Catalogue 2008/22GB

CLAMPING. SCREWING. LOCKING.

Plus Service Guarantee

Magnetic clamping technology

WE GENERATE EXCITEMENT.

Since its founding by Andreas Maier in 1890, our company has lived though many exciting times. Today we are the leading manufacturer in Europe, supplying over 5,000 different products from the fields of clamping, screwing and locking. With this extensive product range we can meet all of our customers' needs and requirements. But providing optimal quality means meeting the challenges at all levels: Expert consultation, modern team organisation, individual solutions (including special developments), flexibility in response to changing conditions, etc. And we ourselves find this so exciting that we look forward every day to shaping the market together with our employees and our customers – both now and in the future. That is something you can count on.

COMPANY HISTORY

1890 Company founded by Andreas Maier as a lock manufacturer.

1920 Production program extended to include spanners.

1928 Production-line assembly of „FELLBACH LOCKS".

1951 With the introduction of clamping elements, AMF diversified into the fields of workpiece and tool clamping.

1965 Toggle clamps extend the AMF product range. AMF catalogues are now published in ten languages.

1975 Hydraulic clamping marks further specialisation.

1982 Clamping and fixture systems round off AMF's clamping expertise.

1996 Introduction of the AMF Team Organisation in all business sectors. Quality assurance certified to ISO 9001.

2001 Introduction of the AMF Service Guarantee for all products.

2004 Introduction of the ZPS zero-point clamping system.

2007 The TTEC clamping system for automated welding and magnetic clamping technology extend the AMF product range.

MANAGING DIRECTORS

> Volker Göbel
Johannes Maier
Hans-Günther Maier

THE AMF SERVICE GUARANTEE

> Assuredly on the way to the top

5 Individual development
You cannot find the product you need? Talk to us; we will find the right solution for you – from a special version, right through to a completely new development.

4 Warranty
We believe in the high quality of our products. Complaints are dealt with quickly, unbureaucratically and generously – as far as possible, even well-beyond the guarantee period.

3 Certified quality
AMF stands for painstaking production in our own works. We have followed this tradition since 1890 – today, of course, with a modern quality assurance system to ISO 9001.

2 Short delivery times
From the AMF finished-product stores with over 5.000 articles, we can supply 98 % of orders from stock. And you can be sure that every stock article ordered is espatched the same day.

1 Real technical advice
Many tasks and a multitude of solutions. From AMF Professional Products you can find the right way to solve your problem – fast and reliably – either at your local dealer or with the help of the specialist in our team. Just call us!

E Made in Germany
It goes without saying that our range of products is developed and manufactured by our team of employees in Germany.

2008/2GB

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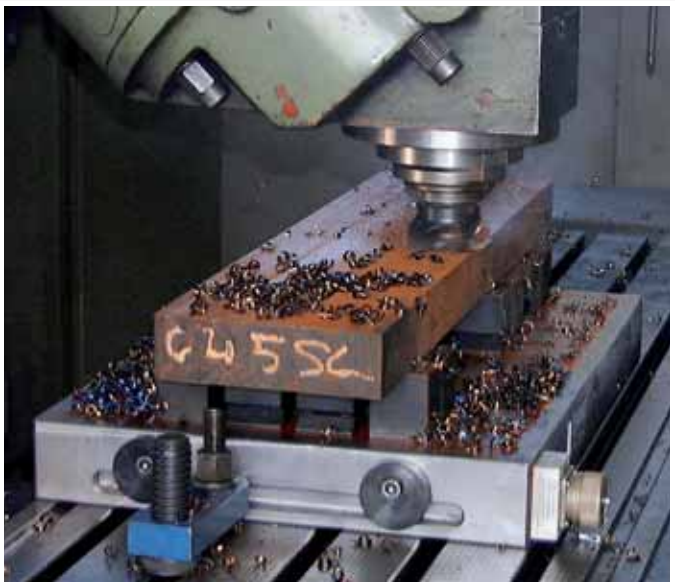

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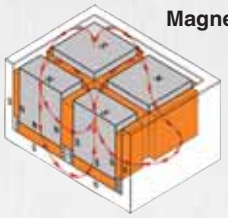
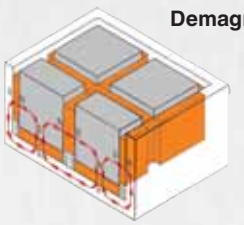
„AMF magnetic clamping technology, the winning technology!“

Functional principle of the magnetic clamping technology:

Based on years of development work and experience, AMF has been able to go beyond the typical limitations of obsolete electro-mechanical clamping systems, which are unsafe, unreliable, subject to overheating, and maintenance-intensive. The innovative AMF electropermanent technology has enabled electropermanent magnetic systems capable of ensuring great strength, total security, and long-term reliability.
The **double magnetic cycle** comprises a series of square poles in a chessboard arrangement. At the 4 sides of the poles there are static permanent magnets, while under the poles there are reversible magnets.
The windings of the reversible magnets generate a brief, **strong magnetic field** that is able to reverse the polarity of this type of magnet in a fraction of a second. This characteristic makes it possible for the square pole plates to either direct their entire magnetic field outwards - the entire force is then available to magnetize workpieces - or to short-circuit it inside the plate - meaning that the clamping surface is then completely free of magnetic flux.





The „**neutral crown**“ enables total **magnetic insulation**, which means that previous disadvantages like chips adhering to the workpiece have been virtually eliminated.

Even safe without current!

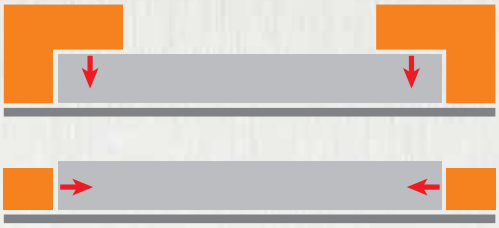
The system is insensitive to possible power failures and therefore **”intrinsically safe”**. The current to reverse polarity is only needed for a few seconds, the power consumption practically non-existent, even though the magnetic force is constant for an unlimited period. The clamping surface is not heated, so deformation or expansion of the workpiece is not possible.

The AMF magnetic clamping technology represents an innovation over previous systems

Features	previous magnetic clamping systems	The AMF magnetic clamping technology
Clamping power	approx. 350 - 830 daN	**375 - 1000 daN**
Repeatability	approx. 0,1 mm	**0,01 mm**
Plane parallelism	approx. 0,1 mm	**up to 0,02 mm**
Electric voltage	400 V / 16 A	**230 V / 16 A**
Material thickness of the magnetic clamping plates	larger than 50 mm	**from 35 mm**
Thread for pole extensions	not hardened	**hardened**

Beyond traditional limits

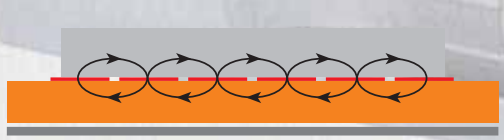
Even the most sophisticated machine tools are frequently unable to realize their full potential due to restraints represented by traditional clamping systems.



In fact, the workpieces are never completely free to execute all the machining anticipated when operating with vices and clamps and it is therefore necessary to proceed with successive positioning to carry out the cycle completely, with all the inevitable drawbacks in terms of productivity. Moreover, the use of traditional mechanical systems frequently induce structural stresses, creating deformations that generate problems when processing and consequently achieving the required tolerances.

Free workpiece and uniform clamping

The use of a magnetic system enables the workpiece to be positioned on a magnetic surface that acts as a mechanical reference and as a clamping area.



The force is distributed uniformly over the entire contact surface without compressing or deforming the workpiece, which remains completely free for all the machining operations with a single set-up.

Because there are no obstacles or constraints, the machine‘s capacities can be best exploited. The absence of vibration allows higher stock removal, longer-life for the tools, better finishing and superior accuracies.

Specifications subject to change.

