



Batt Insulation

No Added Formaldehyde Alternatives

For decades, formaldehyde has been the standard binder used to glue the fiberglass fibers together in batt insulation. In recent years, however, concerns have been rising about the risks of cancer and bronchial health impacts from formaldehyde.¹ Pressure from the green building movement, through market selection, has led to the introduction of several new alternative batt insulation products with no added formaldehyde, listed in the accompanying chart. This fact sheet identifies the alternatives currently on the market (or expected in 2008), outlines the primary environmental health toxicants in the currently available products, and reviews some of the claims made for the different alternatives.

Manufacturers are currently using one of two major approaches to reduce the problem of exposure to formaldehyde from insulation, offering either:

- 1) **Fiberglass insulation with different binding techniques (Johns Manville)**
- 2) **Cotton insulation**
 - a. **EcoBlue (EcoBlue, Inc., formerly InsulCot)**
 - b. **UltraTouch (Bonded Logic)**

NOTE

There are many concerns about the use of the term “formaldehyde free” in marketing or otherwise describing building products. A wide range of materials, including wood and paper, naturally emit very small trace amounts of formaldehyde. Therefore for clarity, we exclusively use the term “no added formaldehyde” instead of “formaldehyde free” to describe these products.

Fiberglass insulation with no added formaldehyde

There is currently only one “no added formaldehyde” fiberglass insulation product on the market. It is from Johns Manville and is made with an acrylic binder. Owens Corning previously made a fiberglass batt product with no added formaldehyde but discontinued it due to insufficient demand. Neither Owens Corning nor the other leading manufacturers—Certainteed, Guardian Building Products, and Knauf—have disclosed any plans to bring fiberglass products with no added formaldehyde to market at this point. Johns Manville’s product line has met California Section 01350 standards through testing at Berkeley Analytical and is listed on the Collaborative for High Performance Schools (CHPS) Low-emitting Materials List.

Source materials

Sand, used to make fiberglass, is not a renewable material but is available globally in huge amounts. Mining of sand can have significant environmental impacts depending upon the region. Johns Manville sources its sand from a variety of locations close to where each regional facility creates the fiberglass.

Flame retardants

The Johns Manville product is class A rated without flame retardants, though some of the facing options use antimony trioxide, a California Proposition 65 listed chemical, as a flame retardant.

Cotton insulation

There are only two products currently known on the market made from cotton: Bonded Logic's Ultra Touch and EcoBlue (formerly InsulCot).

Ultra Touch is made from 85% cotton and the remaining 15% is a combination boric acid and co-polyolefin (for binding).

EcoBlue is made from 75% cotton and 25% polyester. 10% of the blend is polyester melted into the cotton mix to act as a binder. The other 15% polyester portion is added as a "spring back fiber" to give the insulation resiliency. The company is undertaking research to identify a natural fiber that can replace the 15% polyester used for the spring back.

Source materials

Both cotton insulation products currently on the market source their materials from pre-consumer denim scraps from the manufacturing of denim products, diverting them from landfill. The source materials for EcoBlue cotton insulation comes from overseas—the company cited China and Turkey. Ultra Touch (Bonded Logic's product) uses cotton fibers primarily from Mexico, with a very small percentage sourced in the US from one of the few remaining denim plants in North Carolina.

Flame retardants

Bonded Logic uses boric acid/borax as a flame retardant and fungicide/insecticide. Boric acid is used in some pressure-treated wood as an alternative to copper and arsenic-based treatments. EcoBlue uses a phosphorus-based flame retardant in its product. Both flame retardants are considered better alternatives to halogenated flame retardants, which are toxic chemicals found abundantly in the environment and are linked with human health concerns.²

Competing claims

Manufacturers of cotton insulation claim that there is a major difference in energy required to produce cotton insulation versus fiberglass insulation. They assert that it takes a large amount of energy to produce fiberglass insulation, which requires temperatures in excess of 2000 degrees to make the product. Cotton insulation, on the other hand, is heated at approximately 350 degrees, using significantly less energy. We are not aware of any comparative full life cycle analyses of the energy used to make the two types of products.

EcoBlue is new to the market and based on the technology and staff for InsulCot, used primarily in residential applications. As a result this product does not have much experience yet in commercial/institutional applications.

Johns Manville asserts that fiberglass is superior to cotton insulation, challenging cotton's resistance to fungi and moisture and whether the cotton is grown pesticide-free.

Both cotton products claim the same thermal resistance with an R-19 batt measuring 5.5 inches thick. This is slightly better thermal resistance than standard fiberglass batts (6-1/2" for R-19) and slightly less thermal resistance than high density fiberglass batts (5.5" batts are rated at R-21).

Cotton insulation manufacturers note that cotton does not present the same skin, eye and respiratory irritation problems that fiberglass does for workers or those otherwise exposed to the insulation. Unlike cotton, the cancer potential of small fiberglass fibers that have the ability to penetrate deep into the lungs is seriously debated and they are listed as possible carcinogens by the State of California.³

ENDNOTES

- 1 More information on formaldehyde, its health impacts, and recent regulatory actions to reduce emissions can be found in the fact sheet "Health Hazards of Formaldehyde Found in Building Materials" at <http://www.healthybuilding.net/healthcare/index.html> and on HBN's PharosWiki at <http://www.pharosproject.net/wiki/index.php?title=Formaldehyde>
- 2 See "Screening out the Toxics: Interior Flooring and Finishes" at <http://www.healthybuilding.net/healthcare/index.html> and Health Care Without Harm <http://www.noharm.org/us/bfr/issue>
- 3 Glasswool fibers were listed as potentially cancer causing under California's Prop 65 in 1990 "Chemicals Known to the State to Cause Cancer or Reproductive Toxicity," 3/21/2008 by the State of California http://www.oehha.org/prop65/prop65_list/Newlist.html