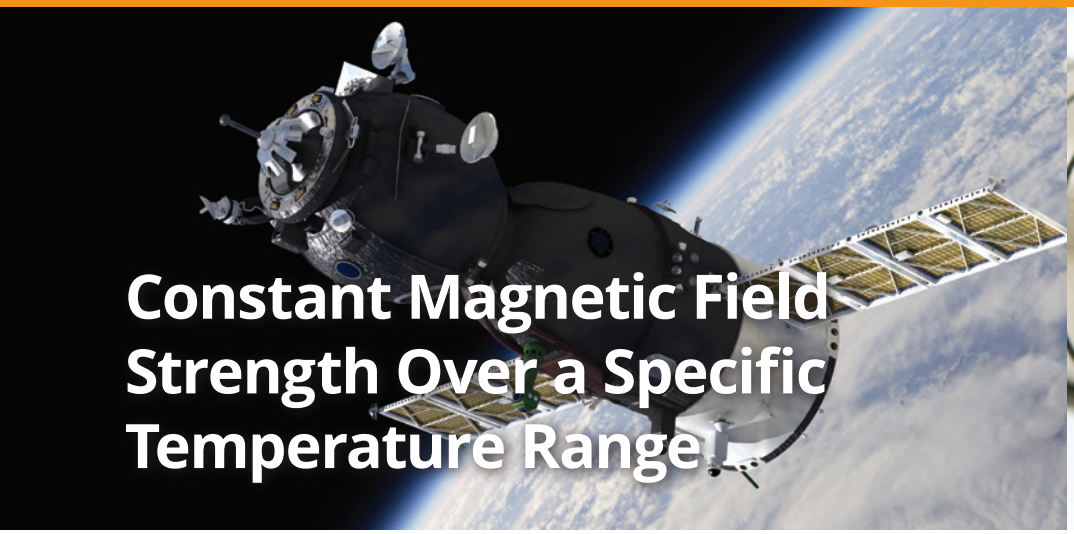
TEMPERATURE COMPENSATED SmCo MAGNETS



Constant Magnetic Field Strength Over a Specific Temperature Range

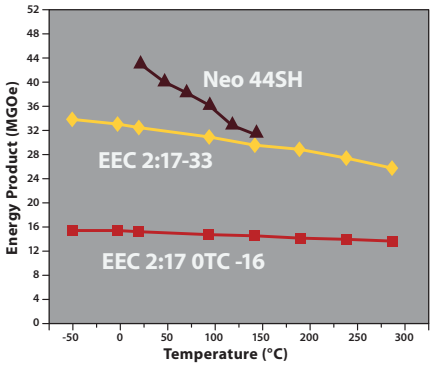
The Original Developers of Temperature Compensated SmCo

Electron Energy Corporation (EEC) successfully developed a series of zero reversible temperature coefficient (RTC) magnets with a maximum energy product $(BH)_{max}$ of 18 MGOe. These magnets, known as temperature compensated samarium cobalt (SmCo TC), were created to address the extremely low RTC requirement for applications such as traveling wave tubes (TWTs), gyroscopes, and accelerometers. EEC's SmCo TC magnets are best known for providing constant magnetic field strength across a specific range of temperatures.

More Than Just Your Supplier

As a producer of permanent magnet materials, EEC has a deep understanding of the science behind the materials. This insight separates EEC from competitors and allows its engineering team to provide best-in-class service to customers. EEC's applications engineering team works closely with customers to develop magnetic solutions and optimize design performance. In addition to applications engineering, EEC also provides magnetic circuit design and research and development services.

Reversible Temp. Coefficient



Features of EEC SmCo TC Magnets:

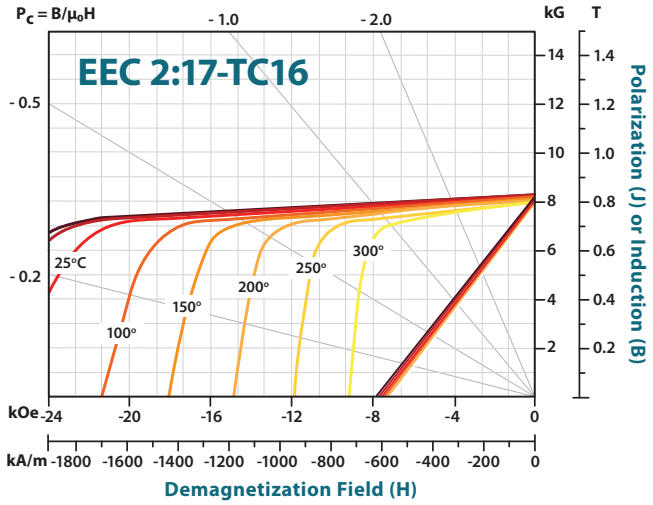
- Constant magnetic field strength across a specific temperature range
- Highest corrosion resistance of any rare earth magnet material
- Reversible temperature coefficient (RTC) of residual induction (B_r) very close to zero
- Available with maximum energy product $(BH)_{max}$ of up to 22 MGOe
- Operating temperatures up to 320°C
- No coating needed to protect parts from corrosion

