



Introduction



Catalogue

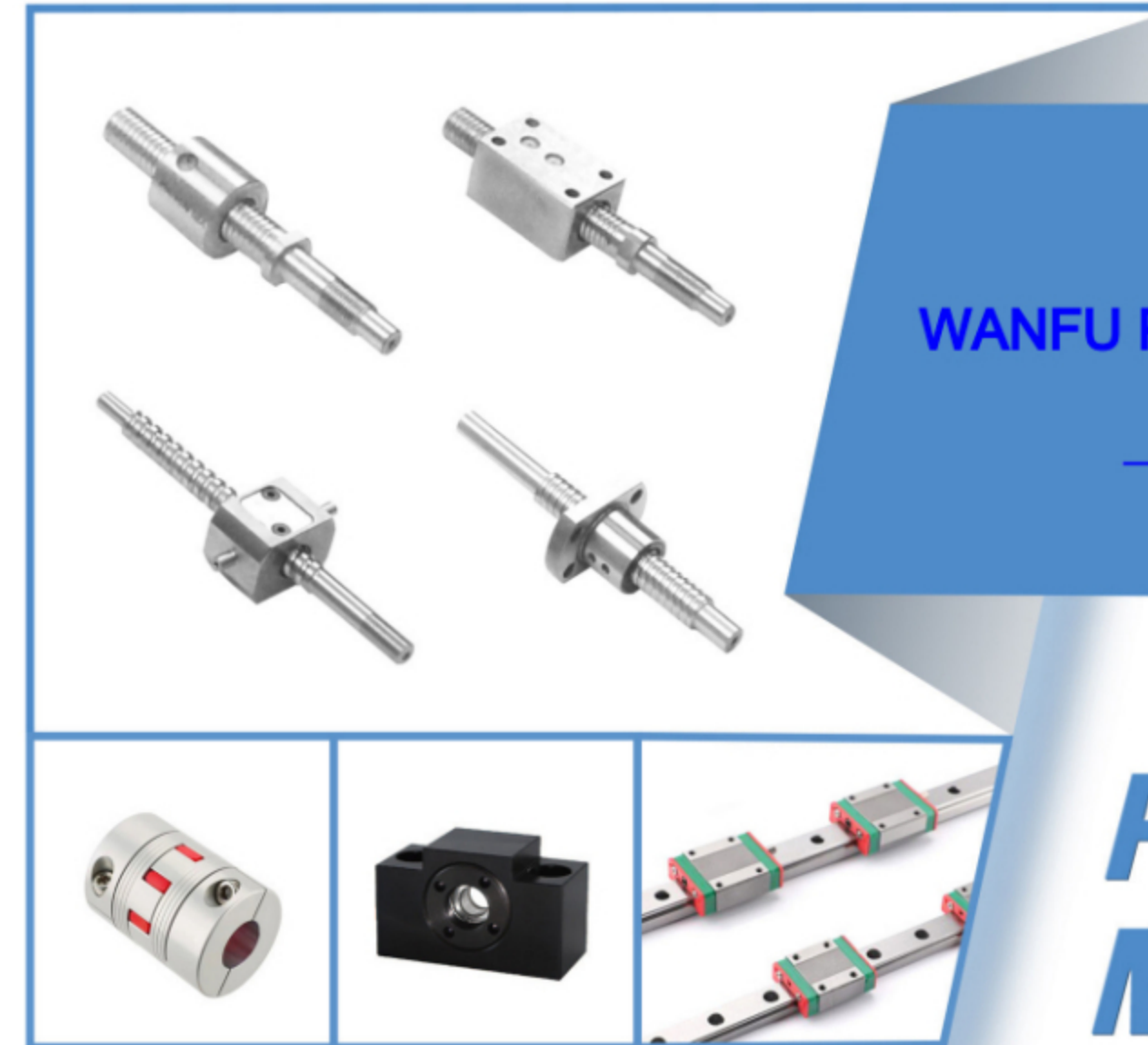


LINEAR MOTION SYSTEMS & SOLUTIONS

Design To Customer

Customization Design Solution Provided in 24 hours!

PRECISION SMALL AND MINIATURE BALL SCREW



WANFU PRECISION COMPANY LIMITED

— Member of WANFU Group

PRODUCT MANUAL



万福精密有限公司

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Website: www.wanfugear.com

Transmission parts and supporting mechanical parts.

Linear transmission components, such as single-axis and multi-axis components.

Motors, controllers, sensors, encoders, etc.

Design, assembly and debugging of non-standard automation equipment, etc.

 Professional Customization

 Precision Machining

 High Quality Assurance

www.wanfugroup.com

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MAIN PRODUCTS

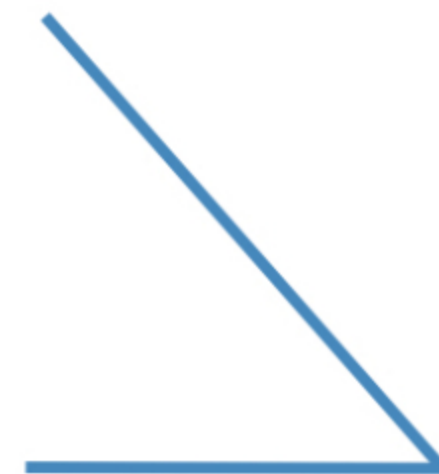


ABOUT US

WanFu Precision Co., Limited is established in 2006, is a manufacturer of linear motion systems. Member of WanFu Group, We provide to customers with linear motion customization solutions. Adhering to the business philosophy of "professional, integrity, and efficiency", we look forward to contributing to the world's automated manufacturing.

Our products include:

- ▶ Transmission parts and supporting mechanical parts, such as: ball screw and lead screw, guide rail, ball spline, coupling, support unit, nut seat, motor house, adapter plate, bearing, etc.;
- ▶ Linear transmission components, such as: single axis robot, multi-axis linear modules, electric cylinders, and linear platforms;
- ▶ Motors, controllers, sensors, encoders, etc., such as: stepper motors, servo motors, drivers, etc.;
- ▶ Design, assembly and debugging of non-standard automation equipment.



