



## Magnetic Quick Mold Change System

Experience the invisible security power



Focusing on electro permanent magnet  
technology development,  
Quality first ,  
continuous innovation.

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## HVR Magnetics Co., Ltd

# Company profile

HVR Magnetics co.,ltd, situated in the Liyu Industrial Park, Tianyuan District, Zhuzhou, Hunan, is a high tech exported oriented company, devoted into research & development and manufacturing of electro permanent lifting magnets, electro permanent magnetic chucks, electro permanent magnetic welding fixtures and quick mold change clamping magnet.

Our main products are electro permanent lifting magnets, battery electro permanent lifting magnets,electro permanent magnetic chucks, electro permanent magnetic quick die change clamping, magnetic welding fixture, etc.

HVR Magnetics co.,ltd has a experienced group of senior engineers with over 10 years experience on designing and manufacturing electro permanent magnets and related products. We able to offer customers ideal solution for various application difficulties. Advanced production and machining equipment and improved quality control system insured the reliability and swiftness of providing high quality product for customers efficiently. Our products have been widely used in metallurgy, machinery, shipbuilding, power supply, automobile manufacturer and rail transport industries and we won customers from Europe, USA, Singapore, Japan, South Korea, Brazil and Russia, etc.

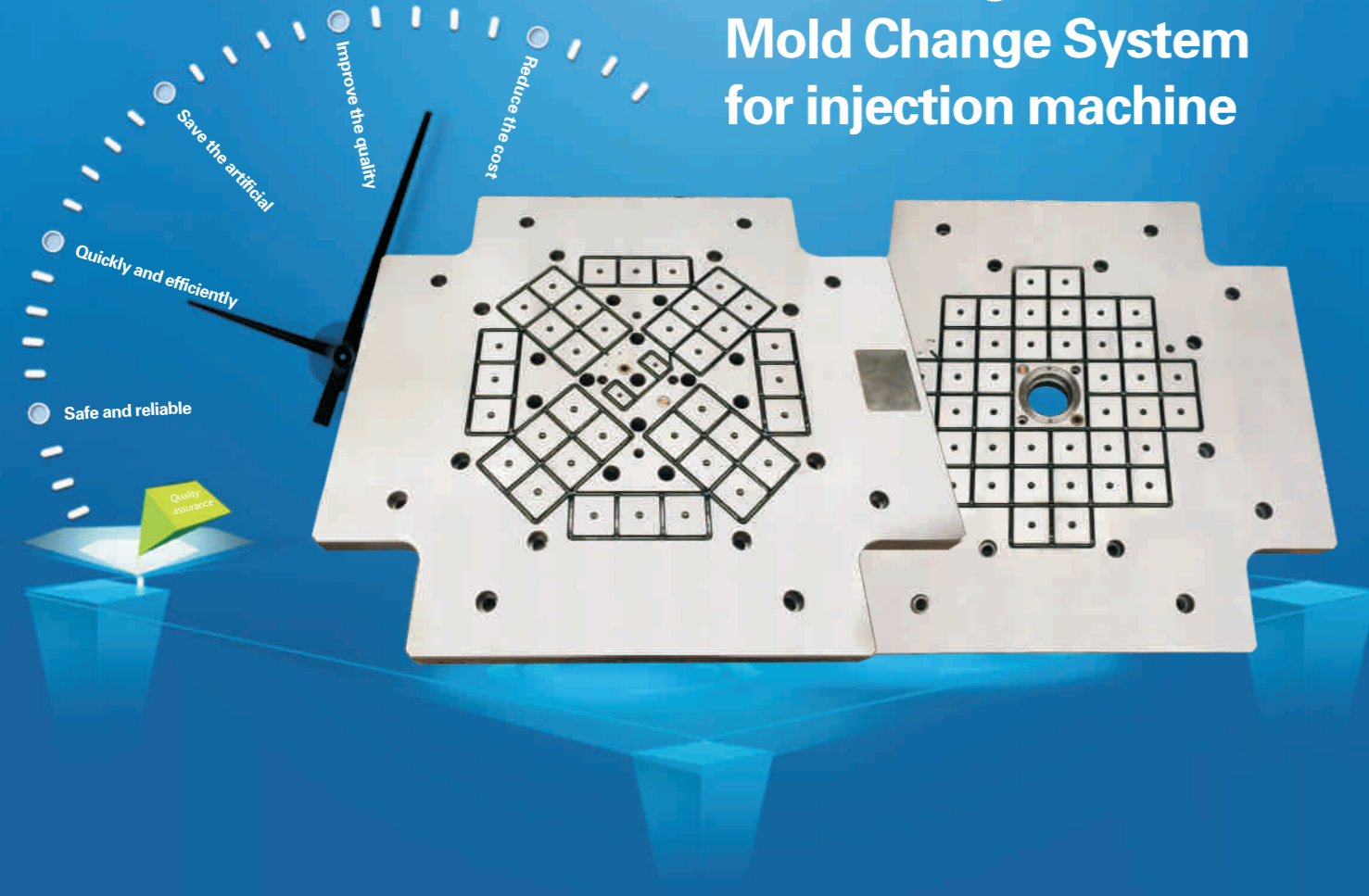
Our product has passed the CE certificate and HVR Magnetics co.,ltd sticked to international requirement. Honest, vigorous and reliable is our principle for production, marketing and trade. Based on win-win foundation, HVR Magnetics co.,ltd seek cooperations with customers from all over the world and build a better future together.



**our partner**



## HQMC Magnetic Quick Mold Change System for injection machine

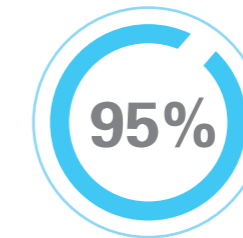


### Safety



- ▶ Unique EPM technique using double magnet system.
- ▶ Magnetic clamping force up to 160N/cm<sup>2</sup> and keep on even power failure.
- ▶ No need to worry about misoperation.

### Energy Saving



- ▶ Electric power is only used for magnetizing and demagnetizing operation with few seconds.
- ▶ Over 95% power saving.

### Quick



- ▶ A single operator can operate the mold change. No need to loosen and tighten bolts one by one.
- ▶ More than 90% time is saved.

