

DuPont™ Styrofoam™ Brand Plazamate™ XR Extruded Foam Insulation in Protected Membrane Roof (PMR) Assemblies

Installation Guide

SYSTEM OVERVIEW

Description

DuPont™ Styrofoam™ Brand Plazamate™ XR Extruded Foam Insulation is next generation in evolution of high-performance closed cell insulation that allows extra design flexibility for architects and engineers by optimizing roof thickness, eliminating expensive commercial roof building alterations required for meeting latest building and energy codes, and assists in reducing overall project costs. It is 100% recyclable, reusable, moisture-resistant, durable, easy to work with Styrofoam™ extruded foam insulation, with more R/in.

Available in compressive strength of 60 psi (415 kPa), Styrofoam™ Brand Plazamate™ XR Foam Insulation features exceptional moisture resistance and R-value** retention. Styrofoam™ Brand Plazamate™ XR resists compressive creep and fatigue, delivering long-term compressive strength and high R-value.

Ease of Use

Styrofoam™ Brand Plazamate™ XR:

- Provides superior resistance to water absorption, water vapor transmission, and freeze-thaw cycling
- Ideal for low-temperature, geotechnical, high-load commercial and other in-ground or water-contact applications such as Protected Membrane Roofs, Green and Blue Roofs, Cold Storage Roofs, Amenity Decks, and many others
- Delivers long-term compressive strength in high-load applications
- Features exceptional R-value and R-value retention, in typical construction and in demanding cold, wet, humid, changing environments
- Resists compressive creep and fatigue

Sustainable Solutions

- Styrofoam™ Brand Plazamate XR Foam Insulation uses BluEdge™ technology. It is free of hydrochlorofluorocarbons (HCFC) and volatile organic components (VOC), carries zero ozone depletion potential, is compliant with low Global Warming Potential (GWP) regulations where sold, and is reusable in many applications.

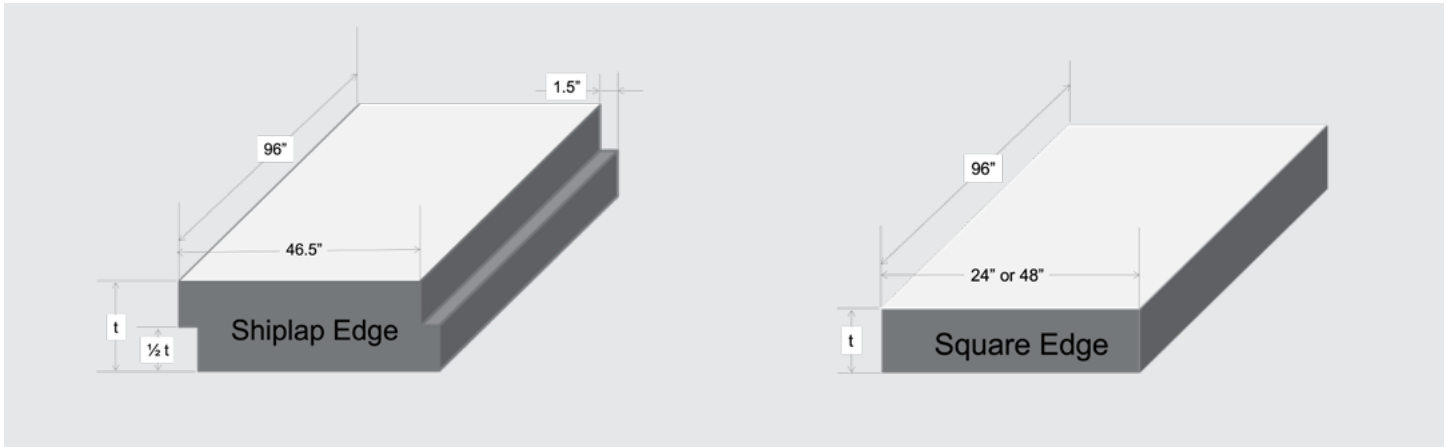
The product is available in several convenient board sizes and two edge treatment options:

Nominal Board Thickness, inches	R-value	Board Size, ft	Edge Treatments
2.3	15	4x8	Square Edge ¹
2.3	15	2x8	Square Edge ^{1,3}
3.0	20	4x8	Square Edge ¹
3.0	20	2x8	Square Edge ^{1,3}
3.0	20	4x8	Shiplap Edge ^{2,3}

¹ - Effective surface area of 2x8 and 4x8 square edge boards are 16 ft² and 32 ft², respectively

² - Effective surface area of 4x8 shiplap edge boards is 31 ft²

³ - Available by special order



Protected Membrane Roof Assembly

Unlike a conventional roof assembly with the waterproofing membrane as the uppermost component, the insulation in a PMR assembly is placed on top of the membrane, protecting the roofing membrane from the full extent of seasonal temperature changes and physical abuse. (Figure 2). The insulation must be able to maintain performance over the life of that roof, despite wet environments, seasonal temperature changes, and foot traffic during and after construction.

