SCREWS AND BARRELS

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ZHEJIANG HUAYE PLASTICS MACHINERY CO.,LTD

Company Introduction

Zhejiang Huaye Plastics Machinery Co., Ltd. (Stock Code:301616) Founded in 1994, Zhejiang Huaye has been deeply engaged in the field of core components for plastic machinery for over 30 years. The company was listed on the Shenzhen Stock Exchange's ChiNext board on March 27, 2025. We are a high-tech enterprise specializing in the R&D, production, and sales of core components for plastic molding equipment. Our main products include screws, barrels, tie bars (column rods), and related accessories, which are widely used in plastic molding equipment such as injection molding machines, extrusion machines, and rubber machinery.

As a key supplier of core components, our company has over 70 R&D and technical personnel with rich industry know-how. We have assisted customers throughout the entire lifecycle of numerous equipment — from R&D and prototyping to mass production and subsequent technological upgrades — ensuring that our own technical capabilities keep pace with the evolution of plastic molding equipment and deliver optimal solutions.

Our company is equipped with complete process flows necessary for the production of barrels and screws, as well as over 700 sets of advanced processing equipment. We also have several bimetallic barrel centrifugal casting production lines with industry-leading capacity (maximum production size: ϕ500mm × 8,000mm). In addition, we operate highly efficient fully hardened screw production lines, electroplating lines, world-class heat-treatment equipment including a Nitrex nitriding furnace, and a 5-meter vacuum quenching furnace, enabling superior production capacity. These facilities meet diverse customer requirements for wear resistance, corrosion resistance, and other properties of plasticizing components, thereby creating greater value for customers.

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Advanced Processing Equipment



▲
Multi Product Machining Center

Machining capability: Universal turning-milling compound machining center for workpieces ranging from 1 m to 20 m in length, with fully automatic attachment head change.

Product advantage: Complete all machining operations of a workpiece on a single equipment.



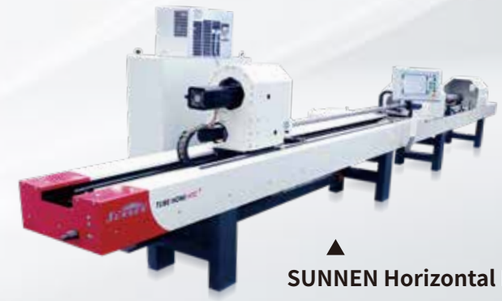
▲
Okuma Smart Multi-Tasking Machining Center



◀ **CNC Screw Grinder**

6-axis Whirling / Milling Center ▶





▲
SUNNEN Horizontal Honing Machine



▲
Mazak Machining Center



Bimetallic Centrifugal Casting ▶

Wear-resistant, Corrosion-resistant, High-temperature resistant, High-speed resistant, High-pressure resistant

Bimetal integral centrifugal casting:
length up to 8 m, outer diameter up to 500 mm.



▲
NITREX Nitriding Furnace

HK Series Bimetallic Barrel



Technical Parameter

Barrel inner hole diameter ID：16mm~400mm

Barrel outer diameter OD：⩽500mm

Barrel length L：⩽10000mm

Overall centrifugal casting length L：⩽8000mm

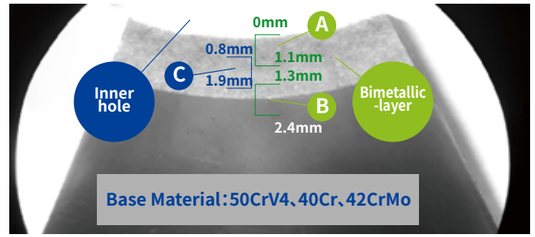
Inner bore surface finish：Ra0.2~0.4
(Special customization requires if below Ra 0.2)

Performance advantages: The alloy powder was melted and then solidified by centrifugal casting at high temperature. A dense alloy layer was formed in the inner hole of the barrel to enhance the wear resistance and corrosion resistance of the barrel.

