

## Cellulose Insulation

Having a well-insulated building envelope is crucial to creating an environmentally sound building. By minimizing heat transfer through the envelope, energy used to maintain the interior climate is similarly minimized, reducing both utility bills and the environmental costs of fossil fuel use.

Fiberglass batts are the most common materials for insulating walls and ceilings. Cellulose insulation is made from recycled paper that is applied as either loose fill into attics and closed wall cavities or damp-sprayed into open wall cavities. Due to its recycled content and potentially higher energy and acoustic performance, cellulose is an environmentally-preferable product.



### ***PRODUCT COMPARISONS***

#### **Cellulose Insulation**

High Recycled Content  
Less Harmful to Installer  
Class I Fire Rating  
No Formaldehyde-based Binders  
Superior Acoustical Properties

#### **Conventional Insulation**

Low Recycled Content  
Potentially Harmful to Installer  
Class I Fire Rating  
Formaldehyde-based Binders  
Inferior Acoustical Properties

### ***LEED CREDITS***

Using this material potentially contributes to obtaining these credits in the US Green Building Council's LEED certification program:

#### **Energy & Atmosphere**

EA Prerequisite 2 Minimum Energy Performance

EA Credit 1 Optimize Energy Performance

#### **Materials & Resources**

MR Credit 4.1 Recycled Content

MR Credit 4.2 Recycled Content

LEED stands for Leadership in Energy and Environmental Design. To find out more about it, visit [www.leedbuilding.org](http://www.leedbuilding.org).



## ***ENVIRONMENTAL ATTRIBUTES***

### **Energy Performance**

Although cellulose insulation's R-value of roughly 3.7 per inch is similar to high-density fiberglass batts, it has a significant advantage over fiberglass. Because of its method of installation, it seals all cavity spaces very effectively, greatly reducing air infiltration and higher frequency sound transmission. The overall R-value of batts, on the other hand, can be significantly lower than its idealized rating due to typically deficient installation. Loose-fill cellulose settles over time, requiring it be installed at its predicted settled density to achieve its rated R-value. Some manufacturers have created "stabilized" products that reduce settling.

### **Resource Impacts**

Cellulose is generally made from about 80% recycled newsprint and other waste paper products such as cardboard and paperboard, creating a market for materials that would often otherwise end up in landfills. At the end of its useful life, cellulose insulation can, theoretically, be composted.

### **Health Considerations**

Unlike most fiberglass batts, cellulose insulation does not have formaldehyde-based binders that can be harmful to installers and offgas once installed. Fiberglass fibers are friable and can easily become airborne, particularly during installation. These fibers can be inhaled, and some health experts claim that this particulate matter is carcinogenic. For fire and pest resistance, up to 20% of cellulose insulation is composed of ammonium sulfate or boric acid, low-toxicity chemical additives. The boric acid additive is much more desirable, as ammonium sulfate can have significant odor problems if not installed precisely to specifications, and some experts claim it is corrosive to copper pipe. Boric acid is also one of the main additives used in cotton batts and infant clothing for fire resistance. While the health risk posed to installers and occupants is lower than fiberglass, chemically sensitive people who may be sensitive to off-gassing from inks may want to order the loose-fill variety, which is made with cardboard rather than newsprint.

Cellulose insulation can absorb more moisture than most other types of insulation. If wall cavities are prone to wetting or are not allowed to dry out after wetting, there could be potential for mildew growth. Ensure a well-designed and constructed wall system.

## ***FUNCTIONAL CONSIDERATIONS***

### **Cost**

Having cellulose insulation installed can cost anywhere from the same to twice that of fiberglass insulation, depending on the nature of the project. However, insulation material costs are generally a small percentage of the total cost of construction. In addition, the excellent sealing characteristics of cellulose insulation make it a superior, incomparable product to fiberglass. Since insulation should be a one-time installation, ensuring quality workmanship and material is important as remedying substandard work later will be costly.

