**INTRODUCTION - TECHNICAL SPECIFICATIONS**

This specification Section is used to prescribe RIGID BOARD INSULATION used in waterproofing systems for roofs, rooftop terraces, garden roofs and other types of roofing in which the waterproofing membrane is installed underneath the insulation boards, protecting it from abrupt temperature changes, freeze-thaw, ultra-violet rays and other risks of deterioration.

This thermal insulation is attained with extruded polystyrene boards manufactured by **Owens Corning Insulating Systems Canada LP (Owens Corning Canada)** in its facilities in Rockford, Illinois, Tallmadge, Ohio and Gresham, Oregon in the United States and in its plant in Valleyfield, Québec in Canada and which is distributed under the following brand names:

**FOAMULAR® & FOAMULAR® NGX™ 350 rigid extruded polystyrene insulation.**

**FOAMULAR® & FOAMULAR® NGX™ 350 CVI rigid extruded polystyrene insulation.**

**Filing, organization and formatting**

This Section has been classified and numbered in accordance with the MasterFormatTM classification system for the construction industry. Its number and title is:

**07 22 16 – ROOF BOARD INSULATION**

This Section is also organized into three Parts and formatted like all other National Master Specification (NMS) Sections which are used by most specification writers in Canada.

**Recommendations for the use of certain tools**

The SPEC NOTES printed in italic are used as a checklist or guide to the specifications writer in order to help him make the right decisions. The SPEC NOTES must be suppressed before printing the document.

The brackets [ ], with or without text help the writer choose materials, products, references and other possibilities at his disposal. The brackets must be suppressed, including all choices not retained, before printing the document.

**Professional responsibility of the specification writer**

Owens Corning Canada LP. publishes this document for information only and cannot in any way assume the role or the professional responsibility of the architect who must sign and seal his Drawings and Specifications.

This document, although written by experienced professionals must not be copied integrally. It must be adapted or even modified to suit the Project with which our technical representatives and our Engineering Services will be happy and proud to collaborate.

NOTE TO THE READER: This Section **07 22 16 – ROOF BOARD INSULATION** is numbered to meet the recommendations of the MasterFormatTM classification system. This classification is also more precise than the National Master Specification (NMS) system (07 21 13 - Board Insulation (formerly 07212 - Board Insulation).

SPEC NOTE : This Section specifies different materials and insulation work required for roofs, rooftop terraces, garden roofs and other types of protected membrane roofing, using extruded polystyrene insulation boards.

This section specifies FOAMULAR® 350 & FOAMULAR® NGX™and FOAMULAR® & FOAMULAR® NGX™350 CVI as well as various accessories required for their installation and forming an integral part of the protected membrane roofing system, rooftop terrace, garden roofs, etc.

The articles and paragraphs describing the materials and installation methods must be integrated whole or in part in the appropriate Project specification sections that concern protected membrane systems.

For any additional information concerning these products, contact your regional technical representative or consult Owen Corning’s web site at the following address: <http://www.owenscorning.ca>.

SPEC NOTE ENVIRONMENT: This Section specifies environmentally responsible material choices, including recycling and reuse options, and generally available disposal options. Increased RSI (R)-value insulation levels will provide improved energy efficiency. Improved energy efficiency reduces the use of nonrenewable energy sources and provides a lessened contribution to global warming.

# General

## SECTION INCLUDES

### Polystyrene roof board insulation for protected membrane roofing.

### Roof board accessories.

## RELATED SECTIONS

### Section 07 60 00 – Flashing and Sheet Metal

### Section 07 92 10 - Joint Sealers

## REFERENCES

SPEC NOTE: Edit list to suit standards specified in project specification.

