



INTRODUCTION - TECHNICAL SPECIFICATIONS

This specification Section is used to prescribe extruded polystyrene rigid foam boards for buildings and civil engineering works, manufactured by **Owens Corning Insulating Systems Canada LP (Owens Corning Canada)** in Rockford IL, USA; Tallmadge OH, USA; Gresham OR, USA; Valleyfield PQ, Canada and distributed under the following brand names:

FOAMULAR® & FOAMULAR® NGX C-200 & CodeBord® Extruded Polystyrene Rigid Insulation

FOAMULAR® & FOAMULAR® NGX Cel-Drain® Extruded Polystyrene Rigid Insulation

FOAMULAR® & FOAMULAR® NGX C-300 Extruded Polystyrene Rigid Insulation

FOAMULAR® & FOAMULAR® NGX 400/600/1000 High Density Extruded Polystyrene Rigid Insulation

Filing, Organization and Formatting

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

07 21 13.13 – FOAM 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/her make the right decisions. The SPEC NOTES must be suppressed before printing the document.

The brackets [], with or without text, help the writers choose materials, products, references and other possibilities at their 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 the Drawings and Specifications.

This document, although written by experienced professionals, must not be copied in whole. It must be adapted or even modified to suit the particular needs of your Project. Our regional technical support representatives and our Engineering Services will be pleased and honoured to assist you with this.

NOTE TO THE READER: This Section **07 21 13.13 – FOAM BOARD INSULATION** is numbered to meet the recommendations of the MasterFormat classification system. This classification is also more specific than the National Master Specification (NMS) system (07 21 13 – BOARD INSULATION (formerly 07212 – Board Insulation)).

SPEC NOTE DESCRIPTION: This Section specifies Foam Board Insulation manufactured using polystyrene resin extruded into rigid boards as well as related accessories and installation methods. These boards are used for buildings and civil engineering works.



For any additional information concerning these products, contact your regional technical support representative or consult Owen Corning Canada's web site at the following address: 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.

Part 1 General

1.1 SECTION INCLUDES

SPEC NOTE: Select one or more locations to be insulated; suppress or add as required.

- .1 Thermal insulation using extruded polystyrene board insulation at the following locations:
 - .1 Below grade, on interior face of foundation walls [and] [on the exterior face of foundation walls not submitted to special loading].
 - .2 Above grade, on exterior face of concrete masonry unit [concrete] [gypsum board] cavity wall back-ups with masonry [____] veneer.
 - .3 Inside buildings, on interior face of foundation walls.
 - .4 Under slabs on grade.
 - .5 Under slabs on grade of skating rinks [refrigerators-freezers].
 - .6 Garden [pedestrian] terraces, [parking areas] situated over heated spaces.
 - .7 [Landing strips], [railroads], [highways], [bridge abutments], [sidewalks], [retaining walls], [landscaping], [_____] [Civil Engineering Works] [and] [large construction projects].
 - .8 Permafrost protection Works.
- .2 Accessories required to apply and maintain insulation in place.

1.2 RELATED SECTIONS

SPEC NOTE: Certain related Sections are essential to construct the air barrier system (e.g. Gypsum board intermediate sheathing) or can substantially contribute to the wall's thermal performance (e.g. Batt insulation in metal stud system cavities) and to control water vapour diffusion within it (e.g. Vapour retarders).