### **Installation**

Loose cellulose fibers are blown into building cavities or attics using special pneumatic equipment. Some installers attach netting to the face of open wall and ceiling cavities and blow in



loose cellulose. Because loose-fill cellulose settles over time, it must be installed to its predicted settled density to achieve its rated R-value. Cellulose coverage charts compensate for settling in the bag count and material weight columns; ensure your installer follows the manufacturer's installation requirements.

Cellulose can also be damp-sprayed into open wall cavities before the drywall is applied. Make sure the damp sprayed cellulose has less than 25% water content before closing the cavities with drywall; failure to test the moisture level could lead to moisture and mold problems in the future. A professional installer is required for the damp-sprayed or closed-cavity applications.

Cellulose insulation can hold moisture, which should not be problematic in walls assemblies that are dry or are able dry out between cycles of water loading. Repeated wetting and drying could, however, cause the borate treatment to leach out and mold to grow.

### **Maintenance**

Any insulation type will have problems if excessive moisture is allowed into the wall cavity. If moisture is entering the wall cavity, the highest building priority should be to eliminate this problem before even considering the insulation. If the wall cavities are kept dry, there should be no need for maintenance.

### **Other Data/Comments**

Check with your local building code and or local utility for recommended insulation levels. The Home Energy Saver can be a useful tool in assessing energy efficiency priorities in your house. It is an excellent on-line calculator developed by Lawrence Berkeley National Laboratory that takes data input by users and reports the measures that will likely be most effective in lowering utility bills and reducing your home's environmental impact. Use it at <http://hes.lbl.gov/>

## ***RESOURCES***

For up-to-date product and retailer information, visit the manufacturers' websites or search the Green Materials Database, [www.builditgreen.org/guide](http://www.builditgreen.org/guide).

### **Manufacturers**

#### **GreenFiber**

(800) 228-0024 (Retailer info)

(888) 592-7648 (Installer info)

[www.greenstone.com](http://www.greenstone.com)

### **Retailers**

#### **Friedman Brothers Hardware (Do it Best)**

3800 Lakeville Hwy  
Petaluma, CA 94954  
(707) 588-7647

#### **Golden State Lumber**

1100 Anderson Drive  
San Rafael, CA 94901  
(415) 454-2532  
[www.goldenstatelumber.com](http://www.goldenstatelumber.com)

#### **Friedman Brothers Hardware (Do it Best)**

**Golden State Lumber**  
3033 South Airport



4055 Santa Rosa Avenue  
Santa Rosa, CA 95407  
(707) 584-7811

**Golden State Lumber**

38801 Cherry Street  
Newark, CA 94560  
(510) 818-1000  
[www.goldenstatelumber.com](http://www.goldenstatelumber.com)

Stockton, CA 95206  
(209) 234-7700  
[www.goldenstatelumber.com](http://www.goldenstatelumber.com)

**Home Depot**

Bay Area- Wide  
(800) 553-3199  
[www.homedepot.com](http://www.homedepot.com)

**Lowe's Home Improvement Center**

Bay Area- Wide  
(800) 44-LOWES (445-6937)  
[www.lowes.com](http://www.lowes.com)

**Installers**

**CCI California Coastal Insulation**

801 West Ranger Avenue  
Alameda, CA  
(510) 337-0782

**McHale Insulation Company**

1300 Galaxy Way  
Concord, CA  
(925) 825-9780

**F. Rodgers Insulation & Interiors**

7085 Las Positas Road  
Livermore, CA  
(800) 750-9101  
[www.frodgers.com](http://www.frodgers.com)

**Synergy Inc.**

2843 Satellite St.  
Hayward, CA 94545  
(510) 259-1700

**Guaranteed Energy Solutions**

1934 Estudillo Street  
Martinez, CA  
(925) 228-1002

---

***Disclaimer***

The above information is provided for general education and informational purposes only and does not constitute an endorsement, approval or recommendation of any kind. The actual suitability and applicability of this information for a given use depends upon a host of considerations. These include laws and regulations applicable to the intended use of the information, specific attributes of that use or project, and the specifications for any product associated with this information. Build it Green disclaims all warranties, express or implied, and strongly encourages the reader to consult with a construction professional and/or product supplier before applying any of this information to a specific use or purpose.