



淳安千岛湖鹏晟科技发展有限公司
Chunan Qiandao Lake Pengsheng Technology Development Co., Ltd

鹏晟科技

淳安千岛湖鹏晟科技发展有限公司

地址：浙江省杭州市拱墅区莫干山路972号泰嘉园K座13楼1303

电话：0571-88283911

网址：www.hzpsmag.com

邮箱：peter@hzpsmag.com

烧结钕铁硼

Sintered NdFeB Magnets

简介 Introduction

概述

烧结钕铁硼永磁材料问世于1983年，其主要成分为

Nd₂Fe₁₄B，是目前磁性能最高的永材料，可制成复杂形状磁体，可进行切割加工。

应用领域

烧结钕铁硼起初主要应用于高性能马达：磁盘驱动器里的音圈马达、无刷马达；其它的应用包括磁分离、磁共振成像、传感器，扬声器等。

性能

烧结钕铁硼的最大磁能是烧结铁氧体的5~15倍，内禀矫顽力是铁氧体的5~10倍，是铝镍钴的6~10；钕铁硼的潜在磁特性是非常高的，理论上说，它的磁能积可以达到527kJ/m³ (66MGOe)，甚至可以吸起比它们自身重量重640倍的物体。

其它

因烧结钕铁硼易腐蚀，它的应用存在局限性；在高温、高温、高酸碱度的环境中应用，烧结钕铁硼必须进行表面处理，可采取的方式有电镀 (Zn、Ni、NiCuNi、

Au等)，电泳 (环氧树脂), parylene, 和这些涂层的组合；近期，随着其成份和工艺的技术革新，耐腐蚀性和温度稳定性都取得了显著的改进。不过，至今钕铁硼材料的温度稳定性仍是不好，在高温下的磁通损失仍较大。



Summarize

Sintered neodymium-iron-boron (NdFeB) permanent-magnet material was developed in 1983. The major composition of NdFeB magnets is Nd₂Fe₁₄B. It is the highest magnetism performance permanent-magnet material at present, that can be made into the complex shape magnet, and cut.

Application field

The sintered NdFeB magnets earliest mainly applications was for the high performance motor: voice coil motors (VCM' s) in hard disk drives, brushless DC motors. Other applications include magnetic separation, magnetic resonance imaging, sensors and loudspeakers etc.

Property

The(BH) max value of the sintered NdFeB magnet is 5 to 15 times higher than sintered ferrite magnets. H_{cj} value is 5 to 10 times higher than sintered ferrite and 6 to 10 times higher than AlNiCo magnets.

The potential magnetic properties of NdFeB magnets are very high. Theoretically, their (BH) max value can be reached to 527 kJ/m³ (66MGOe). They can even attract object which weight is 640 times heavier than themselves.

Others

The sintered NdFeB magnets have some limitations due to their poor corrosion resistance.

In high-humidity, high-temperature, high-PH applications, protective coating is necessary for the sintered NdFeB magnets. Available coatings include plating (Zn, Ni, NiCuNi, Au etc), electrophoresis (Epoxy), parylene, and combinations of these coatings

Recently innovation in composition and process have brought significant improvements in corrosion resistance and temperature stability. But there also have some problem that the NdFeB magnet have some flux loss under high temperature.

磁特性参数 Magnetic Properties

牌号	剩余磁感应强度Br		矫顽力H _{cb}		内禀矫顽力H _{cj}		最大磁能积 (BH) max		工作温度T _w
Grade	mT	kGs	kA/m	koe	kA/m	koe	kJ/m ³	MGOe	°C
N35	1170-1220	11.7-12.2	≥868	≥10.9	≥955	≥12	263-287	33-36	<80
N38	1220-1250	12.2-12.5	≥899	≥11.3	≥955	≥12	287-310	36-39	<80
N40	1250-1280	12.5-12.8	≥907	≥11.4	≥955	≥12	302-326	38-41	<80
N42	1280-1320	12.8-13.2	≥915	≥11.5	≥955	≥12	318-342	40-43	<80
N48	1380-1420	13.8-14.2	≥923	≥11.6	≥955	≥12	366-390	46-49	<80
N50	1400-1450	14.0-14.5	≥796	≥10.0	≥876	≥11	382-406	48-51	<80
N52	1430-1480	14.3-14.8	≥796	≥10.0	≥876	≥11	398-422	50-53	<80
35M	1170-1220	11.7-12.2	≥868	≥10.9	≥1114	≥14	263-287	33-36	<100
38M	1220-1250	12.2-12.5	≥899	≥11.3	≥1114	≥14	287-310	36-39	<100
40M	1250-1280	12.5-12.8	≥923	≥11.6	≥1114	≥14	302-326	38-41	<100
42M	1280-1320	12.8-13.2	≥955	≥12.0	≥1114	≥14	318-342	40-43	<100
48M	1360-1430	13.6-14.3	≥1027	≥12.9	≥1114	≥14	366-390	46-49	<100
50M	1400-1450	14.0-14.5	≥1033	≥13.0	≥1114	≥14	382-406	48-51	<100
33H	1130-1170	11.3-11.7	≥836	≥10.5	≥1353	≥17	247-271	31-34	<120
35H	1170-1220	11.7-12.2	≥868	≥10.9	≥1353	≥17	263-287	33-36	<120
38H	1220-1250	12.2-12.5	≥899	≥11.3	≥1353	≥17	287-310	36-39	<120
40H	1250-1280	12.5-12.8	≥923	≥11.6	≥1353	≥17	302-326	38-41	<120
42H	1280-1320	12.8-13.2	≥955	≥12.0	≥1353	≥17	318-342	40-43	<120
45H	1300-1360	13.0-13.6	≥963	≥12.1	≥1353	≥17	326-358	43-46	<120
48H	1370-1430	13.7-14.3	≥995	≥12.5	≥1353	≥17	366-390	46-49	<150
30SH	1080-1130	10.8-11.3	≥804	≥10.1	≥1592	≥20	223-247	28-31	<150
33SH	1130-1170	11.3-11.7	≥844	≥10.6	≥1592	≥20	247-271	31-34	<150
35SH	1170-1220	11.7-12.2	≥876	≥11.0	≥1592	≥20	263-287	33-36	<150
38SH	1220-1250	12.2-12.5	≥907	≥11.4	≥1592	≥20	287-310	36-39	<150
40SH	1240-1280	12.4-12.8	≥939	≥11.8	≥1592	≥20	302-326	38-41	<150
42SH	1280-1320	12.8-13.2	≥987	≥12.4	≥1592	≥20	318-342	40-43	<150
45SH	1320-1380	13.2-13.8	≥1003	≥12.6	≥1592	≥20	342-366	43-46	<150
28UH	1020-1080	10.2-10.8	≥764	≥9.6	≥1990	≥25	207-231	26-29	<180
30UH	1080-1130	10.8-11.3	≥812	≥10.2	≥1990	≥25	223-247	28-31	<180
33UH	1130-1170	11.3-11.7	≥852	≥10.7	≥1990	≥25	247-271	31-34	<180
35UH	1180-1220	11.8-12.2	≥860	≥10.8	≥1990	≥25	263-287	33-36	<180
38UH	1220-1250	12.2-12.5	≥876	≥11.0	≥1990	≥25	287-310	36-39	<180
40UH	1250-1280	12.5-12.8	≥899	≥11.3	≥1990	≥25	302-326	38-41	<180
28EH	1040-1090	10.4-10.9	≥780	≥9.8	≥2388	≥30	207-231	26-29	<200
30EH	1080-1130	10.8-11.3	≥812	≥10.2	≥2388	≥30	223-247	28-31	<200
33EH	1130-1170	11.3-11.7	≥836	≥10.5	≥2388	≥30	247-271	31-34	<200
35EH	1170-1220	11.7-12.2	≥876	≥11.0	≥2388	≥30	263-287	33-36	<200
38EH	1220-1250	12.2-12.5	≥899	≥11.3	≥2388	≥30	287-310	36-39	<200
28AH	1040-1090	10.4-10.9	≥787	≥9.9	≥2624	≥33	207-231	26-29	<230
30AH	1080-1130	10.9-11.3	≥819	≥10.3	≥2624	≥33	223-247	28-31	<230
33AH	1130-1170	11.3-11.7	≥843	≥10.6	≥2624	≥33	247-271	31-34	<230

