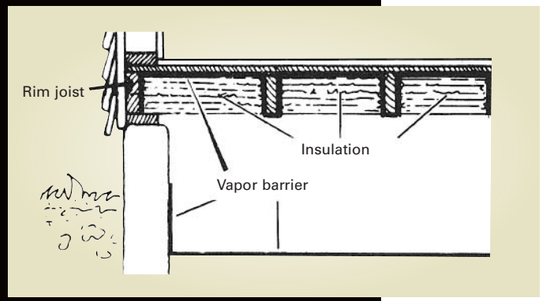
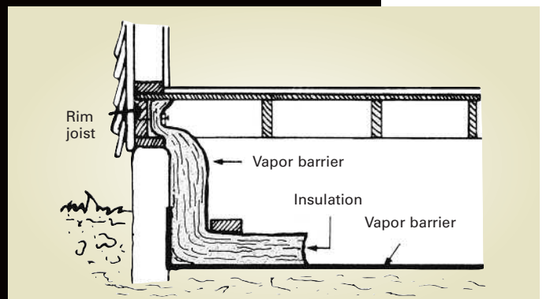
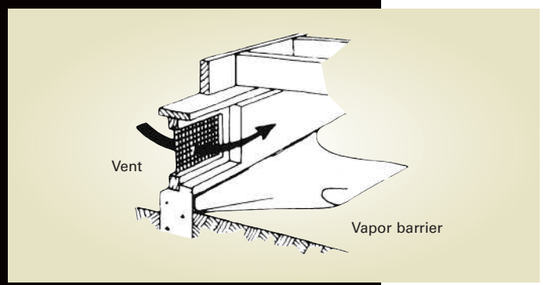






For more information about efficient natural gas appliances, visit CenterPointEnergy.com

Crawl spaces

Unconditioned crawl space

Crawl spaces require insulation, ventilation and vapor barriers. In unconditioned crawl spaces, one vapor barrier covers the ground and another covers the area between the insulation and subfloor. The insulation is installed between the floor joists.

Conditioned crawl space

If a conditioned crawl space is desired, a vapor barrier covers the ground in the same way as in the unconditioned crawl space. Insulation is applied to the rim joist, down the wall and onto the floor, so a vapor barrier should also be installed to cover the insulation. In all cases, be sure to insulate water and drain pipes and heat ducts in the crawl space.

Foundation vent

If the crawl space opens into a conditioned basement or cellar, it should be ventilated to the outside (one square foot of vent for every 1,500 square feet of floor area) with vents placed on opposite walls for cross ventilation. These foundation vents can be closed and sealed in winter and opened in warm weather.

CenterPoint Energy®

Always There.®

INSULATION AND VENTILATION FACTS AND TIPS

CenterPoint® Energy

Almost every homeowner can save both energy and money by adding insulation. The payback period varies with the type of insulation materials, purchase and installation costs, and the price of fuel.

Good insulation is permanent, maintenance-free and can return your investment by lowering your fuel bills. The basic function of insulation is to resist the flow of heat. This is expressed as an "R" value; the higher the "R" value, the more resistance to heat flow. Insulation materials have different "R" values, so buy insulation according to the "R" value you wish to attain, not by total inches.

Types of insulation

There are several types of insulation with various "R" values and prices. Some are easy to install yourself; others may require a contractor or special equipment. Whichever type of insulation you buy, be sure it meets federal standards for fire and vermin resistance. Check for approval codes listed on the packaging.

Insulating material	"R" value per inch
Batt & blanket	
Mineral wool	R–3.15 to 3.85
Fiberglass	R–3.15 to 3.85
Loose fill (pour in)	
Mineral wool	R–2.88 to 3.31
Fiberglass	R–2.88 to 3.31
Cellulose fiber	R–3.70
Vermiculite (expanded)	R–2.13 to 2.27
Perlite (expanded)	R–2.70
Rigid insulation	
Extruded plain (Styrofoam) T.M.	R–5.00
Expanded polystyrene (Beadboard)	R–3.57
Expanded polyurethane (Foam)	R–6.25
Fiberglass (Rigid board)	R–5.00

NOTE: To assure fire safety, rigid insulation should be covered with 1/2" gypsum wallboard when installed.

Where to install

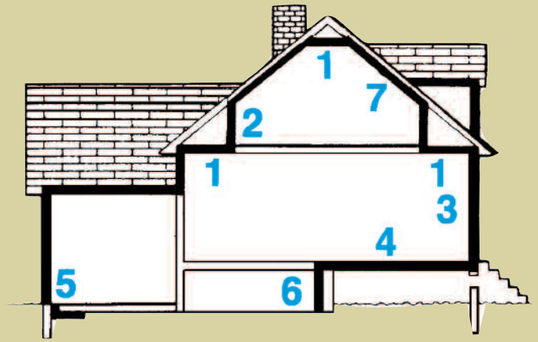
The diagram at right explains which places in your home need insulation. An unconditioned space is an area with no heating or air conditioning; a conditioned space is heated in winter and cooled in summer.

