



1. Product Name

FOAMULAR® Brand Extruded Polystyrene (XPS) Rigid Foam Insulation, including:

- FOAMULAR® Half Inch Rigid Foam Insulation
- Fanfold Rigid Foam Insulation
- INSUL-DRAIN® Rigid Foam Insulation
- FOAMULAR® CW15 XPS Rigid Foam Insulation
- FOAMULAR® CW25 XPS Rigid Foam Insulation
- FOAMULAR® 250 XPS Rigid Foam Insulation
- FOAMULAR® 400 XPS Rigid Foam Insulation
- FOAMULAR® 600 XPS Rigid Foam Insulation
- FOAMULAR® 1000 XPS Rigid Foam Insulation
- PINKCORE® XPS Rigid Foam Insulation and Low-conductivity Ties

2. Manufacturer

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3. Product Description

BASIC USE

FOAMULAR

This product is an extremely lightweight closed cell polystyrene panel used to insulate residential and commercial structures of all kinds. It is an all-purpose foam panel insulation for masonry, cast-in-place concrete and other applications. FOAMULAR Half Inch and Fanfold effectively protect the foundation's sheet or fluid applied membrane in 2 ways. First, they offer higher water resistance than many other commonly used alternative products. Secondly, they offer high resistance to soil pressures and the abuse that occurs during the backfilling process.

These products are well suited for:

- Below grade foundations
- Plazas and parking decks
- Between concrete slabs
- Roof terraces
- Pedestrian concourses
- Tunnels
- Promenade decks

COMPOSITION & MATERIALS

Owens Corning's patented Hydrovac™ process technology makes the unique closed cell polystyrene structure of FOAMULAR insulation highly resistant to moisture while retaining its initial R-value year after year even following prolonged exposure to humidity, condensation, ground water and freeze/thaw cycling.

FOAMULAR's superior R-value of 5 per inch (25.4 mm) of product thickness, outstanding moisture resistance for long-term performance and tough compressive strength enhance the benefits of INSUL-DRAIN by providing energy efficiency to the foundation wall. Tongue-and-groove edges permit easier board alignment and help seal joints between boards.

FOAMULAR 250

This Owens Corning extruded polystyrene insulation is ideal for wall furring, perimeter/foundation, cavity wall, crawlspace, precast concrete, under slab, roofing systems, sheathing and other applications. FOAMULAR 250 performance benefits include:

- High R-value (R-5 per inch (25.4 mm) of product thickness)
- Compressive strength of 25 psi (172 kPa)
- Effective resistance against moisture, mildew, corrosion and rot
- Ease of handling and installation
- Easy to saw, cut and score
- Wide selection of sizes and thickness
- Availability in straight, tongue-and-groove, or scored square edges
- Compliance with building codes and standards

Frost Protected Shallow Foundation (FPSF)

This application for FOAMULAR offers a cost saving alternative to deep foundations in regions that experience seasonal ground freezing and potential frost heave. The concept of FPSF involves the placement of rigid foam insulation in a way that raises the frost penetration depth around a building to permit foundation footing depths as shallow as 16" (406 mm) even in cold climates. FPSF eliminates the need for stem walls, crawlspaces or basements thereby saving money for both the contractor and homeowner. NAHB estimates, based on actual builder costs, that shallow slab-on-grade foundations are about 15% - 21% less expensive to construct than conventional foundations. In addition to these substantial initial savings, FPSF can offer increased energy savings as a result of the insulation provided. Although relatively new

to the United States, FPSF has been extensively used in Scandinavian countries for over 40 years.

Because of its many beneficial thermal/mechanical properties, FOAMULAR Extruded Polystyrene Insulation is an ideal choice in FPSF construction. In fact, XPS is the only code approved product for use in horizontal applications. For more detailed information on FPSF and technical data, see HUD publication *Design Guide for Frost Protected Shallow Foundations* HUD-1497-PDR.

FOAMULAR INSUL-DRAIN

This extruded polystyrene product incorporates the features of insulation, drainage and protection board in a single product. Its precision-cut channels drain water from vertical foundation walls while the durable filtration fabric prevents soil from clogging the channels thus completing the total insulation envelope. It is easy to install, without the need for special tools or equipment, and the product's superior compressive strength and long-term moisture resistance properties mean years of reliable performance on below grade foundation walls even under extremely harsh conditions.

A network of drainage channels, cut into 1 side of the INSUL-DRAIN board, allows ground water to drain away from the vertical foundation wall while providing a flow path for soil gases to vent upward. A horizontal channel on the top edge also aids in proper positioning of the INSUL-DRAIN panels. A durable, non-woven filtration fabric, overlapping the board on 3 sides, prevents soil from clogging the channels. The fabric also overlaps the adjacent boards, as well as the top and bottom edge, for total system performance. The product's 4' x 8' (1219 x 2438 mm) size covers large areas quickly. High compressive strength and resistance to moisture penetration give INSUL-DRAIN outstanding durability below grade. The product will keep performing without crumbling or disintegrating. This makes INSUL-DRAIN extremely effective as a protection board for the waterproofing membrane.