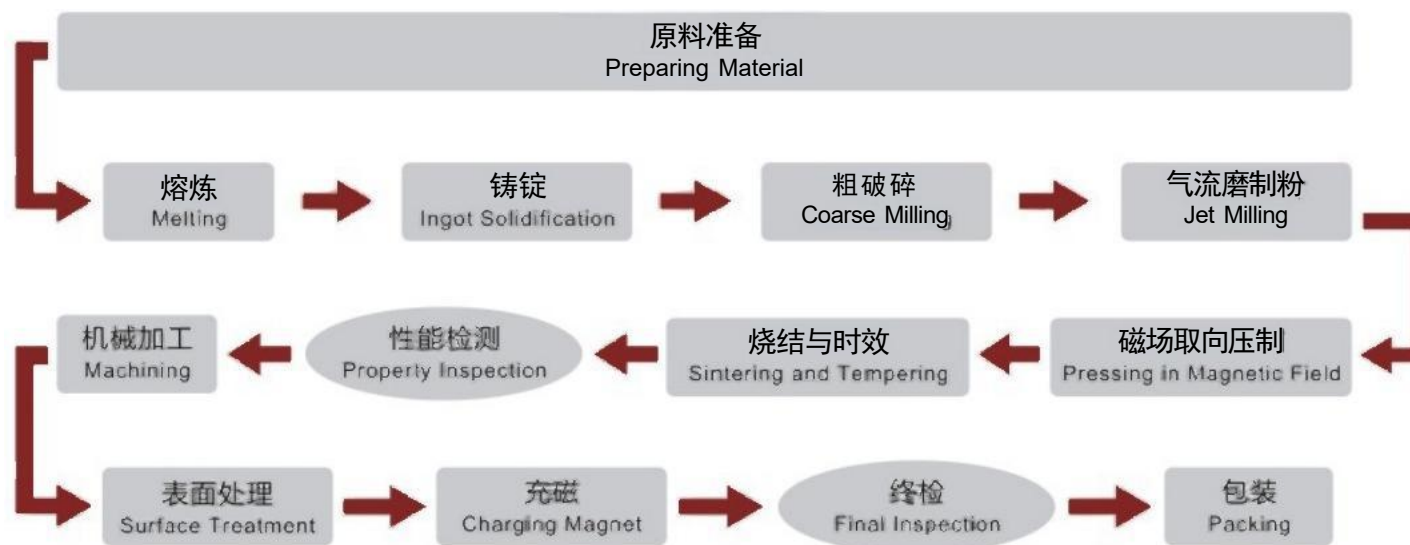
物理特性 Physical Properties

剩磁温度系数 Br Temperature Coefficient	0.095~-0.105%/°C	密度 Density	7.3-7.5/cm ³	居里温度 Curie Temperature	310-340°
矫顽力温度系数 Coercivity Temperature Coefficient	-0.45~-0.06%/°C	维氏硬度 Vickers-hardness	600HV	电阻率 Electrical Resistivity	114 μΩ · cm
横向变形系数 Across Transfiguration Coefficient	0.24	抗压强度 Break Strength	8.0Kgf/mm ²	绕曲强度 Bending Strength	25Kgf/mm ²
热膨胀系数 Thermal Expansion Coefficient	4×10 ⁻⁶ /°C	比热 Specific Heat	0.12Kca/Kg	刚度 Stiffness	0.64N/m ²
导热系数 The Conduction Coefficient	7.7Kcal/[m. h. °C]	弹性模量 Young's Modulus	1.6×10 ¹¹ N/m ²	压缩率 Compressibility	9.8×10 ⁻¹² m ² /N

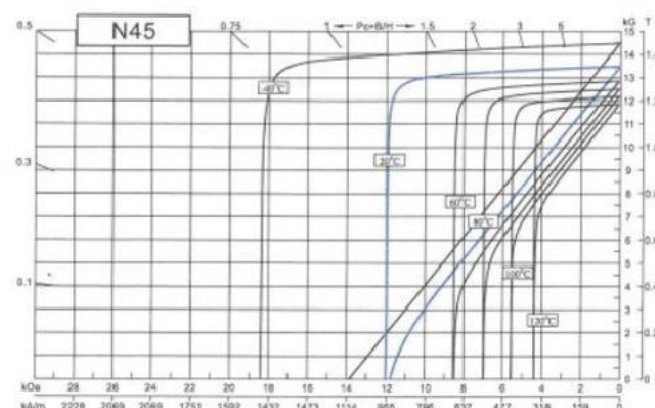
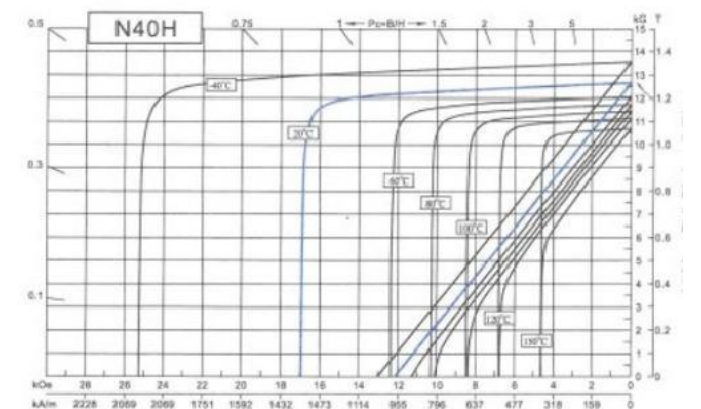
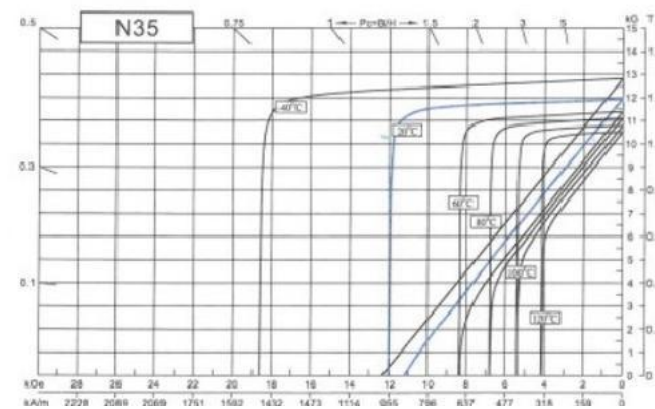
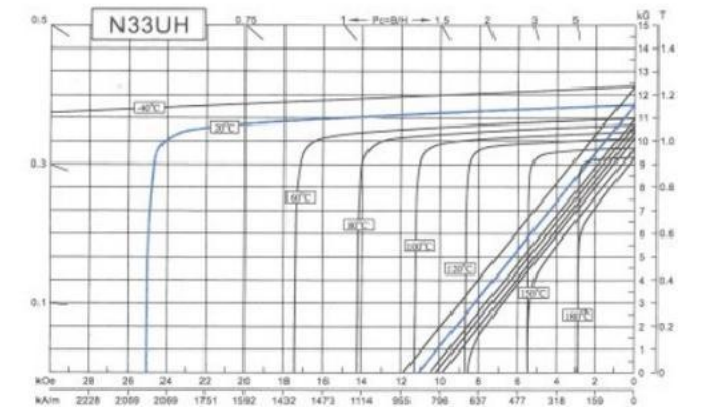
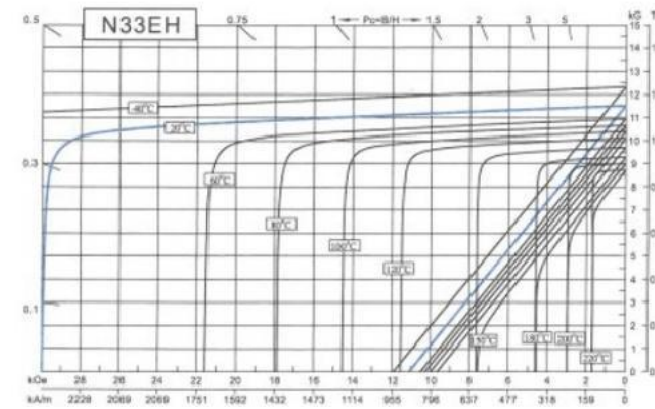
表面处理办法 Surface Treatment Method

表面处理办法 Surface Treatment Method	电镀 Nickel Plated	镀锌 Zinc Plated	环氧漆 Epoxy	镀镍铜镍 Ni-Cu-Ni Plated	镀锌+派瑞林涂层 Zinc plated+Parylene coating
镀层厚度 Coating Thickness	5~15 μm	10~20 μm	10~20 μm	10~30 μm	10~30 μm

