

Product Name

TERRAFOAM® SUBTERRA PROTECTION BOARD and RADON BARRIER

Associated Specification Section

Master Format 2011 # 07 21 13

Manufacturer's Name

Beaver Thermal Solutions Inc.

March 1, 2020

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PRODUCT DESCRIPTION

PRODUCT FEATURES**DESCRIPTION**

Closed cell high density expanded polystyrene (HDEPS) insulation with two layers of high strength poly-woven laminate suitable for high load compressive strength applications.

USES**Geotechnical, void form protection layer, Radon Barrier and other below grade applications:**

- Void form protection layer.
- Radon Barrier for commercial and residential below slab applications.
- Air and vapour barrier for commercial and residential below slab applications.
- Perimeter, grade beam and under slab insulation and protection board.
- Airport runways, taxiways, and aprons.
- Large earth structures, ramps, and beams.
- Isolating bearing pads under heavy process equipment and industrial traffic.
- Frost protected shallow foundations.
- Ice arena and snow melt systems.

PRODUCT ATTRIBUTES AND CHARACTERISTICS

- High Radon gas resistance (per NRC test report A1-016250)
- Excellent puncture resistance and extreme flex durability.
- Low moisture absorption properties.
- Provides vapour barrier protection when seams are taped.
- Light weight and easy to cut.
- Contains no CFCs, HCFCs, or other refrigerant gases.
- Biologically inert. Will not support mold, mildew or fungus growth. Not a food source for pests.
- Contains a chemical additive to inhibit accidental ignition from a small fire source.
- Non-toxic and hypo-allergenic. Does not off-gas.
- The insulation value (R-Value) increase as temperature decreases. Does not lose insulation value over time.

SELECTION CRITERIA

- Suitable for cold climate applications.

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PRODUCT DESCRIPTION

- Available in standard board sizes, in thickness up to 100 mm (4 inches).
- Available in flat sheet form.

SUSTAINABILITY CRITERIA

- Contains recycled content and can contribute to LEED Material and Resources Credit 4 – Recycled Content.
- Manufactured in Edmonton and Vancouver, Canada and may contribute to LEED Material and Resources Credit 5 – Regional Materials.
- Contains no CFC or HCFC gasses; does not contribute to ozone depletion.
- Non-toxic; does not irritate skin on exposure.
- Biologically inert and will not support mould, mildew or fungus growth or pests.

APPLICABLE STANDARDS, RELATED REFERENCES

- ASTM C578 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
- ASTM D1621 – Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
- ASTM D1622 – Standard Test Method for Apparent Density of Rigid Cellular Plastics.
- ASTM D2842 – Standard Test Method for Water Absorption of Rigid Cellular Plastics.
- ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials.
- CAN/ULC-S701 – Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
- ASTM C203 – Standard Test Method for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.
- ASTM C303 - Standard Test Method for Dimensions and Density of Preformed Block and Board Type Thermal Insulation



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PRODUCT DESCRIPTION

- National Research Council of Canada Radon Diffusion Test

QUALITY STATEMENT, TESTS, CERTIFICATIONS, AND APPROVALS

Performance tests certified by Intertek Testing Services Ltd.

PACKAGING, HANDLING, PROTECTION, AND DELIVERY INSTRUCTIONS

Panels must be protected from damage during transit.

Panels must be protected from UV degradation during storage and after erection.

Do not expose to volatile hydrocarbons, such as fuel oils, gasoline, and alcohols.

LIMITATIONS

Degrades with lengthy exposure to ultra-violet rays.

Product will burn when exposed to large continuous flame.

Anhydrous acids may attack expanded polystyrene.

SAFETY PRECAUTIONS

Normal fire precautions and good housekeeping methods must be followed during storage and application.

AVAILABILITY

Available direct from Beaver Thermal Solutions' or appointed distributors.

COST

Varies with thickness and configuration, and relative size of building.

Consult manufacturer for specific product costs or relative costs.

PRODUCT PROPERTIES

Technical Properties

Rigid, closed cell, high strength expanded polystyrene (EPS) board with two layers of poly-woven laminate, to ASTM C578 Type IX, and exceeds CAN/ULC S701 Type 3.

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Table 3. Radon diffusion test results

Product	Radon Diffusion Coefficient D (m ² ·s ⁻¹)	Radon Diffusion Length (m)	Radon Resistance R _{Rn} * (s·m ⁻¹)	Radon in Receiving/Radon in Dosing Cr/Cd	R _{Rn} /R _{Rn6mil}
6 mil polyethylene membrane	8.05E-12	1.96E-03	1.90E+07	11.79%	1.00
Subterra Protection Board with Tuck Tape	1.34E-10	8.00E-03	1.39E+08	3.13%	7.31

* Since 6 mil polyethylene membrane is almost two orders of magnitude thinner than Subterra Protection Board, the NRC project team considers radon resistance a more appropriate radon prevention performance indicator compared to radon diffusion coefficient. As previously mentioned, materials with a higher radon resistance are considered less permeable to radon and therefore can prevent or reduce radon ingress more effectively.

*Subterra Protection Board meets the above radon resistance at => 10 PSI compressive strength.

PHYSICAL PROPERTY	METRIC	IMPERIAL
Compressive Strength at 10% def. (ASTM D1621)	210 kpa (min)**	30 psi (min)**
Thermal Resistance (ASTM C578)	RSI .75 @ 24°C	R 4.3 @ 75°F
	RSI .88 @ -10°C	R 5 @ 15°F
Flexural Strength	370 kpa (min)	56 psi (min)
Water Vapour Permeance (ASTM E96)	2.5 ng/Pa.s.m ² (max)	0.04 perm (max)
Water Absorption (ASTM D2842)	1% maximum	1% maximum
Dimensional Stability	1% maximum	1% maximum

** Subterra Protection Board is available in additional compressive strength values



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PRODUCT DESCRIPTION

ACCESSORIES

Adhesives and/or insulation fasteners.

DIMENSIONS

Thickness: Any thickness up to 100 mm (4 inches).

1220 x 2440 mm (4' x 8') panels.

Profiles: Square edges.

PRODUCT PLACEMENT

PREPARATION

Surfaces must be dry and ready to receive insulation.

INSTALLATION

Install products in accordance with the manufacturer's instructions for each specific application.

Seams must be taped for vapour barrier performance.

MAINTENANCE INSTRUCTIONS AND PROCEDURES

Product should not be exposed to volatile hydrocarbons and anhydrous acids, which may attack the expanded polystyrene.

Corporate Identification

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PRODUCT DESCRIPTION

Technical Services Available

Phone toll free or e-mail

Classification and Filing

Omni Class Table 23 - Products

23-20 50 24 11 11 11 Expanded Polystyrene Slab and Board Thermal Insulation

Master Format 2011:

07 21 13 – Board Insulation

Master Format 1995:

07212 – Board Insulation

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