ChenYang SmCo Magnets

Samarium Cobalt Magnets

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General Information

SmCo magnets (Samarium Cobalt) have also a very strong magnetic field. They tend to resist demagnetization extremely well. Unlike Neodymium magnets, it is also very corrosion resistant. SmCo magnets can operate at higher temperatures up to 300°C and are widely used in applications in which higher operating temperature and higher corrosion and oxidation resistance are crucial. The temperature coefficient of remanence is usually less than ±0.05%.

Two common compositions of SmCo magnets are $SmCo_5$ and Sm_2Co_{17}. They can be sintered and bonded. Generally, the cost of SmCo magnets is higher than NdFeB magnets. But NdFeB magnets are stronger than SmCo magnets.

Material Information

- An alloy compose of $SmCo_5$/Sm_2Co_{17} produce by powder metallurgical method
- Extremely hard & brittle
- High demagnetization resistance
- Excellent anti-corrosion properties
- More expensive than NdFeB magnets because of limited raw material supply
- Outstanding thermal stability

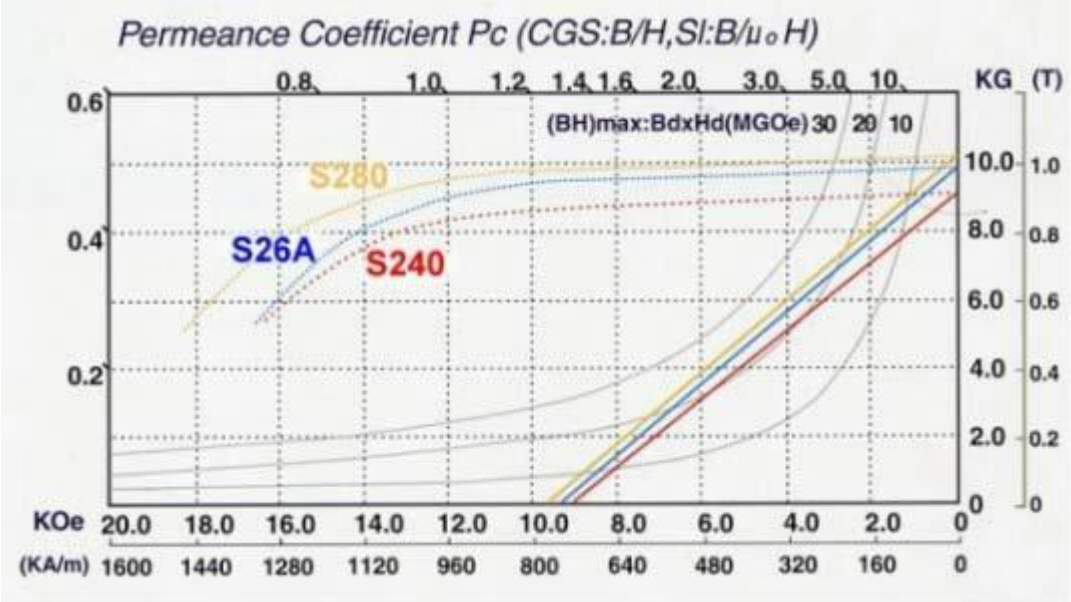
Typical Physical Properties

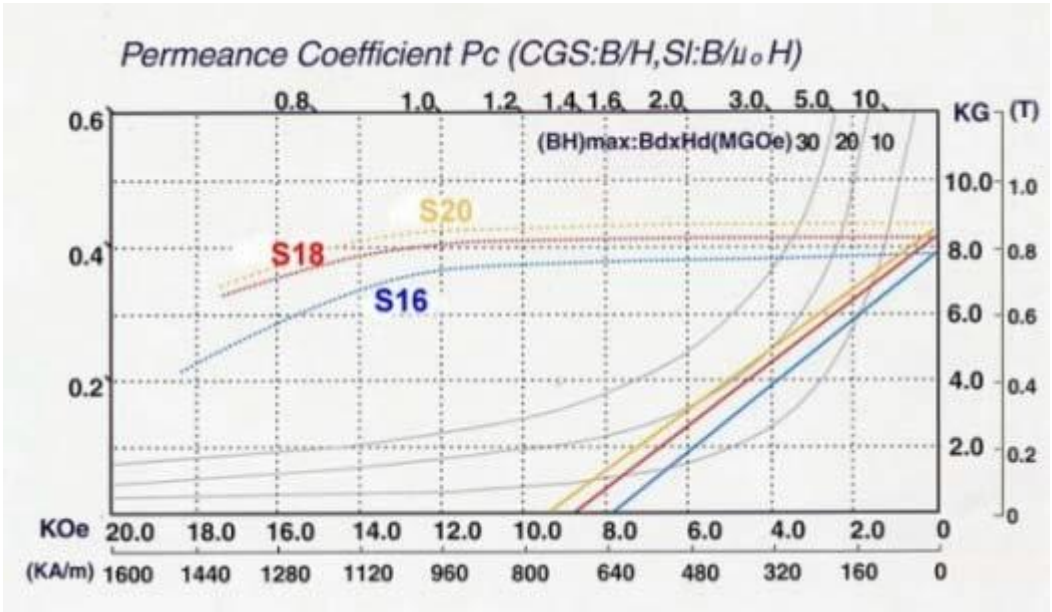
Curie Temperature (°C)	700-800
Maximum Operating Temperature (°C)	350
Resistivity (μ ohm.cm)	50-90
Hardness (Hv)	450-600
Density (g/cm^3)	8.0-8.5
Relative Recoil Permeability (μ_{rec})	1.10
Saturation Field Strength, kOe (kA/m)	37.5 (3000)
Temperature Coefficient of Br (%/°C)	-0.05 ~ -0.03
Temperature Coefficient of iHc (%/°C)	-0.25 ~ -0.19