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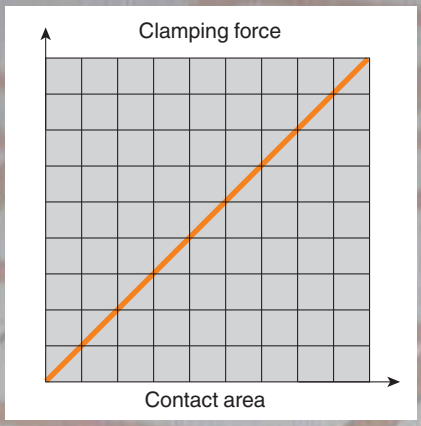
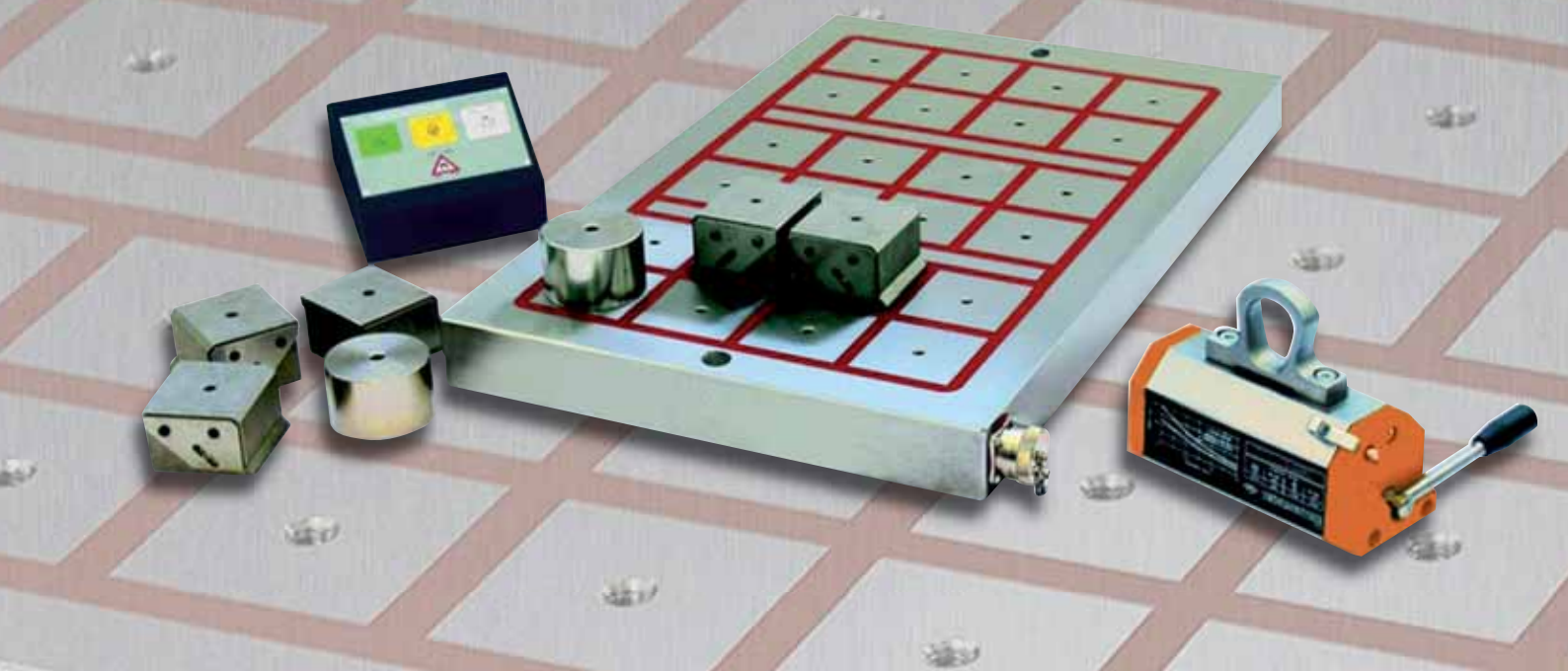
... the benefits of AMF magnetic clamping technology

„The revolutionary answer for a field of virtually unlimited applications!“

The magnetic clamping plates from AMF represent the best display of electropermanent magnetism applied to workholding in the metalworking industry.
They allow a large variety of ferrous parts to be clamped quickly and flexibly, on virtually any type of machine tool.
The systems are powerful, lightweight, compact, easy to install and to use; they ensure a rapid return on investment with significant immediate advantages.
This guarantees real production cost efficiency with simplicity, avoiding complicated and expensive special fixturing equipment or using machines that are larger than necessary, freeing working space, limiting capital outlay and increasing productivity.



The high clamping strength and power of the magnetic clamping plates is developed uniformly, linearly and proportionally to the contact surface of the workpiece and remains constant over time, not tied to the processing phases.



„The benefits at a glance!“

Productivity

- high clamping forces from 375 to 1000 daN
- easy and quick positioning of the workpiece
- drastic reduction in set-up times
- facilitated interaction with CAD/CAM systems
- improved work sequence
- improved surface quality and tolerances
- material thickness of the magnetic clamping plates from 35 mm

Flexibility

- Repeatability of 0,01 mm
- clear access on 5 sides
- all useful strokes used
- workpieces larger than the table surface are machinable
- simultaneous machining of multiple workpieces side by side
- simplified CNC or FMS (flexible manufacturing system) programming

Safety

- constant and concentrated force
- no power consumption during clamping
- ergonomic in operation
- no dispersion of magnetic flux
- no interference
- hardened threads for pole extensions

Cost-effectiveness

- electric power supply from 230 V / 16 A
- limited capital outlay
- no maintenance
- no modification to the machine
- energy-saving
- reduced wear on tools
- high-value over time

Specifications subject to change.

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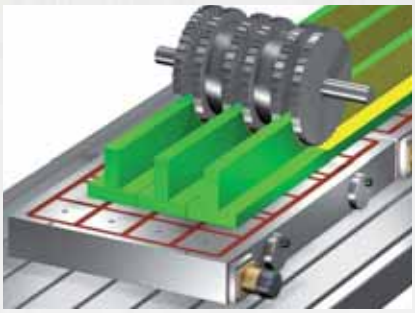
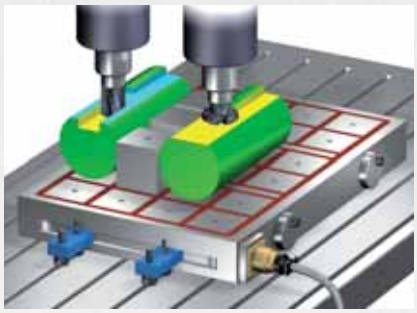
„Free workpiece and uniform clamping“

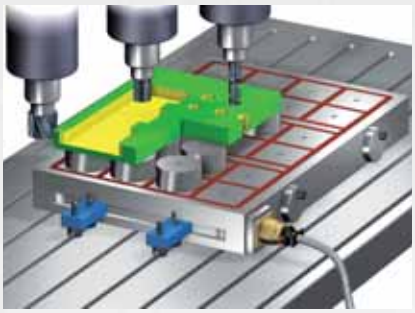
AMF magnetic clamping plates enable **heavy-duty** or **high-speed machining** to be performed on a large variety of components, positioned both horizontally and vertically.
Their robust structure machined from solid block prevents deformation. Fixing is achieved using through-holes or grooves at the sides. The perfect planar matching between the magnetic modules and the machine table ensure excellent, vibration-free mechanical stability.
The systems are the ultimate workholding solution for application on **bench type, gantry or fixed table milling machines, on machining centres, on pallets and cube tooling**. Their modular design enables multiple combinations to prepare table arrangements or for dedicated solutions.



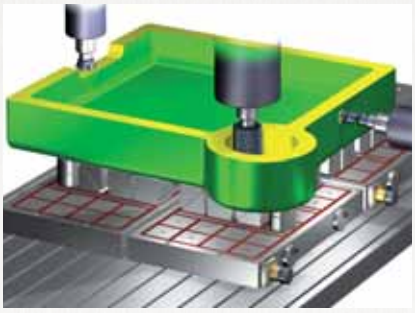
Milling multiple coupled parts



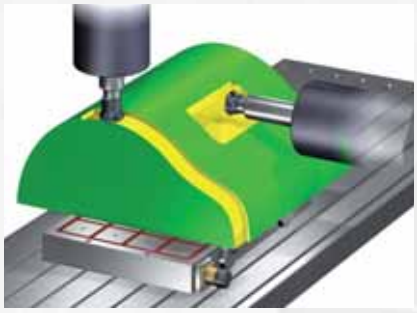
Round bar facing and slots drilling



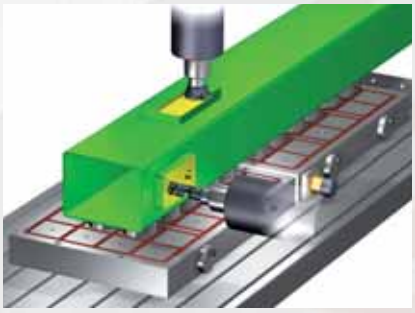
Face milling, drilling and pocket execution



