ALO 10	9	60	Max.20^0 ~ Min. 4^0	36	56	175	10 kg
GTH.ALO 25	9	70	Max.20^0 ~ Min. 4^0	44	62	190	25 kg
GTH.ALO 50	9	96	Max.20^0 ~ Min. 4^0	56	70	220	50 kg

Mounting Example:



- Carriage with pneumatic vibration system in very small dimensions, allowing scrap or parts to be removed from the die/tool.
- This system is equipped with a regulator with a capacity of 2 - 5 bar pressure.
- Depending on application requirements, by mean of a slide, different sizes of plates can be applied, this slide is equipped with an adjustment sloping system.
- The operating speed can be adjusted from the brass valve directly inserted in the tool.
- Maximum positioning inclination 20^0.



Economic Types

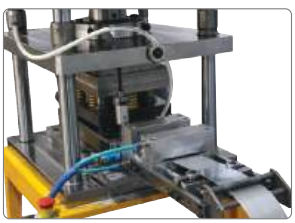
Heavy Duty

Pneumatic Feeder

Code: **A...** Code: **E...**

Order Code	Max. Material Thickness Max. Material Width Feed Length (mm)
A1	1 x 100 x 100
A2	1 x 100 x 200
A3	1 x 100 x 300
A11	1 x 150 x 100
A12	1 x 150 x 200
A13	1 x 150 x 300
A21	1 x 200 x 100
A22	1 x 200 x 200
A23	1 x 200 x 300
A31	1 x 300 x 100
A32	1 x 300 x 200
A33	1 x 300 x 300
A41	1 x 400 x 100
A42	1 x 400 x 200
A43	1 x 400 x 300
A51	1 x 500 x 100
A52	1 x 500 x 200
A53	1 x 500 x 300

Order Code	Max. Material Thickness Max. Material Width Feed Length (mm)
E1	2 x 150 x 100
E2	2 x 150 x 200
E3	2 x 150 x 300
E11	2 x 200 x 100
E12	2 x 200 x 200
E13	2 x 200 x 300
E21	2 x 300 x 100
E22	2 x 300 x 200
E23	2 x 300 x 300
E31	2 x 400 x 100
E32	2 x 400 x 200
E33	2 x 400 x 300
E41	2 x 500 x 100
E42	2 x 500 x 200
E43	2 x 500 x 300



- Material width capacity from 100 mm up to 500 mm.
- Material feeding capacity at thickness from 0.2 up to 1.0 / 2.0 / 3.0 mm.
- Feed length from 100 mm up to 300 mm.
- The feeder casings are produced from special aluminum alloy material.
- The bearing column are produced from hard chrome coated material (1080).
- Movable parts are produced from bronze material.
- Feed length set screw are produced from 4140 material.

Decoilers for Steel Roll

Code: **AGM**

Order Code	Max. Material Width	Steel Roll Inside Diameter (mm)	
		Min.	Max.
AGM 500	20 - 30	470	520
AGM 1250	20 - 400		
AGM 2500	20 - 400		
AGM 2500M	60 - 600		

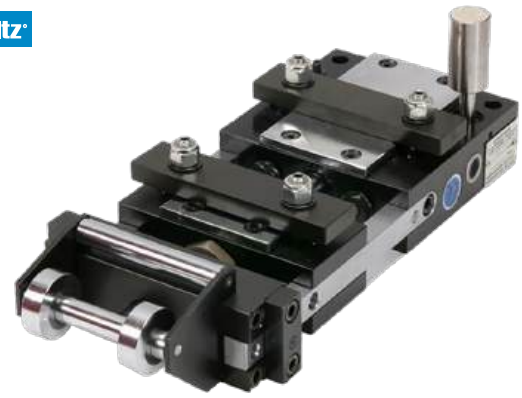
Order Code	Max. Steel Roll Outside Dia.	Steel Roll Weight Kg.
AGM 500	1200	500
AGM 1250	1300	1250
AGM 2500	1300	2500
AGM 2500M	1300	2500

Our mechanical decoilers has threaded rod clamping and discharging system from center. Working capacity range is between 750 kg to 4.000 kg. Motorized, pneumatic snubber bar and brake models are available. Mechanical decoilers take up less space and have minimum operating cost for companies.

Snubber Bar: Optional

Video

herrblitz



Pneumatic Feeder

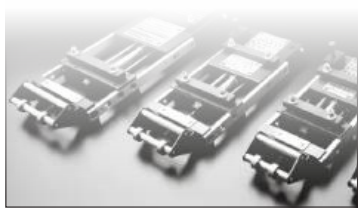
High precision, rapid & efficient performance

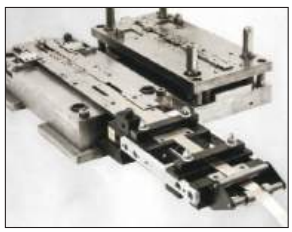
Light Duty — Code: **A - B - C**

Heavy Duty — Code: **P - S - Z**

Order Code	Max. Material Width	Feed Length	Max. Material Thickness
A 50	50 mm	0 ~ 50	0 ~ 1.9
A 100		0 ~ 100	0 ~ 1.8
A 150		0 ~ 150	0 ~ 1.5
A 200		0 ~ 200	0 ~ 1.3
A 250		0 ~ 250	0 ~ 1.1
B 50	75 mm	0 ~ 50	0 ~ 1.8
B 100		0 ~ 100	0 ~ 1.7
B 150		0 ~ 150	0 ~ 1.6
B 200		0 ~ 200	0 ~ 1.2
B 250		0 ~ 250	0 ~ 1.1
C 50	100 mm	0 ~ 50	0 ~ 1.7
C 100		0 ~ 100	0 ~ 1.5
C 150		0 ~ 150	0 ~ 1.4
C 200		0 ~ 200	0 ~ 1.3
C 250		0 ~ 250	0 ~ 1.2

Order Code	Max. Material Width	Feed Length	Max. Material Thickness
P1	0 ~ 155	1.00	0 ~ 3.8
P2		2.00	0 ~ 3.5
P3		3.00	0 ~ 3.0
S1	0 ~ 205	1.00	0 ~ 3.0
S2		2.00	0 ~ 3.0
S3		3.00	0 ~ 3.0
Z1	0 ~ 305	1.00	0 ~ 3.0
Z2		2.00	0 ~ 3.0
Z3		3.00	0 ~ 2.5





Pneumatic - Automatic Feeder

Since they have been made in modular system, it is quite easy to obtain different dimensions.

Standard Accessories: O-Ring kit

Optional Accessories:

* Remote control with electro valve (instead of standard mechanic valve)
* Spring clamp (for pilot release)
* Transparent top case (to avoid accidents)
* Programmed counter to repeat feed length
* Conditioner unit and hose systems to filter pressured air and to lubricate

NEW

Order Code: **SPTA**

Sheet Metal Part Transport Handle

When working with eccentric and hydraulic presses, hand, arm, and finger amputations or crush injuries are among the most common workplace accidents. To prevent such accidents, we have developed the Sheet Metal Part Transport Handle, which ensures a safe working environment.

In the design of the product, not only the risk of hand, arm, or finger amputation or crush injury was considered, but also precautions against electrical leaks were taken. Made from insulating materials, this product eliminates the risk of electric shock, preventing electrical workplace accidents.

Developed with a focus on human health, this product helps prevent workplace accidents that may occur in press machines, allowing workers to work in a safer environment. It also contributes to preventing both material and emotional losses.

Magnet Specifications

Pulling Force: 3-5 kg

Gauss Value: 2000-3000 Gauss

Max. Operating Temperature: 80°C

Magnet Pulling Distance: 0-5 cm

Magnet Type: Neodymium (NdFeB)

Color: Blue

Grade: N35

Tolerance: ± 0.1 mm

Dimensions

Length: 201-250 mm

Width: 35 mm

Height: 50 mm

Material Specifications

Outer Material: Plastic

Fully Stainless: Yes

Color: Blue

Tolerance: ± 0.1 mm

Outer Material

Quality: Rigid PVC

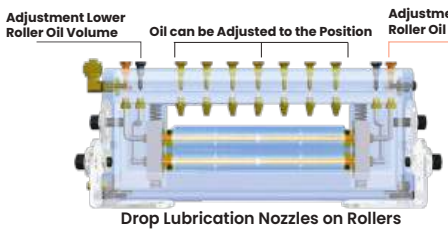
Video

NEW

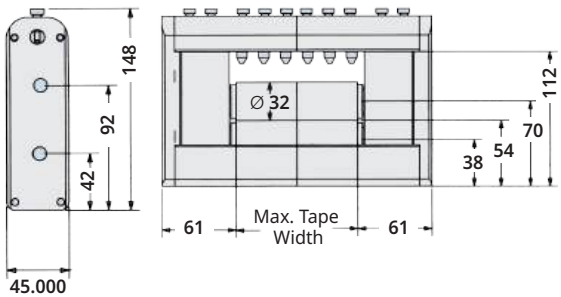
Roller Lubricator for Steel Roll

Code: **RYS**

Type: Drop Lubrication



Drop Lubrication Nozzles on Rollers



Order Code	Max. Material Width
RYS 100	100 mm
RYS 200	200 mm
RYS 300	300 mm
RYS 400	400 mm
RYS 600	600 mm

Video

Min. Material Thickness: 0.10 mm

Max. Material Thickness: 6 mm

Easier and faster production is obtained by lubricating steel roll with drops while work piece / steel roll is switched between rollers in roller lubricating system. This system increases die-tool life and quality product which is not scrap is obtained. Material thicknesses can be adjusted from 0.3 mm to 3.0 mm steel roll thickness.

Standard Features:

* Thanks to local valves, partial lubrication on mobile steel roll.
* Industrial felt plates are available in lubricating roller.
* 3 lt. capacity plastic oil tank.

Optional Features:

* Time cycled lubricating relay.
* Hydraulic pump tank.
* Desired oil capacity.

CE

Order Code: **PKM 1**

Pin Cutting & Face Grinding Machine

LONGNESS TOLERANCE : 1 mm - 24 mm Ø X 325 mm
SHORTNESS TOLERANCE : 1 mm - 24 mm Ø X 60 mm
CUTTING DISC : 115 - 185 mm X 1,0 X 22MM
GRINDING WHEEL : 100 mm X 50 mm X 20 mm (60 GRIT)
MOTOR : 380V - 50 HZ - 0.75 KW - 1500 CYCLE / min.
RPM: 3650 CYCLE / min.
ANGULARITY: 01-24 mm X 90/±0.02
MACHINE WEIGHT : 80 KG.
MACHINE DIMENSIONS : 500 mm X 425 mm X 355 mm

Rapid, Precise and Easy Cutting

"Especially for round work pieces"

**** The 600mm ruler is optional and can be adapted on request (longer length cutting option).***

- Not only it guarantees precision degree but also it provides significant saving on time with best usage options in longitude cuttings.
- We recommend you to avoid unqualified and imitation products without CE certificate in the market.

For additional disc and wheel components, see the order codes below

The machine is shipped with 1x Cutting Disc and 1x Grinding Wheel mounted as standard.
Additional units can be ordered for replacement.

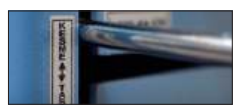
Description	Order Code
D-100 Grinding Whell for PKM1	**K14020**
Cutting Disc for PKM1	**HRD-PKMT**

Video

"PKM1" provides easiness and rapidness with a strong and fast clamping mechanism (vice). Grinding wheel can be easily dressed with diamond dresser on vice.

Diameter cutting capacity is between 1 – 24 mm. Between the 60 – 325 mm length parts.

you can cut precisely with the help of micrometer located on the ruler (600 mm ruler is optional).



Lever Motions:

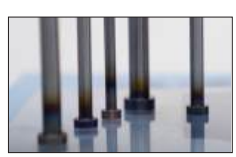
Up: Cutting

Down: Face Grinding

Right: Vice Opening

Plexiglass cover provides safety. When cover is opened, it stops and it cannot be operated without closing cover.

It adjust its own cycle automatically depending on diameter of part and plastic bearing which position transmission drive power on belt.



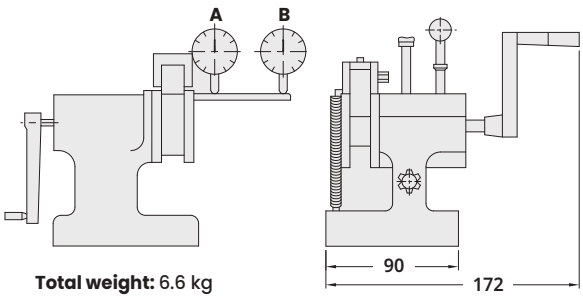
During operation, it grinds cut parts with angularity precision 90 / ±0.02 with the grinding wheel and without changing dimension.

Manual Type

Pin & Punch Former Tool

Order Code: **VPG**

Punch grinder is a tool which can be put on the surface plate of grinding machine for round punches(1.5mm-25mm). It can be ground by putting among three rollers of punch grinder. without checking the center. Accuracy of roller within 0.005mm while turning right or left. It can allow lenght 5-35mm Accuracy of point **A** within 0.005mm and point **B** Within 0.008mm while turning.

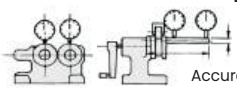


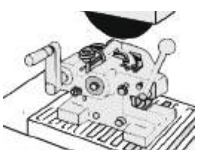
Total weight: 6.6 kg

* It can be put on the grinding machine workbench for form grinding pins, punches or EDM tools.
* Pin clamping diameter: Ø1.5mm x Ø25mm
* Pins etc. can be ground by putting among precision rollers of Former Tool without checking the center, the center is determined automatically.
* Thanks to rigid clamping system, extended grinding length is within 5 - 35mm.

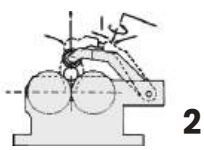
Video

Installation

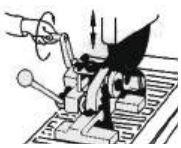




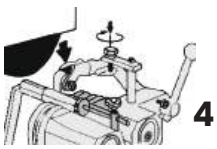
Insert pin into housing. Tighten screw of lever.



When pin is placed between precision rollers, center is found automatically.



After equipment is mounted to grinding machine, start grinding by turning lever.