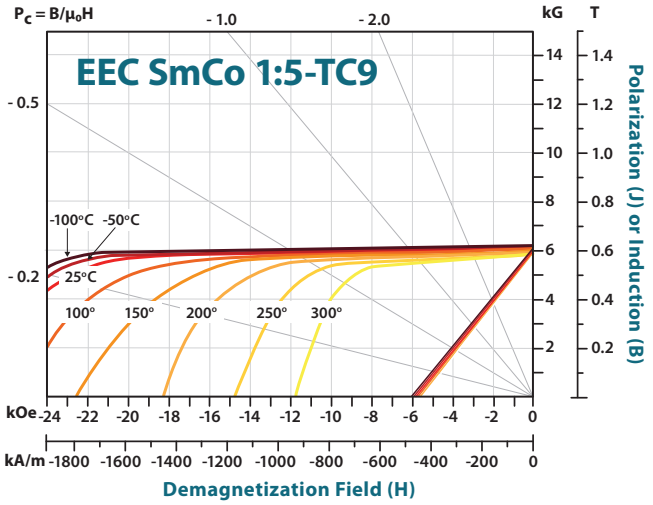
Application Types:

- Actuators
- Gyroscopes
- Accelerometers
- Inertial Guidance Systems
- Traveling Wave Tubes (TWTs)
- High Precision Weighing Scales
- High-Speed Motor Assemblies
- Klystrons
- Magnetrons

924 Links Avenue, Landisville, PA 17538 • 800.824.2735 • Fax: 717.898.0660
www.electronenergy.com

ELECTRON ENERGY CORPORATION





Magnetic Properties of TC SmCo Magnets

Magnet Grade	Maximum Energy Product $(BH)_{max}$				Residual Induction B_r				Coercivity H_c				Intrinsic Coercivity iH_c		RTC of B_r (1)	Max. Operating Temp.(2)
	MGOe		kJ/m³		kG		T		kOe		kA/m		kOe	kA/m	%/°C	°C
	Typ	Min	Typ	Min	Typ	Min	Typ	Min	Typ	Min	Typ	Min	Min	Min	Typ	Typ
Sm^2Co^{17} Temperature Compensated Magnets																
EEC 2:17-TC22	22	20	175	159	9.75	9.35	0.98	0.94	9.2	8.9	732	708	24	1910	-0.030	320
EEC 2:17-TC20	20	18	159	143	9.25	8.85	0.93	0.89	8.8	8.4	700	669	24	1910	-0.025	320
EEC 2:17-TC18	18	16	143	127	8.75	8.35	0.88	0.84	8.2	7.8	653	621	24	1910	-0.015	320
EEC 2:17-TC16	16	14	127	111	8.25	7.85	0.83	0.79	7.8	7.4	621	589	24	1910	-0.001	320
EEC 2:17-TC15	15	13	119	103	8.00	7.60	0.80	0.76	7.3	6.9	581	549	24	1910	-0.001	320
EEC 2:17-TC13	13	11	103	88	7.50	7.10	0.75	0.71	6.8	6.4	541	509	24	1910	0.008	320
EEC 2:17-TC7	7	5	56	40	5.50	5.10	0.55	0.51	4.9	4.5	390	358	24	1910	-0.034	320
EEC 2:17-TC5	5	3	40	24	4.50	4.10	0.45	0.41	4	3.5	318	279	24	1910	-0.008	320
EEC 2:17-TC4	4	2	32	16	4.00	3.60	0.40	0.36	3.5	3.0	279	239	24	1910	0.012	320
$SmCo^5$ Temperature Compensated Magnets																
EEC 1:5 TC15	15	13	119	103	7.8	7.5	0.78	0.75	7.6	7.3	605	581	24	1910	-0.034	300
EEC 1:5 TC13	13	11	103	88	7.3	7.0	0.73	0.70	7.2	6.8	573	541	24	1910	-0.025	300
EEC 1:5 TC11	11	9	88	72	6.7	6.3	0.67	0.63	6.5	6.1	517	486	24	1910	-0.015	300
EEC 1:5 TC9	9	7	72	56	6.1	5.7	0.61	0.57	6.0	5.6	478	446	24	1910	-0.001	300
EEC 1:5 TC7	7	6	56	48	5.4	5.0	0.54	0.50	5.3	4.9	422	390	24	1910	0.012	300
EEC 1:5 TC6	6	5	48	40	5.0	4.5	0.50	0.45	4.8	4.3	382	342	24	1910	0.025	300
EEC 1:5 TC5	5	4	40	32	4.6	4.1	0.46	0.41	4.0	3.6	318	287	24	1910	-0.03	300
EEC 1:5 TC4	4	3	32	24	4.0	3.5	0.40	0.35	3.5	3.1	279	247	24	1910	-0.018	300
EEC 1:5 TC3	3	2	24	16	3.5	3.0	0.35	0.30	3.1	2.6	247	207	24	1910	-0.002	300
EEC 1:5 TC2	2	1	16	8	2.8	2.3	0.28	0.23	2.5	2.0	199	159	24	1910	0.025	300

(1) Typical reversible temperature coefficient (RTC) of B_r calculated between -50°C and 150°C. It is for reference only.
(2) Maximum operating temperature has strong dependence on the loadline and operating environment. Consult EEC engineering for details.

924 Links Avenue, Landisville, PA 17538 • 800.824.2735 • Fax: 717.898.0660
www.electronenergy.com

ELECTRON ENERGY CORPORATION