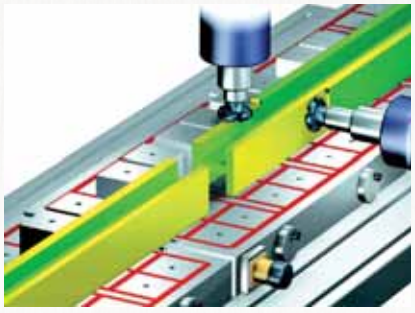
Face milling and contouring on castings



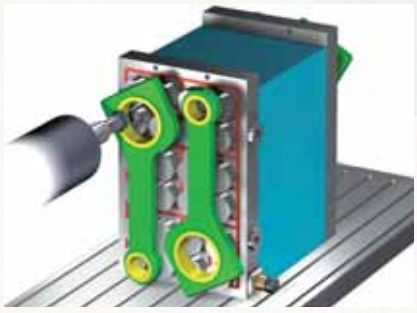
Three-dimensional machining



Fitting surfaces and holes in welded constructions



Fitting surfaces and face milling on profiles



Face milling, contouring, drilling and boring on castings

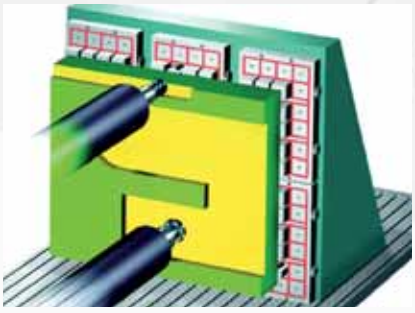


Plate machining on right angle

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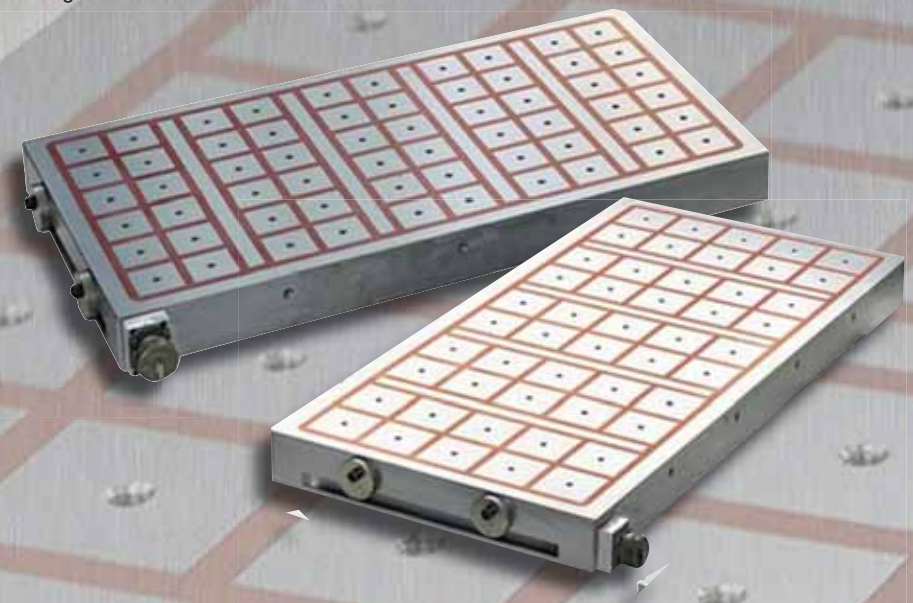
„A custom-tailored decision!“

The standard series of magnetic clamping plates includes two different types with different performance characteristics, capable of adapting to different operating needs, depending on the thicknesses, the surface conditions (or the operating air gaps) and the dimensions of the workpiece to be clamped. The clamping force of each version depends on the different dimensions and types of poles and on the configurations of the magnetic area.

Each pair of N/S poles generates an autonomous and defined force which is not influenced by the operating conditions of the other adjacent poles. Therefore by counting the number of poles occupied by the clamped piece it is possible to predetermine the force generated and consequently to establish the usable machine power with the relative machining parameters.



Magnetic clamping plate no. 2900-50

High polar density version comprising Size 50 poles with a force of approx. 400 daN for each pole. Particularly suited to operating with fixed and mobile pole extensions, ideal for small and large pieces with normal operating air gaps, also with limited thicknesses.

Magnetic clamping plate no. 2900-70

High polar density version comprising Size 70 poles with a force of approx. 780 daN for each pole. Particularly suited for use with pole extensions and for pieces of every size with normal surface structure and medium thicknesses.

AMF magnetic clamping plates (pole size 50 x 50) in use in a vertical machining centre, machining a hydraulic distributor for a rubber spraying machine. Machining is possible from 5 sides using this clamping.

Use in a horizontal machining centre. Machining of moulds on AMF magnetic clamping plates (pole size 70 x 70).

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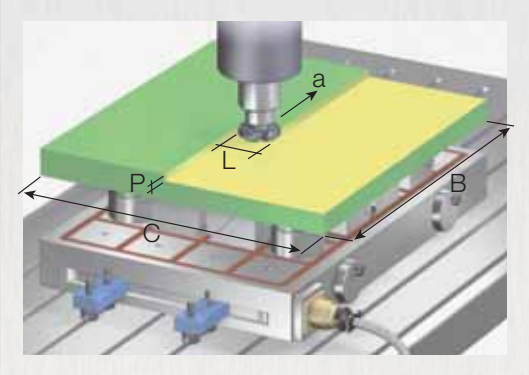
Specifications subject to change.

1) Machining parameters calculation



a = feed rate [mm/Min]
B = workpiece length [mm]
C = workpiece width [mm]
L = cut width [mm]
P = cut depth [mm]
S = workpiece surface [mm²] (B x C)
α = coefficient [mm/min] (see 2)

Q max = maximum stock removal mm³/Min

Q max = S x α

Derived formulae

$$L = \frac{Q\ max}{P \times a} \qquad a = \frac{Q\ max}{P \times L} \qquad P = \frac{Q\ max}{L \times a} \qquad Q\ max = L \times P \times a$$

2) α coefficient

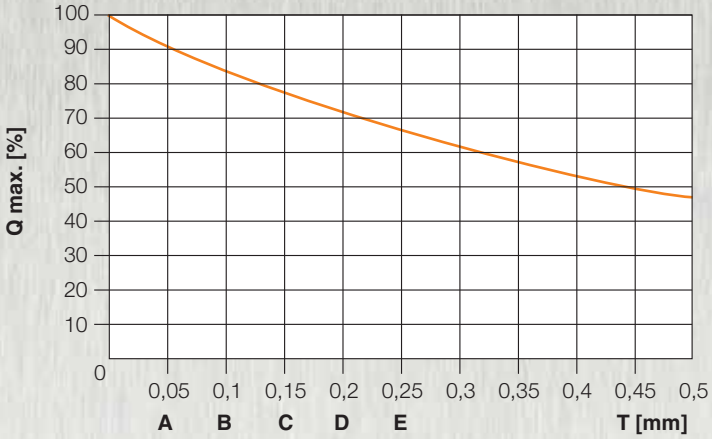
Material	2900-50	2900-70
Mild steel	3,8	5,0
Alloyed steel	2,4	3,0
Cast iron	1,6	2,0

3) Minimum thicknesses for total magnetic short-circuiting

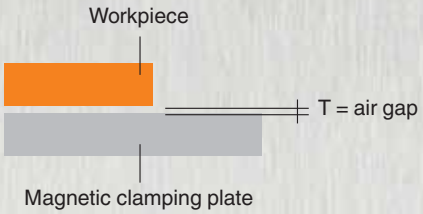
(With workpiece positioned on at least 4 adjacent poles)

Material	2900-50	2900-70
Mild steel	10	19
Alloyed steel	12	22
Cast iron	17	27

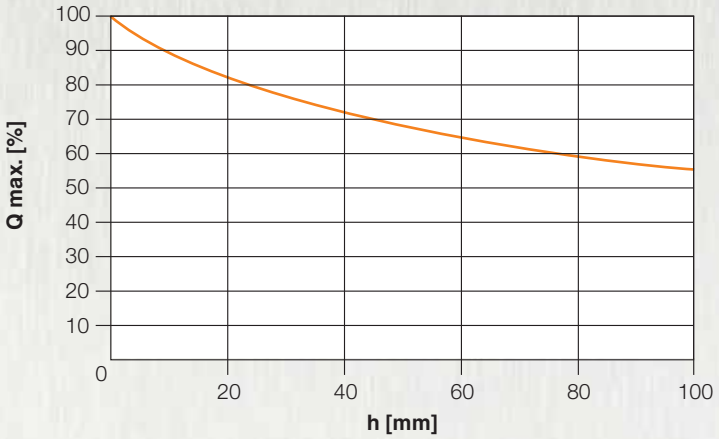
4) Curves for stock removal / surface conditions (workpiece on magnetic clamping plate)

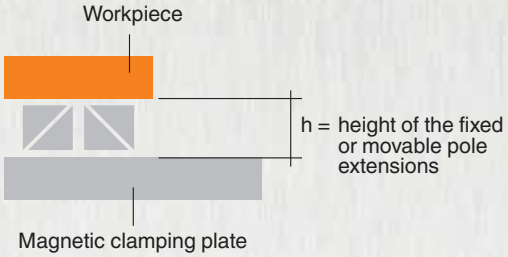


A = milled
B = rough-sized
C = stamped / rolled
D = shell casting
E = sand casting



5) Curve for stock removal / extensions height





Note:

- These data are only indicative. The values have been extrapolated based on tests performed with a free workpiece with a B/C ratio ≤ 2, minimum thickness as indicated in 3) and clamped directly on the magnetic clamping plate. Refer to 4) to relate the stock removal value Q max to the surface condition of the workpiece.
- The Q max value obtained can be improved up to 5 times with the workpiece against stop references.
- Shape errors are recovered by using the movable pole extensions; refer to 5) to relate the values of the stock removal value to the extensions' height.

Specifications subject to change.

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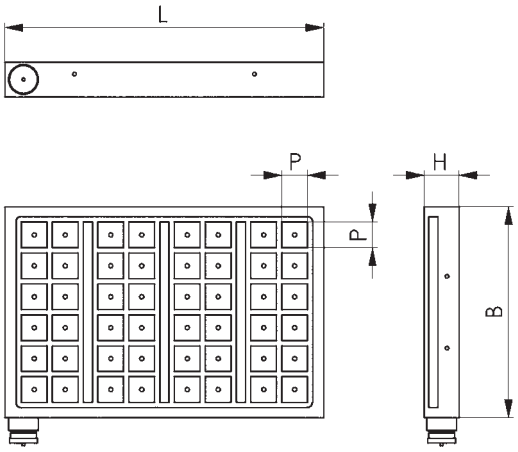
No. 2900-50 Magnetic clamping plate for milling

Scope of supply consists of:
- magnetic clamping plate
- plug contact on the long side, clamping groove on the front and 4 eccentrics
- transport holes on the front

Order no.	L approx.	B approx.	H	Pole size P	Number of poles	Force/poles [daN]	Pole density approx. each m²	kg
303123	600	400	50	50	48	400	196	84
303099	800	400	50	50	60	400	196	112
303131	1000	400	50	50	84	400	196	140
303792	800	500	50	50	70	400	196	140
304337	1000	500	50	50	98	400	196	175

Note:
The control unit is not included in the scope of supply. Please order it separately (no. 2900SE).