生产工艺流程图 Production Process Flow Chart



温度退磁曲线 Demagnetization Curves



烧结铁氧体

sintered ferrite magnets

简介 Introduction

烧结铁氧体(又称陶瓷磁体)开发和生产于1950年代; 烧结铁氧体磁体主要有钡铁氧体(BaO·6Fe2O3)

和锶铁氧体(SrO·6Fe2O3) 两类; 烧结铁氧体又分为各向同性磁体和各向异性磁体。

应用领域

因原材料价格便宜, 同时其生产工艺相对简单, 故其成本低廉, 因此烧结铁氧体是至今使用最广泛的永磁材料; 大量应用于永磁电机、DC 马达、扬声器, 干簧管、磁选机和吸附装置等等。

性能

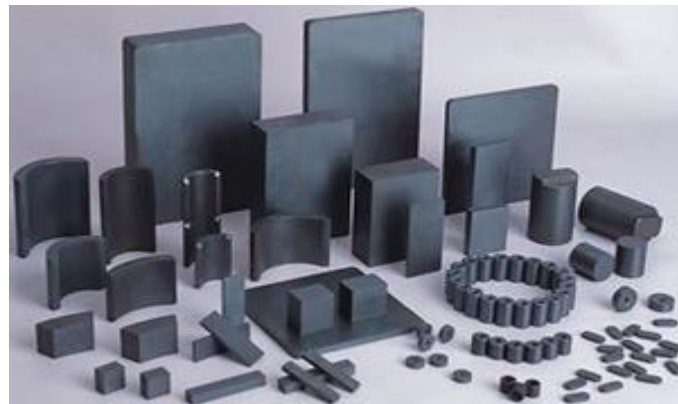
各向同性烧结铁氧体的磁性能较弱, 在任意方向具有相同的磁性能, 可任何方向多极充磁;

各向异性烧结铁氧体磁体比各向同性的磁性能高, 仅能在成型时磁场取向方向充磁; 烧结铁氧体主要原料是氧化物, 故其不受高温、高湿或化学物质(除强酸碱外)影响而被腐蚀。

其它

烧结铁氧体具备优异的退磁阻抗, 在装配和充磁前后无磁通损失; 烧结铁氧体工作温度为-40°C到+28°C, 温度系数较差; Br温度系数为-0.2%/°C, 即温度每升高1°C, Br 下降0.2%;

烧结铁氧体硬度大, 可以使用金刚石工具进行切割、磨削等加工; 烧结铁氧体脆性大, 易碎特性, 生产和运输过程要小心轻放。



Summarize

The sintered ferrite (or Ceramic magnets)was developed and manufactured in the 1950's.

The sintered ferrite have mainly two types: barium ferrite (BaO·6Fe2O3) and strontium ferrite (SrO·6Fe2O3).

The sintered ferrite magnets are available in isotropic magnet and anisotropic magnet.

Application field

The sintered ferrites have widely applications due to their low cost and simple manufacturing process;

The applications include permanent magnet motor, DC motors, loudspeakers, reed switch operation, magnetic separator assemblies and holding devices etc.

Property

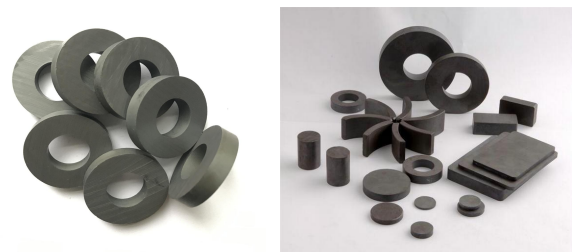
Isotropic ferrite magnets' magnetic properties are low. But they have the same magnetic properties in all directions. It can be magnetized in many different directions or in multi-poles.

Anisotropic ferrite magnets have higher magnetic properties compare with isotropic ferrite magnets. However, this type of magnets can only be magnetized along a preferred direction. Sintered ferrite has good corrosion resistance to high-temperature, high-humidity, and chemical (except the high acid-base).

Others

The sintered ferrite has an excellent resistance to demagnetization and has no magnetic flux loss before or after assembly.

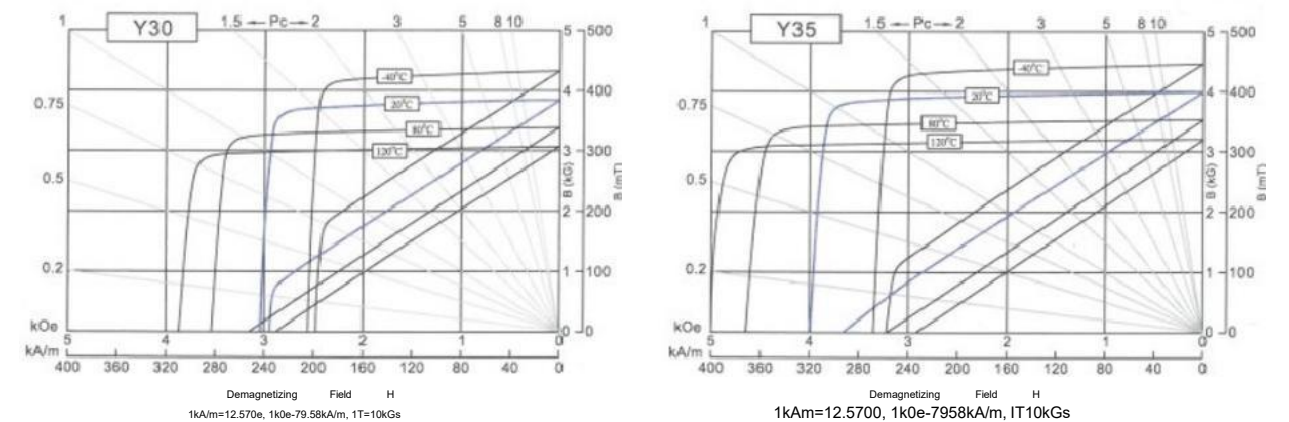
The operating temperature range of sintered ferrite is -400C to +2500C. The temperature coefficient is poor. Br temperature coefficient is -0.2%/°C. The Br losing is approximately 0.2% when temperature is increased by 1°C. The sintered ferrite has high hardness. It means that can only used diamond tools cutting, grinding techniques can be used to manufacture these products. Attention is required during production & transportation due to their brittle nature.



磁特性参数 Magnetic Properties

牌号	剩余磁感应强度Br		磁感矫顽力HcB		内禀矫顽力HcJ		最大磁能积(BH) max		工作温度Tw	等同于
Grade	mT	kGs	kA/m	kOe	kA/m	kOe	k/m3	MGOe	°C	Equivalent to
Y10T	200-235	2.0-2.35	125-160	1.57-2.01	210-280	2.64-3.52	6.5-9.5	0.8-1.2	<250	EC~7/21
Y20	320-380	3.2-3.8	135-190	1.70-2.38	140-195	1.76-2.45	18.0-22.0	2.3-2.8	<250	
Y22H	310-360	3.1-3.6	220-250	2.77-3.14	280-320	3.52-4.02	20.0-24.0	2.5-3.2	<250	IEC~20/28
Y23	320-370	3.2-3.7	170-190	2.14-2.38	190-230	2.39-2.89	20.0-25.5	2.5-3.2	<250	IEC~20/19
Y25	360-400	3.6-4.0	135-170	1.70-2.14	140-200	1.76-2.51	22.5-28.0	2.8-3.5	<250	JIS~MPB320
Y26H	360-390	3.6-3.9	220-250	2.77-3.14	225-255	2.83-3.21	23.0-28.0	2.9-3.5	<250	TDK~FB3X
Y27H	370-400	3.7-4.0	205-250	2.58-3.14	210-255	2.64-3.21	25.0-29.0	3.1-3.7	<250	IEC~25/22
Y30	370-400	3.7-4.0	175-210	2.2-2.64	180-220	2.64-2.77	26.0-30.0	3.3-3.8	<250	IEC~26/18
Y30BH	380-390	3.8-3.9	223-235	2.80-2.95	231-245	2.90-3.08	27.0-30.0	3.4-3.7	<250	
Y30H-1	380-400	3.6-4.0	135-170	1.70-2.14	140-200	1.76-2.51	22.5-28.0	2.8-3.5	<250	TDK~FB4B
Y30H-2	395-415	3.95-4.15	275-300	3.46-3.77	310-335	3.90-4.21	28.5-32.5	3.5-4.0	<250	TDK~FB5H
Y32	400-420	4.0-4.2	160-190	2.01-2.38	165-195	2.07-2.45	30.0-33.5	3.8-4.2	<250	TDK~FB4A
Y33	410-430	4.1-4.3	220-250	2.77-3.14	225-255	2.83-3.21	31.5-35.0	4.0-4.4	<250	TDK~FB4X
Y35	400-410	4.0-4.1	175-195	2.20-2.45	180-200	2.26-2.51	30.0-32.0	3.8-4.0	<250	