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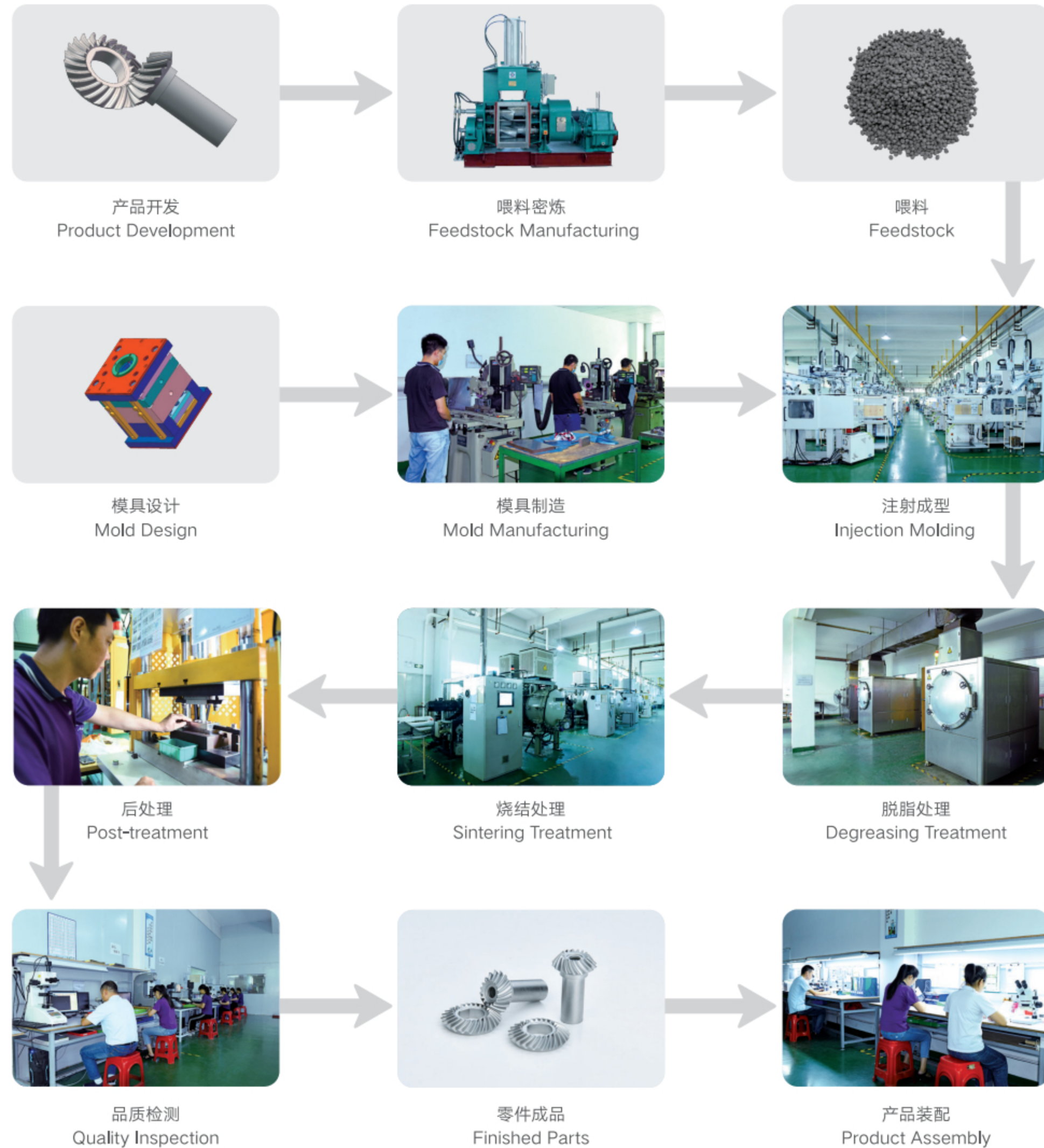
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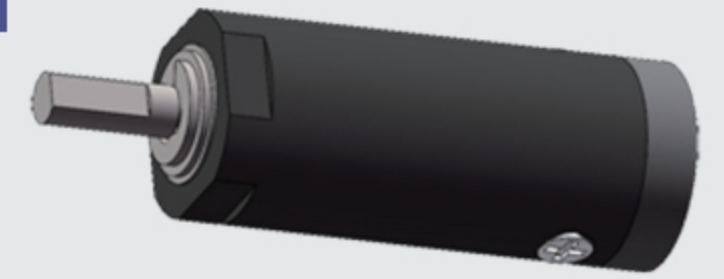
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制造能力 Manufacturing Capacity



标准行星齿轮箱 Standard Planetary Gearbox

WGB06P



外形尺寸 Dimensions

级数 Stage	外形图 Outline Drawing	太阳轮D孔规格 D-hole Size of the Input Sun Gear
2		
3		

齿箱规格 Gearbox Specification

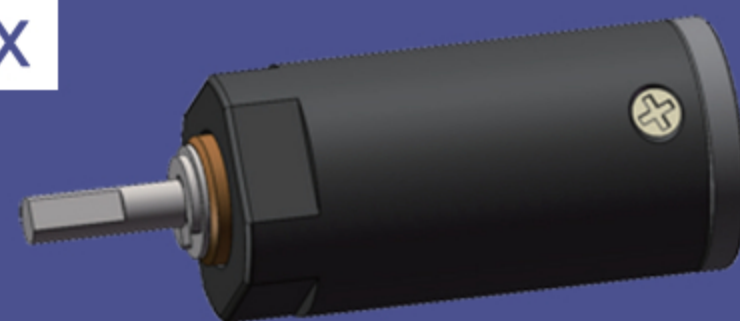
级数 Stage	型号 Model	减速比 Ratio	许用转矩 Normal Torque (gf·cm)	极限转矩 Breakdown Torque (gf·cm)	传动效率 Efficiency	齿轮类型 Gear Type
2	WGB06P-23	23.04	300	700	75%	MIM
	WGB06P-31	30.86	300	700	75%	MIM
	WGB06P-41	41.33	300	700	75%	MIM
3	WGB06P-111	110.59	300	700	70%	MIM
	WGB06P-148	148.11	300	700	70%	MIM
	WGB06P-198	198.37	300	700	70%	MIM
	WGB06P-266	265.67	300	700	70%	MIM



标准行星齿轮箱

Standard Planetary Gearbox

WGB08P



外形尺寸 Dimensions

级数 Stage	外形图 Outline Drawing	太阳轮D孔规格 D-hole Size of the Input Sun Gear
2		
3		

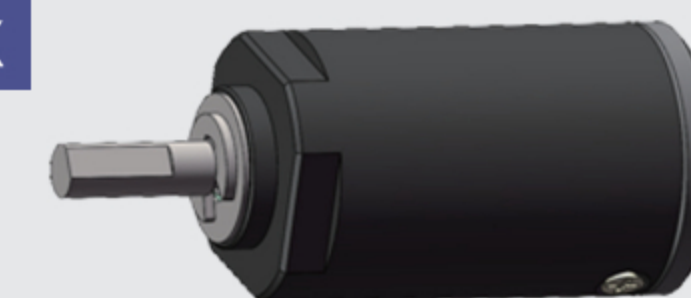
齿箱规格 Gearbox Specification

级数 Stage	型号 Model	减速比 Ratio	许用转矩 Normal Torque (gf·cm)	极限转矩 Breakdown Torque (gf·cm)	传动效率 Efficiency	齿轮类型 Gear Type
2	WGB8P-13	12.96	200	600	75%	MIM
	WGB8P-19	19.20	200	600	75%	MIM
	WGB8P-28	28.44	200	600	75%	MIM
3	WGB8P-47	46.66	300	900	70%	MIM
	WGB8P-69	69.12	300	900	70%	MIM
	WGB8P-102	102.40	300	900	70%	MIM
	WGB8P-152	151.70	300	900	70%	MIM

