

This section includes a manufacturer's guide specification for TERRAFOAM™ HS-40 EPS for below grade, at grade, and above grade foam board insulation applications. The insulation thickness and the differing substrate materials and means of attachment need to be identified or referenced to another section. A vapour barrier and/or an air barrier may be required to be used with this insulation material. For below grade work, a gas barrier (such as for radon or methane) may be required with this insulation material.

Refer also to Beaver Plastics' Product Description for detailed product properties, options, and other technical information. This section includes performance, proprietary, and descriptive type specifications; edit to avoid conflicting requirements.

Part 1 General

1.1 SECTION INCLUDES

In this article, select the components that are intended to be part of the content of this section and will not be included in other sections. This section does NOT include the method of attachment due to the wide variety of substrate support types that may apply. Keep the statements brief and concise. Select one or more of the following application options.

- .1 High density foam board insulation for [above grade,] [at grade,] below grade,] [_____] applications.

1.2 RELATED SECTIONS

In the following paragraphs edit into the Related Section listings, the structural substrates that the insulation will be applied to and apply to this project. There are many substrate materials that may associate with this insulation type - identify them below.

- .1 Section [_____ - _____]: Preparation of adjacent work to receive work of this Section.
- .2 [Section 03 30 00 - Cast-in-Place Concrete: Substrate foundation walls, grade beams, concrete slabs.]
- .3 [Section 04 22 00 - Concrete Unit Masonry: Wall substrate.]
- .4 [Section 09 21 16 - Gypsum Board: Wall substrate.]
- .5 [Section 32 12 00 - Asphalt Paving: Under pavement insulation.]
- .6 [Section 32 13 00 - Concrete Paving: Under pavement insulation.]

1.3 REFERENCES

List reference standards that are included within the text of this section. Edit the following as required to parallel any reference standards statements within this section. Acronyms used for well known standards (first example) and defined text for less or named standards (second example).

- .1 ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
- .2 ASTM C578 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.

- .3 ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
- .4 ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics.
- .5 ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials
- .6 CAN/ULC-S701 – Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.4 SUBMITTALS

Do not request submittals if drawings sufficiently describe the products of this section or if proprietary specifying techniques are used. The review of submittals increases the possibility of unintended variations to drawings, thereby increasing the Specifier's liability. The following submittals are intended for review and acceptability.

- .1 Section [01300] [01 33 00]: Submission procedures.
- .2 Product Data: Provide data on product characteristics, performance criteria, limitations, [and] [_____].

When manufacturer's instructions for specific installation requirements are referenced in PART 3 Execution include the following request for submittal of those instructions. Edit the PART 3 statements to avoid conflict with manufacturer's instructions.

- .3 Manufacturer's Installation Instructions: Indicate special environmental conditions required for installation, installation techniques, [and] [_____].
- .4 Manufacturer's Certificate: Certify that [products] [_____] meet or exceed [specified requirements.] [_____].

Include the following paragraphs for LEED projects, and edit as applicable

- .5 Sustainable Design Submittals:
 - .1 Section [01 35 18]: LEED documentation procedures.
 - .2 Provide required LEED documentation for Product [recycled content] [regional materials] [low-emitting materials].

1.5 QUALITY ASSURANCE

- .1 Manufacturer: ISO 9001:2000 registered company.
- .2 Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed [at the place where the Project is located.] [in the Province of [_____].]

1.6 DELIVERY, STORAGE, AND PROTECTION

- .1 Section [01600] [01 61 00]: Transport, handle, store, and protect products.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

- .3 Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- .4 Store materials off ground, protected from direct sunlight.
- .5 Protect Products from exposure to harmful weather conditions. Store at temperature and humidity conditions recommended by manufacturer.
- .6 Remove damaged or deteriorated Products from site.

1.7 ENVIRONMENTAL REQUIREMENTS

- .1 Section [01600] [01 61 00]: Environmental conditions affecting products on site.
- .2 Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

1.8 SPECIAL WARRANTY

This article extends the contract warranty period beyond one year.

- .1 Section [01700] [01 78 00]: Warranties.
- .2 Provide a [five (5)] [____] year warranty to include coverage for failure to meet specified requirements.

