



A Guide To Selecting Fiber Glass Insulation Products For New Home Construction And Remodeling

Today builders and homeowners are looking for ways to make homes more energy efficient. Energy costs are continually rising. Federal, state and local building codes now incorporate higher efficiency standards, and we're all becoming increasingly aware of the environmental concerns of wasted energy. We want to save our planet... and on our utility bills.

In addition to meeting your local or state code's energy requirements, a well-insulated home is one of the most cost-effective ways to save energy and reduce heating and cooling bills while adding to the thermal and acoustical comfort of any home. There are dozens of insulation products on the market and many special applications in the home. This guide will walk you through the various areas of a home that should be insulated and describe the appropriate fiber glass insulation products to install. On the back, a handy chart summarizes the products by R-values and their intended applications.

THE BASICS

Insulation resists the flow of heat. Heat is a form of energy. By reducing heat flow, a properly insulated home uses less energy in winter for heating and less in summer for cooling.

Identifying Insulation Performance

Fiber glass insulation is identified and labeled by R-value. "R" stands for resistance to heat flow. (The higher the R-value, the greater the insulating power.) All manufacturers of fiber glass insulation products provide performance and installation information such as R-value, number of pieces per package, coverage per bag, size and type either on pre-printed bags or on labels attached to generic bags. In most cases, R-values are also printed on the facings of batts and rolls. Unfaced insulation (no vapor retarder attached) is coded with stripes or ink jet printed to identify the R-value. The most common R-values for fiber glass insulation are R-11, 13, 15, 19, 21, 22, 25, 30 and 38. Loose fill

or blown-in insulation can be installed to any required R-value by following the specification on the bag.

Types of Fiber Glass Insulation

There are two types of fiber glass insulation used in residential construction. Fiber glass loose fill – or blown in insulation – and fiber glass blanket insulation. Fiber glass blanket insulation comes in batts and rolls in various densities, widths and lengths to fit particular applications.

Nominal Dimensions Available		
	Batts	Rolls
Lengths	47", 48"	39' 2"
	90", 93"	40'
	94", 96"	70' 6"
Widths	11", 15"	11"
	15 ¼", 16"	15"
	23", 23 ¼"	23"
	24"	-

Vapor Retarder Facings

Batt and roll insulation is available unfaced or with a facing already attached. The facing material is generally a vapor retarder and is usually applied toward the “warm-in-winter” portion of the home to help resist the movement of moisture vapor to cold surfaces where it can condense. This means that in ceilings the vapor retarder faces down; in the walls, it faces the inside; and in floors over unheated spaces, it faces up. In hot, humid cli-

mates (Gulf Coast), a vapor retarders may not be needed. Check local building practices and/or building codes.

INSULATION FOR ATTICS AND CEILINGS

Available Insulation Products:

- n R-38
- n R-38C
- n R-30
- n R-30C
- n R-19
- n Loose Fill Insulation

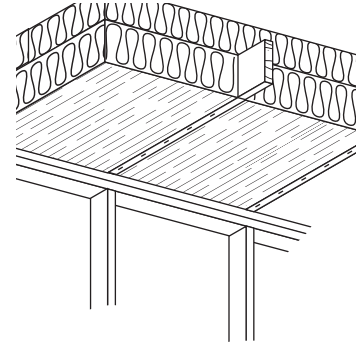
Most energy codes recommend anywhere from R-30 to R-49 for attics. Be sure to check the code for your area. Standard fiber glass batts, fiber glass loose fill insulation or a combination of both are most frequently used.

Attics / Flat Ceilings

The most common products for attics and flat ceilings are R-30 and R-38 batts. Note that these products are full width – 16” or 24” wide. This is to assure that the insulation fills the spaces between the ceiling joists or bottom chords of trusses and also extends above and closes over most wood members.

To achieve R-values of R-38 and higher, two layers can be used and their R-values combined. For example, an R-19 batt added to an R-30 will yield an R-49. When installing a second layer, always use unfaced insulation. Using a vapor retarder can trap moisture

between two layers. Also, it is recommended that the second layer be applied across the joists.



