PHONE IN GROUP

2025

www.phoneingroup.com

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Group Introduction

Phone In Group, originally established as LI RAY Company in 1983, has been dedicated to the magnetic materials industry. In 1990, the company began collaborating with manufacturers in mainland China for magnetic materials, and in 1999, Phone In Mag-Electronics Co., Ltd. was established. The Phone In Group has invested in and established factories in Dongguan, Suzhou, Xinyang, and Ningbo, China. In 2023, Phone In Mag-Electronics Co., Ltd. (BVI) established a branch in Taiwan and a factory in Vietnam, with the goal of becoming a publicly listed company.

Thanks to the efforts of all employees and the exceptional leadership of the company, Phone In Group has established production and sales bases in China, Taiwan, Vietnam, and San Francisco, expanding its global magnetic materials business comprehensively.

Phone In Group has developed into a supplier for world-class brands in smartphones, 3C products, wearable devices, new energy electric vehicles, and motor manufacturers. Its quality has reached world-class advanced standards, with a reputation for excellent quality, competitive pricing, fast delivery times, advanced magnetic performance, and processing research and development technology, as well as automated magnetic component assembly capabilities.

Group Overview

Establishment Date

December 1999

Factory Locations

- 4 Factories (Xinyang, Dongguan, Ningbo, Vietnam)
- 1 NPI Center (Suzhou)

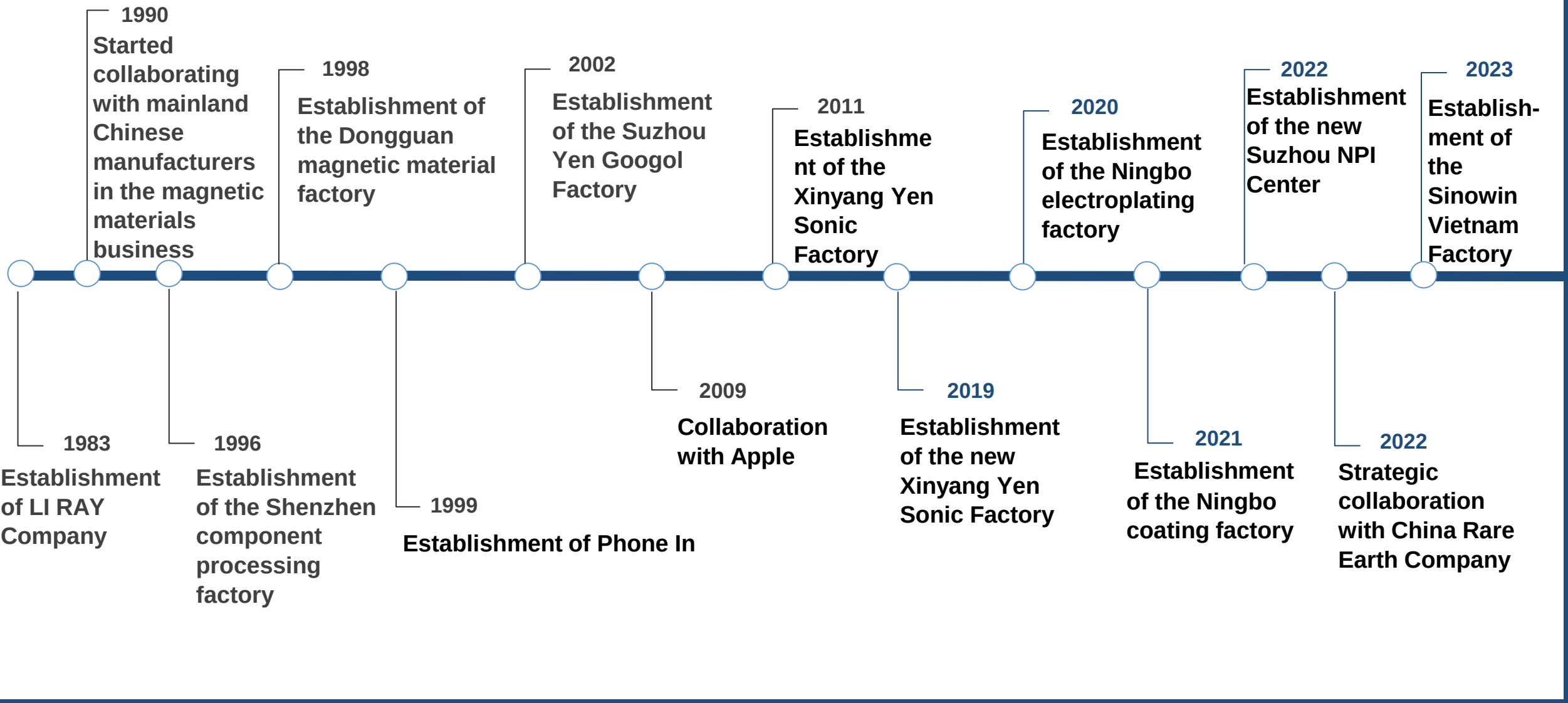
Capital

$30 Million USD

Global Employees

- 600 (China)
- 20 (Taiwan)
- 50 (Vietnam)
- 5 (USA)

Development History



Locations

Ningbo Factory

Taipei
Head office

San Francisco Office

Vietnam Factory

Dongguan Branch

Xinyang Factory

Suzhou NPI Center

✦ Vietnam

Sinowin Industrial (Vietnam) Co., Ltd.

✦ USA

San Francisco Office

✦ Taiwan

Phone In Mag-Electronics Co., Ltd. Taiwan Branch

✦ China

Xinyang Yen Sonic Technology Co., Ltd. (Xinyang Factory)

Xinyang Yen Sonic – Dongguang Branch

Suzhou Yen Googol Electronics Co., Ltd. (NPI Center)

Phone In Mag-Electronics Co., Ltd. (Ningbo Factory)

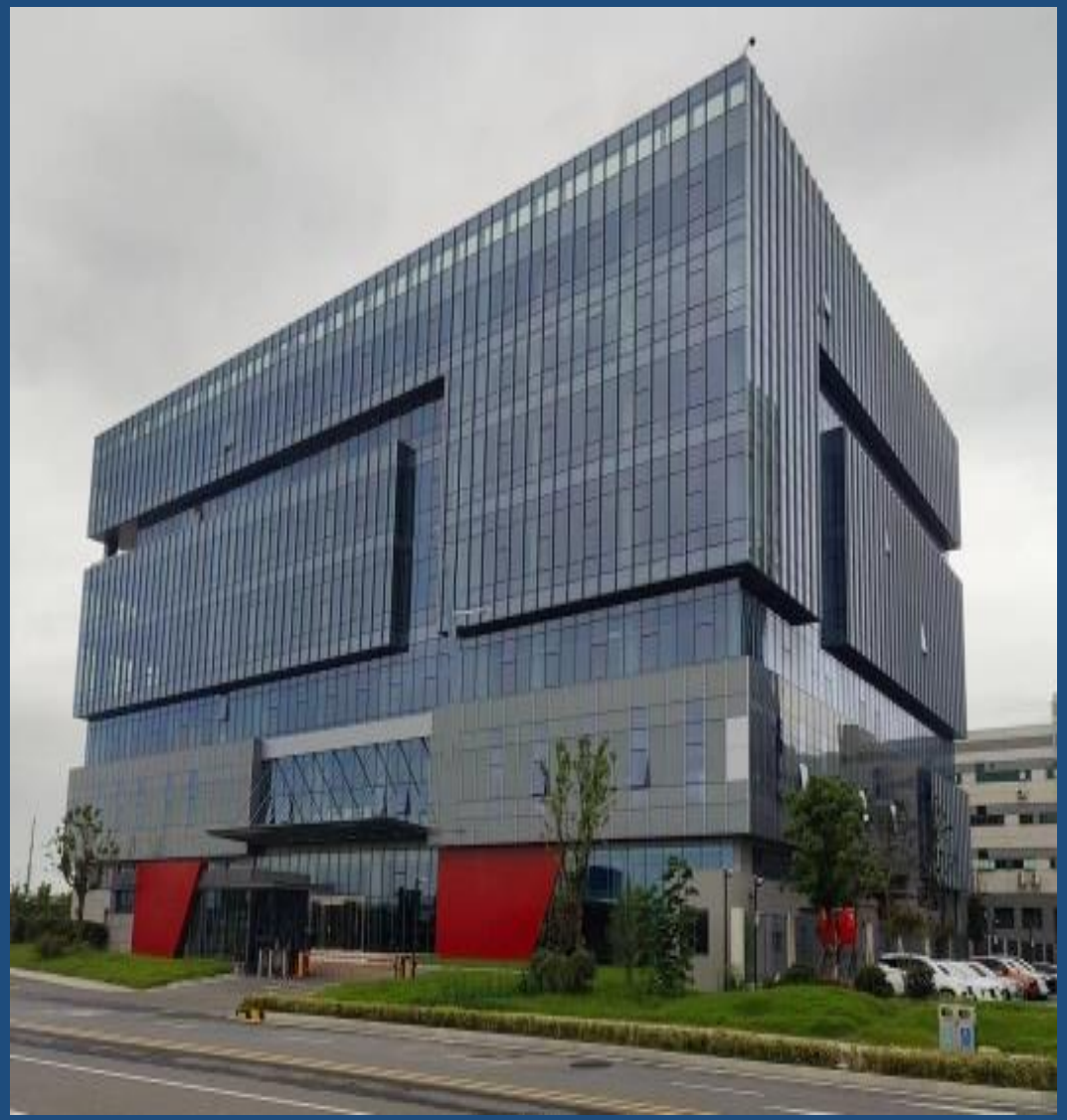
Xinyang Factory

Certified by Apple and third-party SR Social Responsibility.
Certified with ISO 9001/14001, IATF 16949, UL ECVP 2809-2.

- **Address:** No. 6, G4 Connection Line, High-tech Industrial Development Zone, Xinyang City, Henan Province
- **Total Land Area:** 76,000 square meters
- **Total Building Area:** 57,000 square meters

Suzhou (NPI Center)

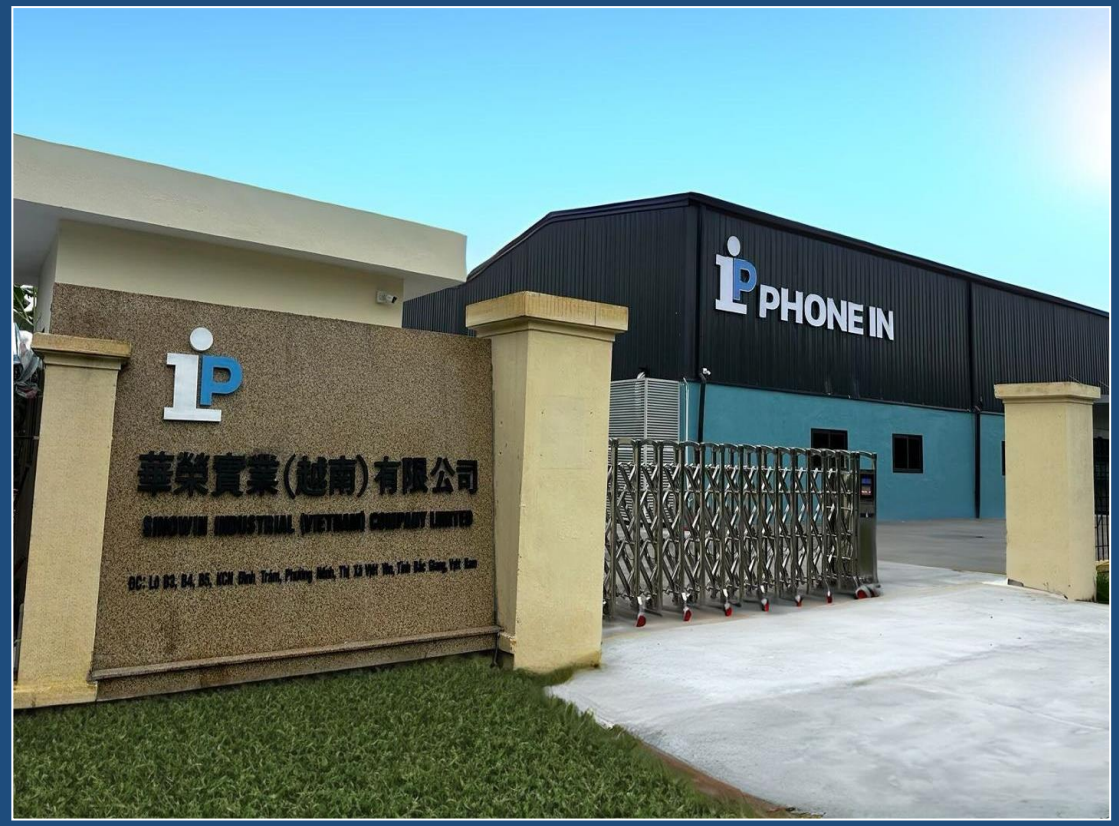
Magnetic Materials Research, Laboratory,
Big Data Center
Certified with ISO 9001/14001/45001



