



# Thermal Insulation for Green Buildings



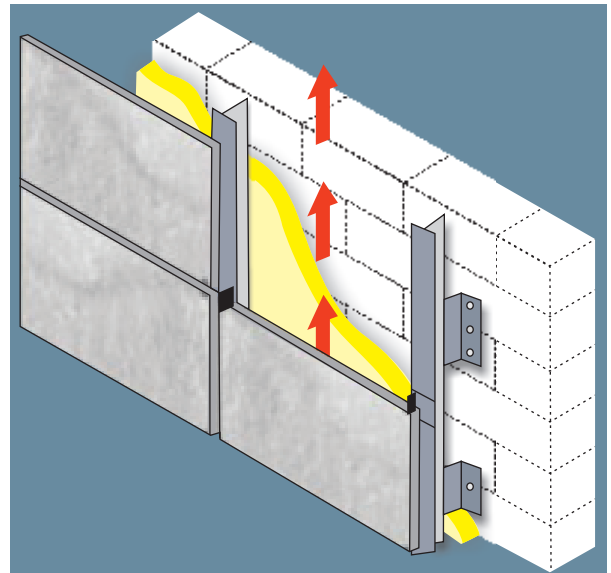
- Reduces Energy Consumption by up to **30%**
- Zero Ozone Depleting Potential
- Minimum VOC
- Excellent Fire Properties
- Uses Abundant & Renewable Raw Materials

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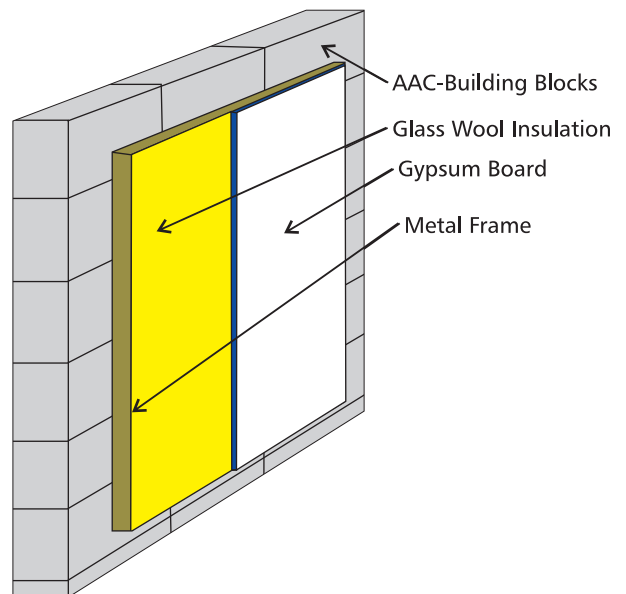
## An Introduction to Glasswool Insulation

Glasswool insulation is one of the most widely used forms of insulation world-wide because of its excellent thermal and acoustic insulation properties, light weight, high tensile strength and exceptional resilience. Glasswool is the most dominant type of insulation used in applications with service temperatures between  $-50^{\circ}\text{C}$  to  $+250^{\circ}\text{C}$ , with a world-wide market size of approximately US\$ 7 billion.

Glasswool insulation consists of fine, long, inorganic fibers bonded together by a high temperature binder. The fibers (each of approximately 6 to 7 micron diameter) are distributed in such a way as to trap millions of tiny pockets of air in the product, thereby creating its excellent thermal and acoustic insulation properties. The product is light gold in colour and its superior tensile strength and resilience makes the product ideal for applications in which there will be vibration, jolting or high compression. The light weight and handleability of Glasswool also offers significant advantages during transport and installation. In addition, Glasswool is chemically inert and has no impurities such as iron shots, sulphur and chloride. The product is non corrosive to metal and does not support any mold growth.



**External Wall Insulation (Ventilated Facade)**



**Internal Wall Insulation**

# Glasswool - A Green Building Material

The use of Glasswool for the thermal insulation of external walls and ceilings has been shown to reduce energy consumption by 20% to 30%. Glasswool is manufactured from widely available and renewable raw materials and provides environmental benefits in terms of resource saving and energy saving in every stage from pre-manufacturing to end use. A comprehensive review is provided below:

Product Life Cycle	Analysis / Review
Pre-manufacturing	<ul style="list-style-type: none"> <li>• Primary raw material: Sand, which is abundant and renewable in nature.</li> <li>• No raw material comes from any derivative of fossil fuel.</li> <li>• Secondary raw material is recycled glass.</li> </ul>
Manufacturing	<ul style="list-style-type: none"> <li>• Energy saving vs. energy used: The life cycle analysis of Glasswool products shows that the energy saved during the use of products may be around 700 times higher than the energy used in their production.</li> <li>• In house glass wool scrap is recycled.</li> </ul>
Distribution and Packaging	<ul style="list-style-type: none"> <li>• Compressed vacuum packaging in roll form requires less transportation volume without affecting the specified thickness required at the time of application.</li> <li>• Less packaging means less scrap.</li> <li>• Less requirement of transportation energy.</li> </ul>
Product Characteristic	<ul style="list-style-type: none"> <li>• High thermal resistance.</li> <li>• Non combustible and fire safe material.</li> <li>• Non corrosive.</li> <li>• No impurities, no shot content, no sulphur, no chloride.</li> <li>• No settling.</li> <li>• Totally inert.</li> <li>• Resistant to mold / fungal growth.</li> </ul>
Use, Re-use and Maintenance	<ul style="list-style-type: none"> <li>• No maintenance required.</li> <li>• Can be reused.</li> <li>• High life expectancy.</li> </ul>
Waste Management	<ul style="list-style-type: none"> <li>• Can be reclaimed and recycled into new product.</li> </ul>

## Contribution of Glasswool to LEED Rating

LEED Credit Category	LEED Credits Available	Glasswool Contribution
Energy and Atmosphere - Optimize Energy Performance	1-10 points depending on percent reduction in energy used.	Helps to reduce building energy consumption by 20 to 30%.
Material and Resource - Recycled Content	1-2 points depending on post consumer, post industrial recycled content.	Recycled content: up to 20% Post industrial glass cullet is recycled in the process.
Material and Resource - Reuse	1-2 points	Glasswool can be easily reclaimed from site and reused.
Material and Resource - Regional / Local Manufacturing	1-2 points depending on whether 20% of total building material is locally manufactured (within 800 KM radius).	Two manufacturing units in North (U.P) and West (MH) can help to provide these points.
Innovation and Design Process	1-4 points depending on the innovation applied.	Acoustic benefit in buildings, fiberglass wool as concrete reinforcement.

NOTE: No individual product can accrue LEED points. For detailed evaluation please consult a LEED Accredited professional.

## Complying with LEED India NC and ECBC, 2007

LEED India NC version 1.0 requires compliance with the Energy Conservation Building Code (ECBC) for a Green Building Project.

The illustrations below show how Glasswool can be applied with other green building materials to achieve the required transmittance value (U-value) so as to comply with ECBC 2007.

24 Hour Use Building and Daytime Use Building		
Climate Zone	Specified U Value (W/sq.m.k)	Recommended Insulation with <b>150mm</b> Thick AAC Block
Composite Hot & Dry Warm & Humid	0.44	System Thickness 200mm GW 24kg/m <sup>3</sup> X 50mm: R-1.51 AAC X 150mm: R-0.94 U-0.41

Note: Lower U values/ Higher R values means better thermal insulation.

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