



*A Berkshire Hathaway Company*

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## INSTALLATION INSTRUCTIONS FOR FIBER GLASS BATTS AND ROLLS

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Johns Manville fiber glass batt and roll insulation is easy to install and does not require a certified installer. Wherever insulation is installed in a building, it is very important that it fits snugly on all sides. If the insulation is too long for a space, cut it to the correct size. If it is too short, cut a piece to fill the void. For unfaced batts, friction fit it into the cavities. If using faced batts, they may in friction fit or the flanges may be stapled to the wood studs. Use a Bostitch, Arrow or similar manual staple gun and  $\frac{1}{4}$ ",  $\frac{5}{16}$ " or  $\frac{3}{8}$ " staples, using enough staples to hold the insulation firmly in place and avoid gaps and fishmouths.

### Personal Protective Equipment:

Safety glasses with side shields are recommended to keep dust out of the eyes. Use ear protection (earplugs, hood, or earmuffs) to prevent airborne dust or fibers from entering the ear, if necessary. Leather or cotton gloves should be worn to protect against mechanical abrasion. Optional: wear a NIOSH-certified disposable or reusable particulate respirator with efficiency rating of N95 or higher (per 42 CFR 84) except required when dust or fiber concentrations exceed the applicable exposure limits of dust  $15 \text{ mg/m}^3$ . Wear a cap, a loose-fitting, long-sleeved shirt and long pants to protect skin from irritation. Exposed skin areas should be washed with soap and water after handling or working with fiber glass.

### Site Preparation:

Other trades, including but not limited to, electrical, plumbing, and mechanical should have already installed their required materials prior to the fiber glass being installed. Proper air sealing should be complete prior to fiber glass batt installation to insure full performance of the fiber glass batts. Verify all holes and seams between sheet goods such as drywall, sheathing, and subflooring at the building envelope are sealed with durable caulk, tape, and/or foam sealants.

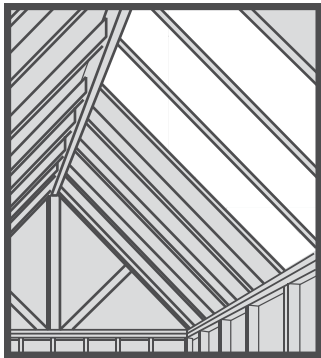
## Insulating Ceilings:

Ceiling insulation provides essential sound control between floors in your home. Properly insulating the ceilings will make your home a more peaceful and quiet place because it will ensure that footsteps and other sounds do not migrate to other rooms.

### How to Install Insulation In Ceilings

1. Seal around all penetrations in band joists. Any walls that leak water must be repaired before insulating.
2. Caulk where wiring runs through the ceiling joists and around the top of the wall.
3. Gently press the insulation between the joists. If you're using unfaced batts or rolls, allow friction to hold the insulation in place (called "friction fit method"). If a polyethylene vapor retarder is used, staple it across the unfaced batts. Check to make sure there are no openings where moisture can escape. If you're using faced insulation, install it with the vapor retarder positioned down toward the room. Hold the insulation up with one hand, while stapling the flange on both sides every 6" - 8" with the other hand. Leave a little extra on each end to cover the top plate of the outside wall. In attic installations, make sure the insulation completely covers the top plate of the outside wall at the end of each joist run. However, it should not block the flow of air from the eave vents. If necessary, install baffles at the inside of eaves.
4. Expand the insulation to its full thickness in the joist cavity to insure complete coverage. Avoid compressing the insulation material, because compression will reduce its R-value.

## Insulating Cathedral Ceilings:



Sloped, vaulted, and cathedral ceilings are different names for essentially the same ceiling configuration. These ceilings are very popular in newer homes and remodeled homes, and they certainly add dramatic visual interest to a room. But because there is little or no attic space separating inside and outside air, proper insulation is especially important.

Many cathedral ceilings will require that insulation be installed around recessed light fixtures. There are some important safety measures you should be aware of when working with insulation around light fixtures. Be sure to review the Special Considerations for the information you need to complete the installation without creating potential fire hazards.

To make your cathedral ceiling insulation job easier, Johns Manville makes special high-performance R-value insulation designed specifically for cathedral ceilings.