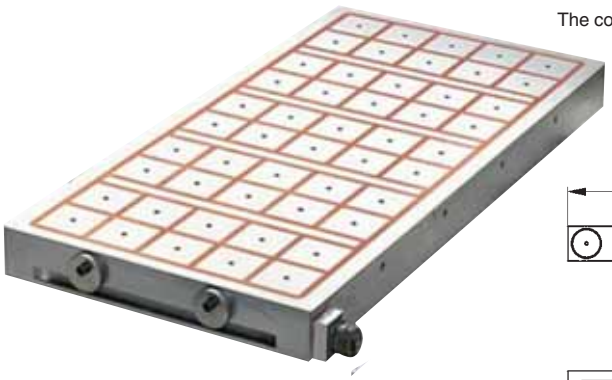


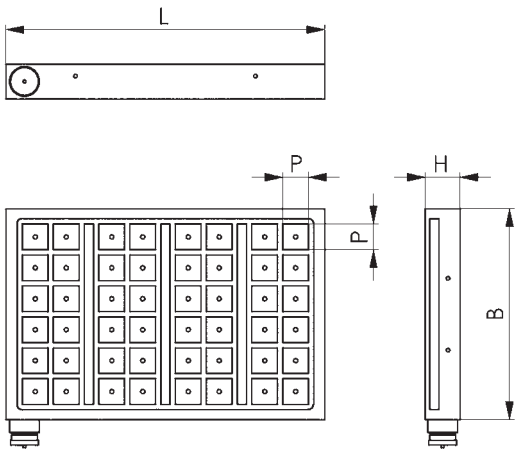
No. 2900-70 Magnetic clamping plate for milling

Scope of supply consists of:
- magnetic clamping plate
- plug contact on the long side, clamping groove on the front and 4 eccentrics
- transport holes on the front

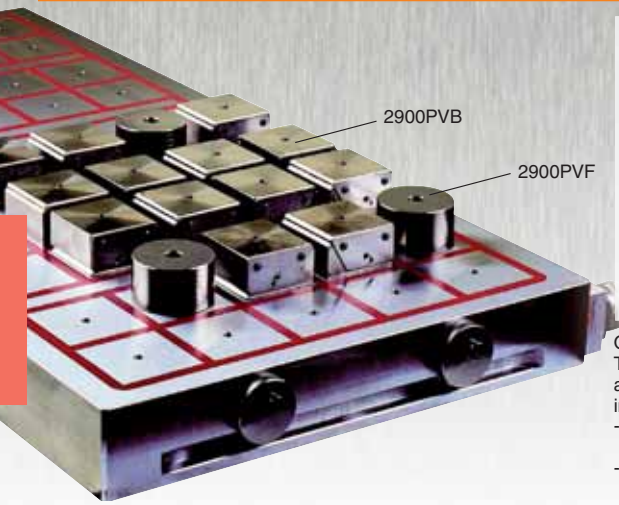
Order no.	L approx.	B approx.	H	Pole size P	Number of poles	Force/poles [daN]	Pole density approx. each m²	kg
303966	600	400	50	70	24	780	100	84
303982	800	400	50	70	32	780	100	112
304220	1000	400	50	70	40	780	100	140
420737	800	500	50	70	40	780	100	140
420745	1000	500	50	70	50	780	100	175
304154	1000	600	50	70	60	780	100	210

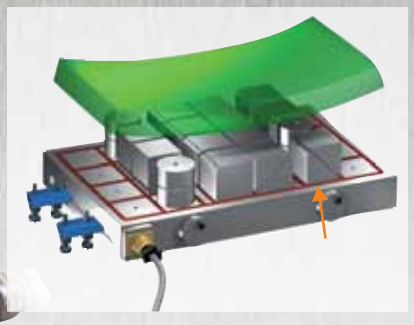
Note:
The control unit is not included in the scope of supply. Please order it separately (no. 2900SE).

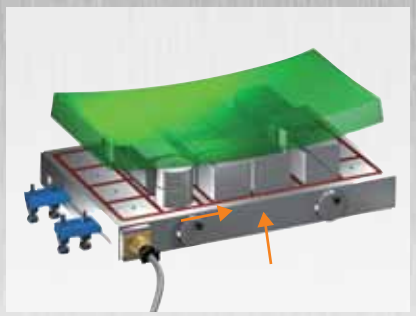




Specifications subject to change.



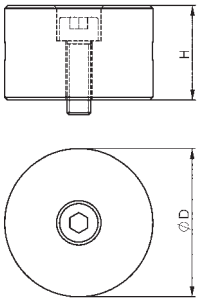




Optimal adaptation to the workpiece surface contour is guaranteed by the movable pole extensions. These pole extensions adapt themselves to the workpiece surface. The workpiece is supported and rests securely on the pole extensions. Optimal machining is possible from 5 sides without any interference contours.

- **Horizontal adaptation** means that the magnetic force affects the workpiece from the sides. Round parts are clamped securely from two sides.
- **Vertical adaptation** means that when power is input the magnetic force affects the workpiece in the upwards direction.

No. 2900PVF Pole extension, fixed

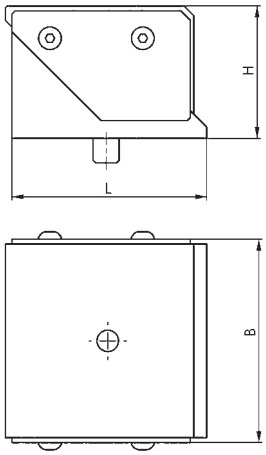


Order no.	Size	Ø D	H	g
420588	**50**	50	32	460
420604	**70**	70	45	1340

Note:

With M8x25 screws for size 50 and M8x40 for size 70 to ISO 4762 in 8.8.

No. 2900PVB Pole extension, movable



Order no.	Size	L	B	H	g
420620	**50**	48	48	30-34	520
420646	**70**	70	73	42-48	1620

Note:

With M8x12 screws for size 50 and M8x18 for size 70 to ISO 4762 in 8.8.

No. 2900PVS Pole extension set

consisting of pole extensions no. 2900PVF and no. 2900PVB. Example: Pole extension set 420513 suitable for magnetic clamping plate 303123..

Order no.	Size	Number of fixed pole extensions	Number of movable pole extensions	kg
420513	**50**	3	45	24,8
420539	**50**	3	57	31,0
420554	**50**	3	81	43,5
420570	**50**	3	67	36,2
420596	**50**	3	95	50,8
420612	**70**	3	21	38,0
420638	**70**	3	29	51,0
420653	**70**	3	37	64,0
420695	**70**	3	47	80,2
420711	**70**	3	57	96,4

Specifications subject to change.

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No. 2900SE Control unit

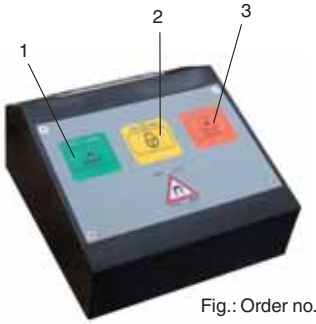


Fig.: Order no. 420547

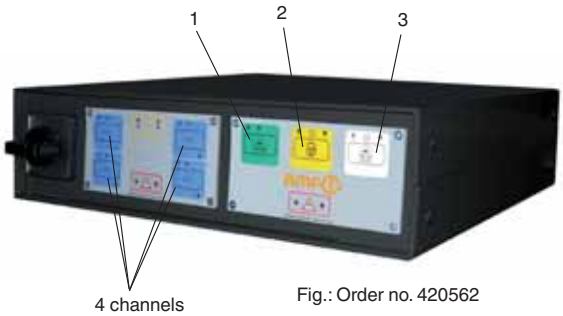


Fig.: Order no. 420562

1) Button **MAG**
2) Button **ENABLE**
3) Button **DEMAG**

Order no.	Channels	Number of magnetic clamping plates to control	L	B	H	kg
420547	**1**	1	135	175	75	1,4
420562	**4**	1 - 4	330	275	85	3,0

Note:

In the DEMAG phase, the control units allow complete deactivation of the magnetic area, the workpiece and the machining chips, which can then be easily brushed off. Mains voltage 230V / 16A.

Our magnetic clamping plates are equipped with a waterproof rapid connector for the cable connection from the control unit to the magnetic clamping plate.

Application:

The AMF magnetic clamping systems are equipped with a series of modern electronic control units suitable for single magnets or for banks of multiple magnets. The units can be connected as individual modules or in series, and have been designed especially for use with AMF magnetic clamping plates. Each control unit is equipped with a system to detect the saturation current (UCS) and the multi-channel units are supplied complete with a machine safety connector and can be supplied with a PLC interface on request.

The control unit has the following three buttons:
- Activation **MAG**
- Deactivation **DEMAG**
- Activation **ENABLE**.

The button for activation **ENABLE** is used simultaneously with that for activation or deactivation, depending on the desired activation cycle. There are four LED control lamps; these are located near the buttons **FULL-MAG** and **DEMAG** and the symbols for **CYCLE** and **ALARM**.
These control lamps are used to indicate the system status: when the system is switched on its status before switch-off is restored. If this option is selected, after execution of the activation cycle the LED on the button for complete or partial magnetization or demagnetization remains switched on. If the cycle has not been executed properly, the central alarm LED is switched on. During the activation cycle, the signals for the cycle are switched on, while all of the others are switched off.
The control lamps for the **MAG** and **DEMAG** cycles light up continuously, while those for the cycles of the partial magnetization **MAG** light up intermittently.

