



## Thorndike Corporation

680 North Bedford Street  
East Bridgewater, MA 02333  
(508) 378-9797 / 9798  
Fax: (508) 378-1529  
Toll free: 800-367-3367  
[www.thorndikecorp.com](http://www.thorndikecorp.com)

**Bulletin No.: 111-3200SF Rev 7.1.21**

**Material: TC3200SF**

**High – Loss, Non – Rigid, Magnetically Loaded Stock**

### HIGH – LOSS NON – RIGID ABSORBER

**TC3200SF** is a high-loss stock based on silicone. This product was developed to overcome the physical limitations of rigid high – loss absorbers. Being flexible, **TC3200SF** 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

### SPECIFICATIONS

TYPICAL PROPERTIES	TC3200SF
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 <sup>10</sup>
Thermal Expansion per °C	63 x 10 <sup>-6</sup>
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

- **TC3200SF** 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

- **TC3200SF** is available in sheets 61.0cm x 61.0cm (24" x 24") as well as customized sizes per customer's request.
- Available in various thicknesses, sizes and customer specified shapes upon request.
- It can be supplied with a Pressure Sensitive Adhesive (PSA).

## INSTRUCTION FOR USE

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

## TEMPERATURE CYCLING

Many rigid materials cannot be bonded to metal surfaces and then temperatures 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 **TC3200SF** is a true elastomer, it deforms slightly to accommodate dimensional changes. In addition, a pyramid or wedge of **TC3200SF** can be bonded over a large area to a waveguide wall to improve heat dissipation.

### Typical Electrical Properties

	GHz	10 <sup>-7</sup>	10 <sup>-6</sup>	10 <sup>-5</sup>	10 <sup>-4</sup>	10 <sup>-3</sup>	10 <sup>-2</sup>	10 <sup>-1</sup>	1.0	3.0	8.6	10.0	18.0
<b>TC3200SF</b>	K'	260	205	145	95	70	52	40	32	25.8	23.8	23.6	23
	tan <sup>δd</sup>	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	603	6.8	6.7	6.6	6.3	6	5	3.8	2.5	1.5	1
	Tan <sup>δm</sup>	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
	Z /Z <sub>0</sub>	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 are recommended for **TC3200SF**® in the Typical Properties Table of this bulletin are based on application experience at Thorndike Corporation.

### Typical Electrical Properties Legend

K'	Real part of the permeability (dielectric constant)
tan <sup>δd</sup>	Dielectric loss tangent
K''	Imaginary part of the permittivity (loss)
M'	Real part of magnetic permeability
tan <sup>δm</sup>	Magnetic loss tangent
M''	Imaginary part of the magnetic permeability (loss)
dB/cm	Attenuation per unit distance
dB/in	Attenuation per unit distance
Z /Z <sub>0</sub>	Normalized impedance magnitude ratio