Damping Foil
2552

Technical Data **January, 2012**

Product Description

3M™ Damping Foil 2552 consists of a room temperature pressure sensitive viscoelastic polymer on a dead soft aluminum foil and is **designed for application to vibrating panels and support members.** The combination of viscoelastic polymer and an aluminum foil backing (a constrained layer damper, or CLD) has proved to be a unique construction with exceptional ability to control resonant vibrations in the temperature range of 32° to 140°F (0° to 60°C), with survivability from -25° to 175°F (-32° to 80°C).

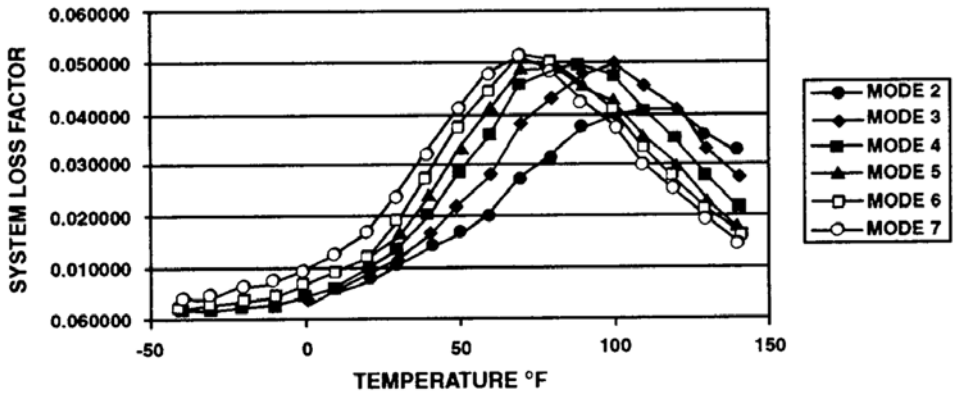
Typical Damping Properties

The high-energy dissipative polymer used in 3M damping foil 2552 can afford excellent control of resonance-induced vibrations. When applied to a vibrating structure, the polymer used in 3M damping foil 2552 converts vibration to negligible heat. Vibration amplitudes and structure-borne noise can be consequentially reduced. The performance of most damping devices is highly dependent on the interaction between the device and the system to which it is applied. A constrained layer control system is no different than a typical damping device and its ability to provide the desired performance is affected by parameters other than temperature and frequency. Namely the geometry, stiffness and the structure to which the control system is applied will affect the performance.

The loss factor of a material is a dynamic property that can define damping performance:

The following data are the results of 3M damping foil 2552 being tested per ASTM E756-83. A sample was applied to a 8.0 inch by 0.5 inch by 0.06 inch steel beam. The beam was tested over a temperature range of -40° to 140°F, in increments of 10°F. Beam modes 2 through 7 were monitored for system damping measurements.

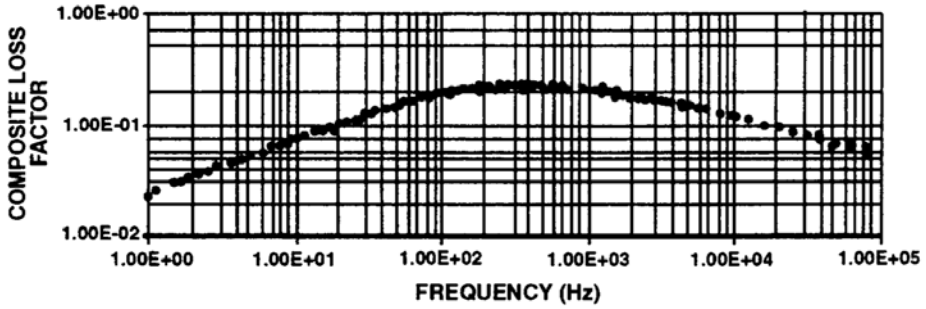
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Typical Damping Properties *(continued)*

Test Method: The following data were obtained by doing a frequency sweep from 1 to 100 radians/sec (0.16 to 16 Hz) at 5 different temperatures: -20°, 10°, 0°, 10°, and 22°C. A 3 point bend geometry was used on the Rheometics RSA II. Time – temperature superposition was used to create the master curve for a reference temperature of 22°C.

3M™ Damping Foil 2552 on 18 mil Stainless Steel
T = 22°C



Data Interpolation:

To determine the damping properties at ambient temperature 72°F (22°C), proceed as follows:

1) Locate the desired frequency on the bottom HORIZONTAL scale.
2) Follow the chosen frequency up to the point of intersection with the plotted data.
3) From this intersect, go left to the vertical scale.
4) Read the COMPOSITE LOSS FACTOR for the chosen frequency.

Note: Please note that the data has been determined by combining 3M™ Damping Foil 2552 with a panel of 0.018" thick stainless steel with a hardness of T-22 and is presented as a reference to the damping that can be achieved when combined with a material of this description and tested at ambient temperature of 72°F (22°C).

Solvent and Fuel Resistance

When properly laminated between two impervious materials, the polymer will resist intermittent exposure to mild acids and alkalies, most oils, grease, gasoline, kerosene, JP-4 fuel, hydraulic fluids, and other typical aromatic and aliphatic hydrocarbon and ketone solvents.

Note: Continuous submersion in chemical solutions like solvents or fuels is not recommended.

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Product Construction and Typical Physical Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

		ASTM Test Method
Aluminum Backing:	10.0 mils (0.25 mm)	
Acrylic Viscoelastic Polymer:	5.0 mils (0.13 mm)	
Easy-release Liner:	58# poly-coated paper	
Total Product Thickness:	15.0 mils (0.38 mm)	
Total Product Weight:	0.17 lbs./sq. ft.	
Adhesion to Steel:	65 oz./in. width (72 N/100 mm)	D-3330
Tensile Strength:	126 lbs./in. width (2205 N/100 mm)	D-3759
Elongation at Break:	12%	D-3759
Temperature Use Range:	-25° to 175°F (-32° to 80°C) Peak damping from 32° to 140°F (0° to 60°C)	
Minimum and Maximum Widths:	2 in. minimum, 23.5 in. maximum	
Available Formats:	**Roll Lengths:** Standard length 36 yds. • 2" to 4": up to 180 yds. • Wider widths available to 180 yds. • Dispensers available for purchase through 3M **Sheets and Die-Cut parts:** 3M can introduce you to fabricators with a background of handling this product and the capability to provide sheet goods and die cut dampers to customer specifications. **Custom Dispensers:** Designed for manual or automatic operation, this custom dispenser removes protective liner from 3M™ Damping Foil 2552 before cutting to a predetermined length. Built to hold and dispense 6" core with a roll size up to 2" wide by 108 yds. Engineered for table top usage, this custom dispenser measures 31"L x 22"H x 10"W and weighs only 45 pounds.	

Characteristics

- Excellent aging qualities of the polymer.
- Wide temperature range for damping. Usable from -25° to 175°F (-32° to 80°C), with peak damping from 32° to 140°F (0° 60°C).
- Liner on product offers the user die-cut capability.
- Pressure sensitive adhesive for ease of application.
- Meets flame retardancy requirements of F.A.R. Part 25.853(a).
- Can pass ASTM E-162 and ASTM E-662 for flamability and smoke generation.

Application Ideas

- Industrial applications.
- Electronic equipment and appliances.
- Reduce resonant noise, vibration and fatigue in metal, plastic panels and support structures.
- Almost anywhere plastic or metal contact with materials can result in potentially damaging vibration.

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Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use

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Printed in U.S.A.
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