Acoustical Wall Panels Answer the Need for Both a Decorative Surface and Sound Control

by

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Acoustical wall panels are becoming an increasingly important element in helping control sound in interior spaces.

The reason: the acoustical absorption offered by a ceiling alone is not always sufficient to adequately control the reverberation of sound off wall surfaces.

Standard gypsum board walls, for example, reflect 98% of the sound that strikes them, and plate glass walls, 97%. Soft acoustical walls are needed to absorb the sound reflected by these surfaces.

Fabric applied directly to gypsum board, sometimes used as a solution to acoustical wall problems, will absorb only about 15% to 20% of the sound that strikes it. The sound penetrates the soft fabric, hits the drywall that is used as a backer and reflects back into the space.

Commercial carpet installed on a wall, another alternate method of absorbing sound, will reflect back 50% of the sound that strikes it (not to mention the fire precautions that must be carefully considered with carpet products).

To answer the need for both a decorative surface and acoustical control, building product manufacturers have responded with an array of attractive acoustical wall panels that are easy to install.

This auditorium installation shows how a combination of shapes and fabrics can be incorporated into custom acoustical wall panels to produce a sound-controlling, one-of-a-kind graphic design.
Standard acoustical wall panels like these are becoming increasingly popular in commercial interiors because they both reduce noise levels and provide aesthetic appeal.

Product Description

Acoustical wall panels are normally available in two options: standard and custom. Standard acoustical wall panels consist of a fabric or vinyl surface adhered to a mineral fiber substrate that provides not only the acoustical control but also the added benefit of tackability. They’re typically 24” or 30” wide, 9’ or 10’ high and 3/4” or 1” thick.

In terms of acoustical performance, standard wall panels can vary from an NRC (Noise Reduction Coefficient) of 0.50, meaning that 50% of the sound that strikes them is absorbed by the panels, all the way up to an NRC of 0.95, where 95% of the sound is absorbed.

The lower NRC products are usually used in standard offices and conference rooms; the higher NRC products in open plan offices, computer rooms and other areas where a high level of noise generated by either equipment or people must be controlled.

It’s important to note here that in addition to reducing the level of sound within a room, the use of acoustical wall panels also reduces the level of sound transmitted through a wall into an adjacent room.

The ability of an acoustical wall panel to perform as a sound barrier is indicated by its STC or Sound Transmission Class rating. (The NRC rating indicates its performance as a sound absorber.) The higher the STC rating, the
Standard acoustical wall panels come in a wide variety of fabrics ranging from basic needle-punched polyesters to classic wovens. Shown here is Soundsoak Rhythms, a contemporary embossed linear fabric from Armstrong.

better the barrier.

The net effect can be rather dramatic. The addition of standard 3/4" acoustical wall panels to one side of a typical gypsum partition wall, for example, can increase the STC of that wall from 38 to 42. By adding panels to both sides, the STC increases all the way up to 45.

Aesthetically, acoustical wall panels come in a wide variety of colors and fabrics, ranging from basic polyesters to classic wovens. Wool-like fabrics and flannelized fabrics with subtle geometric patterns are also available. The panel’s edges are usually wrapped to provide a crisp, clean joint detail where the panels butt together.

Vinyl finishes are also offered in various colors in acoustical wall panels for areas such as classrooms, corridors and copying machine rooms because the finish is easier to clean and resists impact better than fabric. In addition, microperforating technology makes it possible to provide the benefit of acoustical absorption without resorting to the large holes and perforations previously required with vinyl.

With custom panels, the fabric or vinyl is laminated to a fiberglass substrate. Custom wall panels are frequently used when a specifier wishes to continue the fabric treatment in a system’s furniture or seating onto the wall.
Standard acoustical wall panels are widely used in renovation, either to solve an acoustical problem that was not adequately anticipated when the project was originally designed or when the use of the space changes, for example, from a standard office to an open office.

In new construction, both standard and custom panels are used. However, more custom panels tend to be chosen here because they give the specifier the opportunity to select a specific fabric size and performance.

In regard to fire performance, acoustical wall panels with fabric facings should be tested as composite materials for flame spread and smoke development just as gypsum board panels with paper facings are tested as composite materials.

Regardless of whether it’s a standard or custom panel, the fabric, substrate and adhesive used to bond the fabric to the substrate should be rated as a whole and not individually since that’s the way the product will be used. Because it is the safest approach to rating fire performance, Armstrong tests all of its panels in this manner.

