



Architectural Metal Roof Covering Systems THERMAPINK® Extruded Polystyrene (XPS) Insulation

Technical Bulletin

Owens Corning™ THERMAPINK® Extruded Polystyrene (XPS) Insulation (unfaced) is well suited for use in architectural metal roof covering systems. It offers outstanding properties such as high water resistance, light weight and durability, all of which make construction scheduling easier. THERMAPINK® XPS Insulation has long lasting insulation R-value that saves money for the building owner. It provides design flexibility with a variety of thicknesses, dimensional stability, high compressive strength and third party listings for fire performance.

THERMAPINK® XPS Insulation is manufactured to comply with ASTM C578, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.

1) LEED® Certification and Reusability

THERMAPINK® XPS Insulation durability and moisture resistance enables it to be reused in many commercial roofing and re-roofing applications. The ability to be reused saves money when the time comes to reroof, with THERMAPINK® XPS Insulation in the roof.

THERMAPINK® XPS Insulation is made with certified recycled content – certified by Scientific Certification Systems (SCS) to contain a minimum 20% recycled content and contributes to attaining points for LEED® certification. The current recycled content certificate is available at www.owenscorning.com

Reusability also makes THERMAPINK® XPS Insulation a good choice for sustainable building design.

THERMAPINK® XPS Insulation is also GREENGUARD Certified and GREENGUARD Gold Certified, is produced with a zero ozone depletion blowing agent formulation, and carries a lifetime limited warranty¹ on all physical properties. A copy of the Lifetime Limited Warranty is available at www.owenscorning.com.

2) Service Temperatures

The maximum service temperature for THERMAPINK® XPS Insulation is 165°F. To maintain acceptable temperatures in service, it is recommended that the metal panel mounting system maintain a minimum 3/8" air gap between the underside of the metal panel and the THERMAPINK® XPS Insulation surface or any underlayment membrane. The exterior surface temperature of the metal panel should not exceed 200°F. The gap is not required when a protective cover board is used.

Black underlayment, self-adhering membrane, may be placed directly over THERMAPINK® XPS Insulation provided the membrane is chemically compatible with XPS. Black underlayment placed over THERMAPINK® XPS Insulation must be covered with metal panel roof covering as soon as possible to avoid potential damage to the XPS due to sun related heat absorption in the black membrane.

In horizontal applications, FOAMULAR® XPS Insulation may experience greater solar exposure than in vertical applications and it may be damaged by heat buildup. Simple precautions during construction can minimize the potential for heat related damage. Install only as much FOAMULAR® XPS Insulation as can be covered in the same day. For all horizontal applications always turn the print side down so the black print does not show to the sun which may, at times, act as a solar collector and raise the temperature of the foam surface under the print. Additional protection over FOAMULAR® XPS Insulation, such as added cover boards, reflective membrane surfaces or pavers may be required in areas adjacent to reflective walls, parapets, rooftop equipment areas or other vertical surfaces that may reflect and intensify the sun's energy. Do not cover FOAMULAR® XPS Insulation either stored (factory wrapped or unwrapped), or partially installed, with dark colored (non-white), or clear (non-opaque) coverings and leave it exposed to the sun. Examples of such coverings include but are not limited to filter fabrics, membranes, temporary tarps, clear polyethylene, etc. If improperly covered, and exposed to the right combination of sun, time and temperature, deformation damage may occur rapidly. When covering is necessary, use only white opaque material, or, cover with the final approved finish material as soon as possible. A white opaque cover reflects

¹ See actual warranty for complete details, limitations and requirements.



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energy from the sun rather than absorbing it or passing it which reduces the potential for excessive heat exposure. Clear (non-opaque) coverings allow light energy from the sun to pass through rather than reflect it which may produce a partial greenhouse effect, trapping hot air and raising the temperature below the cover. See Owens Corning publication number 10015704, "Heat Build Up Due to Solar Exposure" for more information.

UV Exposure

FOAMULAR® XPS Insulation can be exposed to the exterior during normal construction cycles. During that time some fading of color may begin due to UV exposure, and, if exposed for extended periods of time, some degradation or "dusting" of the polystyrene surface may begin. It is best if the product is covered within 60 days to minimize degradation. Once covered, the deterioration stops, and damage is limited to the thin top surface layers of cells. Cells below are generally unharmed and still useful insulation.