- **Address:** No. 1010, Xiugu Road, Xiangcheng District, Suzhou City, Jiangsu Province
- **Total Land Area:** 12,000 square meters
- **Total Building Area:** 45,000 square meters (7 floors)

Vietnam Factory

Sintering, Machining, Electroplating, Assembly
Certified with ISO 9001/14001/45001



- **Address:** B3 + B4 + B5 Area, Industrial Zone, Dinh Tram Town, Viet Yen District, Bac Giang Province, Vietnam
- **Total Land Area:** 8,000 square meters
- **Total Building Area:** 6,000 square meters

02

Product Development

- Sintered Nd-Fe-B Magnets
- Bonded Nd-Fe-B Magnets
- Hot-Pressed Nd-Fe-B Ring Magnets
- New Electroplating Plant
- New Coating Plant
- Green Energy and Environmental Protection

Sintered Nd-Fe-B Magnets

Sintering Process:
N52/N54/N56/N54M/N52H/N45SH/ N48SH/N50SH/N52SH

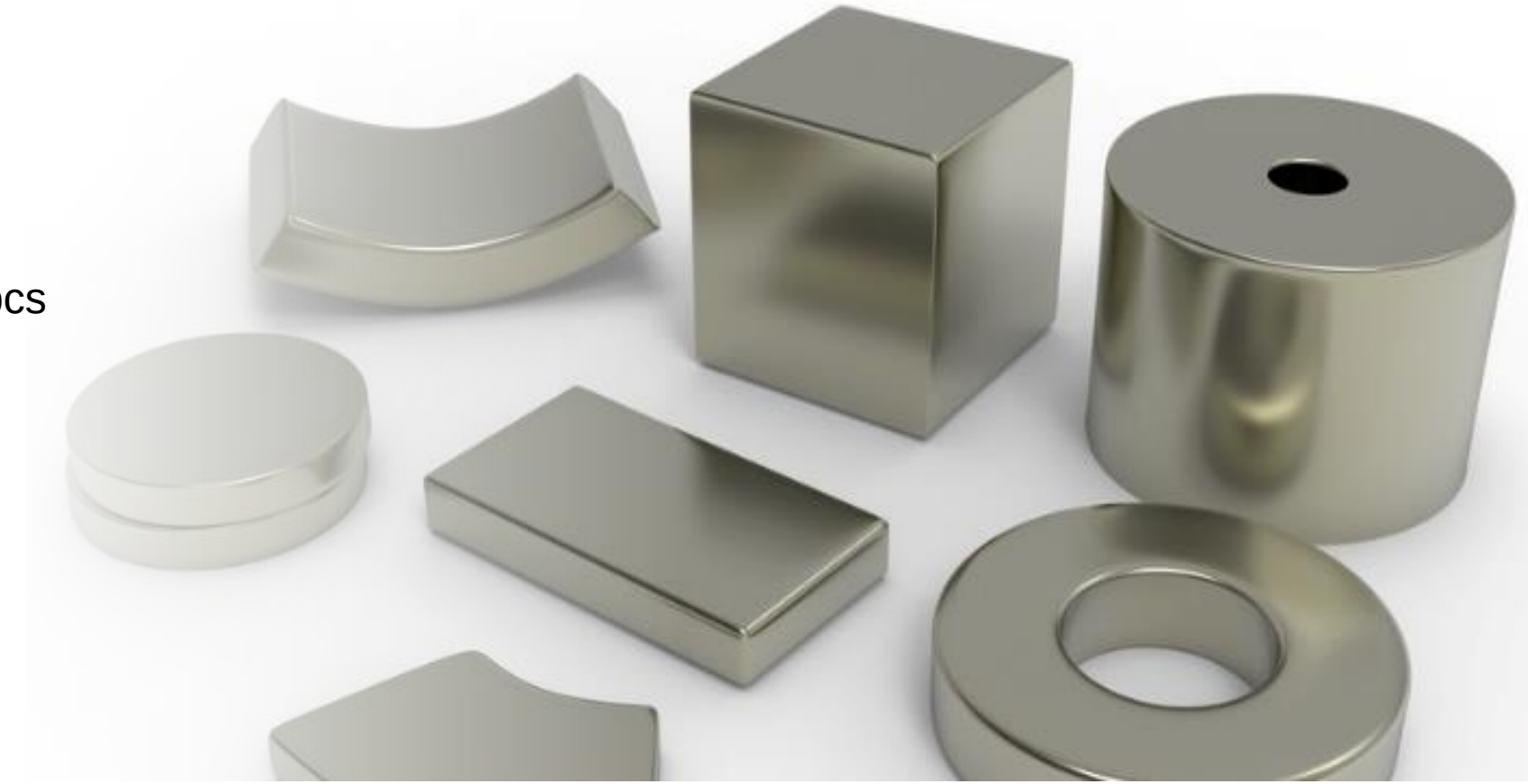
GBD Process:
N40UH/N48UH/N50UH/N52UH/N48EH/ N50EH/N42AH/N45AH/N35TH/N38TH

Monthly Production Capacity:

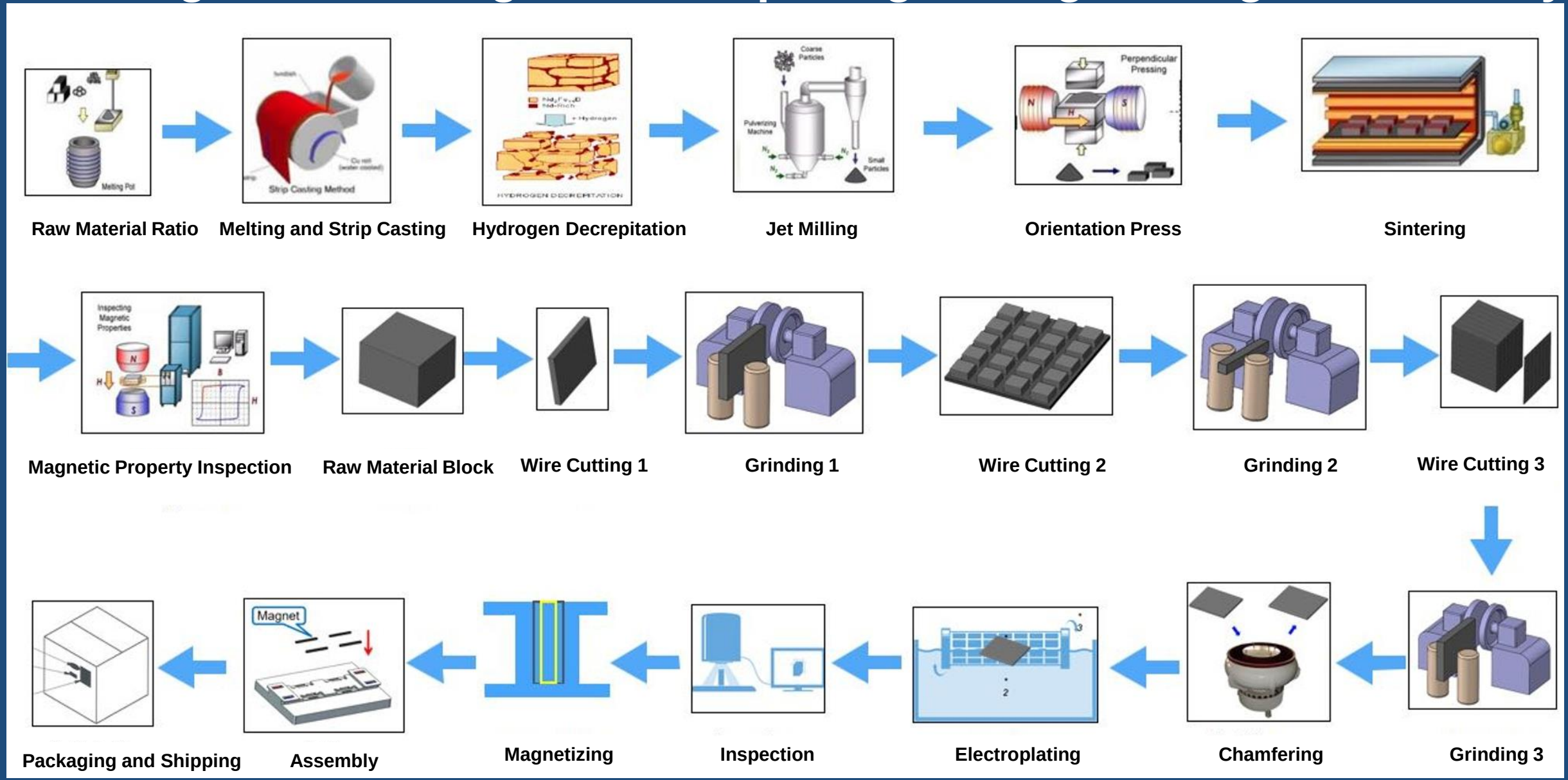
100,000,000 pcs

Annual Production Quantity:

1,600 tons



Sintered Nd-Fe-B Magnets Process :
Sintering → Machining → Electroplating → Magnetizing → Assembly



Application Areas of Sintered Nd-Fe-B Magnets

Smartphones and Tablets

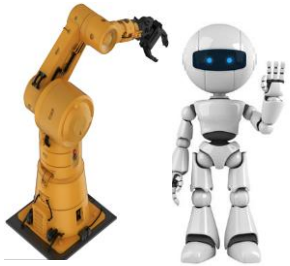
Medical Equipment

Motors

New Energy Electric Vehicles

Smart Watches

Drones

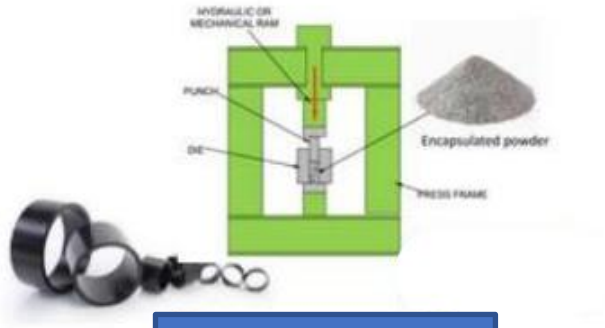


Tools and Precision Machinery

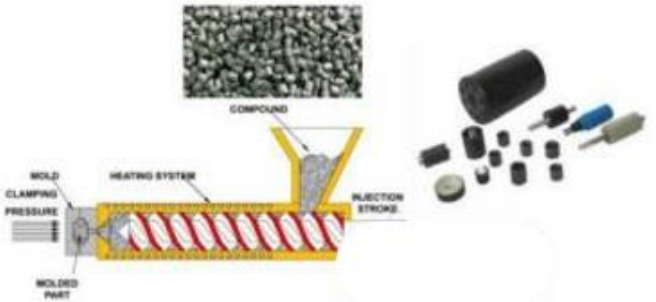
3C Products and Home Appliances

Bonded Nd-Fe-B magnets

Bonded magnetic powder + **Binder** → **Molding, injection molding, calendering** → **Bonded magnets**