温度退磁曲线 Demagnetization Curves



生产工艺流程图 Production Process Flow Chart



烧结钕钴磁体

Sintered SmCo Magnets

简介 Introduction

钕钴永磁材料主要分1:5型 (SmCo5) 和2:17型 (Sm2Co17) 两个系列。

烧结钕钴磁体脆性大、易碎，机加工不能采取传统的加工技术，必须用金刚石含量高的砂轮，同时用水或油冷却。

应用领域

主要应用在伺服马达、水泵接器和传感器；特别是用在磁体工作温度高，高温高湿或其它的高腐蚀的环境里。

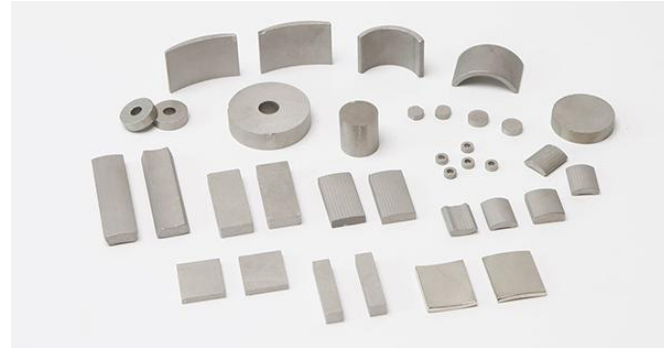
性能

钕钴永磁材料的居里温度在710~880℃之间，最高工作温度在250~350℃之间，比钕铁硼永磁材料230℃的最高工作温度高；钕钴永磁材料较钕铁硼具备更佳的耐腐蚀性；当工作温度高于150℃时，钕钴永磁材料较钕铁硼具备更低的磁通损失；

SmCo5 磁体具有约18MGOe (140kJ/m³) 的最大磁能积，Br可逆温度系数为-0.05%/℃；

Sm2Co17 磁体具有30MGOe (240kJ/m³) 的最大磁能积，其机加工难度很大，其含钴比率比SmCo5 更低，原材料成本更低；

Sm2Co17 磁体具有优良的耐腐蚀性和磁性能高温稳定性，与其它稀土永磁比较，其Br可逆温度系数最低，典型值为-0.03%/℃。



Summarize

The SmCo permanent magnet have two types available: 1 type (SmCo5) type(Sm2Co17).

Sintered samarium cobalt magnets are very brittle, so traditional machining techniques cannot be applied. If machining is required, high concentration diamond grinding wheels is best selection, and water or oil coolant is necessary.

Application field

The SmCo permanent magnet mainly applications are servo-motors, pump couplings, and sensors.

The SmCo permanent magnet can be used in high-temperature, high-humidity and corrosive environment.

Property

The curie temperature of SmCo magnets is 710 to 880℃. The maximum operation temperature is 250 to 350℃. It is higher than the NdFeB materials which maximum operation temperature is 230℃.

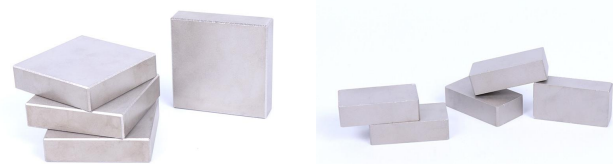
The SmCo materials have better corrosion resistance than NdFeB materials.

The SmCo materials have lower magnetic flux loss than the NdFeB materials when operation temperature is above 1500C.

SmCo5 magnet has (BH)max of about 18 MGOe(140kJ/m³) and Br reversible temperature coefficient of -0.05%/℃.

Sm2Co17 magnet has (BH) max of 30 MGOe(240kJ/m³); Sm2Co17 magnet has poor machining ability, Sm2Co17 material cost is lower than SmCo5 due to less cobalt containing

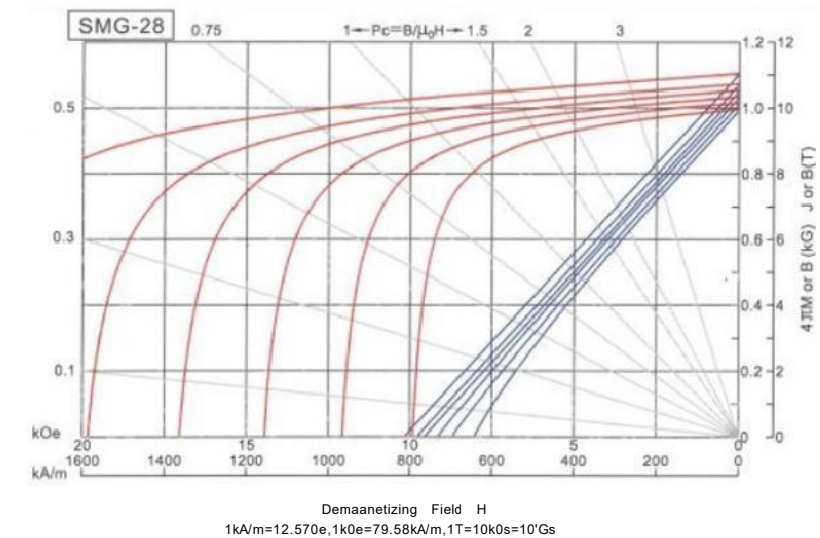
Sm2Co17 magnet has excellent corrosion resistance and high temperature stability. It has the lowest reversible temperature coefficient of all rare earth alloys. The typically value is -0.03%℃.



磁特性参数 Magnetic Properties

材料 Material	牌与	剩余磁感应强度		矫顽力Hcb		内禀矫顽力Hc		最大磁能积 (BH) max		居里温度T	工作温度Tw
		mT	kGs	A/m	koe	kA/m	voc	kJ/m ³	MGOe	℃	℃
SmCo (1:5)	SM-18	850	8.5	620	7.8	≥1350	≥17	145~150	17~19	750	<250
	SM-20	900~960	9.0~9.6	653~717	8.2~9.0	1194~1513	15~19	150~175	19~22	750	<250
	SM-22	930~1000	9.3~10.0	660~772	8.3~9.7	1194~1751	15~22	159~191	20~24	750	<250
	SM-24	960~1040	9.6~10.4	660~780	8.3~9.8	1194~1751	15~22	175~207	22~26	750	<250
SmCo (2:17)	SMG-24	950~1020	9.5~10.2	637~732	8.0~9.2	1433~1990	18~25	175~190	22~24	800	<300
	SMG-26	020~1050	10.2~10.5	748~796	9.4~10.0	1433~1990	18~25	195~215	24~26	800	<300
	SMG-28	1050~1080	10.5~10.8	756~796	9.5~10.0	1433~1831	18~23	205~220	26~28	800	<300
	SMG-30	1070~1120	10.7~11.2	677~820	8.5~10.3	≥1194	≥15	223~247	28~31	800	<300
	SMG-32	1090~1150	10.9~11.5	677~820	8.5~10.3	≥955	≥12	238~262	29~32	800	<300

温度退磁曲线 Demagnetization Curves



生产工艺流程图 Production Process Flow Chart



烧结/铸造铝镍钴磁体

Sintered/Casted AlNiCo Magnets

简介 Introduction

概述

铝镍钴永磁材料主要是由铝、镍、钴、铁、铜、钛等材料组成，按照加工工艺的不同，分铸造型和烧结型两类；

铸造型铝镍钴比烧结型铝镍钴的磁性能更高，但烧结型铝镍钴的磁性的均匀性更佳。

铝镍钴永磁材料是以钴含量的不同来划分等级的，范围从0%(AlNiCo3) 到40%(AlNiCo8)，

各向同性等级磁体 (AlNiCo2, 3 和4) 的磁性能较各向异性等级 (AlNiCo5, 6, 8 and 9) 的相对较低，各向异性等级磁体的取向是在热处理过程中完成的，在指定的磁场中，以可控制的速率从2000。F(1093℃) 冷却至常温；

