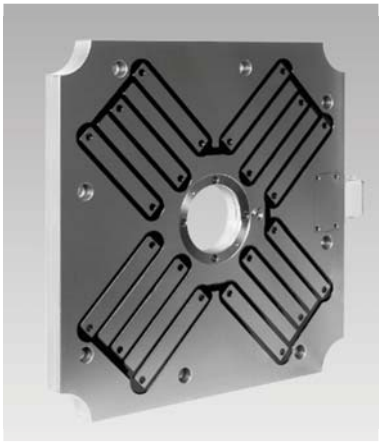
ROEMHELD
RIVI MAGNETICS

Issue 7-17 E

RR 1.1134

Magnetic Clamping Systems M-TECS 120
for temperatures up to 120 °C



Advantages
- Standardisation of moulds/dies no longer required
- High safety by process monitoring
- Clamping of the moulds/dies within a few seconds
- Ergonomic handling with ease
- Mould/die clamping also in heated condition
- No further mounting holes required
- Minimum wear of the moulds/dies
- Motion detection of the mould/die
- Mould/die clamping on the complete surface with minimum deformation

Application
M-TECS 120 magnetic clamping systems are primarily used for automatic clamping of different moulds on injection moulding machines.

Description
With M-TECS 120 magnetic clamping systems, the moulds/dies are magnetically clamped or unclamped at the touch of a button within a few seconds
Since the force of the magnetic clamping plates is generated by permanent magnets, electric clamping is only required to magnetise the plates.
The magnetic clamping plates are de-energised in clamped condition and thus absolutely safe in the case of power failure.
In addition, the complete clamping cycle is monitored by different sensors and thus a reliable mould/die clamping is guaranteed.
M-TECS 120 magnetic clamping systems have the CE mark and comply with the provisions of the applicable machine guidelines 73/23 EEC and EMC 89/336.

Scope of system and delivery
M-TECS 120 magnetic clamping systems are delivered as complete clamping systems with all required system components. The essential components of a system are:
- two magnetic clamping plates
- electric control in a splash-proof control box
- a manual remote control
- required electrical connection cables

Electric control
see catalogue sheet RR 1.5660

Customised versions
All M-TECS 120 magnetic clamping systems are customised and manufactured to meet the specific requirements.
For example, the size and pole technology of the magnetic clamping plates are selected according to the application and the machine.
Please contact us.

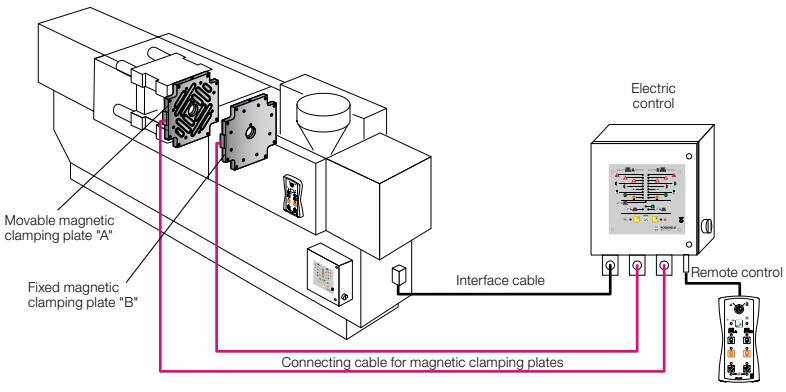
Safeties
- The inductive limit switch checks the form-fit contact of the mould/die and guarantees a clamping without loss of force.
- Sensors in the interior of the coils to register the slightest mould/die movements due to changes of the magnetic flow between the magnetic clamping plate and mould/die.
- A temperature sensor in the magnetic clamping plate prevents overheating and thus damage to the system

Technical basic data

Size of the magnetic clamping plates		Customised
Pole technology		Square pole, long pole or a combination of both (see page 3)
Max. temperature	[°C]	120 (on request up to 240)
Specific magnetic force*	[kg/cm²]	18
Effective magnetic force	[kg/cm²]	5 – 12
Magnetic penetration depth	[mm]	20
Plate thickness	[mm]	47
Mounting		as per existing Euromap grid
Part no.		**81134 (basic version)**

* Force directly on the magnet

Installation on an injection moulding machine

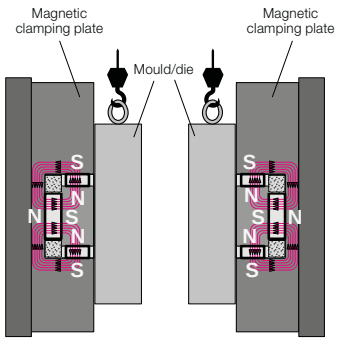


Functioning • Design • Accessories

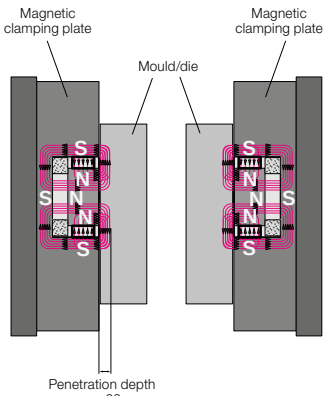
Functioning of the magnetic clamping plates