As mentioned earlier, loose-fill can be installed to any R-value. Because R-values per inch vary by product, always check the manufacturer’s recommended installation instructions and install the proper amount. Inches alone may not determine R-value.

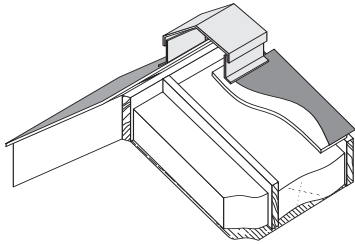
A combination of batts and blown-in insulation can also be used. A batt can be installed during the initial construction process, and a layer of blown insulation can be added later. This method is particularly effective in homes with roof trusses or hard-to-reach “nooks and crannies” – places that are prime for energy loss.

Cathedral Ceilings

A growing number of homeowners prefer the design and style of cathedral ceilings. However, insulating to recommended standards can be a challenge.

High-performance batts (sometimes called high density or super batts) are specially designed for use in cathedral ceilings. They

offer the same thermal performance as standard fiber glass batts but are not as thick.



High-Performance Cathedral Ceiling Batts are available in R-values of R-30 or R-38. The R-30 batts are 8¼” to 8½” thick versus the standard 10” thickness. (Thickness of some R-values can vary by manufacturer.) The R-38 Batts are 10” to 10¼” thick as opposed to the standard 12”. Because the high-performance batts achieve the recommended R-values in less space, they allow room for ventilation between the insulation and the roof deck without the need for roof baffles or the installation of larger roof joists.

Adding Insulation to Your Attic

If your home was built before energy costs started to escalate, its insulation levels may now be far below today’s standards. It is important for homeowners to periodically take an “insulation audit” of their home and consider upgrading existing insulation.

How to Determine The R-Value of the Insulation Already In Your Attic

Determining the amount of insulation in your attic is fairly easy. Slide a ruler next to the joist or to the ceiling boards and measure the insulation you have. If you have six inches or less, definitely add more insulation.

Adding to Existing Insulation

Since R-values are cumulative, there is no need to remove what you already have.* By layering two different batts together you get the combined R-value of both batts. For example, two layers of R-19 batts will give you a total of R-38. Consider using unfaced R-19, R-25 or R-30 batts and laying them cross-wise to the existing insulation covering the joists. If there is no insulation in your attic, R-30 or R-38 full width, faced batts should be used or loose fill installed to the required R-value.

() If cellulose insulation is in the attic you may want to consider removing it due to recent concerns over flammability.*

INSULATION FOR SIDEWALLS

Available Insulation Products:

2 x 4 Construction:

- n R-15 Batts
- n R-13 Batts
- n R-11 Batts

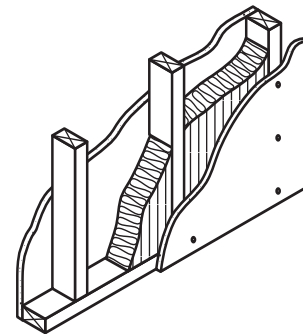
2 x 6 Construction:

- n R-21 Batts
- n R-19 Batts

Today’s insulation products are manufactured to fit in both 2 x 4 and 2 x 6 construction. Standard sidewall widths of both 15” and 23” are available. (16” and 24” widths are available for steel stud construction.) In many parts of the country, building codes today call for insulation levels of R-19 or higher in sidewall assemblies. This usually includes the insulation and exterior sheathing.

2 x 4 Sidewall Construction

Although R-11 insulation is still available, due to upgraded energy codes, R-13 and R-15 fiber glass batts are the insulation products most commonly used in 2 x 4 sidewalls today. Since the R-value of the exterior sheathing contributes to the overall R-value of the wall, R-13 and R-15 batts are commonly used in conjunction with insulating exterior sheathing to create a combined total wall R-value of R-19.