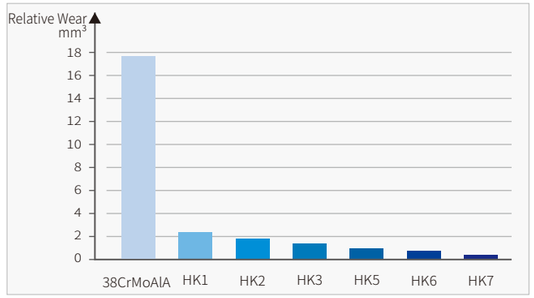
HK Matrix Table of Wear Resistance and Corrosion Resistance

HK Type	Bimetallic Components	Wear Resistance	Corrosion Resistance
HK1	C+Mn+Si+B+Ni+Fe+Cr	★★★★	★★★
HK2	C+Mn+Si+B+Ni+Fe+Mo+Cr	★★★★★	★★★
HK3	W+Cr+B+Ni+Co	★★★★★	★★★★★
HK5	Ni+Cr+W+B	★★★★★★	★★★★★★
HK6	Ni+Cr+W+B	★★★★★★★	★★★★★★★
HK7	Ni+Cr+W+B	★★★★★★★★	★★★★★★★★

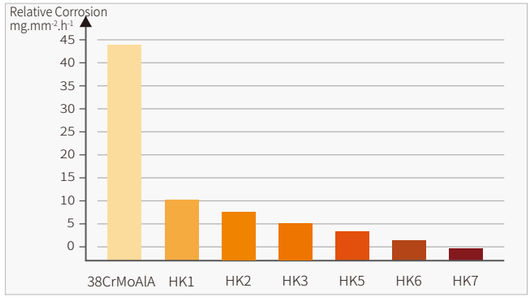
Test Block Analysis Diagram



Relative wear / Mud wear test



Corrosion test of relative corrosion / 10%H_2SO_4aqueous solution



HK1 Iron Base Bimetallic Barrel

Name: **HK1**
Main ingredients: C, Mn, Si, B, Ni, Fe,Cr
Hardness: HRC58-62 (Base material ⩾HRC 28)
Performance advantages: Wear resistance
Application: General purpose resins and general engineering resins. PP, PA, ABS, POM, PBT, PC with less than 35% glass fiber.

HK2 Iron Base Bimetallic Barrel

Name: **HK2**
Main ingredients: C, Mn, Si, B, Ni, Fe, Mo, Cr
Hardness : HRC 64-69 (Base material ⩾HRC 28)
Performance advantages: High wear resistance
Application: General purpose resins and general engineering resins. PP, PA, LCP, PPS, PPA,POM,PBT, PCwith less than 50% glass fiber.

HK3 Nickel Base +35% Cobalt Bimetallic Barrel

Name: **HK3**
Main ingredients: W, Cr, B, Ni, Co
Hardness : HRC 52-56 (Base material ⩾HRC 28)
Performance advantages: Corrosion resistance, high temperature resistance
Application: high temperature resistance resins with iron powder, ceramic powder, aluminum magnesium powder, magnetic powder, copper powder and others.

HK5 Nickel Base +25% Tungsten Carbide Bimetallic Barrel

Name: **HK5**
Main ingredients: W, Cr, B, Ni
Hardness: HRC 50-56 (Base material ⩾HRC 28)
Performance advantages: Wear resistance, corrosion resistance
Application: Suitable for wear resistance and corrosion resistance special engineering resin. PP, PA,LCP,POM, PPA, PBT, PPS, PEI, PA46with less than 30% glass fiber.

HK6 Nickel Base +45% Tungsten Carbide Bimetallic Barrel

Name: **HK6**
Main ingredients: W, Cr, B, Ni
Hardness : HRC 58-62 (Base material ⩾HRC 28)
Performance advantages: High wear resistance, high corrosion resistance
Application: Suitable for wear resistance and corrosion resistance special engineering resin. PP, PA, LCP, POM, PPA, PBT, PPS, PEI, PEEK (halogen free materials: PA46, LCP, 4T, 9T, HTN) with less than 65% glass fiber.

