FOAMULAR® TAPERED ROOFING DESIGN GUIDE

EXTRUDED POLYSTYRENE (XPS) RIGID FOAM INSULATION

Owens Corning® Foamular® Extruded Polystyrene (XPS) Tapered Roofing Insulation Products provide performance and value in low slope roofing systems and are designed to be used over structural roof decks. THERMAPINK® tapered roof insulation provides a thermally efficient, moisture-resistant positive drainage slope for use under single-ply or other lightweight roofing systems.

Tapered roof insulation systems are designed to provide a minimum slope of ¼" per foot, as required by the International Building Code (IBC), toward roof drains or scupper drains leaving no flat areas for ponding. Other slopes are available and provide additional design flexibility. The use of Foamular Extruded Polystyrene (XPS) Tapered Roofing Insulation Products provides a sustainable roofing solution, helping to prevent ponding and damaging snow or ice accumulation in winter, while resisting the growth of fungus and vegetation in summer.

Features

SUPERIOR MOISTURE RESISTANCE

DURABLE

EASY TO CUT, FORM, & FIT

Standards, Codes Compliance

- Meets ASTM C578 Type IV (THERMAPINK® 25 Insulation), Type VI (FOAMULAR® 400 Insulation), Type VII (FOAMULAR® 600 Insulation)
- UL Classified. A copy of UL Classification Certificate U-197 is available at www.owenscorning.com
- See UL ER8811-01 at UL.com
- UL (Underwriters Laboratories) Roof Deck Constructions, tested in accordance with UL 1256, "Standard for Fire Test of Roof Deck Constructions" including Roof Deck Construction #457 (THERMAPINK® 25 Insulation)
- FM (Factory Mutual) Class 1 Roof Decks
- ASTM E108 Fire Classified Assemblies
- ASTM E119 Fire Resistance Rated Roof/Ceiling Assemblies
- UL and FM Wind Uplift Rated Assemblies
- Meets California Quality Standards and HUD UM #71a
- Compliance verification by RADCO (AA-650)

Note: FOAMULAR® 400 and 600 were not tested direct to deck and are not included in UL #457 for direct to deck applications. Refer to www.ul.com "Certifications" or FM Approval RoofNav for details on listings, constructions and assemblies.

Physical Properties

Please refer to Owens Corning® publications, FOAMULAR® THERMAPINK® Product Data Sheet (Pub No. 23546) and FOAMULAR® 400/600/1000 Product Data Sheet (Pub No. 58307) for full listing of Physical Properties.

Technical Information

All FOAMULAR® Tapered Roofing Products are closed-cell, moisture-resistant rigid foam boards and are made with Owens Corning's patented Hydrovac® process technology under strict quality control measures. This makes it highly resistant to moisture and permits the product to retain its high R-value year after year even after prolonged exposure to moisture and freeze/thaw cycling.

Energy-Saving[1], Moisture Resistant XPS Insulation

- THERMAPINK® 25 Tapered Insulation: ASTM C578 Type IV, 25 psi minimum
- FOAMULAR® 400 Tapered Insulation: ASTM C578 Type VI, 40 psi minimum
- FOAMULAR® 600 Tapered Insulation: ASTM C578 Type VII, 60 psi minimum
- FOAMULAR® 1000 (non-standard)

1 Savings vary. Find out why in the seller's fact sheet on R-values. Higher R-values mean greater insulating power.

Application Notes

- The roof designer must specify the number and location of roof drains as well as the minimum roof slope required for projects using Owens Corning™ THERMAPINK® tapered roof insulation. Please note that Chapter 15 of the IBC requires a minimum slope of ¼" per foot for many new construction roofing systems, while requiring only positive slope for reroof systems. Owens Corning™ THERMAPINK® tapered roof insulation is available in ⅛", ¼", and ½" per foot slopes as well as other non-standard slopes upon request.
- THERMAPINK® tapered roof insulation has been tested over steel roof decks without a thermal barrier in accordance with UL Standard 1256 and is listed for use direct to deck in accordance with UL Roof Deck Construction #457. If the tapered maximum thickness exceeds that permitted by #457, a thermal barrier may be required. Check local codes for additional requirements. This product is combustible. For additional information, consult MSDS or contact Owens Corning World Headquarters at 1-800-GET-PINK®.
- All construction should be evaluated for the necessity to provide vapor retarders. See current ASHRAE Handbook of Fundamentals.
- 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. It is recommended that all THERMAPINK® tapered roof insulation printed surfaces be turned down to minimize potential sun exposure and localized heat accumulation on the print.
- FOAMULAR® Extruded Polystyrene Insulation is a thermoplastic material with a maximum service temperature of 165°F. 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 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 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.