It's important you remember to:

- Add insulation to your attic door.
- Wrap insulation around heating and air conditioning ducts which pass through unconditioned spaces.
- Wrap hot water pipes with insulated pipe wrap.
- Add insulation to foundation wall.
- Seal bypass areas.

Installing insulation

- Do not block soffit vents with insulation.
- Provide a 3" clearance around heat-producing fixtures such as recessed ceiling lights.
- For your safety, watch for nails that stick through the roof sheathing above your head. Wear work gloves, loose-fitting clothing and a long-sleeved shirt to avoid skin irritation; wear a mask to prevent inhaling insulation particles.



Where to insulate a home	How much
1. Ceilings with unconditioned spaces above	R–30 to R–38
2. "Knee" walls of a finished or conditioned attic	R–22
3. Exterior walls or walls between conditioned and unconditioned spaces	R–13 to R–16 (New construction)
4. Floors over unconditioned or outside spaces	R–19
5. Slab insulation	R–4 or greater
6. Top of foundation (rim joist or band joist)	Fill with fiberglass batts
7. Vaulted or cathedral ceilings	R-22

Bypasses

Sealing bypasses is an important step in weatherizing your home. A bypass is any hole, crack or crevice that allows conditioned air to leak through your home's insulation. Bypasses are found in interior and exterior walls, around vent pipes, recessed light fixtures, plumbing and electrical wire passages, and chimneys. Seal bypasses before insulating. If your attic is already insulated or floored, you may have to remove insulation or floor boards to plug the bypasses. If bypasses are not sealed, insulation only "filters" the warm air on its way to the attic, so your roof will still be warm and ice dams may develop.

Sealing bypasses

Techniques for sealing bypasses depend on the size and accessibility of the openings. Regular caulk can be used for small holes. Holes too large or deep for regular caulk can be sealed with foam caulk or void filler. Open wall cavities and other large openings can be sealed with pieces of rigid material cut to fit and caulked into place, or stuffed with lightly rolled unfaced fiberglass insulation.

Vapor barriers

Humidity and moisture that collect in insulated areas can cause problems. Therefore, vapor barriers should be placed between insulation and the conditioned space. Suitable vapor barriers can be found on some blanket insulations.

Where no vapor barrier is attached, a separate vapor barrier made of one of the following materials works well:

- Polyethylene film
- Paper-backed aluminum
- Laminated papers consisting of a continuous sheet of asphalt between two sheets of paper
- Surface-coated, asphalt-saturated building paper

When creating vapor barriers:

- Do not add vapor barrier-faced insulation over existing insulation. If unfaced bolts are not available, slash or strip vapor barrier from batts before installing.
- Replace vapor barriers damaged during installation or repair with mending tapes.
- In existing houses where vapor barriers are impossible to install, moisture protection may be obtained by painting interior walls and ceilings with vapor-resistant paint. Follow manufacturer's instructions for applications.

Ventilation

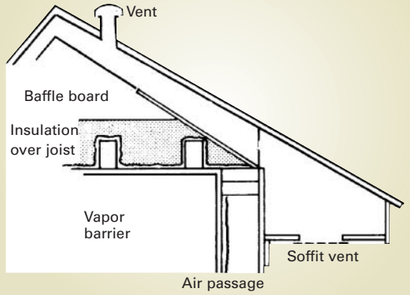
Vents are openings in the attic area that allow moisture to escape. If you don't ventilate properly, water vapor can condense and collect on insulation and rafters. This will reduce the effectiveness of the insulation and could damage the house. Also, without ventilation, attic heat could penetrate into living areas during summer.

Where to ventilate and how much

How much ventilation you need is determined by the area of your attic;

normally one square foot of vent is needed for every 300 square feet of attic area. If you do not have a vapor barrier in this area, the amount of ventilation could be doubled (up to one square foot of vent for every 150 square feet of attic area). Keep in mind that screens and louvers on vents reduce venting capacity, so openings must be increased proportionately. Use a combination of vents; half located low on the roof and half higher up, so air can flow in one and out the other. For example, use soffit and ridge vents.

Install baffle boards as necessary to prevent insulation from blocking air flow and keep vent screens clean.



Power ventilation

Natural ventilation is usually sufficient. Using electrically powered vents is optional. Power vents require additional attic ventilators and they may interfere with proper furnace and fireplace venting. Be sure you choose the correct size power vent to handle the area.