SIZES

See product data sheets for complete size data.

COLORS

FOAMULAR can be recognized by its characteristic pink color. The color pink is a registered trademark of Owens Corning.

LIMITATIONS

FOAMULAR is practical for all buildings having normal temperature conditions but should not be used in contact with chimneys, heater vents, steam pipes or other surfaces where temperatures exceed 150 degrees F (65 degrees C). It is not recommended for applications where sustained temperatures exceed 165 degrees F (74 degrees C).

All construction should be evaluated by a qualified design professional for the necessity of providing vapor retarders to avoid condensation and subsequent damage to the structure. See current ASHRAE *Handbook of Fundamentals* for more information.

Provisions should be made to protect the insulation from excessive exposure to direct sunlight by covering the insulation as soon as possible.

Some plastic or oil based adhesives and many solvent laden mastics are not compatible with polystyrene based rigid foam insulation.

FOAMULAR is a nonstructural material and must be installed on framing of other substrate that is independently structurally adequate to meet required construction and service loading conditions.

4. Technical Data

APPLICABLE STANDARDS

- ASTM C203 Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation
- ASTM C272 Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions
- ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics
- ASTM D2126 Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging
- ASTM D2863 Standard Test Method for Measuring Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)
- ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
- ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials

APPROVALS

- ICBO Evaluation Report No. 3628
- SBCCI PST and ESI Report No. 9727
- BOCA Research Report No. 96-24
- Meets HUD/FHA Use of Materials Bulletin No. 71
- Underwriters Laboratories, Inc., Classification Certificate U-197

Note - Not all products are covered by reports. Contact Owens Corning for copies of reports.

ENVIRONMENTAL CONSIDERATIONS

Conserving energy through effective insulation lowers fuel consumption and resultant operating cost.

PHYSICAL & CHEMICAL PROPERTIES

Test reports and additional information are available upon request.

- Flexural strength of 75 psi (517 kPa) min
- Water absorption of 0.1% by volume max
- Thermal conductivity k-value of 0.2 at 75 degrees F (24 degrees C)
- Thermal conductivity k-value of 0.18 at 40 degrees F (4 degrees C)
- Compressive strength, 25 psi (172 kPa) min
- Dimensional stability, 2% linear change max
- Oxygen index, 24 min
- Flamespread, 5
- Smoke developed, 45 - 175
- Water vapor permeance, 1.2 max

5. Installation

PREPARATORY WORK

Handle and store product according to Owens Corning recommendations. INSUL-DRAIN is installed against exterior below grade foundation walls and can be installed directly over waterproofing or dampproofing membranes provided that the membrane is properly cured.

METHODS

INSUL-DRAIN boards should be installed vertically with the fabric side away from the foundation wall. Align the 4' (1219 mm) dimension along the horizontal and place the edge flush along a corner of the wall. INSUL-DRAIN should be installed so as to extend vertically from the top of the footing to several inches below finished grade. Properly sized gravel fill should be installed at least 1' (305 mm) above the bottom edge of the board. The fabric overhang along the bottom of the board should be tucked underneath to the backside of the board. Should the project require less than a full size 7' or 8' (2133 or 2438 mm) long board, excess

should be trimmed from the bottom of the board leaving a 3" (76 mm) fabric tab to tuck underneath.

A bead of adhesive should be applied along the entire top edge of INSUL-DRAIN to secure top fabric overhang and prevent soil penetration into the drainage channels.

Adjacent INSUL-DRAIN boards are installed by engaging the tongue-and-groove edge to ensure a solid fit between boards. Additional INSUL-DRAIN boards should be installed in a similar fashion.

INSUL-DRAIN boards can be trimmed to fit project dimensions or protrusions by scoring with a utility knife or cut with a handsaw.

At wall corners where 2 INSUL-DRAIN boards intersect, 1 board should be trimmed flush with the wall and the second board trimmed to overhang the wall, by the thickness of the product, to produce a continuous thermal envelope. A bead of sealant should be applied vertically where the boards join each other.

Additional tiers of INSUL-DRAIN boards should be installed the same as the first tier. Be certain to secure all fabric overhangs to adjacent boards with adhesive.

Owens Corning recommends that INSUL-DRAIN boards be at least partially backfilled the same day as installation to stabilize and secure the boards in place. Complete installation recommendations are available from the manufacturer.

