

MilliTec

PERMANENT-ELECTRO MAGNETIC SYSTEMS FOR MILLING

with more "magnetic" effect

with

GRIP

FUNCTION



Total uniformity and maximum rigidity of clamping

- Monolithic technology
- Full metallic surface
- Low thickness and lightweight
- High power
- Total safety



TECNOMAGNETE®
Safety through power



NEW
INTERNATIONAL
PATENT

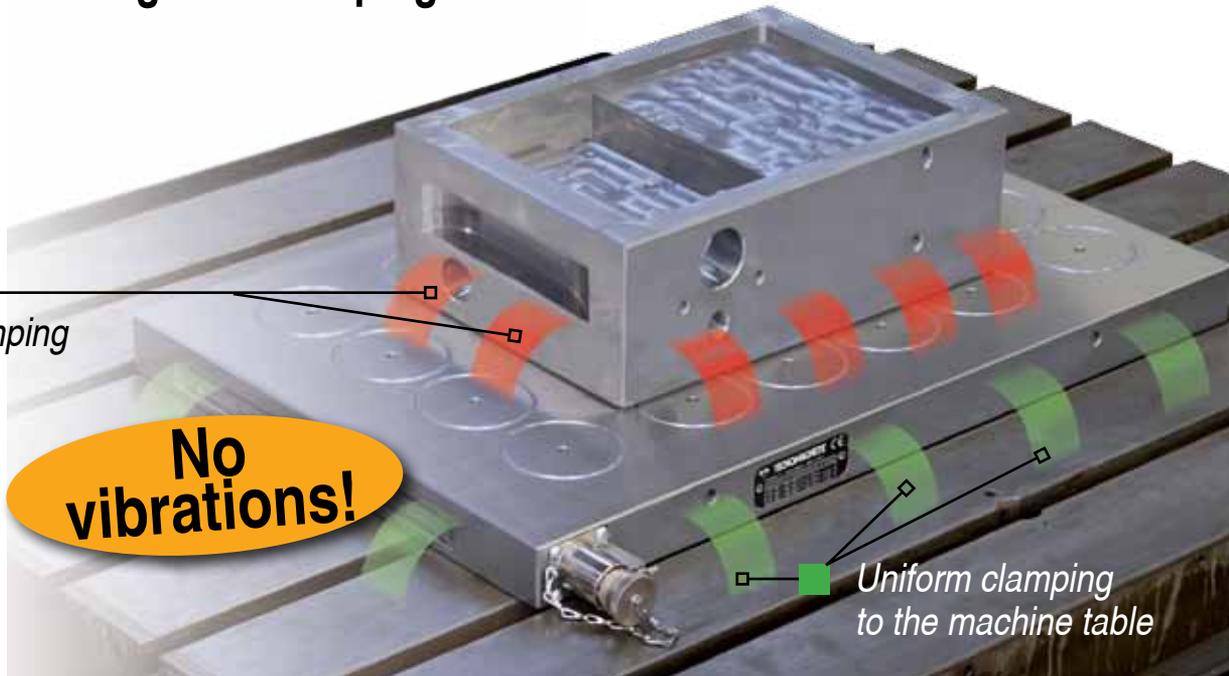


The new force in magnetic clamping for milling

Uniform clamping to the piece

No vibrations!

Uniform clamping to the machine table



MillTec GRIP revolutionizes the concept of magnetic clamping on milling machines and machining centers.

Now you can perform a real uniform clamping, i.e. between the workpiece and the magnetic surface and in the same time between the magnetic system and the machine table.

The clamping force of the system to the machine table is 30% of the nominal force the system to the piece; this can reach 75 Tons/m².

These great forces combine to eliminate any possible bending or deformation caused by the mechanical clamping elements, thus

ensuring perfect stability and structural uniformity to the whole workpiece / magnetic chuck / machine.

All vibrations are eliminated completely to enhance the uniform clamping characteristics of the magnetic system. This results in better quality, more precision and optimum machining speed, together with low wear levels

The reduced thickness and the reduced weight help to optimize machine performance, increasing headway and load capacity, as well as reducing stress levels thanks to faster cycle times.

MillTec GRIP offers great advantages in terms of clearly increased productivity as well as operating quality.