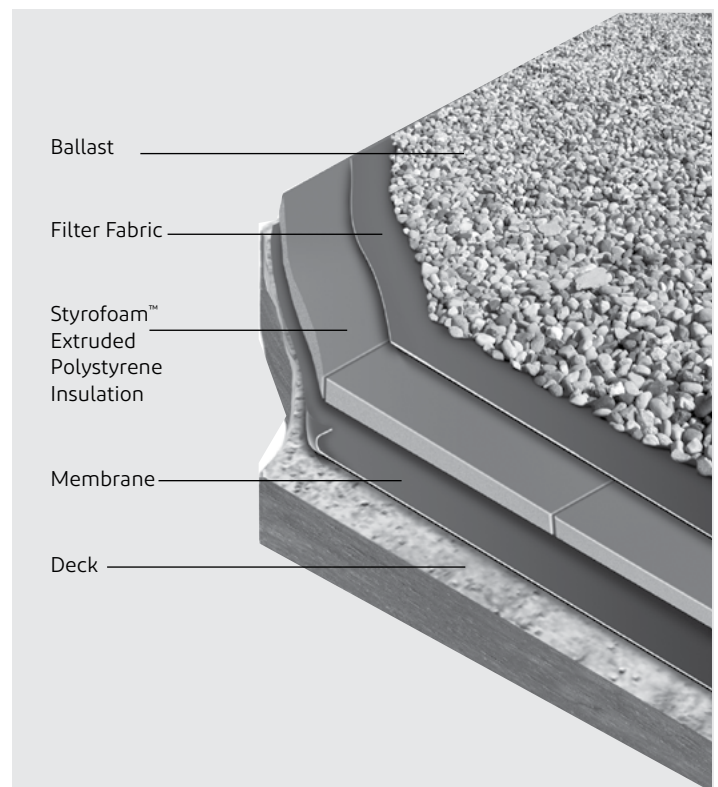


Figure 2

Styrofoam™ Brand Plazamate™ XR Installation

- The PMR assembly using Styrofoam™ Brand Plazamate™ XR is compatible with a range of membrane types. This PMR eliminates the need for a separate vapor retarder, maintains the membrane at a relatively constant temperature throughout the year, and provides durability and protection to the membrane. Styrofoam™ Brand Plazamate™ XR extruded polystyrene insulation delivers exceptional performance in roofing and plaza deck applications.
- The insulation shall be placed directly over the waterproofing membrane unless a drainage composite is specified between the insulation and waterproofing layer. Membrane manufacturers should be consulted whether a slip sheet between the insulation and the specific membrane is required. No adhesive shall be used to bond the insulation to the membrane in PMR assemblies.
- The higher R/inch of Styrofoam™ Brand Plazamate™ XR can allow designers to specify lower parapet assemblies resulting in reduced project costs. The potential use of a single layer of insulation to meet the Code required thermal resistance, may further reduce installation costs. Where a single layer of insulation would satisfy the required R-value, Styrofoam™ Brand Plazamate™ XR insulation boards with shi lap edge treatment are to be utilized, for reducing thermal bridging of potential gaps between the boards. The boards shall be installed with tight joints < 1/8".

- Where multiple insulation layers are required, these shall be either shi lap or square edge. The board layers' ends and edges shall be staggered relative to the layer(s) underneath, ideally 2 feet but at least 8" (see Figure 3). In multilayer applications the bottom layer must be the thickest or, at minimum, equal to the top layer. The product shall be closely butted to parapet walls and the perimeter of large penetrations.

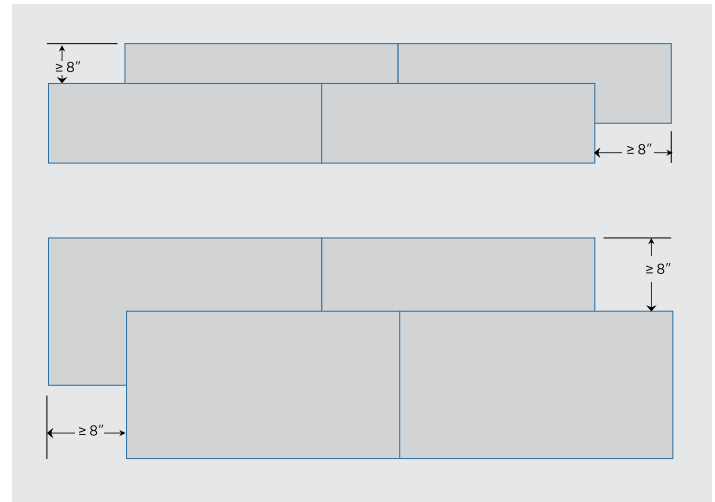


Figure 3

SPECIFICATIONS

Styrofoam™ Brand Plazamate™ XR complies with ASTM C578-19 (Type VII) requirements and meets or exceed the properties listed below:

