THE MAGNETIC FORCE

Complete range of magnetic clamping systems from one source
Electro permanent magnetic clamping by EAS

EAS OFFERS A COMPLETE RANGE OF SOLUTIONS FOR YOUR QMC, QDC AND COUPLING APPLICATION:

- mechanical clamping systems
- hydraulic adaptive and integrated systems
- magnetic clamping systems
- ejector couplers
- mould locking device
- mono and multi coupler solutions
- mould change tables and cars
- inspection and mould tilting units
- storage systems
- die-lifters
- pre rollers
- consulting
- project management and installation
- R.O.I calculations

The complete SMED solutions from one global source, EAS

www.easmagneticclamping.com
www.easchangesystems.com
info@easchangesystems.com
IDEAS COME FROM EAS:

Serving the Quick Mould Change (QMC) market for more than 20 years, EAS listened carefully to its customers to find better solutions for your QMC, JIT and SMED needs. The primary advantage of the magnetic clamping system is that it avoids the need for standardized back plates for vertically loaded moulds. EAS has optimized their new range of electro permanent magnetic clamping solutions which support:

- increased demand for full electric injection moulding machines
- the need for safe systems with sufficient holding force
- simple extra safety device when required
- smaller reduction in daylight opening

Following the acquisition of the Pressmag “know-how” from Braillon - the original inventor of the electro magnet - EAS optimized its range of magnetic clamping systems by using both the benefits of the square pole design and the long pole design for the right application for you, our customer.

THE EAS SOLUTIONS:

1) For small sizes of injection moulding machines (<800T) it is important not to lose much daylight opening due to thick magnetic plates. But at the same time maintain the required clamping forces, despite ejector holes. For these reasons we developed the small 45 mm square pole design (but round at the surface) with only 38 mm (1.5”) plate thickness, the PRESSMAG SP.

2) For larger sizes of machines we optimized and standardized the PRESSMAG HP system working with standard long poles, resulting in high magnetic flux concentration with superior clamping forces. The thickness of these systems is 55 mm (2.16”).

3) For alloyed steels and/or for complete demagnetizing PRESSMAG T and

4) For high temperatures till 250°C or 464°F the PRESSMAG HT.

EAS, the complete magnetic clamping range from one source.
This electro permanent Pressmag SP has a base of 45 x 45 mm square invertible AlNiCo magnets, surrounded by an isolated coil. On top is a round pole while each square is surrounded by not invertible permanent rare earth magnets.

The coils around the invertible magnets generate an electromagnetic field, which inverts the magnets within fractions of a second. This results in clamping the mould for an unlimited time without any additional electrical energy nor generating heat. Another electric pulse will demagnetize the system, releasing the mould and clearing the clamping surface of any magnetic flux. After a magnetizing sequence each pole is either a north or a south pole. After a demagnetizing sequence the poles are neutral. The total holding force is directly proportional to the number of magnetic poles engaged with the mould and taking into account the mentioned specifications and work conditions. It is for this reason that EAS selected the small size poles to enable maximum versatility within a specific area and around ejector or mounting holes as many as possible poles thus creating a high clamping force. This is not possible with large size poles. A laser cut stainless steel mesh seals and covers the total system, resulting in a perfect flat steel to steel surface. This steel to steel surface is also simple to clean.
**PRESSMAG HP**

The Pressmag HP system is a compensated system. This means that each pole is not, as the Pressmag SP system, a north or a south pole, but here the long poles are acting like the north plus pole while the frame plate acts as the south minus pole. The permanent Neodymium and ALNiCo are always active. To magnetize, the electric current in the coils reverses the polarity of the ALNiCo magnets. The magnetic fields generated by the magnets are oriented to the polar face of the chuck, which becomes active and the mould is clamped. A new electric current reverses the polarity of the ALNiCo magnets and turns off the system, the demag phase and the mould is released. By concentrating all long poles for larger machines within the tie bar area, by adding at the side non magnetic filling plates and at the back corner of these filling plates a stainless steel strip for a higher magnetic flux concentration, we achieve higher force within the tie bar area.

