溢源国际有限公司

Main Rich International Limited

中山溢源磁性五金制品有限公司

Zhongshan Main Rich Magnetic Hardware Products Co.，Ltd.

稀土永磁器件供应商

Rare Earth Permanent Magnet Components Supplier

溢源國際
MAIN RICH

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中山溢源磁性五金制品有限公司是溢源国际有限公司（香港）全资拥有在中国营运的公司，主要配合客户磁性产品定制提供专业的开发工作，产品生产厂拥有全自动生产线及各种先进生产设备和磁材检测设备，工厂已通过 ISO 9001:2015，IATF16949:2016相关体系认证。产品应用有:各类电机、汽车部件、航空航天、家用电器、消费电子，风力发电、医疗设备、传感器，电动工具以及磁性组件等。

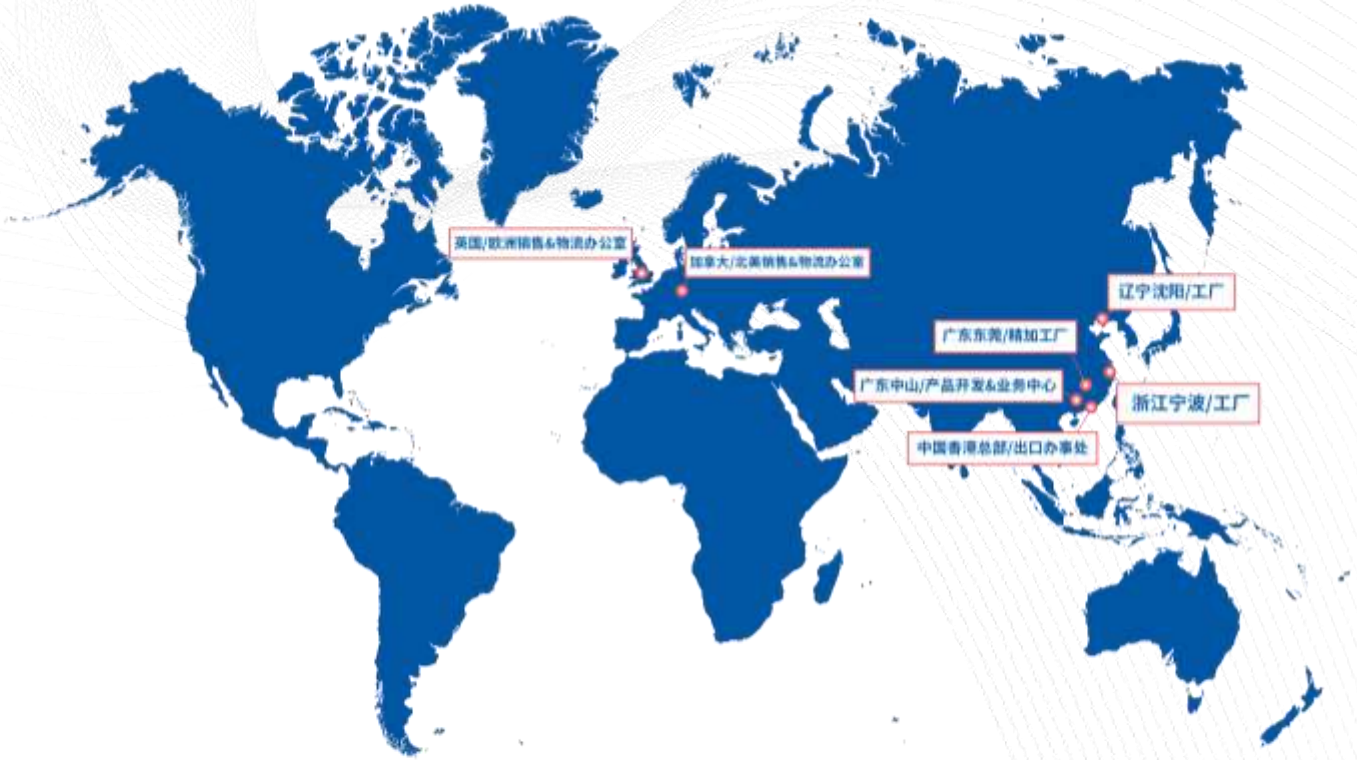
公司会不断寻求技术突破，优化生产管理流程，坚持"质量第一，创新突破"为公司的经营理念，以优质的产品和极具竞争力的价格满足客户各种产品需要，从信息→样品测试→完成订单的过程都追求用最专业最有效的时间来实现，我们不断努力的成果期待能得到你们的支持并在发展的道路上并肩前行。

Zhongshan Main Rich Magnetic Hardware Products Co., Ltd.
A wholly-owned subsidiary of Main Rich International Limited (Hong Kong), operates in China to provide professional development services for customized magnetic products. The production facility is equipped with fully automated production lines, advanced manufacturing equipment, and magnetic material testing devices. The factory has obtained ISO 9001:2015 and IATF16949:2016 certifications.

企业简介 Enterprise Profile

中国香港总部/出口办事处
德国/欧洲销售&物流办公室
英国/欧洲销售&物流办公室
加拿大/北美销售&物流办公室
广东中山/产品开发&业务中心
浙江/工厂
辽宁/工厂

Headquarters in Hong Kong, China / Export Office
Sales & Logistics Office in China / Europe
Sales & Logistics Office in the UK / Europe
Sales & Logistics Office in Canada / North America
Product Development & Business Center / Zhongshan, Guangdong
Precision Machining Factory / Dongguan, Guangdong
Factory / Ningbo, Zhejiang
Factory / Shenyang, Liaoning



企业资源优势

Enterprise Resource Advantages

过去30年溢源公司在经营磁材配合不同客戶不同产品的项目开发上积累了丰富的经验，通过项目开发并整合行业的资源迅速解决客戶对开发产品的技术突破等要求，业务团队运用过去开发产品所积累的丰富经验，就是体现在解决问题的专业能力，让客戶的产品在市场上建立更大的竞争优势，让互相合作的商业价值提升从而达到长久互利的紧密关系。

Over the past three decades, Main Rich has accumulated extensive experience in developing magnetic material solutions for diverse customer projects across industries. By leveraging our project development expertise and integrating industry resources, we quickly address technical challenges and breakthrough requirements for customized products. Our business team’ s deep knowledge, honed through years of product development, translates into specialized problem-solving capabilities that enable clients to build a stronger competitive edge in the market. This approach enhances mutual commercial value and fosters long-term, mutually beneficial partnerships.