The control units are supplied as standard with a magnetic surface for positioning on a metallic surface near the operator.

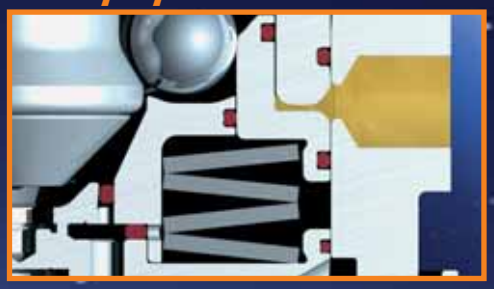
Combining magnetic and zero-clamping technology

By combining our magnetic clamping plates with the proven AMF zero-point system, you obtain maximum manufacturing flexibility. An enormous reduction in your retooling costs is guaranteed! See for yourself what our zero-point system can do. 10 important features that ensure priceless advantages for you:

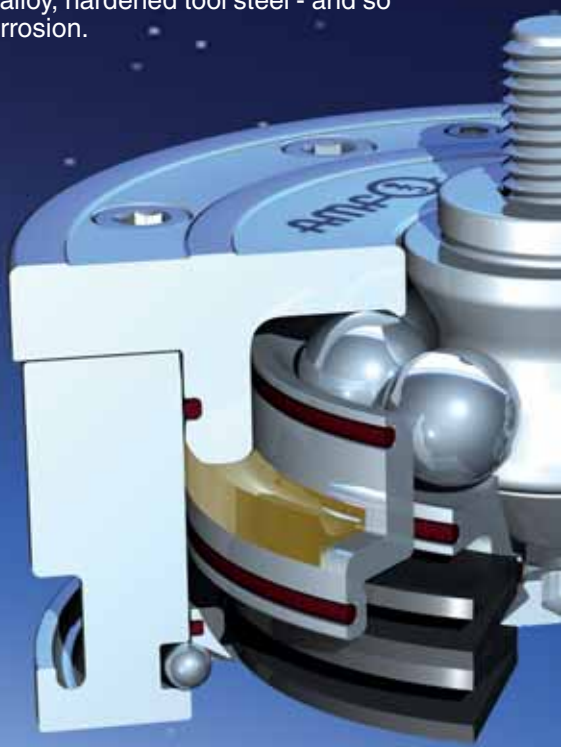
Stainless steel!

High-alloy, hardened tool steel - and so no corrosion.

Safety system!



Process reliability - Clamping module can always be opened.



Media feed!

Low installation depth, fewer feed holes needed.

Three-stroke principle!

Power transmission by means of the three-stroke principle! Optimised force distribution prevents shearing load on the balls.

Form fit!

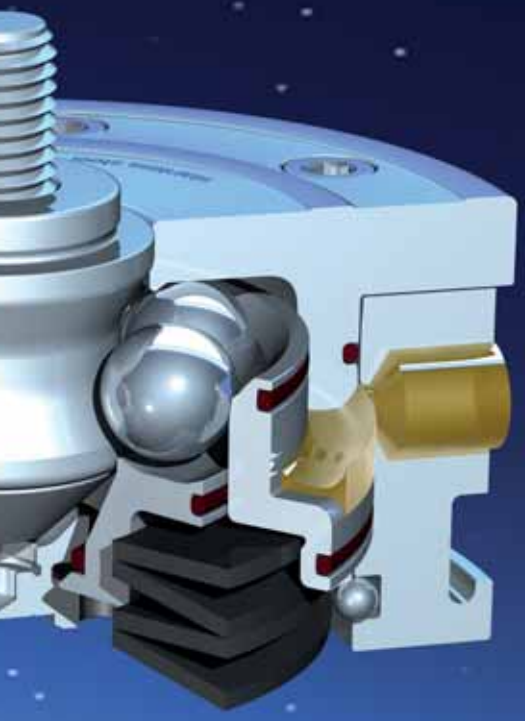
Optimised encapsulation of the balls on 3 sides.

Large intake catchment!

Pre-positioning of 12 mm is sufficient.

Swing-free!

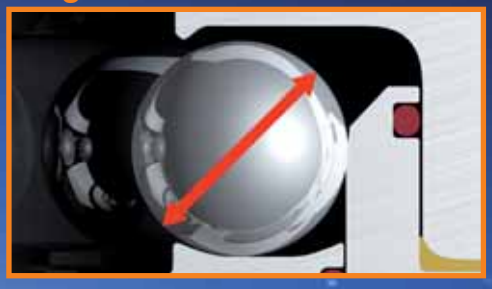
Swing-free run-in and -out across its own supporting edge.



Good holding, pull-in and locking forces!

Size	Clamping force [kN]	Pull-in/locking force up to [kN]	
		hydr.	pneum.
K 5	13	5	1,5
K10	25	10	8
K20	55	20	17
K40	105	40	30

Large ball diameter!



Ball surface is 784% greater than with traditional ball systems.

No ball cage!

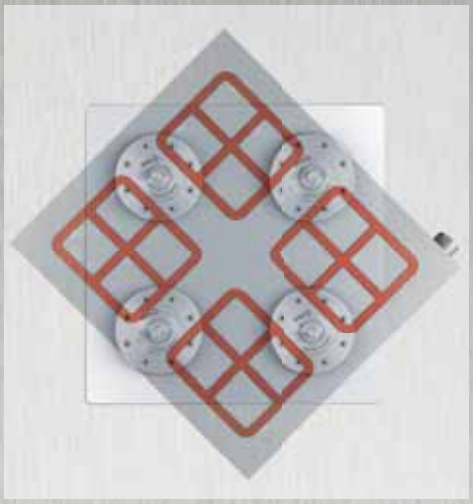
The balls are located free in the ball canal. This freedom of movement enables the balls to continuously re-position themselves.

Specifications subject to change.

„A combination of two innovative clamping systems!“

The previous combined use of magnetic and zero-point clamping technology, in which two plates lay laterally parallel one on top of the other, was only possible with very thick magnetic clamping plates. AMF offers a magnetic clamping plate and an adapter plate as an interface that together have a small thickness so that little of the stroke in the axis being used is lost. The 45° offset arrangement of the plates without an adapter plate means that it is not possible to use 100% of the machine stroke. AMF has addressed these problems and developed an adapter plate for these two systems.
The magnetic clamping plate is fixed to the adapter plate using fastening screws and mounting holes. The adapter plate is equipped with 4 clamping nipples of the AMF zero-point system. This way the magnetic and zero-point clamping plates can be clamped parallel to each other.

Benefits of the combination of magnetic and zero-point clamping technology:
- High clamping force with 400 daN
- Precise positioning thanks to a repeatability of 0.01 mm instead of 0.1 mm previously
- Low electric voltage - electric permanent magnet with 230 volts/16A
- Low material thickness of 35 mm
- Cost savings through reduction of your set-up times
- System can be used flexibly - special fixtures are no longer required



The clamping plates are clamped at a 45° offset to each other.

Specifications subject to change.

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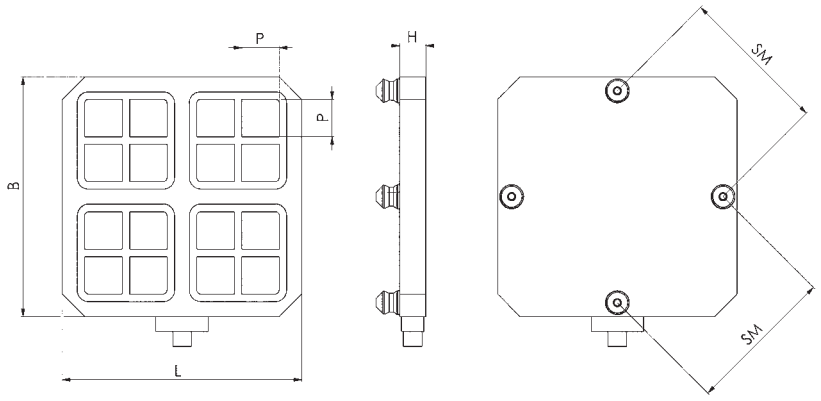
No. 2900N Magnetic clamping plate

with and without zero-point clamping nipples

Order no.	with nipple	L	B	H	SM	Pole size P	Number of poles	Force/poles [daN]	kg
420661	X	320	320	35	200	50	16	400	35
420729		320	320	35	200	50	16	400	35

Note:

In the version with clamping nipple, the following clamping nipples and nipple screws are included:
Clamping nipple no. 6370HN-20 (1 x zero point nipple 303149, 1 x timing nipple 303156, 2 x undersize nipple 303164), 4 x nipple screw no. 6370ZNS-001 (303222).
Our complete zero-point clamping programme can be found in our catalogue „Zero-Point Systems“.



