KNAUF INSULATION

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ENERGY STAR PARTNER

Children & Schools GREENGUARD Indoor Air Quality Certified

Knauf batts, blankets and blowing insulation products are certified for indoor air quality as a low emitting product by The GREENGUARD Environmental Institute™ to both the GREENGUARD Certification Program℠ and the more stringent GREENGUARD For Children and Schools™ standard. www.greenguard.org

U.S. GREEN BUILDING COUNCIL MEMBER

LEED Eligible Product

Use of this product may help building projects meet green building standards as set by the Leadership in Energy and Environmental Design (LEED) Green Building Rating System.

Credit 4.1 - 4.2
Recycled Content

Credit 5.1 - 5.2
Regional Materials

PRESERVING OUR WORLD'S ENERGY RESOURCES

At Knauf, we manufacture a wide variety of products that serve a common goal, helping to make the most of our planet's energy resources. A family-owned global company, we understand and are committed to high standards in quality, performance and environmental responsibility. Every step we take today toward energy conservation helps ensure better lives for generations to come.

Knauf Makes It Easy to Insulate

Year 'Round Energy Savings with Knauf Insulation

With energy costs rising, home insulation is an investment you can't afford not to make. Your home will be more comfortable year-round and you'll save money on heating and cooling costs.

Adequate and properly installed insulation is one of the most important parts of energy conservation in your home. A surprising number of homes are inadequately insulated or not insulated at all, especially older homes built when energy costs were low. And, without sufficient insulation, expensive heat escapes right through the roof!

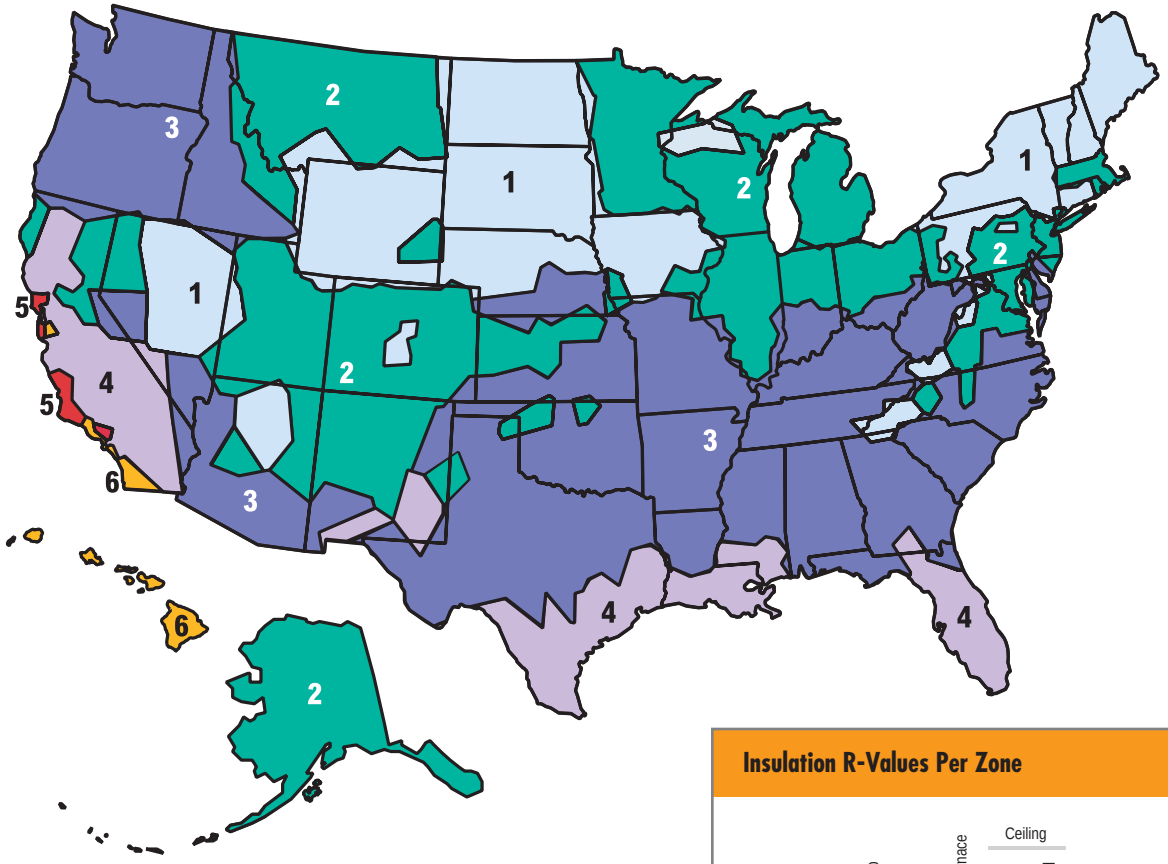
Along with other energy savings measures—storm windows and doors, caulking and weatherstripping—properly installed insulation will keep you warmer in the winter and cooler in the summer while saving heating and cooling dollars.

