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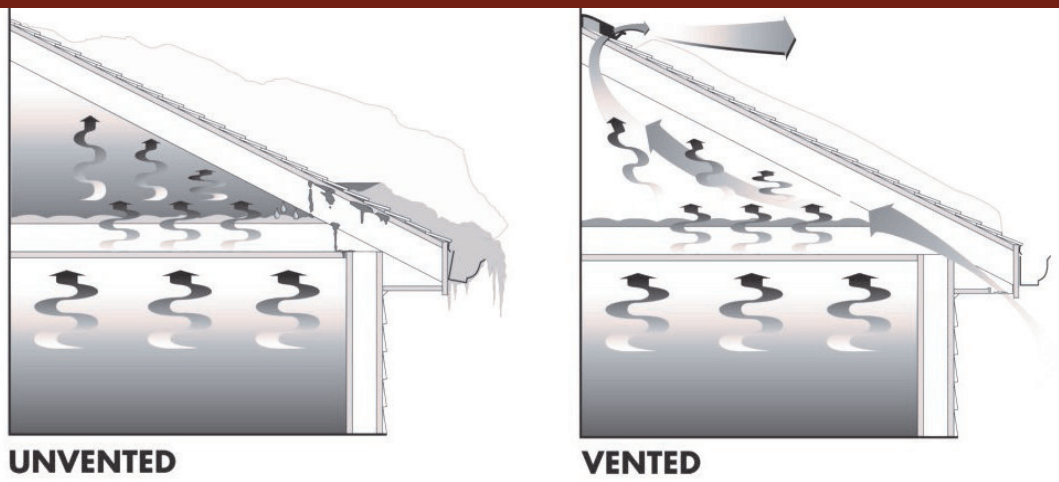
ASPHALT ROOFING MANUFACTURERS ASSOCIATION

Installing Attic Ventilation



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BY ASPHALT ROOFING MANUFACTURERS ASSOCIATION (ARMA)

Does your home have a properly functioning attic ventilation system?

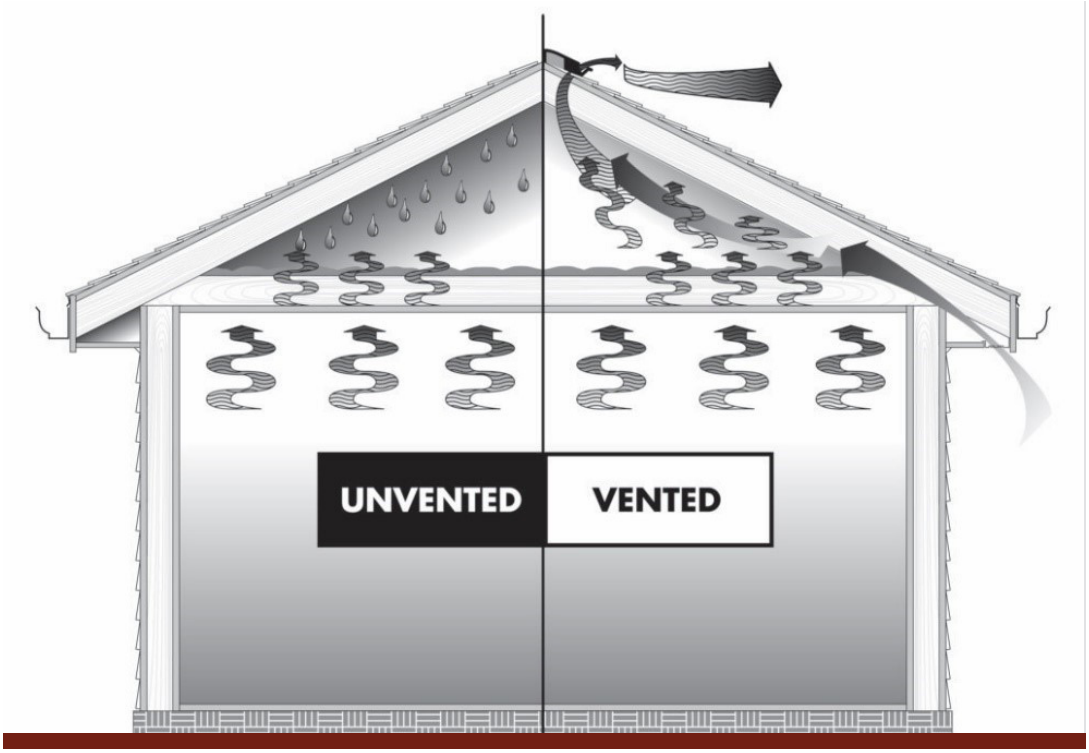
Every home has a roof, but is every roof properly ventilated to prevent premature roof deterioration or roofing system failure?

While current building codes use specific design criteria to reduce the likelihood of moisture problems in unvented attic systems, **the most common and time-tested approach is to provide proper ventilation under the roof assembly.**

Proper attic ventilation is a balanced system of intake and exhaust that allows a continuous flow of air. It not only helps to reduce heat and moisture buildup year-round but it can prolong the life of the building materials. Attic ventilation combined with properly installed insulation can assist with the longevity and performance of a roofing system by helping to prevent ice dams, aiding in reducing energy consumption, and keeping attic temperatures cooler in the summer and the space drier in the winter.