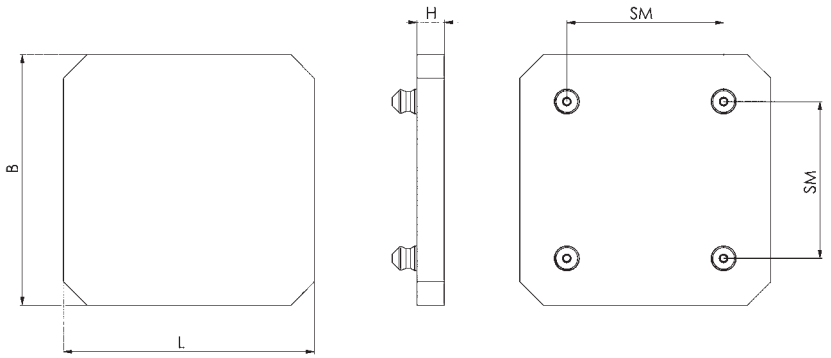
No. 2900A Adapter plate

with and without nipple bores
made of Aluminium

Order no.	with nipple bores	L	B	H	SM	kg
420687	X	320	320	25	200	35
420703		320	320	25	200	35

Note:

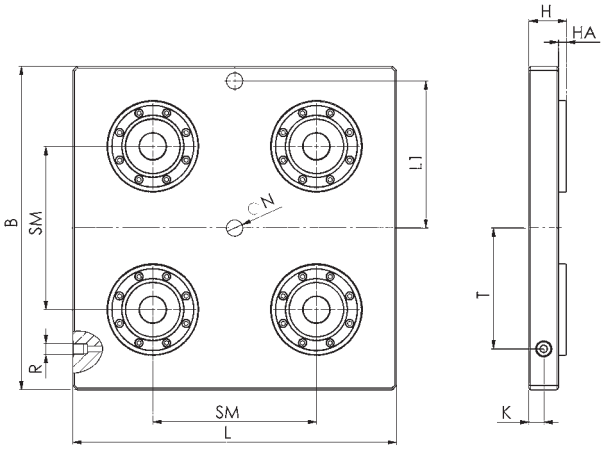
In the version with nipple bores, the following clamping nipples and nipple screws are included:
Clamping nipple no. 6370ZN-20 (1 x zero point nipple 303149, 1 x timing nipple 303156, 2 x undersize nipple 303164), 4 x nipple screw no. 6370ZNS-001 (303222).
The version without nipple bores has the advantage that you can select the gauge and the nipple size yourself.
Our complete zero-point clamping programme can be found in our catalogue „Zero-Point Systems“.



No. 6370S4-002 Quadruple clamping station

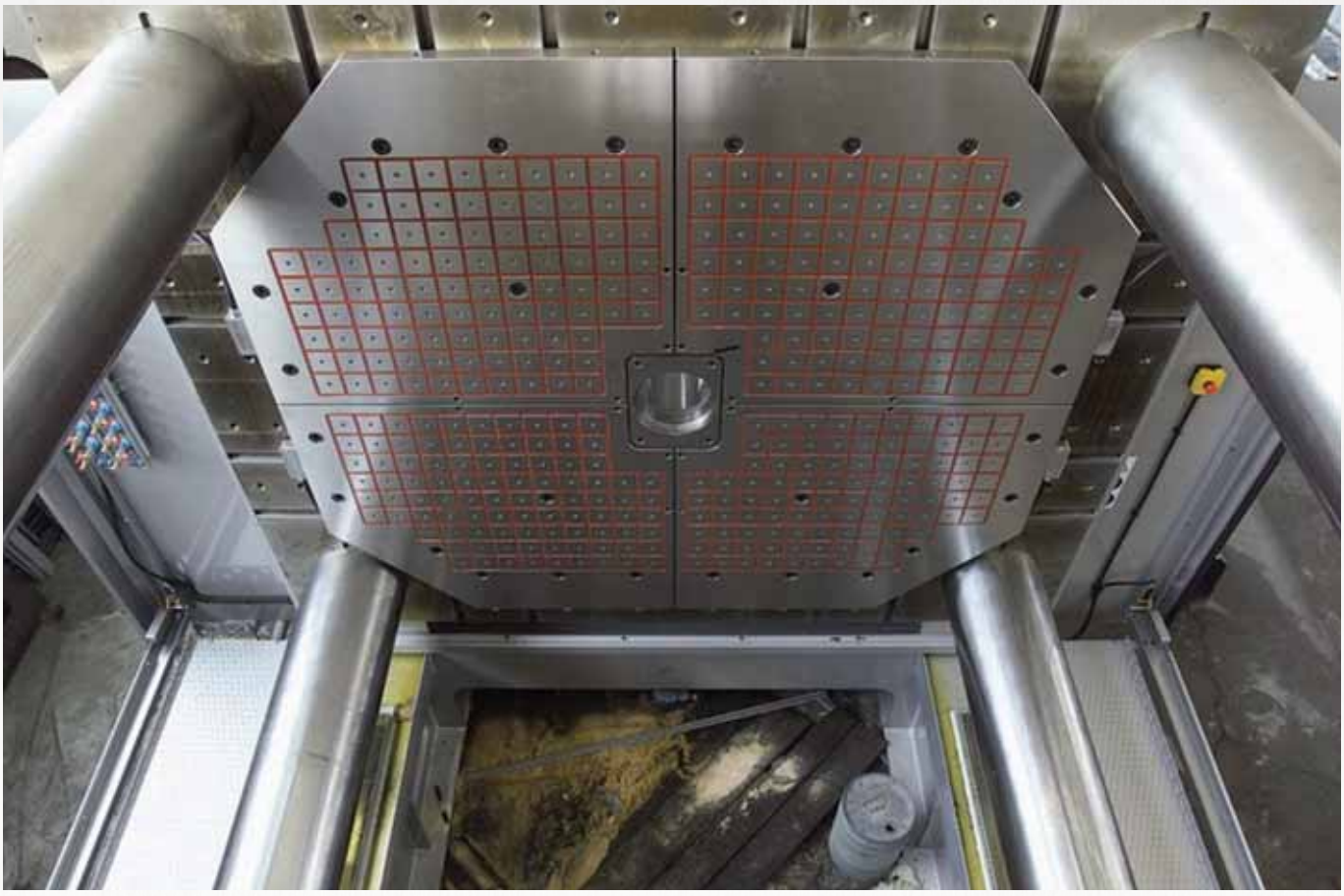
Hydraulic locking.
Repeatability < 0,005 mm.

Order no.	Pull-in/locking force up to [kN]	L	B	H	HA	K	L1	ØN	R	SM	T	kg
303321	4 x 20	396	396	46	10	18	180	20	G1/4	200	148	40



Specifications subject to change.

Magnetic clamping technology for injection moulding



The entire tool is clamped on a machine using the AMF magnetic clamping plates. The advantage of clamping with the AMF magnetic clamping technology is very quick changing of the injection moulding tools. Magnetic clamping plates for injection moulding are available on request.

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AMF magnetic clamping plates being used for surface grinding (available on request).

Magnetic clamping plate on a hydraulic press (available on request).

Magnetic clamping plates for eroding are available on request.

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The most important facts about magnetic lifters

„The practical, safe and economical way to lift ferrous loads!“

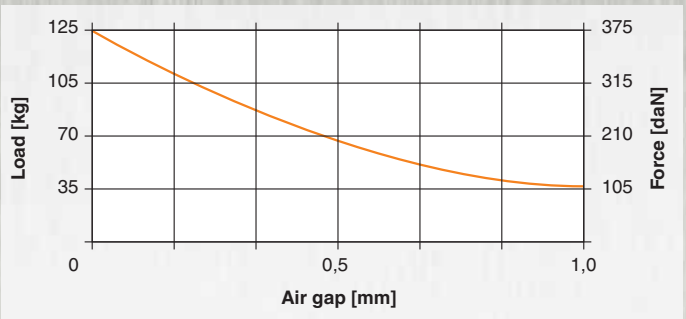
These magnetic lifters are a real revolution in magnetic handling. Compact dimensions, low weight, great power and total operational reliability are the special features of this device. They make this solution especially cost-effective for both small workshops and large industrial firms, with near zero operating costs and quick return on investment.
The series consists of 5 models with carrying capacities of up to 2000 kg. Easy to use and operate, they give huge advantages through increased efficiency and productivity in a great number of applications even with limited handling space and hoisting or lifting equipment with limited carrying capacities.

Ideal for handling workpieces in machine tools and oxygen cutting operation, for plates, sheet and iron blocks in steel structural works and ship-yards building, in steel industries and distribution centres, for changing tooling in production and in general for all the requirements of the modern mechanical workshops.

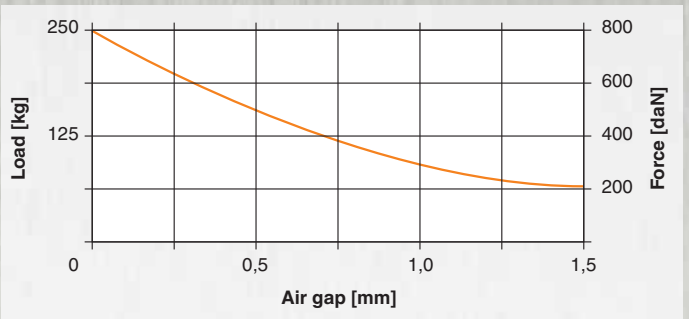
A single operator can handle the load,which is always anchored from above and lifted from the top without deformation or damage and with optimal use of the available work space, perfect human engineering and full safety for men and equipment.