应用领域

铝镍钴新开发的应用领域：温度传感器的霍尔组件和汽车用电子传感器；

传统应用有：磁电管、TWT 放大器、调节器、马达和仪表；

稀土永磁材料在诸多应用领域已经取代铝镍钴。

性能

铝镍钴磁体的矫顽力很低，反向磁场、磁性材料的撞击或者接触都能很容易使其退磁，因此，存储和包装铝镍钴磁体应该彼此磁极方向相反；

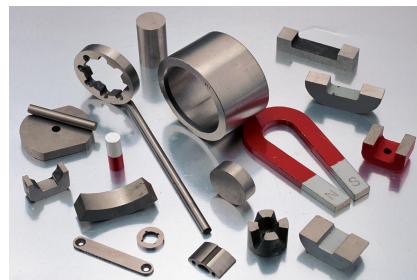
开路磁路中，铝镍钴磁体的长度比直径之比至少是4:1，如果其小于4:1，磁体易退磁；

铝镍钴磁体有很好的耐腐蚀性，不用进行表面涂处理；铝镍钴磁体具有最低的Br可逆温度系数，为-0.02%/℃，故其温度稳定性优良；

最高工作温度可达550℃。

其它

铝镍钴磁体硬度高，韧性低，故其机加工难度大。



Summarize

The AlNiCo permanent magnet materials are primarily composed of aluminum, nickel, cobalt, iron, copper and titanium, AlNiCo is produced by casting or sintering process. The casting type AlNiCo magnets have better magnetic properties than sintering type, but the magnetic performance uniformity of sintering AlNiCo magnets is better.

Grades of Alnico is defined by cobalt content. the range from zero(AlNiCo 3) to 40%(AlNiCo 8).

The isotropic AlNiCo magnet grades (2, 3 and 4) magnetic properties are relatively lower than anisotropic AlNiCo magnet (AlNiCo and 9);

The anisotropic grades AlNiCo magnet orientation is achieved during heat treatment, by cooling the product from a temperature of about 20000 F(10930C) at a controlled rate, within a magnetic field which conforms to the preferred direction of magnetization.

Application field

AlNiCo magnet application newly developed: temperature-sensitive as hall-effect and MR-based automotive electronic sensors. The traditional applications include magneto, TW T amplifiers, actuators, motors and Instrument.

In many applications they are replaced by the rare earth permanent-magnets.

Property

The coercive force of AlNiCo magnets is very low, so it can be easily demagnetized by reverse magnetic force, impact or touched each other, so AlNiCo magnets should be stored and packed with the magnetic poles opposing each other.

In open magnetic circuit, the ration of length/diameter (L/D) of the AlNiCo magnets should be at least 4:1. If it is less than 4:1, AlNiCo magnets property will be easy to diamagnetism. AlNiCo magnets have good corrosion resistance; no coating is needed for surface protection.

AlNiCo magnets have the lowest Br temperature coefficient which is -0.02%/℃ so they have excellent temperature stability.

The maximum operation temperature of AlNiCo magnets is 550℃.

Others

AlNiCo magnets are extremely difficult to machining because they are very hard and brittle.

烧结铝镍钴磁特性参数 Magnetic Properties for Sintered AlNiCo

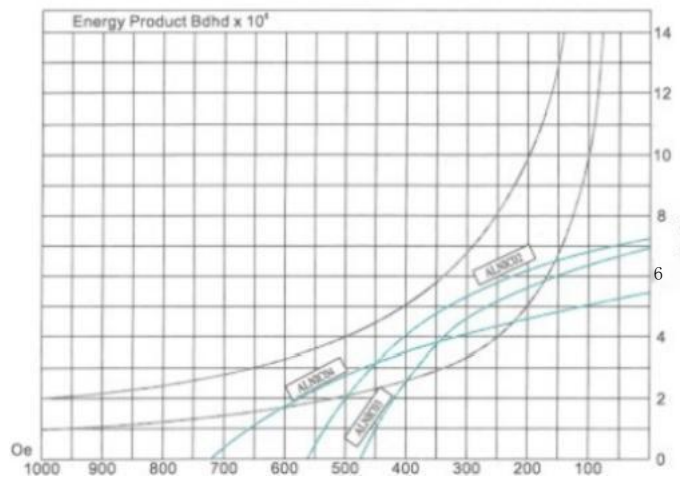
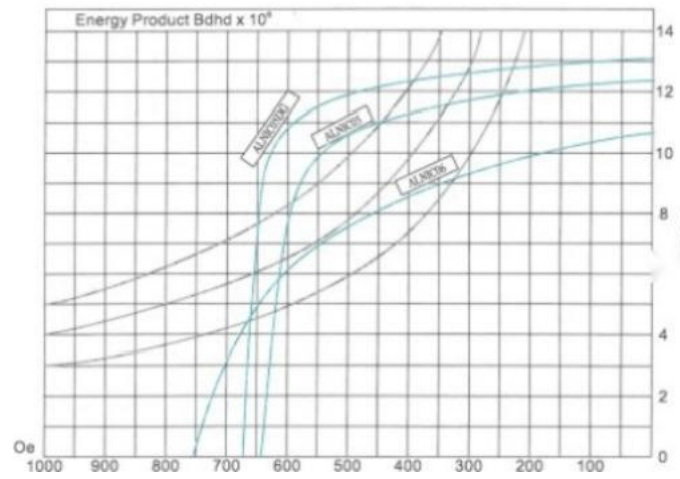
牌号 Grade	剩余磁感应强度 Br		矫顽力hc		内禀矫顽力hcj		最大磁能积(BH) max		密度D	温度系数 QBr	居里温度 TC	备注ramaks
	mT	kGs	kA/m	kOe	kA/m	kOe	kJ/m3	MGOE	g/cm³	%/℃	℃	
SLN8	520.00	5.20	40.00	0.50	43.00	0.54	8~10	1.0~1.25	6.80	-0.022	760.00	Isotropic
SLNG12	700.00	7.00	40.00	0.50	43.00	0.54	12~14	1.5~1.75	7.00	-0.014	810.00	Isotropic
SLNGT14	570.00	5.70	76.00	0.95	78.00	0.98	14~16	1.75~2.0	7.10	-0.020	850.00	Isotropic
SLNGT18	560.00	5.60	88.00	1.10	90.00	1.13	18~22	2.25~2.75	7.20	-0.016	850.00	Isotropic
SLNG28	1050.00	10.50	46.00	0.58	47.00	0.59	28~33	3.5~4.15	7.20	-0.016	850.00	Anisotropic
SLNG34	1100.00	11.00	50.00	0.63	51	0.64	34~38	4.3~4.8	7.20	-0.020	890.00	Anisotropic
SLNGT28	1000.00	10.00	56.00	0.70	57	0.71	28~30	3.5~3.8	7.20	-0.020	850.00	Anisotropic
SLNGT31	780.00	7.80	104.00	1.30	106.00	1.13	33~36	3.9~4.5	7.20	-0.020	850.00	Anisotropic
SLNG33J	650.00	6.50	136.00	1.70	150.00	1.88	31~36	4.15~4.5	7.20	-0.020	850.00	Anisotropic
SLNGT38	800.00	8.00	123.00	1.55	126.00	1.58	38~42	4.75~5.3	7.20	-0.020	850.00	Anisotropic
SLNGT42	880.00	8.80	120.00	1.50	122.00	1.53	42~48	5.3~6.0	7.25	-0.020	850.00	Anisotropic