Before starting grinding, ensure that all fasteners are tightened.

Motor Type

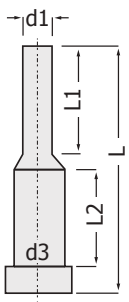
Pin & Punch Former Tool

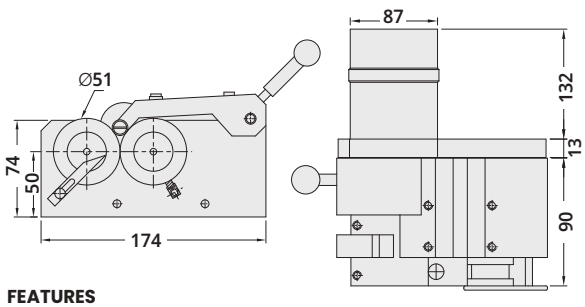
Order Code: **VPGM**

1. High accuracy cylindrical grinding work is possible, just putting this economical unit on surface grinder.
2. No center alignment necessary. just put work piece on rollers.
3. Portable with single hand, thus easily set up.
4. With rollers motor -driven, attention can be concentrated on table/wheel feeds.
5. Work can be formed in radius taper as well.
6. Double roller unit available for long pin or punch grinding.

Technical Information:

Pin clamping length (L): **20 - 120 mm**
Minimum clamping length (L2): **22 mm**
Pin grinding length (L1): **5 - 35 mm**
Pin clamping dia. (d3): **Ø 2 ~ 25 mm**
Pin grinding dia. (d1): **Ø 0.5 ~ 25 mm**
Grinding accuracy: **0.01 mm**

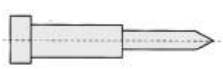




FEATURES

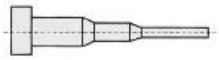
Mounting surface(RLxFB): 175 X 218 X 90 mm
50Hz / 220v: 108 rpm
Roller speed 60Hz / 110v: 129 rpm
Accuracy(Roundness and concentricity): 25.4 mm
Roller driving motor: 110V, Single phase, 25W
Total weight: 11.8 kg

Some Examples Grinding:



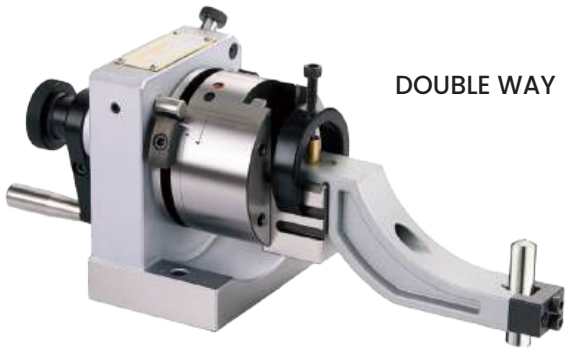
Inclined

Cylindrical Slot



Multi Stepped

Tapered

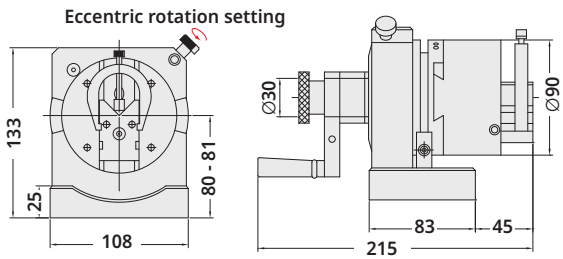


DOUBLE WAY

Pin & Punch Former Tool

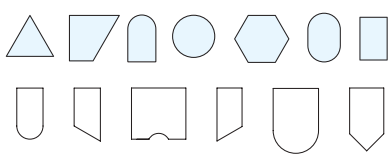
Order Code: **V-PB**

(Pin bearing length: 22 mm)

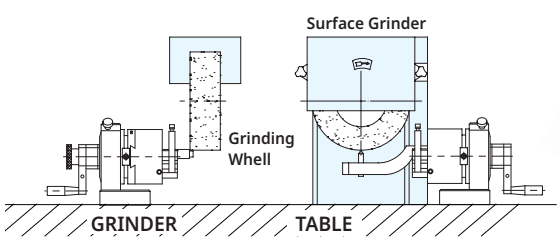


d1: Pin clamping diameter = Ø4 - Ø30 mm
L: Pin clamping length = min. 22 mm
"V" Bearing: Up / down motion = 25 mm
"V" Bearing: One way motion = 12.5 mm
"V" Bearing: Total motion = 25 mm
Equipment surface and angle / scale hardness: 63 HRC
Chuck dividing head angle: 24 Pcs. 15° ± 5°
Wheel diameter: 200 mm
Total weight: 9 Kg.

Punch end shape, some forms



Specifications: It creates the shapes / forms of die punches or mould ejector pins or it enables to create the desired formed shapes as equipment manually in shaped forming processing grinding machine manually. Motion is provided in two ways with equipment, it is provided 360° angular return motion and eccentric (up / down) motions processing practicality.
Total Weight: 10 kg.

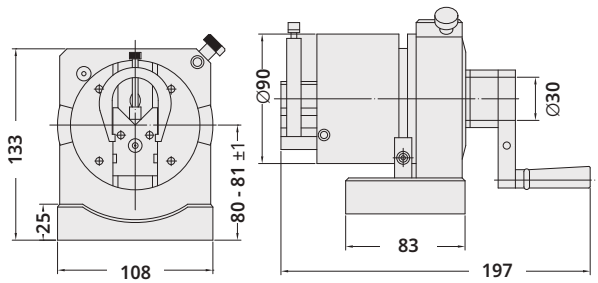


SINGLE WAY

Pin & Punch Former Tool

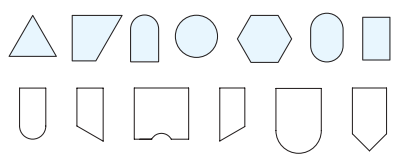
Order Code: **V-PS**

Forming tool / apparatus for mould ejector pins and EDM tools (with mounting on the grinding machine workbench).
"V" Bearing Length: 30mm
Rotation Centreline Height: 15mm

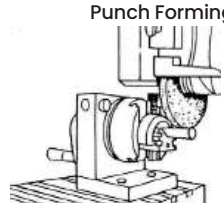


d1: Pin clamping diameter = Ø4 - Ø30 mm
L: Pin clamping length = min. 22 mm
"V" Bearing: Up / down motion = 25 mm
"V" Bearing: One way motion = 12.5 mm
"V" Bearing: Total motion = 25 mm
Equipment surface and angle / scale hardness: 63 HRC
Chuck dividing head angle: 24 Pcs. 15° ± 5°
Wheel diameter: 200 mm
Total weight: 8.7 Kg.

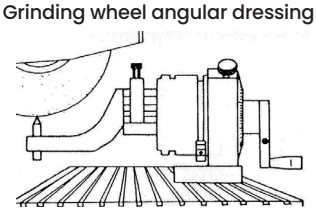
Punch end shape, some forms



Punch Forming

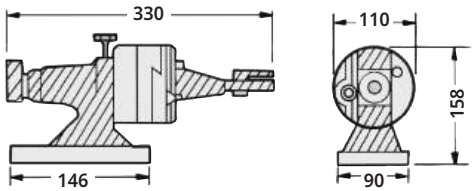


Grinding wheel angular dressing



Wheel Dresser Tool

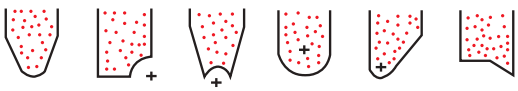
Order Code: **VTDB**



Working System: Manual system tool over grinding machine.

Convex dressing radius = 0.8 R - 40 R
Concave dressing radius = 0 - 40 R
Max. grinding wheel diameter = Ø 250 mm
Rotation angle = 4 x 90^0 = 360^0
Precision dividing head angle = 6"
* Precision centre height is obtained with positive cutting angle diamond dressers.
* Thanks to precision ground dovetail slides, absolute distance shifts are prevented in the desired distance.
* By providing control from one point, convex and concave dressing forms are provided precisely and quickly.
* All working surfaces and measuring scale is 60 HRC.

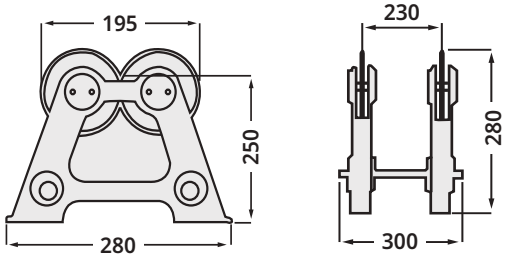
Wheel dressing applications



Wheel Balancing Stand

It helps to measure and develop grinding precision correctly. All surfaces of high precision balancing stand are 55 HRC, steel cast casing. Rotary model round parts are placed on the disc. By turning workpieces, its balance and flatness are monitored.

Order Code: **VBS - 300**

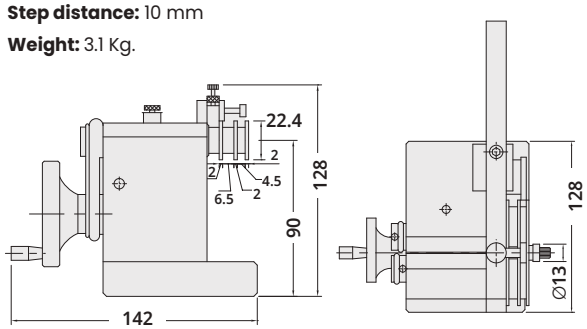


Order Code: **VPGA**

Mini Pin & Punch Former Tool

It is suitable to be used at machining and grinding of small diameters and short pins serially.

Pin diameter capacity: From 0.5 to 6 mm
Step distance: 10 mm
Weight: 3.1 Kg.



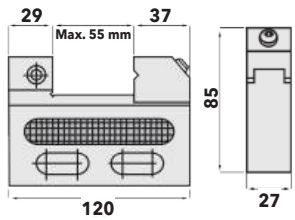
Diamond Wheel Dresser

Code: **TDE**

It is for dressing wheels in grinding machines.

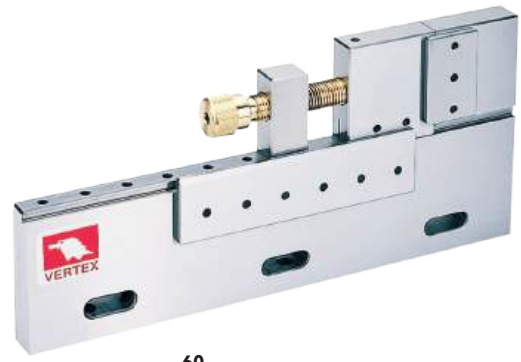
Order Code	Type / Carat	Order Code	Type / Carat
TDE 030	0.30	**TDE 150**	1.50
TDE 050	0.50	**TDE 200**	2.00
TDE 075	0.75	**TDE 250**	2.50
TDE 100	1.00	**TDE 300**	3.00

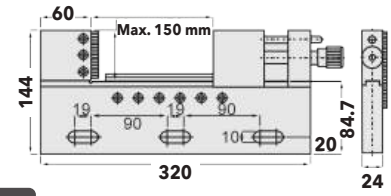
▶ Wire EDM Vise (stainless steel)



Order Code:
VSTV - 50W

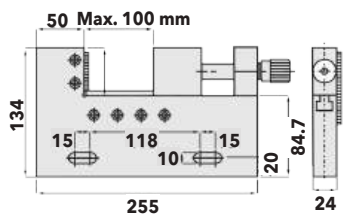
Precision Ground and Hardened: HRC 58 - 60
Parallelism and Squareness: ±0.002 mm /100 mm
Max. Opening: 55 mm
Thickness: 27 mm
Jaw Deep: 25 mm
Weight: 1.4 Kg





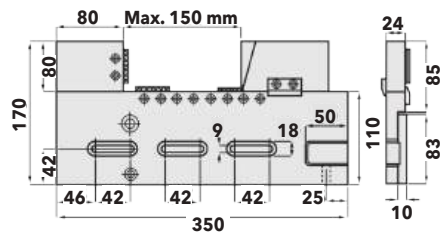
Order Code:
VSTV - 150W

Precision Ground and Hardened: HRC 58 - 60
Parallelism and Squareness: ±0.002 mm /100 mm
Max. Opening: 150 mm
Thickness: 24 mm
Jaw Deep: 60 mm
Weight: 6.8 Kg



Order Code:
VSTV - 100W

Precision Ground and Hardened: HRC 58 - 60
Parallelism and Squareness: ±0.002 mm /100 mm
Max. Opening: 100 mm
Thickness: 24 mm
Jaw Deep: 50 mm
Weight: 4.9 Kg



Order Code:
VSTV - 320W

Precision Ground and Hardened: HRC 45 - 55
Parallelism and Squareness: ±0.003/5 mm /100 mm
Max. Opening: 160 mm
Thickness: 24 mm
Jaw Deep: 60 mm
Weight: 8 Kg

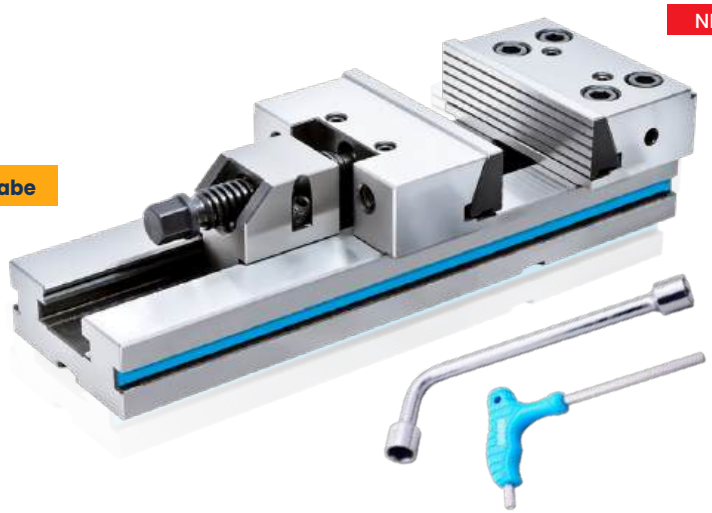
KING workholding tools

At very affordable prices

Certified with Güvenal Quality Assurance Labe

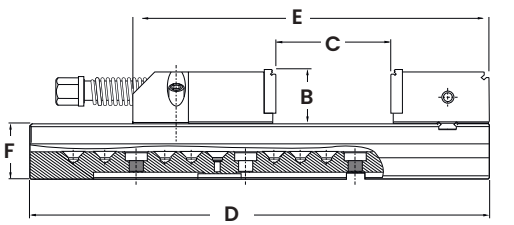
- High Accuracy
- Solid and Safe Structure
- Modularity
- Versatility

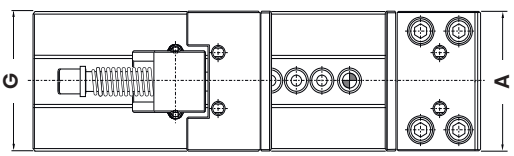
NEW



Precision Modular Vise

1. Carburizing of high quality alloy steel with hardness HRC58~62.
2. Parallelism is 0.005mm/100mm and perpendicularity is 0.005mm.
3. Fast workholding and flexible operation
4. For milling, boring, drilling and grinding of CNC machine tools, machining centers and general machine tools.
5. It can keep high precision by using multiple sets at work.

