ASPHALT ROOFING MANUFACTURERS ASSOCIATION®

TECHNICAL BULLETIN

Why Ventilation is Important

Revised February 2023

Attic ventilation is:
Attic ventilation is the flow of outside air through the space at the underside of the deck of an asphalt shingle roof system. The proper ventilation of this space is a critical design and performance consideration.

The benefits of proper ventilation include:
Ventilation moves heat out of an attic space. Proper ventilation methods can help ensure the maximum service life of roof assembly materials and can improve the energy efficiency of the building. During the summer months, roof deck temperatures can significantly increase due to the sun's energy. The heat from the deck radiates into the attic space. Proper ventilation mitigates that radiated heat to reduce the energy used to cool the building and to improve occupant comfort.

Typical home activities generate moisture vapor which migrates to the attic space. Ventilation moves occupancy-generated water vapor out of the attic space. This internal building moisture is often a cause of roofing system problems, including but not limited to water vapor reaching an unconditioned space and condensing on cooler surfaces. This may cause wood to rot in the roof framing, decking, walls, and ceilings. Proper ventilation helps mitigate many of these moisture problems.

Proper ventilation may reduce ice damming in snowy climates. Ice dams form due to the cyclical thawing of snow over the warmer portion of the roof and re-freezing at the cold eave overhang. For more information, refer to ARMA's Technical Bulletin "Protecting Against Damage from Ice Dams."

The absence of proper ventilation may result in the following problems:

- Premature failure of the roofing system
- Buckling of the roofing shingles due to deck movement
- Rotting of wood members
- Moisture accumulation in the deck and/or building insulation
- Ice dam formation in cold weather

The following practices are components of a proper attic ventilation system:

- Install intake vents at the eaves or in the lower portion of the roof or attic space.

- Install exhaust vents at the ridge or in the upper portion of the roof or attic space.
- Locate the intake and exhaust vents to ensure airflow in all areas of the attic space. When using eave and ridge vents, they should be continuous and run the entire length of the eave and ridge.
- Do not allow blockage or restriction of the airflow, such as by skylights in enclosed rafter spaces or by incorrectly installed insulation. Maintain open air flow from eave to ridge between each rafter space.
- When using static vents, they should be equally spaced and close enough to each other to ventilate the entire attic.
- A combination of different types of intake vents and other kinds of exhaust vents may be necessary to properly ventilate each attic space. However, combining different types of exhaust vents on the same roof above a common attic space could cause short-circuiting of the attic ventilation system, resulting in incomplete ventilation.
- Install a balanced system of intake and exhaust. Balance is achieved when intake vents provide 50 to 60% of the open venting area and exhaust vents provide 40 to 50% of the open venting area. The intake amount should always exceed the exhaust amount. This ventilation system balance is compatible with the requirements of the International Building Code (IBC) and the International Residential Code (IRC).
- Install sufficient ventilation. For many years, the standard industry practice and code recommendation has been to provide a minimum of 1 sq. ft. of net free venting area (NFVA) for every 150 sq. ft. of the attic floor area of the vented space. This value has been demonstrated to provide a sufficient amount of ventilation in most situations. The codes generally allow this ratio to be reduced to 1 sq. ft. of NFVA for every 300 sq. ft. of the attic floor area of the vented space when certain building features (such as balanced ventilation [see previous bullet point] in combination with vapor retarders) are incorporated into the attic space. Once a minimum NFVA ratio has been selected and the area of the vented space has been determined, the required minimum square feet of NFVA can be calculated.
- When reroofing, replace ventilation devices within the field of the roof (e.g., static vents, ridge vents). It is possible to retain intake and exhaust vents not in the field of the roof (e.g., soffit vents, gable vents), provided they remain functional when reroofing is complete.

The manufacturers of ventilation systems and vapor retarders should be consulted for the proper use of their products. It is important to note that the trends continue toward higher energy conservation, air barriers, and generally tighter housing construction methods. The code requirements are minimums, making proper ventilation an important consideration for minimizing energy usage and optimizing roofing system performance. Standard “one size fits all” solutions are not sufficient.

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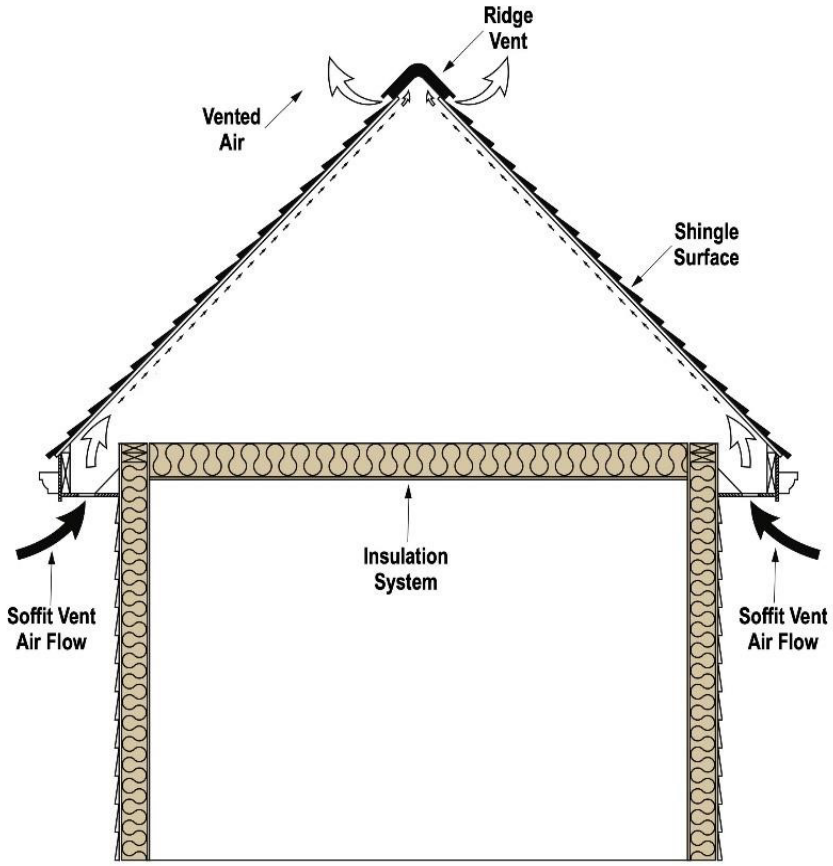

Figure A: Typical ridge and soffit ventilation system

Find additional guidelines in the Residential Asphalt Roofing Manual, published by the Asphalt Roofing Manufacturers Association.