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**Application: Walls and Slab on Grade**

**Disclaimer:** *This Manu-Spec (manufacturer specific proprietary specification) was prepared to assist the specifier in selecting the appropriate Fortefy Thermo insulation products and accelerate the process of drafting a specification that is specific to the project at hand. It is the responsibility of the specifier to draft a specification which is specific to a particular project and ensure the information contained therein is verified by the manufacturer as valid and accurate.*

**Note:** This Manu-Spec utilizes the Construction Specification Institute (CSI) and Construction Specifications Canada (CSC) Manual of Practice and the latest MasterFormat® published in April 2012. The Manu-Spec specifies Fortefy Thermo Insulation boards manufactured by FORTE EPS for use in walls above or below grade and slab on grade applications.

**Note:** Specifier notes are indicated in square brackets [ ] with **red** caption. Delete Specifier notes in final copy of the specification guide for the specific project.

**Note:** Optional notes are indicated in square brackets [ ] with **blue** caption. Delete optional notes in final copy of the specification guide for the specific project

## **1. General**

### **1.1 – Section Includes**

*[Specifier Note: The article below shall be edited to suite the project and the specific application for which the insulation boards are to be used]*

This section specifies rigid expanded polystyrene boards (EPS) for thermal insulation of walls including below grade (foundations), above grade, cavity wall and slab on grade.

### **1.2 – Related Sections**

*[Specifier Note: The article below shall be edited to suit the project by referring the reader to any other specification sections of work that are related to this section.]*

- 1) 03 30 00 – Cast in Place Concrete
- 2) 04 21 00 – Clay Unit Masonry
- 3) 04 22 00 – Concrete Unit Masonry
- 4) 07 10 00 – Damp proofing and Waterproofing
- 5) 07 12 00 – Built up Bituminous Waterproofing

- 6) 07 13 00 – Sheet Waterproofing
- 7) 07 14 00 – Fluid Applied Waterproofing
- 8) 31 23 00 – Excavation and Fill

### **1.3 – References**

*[Specifier Note: The article below shall be edited to retain a list of standards which are applicable to the project specifications. Full details of applicable standards shall be referenced including designation, number, date and description.]*

#### **1) Underwriter’s Laboratories of Canada (ULC)**

- a) CAN/ULC S701-11, standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering
- b) CAN/ULC S102.2-07, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials

#### **2) ASTM International**

- c) ASTM C578-12b, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
- d) ASTM E84-13a, Standard Test Method for Surface Burning Characteristics of Building Materials
- e) ASTM C518-10, Standard Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- a) ASTM E96-13, Standard Test Methods for Water Vapor Transmission of Materials
- f) ASTM D2126-09, Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging
- g) ASTM C203-05a(2012) Procedure B, Standard Test Method for Breaking Load and Flexural Properties of Block Type Thermal Insulation
- b) ASTM D2842-12, Standard Test Method for Water Absorption of Rigid Cellular Plastics
- h) ASTM D1621-10 Procedure A, Standard Test Method for Compressive Properties of Rigid Cellular Plastics
- i) ASTM D2863-13, Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle Like Combustion of Plastics
- j) ASTM C303-10, Standard Test Method for Dimensions and Density of Preformed Block and Board Type Thermal Insulation
- k) ASTM C165-07(2012), Standard Test Method for Measuring Compressive Properties of Thermal Insulations

- 1) ASTM C272/C272M-12, Standard Test Methods for Water Absorption of Core Materials for Sandwich Construction

**3) Canadian General Standards Board (CGSB)**

- a) CGSB 71-GP-24M, Adhesive, Flexible for Bonding Cellular Polystyrene Insulation
- b) CAN/CGSB-51.32-m77, Sheathing, Membrane, Breather Type.