Property and Test Method	Value
Thermal resistance ⁽¹⁾ per inch ASTM C518 ft ² -h-°F/Btu, min	
@ 75°F	6.7
@ 40°F	7.4
@ 25°F	7.7
Maximum Use Temperature, °F	165 °F
Compressive Strength, ⁽²⁾ ASTM D1621, psi, min	60
Water Absorption, ASTM C272, % by volume, max	0.01
Water Vapor Permeance, ⁽³⁾ ASTM E96, perm, max	0.2
Coefficient of Linear Thermal Expansion, ASTM D696, in/in-°F	3.5 x 10 ⁻⁵
Flexural Strength, ASTM C203, psi, min	75
Dimensional Stability, ASTM D2126, % linear change, max	0.9
Surface Burning Characteristics, ASTM E84,	Flame Spread ⁽⁴⁾ 20, Smoke Developed ⁽⁴⁾ 50

⁽¹⁾ Values are consistent with the criteria of ASTM C578. R means the resistance to heat flow. The higher the R-value, the greater the insulating power.

⁽²⁾ Vertical compressive strength is measured at 10 percent deformation or at yield, whichever occurs first. Since Styrofoam™ Brand Extruded Polystyrene Foam insulation is a visco-elastic material, adequate safety factors should be used to prevent long-term creep and fatigue deformation. For static loads, 3:1 is suggested. For dynamic loads, 5:1 is suggested.

⁽³⁾ Based on 1" thickness.

⁽⁴⁾ These numerical flame spread and smoke developed ratings are not intended to reflect hazards presented by this or any other material under actual fire conditions.

INSTALLATION NOTES

- Positive drainage should be provided at the NRCA recommended minimum slope of 1/4" per foot (2 percent). The roof surface should be sound and should drain water freely within 48 hours following a rain.
- Cutting the product can be done with utility knives or fine-toothed hand saws or powered saws for the thicker board products. Irregular cuts can be made with a fine-toothed hole-saw.
- As in all PMR applications, a vapor-permeable filter fabric shall be installed over the insulation when stone ballast is used.
- If using paver ballast and the total area to be covered by pavers is more than 10 percent in a location > 3,000 heating degree-days, they should be raised from the surface of the fabric/insulation using spacers to maintain at least a 3/16" ventilating air space ("diffusion open" design). The spacer can be:
 - 1" thick insulation cut into 6" square blocks and placed under the four corners of the paver
 - Preformed pavers with at least a 3/16" foot in each corner or ribbed undersurface
 - Paver pedestals under each corner
- Paver or stone ballast systems shall be selected and installed in accordance with Tech Solution 508.3 "DuPont Ballast Design Guide for Protected Membrane Roof (PMR) Assemblies" (Tech Solution 508 series)."
- Protect insulation from physical damage. Handle boards carefully to prevent damage during installation. Always wear protective eyewear and gloves when handling and cutting insulation.
- Always store insulation away from direct sunlight, particularly when storing for an extended time. Cover with a light-colored opaque tarp for protection from solar radiation.
- Always check the compatibility with other products that may come in direct contact with the insulation, particularly those containing solvents. Preventive care must be taken, such as allowing the solvents to evaporate or providing a slip sheet.

- Styrofoam™ Brand Plazamate™ XR extruded polystyrene insulation is combustible and may constitute a fire hazard if improperly used or installed. The insulation contains a flame retardant additive to inhibit ignition from small fire sources. During shipping, storage, installation, and use, this material should not be exposed to open flames or other ignition sources.

WARNING: For Professional Use Only – Read and follow the entire Handling section and the Safety Data Sheets (SDSs, formerly MSDSs or Material Safety Data Sheets) carefully before use. The information below is designed to protect the user and allow for safe use and handling of Styrofoam™ Brand products. Follow all applicable federal, state, local and employer regulations.

Precautionary Statements

Styrofoam™ Brand Plazamate™ XR Insulation is combustible; protect from high heat sources.

A protective barrier or thermal barrier may be required as specified in the appropriate building code. For more information, consult MSDS, call DuPont at 1-833-338-7668 or contact your local building inspector.

Because of the critical technical design aspects of many of its applications, DuPont recommends that qualified designers or consultants design the system. Contact a local DuPont representative for more specific instruction.

Shelf Life and Storage

When stored outdoors, keep insulation boards in original packaging and weighted down to prevent boards from being blown around by the wind.

Disposal

Dispose of any residual Styrofoam™ Brand product, in accordance with applicable federal, state, and local government regulations.



**For more information visit
building.dupont.com
or call 1-833-338-7668**

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