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**THORBURN ASSOCIATES INC.**  
**Acoustic and Technology Consultants**  
**Newsletter**

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**Fall 1996**

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Trade show season is finally over for us, just in time to relax for the holidays! We had barely finished our office move before having to jet off to Barcelona for the ISTC large format conference, then back for the World Gaming show in Las Vegas, and on to the IAAPA themed entertainment convention in New Orleans. A warm welcome to everyone we met at those shows who has just joined our newsletter mailing list. If you'd like to see any of our back issues, they're up on our web page at [www.TA-Inc.com](http://www.TA-Inc.com).

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### **Growing Trends in Green Insulation**

Insulation is all around us. Though we may not pay attention to the different types of insulation, we would certainly notice its absence. The main purpose of this hidden barrier is to secure a building's interior temperature from the outside extremes, providing a savings in energy bills and a more comfortable atmosphere for those inside. The right kind of insulation can even increase acoustical ratings for walls and ceilings.

When discussing "green insulations", the term doesn't refer to the color of the product, but to how environmentally friendly it is. Since insulation is so widely used and performs an ecological task, it makes sense that some brands are geared towards being safer for the environment. Many companies are following current trends in recycling by manufacturing insulations which either contain or are made entirely of reclaimed materials. Here's a look at some of the more popular types of insulations and their acoustical properties.

#### **Fiber Glass**

Possibly the most common insulation, fiber glass has long been known for its thermal and sound-reducing properties. The thick sheets of this fluffy material, called "batts", are used in the interior of wall and floor/ceiling constructions. Fiber glass is basically composed of what the name implies: shredded glass fibers held together by a formaldehyde binding agent. The main ingredients in the glass are lime, soda, and ash--all natural resources. This alone doesn't make fiber glass a green product, so some manufacturers have switched to using reclaimed industrial and post-consumer glass for their insulation. One company in particular has used over two billion pounds of recycled glass in the past five years. Some recent versions of fiber glass use alternatives to the formaldehyde binding agent. One brand substitutes an acrylic thermoset resin which has the same strengths as formaldehyde. Another brand avoids chemicals altogether by simply fusing two kinds of glass into thick curly strands.

Fiber glass blocks up to 5 STC points of airborne sound when used for interior partitions. However, the installation of batts does pose a drawback. Rectangular strips of fiber glass don't fit easily around pipes, junction boxes, or outlets. An unprotected gap in the insulation as small as 4% can translate into a 50% heat loss/gain through air infiltration while reducing the sound isolation properties by 1-2 STC points. A "sound batt" is a slimmer, denser version of the typical batt with extra binding agent. Although it is marketed for its sound isolating qualities, in reality it has little more effect than if a standard batt is compressed into the same area as the sound batt.

Fabric wrapped pressed fiber glass panels are made specifically for sound control in a room. Resembling light-weight gypsum board, these panels are attached to the interior walls or ceilings of a finished facility. They provide additional thermal insulation while absorbing up to 50-75%, or 2-4 decibels, of the sound

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energy which strikes their surface. The sound boards come in various thicknesses and can be covered with a selection of patterned cloth for added acoustical and aesthetic effects.

### **Mineral Wool**

Closely resembling fiber glass in structure and function, mineral wool is actually composed of spun mineral fibers which produce a semi-rigid batt insulation. The fibers in these blankets form a highly complex structure which contain millions of air pockets that trap sound. The acoustical ratings for this insulation match or exceed those for fiber glass.

### **Styrofoam**

Thermal properties for polystyrene (styrofoam) boards actually exceed those for fiber glass insulation by a wide margin. Unfortunately, a number of years ago styrofoam got a bad reputation when chemicals used in its manufacture were identified as ozone-depleting. The offending chemical, Chlorofluorocarbon (CFC), was replaced by its much less harmful molecular relatives, Hydrochlorofluorocarbon (HCFC) and Hydrofluorocarbon (HFC). Lately, even HCFC is being replaced by non-chlorine based alternatives. You can now use these foams to keep your building warm without worrying about heating up the rest of the Earth, too.

Polystyrene's greenest feature is the ease with which it can be recycled. Not only are its component materials reclaimable, but since styrofoam doesn't deteriorate like most natural substances, the boards can be salvaged from one project and added to another.

During construction these rigid boards are concealed inside wall, ceiling, or roof areas. The closed-cell fabrication of this hardened foam gives it a high moisture-resistance rating, allowing it to come in direct contact with subterranean backfill for basements constructions. However, a drawback to using this insulation is its combustibility and high rating for developing smoke in a fire situation. Acoustical characteristics for this or any closed-cell foam insulation are nearly non-existent.

### **Spray-On Fiber**

One of the greenest insulations, spray-on fibers contain cellulose, wood or paper pulp bonded by a vinyl acrylic adhesive. The mixture is then chemically treated to resist fire, moisture, and mildew. This final mixture is applied by spraying it either onto the interior of a finished building or between studs in unfinished wall and ceiling assemblies. Companies which make this insulation use anywhere from 50-100% recycled fibers for the composition.

Spray-on insulation ratings match fiber glass in a number of categories. The effectiveness of this system is partly due to its installation. The spray fills in cracks, irregular spaces, and around previously installed electrical and plumbing fixtures. Dead-air spaces between and within the cells of the fibers create a better trap for sound waves and a more solid barrier against temperature changes. The fire-resistant chemical blended into the spray composition gives it a fire and smoke rating comparable to fiber glass.

Coating interior surfaces of a facility with spray-on material provides thermal insulation, absorbs 50-75% of the sound caused by reverberations, and can even increase the light reflectance rating. The bonded fibers will cling to any surface that latex paint sticks to, with a little priming for the more porous areas. Overhead applications can be up to three inches thick without the need for mechanical supports. This makes it a convenient addition after construction has been completed.

### **Cotton**

If cotton cloth is good enough to keep your body warm, then it should be good enough for your house. No, they don't make a giant shirt for your building. Instead, one industrious textile manufacturer uses its shredded scraps to create a non-toxic and itch-free alternative to fiber glass. The scraps are treated with a flame-retardant and formed into batt rolls with a kraft paper facing (like fiber glass) or blown into attics. The first thing you notice about this product is that it's extremely soft, yet still resilient. Not only does this new form of insulation provide comparable noise reduction to fiber glass, but it is also completely biodegradable.

The insulations discussed above are just a part of the growing movement towards green products. Conservation has become more popular due to the increasing awareness of how fragile our environment is. In response, more companies are looking for ways to provide Earth-friendly products.

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