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hanley wood Special Report:
ebuild GREEN INSULATION

4 Greener Insulation Alternatives

Insulation helps lower a home's energy use, but pros are looking beyond R-values as manufacturers churn out new products with more recycled content and less negative impact on the environment during manufacturing or on a home's indoor air quality after installation.

Four "greener" insulation alternatives have gained credibility and market share as builders and remodelers try out everything from foams installed with water-only blowing agents to batts made from blue jeans.

Formaldehyde-Free Fiberglass

All fiberglass insulation, typically made from silica sand and recycled glass, contains at least 20% recycled products from post-consumer or post-industrial sources. Some manufacturers use as much as 40% recycled glass.



Johns Manville EasyFit Fiberglass Insulation

Yet the making of fiberglass insulation consumes large amounts of energy and creates more air pollution than other kinds of insulation because it requires baking the components at extremely high temperatures in fossil fuel-burning furnaces. Still, the North American Insulation Manufacturers Association claims that fiberglass insulation saves 12 times more energy within a year after installation than it uses during the manufacturing

process.

The binders in traditional fiberglass insulation contain formaldehyde, which the EPA considers a "probable human carcinogen" but that manufacturers say is used in such nominal amounts it doesn't present a health concern. In fact, some fiberglass

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batts have earned Greenguard Environmental Institute certification for low chemical emissions.

Still, some manufacturers are making formaldehyde-free alternatives with acrylic or plant-based binders that reduce concerns about off-gassing during manufacturing and after installation. Builders whose clients have a sensitivity to formaldehyde often specify these alternatives, although they cost slightly more than traditional batts.

Cotton Batts

Although the National Academy of Sciences and the American Lung Association have debunked allegations that inhaling glass fibers from all kinds of fiberglass insulation can cause respiratory cancer, some homeowners report throat and eye irritation from fibers that escape into the air during installation, especially in homes whose ductwork is not properly sealed.

Those concerns are behind the growing popularity of non-fiberglass batts, which can be made almost entirely from recycled cotton, sheep's wool, or mineral wool.

Cotton insulation is the most popular non-fiberglass type. The product contains no formaldehyde or volatile organic compounds, and manufacturers say the denim fibers will not cause respiratory or skin problems for people who aren't allergic to cotton. In addition, installers do not need to wear protective clothing when handling the insulation, according to manufacturers.

An added bonus is that most of the cotton comes from shredded denim scraps generated by the making of blue jeans and is 100% recyclable.

Cotton is a flammable material, so the batts are treated with ammonium sulfate or nontoxic borate to make them fire resistant; prevent mold, mildew, bacteria, and fungi; and ward off insects.

Manufacturers claim cotton insulation's thermal properties are comparable to fiberglass and cellulose. Plus, denim-based insulation's acoustic ratings are about 30% higher than traditional fiberglass batts, so builders sometimes choose it for home theaters.

But it costs up to 20% more than traditional fiberglass batts, and some installers charge more to place it because they complain it's hard to cut and dulls their cutting tools.

Spray Foam

A favorite among green builders because it seals as well as insulates, spray foam's thermal performance outpaces other kinds of insulation. Yet making the polyurethane that is a main component of



many foams has a greater impact on the environment than other forms of insulation. Still, foam will save more energy per inch of insulation over its lifespan because its R-value is higher. Nonetheless, its installed price makes it the most expensive choice.



Isynene Medium-Density Spray-Foam Insulation

Although foam insulation does not use recycled materials, some brands contain renewable soy or castor oils—some made from genetically engineered plants—to replace a portion of the petroleum.

Much polyurethane foam insulation uses HFCs (hydrofluorocarbons) as blowing agents, which the EPA says do not harm the ozone layer but could contribute to global warming. Earth-friendly replacement agents like carbon dioxide, water, compressed air, or a mixture of those ozone-friendly agents are increasingly found in foam insulation.

Despite the addition of more environmentally friendly components, manufacturers recommend that installers wear respirators, gloves, and protective clothing to guard against fumes and spills.

Cellulose

Cellulose insulation is made from at least three-fourths shredded newspapers, cardboard, waste paper, and wood pulp, so it surpasses other forms of insulation for recycled content. Besides paper, some cellulose insulation is made from granulated cork, hemp fibers, straw, and grains, although the most common content is recycled newspapers.

Plus, scraps left over during installation can be reused, and the manufacturing process is less energy-intensive than fiberglass and foam and causes less pollution. Still, its organic base makes the insulation flammable, so manufacturers treat it with flame retardants like borate and ammonium sulfate, used in amounts that are harmful only if swallowed. Cellulose insulation produces a lot of dust during installation, so installers are advised to wear respirators.



FiberAmerica Green Seal Cellulose Fiber Insulation

Because cellulose can absorb moisture, its R-value decreases over

time. And if the insulation is exposed to moisture for long periods, it can rot and grow mold. The Cellulose Insulation Manufacturers Association notes, however, that few cases of significant mold growth on cellulose insulation, which is treated with boric acid, have been reported.

Loose-fill cellulose costs less than fiberglass (batt and loose fill), though its installation may be more expensive. Nevertheless, cellulose insulation typically is produced regionally so there's no need to transport it great distances. And because cellulose is growing in market share, the energy savings and environmental benefits have the potential to be huge.

Sharon O'Malley is a contributing editor to Building Products magazine and ebuild.com.

Johns Manville. EasyFit perforated thermal and acoustical fiberglass insulation is part of the manufacturer's line of formaldehyde-free products that use an acrylic binder to eliminate binder-related formaldehyde emissions during manufacturing. Once installed, the batts will not off-gas into the indoor environment, the manufacturer asserts. Available in unfaced or kraft-faced batts, the insulation features vertical perforations that allow installers to separate sections by hand, rather than cutting the insulation, to fit non-standard-width framing cavities. 800.654.3103. www.jm.com.

Bonded Logic. Known as the "blue jean insulation," UltraTouch natural cotton fiber insulation is made from post-consumer recycled cotton denim fibers. The fibers create batt insulation with R-values from R-8 to R-30, the manufacturer claims. UltraTouch, which does not contain chemical irritants or formaldehyde, does not itch, is easy to handle, and can be installed without the use of protective clothing, the maker says. UltraTouch has a high noise-reduction coefficient that helps it reduce airborne sound transmission. 480.812.9114. www.bondedlogic.com.

Icynene. Icynene MD-R-200 is a 100% water-blown, medium-density spray-foam insulation and air barrier material that is HFC-free. It is made using recycled material and offers an R-value of 5.1 per inch, low vapor permeance, and the ability to deliver additional load capacity, the manufacturer says. As a qualified air barrier, the product helps reduce the movement of airborne moisture through the building envelope and prevents problems such as condensation that can result in mold growth, the maker claims. By minimizing air leakage and conductive heat flow, the product can cut household energy bills by up to 50% when compared with fiberglass or cellulose the company says. 800.758.7325. www.icynene.com.

FiberAmerica. The Green Seal cellulose fiber insulation line includes a loose fill, all-borate loose fill, an all-borate wall spray, and a stabilized insulation product. They are all Class 1, Type A building materials best suited for attic, sidewall, and ceiling applications. Made from recycled newspaper, the products are treated with nontoxic, naturally occurring fire-retardant borate minerals for fire safety and insect repellent. The manufacturer claims the products have higher R-values per inch and more thermal resistance than fiberglass. 877.279.1969. www.fiberamerica.us.

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