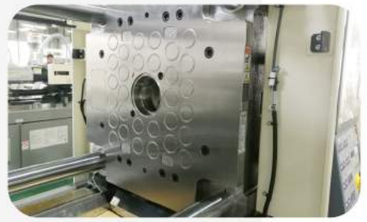
HVR MAG

Main Product Lines Of HVR



Quick Mold Clamping System for Injection Molding & Press Machine

Electro-Permanent Magnetic Lifting Equipment

Electro-Permanent Chuck for Tooling Machine

Customized Automation with Magnetic Chuck

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www.hvrmagnet.com

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HVR MAG

- All steel surface, Oil & Water proof
- 35mm Super thin & Solid construction
- Extra 20% and plus of Magnetic force
- Life time extended with superior design

Electro-Permanent Magnetic Quick Clamping System

Company Profile

Zhuzhou HVR Magnetic Co., Ltd. is a leading company of China's electro-permanent magnetic technology. We are a high-tech enterprises that focus on the development and production of various electro-permanent magnetic product lines such as Quick Mold Clamping System, Chuck for Tooling Machines, Lifting Equipments, Customization for electro-permanent magnetic applications.

Since it's establishment, HVR adhering to this idea on development that "Technology is the Key Productivity", HVR has obtained five patterns for inventions and twenty-nine patterns for utility models. In September 2013 , HVR was awarded by the Department of Science and Technology of Hunan province as High-Tech Enterprises, and in the same year, supported by the National Science and Technology Departments through " The Innovation Fund for small and medium sized enterprises".

The unique advantages of HVR is "safety, energy saving, high efficiency, and environmental friendly". It is widely used in metal tooling, machinery, ship building, electric power, automobile, rail transportation, IT system, medical and varies of industries.

Currently, we keep exporting to Europe, U.S.A. , Singapore, Japan, Korea, Brazil, Russia worldwide. Thanks to these achievements, HVR has become one of the world's most reliable power of industrial magnetic equipments.

HVR adhere strictly to the requirements of the ISO 9001:2015 quality certification standard. Our philosophy is -- "Value-Adding by honest, Win-Win policy with clients" .

Our mission is –

"Create value for employees, Increase benefits for clients, Offer Safe operation as the priority "

With focus on the up-to-date R & D, It allows more people to experience the safety of electro- permanent magnetic products, HVR is currently on the platform of " High-Tech Hunan & Express tunnel in Central China " , it helps us in deep and friendly cooperation with customers domestic & global.

HVR commits its excellent skills to guarantee the safety and superior performance to satisfy high efficiency and cost down demands with our warmest services.

Customers & Partners

JAC 江淮汽车 · SANY · FOXCONN 富士康科技集团 · FUJITSU

中联重科 · 长城汽车 Great Wall · HAITIAN INTERNATIONAL · BOSCH 博世 科技成就生活之美

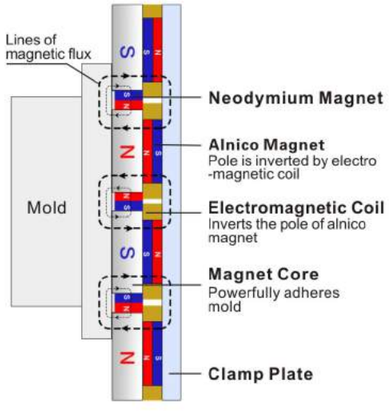
ZPMC 上海振华重工 · 北汽集团 BAIC Group · NUCLEON 纽科伦 · HITACHI

美的 Midea · BYD 比亚迪汽车 · Vanward 万和 · MAERSK

SUMITOMO ELECTRIC · ABB · NIPPON STEEL & SUMITOMO METAL · JOYGLOBAL

Working Principle

Clamp / Magnetized



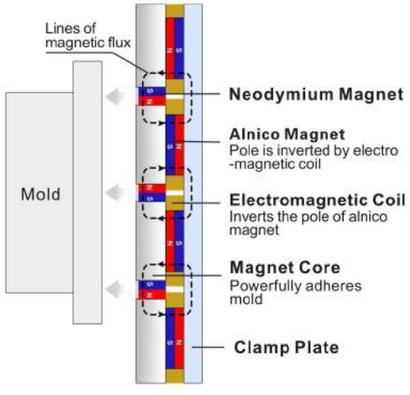
01 Electromagnetic coil energized for 0.5 sec.