Power vs Load-Air Gap curves (for common structural steel of type FE 370B with poles completely covered)

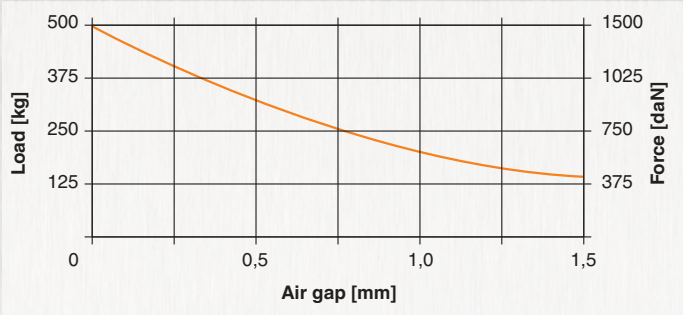
Size 125 - minimum thickness 10 mm



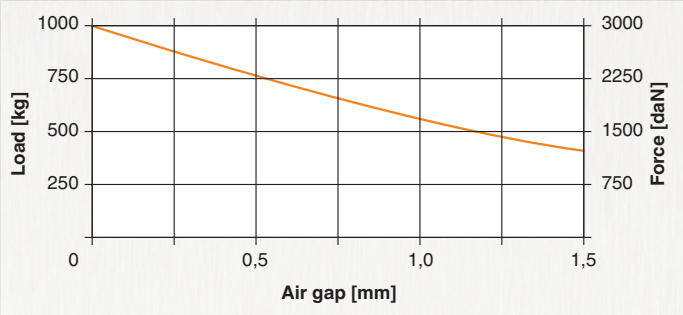
Size 250 - minimum thickness 20 mm



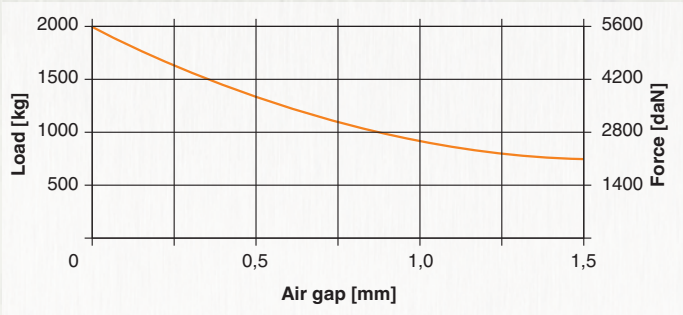
Size 500 - minimum thickness 25 mm



Size 1000 - minimum thickness 40 mm



Size 2000 - minimum thickness 55 mm



Specifications subject to change.

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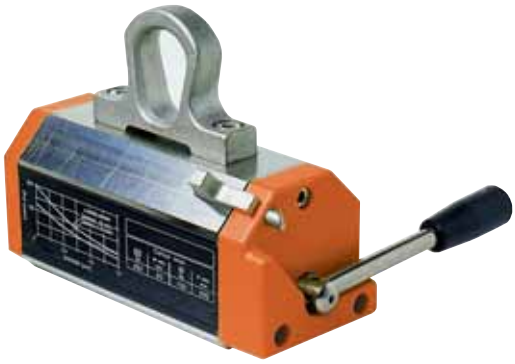
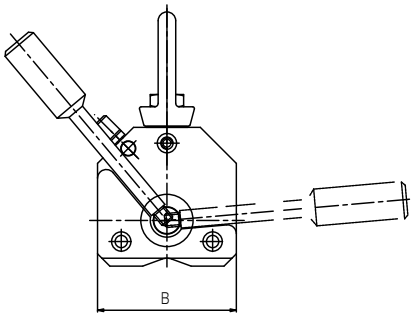
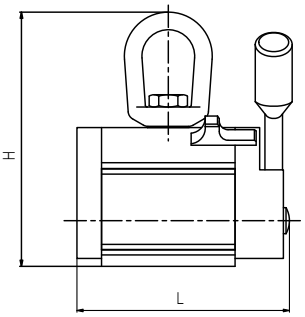
No. 2940 Magnetic lifting device with manual actuation







Order no.	Size	Load max. [kg]	L	B	H	kg
420752	**125**	125	121	79	145	4
420760	**250**	250	189	79	142	6
420778	**500**	500	250	106	189	15
420505	**1000**	1000	342	133	219	34
420521	**2000**	2000	457	166	293	80

Application:

Ideal for lifting finished or rough, flat or round ferrous metal loads.

Requirements:

Load conditions	Size	Load max. [kg]	Strength min. [mm]	Length max. [mm]	dia. max. [mm]
flat	**125**	125	20	1000	-
flat	**250**	250	20	1500	-
flat	**500**	500	25	2000	-
flat	**1000**	1000	40	3000	-
flat	**2000**	2000	55	3000	-
round	**125**	50	10	300	300
round	**250**	100	10	1500	300
round	**500**	200	15	2000	400
round	**1000**	400	25	3000	450
round	**2000**	800	35	3000	600

Specifications subject to change.

„The FAQs for the subject of magnetic clamping technology!“

Some general comments:

For many people, magnets are something mysterious. After all, humans cannot see, hear, smell or taste magnetism, nor can they feel it directly. What is more, magnets attract ferromagnetic objects or other magnets as if by magic. Does it seem to you that this is some kind of unexplainable phenomenon? Not at all! Magnetism is something that science has known about and understood for a long time.
Everyone knows that a bar magnet has two ends, which are generally called its north and south poles, just like the Earth‘s poles. If you have two magnets, then the north and south poles are attracted to each other, while similar poles repel each other, without any need to input energy.
Compass needles also function on this basis: They are small, very light magnets on a movable bearing, which generally align themselves with the Earth‘s magnetic field, so that their alignment provides information on the surrounding magnetic field.

Frequently asked questions:

What happens if there is a power failure?

The system is insensitive to possible power failures, and therefore „intrinsically safe“. Because the current is needed for reversing for only a few seconds, the power consumption is practically non-existent, even though the magnetic force is constant for an unlimited period. The clamping surface is not heated, so deformation or expansion of the workpieces is not possible.

How can the magnetic clamping plates be fastened?

a) laterally in the recesses with clamps (see catalogue „Standard Clamping Elements“)
b) with screws through the mounting holes in the magnetic clamping plate.
c) in combination with an adapter plate for the AMF zero-point clamping system.
d) with clamping nipples directly to the AMF zero-point clamping system (offset 45°)

Can I also clamp on a single pole?

At least two poles have to be covered in order for there to be a magnetic flux.
For optimal clamping, however, 8 pairs of poles should be covered.

What happens if the magnetic clamping plate is cut into or if there is a collision?

The magnetic clamping plate can be reworked from 2 to 5 mm by means of repeated re-grinding. This also restores the plane parallelism.

What precision can I achieve with this system?

Plane parallelism of up to 0.02 mm can be achieved by:
1) rough-milling the first surface
2) turn the plate over, rough-mill, stress release and finishing the second surface
3) turn plate over and finish the second surface

Is mechanical deformation possible during clamping?

Quite the opposite. In the case of flame-cut parts, i.e. with very uneven workpiece surfaces, clamping is carried out with 3 fixed poles (3-point support) and with movable poles. The movable poles compensate for the unevenness, meaning that the workpiece is not deformed during clamping.

Do magnetic risks present any hazards?

Magnetic field height 0 to 100 mm: In this area, cardiac pacemakers, wristwatches and bank cards may be damaged.
At magnetic field height 100 mm and greater there is no longer any health risk.
Caution! Do not put any workpieces on while the magnet is actively clamped. – risk of injury!

Up to how many degrees Celsius can magnetic tables be used?

The magnetic tables can be used at operating temperatures up to 120° C. The neodymium magnet is guaranteed for a maximum temperature of 120 °C (this refers to the temperature in contact with the surface of the magnetic table over a longer time period). As a result of large temperature fluctuations, in some cases „magnetic edges“ may occur, which disappear again when the temperature is again within the guaranteed parameters.

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Conditions for Sales, Payment and Deliveries

These conditions of sale apply to business conducted with companies, legal entities in the public sector, and legal entities with special budget in the public sector. Our deliveries and services are carried out exclusively on the basis of the conditions stated below. Deviating purchasing conditions of the buyer will not become part of the contract, not even through acceptance of the order, unless we have expressly accepted them.

1. Offer and entering into a contract
The basis of our delivery contracts is the latest edition of our catalogue. Orders are not considered as accepted until they have been confirmed by us in writing. When goods are supplied from stock and, for organisational reasons, you receive no separate confirmation, the invoice has the additional function of confirming the order. Details of dimensions and weights, and illustrations, drawings and data are not binding and may be changed by us at any time. Deviations cannot be excluded.

2. Prices
Prices are quoted in EUR ex-works excluding turnover tax, packing, freight, carriage, and insurance. Unless otherwise agreed, our list prices on the day of delivery apply. In order to cover our costs, orders under EUR 50.– net value are subject to a small order surcharge of EUR 10.–.

3. Delivery
Delivery delays are quoted to the best of our knowledge but without guarantee. Agreed delivery delays begin on the day we accept the order and refer to the completion of the goods in our works.

4. Transfer of risk
Risks are transferred to you when the goods are passed to a specific person, company, or organisation that is charged with the execution of carriage of the goods. This applies also to partial deliveries and when we have accepted the costs of carriage, delivery or erection. The risks are also transferred to you when you have defaulted on acceptance.

5. Dispatch
Goods are supplied ex-works. Dispatch is at your cost and risk. Scheduled, FOB, and CIF deliveries are also at your risk. In the absence of specific instructions concerning dispatch, we will arrange same as we think fit, but without accepting any responsibility for choosing the cheapest or most suitable method of dispatch. We make a handling charge of EUR 5.– if goods are sent at your request to a third party. You accept that your order can be supplied in partial deliveries insofar as this is reasonable.