Installation

In general, the installation of standard acoustical wall panels is similar to that of paneling. The only differences are the size of the panel and the means of attachment to the wall.

Soundsoak acoustical wall panels, for example, Armstrong’s most popular line, are installed by means of an internal vinyl H-spline that fits into a kerf on the long sides of the panels and attaches directly onto the wall.

The installation system is demountable, meaning that the panels can easily be removed at a later date. It also means the panels can be treated like furniture for tax purposes and be depreciated over seven years.

The supporting wall is typically drywall or plaster, but can also be flat block, brick or concrete. In the case of brick, block or concrete, however, we recommend that contractors first apply a polyethylene film to the wall as an airflow and vapor barrier, and then apply horizontal furring strips on 12” spacings.

Acoustical wall panels usually install quickly and cleanly, both of which are important considerations, especially in remodeling or renovation jobs where the facility remains in use and disruption must be kept to a minimum. A one or two man crew is all that is required. The actual speed of the job will depend on how much trimming is involved.

In terms of job site conditions, the HVAC system should be operating as close to actual conditions as possible, meaning 60-80 degrees F and a maximum of 70% relative humidity.

Step-by-Step Procedure

The actual installation of standard acoustical wall panels is a relatively easy process. Here, for example, are typical step-by-step procedures for Armstrong’s line of Soundsoak panels:

1. Attach plastic “J” molding to the wall at the point where the bottom of the panels will be located.
2. Measure the length of the wall to be covered and calculate equal size panels for each end. Along one side, drop a plumb line or use a level to draw a plumb line according to the size of the first panel. Make several measurements from the plumb line to the wall and transfer the the panel.
3. With a sharp knife, cut the first panel as marked. If desired, apply “J” molding to the cut edge. The edge can optionally be fabric-wrapped by cutting only the board and not the fabric, trimming the fabric to allow a 2” flap, and wrapping the fabric over the edge and securing it to the back with adhesive.
4. Measure the vertical wall height to be covered and cut the panel to length. Panels can run to the ceiling line or be stopped 1” to 4” short to create a decorative reveal. Never install Soundsoak panels above the ceiling line. This can create air flow through the panel into the ceiling plenum causing soiling of the fabric surface.
5. Apply a strip of globs of panel adhesive along the back of the leading side of the first panel. Insert the “H” spline into the kerf on the trailing edge of the panel, position on the wall, and attach the spline to the wall using #6 x 1-1/4” bugle head Phillips Hi-Low screws (five to six per spline).
6. Cut the next panel to length and insert the lead edge into the previously attached “H” spline, insert another spline into the trailing edge, and attach to the wall as before. Proceed progressively along the wall as described.
7. When installing Soundsoak
around door or window frames, there are two options for handling edge treatment. Use either a “J” molding or a fabric-wrapped edge as previously described in Step 3. Around receptacles, follow standard electrical codes.

8. Outside corners can be handled using a corner holding for protection or two fabric-wrapped panels as previously described. A continuous-wrapped corner can be created by cutting a square block out of the back of the board without cutting the fabric, inserting a plastic “L” corner protector (optional) and then folding the panel around the corner.

9. Measure for the last panel and cut. A “J” molding can be applied or the panel can be optionally fabric-wrapped as previously described. Use a strip or globs of panel adhesive to secure the trailing side of the last panel.

10. When panels are stacked vertically on a wall, use either two “J” moldings, an “H” molding, a wood nailer plus finish trim, or a horizontal accent insert such as Armstrong Duets between the upper and lower panels.

11. Apply “J” molding to the top of the panels. Apply other finish trim desired such as cove molding or wood molding.

Cautions

Do not install standard acoustical wall panels on ceilings or inwardly sloping walls.

When cutting open the cartons, be sure not to score the back of the top panel. Never cut one panel on top of another panel.

Any time the back of a panel is cut or scored for any reason, apply a heavy mastic tape or foil to reseal the back of the panel to prevent air flow through the panel in these areas. This air flow can cause soiling of the fabric surface.

Use clean hands when handling the panel to prevent soiling or staining of the fabric surface. Be sure the area in which the panel will be applied is clean before installing.

About the Author:

Thomas M. McEvoy is marketing manager, commercial walls, for the Architectural Building Products Division of Armstrong World Industries. McEvoy joined Armstrong in 1976. He was named to his current position in 1988.