



# FOAMULAR® 404, 604, 404 RB & 604 RB Extruded Polystyrene (XPS) Rigid Foam Insulation

## Product Data Sheet



### Energy-Saving, Moisture-Resistant High Strength XPS Rigid Insulation

Insulation for PRMA Roofs

**404 and 404 RB: ASTM C578 Type VI, 40 psi minimum**

**604 and 604 RB: ASTM C578 Type VII, 60 psi minimum**

#### Description

FOAMULAR® 404 and FOAMULAR® 604 extruded polystyrene (XPS) insulations are specially designed for use in Protected Roof Membrane Assemblies (PRMA), where the insulation is placed directly over the membrane. The compressive strength of FOAMULAR® insulation provides the integrity needed for long-term roof performance. FOAMULAR® insulation is produced by Owens Corning's patented HYDROVAC® process technology under conditions of strict quality control.

Extruded polystyrene is the only type of insulation recommended for PRMA applications. Owens Corning

offers four specific types of FOAMULAR® insulation for this use: FOAMULAR® 404 & 604, both featuring drainage channels on all four bottom edges; and FOAMULAR® 404 RB & 604 RB. FOAMULAR® 404 RB and 604 RB have four bottom edge drainage channels, and drainage channels running the length of the panel on the top surface as well.

With a minimum of 40 psi compressive strength, FOAMULAR® 404 insulation meets the needs of many PRMA applications. For even greater strength, specify the 60 psi compressive strength of FOAMULAR® 604 insulation. Both products feature rain channels on all four bottom edges to promote drainage below the insulation.

FOAMULAR® 404 RB and FOAMULAR® 604 RB insulation products are used when the insulation is to be placed directly beneath concrete or other types of paver blocks, eliminating the need for pedestals resulting in significant labor and material savings. These high compressive strength, high durability products are used as the insulation layer placed under the ballast of the PRMA roof and offer excellent drainage characteristics because they're manufactured with channels that are cut in the surface of the foam the entire length of each panel. Coupled with the standard bottom-side rain channels, the top side channels help drain moisture away from the underside of the paver to protect it from freeze/thaw cycle damage.

#### Key Features

- FOAMULAR® 404 and 604 insulation products protect the roof membrane from physical damage, thermal stress and UV exposure in PRMA systems
- Designed for use directly with pavers, FOAMULAR® 404 RB and 604 RB insulation products provide the support necessary for pavers while maintaining the drainage necessary to prevent moisture accumulation at the foam-paver interface
- Excellent long-term stable insulating performance with an R-value<sup>1</sup> of R-5 per inch
- Exceptional moisture resistance, long-term durability
- Limited lifetime warranty<sup>2</sup>—maintains 90% of R-value and covers all ASTM C578 properties
- The only XPS foam to be GREENGUARD Children & Schools Certified<sup>SM</sup>
- The only XPS foam with certified recycled content—certified by Scientific Certification Systems (SCS) to contain a minimum 20% recycled content
- Will not corrode, rot or support mold growth
- Zero ozone depletion potential with 70% less global warming potential than our previous formula
- Reusable



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- Lightweight, durable rigid foam panels are easy to handle and install

- Easy to saw, cut or score

### Technical Information

When FOAMULAR® 404, 604, 404 RB and 604 RB are used under dark colored, non-white pavers other than concrete, such as rubber, additional solar heat protection should be considered.

For roofing and other horizontal applications, product should be installed with the printed surface facing downward.

This product is combustible. A protective barrier or thermal barrier is required as specified in the appropriate building code. 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® 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.