### How to Insulate Your Cathedral Ceiling

1. Caulk where wiring runs through the ceiling joists and around the top of the wall.
2. Staple prefabricated vent chutes between joists with one end over the wall top plate. Vent chutes ensure there is at least 1" of space between the roof sheathing and insulation, allowing vapor water to flow out and to cool the roof. Depending on your house, vent chutes may be placed only at the soffit areas or run all the way up to the ridge line.
3. If you're using unfaced insulation, place it between the joists and gently press into position allowing friction to hold it in place. Insulation should be expanded to its full thickness in the cavity to extend over the top of the framing or trusses to insure complete coverage. However, avoid compressing the insulation material, because compression will reduce its R-value.
4. If you're using faced insulation, press it between the ceiling joists with the vapor retarder face down toward the room, unless building codes specify otherwise. Hold the insulation up with one hand while stapling the flanges to the joists on both sides every 6" - 8" with the other hand. Be sure to keep insulation three inches away from recessed lighting fixtures, unless the fixture is IC rated. Also, make sure the insulation is installed at least 3" away from any metal chimneys, gas water heater flues or other heat-generating sources.



## Insulating Exterior Walls:

An exterior wall is any wall that faces outside or otherwise separates conditioned spaces from unconditioned spaces. These walls should be thoroughly insulated in order to create the all-important thermal envelope around your living space. Properly insulated exterior walls make all the difference between a comfortable, energy-efficient home and a drafty one.

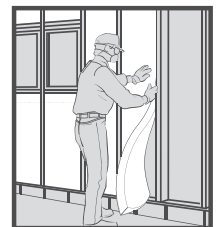
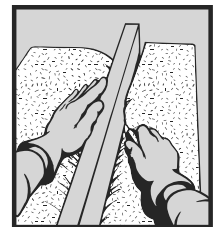
Take time to fit the insulation carefully so heat cannot escape in the winter and the inside stays cool in the summer. A good, tight insulation job saves energy, saves money, and protects your home for the future.

Since exterior walls may have plumbing and wiring running through them, review the Special Considerations for tips on installing insulation around these obstacles.

### How to Install Insulation in Exterior Walls

Insulation should be installed in all exterior walls that separate conditioned spaces from unconditioned spaces.

1. If you are using faced batts, place the batts into the wall cavity and staple the flanges of the batts to the inside or face of the studs about every 12 inches. Kraft facing must not be left exposed. It must be covered with gypsum board or another approved interior finish. Where an exposed application is required, use FSK-25 flame-resistant faced insulation. If you are using unfaced batts, place the insulation into the cavity, making sure that it is the correct size and fits snugly at the sides and ends and does not protrude in the back.
2. If the insulation is too long, cut it to fit properly. Don't double it over or compress it. Use a sharp utility knife and straightedge. Cut batts on a smooth, flat surface, and cut them about 1" larger than the framing cavity. If the material is too short, cut a piece to size to fill the gap.
3. Fill in any narrow gaps between joists by forcing pieces of unfaced insulation into the gaps with a screwdriver or putty knife.
4. To control air leakage, apply caulk or foam sealants around openings like window and door frames and any openings where wires or pipes go through the exterior wall.



### To apply a vapor retarder:

1. To apply the poly film, start at the top plate in one corner of the room.
2. Pull the film tight and staple at least every 12 inches.
3. Drive staples at the center of every stud and around openings, working around the room.
4. Overlap the sheets by one complete cavity to minimize leakage. Then staple evenly through, fastening both sheets to the studs at one- to two-foot intervals.
5. Pull the film tight along the sole plate and staple in the same manner, making sure the staples are driven flat, flush to the stud surface.
6. Trim out the poly from over windows, doors and electrical boxes.

**NOTE:** In areas of the country where vapor retarders are not required, bathrooms would require unfaced insulation and no poly film covering to allow moisture to escape.

## Insulating Basements:

Basement walls and walls in unvented crawl spaces should be insulated to help prevent substantial heat loss. (A crawl space is an unfinished, accessible area below the first floor of a building. An unvented crawl space is part of the basement while a vented crawl space opens to the outside.) Unframed, exterior basement walls should be insulated with blanket insulation, which can be installed horizontally or vertically. Typically, the blanket is held against the sill plate at the top of the basement wall with furring strips. In addition to the furring strips, you will need patch tape, and depending on the installation method you choose, possibly a Hilti-type gun and special fasteners for driving into concrete or cinder blocks.