标准行星齿轮箱

Standard Planetary Gearbox

WGB10P



外形尺寸 Dimensions

级数 Stage	外形图 Outline Drawing	太阳轮D孔规格 D-hole Size of the Input Sun Gear
2		
3		

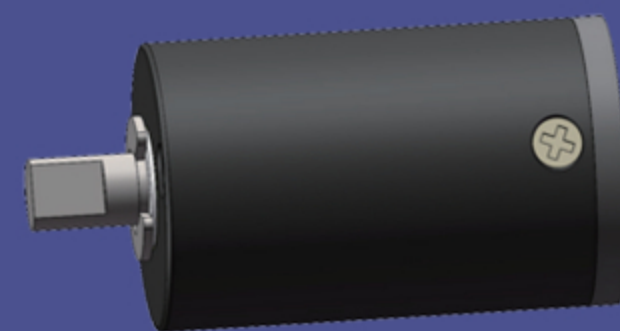
齿箱规格 Gearbox Specification

级数 Stage	型号 Model	减速比 Ratio	许用转矩 Normal Torque (gf·cm)	极限转矩 Breakdown Torque (gf·cm)	传动效率 Efficiency	齿轮类型 Gear Type
2	WGB10P-13	12.96	1500	4000	75%	MIM
	WGB10P-19	19.20	1500	4000	75%	MIM
	WGB10P-28	28.44	1500	4000	75%	MIM
3	WGB10P-47	46.66	1500	4000	70%	MIM
	WGB10P-69	69.12	1500	4000	70%	MIM
	WGB10P-102	102.40	1500	4000	70%	MIM
	WGB10P-152	151.70	1500	4000	70%	MIM



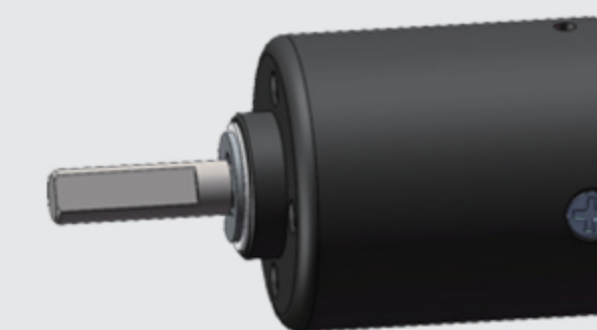
标准行星齿轮箱 Standard Planetary Gearbox

WGB12P



标准行星齿轮箱 Standard Planetary Gearbox

WGB16P



外形尺寸 Dimensions

级数 Stage	外形图 Outline Drawing	太阳轮D孔规格 D-hole Size of the Input Sun Gear
2		
3		

齿箱规格 Gearbox Specification

级数 Stage	型号 Model	减速比 Ratio	许用转矩 Normal Torque (gf·cm)	极限转矩 Breakdown Torque (gf·cm)	传动效率 Efficiency	齿轮类型 Gear Type
2	WGB12P-16	16	400	1000	75%	MIM
	WGB12P-24	24	400	1000	75%	MIM
	WGB12P-36	36	400	1000	75%	MIM
3	WGB12P-64	64	800	2000	70%	MIM
	WGB12P-96	96	800	2000	70%	MIM
	WGB12P-144	144	800	2000	70%	MIM
	WGB12P-216	216	800	2000	70%	MIM

外形尺寸 Dimensions

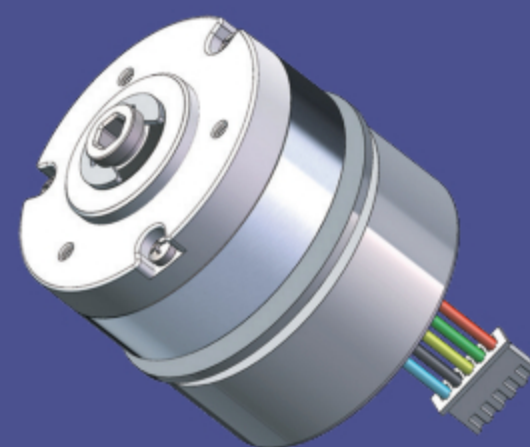
级数 Stage	外形图 Outline Drawing	太阳轮D孔规格 D-hole Size of the Input Sun Gear
2		
3		

齿箱规格 Gearbox Specification

级数 Stage	型号 Model	减速比 Ratio	许用转矩 Normal Torque (gf·cm)	极限转矩 Breakdown Torque (gf·cm)	传动效率 Efficiency	齿轮类型 Gear Type
2	WGB16P-16	16	3000	8000	75%	混合型 Multiple
	WGB16P-24	24	3000	8000	75%	混合型 Multiple
	WGB16P-36	36	3000	8000	75%	混合型 Multiple
3	WGB16P-64	64	4000	8000	70%	混合型 Multiple
	WGB16P-96	96	4000	8000	70%	混合型 Multiple
	WGB16P-144	144	4000	8000	70%	混合型 Multiple
	WGB16P-216	216	4000	8000	70%	混合型 Multiple