Molding



Injection molding

Calendering

- **High degree of freedom in shape**
- **High dimensional accuracy**
- **High resistivity**
- **High magnetization freedom**

Compression Molding	Injection molding	Extrusion	Calendering

Characteristic	Compression Molding	Injection molding	Extrusion	Calendering
Magnetic powder filling ratio (volume fraction)	70-85（%）	50-70（%）	60-80（%）	50-70（%）
Magnet porosity (volume fraction)	5-8（%）	2-5（%）	3-6（%）	6-10（%）
(BH)max/(NdFeB as an example)	12-18 (MGOe)	4-15(MGOe)	10-11(MGOe)	6-8(MGOe)
Dimensional accuracy (taking Φ30mm as an example)	±0.03	±0.03	±0.03	±0.05
Shape complexity	Middle	High	High	Low
Temperature resistance	High	High	High	Low
Advantages	High magnetic properties	Integrated molding, strong impact resistance	Long size, complex cross-sectional shape	Long size, Strong impact resistance

◆ Advantages of injection molded magnets

Advantages of injection molded magnets:

1. Short process flow;

2. High resistivity;

3. High shape freedom;

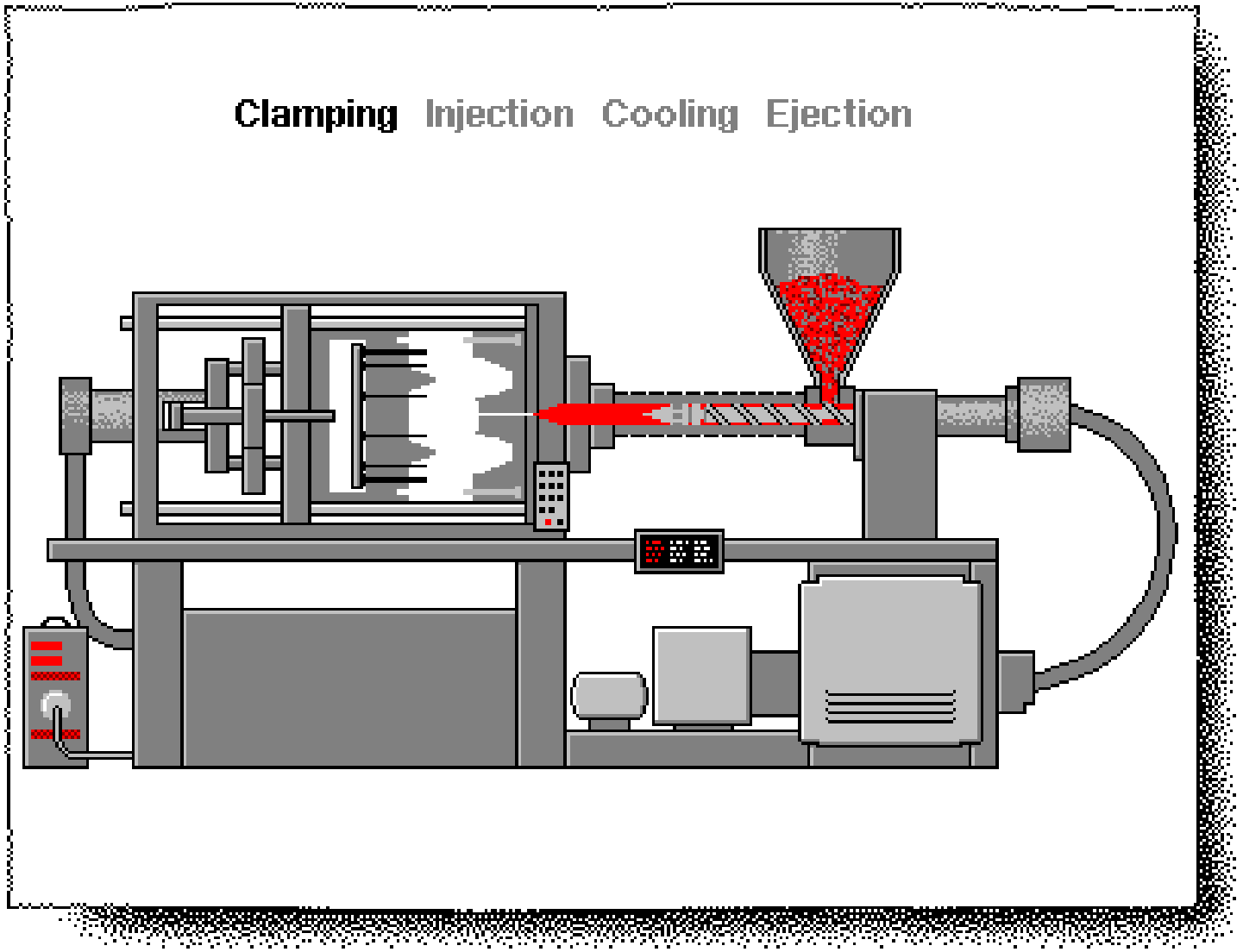
4. High magnetization freedom;

5. No surface treatment required;

6. Simplified engineering;

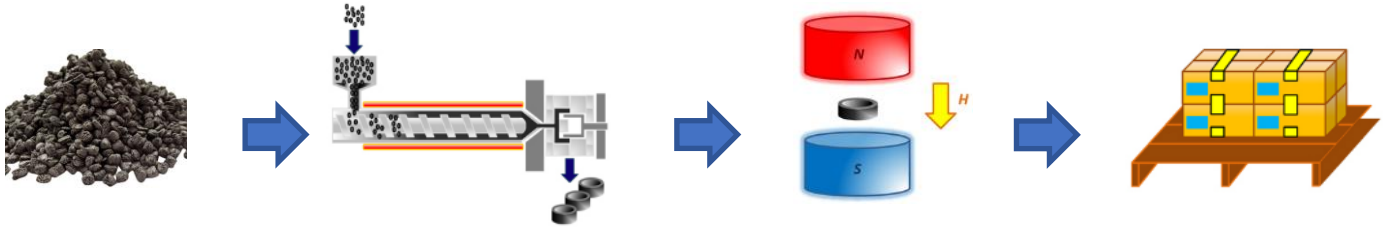
7. Strong impact resistance

(good toughness)



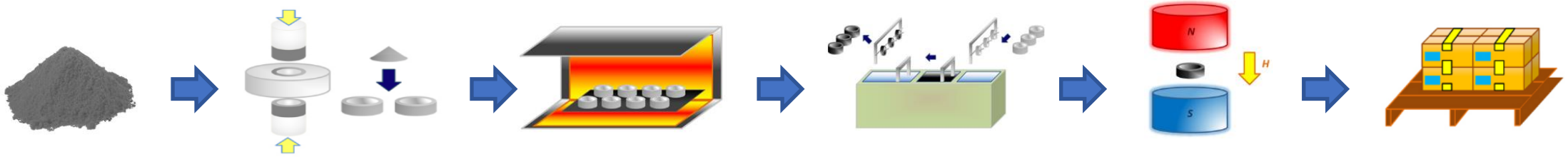
◆Short process

Injection Molding Magnet Process



Granular material → Injection molding → Magnetization → Testing and packaging

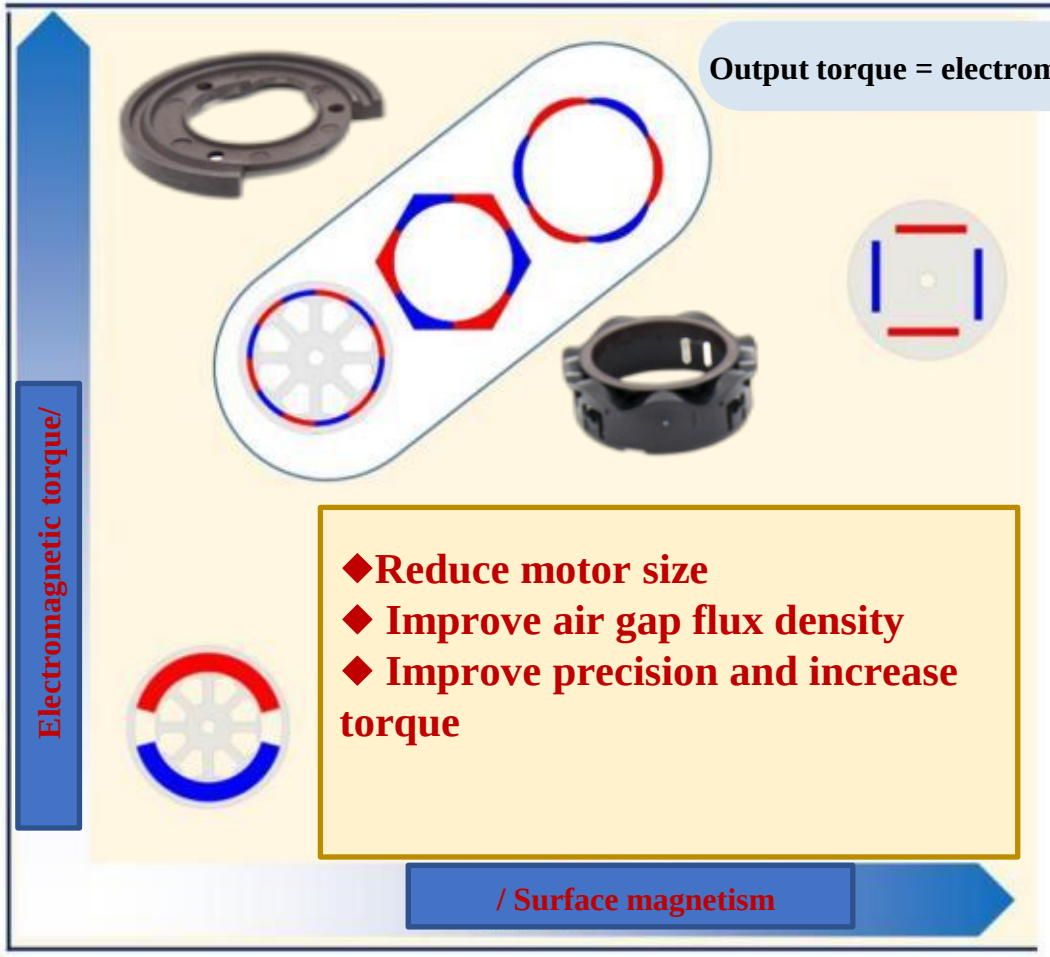
Molded magnet process flow



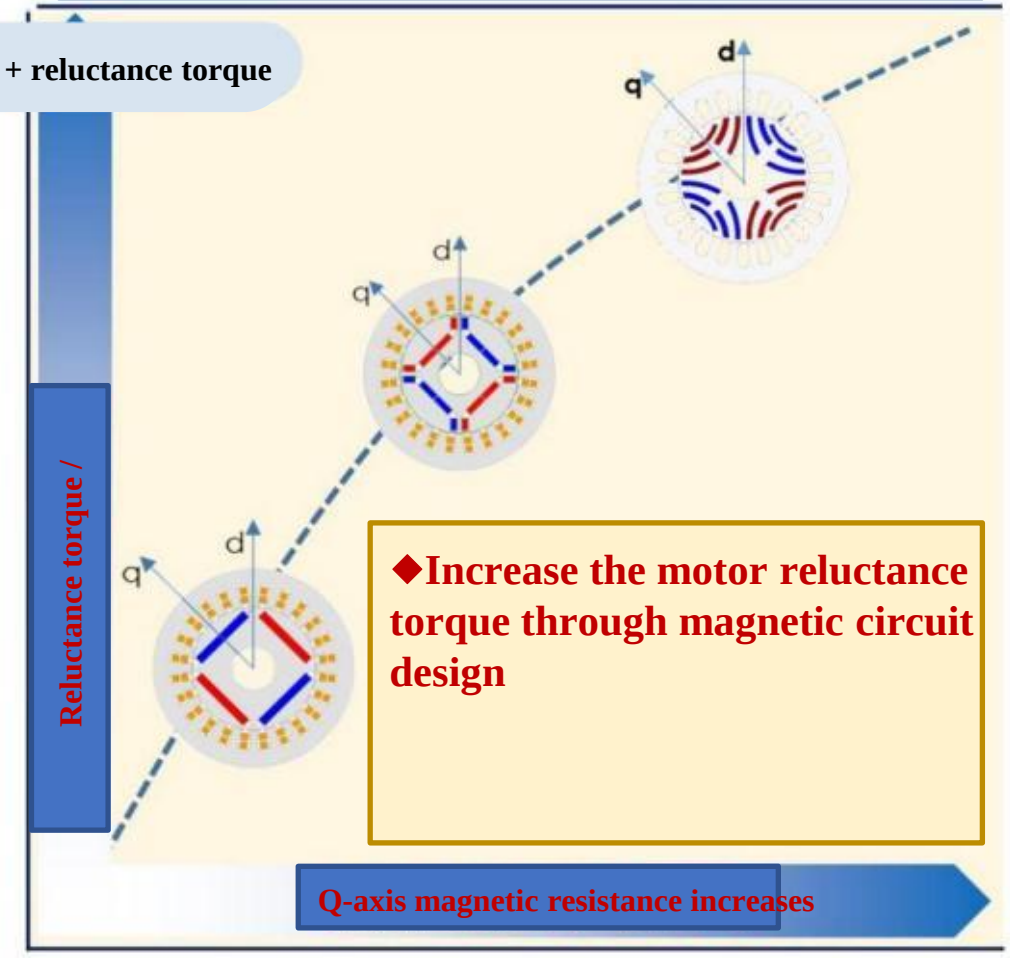
Rubber powder → Compression Molding → Solidify → Surface treatment → Magnetization → Testing and packaging