Part 2 Products

2.1 MANUFACTURERS:

- .1 Beaver Plastics, model "TERRAFOAM™ HS-40".
7-26318-TWP RD 531A
Acheson, Alberta, Canada T7X 5A3

Phone 1-780-962-4433 (International)
Toll free: 1-888-453-5961 (U.S. and Canada)
Fax 1- 1 780 962 4640
Internet web site: <http://www.beaverplastics.com>
E-mail: techsupport@beaverplastics.com
- .2 Substitutions: [Refer to Section [01600] [01 25 00].] [Not permitted.] [Refer to Instructions to Bidders.]

2.2 INSULATION MATERIALS

- .1 Moulded Polystyrene High Density Insulation: [ASTM C578 Type XIV,] [CAN/ULC-S701 Type 2,] polystyrene board with the following characteristics:
 - .1 Board Size: [__x__] mm ([__x__] inches).
 - .2 Board Thickness: [____] mm ([____] inches).
 - .3 Thermal Resistance: Minimum RSI-5 (R-0.87) at 10 deg C, to ASTM C578.

- .4 Water Absorption: In accordance with ASTM D2842, 1% percent by volume maximum.
- .5 Compressive Strength: Minimum 276 kPa (40 psi).
- .6 Board Edges: [Square] [Shiplap] edges.

2.3 ADHESIVE MATERIALS

If one or more adhesive type is used, schedule by type and indicate type on Drawings, or schedule at end of this section. Confirm compatibility of adhesive material with insulation to be used.

- .1 Adhesive [Type 1]: Type recommended by insulation manufacturer for application on this project.
- .2 Adhesive [Type 2]: Vapour retarder type, trowel consistency; [fire retardant] compatible with insulation and substrate, conforming to the following:
 - .1 Initial Set: [____] hours.
 - .2 Cured Full Set: [____] hours at <[____] degrees C> <<[____] degrees F>>.
 - .3 Moisture Vapour Permeance: [____] perms measured in accordance with ASTM E96/E96M, Method E.
 - .4 Bond Strength: <[____] N> <<[____] lbs>>.
 - .5 Service Temperature: <[____] to [____] degrees C> <<[____] to [____] degrees F>> at contact surfaces.

Part 3 Execution

3.1 EXAMINATION

- .1 Section [01 71 00] [01700]: Verify site conditions.
- .2 Verify that substrate, adjacent materials, and insulation boards are dry and ready to receive insulation.

Select one or more of the following installation or application articles to address project particulars. Select only the appropriate applications for high density insulation; coordinate with related substrates and attachment methods.

3.2 INSTALLATION - GENERAL

- .1 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .2 Offset both vertical and horizontal joints in multiple layer applications.

3.3 INSTALLATION - FOUNDATION PERIMETER

- .1 Install boards on foundation [wall] [grade beam] [_____] perimeter, [vertically] [horizontally].
 - .1 Place boards in a method to maximize contact bedding.
 - .2 Stagger [side] [end] joints.

- .2 Extend boards over [control] [expansion] [_____] joints, unbonded to foundation [_____] mm ([_____] inches) on one side of joint.
- .3 Cut and fit insulation tight to protrusions or interruptions to the insulation plane.
- .4 Immediately following application of board insulation, place protective boards over exposed insulation surfaces, [apply Type [_____] adhesive in [five (5)] [_____] continuous beads per board length].
 - .1 Install boards [horizontally] [vertically] from [base of foundation] [_____] to [top of insulation] [_____].
 - .2 Butt board joints tight; stagger from insulation joints.

3.4 INSTALLATION – CRAWLSPACE

- .1 Install insulation to inside face of foundation wall in crawl space area using approved [adhesive] [impaling pins] [furring strips spaced 610 mm (24 inches) on centre maximum].

3.5 INSTALLATION - UNDER CONCRETE SLABS

- .1 Place insulation under slabs on grade after base before slab has been compacted [and vapour barrier installed].
- .2 Cut and fit insulation tight to protrusions or interruptions to the insulation plane.
- .3 Prevent insulation from being displaced or damaged while [placing vapour retarder and] placing slab.
- .4 Extend boards [_____] mm ([_____] inches) in from perimeter foundation wall [as indicated].