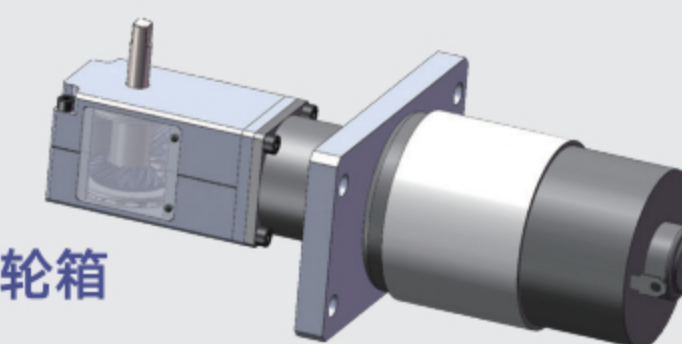
专用齿轮箱
Customized Gearbox

WGB48D 少齿差齿轮箱
Few Teeth Difference Planetary Gearbox

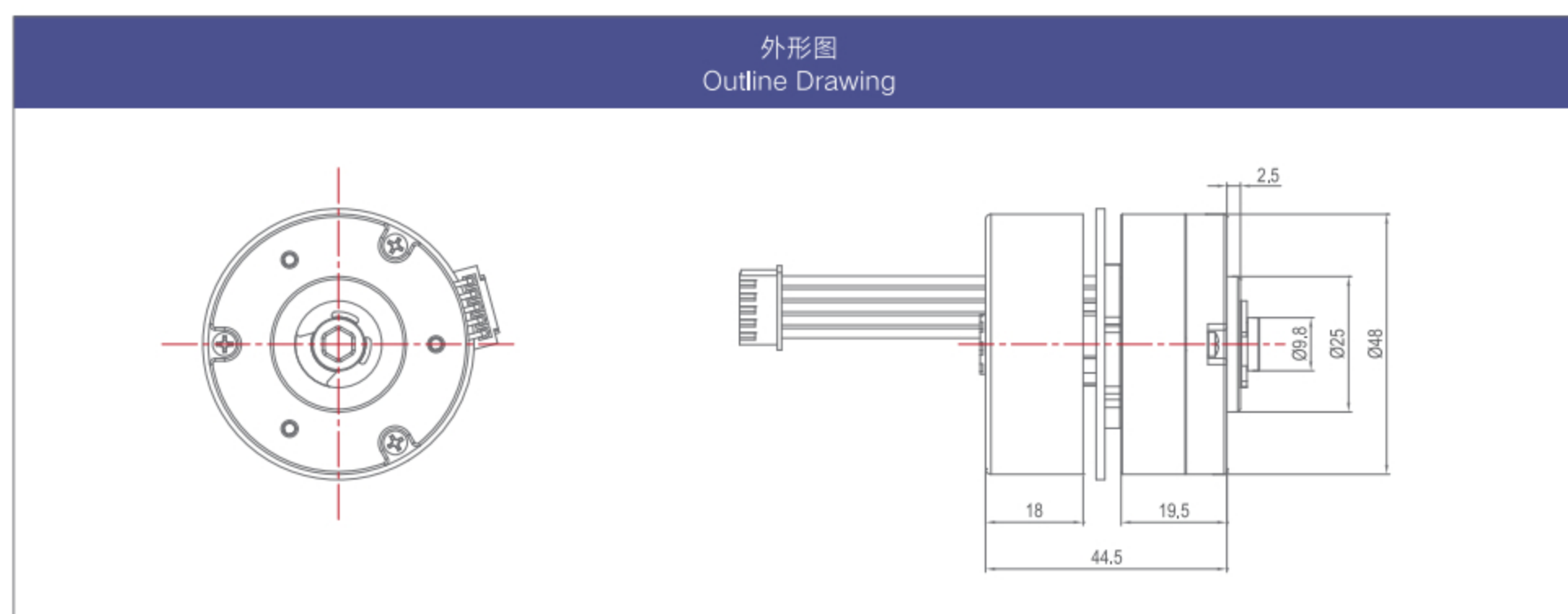


专用齿轮箱
Customized Gearbox

WGB28B 等距螺旋锥齿轮箱
Spiral Bevel Gear Reducer



产品外形 Dimensions



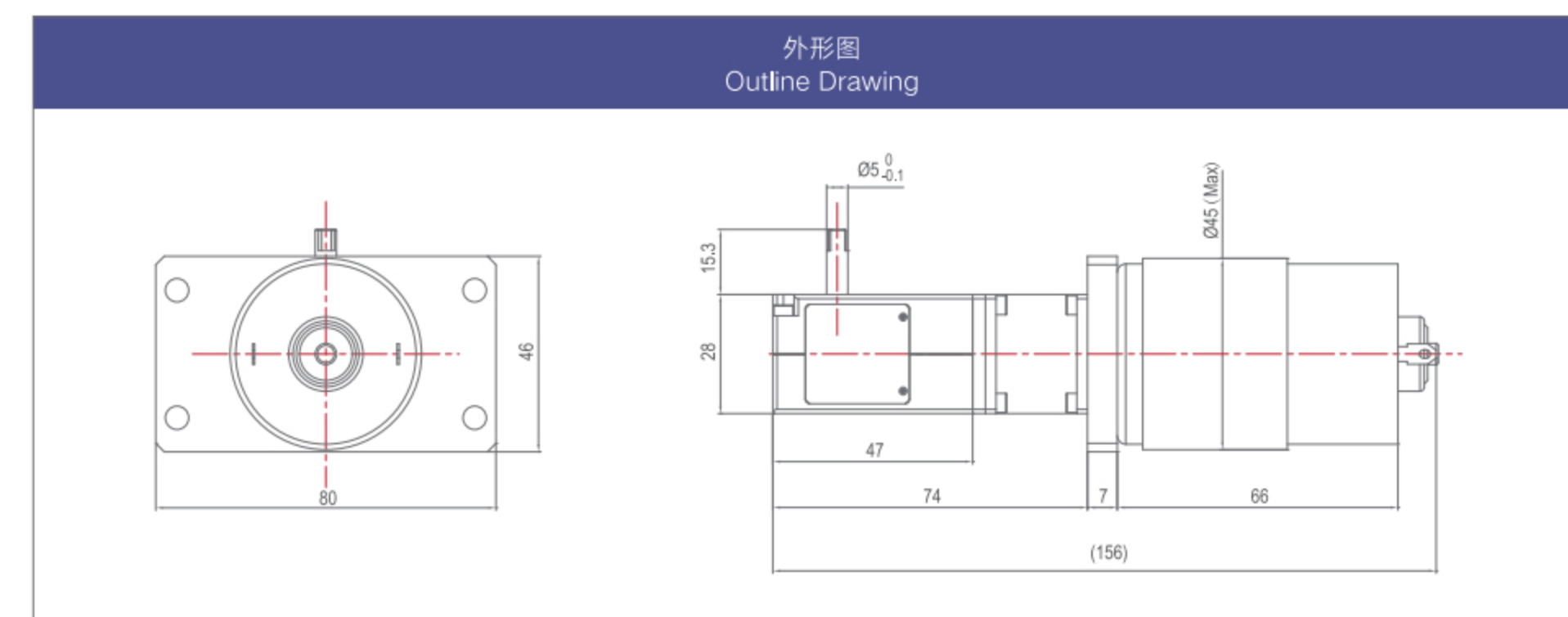
齿箱规格 Gearbox Specification

级数 Stage	型号 Model	减速比 Ratio	许用转矩 Normal Torque (kgf·cm)	极限转矩 Breakdown Torque (kgf·cm)	传动效率 Efficiency	齿轮类型 Gear Type
1	WGB48D-45	45	20	50	75%	混合型 Multiple

产品说明 Product Description

- ☆ 动力源采用无刷电机, 可以根据工况实时调整输出转速与转矩。
The input is BLDC motor, which can adjust the speed and torque in real time.
- ☆ 齿轮箱采用少齿差行星传动, 可以实现小体积大减速比输出。
The gearbox is a planetary gear drive mechanism with few teeth different.
- ☆ 产品体积小, 效率高, 寿命长, 噪音低。
Small size, high efficiency, long life and low noise.
- ☆ 典型应用: 电动咖啡机。
Application: Coffee Machine.

产品外形 Dimensions



齿箱规格 Gearbox Specification

级数 Stage	型号 Model	减速比 Ratio	许用转矩 Normal Torque (kgf·cm)	极限转矩 Breakdown Torque (kgf·cm)	传动效率 Efficiency	齿轮类型 Gear Type
1	WGB28-1	1.44	30	50	75%	MIM

产品说明 Product Description

- ☆ 动力源采用有刷电机, 适合于短时间间歇性工作。
The input is PMDC motor, suitable for intermittent work products.
- ☆ 齿轮箱采用等距螺旋锥齿轮制造, 可以实现交错轴输出。
Spiral bevel gear pair can realize staggered shaft output.
- ☆ 产品体积小, 强度高, 寿命长。
Small size, high strength and long life.
- ☆ 典型应用: 智能开窗器。
Application: Windows Opener.

