3M Damping Foil 2552

1443

Technical Data **June 23, 1998**

Product Description

This product consists of a room temperature pressure sensitive viscoelastic polymer on a dead soft aluminum foil It 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 32°F to 140°F (0°C to 60°C), with survivability from -25°F to +175°F (-32°C to 80°C).

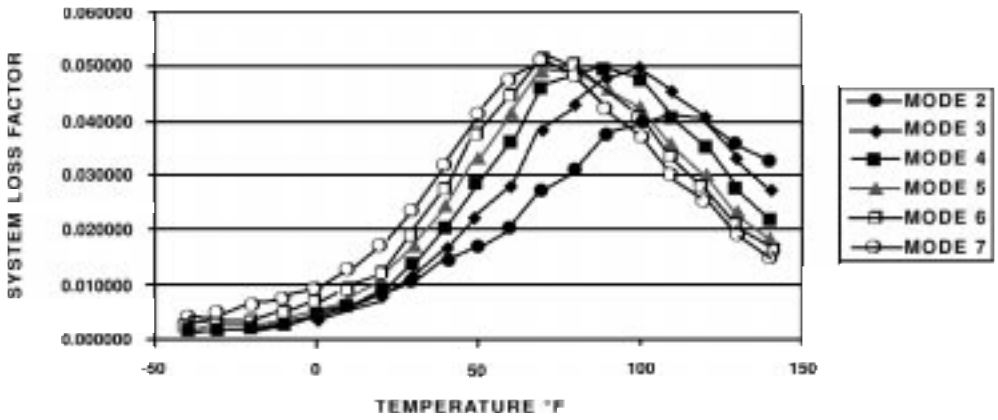
Damping Properties

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 of 2552 was applied to a 8.0 inch by 0.5 inch by 0.6 inch steel beam. The beam was tested over a temperature range of -40°F to 140°F, in increments of 10°F. Beam modes 2 through 7 were monitored for system damping measurements.

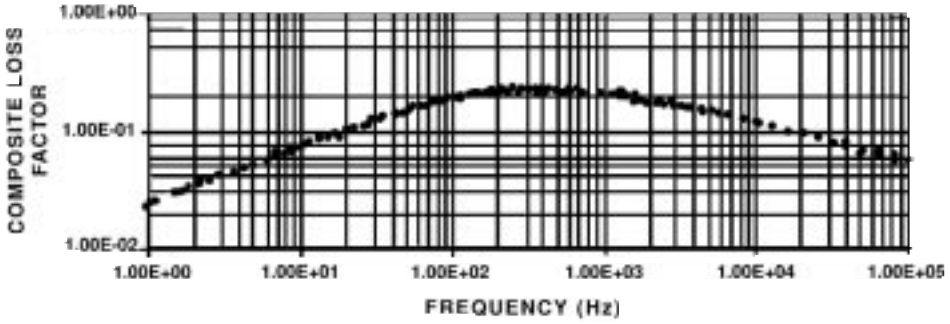
3M™ Damping Foil 2552



Damping Properties cont.

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 Rheometrics 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 = 22C



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 these data have been determined by combining the 3M Damping Foil 2552 product with a panel of 0.018" thick stainless steel with a hardness of T-22. These data are presented as a reference as to the damping that can be achieved from this product when it is combined with a material of this description and tested at this temperature.

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.

Construction

Damping foil part number	Aluminum	Viscoelastic
2552	10 mils (0.254 mm)	5 mils (0.127 mm)

Total Product Weight: 0.17 lbs./sq.ft.

Viscoelastic: Room temperature acrylic viscoelastic polymer with PSA qualities

Liner: Easy Release 58# poly-coated paper liner

Min. Max. Widths Available: 2 in. minimum, 23.5 in maximum.

Formats Available: Roll Lengths: Standard length 36 yds.

- 2" to 4": up to 108 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 their customer's specifications.

Custom Dispenser: 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 3M Damping Foil 2552's 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°F to 175°F (-32°C to 80°C), with peak damping from 32°F to 140°F (0°C to 60°C).
- Liner on product offers the user die-cut capability
- PSA for ease of application

Application Ideas

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

Custom Application Support

- 3M provides technical support, from optimizing the design of your custom noise/vibration solution, through fabrication and timely delivery. Follow -up support is worldwide.

Typical Physical Properties and Performance Characteristics

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:	50 oz./in. (55 N/100 mm) minimum	D-3330
Tensile Strength: (Break or Yield)	80 lbs./in. (1400 N/100 mm) minimum	D-3759
Elongation: (Break or Yield)	15%	D-3759

Important Notice

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Limitation of Remedies and Liability

If the 3M product is proved to be defective, THE EXCLUSIVE REMEDY, AT 3M'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OF, OR TO REPAIR OR REPLACE, THE DEFECTIVE 3M PRODUCT. 3M shall not otherwise be liable for any loss or damages, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including negligence, warranty, or strict liability.

ISO 9002

This Industrial Tape and Specialties Division product was manufactured under a 3M quality system registered to ISO 9002 standards.

3M

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