

Application of Asphalt Shingles to Decks Installed over Insulation or Radiant Barriers

The ARMA Steep Slope Committee has established the following recommendations regarding the application of asphalt shingles directly over insulation, insulated roof decks, and radiant barriers.

Shingle Application Directly Over Insulation

Applying shingles directly over insulation is not recommended for a number of reasons:

1. Continuous free-flow ventilation is impossible to achieve when applying shingles directly over insulation. Heat build-up, a typical result of inadequate ventilation, may accelerate weathering and reduce the anticipated life of the asphalt shingles.
2. Asphalt shingles may be damaged or punctured when nailed onto a non-rigid surface such as roofing insulation.
3. The nail-holding ability of the insulation is not adequate. Consequently, shingle damage and/or blow-off, may occur if shingles are applied directly to insulation.
4. The fire classification of asphalt roofing products may be adversely affected when applied directly over insulation. Individual asphalt shingle manufacturers should be consulted to determine the effects on such classifications.

Shingle Application Directly Over Insulated Roof Decks

Applying asphalt shingles to insulated roof decks is not recommended unless the following factors are considered:

1. Directly applying shingles over insulated roof decks is not recommended unless an adequate continuous ventilation space, free of obstructions, is provided between the top of the insulating material and the underside of a nailable deck. Proper ventilation must be provided to dissipate heat and humidity build-up under the rooftop (See ARMA Bulletin 209-RR-86 entitled "Ventilation and Moisture Control for Residential Roofing"). Factors influencing the minimum ventilation requirement include type of construction, roof pitch/run, temperature, humidity, etc. Consult the deck manufacturer, deck system designer, and asphalt shingle manufacturer for specific requirements.
2. Asphalt shingles should only be applied to deck surfaces such as plywood and oriented strand board or other surfaces as approved by the asphalt shingle manufacturer. Asphalt shingles should not be directly to insulation boards that don't have solid roof deck sheathing, whether factory-applied or field-installed, over their top surface; as mentioned above, asphalt shingles are likely to be damaged or punctured when nailed onto a non-rigid surface. Shingle damage during installation and/or insufficient nail holding power may result in wind blow-offs or other shingle failure and may affect coverage available under the asphalt shingle manufacturer's warranty.
3. Application of asphalt shingles directly over insulated deck systems without providing adequate ventilation may affect coverage available under the asphalt shingle manufacturer's warranty. Consult individual asphalt shingle manufacturers for details.

Shingle Application over Deck Systems Containing Radiant Barriers

Applying shingles over deck systems containing radiant barriers is at times acceptable, but several considerations should be noted:

1. Radiant barrier sheets that are fastened between or beneath the roof rafters should have proper ventilation provided between the radiant barrier and the decking so that heat and humidity build-up can be dissipated.
2. Radiant barriers installed directly beneath asphalt shingles are not likely to provide significant temperature reduction to the shingles. For proper performance, radiant barriers require an air space between the metallic surface and the next nearest surface, otherwise thermal conduction will override the reduction in radiant heat transfer.
3. Radiant barriers installed directly beneath and in contact with the roof deck sheathing may interfere with proper deck ventilation. Perforated versions of radiant barriers may provide a solution. Coverage available under the asphalt shingle manufacturer's warranty may be affected so consult individual asphalt shingle manufacturers for details.

Ventilation Considerations

Most vent system manufacturers recommend a soffit/ridge (inlet/outlet) venting ratio of between 50 and 60 percent. A minimum air space of 3/4-inch (19 mm) is suggested as a ventilation space; a 1-1/2 inches (38 mm) or wider space is preferred. Factors influencing this measurement include type of construction, roof pitch/run, temperature, humidity, etc. Because of their longer run, larger roof expanses, such as those on commercial buildings, may require a much larger air space to move heat and moisture from the system. Adequate intake air flow must also be provided for proper ventilation dynamics. Consult the deck manufacturer, deck system designer, and asphalt shingle manufacturer for specific requirements.