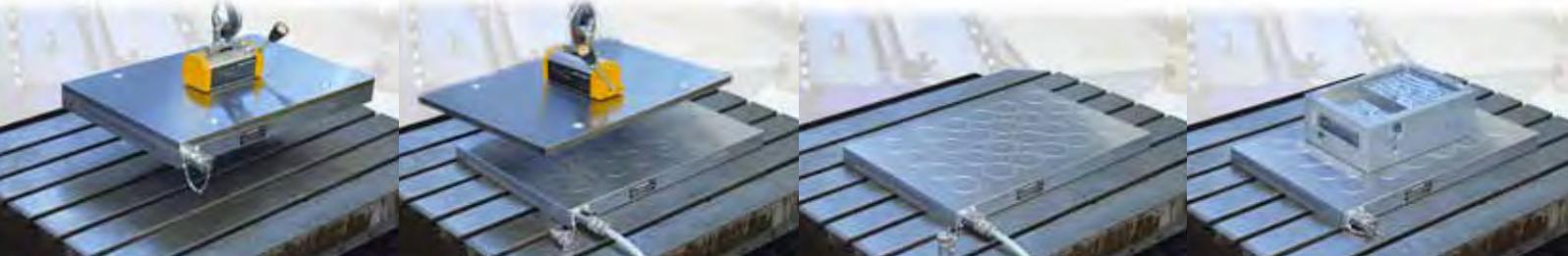


Easy to use with the practical and innovative push-pull fast connector.

42 mm



Easy to install with a few simple steps:



Just switching a key on the control unit you can operate:

- in "GRIP" mode to fix and remove the chuck from the machine table.
- in "WORK" mode, running MAG/DEMAG cycles to clamp/unclamp the workpiece.



"WORK" mode



"GRIP" mode



Successful development

For more than 25 years, the **Quadsystem** technology patented by Tecnomagnete has represented the most advanced frontier in permanent electromagnetism applied to machine tool workpiece holding systems, for fast clamping on injection molding, metal stamping machines and steel handling systems, with impressive operational advantages witnessed by thousands of customers worldwide.

The bi-directional magnetic circuit

All N/S poles are energized by a double magnet circuit (Alnico + Neodymium) and can generate the highest level of magnetic induction into the steel with a high magnetomotive force (MMF) for safe operation even under critical air-gap conditions

The quadrangular chessboard layout

The layout permits horizontal, flat flow of the magnetic flux at a very limited depth, fully concentrated in the polar area and thus in the workpiece being clamped.

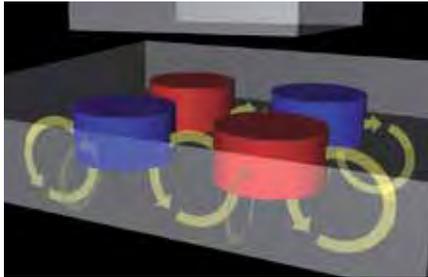
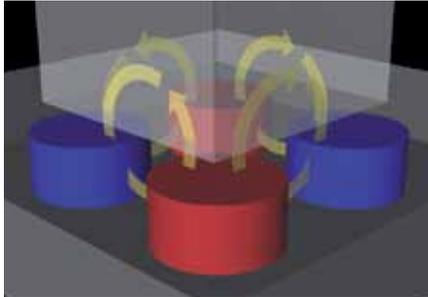
As all N/S poles are absolutely identical, the magnetic circuit is perfectly balanced with no stray flux, no magnetic interference and with constant and predictable performance (Neutral Crown patent).

Intrinsically safe

After the system has been activated by an electric pulse lasting just a few seconds, the workpiece remains clamped with no time limit, with constant power and no power supply, held only by the power of high-energy permanent magnets.

The system can be subsequently deactivated with a short electric pulse.

MAG



DEMAG



The monolithic technology

The new patent identified as **Quadsystem MONOLITE** permits the market launch of a new generation of magnetic devices characterized by solid block structure with no assembled mechanical components.

Machined from a solid block, the poles are integral with the frame and can withstand heavy-duty operations, maintaining absolutely stable conditions without any deflection.

The polar geometry with round poles permits optimum distribution of the magnetic area, with free zones available for additional machining operations to insert high accuracy bushes for side stoppers, specific references or to make a hybrid clamping surface

An impenetrable single surface

The uniform all-steel metallic surface has no inserts, sealing resin or any filling compound. It therefore acts as an impenetrable mechanical shield offering permanent protection for the electric circuit and the permanent magnets fitted inside.

