Bonded Samarium Cobalt

Grade Characteristics

Grade	Type of Material	Isotropic/Anisotropic
SAMLET 3	Injection Molded SmCo	Isotropic
SAMLET 7R	Injection Molded SmCo	Anisotropic
SAMLET 8A	Injection Molded SmCo	Anisotropic
SAMLET 10A	Injection Molded SmCo	Anisotropic
SAM 5	Compression Molded SmCo	Isotropic
SAM 11R	Compression Molded SmCo	Anisotropic
SAM 13A	Compression Molded SmCo	Anisotropic

Composition Characteristics

Grade	Process	Orientation
SAM 15	Compression	Diametral/Transverse
SAM 5	Compression	
SAM 15R	Compression	Radial
SAMLET 9R	Injection	Radial
SAM13A	Compression	Axial (thickness)
SAMLET 10A	Injection	Axial (thickness)
SAM 15A	Compression	Axial (thickness)
SAM 11R	Compression	Radial
SAM 17	Compression	Diametral/Transverse
SAMLET 3	Injection	
SAMLET 7R	Injection	Radial
SAMLET 8A	Injection	Axial (thickness)

Magnetic Characteristics

Grade	Br	Br	Hcb	Hcb	Hcj	Hcj	Bhmax	Bhmax
	mT	KGs	Gauss	KA/m	KOe	Oersteds	KOe	KA/m
SAM 15	780-810	7.8-8.1	470-520	9.0-12.0	12.0-14.0	720-950	112-120	14.0-15.0
SAM 5	460-490	4.6-4.9	310-350	3.9-4.4	9.0-13.0	720-1030	38-44	4.7-5.5
SAM 15R	680-830	6.8-8.3	430-540	5.4-6.8	8.0-11.0	640-870	80-120	10.0-15.0
SAMLET 9R	620-660	6.2-6.6	380-440	4.6-5.6	9.0-12.0	720-950	60-76	7.5-9.5
SAM13A	730-760	7.3-7.6	440-510	5.6-6.4	9.0-12.0	720-950	96-104	12.0-13.0
SAMLET 10A	640-680	6.4-6.8	410-490	5.2-6.2	9.0-12.0	720-950	68-84	8.5-10.5

Grade	Br	Br	Hcb	Hcb	Hcj	Hcj	Bhmax	Bhmax
	mT	KGs	Gauss	KA/m	KOe	Oersteds	KOe	KA/m
SAM 15A	780-810	7.8-8.1	480-520	6.0-6.6	9.0-12.0	720-950	112-120	14.0-15.0
SAM 11R	650-780	6.5-7.8	390-500	4.9-6.3	8.0-11.0	640-870	64-112	8.0-14.0
SAM 17	860-890	8.6-8.9	490-540	6.2-6.8	9.0-12.0	720-950	128-136	16.0-17.0
SAMLET 3	320-370	3.2-3.7	200-260	2.5-3.3	9.0-12.0	720-950	18.0-22.0	2.2-2.7
SAMLET 7R	540-580	5.4-5.8	340-410	4.2-5.2	9.0-12.0	720-950	48.0-60.0	6.0-7.5
SAMLET 8A	570-620	5.7-6.2	380-440	4.6-5.6	9.0-12.0	720-950	58.0-68.0	7.0-8.5

Auxilliary Characteristics

Grade	Saturation Magnetizing Force Hs	Saturation Magnetizing Force Hs	Hk [H@0.9 Br]	Hk [H@0.9 Br]	Recoil Permeability	Hx	BrHx
	kOe	kA/m	kA/m (Squareness) .	kOe (Squareness)	D B/D H		
SAM 15	1600	20	320-560	4.0-7.0	1.05	>4.0	>28
SAM 5	1600	20	240-560	3.0-7.0	1.05	>2.5	>10
SAM 15R	1600	20	240-560	3.0-7.0	1.1	>4.0	>24
SAMLET 9R	1600	20	280-600	3.5-7.5	1.05	>3.5	>18
SAM13A	1600	20	320-560	4.0-7.0	1.05	>4.0	>24
SAMLET 10A	1600	20	280-600	3.5-7.5	1.05	>4.0	>24
SAM 15A	1600	20	280-520	3.5-6.5	1.1	>4.0	>28
SAM 11R	1600	20	200-520	2.5-6.5	1.05	>3.0	>18
SAM 17	1600	20	240-480	3.0-6.0	1.1	>4.0	>30