HK7 Nickel Base +45% Spherical Tungsten Carbide Bimetallic Barrel

Name: **HK7**
Main ingredients: W, Cr, B, Ni
Hardness : HRC 60-65 (Base material ⩾HRC 28)
Performance advantages: Super wear resistance, super corrosion resistance
Application: Suitable for special high glass fiber ultra-halogen-free raw materials: 4T, 9T, HTN, DSM, PSM and various acidic plastics with high corrosion.

Thorough Hardened Screw HPT Series



Through hardened HPT series screw is made of imported alloy steel. After high-temperature quenching and tempering treatment,the hardness of the round rod reaches to HRC60. Under the different types of rough & fine grinding progress, the concentricity of the core diameter and outer diameter reaches 0.03mm. It can meet the high-precision requirements of various products and prolong the screw' s serving life in different applications. HPT series are suitable for plastic material with 25%-65% glass fiber, with wear-resistance, corrosion-resistance, high-temperature resistance, high-pressure resistance, and high-speed resistance property, and they are suitable for fully electrical injection molding machine with high speed and high processing requirements. According to the different customers demands, the PVD coating and Chrome plating are applied to improve the wear-resistance and corrosion-resistance.

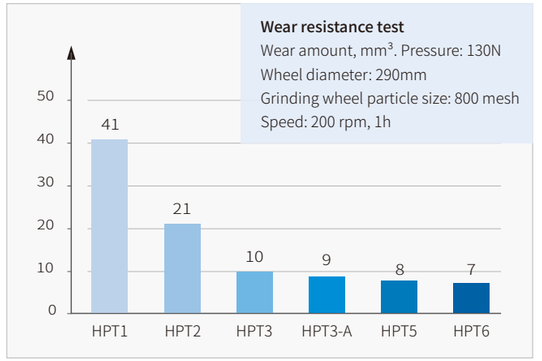
HPT1

Name: **HPT1**
Main ingredients: C、Cr、Mo、V
Hardness range: HRC 58-62
Thermal expansion coefficient: 11.0 x 10-6-11.4 x 10-6
Performance advantages: Wear resistance ★★★★ Corrosion resistance ★★★
Application: General purpose resins and general engineering resins. PP, PA, LCP, ABS, PPA, POM, PBT, PC with less than 35% glass fiber.

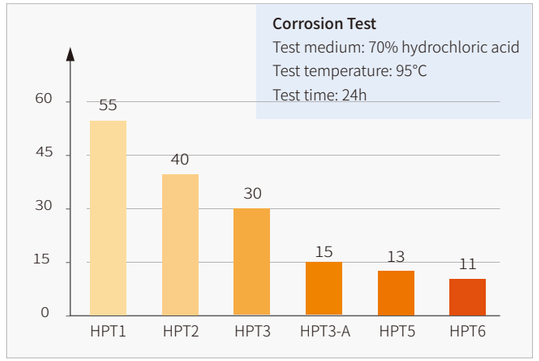
HPT2

Name: **HPT2**
Main ingredients: C、Cr、W、Mo、V
Hardness range: HRC 58-62
Thermal expansion coefficient: 10.8 x 10-6-11.0 x 10-6
Performance advantages: Wear resistance ★★★★★ Corrosion resistance ★★★★★
Application: General purpose resins and engineering resins. PP, PA, LCP, POM, PPA, PBT, PC, PPS, PEI, PEEK with less than 50% glass fiber.

HPT Relative wear / mud wear test



HPT Corrosion test of relative corrosion



HPT3

Name: **HPT3**
Main ingredients: C、Cr、Mo、V、Co
Hardness range: HRC 58-62
Thermal expansion coefficient: 11.0 x 10-6-11.4 x 10-6
Performance advantages: Wear resistance ★★★★★★★ Corrosion resistance ★★★★★★
Application:Suitable for special engineering resins such as PA, LCP, PBT, PEI, PEEK, PP, POM, PPS, etc., with glass fiber content below 50%.

HPT3-A

Name: **HPT3-A**
Main ingredients: C、Cr、Mo、V
Hardness range: HRC 63-68
Thermal expansion coefficient: 11.0 x 10-6-11.4 x 10-6
Performance advantages: Wear resistance ★★★★★★★ Corrosion resistance ★★★★★★
Application: Suitable for adding high-temperature resistant resins and low-viscosity plastics with CIM/MIM powders, iron powder, cermet powder, aluminum-magnesium powder, magnetic powder, copper powder, etc.