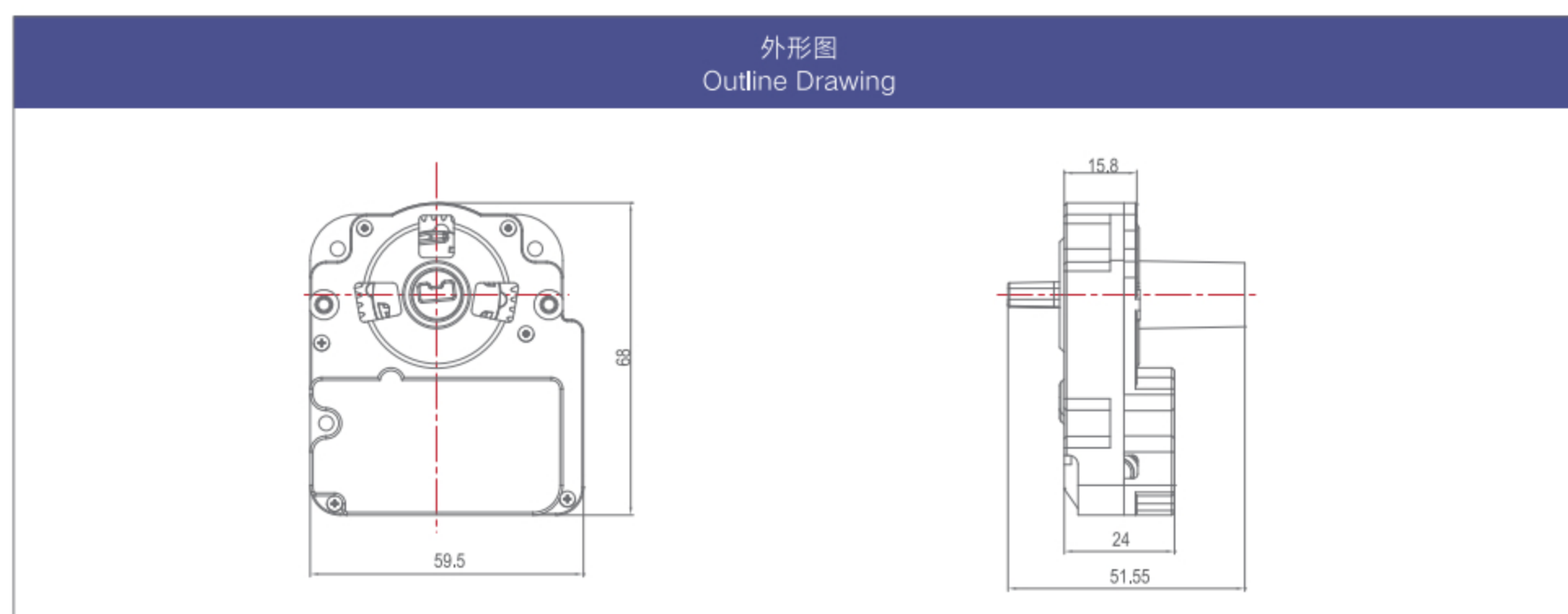


专用齿轮箱
Customized Gearbox

WGB68X 双向离合减速电机
Fingerprint Lock Gear Motor



产品外形 Dimensions



齿箱规格 Gearbox Specification

级数 Stage	型号 Model	减速比 Ratio	许用转矩 Normal Torque (kgf·cm)	极限转矩 Breakdown Torque (kgf·cm)	传动效率 Efficiency	齿轮类型 Gear Type
1	WGB68X-543	543	1.5	7	15%	混合型 Multiple

产品说明 Product Description

- ☆ 动力源采用有刷电机, 适合于短时间间歇性工作。
The input is PMDC motor, suitable for intermittent work products.
- ☆ 齿轮箱采用一级蜗杆斜齿轮副与三级平行轴齿轮副传动, 可以实现小体积大减速比输出。
The gearbox adopts worm and helical gear pair transmission, which can realize volume and large reduction ratio output.
- ☆ 产品体积小, 厚度小, 寿命长, 噪音低。
Small size, ultrathin, long life and low noise.
- ☆ 典型应用: 智能门锁。
Application: Fingerprint Lock.

小模数齿轮零件
Small Module Gear Parts



注: 齿轮模数范围 Gear module range: 0.05~1.5mm



螺旋锥齿轮 Spiral Bevel Gear

等距螺旋锥齿轮是一种新型的螺旋锥齿轮，与传统机加工常见的格里森制弧齿锥齿轮、奥利康制的摆线锥齿轮都不同，是一种可以注射模具成型的新螺旋锥齿轮。

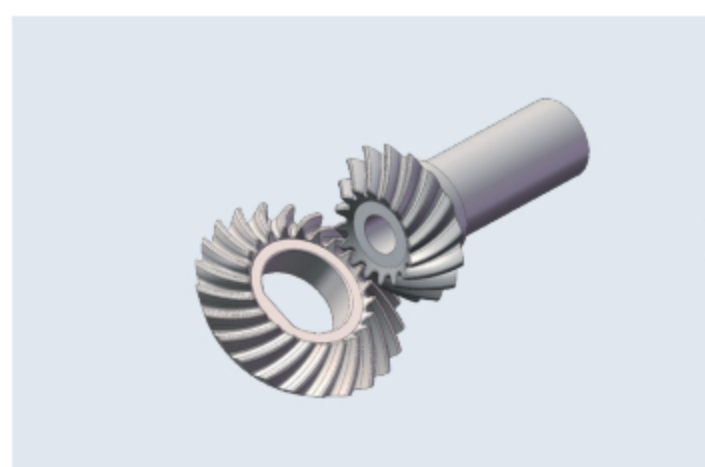
等距螺旋锥齿轮适用于粉末注射成型工艺 (MIM) 制造。该齿轮先经理论设计后，采用五轴数控加工中心加工注射模具型腔的齿轮电极，然后再通过螺旋放电加工模具型腔，最后通过注射成型，产品通过旋转脱模实现产品的量产。

通过MIM制造等距螺旋锥齿轮，可以实现大批量快速生产，性价比高，且零件尺寸可以大幅减小，实现螺旋锥齿轮的微型化。

Equidistant spiral bevel gear is a new type of bevel gear. It is different from Gleason spiral bevel gear or Oerlikon system cycloidal tooth bevel gear. It is a new spiral bevel gear for injection molding.

Equidistant spiral bevel gear is very suitable for metal injection molding (MIM) manufacturing. First, we can design the gear pairs according to conjugate theory of gear; Second, machining gear electrode with five axis CNC Machining; Third, machining mold cavity by spiral EDM; Forth, the gear part production by injection molding, the product is separated from the mold by rotating demoulding. This method can realize the batch production of gears.

MIM equidistance spiral bevel gear, production fast, cost lower, size can be made smaller. This is an important way to realize the miniaturization of spiral bevel gears!



