Thermal Foam EPS Insulation in Roofing Applications

Thermal Foam EPS roof insulation products offer the design versatility to meet a wide range of job conditions and is approved for use under virtually all roofing membranes. Equally suited to new construction and re-roofing applications, Thermal Foam EPS insulation products provide the greatest R-value at the lowest cost in asphaltic built-up and single-ply membrane roofs.

Flat, Tapered, Composite and Flute Fill

Thermal Foam flat EPS board is available in thicknesses to meet today’s stringent energy requirements. Providing maximum dimensional stability and high thermal efficiency at a low cost, Thermal Foam EPS insulation is ideal for single-ply membrane systems and economically adds R-value in built-up systems. It may be factory or job-site laminated to structural board, providing greater strength and durability. Thermal Foam Tapered EPS insulation is custom designed for each roof layout providing the slope required for positive drainage. Use Thermal Foam tapered EPS to reduce framing costs and to eliminate ponding often associated with premature roof failure. Thermal Foam Expanded Polystyrene insulation is widely used as flute fills to provide additional dimensional stability to roofing assemblies.

Field Study Highlights

Of the 32 existing EPS roofs surveyed - age range from 2 to 15 years - “no wet insulation was found in the EPS or wood fiberboard overlamment”.

“EPS insulation can and will perform as a satisfactory element, both mechanically and thermally.”

“The moisture content of EPS insulation samples - ranging in age from 6 to 15 years - was found to be very low, i.e., a maximum of 0.04% by volume.”

“Test results for R-value of EPS insulation samples taken from roof systems of various ages indicated no deterioration in R-value over time.”

Laboratory Study Highlights

- Consistent Performance - “All EPS densities tested in this study can be successfully adhered with asphalt (Type II used in test program) in this temperature range (200F-250F).”
- Water Resistance - “When the interior relative humidity is 80% or less at 70F, with cold exterior conditions, no moisture will occur in the EPS insulation.”
- Permanent R-Value - “Results of this testing indicate that EPS insulation will provide long term thermal performance. EPS thermal resistance values (R-values) may be used without adjustment for aging.”
- Dimensional Stability - “Moisture appears to have little or no effect on the dimensional stability of EPS insulation.”
TECHNICAL DATA

Long Term Insulation Value
R-Value means the resistance to heat flow. The higher the R-value, the greater the resistance to heat flow. Thermal Foam EPS insulation (0.90 pcf) provides a typical R-value of 3.60 per inch at a mean temperature of 75 degrees F and typical R-value of 4.00 per inch at a mean temperature of 40 degrees F. When properly installed and protected from moisture, the R-value of Thermal Foam EPS insulation remains constant. This is because the closed cell structure of Thermal Foam EPS contains only air. The R-value of EPS will not decrease with age. As a result, the thermal resistance or R-value of Thermal Foam EPS may be used without any adjustment for age.

Moisture Resistance
Water vapor transmission through insulation materials is the passage of water through the material in vapor phase. In comparison to other common building material, EPS insulation has moderate water vapor permeability per unit of thickness.

Each roof application should be studied to determine the need for a vapor retarder to control internal condensation. Based on NRCA/MRCA-sponsored studies, vapor retarder placement for EPS insulated roof systems is less critical than for other types of roof insulations.

Temperature Cycling
EPS is able to withstand the rigors of temperature cycling, assuring long-term performance. In a series of tests conducted by the Dynatech Research and Development Co., Cambridge, MA, core specimens removed from existing freezer walls, some as old as 16 years, demonstrate EPS withstands freeze-thaw cycling without loss of structural integrity or other physical properties.

Strength Characteristics
The resilience of Thermal Foam EPS insulation board provides reasonable absorption of building movement without transferring stress to the outer skins at the joints. In most roofing applications, Type I Thermal Foam EPS insulation material provides the dimensional stability and compressive strength necessary to withstand normal roof traffic and equipment weight. If greater rigidity and strength are needed, as a result of design loads, higher density Thermal Foam EPS insulation products are available. For recommendations, contact Thermal Foams, Inc.

Combustibility
Like many construction materials, EPS is combustible. EPS products are manufactured with a flame retardant, however, EPS insulation will burn upon exposure to flame or heat sources, including, but not limited to, open flames, welder’s torches, or other sources of heat. EPS insulation should be covered with a thermal barrier or otherwise installed in accordance with applicable building code requirements. It is the responsibility of the purchaser to ensure that EPS insulation is properly handled and stored on the jobsite.

Solvent Attack
EPS is subject to attack by some petroleum-based solvents. Care should be taken to prevent contact between EPS and these solvents and their vapors.

Application Temperatures
In roof construction requiring hot asphalt, temperatures should not exceed 250 degrees F at the time of direct contact with EPS insulation. Avoid contact between Thermal Foam EPS and high-temperature equipment, such as asphalt kettles and flame sealers.

Installation Exposure
Prolonged exposure to sunlight will cause slight discoloration and surface dusting of Thermal Foam EPS insulation. The insulating properties will not be significantly affected under normal usage. Thermal Foam EPS stored outside should be protected with a light-colored opaque material.

Quality Control and Third Party Agency Evaluations
Thermal Foam EPS is UL Classified in file No. R9699. Underwriters Laboratories (UL) also acts as our independent, third party certification agency for physical properties of our EPS insulation manufactured to meet ASTM C578-01. UL listed EPS roof insulation is noted in Roof Constructions 219, 237, and 374. Thermal Foam EPS roof insulation is FM approved. Consult Thermal Foams, Inc. or the FM approval guide.

Standards Compliance
Thermal Foam EPS insulation is manufactured to meet or exceed the requirements of ASTM C578-01 and applicable building codes.

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<th>TYPE II</th>
<th>TYPE IX</th>
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References