Magnetic Properties of SmCo Magnets (Samarium Cobalt)

Material	Grade	Remanence		Coercivity		Intrinsic Coercivity		Max. Energy Product	
		Br(mT)	Br(kGs)	bHc(kA/m)	bHc(kOe)	iHc (kA/m)	iHc (kOe)	(BH)max (KJ/m^3)	(BH)max (MGOe)
$SmCo_5$	S16	790-840	7.9-8.4	612-660	7.7-8.3	1830	23	118-135	15-17
	S18	840-890	8.4-8.9	644-692	8.1-8.7	1830	23	135-151	17-19
	S20	890-930	8.9-9.3	684-732	8.6-9.2	1830	23	150-167	19-21
	S22	920-960	9.2-9.6	710-756	8.9-9.5	1830	23	167-183	21-23
	S24	960-1000	9.6-10.0	740-788	9.3-9.9	1830	23	183-199	23-25
Sm_2Co_{17}	S220	930-970	9.3-9.7	676-740	8.5-9.3	1433	18	160-183	20-23
	S240	950-1020	9.5-10.2	692-764	8.7-9.6	1433	18	175-191	22-24
	S260	1020-1050	10.2-10.5	748-796	9.4-10.0	1433	18	191-207	24-26
	S280	1030-1080	10.3-10.8	756-812	9.5-10.2	1433	18	207-220	26-28
	S300	1080-1100	10.8-11.0	788-835	9.9-10.5	1433	18	220-240	28-30
	S320	1100-1130	11.0-11.3	812-860	10.2-10.8	1433	18	230-255	29-32

Typical Demagnetization Curves of SmCo Magnets (Samarium Cobalt Magnets)





Dimension Range / Nominal Tolerance

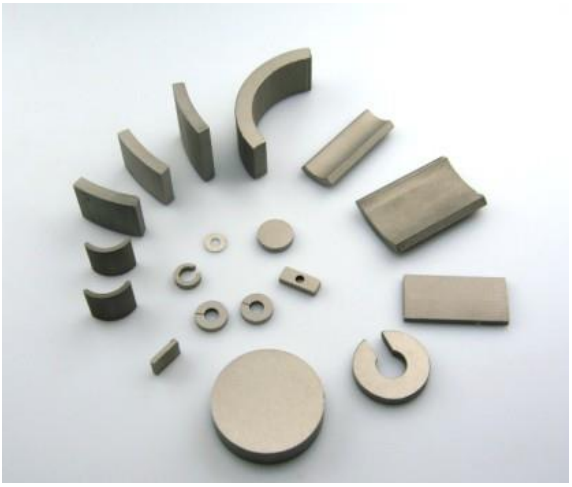
Ring Magnet	Outer Diameter (mm)	Inner Diameter (mm)	Thickness (mm)
Maximum	100	80	50
Minimum	2.6	1.8	0.5
Tolerance	±0.1	±0.1	±0.1

Block Magnet	Length (mm)	Width (mm)	Thickness (mm)
Maximum	100	80	50
Minimum	2.0	1.5	0.5
Tolerance	±0.1	±0.1	±0.1

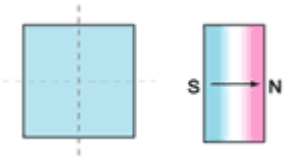
Disc Magnet	Diameter (mm)	Thickness (mm)
Maximum	100	50
Minimum	1.2	0.5
Tolerance	±0.1	±0.1

Segment & other irregular shapes can be manufactured according to customer's sample or blueprint

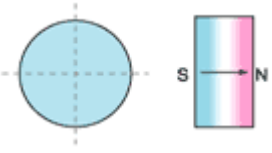
ChenYang Technologies GmbH & Co. KG supplies various kinds of sintered Samarium Cobalt (SmCo) magnets in specific sizes and shapes according to the customers' requirements. It also allows its customers to customize characteristics of their magnets. The shapes can be discs, rings, blocks, slabs, cylinders, tiles and other specific shapes.



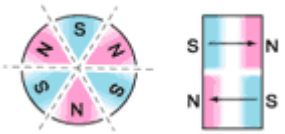
Magnetization Directions of SmCo Magnets



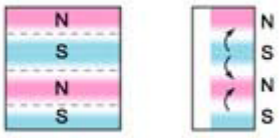
Oriented through thickness



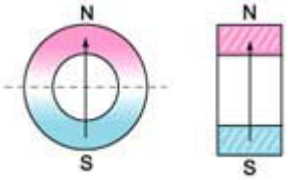
Axially oriented



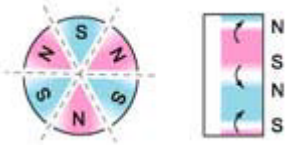
Axially oriented in segments**



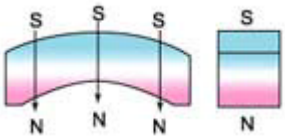
Oriented laterally
multipole on one face **



Oriented through diameter **



Multipole oriented
in segments on one face **



Diametrical oriented

** Spezial magnetization coil is needed

For information about Standard Magnets please see price lists