## **1.4 - System Description**

Provide Fortefy Thermo semi-rigid expanded polystyrene boards installed as per FORTE's published recommendations to meet the design/performance requirements for the project

*[specify the design/performance requirements to be achieved by Fortefy Thermo rigid expanded polystyrene boards]*

## **1.5 - Submittals**

*[Specifier Note: The articles below shall be edited to include relevant documents to be provided by the contractor before, during or after construction in accordance with section 01 and the conditions of contract]*

- 1 – Manufacturer's qualification: Submit manufacturer's (FORTE EPS) proof of participation in a third party certification program to assure product conformance to the specified performance and physical properties in coordination with section 01 33 00 (submittal procedures) and 01 40 00 (quality requirements)
- 2 – Product Data: Submit manufacturer's (FORTE EPS) documents related to the product description, installation recommendations and specifications in accordance with section 01 33 00 (submittal procedures)
- 3 – Samples: Submit product samples with manufacturer's (FORTE EPS) label and specifications in accordance with section 01 33 00 (submittal procedures)
- 4 – Shop drawings: Submit contractor's shop drawings in accordance with section 01 33 00 (submittal procedures) indicating the fastener type, size and the orientation of installing the insulation boards

## **1.6 - Quality Assurance**

*[Specifier Note: The articles below shall be edited to include all quality assurance documents and procedures in accordance with section 01 40 00 – Quality Requirements]*

1 – Installer’s qualification: Installer shall submit records demonstrating at least *[3 years]* of experience installing similar products on projects of similar size and complexity

2 – Manufacturer’s quality assurance: Manufacturer (FORTE EPS) shall submit third party testing report and certification documents to assure manufactured products are in compliance

with *[CAN/ULC S701-11 or ASTM C578-12b]* *[specifier note: Only retain standards applicable to the project]*

## **1.7 - Pre-installation Meetings**

*[specifier Note: specify meeting requirements to comply with section 01 31 00 – Project Management and Coordination.]*

Pre-installation meetings shall be conducted at least *[one week]* before commencing work under this section or any other related sections to:

- Review project requirements
- Existing site conditions
- Review FORTE’s installation recommendations
- Coordinate the sequence of work with other trades

## **1.8 - Delivery Storage and Handling**

*[specifier note: Articles below shall be edited to include specific instructions for the delivery, storage and handling of the product all in accordance with sections 01 65 00 (product delivery requirements) and 01 66 00 (product storage and handling requirements)]*

1 – Review *[FORTE’s]* ordering process, lead times and delivery schedule to avoid construction delays

2 – Products to be delivered in bundles wrapped in plastic sheets complete with *[FORTE’s name]*, logo, product description, product number and applicable third party certification and listing information

3 – Comply with *[FORTE’s]* recommendations for handling products in order to avoid physical damage prior to installing the product

4 – Comply with *[FORTE’s]* recommendations for storing the product onsite prior to installation:

- a) Fortefy Thermo insulation boards shall be protected from continuous and elongated exposure to direct sunlight using a suitable material such as an opaque polyethylene film

- b) Fortefy Thermo insulation boards are combustible and should be kept away from all ignition sources such as open flame, sparks and electrostatic charges during any of its lifecycle phases (including shipping, handling, storage, installation and final application).
- c) The maximum service temperature limit for Fortefy Thermo insulation is 75 °C (165 °F). Exposure beyond this temperature will cause physical properties to change such as warping and shrinking
- d) Fortefy Thermo insulation boards shall be secured to avoid movement by severe weather conditions such as wind gusts or storms
- e) Fortefy Thermo insulation boards exposed to moist conditions shall be thoroughly dried or replaced with dry product prior to installation

### **1.9 - Waste Management and Disposal**

*[specifier note: The articles below shall be edited to inform the contractor on the environmentally responsible methods for disposing of waste in accordance with section 01 74 00 (Cleaning and Waste Management)]*

1 – Packaging material including polyethylene wrapping sheets and/or cardboard shall be placed in designated recycling containers at the job site. The waste packaging material may be later used for other work on the jobsite or transported to recycling facilities

2 – Polystyrene cut pieces and waste shall be placed in a separate container on the job site for later re-use on the job site or transported to a recycling facility.

### **1.10 - Warranty**

1 - Project Warranty: Refer to the project Conditions of Contract for warranty provisions

2 – Manufacturer’s Warranty: Submit for owner’s acceptance, FORTE’s standard warranty document executed by an authorized official for the insulation R-value of Fortefy Thermo Insulation Boards in accordance with CAN/ULC S701 or ASTM C578. Manufacturer’s warranty is in addition to and not a limitation of other rights owner may have under conditions of contract documents.