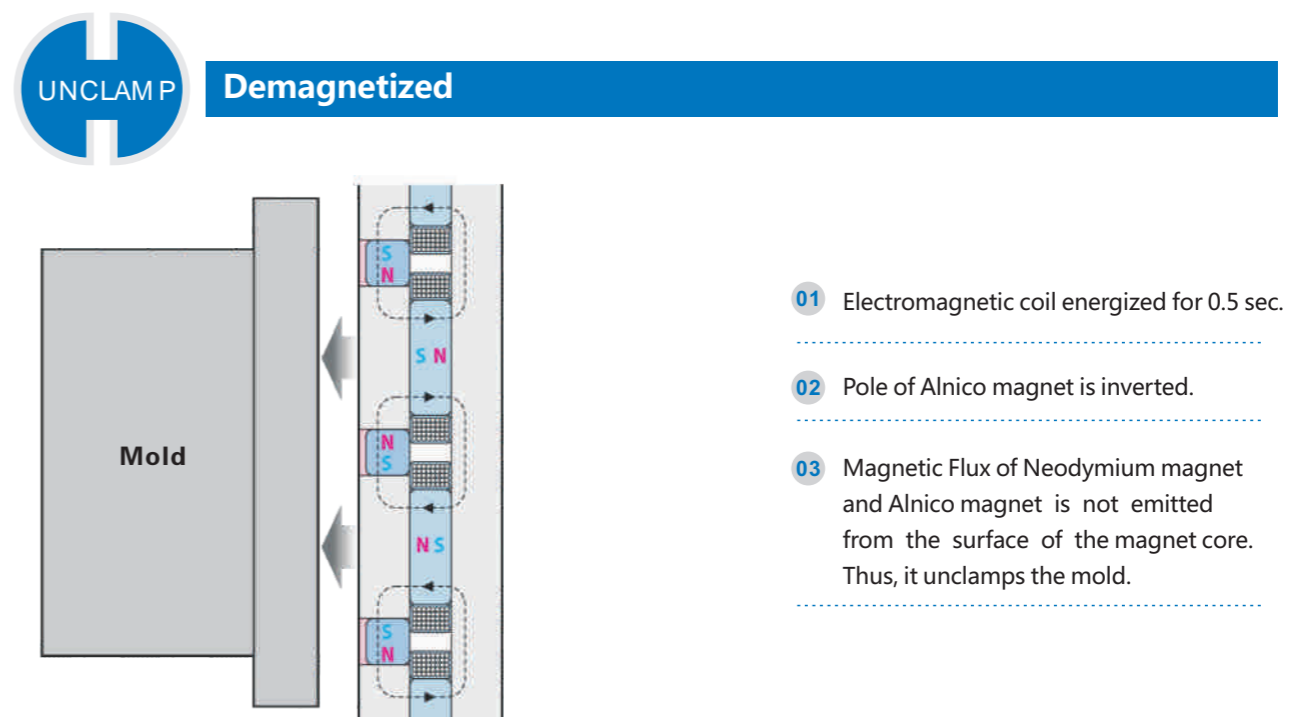
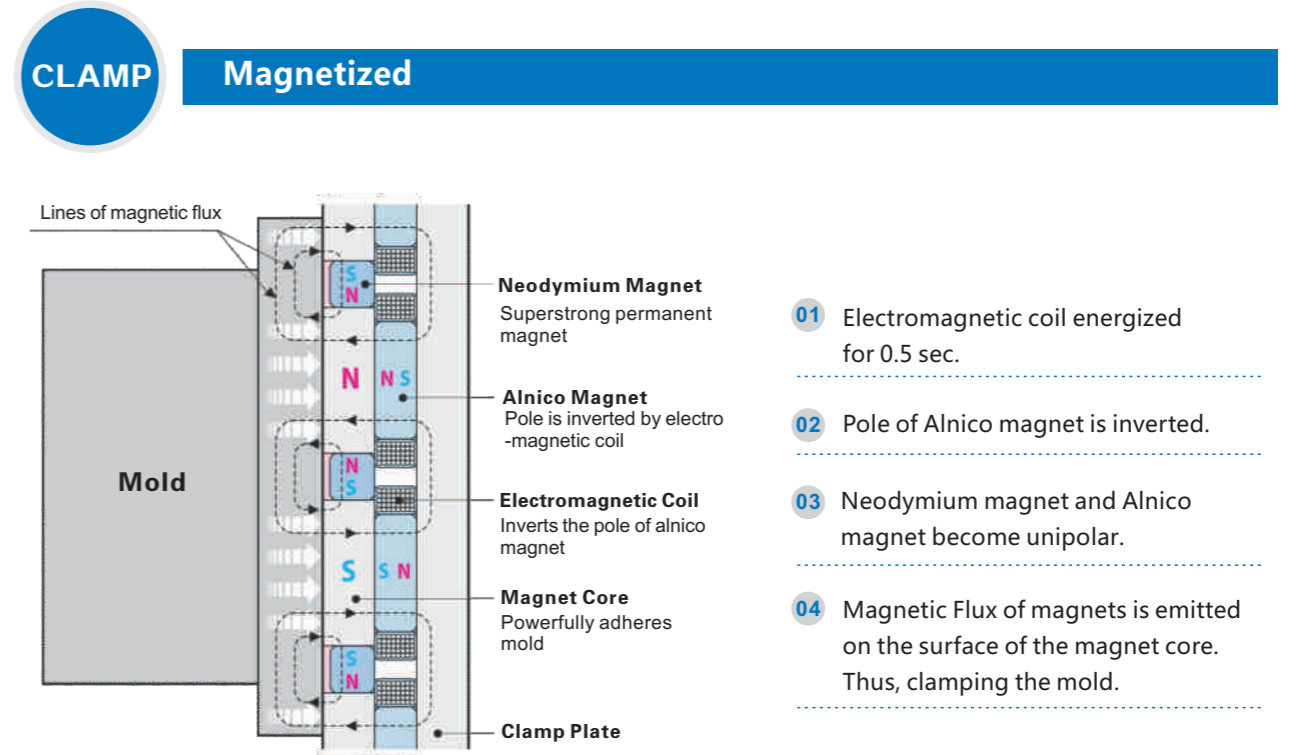
Perfect clamping force,  
**To ensure your safety**  
 Efficient mold change speed,  
**To save your time and money**