- .1 Section 03 30 00 – Cast in Place Concrete
- .2 Section 04 05 00 - Common Work Results for Masonry: [connectors] [gaskets or flashings]
- .3 Section 07 11 13 – Bituminous Dampproofing



- .4 Section 07 12 00 – Built-up Bituminous Waterproofing
- .5 Section 07 26 16 – Below-Grade Vapour Retarders
- .6 Section 07 27 00 – Air Barriers
- .7 Section 09 21 16 – Gypsum Board Assemblies
- .8 Section 31 23 00 – Excavation and Fill
- .9 Section 33 41 00 – Subdrainage: Foundation and underslab drainage
- .10 Section 34 00 00 – Transportation: [Roadway] [Airport] [Railway] Work

1.3 REFERENCES

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

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C177-19, Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus
 - .2 ASTM C203-05a(2017), Standard Test Method for Breaking Load and Flexural Properties of Block-Type Thermal Insulation
 - .3 ASTM C518-17, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
 - .4 ASTM E228-17, Standard Test Method for Linear Thermal Expansion of Solid Materials With a Push-Rod Dilatometer
 - .5 ASTM D1621-16, Standard Test Method for Compressive Properties of Rigid Cellular Plastics
 - .6 ASTM D2126-15, Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging
 - .7 ASTM D2842-19, Standard Test Method for Water Absorption of Rigid Cellular Plastics
 - .8 ASTM E96/E96M-16, Test Methods for Water Vapor Transmission of Materials
- .2 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102.2:2018, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies
 - .2 CAN/ULC-S604:2016, Type A Chimneys
 - .3 CAN/ULC-S701.1:2017, Standard for Thermal Insulation, Polystyrene, Boards
- .3 Canadian Gas Association (CGA)
 - .1 CSA-B149 HB:20, Natural Gas and Propane Installation Code Handbook
 - .2 CSA-B149.1:20, Natural Gas and Propane Installation Code



- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheet (SDS)

1.4 SUBMITTALS

- .1 Section 01 33 00: Submittal procedures.
- .2 Product data:
 - .1 Submit proof of manufacturer's CCMC Listing and Listing Number to (Engineer) (Consultant)].

Visit www.owenscorning.ca for a current copy of the [Safe Use Instruction Sheet \(SUIS\)](#) for [FOAMULAR®](#) and [FOAMULAR® NGX™](#) Extruded Polystyrene Insulation.

- .2 Submit WHMIS SDS - Safety Data Sheets. Indicate VOC content.
- .3 Sustainable design reporting:
 - .1 Section 01 35 66: LEED documentation procedures.
 - .2 Submit ecological certificates issued by independent agencies and the evaluation of the products' contribution towards obtaining LEED™ credits identified in article QUALITY ASSURANCE.
- .4 Samples:
 - .1 Polystyrene board: [One] [two (2)] sample[s] of each type, 600 x 600 mm x indicated thickness, including the following required information printed on one face:
 - .1 Reference standard product meets
 - .2 Board Type, name of manufacturer or brand name
 - .3 The following cautionary statement: "This product is combustible. A protective barrier or thermal barrier is required to separate this product from interior living or conditioned spaces as specified in the appropriate building code."
 - .2 Accessories: One (two) sample(s) of each type of specified accessory and fastener.

1.5 QUALITY ASSURANCE

- .1 Identification: Clearly label each insulation board with the information listed in manufacturer's Product Data Sheet.

CCMC listings for Owens Corning FOAMULAR & FOAMULAR NGX products include:

- *FOAMULAR® & FOAMULAR® NGX™ C-200: product listing number CCMC 13431-L.*
- *FOAMULAR® & FOAMULAR® NGX™ CODEBORD®: product listing number CCMC 13431-L.*
- *FOAMULAR® & FOAMULAR® NGX™ C-200/ FOAMULAR® Cel-Lok®: product listing number CCMC 13431-L.*



- **FOAMULAR® & FOAMULAR® NGX™ C-300: CCMC product listing number 13430-L.**

- .2 Listed with Canadian Construction Materials Centre (CCMC) Product Evaluation, published by the Institute for Research in Construction (IRC) of the National Research Centre Canada (CNRC).
- .3 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 or contact Owens Corning [GET TECH](#).

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.

- .1 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. 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 the adhesive.

- .4 Contribution of board insulation to the LEED v4 certification of the building Project:
 - .1 Energy and Atmosphere (EA): credit EAp2 for minimum energy performance, and credit EAc2 for optimization of building energy performance.