*[Specifier Note: Information below shall be coordinated with the official product warranty offered by FORTE]*

*[Warranty Period: 20 years]*

*[Warranty Commencement: Date of Manufacturing]*

## 2. Products

*[Specifier note: For additional information on Fortefy Thermo insulation boards not mentioned in article 2.1 below, please contact FORTE or visit [www.forteeps.com](http://www.forteeps.com)]*

### 2.1 – Product Description

- a) Fortefy Thermo insulation is a rigid insulation board made from molded expanded polystyrene. The raw beads used in the expansion and molding process contain pentane as the blowing agent typically within the range of 3% - 6% by weight.
- b) Fortefy Thermo insulation does not contain any Hydrofluorocarbon (HFC) or Hydrochlorofluorocarbon (HCFC) gases.
- c) Fortefy Thermo boards are rigid, lightweight, easy to handle and install and the material can be recycled at the end of its lifecycle.
- d) Fortefy Thermo boards provide a long term R-value and moisture resistance due to its closed cell structure.

### 2.2 - Manufacturer

FORTE EPS Solutions Inc.  
16567 Hwy 12, ON L4R 4K8  
Phone: 705-527-4220  
Toll free: 1-855-527-4220  
Website: [www.forteeps.com](http://www.forteeps.com)  
Email: [info@forteeps.com](mailto:info@forteeps.com)

### 2.3 - Material

*[Specifier note: The articles below shall be edited to specify the material type and thickness required for the specific project requirements]*

*[Specifier note: The article below shall be edited to retain the applicable standards for physical properties and surface burning characteristics of the insulation boards for the project]*

1 – Standards: Insulation boards tested for physical properties in accordance with CAN/ULC-S701-11 and surface burning characteristics in accordance with CAN/ULC-S102.2

2 – Standards: Insulation boards tested for physical properties in accordance with ASTM C578-12b and surface burning characteristics in accordance with ASTM E-84

3 – Thermal Resistance: [Specify the overall thermal resistance required for the project]

*[Specifier note: The articles below shall be edited to retain the material type(s) appropriate for the project requirements]*

4 – **Type 1** (CAN/ULC-S701 and CAN/ULC-S102.2): RSI 0.65 per 25mm (R-3.75 per inch)

a) Acceptable material: **Fortefy Thermo** Insulation board manufactured by FORTE EPS

5 – **Type 2** (CAN/ULC-S701 and CAN/ULC-S102.2): RSI 0.7 per 25mm (R-4.04 per inch)

a) Acceptable material: **Fortefy Thermo HD** Insulation board manufactured by FORTE EPS

6 - **Type 3** (CAN/ULC-S701 and CAN/ULC-S102.2): RSI 0.74 per 25mm (R-4.27 per inch)

a) Acceptable material: **Fortefy Thermo HDS20** Insulation board manufactured by FORTE EPS

7 - **Type I** (ASTM C578-12b and ASTM E-84): RSI 0.63 per 25mm (R-3.6 per inch)

a) Acceptable material: **Fortefy Thermo** Insulation board manufactured by FORTE EPS

8 – **Type II** (ASTM C578-12b and ASTM E-84): RSI 0.70 per 25mm (R-4.0per inch)

a) Acceptable material: **Fortefy Thermo HD** Insulation board manufactured by FORTE EPS

9 – Material Thickness: [----- mm][----- inch][as indicated]

10 – Edge finish: [Square] [Shiplap]

## **2.4 - Accessories**

### **1) Adhesives**

*[Specifier note: Adhesives must be recommended by the manufacturer as being compatible for use with expanded polystyrene foam insulation]*

Adhesive Type:[Specify adhesive name, type and manufacturer]

Standard: Adhesive is tested and approved to CGSB 71-GP-24M, Type [-----], class [-----], low VOC, suitable for use with expanded polystyrene foam insulation]

## **2) Fasteners**

*[Specifier note: the articles below shall be edited to retain the suitable method of fastening depending on the specific application for the project]*

a) Fastening to concrete/masonry/steel studs above or below grade: Use self tapping screws with minimum washer diameter of 25 mm (1 inch). Screws shall be long enough to penetrate minimum 25mm into the concrete/masonry/steel studs

a) Fastening to wood stud framing: Use screws or spiral nails or screws with minimum 25 mm diameter plastic washers. Nails or screws shall be sufficient in length to penetrate minimum of 25 mm (1 inch) into the wood stud framing.