6. Reservation of proprietary rights
Goods delivered remain our property until payment of all claims has been received in full or until redemption of cheques given in payment. The cancellation of individual positions in an open invoice and the drawing of a balance and its acceptance do not affect proprietary rights. You have the right to dispose of the goods as a normal commercial transaction, but you are forbidden to pawn, mortgage, or transfer ownership of them in settlement of a debt or debts. You surrender to us herewith your right to payment for goods for which we reserve our proprietary rights. You have the right to collect these payments as long as you meet your obligations to us. If we request it, you are obliged to name the third party and we have the right to publish this information and the transfer of rights.

7. Cancellation rights due to late payment or insolvency
If you do not pay for the goods by the time payment is due, and if you have not paid after expiry of a reasonable time limit set by us, we have the right to withdraw from the contract and demand the return of goods already supplied. Rights under § 323 BGB (BGB = German civil law code) remain otherwise unaffected.
Application for the opening of insolvency proceedings gives us the right to withdraw from the contract and demand the immediate return of goods supplied before the bankruptcy court orders protective measures.

8. Packaging
Packages comply with the German packaging regulations (WO). Disposable packaging is charged at cost. The packaging is not returnable.

9. Tooling costs
In the absence of any agreement to the contrary, tooling made for the execution of an order remains our property in all cases. This applies even if we have made a charge for a proportion of the tooling costs.

10. Payment
Our invoices are payable net within 30 days of the date of the invoice, or with 2% discount if paid within 10 days. Invoices below EUR 50.– are payable immediately without discount. Our credit notes and your charges on us reduce the amount subject to discount. Late payment entitles us to interest at the rate the bank charges us for a current account overdraft but at least 8 percent above the current base rate of the European Central Bank. If payment is overdue, we are entitled, after giving you notice in writing, to cease fulfilling our obligations under the contract until payment is received.

11. Offsetting exclusion
You can only offset payments with legally-established or unopposed counter claims.

12. Guarantee
If you come to an agreement with us on properties of the goods, we include this agreement in our technical specifications. If we have to supply to your drawings, specifications, samples, etc., you accept the risk associated with suitability for the intended purpose. The point in time at which risk is transferred is decisive for the contractual condition of the goods. The deterioration of parts subject to wear in the course of normal use does not constitute a defect. If the goods supplied are defective, we will – at our choice and within a reasonable time limit set by you – supply a replacement or repair the goods. If such repair or replacement is not satisfactory, you have the right to reduce the price or withdraw from the contract. Any further guarantee claims are excluded. Recognisable defects must be notified at the latest within 10 days of receipt and defects that are not recognisable must be notified as soon as they are discovered. The guarantee period is 24 months and starts with dispatch of the goods from our works.

13. Hindered or impossible performance
If we are prevented from meeting our obligation by some unforeseeable event (e.g. disruption of our plant, or delay in the delivery of important raw materials), which, in spite of taking all reasonable care appropriate to the circumstances of the case, we have been unable to avert, and it has become impossible to execute the delivery or service punctually, the delivery delay will be extended to an appropriate extent.

14. Liability
Except in the case of injury to life or limb, or damage to health caused by our breach of duty, we are only liable in the event of intent or culpable negligence on our part.

15. Customer specials
Orders for customer specials must be in writing and include binding details of execution, quantities etc. For technical reasons we reserve the right to supply 10% more or less than the quantity specified. If technical changes or cancellation are required, the costs incurred will be charged to the customer.

16. Deliveries of samples and return of goods
Samples will be charged. When goods have been sent for testing or as samples, we will credit you with the additional price against subsequent orders, as long as the net contract value is at least EUR 125.–. The return of goods is only possible with prior agreement. Customer specials may not be returned. For goods returned for reasons outside our responsibility (e.g. wrongly ordered), we charge 10% of the value of the goods but at least EUR 7.50, to cover administration costs.

17. Place of fulfilment, court of jurisdiction
The place of fulfilment for all obligations arising from this contract is D-70707 Fellbach. The court of jurisdiction for any legal dispute arising from this contract is D-71332 Waiblingen. (All disputes that arise from this contract or about its validity will be decided by a court of arbitration according to the Arbitration Rules of the German Committee for Arbitration Courts/Settlement and Arbitration Procedure of the International Chamber of Commerce. Such decisions will be final and normal legal procedures are excluded.) German law applies (BGB and HGB = civil and commercial codes). The application of UN purchasing law (CISG) is excluded.

18. Validity clause
If individual conditions should be found to be not legally valid, the remaining conditions continue to apply. The invalid conditions will be replaced by conditions which fulfil as closely as possible the commercial intent of the contract with reasonable consideration of the interests of both parties. With the publication of these Conditions for Sales, Deliveries and Payment, all previous versions become invalid. This does not apply to contracts agreed before publication.

...just copy and mail or fax!

Request for Catalogues:

- ☐ **Locks for Gates and Doors**
- ☐ **Hand Tools**
- ☐ **Toggle Clamps** mechanical + pneumatic
- ☐ **Standard Clamping Elements** mechanical
- ☐ **Hydraulic Clamping systems**
- ☐ **Clamping and fixture systems**
- ☐ **Magnetic clamping technology**
- ☐ **Zero-Point Systems**
- ☐ **Clamping and fixture system** for laser welding
- ☐ **Wir bitten um Rückruf bzw. Fachberatung**

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Werkzeugfabrik
Postfach 17 60

70707 Fellbach
Germany

Company/Address (Please don't forget your phone no.)

Contact person:

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How do I order?

AMF e-Business offers you new possibilities! Many of our customers have been ordering AMF products electronically for several years now. Currently, for more than 30% of our sales, orders are placed electronically and processed online. In the side bar, you will find the various ordering options with which you too can profit from the advantages that AMF e-Business offers.

e-commerce at AMF – the AMF Online Shop

In our new AMF Online Shop, AMF offers you the best conditions for your Internet buying. Its basis today is a medium-neutral database from which our Online Shop and related print media are generated fully automatically. In this way, you have access to the latest products and revisions at all times and immediately.

Using the direct online connection to the AMF inventory control system, you can check the availability and delivery of the goods you need, and check the current status of your order at any time.

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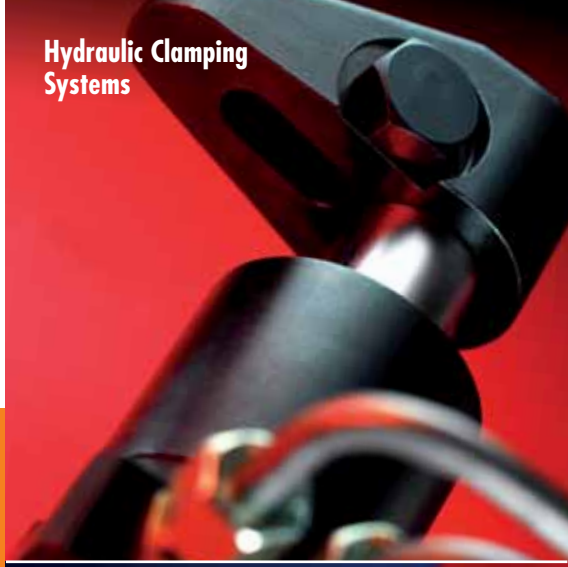

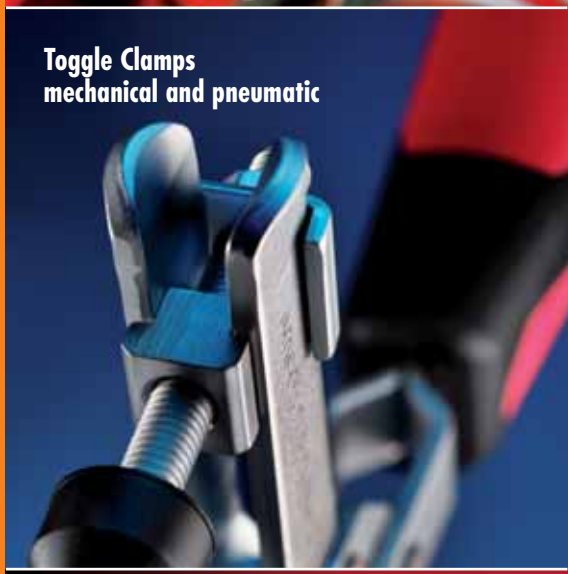

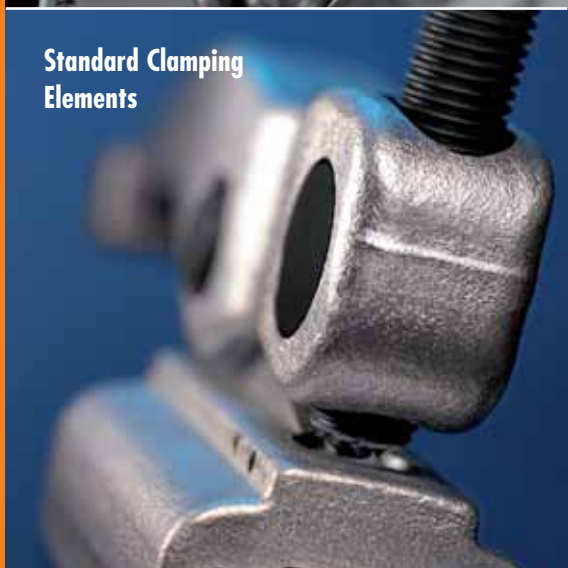

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