零件三维设计 3D Design



电极与模具型腔 Electrode and Cavity



MIM烧结成品 Sintered Product

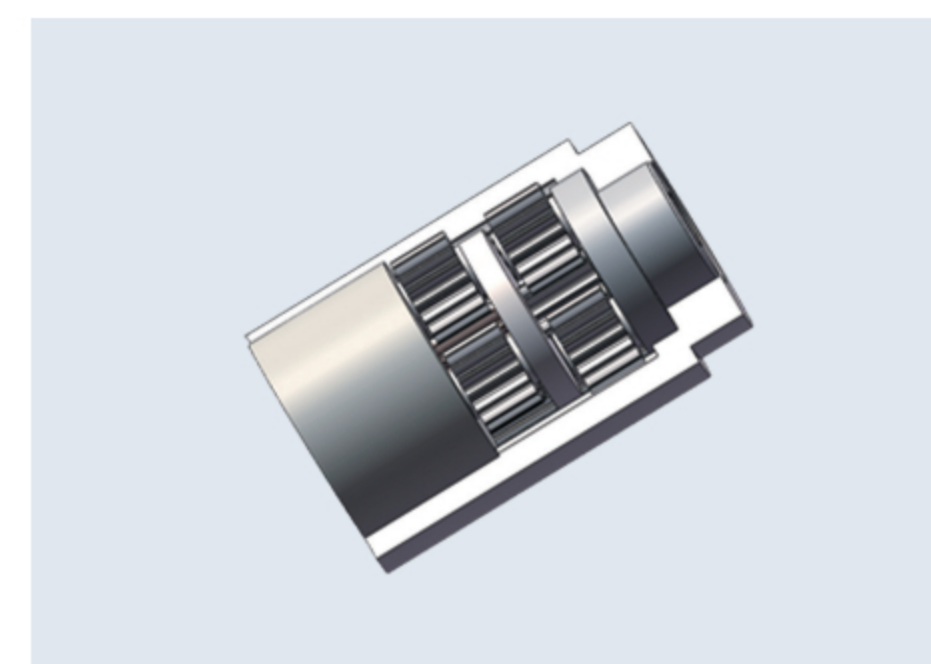


MIM注塑坯 Injection Blank

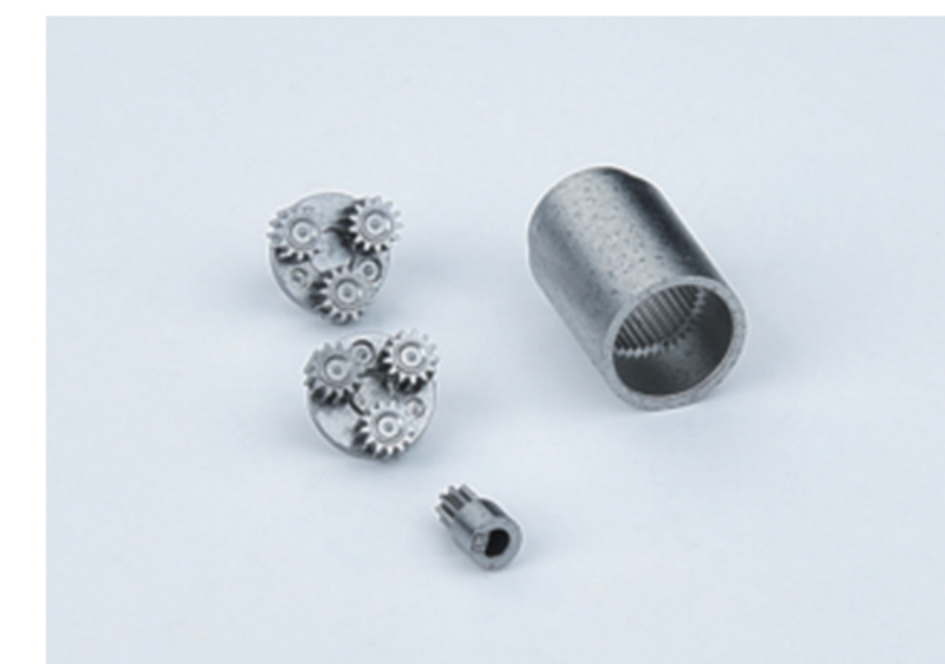
超微型齿轮 Microgear Parts

手机伸缩摄像头驱动模块由步进电机、两级行星齿轮减速器和丝杆螺母直线运动副构成。其中，行星齿轮箱部分核心齿轮零件皆采用MIM工艺制造。

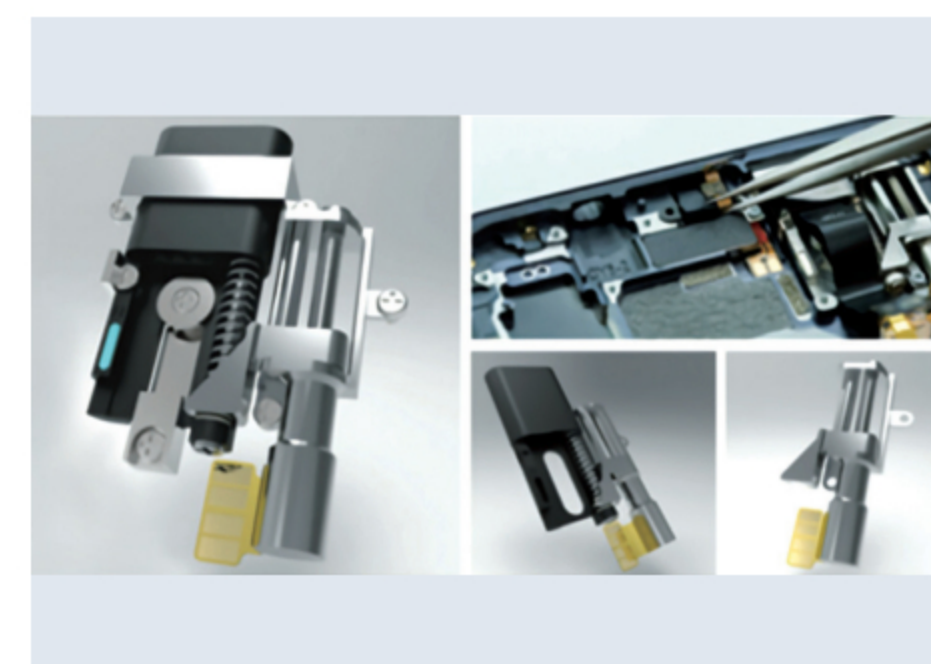
The front camera drive module of mobile phone is composed of stepping motor, planetary gearbox and screw nut linear movement pair. Among them, all gears of the planetary gearbox are manufactured by MIM.