Basically, the electric permanent magnet clamping system is firmly kept in place even in the case of a power failure: Power is only required for approx. 1 to 2 seconds to magnetise the system. Then, the clamping system works independently of any power supply. The magnetic clamping force is exclusively generated by the permanent magnets. Only for unclamping the mould, electrical energy is required again (for 1 to 2 seconds) to demagnetise the clamping plate. An existing AlNiCo magnet in the core is re-polarised by a current pulse. This magnet affects the magnetic field and relocates it to the interior of the magnetic clamping plate (demagnetised) or approx. 20 mm outside the plate (magnetised).

demagnetised

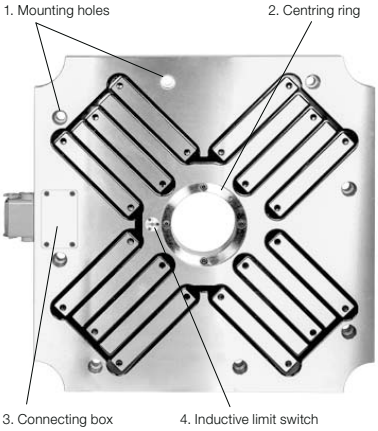


magnetised



Structure of the magnetic clamping plates

1. The mounting holes are completely designed according to the already existing mounting grid as per Euromap. Further bore holes in the machine bed are not required.
2. The centring ring is manufactured as per customer's specifications. An exchangeable centring ring is available as an accessory.
3. The completely sealed connecting box guarantees permanent access to the wiring of the plate connection.
4. The inductive limit switch checks the perfect contact of the mould/die and then releases the magnetisation.



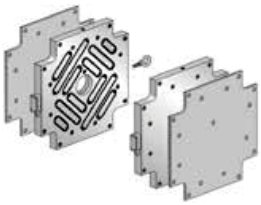
Further safety equipment in the plate:

- Sensors in the interior of the coils respond to induction and report the slightest mould/die movements.
- A temperature sensor in the magnetic clamping plate prevents overheating and thus damage to the system

Accessories

Insulation plates

The insulation plates are mounted between the machine bed and the magnetic clamping plates. They enable uniform heat distribution and avoid that the heat passes from the mould/die to the machine.
The insulation plates are available with a thickness of 6 and 10 mm.
Since the magnetic clamping plates are equipped with firmly mounted insulation plates, this investment is not required for all new moulds/dies.



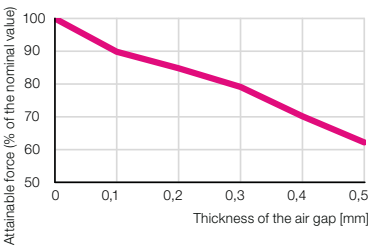
Centring ring

Too many tool changes can wear the centring on the magnetic clamping plate. An exchangeable centring ring guarantees the precise centring of the moulds/dies without exchanging the complete clamping system.

Force sensor "FES"

Force sensor "FES" for measuring the air gap and continuous monitoring and display of the retention force.

Reduction of the clamping force

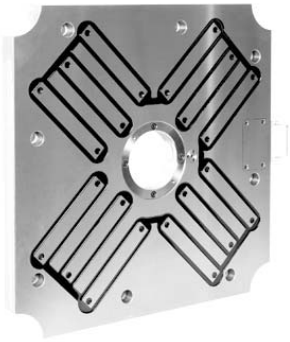


Pole technologies

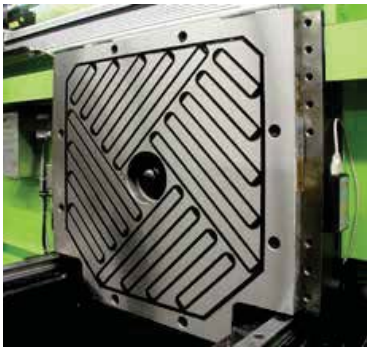
Long pole technology

Long poles are particularly suitable for small and medium-sized machines. Due to the geometric properties of the long poles, a flexible arrangement is also possible in the case of many additional holes.

Plate thickness	[mm]	47
Pole size	[mm]	individual

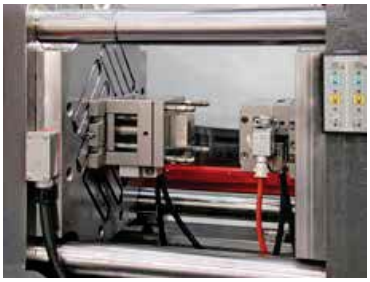


Application examples



Concentration effect of the long pole technology

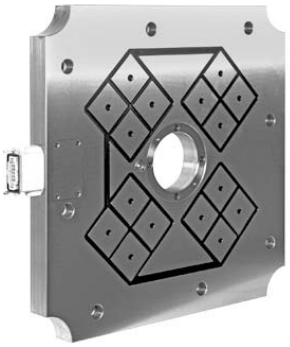
Using the long pole technology, a sufficiently high retention force is generated also without full coverage of the poles. The magnetic field lines of the not covered pole surface act in addition to the covered pole surface on the mould/die and enable a safe clamping of smallest moulds/dies.



Square pole technology

Square poles are particularly suitable for large machines. With full coverage of the poles, the maximum retention force is obtained.

Plate thickness	[mm]	55
Pole size	[mm]	50 x 50 or 70 x 70



Combination of long and square pole technology

By the combination of long and square poles, Römheld Rivi combines the advantages of both pole technologies.