



Noise Control Materials

PA NOTE

Synchronous drive noise can be reduced by using split width belts, minimizing belt speed, minimizing belt widths, maximizing sprocket diameter, or using a reduced noise belt. These very often prove sufficient on applications with minimal noise problems. When they do not, then the most effective method of reducing noise is the use of acoustical noise guards or enclosures. These noise guards can use various noise control materials.

Noise levels are measured and reported in decibels (dBA) and frequency in hertz (hz). These numbers can be found on the output of the design flex program.

TYPE OF MATERIALS

There are basically four types of noise control materials:

Damping materials are used where necessary to reduce the noise radiating from vibrating surfaces. Damping coatings take many forms, mastic for spraying and some with pressure sensitive adhesives. The main consideration in using these materials is how well the coating can adhere to the vibrating surface. The damping properties of the materials will vary with both temperature and frequency.

Noise Barriers (Figure 1) are used to block and reflect the transmission of noise. These barriers do not absorb, dissipate, or deaden the noise. Barriers block the path of noise and generally reflect most of it back towards its point of origin. Some noise is reflected, some gets through, and very little is absorbed.

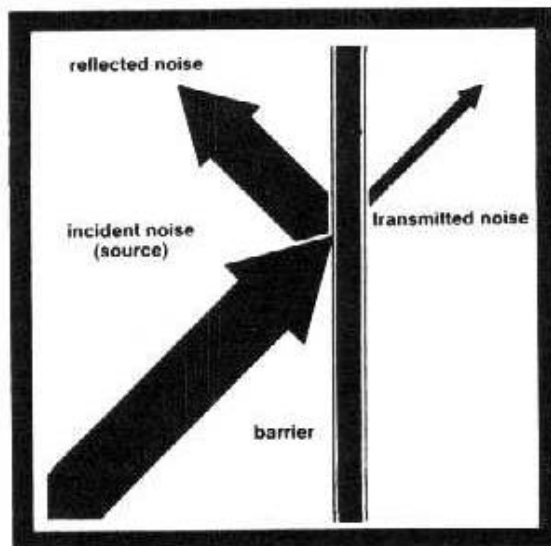


Figure 1



Most noise barriers are more effective at high frequencies and are rated for their sound transmission loss (STL) capability.

Good barrier materials are dense, not fibrous and porous like absorber materials, and do not vibrate. The sheet metal structure of a noise guard is considered the noise barrier.

Noise Absorbers (Figure 2) are used to reduce noise reflections and dissipate noise energy. Noise absorbers are used inside noise guards where necessary, between the noise source and the noise barrier. Most of the noise is transmitted, but some energy is dissipated in the process. Very little noise is reflected. The amount of noise dissipated or absorbed is stated as a fraction (absorption coefficient) of the total. Absorptive material is most effectively used in conjunction with barriers or barrier materials. If barriers do not already exist in the form of machine guards, they may need to be introduced into the treated area. Whether there is a noise problem or not, OSHA standards say drives must be protected or guarded.

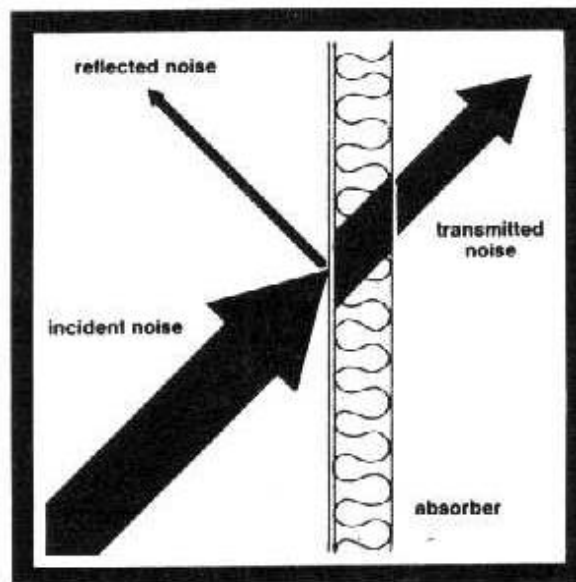


Figure 2

Noise absorbers have a frequency band in which they are more effective in reducing noise (a higher absorption coefficient). Most industries use a NRC (Noise Reduction Coefficient) which is an average performance over several frequencies as a convenient way to classify materials.

Urethane foams are excellent absorbers and are strong (unlike glass fiber) with or without facing. However, the flame and smoke performance of these foam materials is somewhat poorer than that of glass fiber. As with barrier materials, it is recommended that performance comparisons be made in the frequency range to be quieted.