02 Pole of Alnico magnet is inverted.

03 Neodymium magnet and Alnico magnet become unipolar.

04 Magnetic Flux of magnets is emitted on the surface of the magnet core. Thus, clamping the mold.

Unclamp / Demagnetized



01 Electromagnetic coil energized for 0.5 sec.

02 Pole of Alnico magnet is inverted.

03 Magnetic Flux of Neodymium magnet and Alnico magnet is not emitted from the surface of the magnet core. Thus, it unclamps the mold.

Safety
Magnetic force remain permanently after magnetization

Energy Saving
Over 95% power saving

Quick
More than 90% time is saved

Longer life time
IP67 water proof

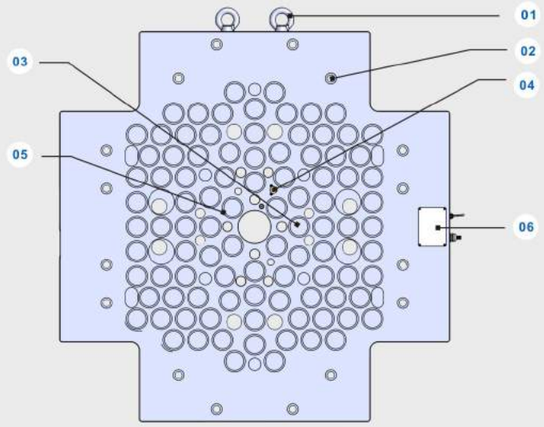
Higher Yield
Magnetic force guarantee an ideal clamping on mold

Maintenance free
none spare parts reuired for template

- HQMC electro-permanent magnetic quick mold clamping system is perfectly for 50~4000 Tons injection molding machines. The latest magnetic structure and outstanding design of magnetic circuit achieves a 20% and more of the magnetic force than conventional magnetic temperate design.
- HQMC electro-permanent magnetic quick mold clamping system provides much greater improvement on mold change efficiency. It performs a less than 3 minutes for general injection machines of mold change, maximum shorten the mold change time from 2 hours down to 20 minutes and less for over sized molds.
- It requires just single operator for mold change and takes three minutes only to complete. Without extra tools can well handling this system beyond the safe distance of the machine. HQMC system reduces labor costs and labour intensity greatly , especially an eight safety protection measures constructs a real-time protection/warning systems— "safty is priority , we insist".

Description of Magnetic Template

Movable Magnetic Template



01 Eyebolt

02 Mounting screw hole

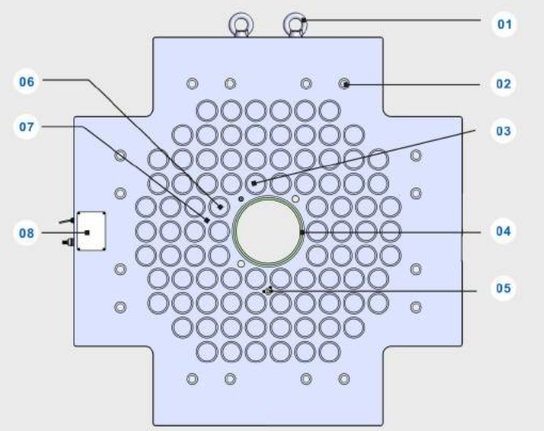
03 Mold dislocation detection

04 Distance detection

05 Magnetic flux detection

06 Junction box

Fixed Magnetic Template



01 Eyebolt

02 Mounting screw hole

03 Mold dislocation detection

04 Locating ring

05 Distance detection

06 Magnetic flux detection

07 Temperature detection

08 Junction box

Operation Panel & Mounting

Human-Machine Interface

Type:HQMC-11A Length:159mm Width:122mm Height:39mm

1.Full metallic surface. High mechanical strength. High protection level.
2. Full-metal push button switch, good controllability, high protection level, safe and stable, more suitable for industrial environment.
3. Proximity Sensor .Magnetic flux contro system .Safety Key that enables the operator to perform simply and clearly
4.Step –by step help pages with detailed explanation of each operation.
5.An alarm is generated and machine operation is inhibited