如何应对在合作中的不确定性？

How do we address uncertainties in partnerships?

成本太高？原料价格波动？如何提供专业服务

Cost too high? Raw material price fluctuations? How to provide professional services?

应对不确定性具体措施 Specific Measures to Address Uncertainties

上下游资源互动

Upstream-Downstream Resource Synergy

保障钕铁硼产品的稳定供应，溢源矿业为原材料采购打通渠道，为供应链厂家降低生产成本，实现溢源公司的平台价值

To ensure the stable supply of neodymium-iron-boron products, Main Rich Mining has opened up channels for raw material procurement, reduced production costs for supply chain manufacturers, and realized the platform value.

成本控制

Cost Control

面对原材料价格的波动，溢源矿业采取积极的控制措施，能够在一定程度上抵消原材料价格上涨带来的成本压力，保持磁材的市场竞争力。

In response to raw material price fluctuations, Main Rich Mining implements proactive control measures to effectively offset cost pressures caused by rising material prices, thereby maintaining the market competitiveness of magnetic materials.

应对不确定性具体措施 Specific Measures to Address Uncertainties

增值服务延伸价值

Value-Added Services & Extended Value

运用30多年行业内的专业知识和大数据分析，针对原材料价格的市场预判，与客户快速对接，为客户创造先机的优势，提前为订单价格作出准备，优化生产和备料或库存管理。

By leveraging over 30 years of industry expertise and big data analytics for raw material price forecasting, we rapidly align with clients to create a preemptive advantage, proactively prepare order pricing, and optimize production, material sourcing, and inventory management.

与供应链和客户保持密切沟通

Close Communication with Supply Chain and Clients

及时了解客户的需求和市场变化。在原材料上涨的情况下，与客户通过签订长期合同等方式，为供应链锁定成本，为客户减轻负担。

By staying attuned to customer needs and market dynamics, we mitigate risks posed by rising raw material prices through strategies like long-term contracts, ensuring cost stability for the supply chain and alleviating financial burdens for clients.

工艺流程和生产设备介绍

Enterprise Facilities Introduction

工艺流程 Process Flow

原材料Raw Materials

氢碎HD

模压成型Pressing

性能测试Performance Testing

扩散工艺/GBD
Grain Boundary Diffusion

黑片检测Sami Product Inspection

表面处理Surface Treatment

速凝铸片Quick-Curing Strip Casting

甩带片Strip Casting

制粉Jet Milling

烧结Sintering

机加工Machining

充磁Magnetizing

成品检验Final Inspection

已充磁产品检验
Magnetized Product Inspection

包装Packing

出货
DELIVERY

生产设备 Testing Equipment

熔炼炉

Image Size Measuring Instrument

甩带炉

Universal Testing Machine (UTM)

气流磨

Hardness Tester

烧结炉

Fully Automatic Magnetic Declination Tester

生产设备 Testing Equipment

激光切割

Image Size Measuring Instrument

异型磨床

Universal Testing Machine (UTM)

表面处理

Hardness Tester

包装检验

Fully Automatic Magnetic Declination Tester

工程中心 Engineering Center

工程中心环境

Engineering Center Environment Display

扫描电镜

Scanning Electron Microscope (SEM)

磁场分析仪

Magnetic Field Analyzer

测试设备 Testing Equipment

图像尺寸测量仪

Image Size Measuring Instrument

万能试验机

Universal Testing Machine (UTM)

硬度测试仪

Hardness Tester

全自动磁偏角测试仪

Fully Automatic Magnetic Declination Tester

产品介绍

Product Introduction

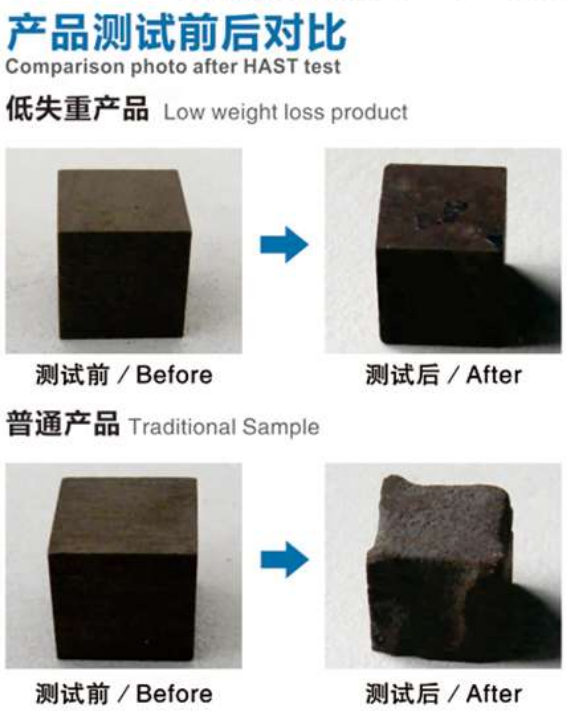
公司根据客户要求提供定制化服务， 欢迎随时联系我们。

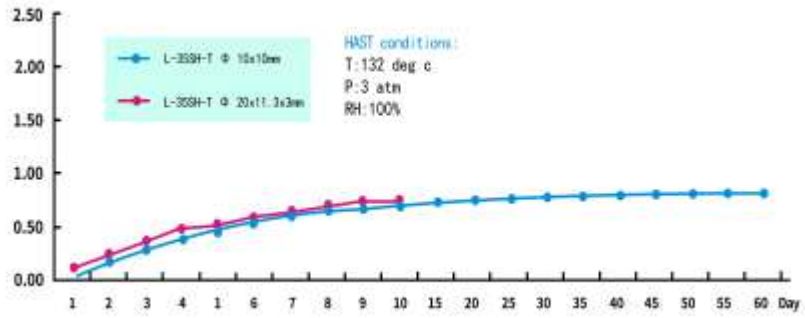
We provide customized solutions tailored to your specific needs. Feel free to contact us anytime.

低失重产品 Low-Weight-Loss Products

在高温高压和高湿的条件下， 表面未经处理的磁体的单位失重率可以定性的反映磁体的使用寿命，我们的低失重磁体可达到小于1mg/cm²的行业内先进水平。

Under high temperature, high pressure and high humidity conditions, the weight loss per unit area of untreated magnets can qualitatively reflect their service life. Our low-weight-loss magnets achieve an industry-leading level of less than 1 mg/cm².