Some methods for creating a continuous air space for proper ventilation are shown in Figures A, B and C.

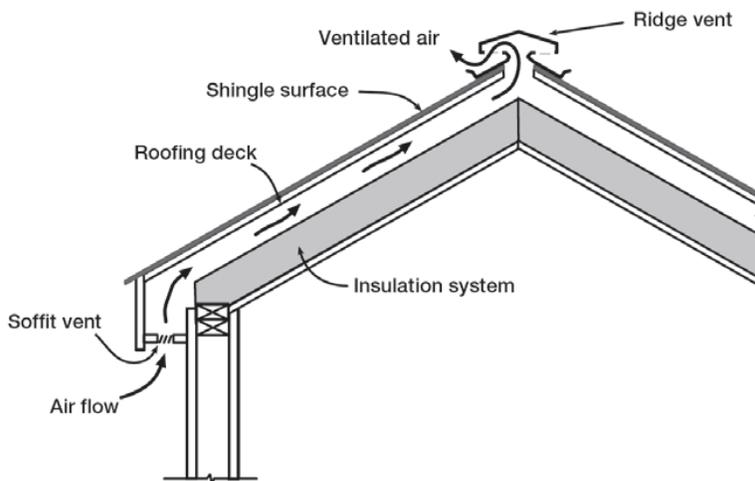


Figure A: Continuous air flow through an insulated roof system using soffit and ridge vents

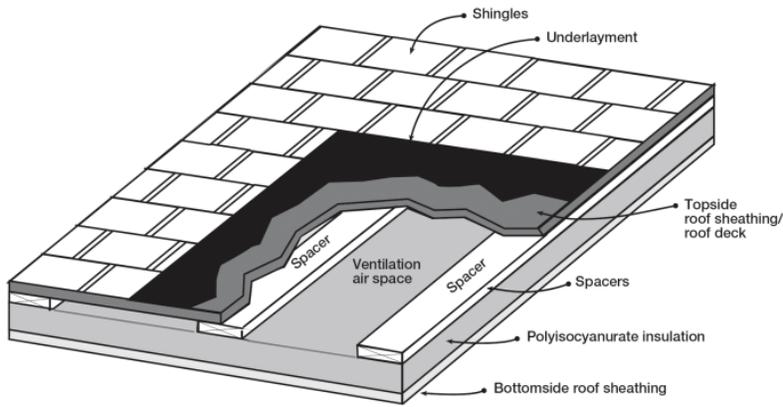


Figure B: Vented roofing assembly created by installing spacers between the rigid insulation and the nailable roof deck sheathing

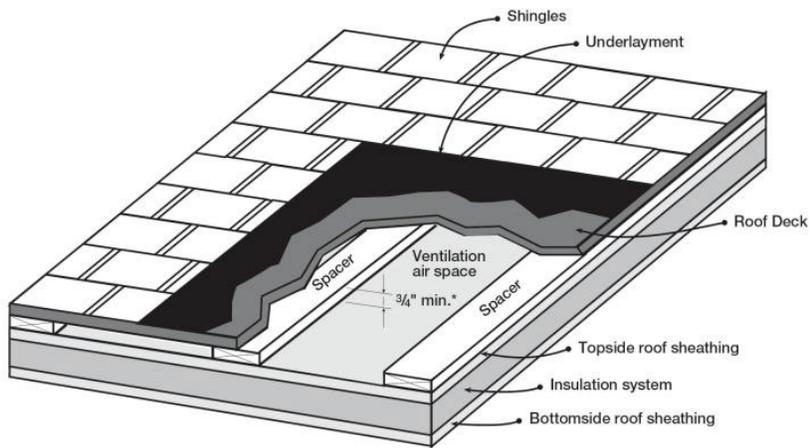


Figure C: Vented roofing assembly created by installing spacers between rigid “nailboard” roof insulation and a topside nailable deck sheathing

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