



INNOVATIONS FOR LIVING™

07 21 13.13.OCC
FOAMULAR® 400/600/1000

High Density Extruded Polystyrene Rigid Insulation

Product Data Sheet



PRODUCT DESCRIPTION

High-density PINK extruded polystyrene (XPS) rigid insulating boards. FOAMULAR® 400/600/1000 boards are manufactured using Owens Corning patented HYDROVAC® technology. Owens Corning uses blowing agents that meet or surpass government environmental requirements (Montreal Protocol).

Their outstanding compressive strength, dimensional stability as well as their excellent thermal resistance (RSI 0.87/25 mm; R-5/in.) and hydrophobic properties (0.7% water absorption) make them an excellent insulation choice for use in large civil engineering works, for roofing and terraces, road applications as well as all other building works where insulation boards are submitted to dead and live loads greater than those which can be supported by FOAMULAR® C-200, FOAMULAR® CodeBord® and FOAMULAR® C-300 extruded polystyrene rigid insulation.

Recommended Uses

Use FOAMULAR® 400/600/1000 high-density extruded polystyrene rigid insulation where heavy loads will be applied to the insulation.

The dead load shall not exceed 1/3 and the live load shall not exceed 1/5 of the published compressive resistance. High-density insulation can be used in the following applications to help:

- reduce heat loss from freeze/thaw- sensitive soils under roads, railways, landing strips and other similar locations; NOTE: In the spring, these heat losses cause degradation of paved areas, compacted fill and topsoil covered areas and may impede pedestrian, vehicular and even animal traffic as well as underground infrastructures (pilon foundations, water and gas piping, backfilled trenches for underground services and others);
- reduce heat gains in permafrost areas where melting decreases its capacity to support traffic bearing roads or building foundations to the point of failure;
- reduce ground heat loss under concrete foundations that support heavy dead loads – i.e. pulp and paper machinery – and/or live loads – i.e. heavy product handling rolling equipment;
- reduce heat loss from automobile parking areas, pedestrian terraces or gardens situated over heated interior spaces; and
- avoid ground freezing under skating rinks, freezers – refrigerators.

To select proper insulation board compression strength, consult design engineers responsible for civil engineering and special building structures and an Owens Corning Canada regional technical support representative.

FOAMULAR® 400/600/1000 extruded polystyrene rigid insulation boards are GREENGUARD and SCS certified (refer to TECHNICAL

DATA) and can contribute to obtain LEED® Canada certifications credits when used in a building submitted to the LEED® Canada NC and CS 2009 rating system (refer to TABLE 2).

Limitations

Owens Corning Canada LP does not recommend using FOAMULAR 400/600/1000 PINK extruded (XPS) polystyrene rigid thermal insulation boards in the following applications:

- In soils that may contain hydrocarbons and other petroleum derivatives, and all other products that may cause corrosion and deterioration of the polystyrene boards. Consult soils investigation reports and an Owens Corning Canada regional technical support representative.

FOAMULAR® 400/600/1000 are combustible products and their use is prohibited:

- When in contact with surfaces whose temperature may exceed 74°C or in locations where ambient temperature will constantly exceed 74°C.
- Where it is impossible to provide clearances required by Codes and Regulations (building, electrical, gas and oil) between the expanded/extruded polystyrene insulation and heat-emitting appliances, chimneys, pipes, conduits and vents to these appliances and between insulation and recessed light fixtures that are not encased in CSA-approved insulated boxes.

Other precautions to be taken:

- Protect polystyrene boards from prolonged exposure to sunlight, which may cause surface discoloration and/or deterioration; backfill as soon



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as insulation is completed; keep boards in storage and in its packaging until time of installation.

- Before using adhesives, sealants or other similar products with polystyrene boards, verify their compatibility with adhesive manufacturers.

Components

Polystyrene insulation is manufactured from polystyrene resin and extruded into rigid boards.

Recycled materials incorporated into polystyrene board fabrication are obtained from one source:

- “Post-industrial” (or “pre-consumer”) source: materials recycled from industry-wide manufacturing waste that can be recycled to fabricate polystyrene boards.

TECHNICAL DATA

Applicable Codes and Standards

Applicable National Building Code of Canada or provincial building Code

Canadian Standards (Underwriters Laboratories of Canada (ULC))

- CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering
- CAN/ULC-S102.2, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies

Canadian General Standards Board (CGSB)

- CGSB 71-GP-24M, Adhesive, Flexible, for Bonding Cellular Polystyrene Insulation

American Standards:

- ASTM C177, Standard Test Method for Steady-State Heat

Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

- ASTM C203, Standard Test Method for Breaking Load and Flexural Properties of Block-Type Thermal Insulation
- ASTM C518, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- ASTM D696, Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C With a Vitreous Silica Dilatometer
- 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 D2842, Standard Test Method for Water Absorption of Rigid Cellular Plastics
- ASTM E96, Test Methods for Water Vapor Transmission of Materials

Codes & Standards Compliance:

- Meets Montreal Protocol 2010, CFC, HCFC Free
- Zero Ozone Depletion Potential
- 70% Less Global Warming Potential

Health Canada/Workplace Hazardous Materials Information System (WHMIS). Please visit www.owenscorning.ca for a current copy of the Material Safety Data Sheet (MSDS) for “FOAMULAR® high density extruded polystyrene insulation”.

