

# Ventilation

Install Vents to Cool Attic Spaces



## SKILL SET

Be sure you have the experience needed for this job. Improperly installed attic vents can cause roof leaks. If you are in doubt, hire a contractor. Two people make the task easier.

## SAFETY

This job requires working in unconditioned attic spaces, tight clearances and under task lighting. Exercise caution when on a ladder and the roof. Use a dust mask/respirator, gloves, safety glasses and kneepads.

## TOOLS

Utility knife, measuring tape, lights, straight edge, markers, staple gun and hammer.

## MATERIALS

Insulation baffles  
Attic vents  
Flashing  
Roofing cement  
Fasteners – screws, roofing nails or staples, depending on the application

## COST BENEFIT

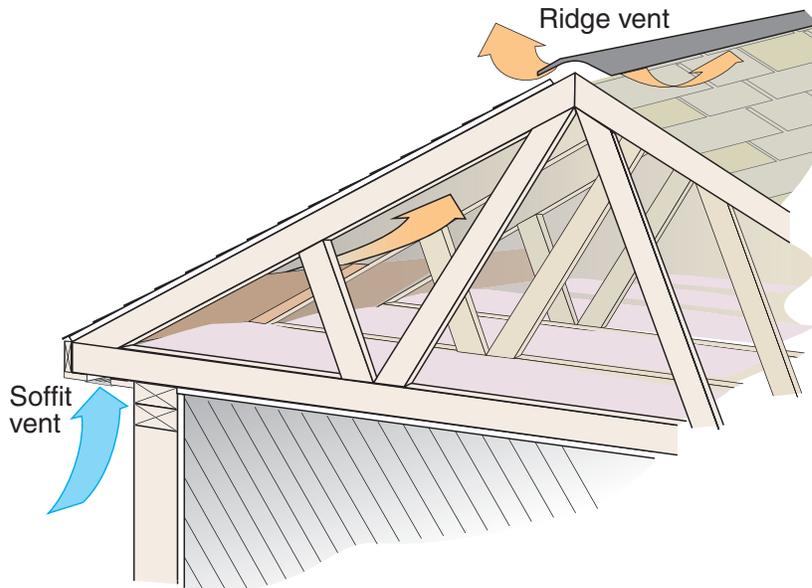
Labor is the big cost here, although simple insulation jobs can be completed as a weekend project. Materials are inexpensive. Insulation baffles range from \$1.00 to \$3.00 apiece and can be purchased less expensively in bulk.

### PRIORITY LEVEL

LOW MED HIGH

### SKILL LEVEL

DIY PRO



To ventilate the roof, locate vents high along the roof ridge and low along the eave or soffit. Vents should provide air movement across the entire roof area. Types of vent systems include: ridge, gable, soffit, mushroom and turbine vents.

## Attic Ventilation

In winter, properly designed roof vents expel moisture which could otherwise accumulate and deteriorate insulation or other building materials. In summer, ventilation reduces roof and ceiling temperatures, thus potentially saving on cooling costs and increasing roof life. The combination of continuous ridge vents along the peak of the roof and continuous soffit vents at the eave provides the most effective ventilation. Outside air enters the attic through the soffit vents and is exhausted out through the high vents. In most homes, this natural convective flow of heated air and moisture out of the attic is sufficient. There are a wide variety of products available including ridge, gable, soffit, mushroom and turbine vents. The type and placement of attic vents will be determined largely by the roof design.

## How Big? How Much?

**Determine needed ventilation** – The amount of attic ventilation needed is determined by the size of the attic floor and the amount of moisture and heat entering the attic. General guidelines are:

- 1 square foot of attic vent for each 150 square feet of attic floor area without a ceiling vapor retarder.
- 1 square foot of vent for each 300 square feet if there is a vapor retarder.
- The total vent area should be divided equally between high and low vents.

**Determine size of attic vents** – Examine the existing ventilation and make sure it is sufficient. If not, determine the needed amount of ventilation and add attic vents as necessary. Attic vents are sized in terms of net square feet of unobstructed vent area—the size of the actual opening through which air flows. You may have a rectangular gable vent that is 2 feet tall and 3 feet wide; however, if that opening is covered by a wood louver, the actual area through which air flows will be substantially

less than the size of the opening. The chart shows factors for determining the net free vent area for different vent coverings. For example, the area of the opening for the 2-foot by 3-foot gable vent is:

$$2 \text{ ft} \times 3 \text{ ft} = 6 \text{ sq ft}$$

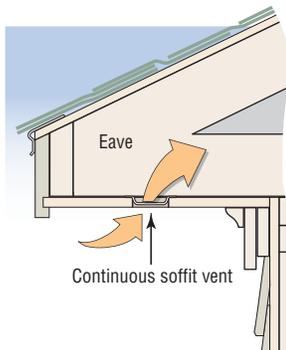
The vent is covered by a wood louver. From the chart, the ratio of opening area to net free vent area is 2.25. The net free vent area of the gable vent is then:

$$6 \text{ sq ft} / 2.25 = 2.7 \text{ sq ft}$$

Reduction Factor for Vent Covers	
Type of cover	Reduction Factor
Wire mesh or chicken wire	1.00
Insect screen	2.00
Metal louvers	1.50
Metal louvers with insect screen	2.00
Wood louvers	2.25
Wood louvers with insect screen	3.00