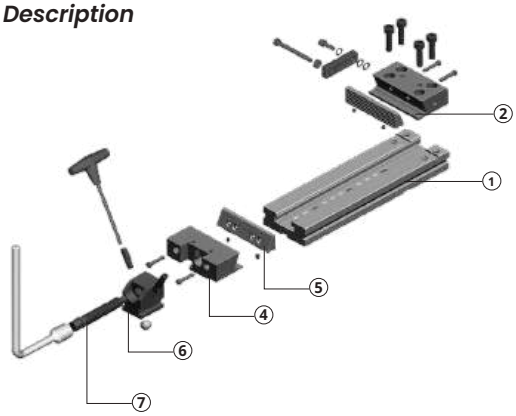




The verticality of the clamp is 50:002. The surface is hardened with high quality alloy steel. The hardness HRC58-62 is used for milling, boring, drilling and grinding of CNC machine tools, machining centers and general machine tools.

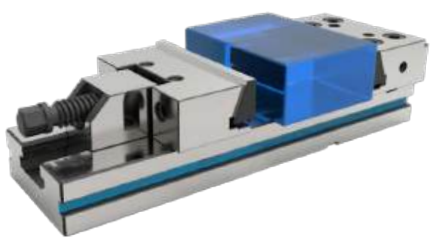
Order Code	A mm	B mm	C mm	D mm	E mm	F mm	G mm	Weight Kg.	Tightening Force
NCB 150 A	**150**	50	**200**	420	500	50	125	25	30 kgf.
NCB 150 B	**150**	50	**300**	520	600	50	125	29	30 kgf.
NCB 175 B	**175**	60	**300**	555	630	58	145	42	30 kgf.
NCB 200 B	**200**	65	**300**	595	680	70	170	69	40 kgf.

Product Appearance Diagram and Parts Description



1. Clamp body
2. Fixed Clamp
3. Fixed clamp splint
4. Movable Clamp
5. Movable clamp splint
6. Fixed Support
7. Screw

By adhering to our special quality & reasonable pricing principles in "Workholding Tools", we work hard to always increase your productivity for our valued KING users. We would like to thank you for choosing our products and starting to discover the KING world.



Permanent Magnetic Clamping Block

- **Ideal Technology for Medium and Large Workpieces**
- **Can Do 5-Sides Machining**
- **Robust and Flexible Clamping Method**
- **Fast, Easy, Compact and Balanced System**

The all models of "ECB - Magnetic Clamping Blocks" are a new sense of clamping methods for metal workig on Cnc machining center and milling machine in quick clamp workpieces. Especially, it is ideal to machining parts at Mould & Die production. A special clamping and machining technology without requiring any power supply.

Specifications:

- Free to set up position, numbers and distance of Magnetic Clamping Block according to the dimension of workpiece.
- The products including changeable Induction Soft Block. It can be revised surface to be 100% accuracy on the machine for clamp workpieces. Can be also cutting, drilling, tapping and slotting directly to the Induction Soft Block during machining workpiece. Multi-function of Induction Soft Block, the user can make it by themselves according to workpiece required.
- Suitable for medium and large workpieces, not suitable for small workpieces.
- Minimum dimension of workpiece required as larger than area of two Magnetic Clamping Blocks. Compact structure, time - effort and space saving.

Important:

- Please always make sure the Switch was in ON position before machining. Please always switch it OFF when not in use.
- The Magnetic Clamping Blocks are not suitable for non-magnetic materials, such as brass, copper, aluminium, stainless steel and etc.

Holding Force: 500 Kgf / Unit
Min. Workpiece Thickness: 15 mm
Accuracy: 90^{O}= 0.015/100mm
L x W x H Dimensions: 159.5 x 76 x 78 mm
Mag. Clamping Area (L x W): 126 x 76 mm
Weight: 7 Kg.

Order Code: **ECB - 50**

Holding Force: 750 Kgf / Unit
Min. Workpiece Thickness: 15 mm
Accuracy: 90^{O}= 0.015/100mm
L x W x H Dimensions: 207.5 x 76 x 78 mm
Mag. Clamping Area (L x W): 174 x 76 mm
Weight: 9.5 Kg.

Order Code: **ECB - 75**

Holding Force: 1200 Kgf / Unit
Min. Workpiece Thickness: 20 mm
Accuracy: 90^{O}= 0.015/100mm
L x W x H Dimensions: 220 x 108 x 108 mm
Mag. Clamping Area (L x W): 188 x 108 mm
Weight: 18 Kg.

Order Code: **ECB - 120**

Holding Force: 2100 Kgf / Unit
Min. Workpiece Thickness: 30 mm
Accuracy: 90^{O}= 0.015/100mm
L x W x H Dimensions: 274 x 133 x 134 mm
Mag. Clamping Area (L x W): 234 x 133 mm
Weight: 36 Kg.

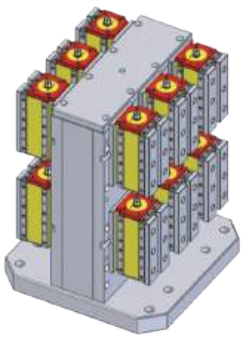
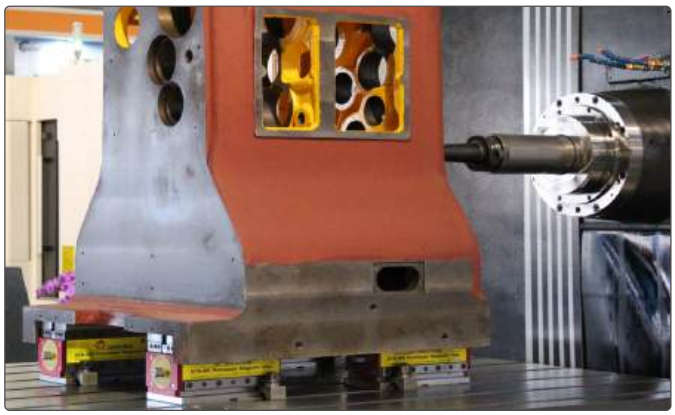
Order Code: **ECB - 210**

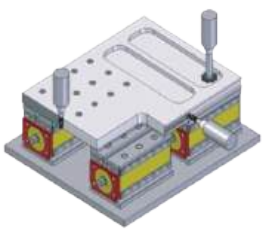
Standard Accessories

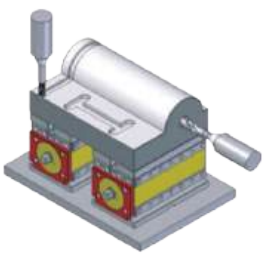
* 2x induction jaws
* Turn-on / Turn-off lever
* 4x Block securing clamp
* Side, front and rear support brackets
* Two-block combined connector

Code: **ECB**

The ECB Series Permanent Magnetic Workholding Blocks are highly efficient magnetic systems designed for securely clamping and holding metal parts in industrial applications. These blocks increase precision during the machining process by holding the parts in place with their strong magnetic fields.

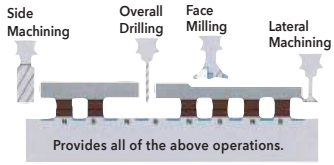







Electro-Permanent Magnetic Chuck

- ► Super Power Magnetic Force = 1250 Kgf / per 4 Pole
- ► We Present "Tool Cabinet as a Free Gift"
- ► Can Do 5-Sides Machining
- ► Clamping within a Few Seconds
- ► Monoblock Design / Compact & Robust



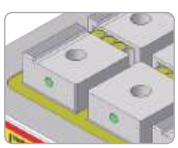
Electro-Permanent Magnetic Chucks are most suitable for heavy duty operations on small & medium workpieces and even for rough milling. Suitable for drilling and finishing operations on workpieces. All 5-sides of the workpiece can be machined in the same setting if clamped magnetically.

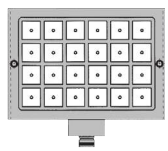
Specifications:

- Perfect safety in case of power failure. No electricity needed to keep the Magnetic Chuck ON.
- A minimum of 4 alternate magnetic poles contact is necessary for optimum clamping.
- More functions for cooperate with Induction Blocks (it is provided to you free by Güvenal).
- Magnetic force = 1250 Kgf / per 4 pole.
- Adjustable magnetic force (8 level).
- Can do 5-sides machining.
- Easy and practical to clamp a workpiece. It provides significant savings in clamping time.
- Recommended minimum thickness of workpiece: 10 mm.

Standard Accessories / Set Content:

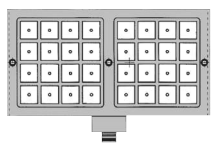
1. Electro-Permanent Magnetic Chuck
2. Controller
3. Remote Control (to adjust the magnetic force)
4. Induction Blocks (according to the number of poles)
5. Tool Cabinet (mobile)
6. Fasteners & Connection Cables
7. User & Training Manual





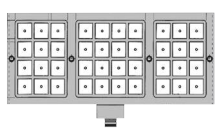
Order Code: **EEPM 3040 W**

Total Holding Force: 7500 Kgf
Width: 300 mm x **Length:** 430 mm
Height: 60 mm
Pole Dimension: 50 x 50 mm
Number of Pole: 24 pcs
Voltage (single phase): 220V
Controller Voltage (single phase): 220V
Chuck Net Weight: 61 kg



Order Code: **EEPM 4060 W**

Total Holding Force: 15000 Kgf
Width: 420 mm x **Length:** 590 mm
Height: 60 mm
Pole Dimension: 50 x 50 mm
Number of Pole: 48 pcs
Voltage (single phase): 220V
Controller Voltage (single phase): 220V
Chuck Net Weight: 100 kg

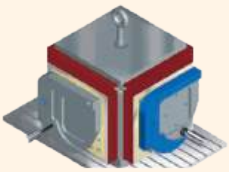


Order Code: **EEPM 40100 W**

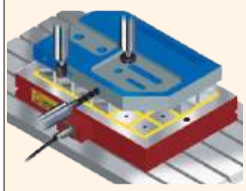
Total Holding Force: 26200 Kgf
Width: 420 mm x **Length:** 990 mm
Height: 60 mm
Pole Dimension: 50 x 50 mm
Number of Pole: 84 pcs
Voltage (single phase): 220V
Controller Voltage (single phase): 220V
Chuck Net Weight: 193 kg

Code: **EEPM**

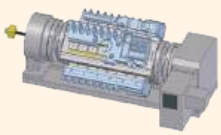
Some Applications:



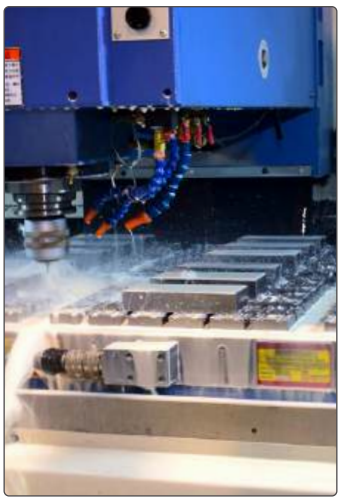
Forming & Machining on "Pallet Change"

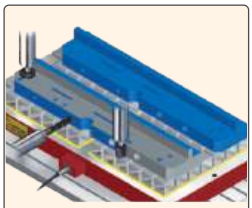


5 Sides Machining

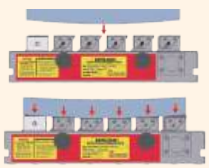


4th Axis Divider in Group Operations

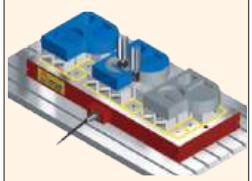




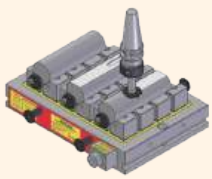
Multi-workpiece 5 Sides Machining



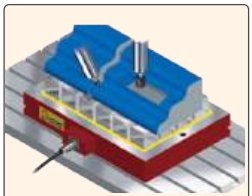
Flexible workholding with the spring blocks



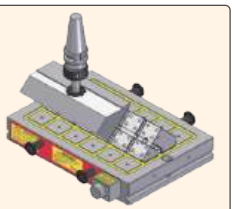
Multi-workpiece Forming



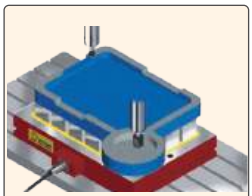
In cylindrical workpiece machining



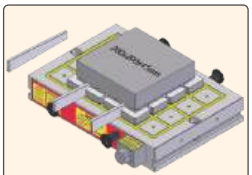
Mould 3D Forming



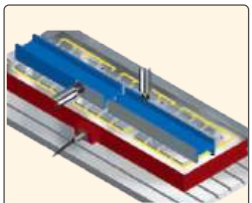
Angled surface machining/drilling



Casting Iron Forming & Machining



Special steel material separation method



Multi-workpiece Machining

NEW

Super Permanent Magnetic Chuck

Manually Operated / Heavy-duty Type

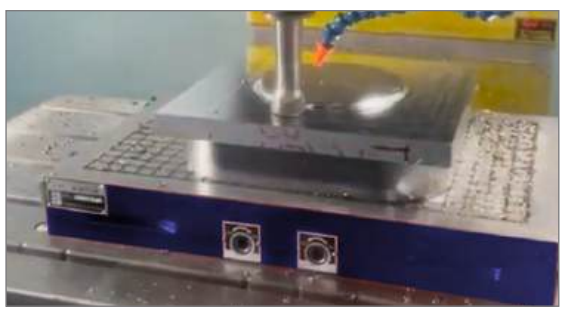
Magnetic force is generated using high-performance materials—there is no time limitation, no energy consumption, no heat generation, making it environmentally friendly and safe. "KING NMMC" offers extremely simple and practical use.

The super-strong holding force and magnetic field can be combined and intensified as the contact area with the workpiece increases, allowing it to be used effectively for heavy milling and drilling operations.

The ultra-powerful permanent magnetic clamping panels are rigid and stable, do not heat up or deform during use, ensuring precise machining.

A simple wrench eliminates the need for an external power source, removing the risk of workpiece drop due to magnetic force loss or power failure.

Workpiece clamping is performed quickly and easily, significantly reducing setup and clamping time. It enables five-sided machining and increases overall machining efficiency by up to 80%



+ Engineered for precision metal cutting applications, this system is ideally suited for CNC machining centers, CNC engraving and milling machines, surface grinders, and a wide range of other metalworking equipment.

+ Side Stoppers for small workpieces are provided free of charge with the product.

+ In multiple operations, it offers the advantage of quick clamping by allowing fast setup and removal, significantly saving time.

KING workholding tools

At very affordable prices

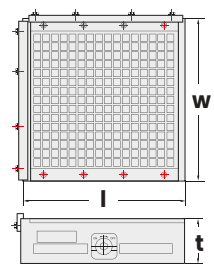
Certified with Güvenal Quality Assurance Labe

- Custom-Designed for CNC Machines
- Suitable for Heavy-Duty Machining Applications
- High-Precision Workholding
- Capable of Powerful Milling and Drilling Operations
- Enables 5-Sided Machining

4.4 TON **Total Clamping Capacity** **300 x 400 x 90 mm**

Order Code: **NMMC 3040**

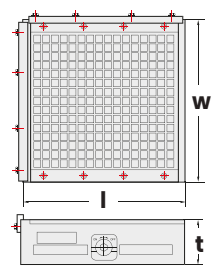
Dimensions (width × length × thickness):
300 x 400 x 90 mm
Total Number of Magnetic Poles: 176
Clamping Force per Pole: 25 kgf
Total Clamping Capacity: 4.4 TON
Weight: 57.5 Kg.

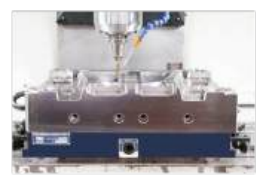


9.3 TON **Total Clamping Capacity** **400 x 600 x 90 mm**

Order Code: **NMMC 4060**

Dimensions (width × length × thickness):
400 x 600 x 90 mm
Total Number of Magnetic Poles: 375
Clamping Force per Pole: 25 kgf
Total Clamping Capacity: 9.3 TON
Weight: 100 Kg.





Watch the product video

Budget-friendly! A machine that pays for itself in a short time!

End Mill Sharpening Machine

The budget friendly and handy End Mill Sharpening Machine is ideal for resharpening Carbide and HSS end mills. Practical using thanks to easy, compact and robust design. Easy to operate, no experience required for sharpening a precision end mill.

Standard Accessories / Set Content:

1. End Mill Sharpening Machine
2. Tool Cabinet
3. 10 pcs ER Collet Set for EMG-413
6 pcs ER Collet Set for EMG-1325
4. 2 pcs Sharpening Wheel
5. Collet Holder (for 2/4 flute end mill)
6. Collet Holder (for 3 flute end mill)
7. Hex Key (4 mm)
8. Connection Cables
9. User & Training Manual

Optional Sharpening Wheels:
(order code = product description)

*** EMG-413-1D =** "SDC Wheel #300" for Carbide End Mills / Ø 4 - 5
*** EMG-413-2D =** "SDC Wheel #300" for Carbide End Mills / Ø 6 - 13
*** EMG-413-1C =** "CBN Wheel #300" for HSS End Mills / Ø 4 - 5
*** EMG-413-2C =** "CBN Wheel #300" for HSS End Mills / Ø 6 - 13
*** EMG-1325-1D =** "SDC Wheel #150" for Carbide End Mills / Ø 12 - 25
*** EMG-1325-1C =** "CBN Wheel #150" for HSS End Mills / Ø 12 - 25

- **End Mill Sharpening in 1 Minute**
- **We Present "Tool Cabinet as a Free Gift"**
- **Operation is Fast and Easy**
- **Provide Savings**

! Please clean the sharpening chips often for avoid the chip scrape to the sharpening base and keep usage life.

Order Code: **EMG - 413**

End Mill Diameter: Ø 4 - 13 mm
End Mill Angle: 6^0 - 20^0 - 30^0
Sharpening Wheel 1: SDC #300 / for Carbide End Mills (Ø4-5)
Sharpening Wheel 2: SDC #300 / for Carbide End Mills (Ø6-13)
Motor / Power Supply: 450W / AC 220V
Speed: 6000 RPM
Net Weight: 17 kg

Order Code: **EMG - 1325**

End Mill Diameter: Ø 12 - 25 mm
End Mill Angle: 6^0 - 20^0 - 30^0
Sharpening Wheel 1: CBN #150 / for HSS End Mills (Ø12-25)
Sharpening Wheel 2: SDC #150 / for Carbide End Mills
Motor / Power Supply: 1000W / AC 220V
Speed: 4300 RPM
Net Weight: 31 kg

Drill & End Mill Cutter

The handy Drill & End Mill Cutter is ideal for cutting Carbide and HSS tools. Practical using thanks to easy, compact and robust design. Easy to operate, no experience required for cutting a precision tool.

Order Code: **ECO - 316**

Diameter: Ø 3 - 16 mm
Cutting Wheel: SDC #100 / for Carbide Tools
Motor / Power Supply: 600W / AC 220V
Speed: 6000 RPM
Net Weight: 13 kg

Standard Accessories:

1. Drill & End Mill Cutter
2. SDC #100 Cutting Wheel
3. Hex Keys (4 - 10 mm)
4. Connection Cables
5. User & Training Manual

Optional Cutting Wheels:
(order code = product description)

*** ECO-316-1C**
"CBN Wheel #100" for HSS Tools

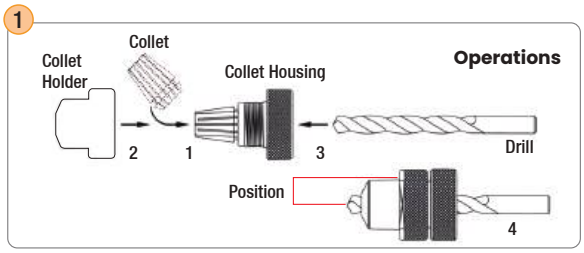
*** ECO-316-1D**
"SDC Wheel #100" for Carbide Tools

Budget-friendly! A machine that pays for itself in a short time!

Drill Sharpening Machine

The budget friendly and handy Drill Sharpening Machine is ideal for resharpening HSS and Carbide drills. Practical using thanks to easy, compact and robust design.

1



2

1. Set up the drill to the collet holder: Follow up the steps 1,2,3 and 4 for set up the drill to the collet holder (without tighting), as shown on image-1.

2. Set up the diameter of drill:

* Turn right the scale to be "0" position.
* Adjust the scale to meet the diameter of the drill.

3

3. Set up the drill to the sharpening position: Insert the collet holder with drill and turn right, then tight the drill by collet holder for set up the sharpening position, as shown on **image-3.**

Important: Please always check the center edge of drill must be parallel with the gap of "Collet Holder", as shown on the **image-1 / "position".**

4

4. Adjust the drill tip & chip evacuation shape angles: Adjust the drill tip & chip evacuation shape angles to the suitable / desired position. Turn right for bigger, turn left for smaller, as shown on **image-4.**

5

5 & 6. Sharpen the drill tip & chip evacuation shape:

* Turn on the power of the machine.
* Insert the collet holder with drill and push to the sharpening wheel slowly, then move left and right repeatedly to sharpen the drill until the sharpening sound disappeared, as shown on image-5.
* Take out the collet holder with drill and change to the other side to sharpen again in same way as above mentioned, as shown on **image-6.** Turn off the power of the machine. Your drill is ready to use.

6

Standard - Chip Evacuation Shapes:

The center point suitable for carbide / hard steels HSS E cobalt, Tin coated etc. hard materials

The center point suitable for general materials such as iron, general steel and brass.. etc.

The center point suitable for soft materials such as copper,aluminium, plastic.. etc.

Order Code: EDG - 213

Drill Diameter: Ø 2 - 13 mm
Point Angle of Sharpening: 90^0 - 140^0
Sharpening Wheel: CBN #400 / for HSS Drills (Ø2-13)
Motor / Power Supply: 250W / AC 220V
Speed: 5500 RPM
Net Weight: 8.5 kg

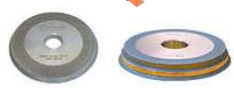
Order Code: EDG - 1226

Drill Diameter: Ø 12 - 26 mm
Point Angle of Sharpening: 90^0 - 140^0
Sharpening Wheel: CBN #400 / for HSS Drills (Ø12-26)
Motor / Power Supply: 450W / AC 220V
Speed: 4500 RPM
Net Weight: 26 kg

Standard Accessories / Set Content:

1. Drill Sharpening Machine
2. Tool Cabinet
3. 12 pcs ER Collet Set for EDG-213
15 pcs ER Collet Set for EDG-1226
4. CBN Sharpening Wheel for HSS Drills
5. Collet Holder
6. Hex Keys (4 - 5 - 6 mm)
7. Connection Cables
8. User & Training Manual

Optional Sharpening Wheels: (order code = product description)



*** EDG-213N-1D =** "SDC Wheel #400" for Carbide Drills / Ø 2 - 13
*** EDG-213N-1C =** "CBN Wheel #400" for HSS Drills / Ø 2 - 13
*** EDG-1226N-1D =** "SDC Wheel #400" for Carbide Drills / Ø 12 - 26
*** EDG-1226N-1C =** "CBN Wheel #400" for HSS Drills / Ø 12 - 26

- **Drill Sharpening in 30 Seconds**
- **We Present "Tool Cabinet as a Free Gift"**
- **Operation is Fast and Easy**
- **The Left & Right Sharpening Method Gives the Sharpest and the Most Durable Drill**

! Please clean the sharpening chips often for avoid the chip scrape to the sharpening base and keep usage life.

Best in Class: Top Quality & Safety CE

Lifting Magnet (safety factor: x3.5 times)

Code: **ELM**

ELM - 100

ELM - 300

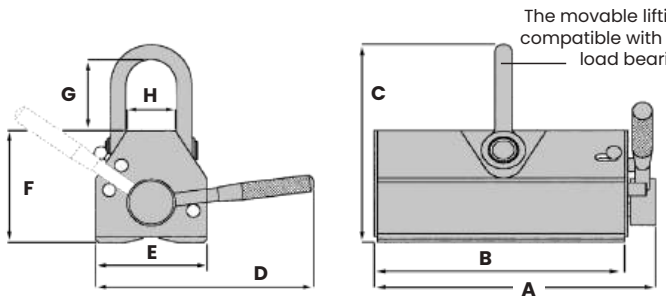
ELM - 600

ELM - 1000

ELM - 2000

ELM - 3000

It features powerful magnetic force, with 3.5 times safety factor makes more safety in use. It is very practical, suitable for move plate steel, block steel and round steel, such as dies, moulds, machine parts and iron materials etc.. It is designed according to the self temporary continuous magnetic carrier block rotary pole logic. When ON - OFF open - close position is on the workpieces, it is taken / turned to ON / open position. When it is in idle position, it absolutely should be in OFF / close position.Carrying capacity can change according to the surface cleaning, thickness, quality, planarity and shape (flat / round) of metal material, also magnetic block and interval of workpiece. It does not require any power supply. There is no relation with electric interruptions, thus eliminating hazards due to failure wiring system as electric type. The handling ring is movable and it is compatible with balanced load bearing. It lifts and handles the load and it is easy to mount.



Order Code	Capacity	A	B	C	D	E	F	G	H	Weight	Safety Factor
ELM - 100	100 kg	107	84	120	125	60	71	41	30	2.5 kg	x3.5
ELM - 300	300 kg	180	155	156	185	90	93	51	41	8.6 kg	
ELM - 600	600 kg	255	224	212	260	115	120	77	52	21 kg	
ELM - 1000	1000 kg	280	245	286	371	165	169	97	87	46 kg	
ELM - 2000	2000 kg	422	380	348	512	216	215	105	121	118 kg	
ELM - 3000	3000 kg	566	530	400	770	216	222	147	80	181 kg	x3.0

Order Code	Steel Plate		Round Steel		Max. Length
	Max. lifting capacity	Min. thickness required	Max. lifting capacity	Max. diameter	
ELM - 100	100 kg	15 mm	60 kg	150 mm	1000 mm
ELM - 300	300 kg	25 mm	180 kg	250 mm	1500 mm
ELM - 600	600 kg	30 mm	360 kg	350 mm	2000 mm
ELM - 1000	1000 kg	40 mm	600 kg	450 mm	2500 mm
ELM - 2000	2000 kg	55 mm	1200 kg	550 mm	3000 mm
ELM - 3000	3000 kg	60 mm	1800 kg	650 mm	3500 mm

IMPORTANT !
With ON / OFF switch, it is very easy and convenient to operate. See as the example pictures as below.
Note: Never moves the handle to "ON" side, except on an iron object of holding.

Tolerance and Fit Systems

Technical Drawing / Terms: If producer and quality supervisor can speak the same language, the products will be perfect.

Tolerance Definition: Error margins of workpieces in standard dimensions in the meaning of tolerance (indulgence).
Tolerance is the error margins within the lower and upper limit specified by taking the main dimensions as a reference.
A standardization has been done around the world and certain standards have been determined due to negative situations such as difference of the products in the past, rejects and economic / labourship losses. Selecting small tolerances in the production method improve the quality but increases the cost. Selecting large tolerances decreases both costs and quality. Therefore, tolerance values in the Machine and Die / Mould production has been standardized.