### *How to Install Basement Insulation on Unframed Walls: Horizontal Installation*

1. Seal around all penetrations in band joists. Any walls that leak water must be repaired before insulating.
2. Pre-drill an ample supply of 1x2 furring strips.
3. Measure the length of insulation you'll need for the full wall and cut it on the unfaced side.
4. Grip the insulation by the flange, and with the faced side toward you, position it against the sill plate at the top of the basement wall. Then position a furring strip and nail through the furring and the flange to the sill plate to secure the insulation. Whenever possible, pull the insulation behind any ductwork, plumbing, or electrical that may lie along the walls. Otherwise, carefully cut and fit the blanket around obstructions.
5. When you cover the full wall, you'll need to attach a second length of the blanket to the lower edge of the first one. If you have cut a piece to fit and there is no flange, create one by pulling back the insulation. Overlap the flanges of the top and bottom pieces so that the insulation butts together tightly. Then, staple through the flange to hold the pieces together. An alternate method is to attach furring strips to the wall at the mid-point and bottom of the wall. Then staple the blanket flange to the furring strips.
6. To give the insulation a finished look, tape over all joints, seams and stapled edges with 3-inch wide, white vinyl patch tape.
7. Cut small pieces of batt insulation to fit against the header joists and push them into place between each floor joist.

### *How to Install Basement Insulation on Unframed Walls: Vertical Installation*

1. Seal around all penetrations in band joists. Any walls that leak water must be repaired before insulating.
2. Cut lengths of insulation a few inches longer than the height of the walls.
3. Attach the blanket to the wall using furring strips or a Hilti-type gun to drive fasteners into the concrete or cinder blocks. Fit adjacent blankets tightly together.
4. Trim the bottom of the insulation flush with the floor.
5. To give the insulation a finished look, tape over all joints and with 3"-wide, white vinyl patch tape.



### *How to Install Insulation in a Finished Basement*

Finished basements are insulated like any other room in your house.

### *How to Insulate a Vented Crawl Space*

If the sub-floor is already in place, the insulation is installed from below, much as it is installed in ceilings.

1. Cover the ground with sheets of six-mil plastic film. The sheets should overlap each other by approximately twelve inches, and extend a few inches up the walls.
2. Tape the film in place at the walls and hold the seams in place with tape, scrap lumber, or rocks. After the ground is covered, you're ready to install the insulation.
3. Fit the insulation batts into the joists with the Kraft-paper vapor retarder facing against the sub-floor. Make sure the insulation fits snugly so that there is no air space between the flooring and the insulation.
4. Staple the insulation flanges securely to the sides or bottom of the joists (called "inset stapling").



When installing Kraft-faced insulation, use wire lacing, screen or stiff wire fasteners to hold the insulation firmly in place. The fasteners are bowed upwards into the insulation, pressing it gently against the sub-floor without overly compressing it. Place the fasteners at least six inches from the end of each batt, and no more than 24 inches apart. The vapor retarder side is installed up against the subfloor. Where heating ducts between joists are exposed to cold air, insulation should be installed below the ducts to prevent heat loss.

In cold climates, if water pipes are running through the joists in the crawl space insulation should be installed below the pipes to protect them from freezing.

### *How to Insulate an Unvented Crawl Space*

In an unvented crawl space, the general rule is to insulate the perimeter walls. This eliminates the need to separately insulate the water pipes and heating ducts.



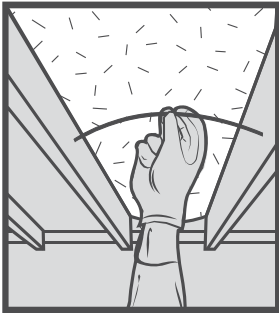
1. Cover the ground with sheets of six-mil plastic film. The sheets should overlap each other by approximately twelve inches, and extend a few inches up the walls.
2. Tape the film in place at the walls and hold the seams in place with tape, scrap lumber, or rocks. After the ground is covered, you're ready to install the insulation.
3. Locate the header joists, which run across the ends of the floor joists. Measure and cut pieces of unfaced insulation and place them against the header joists between each floor joist. Completely fill the spaces enclosed by the sub-floor, sill, and floor joists.
4. Install lengths of standard batts or the wider basement blanket insulation to the sill using furring strips to nail the insulation to the edge of the sill plate. The insulation should be cut long enough to hang down the wall and extend two feet into the crawl space. It can also be installed horizontally in the same manner.
5. Anchor the insulation as close as possible to the wall where it meets the ground using 2x4s.
6. Locate the stringer joists, which run parallel to floor joists. Position an insulation blanket against the underside of the sub-floor and staple or nail it directly to the stringer joist. Or, attach the blanket to the top of the sill, and wedge smaller pieces between the sill plate and sub-floor. (This technique takes longer, but provides better thermal protection at the joist.) The insulation should be cut long enough to hang down the wall and extend two feet into the crawl space. It can also be installed horizontally in the same manner.
7. Anchor the insulation as close as possible to the wall where it meets the ground using 2x4s.
8. Make sure all pieces of insulation are tightly butted together. Be sure they fit snugly, without gaps between them. Taping is not usually necessary. An alternate way of fastening basement blankets to the walls in crawl spaces is using a Hilti-type gun to drive the fasteners into the concrete.

