TECHNICAL DATA SHEET

ANC VBD-10 DAMPING COMPOUND

Water based visco-elastic damping compound that reduces structure-borne vibration in a variety of materials. By imparting vibration damping and a shift in the dominant frequency, the resulting noise reduction provides a means of improving the noise transmission loss in many applications.

- Improves fatigue life of treated surfaces
- Tough, durable and paintable
- Easily applied with trowel, brush, or spray
- Meets FMVSS 302

Applications:

Typical uses include new construction and equipment requiring damping treatment plus superior flame spread and smoke density ratings, including bus, rail, and marine applications.

Also used in fan and blower housings, duct work, bins, chutes, hoppers, machine guards, and stadium seating.

Product Data

Odor	total odorless when dry	
Color	Beige	
Weight	Wet: 11.9 LB/US gal.	
Flammability	Flame spread index: 2 (per ASTM E-162)	
Flaming mode	specific optical density after 1.5 min.	1
(per ASTM E662)	specific optical density after 4.0 min.	25
	Max. specific optical density	140
	Max. Corr. optical density	139
Non-Flaming mode	specific optical density after 1.5 min.	1
(per ASTM E662)	specific optical density after 4.0 min.	3
	Max. specific optical density	132
	Max. Corr. optical density	132

Typical Coverage:

Dry Thickness	Square Ft./Gal.		
	Spray	Brush	Trowel
1/16”	16	Approx. 16	Approx. 16
1/8”	8.5	Approx. 8.5	Approx. 8.5

Ordering Information:

Available in…..	Weight
5 gallon pails	55 lbs.
55 gallon drums	540 lbs.

Typical properties of ANC VBD-10

color	Beige
Total solids	62%
Viscosity	Paste
Wet density (g/cm^3)	1.43
Dry density (g/cm^3)	1.73
Wet density (LB/US gal)	11.9
Wet density (LB/ imp. Gal)	14.3
Thermal conductivity (BTU in/hr ft^2 F	2.1
Flash point	None
Hardness, shore D	58
Thickness, in	N/A
Thickness, mm	N/A
Standard sheet size, in.	N/A
Standard sheet size, cm	N/A
Surface weight, lb/ft^2	N/A
Surface weight kg/m^2	N/A
Resistance to fungus (ASTM G-21 rating)	O*

*No attack and no evidence of discoloration

Damping:

ANC VBD-10 is an extensional damper, which means it is applied to the surface that must be damped. It can be applied with a sprayer, trowel, or paintbrush, as long as it covers the surface of the substrate and adheres well.

The amount of damping is achieved depends on the ratio of thickness of the damping material to that of the substrate. Generally, a ratio of 1 to 1 of 2 to 1 of damping compound to substrate is recommended. Keep in mind that damping increases approximately in proportion to the square of the thickness ratio.

All Noise Control damping products have high-energy dissipation resulting in the suppression of vibration and its accompanying noise. Additionally, damping products reduce vibrational transfer to adjoining structures, increases the metals working life, and delays the onset of fatigue.

Loss Factor (η):

The extent of damping is usually referred to as the "loss factor". In a composite material the loss factor is directly proportional to the ratio of energy dissipated as the result of damping during one cycle, D, to the total energy of the vibrating system, W.

$\eta=(1/2\pi)*(D/W)$

A minimum loss factor OF 0.05 is generally adequate to control a vibrating metal structure. Depending on the amount of noise reduction required a loss factor of 0.2 or higher might be specified.

Other than the loss factor (see equation above), there are two other ways to express damping. The damping ratio

$\text{Damping ratio}=(C/C_c)$ Or

decay rate

$\text{Decay rate} = 27.3\ (f_n)*\ \eta$

The damping ratio is directly related to the loss factor where C_c is the critical damping (the amount of damping necessary to just prevent oscillation) coefficient and C is the damping coefficient of the substrate.

The decay rate is defined as the rate of natural attenuation for free vibrations within a substrate, and is expressed in decibels per second.

The loss factor for extensional damping materials is minimally dependent on frequency and largely dependent of temperature. For every damping material there is a temperature at which maximum damping occurs.

Composite loss factor (η)=a*(thickness ratio)^b

ANC VBD-10 ---a & b values (when applied to 1/32" thick steel)

250 Hz	a	0.050
	b	0.91
500Hz	a	0.052
	b	0.84
1000Hz	a	0.048
	b	0.95

Figures 1 through 3 show the dependence of the composite loss factor of ANC VBD-10 on temperature, frequency, and thickness ratio of the damping compound to steel.