HPT5

Name: **HPT5**
Main ingredients: C、Cr、Mo、V、W、Mn
Hardness range: HRC 60-62
Thermal expansion coefficient: 11.0 x 10-6-11.4 x 10-6
Performance advantages: Wear resistance ★★★★★★ Corrosion resistance ★★★★★★★★
Application: It is suitable for special engineering resins with super corrosive flame retardant and halogen-free flame retardant formulations, including reinforced PA, PA46, LCP, POM, PBT, PPS, PA4T, 9T and other plastic raw materials and the addition of less than 60% glass fiber.

The Characteristics tics of “HIP” Technology Treated Screw



HIP6

Name:**HPT6**

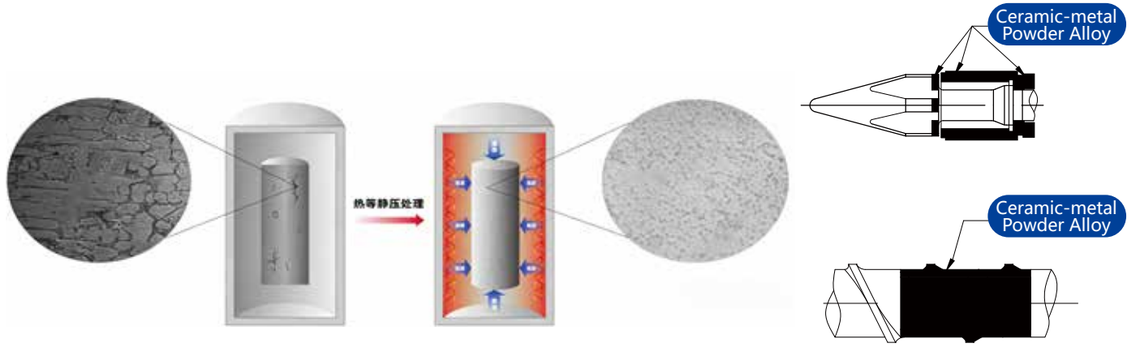
Hardness range: HRC 62-68

Performance advantages: Super Wear Resistance ★★★★★★★★ Super Corrosion Resistance ★★★★★★★★

Application: Forming of metal powders such as magnetic materials, composite materials, iron powder, ceramic powder, aluminum-magnesium powder, magnetic powder, and copper powder. Suitable for high-temperature, high-glass-fiber specialty engineering plastics, fluorinated resins, and specialty halogen-free flame-retardant resins (PA46, PA4T, PA10T, PPA, LCP, PA9T).

Service life is more than 15 times that of the nitriding series.

Service life is more than 5 times that of the special alloy series.



Optics Screw



Optical screw is a core component specially designed for injection molding high-precision, high-transparency optical products (such as light guide plates, lenses, optical lenses, transparent housings, etc.). Its design focuses on low shear, high plasticizing uniformity, and excellent surface quality, ensuring that optical products are free from black spots and flow marks while achieving high light transmittance.

Technical Parameter

Machining diameter: Φ15 mm ~ Φ300 mm

Machining length: ⩽ 10,000 mm

Surface finish: ⩽ Ra0.05 μm (high precision)

Straightness: 0.015 mm/m

Plating layer thickness: 0.04mm ~ 0.06 mm

Application

PC (Polycarbonate): High viscosity, amorphous; requires low-shear design to prevent degradation.

PMMA (Acrylic): High light transmittance, shear-sensitive; requires uniform plasticizing temperature.

High glass-fiber reinforced materials: When adding 30%–40% glass fiber, a fully hardened alloy screw is recommended.

Other transparent materials: e.g., PS, PET, transparent ABS, etc.

PVD Coated Screw

PVD TiN Coating screw

Hardness: HV1800-2200

Coating Thickness: 5-6μm

Application: PC, PMMA ultra-thin light guide plate (LGP).



PVD CrN Coating

Hardness: HV1700-1900

Coating Thickness: 5-6μm

Application: glass fiber, metals, Halogen-free flame retardant.



