

# HALO® SUBTERRA® PROTECTION BOARD

## MATERIAL PROPERTY DATA SHEET

GPS Insulation

### PRODUCT NAME

Halo® Subterra® Protection Board - The Advanced Below-Grade Rigid Insulation.

### MANUFACTURER

- Beaver Plastics Ltd., 7-26318-TWP RD 531A, Acheson, Alberta, T7X 5A3 888-453-5961
- AMC Foam Technologies Inc., 35 Headingley St., Headingley Manitoba, R4H 0A8, 877-789-7622
- Form Solutions P.O. Box 358 Port Hope, ON, L1A 3W3 888-706-7709
- Form Systems, Inc. 330 Cain Drive, Haysville, Kansas 67060 1-888.838.5038
- Perma R Products Inc. 2604 Sunset Dr. Grenada, MS, 38901 800-647-6130
- Perma R Products Inc. 106 Perma R Rd. Johnson City, TN, 37604 800-647-6130
- Progressive Foam Technologies 1 Southern Gateway Dr. Gnadenhutten, OH, 44629 800-860-3626

### PRODUCT DESCRIPTION

Rigid foam insulation made from GPS (graphite infused expanded polystyrene).

Coated with a polypropylene woven fabric on both sides.

Provides a minimum compressive strength of 16 and 25 psi (Subterra Protection Board 16 and Subterra Protection Board 25, respectively).

Confirm availability of various Subterra Protection Board products with your local Halo representative.

### BASIC USE

Suitable for use in residential, multi-residential, commercial, and industrial buildings for below-slab applications providing the

- air and vapor barrier,
- radon barrier,
- void form protection,
- and continuous insulation.

Provides more than 7 times higher radon resistance than 6 mil polyethylene membranes.

The tough woven fabric laminate makes Subterra Protection Board strong and durable against repeated loading conditions, such as construction traffic.

### STANDARDS

- ASTM C578 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- ASTM C518 – Standard Test Method for Steady-state Thermal Transmission Properties by Means of the Heat Flow Meter 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.
- ASTM C203 – Standard Test Methods 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.
- ASTM D2863 – Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index).
- CAN/ULC-S701 – Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
- CAN/ULC S102.2 - Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.
- AC 71, Acceptance Criteria for Foam Plastic Sheathing Panels Used as Weather Resistive Barriers.
- National Research Council of Canada Radon Diffusion Test

### CODE EVALUATION APPROVALS

- CCMC 14004-L
- QAI Listing B1031-2

### PHYSICAL PROPERTIES

Conforms to the physical properties shown in Tables 1 through 4.

### ENVIRONMENTAL DATA

Produced without the use of chlorofluorocarbon (CFCs), hydrochlorofluorocarbon (HCFCs) or formaldehyde. As a result, will not produce harmful emissions to the environment.

BASF Neopor Plus is recognized as a product that produces low chemical emissions by the Greenguard Environment Institute – Neopor Plus is Greenguard Indoor Air Quality Certified® and Greenguard Children & Schools<sup>SM</sup> Certified product.

### FIRE INFORMATION

Made of combustible materials and may need to be protected from high heat sources. In addition, a thermal barrier may be required when used in the interior of a building. Refer to your local building codes for appropriate protection and thermal barrier requirements.

### INSTALLATION

Halo Subterra Protection Board products are light weight, which makes them easy to handle, cut, and install.

For detailed installation instructions refer to the Halo Subterra Protection Board Installation Guide.

### PRODUCT SIZES

Available in 4ft x 8ft sheets, 5/8", 1", 1.5" and 2" thick. Custom sizes are available. Contact your local Halo representative for more information.



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**Table 1: Thermal Insulation<sup>1</sup>**

Product <sup>2</sup>	R-value @ 75°F (RSI @ 24°C) <sup>2</sup>	R-value @ 40°F (RSI @ 4.4°C) <sup>2</sup>
Subterra Protection Board *Applies to all Subterra Protection Board products.	5 (0.88)	5.2 (0.92)

- In accordance with ASTM C578, "Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation", and CAN/ULC S701, "Standard For Thermal Insulation, Polystyrene, Boards and Pipe Covering", at 75°F (24°C), and at 40°F (4.4°C) from data provided by BASF. GPS R-value increases with decreasing temperatures.
- At 1" nominal thickness (actual thickness = 1.06").

**Table 2: Material Properties**

ASTM C578 <sup>1</sup>	Subterra Protection Board 16	Subterra Protection Board 25
EPS Type	II	IX
Compressive Resistance at 10% def., Min., psi (ASTM 1621)	16	25
Flexural Resistance Min., psi (ASTM C203)	70 <sup>2</sup>	70 <sup>2</sup>
Water Vapor Permeance Max., perms (ASTM E96)	0.04 <sup>2</sup>	0.04 <sup>2</sup>
Water Absorption Max., % (ASTM C272)	1.1	1.1
Dimensional Stability Max., % (ASTM D2126)	2.0	2.0
Oxygen Index Min., % (ASTM D2863)	24	24

  

CAN/ULC S701 <sup>1</sup>	Subterra Protection Board 16	Subterra Protection Board 25
EPS Type	2	3
Compressive Resistance at 10% def., Min., kPa (ASTM D1621)	110	172
Flexural Resistance Min., kPa (ASTM C203)	483 <sup>2</sup>	483 <sup>2</sup>
Water Vapor Permeance Max., ng/Pa-s-m <sup>2</sup> (ASTM E96)	2.1 <sup>2</sup>	2.1 <sup>2</sup>
Water Absorption Max., % (ASTM C272)	1.1	1.1
Dimensional Stability Max., % (ASTM D2126)	1.5	1.5
Oxygen Index Min., % (ASTM D2863)	24	24

**NOTES:**

- Unless noted otherwise, properties are based on 1" thickness without laminate by data provided by BASF.
- Based on independent testing conducted by QAI with laminate and 1" thick GPS.
- Confirm availability of various Subterra products with your local Halo representative. Subterra is also available in greater compressive strengths. Contact your local Halo representative for available compressive strengths.

**Table 3: Surface Burning Characteristics**

	Flame Spread Index Max.	Smoke Developed Index Max.	Thickness Max.	Density
ASTM E84	5	25	5 in.	2 pcf
CAN/ULC S102.2	230	500	102 mm	32 kg/m <sup>3</sup>

**Table 4: Additional Properties**

	Results
Water Resistance: Hydrostatic Pressure Test, per AATCC Test Method 127, and ICC ES AC71	Passed. No water leakage was observed at the underside of the Subterra boards.
Radon Resistance, per The NRC Radon Diffusion Test Chamber <sup>1</sup>	More than 7 times higher radon resistance than 6mil polyethylene membranes. Radon Resistance: Subterra Protection Board: 1.39x10 <sup>8</sup> s/m at 1/2" thickness 6 mil polyethylene vapor barrier: 1.90x10 <sup>7</sup> s/m
ASTM E2178/ULC S741, Air Permeance of Building Materials.	Air leakage at taped joints: 0.0035 L/(s-m <sup>2</sup> )

- Since 6 mil polyethylene membrane is almost two orders of magnitude thinner than then tested 1/2" thick Subterra Protection Board, the NRC project team considers Rn resistance a more appropriate Rn prevention performance indicator compared to Rn diffusion coefficient. As previously mentioned, materials with a higher Rn resistance are considered less permeable to Rn and therefore can prevent or reduce Rn ingress more effectively.

