



ATS® Technical Bulletin

Subject: Interior Vapor Retarders

This Technical Bulletin is being issued to address statements being made about “flash & batt” systems and to further update you on laboratory and field testing that has been conducted on the Guardian ATS® System that uses a ½-inch thick layer of two-component closed-cell polyurethane foam together with fiberglass insulation.

Interior Vapor Retarders

Guardian recently engaged R&D Services, Inc., a third party accredited laboratory, to calculate the moisture movement in walls and determine if and where interior (warm-in-winter side of the insulation) vapor retarders are needed. It was decided by R&D Services, Inc. that the WUFI 4.1 (including ASHRAE 160P requirements) program would provide the best methodology to determine the answers to these questions. WUFI is the most advanced and detailed computer modeling program of hygrothermal (moisture and heat) transfer through walls.

Tampa, Atlanta, St. Louis, Chicago, Madison and San Francisco were selected to represent a variety of climatic conditions in simulations to analyze for moisture problems in the ATS walls.

The results of the analysis were not surprising. An interior vapor retarder should be used in heating dominated climates while there is no need for an interior vapor retarder in cooling dominated climates. Specifically, using the attached Climate Zone map for reference, Guardian recommends using an interior vapor retarder (one perm or less) in Zones 5, 6, 7 and 8. An interior vapor retarder is not required in Zones 1, 2, 3, and 4. Local building codes should always be followed.

Condensation Issues

If a coated kraft or polyethylene interior vapor retarder is installed properly in the recommended Climate Zones mentioned above and all surrounding building materials are dry, there should not be condensation issues with the ATS System. Being a good insulation system, the ATS foam shifts the dew point temperature toward the interior of the wall cavity. However, if moisture is controlled to remain outside the insulated wall cavity the location of the dew point temperature becomes irrelevant.

ASTM E 96 Standard Test Method for Water Vapor Transmission

The ATS System does not create a double vapor retarder in a given wall cavity. The ½-inch thick layer of closed-cell polyurethane foam used for the ATS System is not a vapor retarder. It has a perm rating about five-times higher than the traditionally-accepted one perm or less for a vapor retarder material.

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ASTM E 283 Standard Test Method for Air Permeability

The ½-inch thick closed-cell polyurethane foam used for the ATS system has been tested in accordance with ASTM E 283 to determine air leakage rate and durability. The resulting air leakage rate was less than the generally-accepted rate for an air barrier as established by the Air Barrier Association of America.

ASTM C 283 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Wall, and Door Under Specified Pressure Differences Across the Specimen

Wall cavities containing ATS were placed in an environmental chamber and run through several freeze/thaw cycles by another third-party accredited laboratory facility to determine if there was any degradation of the material; specifically searching for cracks or any delamination from the framing or exterior sheathing. The wall cavity was sealed with ½-inch thick two-component closed-cell polyurethane foam insulation for the ATS System and tested for air permeability before and after the thermal cycling. The ATS System established a near zero leakage rate before thermal cycling, and the half-inch foam layer retained its structural integrity and retained the near zero leakage rate after the thermal cycling was completed.

ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials

The ATS ½-inch thick two-component closed-cell polyurethane foam meets the requirements for a Class 1 material (FS: 25; SD: 200) when tested in accordance with ASTM E 84 by a third-party accredited fire laboratory.

Conclusion / Summary

The Guardian ATS System, when properly installed, provides a superior energy-efficient, high thermal performance insulation system. Any concerns regarding condensation problems are eliminated by using an interior vapor retarder in the northern Climate Zones where they are typically part of the building codes.