



**SOME BASIC ATTIC  
DETECTIVE WORK CAN  
UNCOVER LOTS OF WAYS TO  
REDUCE YOUR ENERGY BILL.**

**READ ON!**

**B**ecause warm air naturally rises, the attic or roof area of your home is your first priority for insulating. Insulation reduces the upward flow of heat, keeping it inside your home longer. That means you'll stay warmer, and your heating system will not come on as often—reducing your utility costs!

In Montana's cold climate, insulating existing attics to an R-value of at least .38 is recommended. R-value is the measure of an insulation material's ability to resist heat flow. It's measured per inch of material. For example, glass fiber batt or blanket insulation has an R-value of around 3.2 per inch, and the R-value of loose-fill cellulose is about 3.7 per inch.

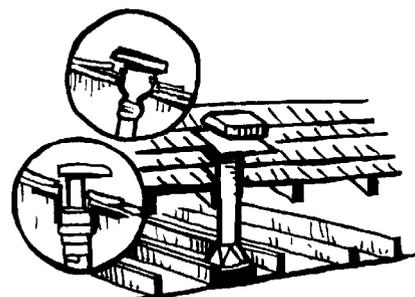
Both of these insulation types are commonly used to insulate attics. Twelve inches of the glass fiber batt insulation achieves R-38, and about 10 1/2 inches of cellulose will do the trick. How much insulation is in your attic?

### Attic/Roof Types

How your attic should be insulated depends on how your roof is built. Common attic/roof types are:

**1. Unfinished Attic.** In these homes, the attic is not part of the living space. You can often get into the attic by ladder through a hatch usually located in a hallway or closet ceiling. Unfinished attics are generally the easiest type to insulate; the insulation goes between the framing members (joists) of the attic floor, which is also your living area's ceiling. Capable do-it-yourselfers can tackle this job with advice from a professional. Rolls of glass fiber or loose-fill cellulose have been the insulation of choice for most do-it-yourself jobs. This brochure primarily deals with steps you can take to add insulation to your unfinished attic.

**2. Finished Attic.** A portion of these attics are living spaces. As a result, insulation should be placed in the exterior walls (called kneewalls), the entire ceiling and the outer floor areas—those not part of the living space. An experienced professional should be called upon for this job since it often requires the use of several insulation products and use of special insulation blowing equipment.



**BATHROOM AND KITCHEN VENTS SHOULD  
BE VENTED THROUGH THE ROOF—  
NOT INTO THE ATTIC.**

**3. Flat, Vaulted or Cathedral Ceilings.** These types of ceilings don't have attics above them, and due to little or no space to add insulation, it may be impossible to add insulation to this roof type. If there is space, the insulation must be blown or placed between the interior ceiling and the exterior roof. It's very important that these construction types be well-ventilated and sealed to prevent moisture problems. They, too, usually require the expertise of a contractor.



**WEATHERSTRIP YOUR ATTIC HATCH DOOR AS  
YOU WOULD ANY OUTSIDE DOOR.**

### Adding Insulation to Your Unfinished Attic

Here are the steps either you or a weatherization contractor should take to insulate or add insulation to your unfinished attic:

**1. Be an Attic Detective.** Go up into your attic with a flashlight and a dust mask to investigate. **CAUTION! If you find vermiculite insulation in your attic, DO NOT PROCEED. Since Vermiculite may contain asbestos, always have it tested before continuing.** Construct a makeshift walkway by laying boards on top of the joists, because the ceiling below won't support your weight. Measure the amount of insulation present and determine its type—it's most likely mineral or rock wool, glass fiber or cellulose fiber. You can take a sample to your Extension office or building materials supplier if you are unsure. If there is already insulation up there and it's dry and evenly spread out, you can leave it alone and add more insulation on top if needed. You can put batt insulation over existing

loose-fill or vice versa. Just make sure that the new insulation doesn't have a vapor barrier, which would trap moisture inside the old insulation. (More on that later)

If the existing insulation is or has been wet, find and correct the moisture problem. It could be a leaky roof, or it may be caused by too much air leaking up from your living space. When warm air from your house rises into the attic, it carries with it large amounts of moisture, too. When the moisture hits the cold surfaces of your attic, it can condense and cause a number of problems: wet insulation that doesn't insulate well, mold growth and damage to sheetrock and other building materials. To control moisture, also make sure bathroom and kitchen vents are not vented directly into the attic. They should be vented through the roof.

**2. Electrical.** Check all wiring and electrical junction boxes to assure wiring is not exposed and boxes are covered. Many old homes have a two wire system referred to as "knob and tube wiring." This type of wiring should not be covered with insulation.

**3. Seal Air Leaks.** Insulating won't save you much money or keep you much warmer unless you first seal all the air (and moisture) passageways between your living space and your attic. Common air leakage spots include the tops of interior and exterior walls, around pipes and heating ducts, light fixtures and wires. Conventional caulking methods work fine, though special care should be taken around chimneys and plumbing stacks. You should also weatherstrip the attic hatch door, treating it as you would a door to the outside.