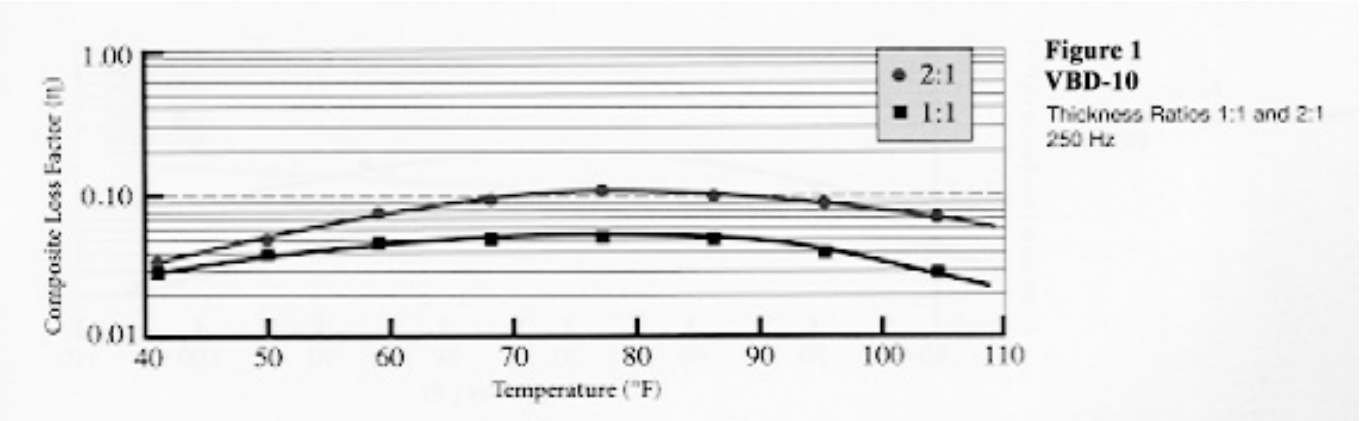

Figure 1
VBD-10
Thickness Ratios 1:1 and 2:1
250 Hz

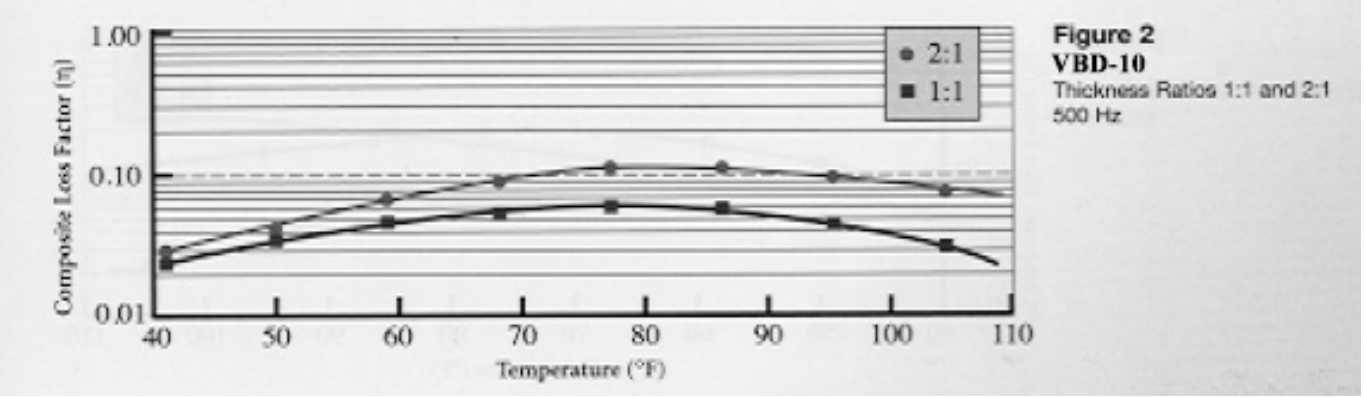

Figure 2
VBD-10
Thickness Ratios 1:1 and 2:1
500 Hz

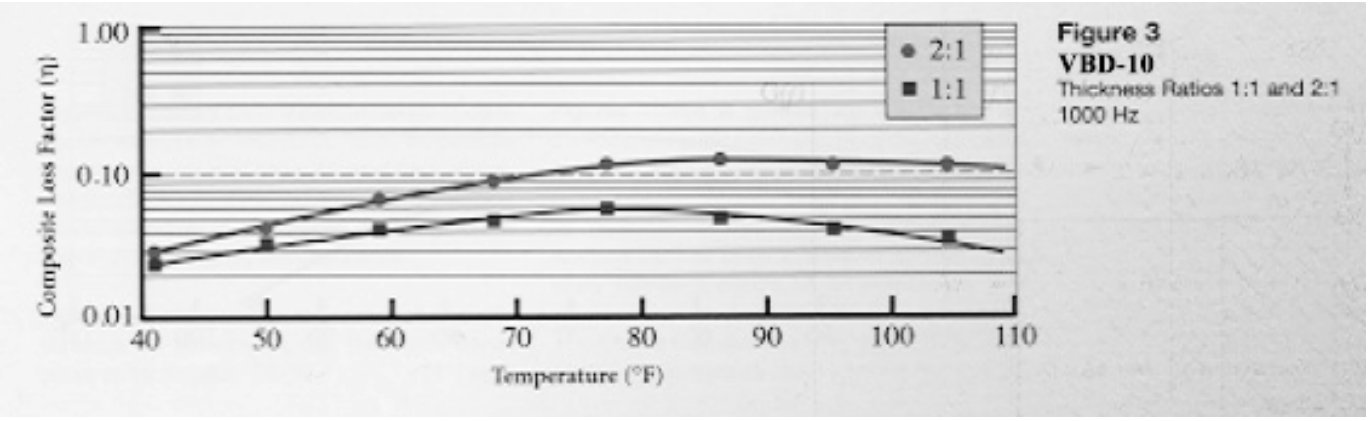

Figure 3
VBD-10
Thickness Ratios 1:1 and 2:1
1000 Hz

Though there exists a loss factor of the damping material itself, generally a loss factor refers to the system of the damping material on a base layer whose vibrations are to be damped.

Vibration Damping:

ANC VBD-10 is a viscous, water-based material. It contains water that must be driven off at room or elevated temperatures. All Noise Control's ANC VBD-10 is based on an aqueous polymer emulsion that is non-toxic, non-flammable (before drying), and has a good resistance to water and solvents.

Choosing a vibration damper:

Since some vibration damping compounds have a very good resistance to solvents but poor resistance to water, or vice versa, it is important to take into account the environment to which the material will be exposed. In some cases thermal properties may be an issue, as well as abrasion and tear resistance. Crucial factors usually include fire and smoke retardency and the degree of flexibility, especially if the compound is being applied to thin sheet metal which may be flexed. That flexing could cause some damping compounds to crack.

ANC VBD-10 (resistance to two day immersion)

Diesel fuel	Excellent
Mineral spirits	Excellent
Lubricating oil	Very good
Gasoline	Fair
Toluene	Fair
Methanol	Fair
water	Fair

The resistance of ANC VBD-10 to immersion in various substances is shown above. While there was no actual degradation, there was swelling and softening. However, after being allowed to dry at room temperature for a few days, complete recovery occurred.