行星齿轮箱三维设计 3D design of planetary gearbox



行星齿轮箱零件 Gear parts in planetary gearbox



智能手机摄像头伸缩模组 Front camera drive module of mobile phone



带伸缩摄像头的智能手机 Smartphone with telescopic camera



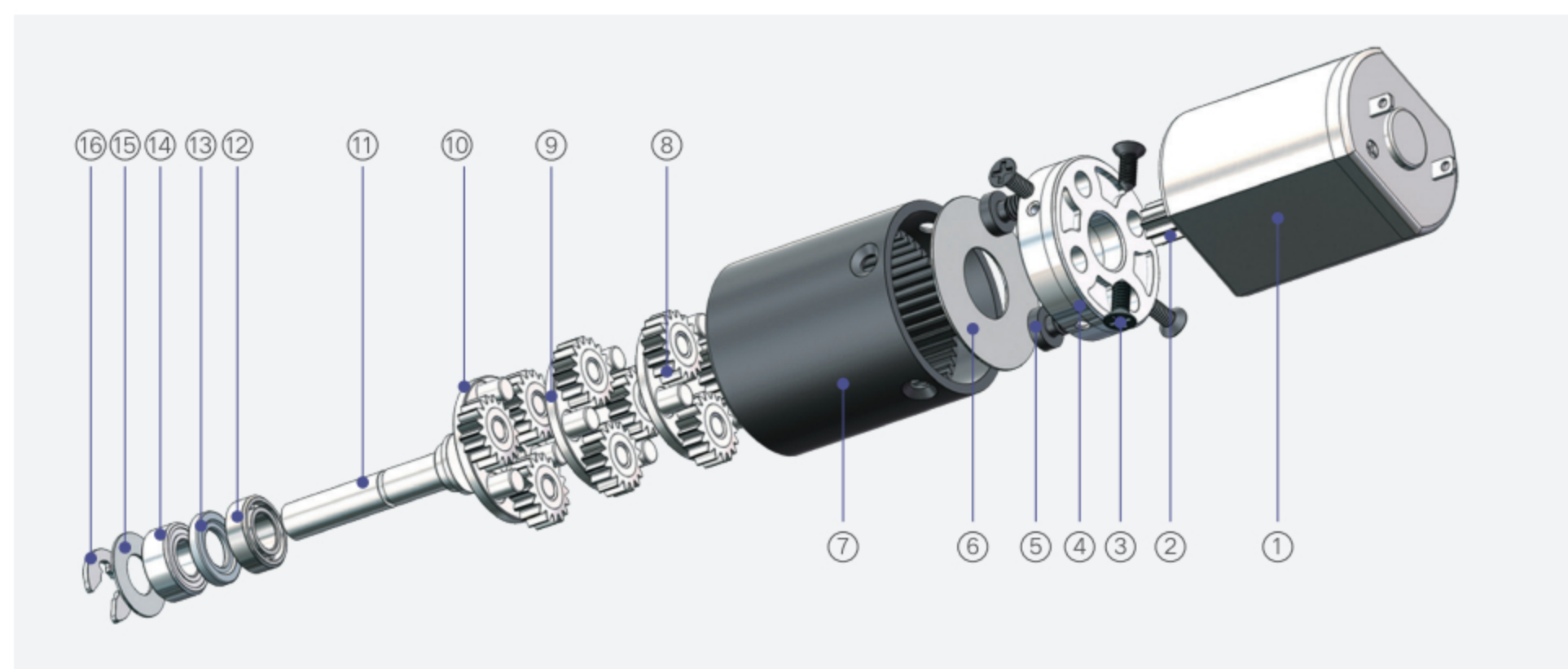
微型行星齿轮箱简介 Introduction of Micro Planetary Gearbox

微型行星齿轮箱一般是指采用模数小于1mm的齿轮构成的行星齿轮箱产品,其由多级行星齿轮传动副构成,而每级行星传动一般由太阳轮、行星齿轮、内齿圈和支持行星齿轮自转与公转的转臂(又称行星架)构成。产品外形一般呈圆柱形,且输入输出保持同轴,是微型电机优选选配的一种齿轮减速产品。该类产品具有体积小、传动比大、传动效率高、结构紧凑、承载能力高等一系列优点。

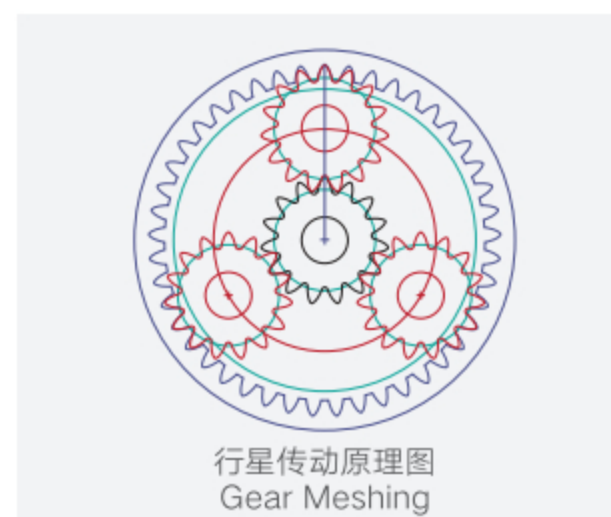
基于市场需求,我司自主开发了一系列微型行星齿轮箱产品,直径尺寸范围从4mm到16mm,形成了一系列产品,供客户自由选择。

Micro planetary gearbox generally refers to the planetary gearbox product composed of gears with modulus less than 1 mm. It is composed of multi-stage planetary gear transmission pairs, and each stage of planetary transmission is composed of sun gear, planetary gear, internal gear and planetary carrier supporting planetary gear self rotation and revolution. The shape of this gearbox is usually cylindrical. The input shaft and output shaft are coaxial. It is an optimal selection for micro motor. This kind of products have a series of advantages, such as small volume, large transmission ratio, high transmission efficiency, compact structure and high load-carrying capacity.

Based on the market demand, our company has independently developed a series of micro planetary gearbox products with the diameter ranging from 4mm to 16mm, forming a series of products for customers to choose freely.



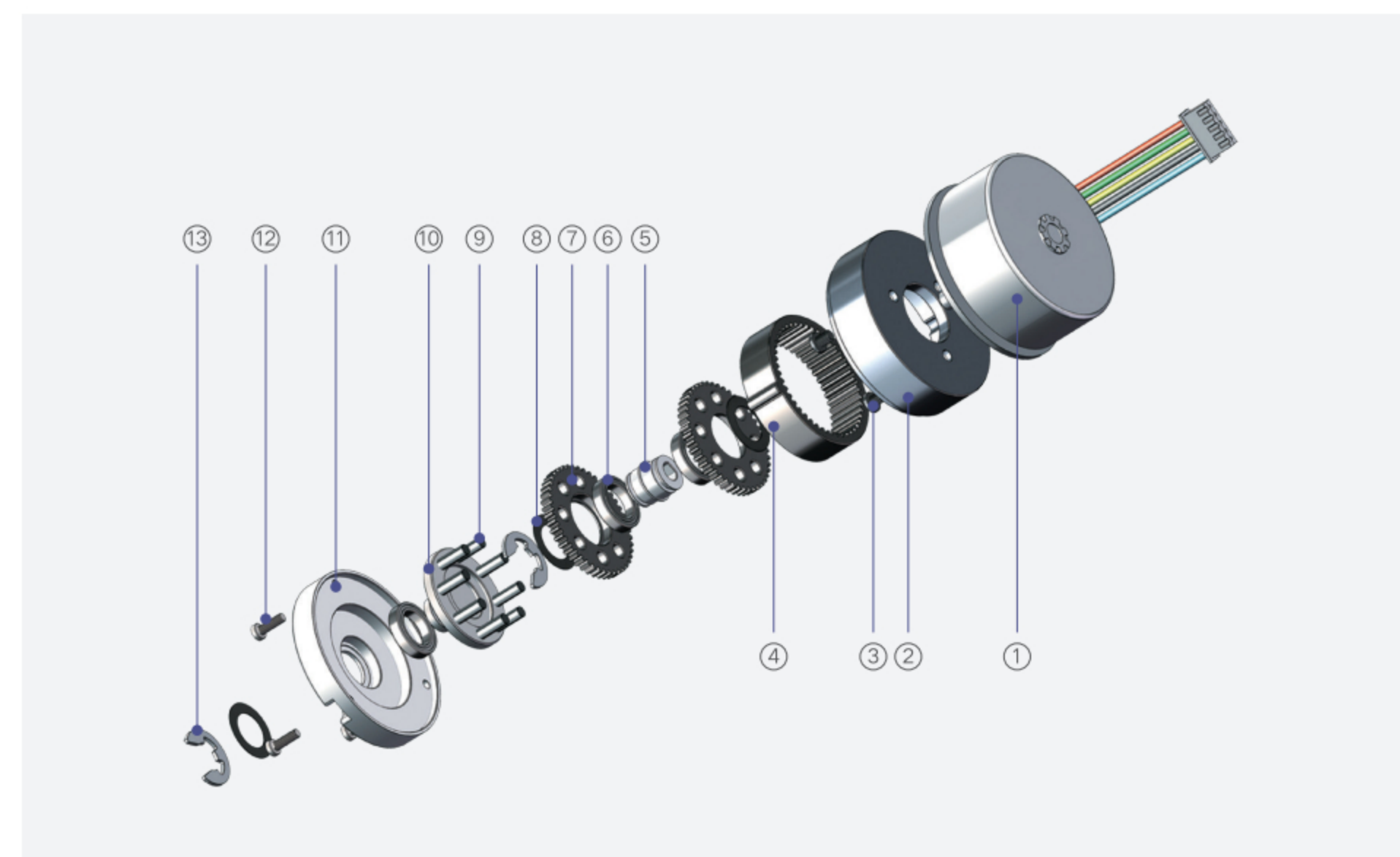
1	电机	Motor	9	转臂齿轮组	Planet Carrier
2	太阳轮	Sun Gear	10	输出转臂	Output Planet Carrier
3	螺钉	Screw	11	转轴	Shaft
4	转接板	Flange	12	球轴承	Ball Bearing
5	螺钉	Screw	13	隔片	Washer
6	垫片	Washer	14	球轴承	Ball Bearing
7	内齿轮	Internal Gear	15	垫片	Washer
8	行星齿轮	Planet Gear	16	弹性挡圈	Circle