- .2 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.
- .3 Indoor Environmental Quality (EQ): credits EQc2 for low-emitting materials, EQc5 thermal comfort.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Section 01 66 00: Transport, handle, store, and protect products.
- .2 Deliver, store and handle polystyrene boards in accordance with manufacturer's printed instructions.
- .3 Waste handling: Separate waste materials for [reuse] [and] [recycling] in accordance with Section [01 74 19 – Construction Waste Management and Disposal].
- .4 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of insulation materials.

1.7 SITE CONDITIONS

- .1 Maintain manufacturer's recommended ambient conditions during installation.

Part 2 Products

2.1 EXTRUDED POLYSTYRENE INSULATION

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. In addition, plastic foam insulation must demonstrate a low impact on stratospheric ozone and global warming using appropriate blowing agents. Blowing agents used to fabricate FOAMULAR® extruded polystyrene insulation meet the Montreal Protocol requirements.

The FOAMULAR® ozone depletion potential is ZERO and has a 70% lower global warming potential. 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 the paragraph to specify below-grade thermal insulation applied to the inner face of concrete and masonry unit foundation walls and/or on the exterior side of masonry or gypsum board cavity wall back-ups with a masonry veneer; for additional information, refer to Product Data Sheet 07 12 13.13.OCC FOAMULAR® & FOAMULAR NGX™ C-200 & FOAMULAR® & FOAMULAR NGX™ CODEBORD® Extruded Polystyrene Rigid Insulation.

- .1 Insulation [Type A]: Extruded rigid polystyrene board insulation to CAN/ULC-S701, Type 3:



- .1 Manufacturer: PINK, [FOAMULAR C-200] [FOAMULAR CODEBORD] [FOAMULAR NGX C-200] [FOAMULAR NGX CODEBORD] manufactured by Owens Corning Canada.
- .2 Thermal: RSI 0.88 / 25 mm
- .3 Compressive strength: 140 kPa (20 psi)
- .4 Water vapour permeance : >30 ng/Pa.s.m² (0.52 Perm) and <60 ng/Pa.s.m² (1.05 Perm)
- .5 Recycled content: Minimum [20%], pre-consumer.
- .6 Dimensions: [610 mm] [1220 mm] x [2438 mm] [2743 mm] x [25 mm] [38 mm] [51 mm] [64 mm] [76 mm] [102 mm] [thickness as indicated], [ship lapped] [square] edges

SPEC NOTE: Use paragraph 2.1.2 to specify below-grade thermal insulation applied to the outer face of concrete and masonry unit foundation walls and for under residential concrete slabs where applied loads do not exceed the products capacity. Do not use for flat or low slope roofing applications. For additional information, refer to Product Data Sheet 07 12 13.13.OCC FOAMULAR® & FOAMULAR NGX™ C-300 Extruded Polystyrene Rigid Insulation.

- .2 Insulation [Type B]: Extruded rigid polystyrene board insulation to CAN/ULC-S701, Type 4:
 - .1 Manufacturer: [FOAMULAR® C-300] [FOAMULAR® NGX C-300] manufactured by Owens Corning Canada.
 - .2 Thermal: RSI 0.88 / 25 mm
 - .3 Compressive strength: 210 kPa (30 psi)
 - .4 Water vapour permeance : >30 ng/Pa.s.m² (0.52 Perm) and <60 ng/Pa.s.m² (1.05 Perm)
 - .5 Dimensions: [610 mm] [1220 mm] x [25 mm] [38 mm] [51 mm] [64 mm] [76 mm] [89 mm] [102 mm] [thickness as indicated], [ship lapped] [square] edges
 - .6 Recycled content: Minimum [20%], pre-consumer.