PVD AlTiN Coating

Hardness:HV2800-3300

Coating Thickness: 5-6μm

Application: fluorinated polymer (PTFE, PVDF), polyarylether (PEEK, PPS, PSU, PES, PPE, PPO) .



Screw and Barrel For Extrusion Machine



Technical Parameter

- Screw out diameter OD：15mm ~ 300mm
- Screw length L：⩽10000mm
- Nitriding hardness：⩾HV 900
- After grinding 0.20mm, ⩾HRC 760 (38CrMoALA)
- Nitrided brittleness：⩽2 level
- Surface finish：Ra0.4μ m
- Straightness：0.015mm
- Thickness of bimetallic layer：1.5mm ~ 2mm
- Hardness of bimetallic layer：HRC53-57(Ni-based)；HRC60-65(Ni base+tungsten carbide)
- Thickness of chrome plating layer:0.03mm ~ 0.05mm

Screw and Barrel For Extrusion Machine

- Screw 42CrMo Plasma nitriding and Chrome-plating
- Screw 42CrMo Plasma nitriding, bimetallic welding and Chrome-plating
- Screw 38CrMoAlA Low pressure nitriding
- Screw 38CrMoAlA Plasma nitriding and Chrome-plating
- Screw 38CrMoAlA Plasma nitriding, bimetallic welding and Chrome-plating
- Barrel 38CrMoAl Nitriding
- Barrel HK1 Bimetallic Barrel
- Barrel 38CrMoAl Nitriding
- Barrel 38CrMoAl Nitriding
- Barrel HK1 Bimetallic Barrel



Application market

It is suitable for ABS sheet, PVC soft and hard pipe, cable, blown film, cast film, blow molding, profile, pipe and other products.

Screw and Barrel For Rubber Machine

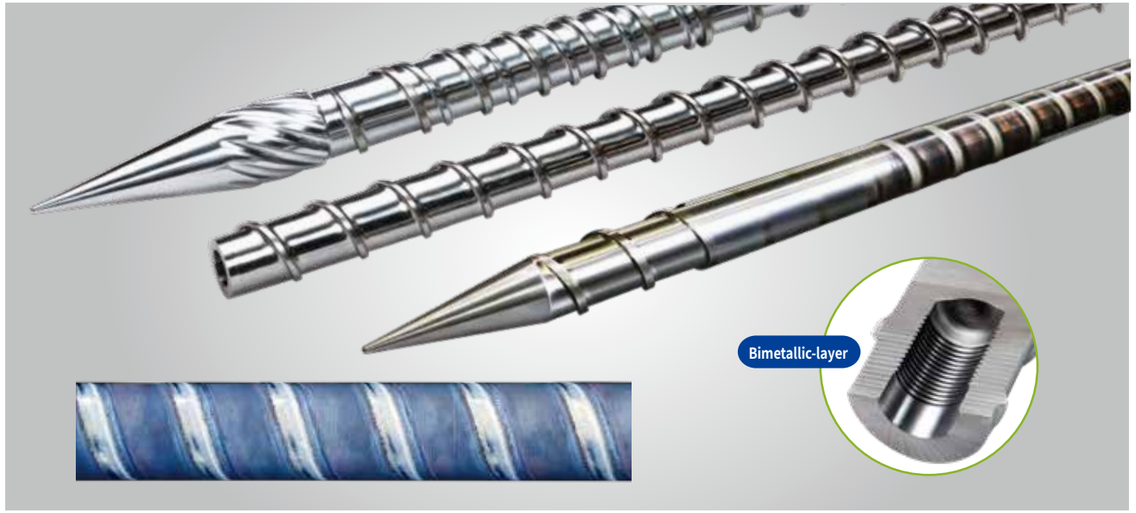
- Screw 38CrMoAlA Low pressure nitriding
- Screw 38CrMoAlA Plasma nitriding and Chrome-plating
- Screw 38CrMoAlA Plasma nitriding, bimetallic welding
- Barrel 38CrMoAl Nitriding
- Barrel 38CrMoAl Nitriding
- Barrel HK1 Bimetallic Barrel



Application market

Tires, shoe materials, wires and cables, pipes, seals, etc.