Availability

Foamular Extruded Polystyrene (XPS) Tapered Roofing Insulation Products are available in three types.

- Tapered THERMAPINK® 25 (ASTM C578 Type IV) is the most commonly used tapered product, but for applications that require higher compressive strengths.
- Tapered FOAMULAR® 400 (ASTM C578 Type VI)
- Tapered FOAMULAR® 600 (ASTM C578 Type VII)

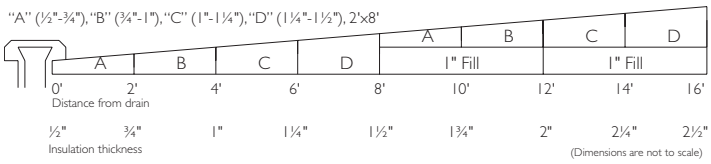
PANEL	THERMAPINK® 25 TAPER INSULATION	FOAMULAR® 400 TAPER INSULATION	FOAMULAR® 600 TAPER INSULATION
1/8" slope A	X	X	X
1/8" slope B	X		X
1/8" slope C	X		X
1/8" slope D	X		X
1/4" slope E	X	X	X
1/4" slope F	X	X	X
1/2" slope G	X	X	X

Note: Most tapered products are MTO. Consult Product & Packaging Guide for sizing availability of fill and base layer boards.

Typical Tapered Installation

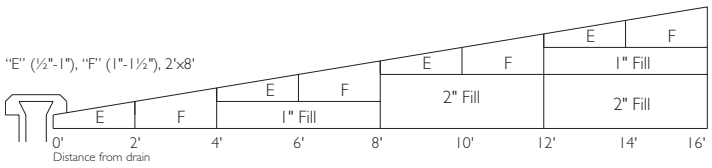
Typical Tapered Roofing Section 1/8" per foot slope

Utilizes four tapered panel sizes, A, B, C and D panel



Typical Tapered Roofing Section 1/4" per foot slope

Utilizes two tapered panel sizes, E and F panel



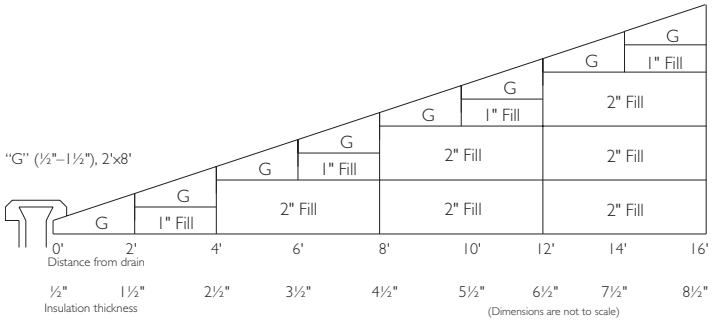
System Average R-Value

DISTANCE FROM DRAIN	0'-4'	0'-8'	0'-12'	0'-16'	0'-20'
Average R-Value[2]					
1/8" slope	3.75	5.00	6.25	7.50	8.75
1/4" slope	5.00	7.50	10.00	12.50	15.00
1/2" slope	7.50	12.50	17.50	22.50	27.50

2 Average R-value @ 75°F (24°C) mean temperature

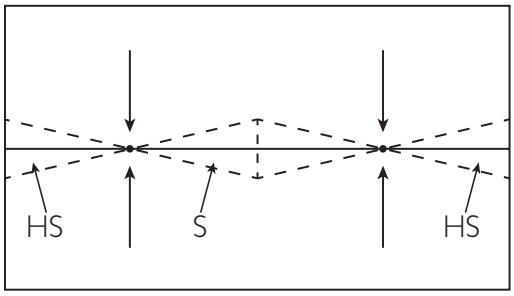
Typical Tapered Roofing Section 1/2" per foot slope

Utilizes one tapered panel size, G panel



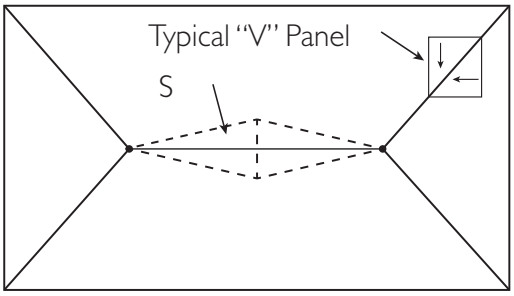
Typical Tapered Layouts

Cricket and saddle material are included in the design package for field fabrication.



