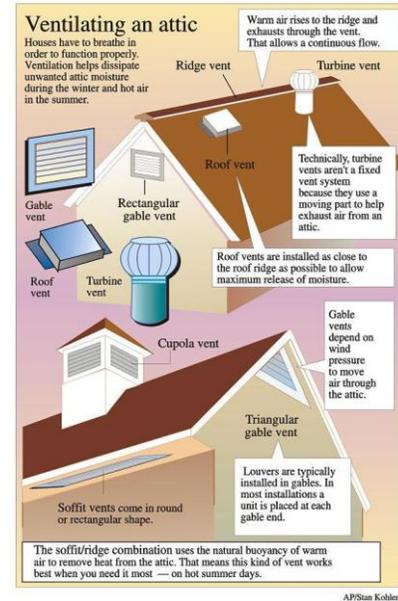
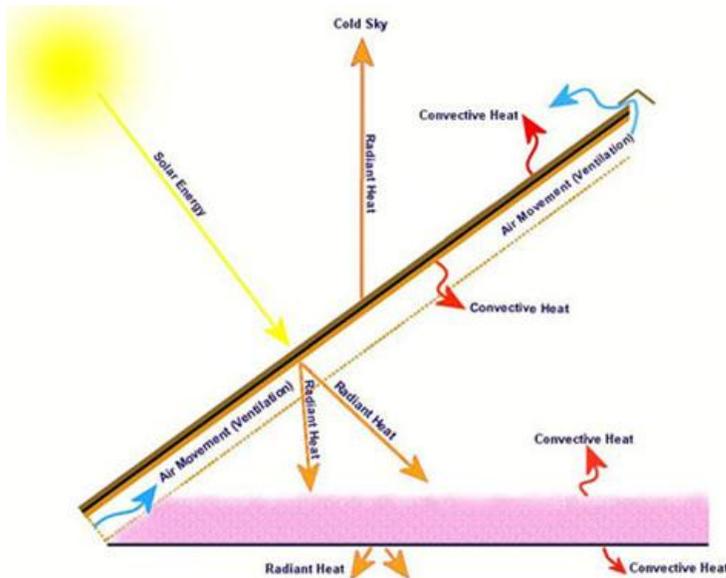


## Proper Attic Ventilation

The proper ventilation throughout the attic is a critical component of a home. It is generally required that one square foot of free vent area be provided for every one hundred and fifty square feet of ceiling area. Proper ventilation will help to keep the home and garage cooler during warm weather and extend the life of the roofing materials. Proper ventilation will also help reduce the potential for heat build-up and condensation within the attic.

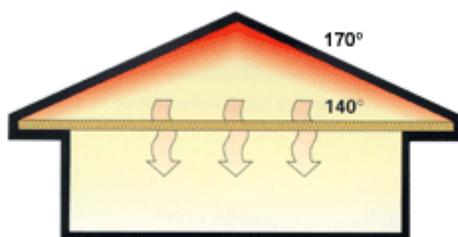


One of the critical aspects of a roof system's durability is the ventilation of the attic or space below the roof. Attic ventilation means exchanging the existing air in an attic for fresh air and allowing the fresh air to circulate throughout the attic. The two basic benefits of this air exchange are a cooler attic in the summer and a dryer attic in the winter.

These combined benefits provide greater occupant comfort; savings in the energy used for cooling, and help in maintaining the structural integrity of the roof system. Without adequate venting of the under roof or attic area, heat and moisture can build up and possibly lead to premature roof aging and/or structural concerns. Two natural forces help provide ventilation, convection and wind.

Convection is the natural tendency for warm air to rise. As the warm air rises in an attic, cooler air is pulled in to replace it. Wind flow over a roof system also creates air movement in the attic as areas of positive and negative pressure are created. The positive wind pressure on the upwind side of a home forces in fresh air, while negative pressures on the downwind side draw out warm moist air.

However, for any movement of air to take place, there must be adequate intake and outlet vents. For the airflow to be effective, the vents must be sized properly and positioned at the correct locations in the roof.



The principal source of attic heat is solar heat gain from direct sunlight on the roof. Even on a cloudy day there is an appreciable amount of heat transmitted to the roof. This solar heat is transmitted through the roof material and, in turn, is radiated to the attic floor -- or to the top surface of the ceiling insulation. This surface becomes heated, and the attic air in contact with the underside of the roof and the top of the insulating material also becomes heated.

Gradually, the temperature increases until the entire attic, including the roof framing, sheathing, floor, insulation, and air are extremely hot. On a hot summer day with outside temperatures around 95° F the roof sheathing in a poorly vented attic may reach a temperature in excess of 170° F. The attic floor or insulation surfaces may reach 140° F or more.

As the sun lowers in the sky and eventually sets, the roof begins to radiate the heat from the attic to the outside air thus allowing the attic to cool. Sometimes the heat absorbed by the structural materials, however, is not entirely removed during the overnight period. Consequently, in certain situations the heat can build up sooner and stay longer the next day, exacerbating heat related effects on the roof system. High attic temperatures can promote deterioration of roof sheathings and cause wood framing members to split and deform.