Applying ANC VBD-10:

In order for an extensional damper to be effective, it must be well bonded to the substrate, and depends on what the substrate is and how well it has been cleaned and prepared for the application of the damping compound. Often it is necessary to coat the substrate with a primer before the damping compound is applied. Before attempting to coat the substrate make sure it is free from dirt or any film which would interfere with the bonding of the damping compound to the material to be coated.

ANC VBD-10 can be applied by trowel, stiff brush, of spraying. It is best applied by spraying it onto the substrate to a maximum thickness of 1/8". We recommend the following spraying systems.

Air assisted spraying:
The 10:1 president air spray system, model #255-886 equipped with a heavy fluid reverse-a-clean air spray gun #204-000 with a ¼-size round type cap.

Airless spraying:
The 30:1 president hydra spray package #231-063 with agitator or the 33:1 bulldog airless spray package #237-165 with a hydra mastic reverse-a-clean spray gun. A tip size of 0.043 inches is recommended. To assist the application the use of a ram or follower plate is highly advisable.

Weights & thickness' of ANC VBD-10 required for a dry thickness ration of 1:1

Sheet metal		**ANC VBD-10**		
Thickness		Wet weight ($lb./ft^2$)	Wet thickness (inches)	Dry weight ($lb./ft^2$)
Gauge	Inches			
12	0.1046	1.11	0.149	0.65
14	0.0747	0.79	0.107	0.47
16	0.0598	0.63	0.085	0.37
18	0.0478	0.51	0.068	0.30
20	0.0359	0.38	0.051	0.22
22	0.0299	0.32	0.043	0.19
24	0.0239	0.25	0.034	0.15