2 x 6 Sidewall Construction

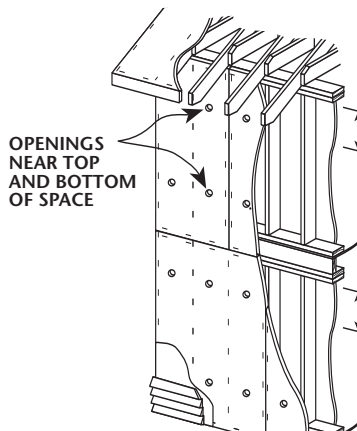
For homes built with 2 x 6 construction, R-21 high-performance batts offer optimum thermal performance. When a standard R-19 batt, (6” to 6¾” thick) is used to fill the 5½” wall cavity, it has to be compressed. Compressing the insulation

causes it to lose some of its thermal effectiveness, reducing its R-value to R-18. However, R-21 high performance batts offer more R-value per inch and fit into wall cavities without being compressed.

Upgrading Sidewall Insulation In Existing Homes

If you are planning on redecorating the interior of your home, the sidewalls can be insulated from the interior. To use batts, you must remove the drywall, add the insulation and then replace the drywall.

Fiber glass loose fill insulation is a good way to insulate sidewalls in existing homes. Holes are made in the drywall and the fiber glass loose fill is blown in through the openings. The openings can be patched and concealed at the time of redecoration.



Exterior application of sidewall insulation is accomplished by removing sections of the exterior siding, making holes in the sheathing and blowing insulation in to fill the stud spaces. In both cases, it is recommended that a professional insulation contractor with knowledge of general framing principles should be hired to do the job.

INSULATION FOR FLOORS AND CRAWL SPACES

Available Insulation Products:

- n R-30
- n R-25
- n R-21
- n R-19
- n R-15
- n R-13
- n R-11

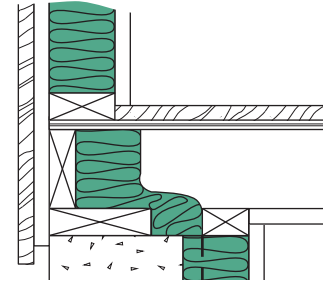
Standard batts and high-performance batts can be used under floors and in crawl spaces. When insulating floors over unheated basements or crawl spaces, faced products should be used and vapor retarders should face heated areas. Unfaced R-25 or R-19 insulation batts are usually cut into small pieces to fit snugly between the floor joists against sills and band joists. For insulating foundation walls of heated crawl spaces, use either unfaced insulation where the building code does not require a vapor retarder, or insulation with a special facing recommended for exposed applications. The insulation should be fastened to the sill plate and draped down the wall. The recommended R-value for this application varies by geographic area.

INSULATION FOR BASEMENTS

Available Insulation Products:

- n R-21
- n R-19
- n R-13
- n R-11
- n R-6
- n R-3

To have a truly energy efficient home, the basement cannot be ignored. Today, many building codes require basement insulation.



For unfinished basements that contain furnaces, water heaters, ducts, etc., manufacturers offer special basement wall insulation which is available in 4 ft. or 6 ft. widths in 50 ft. rolls. It comes with a white flame-resistant, polypropylene facing and is intended for use in applications where the insulation will be left exposed. It can be applied either full or half wall height.

For finished basements, standard or high-performance batts can be used depending on the R-value required. Vapor retarders should face heated areas and be covered as soon as possible.

OTHER FIBER GLASS INSULATION PRODUCTS AVAILABLE

Sill Sealers

This is a strip of insulation 1" thick and up to 6" wide that comes in a roll, usually 50' or 100' long. It is placed between the top of masonry foundations and sill plates. It

resists the flow of heat, keeps out insects and reduces the need for caulking.

Water Heater Jacket

Water heater insulation is usually 1" thick and is wrapped around the water heater to help retain the tank's heat.