◆High shape freedom

Designability of magnetic ring shape



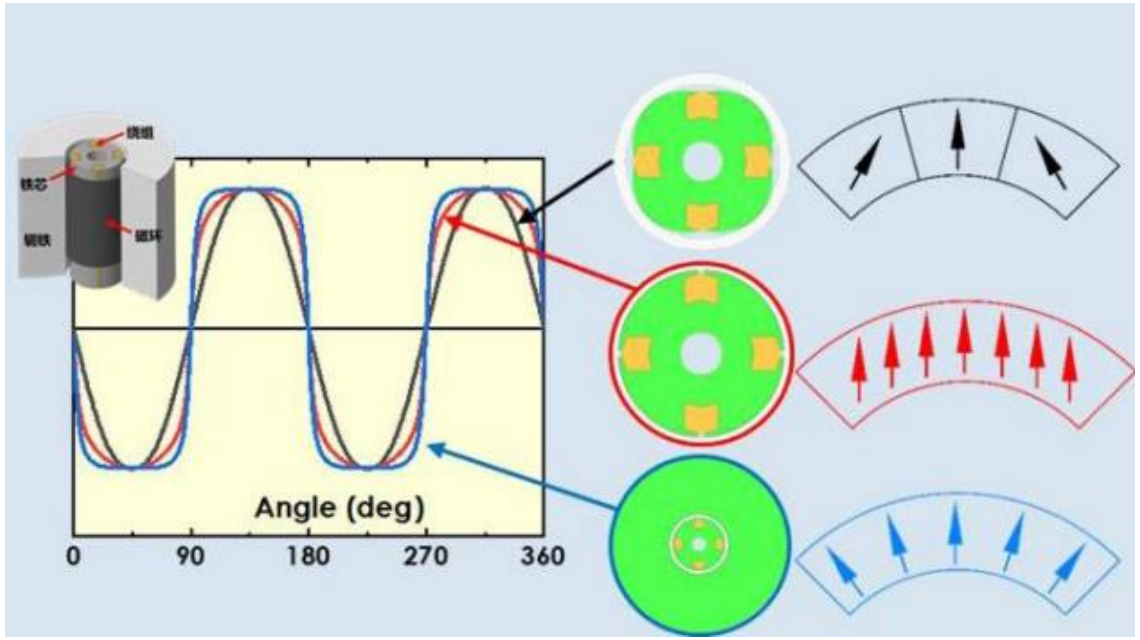
Designability of electromagnetic structures

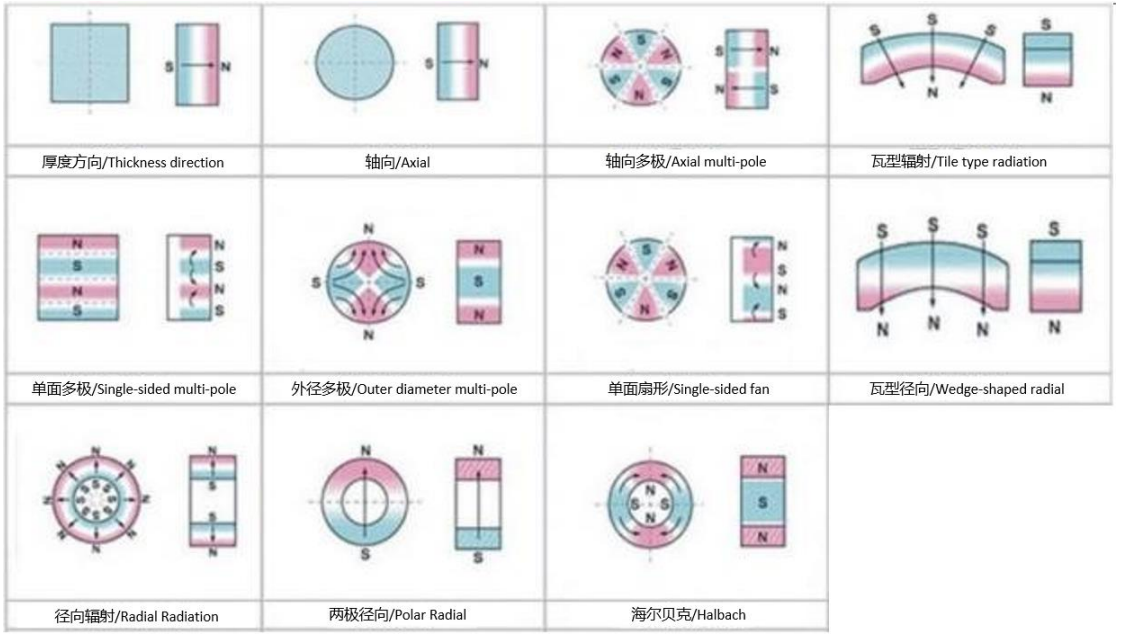


◆High magnetization freedom

●The magnetic field waveform distribution on the surface of the magnetic ring can be customized according to the motor use requirements (sine wave/square wave/saddle wave)

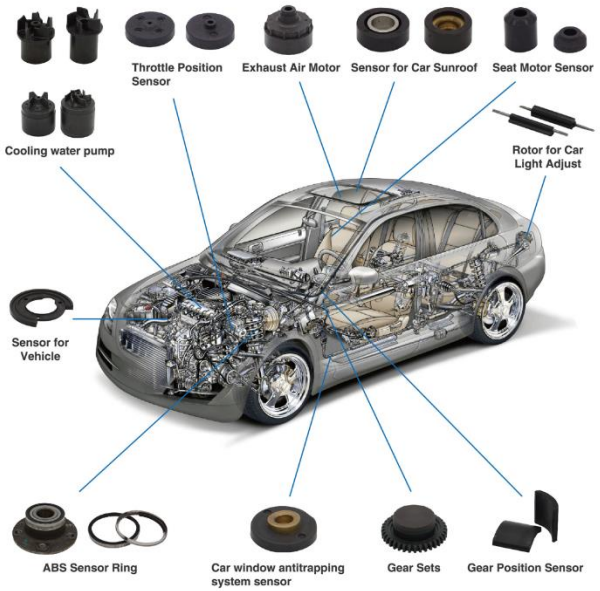
●Reduce motor harmonic distribution, reduce motor operating noise, and improve motor operating efficiency

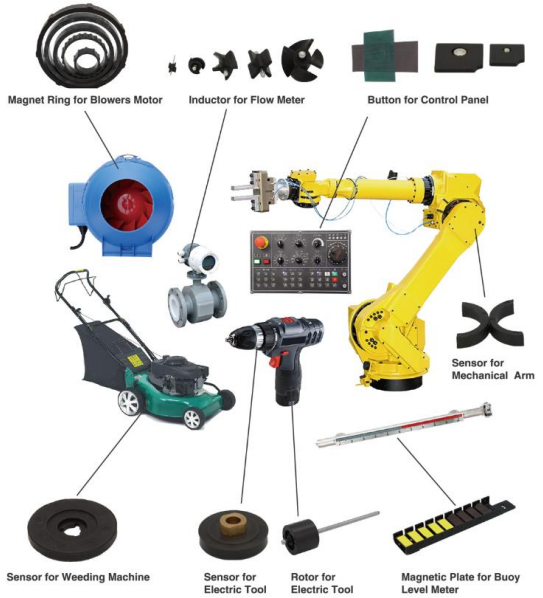




◆No surface treatment required

- Injection molded magnets have good chemical stability. After being immersed in acid, alkali, organic solvents, oils and water at room temperature for 10 days, the mass generally increases by only 0.2%~0.5%, and there is no abnormal change in magnetism and appearance.
- The quality, appearance and magnetic properties of injection molded magnets change very little after being tested at low temperature (-40 ℃), high temperature (100 ℃), thermal cycle, immersion, moisture resistance, weathering and salt spray.

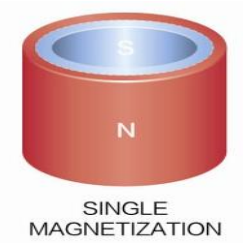




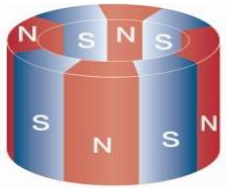
◆Injection Molded Magnets Grade

Grade	Br/kGs	Hcj/kOe	(BH)m/MGOe	Tw/℃
PIM-17	8.7-9.5	13.0-14.5	16.5-17.5	120~180
PIM-15	8.2-9.0	13.0-14.0	14.5-15.5	120~180
PIM-13	7.2-7.7	7.5-10.0	13.0-14.0	120~180
PIM-10	6.5-7.2	7.0-9.2	10.0-11.0	120~180
PIM-8	6.0-6.8	7.0-8.0	7.5-8.5	120~180

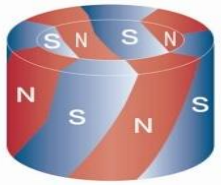
Hot-Pressed Nd-Fe-B Ring Magnets



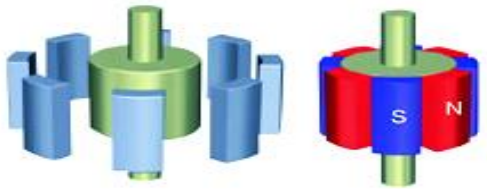
SINGLE MAGNETIZATION



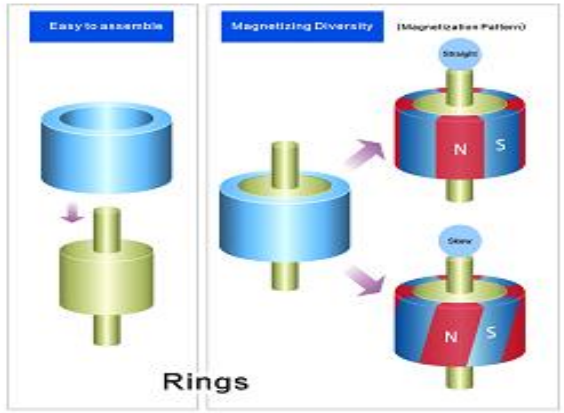
STRAIGHT MAGNETIZATION



SKEW MAGNETIZATION



Segments



Rings

Radially Oriented Ring magnet can be multi-magnetized and uni-pole magnetized. Compare with traditional Arc magnet, our product advantage mainly as follows:

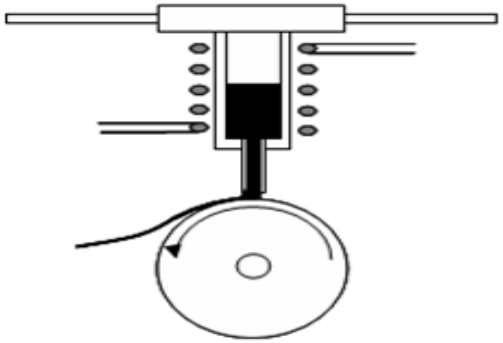
1-Assembling easier, no fall off problem and save cost of concerned assembling part,

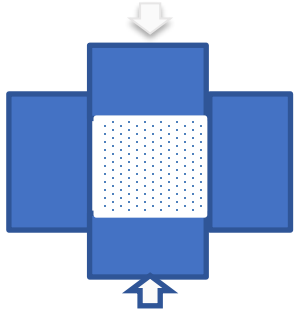
2-Optimized the magnetic field and motor structure, improved the motor running property,

3-Can be magnetized in freely as union-pole, multi-pole or skewed.