## **3. Execution**

### **3.1 - Manufacturer's Instructions**

Comply with FORTE's instructions and recommendations for installing Fortefy Thermo insulation boards included in this specification guides as well as other technical brochures and bulletins.

### **3.2 - Examination**

*[Specifier note: The articles below shall be edited to specify any actions required to determine on site are at acceptable prior to installing Fortefy Thermo insulation boards]*

- 1) Inspect all substrates to which Fortefy Thermo insulation boards will be applied and ensure the same is clean with no dust on surfaces, smooth, dry, free of snow or ice and no protrusions.
- 2) Report to project consultant in writing should site conditions prove not suitable for EPS installation as mentioned in article 3.2.1

### **3.3 - Installation**

*[Specifier note: The articles below shall be edited to retain only those pertaining to the project application]*

#### **A) General**

- 1) Install Fortefy Thermo insulation boards with appropriate thickness to achieve the project required R-values as indicated in drawings.



- 2) Cut and fit Fortefy Thermo insulation boards tightly around projections, penetrations and openings.
- 3) Fortefy Thermo insulation boards shall be installed *[horizontally][vertically]* with vertical joints of the boards staggered in a running bond between each course. Butt edges and ends shall be placed tightly to adjacent boards
- 4) Fortefy Thermo insulation boards shall be secured to substrate using compatible adhesive as described in article 3.3.B below or fastened as described in article 3.3.C below.

**B) Securing with compatible adhesive**

*[Specifier note: Retain only one of the methods listed below depending on the project application. Coordinate the appropriate method with the recommendations of the adhesive manufacturer]*

- 1) Notched Trowel: Apply adhesive using a saw tooth notched trowel with 3 mm (1/8”) notches to the back of the EPS boards or substrate. Press the Fortefy Thermo insulation boards firmly into place with a sliding motion
- 2) Bead (caulking gun): Apply 6.5 mm (1/4”) diameter bead at 150 mm (6”) on centers each way to the back of the EPS insulation boards or substrate. Press the Fortefy Thermo insulation boards firmly into place with a sliding motion.
- 3) Gob: Apply walnut size gobs to the back of the EPS boards or substrate at 150 mm (6”) on center spacing each way. Gobs diameter when compressed should be roughly 25 to 50 mm (1 to 2 inch). Press the Fortefy Thermo insulation boards firmly into place with a sliding motion
- 4) Film: Apply the adhesive in a continuous thin film of *[-----] [mm][inch]* thickness at a rate of *[-----][m<sup>2</sup>/L][ft<sup>2</sup>/gal]* to the back of the EPS boards. Place Fortefy Thermo insulation boards firmly into place with a sliding motion.

**C) Securing with mechanical fasteners**

- 1) Secure Fortefy Thermo insulation boards *[vertically][horizontally]* to wood furring strips, steel channels, concrete or masonry using fasteners at 300 mm (12 inch) maximum on centers each way. Fastener types shall be as described in article 2.4.2 above.

**D) Cavity Walls:** Install Fortefy Thermo insulation boards on the exterior surface of interior wythe of cavity wall. Fit the EPS boards tightly around wall ties, openings and wall penetrations.

**E) Perimeter Foundation Wall:** Install Fortefy Thermo insulation boards on the exterior surface of foundation walls using adhesives as described in article 3.3.B or mechanical fasteners as described in article 3.3.C

**F) Slab on Grade:** Install Fortefy Thermo insulation boards over compacted grade fill with vapor retarder and under concrete slab on grade

### **3.4 - Field Quality Control**

*[Specifier note: The articles below shall be edited to retain only those required for the project as per the conditions of contract]*

- 1) Site Visits: *[Specify the purpose, number and schedule of site visits required by FORTE's field representative]*
- 2) Field Reports: *[Specify the format, content and frequency of field reports to be submitted by FORTE's field representative following a site visit]*

### **3.5 - Cleaning**

Remove and dispose of trash and debris resulting from the work under this section in a legal manner and as per the conditions of contract.

### **3.6 - Protection**

Protect installation from damage due to subsequent construction work on site.