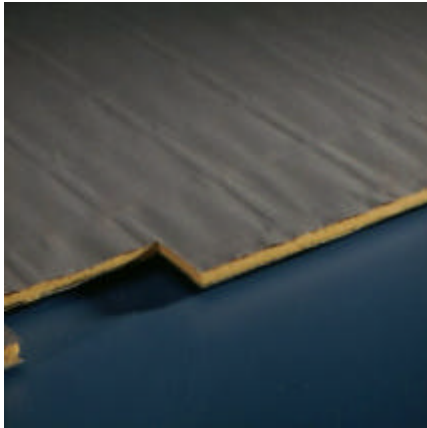


FGSA

Phone: 937-438-1100 * Fax 937-438-2190

A NEW CONCEPT IN SOUND ABSORPTION MATERIAL



FGSA is a material for absorption of airborne sound, intended for use as an interior lining of engine enclosures and hoods in buses, boats, trucks, tractors, construction equipment, compressors, and generator sets. Other areas of application are data processing equipment, aircraft, recreational and military vehicles, and machinery of various kinds, noise abatement enclosures, and test cells, hygienic and in factory environments.

High Mechanical Strength

FGSA (Fiber Glass Sound Absorber) consists of a rigid, resinated fiberglass carrier, molded in a checkered pattern with cavities and ridges. An aluminized scrim reinforced film facing is bonded to the ridges, leaving a gap between the film facing and the carrier. This allows the film facing to vibrate freely into the cavities, thus letting the sound waves enter the porous carrier, which has the optimum airflow resistance for absorbing sound.

Durable

The material is highly resistant to wear and tear because the surface film is heat sealed around the edges, FGSA can be washed or steam cleaned. The surface foil, which is made of polyester, can be cleaned with normal engine cleaning agents.

For applications requiring high heat stability FGSA Turbo film facing is used where the film is a vinyl seal fiberglass cloth.

Light Weight

FGSA weighs only 1000 g/m² (0.2 lbs/ft².), thus making it very useful in the automobile and marine industries and in other areas where low weight is important.

Thin and Broadband

FGSA is usually installed with a small air space between the absorber and enclosure or back wall, utilizing spacers and its own self-supporting quality. Varying the size of the air space can optimize the low frequency performance. The fiberglass carrier with the film facing gives good absorption over a broad frequency range.

Since the profile of the carrier allows the film facing to be free to vibrate; there is little or no deterioration of the high frequency performance, which is usually the case with flexible absorbers such as foam and felt when, covered by a film

FGSA is supplied in standard thicknesses of 7 mm (¼") or 12 mm (½") thin, broadband absorbing material. There is, therefore, no need to increase the thickness of the materials as in the case with flexible foam and fiberglass absorbers to achieve a high level of low frequency absorption.

Low Installed Cost

FGSA is available in standard panels or can be die cut to your specifications. The panel can be attached utilizing staples or other common hardware, such as bolts, rivets, channels, pins, etc. The mounting surface can be sheet metal brackets, timber frames or similar raised sections to provide the required air gap.

Expanded or perforated metals can cover the absorber to provide mechanical protection and to act as a retainer for the absorber. (The metal facing will not deteriorate the acoustical performance, since the film facing still can vibrate into the cavities of the absorber.)

The complete SA assembly is thus fitted into the vessel using mechanical fixings, which facilitate dismantling and refitting for service or repair.

Superior Acoustic Performance

FGSA typically has double the sound absorption below 1KHz and the equivalent absorption above 1Khz for the same thickness of film faced foam material.

Additionally FGSA is not affected by the contact of open faced metal screens or covers that may be used for mechanical protection.

Finally with FGSA, because of the spacing from the wall, it can increase the transmission loss of sound passing through the bulkhead by as much as 39 dB on average. This depends on the size of the air gap and the mass of the main bulkhead wall. But in general the air gap in typical installations is greater than that available with traditional foam or fiber products, and the effective sound reduction is always greater even though the FGSA product weighs less than half that of the foam product.