SPEC NOTE: Use paragraph 2.1.3 to specify thermal insulation boards used in civil engineering work projects and large construction projects (i.e. landing strips, railways, highways, roads, sidewalks, retaining walls, landscaping, permafrost protection and others) and/or to insulate parts of buildings (i.e. foundation walls, pedestrian and garden terraces and others) that require high density insulation boards subjected to live and dead loads greater than those that FOAMULAR® & FOAMULAR NGX™ C-200/CODEBORD® and FOAMULAR® & FOAMULAR NGX™ C-300 can support; for additional information, refer to Product Data Sheet 07 21 13.13.OCC FOAMULAR® & FOAMULAR NGX™ 400/600/1000 High Density Extruded Polystyrene Rigid Insulation.

- .3 Insulation [Type C]: High Density extruded rigid polystyrene board insulation to CAN/ULC-S701, Type 4:
 - .1 Manufacturer: [FOAMULAR®] [FOAMULAR® NGX] [400] [600] [1000] manufactured by Owens Corning Canada.
 - .2 Thermal: RSI 0.88 / 25 mm
 - .3 Compressive strength: [275 kPa (40 psi)] [415 kPa (60 psi)] [690 kPa (100 psi)]



- .4 Dimensions: 610 mm x 2438 mm x [25 mm] [38 mm] [51 mm] [76 mm] [102 mm] [thickness as indicated], square edges
- .5 Recycled content: Minimum [20%], pre-consumer.

2.2 ADHESIVES

SPEC NOTE ENVIRONMENT: Owens Corning does not recommend solvent based adhesives which react with polystyrene foam. Low VOC adhesives are environmentally safe.

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

- .1 Adhesive: Compatible with foam board product.
 - .1 Type: [___]
 - .2 Class: [___]
 - .3 VOC emission: [___]
 - .4 Selected product: [_____].

SPEC NOTE: Use pilot hole self-tapping screws to fasten insulation boards to concrete or concrete masonry unit foundation walls and to steel studs. Use nails to fasten boards to wood studs.

- .1 Screws: self-tapping type for steel, masonry anchors for concrete, zinc coated by electrolytic process, #8-18, of sufficient length to penetrate substrate minimum 25 mm (1 in).
- .2 Nails: spiral type, of sufficient length to penetrate substrate minimum 25 mm (1 in).
- .3 Washers: Minimum 25 mm diameter, plastic or metal.
- .4 Wood furring strips: 300 mm wide x 100 mm thick.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 71 00: Verify existing conditions before starting work.
- .2 Verify that substrates are clean, dry, sound, smooth, continuous and ready to accept the Work of this section.

3.2 PREPARATION

SPEC NOTE: Thermal insulation is essential to the energy performance of buildings and civil engineering projects. Coordinate extruded polystyrene insulation board installation with all adjacent, underlying or penetrating work projects.



These might include air barrier systems applied to substrates, masonry connectors, flashings, foundation waterproofing, different types of fill and compaction under slabs-on-grade or geo engineering projects, mechanical, electrical and telecommunication conduits and various other types of civil engineering projects.

- .1 Coordinate adjacent, underlying and penetrating work which must be completed prior to or after insulation work.
- .2 Protect surrounding work from damage or disfiguration.

3.3 INSTALLATION - GENERAL

- .1 Install to manufacturer's written instructions.
- .2 Maintain continuity of thermal protection to building elements and spaces.
- .3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, exterior doors and windows, and other protrusions.

SPEC NOTE: Verify clearances with local building regulations and safety codes. Check requirements for chimney vents and specify type required. Where lighting fixtures are supplied with CSA-approved insulated enclosures, specified clearances are not required unless indicated otherwise by fixture manufacturer. Edit the following paragraph to suit project requirements.

