

## ETREMA Products Terfenol-D Magnetostrictive Smart Material (Tb0.3Dy0.7Fe1.92)

Category : Metal , Electronic/Magnetic Alloy

### Material Notes:

Terfenol-D is the commercial name for Tb0.3Dy0.7Fe1.92; a composition of material that exhibits giant magnetostriction. Magnetostriction is the phenomenon in which an applied magnetic field causes an anisotropic change in length in the material (Joule effect) or a change in the stress state of the material changes its magnetic properties (Villari effect). Magnetostrictive alloys have a wide range of applications in the areas of ultrasonics, sensors, audio, and transducers such as: Actuators Seismic tools Non-round machining High-powered ultrasonics Sonar Fuel injection Vibration control Information provided by ETREMA Products.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_ETREMA-Products-Terfenol-D-Magnetostrictive-Smart-Material-Tb03Dy07Fe192.php](http://www.lookpolymers.com/polymer_ETREMA-Products-Terfenol-D-Magnetostrictive-Smart-Material-Tb03Dy07Fe192.php)

Physical Properties	Metric	English	Comments
Density	9.25 g/cc	0.334 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	28.0 MPa	4060 psi	
Modulus of Elasticity	25.0 - 35.0 GPa	3630 - 5080 ksi	
	18.0 - 55.0 GPa	2610 - 7980 ksi	at constant current
	50.0 - 90.0 GPa	7250 - 13100 ksi	at constant voltage
Compressive Strength	700 MPa	102000 psi	
Bulk Modulus	90.0 GPa	13100 ksi	

Thermal Properties	Metric	English	Comments
CTE, linear	12.0 $\mu\text{m}/\text{m}\cdot\text{°C}$	6.67 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 20.0 °C	@Temperature 68.0 °F	
Specific Heat Capacity	0.320 - 0.370 J/g·°C	0.0765 - 0.0884 BTU/lb·°F	
Thermal Conductivity	10.5 - 10.8 W/m·K	72.9 - 75.0 BTU-in/hr-ft <sup>2</sup> ·°F	
Melting Point	1240 °C	2260 °F	

Component Elements Properties	Metric	English	Comments
Dysprosium, Dy	42.3 %	42.3 %	

Iron, Fe Component Elements Properties	40 % Metric	40 % English	Comments
Terbium, Tb	17.7 %	17.7 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000600 ohm-cm	0.0000600 ohm-cm	
Magnetic Permeability	4.5 - 10	4.5 - 10	
Curie Temperature	357 °C	675 °F	

Descriptive Properties	Value	Comments
Magnetomechanical Conversion Efficiency	49 - 56%	
Magnetomechanical Coupling Factor	0.7 - 0.75	
Magnetostrictive Energy Density	0.014 - 0.025 J/cm <sup>3</sup>	
Magnetostrictive Strain Production	1500 - 2000 μm/m	
Sound Speed	1640 - 1940 m/s	

## Contact Songhan Plastic Technology Co.,Ltd.

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