L-35SH-T磁体HAST试验失重曲线图

WEIGHT LOSS CURVE OF UNCOATED L-35SH-T MAGNET WITH HAST

不同的牌号， 不同的配方， 失重水平有较大差异， 我司根据客户要求可提供定制化服务， 如您有特殊要求， 欢迎联系我们专业的工程师。

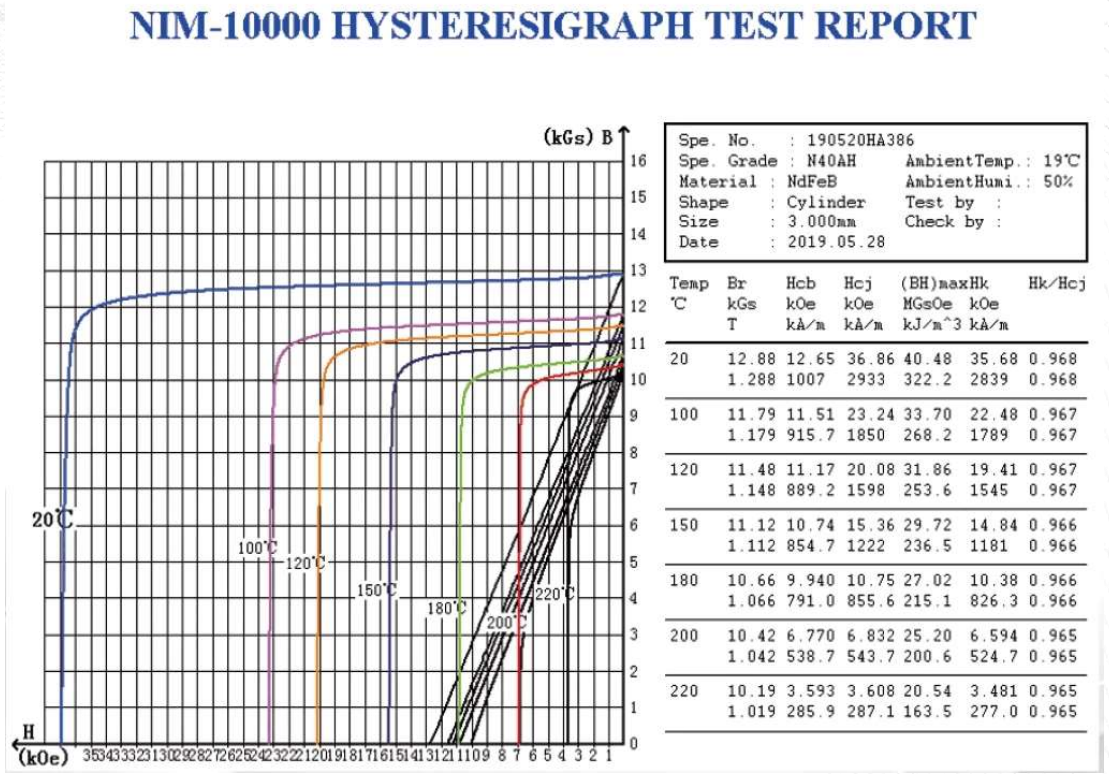
Weight loss performance varies significantly across different grades and formulations. We offer customized solutions tailored to specific requirements – for specialized needs, our dedicated engineering team is available to assist.

低温度系数产品 Low Temperature Coefficient Product

通过优化的配方设计和改进的制程工艺，使得同等牌号的产品具有更高的耐热稳定性和更低的热退磁率。

Through optimized formula design and improved manufacturing processes, products of the same grade exhibit higher thermal stability and a lower thermal demagnetization rate.

变温测磁仪Hysteresigraph



Temp ℃	Br kGs / T	Hcb kOe / kA/m	Hcj kOe / kA/m	(BH)max MGsOe / kJ/m^3	Hk kOe / kA/m	Hk/Hcj
20	12.88 / 1.288	12.65 / 1007	36.86 / 2933	40.48 / 322.2	35.68 / 2839	0.968
100	11.79 / 1.179	11.51 / 915.7	23.24 / 1850	33.70 / 268.2	22.48 / 1789	0.967
120	11.48 / 1.148	11.17 / 889.2	20.08 / 1598	31.86 / 253.6	19.41 / 1545	0.967
150	11.12 / 1.112	10.74 / 854.7	15.36 / 1222	29.72 / 236.5	14.84 / 1181	0.966
180	10.66 / 1.066	9.940 / 791.0	10.75 / 855.6	27.02 / 215.1	10.38 / 826.3	0.966
200	10.42 / 1.042	6.770 / 538.7	6.832 / 543.7	25.20 / 200.6	6.594 / 524.7	0.965
220	10.19 / 1.019	3.593 / 285.9	3.608 / 287.1	20.54 / 163.5	3.481 / 277.0	0.965

NIM-200C HYSTERESIGRAPH TEST REPORT

低磁偏角产品介绍 Low Deviation Angle Product

机器人应用传感器领域类磁偏角精度要求非常高。如何控制偏转角呢？通过压制、烧结和机械加工过程，±5° 是偏转角的正常标准。但传感器产品中使用的磁铁要求小于 ±3°，因此磁铁的通过率只能达到 70%-80% 左右。所有磁铁在磁化后都应进行 100% 的最终检查。

In the field of sensors for robot applications, the precision requirement for the magnetic declination angle is extremely high. How to control the deflection angle? Through the processes of pressing, sintering and machining, ±5° is the normal standard for the deflection angle. However, the magnets used in sensor products are required to have a deflection angle of less than ±3°, so the pass rate of the magnets can only reach about 70%-80%. All magnets should be inspected 100% after magnetization.

专业高精度低磁偏角测试仪

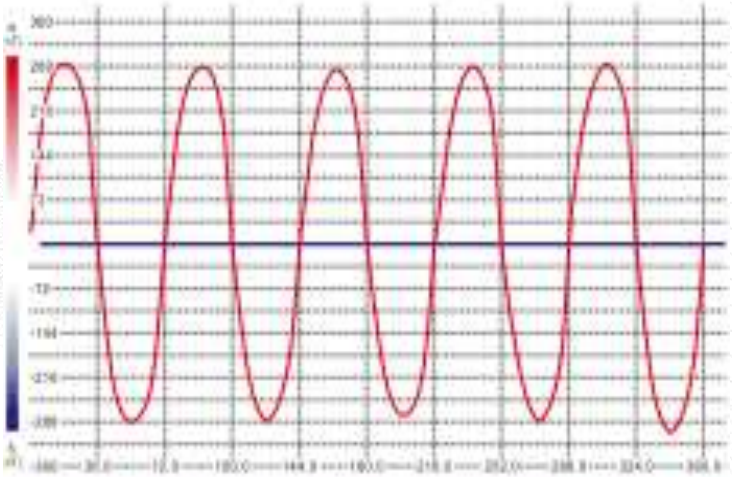
Magnetic deviation angle tester

辐射环 Radial Oriented Ring Magnet

辐射环(烧结钕铁硼)是指辐射取向的磁环，产品的取向从圆心向四周呈辐射状取向。它的充磁方式多样，有单极充和多极充，有直充和斜充等，常见的多极充有:2极、4极、8极、10极、12极等，充磁极数及斜充的角度由最终充磁夹具决定。