## HQMC magnetic Clamping VS Traditional clamping

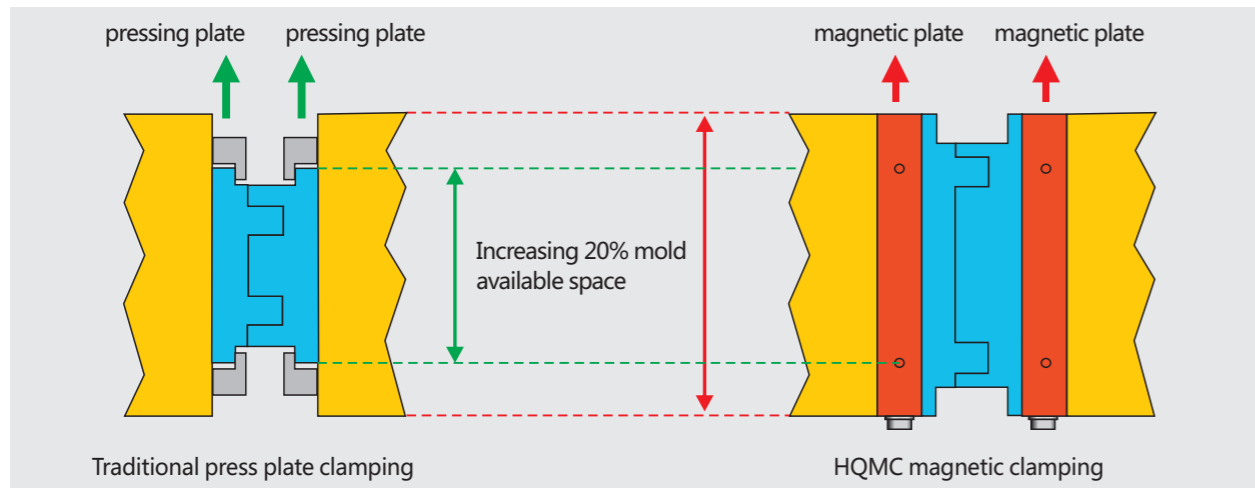
Contents	Traditional clamping		HQMC magnetic Clamping
	Mechanical clamping	Hydraulic clamping	
<b>Reliability</b>	Serious potential safety hazard Causing by mechanical clamping.	Clamping force cannot accurate reflect, cannot learn each clamp point actual mechanical force without any kinds of feedback signal Hydraulic components always required to be repair and replace.oil channel easy blocking.	Magnetic clamping force reflect in a real time. Not affect by power failure, with no moving part, no electricity required, no maintenance cost.Feedback signal detection available.
<b>Mold change efficiency</b>	long mold change cycle, low efficiency.	Mold change cycle very long, low efficiency.	Mold change time could be shortened to several minutes, more than 90% mold change time can be saved. Only one operator is required.
<b>Clamp point</b>	Clamping force only available in mold peripheral location with very limited clamping points, mold base center area no clamping force, letting mold easy become deformation.	Each clamping position mechanical force inconsistent, no clamping force in mold center area with mold easy become deformation.	Uniform clamping over the entire area, especially the center area where the center area existed high clamping force. Guarantee total clamping area has consistent force.
<b>Product quality</b>	plastic product consistency is bad owing to mold center area no clamping force.	plastic product consistency is bad owing to mold center area no clamping force.	Due to uniform clamping force over the entire area, plastic product will become high consistency.
<b>Applicability</b>	low suitability	Due to the clamping position is fixed, all the mold back plate should be design in the same technical specification, without user friendly and wasteful.	No need fixed size mold back plate, mold size more than platen dimension also workable, Strong adaptability, no interface space in the mold peripheral.
<b>Maintenance costs</b>	pressing plate and bolt always needs replace, huge labor cost .	Hydraulic pump needs long time working, huge energy consuming ,Oil always leakage, Needs artificial clean.	No energy consumption during the working processing, no leakage and human maintenance.

## Structure and functions

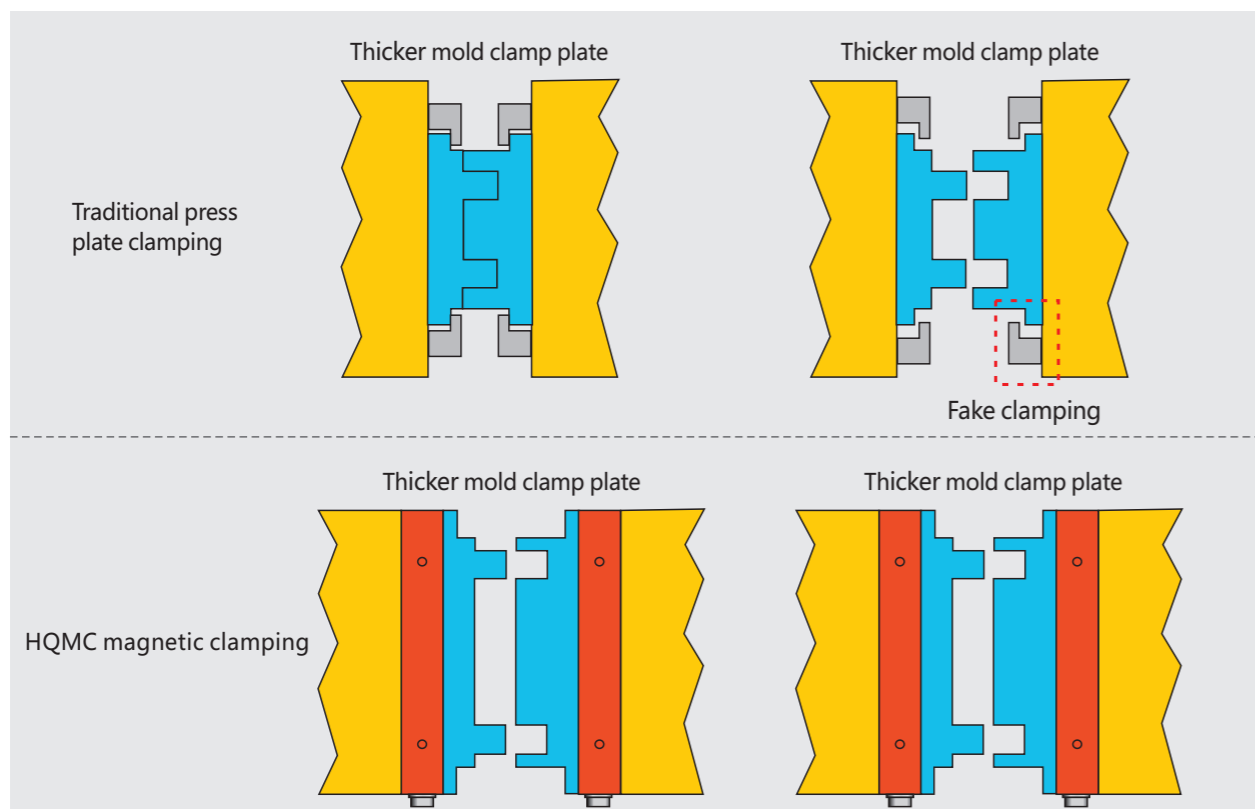


## Friendly for various types of molds

Unlike the traditional mechanical clamp needs enough space to fasten mold, short the available mold space. No extra space is required for magnetic clamping system, no interface of injection machine platen, making injection machine running in maximum efficiency way.