We pay attention to products that do not have different features. This system is important for product replacements and repairs. Güvenal branded Die & Mould Components are designed according to DIN / ISO norms.
The different standard types of other local producers are to create problems and difficulties in the production phase. These dies and moulds shipped to other countries will create the same problems and difficulties at the destination. For this reason, we recommend you to prefer Güvenal brand products for your dies and moulds, especially systems used as sets.

There are two types of tolerance depending on the type of writing:
1- Numerical Tolerance:
Written nearby principal dimensions (basic dimension).

Example: $40^{+0.05}_{-0.01}$ 40 ± 0.05

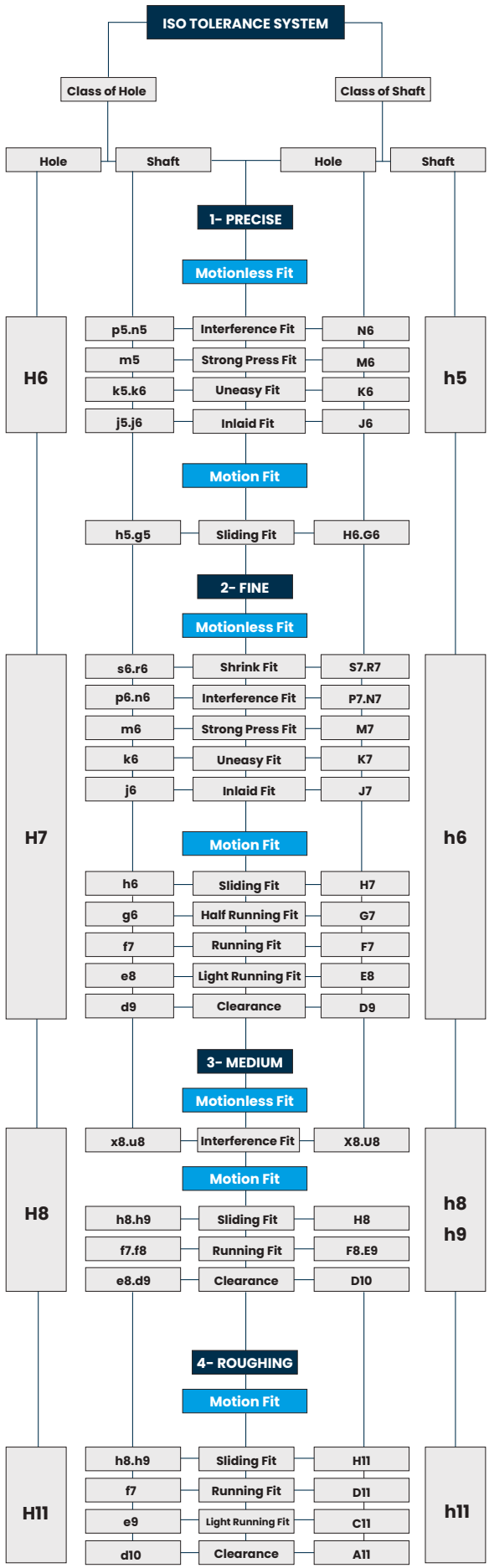
2- Letter Tolerance:
The letters and numbers which classified according to DIN and I O systems are written to right hand side of the principal dimension and read according to type of micron.

Example: 40^{H7} 40_{h6}

There are two types of tolerance according to their practice:
1- Manufacturing Tolerance: It is based on the difference between the largest dimension and the smallest dimension.
2- Fit Tolerance: It is made according to shaft and hole system that indicated by DIN and ISO system. Beside, it is the relation due to difference between dimensions of two simple components (hole and shaft) to be joined each other.

Recommendation: It is easy to machining external surfaces of workpieces. Since it will be hard to machining internal surfaces, hole dimensions should be kept fixed and a precise machining is performed by giving tolerance to the shaft.

Comparing of DIN and ISO Systems
1- Both systems have been classified according to normal hole and normal shaft system.
2- Normal temperature has been accepted as 20^0C in both systems.
3- Tolerance differences of shafts and holes, often tolerance comparement and keeping the basis for tolerance of difference to a zero base line is the same in both.
4- At DIN System there are 4 types of fit which are Precise, Fine, Medium and Roughing. At ISO System there are 18 kind different quality.
5- At DIN System the product diameter were found to be arithmetic average, at ISO System it is found by diameter's geometric average.



ISO Tolerances for HOLES / mm (ISO 286-2)

(micron / 0,001 mm)

>	3	6	10	18	30	40	50	65	80	100
(incl) <	6	10	18	30	40	50	65	80	100	120
E6	+ 28 + 20	+ 34 + 25	+ 43 + 32	+ 53 + 40	+ 66 + 50		+ 76 + 60		+ 94 + 72	
E7	+ 32 + 20	+ 40 + 25	+ 50 + 32	+ 61 + 40	+ 75 + 50		+ 90 + 60		+ 107 + 72	
E11	+ 95 + 20	+ 115 + 25	+ 142 + 32	+ 170 + 40	+ 210 + 50		+ 250 + 60		+ 292 + 72	
E12	+ 140 + 20	+ 175 + 25	+ 212 + 32	+ 250 + 40	+ 300 + 50		+ 360 + 60		+ 422 + 72	
E13	+ 200 + 20	+ 245 + 25	+ 302 + 32	+ 370 + 40	+ 440 + 50		+ 520 + 60		+ 612 + 72	
F6	+18 + 10	+ 22 + 13	+ 27 + 16	+ 33 + 20	+ 41 + 2		+ 49 + 30		+ 58 + 36	
F7	+ 22 + 10	+ 28 + 13	+ 34 + 16	+ 41 + 20	+ 50 + 25		+ 60 + 30		+ 71 + 36	
F8	+ 28 + 10	+ 35 + 13	+ 43 + 16	+ 53 + 20	+ 64 + 25		+ 76 + 30		+ 90 + 36	
G6	+ 12 + 4	+ 14 + 5	+ 17 + 6	+ 20 + 7	+ 25 + 9		+ 29 + 10		+ 32 + 12	
G7	+ 16 + 4	+ 20 + 5	+ 24 + 6	+ 28 + 7	+ 34 + 9		+ 40 + 10		+ 47 + 12	
G8	+ 22 + 4	+ 27 + 5	+ 33 + 6	+ 40 + 7	+ 48 + 9		+ 56 + 10		+ 66 + 12	
H3	0 + 2.5	0 + 2.5	0 + 3	0 + 4	0 + 4		0 + 5		0 + 6	
H6	+ 8 0	+ 9 0	+ 11 0	+ 13 0	+ 16 0		+ 19 0		+ 22 0	
H7	+ 12 0	+ 15 0	+ 18 0	+ 21 0	+ 25 0		+ 30 0		+ 35 0	
H8	+ 18 0	+ 22 0	+ 27 0	+ 33 0	+ 39 0		+ 46 0		+ 54 0	
H9	+ 30 0	+ 36 0	+ 43 0	+ 52 0	+ 62 0		+ 74 0		+ 87 0	
H10	+ 48 0	+ 58 0	+ 70 0	+ 84 0	+ 100 0		+ 120 0		+ 140 0	
H11	+ 75 0	+ 90 0	+ 110 0	+ 130 0	+ 160 0		+ 190 0		+ 220 0	
J6	+ 5 - 3	+ 5 - 4	+ 6 - 5	+ 8 - 5	+ 10 - 6		+ 13 - 6		+ 16 - 6	
J7	+ 6 - 6	+ 8 - 7	+ 10 - 8	+ 12 - 9	+ 14 - 11		+ 18 - 12		+ 22 - 13	
J8	+ 10 - 8	+ 12 - 10	+ 15 - 12	+ 20 - 13	+ 24 - 15		+ 28 - 18		+ 34 - 20	
JS6	+ 4 - 4	+ 4.5 - 4.5	+ 5.5 - 5.5	+ 6.5 - 6.5	+ 8 - 8		+ 9.5 - 9.5		+ 11 - 11	
JS7	+ 6 - 6	+ 7.5 - 7.5	+ 9 - 9	+10.5 - 10.5	+ 12.5 - 12.5		+ 15 - 15		+ 17.5 - 17.5	
JS8	+ 9 - 9	+ 11 - 11	+13.5 - 13.5	+16.5 - 16.5	+ 19.5 - 19.5		+ 23 - 23		+ 27 - 27	
K6	+ 2 - 6	+ 2 - 7	+ 2 - 9	+ 2 - 11	+ 3 - 13		+ 4 - 15		+ 4 - 18	
K7	+ 3 - 9	+ 5 - 10	+ 6 - 12	+ 6 - 15	+ 7 - 18		+ 9 - 21		+ 10 - 25	
K8	+ 5 - 13	+ 16 - 16	8 - 19	+ 10 - 23	+ 12 - 27		+ 14 - 32		+ 16 - 38	
M6	- 1 - 9	+ 3 - 12	- 4 - 15	- 4 - 17	- 4 - 20		- 5 - 24		- 6 - 28	
M7	0 - 12	0 - 15	0 - 18	0 -21	0 - 25		0 - 30		0 - 35	
M8	+ 2 - 16	+ 1 - 21	+ 2 - 25	+ 4 - 29	+ 5 - 34		+ 5 - 41		+ 6 - 48	
N6	- 5 - 13	- 7 - 16	- 9 - 20	- 11 -24	- 12 - 28		- 14 - 33		- 16 - 38	
N7	- 4 - 16	- 4 - 19	- 5 - 23	- 7 -28	- 8 - 33		- 9 - 39		- 10 - 45	
N8	- 2 - 20	- 3 - 25	- 3 - 30	- 3 - 36	- 3 - 42		- 4 - 50		- 4 - 58	
P6	- 9 - 17	- 12 - 21	- 15 - 26	- 18 - 31	- 21 - 37		- 26 - 45		- 30 - 52	
P7	- 8 - 20	- 9 - 24	- 11 - 29	- 14 - 35	- 17 - 42		- 21 - 51		- 24 - 59	
P8	- 12 - 30	- 15 - 37	- 18 - 45	- 22 - 55	- 26 - 65		- 32 - 78		- 37 - 91	
R6	- 12 - 20	- 16 - 25	- 20 - 31	- 24 - 37	- 29 - 45		- 35 - 54	- 37 - 56	- 44 - 66	- 47 - 69
R7	- 11 - 23	- 13 - 28	- 16 - 34	- 20 - 41	- 25 - 50		- 30 - 60	- 32 - 62	- 38 - 73	- 41 - 76

ISO Tolerances for SHAFTS / mm (ISO 286-2)

(micron / 0,001 mm)

>	3	6	10	18	30	40	50	65	80	100
(incl) <	6	10	18	30	40	50	65	80	100	120
a12	- 270 - 390	- 280 - 430	- 290 - 470	- 300 - 510	- 310 - 560	- 320 - 570	- 340 - 640	- 360 - 660	- 380 - 730	- 410 - 760
d6	- 30 - 38	- 40 - 49	- 50 - 61	- 65 - 78	- 80 - 96		- 100 - 119		- 120 - 142	
e6	- 20 - 28	- 25 - 34	- 32 - 43	- 40 - 53	- 50 - 66		- 60 - 79		- 72 - 94	
e13	- 220	- 270	- 334	- 410 - 440	- 50		- 60 - 520		- 72 - 612	
f5	- 25	- 32	- 40	- 49 - 36	- 25		- 30 - 43		- 36 - 51	
f6	- 10 - 18	- 13 - 22	- 16 - 27	- 20 - 33	- 25 - 41		- 30 - 49		- 36 - 58	
f7	- 10 - 22	- 13 - 28	- 16 - 34	- 20 - 41	- 25 - 50		- 30 - 60		- 36 - 71	
g5	- 4 - 9	- 5 - 11	- 6 - 14	- 7 - 16	- 9 - 20		- 10 - 23		- 12 - 27	
g6	- 4 - 12	- 5 - 14	- 6 - 17	- 7 - 20	- 9 - 25		- 10 - 29		- 12 - 34	
g7	- 4 - 16	- 5 - 20	- 6 - 24	- 7 - 28	- 9 - 34		- 10 - 40		- 12 - 47	
h3	0 - 2.5	0 - 2.5	0 - 3	0 - 4	0 - 4		0 - 5		0 - 6	
h4	0 - 4	0 - 4	0 - 5	0 - 6	0 - 7		0 - 8		0 - 10	
h5	0 - 5	0 - 6	0 - 8	0 - 9	0 11		0 13		0 15	
h6	0 -8	0 - 9	0 - 11	0 - 13	0 - 16		0 - 19		0 - 22	
h7	0 - 12	0 - 15	0 - 18	0 - 21	0 - 25		0 - 30		0 - 35	
h8	0 - 18	0 - 22	0 - 27	0 - 33	0 - 39		0 - 46		0 - 54	
h9	0 - 30	0 - 36	0 - 43	0 - 52	0 - 62		0 - 74		0 - 87	
h10	0 - 48	0 - 58	0 - 70	0 - 84	0 - 100		0 - 120		0 - 140	
h11	0 - 75	0 - 90	0 - 110	0 - 130	0 - 160		0 - 190		0 - 220	
h12	0 - 120	0 - 150	0 - 180	0 - 210	0 - 250		0 - 300		0 - 350	
j5	+3 - 2	+4 - 2	+5 - 3	+5 - 4	+6 - 5		+6 - 7		+6 - 9	
j6	+6 - 2	+7 - 2	+8 - 3	+9 - 4	+11 - 5		+12 - 7		+13 - 9	
j7	+8 - 4	+10 - 5	+12 - 16	+13 - 8	+15 - 10		+18 - 22		+20 - 15	
js5	+ 2.5 - 5	+3 - 3	+4 - 4	+ 4.5 - 4.5	+ 5.5 - 5.5		+ 6.5 - 6.5		+ 7.5 - 7.5	
js6	+4 - 4	+ 4.5 - 4.5	+ 5.5 - 5.5	+ 6.5 - 6.5	+ 8 - 8		+ 9.5 - 9.5		+ 11 - 11	
js7	+6 - 6	+ 7.5 - 7.5	+9 - 9	+ 10.5 - 10.5	+ 12.5 - 12.5		+ 15 - 15		+ 17.5 - 17.5	
k5	+6 +1	+7 +1	+9 +1	+ 11 +2	+ 13 +2		+ 15 +2		+ 18 +3	
k6	+9 +1	+ 10 +1	+ 12 +1	+ 15 +2	+ 18 +2		+ 21 +2		+ 25 +3	
k7	+ 13 +1	+ 16 +1	+ 19 +1	+ 23 +2	+ 27 +2		+ 32 +2		+ 38 +3	
m5	+9 +4	+ 12 +6	+ 15 +7	+ 17 +8	+ 20 +9		+ 24 +11		+ 28 +13	
m6	+ 12 +4	+ 15 +6	+ 18 +7	+ 21 +8	+ 25 +9		+ 30 +11		+ 35 +13	
m7	+ 16 +4	+ 21 +6	+ 25 +7	+ 29 +8	+ 34 +9		+ 41 +11		+ 48 +13	
n5	+ 13 +8	+ 16 +10	+ 20 +12	+ 24 +15	+ 28 +17		+ 33 +20		+ 38 +23	
n6	+ 16 +8	+ 19 +10	+ 23 +12	+ 28 +15	+ 33 +17		+ 39 +20		+ 45 +23	
n7	+ 20 +8	+ 25 +10	+ 30 +12	+ 36 +15	+ 42 +17		+ 50 +20		+ 58 +23	
p5	+ 17 +12	+ 21 +15	+ 26 +18	+ 31 +22	+ 37 +26		+ 45 +32		+ 52 +37	
p6	+ 20 +12	+ 24 +15	+ 29 +18	+ 35 +22	+ 42 +26		+ 51 +32		+ 59 +37	
r6	+ 23 +15	+ 28 +19	+ 34 +23	+ 41 +28	+ 50 +34		+ 60 +41	+ 62 +43	+ 73 +51	+ 76 +54