Long durability and environmentally friendly

Thanks to the absence of assembled and moving parts and its metallic surface, the product needs no specific maintenance. It remains reliable throughout its service life, and all components can be 95% recycled.

No waste, no fluid, no heat generation, no power consumption.



With MillTec

maximum flexibility and productivity

The MillTec innovative magnetic system for milling applications offers a wide range of strong, safe magnetic modules suitable for a wide variety of both high speed and heavy duty machining operations

The MillTec modules are the ideal solution for applications with both vertical and horizontal axes on gantry, moving table or travelling column bed milling machines, on machining centers, pallets, right angles and tombstones on FMS systems.

Uniform clamping

When clamped with brackets and vices, workpieces are never fully accessible and multiple setups are needed to complete the machining cycle.



MillTec applies uniform clamping force across the entire contact surface, with no compression and deformation of the workpiece.

Full machining in one setup

With MillTec, the workpiece is always fully accessible on 5 faces. It is thus possible to proceed with full machining in one setup, improving the tool path in all machining operations (face milling, contouring, milling and drilling).

Set-up and changeover times are drastically reduced even for multiple workpieces.

Self shimming and fast stress release

The new generation of independent RMP mobile pole extensions makes it even easier and more practical to perform such operations on any kind of workpiece. Their round shape and the integrated threaded pin allow easy, fast positioning without any tools, while also ruling out the risk of any mistakes.

he RMP pole extensions are designed to prevent any penetration of dust or chippings, thus guaranteeing perfect, constant performance without any need for cleaning and maintenance.



International patent
WO 2009/007807

The integrated mechanism with its double slant surface permits better flux transmission with a 20% improvement in the magnetic performance compared to traditional pole extensions with a single slant surface.

Contouring and through drilling

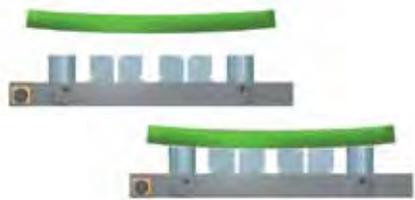
Fixed pole extensions with different heights and integrated threaded pin are available to raise the workpiece from the magnetic clamping surface, thus facilitating the full machining cycle.



RMP 70/45



PFR 70/45



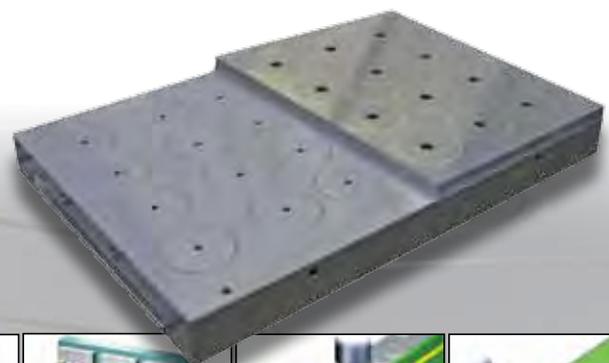
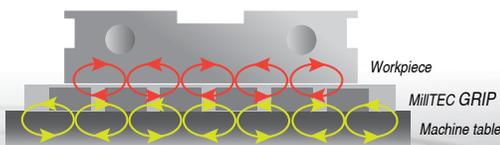
Automatic shimming system

