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Buyer's Guide to Green Insulation

September 4, 2009 By [Green Home Guide Staff](#)



Insulation comes in a variety of forms. Loose fill is blown into (or sometimes damp-sprayed into) attic rafter spaces and wall cavities. Rigid [foam insulation boards](#) are usually put between the interior wall and the house's siding, and [foam is sprayed](#) into wall cavities and used to seal air leaks. Blanket rolls and batts are used in attics and unfinished walls and cavities. Properly installed, loose fill, rolls and batts are all effective at reducing heat loss from conduction and air infiltration.

To narrow the field of possible materials for your project, begin with your climate. The [Department of Energy's](#) website shows estimates of the total R-value (a rating of a material's resistance to heat flow) that parts of your home should have based on your climate. Also see the [Department of Energy's Insulation Fact Sheet](#), and GreenHomeGuide's materials overview on [Choosing the Right Insulation](#).

This summary table provides application tips and pros and cons to help you narrow your decision.

Material	Application Tips	Pros	Cons
Cellulose	Available as loose fill. Appropriate for small to large remodels in parts of the structure with very low to no moisture. Good for wall cavities or attic floors and ceilings. Wall cavities need small holes to spray through. Can be blown in dry, or sprayed in damp to prevent gaps and settling.	<ul style="list-style-type: none"> * Requires up to 30 times less energy to make than fiberglass and mineral wool * At least 75% post-consumer recycled content (newspaper) * No effect on indoor air quality (treated with nontoxic borate) 	<ul style="list-style-type: none"> * Can absorb moisture * Can settle (if blown in dry)
Cotton	Available as batt and loose fill. Appropriate for small to large remodels in	<ul style="list-style-type: none"> * Renewable, plant-based 	<ul style="list-style-type: none"> * Cotton

	areas with very low to no moisture. Good for wall cavities or attic floors and ceilings. Batts require open walls.	material	farming typically uses large volumes of water and pesticides
		* At least 70% post-industrial recycled content (e.g., denim)	
		* Recyclable	* Can absorb moisture
		* No effect on indoor air quality (treated with nontoxic boron)	
Fiberglass	Available as board, batt, and loose fill. Appropriate for small to large remodels in areas with very low to no moisture. Good for wall cavities or attic floors and ceilings. Batts and boards require open walls. Boards can be used in interior basement spaces.	* Made of abundant material (silica)	* Releases eye, throat and skin irritants
		* Up to 40% recycled content	* Energy-intensive manufacturing process
			* Some products contain formaldehyde
Polyisocyanurate Foam Insulation	Foam insulation boards. Appropriate for larger projects or new construction in areas with low to no moisture. Choose closed-cell option for higher moisture areas. Best for interior basement walls, beneath siding, and attic ceilings.	* No hydrochlorofluorocarbons (HCFCs)	* Made from petrochemicals
		* Typically no indoor air quality effects	* Not recyclable
Polystyrene-Expanded (EPS) Foam Insulation	Foam insulation boards. Appropriate for larger projects or new construction in areas with low to no moisture. Best for interior basement walls, beneath siding, and attic ceilings; can be used below grade if coated with foil or plastic.	* No HCFCs	* Made from petrochemicals
		* Recyclable	* Contains highly toxic HBCD brominated flame retardant and other toxins
		* Typically no indoor air quality effects	
Polystyrene-Extruded (XPS) Foam Insulation	Foam insulation boards. Appropriate for larger projects or new construction in areas with moderate to no moisture. Best for interior basement walls, beneath siding, attic ceilings or below grade.	* More moisture resistant than EPS	* Most products still use HCFCs (but they are to be phased out by 2010)
		* Typically no indoor air quality effects	
		* Recyclable	* Made from petrochemicals
			* Contains highly toxic HBCD brominated flame retardant and other toxins
Spray Polyurethane Foam (SPF) Insulation	Spray foam is appropriate for small to large remodels in areas with moderate moisture. Good for wall cavities and attics. Sprayed through small holes in walls.	* No HCFCs	* Not recyclable
		* Prevents air leakage	
		* Doesn't settle	* Most SPF products are made primarily

Mineral Wool (AKA Rock Wool or Slag Wool)

Available as batt, loose fill, and board. Appropriate for small to large remodels in areas with moderate to no moisture. Good for wall cavities and attics. Batts and boards require open walls. Can be used below grade if made for that purpose.

- * Low density SPF bio-based products are available, which use up to 33% soy oil
 - * No additional flame retardants necessary
 - * Abundant materials (steel slag or natural rock)
 - * Moisture resistant
 - * Often contains 75%–90% recycled content
- from petrochemicals
- * Releases some eye, throat and skin irritants

Other Resources

There are other, somewhat less commonly known, types of insulation that also have green attributes. These include cementitious foam, sheep’s wool, and hemp insulation, as well as radiant barriers.

Visit [Green Building Advisor](#) for a list of insulation products that are included in the GreenSpec directory of environmentally preferable building products. To find insulation products that are Greenguard Indoor Air Quality certified, check out the [Greenguard product directory](#).

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ListedGreen.com 1 year ago

[ListedGreen.com](#) allows for all listings to choose from these great insulation options discussed above, but personally feel that Cotton in it's "recycled" form, makes the most ecological sense and offers great soundproofing to boot.


Paul 1 year ago

Don't you wish that this insulation chart was as simple as depicted
While not totally incorrect this chart is very misleading

One example is understanding GWP and paybacks based on service life

Another is how is one to consider off gasing issues when they have to sink through wall systems in rooms that either benefit from fresh air or mechanical air exchanges

Thatis why working with an energy specialist, architect and mechanical engineer is critical

The environmental benefit in reducing energy demand far outweighs any of the cons

I encourage the editors to do more thorough research to make this article of any value

See; www.naima.org, www.pima.org and their are many others

Paul Bertram

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