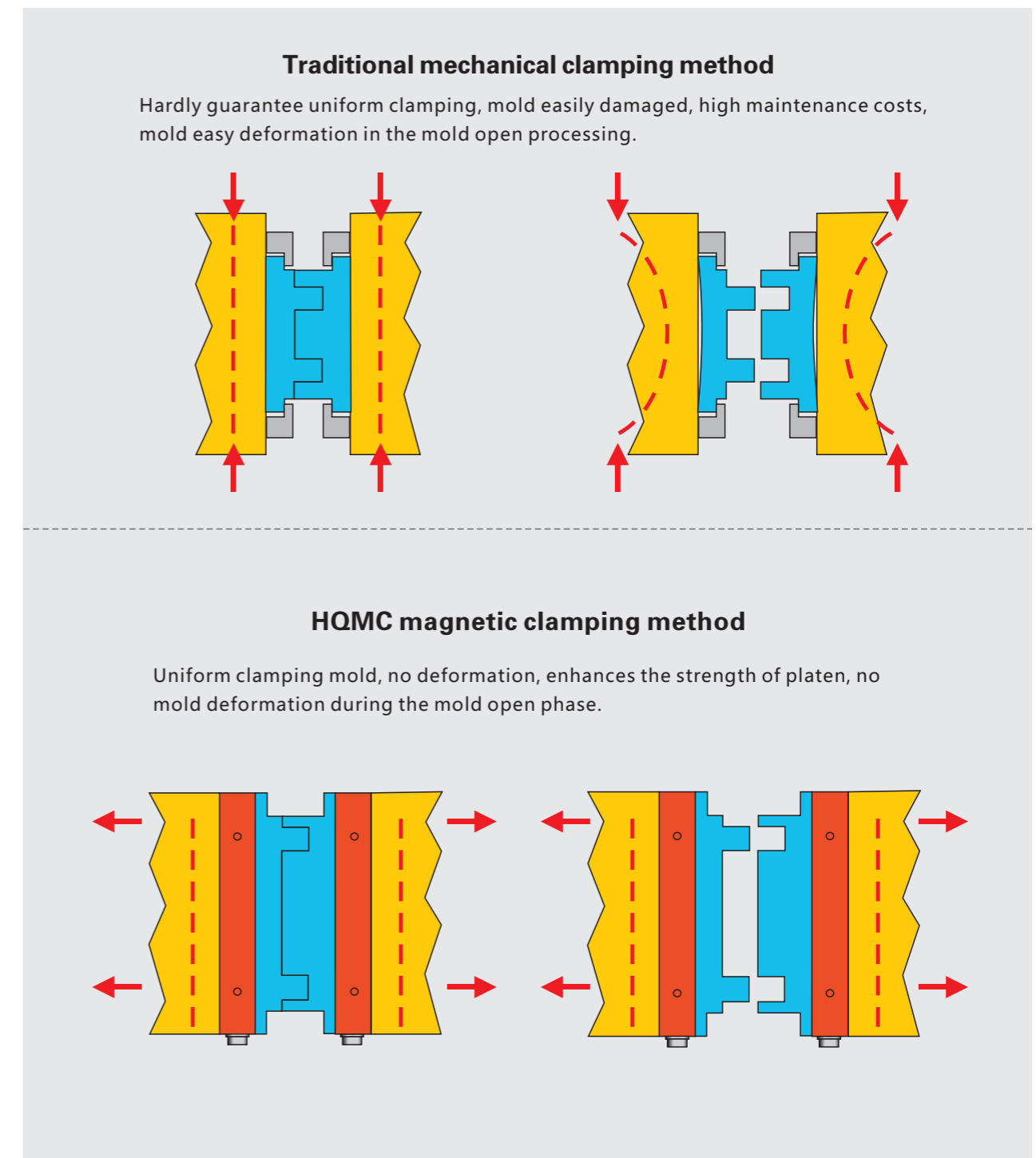


During Production Processing, too much time is wasting due to the mechanical clamp selection. Owing to magnetic quick mold change system uniform clamping mold back space, avoid mechanical fake clamping and other dangerous circumstance happen.



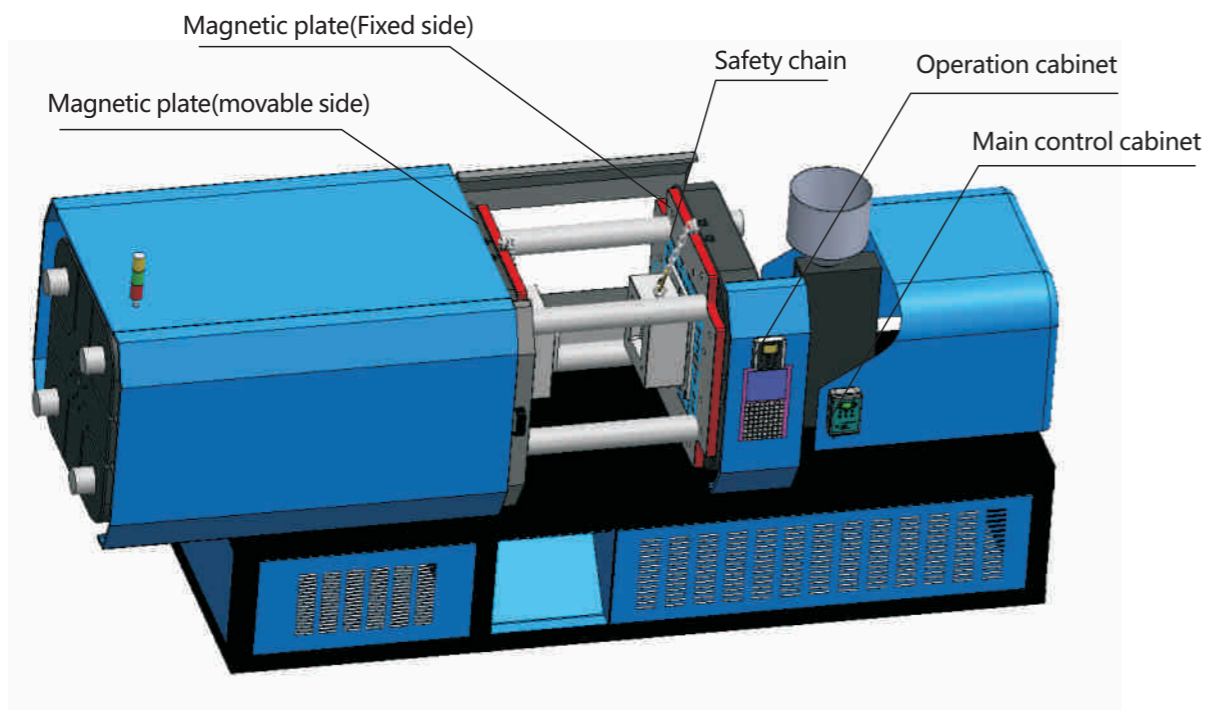
## No mold deformation

The amount of mold deformation is very difficulty definition during the machine injection manufacturing process; also negative affected the quality of products and the life of mold.

