

**SECTION 07 21 13
BOARD INSULATION**

HALO SUBTERRA

[NOTE TO USERS: *This document has been prepared for the Halo Subterra sheathing products and has been prepared in accordance with the Construction Specifications Institute (CSI) Section Format 2004. The main intention of this document is to aid the Contractor/Installing Contractor in developing CSI specifications of Halo Subterra for use in combination with specific project specification manuals, which follow CSI formatting, as part of the overall project scope of work.*

This document is a template and where appropriate, may require modifications to suit specific projects.

Italicized text enclosed in parenthesis, [], are intended for the user of this document to aid in determining where modifications may be required.]

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

[This section may be modified to suit specific project details]

1. Rigid board perimeter insulation
2. Rigid board under-slab insulation

B. Related Sections:

[This section may be modified to suit specific project details]

1. 072600 – Weather Barriers: insulation provided as vapor barrier
2. 072700 – Air Barriers: insulation provided as an air barrier and air sealant materials

C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to all work of this Section.

1.2 REFERENCES

[This section may be modified to suit specific project details]

A. American Society for Testing and Materials (ASTM)

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.

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5. ASTM D844 – Standard Test Method for Surface Burning Characteristics of Building Materials.
 6. ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials.
 7. ASTM D1622 – Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 8. ASTM C203 – Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation
 9. ASTM C303 – Standard Test Method for Dimensions and Density of Preformed Block and Board-Type Thermal Insulation
 10. ASTM D2863 – Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)
 11. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
- B. AC 71 Acceptance Criteria For Foam Plastic Sheathing Panels Used As Water-Resistive Barriers
- 12.
- C. Underwriters Laboratories of Canada
1. CAN/ULC-S701 – Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 2. CAN/ULC S102.2 - Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies

1.3 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]

- A. Submit manufacturer's product literature and installation instructions under provisions of Section 013300.
- B. Product Data: Submit product data for each type of insulation and accessories proposed for the work.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Section 016600: Product Storage and Handling Requirements
- B. Store materials off ground and protect against sunlight, wind, moisture and accidental ignition.
- C. Deliver, store and handle materials in accordance with manufacturer's instructions.
- D. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- E. Remove damaged or deteriorated products from site.

1.5 PROJECT/SITE CONDITIONS

- A. Section 016100: Common Product Requirements.
- B. Do not install insulation adhesives and sealants when temperature or weather conditions are detrimental to successful installation.

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PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Beaver Plastics Ltd, 7-26318-TWP RD 531A, Acheson, AB, Canada, T7X 5A3, 1-888-453-5361
- B. AMC Foam Technologies, 35 Headingley St, Headingley, MB, Canada, R4H 0A8, 204-633-8800
- C. Form Solutions, 840 Division St, Cobourg, ON, Canada, K9A 5V2, 1-888-706-7709
- D. Perma R Products Inc., 2604 Sunset Drive, Grenada, MS, 38901, 1-800-647-6130
- E. Progressive Foam Technologies Inc., 6753 Chestnut Ridge Rd., Beach City, OH, 44608, 1-800-860-3626

2.2 EXISTING PRODUCTS

[This section may be modified to suit specific project details]

- A. *[Exterior foundation perimeter, and below-slab insulation]*
 - 1. Subterra 16
 - a. Standard: ASTM C578, Type II EPS, CAN ULC/S701, Type 2 EPS
 - b. Thermal Resistance: Minimum R per nominal inch of 5.0 (actual thickness = 1.1") when tested in accordance with ASTM C518 at 75 degrees F. mean temperature.
 - c. Compressive Strength at 1" thickness: Minimum 16 psi *[110 kPa under CAN/ULC S701]* when tested to ASTM D1621
 - d. Flexural Strength at 1" thickness: 70 psi (483 kPa) per ASTM C203.
 - e. Water Absorption: Maximum 1.1% *[1.1% under CAN/ULC S701]*
 - f. Water Vapor Permeance at 1" thickness: <1.0 perms *[<57 ng/Pa-s-m²]*
 - g. *Standing Water Test per AC 71*
 - 2. Subterra 20
 - a. Standard: CAN ULC/S701, Type 3 EPS
 - b. Thermal Resistance: Minimum R per nominal inch of 5.0 (actual thickness = 1.1") when tested in accordance with ASTM C518 at 75 degrees F. mean temperature.
 - c. Compressive Strength at 1" thickness: Minimum 20 psi *[140 kPa under CAN/ULC S701]* when tested to ASTM D1621
 - d. Flexural Strength at 1" thickness: 70 psi (483 kPa) per ASTM C203.
 - e. Water Absorption: Maximum 1.1% *[1.1% under CAN/ULC S701]*
 - f. Water Vapor Permeance at 1" thickness: <1.0 perms *[<57 ng/Pa-s-m²]*
 - g. *Standing Water Test per AC 71*
 - 3. Subterra 25
 - a. Standard: ASTM C578, Type IX EPS
 - b. Thermal Resistance: Minimum R per nominal inch of 5.0 (actual thickness = 1.1") when tested in accordance with ASTM C518 at 75 degrees F. mean temperature.
 - c. Compressive Strength at 1" thickness: Minimum 25 psi when tested to ASTM D1621
 - d. Flexural Strength at 1" thickness: 70 psi (483 kPa) per ASTM C203.
 - e. Water Absorption: Maximum 1.1% *[1.1% under CAN/ULC S701]*
 - f. Water Vapor Permeance at 1" thickness: <1.0 perms *[<57 ng/Pa-s-m²]*
 - g. *Standing Water Test per AC 71*
 - 4. Subterra 30