Let Knauf Help

Installing Knauf insulation is an efficient and easy way to insulate your home. Just one inch of fiber glass insulation provides better insulation properties than two feet of brick! Yet fiber glass insulation is lightweight, clean and easy to cut and handle. Knauf fiber glass insulation not only provides an excellent thermal retarder, but also reduces the transmission of airborne noise between the rooms of your house, giving you a more relaxed and private atmosphere.

Knauf Insulation has a complete product line of easy-to-install pre-cut sizes and thicknesses to suit every home and climate. Our blanket insulation is available in unfaced, kraft-faced and foil-faced rolls. And Knauf offers you an extra wide stapling flange for faster, easier installation. Our durable packaging is lightweight and easy to handle for simple transportation to your home. The sturdy polyethylene plastic protects the insulation from dirt, moisture and damage. And detailed instructions are on the back of every bag, making installation a breeze!

Insulation R-Values Nationwide



Insulation Facts

Insulation is measured in R-values. "R" means resistance to heat flow. The higher the R-value, the greater the insulating power. Heating and air conditioning costs and the climate in which you live determine the R-values of insulation you'll need to cost effectively insulate your home.

Insulation R-Values Per Zone

Zone	Gas	Heat pump	Fuel oil	Electric furnace	Ceiling: Attic	Ceiling: Cathederal	Wall[A]	Floor	Crawl space[B]	Slab edge	Basement: Interior	Basement: Exterior
1	✔	✔	✔		R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10
1				✔	R-49	R-60	R-28	R-25	R-19	R-8	R-19	R-15
2	✔	✔	✔		R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10
2				✔	R-49	R-38	R-22	R-25	R-19	R-8	R-19	R-15
3	✔	✔	✔	✔	R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10
4	✔	✔	✔		R-38	R-38	R-13	R-13	R-19	R-4	R-11	R-4
4				✔	R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10
5	✔				R-38	R-30	R-13	R-11	R-13	R-4	R-11	R-4
5		✔	✔		R-38	R-38	R-13	R-13	R-19	R-4	R-11	R-4
5				✔	R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10
6	✔				R-22	R-22	R-11	R-11	R-11	(C)	R-11	R-4
6		✔	✔		R-38	R-30	R-13	R-11	R-13	R-4	R-11	R-4
6				✔	R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10

(A) R-18, R-22, and R-28 exterior wall systems can be achieved by either cavity insulation or cavity insulation with insulating sheathing.
For 2" x 4" walls, use either 3½" thick R-15 or 3½" thick R-13 fiber glass with insulating sheathing.
For 2" x 6" walls, use either 5½" thick R-21 or 6¼" thick R-19 fiber glass insulation.

(B) Insulate crawl space walls only if the crawl space is dry all year, the floor above is not insulated. and all ventilation to the crawl space is blocke
A vapor retarder (e.g., 4- or 6-mil polyethylene film) should be installed on the ground to reduce moisture migration into the crawl space.

(C) No slab edge insulation is recommended.

NOTE: For more information, see: Department of Energy Insulation Fact Sheet (D.O.E./CE-0180). Energy Efficiency and Renewable Energy Clearinghouse, P.O. Box 3048, Merrifield, VA 22116; phone (800) 363-3732; www.ornl.gov/roofs+walls/insulation/ins_11.html.

