

# Bonded Ndfeb magnet

Bonded NdFeB magnets are manufactured by binding rapid-quenching NdFeB powder. The powder is mixed with resin to form a magnet by compression molding with epoxy or injection molding with nylon. The latter technique is particularly effective in large volume production, though the magnetic value of products is lower than those made with compression molding because of their relatively lower density. Various shapes of high dimensional accuracy can be produced without further processing. Surface is treated by epoxy coating or nickel-plating to prevent corrosion.



## Other Properties of NdFeB Bonded Magnets

### Hybrid magnets to create different magnetic properties

With different ratio of additives to NdFeB powder, magnetic properties of hybrid NdFeB magnets can be tuned in a wide range. Once the ratio is fixed, magnetic property fluctuation can still be limited in a narrow bank. Hybrid magnets will meet customers' specified properties.

### Characteristics for the initial magnetization of NdFeB bonded magnets

Rapidly quenched NdFeB powder used for bonded magnets is multi grain with grain size of sub-micron. Powder is isotropic in magnetic properties, which results in flat increasing of remanence and intrinsic coercivity with applied field. Magnet can only be magnetized to saturation in high fields.

### Advantages of Bonded Magnet

\*Produced with high efficiency, stability and repeatability.

- \*Magnet and other part may form together in one step.
- \*Free choice of magnetizing direction-especially for multi-polar applications
- \*High dimensional accuracy-large quantity applications with minimum post-press machining.
- \*Thin-wall ring and complex shape magnets.
- \*High resistance to corrosion.

## Magnetic properties of bonded NdFeB Magnets

P/N	Br Remanence		Hcj Intrinsic Coercivity		Hcb Coercive Force		(BH)max. Maximum Energy Product	
	MT	kG	kA/m	kOe	kA/m	kOe	KJ/m <sup>3</sup>	MGOe
ndfeb-NB6	440-560	4.40-5.60	560-680	7.0-8.5	240-320	3.0-4.0	32-48	4.0-6.0
ndfeb-NB8	540-640	5.40-6.40	640-720	8.0-9.0	320-400	4.0-5.0	48-64	6.0-8.0
ndfeb-NB8M	540-620	5.40-6.20	1040-1360	13.0-17.0	384-464	4.8-5.8	56-72	7.0-9.0
ndfeb-NB10	620-700	6.20-7.00	608-800	7.6-10.0	360-456	4.5-5.7	64-80	8.0-10.0
ndfeb-NB12	690-760	6.90-7.60	640-840	8.0-10.5	400-480	5.0-6.0	80-96	10.0-12.0

## Physical Characteristics of bonded NdFeB Magnets

P/N	$\mu_{rec}$ Recoil Permeability	Hs Magnetizing Field	$\rho$ Density	Temperature Coefficient			Tc Curie Temperature	K <sup>[2]</sup> Ring Crushing Strength	Coefficient of Thermal Expansion (25-200) $\mu\epsilon$
	$\mu_{rec}$	kA/m	g/cm <sup>3</sup>	kOe	$\alpha(Br)\%/^{\circ}C$	$\beta(Hcj)\%/^{\circ}C$	$^{\circ}C$	kg/mm <sup>2</sup>	10 <sup>-6</sup> / $^{\circ}C$
ndfeb-NB6	1.22	$\sqrt{1600}$	5.1-5.6	$\geq 20$	-0.14	-0.40	360	$\sqrt{5.5}$	4.8
ndfeb-NB8	1.22	$\sqrt{1600}$	5.4-5.8	$\geq 20$	-0.13	-0.40	360	$\sqrt{5.5}$	4.8
ndfeb-NB8M	1.18	$\sqrt{2000}$	5.8-6.0	$\geq 25$	-0.12	-0.38	305	$\sqrt{5.5}$	4.8
ndfeb-NB10	1.22	$\sqrt{1600}$	5.8-6.0	$\geq 20$	-0.11	-0.40	360	$\sqrt{5.5}$	4.8
ndfeb-NB12	1.17	$\sqrt{1600}$	5.9-6.1	$\geq 20$	-0.11	-0.41	360	$\sqrt{5.5}$	4.8

Note: [1] The properties given above are typical at room temperature(23 $^{\circ}C$ )for uncoated samples.

[2] Ring Crushing Strength K is defined as follows, with the force applying along a diameter of magnet ring and P is the value at which the first crack appears.  $K=P(D-T)/LT^2$

K-Ring Crushing Strength(kg/mm<sup>2</sup>) P-Load on magnet ring(kg)

D-Outer diameter(mm) T-Ring thickness(mm)

L-Height of the ring(mm)



## Demagnetization Curves of Bonded NdFeB Magnets

### **Safety Notes for the Use and Storage of Bonded Magnets.**

\*Do not place magnets near person wearing electrical medical equipment, such as pacemaker, because the magnet may result in malfunction of the equipment and endanger person's life.

\*Keep magnets away from magnetic memory media or other magnetic field sensitive devices such as magnetic cards, tapes, floppy disks, hard disk drives, and watches. Otherwise information stored in the media or the devices may be damaged.

\*Big block of magnet will strongly attract each other or attract iron steel pieces, which may cause serious injury to person.

\*Relatively weak in strength, bonded magnets may break into pieces when collide with other materials. Be careful in assembling magnets and prevent the tiny fragments from entering into eyes or cause other injuries.

\*Keep magnets in good condition and avoid following environment in case that magnets become rust or weaken in mechanical or magnetic strength.

- A. With acid, alkali, organic solvent or electrolytes.
- B. Immersed in water or in oil.
- C. Space filled with hydrogen.
- D. Space filled with corrosive gases such as Cl<sub>2</sub>, NH<sub>3</sub>, NO<sub>x</sub>, etc.
- E. With radioactive rays.

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