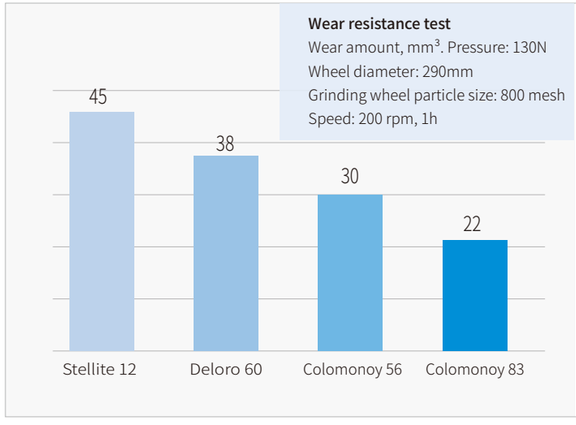
PTA Bimetallic Screw



Technical Parameter

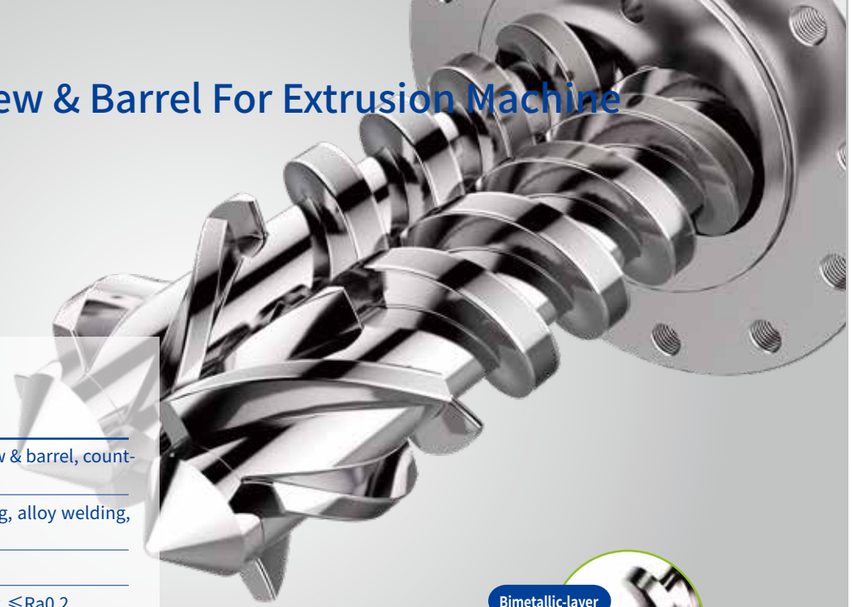
- 38CrMoALA, Gas nitriding and bimetallic welding
- 38CrMoALA, Plasma nitriding, bimetallic welding and Chrome-plating
- 42CrMo, Plasma nitriding, bimetallic welding and Chrome-plating
- 38CrMoAl after Nitriding hardness: ⩾HV900
- Thickness of chrome layer：0.01mm ~ 0.03mm
- Thickness of bimetallic layer：1.5mm ~ 2.0mm
- Hardness of bimetallic layer: HRC53-57(Ni-based)；HRC60-65(Ni base+tungsten carbide)
- Applicable resin: It is suitable for corrosion formula, regrinding resin,calcium powder filling, additive fireproof materials, and additiveplastic materials with less than 15% glass fiber.

Relative wear/mud wear test





Parallel Twin-Screw & Barrel For Extrusion Machine



Technical Parameter

Product category: corotating twin-screw & barrel, counter-rotating parallel twin-screw & barrel

Surface processing technology: nitriding, alloy welding, chrome plating, etc.

Nitriding hardness : HV 860-980

Straightness: 0.05mm Surface finish：⩽Ra0.2

Specification	ϕ52/25	ϕ60/25	ϕ75/36	ϕ90/36
ϕ107/28	ϕ120/26	ϕ130/28	ϕ135/28	ϕ160/33



Screw

- Produced with High-quality 38CrMoALA or 1.8550 forging material, with quenching and tempering to HV290-320, flight surface made with nickel alloy plasma welding, alloy thickness⩾1.7mm, hardness⩾HRC58, nitriding by NITREX process after finishing machine, depth(Nht): 0.5-0.7mm, hardness: HV860-980, grade 2 metallographic structure or above.

