HOMEOWNER REPAIR GUIDE

INSULATING AN ATTIC FLOOR

Why is it so important that your attic be adequately insulated? The answer is that, because heat rises, an attic without insulation will allow the warmth from the living space below it to escape – causing heating costs to go "through the roof," as well.

WHERE TO INSULATE

Your first decision will be where to install the insulation. In an unfinished attic, the most effective method is to add insulation between the joists of the attic floor. You can lay fiberglass (sold in pre-cut batts or rolls that you cut to size) into the joist cavities or pour in loose-fill insulation (cellulose is the most common type, although you can occasionally find glass fiber and rock wool). If your attic is finished but only used for storage, you may choose to pull up several pieces of the floor and blow in loose cellulose there. In both these situations, insulating the attic floor will retain the heat in the house below it and leave the attic cold. On the other hand, if your attic is finished and currently used as living space, you will need to add insulation behind the ceiling and ceiling walls. Insulating in this way will allow the heat from the other floors to pass through to warm the attic, but keep it from being lost through the roof.

> **NOTE**
> If you plan to have insulation blown into the ceiling of your finished attic, Home Repair Resource Center recommends that this work be done by a professional, to ensure uniform coverage.

UNDERSTANDING R-VALUE

Insulation is described in terms of its R-value. The higher the R-value, the more effective the insulation. In Northeastern Ohio, it is recommended that attic insulation have an R-value of 49. However, if your attic has a floor, you may not be able to install enough insulation beneath it to attain an R-49 rating; you will be limited to the depth of the cavities between the floor joists. Say, for example, your joists are 2" x 8" boards; the cavity will be about 7.25 inches deep.

MATERIAL	R-VALUE PER INCH	MAXIMUM IN A 7.25" JOIST CAVITY
Fiberglass	Roughly 3.0	7.25 x 3, or R-22
Cellulose	Almost 4.0	7.25 x 4 or about R-29 – better than fiberglass, but still short of the recommended rating

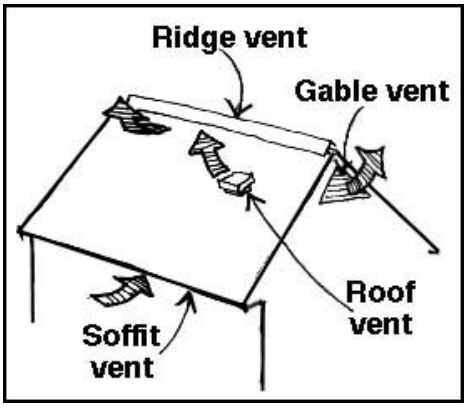
(Forcing more material into the space will not increase the R-value; if the insulation is too tightly compressed, it loses its effectiveness.) Nevertheless, some insulation is better than none at all.

After you have determined the kind of insulation you want to install, your next step will be to figure out how much to buy. Measure the square footage of the floor and the depth of the joist cavity before going to purchase the

materials, so that you'll have an idea of the quantity you will need. The packaging labels on each product will tell you how much material you'll need to fill the space.

VENTILATION

When insulating an attic, you may be tempted to close up every little nook and cranny you can find, but you should also consider how well your attic is ventilated. In our Northeast Ohio climate, the goal should be to insulate the living space of the house, while allowing the roof to remain the same temperature as the outside. Not only does poor ventilation keep heat trapped in your attic in the summer, reducing your ability to keep the house cool, but it can also cause problems in the winter.



Types of attic vents

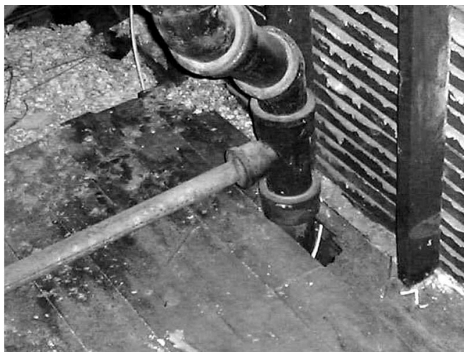
Warm roofs are the main cause of ice dams, because the melting snow refreezes over the colder soffit area (also known as eaves or overhang) and in the gutters, causing wetness to back into overhangs and between the roofing shingles. It's important that there be a free flow of outside air from the soffit of your roof all the way to the peak; air should flow in through soffit vents and out through gable vents, ridge vents or other types of roof vents (see illustration). To prevent the insulation from blocking airflow on the underside of the roof, baffles should be used in areas where insulation butts against rafters or roof sheathing.



Baffles allow air movement beneath rafters

VAPOR BARRIERS AND AIR SEALING

If you insulate the attic floor, it is also important to have a vapor barrier in place, to prevent warm, moist air from rising into the chilled attic from the living space below. The moisture will condense on the wood and insulation, reducing the insulation R-value and encouraging the growth of mold and mildew. You'll need to plug up and seal any openings from the heated area to prevent such humid infiltration. Look for anything that penetrates from the rooms below, and seal any gaps around them.



Seal around pipes and other penetrations

Seal around chimneys, soil stacks, exhaust fan housings and recessed light fixtures. Check for holes that may have been drilled for wiring, and use caulk or spray foam to close them. Chimneys should not have any combustibles against them and may require metal flashing and high heat caulk to seal air leaks. It is especially important to duct exhaust fans and clothes dryers to the outside to reduce humidity in the attic.