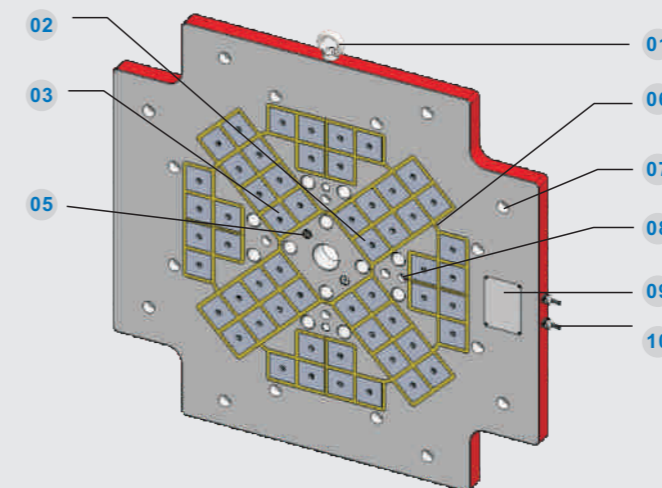




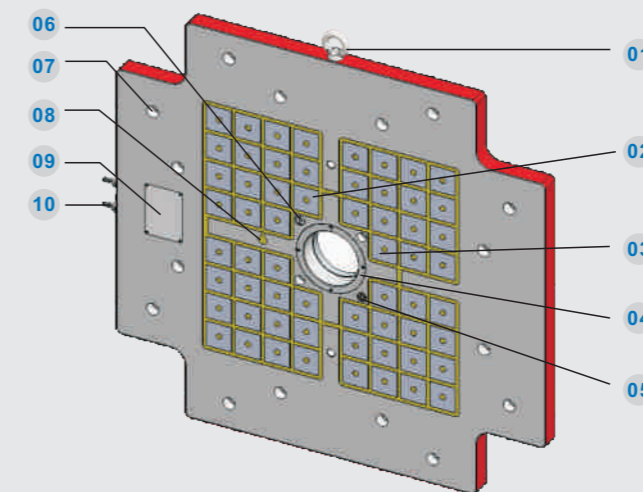
# HQMC magnetic quick mold change system configuration



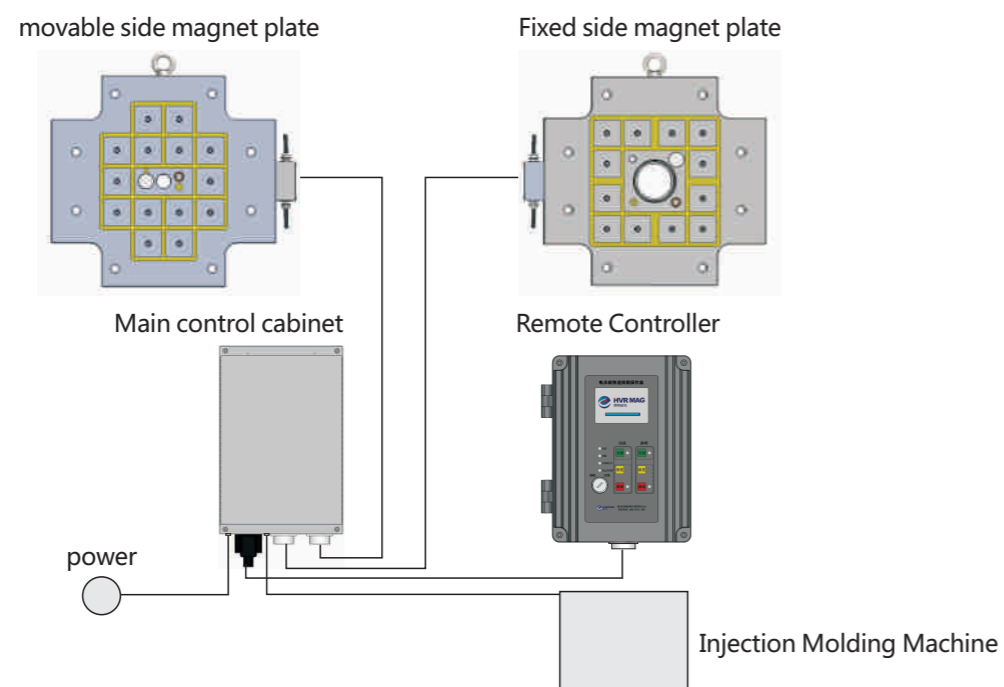
## movable side magnet plate



## Fixed side magnet plate



- 01 Eyebolt
- 02 Mold dislocation detection
- 03 Magnetic flux detection
- 04 Locating ring
- 05 Stripper device
- 06 Distance detection
- 07 Mounting screw hole
- 08 Temperature detection
- 09 Junction Box
- 10 Cable



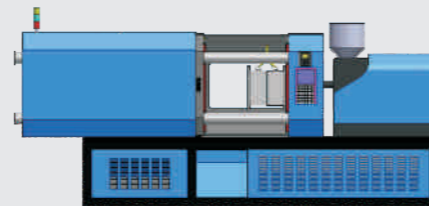
# HQMC Magnetic Quick Mold Change System

## Working Process

### Mold Clamping operation

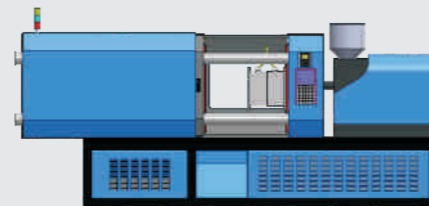
01

Lifting mold into injection machine



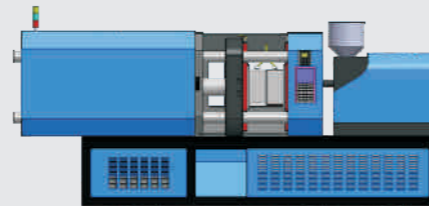
02

Align with the locating ring.  
And adjust position and close the mold.



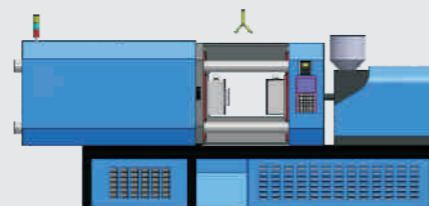
03

Doing MAG operation for fixed and  
movable side magnet plate



04

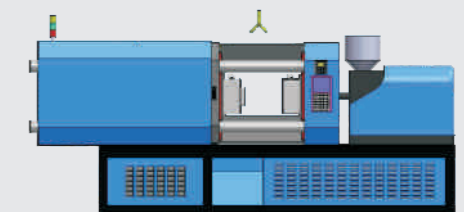
Unlock mold from lifting equipment, remove  
hoisting gear, then injection machine could  
normally work.



### Remove mold operation

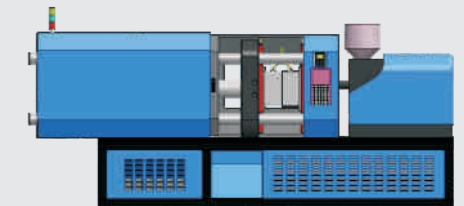
01

Close the mold and add lifting chain.



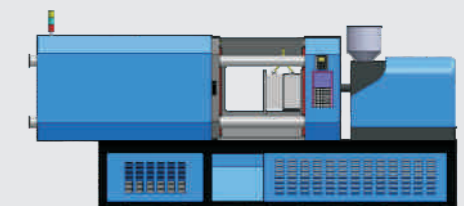
02

Doing the DEMAG operation for fixed side  
and movable side magnet plate.