### American Standards and Testing Materials (ASTM)

#### ASTM C177-19, Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus

#### ASTM C203-05a(2017), Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation

#### ASTM C518-17 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

#### ASTM E228-17 Standard Test Method for Linear Thermal Expansion of Solid Materials With a Push-Rod Dilatometer

#### ASTM D1621-16 Standard Test Method for Compressive Properties of Rigid Cellular Plastics

#### ASTM D2126-15 Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging

#### ASTM D2824/D2824M-18 Standard Specification for Aluminum-Pigmented Asphalt Roof Coatings, Nonfibered, and Fibered without Asbestos

#### ASTM E96/E96M-16 Standard Test Methods for Water Vapor Transmission of Materials

### l’Association des Maîtres Couvreurs du Québec (AMCQ).

### Canadian Roofing Contractors Association (CRCA): Canadian Roofing Reference Manual

### Underwriters' Laboratories of Canada (ULC)

#### CAN/ULC-S102.2:2018, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies

#### ULC CAN-S114:2018, Standard Method of Test for Determination of Non-combustibility in Building Materials

#### CAN/ULC-S701.1:2017, Standard for Thermal Insulation, Polystyrene, Boards

## SUBMITTALS

### Section 01 33 00: Submittal procedures.

### Product data: Include technical data supporting specified performance requirements.

#### Submit proof of manufacturer's CCMC Listing and Listing Number to (Engineer) (Consultant)].

Visit [www.owenscorning.ca](http://www.owenscorning.ca) for a current copy of the [Safe Use Instruction Sheet (SUIS) for FOAMULAR® NGX™ Extruded Polystyrene Insulation](https://sds.owenscorning.com).

#### Submit WHMIS SDS - Safety Data Sheets. Indicate VOC content.

### Sustainable design reporting:

#### Section 01 35 66: LEED documentation procedures.

#### Submit ecological certificates issued by independent agencies and the evaluation of the products' contribution towards obtaining LEED™ credits identified in article QUALITY ASSURANCE.

### Samples:

#### Polystyrene board: [One (1)] [Two (2)] sample(s) of each type, 600 x 600 mm x indicated thickness, including the following required information printed on one face:

##### Reference standard product meets

##### Board Type, name of manufacturer or brand name

#### Accessories: [One] [Two] sample(s) of each type of specified accessory and fastener.

## QUALITY ASSURANCE

### Identification: Each insulation board must be clearly labelled with the information listed in manufacturer's applicable Product Data Sheet.

### Sustainability standards certification by an independent agency:

SPEC NOTE: GREENGUARD and GREENGUARD Gold Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit [spot.ul.com](https://spot.ul.com/main-app/products/catalog/) or contact Owens Corning [GET TECH](https://www.owenscorninglibrary.ca/leed/).

SPEC NOTE: SCS (Scientific Certification Systems) Global Services provides independent verification of recycled content in building materials and verifies recycled content claims made by manufacturers. For more information, visit [www.SCSglobalservices.com](http://www.scsglobalservices.com/).

#### Submit the certificate issued by the SCS Global Services certifying that the polystyrene board insulation meets the recycled materials content requirements in the tested product; internet site: [www.SCSglobalservices.com](http://www.scsglobalservices.com/). Include certificate number, duration of the certification and all restrictions for the products, as applicable.

SPEC NOTE: Canada Green Building Council (CaGBC) has promoted the application of the LEED Canada Rating System(LEED Canada NC and CS). LEED is the acronym of Leadership in Energy and Environmental Design.

SPEC NOTE: As a design guideline and a third-party certification tool, LEED aims to improve occupant comfort, environmental performance and economical efficiency of buildings by using proven and innovative procedures, standards and technologies. It furnishes a definition generally recognized in the industry of what constitutes a “green building”. LEED v4 rating system comprises a set of explicit performance criteria organized into nine (9) principal categories: Integrative Process, Location and Transportation, Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality. Innovation, Regional Priority.

For each performance criteria, the LEED rating system states the fundamental objective and the necessary documentation to be submitted to meet each compulsory condition and to obtain each voluntary “credit”. Projects are awarded points for their certification by meeting or exceeding each credit’s technical requirements. All compulsory conditions must be met before the project may be admissible to the certification. The points are then accumulated into a final total corresponding to one of the possible LEED certification levels: CERTIFIED, SILVER, GOLD or PLATINUM.

Consider adding any credits anticipated from adhesive or other specified products.

### Contribution of board insulation to the LEED v4 certification of the building Project:

#### Energy and Atmosphere (EA): credit EAp2 for minimum energy performance, and credit EAc2 for optimization of building energy performance.

#### Materials and Resources (MR): credits MRc1 for live cycle impact reduction, MFc2 for environmental product declaration, MRc3 for sourcing and raw materials, MRc5 for waste management.

#### Indoor Environmental Quality (EQ): credits EQc2 for low-emitting materials, EQc5 thermal comfort.

## DELIVERY, STORAGE AND HANDLING

### Section 01 66 00: Transport, handle, store, and protect products.

### Deliver, store and handle polystyrene boards in accordance with manufacturer's printed instructions.

### Waste handling: Separate waste materials for [reuse] [and] [recycling] in accordance with Section [01 74 19 – Construction Waste Management and Disposal].

## SITE CONDITIONS

### Maintain manufacturer’s recommended ambient conditions during installation.

# Products

## INSULATION BOARD

SPEC NOTE ENVIRONMENT: Thermal insulation provides reduced environmental impacts through energy savings. Further reduced environmental impacts can be achieved through the specification of materials that contain a high portion of recycled content. All extruded polystyrene insulation boards manufactured by Owens Corning contain no CFC nor HCFC, meeting all requirements of the Montreal Protocol. Their ozone depletion potential is ZERO and they have 70% lower global warming potential compared to previous formula. All boards contain 20% recycled material content.

FOAMULAR NGX™products have all the same properties as FOAMULAR plus the blowing agent formulation that delivers a 90% reduction to Global Warming Potential (100 year), including the complete elimination of HFC 134a

SPEC NOTE: use paragraph 2.1.1 to specify FOAMULAR & FOAMULAR NGX™ 350 insulation boards with smooth faces.

### Insulation board: Extruded rigid polystyrene board insulation to CAN/ULC-S701, Type 4:

#### Manufacturer: [FOAMULAR 350] [FOAMULAR 350 CVI] [FOAMULAR NGX 350] [FOAMULAR NGX 350 CVI] manufactured by Owens Corning Canada.

#### Thermal: RSI 0.88 / 25 mm (R 5.0/inch)

#### Compressive Strength: 240 kPa (35 psi)

#### Water absorption (max): 0.7%

#### Water vapour permeance: >30 ng/Pa.s.m2 ( 0.52 Perm) and  <60 ng/Pa.s.m2 (1.05 Perm)

#### Recycled content: Minimum 20%, pre-consumer.

#### CFC and HCFC free.

#### Dimensions: 610 mm x 1220 mm x [51 mm] [76 mm] [102 mm] [thickness as indicated]

#### Profile:

##### Edges: ship lapped edges.

SPEC NOTE: Specify drainage channels only for FOAMULAR® & FOAMULAR NGX™ 350 CVI thermal insulation boards with underside drainage channels to ensure optimum water drainage between the membrane and the insulation. For additional information, refer to article 3 PRODUCT DESCRIPTION of product data sheet D.S..07 22 16.13.OCC FOAMULAR® & FOAMULAR NGX™ 350 and FOAMULAR® & FOAMULAR NGX™ 350 CVI rigid extruded polystyrene insulation.

##### Drainage channels:

###### One (1) lengthwise and two (2) widthwise per board, 13 mm x 13 mm, maximum depth.

###### One (1) around perimeter of board, 6.5 mm wide by 13 mm deep.

## ADHESIVES

SPEC NOTE ENVIRONMENT: OWENS CORNING does not recommend solvent based adhesives which react with polystyrene foam.

SPEC NOTE: contact your regional technical representative to obtain a list of adhesive products and manufacturers. Adhesives should be selected according to installation method (type), application temperature (class) and their chemical compatibility with polystyrene boards, substrates as well as related materials and accessories (i.e. air barrier membranes, flashings, waterproofing membranes, etc.).

### Adhesive: Compatible with foam board product.

#### Type: [\_\_\_]

#### Class: [\_\_\_]

#### VOC emission: [\_\_\_]

#### Selected product: [\_\_\_\_\_\_\_\_\_\_\_\_].

## ACCESSORIES

SPEC NOTE: Use of the following accessories may be required by the roofing systems.

### Separation sheet: Polyethylene, 0.12 mm (5 mils) thickness.

### Filter fabric: 100% polypropylene sheet, ultra-violet resistant, weaved, black colour, designed for installation in a protected membrane roofing system between the insulation and the ballast.

### Ballast:

#### Natural stone, type, screen and gauge to recommendations of the AMCQ and CRCA.

#### Prefabricated concrete pavers on pedestals, as recommended by the insulation and concrete pavers' manufacturers.

# Execution

## EXAMINATION

### Verify that surfaces and conditions are ready to accept the Work of this section.

### Verify that insulation boards are compatible with asphalts or adhesives used.

### Report any unsatisfactory conditions to the Architect [Consultant] in writing.

### Do not start work until deficiencies have been corrected. Commencement of Work implies acceptance of conditions.

## PREPARATION

### Ensure all substrate surfaces are firm, straight, smooth, dry, free of snow, ice or frost, contamination and swept clean of dust and debris.

### Ensure that interfacing work is complete and proper including curbs, drains, sleeves, vents, pipes, and other items passing through substrates.

### Ensure plywood and lumber nailer plates have been installed to walls and parapets.

## INSTALLATION

### Install roof insulation boards to manufacturers written instructions.

SPEC NOTE: Separation sheets are necessary with hot applied rubberized asphalt.

### Separation sheets:

#### Place separation sheet in adhesive or asphalt while still hot enough to assure good bond but so hot as to damage sheet.

#### Begin application at low end, lapping sheets 100 mm (4 in).

#### Cut sheet around drains, vents and other penetrations; carry sheet up vertical faces of curbs and cover with a flashing.

#### Carry separation sheet up vertical faces and adhere to vertical faces and on top of the roof curbs and parapets while asphalt is still warm.

### Polystyrene board:

#### Apply insulation loose immediately after application of separation sheet parallel to roof edges at perimeter.

SPEC NOTE: Specify a second thickness of insulation boards when job conditions or energy conservation require it.

#### Place second layer of insulation boards so that joints are offset from the first layer. Apply random spots of adhesive to ensure stability of the insulation boards before ballast installation.

#### Butt joints tightly without forcing them in parallel rows with offset end joints. Cut and fit boards around openings and edges.

#### Feather boards around roof drains, up to 600 mm (2 ft.) from the drain, to ensure efficient drainage.

#### Do not install more insulation boards that will be possible to ballast with stone or pavers in the same day.

#### Keep insulation minimum 75 mm (3 in.) from heat emitting devices or penetrations, and minimum 50 mm (2 in.) from sidewalls of CAN4‑S604 type A chimneys and CAN/CGA‑B149.1 and CAN/CGA‑B149.2 type B vents.

### Filter fabric:

#### Apply continuous layer of filter fabric over installed insulation to protect from ultra-violet radiation. Lap joints 300 mm (12 in.) minimum.

#### Carry fabric up vertical surfaces minimum 100 mm (4 in.) high and fasten in place onto substrate using a compatible adhesive or support it temporarily prior to covering it with a cladding (metal flashing, cladding, etc.)

### Ballast:

#### Apply stone ballast, as soon as possible after placement of fabric, at minimum rate of 73 kg/m2 (15 lbs/ft2)

#### Spread stone ballast to an even thickness over entire area. Extend ballast over base of metal flashings by 100 mm (4 in).

#### Spread additional stone ballast around perimeter for width of 1200 mm (4 ft.) to increase ballast weight to 98 kg/m² (20 lbs/ ft²) or more depending on wind uplift.

#### Install pavers over fabric on leveling pads accurately aligned and leveled.

## CLEANING

### After installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

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