Pole extensions with recess

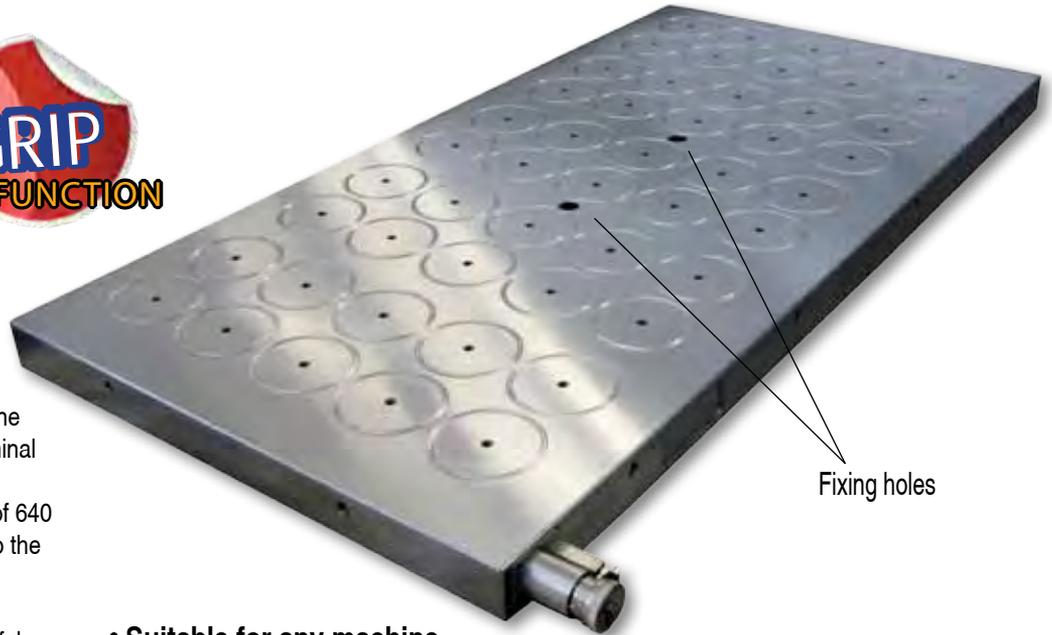
The extensions have been designed for a reduced flux depth into the piece, specifically for clamping thin parts (over 10 mm).

Dedicated polar top plates

Dedicated polar top plates are available to create clamping surfaces shaped according to the profile of the workpiece being machined.



An innovative concept for transferring machine rigidity to the workpiece



• GRIP effect

The self-clamping force to the machine table is equivalent to 30% of the nominal force of the system.

Each pole provides a nominal force of 640 daN to the workpiece and 200 daN to the machine table

The Grip function generates a powerful clamping force toward the magnet and the machine table.

Workpiece, MillTec and machine become a single block, magnetically clamped, with absolute rigidity, avoiding any vibration thus granting higher precision, better tolerances and low tools consumption.

A smooth machine table surface with large areas of intimate contact generates the maximum GRIP effect.

• Suitable for any machine

The chuck must be fixed by 2 through holes, standard supplied.

The parking plate supplied with the system is essential for transport and installation. It can be reused for moving the system and / or transfer to another machine.



Machining examples with MillTec Grip

FACE MILLING



SLOT EXECUTION



EDGE MILLING



D_c	Tool diameter	mm
Z_n	Cutting edges	n.
n	Cutting speed	rpm
a_p	Cutting depth	mm
a_e	Cutting width	mm
V_f	Feed of the table	mm/min
Q	Stock removal rate	cm ³ /min

FACE MILLING

125
8
860
1,5
80
4000
480

SLOT EXECUTION

50
5
1800
2
50
5000
500

EDGE MILLING

50
5
1800
5
5
4000
100

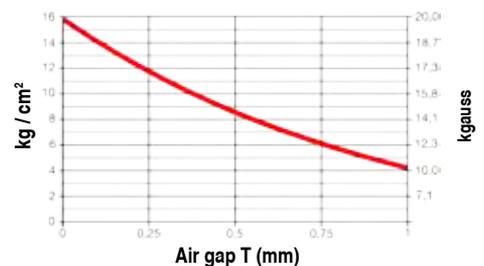
Piece dimensions: 410x260x50mm, positioned on 3 fixed extensions PFR 70/45 and 9 mobile RMP 70/45.