- .4 Maintain minimum clearance from heat-emitting devices such as recessed light fixtures, chimneys and vents.
 - .1 Recessed lights: Minimum [75 mm]
 - .2 Chimneys [CAN4-S604 type A]: [50 mm]
 - .3 Vents [CAN/CSA-B149.1], [type B] [type L]: Minimum [50 mm].
- .5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only foam insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .6 Use boards with ship lapped edges where joint overlap is required in single layer applications.
- .7 Offset both vertical and horizontal joints in multiple layer applications.

SPEC NOTE: Board installation may require adhesives or mechanical fasteners; use one or the other following paragraphs according to installation method or type of insulating material specified.

- .8 Adhesives:
 - .1 Apply adhesive to [insulation board] [substrate] at rate of [___] L/m² by [notched trowel] [___] in accordance with adhesive manufacturer's recommendations.
 - .2 Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous elastomeric membrane over expansion and



control joints using compatible adhesive and primer before application of insulation.

- .9 Mechanical fastening: Secure furring with minimum four self-tapping screws per length of channel.
- .10 Secure insulation boards using fasteners appropriate to substrate, at minimum four self-tapping screws per length of channel or maximum rate of one fastener per 0.19 m² (2 sq. ft.). Space furring maximum 600 mm [24 in.] o.c.
- .11 Temporarily protect installed insulation boards from inclement weather, excessive sunlight and other physical damages.

3.4 INSTALLATION - PERIMETER FOUNDATION

SPEC NOTE: Extent of perimeter foundation insulation should be indicated on drawings.

- .1 Interior application: Install on inside face of perimeter foundation walls. Extend boards [(____) mm vertically below bottom of finish floor slab] [as indicated].
- .2 Exterior application: Install on exterior face of perimeter foundation wall with adhesive [fasteners]. Extend boards [(____) mm minimum below finish grade] [as indicated] [to top of footing].
- .3 Under slab application: Lay boards on level compacted fill. Extend boards [(____) mm in from perimeter foundation wall] [as indicated].
- .4 Perimeter heating duct application:
 - .1 Compact walls of heating duct trench to form solid backing.
 - .2 Attach insulation boards to perimeter foundation wall extending from underside of finish floor to [100] (____) mm below bottom of heating duct.
 - .3 Lay insulation boards in bottom of heating duct trench. Extend to [(150) mm beyond heating duct] [(600) mm minimum from inside face of perimeter foundation wall]. Secure insulation in place to prevent displacement.

3.5 INSTALLATION – HIGH DENSITY BOARDS

SPEC NOTE: Owens Corning is not responsible for its products' installation. Owens Corning recommends fastening insulation boards temporarily to compacted fill and between each layer prior to installation of finish materials.

- .1 Install high density insulation boards having an appropriate minimum compressive strength where indicated on the Drawings.
- .2 Ensure compatibility between insulation boards and adhesives employed to adhere boards to fill or to themselves (multiple layer application).
- .2 Start installation from centre and work out towards edges of surface as dimensioned on the Drawings. Butt joints tightly. Offset transverse joints, placing board along dimension parallel to median line of surface to be covered.



- .3 Provide transition zone at each extremity of thermally insulated road sections to ensure a gradual transition of the fill's thermal properties. Reduce insulation thickness by 25 mm (1 in.) for each 5.0 m (16 ft.) of road length.
- .4 Retain insulation boards using backfill material or sufficient number of [wood] [steel] pegs to avoid displacement due to wind or flotation where water is present.
- .5 Where required by insulation manufacturer, temporarily maintain boards in place using an adhesive.
- .6 Wrap concrete or masonry work below or partially below grade (i.e. pylon foundations) to minimize frost adherence and reduce frost heave that may cause damaging distortions to the [steel] [concrete] [wood] structure.
- .7 Prohibit vehicular and heavy equipment traffic directly on insulation to avoid damage.
- .8 Do not enclose insulation until it has been inspected by [Consultant].

3.6 CLEANING

- .1 Protect finished Work in accordance with Section [01 76 00 – Protecting Installed Construction].
- .2 Remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION



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