FPSF construction is similar to traditional foundation construction except for insulation details and material savings. Rough grading, foundation layout, subgrade preparation, wall forming, steel reinforcing and concrete casting follow conventional methods but shallow foundation means less of each component used. FPSF is most commonly used in monolithic slab-on-grade, independent slab and stem wall, and permanent wood foundation applications. In some applications, rigid foam insulation panels are placed horizontally outside the foundation. The technique can be applied to the construction of new homes as well as additions to existing homes with conventional foundations or homes with walk-out basements.

PRECAUTIONS

Caution - Combustible
FOAMULAR insulation will ignite if exposed to fire of sufficient heat and intensity, although it does contain a flame retardant additive to inhibit ignition from small fire sources. Products intended for wall applications should be

installed only with a thermal barrier on the interior side of the wall. During shipping, storage, installation and use, this product should not be exposed to open flame or other ignition sources.

BUILDING CODES

Current data on building code requirements and product compliance may be obtained from Owens Corning technical support specialists. Installation must comply with the requirements of all applicable local, state and national code jurisdictions.

6. Availability & Cost

AVAILABILITY

FOAMULAR products are available through a network of Owens Corning distributors throughout the country. Contact manufacturer for more information. Note: All products and sizes may not be available in all markets. For information about nonstandard products, consult a local sales representative.

COST

Budget installed cost information may be obtained from a local Owens Corning distributor or from the manufacturer.

7. Warranty

It is the responsibility of the contractor to install FOAMULAR in accordance with Owens Corning's published recommendations. The presence of an Owens Corning representative at the jobsite does not relieve the contractor from the responsibility to follow these instructions. Owens Corning is not responsible for any liability resulting from a failure to follow these instructions. The manufacturer offers a warranty on retention of R-value over time. The manufacturer's liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to the manufacturer within 30 days from the date it was, or reasonably should have been, discovered. Further information on warranty conditions, duration and remedies may be obtained from Owens Corning.

8. Maintenance

These products are maintenance-free when installed according to the manufacturer's published recommendations.

9. Technical Services

A staff of factory trained service personnel offers design assistance and technical support. For technical assistance, contact Owens Corning.

FOAMULAR Extruded Polystyrene Insulation					
Typical Physical Properties⁽¹⁾					
Property	ASTM Method⁽²⁾	Product Values			
		DURAPINK	FOAMULAR 250	FOAMULAR 400	FOAMULAR 600
R Value ⁽³⁾	C 518	5.0	5.0	5.0	5.0
Thermal Conductivity - "k" (Btu x in/ft ² x hr x °F, max) ⁽³⁾ @ 75°F mean temperature @ 40°F mean temperature	C 518	0.20	0.20	0.20	0.20
		0.18	0.18	0.18	0.18
Compressive Strength minimum value (lb/in ²) ⁽⁴⁾	D 1621	25.0	25.0	40.0	60.0
Flexural Strength (lb/in ² , min.) ⁽⁵⁾	C 203	75	75	115	140
Water by Absorption (% by volume, max.) ⁽⁶⁾	C 272	0.10	0.10	0.05	0.05
Water Vapor Permeance (perm, max.) ⁽⁷⁾	E 96	1.10	1.10	1.10	1.10
Water Affinity	—	hydrophobic	hydrophobic	hydrophobic	hydrophobic
Water Capillarity	—	none	none	none	none
Dimensional Stability (% linear change, max.) ⁽⁸⁾	D 2126	2.0	2.0	2.0	2.0
Linear Coefficient of Thermal Expansion (m/in/°F, max.)	—	2.7 x 10 ⁻⁵	2.7 x 10 ⁻⁵	2.7 x 10 ⁻⁵	2.7 x 10 ⁻⁵
Flame Spread ⁽⁹⁾⁽¹⁰⁾	E 84	5	5	5	5
Smoke Developed ⁽⁹⁾⁽¹⁰⁾⁽¹¹⁾	E 84	45-175	45-175	45-175	45-175
Oxygen Index, min ⁽⁹⁾	D 2863	24	24	24	24
Type Classifications	C 578	Type IV	Type IV	Type VI	Type VII

(1) Properties shown are representative values for 1" thick material based upon most recent product quality audit data. (2) Modified as required to meet ASTM C 578. (3) Thermal resistance (R) - (hr x ft² x °F/Btu) - of a 1" thickness 5.0 (at 75°F mean temperature), 5.4 (at 40°F mean temperature). (4) Value at yield or 10%, 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) Actual water vapor permeance data decreases as thickness increases. (8) Data ranges from 0.0 to value shown. (9) These laboratory tests are not intended to describe the hazard presented by this material under actual fire conditions. (10) Data from Underwriters Laboratories, Inc. Classified. See Classification Certificate U-197. (11) ASTM E 84 is thickness-dependent therefore a range of values is given.

10. Filing Systems

- First Source for Products
- MANU-SPEC®
- Sweet's Catalog Files
- Additional product information is available from the manufacturer upon request.