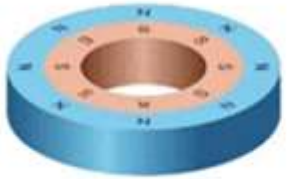
Ring magnet magnetized in Radial Direction is developed successfully which is using shaping method by new multipole radiation orientation, and meet different requirements of permanent motors. Fundamentally changed the past situation that radial ring magnet only relied on the magnetic tile assembly, greatly improve the performance of the motor.

The popular poles include: 2 pole, 4 poles, 8 poles, 10 poles, 12 poles etc, the number of poles and the skew angle were decided by the magnetizing tooling.

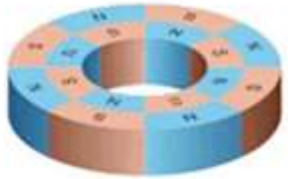


辐射环 Radial Oriented Ring

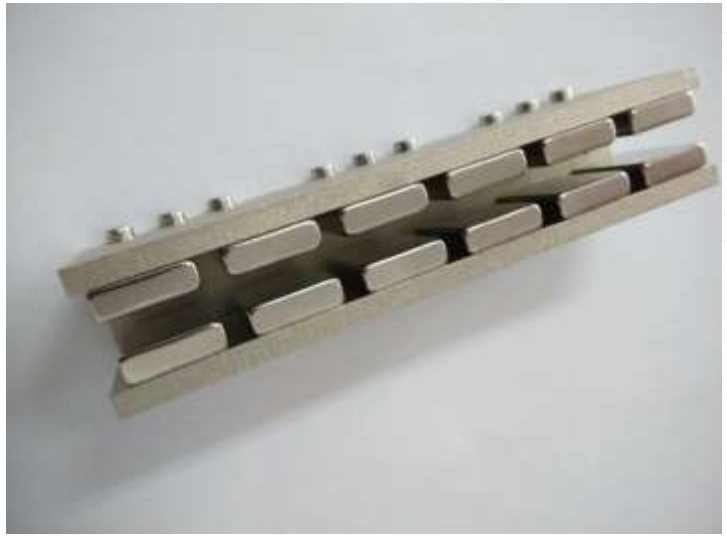
内外径辐射充磁
Radial Magnetised

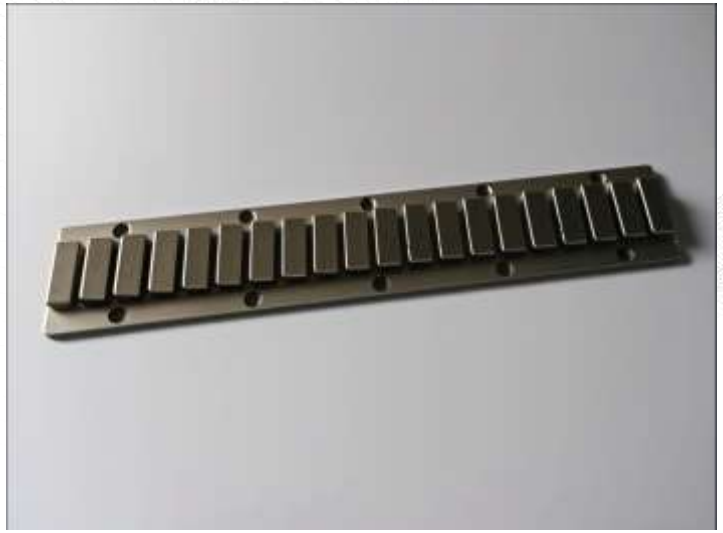


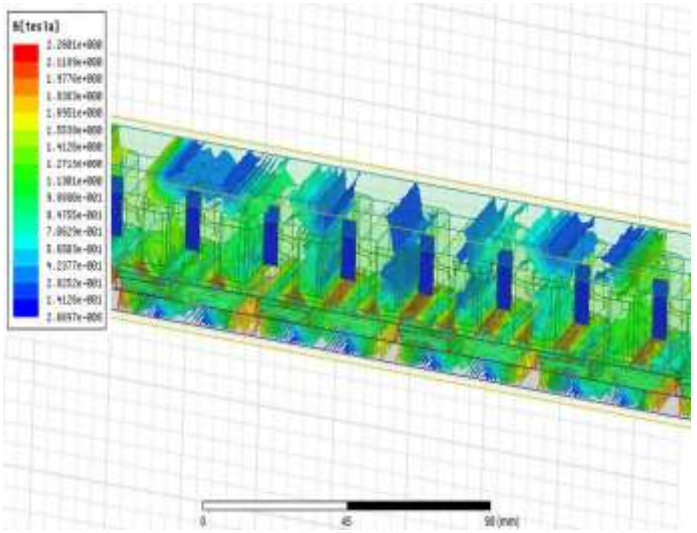
辐射取向多极充磁
Multi-poles
Magnetised Radial Orientation



磁组件产品 Magnetic Property Distribution Chart







工艺特点 Tech. Features

直线电机组件

直线电机产品是直接驱动的，由一个无接触力和“u型通道”或“扁平”稀土磁道组成。这种设计消除了与滚珠丝杠、皮带和齿条和小齿轮运动控制和定位系统相关的间隙、发条、磨损和维护问题。力和磁轨道的非接触设计使系统免维护。我们生产全系列直线电机，以满足您的工业自动化应用需求。

Linear Motor Assemblies

Our linear motor products are direct-drive and consist of a contactless force and "u-channel" or "flat" rare earth magnetic path. This design eliminates the backlash, clockwork, wear and maintenance problems associated with ballscrew, belt and rack and pinion motion control and positioning systems. The non-contact design of the force and magnetic tracks makes the system maintenance free. We manufacture a full line of linear motors to meet your industrial automation application needs