Barrel

- The barrel is made of high-quality 38CrMoALA forging material, after quenching and tempering to HB290-320, nitriding with NITREX furnace process after finishing machine, the nitriding depth is 0.5-0.7 mm, the hardness is HV860-980, with grade 2 metallographic structure or above.
- The barrel is designed as “detachable”, 42CrMo barrel is quenched and tempered to hardness HB290-320, inlaid with German HPT1 alloy sleeve. The thickness of the alloy is more than 7 mm, the hardness is HRC58-62, the shell of the barrel can be recycled, and the inner alloy sleeve can be replaced after wear out.



Application market

- Extrusion of PVC pipes, profiles and sheet foam products.
- CPVC pipe extrusion.



Conical Twin-Screw & Barrel For Extrusion Machine



Technical Parameter

Product category: corotating twin-screw & barrel, counter-rotating parallel twin-screw & barrel

Surface processing technology: nitriding, alloy welding, chrome plating, etc.

Nitriding hardness : HV 860-980

Straightness: 0.05mm Surface finish：⩽Ra0.2

Specification	ϕ45/97	ϕ51/105	ϕ55/113	ϕ65/132
	ϕ80/155	ϕ92/188	ϕ95/191	ϕ115/225



Screw

- Produced with High-quality 38CrMoALA or 1.8550 forging material, with quenching and tempering to HV290-320, flight surface made with nickel alloy plasma welding, alloy thickness⩾1.7mm, hardness⩾HRC58, nitriding by NITREX process after finishing machine, depth(Nht): 0.5-0.7mm, hardness: HV860-980, grade 2 metallographic structure or above.

Barrel

- The barrel is designed as “detachable”, 42CrMo barrel is quenched and tempered to hardness HB290-320, inlaid with German HPT1 alloy sleeve. The thickness of the alloy is more than 7 mm, the hardness is HRC58-62, the shell of the barrel can be recycled, and the inner alloy sleeve can be replaced after wear out.



Application market

- Extrusion of PVC pipes, profiles and sheet foam products.
- Extrusion of PE, PP bellows.



Tie Bar



Tie bars are the core load-bearing components of the clamping unit in injection molding machines, die-casting machines, forging presses, and other equipment, withstanding the full clamping force during operation. Our company is equipped with large CNC lathes, precision thread grinders, a medium-frequency quenching production line, and fully automatic chrome plating / nitriding treatment lines, enabling us to meet one-stop supporting needs ranging from small and medium--sized to ultra-large equipment.

Technical Parameter

- Machining length: 2500mm ~ 10000mm
- Machining outer diameter: ϕ150mm ~ ϕ600mm
- Surface finish: ⩽ Ra0.4
- Concentricity: ⩽0.03mm / 1000mm

Process	Reference Range	Remarks
Surface hardening	Case depth 1.5mm ~ 3.0mm	Medium-frequency continuous hardening, uniform case depth
Hard chrome plating	Coating thickness 0.02mm ~ 0.08mm	Hardness ⩾ HV 650, strong adhesion
Gas nitriding	Nitrided layer depth ⩾ 0.2 mm	Surface hardness HV 650 ~ HV 750

Two-Plate Injection Molding Machine Tie Bars

Technical Parameter

- Applicable tonnage: 400T ~ 6,000T
- Material grades: 42CrMo, 40Cr
- Processes: Nitriding, plating

Designed specifically for two-platen injection molding machines, this component addresses the challenges of long stroke and high-speed mold opening/closing. It ensures smooth motion of the long rod and excellent thread fatigue resistance. Made of high-strength alloy steel that has been quenched and tempered, it achieves an optimal balance between core toughness and surface hardness.