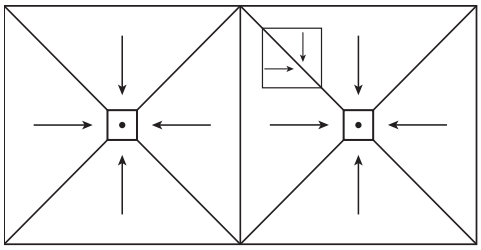
Two-Directional Taper System

Utilizes tapered panels installed in two directions, accompanied with saddles ("S") between the drains, and half saddles ("HS") between drains and outside walls. The saddles assist in directing the water flow to the drains.



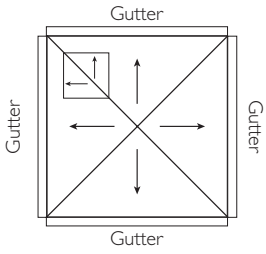
Modified Two-Directional Taper System

Utilizes tapered panels installed primarily in two directions with saddle ("S") placed between the drains; however, two of the four sides utilize mitered valleys. This system is desirable when a constant thickness of insulation is required at the outside perimeter of the roof.



Four-Directional Taper System

This system utilizes tapered panels installed in four different directions. Mitered valleys lead to drains.



Four-Directional Taper System—Perimeter Drainage

Utilizes a four-way taper system directing the water flow to the outside perimeter. This system may be selected when gutters are employed rather than roof drains. Desired drainage is obtained with the creation of hip miters.

Product and Packaging Data

Foamular® Extruded Polystyrene (XPS) Tapered Roofing Insulation Products

- **Material** – Extruded polystyrene closed-cell foam, ASTM C578 Type IV (25 psi minimum), VI (40 psi minimum), & VI (60 psi minimum)
- **Packaging** – Shipped in poly-wrapped units with individually wrapped or banded bundles.

THICKNESS (IN)	PRODUCT DIMENSIONS THICKNESS (IN) X WIDTH (IN) X LENGTH (IN)	PALLET (UNIT) DIMENSIONS (TYPICAL) WIDTH (FT) X LENGTH (FT) X HEIGHT (FT)	SQUARE FEET PER PALLET	BOARD FEET PER PALLET	BUNDLES PER PALLET	PIECES PER BUNDLE	PIECES PER PALLET
THERMAPINK® 25 and FOAMULAR® 600 Tapered Insulation (FOAMULAR® 400 Tapered Insulation only available in E, F and G panels.)							
1/8" slope A	0.5-0.75 x 24 x 96	4 x 8 x 8	4,608	2,880	24	12	288
1/8" slope B	0.75-1 x 24 x 96	4 x 8 x 8	3,456	3,024	18	12	216
1/8" slope C	1-1.25 x 24 x 96	4 x 8 x 8	2,688	3,024	14	12	168
1/8" slope D	1.25-1.5 x 24 x 96	4 x 8 x 8	2,304	3,168	12	12	144
1/4" slope E	0.5-1 x 24 x 96	4 x 8 x 8	3,840	2,880	10	12	240
1/4" slope F	1-1.5 x 24 x 96	4 x 8 x 8	2,304	2,880	12	12	144
1/2" slope G	0.5-1.5 x 24 x 96	4 x 8 x 8	2,688	2,688	14	12	168

Warranty

FOAMULAR® XPS Insulation is warranted to maintain 90% of its R-value and to retain all other properties defi ned in ASTM C578 for the lifetime of the building. See the actual warranty for complete details, limitations and requirements at www.owenscorning.com.

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.

Certifications and Sustainable Features

FOAMULAR® XPS Insulation is reusable

- FOAMULAR® XPS Insulation is made with a zero ozone depletion formula
- Certified by SCS Global Services to contain pre-consumer recycled content
- Certified to meet indoor air quality standards under the stringent GREENGUARD Certification Program and GREENGUARD Gold
- Approved under the Home Innovation Research Labs NGBS Green Certification Program
- Utilizing FOAMULAR® XPS Insulation can help achieve green building certifications including the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) certification

RECYCLED CONTENT MATTERS

Scan to learn more

Environmental and Sustainability

Owens Corning is a worldwide leader in building material systems, insulation and composite solutions, delivering a broad range of high-quality products and services.

Owens Corning is committed to driving sustainability by delivering solutions, transforming markets and enhancing lives. More information can be found at www.owenscorning.com.

Notes
For additional information, refer to the Safe Use Instruction Sheet (SUIS) found in the SDS Database via http://sds.owenscorning.com.

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