Certification by Independent

Third Party Agencies

– Recycled Content and Indoor Air Quality Standards

TABLE I Physical Properties

Properties	Test Method	FOAMULAR® 400/600/1000 (CAN/ULC S701, Type 4)		
		400	600	1000
THERMAL RESISTANCE ⁽¹⁾ R value (ft ² hr °F/BTU) Rsi value (m ² °C/W)	C518 or C177		5.0 0.87	
COMPRESSIVE STRENGTH, min. ⁽²⁾ (psi) (kPa)	D1621	40 275	60 415	100 690
COMPRESSIVE MODULUS, min. (psi) (kPa)	D1621	1800 12,420	2500 17,590	3700 25,510
WATER ABSORPTION (maximum % by volume)	D2842	0.35	0.3	0.2
WATER VAPOUR PERMEANCE, typical (Perm) (ng/Pa.s.m ²)	E96	0.60 35	0.60 35	0.60 35
WATER CAPILLARITY	–	None		
WATER AFFINITY	–	Hydrophobic		
FLEXURAL STRENGTH, typical (psi) (kPa)	C203	75 517	105 725	150 1035
LINEAR COEFFICIENT OF THERMAL EXPANSION (in./in./°F) (m/m/K)	Modified D696	2.7 × 10 ⁻⁵ 4.9 × 10 ⁻⁵		
DIMENSIONAL STABILITY, max. (% linear change)	D2126	1.5		
MAXIMUM SERVICE TEMPERATURE (°F) (°C)	–	165 74		

⁽¹⁾ Thermal resistance per inch of thickness (25 mm). ⁽²⁾ at 10% deformation or yield



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SCS Certification (Scientific Certification Systems) for recycled materials content.

Certification based on the environmental claims certification program:

- 20% minimum certified recycled materials content distributed as follows:
-20% “post-industrial” (or “pre-consumer”) recycled polystyrene materials content; average for Owens Corning manufacturing facilities rigid polystyrene insulation: FOAMULAR® brand, (Rockford IL, USA; Tallmadge OH, USA; Gresham OR, USA; Valleyfield PQ, Canada);
- “Certificate of Achievement”: “manufactured by Owens Corning (various forms and sizes)”.

For up-to-date Certification information, go to www.scs-certified.com.

FOAMULAR® 400/600/1000 high density extruded polystyrene rigid insulation boards are GREENGUARD Certified to meet stringent indoor air quality standards.

Certification in accordance with the GREENGUARD Product Emission Standard for Children & Schools:

- VOCs < 1/100 TLV and < ½ CA chronic REL
- Formaldehyde < 0.0135 ppm/13.5 ppb
- Total VOCs < 0.22 mg/m³
- Total Aldehydes < 0.043 ppm/43 ppb
- Respirable particles < 0.01 mg/m³
- Total Particles < 0.02 mg/m³ (< 10µm)

“GREENGUARD Indoor Air Quality Certified” certification: Owens Corning FOAMULAR® high density extruded polystyrene rigid insulation. For up-to-date Certification information, go to www.greenguard.org.

IDENTIFICATION AND SIZES

Package Identification

Each board must be adequately labelled or marked to indicate the following information:

- CAN/ULC-S701-Type 4
- Board Type
- Name of the manufacturer or brand name
- A cautionary statement as follows:

Caution: COMBUSTIBLE PRODUCT. KEEP AWAY FROM HEAT, SPARKS AND FLAME. THIS PRODUCT WILL IGNITE IF EXPOSED TO AN IGNITION SOURCE OF SUFFICIENT HEAT AND INTENSITY. PROTECTION OR THERMAL BARRIER IS REQUIRED IN ACCORDANCE WITH APPLICABLE BUILDING CODE.