Manufacture of Ring Magnets

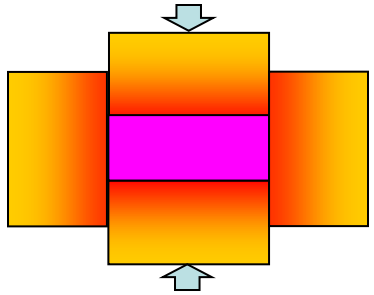
Melt Spinning → **Cold Pressing**



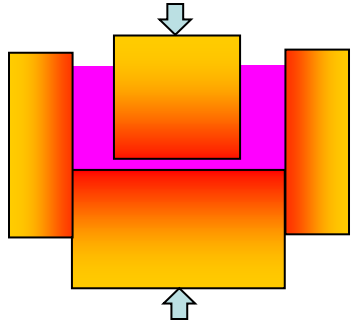


Room Temperature
Isotropic Magnets
D～5.4g/cm3

Hot Pressing → **Hot backward extrusion**



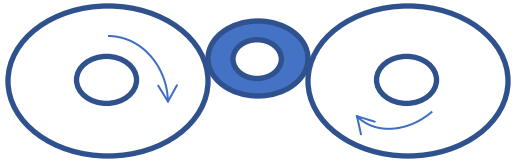
600~800℃
Isotropic Magnets
D=7.6g/cm3



700~900℃
Anisotropic Magnets
D=7.6g/cm3

Manufacturing of Ring Magnets

OD Grinding → cutting → ID Grinding →



→ OD Grinding (finish) → Appearance and Crack Inspection → Cleansing →

→ Coating → Dimensional and magnetic properties Inspection → Shipping

Dimensions and tolerances

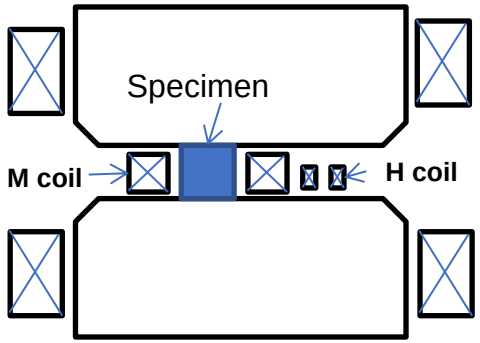
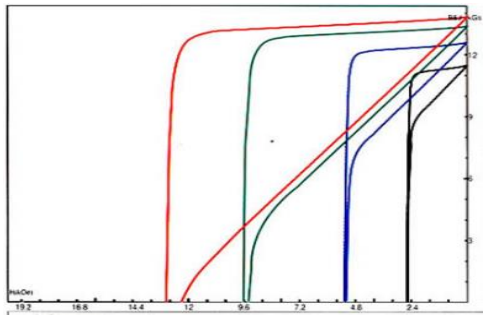
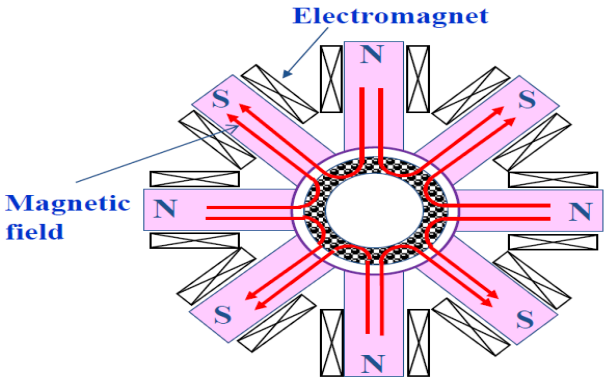
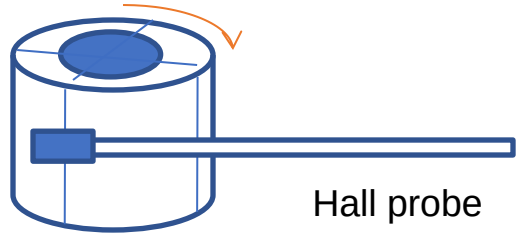
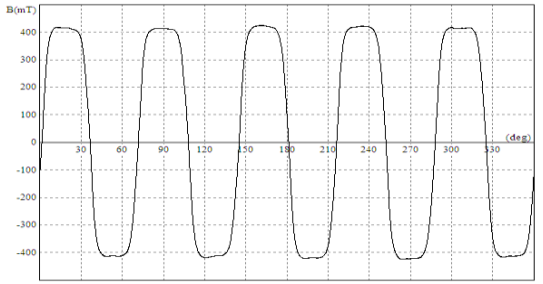
Dimensions (mm)	min	max
Inner diameter/Outer diameter (ID/OD)	0.7	0.9
Hight	0.5	50
Diameter	10	60
Optimum Diameter	20	40

Tolerances（mm）	OD	ID	H	concentricity	roundness
Machined magnets	±0.03	±0.03	±0.1	0.03	0.03
Coated magnets	±0.04	±0.04	±0.05	0.05	0.03

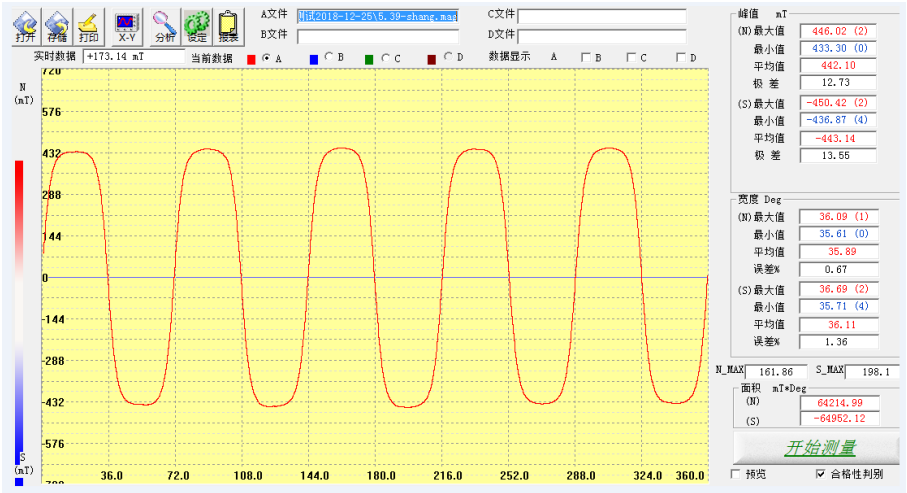
Magnetic Properties of Ring Magnets

Grade	Br		Hcb		Hcj		(BH)max	
	T	(kGs)	(kA/m)	(kOe)	(kA/m)	(kOe)	kJ/cm^3	MGOe
50M	**1.4~1.45**	**14~14.5**	**⩾1043**	**⩾13.1**	**⩾1114**	**⩾14**	**374~406**	**47~51**
45M	**1.33~1.37**	**13.3~13.7**	**954~1058**	**12.0~13.1**	**⩾1273**	**⩾16**	**318~366**	**40~46**
42M	**1.29~1.32**	**12.9~13.2**	**939~1034**	**11.8~13.0**	**⩾1273**	**⩾16**	**302~342**	**38~43**
48H	1.35~1.4	13.5~14.0	1042~1114	13.1~13.6	⩾1432	⩾18	342~366	43~46
45H	1.32~1.35	13.2~1.35	954~1042	12.5~13.1	⩾1432	⩾18	318~342	40~43
42H	1.29~1.32	12.9~13.2	931~1010	12.2~13.1	⩾1432	⩾18	286~326	36~41
40H	1.26~1.29	12.6~12.9	931~1010	11.7~12.7	⩾1432	⩾18	286~318	36~40
38H	**1.22~1.26**	**12.2~12.6**	**907~986**	**11.4~12.4**	⩾1432	≥18	278~310	35~39
45SH	**13.2~1.35**	**12.9~13.3**	**954~1042**	**12.5~13.1**	**≥1592**	**≥20**	**318~342**	**41~44**
42SH	**1.29~1.32**	**12.9~13.2**	**962~1042**	**12.2~13.1**	**≥1592**	**≥20**	**302~326**	**38~41**
40SH	**1.26~1.29**	**12.6~12.9**	**939~1010**	**11.8~12.7**	**≥1592**	**≥20**	**286~318**	**36~40**
38SH	**1.22~1.26**	**12.2~12.6**	**923~986**	**11.6~12.4**	**≥1592**	**≥20**	**278~310**	**35~39**
35SH	**1.18~1.23**	**11.8~12.3**	**891~962**	**11.2~12.1**	**≥1592**	**≥20**	**246~286**	**31~36**
38UH	**1.22~1.26**	**12.2~12.6**	**907~986**	**11.4~12.4**	**≥1989**	**≥25**	**278~318**	**35~40**
35UH	**1.18~1.23**	**11.8~12.3**	**891~962**	**11.2~12.1**	**≥1989**	**≥25**	**246~286**	**31~36**

Magnetic Properties Testing

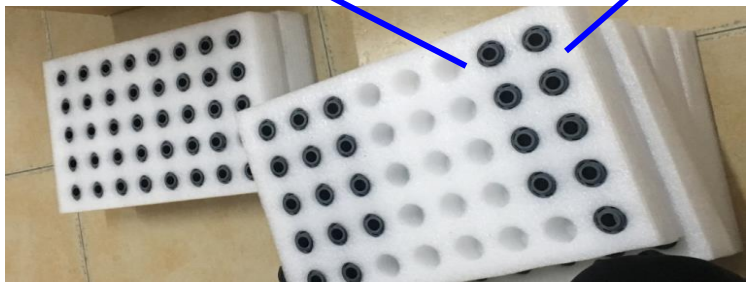
B-H Cuve 1 piece/lot	Magnetic Flux 2~20 pieces/lot	Surface Flux Density 2~20 pieces/lot
1. A few rectangular specimens are cute from a ring magnet. 2. Fully magnetized by pulse field. 3. Measure by B-H tracer.  	1. Machined ring magnets are magnetized in a multi-pole magnetizing fixture. 2. Measured flux in the fixture by a flux meter. 	1. Machined ring magnets are magnetized in a multi-pole magnetizing fixture. 2. Measured by gauss meter.  

Application - Servo motor 40,60,80

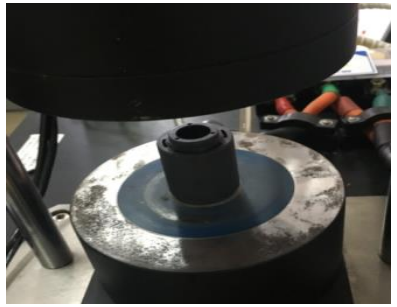


For servo motor, our hot-pressed ring are now replacing sintered radial ring, because of better performance.