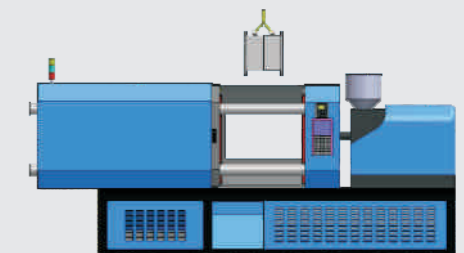
03

Movable platen return back, start to  
remove the mold.



04

Mold remove operation finish, injection  
machine Standby.



# 8 security protection measures

Various types of security protection methods are both available in HVR quick mold change system, not only mistake operation can be avoided, but also protect the total system running in security manner, unique security testing manners as follow:

## 1 Mold close detection

During the mold change cycle, each piece of mold should be in close position, only can doing MAG operation in mold close condition, this interconnected control operation avoid fake operation due to foreign matter and gap existed between magnet plate and mold.

## 5 Die dislocation detection

Die dislocation detection sensor detect mold position in real time, control system report fault signal while mold position has a slight slip, injection mold machine also automatic stop running during in this circumstance

## 2 Magnetic flux detection

During the magnetic quick mold change system in operation period, Magnetizing strength detection function is available in the controller, only when the Magnetization intensity achieve safety standard, the MAG success signal will be present. otherwise, fault signal will be flash. In the meantime, Magnetic flux detection sensor existed in the entire magnet contact area, if magnetic flux sensor detected small value decrease, controller will report warning signal and stop injection mold machine automatic operation.

## 6 Distance detection

Distance detection sensor use to detect the distance between magnet plate and mold, controller only can do DEMAG operation when the distance less than 0.2mm. System will report warning signal if distance over this standard, injection mold machine will automatic stop working in this circumstance.

## 3 Temperature detection

In order to prevent magnet plate contact area high temperature give rise to fault demagnetization and whole magnet system clamping decrease, Temperature detection sensor will emit warning signal and force injection mold machine stop any operation if actual contact temperature over the setting value.

## 7 Interlock Control System

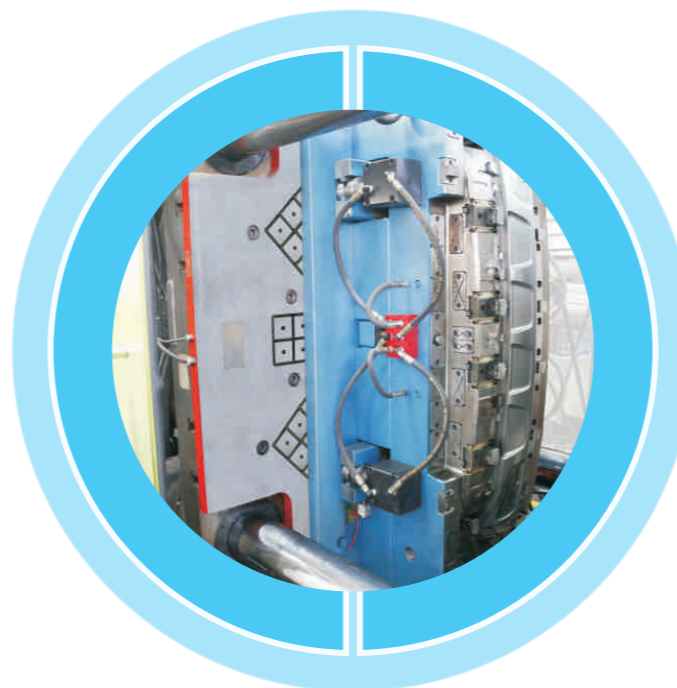
Only when all detection sensor in normal working condition and magnet plate from fixed side and movable side magnetization successful, with key switch turn into injection condition, injection machine automatic working is allowed. Otherwise, injection machine will stop working due to safety consideration.

## 4 Magnetizing current intensity detection

During magnet quick mold change system doing MAG and DEMAG operation, current detection sensor monitoring MAG and DEMAG pulse current. MAG or DEMAG success signal will be reported only when reaching the request value.

## 8 Key switch control

Using key switch to transform mold change condition and injection condition. Two bottoms are designed for DEMAG operation, only when LOCK and DEMAG bottoms press at the same time, this operation consider workable. MAG and DEMAG operation consider Invalid during the injection processing stage .





## HQMC Magnetic Quick Mold change System Specifications

Description	P50	P70
Dimension of square pole(mm)	50x50	70x70
Magnetic force per pole(kg)	380	720
Magnetic plate thickness(mm)	40	50
Operating temperature(°C)	120/150/180	
Magnetic flux depth(mm)	20	
Mold proximity sensor range(mm)	0.2	
Standard voltage	AC220V/380V/415V/440V,50/60Hz	
Injection machine mold clamping force(KN)	500-40000	

## HQMC Magnetic Quick Mold Change System configuration table

No.	item	Configuration specification	Number
1	Magnetic plate (Fixed side)	●	1
2	Magnetic plate (movable side)	●	1
3	locating ring	●	1
4	Main control cabinet	●	1
5	remote controller (operation panel)	●	1
6	IPC interactive touch screen operation system	○	1
7	Mold mismatch detection device	●	Install on movable and fixed platen side, Each side one unit
8	magnetic flux detection device	●	Install on movable and fixed platen side, Each side one unit
9	displacement sensor	●	Install on movable and fixed platen side, Each side one unit
10	temperature sensor	●	Install on movable and fixed platen side, Each side one unit
11	Mold ejector device	●	Install on movable and fixed platen side, Each side one unit
12	Mounting bolt	●	According to the technical specification
13	Connecting cable	●	1
14	Operation and maintenance Manual	●	1

NOTE: ● Standard configuration  
○ Optional configuration

**“HQMC magnetic quick mold change system  
Focus on your efficiency and safety ”**

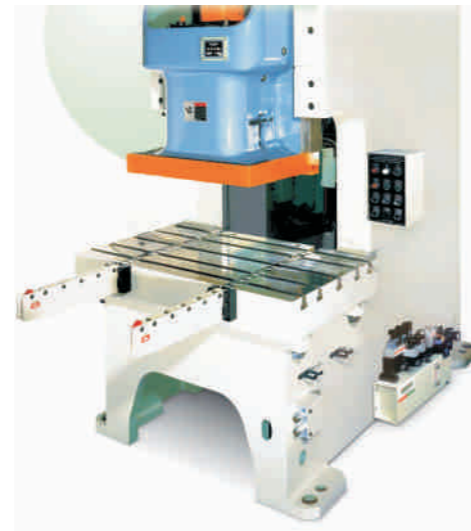


# HQMC Magnetic Quick Mold Change system for Punching Machine

Huge human resources and time are waste while in mold change cycle, creating manufacture production cost increasing; also decrease the efficiency of production, after using HVR magnetic system, mold change cycle could be shorten, rate of good product greatly increasing, strength company competitive force.

HVR magnetic system friendly for any dimension and any shape mold, no special mold standard are required if using this innovation product. Design and manufacture cost can be saving.

The magnet pole also could be design in long strip shape taking care of long strip Mold base, hence providing the best performance.



