3M

Vibration Damping Tape

2542

Technical Data **April 2014**

Product Description

3M™ Damping Foil 2542 consists of a room temperature pressure sensitive viscoelastic polymer on dead soft aluminum foil and is **designed for application to vibrating panels and support members**. This 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 0° to 60°C (32° to 140°F). The adhesion characteristics of this material allow application to many substrates.

Product Construction

Damper	Liner	Backing	Viscoelastic
2542	4 mil (0.1 mm) 58# Paper	5 mils (0.13 mm) Aluminum	5 mils (0.13 mm) Acrylic Damping Polymer

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 Method
Adhesion to Steel:	65 oz/in width (72 N/100 mm)	D-3330
Tensile Strength:	63 lbs/in width (1102 N/100 mm)	D-3759
Elongation at Break:	7%	D-3759
Total Product Weight:	0.097 lbs/sq ft	
Temperature Use Range:	-25°F to 175°F (-32°C to 80°C) Peak damping from 32°F to 140°F (0°C to 60°C)	

Characteristics

- Excellent aging qualities of the acrylic viscoelastic damping polymer.
- Wide temperature range for damping. Usable from -32°to 80°C (-25°to 175°F) at 100 Hz; performs best at 0°to 60°C (32°to 140°F).
- Liner on products offer the user die-cut capability.
- Pressure sensitive adhesive for ease of application.

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Typical Damping Properties

The high-energy dissipative polymer used in 3M damping foil 2542 can afford excellent control of resonance-induced vibrations. When applied to a vibrating structure, the polymer used in 3M damping foil 2542 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.

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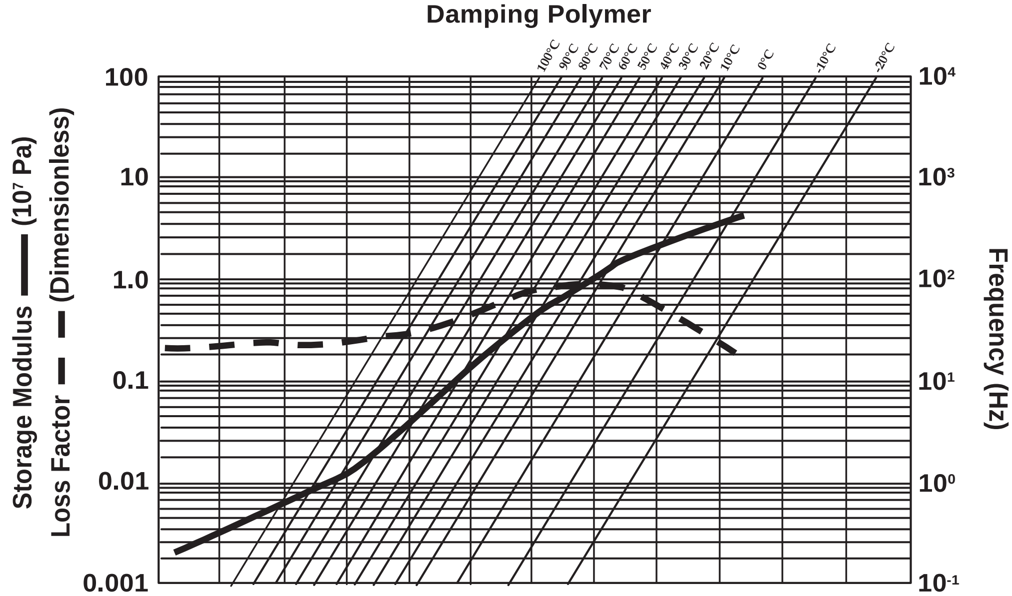
The loss factor and shear (storage) modulus of a material are two dynamic properties that can define damping performance. These two properties identify a material's ability to convert vibratory energy to heat energy. The curve shows the performance of the Damping Polymer plotted against temperature and frequency in the form of a reduced temperature nomograph, illustrating both the high performance and the temperature-dependent qualities of this damping system.

Damping Polymer



1 Pascal = 1.45 x 10^{-4} PSI

Test Method: These properties were determined isothermally a teach temperature on a Polymer Laboratories Dynamic Mechanical Thermal Analyzer (DMTA). The strain amplitude used 8.47% peak to peak. Measurements were done at frequencies of 0.3, 1.0, 3.0, 10, and 30 Hz. Data at non-test frequencies and temperatures were determined from time-temperature superposition principles.

IMPORTANT: The oblique constant temperature lines are separated by non-uniform spacings. Hence a linear extrapolation of a temperature not explicitly shown cannot be used to obtain other temperature data.

To determine the damping properties at the desired temperature and frequency from the data graph, proceed as follows:

1. Locate the desired frequency on the RIGHT vertical scale.
2. Follow the chosen frequency line to the desired temperature isotherm.
3. From this intersect, go vertically up and/or down to intersect the shear (storage) modulus and loss factor curves.
4. From this intersect, follow horizontally to the LEFT vertical scale and read the shear (storage) modulus and loss factor values form the appropriate left vertical scale.

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Application Ideas

- Automotive and industrial applications.
- Electronic equipment and appliances.
- Reduce resonant noise, vibration, and fatigue in metal and plastic panels on support structures.

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.

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ISO 9001

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