The stairwell to the attic should also be insulated by drilling into the sidewalls and stair risers and blowing-in loose-fill product. If there is a landing floor between two flights of stairs, you may need to drill into it with a hole-saw and, when finished, use tapered wood plugs (and glue) to fill the holes after the insulation is blown in.

INSTALLATION OF ATTIC FLOOR INSULATION

PROTECT YOURSELF

Most insulation products can be rather irritating to your breathing, as well as to your eyes and skin. Dress for work with a long-sleeved shirt, gloves, hat, and long pants. Wear goggles and, at a minimum, a dust mask (a HEPA-filtered respirator will filter the dust more efficiently). Consider earplugs too, if using a blower to install loose-fill product. If there is no flooring, it's a good idea to stand on a sturdy plank or piece of plywood temporarily screwed to the joists while you work. Don't smoke while working with insulation, and shower thoroughly afterwards.



Figure 1

BAFFLES

Start your job by installing baffles in areas where you need to hold back insulation. Where joists intersect with roof rafters, insert a plastic or polystyrene baffle in each rafter bay. Staple the baffles into position (Figure 1).



Figure 2

VAPOR BARRIER

You need to make sure you have a vapor barrier in place, to prevent the movement of most air from the living area. If the insulation you are installing has a vapor barrier, make sure it faces the interior of your house.

You can also create a vapor barrier by cutting sheets of 6 mil polyethylene plastic about six inches wider than the space between the floor joists and laying them in place with a few inches extra on each side. Use a staple gun to tack each sheet to the sides of the joists (Figure 2).

If you cannot get a vapor barrier under a floor in the attic, you can use vapor barrier paint on the ceilings below.

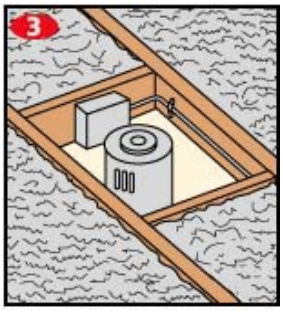


Figure 3

ELECTRICAL FIXTURES

There may be electrical fixtures (recessed lights, etc.,) that protrude through your ceiling. These fixtures can become quite hot when in use. The best thing to do is to replace the old fixture with an IC-rated ("Insulation Contact") fixture that can be covered directly with insulation. Otherwise, you will need to install baffles to hold back the insulation. Use a piece of 1" x 6" or 1" x 8" lumber to create a dam on either side of the fixture. Keep the baffle about 3" away from the fixture (Figure 3).



Figure 4

FIBERGLASS INSULATION

To install fiberglass insulation, start by measuring out each section. Cut a piece to the proper length and press it in place. Make sure the fiberglass batting is tucked snugly into the space, with no gaps next to the ceiling joists or baffles, but don't pack it in too tightly. This will defeat its insulating effect.

If you are not planning to put in an attic floor, you can add another layer of insulation perpendicular to the ceiling joists (Figure 4). Don't place a vapor barrier between the layers, because moisture would be trapped between the two vapor barriers. Adding this second layer will bring you closer to the recommended R-value for our climate.



Figure 5

LOOSE-FILL INSULATION

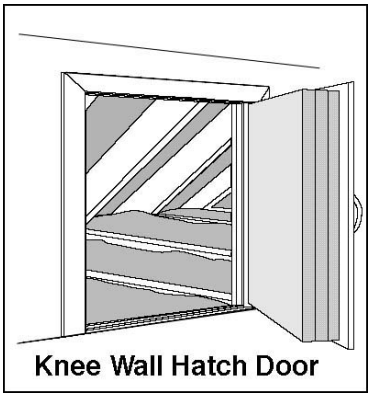
Cellulose (and other loose-fill) insulation can also be installed in an attic without flooring. While it's easy to just pour the insulation into the spaces between the joists, you may wish to rent a blower, as it will "fluff-up" the material uniformly, leaving no dense lumps. Install the insulation into each and every joist cavity, making sure you have filled the space completely. Contractors will often "shoot" in material to a depth of more than twelve inches, to allow for some settling.

If your attic has flooring atop the joists, you may need to remove some of the flooring planks before you can blow insulation into the joist cavities. Select pieces that will allow you to access most of the spaces in between the joists. Blow insulation between the ceiling joists (Figure 5). (Take special care near any electrical fixture; as discussed above, make sure to blow the insulation in such a way that the baffles will hold it away from the fixture.) Replace the flooring pieces you removed.

ATTIC DOORS AND HATCHES

Two final areas – and ones that many people do not consider – are the attic door and access hatches. An attic door should be treated as though it were an opening to the exterior of the house. Install weather-stripping and a door sweep, and insulate the attic side of the door with fiberglass batts or foam board.

The knee wall hatch shown in the illustration to the right has 3 inches of rigid foam board (an R-15 value) glued to the back of the door and weather-stripping around the perimeter of the opening to seal off drafts. If your attic uses a folding ladder with a hatch, there are kits to insulate the cover of the assembly to minimize air infiltration.



Insulated knee wall hatch door

TOOLS YOU MAY NEED
Staple gun
Tape measure
Utility knife
Goggles and dust mask or respirator
Straight edge
Insulation blower (rental)
Pry bar
Electric drill and hole-saw
Caulk gun
Tin snips

MATERIALS TO PRICE
Fiberglass insulation or cellulose insulation
Baffles
Plastic sheets
5/16” staples
Foam board (optional)
Silicone caulk
Low-expansion foam
Aluminum flashing
Door weatherstripping

Home Repair Resource Center empowers homeowners to maintain their homes for sustainable and diverse communities.

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