According to the **Asphalt Roofing Manufacturers Association (ARMA)**, the best attic ventilation system allows natural air movement and includes a balance between intake and exhaust, as well as attic insulation that does not obstruct airflow. **There are different system choices for both intake and exhaust.**

The Creation of Natural Air Movement



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VENT INSTALLATION

For an attic ventilation system to function most effectively, unobstructed intake and exhaust points allowing a natural flow of air must be installed. Natural airflow is created by installing intake vents at the eaves, soffit, or lower portion of the roof or attic space and by installing exhaust vents at the ridge or upper portion of the roof or attic space. **These vents should never be blocked or covered so that air can enter and exit freely.**

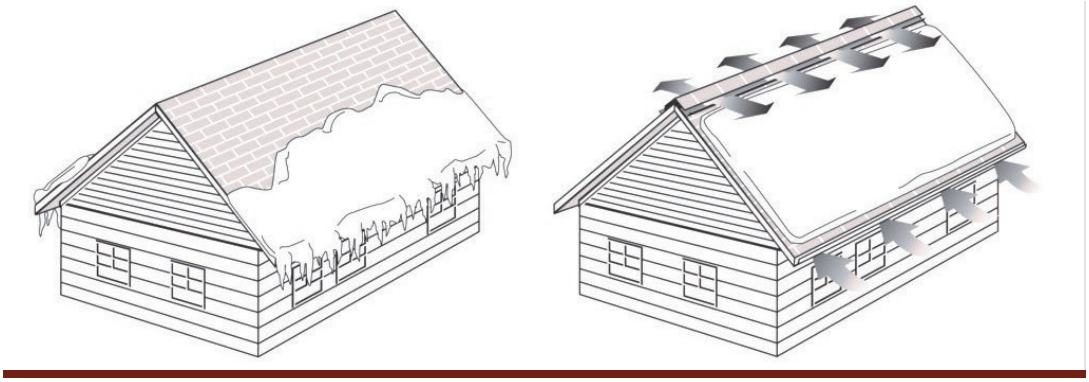
As a general rule, combining different types of exhaust vents on a roof above a common attic space should be avoided (example: a ridge vent in conjunction with a roof fan). Doing so can result in a ventilation "short circuit", wherein an exhaust vent pulls air from another exhaust vent instead of pulling from intake vents. To increase the effectiveness of a passive attic ventilation system, an appropriate method is to increase air intake rather than exhaust.

THE STACK EFFECT

Installing intake and exhaust vents allows the process known as the stack effect to assist the movement of air in an attic. Heated air is lighter than cold air and increases pressure in the upper parts of an attic while decreasing pressure in the lower parts. Heated air rises due to the pressure difference and exits the attic through exhaust vents placed near or at the ridge of the attic. Intake vents placed at the eaves, soffit, or lower portion of the attic or roof allow air to naturally enter the attic due to the pressure difference.

THE WIND EFFECT

Proper installation of intake and exhaust vents is important for creating a flow of air due in part to the wind effect. As wind-driven air is pushed against a building's exterior surface, areas of high and low pressure are created. Areas of high-pressure force air into the attic through intake vents such as eaves and soffit vents, while areas of low pressure pull air out of exhaust vents, such as a ridge vent. Installing intake and exhaust vents at the previously specified locations allows the air to be pushed into the attic as well as pulled out of the attic.



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A Balance Between Intake and Exhaust Installation

While installation of intake and exhaust vents is critical to creating a flow of air, it is equally important to create the recommended balance between intake and exhaust.

The minimum amount of net free area required for ventilation is 1 square foot for every 150 square feet of area of the space ventilated, as directed by the International Building Code (IBC). Net-free area is the actual open area for the passage of air within a vent. The IBC permits a reduction of the minimum net free ventilation area to 1/300 of the vented space provided both of the following conditions are met, as quoted from the 2021 International Building Code:

1. In Climate Zones 6, 7, and 8, a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.

2. Not less than 40 percent and not more than 50 percent of the required ventilating area is provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located not more than 3 feet (914 mm) below the ridge or highest point of the space, measured vertically, with the balance of the ventilation provided by eave or cornice vents. Where the location of wall or roof framing members conflicts with the installation of upper ventilators, installation more than 3 feet (914 mm) below the ridge or highest point of the space shall be permitted.

Without a continuous flow of air, water vapor cannot exit the attic. Trapped water vapor can lead to wood rot, mold, mildew, and wet insulation. Additionally, trapped warm air may melt any snow on the roof in cold climates. The melted snow can trickle down to the gutter and eave where it can refreeze, creating an ice dam. This can cause leaking or damage to shingles, gutters, insulation, or the roof.

Check with the manufacturer of your roofing system to determine how well your attic is ventilated. To learn more, visit [www.asphaltroofing.org.](http://www.asphaltroofing.org)

About Aaron R. Phillips

Aaron R. Phillips
ARMA Vice President
of Technical Services

My goal is to advocate and advance the technical interests of the asphalt roofing industry.

Aaron R. Phillips, ARMA Vice President of Technical Services, has worked in the asphalt roofing industry since 1988. Phillips serves as ARMA's primary technical voice, assuring that asphalt roofing is accurately, equitably, and appropriately represented in all scientific and technical discussions regarding residential and commercial roofing applications. He manages all of ARMA's technical-related activities and also serves as the association's technical liaison to organizations involved in the development of building standards. Phillips has been active in various industry organizations throughout his career, including more than 25 years of service as an ARMA volunteer.

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Beautiful, Affordable, and Reliable

About ARMA

The Asphalt Roofing Manufacturers Association (ARMA) is a trade association representing North America's asphalt roofing manufacturing companies and their raw material suppliers. The association includes the majority of North American manufacturers of asphalt shingles and asphalt low slope roof membrane systems. Committed to advances in the asphalt roofing industry, ARMA is proud of the role it plays in promoting asphalt roofing to those in the building industry and the public.

For more information about ARMA, visit **asphaltroofing.org**.

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