COMMONLY USED HOLE-BASIS FITS

Hole	Tolerance Zone Class of Hole																
	Clearance Fit							Transition Fit			Interference Fit						
H6						g5	h5	js5	k5	m5							
					f6	g6	h6	js6	k6	m6	n6*	p6					
H7					f6	g6	h6	js6	k6	m6	n6	p6*	r6*	s6	t6	u6	x6
				e7	f7		h7	js7									
H8					f8		h7										
				e8			h8										
H9			d9	e9													
			d8	e8			h8										
H10		c9	d9	e9			h9										
	b9	c9	d9														

COMMONLY USED SHAFT-BASIS FITS

Shaft	Tolerance Zone Class of Hole																
	Clearance Fit							Transition Fit			Interference Fit						
h5							H6	JS6	K6	M6	N6*	P6					
h6					F6	G6	H6	JS6	K6	M6	N6	P6*					
					F7	G7	H7	JS7	K7	M7	N7	P7	R7	S7	T7	U7	X7
h7				E7	F8		H7										
					F8		H8										
h8			D8	E8	F8		H8										
			D9	E9			H9										
h9			D8	E8			H8										
		C9	D9	E9			H9										
	B10	C10	D10														

*** Some exceptions for these fits may occur depending on the dim nsion.**

SOME TOLERANCES VALUE WITHOUT IN TABLES

Basic Step Dimension from .... to .... (mm)	Tolerance Zone Class of Hole			Tolerance Zone Class of Shaft			
	H3	H4	H5	h3	h4	h5	js4
1 3	+ 2 + 2	+ 3 0	+ 4 0	0 - 2	0 - 3	0 - 4	+ 1.5 - 1.5
3 6	+ 2.5 0	+ 4 0	+ 5 0	0 - 2.5	0 - 4	0 - 5	+ 2 - 2
6 10	+ 2.5 0	+ 4 0	+ 6 0	0 - 2.5	0 - 4	0 - 6	+ 2 - 2
10 18	+ 3 0	+ 5 0	+ 8 0	0 - 3	0 - 5	0 - 8	+ 2.5 - 2.5
18 30	+ 4 0	+ 6 0	+ 9 0	0 - 4	0 - 6	0 - 9	+ 3 - 3
30 50	+ 4 0	+ 7 0	+ 11 0	0 - 4	0 - 7	0 - 11	+ 3.5 - 3.5
50 80	+ 5 0	+ 8 0	+ 13 0	0 - 5	0 - 8	0 - 13	+ 4 - 4
80 120	+ 6 0	+ 10 0	+ 15 0	0 - 6	0 - 10	0 - 15	+ 5 - 5
120 180	+ 8 0	+ 12 0	+ 18 0	0 - 8	0 - 12	0 - 18	+ 6 - 6
180 250	+ 10 0	+ 14 0	+ 20 0	0 - 10	0 - 14	0 - 20	+ 7 - 7
250 315	+ 12 0	+ 16 0	+ 23 0	0 - 12	0 - 18	0 - 23	+ 8 - 8
315 400	+ 13 0	+ 18 0	+ 25 0	0 - 13	0 - 18	0 - 25	+ 9 - 9
400 500	+ 15 0	+ 20 0	+ 27 0	0 - 15	0 - 20	0 - 27	+ 10 - 10

TIGHTENING TORQUES & TENSION LOADS FOR HEX-SOCKET HEAD CAP SCREWS

Nominal Diameter (metric)	Hex Key (mm)	Thread Pitch (mm)	Class 12.9 Tension Load (kgf.m)	Class 12.9 Tightening Torque (N.m)
M2	1.5	0.40	**from** 1649 **to** 1517	**from** 0.52 **to** 0.63
M2.5	2	0.45	2746 2531	1.06 1.30
M3	2.5	0.50	4117 3800	1.84 2.26
M3.5	-	0.60	5529 5100	2.84 3.47
M4	3	0.70	7140 6585	4.22 5.16
M5	4	0.80	11683 10789	8.32 10.2
M6	5	1.00	16452 15185	14.30 17.51
M7	-	1.00	24079 22274	23.52 29.04
M8	6	1.25	30197 27897	34.44 42.31
M10	8	1.50	48075 44440	67.87 83.56
M12	10	1.75	70087 64814	116.20 143.18
M14	12	2.00	95816 88632	184.84 228.03
M16	14	2.00	132442 122729	287.36 357.10
M18	14	2.50	160424 148453	396.50 489.90
M20	17	2.50	206678 191522	560.50 969.60
M22	17	2.50	257530 238923	766.85 957.80
M24	19	3.00	297784 275946	969.15 1204.33
M27	19	3.00	390753 362615	1417.63 1772.15
M30	22	3.50	475873 441351	1933.30 2411.40
M33	24	3.50	592711 550321	2614.50 3275.20
M36	27	4.00	695526 645441	3370.30 4213.40
M39	-	4.00	835380 775921	4359.90 5470.80
M42	32	4.50	955884 887420	5404.20 6768.50
M45	-	4.50	1123036 1043387	6768.60 8503.50
M48	36	5.00	1256949 1167287	8122.00 10186.10
M52	-	5.00	1512368 1405684	10462.40 13164.30
M56	41	5.50	1742185 1618931	12953.70 16882.40
M60	-	5.50	2033432 1890903	16046.90 16282.40
M64	46	6.00	2306271 2144137	19393.30 24418.60
M68	-	6.00	2641950 2457681	23421.30 29559.10

1 kgf.m = 9.81 N.m **1 N.m = 0.102 kgf.m**

Mechanical Properties of Screws

TS 3576 (DIN ISO 898)

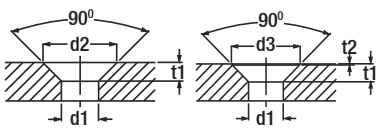
Material Properties		3.6	4.6	4.8	5.6	5.8	6.8	8.8	9.8	10.9	12.9
Tensile Strength	Rm N/mm^2	300	400		500		600	800	900	1000	**1200**
Yield Strength	R eL N/mm^2	180	240	320	300	400	480	-	-	-	**-**
0.2% Yield Strength	Rp 0.2 N/mm^2	-	-	-	-	-	-	640	720	900	**1000**
Elongation %	A	25	22	14	20	10	8	12	10	9	**8**

Countersunk Head Screws / Hex-Socket

DIN 74

Type - A

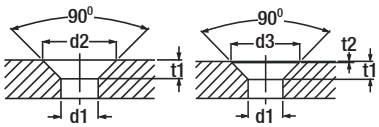
Medium Quality (o) / Fine Quality (i)



for TS 1023 / 1,3,4,7 — for TS 432 / 10,11,12,14,15,16

Type - B

Medium Quality (o) / Fine Quality (i)

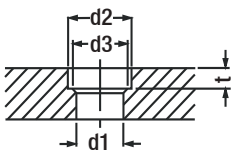


for DIN 7991 (TS 1023 / 13) screws

Screw Dimension			M2	M3	M4	M5	M6	M8	M10	M12	M16	M20
Quality o	d1	H13	2.4	3.4	4.5	5.5	6.6	9	11	14	18	22
	d2	H13	4.6	6.5	8.6	10.4	12.4	16.4	20.4	24.4	32.4	40.4
	t1		1.1	1.6	2.1	2.5	2.9	3.7	4.7	5.2	7.2	9.2
Quality i	d1		2.2	3.2	4.3	5.3	6.4	8.4	10.5	13	17	21
	r3		4.3	6	8	10	11.5	15	19	23	30	37
	t1		1.2	1.7	2.2	2.6	3	4	5	5.7	7.7	9.7
	t2	H13	0.15	0.25	0.3	0.3	0.45	0.7	0.7	0.7	1.2	1.7
Quality o	d1	H13	-	3.4	4.5	5.5	6.6	9	14	18	18	22
	d2		-	6.6	9	11	13	17.2	21.5	26	32	38
	t1	H12	-	1.6	2.3	2.8	3.2	4.1	5.3	6	7	8
Quality i	d1	H12	-	3.2	4.3	5.3	6.4	8.4	10.5	13	17	21
	r3		-	6.3	8.3	10.4	12.4	16.5	20.5	25	31	37
	t1		-	1.7	2.4	2.9	3.3	4.4	5.5	6.5	7.5	8.5
	t2		-	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.5

Hex-Socket Head Cap Screws

DIN 974-1 / DIN 74

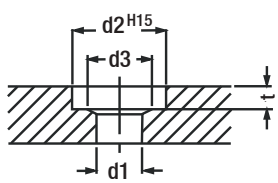


Type - H: DIN TS 1020 / 18, TS 1020 / 17
Type - J: DIN TS 1020 / 16
Type - K: DIN TS 1020 / 15

Screw Dimension		M5	M6	M8	M10	M12	M14	M16	M20	M24	M30
d1	o - H13	5.5	6.6	9	11	14	16	18	22	26	33
	i - H12	5.3	6.4	8.4	10.5	13	15	17	21	25	-
d2	H13	10	11	15	18	20	24	26	33	40	48
d3		only burr				16	18	20	24	28	36
t	Type - H	4	4.7	6	7	8	9	10.5	12.5	14.5	-
	Type - J	4.2	4.8	6	7.5	8.5	9.5	11.5	13.5	15.5	19.5
	Type - K	5.7	6.8	9	11	13	15	17.5	21.5	25.5	32

Countersunk Head Screws and Fillister Head Screw

DIN 974-2 / DIN 74



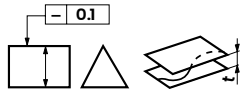
DIN 931, 934 etc., (TS 1021 / ... etc.)
Type-SA & Type-TA = for Socket Wrench
Type-SB & Type-TB = for Box Wrench

Screw Dimension		M5	M6	M8	M10	M12	M14	M16	M20	M24	M30
d1	o - H13	5.5	6.6	9	11	14	16	18	22	28	33
	i - H12	5.3	6.4	8.4	10.5	13	15	17	21	25	-
d2	SA.TA	15	18	24	28	33	36	40	46	57	71
H15	SB.TB	18	20	26	33	36	43	46	53	71	82
d3		only burr							16	20	24
t	SA.SB	4.2	4.8	6.5	8	9	10	11.5	14.5	16.5	21
	TA.TB	4.7	5.8	7.5	9	11	12	14.5	17.5	20.5	26

FORM and POSITION TOLERANCES IN ACCORDANCE with DIN ISO 1101

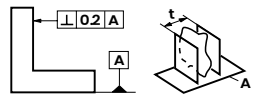
Form and positional tolerances are specified only when dimensional tolerances alone are insufficient to ensure functional requirements. This mainly applies to characteristics such as coaxiality, symmetry, and run-out.

Straightness



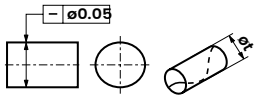
The actual edge of the prism must lie between two parallel planes spaced t = 0.1 mm apart.
If a surface or line is toleranced, the minimum spacing between the indicating arrow or datum triangle and the dimensional line should not fall below 4 mm.

Perpendicularity



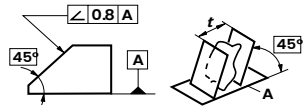
The actual surface must lie between two planes which are parallel and perpendicular to the reference surface A and are t = 0.2 mm apart.

Straightness



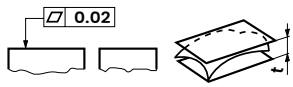
The actual axis of the cylinder must lie within a cylinder of diameter t = 0.05 mm.
In the case of tolerancing an axis or central plane, the indicating arrow or the datum triangle lies on an extension of the dimensional line.

Slope



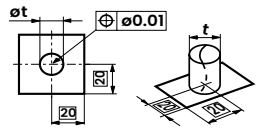
The actual surface must lie between two planes which are parallel and are inclined in relation to the reference surface A at the geometrically ideal angle of 45°, and are t = 0.8 mm apart.

Flatness



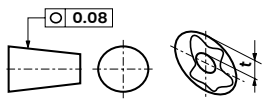
The actual surface must lie between two parallel planes spaced t = 0.02 mm apart.

Position



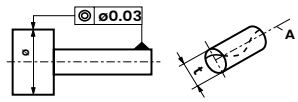
The actual axis of the bored hole must lie within a cylinder of diameter t = 0.01 mm, the axis of which is located at the geometrically ideal location.

Roundness
(circularity)



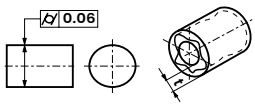
The actual circumference of each cross-section must lie between two concentric circles spaced t = 0.08 mm apart.