Grade	Saturation Magnetizing Force Hs	Saturation Magnetizing Force Hs	Hk [H@0.9 Br]	Hk [H@0.9 Br]	Recoil Permeability	Hx	BrHx
	kOe	kA/m	kA/m (Squareness)	kOe (Squareness)	D B/D H		
SAMLET 3	1600	20	200-560	2.5-7.0	1.05	>2.0	>6
SAMLET 7R	1600	20	320-560	4.0-7.0	1.05	>3.5	>17
SAMLET 8A	1600	20	320-560	4.0-7.0	1.05	>3.5	>18

Thermal Characteristics

Grade	Max Operating Temp	Rev Temp Coeff
	°C	%/°C
SAM 15	150	0.032-0.037
SAM 5	150	0.032-0.037
SAM 15R	150	0.032-0.037
SAMLET 9R	120	0.032-0.037
SAM13A	150	0.032-0.037
SAMLET 10A	120	0.032-0.037
SAM 15A	150	0.032-0.037
SAM 11R	150	0.032-0.037
SAM 17	150	0.032-0.037
SAMLET 3	120	0.032-0.037
SAMLET 7R	120	0.032-0.037
SAMLET 8A	120	0.032-0.037

MSDS

Section 1 - Product Name

Product Name: Epoxy Bonded Samarium Cobalt Magnet (SAM Series)

Section 2 - Hazardous Ingredients

Chemical Name: RE 2 TM 17; RE - Sm, TM - Fe, Cu, Zr

Material/Component(s):

Material or Component	Weight %	CAS No.	ACGUH TLV (mg/m^3)
Samarium (Sm)	20-30	7440-19-9	NA
Iron (Fe)	10-20	7439-89-6	NA
Copper (Cu)	2-12	7440-50-8	NA
Zirconium (Zr)	2-4	7440-67-7	NA

Section 3 - Physical Characteristics

Vapor Pressure: NA
Vapor Density: NA
Specific Gravity: 6.6
Melting Point: 1350 C
Evaporation Rate: NA
Odor: None detectable
Solubility in Water: Insoluble

Section 4 - Fire and Explosion Hazard Data

Flash Point: NA
FLAMMABLE LIMITS: NA
LEL: NA
UEL: NA
Extinguishing Media: Dry sand or special powder extinguisher
Special Fire Fighting Procedures: Use a special powder extinguisher or pour dry sand on the fire to cut off the oxygen supply. Water should be avoided at all costs.

Unusual Fire and Explosion Hazards(s): Flammable

Section 5 - Reactivity Data

Stability: Stable
Conditions to Avoid: NA
Incompatibility (Materials to Avoid): NA
Hazardous Polymerization: Will not occur
Hazardous Decomposition or Byproducts : NA

Section 6 - Health Hazard Data

Health Hazards (Acute & Chronic): Allergic skin irritations can occur on contact. Harmful if inhaled. Irritation of mucous membranes and epithelium of the respiratory organs. Dermal immune response may occur as result of repeated or long term exposure. Carcinogenicity - NTP? No IARC Monographs? No OSHA Regulated? No Signs and Symptoms of Exposure - None Medical Conditions Generally Aggravated by Exposure - None

Emergency and First Aid Procedures:

Procedure For	Procedure
Skin Contact	Wash with soap and plenty of water
Eye Contact	Immediately wash eye thoroughly with clean water for 15 minutes; report abnormalities to a doctor
Ingestion	Induce vomiting by finger, rinse mouth with clean water; report any abnormalities to a doctor
Ingestion	Induce vomiting by finger, rinse mouth with clean water; report any abnormalities to a doctor

Section 7 - Precautions for Safe Handling and Use

Spill Procedure: Not a hazard as a solid compact magnet. In case of spill, use protective gear and place spillage into metal can and store in preparation for disposal.
Waste Disposal Method: Observe all federal, state and local regulations when disposing this material.
Precautions to be taken in Handling and Storing: Wear cotton gloves when handling. Keep away from heat sources. Store in a cool, dry place.

Section 8 - Control Measures

Respiratory Protection: NA

Eye Protection: Safety goggles
Skin Protection: Protective clothing and gloves advisable
Ventilation: Local exhaust
Work / Hygienic Practices: NA