CONTRIBUTION TO LEED® CANADA 2009 CERTIFICATION

TABLE 2: Contribution of OWENS CORNING CANADA'S FOAMULAR® 400/600/1000 high density extruded polystyrene rigid insulation boards towards LEED® credits⁽¹⁾

Category and performance criteria	Requirements to meet to obtain a voluntary credit	Insulation's contribution to the performance	Additional comments
EA (Energy and Atmosphere) Credit 1 for energy performance optimization of new or existing buildings.	Anticipated energy cost reduction compared to NMECB ⁽²⁾ and ASHRAE/IESNA 90.1-2007: 3 to 21 points for core and shell, based on % reduction.	Insulation contributes significantly to the reduction of a building's energy demand. Global contribution depends on the design RSI value.	The Project Manager is responsible for the energy analysis concerning the global energy efficiency of the building (ex. LEED standard form letter).
MR (Materials and Resources) Credit 4 for recycled materials content. ⁽³⁾	“Post-consumer” recycled content plus one half “post-industrial” recycled materials: 1 point for at least 10% and 2 points for at least 20%.	FOAMULAR® 400/600/1000 insulation boards (Rockford IL, Tallmadge OH, Gresham, OR, Valleyfield, PQ: 20% post-industrial, 0% post-consumer).	Recycled content certifications by Scientific Certification Systems for FOAMULAR® 400/600/1000 high density extruded polystyrene rigid insulation boards (20% North American average).
MR (Materials and Resources) Credit 5 for locally or regionally produced materials.	Materials regionally extracted and manufactured: 1 point for at least 20% and 2 points for at least 30%.	All extruded polystyrene rigid insulation boards are manufactured at the Rockford IL, Tallmadge OH, Gresham, OR, Valleyfield, PQ, plant and can contribute towards credits for this category.	Verify with local sales representatives to determine the product's origin.

Sizes and Packaging

FOAMULAR® 400: 610 mm x 2438 mm (24 in. x 96 in.) x 25 mm, 38 mm, 51 mm, 76 mm and 102 mm thickness (1 in., 1.5 in., 2 in., 3 in. and 4in.).

FOAMULAR® 600: 610 mm x 2438 mm (24 in. x 96 in.) x 25.4 mm, 38 mm, 51 mm and 76 mm thickness (1 in., 1.5 in., 2 in. and 3 in.).

FOAMULAR® 1000: 610 mm x 2438 mm (24 in. x 96 in.) x 38 mm, and 51 mm thickness (1.5 in. and 2 in.).

⁽¹⁾ Refer to the LEED® Canada for new construction and major renovations 2009, as promoted by the CaGBC.

⁽²⁾ Model National Energy Code for Buildings 1997.

⁽³⁾ The recycled content of a material or furniture must be determined by dividing the weight of the recycled content of the item by the total weight of the whole item, then by multiplying the resulting ratio by the total cost of the item.



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Packaging: Shipped in units containing four (4) shrink-wrapped 2 ft wide x 2 ft high x 8 ft long packages and measuring 4 ft wide x 4 ft high x 8 ft long.

Boards are available with square edges.

APPLICATION

Safety Measures:

Applicator Protection

This product is combustible and may constitute a fire risk if not used or installed properly. Although it contains a fire-suppressing agent, the product will ignite if exposed to a sufficiently intense flame. Do not expose to open flames or any other ignition source during transport, handling, storage or use.

Preparation

Ensure surfaces to be covered with insulation boards have been inspected, notably:

- substrate solidity and level – fill and others; and
- subsurface mechanical, electrical and telecommunication service lines penetrating or in proximity to insulation boards.

Installation

Carefully adjust insulation boards to obtain tight joints between each board and around electrical service boxes, piping, air ducts and framing passing through; where two layers are required, overlap all joints. Backfill insulation

boards or use wood or steel pegs to avoid their displacement due to wind or flotation on water puddles generated by the rain or during subsurface work or near watercourses. Where required, adhere insulation boards together temporarily using an adhesive, to manufacturer's requirements.

Consult an Owens Corning Canada regional technical support representative for the appropriate fastener and adhesive selection.

AVAILABILITY AND COST

Cost Estimates

Cost estimates are readily available from a physical description consisting of drawings and a brief specification based on the information contained in this Product Data Sheet. For more information on product availability or costs, contact your regional technical support representative.

TECHNICAL SERVICES

Owens Corning Canada LP publishes many Technical Bulletins and offers in-depth consultation services and dew point analysis to help you select the appropriate products for your designs, and prepare details and specifications. For more information, contact your regional technical support representative.

QUALITY CONTROL

Owens Corning Canada LP regularly submits its products to independent agencies that certify their environmental quality in terms of:

- Toxic chemical and volatile particle emissions affecting indoor air quality and the ozone layer.
- Recycled materials content.

INFORMATION CLASSIFICATION SYSTEM

Architectural Specifications

Classification in accordance with MasterFormat™ 2004 (level 4) published by CSC-DCC and CSI. Selected number and title are **07 21 13.13 – Foam Board Insulation.**

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Classification in accordance with MasterFormat 2004 (level 5) published by CSC-DCC and CSI. Selected number **07 21 13.13.OCC FOAMULAR® 400/600/1000** corresponds to Owens Corning Canada (OCC) classification for FOAMULAR® 400/600/1000 high density extruded (XPS) polystyrene rigid thermal insulation boards.



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