## Easy installation

Only needs several screws to install magnet system on your punching machine, Full range of systems are customizing design and manufacture according to your technical specification. With advancing design and innovation, the thickness of magnet plate is become thinner, saving available opening stroke.

## Easy operation

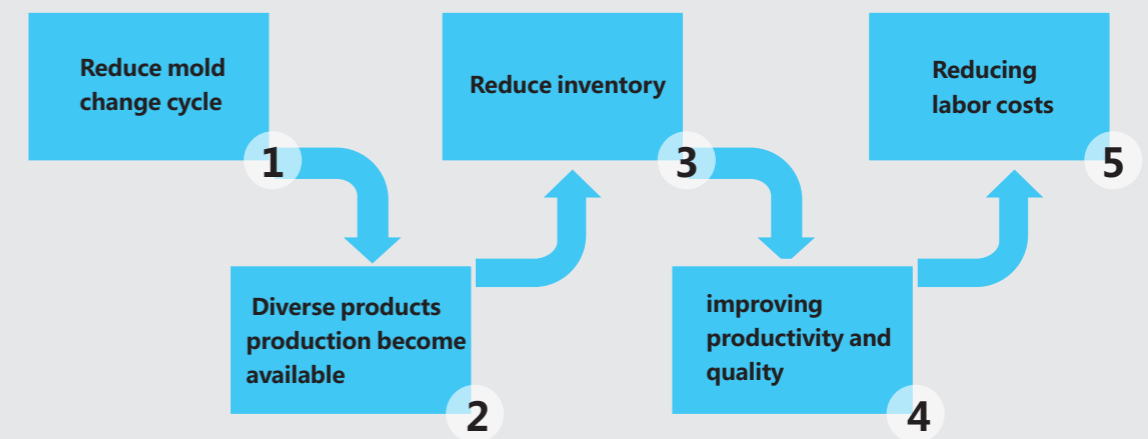
No extra tools are required for fasten mold, user can operate this system at safety distance with simple operation.guarantee the safety of operator. The operation process would short into following steps: Putting mold on the machine table— close punching machine—press MAG bottoms for upper magnet plate— press MAG bottoms lower magnet plate, All the processing become simple and effectively in one step.

## Security and stability

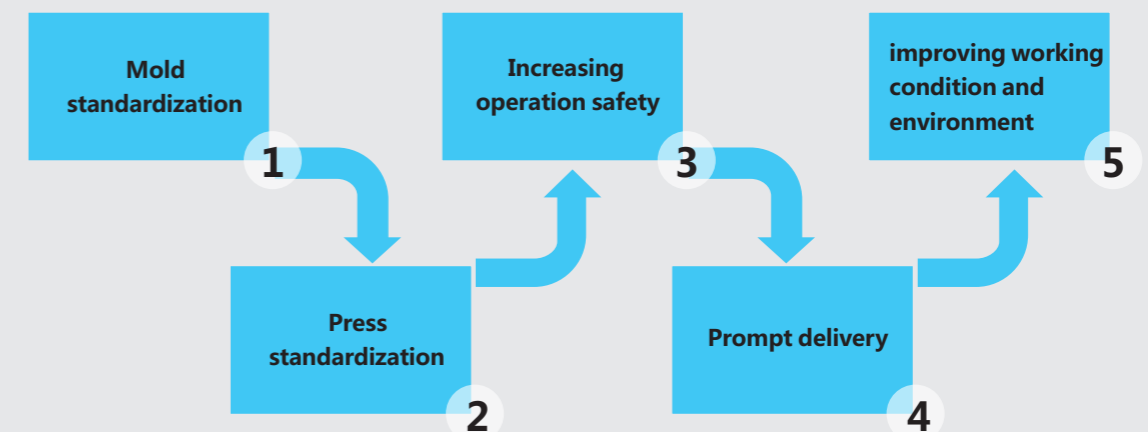
Thanks for electro permanent magnet technology, the magnetic clamping force keep on and without any decrease even power failure or cable broken, unlike traditional clamping method making mold deformation,Stamping work piece high precision and high quality can be guarantee become simple and effectively in one step.

## To bring you economic benefits

### Direct Benefits



### Indirect Benefits



**Q In accordance with the value of the magnetic plate clamping force , what basis is design with?**

**A** To answer this, you need to understand the clamping force effect of the magnetic system. This product is using for overcome friction force from mold itself gravity by clamping mold back base, achieving mold does not fall from magnetic plate. design basis (1): the weight of mold.design basis; (2): The maximum injection molding machine open clamping force design basis; (3): movable mold clamping force is larger than fixed side.

**Q if Sudden power failure the mold will fall?**

**A** No, the magnetic plate with electric permanent magnetic principle to design & manufacture. It only needs electrical energy at the moment of magnetization and demagnetization, the rest time no need electricity. the working magnetic is from its inside rare earth permanent magnet materials, rather than electromagnetic, power outages can guarantee permanent magnet.

**Q Magnetic radiation is harmful to human ?**

**A** No, harmless. The magnetic plate after magnetization, forming a closed magnetic field on the surface of the magnetic chuck. The effective distance range of magnetic line is 20mm from the magnetic chuck, more than 20mm, the magnetic field becomes very thin, it is similar to the magnetic field strength in the air, so people with pacemakers do not close, bank cards, watches , mobile phones and other items do not close the range from less than 20mm chuck surface.

**Q Magnetic plate water resistance, oil resistance, corrosion resistance ?**

**A** Absolutely no problem. By using multi layer, waterproof, anti - oil, corrosion - resistant structure, allowing to work in water, oil and gas environment.

**Q Magnetic plate is afraid of high temperature?**

**A** This system allow operating temperature range: T1: 0-120 degrees, T2: 0-150 degrees, T3: 0-180 degrees, different temperature levels with different price, more than 180-degree heat, we not recommend to use.

**Q Magnetic platen has any interference to the mechanical hand or injection molding machine ?**

**A** No, there is no interference. Magnetic plate only use electrical in a moment for replace mold, other times magnetic plate is completely powered off , magnetic working range is only within 20mm range of the magnetic chuck, other areas without magnetic, so it will not interfere the injection molding machine and mechanical hand work.

**Q Mold back base is not flat, how to solve ?**

**A** Need be adjusted to let the back base making full contact with magnetic system. Remove the bulgy part, such as the edge of the dent, back plane landing angle extrusion highs, tighten the back plane screw and the guide column, remove the thick dirt on the back plane.

**Q which parameters needs to be confirm before system selection?**

**A** A、 mold clamping force  
 B、 movable and fixed mold outside dimension, fixed hole size, fixing ring diameter and height, diameter and length of the mandrel.  
 C、 injection molding machine brands, models.  
 D、 mold contact temperature.

**Q Mold with heat insulation plate can be used directly ?**

**A** Insulation panels applied to the outside of the mold back plane, can not be used; insulation panels applied to the inside of the mold back plane, can be used.