Type:HQMC-12A Length:275mm Width:255mm Height:51mm

1.Full metallic surface. High mechanical strength. High protection level.
2. Full-metal push button switch, good controllability, high protection level, safe and stable, more suitable for industrial environment.
3.Different access profiles:Machine operator/supevisor/maintenance
4.Graphic display of run time/mold use/opeator activities.
5. All the external keys are connected with separate I/O signal and main control box. Even if the touch screen or communication fails, the system can carry out normal mold change operation

Installation diagram

The highest safety standard

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 external matter and gap existed between magnetic template and mold。

2 Magnetic flux detection

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

3 Temperature detection

In order to prevent Magnetic Template contact area high temperature cause the Magnetic force losing and whole magnet system clamping decrease, Temperature detection senor will emit warning signal and force injection mold machine stop any operation if actual contact temperature over the setting value。

4 Magnetizing current intensity detection

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

5 Die dislocation detection

Die dislocation detection senor 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。

6 Distance detection

Distance detection senor 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。

7 Interlock Control System

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

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 。

Specifications & Configurations

Dimension (mm)	⌀44	⌀66	□50x50	□80x80
Magnetic force/ Pole (Kg)	350	900	400	1000
Template Thickness (mm)	35	46	35	51
Max. operating temperature (℃)	120/150/180			
Magnetic flux depth(mm)	20			
Mold proximity sensor range(mm)	0.2			
Standard voltage	AC220V/380V/415V/440V,50/60Hz			
model of Injection molding machine (KN)	500-40000			

No.	Item	Configuration	Q'ty
1	Magnetic Template (Fixed side)	☑	1
2	Magnetic Template (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 fixed platen side
11	Mounting bolt	☑	According to the technical specification
12	Connecting cable	☑	1
13	Operation and maintenance Manual	☑	1

NOTE: ☑ Standard configuration ☐ Optional configuration

Strength of Magnetic Clamping

Disadvantages of conventional clamping / 01 02 03

01

conventional clamping

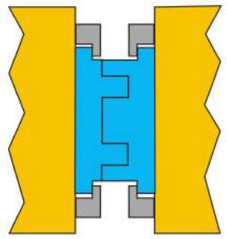


fig. 1: the maximum size of mold is limited due to clamp blocks utilized

02

a thinner mold base

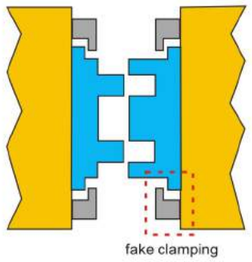


fig. 2: it costs much time on select proper clamp blocks if base board is thinner

03

conventional clamping structure

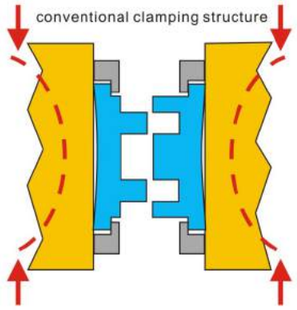


fig. 3: it causes flash and damage of molds because of uneven clamping force . a frequent maintenance of molds may occur & deformation when mold opening.

Strength of magnetic clamping / 04 05 06

04

magnetic clamping

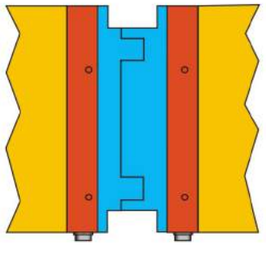


fig. 4: no extra space is required for magnetic clamping system, no interfac of injection molding machine platen, making injection machine running in maximum efficiency way.

