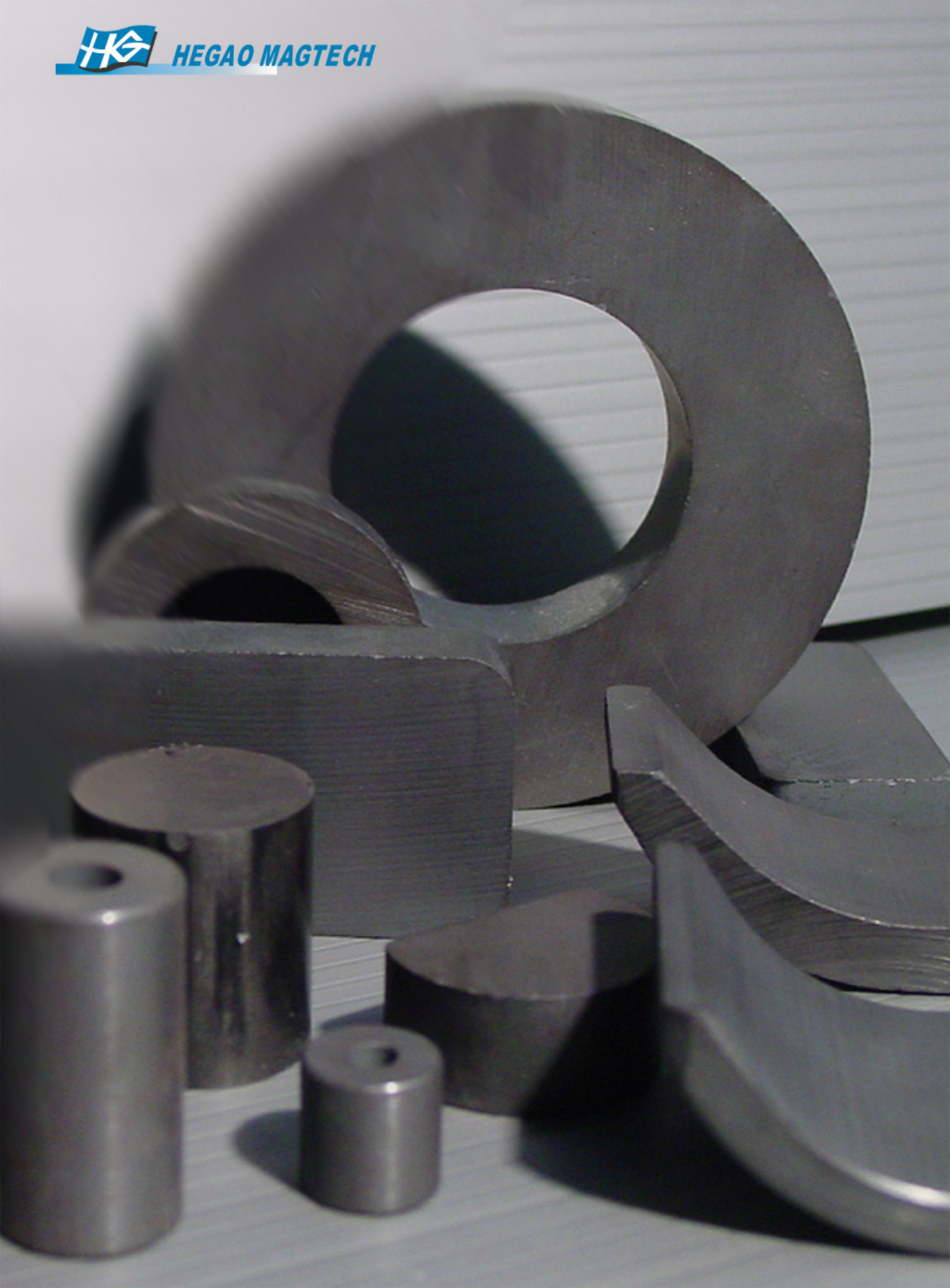
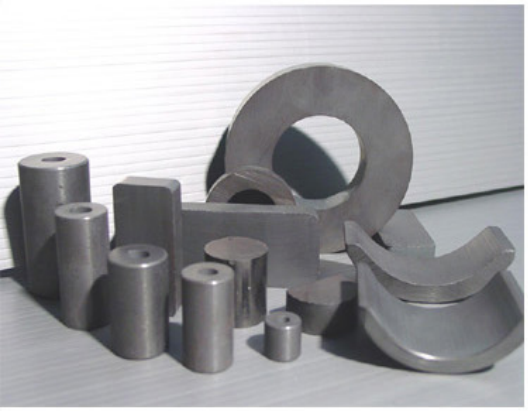
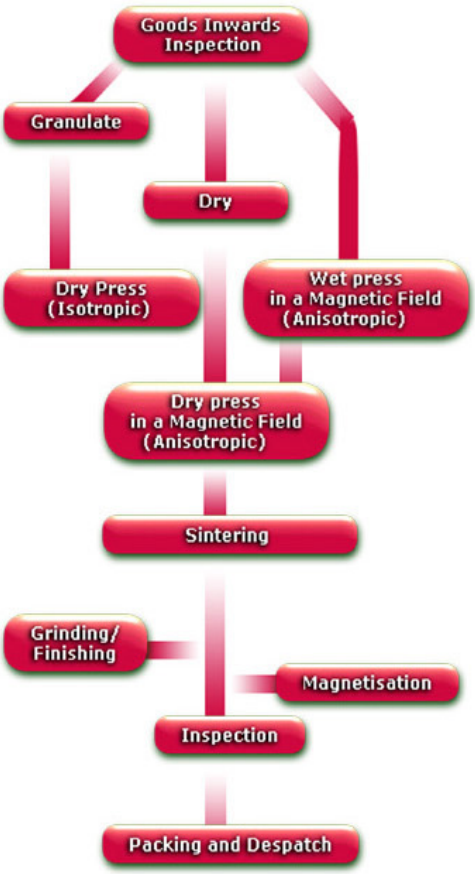
HEGAO MAGTECH



Sintered Hard Ferrite



PROCESS FLOW



General Information

Ferrite magnets are sintered permanent magnets composed of Barium or Strontium Ferrite. This class of magnets, aside from good resistance to demagnetization, has the popular advantage of low cost.