Coaxiality
Concentricity



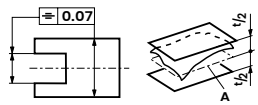
The actual axis of the large diameter must lie within a cylinder which is coaxial with the reference axis A and has a diameter of t = 0.03 mm.

Cylindricity



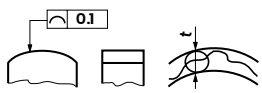
The actual surface of the cylinder must lie between two coaxial cylinders which have a spacing of t = 0.06 mm.
The cylindricity is the sum of tolerances for roundness and parallelism.

Symmetry



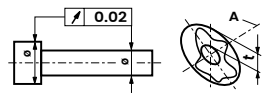
The actual central plane of the groove must lie between two parallel planes spaced t = 0.7 mm apart, which are arranged symmetrically in relation to the central plane of the reference surface A.

Profile of any lin



The actual line must lie between two envelope lines on circles having a diameter t = 0.1 mm.

True running

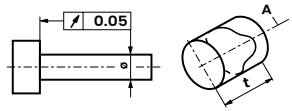


When rotated about the reference axis A, the true-running deviation (run-out) must not exceed t = 0.02 mm.
This tolerance is the sum of roundness and coaxiality tolerances.

Profile of any surfac

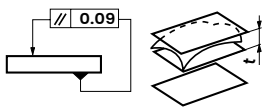
The actual surface must lie between two envelope surfaces on spheres having a diameter t = 0.07 mm.

Axial running



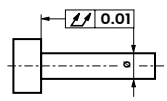
When rotated about the reference axis A, the axial running deviation (axial run-out) must not exceed the tolerance t = 0.05 mm.

Parallelism



The actual surface must lie between two planes which are parallel to the reference surface and are spaced t =0.09 mm apart.

Total run-out



Given multiple rotation about the reference axis and axial displacement between workpiece and measuring instrument, all the measured points must lie within the overall run-out tolerance of t = 0.01 mm.

The most recent editions of the DIN ISO standards are always the authoritative and reliable sources.

STEEL HARDNESS CONVERSION TABLE

Tensile Strength N / mm²	Vickers HV	Brinell HB	Rockwell HRC
835	260	247	24
850	265	252	24.8
865	270	257	25.6
880	275	261	26.4
900	280	266	27.1
915	285	271	27.8
930	290	276	28.5
950	295	280	29.2
965	300	285	29.8
1030	310	295	31
1060	320	304	32.2
1095	330	314	33.3
1125	340	323	33.4
1155	350	333	33.5
1190	360	342	36.6
1220	370	352	37.7
1255	380	361	38.8
1290	390	371	39.8
1320	400	380	40.8
1350	410	390	41.8
1385	420	399	42.7
1420	430	409	43.6
1455	440	418	44.5
1485	450	428	45.3
1520	460	437	46.1
1555	470	447	46.9
1595	480	(456)	47.7
1630	490	(466)	48.4
1665	500	(476)	49.1
1700	510	(485)	49.8
1740	520	(495)	50.5
1775	530	(504)	51.1
1810	540	(513)	51.7
1845	550	(523)	52.3
1880	560	(532)	53
1920	570	(542)	53.6
1955	580	(551)	54.1
1995	590	(561)	54.7
2030	600	(570)	55.2
2070	610	(580)	55.7
2105	620	(589)	56.3
2145	630	(599)	56.8
2180	640	(608)	57.3
-	650	(618)	57.8
-	660	-	58.3
-	670	-	58.8
-	680	-	59.2
-	690	-	59.7
-	700	-	60.1
-	720	-	61
-	740	-	61.8
-	760	-	62.5
-	780	-	63.3
-	800	-	64
-	820	-	64.7
-	840	-	65.3

BRONZE ALLOYS COMPARISON TABLE

Material	DIN	EN	NF/AFNOR	BS	ISO	JIS	SAE / AISI & Other
2.0220	CuZn5	CW500L	CuZn5	CZ125	CuZn5	C2100	C21000 . B134 - 1
2.0230	CuZn10	CW501L	CuZn10	CZ101	CuZn10	C2200	C22000
2.0240	CuZn15	CW502L	CuZn15	CZ102	CuZn15	C2300	C23000.B 134 - 6.B135-1
2.0250	CuZn20	CW503L	CuZn20	CZ102	CuZn20	C2400	C24000
2.0265	CuZn30	CW505L	CuZn30	CZ102	CuZn30	C2600	C26000.B 134 - 6.B135-2
2.0321	CuZn37	CW508L	CuZn37	CZ108	-	C2700	C27200 . MS63
2.0360	CuZn40	CW509L	CuZn40	CZ109	CuZn40	C2800	C28000
2.0598	CuZn25Al5	CC762	-	HTB3	CuZn25	-	C86300 . SAE 430B
2.0596	CuZn34Al2	-	U-Z 36 N3	HTB1	-	-	C86200 . SAE 430A
2.0592	CuZn35Al1	-	U-Z 36 N3	HTB1	CuZn35	-	C86500 . SAE 43
2.0510	CuZn37Al1	CW716R	-	-	-	-	-
2.0550	CuZn40Al2	CW713R	-	C2135	CuZn37	-	C76420 . So - MS Al2
2.0561	CuZn40Al1	CW718R	-	-	-	-	-
2.0401	CuZn39Pb3	CW614N	-	CZ121 Pb3	-	-	MS58
2.0241	CuZn39Pb2	CW617N	-	CZ123	-	-	So - MS58 Pb2
2.0460	CuZn20Al2	CW720R	-	-	-	-	-
2.0872	CuNi10Fe1Mn	-	-	-	-	-	-
2.0882	CuNi30Mn1Fe	CW354H	-	-	-	-	-
2.0936	CuAl10Fe3Mn2	-	-	-	-	-	-
2.0975	CuAl8Mn	-	-	-	-	-	-
2.0936	CuAl10Fe	CW306G	-	-	-	-	C45200 . B150 . B124
2.0975.04	CuAl10Ni	-	U - A - 10N	-	-	-	C95500
2.0978	CuAl11Fe6Ni6	CW308G	-	-	-	-	-
-	CuAl10Ni5Fe4	CW307G	-	CN102	-	-	C63000 B 171 - 95
2.1020	CuSn6	CW452K	-	-	-	-	-
2.1030	CuSn8	CW453K	-	-	-	-	-

STANDARD PROGRESSION OF SURFACE ROUGHNESS (REFERENCE)

Arithmetical Average Roughness "Ra"			Max. Height "Ry"	10 Point Average Roughness "Rz"	"Ry - Rz" Reference Length	Conventional Finishing Symbols
Standard Progression	Cut-off Value λc (mm)	Modern Finishing Symbols	Standard Progression		ℓn(mm)	
0.012 0.025 0.05 0.1 0.2	0.08 0.25 0.8	0.012 0.2	0.05 0.1 0.2 0.4 0.8	0.05 0.1 0.2 0.4 0.8	0.08 0.25 0.8	
0.4 0.8 1.6		0.4 1.6	1.6 3.2 6.3	1.6 3.2 6.3		
3.2 6.3	2.5	3.2 6.3	12.5 25	12.5 25	2.5	
12.5 25	8	12.5 25	50 100	50 100		
50 100	-	50 100	200 400	200 400	8 -	-

STEEL GRADES COMPARISON TABLE

Case Hardening Steels

Material Nr.	ISO (683/1, 10, 11)	SAE AISI	BS 970 Part-1	DIN	NF A35 - 551 - 554	JIS G 4052
1.5713	13NiCr6	3115	-	13NiCr6	10NC6	-
1.5752	14NiCr14	3415 - 3310	655H13	14NiCr14	14NC12	-
1.5919	15CrNi6	3115	S107.970-3	15CrNi6	16NC6	-
1.5920	18CrNi8	6264	080M46	18CrNi8	-	-
1.6523	21NiCrMo2	8620	805H20.805M20	21NiCrMo2	20NCD2	SNCM220H
1.6587	17NiCrMo6	4820, 4317	820A16	17NiCrMo6	18NCD6	-
1.7015	15Cr3	5015	523M15.530A32	15Cr3	12C3.15Cr2.18C3	-
1.7034	34Cr4	5135	530A36.530M36	34Cr4	37Cr4.38C4	-
1.7035	41Cr4	5140	530A40.530M40	41Cr4	41Cr4.42C4	-
1.7131	16MnCr5	5115	527M17.590H17	16MnCr5	16MC5.16MnCr5	-
1.7139	16MnCrS5	5115	527M17.590H17	16MnCrS5	16MC5	SMnC420H
1.7147	20MnCr5	5120	-	20MnCr5	20MC5	SMnC420H
1.7149	20MnCrS5	4820, 4826	-	20MnCrS5	-	-
1.7243	18CrMo4	-	708M20	18CrMo4	18CD4	-
1.7321	20MoCr4	8620	805A22	20MoCr4	20MoCr4KD	-
1.7323	20MoCrS4	8620	-	20MoCrS4	-	-
1.7352	25CrMo4	-	-	25CrMo4	-	-
1.7326	25CrMoS4	-	-	25CrMoS4	-	-

Tempered Steels

Material Nr.	ISO (683/1, 10, 11)	SAE AISI	BS 970 Part - 1	DIN	NF A35 - 551 - 554	JIS G 4052
1.6511	-	4340, 9840	817M37, 816M40	36CrNiMo4	35NCD5, 40NCD3	-
1.6580	-	4340	823M30	30CrNiMo8	30CND8	SNCM431
1.6582	-	4340, 4337	816M40, 817M40	34CrNiMo6	35NCD3	SNCM447
1.7006	-	5045, 5046	-	46Cr2	42C2, 46Cr2	-
1.7033	34Cr4	5132	530A32, 530M32	34Cr4	32C4, 34Cr4	SCr430
1.7034	34Cr4	5135	530A36, 530M32	37Cr4	38Cr4, 38C4	SCr435
1.7035	41Cr4	5140	530A40, 530M40	41Cr4	41Cr4, 42C4	SCr440
1.7218	-	4130	708A25	25CrMo4	25CD4, 25CrMo4	SCM430
1.7220	34CrMo4	4135, 4137	708A37	34CrMo4	35CrMo4, 35CD4	SCM432
1.7225	42CrMo4	4140, 4142	708M40, 311-5/1	42CrMo4	42CD4TS	SCM440
1.7228	-	4150	708A47	50CrMo4	50CrMo4	SCM445

ISO: International Organization for Standardization
DIN: Deutsches Institut für Nörmung / German Standards
SAE: Society Automotive Engineers

BS: British Standards
AISI: American Iron and Steel Institute
JIS: Japan Industrial Standards

UNI: Ente Nazionale Italiano di Unificazione
NF: Norme Francaise

STEEL GRADES COMPARISON TABLE

Cold Work Tool Steels

Material Nr.	DIN	AISI	BS	NF / AFNOR	JIS
1.2080	X210Cr12	D3	BD3	Z200C12, X200Cr12	SKD1
1.2345	X50XrVMo 5 - 1	-	-	-	-
1.2379	X155CrVMo 12 - 1	D2	BD2	Z160CDV12	SKD11
1.2380	X220CrVMo 13 - 4	-	-	-	-
1.2436	X210CrW12	D6	D6	-	SKD2
1.2601	X165CrMoVa12	-	-	-	SKD11

Hot Work Tool Steels

Material Nr.	DIN	AISI	BS	NF / AFNOR	JIS
1.2343	X37CrMoV 5 - 1	H11	BH11	Z38CDV5	SKD6
1.2344	X40CrMoV 5.1	H13	BH13	Z40CDV5	SKD61
1.2365	X32CrMoV 3.3	H10	BH10	32CDV28	SKD7
1.2367	X38CrMoV 5.3	H11	BH11	-	SKD61
1.2581	X30WCRV 9.3	H21	BH21	Z30WCV9	SKD5
1.2714	X 165CrMoVa 12	6F3, L6	BS224	55NCDV7	SKT4

Plastic Mould Steels

Material Nr.	DIN	AISI	BS	ASTM	NF / AFNOR
1.2083	X42Cr13	420	SUS 420J2	-	X41CR13KU
1.2312	40CrMnMoS 8-6	P20 + S	-	-	-
1.2738	40CrMnNiMo 8 - 6 - 4	P20	SNCM	90MV8	40CMND8

Oil Hardening Tool Steels

Material Nr.	DIN	AISI	BS	NF / AFNOR	JIS
1.2510	100MnCRW4	O1	-	-	SK33
1.2842	90MnCrV8	O2	BO2	90MV8	-

Spring Steels

Material Nr.	DIN	AISI	BS	NF / AFNOR	EN 100027-2
1.0900	38Si6	-	-	-	1.5022
1.0902	46Si7	9245	-	45S7	1.5024
1.0903	51Si7	9255	-	50S7	1.5025
1.0904	55Si7	5155H, 9225	251A58	55S7	1.5026
1.0908	60SiMn5	-	-	-	1.5142
1.0961	60SiCr7	9262	-	-	-
1.0970	38Si7	-	-	-	1.5023
1.5028	65Si7	9260H	251A61	60S7	1.5028
1.5029	71Si7	-	-	-	-
1.5225	51MnV7	-	-	-	-
1.7103	67SiCr8	9254	-	-	1.7103
1.7138	52MnCrB3	50B50	-	-	-
1.7176	55Cr3	5155	-	-	-
1.7701	51CrMoV7	-	-	-	-

Recommended Materials for Injection Mould & Stamping Die Production

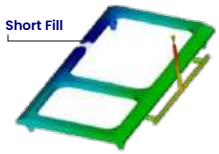
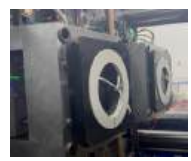
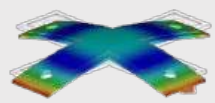
The following steels are standard grades.