铸造铝镍钴磁特性参数 Magnetic Properties for Casted AlNiCo

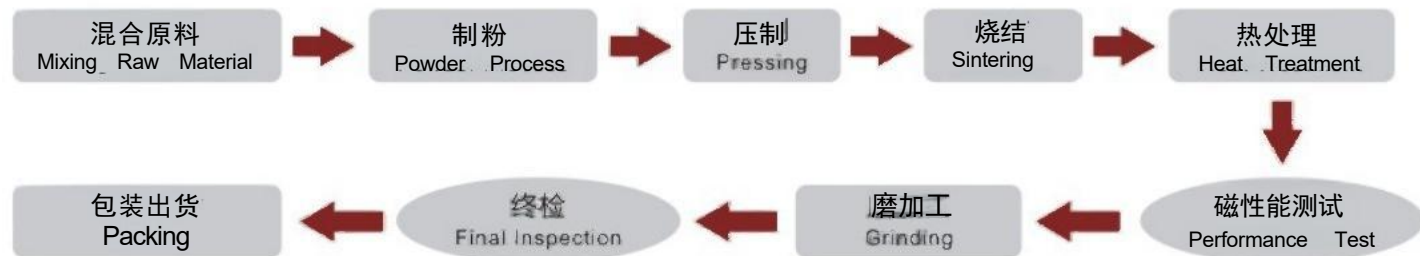
牌号 Grade	剩余磁感 应强度Br		矫顽力 Hcb		最大磁能积 (BH) max		密度 D	居里温度 Tc	工作温度 TW	温度系数 QBr	MMP	IEC
	mT	kGs	A/m	kOe	kJ/m3	MGOe	g/cm	℃	℃	%/℃	等同于 Equivalent	等同于 Equivalent
1. Isotropy各向同性												
*CLN9	690	6.9	37	0.47	9	1.13	6.9	760	760	-0.03	Alnico3	Alnico9/3
*CLN8	600	6.0	40	0.5	10	1.25	6.9	760	760	-0.03	Alnico3	Alnico9/3
*CLNG12	720	7.2	45	0.6	12	13.5	7	810	810	-0.03	Alnico2	Alnico12/6
*CLNG13	700	7.0	48	0.6	13	1.63	7	810	810	-0.03	Alnico2	Alnico12/6
2. LNG Series常规等级												
CLNG16	800	8.0	53	0.66	16	2	7.3	850	850	-0.02	[Alnico4]	/
CLNG28	1050	10.5	46	0.6	30	3.75	7.3	850	850	-0.02	[Alnico4]	/
CLNG32	1180	11.8	46	0.575	32	4	7.3	890	890	-0.02	[Alnico5C]	/
CLNG34	1180	11.8	46	0.575	34	4.25	7.3	890	890	-0.02	[Alnico5C]	/
CLNG37	1200	12.0	48	0.6	37	4.65	7.3	890	890	-0.02	Alnico5	Alnico37/5
CLNG40	1250	12.5	48	0.6	40	5	7.3	890	890	-0.02	Alnico5	
CLNG44	1250	12.5	52	0.65	44	5.5	7.3	890	890	-0.02	Alnico5	Alnico44/5
CLNG48	1250	12.5	52	0.65	48	6	7.3	890	890	-0.02	Alnico5DG	Alnico52/6
CLNG52	1300	13.0	56	0.7	52	6.5	7.3	890	890	-0.02	Alnico5DG	Alnico52/6
CLNG60	1350	13.5	56	0.7	60	7.5	7.3	890	890	-0.02	Alnico5~7	/
3. LNGT Series of High Performance高性能LNGT系列												
*CLNGT18	580	5.8	90	1.13	18	2.2	7.3	860	860	-0.03	Alnico7	Alnico17/9
CLNGT32	800	8.0	100	1.25	32	4	7.3	860	860	-0.03	Alnico8	Alnico38/11
CLNGT34	800	8.0	104	1.3	34	4.25	7.3	860	860	-0.03	Alnico8	Alnico38/11
CLNGT38	820	8.2	110	1.38	38	4.75	7.3	860	860	-0.03	Alnico8	Alnico38/11
CLNGT44	880	8.8	120	1.5	44	5.5	7.3	860	860	-0.03	Alnico8	
CLNGT60	900	9.0	110	1.38	60	7.5	7.3	860	860	-0.03	Alnico9	Alnico60/11
CLNGT72	1050	10.5	112	1.41	72	9	7.3	860	860	-0.03	Alnico9	/
CLNGT82	1100	11.0	120	1.5	82	10.25	7.3	860	860	-0.03	Alnico9	/
CLNGT36J	700	7.0	140	1.75	36	4.5	7.3	860	860	-0.03	Alnico8HC	Alnico36/15

说明：*——各向同性的，其它的是各向异性的。 Remark:*—— Isotropic, others are anisotropic.

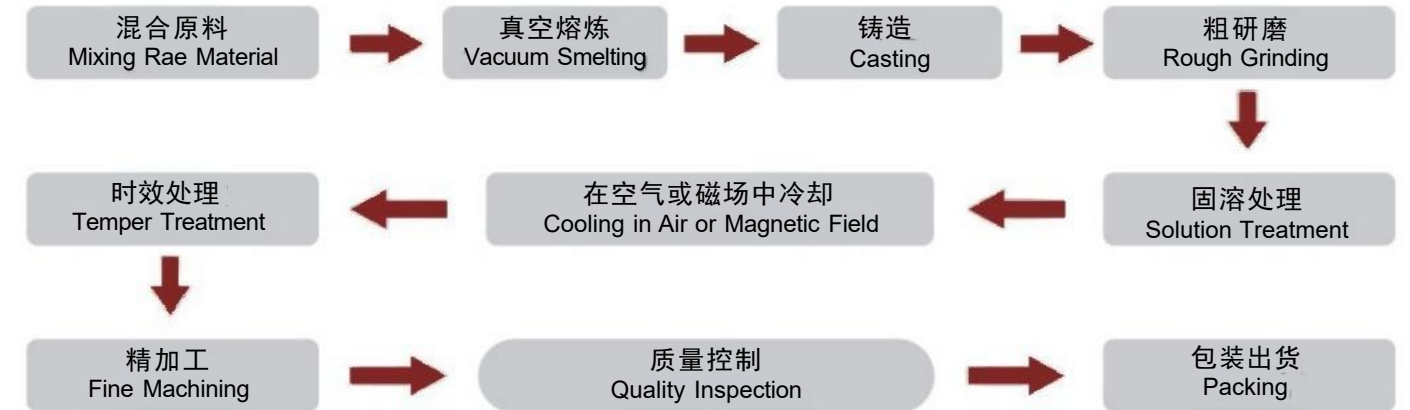
温度退磁曲线 Demagnetization Curves



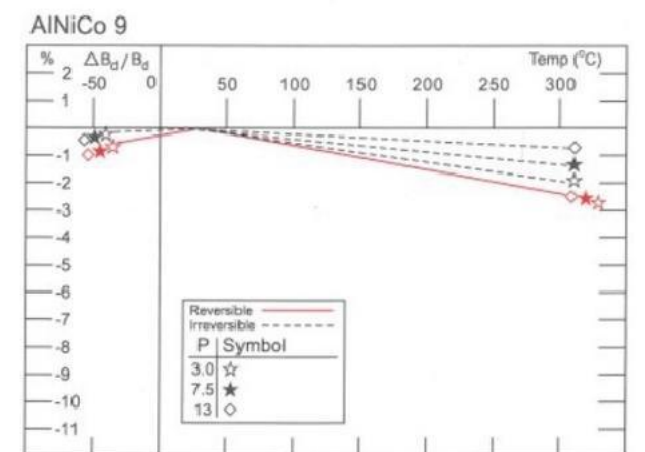
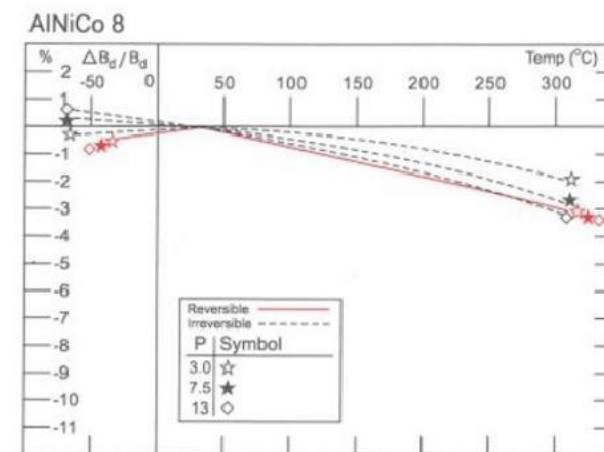
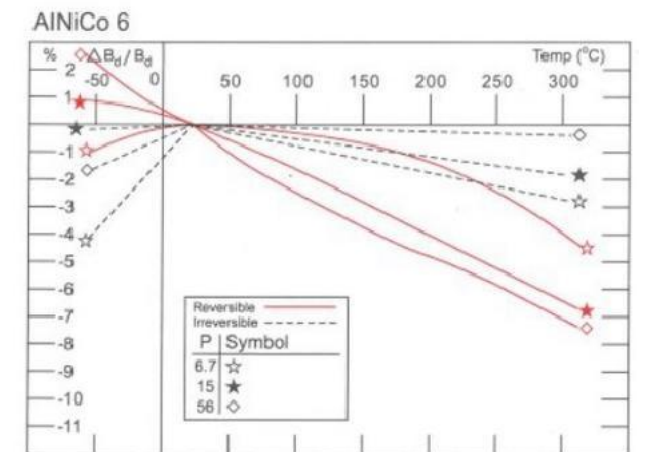
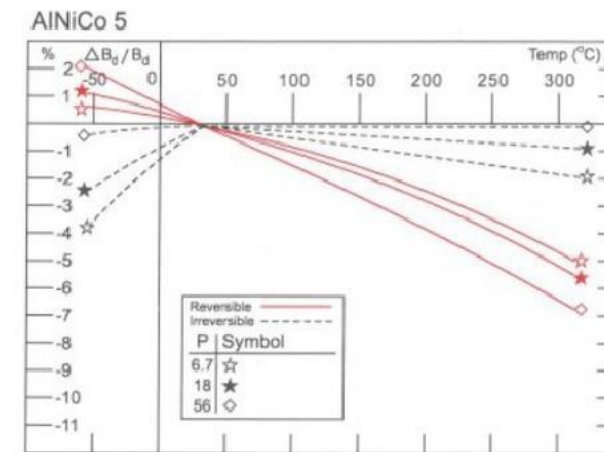
烧结铝镍钴生产工艺流程图 Production Process Flow Chart for Sintered ALNiCo