Before You Start . . .

You'll need long-sleeved clothing, gloves and goggles. You'll also want to have a tape measure, utility knife and a staple gun handy. We also recommend that you use a dust mask for protection against nuisance dust and follow the handling instructions printed on the bag.

Remember . . .

- Don't take the insulation out of the package before you are ready to install. Knauf insulation is compression-packed and will expand to the labeled thickness when the package Is opened.
- Watch out for nails—especially in attics where roofing nails may protrude through the sheathing.
- Place boards over the joists to make a path.
- DO NOT block attic vents—provide plenty of attic ventilation to prevent condensation.
- Facing may be flammable. Fiber glass insulation is non-combustible, but kraft and non fire-rated facings are combustible and should not be left exposed. FSK-25 foil facing is approved for exposed applications.
- Cover faced insulation with an approved interior finish as required by local codes.
- Provide heat source clearance: install ONLY non-combustible unfaced fiber glass insulation around chimneys, flues and other heat sources.
- DO NOT install insulation within 3" of recessed electrical fixtures, lights, fans or other heat-generating devices unless marked IC.
- Vapor retarders: Kraft, foil and FSK-25 foil facings applied to Knauf batts act as vapor retarders. The selection and positioning of faced batts should be in accordance with local codes and practices.
- For additonal installation information, call Knauf Insulation Technical Services at 800-825-4434, ext. 8212 or visit simplyinsulate.com.

Details Count

- Fill in all cracks around windows and doors. Your scraps can be cut easily to fit into small, irregular spaces.

Fill in all cracks around windows and doors.

Patch any tears in vapor retarders.

- Be sure the insulation fits well, but is NOT overly compressed. Compressed fiber glass loses its effectiveness.
- Seal and wrap heating and air conditioning vents, ducts and water pipes in unheated areas of your home to increase the operating efficiency of your heating and cooling systems. In some instances, wrapping exposed water pipes may prevent them from freezing.
- Patch any tears in vapor retarders.
- Try to fit insulation behind pipes or other obstructions unless this would compress the insulation to a great extent. If so, cut the insulation to fit around these objects.

Insulating Your Attic

With Existing Batt Insulation

Because heat rises, the greatest energy loss is through your attic. Check the R-value of your existing insulation to determine how much additional insulation you'll need. The R-value should be printed on one side of the batt surface. If you cannot determine the R-value of the existing insulation, estimate the R-value of batt insulation by measuring the average thickness and multiplying by 3.1. Install an insulation product with at least the R-value needed to make up the difference between the existing insulation and the minimum code requirement for your area of the country.

To calculate the number of packages of insulation needed, determine the area of the attic (in square feet) to be insulated, by multiplying the length by its width. The number of square feet of insulation material is clearly marked on each package. Divide the total attic area to be insulated by the square footage in a package to determine the number of packages required (don't forget to round up to the nearest whole package).

- Install Knauf unfaced batt insulation between the ceiling joists on top of existing insulation when the height of the existing insulation is less than the height of the joist. If the joists are full, place batts over existing insulation at right angles to the ceiling joists. Butt insulation batts snugly against each other.
- Begin by laying batts at the outer edges of the attic and work toward the middle and the attic access panel. Lay long runs first, using trimmed pieces for short spaces and between framing members.
- Butt the insulation snugly at all joints. Without compressing the insulation, push it under wiring or ductwork whenever possible. Do not block attic vents.
- Insulate the top of attic access panels by stapling or gluing insulation directly to the panel.

With Existing Loose-Fill Insulation

Installing batts on top of loose-fill insulation can cause significant R-value loss if the loose fill is compressed. It is recommended to install loose fill insulation on top of loose fill insulation. To check the R-value of your existing loose fill insulation, look for an attic card stating the R-value originally installed. If you cannot find the attic card, you can estimate the R-value by measuring the average thickness of the installed loose-fill insulation and multiply by 2.3. Contact a professional insulation contractor for the proper insulation of additional loose-fill insulation.