## Floor Insulation:

Underfloor means the floor above an unheated crawl space or basement. Once the underfloors are properly insulated, you will increase the overall comfort of your home because underfloor insulation provides valuable sound control and thermal control.

The procedure for installing insulation in underfloors is similar to installing ceiling insulation. Follow the installation tips below to ensure that you do a professional job.

### *How to Install Underfloor Insulation*

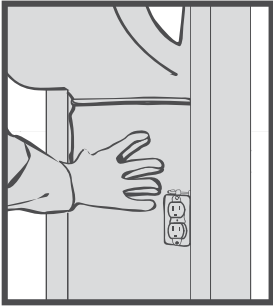


1. Caulk where wiring runs through the floor joists and around the top of the wall.
2. Gently press the insulation between the joists. If you're using unfaced batts or rolls, allow friction to hold the insulation in place (called "friction fit method.") If you're using faced insulation, install it with the vapor retarder positioned up toward the subfloor. This product would also be installed using the friction fit method. The vapor retarder side is installed up against the subfloor.
3. Expand the insulation to its full thickness in the joist cavity to insure complete coverage. However, avoid compressing the insulation material, because compression will reduce its R-value.

The easiest and most effective method of holding insulation in place is to use straight, rigid wire fasteners (preferably galvanized), with pointed ends. The fasteners are made for joist spacings of 12, 16, 18, 20 and 24 inches, and may be used against wood, metal or concrete. The fasteners, which are slightly longer than the joist spacing, are placed by hand between the joists and bowed upwards into the insulation, causing the insulation to be in contact with the subflooring. Install the fasteners so they hold the insulation in contact with the subfloor but avoid unnecessary compression. Spacing of fasteners is as required to prevent sagging of the insulation, normally 12 to 24 inches apart and not more than 6 inches from ends of the insulation.

Keep all insulation at least 3 inches away from combustible sources such as chimneys, non-IC fixtures, and heated (furnace, water heater, etc) flue pipes.

## Insulating Around Electrical:



Installing insulation around junction boxes that house electrical receptacles and switches, and around wiring in walls and ceilings requires some special techniques. When cutting insulation around wiring, be sure to keep your utility knife clear of the wires.

**Junction Boxes** - Hold the insulation up in the wall cavity and check where the junction box lines up. Cut a notch in the batt for the junction box. Place that cutout of insulation behind the junction box, and then insert the rest of the batt in the cavity.

**Wiring in Walls** - When electrical wiring passes through a stud cavity, split the insulation with a utility knife and fit half in front of and half behind the wire so that the wire is nested inside the insulation. If the wiring is located close to the inside surface, then press insulation behind the wiring.

**Wiring in Ceilings** - Insulation should be placed between electrical wiring and the ceiling.

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## Insulating Around Plumbing & Piping:



In almost any insulation project, you are bound to encounter plumbing pipes in walls and ceilings. It's important to insulate around these obstacles properly, especially in exterior walls where an improper installation could lead to frozen pipes. Remember, in that particular application, the object is to block cold air from the pipes. You should have no problem tucking JM insulation into position. Take your time to ensure that the insulation fills the width of the cavity, and do your best to eliminate gaps wherever possible. Never stress pipes by inserting the insulation too forcefully or tightly.

In walls where plumbing fixtures are to be placed, insulation must be installed first. Where there is plumbing in exterior walls, install the insulation **BEHIND** the pipes, between the pipes and the exterior. To protect pipes from freezing, insulation should never be placed between the pipes and the warm side of the wall.