烧结钕铁硼的尺寸公差
Dimensional tolerances of Sintered NdFeB Magnets

我们整理了国家标准对于尺寸公差和形位公差的基本要求，可供设计选材时使用。

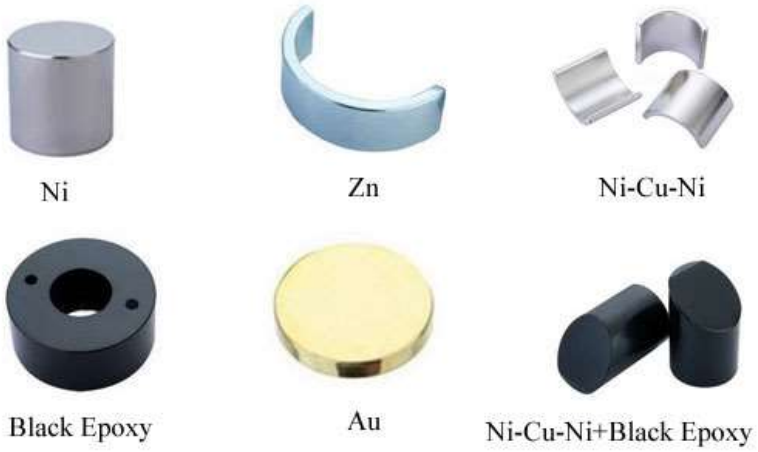
We have organized the basic requirements for dimensional and geometric tolerances specified in national standards, available for reference during design and material selection processes.

烧结钕铁硼的尺寸公差和形位偏差国家标准
National Standard for Dimensional Tolerances and Geometric Deviations of Sintered NdFeB Magnets

烧结面偏差 Sintered Surface Deviation			加工面偏差 Machined Surface Deviation			
尺寸范围（mm） Dimension Range (mm)	垂直于压制方向 Perpendicular to Pressing Direction	压制方向 Pressing Direction	平磨 Surface Grinding	内外圆磨 Internal/External Cylindrical Grinding	线切割 Wire Cutting	切片 Slicing
≤10	±0.20	±0.30	±0.05	±0.05	±0.03	±0.03
10-20	±0.30	±0.40	±0.05	±0.08	±0.05	±0.05
20-50	±0.50	±0.65	±0.10	±0.13	±0.08	±0.10
50-80	±1.00	±1.10	±0.15	±0.20	±0.13	±0.15
偏差种类 Deviation Type	检查部位 Inspection Area	基本尺寸 Basic Size	偏差 Tolerance Specification			
平行度 Parallelism	加工面间 Machining between surfaces	任意 Any	两平面间公差值的二分之一 The tolerance between the two planes is one-half			
垂直度 Perpendicularity	烧结面间 Between sintered surfaces	任意 Any	90°±1°			
	加工面与烧结面间 Between machined and sintered surfaces		90°±1°			
	两加工面间 Between two machined surfaces		90°±1°			
同轴度 Coaxiality	烧结面间 Between sintered surfaces	≤14	±0.35mm			
		>14-24	±0.60mm			
		>24-40	±0.80mm			
		>40-60	±1.10mm			
		>60-80	±1.50mm			
		>80-100	±2.00mm			
	加工面间 Between machined surfaces	任意 Any	±0.80mm			

烧结钕铁硼的镀层介绍
Sintered NdFeB Magnets Coating Introduction

The pictures of common coating



烧结钕铁硼的镀层种类及耐蚀性
Types of coatings and corrosion resistance of sintered NdFeB

种类 Coating Type	颜色 Color	厚度（μm） Thickness	饱和蒸汽试验（h） Saturated Steam Test	盐雾试验（h） Salt Spray Test
镍 Ni	银色 Silver	10-20	48-72	72
镍铜镍 Ni-Cu-Ni	银色 Silver	10-20	48-72	24
锌 Zn	蓝色 Blue	8-20	24	24
黑色环氧 Black Epoxy	黑色 Black	15-25	48	96
镍铜+环氧 Ni-Cu + Black Epoxy	黑色 Black	15-25	48	96
磷化 Phosphating	灰色 Gray	1-2	/	/
钝化 Passivation	灰色 Gray	1-2	/	/

1. Sintered NdFeB (烧结钕铁硼): Neodymium Iron Boron permanent magnet.

2. Saturated Steam Test: Evaluates corrosion resistance under high-temperature, high-humidity conditions.

3. Salt Spray Test: Accelerated corrosion test per standards like ASTM B117.

4. / : Indicates "not applicable" or "no data".

烧结钕铁硼的物理特性
Physical properties of sintered NdFeB

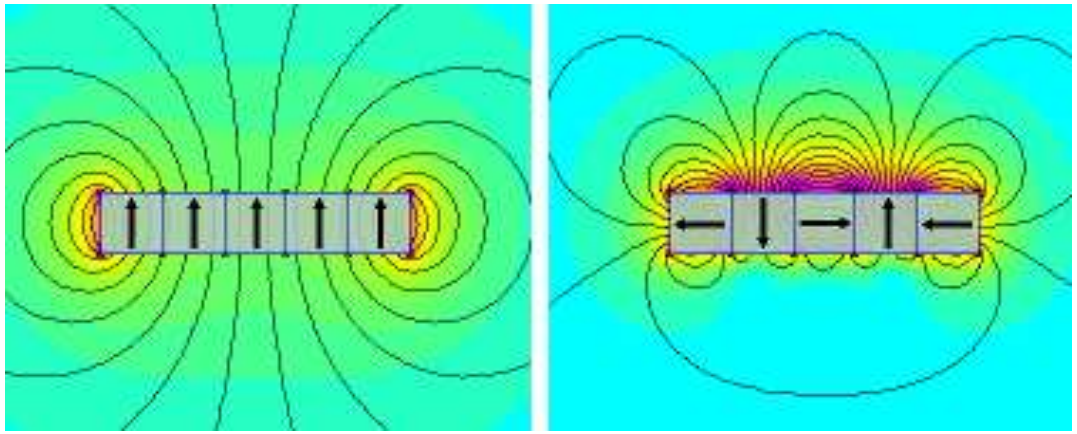
烧结钕铁硼的物理参数 Physical parameters of sintered NdFeB		
类目 Category	参数 Parameter	参考值 Reference Value
磁性能 Magnetic Properties	剩磁物理系数 (%/K) Remanence Temperature Coefficient	"-0.08--0.12
	内禀矫顽力温度系数(%/K) Intrinsic Coercivity Temperature Coefficient	"-0.42--0.70
	居里温度(Tc) (K) Curie Temperature	310-380
物理性能 Physical Properties	反充磁导率 (μ_{rec}) [-] Recoil Permeability	1.05
	密度(g/cm³) Density	7.6
	维氏硬度(Hv) Vickers Hardness	650
	电阻率 (μΩ·m) Electrical Resistivity	1.4
	抗压强度(Mpa) Compressive Strength	1050
	抗拉强度(Mpa) Tensile Strength	80
	抗弯强度(Mpa) Flexural Strength	290
	导热系数(W/(m·K)) Thermal Conductivity	6-8

常见的磁路设计结构 Popular magnetic circuit of Design and structure

1 海尔贝克阵列 Halcach Array

海尔贝克阵列是一种特殊的永磁体的排列，会显著增加阵列某一侧的磁场，而另一侧磁场很低。目的是用最少量的磁体产生最强的磁场。由于海尔贝克阵列特殊的磁路结构，磁场回路大部分可在磁性器件内部循环，从而降低漏磁实现聚磁，实现在非工作区域自屏蔽效应。

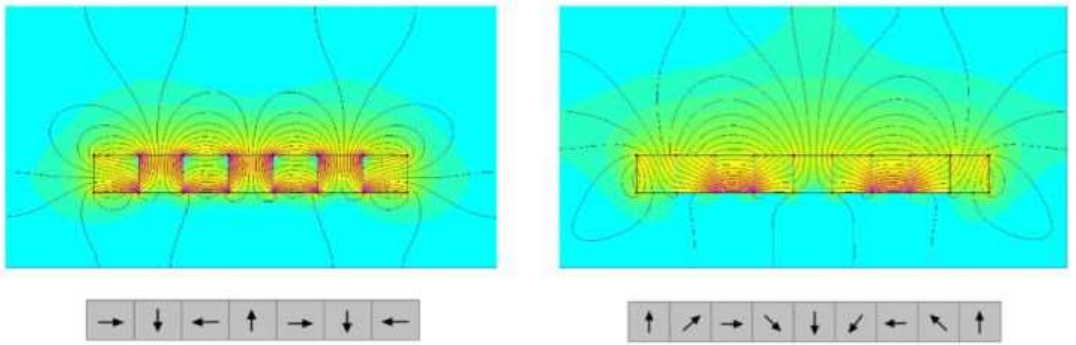
Halcach Array is a special arrangement of permanent magnets that augments the magnetic field on one side of the aray while reducing the filed of other side. It is an appraximately ideal structure in engineering with the goal of generating the strongest magnetic field with the minimum amount of magnets. Due to the special magnetic circuit structure, most of the magnetic field circuit can circulate inside the magnet product, thereby reducing the magnetic leakage and achieving self shielding effect in the non working area.



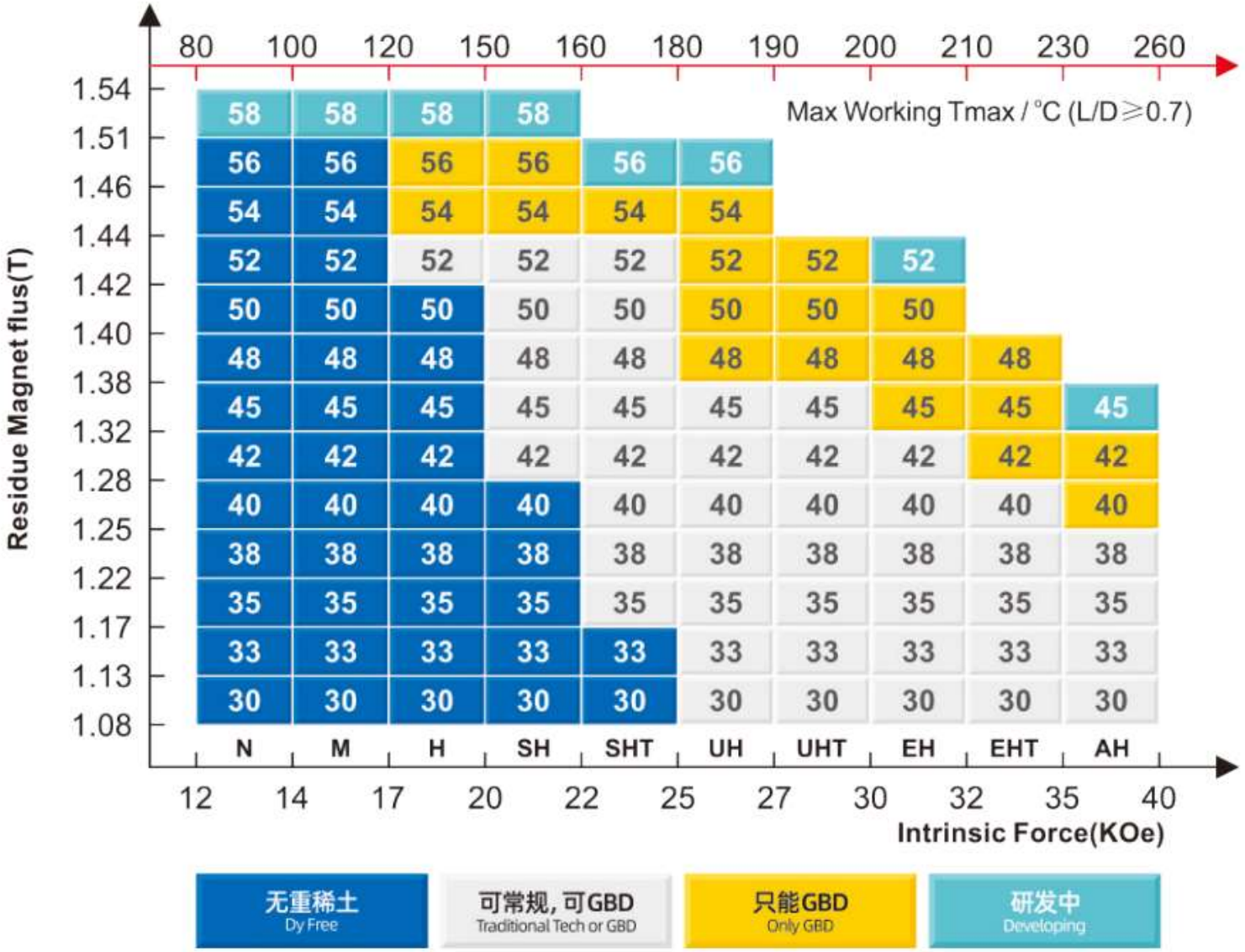
2 多极磁路 Multipole Magnetic Circuit

多极磁路主要是利用磁力线优先选择最近的异极形成磁回路的特点，相比普通的单极磁铁，多极磁路的磁力线(磁场)更加聚集在表面，尤其极数越多越发明显。多极磁路分两种，一种是一个磁铁多极充磁的方式，一种是多个单极磁铁吸附的方式，这两种区别在于成本，实际的功能是一样的。多极磁路在小间距吸附的优势非常明显。

The multipole magnetic circuit mainly utilizes the feature of preferentially selecting the nearest opposite pole to form a magnetic circuit. Compared to ordinary monopole magnets, the magnetic field lines of the multipole magnetic circuit are more concentrated on the surface, especially with more poles being more pronounced. There are two types of multipole magnetic circuits, one is the method of multipole magnetization with one magnet, and the other is the method of multiple monopole magnets adsorption. The difference between these two methods lies in their cost, and their actual functions are the same. The advantage of multipole magnetic circuit in small spacing adsorption is very obvious.



