ASPHALT ROOFING MANUFACTURERS ASSOCIATION

technical bulletin

Asphalt Roofing Manufacturers Association

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Ventilation and Moisture Control for Residential Roofing

The proper ventilation of attic areas is a critical design and performance consideration. If implemented correctly, proper ventilation methods can help ensure the maximum service life of roof assembly materials, and can improve energy efficiency of the building. The minimum amount of ventilation required is defined by the building codes for residential construction. In addition, ventilation is recommended by shingle manufacturers to help ensure the performance of the roof materials. Overlooking this consideration 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

In cold climates, internal building moisture is often a cause of roofing system problems. Occupancy generated water vapor may reach an unconditioned space and condense on cold surfaces. This may cause wood to rot in the roof framing, roof decking, walls and ceilings. Proper ventilation helps to reduce the occurrence of many problems such as expansion/contraction of decking and ice damming in cold, snowy climates. Ice dams are formed by the cyclical thawing of snow over the warmer portions of the roof and re-freezing at the cold eave. Refer to ARMA's Technical Bulletin "Protecting Against Damage from Ice Dams."

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, and could reach the living space if the attic floor/ceiling is not well insulated. This will increase the demand on the home's cooling system and energy use. Additionally, it will accelerate the aging of asphalt roofing products. By properly ventilating the underside of the roof deck, heat buildup and its related problems will be reduced.

Refer to ARMA's Technical Bulletin "Attic Ventilation Best Practices for Steep Slope Asphalt Shingle Roof Systems." For any given home, the minimum amount of ventilation required by code is dependent on three primary factors: the size of the attic, the placement of the vents and the airflow rating of the vents. When considering air movement, there are two categories of vents - intake vents and exhaust vents. The optimal attic ventilation installation is a balanced combination of properly located, properly sized intake and exhaust vents (and there are many types within each category).In some cases, a minimum net free ventilation area equal to one square foot per 150 square feet of attic floor area must be designed and properly installed to provide proper ventilation.

In other cases, ventilation can be at a ratio of 1 square foot ventilation per 300 square feet of attic floor area. Ventilation manufacturers recommend that the free-flow ventilation be equally balanced between intake and exhaust vents regardless of which ratio is used. Because eave and ridge venting provides continuous airflow along the entire roof peak and eave, instead of localized as is the case with individual vents, it is generally viewed as the superior venting technique (see Figure A).

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

Additional guidelines may be found in the Residential Asphalt Roofing Manual, published by the Asphalt Roofing Manufacturers Association, 529 14th Street, NW Suite 750, Washington, DC 20045, www.asphaltroofing.org.

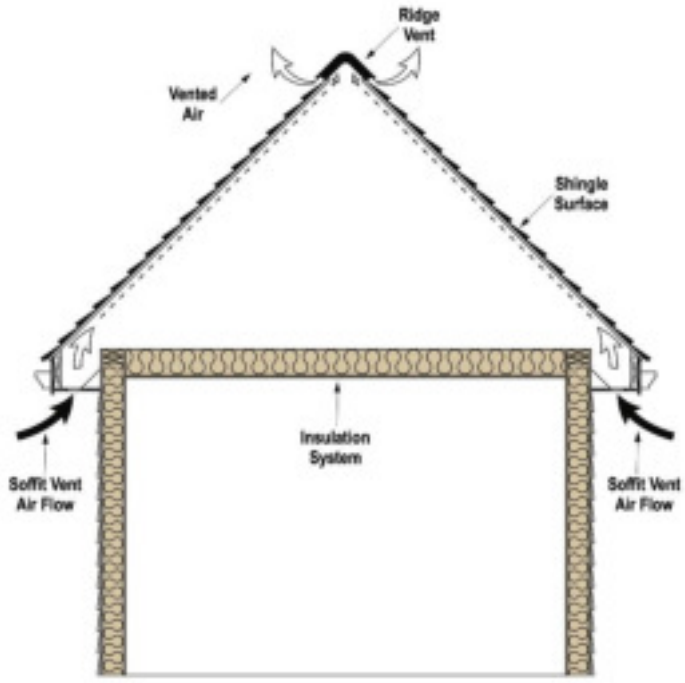

Figure A: Ridge and soffit ventilation system