

Flexible Absorber/Barrier Composite for Noise Control

DuPont™ LoWave™ acoustical material is a high-performance noise control blanket designed to cover a wide frequency range. A unique combination of barrier and absorber materials provides enhanced low-frequency performance. This new product is an easy-to-install composite, with various components that can be designed to meet many unique application requirements. It is available in panels, rolls or custom configurations (see Figure 1).

Applications. The composite can be fabricated to control both broadband noise and pure tones generated by compressors, chillers, fans, motors, generators and other mechanical equipment. DuPont™ LoWave™ composites can be flexible or rigid to accommodate various applications – equipment housings, custom parts, enclosures and/or metal panels. Available facings permit the composite to be used in either indoor or outdoor applications. Product specifications:

- Panels: custom widths, lengths, thickness, weight, facings. Options: grommets, Velcro, baffled vents, roof panels, doors, windows, supports, track and hardware
- Rolls: 4 × 25 ft. Options: bound or unbound edges, Velcro, grommets, edge tape.
- Available facing colors: white
- Available barrier colors: gray, tan, blue or olive drab
- Detailed Description: Combination of the following layers – quilted melamine foam, mass layer, nonwoven, limp mass barrier, quilted fiberglass batting with vinyl coated fabric facing
- Flammability: Class 1 (A) flammability rating per ASTM E84; Flame Spread: 25; Smoke density: 65
- Nominal thickness: 1-2 in.
- Standard width: 48 in. wide
- Roll length: 25 ft long
- Roll weight: 150-300 lbs
- Density: 1.5-3.0 lb/ft²

Noise Control Case Study. A U.S. manufacturer of laboratory equipment was concerned that one of its newest pieces of equipment would not gain widespread acceptance in the marketplace due to excessive overall noise level and unpleasant sound quality. Company officials needed to



Figure 1. DuPont™ LoWave™ noise control material.



Figure 2. Blankets placed around motor.

improve the sound signature of the equipment and improve the comfort level of people working around it without altering external product design.

The sound level of a motor and fan assembly enclosed in a typical metal housing was measured at 78 dBA and had significant low-frequency content. The control objectives were to: reduce the measured noise level by 8-10 dBA; reduce the sound pressure level at frequencies below 250 Hz; improve sound quality without altering equipment design; and maintain adequate air circulation around the fan.

The solution consisted of DuPont™ LoWave™ blankets installed around the motor and fan area that still allowed for sufficient airflow and two separate blankets applied to the housing doors, as shown in Figures 2 and 3. The treatment was designed to reduce both noise transmission through the metal housing and reverberation within the enclosed space of the housing.

Two materials were chosen: 1. a typical mineral wool/barrier composite; and 2.



Figure 3. Blanket affixed to motor housing.

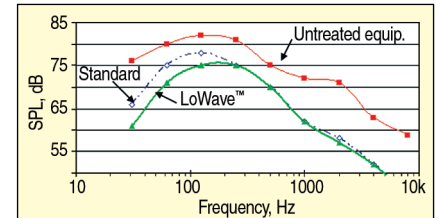


Figure 4. Octave band analyses of untreated and treated equipment.

DuPont™ LoWave™. Both blanket systems were of equal thickness and similar density. The blanket systems were configured for the application and were applied to the test unit in sequence. Sound level measurements and octave-band analyses were made of both configurations. A blind subjective sound quality evaluation was conducted with a group of five engineers while the equipment was operating in an industrial environment.

Figure 4 shows a comparison of octave-band analyses measured in a typical operators location. Below 250 Hz, significant improvement (3-5 dB) over 'standard' acoustical materials was achieved using DuPont™ LoWave™ material in addition to excellent performance above 250 Hz. All five engineers in the subjective study judged the new material to be the desirable noise control treatment.

Using DuPont™ LoWave™, the equipment manufacturer was able to achieve an acceptable sound level of 68 dBA, with 7 dB improvement at 125 Hz without reconfiguring the mechanical equipment or redesigning the metal housing.

DuPont™ LoWave™ is the newest product to join the DuPont Building Innovations portfolio, which is backed by DuPont building science, expert service and support. For more information about DuPont LoWave, contact Jeff Argus at 302.999.6662 or jeffrey.g.argus@usa.dupont.com or visit www.acoustics.dupont.com.