

## Sintered Samarium Cobalt Magnet

Sintered Samarium Cobalt (SmCo) magnets are manufactured by using powder metallurgy techniques, which include stringent process controls and complicated heat treatment, cycles. The composition of this Sintered SmCo magnets alloy is approximately 35% Samarium, 60% cobalt with the balance being Fe & Cu. By varying the percentages of this composition and changing the sintering & heat treatment cycles the two grades 1:5 & 2:17 are produced. The difference between them is in energy product, temperature coefficient and magnetisation force required to saturate. The 2:17 Sintered SmCo magnets (most popular) offers a better performance & lower temperature coefficient, however it is slightly more expensive and requires very high fields to magnetise it.



### Features of Sintered SmCo Magnet:

An alloy compose of SmCo5/Sm2Co17; Limited raw material supply result high in cost; High resistance to demagnetization; Energy products go up to 32 MGoe, suitable for using in a temperature of over 100 °C to 350°C or hostile environments; Various shapes and dimensions can be met; low temperature coefficient; High performance and Extremely brittle; Outstanding thermal stability; Excellent resistance to corrosion and oxidation, no coating is needed for surface protecting.

### Applications of Sintered SmCo Magnet:

Sintered Samarium Cobalt magnet is suitable for machines with high magnetic requirements Good for strict working environment requirement. robotics, machine tools to relays sensors, UHV magnetrons, motors, watch, transducers, instruments, positional detector, generators, radar and so on. Electronic magnetron, Magnetic Transmission, Magnetic Treatment, Magnistor, Etc.

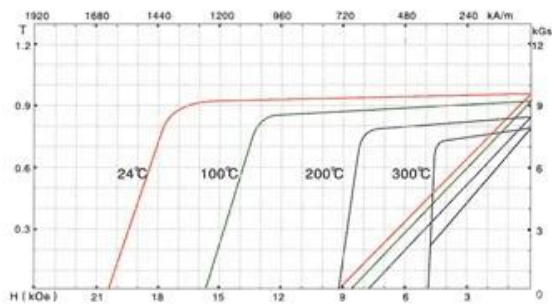
Grade		Residual Fulx Br		Coercive Force Hcb		Intrinsic Coercive force Hcj		Max. Energy Product (BH) max	
		mT	kGs	kA/m	koe	kA/m	koe	kJ/m <sup>3</sup>	MGoe
SMCO 1:5	SmCo5-NE16	750~880	7.5~8.8	597±40	7.5±0.5	≥1591	≥20.0	127±16	16±2
	SmCo-NE16A	750~880	7.5~8.8	597±40	7.5±0.5	≥1989	≥25.0	127±16	16±2
	SmCo-NE16B	750~880	7.5~8.8	597±40	7.5±0.5	≥2386	≥30.0	127±16	16±2
	SmCo-NE18A	800~930	8.0~9.3	637±40	8.0±0.5	≥1591	≥20.0	143±16	18±2
	SmCo-NE18T	800~930	8.0~9.3	637±40	8.0±0.5	≥1591	≥20.0	143±16	18±2
	SmCo-NE18B	800~930	8.0~9.3	637±40	8.0±0.5	≥1989	≥25.0	143±16	18±2
SMCO 2:17	SmCo-NE20	900~950	9.0~9.5	≥670	8.5~9.2	≥1591	≥20.0	159±16	20±2
	SmCo-NE20A	900~980	9.0~9.8	637±40	8.0±0.5	≥1989	≥25.0	159±16	20±2
	SmCo-NE22	900~1030	9.0~10.3	653±40	8.2±0.5	≥1432	≥18.0	175±16	22±2
	SmCo-NE22A	900~1030	9.0~10.3	653±40	8.2±0.5	≥1989	≥25.0	175±16	22±2
	SmCo-NE24	950~1080	9.5~10.8	676±40	8.2±0.5	≥1432	≥18.0	191±16	24±2
	SmCo-NE24A	1000~1100	10.0~11.0	676±40	8.2±0.5	≥1989	≥25.0	191±16	24±2
	SmCo-NE26	1000~1130	10.0~11.3	357~516	4.5~6.5	413~556	5.0~7.0	207±16	26±2
	SmCo-NE26A	1000~1130	10.0~11.3	716±40	9.0±0.5	≥796	≥10.0	207±16	26±2
	SmCo-NE26B	1000~1130	10.0~11.3	716±40	9.0±0.5	≥1194	≥15.0	207±16	26±2
	SmCo-NE26C	1000~1130	10.0~11.3	716±40	9.0±0.5	≥1591	≥20.0	207±16	26±2
	SmCo-NE26D	1000~1080	10.0~10.8	≥732	9.0~10.5	≥2300	≥30.0	207±16	26±2

