Acoustical

Absorbing • Damping • Acoustical Transparency

General Description

FXI acoustical materials are designed to perform a number of specific and seemingly opposite acoustical functions…either reducing sound levels or passing sound undistorted and undiminished. Certain non-reticulated foams are ideal for sound absorption and attenuation. Reticulated foams can absorb sound very effectively or can be completely acoustically transparent.

Acoustical foam absorbs the airborne or fluid-borne noise, causing a loss in energy by weakening reflected vibrations. Acoustical foam for sound absorption provides high efficiencies, consistentency, and predictablity from installation to installation.

Noise Absorption Applications

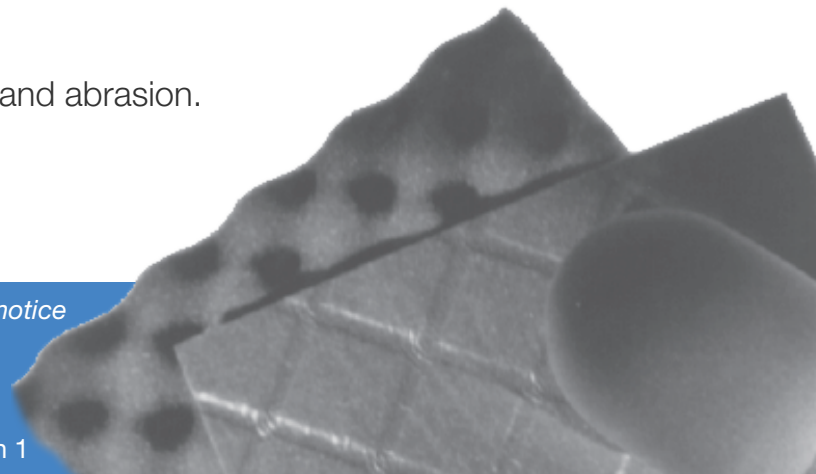
- Commercial aircraft ventilation ducts
- Headliners and back panels for tractor cabs and off-road vehicles
- Data-processing equipment
- Portable air compressors and power units, appliances, snowmobiles
- Headliners and panels for automobiles
- Anechoic test chambers

Sound fidelity applications

- Stereo speaker grilles
- Earphones
- Microphone covers

Benefits

- Predictable sound absorption in broad (low, mid, high) frequency range
- Nearly “total perfection” in sound transparency applications
- Fabrication design flexibility
- Functional/decorative laminate capabilities
- Installation ease
- Excellent shape retention, and resistance to wear and abrasion.



*information subject to change without notice

Table 1: *Acoustical Functions*

Acoustical Functions

Product	Function	Application
SIF® Foam	Acoustically Transparent Air Diffuser	Microphone wind screens, headphone covers Power brakes units, mufflers
SIF@ Felt Foam[1]	Sound Absorber	General use for mid and high frequencies
AEROFONIC® Foam[1]	Sound Absorber	Specialty use where FAR 25.853 rating is required
ARESTO™ Foam[1]	Sound Absorber	General use where UL 94 HF-1 rating is required
PYRELL® Foam[1]	Sound Absorber	Specialty use where UL 94 HF-1 rating and halogen-free are required
HYFONIC™ Foam	Sound Absorber	General use where UL 94 HF-1 rating and hydrolytic stability are required
Natural Acoustic Foam	Sound Absorber	General use where UL 94 HF-1 rating and renewable content are required
Custom Laminates[1]	Sound Absorber	Specialty use for unique substrate combinations

[1] Available in a range of densities

Table 2: *Typical Physical Properties*

Typical Physical Properties

	SIF® Foam	SIF® Felt Foam	Aerofonic® Felt	Aresto® Foam	Pyrell® Foam	HyFonic™ Foam	Natural Acoustic Foam
Grade	90 ppi	3-900	3-700	70 ppi	70 ppi	65 ppi	70 ppi
Foam Type	Polyester	Polyester	Polyether	Polyester	Polyester	Polyether	Polyether
Density (pcf)	1.9	5.4	5.4	1.9	2.0	1.9	1.9
Tensile Strength (psi)	35	100	75	24	22	17	14
Elongation (%)	415	450	315	260	220	190	160
Noise Reduction Coefficent @ 1.0”	1.0*	0.83**	0.49	0.35	0.34	0.35	0.34

[1] Tested in accordance to ASTM D 3574; not to be used as a specification
** @ 6”*
*** @ 2”*

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Vibration Isolation

Noise transmission sound barriers are used to reduce the noise level being transmitted through a housing when the housing itself does not satisfactorily perform that function. When noise levels are severe, an additional high mass transmission reduction wall or septum is often required. Acoustical foam is applied as a decoupler between the housing and the inner septum, and as an absorber on the outer septum wall, to effectively absorb and reduce noise energy.

