

XPS TECH TALK ♦ ♦ ♦

Volume II: October 2006

Preventing Heat Damage to Extruded Polystyrene Foam Insulation (XPS) Due to Solar Heat Exposure in Roof Insulation Applications



IMPORTANT: Extruded polystyrene insulation (XPS) has a long-term, stable R-value of 5 per inch, is the most moisture resistant rigid board in the insulation market, and is very dimensionally stable and durable for construction applications.¹ As with any construction material, it must be installed in accordance with manufacturer's recommendations and good construction practice. XPS is a thermoplastic material, meaning if heated above its maximum service temperature of 165°F, it may experience dimensional change. If exposed to temperatures significantly above its maximum service temperature, it may be damaged. When placed under black/dark (non-white) roofing materials, heat build-up from sun exposure may result in XPS damage. Precautions taken during the construction process will minimize the potential for damage.

For roofing in general, it is preferable to apply only as much XPS insulation as can be covered by the finished roofing surface (overlayment, if any, roofing membrane and/or ballast) in the same day of installation to prevent XPS discoloration, wind displacement and possible damage from heat build-up by excessive sun exposure. For incomplete roofs, if temporary protective coverings must be used, such as polyethylene or other sheets, they should be white.

For ballasted roofing systems with no cover board over the XPS, black/dark (non-white) roofing membranes or filtration fabrics in PRMA, over XPS insulation, must be ballasted immediately after placement. This prevents potential heat damage to the XPS from temperature build-up on and under the black surface due to sun exposure and possible wind displacement of the XPS under the membrane/fabric.

For mechanically attached and fully adhered roofing systems using approved cover boards over the XPS, in areas where black/dark membranes are used and where "reflected solar energy" is expected to be present, XPS needs protection in addition to normally specified cover boards. Roof areas adjacent to higher walls or other structures with reflective cladding (for example, metal or glass); or near or in between large groupings of mechanical equipment; or near higher reflective parapets should be considered for potential "reflected solar energy" and additional heat protection. Such roof areas must be covered with pavers or ballast, or black/dark (non-white) membranes must be coated with white reflective topping, to avoid damage due to the intensified heat exposure from reflected sun in such areas.

For more details, please refer to current literature from XPSA member manufacturers or contact XPSA staff to be directed to the most appropriate person to assist you with this.

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¹ Physical performance properties as defined in ASTM C 578-06, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation

