



INNOVATIONS FOR LIVING®

07 21 13.13.OCC

FOAMULAR® C-200/FOAMULAR® Cel-Lok® System Extruded Polystyrene Rigid Insulation

Product Data Sheet



PRODUCT DESCRIPTION

Insulation System composed of:

- FOAMULAR® C-200 extruded polystyrene (XPS) rigid thermal insulation, with three double grooves per board for insertion of U shaped metal furring strips.
- Once furring strips are inserted, they are fastened to concrete or concrete masonry unit walls using pilot hole-concrete screws; metal furring channels are used to hold insulation in place and as fastening base for finishing material that must be an approved thermal barrier (i.e. gypsum board), as required by the applicable building Code. For exterior applications the zinc coating is not sufficient corrosion protection for the metal channels.

The FOAMULAR® C-200 extruded polystyrene rigid insulation board used in the FOAMULAR® Cel-Lok® System is manufactured using Owens Corning patented HYDROVAC® technology.

Owens Corning uses blowing agents that meet or surpass government environmental requirements (Montreal Protocol).

Its outstanding thermal resistance (RSI 0.87/25 mm; R-5/in.),

compressive strength (140 kPa; 20 psi), hydrophobic properties (0.7% water absorption) and fastening system make it an excellent insulation choice for interior applications.

Recommended Uses

The FOAMULAR® Cel-Lok® System can be used in buildings, on concrete or concrete masonry unit walls and concrete slabs. The FOAMULAR® Cel-Lok® System offers the following advantages:

- applying the insulation directly to wall will yield a reduction in the total thickness of the wall assembly which will allow for a greater living space; and
- the elimination of thermal bridges caused by the installation of wood or metal framing required for use of semi-rigid or blanket insulation. – Note: The FOAMULAR® C-200 insulation used in FOAMULAR® Cel-Lok® is combustible and has a flame spread rating greater than 25 but less than 500. Consult applicable building Code for required thermal barrier protection.

The FOAMULAR® C-200 extruded polystyrene rigid insulation boards used in the FOAMULAR® Cel-Lok® System are GREENGUARD and SCS certified (refer to TECHNICAL DATA) and can contribute to obtain LEED® Certification credits when used in a building submitted to the LEED® Canada NC 2009 Green Building Council Rating System (refer to TABLE 2).

Limitations

Owens Corning Canada LP does not recommend using FOAMULAR® Cel-Lok® boards in the following locations:

- In a foundation wall assembly where the position of the thermal insulation might contribute to

condensation of humid interior air and promote mildew in the wall assembly.

- On cracked or moist surfaces that may be the origin of water infiltrations past or future and that require the installation of protective materials and products on the exterior side of the wall or its repair (i.e. waterproofing membranes, drainage and others).

The FOAMULAR® Cel-Lok® System uses combustible insulation boards and its use is prohibited:

- Without an approved thermal barrier to protect (i.e. gypsum board or other finishing material meeting the requirements of the applicable building Code).
- 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; install veneer or backfill as soon 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



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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

Health Canada/Workplace Hazardous Materials Information System (WHMIS).

Visit www.owenscorning.ca for a current copy of the Material Safety Data Sheet (MSDS) for “CELFORT® extruded polystyrene insulation”.

TABLE I Physical Properties

Properties	Test Method	FOAMULAR® C-200 / FOAMULAR® Cel-Lok® (CAN/ULC S701, Type 3)
THERMAL RESISTANCE ⁽¹⁾ R value per inch (ft ² hr °F/BTU) Rsi value per 25 mm (m ² °C/W)	C518 or C177	5.0 0.87
COMPRESSIVE STRENGTH, min. ⁽²⁾ (psi) (kPa)	D1621	20 140
WATER ABSORPTION (maximum % by volume)	D2842	0.40
WATER VAPOUR PERMEANCE, max. (Perm) (ng/Pa.s.m ²)	E96	0.80 45
WATER CAPILLARITY	–	None
WATER AFFINITY	–	Hydrophobic
FLEXURAL STRENGTH, typical (psi) (kPa)	C203	44 300
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

Physical Properties

Canadian Construction Materials Centre (CCMC) Product Evaluation

FOAMULAR® C-200 insulation used in the FOAMULAR® Cel-Lok® system complies to CAN/ULC S701, Type 3 and has a CCMC listing.