**Q Movable mold side injection molding machine top rod longer than the top rod of mold inside circumstance**

**A** In this case, the injection machine rod is not top in the place has push the mold top rod completely out of the top, if the speed of movement setting too high, it will cause a opposite impact force to attraction force through the top rod movable mold and can cause the mold be knocked down from the machine.

solution way:Strictly control ejection stroke, do not allow larger than actual ejection stroke, properly lowering rod bar end side speed.

**Q The mold back cavity area is too large, clamping force will not enough**

**A** when the mold back plate uneven or cavity, the clamping force of magnetic system will decrease because contact area decrease. HQMC magnetic system in the design process are usually considered nearly 30% safety margin, it means that when the mold back plate cavity area does not exceed 20%, the magnetic system is safe. However, taking into account the actual operating conditions are always several factors affecting the attraction force of the magnetic platen, If the flatness of the mold back plate itself does not reach magnetic platen technical requirements of 0.2mm / M, If the flatness of the mold back plate itself does not reach magnetic platen technical requirements of 0.2mm / M, the back plate also have too much cavities, the mold will glide or fall due to lack of clamping force.

solution way: strictly control the actual area of mold back plate in safety standard also of take care size of the flatness of the mold back plate.

**Q The mold temperature is too high**

**A** If mold back plate temperature is too high, exceeding the allowed maximum operating temperature will lead to the magnetic clamping force decline in the mold base. There is a temperature detect sensor setting on the HQMC magnetic plate, when temperature alarm activate, mold back plate need to be insulated to prevent suction force decreases.

**Q The mold opening speed applied in the small and medium toggle injection molding machine**

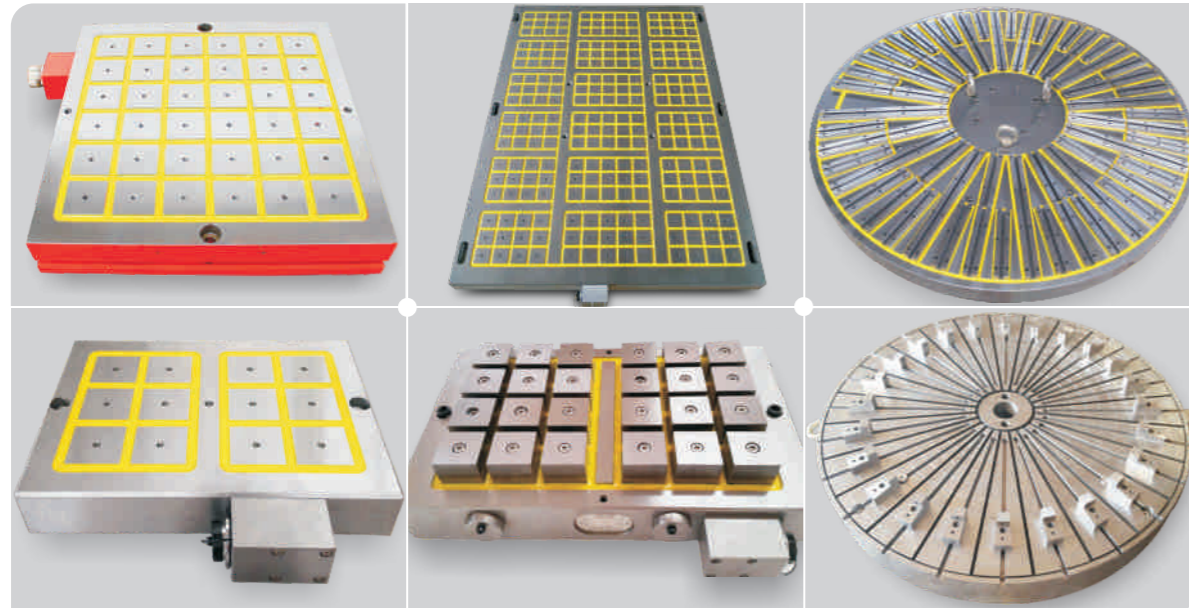
**A** When the magnetic platen is applied to the injection molding machine, its main purpose is to help customers to reduce changeover times improve equipment. Compare to traditional mechanical clamps for production efficiency, magnetic platen has made a lot of improvements on security. But as the above analysis, the size of the magnetic design can not exceed the maximum clamping force of the injection molding machine. So here we need to remind all customers, when using a magnetic platen, the mold speed setting should be adjusted to a reasonable extent in the first paragraph to avoid the high-speed mold. Too fast, it will cause the vacuum in a mold cavity can not be added in a short time, so that the mold will be pulled down from the magnetic platen by vacuum force.

Solution: control the speed of the first paragraph of mold within a reasonable range. Since  $v = \frac{1}{2}at^2$ ,  $mv = Ft$ , so  $F = \frac{1}{2}atm$  (V: mold speed, a: acceleration, t: mold time, m: weight of the mold, F: Opening Force) mold speed, It means big acceleration, when the maximum value of the maximum F exceeds the magnetic attraction force of the platen, there will be pulled off the phenomenon, of course, at this time the magnetic platen alarm unit will immediately display alarm and stop operation of the device.

**Q mold cannot doing open mold operation**

**A** If the down time is too long after high-pressure clamping,related metal structure leads to an elastic deformation of the mold cannot mold, or because of the mold itself defect can not mold. At this moment, force open the mold, the injection mold opening force will be larger than the magnetic clamping force , mold will slide or fall, quick change system will send alarm and emergency signal letting machine shut down. So, When a similar situation occurs, Safety protection measures for mold must be well done to prevent mold drop (use safety chain, etc.) At the same time, for the mold which can not mold, we need to make timely repairs to prevent similar accidents.





### Electro Permanent Magnetic Chuck

- ▶ Magnetic clamping force up to 16kg/cm<sup>2</sup>, No reduction with the time.
- ▶ Uniform magnet clamping over the entire contact area, the thickness of magnet field within 16mm.
- ▶ Electrical energy only consumption within 3 seconds, more than 95% energy could be saved, 5 sides machining in one step could be available.
- ▶ More than 30% working life of cutting tool could be enlarge, no needs repeat clamping work piece, high precision manufacturing can be guarantee.



### Electro Permanent Magnet for smart phone

- ▶ Magnet system is composed by mounting base, magnet units, former bar, cover plate.
- ▶ Unlike air cylinder, this product has strong clamping force, stable, Uniform, simple operation technical feature.
- ▶ Especially suit for metal flame and Mobile phone glass screen, machining, More than 30% qualified rate compare with air cylinder.
- ▶ Friendly for various kinds of products, long term running cost much lower than traditional method.



### Electro Permanent Lifting Magnet

- ▶ Unique inside structure, using two kinds of permanent magnets as magnet source;
- ▶ Magnetic clamping force up to 16kg/cm<sup>2</sup>, No electricity consumption during the working period;
- ▶ Electrical energy only consumption within 2 seconds, more than 95% energy could be saved;
- ▶ Without moving parts, simple operation, no maintenance cost;
- ▶ No residual magnetism existed on the surface, the depth of magnet field could be controlled, energy saving.