Ferrite magnets are very hard and brittle, and require specialized machining techniques. Moreover, they should be machined in an unmagnetized state. We are equipped to machine these materials to specifications.

Anisotropic grades are oriented in the manufacturing direction, and must be magnetized in the direction of orientation. Isotropic grades are not oriented and can be magnetized in any direction, although some degree of greater magnetic strength will be found in the pressing dimension, usually the shortest dimension.

Due to their low cost, Ferrite magnets enjoy a very wide range of applications, from motors and loudspeakers to toys and crafts, and are the most widely used permanent magnets today.

Pressing and sintering involves pressing very fine ferrite powder in a die, and then sintering this pressed magnet. All fully dense Ferrite magnets are produced this way. Ferrite magnets can be wet pressed or dry pressed. Wet pressing yields better magnetic properties, but poorer physical tolerances. Generally, the powder is dry for grade 1 or 5 materials, and wet for grade 8 and higher materials. Sintering involves subjecting the material to high temperatures to fuse the pressed powder together, thus creating a solid material. Magnets produced through this process usually need to have some finish machining, otherwise surface finishes and tolerances are not acceptable. Some manufacturers extrude instead of press wet powder slurry and then sinter the material. This is sometimes done for arc segment shapes, where the arc cross-section is extruded in long lengths, sintered, and then cut to length.

Assemblies

We are able to manufacture metal and other components of finished sub assemblies using our CNC machining facilities.

Assemblies using metal or other components and magnets can be fabricated by adhering magnets with adhesives to suit a range of environments, by mechanically fastening magnets, or by a combination of these methods. Due to the relatively brittle nature of these magnet materials, press fits are not recommended.

Surface Treatments

The corrosion resistance of Ferrite is considered excellent , and no surface treatments are required. However, Ferrite magnets may have a thin film of fine magnet powder on the surface and for clean, non-contaminated applications, some form of coating may be required.

Magnetizing and Handling

Ferrite magnets require magnetizing fields of about 10 kOe. They can be magnetized with multiple poles on one or both pole surfaces. No special handling precautions are required, except that large blocks of Ferrite magnets are powerful, and care should be taken to ensure that they do not snap towards each other.

Temperature Effects

Up to about 840 F, changes in magnetization are largely reversible, while changes between 840 F and 1800 F are re-magnetizable. For all Ferrite magnets, the degradation of magnetic properties is essentially linear with temperature. At 350 F, about 75% of room temperature magnetization is retained, and at 550 F, about 50% is retained.

烧结铁氧体的磁性能
Magnetic Properties of Sintered Hard Ferrite

牌 号 Grade			剩 磁 Remanence Br		矫顽力 Normal Coercivity Hcb		最大磁能积 Max. Energy (BH)Max	
	MMPA	TDK	mT	Gs	KA/m	Oe	KJ/m3	MGOe
Y15			280-360	2800-3600	128-192	1600-2400	14.3-17.5	1.8-2.2
Y20			320-360	3200-3600	128-192	1600-2400	18.3-21.5	2.3-2.7
Y25			350-390	3500-3900	152-208	1900-2600	22.3-25.5	2.8-3.2
Y30			385-400	3850-4000	176-192	2200-2400	27.5-30.0	3.45-3.8
Y32	C-11	FB4A	400-410	4000-4100	192-220	2400-2750	30.0-32.0	3.8-4.0
Y35	C-8B	FB4X	410-420	4100-4200	220-264	2750-3300	31.5-33.0	4.0-4.2
Y30BH			370-390	3700-3900	176-240	2800-3000	26.0-28.0	3.3-3.6
Y30HJ	C-9	FB5A	365-380	3650-3800	264-270	3300-3375	28.0-29.0	3.5-3.7
Y30H-1	C-8A	FB4B	380-390	3800-3900	230-250	2875-3125	27.0-29.0	3.4-3.7
Y33HJ	C-12	FB5F	395-400	3950-4000	275-285	3437-3562	28.5-30.0	3.58-3.8

烧结铁氧体的物理性能
Physical properties of Sintered Hard Ferrite

参 数 Parameters	符号 Mark	单位 Unit	数值 Values	备注 Remark
回复磁导率 Recoil Permeability	rec	Gs/Oe	1.05-1.3	
居里温度 Curie Temperature	Tc	℃	≥450	
磁感应温度系数 Temp. Coefficient of Magnetic Induction	A(Br)	$℃^{-1}$	-0.2%	0-100℃
内禀矫顽力系数 Temp. Coefficient of Inturensic Coerrice Induction	A(Hcj)	$℃^{-1}$	-0.2-0.5%	0-100℃
密 度 Density	d	G/cm^3	4.6-5.0	
电阻率 Specific Resistance		Ω.cm	≥106	
热膨胀系数 Coefficient of Thermal Expansion		A $℃^{-1}$	$7\text{-}15X10^{-6}$	
硬 度 Hardness	HV	--	480-580	