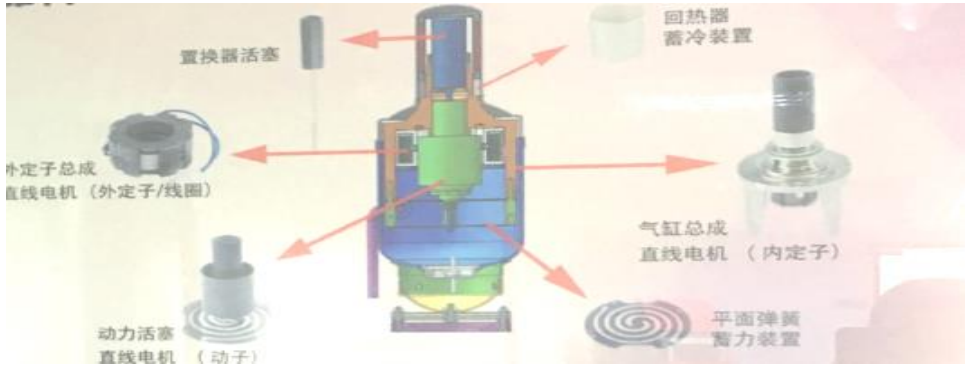
Application - Thin-wall thickness



After injection molding



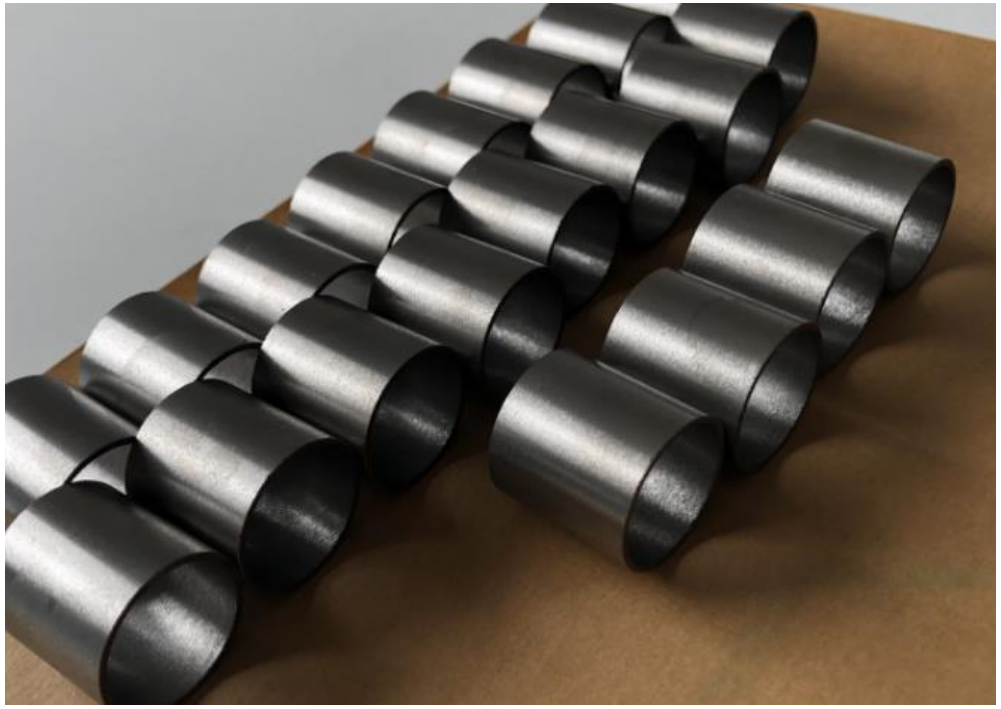
Magnetization



Application: compressor

Vaccine and portable refrigeration

To replace Bonded ring



OD20*ID18*20, 40H, passivation

Thin-walled rings can be fabricated by hot pressing to replace bonded magnets, because of better magnetic performance.

New Electroplating Factory

Electroplating Factory Production Line

Production Line

Plasma Emission Spectrometer

New Coating Factory

Epoxy resin enhances the corrosion resistance and insulation of magnets.
Phone In Group has independently developed an automated epoxy resin coating process, achieving automated loading and unloading, and a digitally controlled production process. This ensures quality, reduces manpower, lowers costs, and successfully establishes core technology standards that meet Japanese industry benchmarks.

Coating Machine

System Certifications

ISO 9001

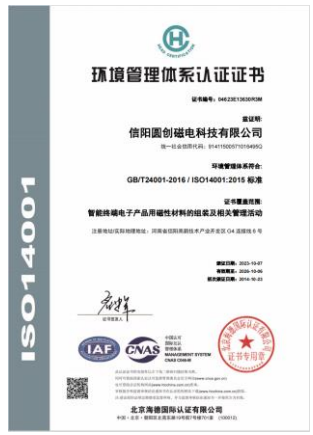
ISO 14001

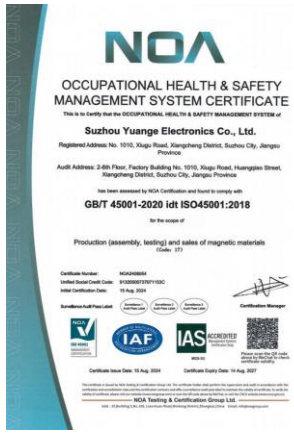
ISO 45001

IATF 16949

RoHS 2.0 / REACH ready

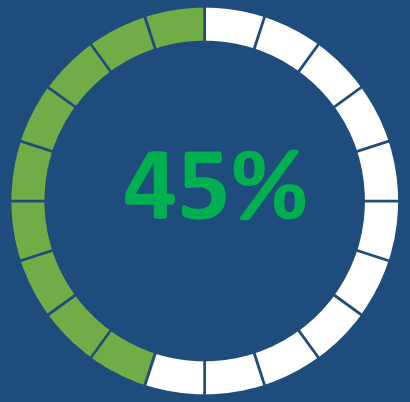
UL ECVP 2809-2



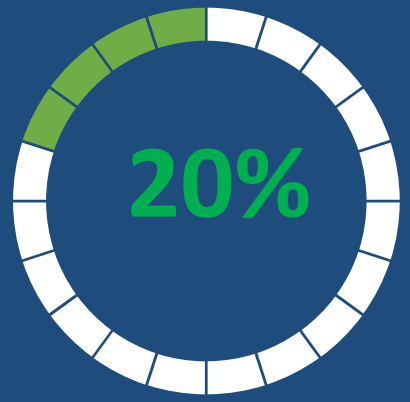


Green Manufacturing

Beyond 100% REE, Phone In Group does more in Green Manufacturing

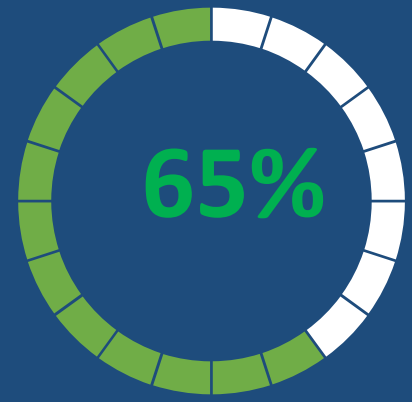


925,750 kWh



-93,600 Nm³

-3,420T



-240T

100% of available area covered with solar panels.
Solar power generation increased to 45% of total capacity in 2023.

Reduced natural gas usage by 20%.
Insulation layer installed for heat collection and reuse.

30% recovery of electroplating wastewater.
Collaborating with local government.

Reduced pollution emissions by 65%.
In 2023, using recycled rare earths reduced the mining of rare earth ores by approximately 240 tons.

03

Manufacturing

- Machining Equipment
- Laser Cutting Process
- Magnetic Material Testing Equipment
- Automated Production Equipment
- Automated Inspection Equipment

Newly Built Magnetic Material Machining Production Workshop

In SINOWIN - the machining workshop has a total of 26 pieces of equipment installed, including multi-wire cutting machine operation area, double-sided grinding machine operation area, centerless grinding machine operation area, special-shaped grinding machine operation area, hole drilling operation area, automatic chamfering and deburring operation area, and automatic double-work station glue removal operation area.

Automatic Grinding Machine

Multi-Wire Saw

Multi-Wire Cutting Operation Area

2-station high-speed multi-wire cutting machine 1 set

2-station high-speed multi-wire cutting machine 1 set

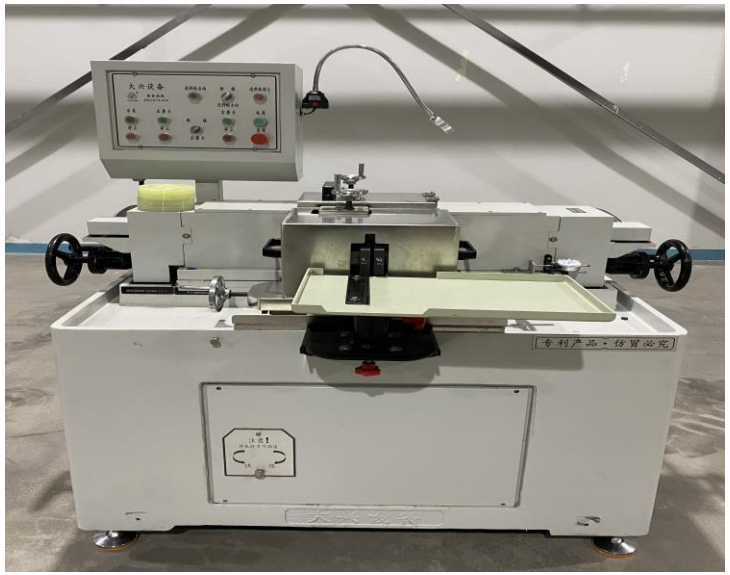
Small 3-station multi-wire cutting machine 2 sets

Horizontal 2-station tile multi-wire cutting machine 1 set

Double-Sided Grinding Operation Area

Centerless Grinding Operation Area

Double-sided grinding machine 1 set



Double-sided grinding machine 2 sets

Centerless grinding machine

Special-Shaped Grinding Operation Area

Special-shaped double station grinding machine 2 sets

Special-shaped single station grinding machine 6 sets

Vertical double end grinding machine 1 set

Automatic edging machine 1 set

Automatic Punching Operation Area

Automatic hole machine 2 sets

Automatic edging machine 1 set

Knife sharpener 1 set

Angle automatic grinding machine 2 sets

Angle Grinding Operation Area

Dual Station Glue Removal Operation Area

Dual station glue remover 1 set

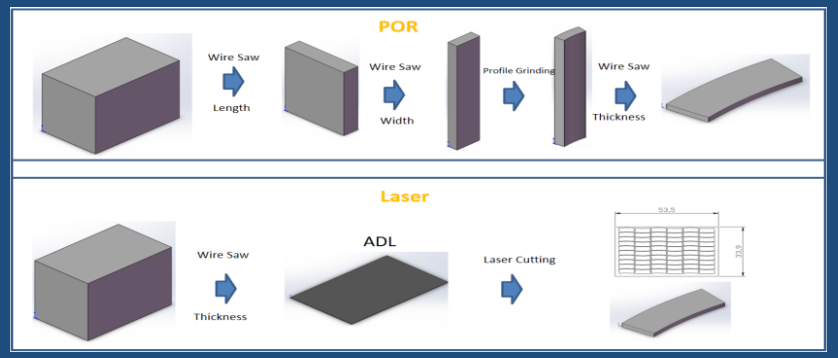
Laser-Cut Machining

Phone In has applied over 30 years of experience in magnet manufacturing to develop and introduce laser cutting technology with simplifes the machining process. This method optimizes recycled material utlization as well as reduces overall carbon emissions. Laser cutting is applicable to various magnet specifications

Creating a new chapter of environment protection, high efficiency, clean workshop and stable manufacture.

Comprehensive Capacity Comparison

	POR	Laser
Block Size (mm)	53.5*33.9*42.1	
Output/ block (pcs)	4,050	4,800
M'tl Utilization	44.7%	59.0%
Ramp Process L/T	3 weeks	2 weeks



Note :

1. **Shortening cycle time of product manufacturing.**
2. **Reduction of operators at the same Q'ty.**
3. **Improved material utilization.**
4. **High environmental cleanliness.**
5. **Simple waste recycling.**

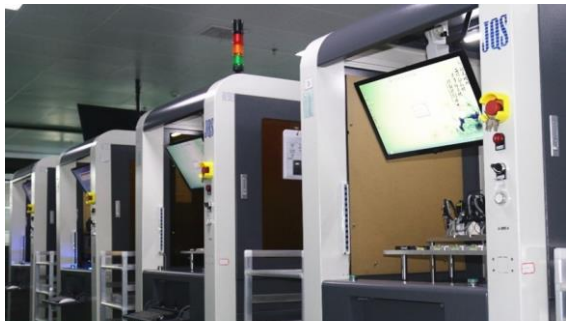
	POR			Laser cutting		
	Product Q'ty(pcs)	C/T (pcs/sec)	OP/Day	Product Q'ty(pcs)	C/T (pcs/sec)	OP/Day
Wire-saw- Length	1	12	2	-	-	-
Polish- Length	1	2	2	-	-	-
Wire-saw- Width	1	0.92	2	-	-	-
Polish- Width	1	0.31	2	-	-	-
Profile Grinding	1	0.9	3	-	-	-
Wire-saw- Thickness	1	0.08	2	1	4.24	2
ADL- Thickness	1	0.06	1	1	1.25	1
Laser	-	-	-	1	0.9	1
Total		16.27	14		6.39	4

Magnetic Material Testing Equipment

- **Magnetic declination measuring tester**

- **One dimensional flux meter**

- **JQS gauss test machine**

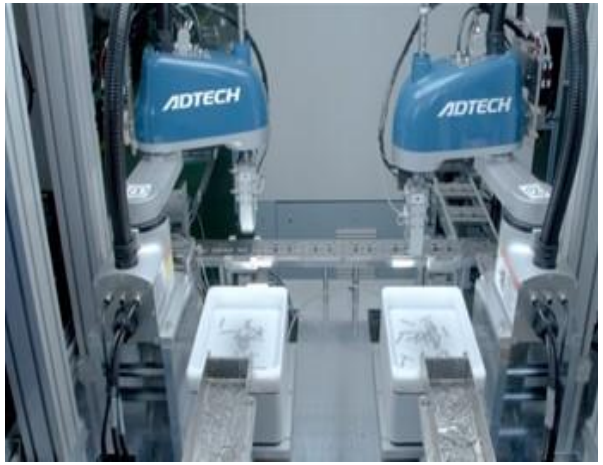


Automated Production Equipment

Modular Automated Assembly Line

Fully Automated Intelligent Assembly Line

Automated Production Equipment



Automatic glue removal machine

AGV smart truck

Any Feeder Machine

Automatic glue removal machine

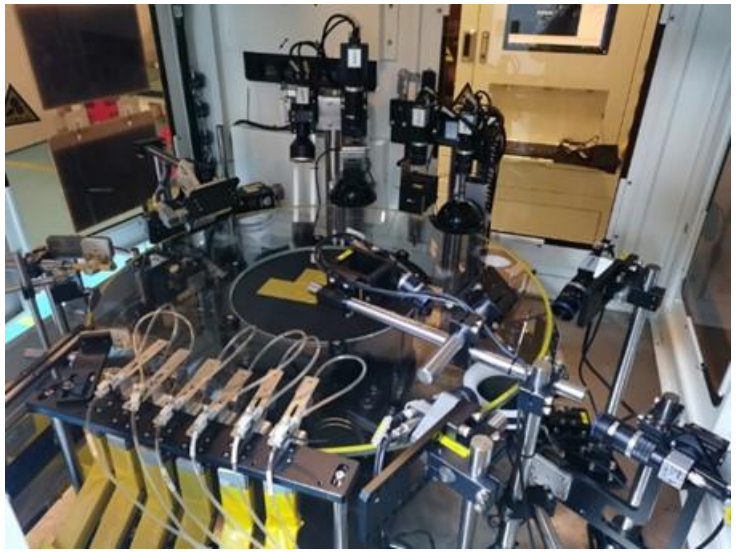
Automated Inspection Equipment

▲

AOI magnet inspection machine

▲

Automated
sorting equipment

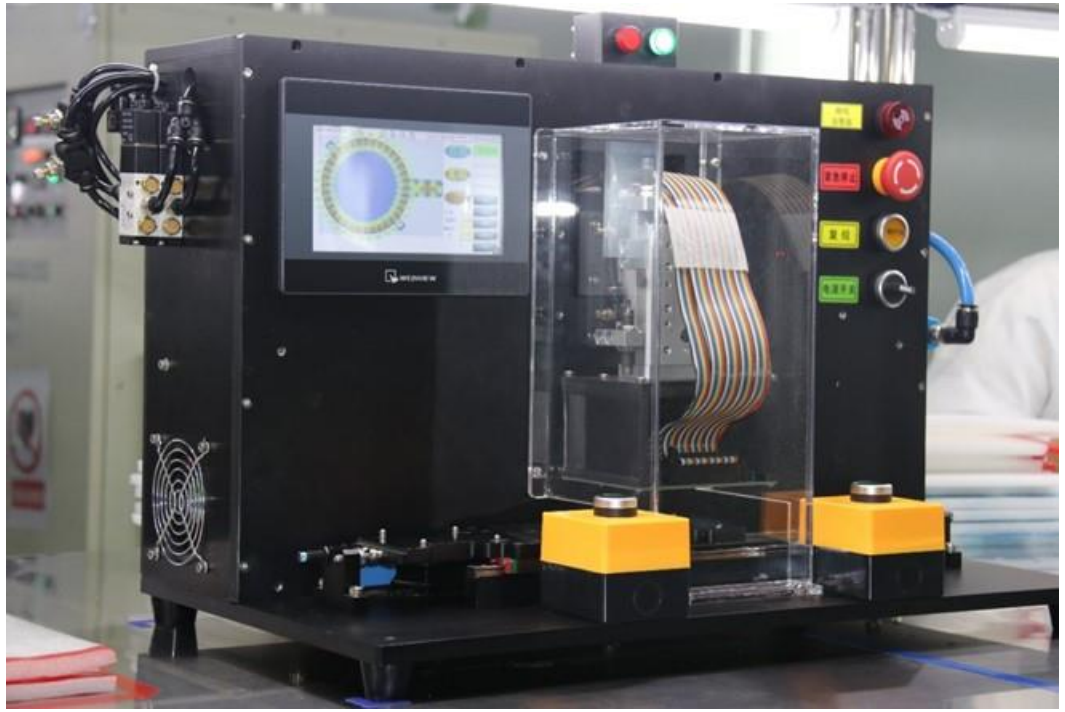


▲

AOI with 3D Profile
Scanning Datum Machine

Automated Inspection Equipment

Top of the line production equipment



Polarity detection equipment

Visual laser engraving machine

Flashing test machine

04

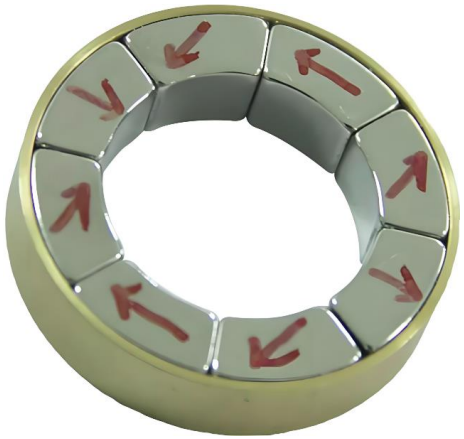
Customer Service

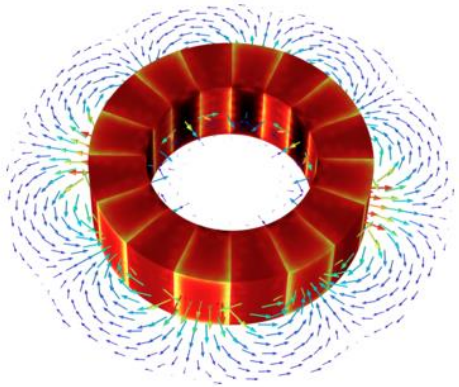
- Design and Manufacturing Services
- Core Values
- Excellent Customers

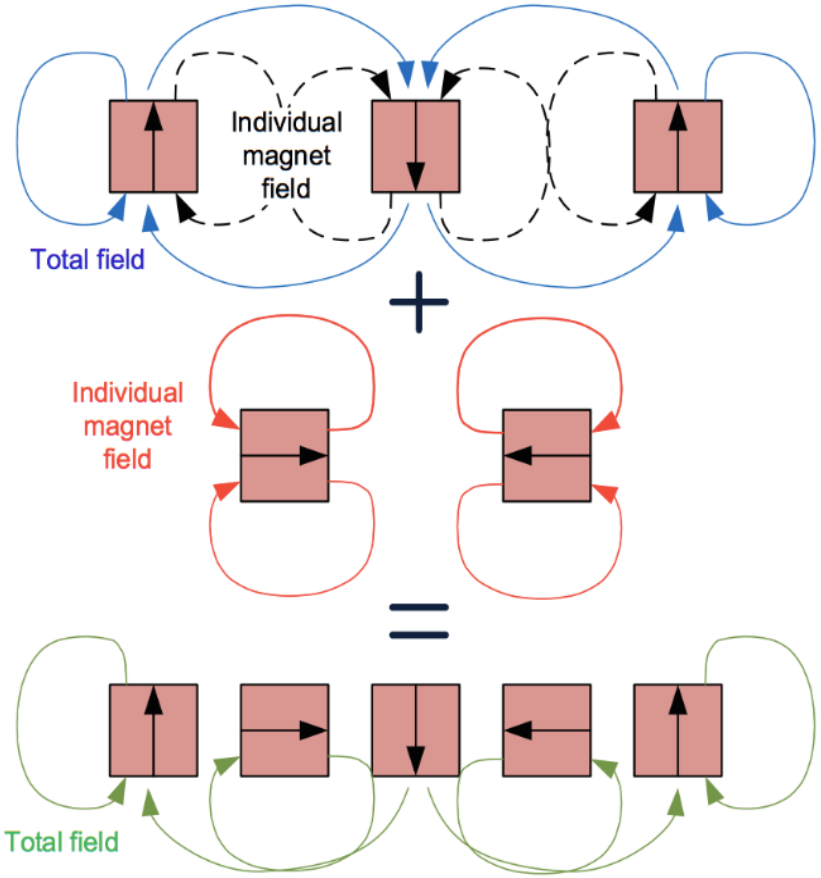
Design and Manufacturing Services

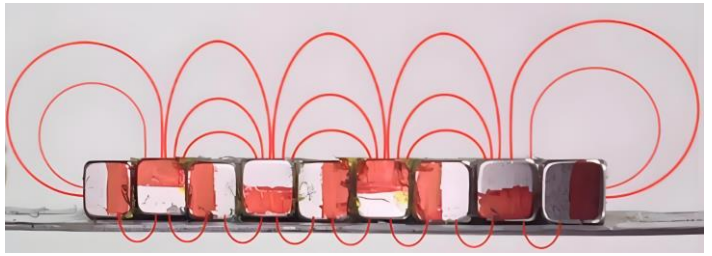
- High-precision and performance magnets, precision control of non-magnetic areas
- Flux value, Gauss value, tension value simulations and systems analysis
- Magnetic assembly hardware post processing
- Customized multi-pole magnetization solutions
- Halbach Array magnetization and assembly