Die Casting Machine Tie Bars

Technical Parameter

- Applicable tonnage: 100T ~ 6,000T
- Material grades: 42CrMo、40CrNiMo
- Processes: Plating

For harsh working conditions in die-casting workshops — including high temperature, high humidity, metal splashing, and corrosion caused by release agents — high-temperature resistant materials combined with a special coating process are adopted to significantly improve galling resistance and corrosion resistance. This solution is suitable for aluminum, magnesium, and zinc alloy die-casting machines.

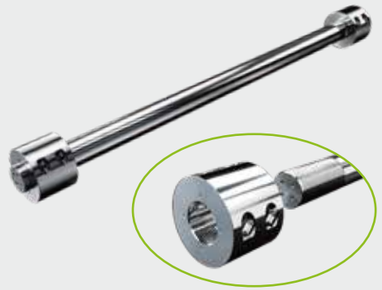


Forging Press Tie Bars

Technical Parameter

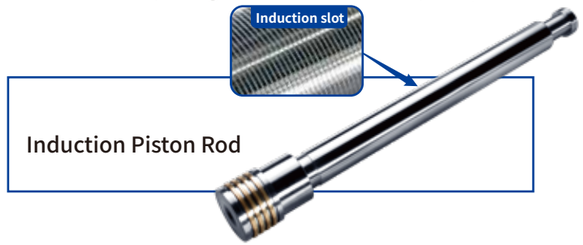
- Applicable pressure：100kN ~ 80,000kN
- Material grades: 42CrMo、30Cr2Ni2Mo

Applicable to heavy-duty equipment such as hot forging presses, screw presses, and multi-station cold heading machines. Designed for operating conditions with high instantaneous impact forces and severe eccentric loads, it features a large cross-section design and rigorous non-destructive testing (NDT) to ensure safe operation under long-term high loads.



Piston rod

Material aterials (such as 45#, 40Cr, 42CrMo, etc.) can be selected according customers’ needs, heat treatment process could be surface chrome plating and intermediate frequency.





Nut gate

Material (such as 45#, 40Cr, 42CrMo, castings) will be choosed according customers’ needs; heat treatment process could be: blackening, galvanizing, salt bath nitriding, gas nitriding. Currently, the maximum outer diameter of nuts can reach ϕ1600mm.





Screw Tip Assembly

Technical Parameter

- Three Small Parts (D): 15mm – 300mm
- Materials:SKD61, HPT Series, 38CrMoAl, 42CrMo, HIP
- Processes:Sintering, Coating, Alloy spraying, Electroplating, Gas Nitriding, Quenching + Plasma Nitriding
- Surface Roughness: ⩽ Ra0.4 Alloy layer thickness: 1.5mm – 2mm
- Chromium plating thickness: 0.03mm – 0.05mm
- Alloy hardness:Nickel-based: HRC 54–58
- Tungsten carbide: ⩾ HRC 60 **HIP hardness: ⩾ HRC 65**



Nozzle

Technical Parameter

- Materials: SKD61, 38CrMoAl, 42CrMo
- Processes: Inner hole electroplating, gas nitriding, quenching, inner hole coating
- Types: Pneumatic pin-type anti-flow nozzle
- Hydraulic mixing anti-flow nozzle
- Static mixing nozzle assembly
- Filter hole diameter: Minimum 0.8 mm
- Inner surface roughness: Ra0.2 – 0.4 (Ra <0.2 available upon special request)



Testing Equipment

Huaye has a set of strict testing standards, with quality strategy as the guide, comprehensive process management and control, and special emphasis on process control.



Company Honors

Countless honors have proved the brilliant development of Huaye. They are motivation and responsibility, and inspire Huaye people to forge ahead in a higher and farther septs. Won the "Top 5 Companies in China's Plastic Machinery Industry for Auxiliary Machinery and Accessories", "Zhejiang Hidden Champion", "HUSKY Excellent Quality Award", "Toshiba Machinery Quality Supplier", and "Milacron High Quality Supplier" and so on.



Business Clients

Our products are exported to more than 50 countries, including Canada, the United States, Germany, India, Japan, etc. We have established cooperative relationships with internationally renowned plastic machinery manufacturers such as Engel, Husky, and KraussMaffei. By expanding into international markets, we enhance our brand's global influence and realize our strategic globalization layout.