HVAC Insulations

Insulation products such as fiber glass air duct board, exterior duct wrap and fiber glass duct liner are used to increase indoor comfort by delivering heated and cooled air from room-to-room at design temperatures, controlling condensation and abating sound such as cross talk or HVAC equipment noise. Some of the products you will find in your home include:

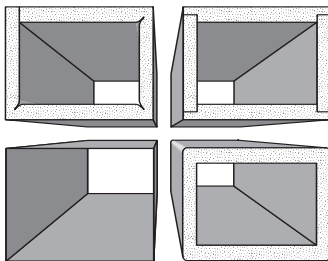
Fiber Glass Ductboard

Fiber glass ductboard is fabricated into HVAC ducts from 1" or 1½" rigid boards of insulation material. The outside surface of the board is a reinforced aluminum air barrier and vapor retarder. Fiber glass ductboard systems are virtually air-tight when properly assembled and sealed. They are assembled either in the HVAC contractor's shop or on site.

Exterior Fiber Glass Duct Wrap

Flexible fiber glass duct wraps are fiber glass blankets with a foil-scrim facing on one side. Duct wrap is applied to the outside of

metal ducts. This type of insulation is useful in applications where noise control is not a problem, but where heat flow through duct walls must be retarded and/or moisture controlled.



Duct Liner

Fiber glass duct liner is a thermal and acoustical insulation which is applied to the inside of sheet metal ductwork to control heat loss or gain, distribute air quietly and control moisture condensation on the outside of the duct. At a sheet metal shop, the insulation is fabricated and fastened to sheet metal before it is formed into ductwork.

OTHER PLACES TO INSULATE

Perform a Home Energy Audit

To achieve the maximum thermal efficiency it is important to insulate any space where energy can be lost.

The following areas are often overlooked:

- n Walls between living spaces and unheated garages, dormer walls, portions of walls above ceilings or adjacent lower sections of split levels.

- n Ceilings with cold spaces above, including dormer ceilings.
- n Knee walls of attic spaces finished as living areas.
- n Sloped walls and ceilings of attic spaces finished as living areas.
- n Perimeters of slabs on grade.
- n Floors above vented crawl spaces.
- n Floors over unheated or open spaces, such as garages or porches. Floors over unheated basements. The cantilevered portions of floors.
- n Band or header joists, the wall sections at floor levels.

PRODUCT CHART

The chart on the following page is a summary of the various products available and where they are most commonly used.

ADDITIONAL INFORMATION

NAIMA has published a variety of informational pieces on the proper installation procedures and recommended insulation practices. For a complete listing of NAIMA publications, contact:

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Product Summary Chart

Note: Thickness of some R-values can vary by manufacturer

	Loose-Fill	R-38 12"	R-38C 10"-10½"	R-30 9½"-10"	R-30C 8¾" - 8½"	R-25 8"	R-21HP 5 - 5½"	R-19 6 - 6½"	R-15 HP 3½"	R-13 3½"	R-11 3½"	R-6 Masonry 1¾"	R-3 Masonry 1¾"
Attics & Flat Ceilings (New Construction)	4	4		4									
Attics (Retrofit)	4	4		4		4		4					
Cathedral Ceilings			4		4		4						
2x4 Exterior Walls									4	4	4		
2x6 Exterior Walls							4	4					
Floors & Crawl Spaces			4		4	4	4	4	4	4	4		
Basement Walls							4	4	4	4	4	4	4

Areas To Insulate

NAIMA METAL BUILDING COMMITTEE MEMBERS:

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Valley Forge, PA 19482
215/341-7000

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Shelbyville, IN 46176
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Schuller International, Inc.

PO Box 5108
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800/654-3103

NAIMA is a trade association of North American manufacturers of fiber glass, Owens-Corning Fiberglass Corporation, Rock wool and slag wool insulation products. NAIMA's goal is to promote energy efficient environmental preservation through the use of fiber glass, rock wool, and slag wool insulation products and to encourage safe production and use of these insulation products.

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