
SUBJECT: VENTILATION OF METAL ROOFING WITH ENKAMAT

The ventilation of metal roofing when installed over Premier SIPS provides many building science benefits. The primary benefit of venting above a Premier SIPS roof deck is the removal of unintended moisture vapor that may emanate (known as “vapor drive”) from the interior of the building from the misapplication of Premier SIPS sealant and tape at spline joints and SIP to SIP intersections. The venting of moisture vapor between the metal roof covering and the top of the SIP roof deck reduces the risk of condensation and the potential of moisture damage of the SIPs upper skin. It should also be noted that vapor permeable underlayments should also be used in metal roof assemblies when applied over SIP roof decks (See Premier Technical Bulletins R3 & R6). In addition to the venting of interior moisture, any rainwater or melting snow that circumvents the metal roofing materials is also removed by virtue of the ventilation space.

Additional benefits of a ventilation cavity are: The reduction in the temperature of the SIPs upper skin from high heat generated by direct sunlight exposure in hot climate zones and the potential of concentrated heat from reflective surfaces, such as windows and reflective ponds. Metal roofing systems, particularly dark in color and zinc and copper, can expose Premier SIPS roof decks to high temperatures and potential damage to its rigid insulation core. Underlayments can also be damaged by excessive heat exposure. The vented cavity keeps temperatures at the Premier SIPS roof surface within safe operating temperatures for both the SIP and underlayment. Impact noise of rain and hail are mitigated as well.

Premier SIPS has investigated a unique product that is compatible with Premier SIPS for achieving a cost effective above the roof deck ventilation cavity - Enkamat 7020. Enkamat 7020 is commonly used in roofing applications to provide the ventilation, drainage, and thermal separation needed for the long service life of roof structures.

Enkamat 7020 is a three-dimensional mat made of continuous nylon filaments fused at their intersections. The 95% open structure of the entangled filaments facilitates drying of condensed water vapor from the building interior, while giving full support to the metal roof. The nylon filaments do not fail under the



Enkamat 7020

load of the roof and the rigors of the construction environment, including construction foot traffic. The space created between the Premier SIPS roof deck and the roof covering will allow moisture to flow away or evaporate.

Testing has been conducted on the temperature difference that a Premier SIP surface experiences when ventilated with Enkamat 7020 when compared to no ventilation. A standing seam metal roof was applied over a Premier SIPS small scale roof structure for testing evaluation. Dark colored standing seam metal roof panels were fixed to the SIPs roof over the Enkamat 7020/roofing underlayment. An assembly of metal roof panels over roofing underlayment alone was also tested for comparison. The top surface of both metal roofing assemblies was brought to a temperature of 194° F (90° C) using infrared heat lamps. This temperature was held for 6 hours to ensure that temperatures moving through the assembly would stabilize.

The temperature recorded on the top surface of the Premier SIPS was reduced by 18% with the use of the Enkamat 7020. These results clearly demonstrate the effect of an air space lowering the temperature of a Premier SIPS roof deck, when metal roofing experiences solar exposure, resulting in high surface temperatures.

SIP Ventilation	Temperature Reduction from Metal Roof to Top Surface of Premier SIP
None	10°F
Enkamat 7020	43°F

Premier SIPS recommends Enkamat 7020 as a product that provides the important benefit of easy, cost-effective installation over Premier SIPS, thereby achieving the additional building science benefits of ventilation: Cooling top of roof deck air temperature, allowing above roof deck evaporation of moisture and mitigating the sounds of rain and/or hail striking the metal roof.

Similar performing ventilating mats may be available in the marketplace including the following options: 1. Dorken Delta-Trela: <https://www.dorken.com/en/our-products/products/residential/delta-trela.php> 2. Benjamin Obdyke's Cedar Breather Roof Ventilation Mat <https://benjaminobdyke.com/product/cedar-breather-ventilated-underlayment/> 3. Keene Viper CDR Vent: <https://www.keenebuilding.com/products/viper-cdr-vent/>. It is the responsibility of the designer and installer to determine if the manufacturer of these ventilating mats recommends the use of their products and provide installation instructions and details for application when applied over SIP roof deck assemblies.