烧结钕铁硼产品性能分布 Magnetic Property Distribution Chart



工艺特点 Tech. Features

01 持续优化工艺流程

Constantly Improving the Process

02 晶粒细化

Refining the Particle Size

03 原材料配方优化

Improve and Optimize raw material composition

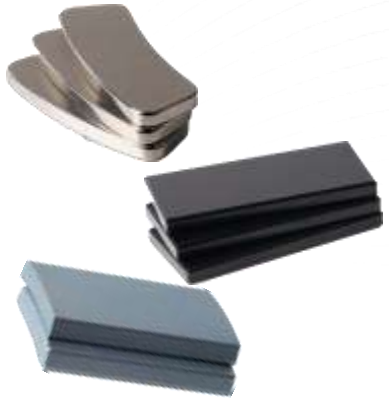
04 晶界扩散工艺应用
(渗镝、渗铽工艺)

Grain boundary diffusion(Dy,Tb)

主要应用&客户

Main Applications and Clients

产品应用 Application



家用电器应用的钕铁硼
Motors application

高速电机（空心杯）
应用的钕铁硼
High-speed motors (hollow cup) application

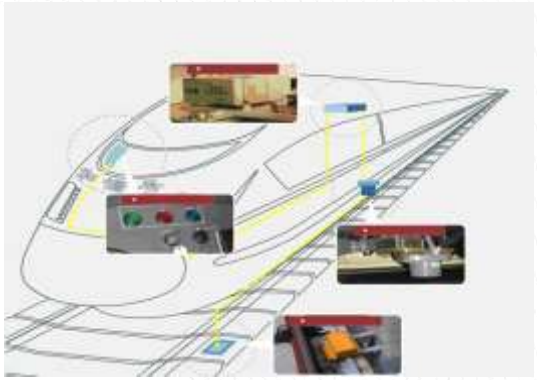
无人机电机的烧结钕铁硼
Done Motors

电子产品的钕铁硼
Electronic products

我们致力于新产品的研发，可根据用户的要求而提供定制服务，包括磁体组件的设计和技术支持，从磁体的耐腐蚀性，耐高温性能，亲水性、剪切力及性能牌号分析都能得到适当解决。

We are committed to the development of new technics and new products, and can supply not only customized magnets as per particular requirements, but also magnetic assembly consult service and technical support.

医疗设备应用的钕铁硼
Medical device application



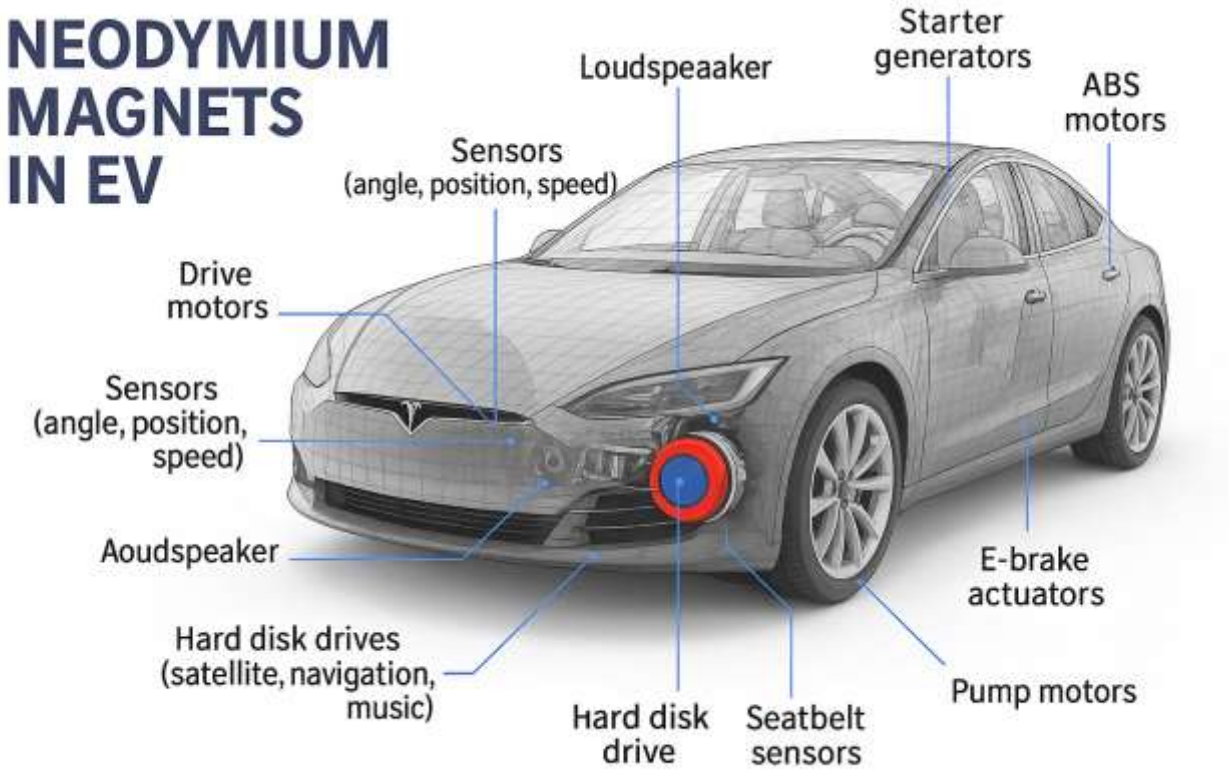
高铁系统应用的钕铁硼地感器
NdFeB track sensors for high-speed rail systems

产品应用Application

汽车是钕铁硼磁铁非常重要的应用领域，它在其中起着至关重要的作用，很多电机和部件都需要磁铁才能使汽车更轻、更智能、越来越舒适、驾驶体验越来越好。

Automobiles are a crucial application field for neodymium iron boron magnets, where they play an indispensable role. Many motors and components require magnets to make vehicles lighter, smarter, increasingly comfortable, and continuously improve the driving experience.