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- a. Standard: ASTM C578, Type IX EPS, CAN ULC/S701, Type 3 EPS
 - b. Thermal Resistance: Minimum R per nominal inch of 5.0 (actual thickness = 1.06") when tested in accordance with ASTM C518 at 75 degrees F. mean temperature.
 - c. Compressive Strength: Minimum 30 psi [210 kPa under CAN/ULC S701] when tested to ASTM D1621
 - d. Flexural Strength at 1" thickness: 70 psi (483 kPa) per ASTM C203.
 - e. Water Absorption: Maximum 1.1%
 - f. Water Vapor Permeance at 1" thickness: <1.0 perms [*<57 ng/Pa-s-m²*]
 - g. *Standing Water Test per AC 71*

2.3 MATERIALS

[This section may be modified to suit specific project details]

- A. Block molded expanded polystyrene (EPS) made of BASF Neopor Plus beads
- B. Woven polypropylene fabric: for use with Subterra 16 and Subterra 30.

2.4 MANUFACTURED UNITS

- A. Board size: 4 ft x 8 ft
- B. Board thickness: *[This section may be modified to suit specific project details]*
[Subterra 16 and Subterra 30]: 1.0 in [25 mm], 1.5 in [38 mm], 2.0 in [51 mm] [or as required]

2.5 ACCESSORIES

- A. Adhesives:
[This section may be modified to suit specific project details]
 - 1. Type recommended by insulation manufacturer for application.
 - 2. Gun grade, mastic type, compatible with insulation and substrate.
 - 3. Tape: Blue Tuck Tape, 3M air and vapor barrier flashing membrane, Blueskin permeable flashing tape.
 - 4. Insulation fasteners: Impaling clip of *[unfinished, galvanized steel, plastic or nylon]* with washer retainer *[and clips]* to be *[adhered][mechanically fastened]* to surface to receive board insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
 - 5. Protective boards: *[Cementitious][Wood fiberboard][cladding per job specific]*

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3.0 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate, adjacent materials are dry and ready to receive insulation *[and adhesive]*.
- B. Verify substrate surface is flat, free of *[honeycomb,] [fins,] [irregularities,] [materials or substances that may impede adhesive bond]*.

3.2 RIGID BOARD PERIMETER INSULATION BELOW-GRADE

[This section may be modified to suit specific project details]

- A. *[Subterra 16 or Subterra 30 for exterior insulation]*
- B. *[Coordinate with Section 31 20 00 for installation of Subterra 16 or Subterra 30]*
- C. Follow Halo recommended installation instructions.
- D. Minimum vertical height: as detailed.

3.3 BELOW-SLAB INSULATION

[This section may be modified to suit specific project details]

- A. Use Subterra 16 or Subterra 30.
- B. Ensure that granular sub base is properly leveled to ensure uniform contact with insulation boards.
- C. Follow Halo recommended installation instructions.

3.4 WORKMANSHIP

[This section may be modified to suit specific project details]

- A. Install insulation to maintain continuity of thermal protection to building elements and spaces.
- B. Keep insulation minimum *[75 mm][3 inches]* from heat emitting devices such as recessed light fixtures, and minimum *[50 mm] [2 inches]* from *[sidewalls of CAN4-S604 type A chimneys] [and] [CAN/CGA-B149.1 and CAN/CGA-B149.2 [type B] [and] [L] vents]*.
- C. 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.
- D. Offset both vertical and horizontal joints in multiple layer applications.

END OF SECTION