Codes & Standards Compliance:

- Meets Montreal Protocol 2010, CFC, HCFC Free
- Zero Ozone Depletion Potential
- 70% Less Global Warming Potential
- Product Listing Number (insulation board) **CCMC I3431-L.**

Certification by Independent

Third Party Agencies

– Recycled Content and Indoor Air Quality Standards



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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 board: FOAMULAR® C-200/FOAMULAR® Cel-Lok®/
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.

The FOAMULAR® C-200 extruded polystyrene rigid insulation boards used in the FOAMULAR® Cel-Lok® System are GREENGUARD Certified to meet stringent 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 PINK extruded polystyrene rigid insulation (Bulletin B-5-41 includes FOAMULAR® Cel-Lok® insulation on the GREENGUARD List). 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 3
- Board Type
- Name of the manufacturer or brand name
- CCMC Product Listing Number
- 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 CERTIFICATION

TABLE 2: Contribution of Owens Corning Canada's FOAMULAR® C-200/FOAMULAR® Cel-Lok® System 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 MNECB ⁽²⁾ or ASHRAE 90.1-2007: 1-19 points for NC, 3 to 21 points for CS, 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%.	Extruded polystyrene rigid insulation boards used in the FOAMULAR® Cel-Lok® System (Rockford IL, Tallmadge OH, Gresham, OR, Valleyfield, PQ 20% post-industrial, 0% post-consumer).	Recycled content certifications by Scientific Certification Systems for PINK extruded polystyrene rigid thermal insulation boards used in the FOAMULAR® Cel-Lok® System (20% North American average).
MR (Materials and Resources) Credit 5 for locally or regionally produced materials.	Use building materials/products extracted, harvested, recovered & processed within 800 km (2,400 km if shipped by rail or water) of the final manufacturing site. Demonstrate final manufacturing site is within 800 km (2,400 km if shipped by rail or water) of project site for these products: 1 point for at least 20% and 2 points for at least 30%.	All Canadian extruded polystyrene rigid insulation boards are manufactured at the Rockford IL, Tallmadge OH, Gresham, OR, 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® C-200: 610 mm x 2438 mm (24 in. x 96 in.) x 25 mm, 38 mm, 51 mm, 64 mm, 76 mm, 89 mm and 102 mm thickness (1 in., 1.5 in., 2 in., 2.5 in., 3 in., 3.5 in. and 4 in.).

Metal furring channels: 0.46 mm (28 Gauge) x 9.5 mm (3/8 in.) x 38 mm (1.5 in.) x 2413 mm (95 in.).

Insulation packages 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.

⁽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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Insulation boards are available with ship lapped 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 planarity; and
- mechanical, electrical and telecommunication service lines penetrating in or passing through voids in the exterior and foundation walls.

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. Assure a tight bond to substrate to prevent creating air passages between insulation and substrate which (if not sealed) can lead to air circulation behind (by convection) and possible condensation.

Fasteners: Masonry screws of sufficient length to penetrate minimum 25 mm into substrate. Use a minimum of 4 screws per length of metal furring channel.

Install continuous vapour barrier as required by applicable Building Code.

Insulate around insulated wall and perforations in insulation boards (i.e. around electrical service boxes, windows) filling joints with low-expansion single-component polyurethane foam insulation.

Consult an Owens Corning Canada regional technical support representative for the appropriate fastener and insulating foam sealant.

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.**

Data Sheet

Classification in accordance with MasterFormat 2004 (level 5) published by CSC-DCC and CSI. Selected alpha-numeric identification **07 21 13.13.OCC FOAMULAR® Cel-Lok® System** corresponds to Owens Corning Canada (OCC) classification for FOAMULAR® C-200/FOAMULAR® Cel-Lok® extruded polystyrene rigid insulation board with metal channels.



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