### Typical Physical Properties<sup>1</sup>

FOAMULAR® 404, 604, 404 RB and 604 RB Extruded Polystyrene Insulation

Property	Test Method <sup>2</sup>	Value			
		404	404 RB	604	604 RB
<b>Thermal Resistance<sup>3</sup>, R-Value (180 day)</b> minimum, hr•ft <sup>2</sup> •°F/Btu (RSI, °C•m <sup>2</sup> /W) @ 75°F (24°C) mean temperature	ASTM C 518				
1½" Thickness		7.5 (1.32)	—	7.5 (1.32)	7.0 (1.23)
2" Thickness		10 (1.76)	9.5 (1.67)	10 (1.76)	9.5 (1.67)
2½" Thickness		12.5 (2.20)	—	—	—
3" Thickness		15 (2.64)	14.5 (2.55)	15 (2.64)	14.5 (2.55)
4" Thickness		20 (3.52)	—	—	—
@ 40°F (4.4°C) mean temperature					
1½" Thickness		8.1 (1.43)	—	8.1 (1.43)	—
2" Thickness		10.8 (1.90)	—	10.8 (1.90)	—
2½" Thickness		16.2 (2.85)	—	—	—
3" Thickness		16.2 (2.85)	—	16.2 (2.85)	—
4" Thickness		21.6 (3.8)	—	—	—
<b>Long Term Thermal Resistance, LTTR-Value<sup>3</sup></b> minimum, hr•ft <sup>2</sup> •°F/Btu (RSI, °C•m <sup>2</sup> /W) @ 75°F (24°C) mean temperature	CAN/ULC S770-03				
1½" Thickness		7.8 (1.37)	—	7.8 (1.37)	—
2" Thickness		10.6 (1.87)	—	10.6 (1.87)	—
2½" Thickness		13.4 (2.36)	—	—	—
3" Thickness		16.2 (2.85)	—	16.2 (2.85)	—
4" Thickness		22 (3.87)	—	—	—
<b>Compressive Strength<sup>4</sup></b> , minimum psi (kPa)	ASTM D1621	40 (276)		60 (414)	
<b>Flexural Strength<sup>5</sup></b> , minimum psi (kPa)	ASTM C203	115 (793)		140 (965)	
<b>Water Absorption<sup>6</sup></b> , maximum % by volume	ASTM C272			0.05	
<b>Water Vapor Permeance<sup>7</sup></b> , maximum perm (ng/Pa•s•m <sup>2</sup> )	ASTM E96			1.1 (63)	
<b>Dimensional Stability</b> , maximum % linear change	ASTM D2126			2.0	
<b>Flame Spread<sup>8,9</sup></b>	ASTM E84			5	
<b>Smoke Developed<sup>8,9,10</sup></b>	ASTM E84			45-175	
<b>Oxygen Index<sup>8</sup></b> , minimum % by volume	ASTM D2863			24	
<b>Service Temperature</b> , maximum °F (°C)	—			165 (74)	
<b>Linear Coefficient of Thermal Expansion</b> , in/in/ °F (m/m/°C)	ASTM E228		3.5 × 10 <sup>-5</sup> (6.3 × 10 <sup>-5</sup> )		

1. Properties shown are representative values for core 1" thick material, unless otherwise specified.
2. Modified as required to meet ASTM C578.
3. R means the resistance to heat flow; the higher the value, the greater the insulation power. This insulation must be installed properly to get the marked R-value. Follow the manufacturer's instructions carefully. If a manufacturer's fact sheet is not provided with the material shipment, request this and review it carefully. R-values vary depending on many factors including the mean temperature at which the test is conducted, and the age of the sample at the time of testing. Because rigid foam plastic insulation products are not all aged in accordance with the same standards, it is useful to publish comparison R-value data. The R-value for FOAMULAR® XPS insulation is provided from testing at two mean temperatures, 40°F and 75°F, and from two aging (conditioning) techniques, 180 day real-time aged (as mandated by ASTM C578) and a method of accelerated aging sometimes called "Long Term Thermal Resistance" (LTTR) per CAN/ULC S770-03. The R-value at 180 day real-time age and 75°F mean temperature is commonly used to compare products and is the value printed on the product.
4. Values at yield or 10% deflection, whichever occurs first.
5. Value at yield or 5%, whichever occurs first.
6. Data ranges from 0.00 to value shown due to the level of precision of the test method.
7. Water vapor permeance decreases as thickness increases.
8. These laboratory tests are not intended to describe the hazards presented by this material under actual fire conditions.
9. Data from Underwriters Laboratories Inc.® classified. See Classification Certificate U-197.
10. ASTM E84 is thickness-dependent, therefore a range of values is given.