3.6 INSTALLATION - UNDER PAVEMENT

- .1 Place insulation over base course before compaction.
- .2 Cut and fit insulation tight to protrusions or interruptions to the insulation plane.
- .3 Extend boards [_____] mm ([_____] inches) in from perimeter edges [as indicated].
- .4 Prevent insulation from being displaced or damaged until pavement is installed.

3.7 INSTALLATION - EXTERIOR WALLS

Use the following where insulation occurs behind cement plaster, a synthetic surfacing, metal siding, or other finishing material. Minor editing can identify application to soffit surfaces and interior applications.

- .1 Adhere a <[_____] mm> <<[_____] inch>> wide strip of [polyethylene] [_____] sheet over [_____] joint with [double] [_____] beads of Type [_____] adhesive each side of joint.
 - .1 Tape seal joints between sheets.
 - .2 Extend sheet [full height of joint.] [_____].

- .2 Apply Type [____] adhesive [in [three (3)] [____] continuous beads per board length] [to full bed <[3] [____] mm> <<[1/8] [____] inch>> thick]. Daub adhesive tight to protrusions.
- .3 Install boards on [wall surface] [____], [vertically] [horizontally]. [Place [____] membrane surface of insulation against adhesive.]
- .4 Place boards in a method to maximize contact bedding. Stagger end joints. Butt edges and ends tight to adjacent board and to protrusions.
- .5 Cut and fit insulation tight to protrusions or interruptions to the insulation plane.

Coordinate the following paragraphs with Section 07 26 00 - Vapour Retarders.

- .6 Place <[____] mm> <<[____] inch>> wide [polyethylene] [____] sheet at perimeter of wall openings, from adhesive vapour retarder bed to [window] [door] [____] frame. Tape seal in place to ensure continuity of vapour retarder and air seal.
- .7 [Tape insulation board joints.]

3.8 INSTALLATION - CAVITY WALLS

Utilize this article where rigid insulation occurs in cavity walls, placed on outer surface of inner masonry wythe or other substrate. Ensure insulation board is sized to suit spacing of through wall reinforcement. The use of impale fasteners will improve positioning and bond of insulation. If another mechanical method of fastening insulation is employed, edit the following paragraphs accordingly.

- .1 Secure impale fasteners to substrate at a frequency of [[six (6)] [____] per insulation board] [[____] per <3 sq m> <<10 sq ft>>].
- .2 Adhere a <[____] mm> <<[____] inch>> wide strip of polyethylene sheet over [control] [____] joint with [double] [____] beads of Type [____] adhesive each side of joint between sheets. Extend sheet [full height of joint] [____].
- .3 Apply Type [____] adhesive [in [three (3)] [____] continuous beads per board length] [to full bed <[3] [____] mm> <<[1/8] [____] inch>> thick on substrate]. [Daub adhesive tight to protrusions to ensure continuity of vapour retarder and air seal.]
- .4 Install boards [horizontally between wall reinforcement] [vertically] [____].

On full bed adhesive, place membrane faced boards against adhesive. On bead adhesive, boards may be placed with membrane facing out to permit joint taping.

- .5 [Place membrane surface against adhesive.] [Place membrane surface facing out, [butter with adhesive] [tape seal] board joints.]
- .6 Place boards in a method to maximize contact bedding. Stagger [side] [end] joints. Butt edges and ends tight to adjacent board and no protrusions. [Place impale fastener locking discs].
- .7 Cut and fit insulation tight to protrusions or interruptions to the insulation plane.

Coordinate the following paragraphs with Section 07 26 00 - Vapour Retarders.

- .8 Place <[____] mm> <<[____] inch>> wide [polyethylene] [_____] sheet at perimeter of wall openings, from adhesive vapour retarder bed to [window] [door] [_____] frame. Tape seal in place to ensure continuity of vapour retarder and air seal.

3.9 PROTECTION OF FINISHED WORK

- .1 Section [01700] [01 45 00]: Protect finished Work.
- .2 Do not permit work to be damaged prior to covering insulation.

END OF SECTION