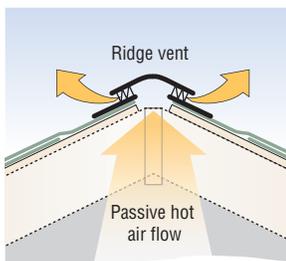
## Soffit Vents

1. Determine if the eave area has sufficient room for soffit vents. Generally, the vents are installed on the underside of the eave, called the soffit. If the roof does not have an eave, the vents may be placed in the fascia framing between the rafters.
2. Follow the manufacturer's instructions for cutting holes for the vents. Holes for both continuous and rectangular soffit vents can usually be cut with a power saw. Using a power saw overhead requires considerable skill and strength. Be certain that you have the experience necessary to do this job safely.
3. After the opening is cut, position the vent and secure with weather-resistant nails or screws.
4. If the vent does not have insect screening, install it before positioning the vent in the opening.
5. Make certain that soffit vents are not blocked by insulation. Add insulation baffles to ensure ventilation air flow if necessary.



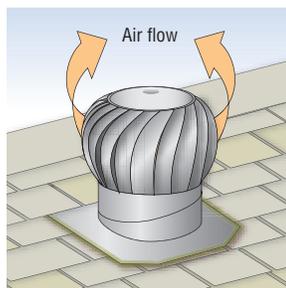
## Ridge Vents

1. Follow the manufacturer's instructions in marking the placement of the ridge vent on the roof ridge. Generally, installing the vent will require removing the cap shingles and cutting through the roof deck.
2. Remove the cap shingles in the area where the ridge vent will be installed.
3. Follow the manufacturer's recommendations on how wide of a gap to allow along the ridge for the ridge vent. For most vents, a cut will be required one to two inches on each side of the ridge. Mark a line showing where to cut and remove any nails that may be in the way of the saw.
4. Cut through the shingles and decking using a circular saw with a carbide-tip blade.
5. Remove the loose shingles and decking material.
6. Secure the ridge vent in place according to the manufacturer's instructions.
7. Be careful not to damage the vent during installation or clean-up.



## Roof Louver or Turbine Vents

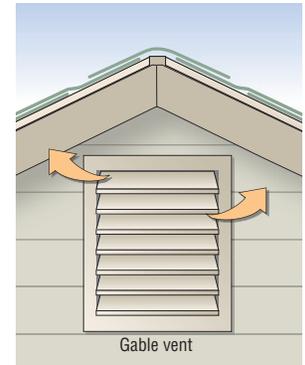
1. Choose a location between two roof rafters as close to the roof ridge as possible.
2. Follow the manufacturer's instructions for cutting a hole in the shingles and roof decking for the vent.



3. Install the vent according to the manufacturer's instructions. Be certain to follow guidelines for flashing to prevent roof leaks.
4. Repair or replace any shingles that may have been damaged during the work. Also check to make certain that the vent was not damaged during installation.

## Gable Vents

1. Generally, gable end walls are constructed of studs. Choose a gable vent that will fit between two studs rather than a vent that requires cutting through the studs on the gable end, then consult with a knowledgeable professional to ensure that no structural damage occurs.
2. Most gable vents mount over the exterior wall finish and are held in place by a flange. Follow the manufacturer's instructions for positioning the gable vent and marking the area on the exterior wall finish to be cut for the vent.
3. Use a power or hand saw to cut through the exterior wall finish. Remove the cut materials.
4. Insert the gable vent and secure according to the manufacturer's instructions



**Power Attic Ventilators – are they effective?**

Electrically powered roof ventilators can consume more electricity to operate than they save on air conditioning costs and are NOT recommended for most designs. Power vents can create negative pressures in the home which may have detrimental effects such as:

- Drawing air from the crawl space into the home
- Pulling pollutants such as radon and sewer gases into the home
- Backdrafting fireplaces and fuel-burning appliances

The diagram shows a cross-section of a house with a power vent on the roof. Blue arrows indicate 'Intentional ventilation pathway' from the attic to the outside. White arrows show 'Unwanted ventilation pathway from living space' being drawn into the attic. A yellow arrow shows air being drawn from the 'Crawl space' into the living space.