Composite Material (Figure 3) a combination of absorber and barrier, is used to block the transmission of noise and reduce reflections from the barrier. These materials are fibrous on one side and dense on the other. In selecting



composite materials, it is important to assure that the individual materials are compatible for the application. It would

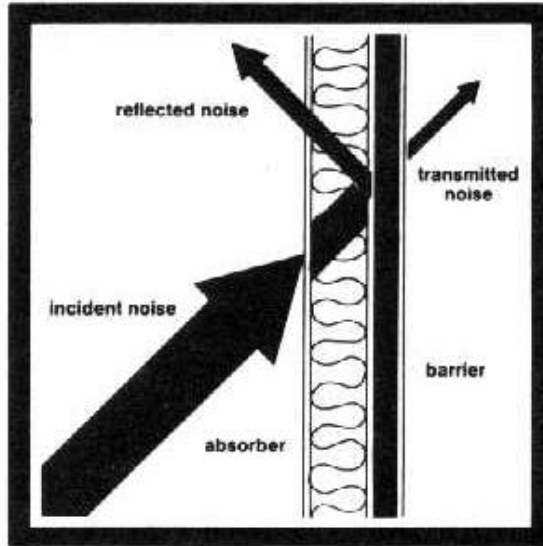


Figure 3

be wrong to select a barrier to be effective for a low frequency noise problem and then to combine it with an absorber which is only effective at high frequencies.

DECIBEL SYSTEM

The decibel system uses a logarithmic scale. For example, a 110 dBA noise reading reduced to 100 dBA is not a 10 percent reduction, but actually represents a 10 times reduction in acoustical energy. A drop of just three decibels means the sound pressure level has been cut in half.

Acoustical Leaks - Direct air path leaks or openings around shafts, for visual inspection, or for cooling, can reduce the effectiveness of noise guards. For example, if a guard has the potential of 40 decibel noise reduction, a small opening of 1 percent of the total surface will cause the actual reduction to be only 20 decibels.

A list of acoustic product manufactures follows:

ACOUSTIC PRODUCT MANUFACTURERS



GatesFacts™ Technical Information Library

Gates Compass™ Power Transmission CD-ROM version 1.2

The Gates Rubber Company
Denver, Colorado USA



Barley Earhart Company
233 Divine Highway
Portland, MI 48875
(517) 647-4117

Industrial Noise Control, Inc.
1411 Jeffrey Drive
Addison, IL 60101
(312) 620-1998

H. L. Blachford, Inc.
1855 Stephenson Highway
Troy, MI 48083
(313) 689-7800

E. N. Murray Company, Inc.
707 Umatilla Street
Denver, CO 80204
(303) 892-1106

The Branford Company
PO. Box 713
Shelton, CT 06484
(203) 735-6415

Peabody Noise Control, Inc.
6300 Irelan Place
P O. Box 655
Dublin, OH 43017
(614) 889-0480

E-A-R Division
Cabot Corporation
7911 Zionsville Road
P.O. Box 68898
Indianapolis, IN 46268-0898
(317) 872-4763

The Soundcoat Company
1 Burt Drive
Deer Park, L.I., NY 11729
(516) 242-2000

Eckel Industries, Inc.
155 Fawcett Street
Cambridge, MA 02138
(617) 491-3221

The Soundcoat Company
3002 Croddy Way
Santa Ana, CA 92704
(714) 979-9202

Ferro Corporation
Composites Division
34 Smith Street
Norwalk, CT 06852
(203) 853-2123

Soundown Corporation
P.O. Box 341
Swampscott, MA 01907
(617) 744-2413

Carroll George, Inc.
Industrial Park
P.O. Box 144
Northwood, IA 50459
(515) 324-2231

United McGill Corporation
1501 Kalamazoo Drive
P.O. Box 909
Griffin, GA 30224
(404) 228-9864

Illig Industries, Inc.

United McGill Corporation



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The Gates Rubber Company
Denver, Colorado USA

9750 Alden
P.O. Box 15007
Lenexa, KS 66215
(913) 492-2400

1747 E. Charter Way
P.O. Box 6156
Stockton, CA 95206
(209) 466-2352

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Selection of the appropriate noise control material will depend on the specific application, actual noise levels and the amount of reduction required to meet customer standards. The manufacturers listed above may be contacted for assistance in making the proper selection. If there are additional questions contact Gates Belt Application Engineering.