

# Samarium Cobalt

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## Samarium Cobalt Magnet Materials

Samarium Cobalt holds its standard property in higher maximum temperatures than neodymium, although its maximum strength is less. The cost of SmCo material is the most expensive, so SmCo is recommended only when its performance in a high temperature environment is a concern.

1. SmCo permanent magnet has high magnetic energy product and high coercive force. Its properties are better than Alnico, ferrite permanent magnet. Its max. energy product is up to 239kJ/m<sup>3</sup>(30MGOe), which is three times of that of AlNiCo8 permanent magnet, eight times of that of ferrite permanent magnet (Y40). So the permanent magnetic component made from SmCo material is small, light and stable in property. It is widely applied to electro acoustic & telecommunication apparatus, electric motors, measure meters, peg-top electronic watch, microwave apparatus, magnetic mechanism, sensor and other static or dynamic magnetic routes.

2. The curie temp. of the SmCo permanent magnet is high and its temp. Coeff. is low. So it is suitable for use at 300, high temp.

3. SmCo permanent magnet is hard and brittle. Its rigidity strength, tensile strength and press strength are low. So it is not suitable for framework.

4. The main ingredient of SmCo permanent magnet is metal cobalt(CoY99.95%). So its price is high.

### Samarium Cobalt Corrosion Characteristics (Surface Treatment)

Samarium Cobalt rare earth magnets are very resistant to corrosion and do not normally require any surface treatment.

## Magnetic Properties

### Sintered SmCo5 /Sm2Co17 Material Characteristics

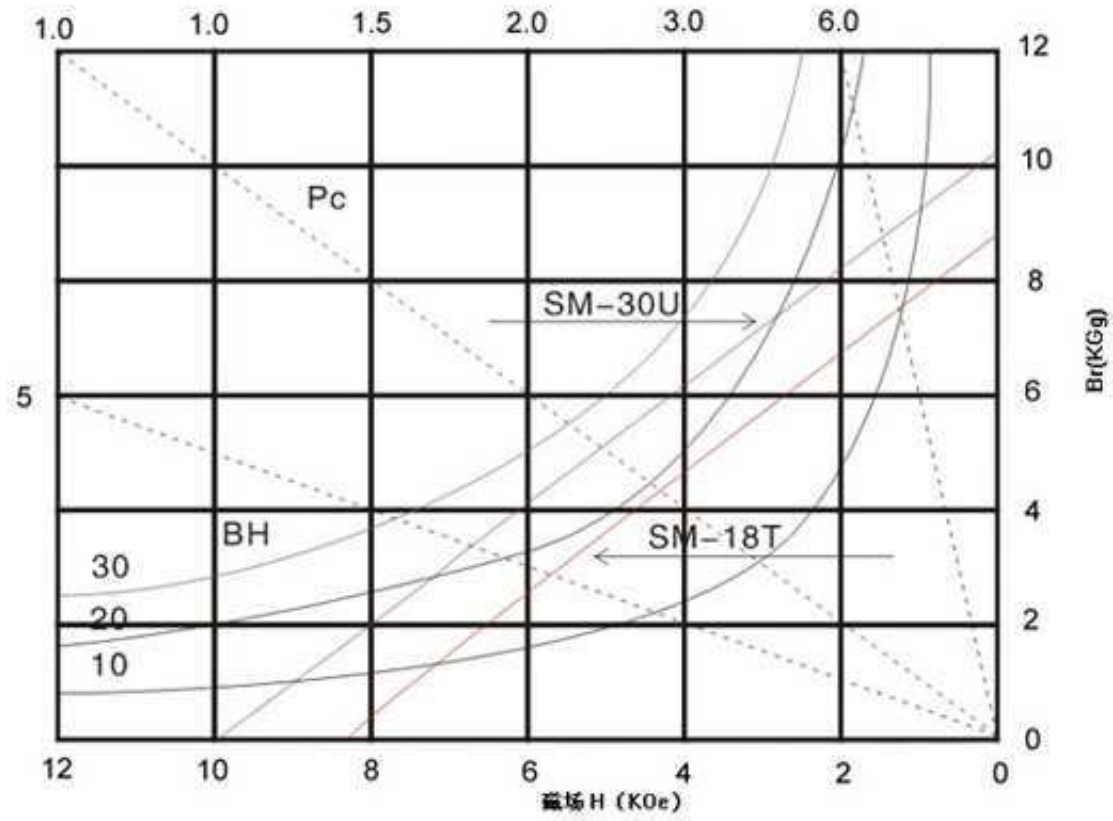
Grade	Residual Flux Density		Intrinsic Force		Coercive Force		Maximum Energy Product	
	mT	KGs	KA/m	KOe	KA/m	KOe	KJ/m3	MGOe
XG-16A	800-900	8.0-9.0	>1989	>25.0	613-692	7.7-8.7	127±16	16±2
XG-16B	800-900	8.0-9.0	>1432	>18.0	613-692	7.7-8.7	127±16	16±2
XG-20A	880-1000	8.8-10	>1989	>25.0	637-756	8.0-9.5	159±16	20±2
XG-20B	880-1000	8.8-10	>1432	>18.0	637-756	8.0-9.5	159±16	20±2
XG-22A	1000-1060	10-10.6	>2389	>30.0	676-796	8.5-10.0	175±16	22±2
XG-22B	1000-1060	10-10.6	>796	>10.0	637-756	8.0-9.5	175±16	22±2
XG-26A	1020-1080	10.2-10.8	>2070	>26.0	756-836	9.5-10.5	207±16	26±2
XG-26B	1020-1080	10.2-10.8	>796	>10.0	716-796	9.0-10.0	207±16	26±2
XG-30A	1060-1150	10.6-11.5	>1989	>25.0	756-836	9.5-10.5	239±16	30±2
XG-30B	1060-1150	10.6-11.5	>796	>10.0	716-796	9.0-10.0	239±16	30±2

## Physical Properties

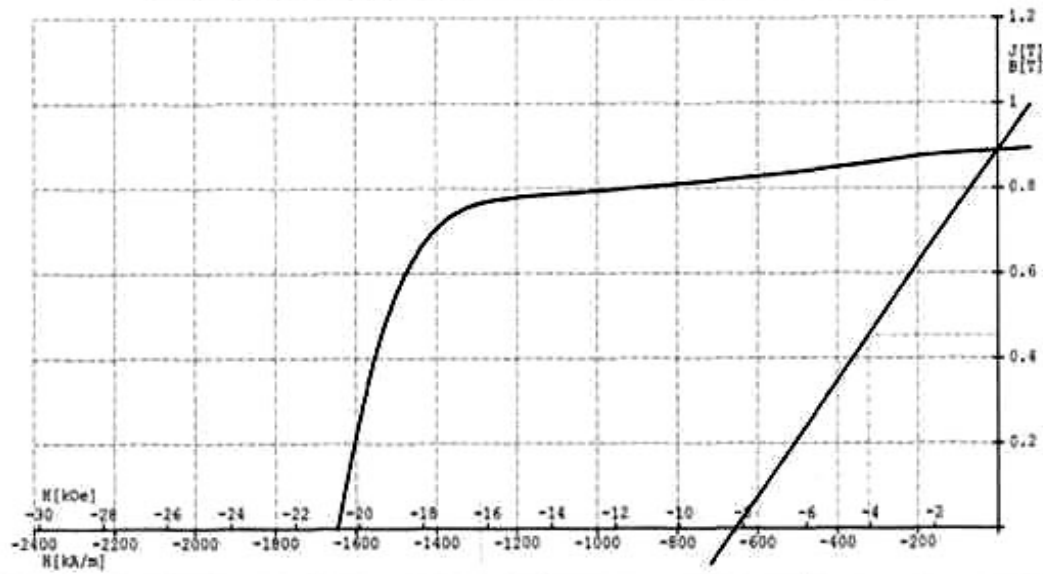
### Physical Characteristics of Sintered SmCo

Tc Curie Temp	Tc	℃	800~850	Thermal ExpansionCoefficient	C//	1/℃	~8×10 <sup>-5</sup>
ρ Density	D	g/cm <sup>3</sup>	8.3~8.5		C⊥	1/℃	~11×10 <sup>-5</sup>
μ <sub>rec</sub> Recoil permeability	μ <sub>rec</sub>		1.00~1.05	Bending Strength		N/m <sup>2</sup>	~1.5×10 <sup>8</sup>
Max. Operating Temp	T.max	℃	350	Compressive Strength		N/m <sup>2</sup>	~8×10 <sup>8</sup>
Electrical Resistivity		Ω.Cm	~8.6×10 <sup>3</sup>	Tensile Strength		N/m <sup>2</sup>	~3.5×10 <sup>7</sup>
Vicker	Hv		500~600	Young's Modulus		N/m <sup>2</sup>	~1.2×10 <sup>11</sup>
Thermal Permeability		W/mK	~12	H <sub>a</sub> Magnetizing Field		Ka/m	≥1600

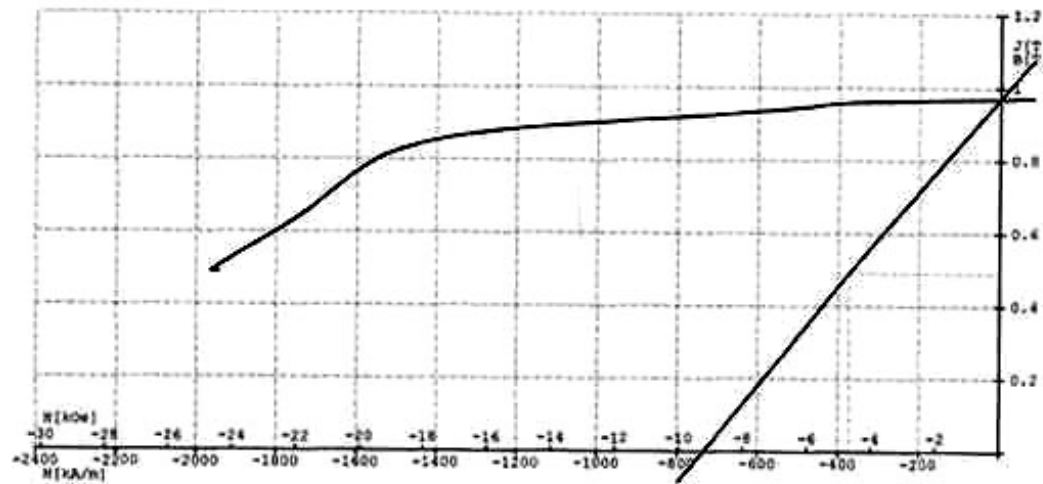
# Typical Curve



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