3) Moisture and Vapor Resistance

Low Water Absorption

THERMAPINK® XPS Insulation, in total immersion, has a maximum water absorption rate of 0.3 volume percent. That is as much as 10 times less than alternate insulation products such as EPS or polyisocyanurate. Roof insulation is likely to be exposed to water during construction, or from leaks during the life of the building,

or from water vapor migration from the building interior to the exterior. Testing by the U.S. Army Corps of Engineers, Cold Regions Research Laboratory has shown that moisture susceptible insulations retain only 40 percent of their insulating value after only 300 days of laboratory wetting.

THERMAPINK® XPS Insulation under the same conditions retains greater than 90 percent of its insulating value after 300 days, and greater than 80 percent after 700 days.

Vapor Retarders

The need for and placement of vapor retarders is an important design consideration in roofing assemblies. Depending on design conditions, THERMAPINK® XPS Insulation may be considered to be a vapor retarder. Depending on conditions, an additional retarding layer may need to be added. THERMAPINK® XPS Insulation permeance ranges from 1.1 perm for a 1" thickness to 0.6 perm for a 3" thickness.

Building Interior Moisture Protection

Due to THERMAPINK® XPS Insulation's low water absorption, designers may consider omitting the layer of saturated felt underlayment sometimes placed under architectural metal roofing, over the insulation, to serve as a protection layer against condensation that may form under the metal and drip to the insulation layer below. When the underlayment is omitted, the XPS joints should be sealed with a tape recommended by its manufacturer for that application.

Taping XPS joints, or the use of an underlayment over the insulation, may provide temporary and partial water shed protection to the interior of the building if the installation of the metal roof covering is delayed.

4) Metal Roof Panel Underlayment

THERMAPINK® XPS Insulation may be covered with a full coverage underlayment material recommended by its manufacturer for use under architectural metal roofing systems. Prior to installation of the underlayment material, insure that the surface is clean, dry and, if recommended by the underlayment manufacturer, properly primed with a water based primer. Solvent based primers cannot be used as they will damage THERMAPINK® XPS Insulation.

Underlayment Notes

Owens Corning does not recommend a particular underlayment. Underlayment manufacturers designate certain specialized products for applications where higher in-service temperatures are expected. Before use, verify that the underlayment material is recommended by its manufacturer for use in the system. See Section 2 regarding immediate coverage of black underlayment over THERMAPINK® XPS Insulation with metal panels.

5) Warranties

Single source complete system warranties are available from



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some metal roof system manufacturers. Owens Corning provides a Lifetime Limited Performance Warranty¹ for THERMAPINK® XPS Insulation physical properties including retention of 90 percent of its advertised R-value for the life of the building.

Full system specification and construction details are the responsibility of the metal roof manufacturer.

6) Building Code Specifications

Underdeck Flame Spread (UL 1256)

THERMAPINK® XPS Insulation is permitted to be installed directly over structural steel roof decks, under metal roof panels, without a gypsum board thermal barrier, as detailed in Underwriters Laboratories (UL) Roof Deck Construction #457. Verify acceptance with local building code officials.

Fire Resistance Ratings (in hours) (ASTM E119)

Time rated fire resistance assemblies require a layer of 5/8", Type X, gypsum board to be installed over the structural steel deck in accordance with details a UL or other third party listed assembly. All types of foam plastic insulation require a gypsum board layer over the steel deck, or some form of additional protection, when installed as a part of an hourly fire resistance rated roof system. Additional protection may consist of gypsum board installed on top of the deck, or sprayed cementitious coatings on the bottom side of the deck.

Exact details, types and amounts, for additional protection are determined by the specifications provided in the third party assembly listing.

Class A Rating (top side flame spread and penetration) (ASTM E108)

Insulated architectural metal roof covering systems can be Class A fire rated over both non-combustible and combustible decks. Consult the Underwriters Laboratories (UL) On-Line Certifications Directory for additional information.

Uplift Resistance Classified, Class 90 (UL 580)

THERMAPINK® XPS Insulation is accepted for use in UL Class 90 wind uplift classified assemblies. See UL Roof Deck Constructions such as 303, 238, 238a or 238b for typical specifications. Many other listings exist for uplift classification of architectural metal roofing. See the metal roof covering manufacturer's specific listings for complete details.

THERMAPINK® XPS Insulation is combustible, but contains a flame retardant additive to inhibit accidental ignition from small fire sources. During shipping, storage, installation and use, this material should not be exposed to flame or other ignition sources.

All products described here may not be available in all geographic markets. Consult your local sales office representative for more information.

For more information on the Owens Corning family of building products, contact your

Owens Corning dealer, call 1-800-GET-PINK®, or access www.owenscorning.com.



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