SmCo-NE28	1060~1180	10.6~11.8	357~516	4.5~6.5	413~556	5.0~7.0	223±16	28±2
SmCo-NE28A	1060~1180	10.6~11.8	763±40	9.6±0.5	≥796	≥10.0	223±16	28±2
SmCo-NE28B	1050~1150	10.5~11.5	≥750	9.4~9.8	≥960	≥12.0	223±16	28±2
SmCo-NE28C	1060~1180	10.6~11.8	763±40	9.6±0.5	≥1194	≥15.0	223±16	28±2
SmCo-NE30	1100~1200	11.0~12.0	438~597	5.5~6.5	454~597	5.7~7.5	238±16	30±2
SmCo-NE30A	1100~1200	11.0~12.0	≥560	7.0~8.5	≥716	≥12.0	238±16	30±2
SmCo-NE30B	1100~1200	10.8~11.2	796-859	10.0-10.8	≥1990	≥25.0	223-247	28.0-31.0
SmCo-NE32	≤1120	≤11.2	≤557	≥7.0	≥637	≥8.0	≥239	≥30.0

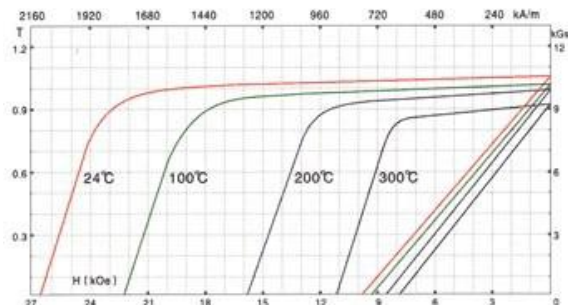
### Characteristics & application of Samarium Cobalt permanent magnet

Curie Temp.	T <sub>c</sub>	°C	800-850	Coeff. of thermal expansion	C//	1/°C	~8×10 <sup>-5</sup>
Density	D	g/cm <sup>3</sup>	8.3~8.5		C⊥	1/°C	~11×10 <sup>-5</sup>
Recoil Permeability	μ <sub>rec</sub>		1.00~1.05;	Rigidity strength		N/m <sup>2</sup>	~1.5×10 <sup>8</sup>
Max. Working Temp.	T <sub>max</sub>	°C	350	Compress strength		N/m <sup>2</sup>	~8×10 <sup>8</sup>
Electrical Resistivity		Ω.Cm	8.6×10 <sup>5</sup>	Tensile strength		N/m <sup>2</sup>	~3.5×10 <sup>7</sup>
Vickers Hardness	Hv		500~600	Young's Modulus		N/m <sup>2</sup>	~1.2×10 <sup>11</sup>
Thermal Conduct rate		W/mK	~12	Magnetization field H <sub>a</sub>		kA/m	≥1600

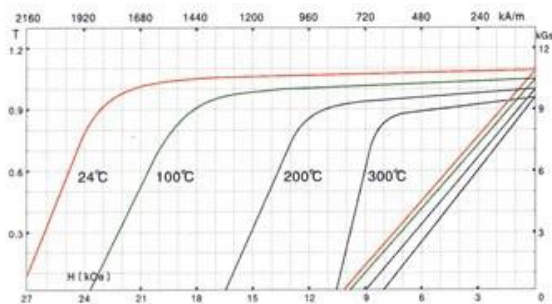
### Typical Demagnetization Curves of Samarium Cobalt Magnets



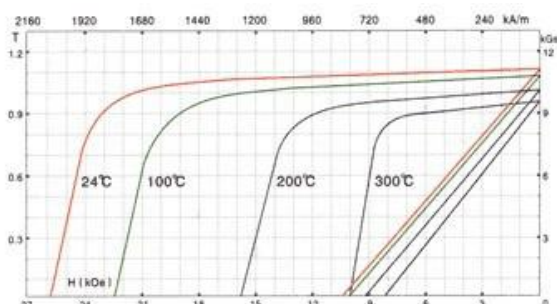
SmCo<sub>5</sub> Demagnetization Curve NE 18A



Sm<sub>2</sub>Co<sub>17</sub> Demagnetization Curve NE 26A



Sm<sub>2</sub>Co<sub>17</sub> Demagnetization Curve NE 28A



Sm<sub>2</sub>Co<sub>17</sub> Demagnetization Curve NE 30A