Mat. No.	DIN Name	Chemical Composition (%)	Strength	Hardening / Nitriding
1.1730	C45	C: 0.45; Si: 0.3; Mn: 0.7	Annealed, strength approx. 650 N/mm²	Hardening not common, since there is the risk of stress cracking and excessive distortion on hardening, consequently it should only be used in exceptional cases. Nitriding not common.
1.2080	X 210 Cr 12	C: 2.1; Si: 0.3; Mn: 0.3; Cr: 12.0	Soft-annealed with max. 800 N/mm² (250 HB)	Hardening: 930–960 °C oil or 950–980 °C air. Usual working hardness 50–56 HRC. Nitriding not common, since installation hardness and corrosion resistance are impaired.
1.2083	X 40 Cr 14	C: 0.42; Cr: 14.0	Soft-annealed with max. 760 N/mm² (225 HB)	Hardening in hot bath or oil, Usual working hardness 50–56 HRC. Nitriding not common, since the installation hardness and corrosion resistance are impaired.
1.2085	X 33 Cr S 16	C: 0.3; Si: 0.5; Mn: 1.0; Cr: 16.0; S: 0.1	Tempered to 950–1100 N/mm² (280–320 HB)	Used in the delivered state, i.e. pre-tempered to 280–320 HB.
1.2162	21 Mn Cr 5	C: 0.21; Mn: 1.3; Cr: 1.2	Soft-annealed 600 N/mm²	Hardening in oil, usual working hardness 59–61 HRC. Core strength approx. 1080 N/mm 2. Nitriding possible according to all methods, but usually carried out only in the tempered state.
1.2311	40 Cr Mn Mo 7	C: 0.40; Mn: 1.5; Cr: 1.9; Mo: 0.2	Pre-tempered to 950–1100 N/mm² (280–325 HB)	Hardening is not common. In exceptional cases, consult the heat-treating department. Nitriding for improving the wear resistance possible according to all known nitriding methods.
1.2312	40 Cr Mn Mo S 8 6	C: 0.4; Mn: 1.5; S: 0.05 0.1; Cr: 1.9; Mo: 0.2	Pre-tempered to 950–1100 N/mm² (300–345 HB)	Hardening not common. In exceptional cases, in air or hot bath. In the oil bath there is a risk due to stress cracks. Nitriding can be easily carried out using all known methods; however, slow cooling is necessary due to the risk of stress cracking.
1.2316	X 38 Cr Mo 16	C: 0.36; Cr: 16.0; Mo: 1.2; Ni: ≤ 1	Tempered 950–1100 N/mm² (280–320 HB)	Used in the delivered state, i.e. pre-tempered to 280–320 HB. Nitriding reduces the corrosion resistance.
1.2343	X 37 Cr Mo V 5-1	C: 0.39; Si: 1.1; Cr: 5.2; Mo: 1.5; V: 0.4	Soft-annealed with max. 780 N/mm² (229 HB)	Hardening in oil, air or hot bath, usual working hardness 30–53 HRC. Nitriding readily possible according to all known methods. Especially advantageous if the wear resistance is to be increased further at maximum core strength.
1.2344	X 40 Cr Mo V 5-1	C: 0.4; Si: 1.1; Cr: 5.2; Mo: 1.5; V: 1.0	Soft-annealed with max. 780 N/mm² (229 HB)	1.2344 steel is hardened by heating to 1020–1050°C, followed by rapid quenching. It typically achieves a hardness of 52-54 HRC. Nitriding is performed at 500–550°C, enhancing surface hardness and wear resistance. Slow cooling is required to avoid stress cracking.
1.2363	X 100 Cr Mo V 5	C: 1.00; Si: 0.3; Mn: 0.5; Cr: 5.1; S: 1.0; V: 0.15	Soft-annealed with max. 800 N/mm² (240 HB)	Hardening in oil, air or hot bath, usual working hardness 63–65 HRC. Nitriding not common.
1.2379	X 155 Cr V Mo 12-1	C: 1.55; Cr: 12.0; Mo: 0.7; V: 1.0	Soft-annealed with max. 860 N/mm² (255 HB)	Hardening in oil, air or hot bath, usual working hardness 56–62 HRC. Nitriding very readily possible according to all known methods, although the material must be subjected to secondary hardening.
1.2436	X 210 Cr W 12	C: 2.1; Cr: 12.0; W: 0.7	Soft-annealed with max. 860 N/mm² (255 HB)	Hardening in oil, air or hot bath, usual working hardness 58–65 HRC. Nitriding suitable to a limited extent, we recommend the material 1.2379.
1.2767	45 Ni Cr Mo 16	C: 0.45; Cr: 1.4; Mo: 0.3; Ni: 4.1	Soft-annealed with max. 880 N/mm² (262 HB)	Hardening in oil, air or hot bath, usual working hardness ~52 HRC. Nitriding possible, but not common on account of the drop in strength at the nitriding temperature.
1.2842	90 Mn Cr V 8	C: 0.9; Mn: 2.0; Cr: 0.4; V: 0.1	Soft-annealed with max. 770 N/mm² (229 HB)	Hardening in oil or hot bath, usual working hardness 56–62 HRC. Normally this material is not nitrided. In this case we recommend the material 1.2379.
3.4365	Al Zn Mg Cu 1.5	Si: 0.4; Fe: 0.5; Cu: 1.2-2.0; Mn: 0.3; Mg: 2.1-2.9; Cr: 0.18-0.28; Zn: 5.1-6.1; Ti: 0.2; Ti+Zr: 0.25	Rolled, artificially aged, stretched for stress relief. Tensile strength 480–530 N/mm²	

Key Features and Applications of Recommended Materials for Mould and Die Production

Mat. No.	Key Features	Applications
1.1730	Unalloyed tool steel with excellent machinability; chilled cast steel, suitable for flame and inductive hardening.	Used in mould, die, and apparatus production where unhardened parts are used.
1.2080	High-chromium-alloy tool steel with great dimensional stability and maximum wear resistance. Polishing is possible, but a mirror finish cannot be achieved. Structure erosion is not possible, as coarse carbides are washed out.	For punches and die plates used in high-speed cutting, pressure strips, guide strips, hobs, and slides subjected to high surface loading.
1.2083	Low corrosion, high-alloy, low warpage steel for through-hardening, offering excellent properties for mirror polishing, good photo etching, high machinability, excellent wear resistance, and high dimensional stability.	Cavity plates and inserts for working with chemically aggressive plastics; due to excellent polishability, they are suitable for optical and medical products.
1.2085	Corrosion-resistant, pre-hardened mould steel with high strength and without subsequent heat treatment.	Plates for corrosion resistant mould bases and die sets; moulds for corrosive plastics; better corrosion resistance reduces the amount of mould maintenance required. !Not suitable for mould inserts!
1.2162	Standard case-hardened steel with good machinability, after suitable heat treatment, a high surface hardness with good wear resistance and a tough core.	Machine parts and mould plates with high surface hardness; synthetic resin press moulds for processing thermoplastics and thermosets.
1.2311	Alloyed and pre-toughened tool steel, especially suitable for polishing; high dimensional stability.	Cavity plates, inserts, and machine parts requiring high strength without the need for subsequent heat treatment.
1.2312	Alloyed and pre-toughened tool steel with excellent machinability in the hardened condition due to the sulphur additive; offers high dimensional stability.	Plates for mould bases and dies with increased strength requirements; high-tensile machine parts.
1.2316	Good corrosion resistance especially with polished surface. Good properties for etching and structure eroding.	Moulds for processing corrosive plastics.
1.2343	High hot strength, maximum toughness with high installation hardness. Very good thermal conductivity, readily machinable. Very suitable for mirror finishes on account of the homogeneity. Best properties during etching, embossing, structure eroding. Eroding readily possible.	Mould plates and for diecasting, injection-moulding and extrusion tools.
1.2344	High-alloy hot-work steel, high heat resistance, high wear resistance, good toughness, thermal conductivity and hot cracks resistance.	Standard material for hot-work tools, extrusion moulds, dies, tools for plastic processing.
1.2363	Dimensionally stable cold-work steel with a very high toughness, good machinability and a high through-hardening capacity.	Cavity plates, inserts, cutting punches, wear plates, and cutting dies with high toughness requirements.
1.2379	High-alloy steel for through-hardening with moderate machinability; extremely wear-resistant, low warpage, good dimensional stability, toughness, and through-hardening capability.	Mould plates, inserts, cutting punches, wear plates, and cutting tools with high wear resistance requirements.
1.2436	Dimensionally stable chrome steel with high wear resistance, good compressive strength, and adequate toughness.	Used for cutting, punching, drawing, pressing, shearing, and bending tools, as well as guide strips.
1.2767	Nickel-alloyed steel for through-hardening, with moderate machinability; excellent resistance to bending, high compressive strength, and very high toughness; good through-hardening ability, even for larger sections.	High-performance cavity plates and inserts for processing plastics with high surface requirements (mirror finish); stamping, forming, and bending inserts for applications with particularly high pressure and bending stresses.
1.2842	Oil-hardening steel with simple heat treatment, offering easy machinability, high hardenability, and good dimensional stability. EDM and hard chrome plating: possible. Polishing, etching, nitriding: not possible – use 1.2379 instead.	Cavity plates and inserts exposed to abrasive stress; cutting punches, wear plates, cutting dies, and guiding plates; pressure pads and guiding rails.
3.4365	Highest-strength aluminum material with optimal thermal conductivity, good workability (machining, eroding, polishing), and weight-saving properties.	Plates for mould bases and die sets with increased strength requirements; components for machine and jig construction.

TYPICAL MOULDING PROBLEMS and POTENTIAL CAUSES

Cause / Problem		Injection Moulding Machine	Mould	Material
Short fill		1- Low material temperature 2- Low injection pressure 3- Material feed shortage 4- Too small nozzle hole diameter 5- Cylinder nozzle clogging	1- Small gate or runner 2- Inadequate gate position 3- Inadequate position of or no air vent 4- Low mould temperature 5- Cold slag clogging in runner or gate	1- Low fluidit 2- Low lubricity
Flash		1- Weak clamping force 2- High injection pressure 3- Material overfeed 4- High material temperature	1- Defect or Contamination on Parting Plane 2- Wide project area to the machine 3- High mould temperature	1- Excessive fluidit
Sink marks		1- Low injection pressure 2- Slow injection speed 3- High material temperature 4- Short pressure retention 5- Material feed shortage	1- High mould temperature 2- Products thickness uneven 3- Small gate 4- Cooling time shortage 5- Inadequate ejection	1- Material, too soft 2- High contraction coefficien
Weld lines		1- Low material temperature 2- Low injection pressure 3- Slow injection speed	1- Small gate or runner 2- Low mould temperature 3- Inadequate gate position 4- Inadequate air vent	1- Rapid curring 2- Insufficient dryin 3- Low lubricity
Poor gloss / Surface haze		1- Nozzle clogging or small diameter 2- Material feed shortage	1- Inadequate air vent 2- Small gate or runner 3- Insufficient measures for corrosio 4- Excessive mould release agent	1- Insufficient dryin 2- High volatility 3- A foreign body mixed
Flow mark		1- Low material temperature 2- Low injection pressure 3- Slow injection speed 4- Too small nozzle diameter	1- Low mould temperature 2- Products thickness uneven 3- Small gate or runner 4- Small or no slag / deposit well	1- Low fluidit 2- Low lubricity
Jetting / Bubble (splay)		1- Fast injection speed 2- Low injection pressure 3- Small injection capacity 4- Short pressure retaining 5- High material temperature	1- Inadequate air vent 2- Small gate or runner 3- Products thickness uneven 4- Small or no slag / deposit well	1- Insufficient dryin 2- High volatility
Burn marks		1- High material temperature 2- Long stay inside cylinder 3- Flaw inside cylinder	1- Inadequate position of or no air vent 2- Small or no slag / deposit well 3- Oil or something inside cavity	1- Excessive lubricant 2- Insufficient dryin
Sprue / Ejection Failure		1- High injection pressure 2- Material overfeed	1- Dislocations of nozzle hole and sprue hole 2- High mould temperature 3- Low sprue gradient 4- Undercut on or low gradient of cavity	1- Insufficient lubrican
Warping / Deformation		1- High injection pressure 2- Long pressure retaining 3- Insufficient annealin	1- No good ejection mechanism 2- High mould temperature 3- Big gate 4- Uneven cooling	1- Low fluidit 2- High contraction coefficien 3- Low material rigidity

NOTES

NOTES

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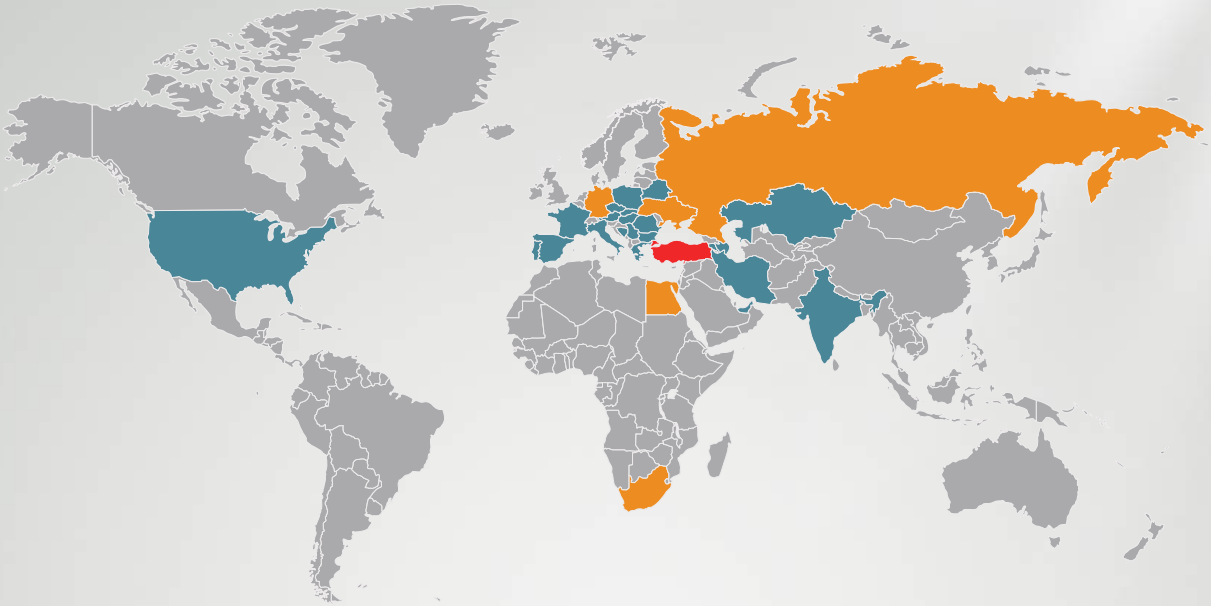

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