NdFeB magnets

- Key trends
- Industry outlook
- Supplier profiles
- Top products
Buyer’s Guide to sourcing anisotropic bonded NdFeB magnets

An exclusive report on anisotropic bonded NdFeB magnets, including key trends, industry outlook, suppliers and top products

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Output of anisotropic bonded NdFeB magnets on steady rise

Major suppliers of bonded NdFeB magnets in China continue to pursue the development and manufacture of anisotropic varieties to build up the category amid climbing demand. This is expected to increase local output by more than 20 percent in end-2015. The type, however, is still a minority to conventional isotropic kinds, which represent more than 90 percent of yield.

Galaxy Magnet, the largest bonded NdFeB magnet maker in the country and a key one globally, acquired independent intellectual property rights in the preparation of anisotropic variants. It began batch production in 2014 as scheduled, and is on track to meet the 300-ton target annual capacity in two years.

Guangzhou Zhongci, which entered the anisotropic segment in 2014, has introduced an injection molded MJMN1330-grade model. The unit has 8,230Gs residual flux density, 6,780Oe coercivity, 13,680Oe intrinsic coercive force, and 15.10GMoe maximum energy product. It supports up to 100 C operating temperature. The applications are sensors, linear actuators, microphone assemblies, magnetic separators, and DC and servo motors.

In the years ahead, uptick in requirement is anticipated to attract more players. The local pool remains small with fewer than 10 manufacturers due to the venture’s high technology and investment. The outlay for equipment, in particular, is still prohibitive, spurring the majority of suppliers to stay focused on mainstream isotropic variants.

Anisotropic magnets are made using hydrogenation, disproportionation, desorption and recombination, through which technique up to 300nm crystallites can be realized. Compared with isotropic counterparts, they have higher magnetic performance by 30 to as much as 100 percent. As such, the advanced type contributes to greater miniaturization, lighter weight and enhanced precision in application products. In addition, the technology allows substitution of pure neodymium with praseodymium-neodymium alloy for better anti-oxidation and mechanical performance. The latter metal is only 80 percent the cost of the other material. With these advantages, the magnet type is forecast to gain more traction upstream in coming years.

NdFeB magnet hub

China is the biggest production base for NdFeB magnets, generating up to 80 percent of the global volume. The rest comes from Japan and the US. Neomax, Shinetsu, TDK and Hitachi Metals are among the key companies in the first.

The domestic pool has 200 suppliers, mostly small and midsize operations. Only about 20 makers boast annual manufacturing capacity surpassing 100 tons. Fewer than 50 offer bonded types, while the majority concentrate on sintered kinds. The last accounts for 90 percent of local output for the line.

Companies are confident the industry in China will bounce back to two-digit output growth in coming months. Besides rising demand, they cite declining expenditure as spur because input sourcing options are now wider with the expiration of a Magnequench patent last year. The latter development is also expected to strengthen the bonded NdFeB magnet sector, which has not expanded as fast as the sintered category due to material cost challenges.

In the next one or two years, the consumer electronics, wind power and electric vehicle segments will be among the top applications for this line in China, particularly the last two, according to the China Industry Information. Installed generation capacity for the second industry will exceed 20 million kw in 2015, climbing nearly 20 percent YoY, opening up more opportunities for the line. For the EV market, the projected requirement for NdFeB magnets will hit 2,879.1 tons by end-2015 from about 1,801.7 tons last year. In 2020, this may reach 30,000 tons.

Mainstream bonded NdFeB magnets

The local selection targets office automation, A/V devices, computers, motors and automotive uses. The typical choices are square, cylindrical and round units, which have zinc, nickel, epoxy resin, nickel-copper-nickel or gold coating.

Products are processed using compression bonding or injection molding. Based on the former, there are BNP-6, BNP-8L, BNP-8, BNP-8SR, BNP-8H, BNP-9, BNP-11, NBP-11L and BNP-12L-grade kinds. The options in the second include BNI-3, BNI-4, BNI-5, BNI-6, BNI-6H, BNI-7 and BNI-5SR (PPS).

The key materials include NdFeB powder, metal and epoxy. The availability of the first locally has helped many manufacturers lower production costs by 20 to 30 percent. Large companies still rely on Magnequench for products exported to Europe, the US and Japan.

To reduce dependence on imported inputs, a few China companies are investing in magnet powder production. Galaxy Magnets set up a subsidiary in Leshan, Sichuan province in 2012, which started mass manufacture in 2014. The annual capacity is 600 tons.

Even so, material costs will continue to fluctuate in coming months and affect prices accordingly.
A selection of bonded NdFeB magnets from China

**Bonded NdFeB magnet in BNP-10 grade**
Hangzhou Rongchang Magnet Co. Ltd
★★★★✩✩✩
This model ND-R-4105520 isotropic bonded NdFeB magnet from Hangzhou Rongchang comes in BNP-10 grade and has a black epoxy coating. It suits speakers, sensors, DC and linear motors, and MRI and other medical equipment.
The maker accepts a minimum order of 10 units.

**Bonded NdFeB magnet suits drive generators**
Ningbo Xiong Hai Magnetics Co. Ltd
★★★★✩✩✩
Ningbo Xiong Hai’s model XHM13 isotropic bonded NdFeB magnet has 5,200 to 7,600G residual induction, 3.8 to 6kOe normal and 8 to 16kOe intrinsic coercivity, and 40 to 96MGOe energy product. The maximum operating temperature is 140 C. The minimum order quantity is 200 units.

**Bonded NdFeB magnet operates in 80 C**
Shenzhen City Ri Shengchang Magnet Technology Co. Ltd
★★★★✩✩✩
Shenzhen City Ri Shengchang’s model Bonded NdFeB-004 is a zinc-coated isotropic magnet with 80 C operating temperature. The unit is 150x100x250mm. It may come in custom shapes.
The minimum order is 1,000 units. Delivery takes 10 days.

**Bonded NdFeB magnet resists demagnetization**
Yuxiang Magnetic Materials Industry Co. Ltd
★★★★✩✩✩
Yuxiang Magnetic’s model YX002 isotropic bonded NdFeB magnet with epoxy or nickel plating comes in various shapes and sizes. It boasts 8 to 48MGOe energy product.
The minimum order quantity is 1,000 units for delivery within 15 days.

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## Supplier comparison table

<table>
<thead>
<tr>
<th>Company</th>
<th>Year established</th>
<th>Main product lines</th>
<th>Total annual sales ($mn)</th>
<th>Total annual exports ($mn)</th>
<th>Top export markets</th>
<th>Number of staff</th>
<th>MOQ (units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anhui Astromagnet Co. Ltd</td>
<td>1997</td>
<td>Bonded NdFeB magnets, magnetic products</td>
<td>35</td>
<td>10.5</td>
<td>North America, Asia, Australasia</td>
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<td>Eastern Europe, North America, Middle East, Africa</td>
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<td>Ningbo Hui Hesing Advanced-tech Material Co. Ltd</td>
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<td>Westmag Technology Corp. Ltd</td>
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<td>Xiamen U-polemag Electronics &amp; Technology Co. Ltd</td>
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<td>Yuxiang Magnetic Materials Industry Co. Ltd</td>
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