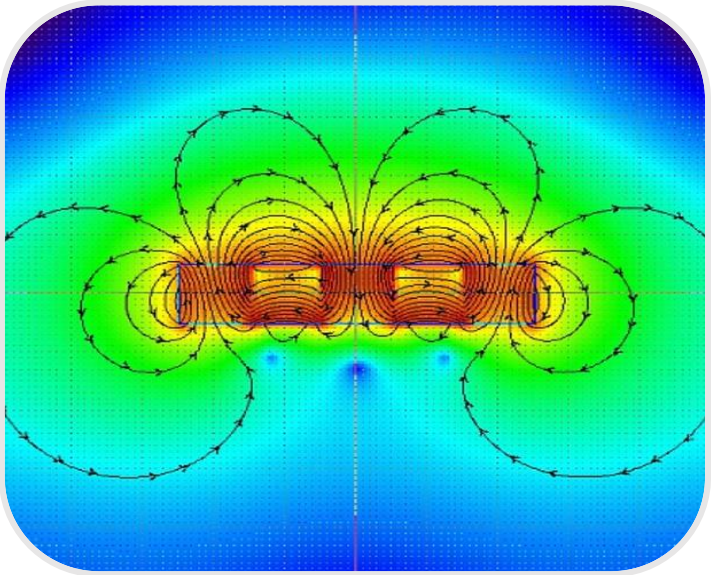
Halbach Array Magnet Assembly and Production Services







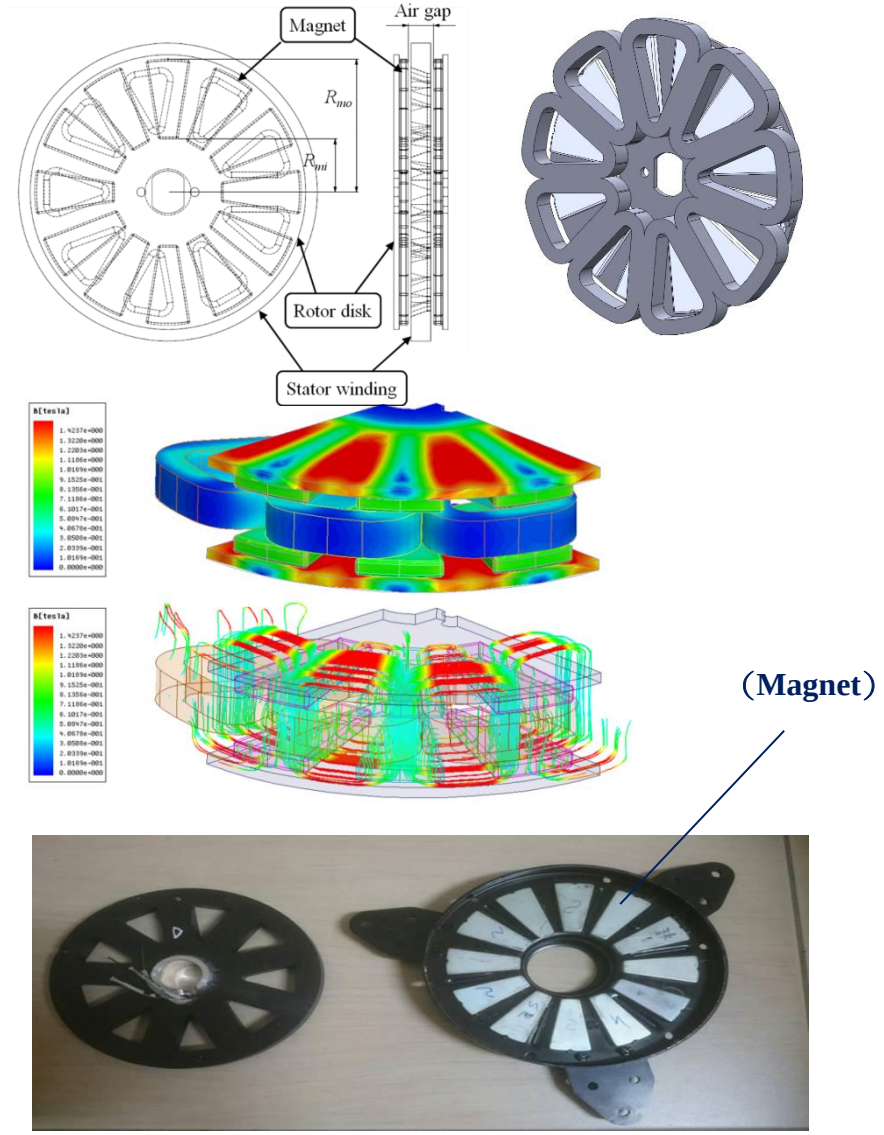




The Halbach Array is a type of magnetic structure that is an engineering approximation of an ideal configuration. Its goals are to maximize the output field, minimize weight, and reduce leakage. It is particularly applied in new energy vehicle motors and other devices. In 3C products, it is especially used in high-end wireless charging magnetic absorption module assemblies.

The high-performance, ultra-thin Halbach Array magnetic components are integrated into these applications.

Motor/Generator Design and Simulation Analysis Services



Customized Magnet Design and Manufacturing

Design magnet size, shape, and model to meet design requirements and reduce costs. Provide high-performance magnetic designs tailored for specific applications to ensure optimal efficiency and performance in motors/generators.

Magnet Testing and Verification Services

- Provide magnetic performance testing services to ensure compliance with design requirements and standards.
- Conduct magnet life testing and durability analysis to assist in improving product quality.

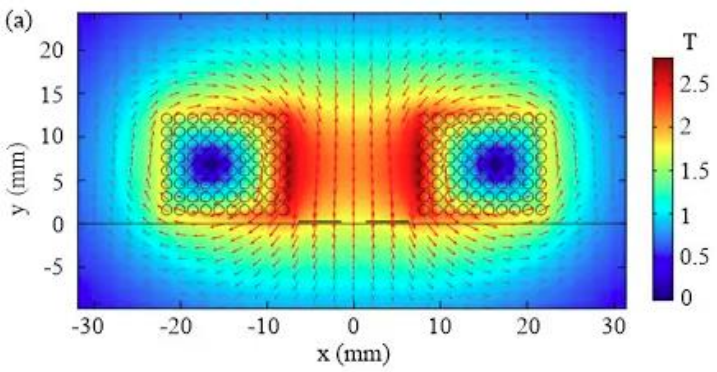
Motor Design Simulation and Optimization

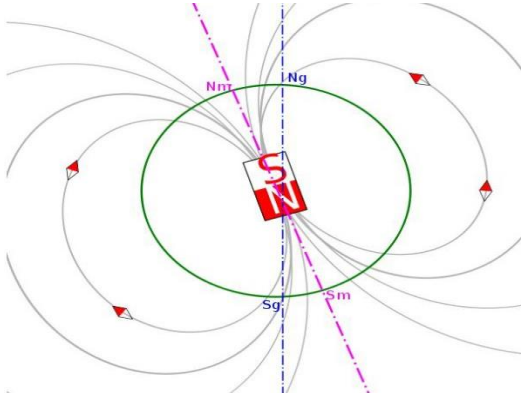
- Numerical simulation services for motor/generator design to ensure optimal magnetic circuit design and magnetic field distribution for key performance indicators.
- Electromagnetic, thermal, and mechanical performance analysis to ensure design stability and efficiency.
- Optimize existing motor designs to enhance performance, reduce losses, and extend motor lifespan.

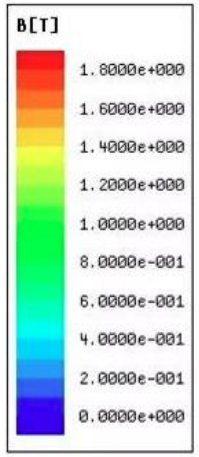
Technical Consultation and Solution Development

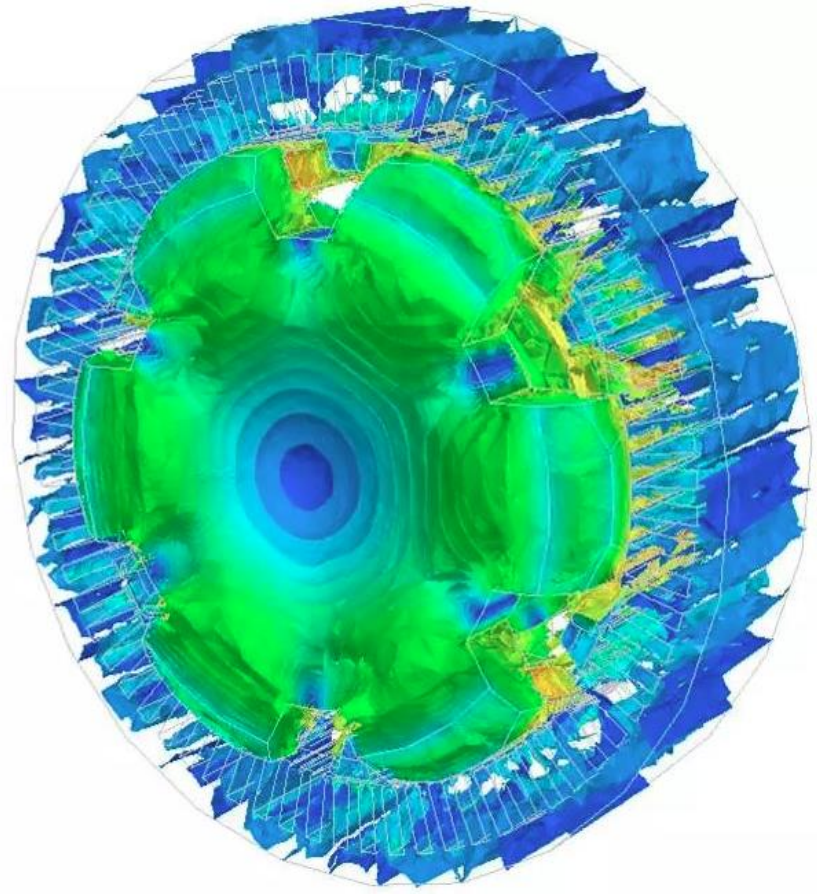
- Professional consulting for magnetic material applications to help solve technical design challenges.
- Co-develop new motor technologies focusing on high-performance and high-density magnet applications.

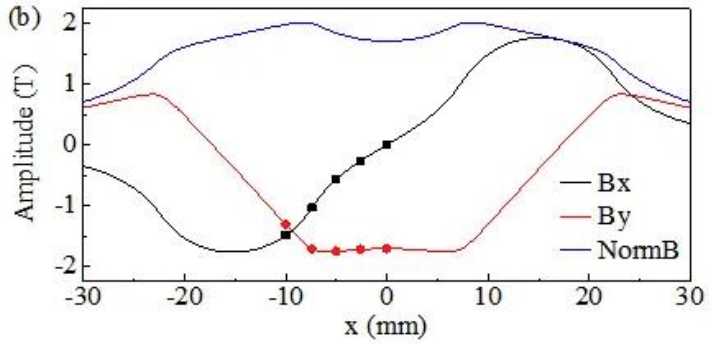
Motor/Magnetic Circuit Design and Magnetic Field Simulation Services

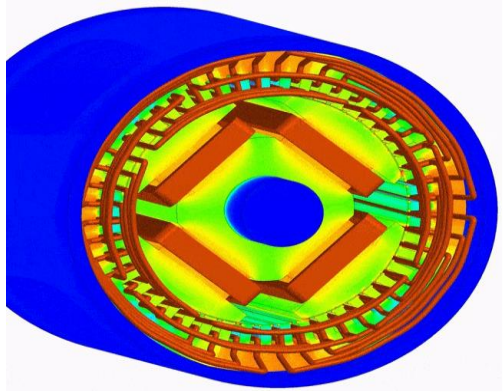












Phone In Group Corporate Culture

◆Management Philosophy:

★ Humanization
★ Refinement
★ Service-oriented

◆Corporate Vision:

To provide customers with more immersive magnetic application solutions and products for smart terminal devices.

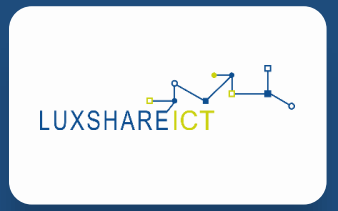
◆Corporate Mission:

To develop advanced magnetic material technologies and solutions that create value for customers.

◆Core Values:

★ Focus on Needs
★ Create Value
★ Bear Responsibility
★ Innovate and Share

Excellent Customers



Thank you!

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