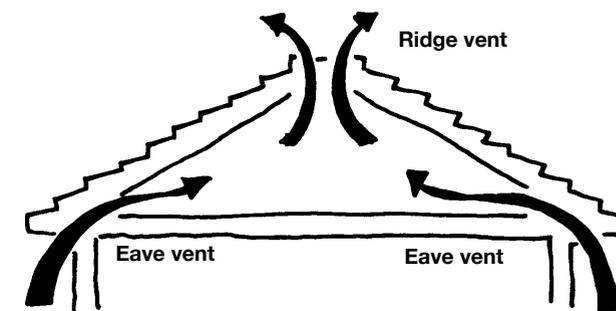
**4. Install a Vapor Barrier.** Moisture can also cause problems by traveling right up through the ceiling and into the insulation. If your attic is being insulated for the first time, to head off a potential moisture problem, you can lay down a vapor barrier (often a sheet of polyethylene plastic) on the attic floor before pouring in loose-fill



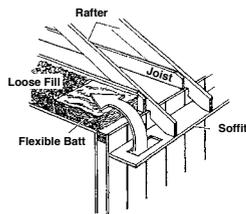
**IF YOU INSTALL ADDITIONAL INSULATION,  
IT SHOULD BE UNFACED—OR USE A KNIFE TO  
FREELY SLASH THE VAPOR-BARRIER TYPE**

can paint your ceilings with vapor barrier paint—especially in high-moisture rooms such as kitchens and bathrooms. If some insulation already exists, it is important that new insulation not have a vapor barrier. Preferably, the new insulation should be unfaced—manufactured without a barrier attached. If unfaced insulation is not available, use the vapor-barrier type but remove the barrier or slash it free with a knife.

**5. Ensure Enough Ventilation.** Proper ventilation is another key to a successful attic insulation job. It lets your attic breathe, ridding it of moisture in the winter and keeping it cooler in summer. If you install a vapor barrier, you need one square foot of free vent area for every 300 square feet of attic floor area. Without a vapor barrier, you need twice as much ventilation: one square foot of vent for every 150 square feet of floor.



**A COMBINATION OF RIDGE AND EAVE VENTS CREATES  
NATURAL CONVECTION CURRENTS, KEEPING YOUR ATTIC  
COOL AND MOISTURE-FREE.**



**DON'T BLOCK VENTILATION OPENINGS OR COMBUSTION AIR SUPPLY SOURCES.**



**CREATE A SHEET METAL SHIELD AROUND LIGHT FIXTURES AND MOTORS.**

Vents should be located on opposite ends of the attic, with some near the top and others near the bottom to allow for good cross-ventilation. Talk with a contractor about which types of vents would be best for your attic.

### 6. Finally, the Insulation!

Now you're ready to either roll out the batts or pour in the loose-fill. You

may want to use some of both, putting mats in the straight-al-ways and loose fill in the nooks and cranies. Buy batts wide enough to just fit between the attic framing. First fill the joist spaces, and then roll out a second layer on top, perpendicular to the first. Be sure to place the batts as close together as possible.

If you opt for loose-fill insulation, pour it in and then level it with a rake or a board. If you plan to add loose-fill above the height of the joists, attach wooden sticks to the joists to serve as depth markers.

As you add insulation, it's important to not block any combustion air supply source or any ventilation openings, especially in the eaves. Ventilation chutes can be created during the insulation job to prevent vents from being blocked off. Also, keep insulation three inches away from recessed light fixtures, chimneys, fan motors and flues to reduce fire danger. Do this by surrounding the objects with a sheet metal barrier. Also, extend the barrier four inches above the finished insulation level. If you have a water heater, furnace or knob and tube wiring in your attic, consult a professional for information on insulating around these obstacles.

Whatever insulation type you choose, follow the manufacturer's directions carefully and don't unwrap the insulation until you get it up in the attic. Also, since you'll be spending time in a dusty space, wear a respirator dust mask, work gloves and protective clothing. It's a dirty job, but well worth the doing!

### For More Information

If you are on a limited income, you may qualify for a free attic/roof insulation job and other weatherization assistance. Contact your local utility and your local Human Resources Development Council for details.

To learn more about insulation in general, obtain a copy of Power Bill's Insulation Choices brochure. Brochures are available on insulating your walls and floors and on other energy conservation topics as well. For additional information, contact your local utility, the Human Resources Development Council, the tribal weatherization office, or the MSU Extension office in your country.

**FOR THE HRDC OR TRIBAL WEATHERIZATION OFFICE NEAREST YOU, CALL 1-800-332-2272.**



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**Put a lid on heating costs by installing ATTIC INSULATION**

**NO WONDER THE HOUSE WAS SO COLD AND MY UTILITY BILL WAS SO HIGH— NOT ENOUGH INSULATION! THIS SHOULD DO THE TRICK.**