铸造铝镍钴生产工艺流程图 Production Process Flow Chart for Casted ALNiCo



温度影响 Temperature Effect



胶磁磁体

Flexible Ferrite Magnets

简介 Introduction



概述

胶磁产品已经有30多年的历史，它是一种铁氧体磁粉和橡胶化合物的复合材料，分各向同性和各向异性两大类。

应用领域

各向同性胶磁的磁性能比各向异性胶的低；各向同性胶磁主要应用在宣传、装饰礼品、冰箱贴、和玩具、教学材料。

各向异性胶磁主要应用在微型达，传感器和磁性吸附产品。

性能

胶磁产品具备优异柔性，易折迭、弯曲而不害其磁性；

胶磁产品具备优异机加工特性，易裁剪、切割和打孔。

其它

胶磁产品的粘结剂为聚乙烯和丁腈橡胶；

胶磁的使用温度可达120°C。

Summarize

The flexible ferrite magnet has more than 30 years history. It is a composite material of ferrite magnet powder and compound rubber. There are two types: anisotropic & isotropic.

Application field

The isotropic flexible ferrite magnets' magnetic property is lower than anisotropic flexible ferrite magnets.

The principle applications of isotropic flexible ferrite magnets are promotional, decoration, refrigerator, toys and learning material.

The principle application of anisotropic flexible ferrite magnets are mic-motors, Sensors and magnetic attraction application.

Property

The flexible ferrite magnet has excellent flexibility characteristic, easily folded and twisted without damaging the magnetic property of the magnet.

The flexible ferrite magnet has excellent machining characteristic, easily for cutting, punching, drilling.

Others

The flexible ferrite magnet's binder is the polyethylene and poly butadiene rubber.

The flexible ferrite magnet's operation temperature is up to 1200°C.



磁特性参数 Magnetic Properties

牌号 Grade	剩余磁感应强度Br mT	矫顽力Hcb kA/m	内禀矫顽力Hcj kA/m	最大磁能积(BH) _{max} kJ/m ³	密度D g/cm ³	工作温度Tw °C
Y04T	135~155	85~105	175~210	3.2~5.0	3.8	<80
Y10	220~240	145~165	190~225	9.0~10.6	3.4	<80
Y11	230~250	160~185	225~260	10.0~12.0	3.5	<80
Y13	250~270	175~195	200~230	11.5~14.5	3.6	<80
Y15	>270	175~190	200~230	>14.5	3.7	<80

生产工艺流程图 Production Process Flow Chart



规格标准 Standard Size

	最小尺寸 Min. Size	标准尺寸 Standard Size	最大尺寸 Max. Size
长度Length	0	30M/100'	无限制No limitation

胶磁卷材 Flexible Magnetic Sheet In Roll			
宽度Width	0	610/620/1000mm	1200mm
	0	24'' / 40''	471
厚度Thickness	0.3mm	0.4/0.5/0.6/0.7mm.	2mm
	0.012'	0.015'' / 0.02'' / 0.03'	0.078'

胶磁片材 Flexible Magnetic Sheet In Sheet			
宽度Width	0	610/620/1000mm	1200mm
	0	24' / 40' ,	47'
厚度Thickness	0.3mm	0.4/0.5/0.6/0.7mm.	8mm
	0.012'	0.015'' / 0.02'' / 0.03'	0.315'

组件 assembly

1. 电机组件 Motor assembly

除了永磁磁铁，我们还可以根据客户的特殊需求，制造各种组件产品，比如电机外壳组件、高速转子和精密步进电机转子等电机组件。

Besides the permanent magnets, we are capable of producing different assembly parts for your specific needs, such as motor housing assembly, high speed rotor & multiple step motor rotor electrical components etc.

高速转子



步进&无刷电机转子



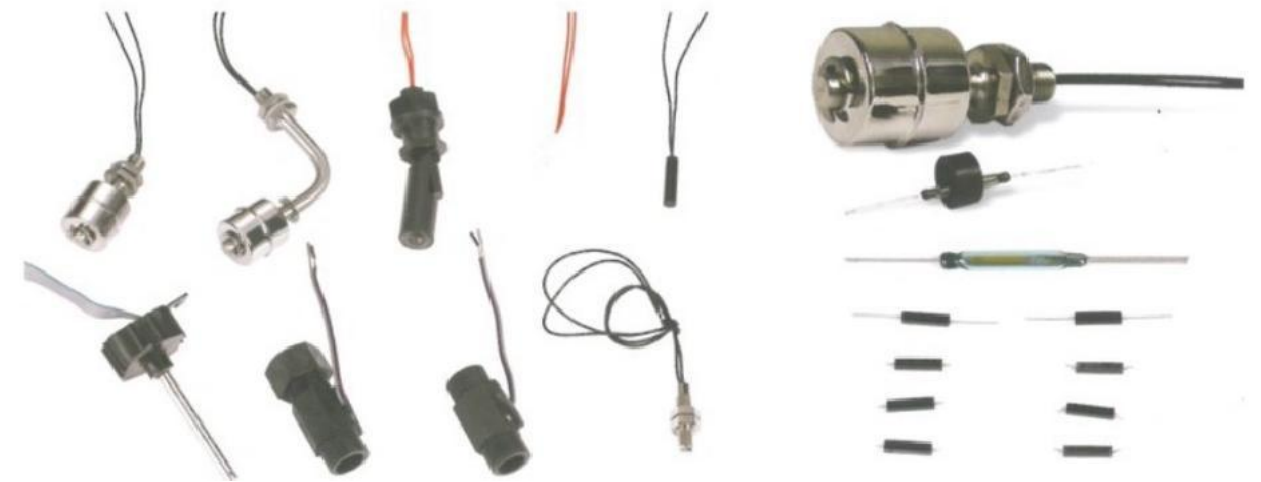
电机外壳组件



2. 磁性传感组件

我们在磁传感应用上的经验，除了可以帮助客户选择合适的磁石，还能为客户定制各种磁传感组件，用于直线、角度和速度测量、安防产品和仪表等。

The experience of the magnetic sensor application of our senior technical engineer can choose suitable magnetic products and provide profession design solution to meet customers'specific needs; we also can produce the magnetic sensor component for linear, rotary and speed sensor, security product and instrumentation etc.



3. 其他组件

除了生产电机组件和传感组件外，我司还帮助客户设计生产其他组件，如磁性锁，磁过滤器、磁挂钩等组件产品。

Besides the motor assembly and sensor assembly, we also help customer to design and manufacture other assemblies, such as magnetic lock, magnetic filter, magnetic holding purpose and so on.