Insulating with Unfaced Blankets: Begin laying the blankets at the outer edges of the attic and work toward the middle.

Insulating with Faced Insulation: Keep the vapor retarder down, toward the "warm-in-winter" area of your house.

Uninsulated

Install Knauf kraft or unfaced batts in an uninsulated attic. Follow the above directions. If a vapor retarder is required, the selection and positioning should be in accordance with local codes and practices.

Insulating Your Walls

Knauf fiber glass batts with attached vapor retarders make easy work of insulating unfinished or new walls in your home. The kraft facing (vapor retarder) helps protect your home's framing against damage caused by moisture.

- Friction fit the insulation between the studs with the vapor retarder facing the warm-in-winter area. If desired, flanges may be stapled to the face or inside of the wall studs.
- Knauf unfaced batts can be used with a separate vapor retarder of 4 to 6 mil polyethylene or foil-backed gypsum board when insulating exterior walls in your home.
- The selection and positioning of an appropriate vapor retarder, if required, should be in accordance with local codes and practices.

Wood Frame

- If a vapor retarder is required, the selection and positioning should be in accordance with local codes and practices.
- Determine the width of insulation needed (15" or 23") by measuring the typical distance between wall studs. When installing Knauf unfaced batts, friction fit between framing members.
- When installing Knauf kraft or foil-faced batts, and the location of the vapor retarder is recommended toward the inside of the home, place batt between framing members unfaced side in first. The faced batts can be pressure fit with no stapling or face stapled or inset stapled. When installing Knauf kraft or foil-faced batts and the location of the vapor retarder is recommended toward the outside of the home, place batt between framing members facing side in first.
- Make sure batts fit snugly against top and bottom wall plates. The front face of the batt should be flush with the face of the wood framing.
- Without over-compressing, tuck insulation behind wiring, plumbing or ductwork whenever possible. Batts can be partially cut or separated when fitting insulation behind wiring or plumbing fixtures.

Insulating Exterior Walls: Knauf unfaced blankets can be used with a polyethylene vapor retarder.

Insulating Exterior Walls: The location of the vapor retarder is recommended toward the inside of the home.

- Gently stuff scrap pieces of insulation in any small openings—especially those around windows or doors. Place small pieces of insulation behind all outlet boxes. Do not over-compress insulation.
- Attention to details is very important. Seal all penetrations in exterior walls with insulation caulk or foam sealants.
- Cover all insulation and vapor retarders with an approved finish material (i.e. gypsum board).

Insulating Your Ceiling

Ceilings are insulated just like walls. With the vapor retarder toward the warm-in-winter side, staple the flanges of Knauf kraft-faced insulation to the inside of ceiling joists.

Cathedral Ceilings

- If a vapor retarder is required, the selection and positioning should be in accordance with local codes and practices.
- Determine the width of insulation needed (15" or 23") by measuring the typical distance between wall studs. When installing Knauf unfaced batts, friction fit between framing members.
- Determine the maximum thickness of insulation that can be installed by subtracting 1" from the depth of the cathedral ceiling cavity. Select either Knauf R-30 HD (8") or R-38HD (10") High Density Cathedral Ceiling Insulation.
- When installing Knauf unfaced batts, friction fit between framing members.
- When installing Knauf kraft-faced batts and the location of the vapor retarder is recommended toward the inside of the home, place between framing members and face staple or inset staple flanges to the face of the ceiling joists to maintain proper batt position.
- When installing Knauf kraft-faced batts and the location of the vapor retarder is recommended toward the outside of the home, place between framing members facing first and use tiger teeth wires to keep the insulation in place.
- Butt insulation firmly against both the top plate of the wall at the bottom and the ridge joist at the top of the cathedral ceiling.
- Do not push batts completely into the joist cavity. The front face of the batt should be flush with the face of the ceiling joist, leaving at least 1" airspace between the batt and the underside of the roof deck.

Insulating Ceilings: Staple the flanges of Knauf kraft-faced insulation to the inside of the ceiling joists.

- Do not compress batts or block ventilation. Please consult with your local codes and practices to determine the required ventilation in cathedral ceiling applications and ventilation baffle requirements.