That’s why we say: “Our poles are longer and stronger”

**PRESSMAG T**

This magnetic clamping system is ideal for large machines and tools requiring total demagnetism and/or for alloyed steel tools and for applications till 150 °C.

**WORKING CONDITIONS AND SPECIFICATIONS**

EAS Pressmag systems are reliable and safe clamping systems if you apply the following simple rules and specifications.

- The magnetic platens as well as the mould back plates must be free of marks, dirt, rust and grease, which can create an air gap between the magnetic platen and the mould back plate. Such an air cap results in a significant loss of clamping force.
- The mould back plates must be made out of non alloyed steel. In case of alloyed steel EAS offers the unique Pressmag T version as solution.
- Back plates must be machined to a roughness of Ra = 1.6 or better and have a minimum flatness of 0.1 mm/meter .
- For the Pressmag SP the mould back plate thickness must be min. 20 mm (0.75”) and for the Pressmag HP and Pressmag T, min. 30 mm (1.18”)
- The standard HP long pole creates 25,0 kN/pole clamping force, while the SP 45x45 mm square pole provides 2.4 kN/pole
- The Pressmag SP is suitable for max. 150° C or 300° F.
- The Pressmag HP is suitable for max. 100° C or 212° F.
- The magnetic flux depth is 20 mm (0.75”) for the Pressmag SP and 25 mm for the Pressmag HP and T, with no interfering with moving parts in moulds or dies.
- The magnetic holding force is based on the opening force of the injection moulding machine.

Be careful with openings in the back plate of the mould as this will limit the clamping force. Minimum mould dimensions are given for every system to ensure that the mould is clamped safely enough in relation with the opening force of the machine.

The advantage of the long pole HP system is that when the poles are only partly covered by the mould the total magnetic flux of the long pole will act on the mould, resulting in high clamping forces on smaller moulds.
The advantages and standard features of the EAS Pressmags

PRESSMAG SP
- Very suitable for smaller sizes of injection moulding machines (< 800T).
- Small square/round poles, resulting in high forces within limited areas and despite holes. Standard 45 x 45 mm poles with stainless steel mesh seal, for cleaner and longer life.
- Up to 150 °C (300°F)
- Plate thickness 38 mm (1.5”)
- 2,45 kN force per pole

LOCATION AND CENTERING RING
Up to 200 ton machines the Pressmag SP and HP systems are delivered without an additional centering and location ring. These are available as an option. All other sizes come with a replaceable hardened centering rings for a quick and precise mould set up as well as exact mounting of the Pressmag plates on to the machine.

SENSORS
The Pressmag HP is standard equipped with two proximity switches and a temperature switch. The proximity switch gives a signal if the air gap is becoming too big or no mould is detected and switches off the machine. A flux sensor on request. A flux sensor registers a change in the magnetic flux, either to indicate an alloyed steel that can not be clamped or as additional safety connected to the machine. Systems below 200 ton have 1 proximity switch per plate.

JUNCTION BOX
Machined into the body as an integrated part. Sealed and waterproof. Removable to have access to the cable connections if required.
MOUNTING AND INJECTOR HOLES
According to the international standards Euromap, SPI and JIS the Pressmags are equipped with mounting holes and/or ejector holes. Furthermore is each plate equipped with threaded holes on top of the plates for mounting lifting eyes for easy installation onto the machine plates.

ADDITIONAL PATENTED MECHANIC SAFETY DEVICE
Safety is a very important aspect. EAS patented an integrated and adaptive optional safety device, which prevents the mould from falling into the machine in case for one reason or the other the clamping force is not sufficient to hold the mould. On the mould one need to mount holding plugs, while in the Pressmag a key slot will be machined in which the plug will “hang” in case of a mould drop. An adaptable retrofit solution is also available as an option. Sensor technology will stop the machine in case something is incorrect but this safety device will actually stop the mould from falling, thus avoiding expensive damage. Another example that IdEAS come from EAS.