05

a thinner mold base

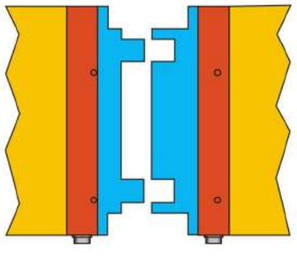


fig. 5: owing to magnetic clamping , a fully contact phase of mold provides a perfect clamping.thickness of base board of mold never be an issue for clamping anymore.

06

magnetic clamping

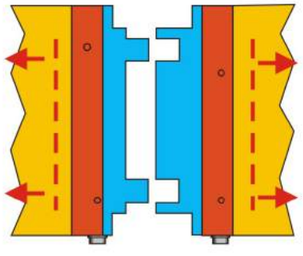
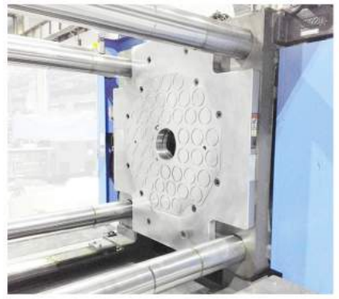


fig. 6: uniform clamping molds, no deformation , enhances the strength of platen, no mold deformation during the mold opening.

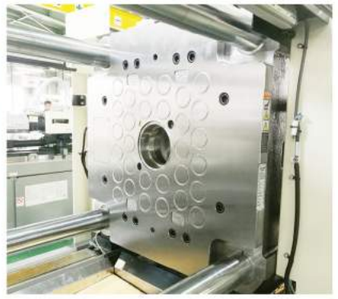
Magnetic Clamping v.s. Conventional Clamping

Contents	Traditional clamping		HQMC magnetic Clamping
	Mechanical clamping	Hydraulic clamping	
Reliability	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.
Mold change efficiency	long mold change cycle, low efficiency.	Limitation of thickness of mold base board, it causes much less efficient mold change time	Mold change time could be shortened to several minutes, more than 90% mold change time can be saved. Only one operator is required.
Clamp point	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.
Product quality	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.
Applicability	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.
Maintenance costs	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.

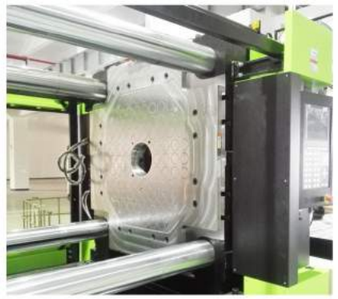
Application cases



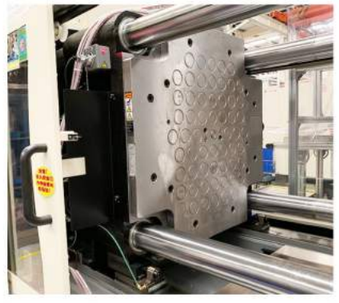
01 Haitian 200T



02 NISSEI 200T

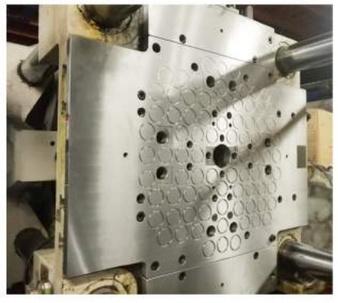


03 IZUMI 360T



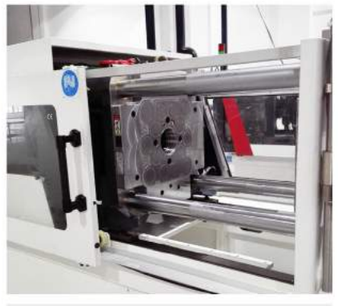
04 Haitian 650T

05 Arburg 180T



06 TEDERIC 800T

07 Haitian 650T



08 MILACRON 110T

09 NISSEI 180T

Electro-Permanent Magnetic Quick Mold Change for Press 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.

FAQ (Frequently-Asked Question)

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 senor 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.