Insulating Your Basement

Install furring strips or studs vertically against the foundation wall on 16" or 24" centers.

- Install Knauf kraft or unfaced batt insulation between framing members.
- Friction-fit unfaced insulation betwen framing.
  Partially or Totally Below Grade: Use Knauf unfaced batts with no vapor retarder.

  Above Grade: Use either Knauf kraft-faced or Knauf unfaced batts.
- Install furring strips or studs vertically against the foundation wall on 16" or 24" centers.
- Determine the width of insulation needed (15" for wall studs, 16" on center and 23" for wall studs 24" on center).
- When installing unfaced batts, friction fit between framing members.
- The selection and positioning of an appropriate vapor retarder, if required for above grade basement walls, should be in accordance with local codes and practices. Follow the instructions for exterior walls.

Cover either application with an approved finish material (i.e. gypsum board).

Insulating Basements: Staple flanges every 4" to 6" along both sides of the studs.

Insulating Floors Over Unheated Crawlspaces

- Insulate those areas separating ventilated crawl spaces and living spaces by installing Knauf batts with vapor retarders toward the warm-in-winter side. The insulation fits between the floor joists, and can be secured using wire rods, or by stapling chicken wire or screening over the insulation.
- One other way to hold the insulation in place is to hammer nails into the joists at regular intervals, then lace a rustproof wire between these nails.
- To protect water lines and HVAC duct systems, position insulation so they are kept between the insulation and the conditioned portion of the home.
- The ground in the crawl space should be covered with a 6 mil polyethylene film to serve as protection against moisture ground. It is also important to provide adequate ventilation to the outside when insulating unheated areas of your home.
- Determine the width of the insulation needed by measuring the typical distance between floor joists (usually 15" or 23").
- Determine the maximum R-value of insulation that can be installed by measuring the depth of floor framing members. Select R-38 (12"), R-38HD (10¼"), R-30 (10"), R-30HD (8¼"), R-26 (9"), R-22 (6½"), R-19 (6¼") or R-13 (3½").

Crawlspace Walls

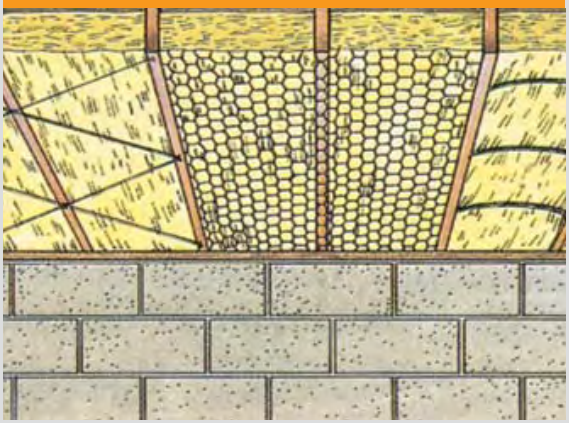
- Friction fit slightly oversized sections of Knauf batts in each joist end over sill plates.
- Vertically drape sections of Knauf unfaced batts down the crawlspace foundation wall. Extend the insulation from the sill plate down the entire height of the wall and continuing about 2' onto the crawlspace floor.
- Secure the insulation by driving galvanized nails and washers through the insulation into the sill plate. You can also nail wood lathes into the sill plate every 18", compressing the insulation between the lathe and sill plate.
- Be sure to cover the ground with 6 mil polyethylene film to served as a barrier to ground moisture. Ventilate crawlspace to the outside during cooling season.

Please Note . . .

The chemical and physical properties of Knauf fiber glass insulation represent typical average values determined in accordance with accepted test methods. The data is subject to normal manufacturing variances. The data is supplied as a technical service and is subject to change without notice. Check with your Knauf field sales representative to ensure that the information is current.

Energy savings will vary—check the seller's fact sheet on R-values to find out why. Higher R-values mean greater insulating power.

Insulating Crawlspaces: Wire rods, chicken wire or screening can be used to secure insulation in crawlspaces.



Insulating Crawlspaces: Secure insulation between floor joists by stapling chicken wire or screening over the batts.