### Maximum Design Load Recommendation, PSF

FOAMULAR® Insulation Product	Dead Load	Live Load
404	1,910	1,150
404 RB	1,110	660
604	2,880	1,720
604 RB	1,660	1,000



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### Product and Packaging Data

FOAMULAR® 404, 604, 404 RB and 604 RB Extruded Polystyrene Insulation

Material		Packaging							
Extruded polystyrene closed-cell foam panel with continuous skin on face and back surface.		Shipped in poly-wrapped units with individually wrapped or banded bundles.							
Thickness (in)	Product Dimensions Thickness (in) x Width (in) x Length (in) <sup>1</sup>	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	Edges	
<b>F-404/404 Ribbed</b>									
1.5"	1.5 x 24 x 96	4 x 8 x 8	2,048	3,072	8	16	128	Rain channeled on all bottom edges.	
2"	2 x 24 x 96	4 x 8 x 8	1,536	3,072	8	12	96		
2½"	2.5 x 24 x 96	4 x 8 x 8	1,152	2,880	8	9	72		
3"	3 x 24 x 96	4 x 8 x 8	1,024	3,072	8	8	64		
4"	4 x 24 x 96	4 x 8 x 8	768	3,072	8	6	48		
Ribbed 2"	2 x 24 x 96	4 x 8 x 8	1,536	3,072	8	12	96	Rain channeled on all bottom edges and ribbed channels on the top surfaces	
Ribbed 3"	3 x 24 x 96	4 x 8 x 8	1,536	3,072	8	8	64		
<b>F-604/604 Ribbed</b>									
1½"	1.5 x 24 x 96	4 x 8 x 8	2,048	3,072	8	16	128	Rain channeled on all bottom edges.	
2"	2 x 24 x 96	4 x 8 x 8	1,536	3,072	8	12	96		
3"	3 x 24 x 96	4 x 8 x 8	1,024	3,072	8	8	64	Rain channeled on all bottom edges and ribbed channels on the top surfaces	
Ribbed 1½"	1.5 x 24 x 96	4 x 8 x 8	2,048	3,072	8	16	128		
Ribbed 2"	2 x 24 x 96	4 x 8 x 8	1,536	3,072	8	12	96		
Ribbed 3"	3 x 24 x 96	4 x 8 x 8	1,024	3,072	8	8	64		

1. Product availability and lead times vary by region and by product. Consult your local Owens Corning sales representative for availability and lead times.

### Standards and Codes Compliance

- Meets ASTM C578 Type VI (404 and 404 RB) and Type VII (604 and 604 RB)
- UL Classified. A copy of UL Classification Certificate U-197 is available at [www.foamular.com](http://www.foamular.com)
- See ICC-ES Evaluation Report No. 1061 at [www.icc-es.org](http://www.icc-es.org)
- FM (Factory Mutual) Class I Roof Decks
- ASTM E108 Fire Classified Assemblies
- Meets California Quality Standards and HUD UM #71a



### Certifications and Sustainable Features of FOAMULAR® XPS insulation

- Compliance verification by RADCO (AA-650)
- FOAMULAR® XPS insulation is reusable
- FOAMULAR® XPS insulation is made with a zero ozone depletion formula
- Certified by Scientific Certification Systems to contain a minimum of 20% pre-consumer recycled polystyrene
- Certified to meet indoor air quality standards under the stringent GREENGUARD Indoor Air Quality Certification Program®, and the GREENGUARD Children & Schools Certification Program<sup>SM</sup>

- Approved under the National Association of Home Builders (NAHB) Research Center Green Seal of Approval
- 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
- FOAMULAR® XPS insulation may qualify for The Buy American provision of the American Recovery and Reinvestment Act (ARRA)



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### 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.sustainability.owenscorning.com](http://www.sustainability.owenscorning.com).

### Warranty

FOAMULAR® XPS insulation limited lifetime warranty maintains 90% of its R-value for the lifetime of the building and covers all ASTM C578 properties. See actual warranty for complete details, limitations and requirements at [www.foamular.com](http://www.foamular.com) or [www.owenscorningcommercial.com](http://www.owenscorningcommercial.com).

### Notes

1. R means the resistance to heat flow; the higher the R-value, the greater the insulating power.
2. See actual warranty for complete details, limitations and requirements.

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 our web sites: [www.foamular.com](http://www.foamular.com) and [www.owenscorning.com](http://www.owenscorning.com).

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