品质控制

Quality Control

简介 Introduction

先进而齐全的检测设备，全面的检测方法，充分运用 APOP, PPAP, MSA 等工具，对产品质量进行监测；

优秀的质量控制团队，超前的质量意识，能对各种磁性材料和磁组件的质量进行检测、分析和控制；对供货商质量管理体系进行评、辅导，促进供货商以系统保证质量；

坚决按照 ISO 质量管理要求，执行公司“提供价值，满足需求，超越期望，实现共赢”的总方针，为客户提供质量合格的产品。

Quality policy

Fully use the quality tools such as APQP PPAP, MSA and so on to control the product quality, with advanced and all-round measure device, and overall measurement methods.

Excellent quality control team, with super quality intention, can measure, analysis, and control all kinds of magnets material and components. Audit and assist supplier quality system to help supplier assure quality.

Strictly according to ISO quality system requirement, perform company's general guides" improve value, fulfillment requirement, exceed expectation, realize the multi-winner", to supply eligible products for customers.

检测设备 measure equipment



2 coordina teprojector
二次元



Universal microscope
万能工具显微镜



Multi-poles magnetization tester
多级测磁仪



Constant temperature and humidity tester
恒温恒湿测试仪

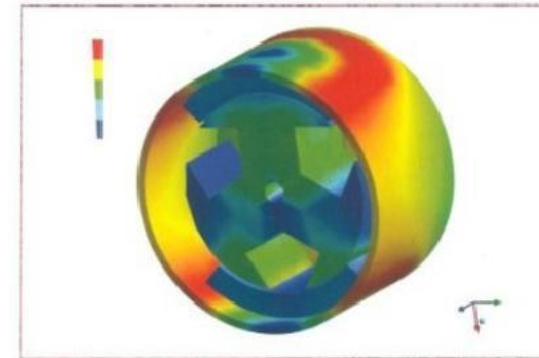


salt spray tester
盐雾试验机



Hysteresigraph
磁滞曲线仪

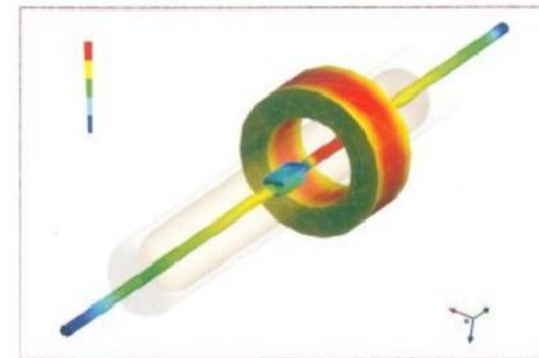
磁组件设计方案 Magnetic Assembly Design Solution



雷機磁路模拟
Motor Magnetic Simulation



高速电机转子
High Speed Rotor



磁簧开关组件模拟
Reed Switch Assembly Simulation



磁簧开关组件
Reed Switch Assembly

MXCY 具备优化的、您所信赖的专业磁方案设计能力，能应用专业的分析软件辅助设计，以获得高效的、低成本的设计方案，如电机高速转子、传感器组件等。

Magnetic Assembly Design Solution
MXCY has design ability about optimized and reliable professional magnetic solutions. Apply to professional analysis software design, timely and economical cost design projects will be achieved, such as motor high-speed rotor and sensor assembly etc.

永磁材料介绍

Introduction for Performance Magnetic Material

磁性材料术语 Mangnic Material Terms

什么是永磁体?

磁体是能显示外部磁场的物体，包括永磁体和软磁体，永磁体是将其放入一个强磁场中，对外显示磁场，在该外加磁场去掉后，任能对外产生磁场的物体，永磁体的工作环境不发生变化时(如温度、退磁场等)其对外的磁场是持续的，不会减弱的。

B— 磁感应强度

磁感应强度是描述磁场强弱和方向的基本物理量，是矢量，常用符号B表示，又称磁通密度

Br— 剩余磁感应强度

将一个磁体在外磁场的作用下充磁到技术饱和后撤消外磁场，此时磁体表现的磁感应强度是剩余磁感应强度，简称剩磁。

Hcb —磁感矫顽力

磁体在反向充磁时，使磁感应强度降为零所需反向磁场强度的值称为磁感矫顽力。

Hcj— 内禀矫顽力

磁体在反向充磁时，使磁体的磁化强度降为零所需施加的反向磁场强度，该反句磁场强度的值称之为内禀矫顽力。

(BH) max —最大磁能积

退磁曲线上任何一点的B和H的乘积(即BH)称为磁能积，而BxH的最大值称之为最大磁能积。

H— 磁场强度

磁场强度是磁感应强度B与真空磁导率 μ_0 之商，再与磁极化强度M之差值，即 $H=(B/\mu_0)-M$ ，是一个矢量。

What is a permanent Magnet?

Magnet is an object that exhibits an external magnetic field, including permanent magnet and soft magnet.

It permanent magnet is a material that when inserted into a strong magnetic will not only exhibit a magnetic field but also continue to exhibit a magnetic once removed from the original field.

If the permanent magnet operation environment (temperature, demagnetizing field.etc) isn't change, the exhibited magnetic field would be continuous without weakening

B- Magnetic Induction

Magnetic induction is a basic parameter to describe the magnetic field strength and direction.is a vector, its common

symbol is B, also was called magnetic flux density.

Br- Residual Magnetic Induction

After a magnet was magnetized to technical saturated under the action of external magnetic field, then the external magnetic field was cancelled. at this time, the magnet performed magnetic induction is residual magnetic induction, shortened form is remanence.

Hcb-Coercive Force

A magnet was magnetized by reverse magnetic field, making its magnetic induction reduce to zero, at this time, the reverse magnetic field strength value is magnetic induction coercive force.

Hcj-Intrinsic Coercive Force

A magnet was magnetized by reverse magnetic field, making magnetic polarization intensity reduce to zero, at this time, the reverse magnetic field strength value is Intrinsic coercive force.

(BH) max Maximum Magnetic Energy Product

B and H multiplication of any point on the demagnetization curve (namely BH) we called magnetic energy product, the biggest BH value is the maximum magnetic energy product.

H- Magnetic Field Strength

Magnetic field strength mean that magnetic induction B divide vacuum permeability, then the division value subtract magnetic polarization intensity M,namely $H=(B/\mu_0)-M$,is a vector.

磁性材料选择及设计注意事

1、 异方性磁体根据磁化方向磁性差异很大，设计时需 I. Special attention should be paid, in designing, to anisotropic magnet poles as the great differences between magnetization directions.

2、 商品型录的磁特性在不同尺，形状等场合，磁性可能有偏差，应制样确认。

2.A sample should he confirmed before placing an order as magnetic properties listed in catalogue may Vary at different Sizes and shapes

3、 自行充磁时，应考虑材质之保磁力，并提供足够磁场充磁，以防达不到原磁路设计要求的磁性。同时要注意安全，防止磁头爆裂及磁体飞出。

3.Hcb and Hej indexes should be considered when the magnet is magnetized by your company. The magnetic field should be strong enough to meet the designing requirements.At the same time, great attention should be paid to prevent the magnetizing fixture from Cracking and splashing 01 the magnets.

4、 使用者切断及分割磁体时，可能造成磁特性劣化或者著磁不良。

4.The magnetic properties might become inferior or demagnetized when being sheared or pulled apart.

5、 很多磁体材质具有硬、脆的特性，使用在高速旋转及振动场合时，应特别留意维持磁体和轭铁接著强度，设计时应考虑避破裂现象。

5.The bonding strength between magnet and yoke should be noted when the magnet is used in high rotation speed or/and in vibration conditions. Due to the hard and inflexible properties of the magnet.It is necessary to consider, when in designing, to avoid cracking and splashing Of the magnet.

6、 磁体和磁体、轭铁、极片等使用接著剂接合时，应注意接著剂的种类、用量条件、强度等，确认其可信赖度。

6.The reliability of the binder should be confirmed in terms Of these properties such as types, volume used, working conditions and strength when used to bond magnet to other magnets, yoke or polarization chips.

7、 磁体在特定的环境下储存及用，避腐蚀性气体、高温潮湿、低温环境对磁体造成腐蚀或磁性及强度的劣化。

7.Magnets should be stored and applied in specified environment from corrosion or strength inferiority by corrosive gas, high and low temperature or moisture.

8、 著磁体的磁体应妥善保管，用非导磁物质(纸板或

PVC 盘等)隔开，避免磁体互吸及碎屑污染，同时应远离磁场，避免退磁。

8.Magnetized magnets should be carefully taken care of, be insulated with non-magnetic material from other magnets and iron debris, and be kept distant from other magnetic fields