Applications

- Acoustical panels
- Aircraft
- Turbine engines
- Broadcast studios' data processing equipment
- Power generators housings
- Automotive headliner

Vibration Damping

Acoustical foams are used to reduce vibrations of physical structures that, in turn, produce noise due to that vibration. In some cases, for maximum vibration reduction, acoustical foams are used in conjunction with a damping layer, such as a viscoelastic material.

Applications

- Air conditioning equipment
- Dishwashers
- Aircraft compartments
- High-speed rail cars
- Data processing machines
- Enclosed power units
- Engine housing

Sound Fidelity

Reticulated acoustical foams have been proven virtually acoustically transparent; effectively invisible to sound waves in audible frequencies. This is true even of foam two inches thick. A leading California stereo speaker manufacturer made this fact well-known by introducing a line of speakers that offered nearly perfect sound transparency through high performance foam grilles in a variety of colors.

Applications Include

- Stereo speaker grilles
- Earphones
- Microphone windscreen covers
- Smoke alarm grilles

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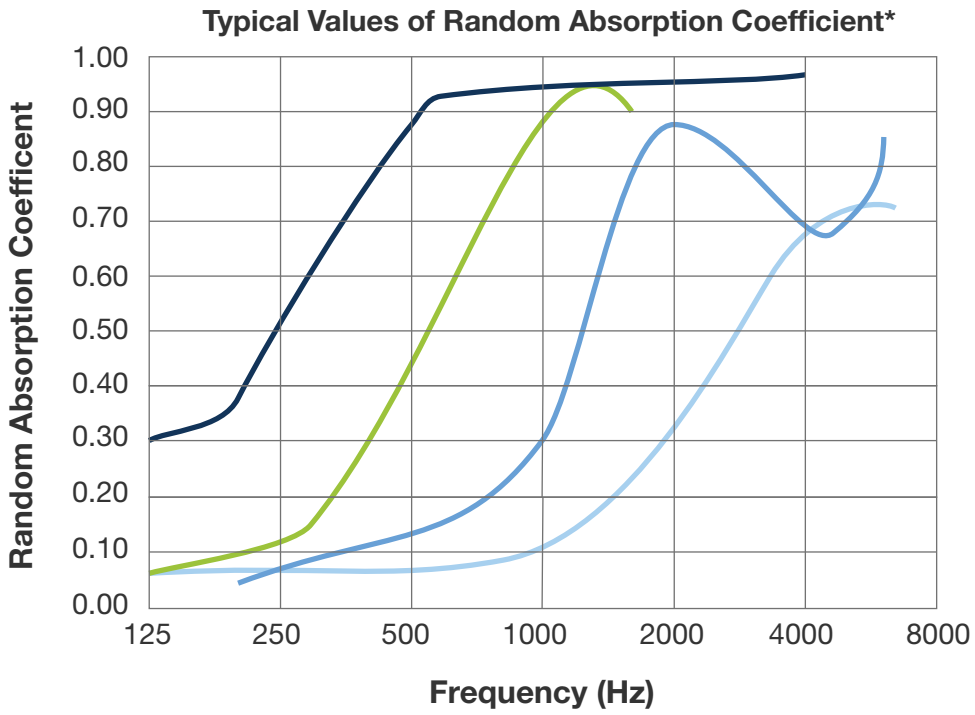
Figure 1: *Typical Values of Random Absorption Coefficient**



** Test method ASTM C 384-77, using No. 4 mounting; i.e., material in contact with backing plate. Normal incidence converted to Random Incidence.*

FXI – Committed to Innovation, Service and Quality

For over 50 years FXI's technology has been leading the way to new and innovative applications for polyurethane foam solutions. We have one of the largest R&D centers and hold more patents than most companies in our industry. Across an increasing range of markets and applications, our team is ready to help you solve your most complex problems. With manufacturing facilities across the country, FXI is there when you need us – ready to deliver the highest quality products to help your business grow.

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