Laird
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Eccosorb®MFS

High-Loss, Non-Rigid, Magnetically Loaded Stock

HIGH-LOSS NON-RIGID ABSORBER

Eccosorb MFS is a high-loss stock based on silicone. This product was developed to overcome the physical limitations of rigid high-loss absorbers. Being flexible, Eccosorb MFS can be fitted to compound curves. It has low outgassing properties for space applications.

FEATURES AND BENEFITS

- Flexible structure for improved fit
- Low outgassing for space applications
- Good adhesion to metals during t° cycling due to elastomeric properties

MARKETS

- Commercial Telecom
- Security and Defense

SPECIFICATIONS

TYPICAL PROPERTIES	ECCOSORB MFS
Frequency Range	1 – 18 GHz
Service Temperature °C (°F)	<160 (< 320)
Density g/cc	4.15 – 4.3
Hardness, Shore A	>70
Volume Resistivity ohm-cm	10^{10}
Thermal Expansion per °C	63×10^{-6}
Thermal Conductivity W/mK	0.865
Water Absorption % 24 Hours	<0.1
Dielectric Strength volts/mil	>10

Data for design engineer guidance only. Observed performance varies in application. Engineers are reminded to test the material in application.

APPLICATIONS

- Eccosorb MFS is engineered for terminations, loads, attenuators in microwave circuits, and in waveguides and transmission systems.
- It can be bonded to low-expansion-coefficient ceramics, such as sintered ferrites.

AVAILABILITY

- Eccosorb MFS is available in two types, Eccosorb® MFS-117 and Eccosorb® MFS-124
- Sheets: 30.5cm x 30.5cm (12" x 12") in thicknesses of 0.32cm (1/8"), 0.64cm (1/4"), 1.27cm (1/2") & 2.54cm (1.0")
- Bars: 30.5cm long (12") in squares of 0.64, 1.27, 2.54 cm (1/4, 1/2, 1.0").
- It can be supplied with a Pressure Sensitive Adhesive (PSA).
- Available in other thicknesses, sizes, and customer specified shapes upon request

INSTRUCTION FOR USE

- Can be cut with a sharp knife, sawed, sanded, and ground to form pyramids, cones and other machines parts. Magnetic holding devices can be used for machine operations.

Americas: +1.866.928.8181
Europe: +49.(0)8031.2460.0
Asia: +86.755.2714.1166

www.lairdtech.com

TEMPERATURE CYCLING

Many rigid materials cannot be bonded to metal surfaces and then temperature cycled. Temperature changes break this bond. This is due to the difference in the thermal expansion coefficient between the metal and the load material. Since Eccosorb MFS is a true elastomer, it deforms slightly to accommodate dimensional changes. In addition, a pyramid or wedge of Eccosorb MFS can be bonded over a large area to a waveguide wall to improve heat dissipation.

Typical Electrical Properties

	GHz	10^{-7}	10^{-6}	10^{-5}	10^{-4}	10^{-3}	10^{-2}	10^{-1}	1.0	3.0	8.6	10.0	18.0
MFS-117	K'	195	158	120	85	62	48	38	28	22.9	21.4	21	20.6
	tan δ_d	0.18	0.21	0.23	0.24	0.22	0.18	0.12	0.09	0.06	0.02	0.02	0.02
	K"	35	33	28	20	14	8.6	4.6	2.5	1.4	0.42	0.42	0.41
	M'	5	5	5	5	5	5	4.8	4.1	3.4	1.2	1.1	1
	tan δ_m	0	0	0	0	0	0	0.1	0.2	0.39	1.36	1.5	2
	M"	0	0	0	0	0	0	0.48	0.82	1.33	1.63	1.7	2
	dB/cm	0	0	0	0	0	0.03	0.27	2.8	11	46	56	119
	dB/in	0	0	0	0	0	0.08	0.69	7.1	28	117	142	302
	$\lvert Z\rvert/Z_0$	0.16	0.18	0.2	0.24	0.28	0.32	0.36	0.39	0.4	0.3	0.31	0.33
MFS-124	K'	260	205	145	95	70	52	40	32	25.8	23.8	23.6	23
	tan δ_d	0.4	0.39	0.36	0.31	0.26	0.2	0.14	0.08	0.07	0.05	0.03	0.04
	K"	104	80	52	29	18	1	5.6	2.6	1.8	1.19	0.71	0.92
	M'	7	6.9	6.8	6.7	6.6	6.3	6	5	3.8	2.5	1.5	1
	tan δ_m	0	0	0	0	0	0	0.2	0.45	0.69	1.1	1.4	2.5
	M"	0	0	0	0	0	0	1.2	2.3	2.62	2.75	2.1	2.5
	dB/cm	0	0	0	0	0	0.03	0.48	6.5	20	63	67	149
	dB/in	0	0	0	0	0	0.08	1.2	16.51	50	160	170	378
	$\lvert Z\rvert/Z_0$	0.16	0.18	0.21	0.26	0.3	0.34	0.39	0.42	0.42	0.39	0.33	0.34

*Note: Attenuation is a theoretical property calculated from the Complex Permittivity and Complex Permeability of a lossy material and is strictly a means of comparing one absorbing material to another. The attenuation properties are not an indication of how the material will perform inside a microwave device. The frequencies of use recommended for Eccosorb® MFS-117 & Eccosorb® MFS-124 in the Typical Properties Table of this bulletin are based on application experience at Laird.

Typical Electrical Properties Legend

K'	Real part of the permittivity (dielectric constant)
tan δ_d	Dielectric loss tangent
K"	Imaginary part of the permittivity (loss)
M'	Real part of the magnetic permeability
tan δ_m	Magnetic loss tangent
M"	Imaginary part of the magnetic permeability (loss)
dB/cm	Attenuation per unit distance
dB/in	Attenuation per unit distance
$\lvert Z\rvert/Z_0$	Normalized impedance magnitude ratio