操作电机Operating motor：38SH、35UH、38UH、35EH、38EH、40EH、
动力转向电机Power Steering Motor（EPS）：45H、48H、38SH、40SH、42SH、48SH、35UH，
泵电机Pump motor：33UH、35UH
主动悬架电机Active suspension motor：42SH
启动电机Starter motor：38UH
车顶电机Roof motor：35M、38H
传感器Sensor：
防抱死制动系统传感器Anti-lock braking system sensors：44H、42SH
分配器传感器Dispenser sensor：42SH、33EH
CAM 传感器CAM sensors：42SH、33EH
其他Sensor：
发电机Generator：38UH
悬架控制Suspension control：42SH
发电机Generator：38UH
点火线圈Ignition coil：30UH、33UH、35UH、33EH
扬声器Speakers：38H、40H
齿轮箱Gearbox：38UH、35EH



产品应用 Application

用于机器人的径向多级环形磁铁

1.提高表面高斯分布的一致性。

2.减少几何中心和重心的偏差，将表面高斯之增加30%。

3.提高耐高温性能

4.表面磁场的分布正弦波形，有利于低噪音和地震动的设计

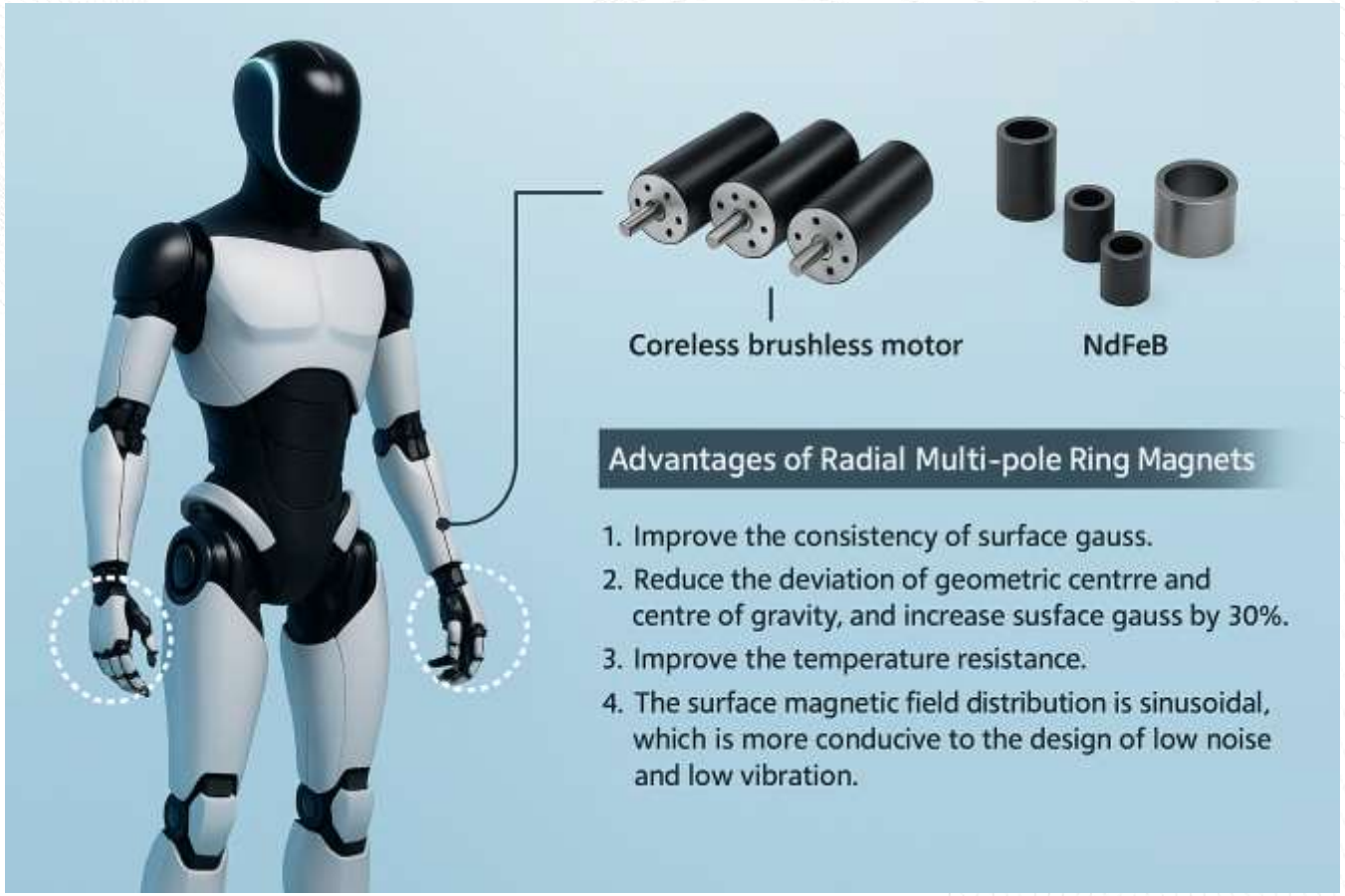
Advantages of Radial Multi-pole Ring Magnets

1.Improve the consistency of surface gauss.

2.Reduce the deviation of geometric centrre andcentre of gravity,and increase susface gauss by 30%.

3.Improve the temperature resistance.

4.The surface magnetic field distribution is sinusoidalwhich is more conducive to the design of low noiseand low vibration.



主要合作客戶 Partner Clients

JOHNSON ELECTRIC
MOONS' moving in better ways
广铁集团
中驱电机 China Drive Motors
核心医疗
上海电气 SHANGHAI ELECTRIC
HUAWEI
xiaomi
A Nidec Group Company Sankyo All for dreams
EMC FIME Motors for heating and ventilation
ThyssenKrupp
ZF
MAHLE
Valeo
TOTO
Nidec All for dreams
BMW
PORSCHE
TESLA
GM
Ford
BYD

提升效率 降低成本 多领域应用
为您提供最优质的服务

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中山溢源矿业有限公司
Zhongshan Main Rich mining Co., Ltd.
中山溢源磁性五金制品有限公司
Zhongshan Main Rich Magnetic Hardware Products Co., Ltd.

溢源國際
MAINRICH