Applications

Typical applications include engine compartment in boats and vehicles, scooters, off-road vehicles and gardening tools including exhaust silencers. Workshop machines, fans, mills, printers and material handling machines, ovens, particle separators, power equipment, generators, engines, and compressors. Hydraulic equipment. Food processing machines

FGSA Acoustic Performance

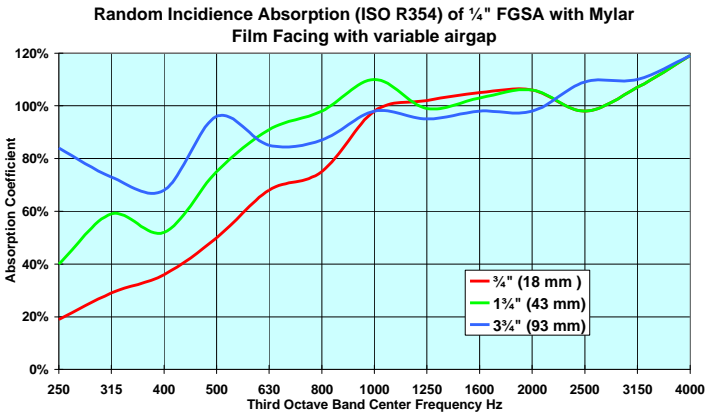


Figure 1 Effect of increasing the air gap behind FGSA panels

FGSA has improved performance at low frequencies as the size of the air gap behind it increases. These results are from tests carried out according to ISO R354 random incidence method. NB values above 1 are due to the edge effects arising from the measurement method.

The 1/4" FGSA was covered with a polyester film facing both sides, the dimensions on the graph represents the size of the airspace behind the FGSA

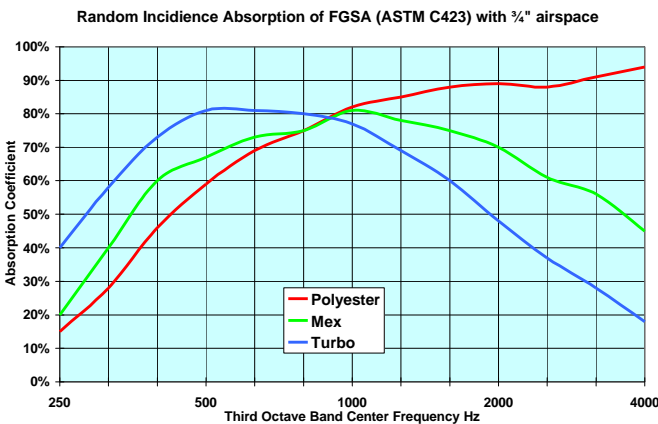


Figure 2 Effect on the absorption of using different facing materials

The installation of FGSA often requires their film facings to survive in extreme conditions of heat and physical stress. This requires films with stronger and heavier film facings.

This increase in strength and durability also causes the absorption performance to improve at low frequencies.

These results are from tests carried out to ASTM C423 with an air gap of 18 mm behind the 1/4" FGSA panels.

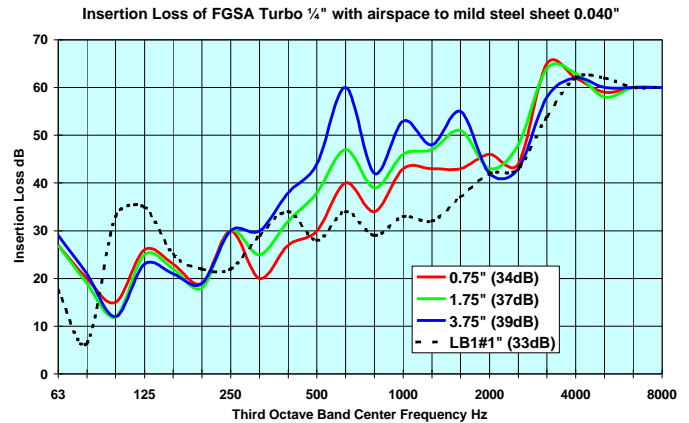


Figure 3 Comparison of Sound Transmission Loss for FGSA with different Air gaps behind the panels

The effect of using FGSA with an air gap increases the sound transmission loss of the bulkhead or wall. This graph shows the increase in transmission loss when FGSA is applied to the surface of a radiating steel panel in a laboratory test fixture.

Without an air gap the improvement is a SRI of only about 12dB(Sound Reduction Index = average insertion loss between 100 and 3150 Hz). With 3/4" air gap, the SRI improves to 34 dB. When the air gap is further increased, to 1 3/4" and 3 3/4" the SRI improves to 37 and 39 dB respectively.

In contrast a typical PU foam barrier product (LB1#1") consisting of 1/4" PU foam laminated to a 1lb /ft² barrier and 3/4" Mylar film faced PU foam has a SRI of only 33dB.