PRESSMAG HP
- Very suitable for larger sizes of injection moulding machines. (> 800T)
- High flux generation, high forces on smaller moulds
- Standard 310 mm (12.2") long poles with resin sealing
- Up to 100 °C (212 °F)
- Plate thickness 55 mm (2.16 “)
- Non magnetic filling plates outside the tie bar area with flux concentrating
- 25 kN force per pole

PRESSMAG T
- Suitable for all machine sizes
- For zero residual magnetism
- For alloyed steels
- Up to 150 °C (300 °F)
- Plate thickness 55 mm (2.16 “)
CONTROLS
The EAS controls are completely designed to work SAFELY with the pressmag systems.

- To the VDMA and SPI recommendations, we define interfaces between the machine and our magnetic clamping system (MCS):
  - E70.0 is for retrofit existing machine
  - E70.1 is for new machines, controls integrated
- Magnetizing/Demagnetizing sequences only allowed in Mould Change Mode (not in manual-Semi Auto-Automatic mode)
- Magnetizing sequence only allowed if proximity switches give signals (mould loaded)
- 2 safety channels
- Machine movements stopped in case of magnetic clamping system alarm
- After MCS alarm it is impossible to restart the machine until understanding of the problem root cause and resetting the MCS alarm switch (with special key switch) and demagnetizing of both plates, then new magnetizing sequence. This to recover the full and safe clamping force
- 2 hands operation for Mag/Demag sequences: 1 key switch for plate selection + 1 push-button for Mag or Demag sequences (2 simultaneous controls required to operate the MCS)

Compliances to the Machine Directive (safety of Machinery- Electrical equipment of machines) and EMC directive (Electro Magnetic compatibility)

SENSORS:
- Proximity switches for detecting mould presence and monitoring air gap during machine operations.
- Flux sensing systems for detecting tool back plate material, flux level after magnetizing sequence and monitoring air gap during machine operations.
- Temperature sensor for monitoring temperature of the mould back plate.

READINGS:
- Current measurements done during magnetizing sequence to confirm magnets saturation
- Current measurements done during Demagnetizing sequence to confirm complete sequence.
- Main voltage monitoring during Mag/Demag sequence
- Main frequency monitoring during Mag/Demag sequence
- All done by an integrated PLC system

TEMPERATURE SELECTION
- Pressmag SP has a standard temperature range for mould back plates till 150°C (300°F)
- Pressmag HP has a standard temperature range for mould back plates till 100°C (212°F)
- Pressmag T is applied for a temperature range till 150°C (300°F) and for alloyed steels as well as if zero residual magnetism is required.
- Pressmag HT is applied for high temperatures till 250°C (464°F)

HUMAN/MACHINE INTERFACE WITH A CONTROL PANEL WITH DISPLAY OF:
- All magnetic status (Movable and fixed plates magnetized or demagnetized)
- Movable and fixed plate proximity switch status
- Alarm status
- Movable and fixed plate flux status
- Temperature sensor status if you have this option in your system
EAS Pressmags, the total range for each temperature and application

VERTICAL PRESSES
EAS offers also a large QDC program for metal stamping applications. This EAS QDC (Quick Die Change) program is a range for saving time at a die change on vertical presses, such as stamping presses or vertical injection moulding machines. Next to the Pressmag system for clamping the upper and lower part of the tool, we offer die lifters for lifting the lower part of the tool above the pressbed for easy positioning as well as pre rollers for a simple loading and unloading of the tool in front of the press.

HORIZONTAL MOULD CHANGE ON INJECTION MOULDING MACHINES
For a horizontal mould change EAS supplies next to the magnetic clamping unit also driven and/or non driven rollers, mould change tables or cars, as well as multi coupler and mould locking devices. In this case the mould back plate needs to be standardized. The application picture shows a full automatic mould change solution at a well known global automotive supplier with a mould change time of less than 3 minutes for a 40 ton mould. Ask EAS for their global experience on thousands of machines, advice and project management as Time is still Money.

RUBBER PRESSES
For high temperature applications such as rubber or ceramic presses, we offer the Pressmag HT version which works till a temperature range of 250° C.

DIE CASTING MACHINES
Pressmag HT solutions can be used on high temperature die casting applications.

ROTATING TABLES
For multi-color or rotating plate presses, EAS also offers magnetic clamping solutions. The same of course applies for tiebar less machines and other special applications. Ask EAS and you will be enjoyed about the ideas and experience.