

Preventing Condensation

The terms "vapor barrier", "vapor retarder", "air barrier", and "drainage plain" seem to be used interchangeably- this causes problems. This technical bulletin is going to discuss vapor retarders which are categorized into 3 classes. Class I is vapor impermeable, Class II is vapor semi-impermeable, and Class III is vapor semi-permeable. A Class I vapor retarder is considered a "vapor barrier", but using "classes of vapor retarders" offers a more specific definition, we will be using this terminology.

Vapor retarders and SIPs: SIPs are a Class II vapor retarder, so, other than at SIP junctures, an additional vapor retarder is basically never needed with SIP construction. In normal climates, the only time a Class I vapor retarder is needed is in rooms with higher than normal inside humidity. Rooms containing hot tubs and swimming pools will require this additional protection and dehumidification. Consult local building codes and professional HVAC engineers for specific vapor retarder requirements.

A Class I vapor retarder shall be installed at the interior of the ridge juncture of the panels. A pliable roof membrane, such as a self-adhesive rubber laminate material or another Class I vapor retarder can be used for this seal. There should be no wrinkles or voids that allow air or vapor to enter the ridge juncture. See detail R-17. A heat recovery ventilator or HRV (or in some climates an energy recovery ventilator) is recommended for any SIP building.

The builder must also take care to seal around all penetrations through any panel. The sealing of SIP buildings is important for two reasons

1. Thermal efficiency - it is one of the major advantages of SIP construction. By sealing all panel junctures to eliminate unwanted air infiltration, heating, cooling, and air exchange can be precisely controlled and energy demands reduced.
2. Air leakage - humid air can and will leak into any possible voids ("dead air" spaces) adjacent to panel OSB skins. The presence of humid air and dropping temperatures can result in condensation.

To achieve the maximum long-term value that SIP buildings can provide, the builder must use construction sealant and expanding foam sealant throughout the building process. Connections and junctures, as well as gaps around doors, windows, corners, and other penetrations must all be thoroughly sealed. Experience has indicated that thermal and vapor sealing at roof ridges and valleys is particularly important and warrants extra attention. It is recommended that roof ridges be filled with expanding foam sealant to fill the ridge juncture. See detail R-18. Also, when electrical work is complete, all electrical boxes and wire chases should be sealed. See detail G-4. For sealing wood-to-wood connections, use the provided construction sealant. For sealing wood-to-foam connections, use the provided expanding foam sealant as recommended.



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