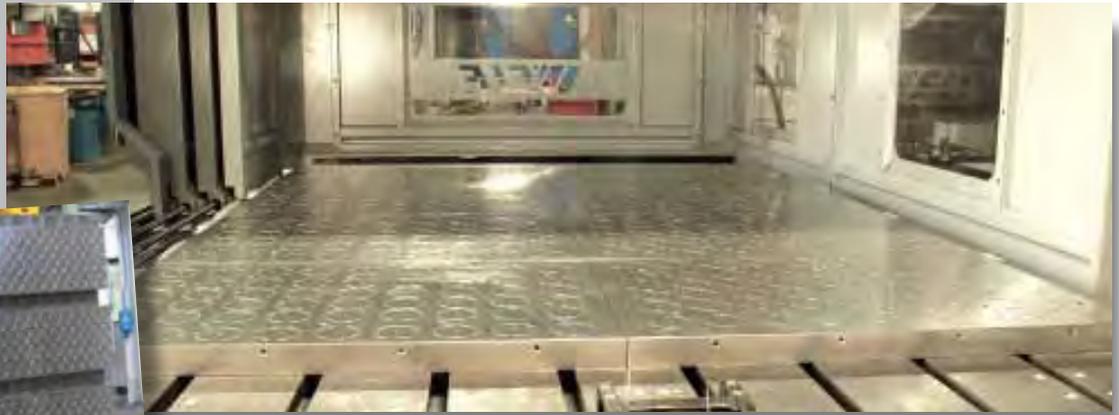
Material: FE 275 JR. Machine: VMC 1600 - 27kW

Magnetic chuck: MillTec GRIP 304HD (320x425x42mm), magnetically clamped on machine table.

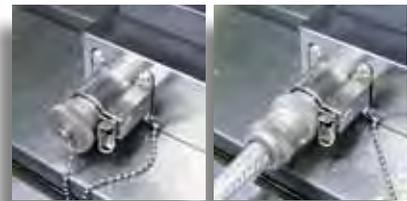
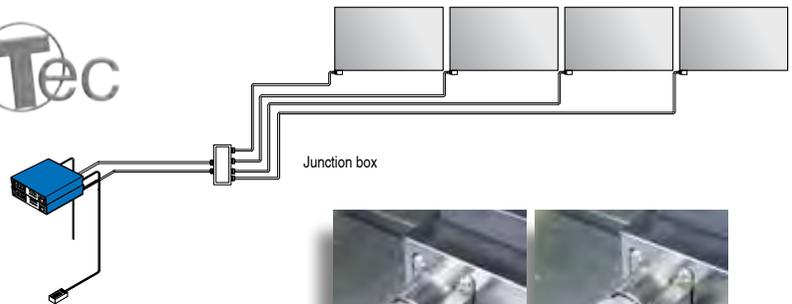
Lateral stops could be required at both workpiece and chuck for heavy-duty machining operations.

MTG - Force vs airgap curve





MillTec



TECNOMAGNETE®

All the magnetism of the leader

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Germany

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Japan

TECNOMAGNETE Ltd.

USA

TECNOMAGNETE Inc.

Distributor:

Modular system for all demands

MillTec can be installed on any type of milling machine and machining center. Its modularity allows to match different units to configure magnetic tables of any size.

MillTec is ideal for fixed layouts and pallet systems, for horizontal and vertical operation.

Standard Specifications

Model	Dimensions (mm)		Poles n°	Force kgf (*)
	A	B		
MTG 304	320	x 420	12	7.800
MTG 306	320	x 600	18	11.700
MTG 308	320	x 785	24	15.600
MTG 310	320	x 970	30	19.500
MTG 404	405	x 420	16	10.400
MTG 405	405	x 500	20	13.000
MTG 406	405	x 600	24	15.600
MTG 408	405	x 785	32	20.800
MTG 410	405	x 970	40	26.000
MTG 506	485	x 600	30	19.500
MTG 508	485	x 785	40	26.000
MTG 510	485	x 970	50	32.500
MTG 606	570	x 600	36	23.400
MTG 608	570	x 785	48	31.200
MTG 610	570	x 970	60	39.000

(*): Maximum force with workpiece in intimate contact, with all poles covered

Thickness 42mm

Up to 16 kg/cm² in active magnetic area

Over 75 Ton/m² in workpiece contact area

Magnetic flux depth: 17mm

Electrical connections

MillTec modules are equipped with new waterproof fast connectors in the ERGON series. Fixed connections can be provided to assemble magnetic tables.

Electronic control units

ST series electronic control units are equipped with current (UCS) and cycle status control systems.

They have been designed for fast activation and deactivation cycles to save power consumption, limit electromagnetic emissions and warrant long-term reliability.

The ST200 SK, available from 200V to 400V, is equipped with a key selector for WORK/GRIP function.

The practical TC remote pendant is included in the standard supply.

An RS232 connector is located at the back of the machine to connect with the PLC.

The ST200 can be used to control multiple chucks tables, equipped with TCF pendant for independent selection of each MillTec module.

ST 200 SK



TCF