For vented crawl spaces in cold climates where water pipes run through the joists, install insulation below the pipes to protect them from freezing.

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## Insulating Around Windows:

**Exterior Wall Windows** - Apply sealants around all windows. Sealants can eliminate drafts, provide thermal resistance, and keep out moisture, dust and insects. The sealants you will be using are generally of two types: caulk and urethane foam.

Caulk is a paste-like material that cures to a solid state. It is applied with a caulking gun to seal small cracks or gaps. As you apply the caulk to these small spaces, move at a slow, steady pace, forcing caulk into the gap. Smooth excess caulk with your fingertip or a putty knife before it dries.

Urethane foams are liquid materials that expand rapidly as they set to a semi-rigid state. They are used to fill larger gaps and holes. The most common type is available in an aerosol can or large canister. To apply urethane foam, follow the directions on the label. Place the nozzle over one end of the gap, and then squeeze the trigger while dragging the nozzle across the gap. Because this material will expand, do not overfill the gap.

Use small scraps of insulation to fill in the cracks around windows and doors. Separate the insulation from the facing and use a putty knife or screwdriver to work it into spaces between studs or anywhere you can see daylight. This is an important quality step on every job.

**Basement Windows** - If there are windows in your basement wall, you can make a metal window frame and attach it to the walls around the window. Cut out insulation and tuck it behind the frame to finish. Another method is to attach furring strips to the wall around the windows and staple insulation to the strips, then tape.



## Insulating Around Ductwork:

To insulate around heat ducts in ceilings or floors, cover ducts with insulation so the air temperature in the ducts can be maintained more efficiently.

In basement ceilings, whenever possible, pull the insulation behind any ductwork.

## Insulating Non-standard Size Spaces and Narrow Cavities:



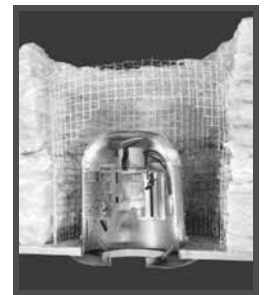
You will need to trim and piece the insulation.

1. Cut the insulation and facing about an inch wider than the space using a sharp utility knife against a safe backstop, such as an unfinished floor or other smooth, flat surface. Always cut on the unfaced side of the batt.
2. For shorter spaces, cut the insulation to fit properly. Don't double it over or compress it. Compression changes the R-value of the insulation.
3. If it takes more than one batt to fill the height of a wall cavity, you need to make sure the two pieces are butted snugly together.

## Insulating Around Recessed Lights in Ceilings:

Recessed lighting fixtures, as well as fan motors and other heat sources protruding into the ceiling, are a potential fire hazard. Building and fire codes require that there be at least a 3" clearance from any heat-generating source—including chimneys—unless the fixture is IC rated. This rating will be clearly marked on the fixture.

To ensure that this 3" clearance is maintained, you can install a baffle made with metal, cardboard or sheet metal around the heat source. If there are facing materials, trim them around the baffle to ensure adequate clearance from the fixture.

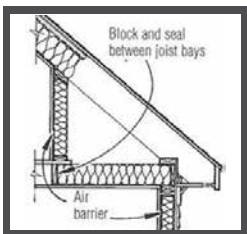


## Insulating Scuttles & Pull-Down Stairways:

A scuttle is the opening for accessing the attic. Scuttles, pull-down stairways and other attic access holes should also be insulated to the same R-value as your attic.

Many attics are filled with loose-fill insulation. However, that does not work for scuttles or pull-down stairways. Batt insulation, however, can be glued directly to a scuttle hatch. Pull-down stairways may require a build-up framework to lay batts on and around.

If you have pull-down attic stairs or an attic door, seal these similarly: Weatherstrip the edges and put a piece of rigid foam board insulation on the back of the door.



## Knee Walls:

Insulation installed in knee walls should be secured to prevent it from falling out of the cavity and covered with an air barrier material. The air barrier should be a durable material which is permanently attached to the wall framing.

## RE-ENTRY/RE-OCCUPANCY TIMES:

The area during and after installation of fiber glass batts may be used by other trades or occupants. There are no time restrictions for re-entry into the area.

ASTM C1320 Standard Practice for Installing mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction