

## NdFeB Powder



Ningbo Empire Magnetics Co.,Ltd is specialized in producing melt-spun NdFeB permanent magnetic powder, we have a complete set of the most advanced equipment for producing, analyzing and testing melt-spun NdFeB powder. At present, such products range covers different kinds of magnetic powder. NdFeB powder is based upon Neodymium-iron-boron alloy compositions that are rapidly quenched from their molten state at high cooling rates, on the order of 1,000,000 degrees per second. Through rapid quenching a material that has a precise grain structure (typically 30-50 nanometer) is obtained. For the consequent grain size is smaller than the critical size for a single magnetic domain, the NdFeB powder material features with magnetically isotropy and 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. Unlike ultra-fine anisotropic NdFeB powder in the production application of sintered NdFeB magnets, our powder is stable against oxidation-forced demagnetization, thus suitable and ready for making bonded permanent magnets.

### Processing flow:

1. Jet Casting. Firstly, to melt an Neodymium-iron-boron ingot, then jet the metal under high pressure onto the surface of a revolving metal wheel that the wheel is kept at cool temperature while the molten metal is cooled. During the process the material solidifies into a small metal ribbon about 35  $\mu\text{m}$  (micrometers) thick and 1-3 mm wide. By controlling variables such as the flow rate of the metal, the wheels rotating speed, the cooling rate; we can achieve optimum magnetic properties. The gathered ribbon is milled into a platelet and there a heat treatment is carried out to achieve desired magnetic properties.
2. Spinning-cup atomization, much like a centrifuge. Molten metal is ejected into the surface of a rapidly spinning cup and when leaving the rim of the spinning cup, it forms droplets that will form into very small spheres during spinning and solidification. Finally, the powders are collected and heat-treated to achieve desired magnetic properties.

### Application of NdFeB powder:

Magnet applications. For making isotropic bonded NdFeB magnets, which are manufactured by mixing NdFeB powder with polymer binder and then pressing (compression to form the required shape). The automobile industry, office automation, automotive. DC brush-type motors. multi-pole stepper and spindle motor applications. Magnetic paints, magnetic printable substrates, magnetic films, medical diagnostics and therapeutics, video tape, copy toners, fingerprinting, sensors, fuel injectors, permanent magnets, nano level fluid sealing, electric toys and magnetic curing products, etc.

### Magnetic Properties of Melt-spun NdFeB Magnetic Powder

Grade	Br		Hcb		Hcj		(BH)max		Temp. Coeff. Of Br. To 100	Temp. Coeff. Of Hcj. To 100
	T	KGs	KA/m	KOe	KA/m	KOe	KJ/m <sup>3</sup>	MGOe	%/°C	%/°C
NQP-A	0.74-0.80	7.40-8.00	440-496	5.50-6.20	1035-1360	13.0-17.0	80-96	10.0-12.0	-0.13	-0.40
NQP-B	0.74-0.83	7.40-8.30	320-520	4.00-6.50	560-800	7.0-10.0	64-108	8.0-13.5	-0.105	-0.40
NQP-C	0.74-0.81	7.40-8.10	440-504	5.50-6.30	1035-1360	13.0-17.0	80-96	10.0-12.0	-0.07	-0.40
NQP-D	0.74-0.83	7.40-8.30	440-520	5.50-6.50	640-800	8.0-10.0	92-108	11.5-13.5	-0.07	-0.40
NQP-L	0.85-1.10	8.50-11.0	192-280	2.40-3.50	240-400	3.0-5.0	56-76	7.0-9.5	-0.048	-0.35

Physical Properties:

Grade	Curie Temp.	Working Temp.(Max.)	Density	Particle Size	Click the following link to check the demagnetization curve
	°C	°C	g/cm <sup>3</sup>	µm	
NQP-A	310	120	6.0	50-200	<a href="#">NQP-A demagnetization curve</a>
NQP-B	390	120	6.0	50-200	<a href="#">NQP-B demagnetization curve</a>
NQP-C	470	150	6.0	50-200	<a href="#">NQP-C demagnetization curve</a>
NQP-D	470	150	6.0	50-200	<a href="#">NQP-D demagnetization curve</a>
NQP-L	400	100	6.0	50-200	<a href="#">NQP-L demagnetization curve</a>