少齿差行星齿轮箱简介 Introduction of Few Teeth Difference Planetary Gearbox

少齿差行星齿轮传动是由齿数差很少的渐开线内啮合变位齿轮副组成的一种特殊的行星齿轮传动形式。该产品具有传动比大,体积小,结构紧凑,齿轮数量少,便于制造、装配和使用等优点。我司可根据客户要求定制开发各类微型少齿差行星齿轮箱产品。

Planetary gear transmission with few teeth number difference is a special form of planetary gear transmission, which is composed of involute internal meshing modified gear pair with few teeth difference. This kind of products have the advantages of large transmission ratio, small volume, compact structure, small number of gears, and easy to manufacture, assemble and use. Our company can customize and develop all kinds of micro planetary gearbox with few teeth difference according to customer requirements.



1	电机	Motor	8	垫片	Washer
2	齿箱体	Gear Housing	9	转轴	Shaft
3	螺丝	Screw	10	行星架	Planet Carrier
4	内齿圈	Internal Gear	11	齿箱盖	Gear Cover
5	曲柄	Crankshaft	12	螺丝	Screw
6	球轴承	Ball Bearing	13	弹性挡圈	Circle
7	行星齿轮	Planet Gear			





金属粉末 注射成形技术 (MIM) 简介

金属粉末注射成形(Metal Injection Molding, MIM)是传统粉末冶金工艺与现代塑料注射成型工艺相结合而形成的一门新兴近净成形技术。其工艺过程大致分为四个阶段: 喂料制备→注射成形→脱脂处理→烧结。具体描述为: 首先将金属粉末与有机粘结剂均匀混炼为喂料, 然后用注塑机将喂料加热注射进模具型腔, 得到零件的注塑坯, 接着将注塑坯中的粘结剂等脱脂处理得到生坯, 最后将生坯进行烧结致密化后得到最终成品。成品与常规金属制品相似, 可以在进行后续的抛光、整形、热处理等工艺处理, 从而得到满足设计要求的机械零件。

MIM工艺技术特点

- ☆ 如同生产塑料制品一样生产形状复杂的小型金属零件, 通常重量在0.1~200g。
- ☆ 表面光洁度好、尺寸精度高, 通常的公差为±0.3%~0.5%。
- ☆ 材料适用范围广, 制品致密度高(可达95%~99%), 且组织均匀、性能优异。
- ☆ 产品质量稳定, 生产效率高, 可实现自动化、大批量、规模化生产。
- ☆ 允许薄壁结构, 最小壁厚可以做到0.3mm。

MIM可选用的材料

材料体系	合金牌号或成分	应用领域
低合金钢	Fe2Ni, Fe4Ni, Fe8Ni	汽车、机械等行业的各种结构件
不锈钢	304L, 316L, 17-4PH, 420, 440C	医疗器械、钟表零件
硬质合金	WC-Co	各种刀具、钟表、手表
陶瓷	Al ₂ O ₃ , ZrO ₂ , SiO ₂	电子、日常生活用品、钟表
钛合金	Ti, Ti-6Al-4V	医疗、军工结构件
磁性材料	Fe, NdFeB, SmCo5, Fe-Si	各种磁性能部件
工具钢	CrMo4, M2	各种工具

Introduction Of Metal Injection Molding Technology

Metal injection molding (MIM) is a net forming technology by the combination of traditional PM process and modern plastic injection molding process. The process can be divided into four stages: feedstocks preparation → injection molding → degreasing → Sintering. The details is as follows: firstly, the metal powders and organic binders are evenly mixed, and then the feedstocks are heated and injected into the mold cavity with an injection molding machine to obtain the green parts. Then, the binder in green parts is degreased to obtain gray parts, and finally the gray parts are sintered to obtain the final product. Similar to conventional metal products, the finished products can be polished, reshaped and heat treated to obtain the mechanical parts meeting the design requirements.

MIM Technology Features

- ☆ As the production of plastic products, small metal parts with complex shapes, usually weighing 0.1~200 g.
- ☆ The surface finish is good and the dimension precision is high. The usual tolerance is ±0.3~0.5%.
- ☆ The material has wide application range, high density (up to 95~99%), uniform structure and excellent performance.
- ☆ The product quality is stable and the production efficiency is high, which can realize the automation, mass production and large-scale production.
- ☆ Allow thin-walled structure, the minimum wall thickness can be 0.3 mm.

Materials For MIM

Materials	Material Brand	Application
Low Alloy Steel	Fe2Ni, Fe4Ni, Fe8Ni	Structural parts for automobile, machinery and other industries
Stainless Steel	304L, 316L, 17-4PH, 420, 440C	Medical equipment, clock parts
Cemented carbide	WC-Co	Knives, clocks and watches
Ceramic	Al ₂ O ₃ , ZrO ₂ , SiO ₂	It electronics, daily necessities, clocks and watches
Titanium Alloy	Ti, Ti-6Al-4V	Medical and military structural parts
magnetic material	Fe, NdFeB, SmCo5, Fe-Si	Various magnetic components
Tool Steels	CrMo4, M2	Tools