

HEAT-SHEET® RADON REMOVER - MATERIAL PROPERTY DATA SHEET

Rev.

PRODUCT NAME

Heat-Sheet® Radon Remover expanded polystyrene (EPS) panels

MANUFACTURER

- Beaver Plastics Ltd.
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Acheson, Alberta, Canada, T7X 5A3
1-888-453-5961
- AMC Foam Technologies Inc.
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Headingley, Manitoba, Canada, R4H 0A8
1-877-789-7622
- Form Solutions
P.O. Box 358
Port Hope, ON, Canada, L1A 3W3
1-888-706-7709
- Form Systems Inc.
330 Cain Drive
Haysville, KS, USA, 67060-2004
1-888-838-5038

PRODUCT DESCRIPTION

Made with high density expanded polystyrene (EPS) designed to support the weight of cast-in-place concrete, and foot traffic during construction.

Manufactured in 2ft x 4ft panels with interlocking edges to ensure a stable fit between panel joints, and staggered protruding nodules. The staggered nodules provide unimpeded flow of radon to the outlet exhaust system.

Panels are available in a variety of thicknesses. See Table 1, Product Chart.

BASIC USE

Used under concrete slabs providing continuous insulation, the gas permeable layer forming part of the radon depressurization system.

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.
- NFPA 286 "Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth".

CODE EVALUATION APPROVALS

- CCMC 14007-L
- QAI Certification Listing No.B1031-2

PHYSICAL PROPERTIES

Made with Type 2 or 3 expanded Polystyrene (EPS), per CAN/ULC S701. And Type II, IX or XIV EPS, per ASTM C578.

However, compressive strengths between 16 psi and 60 psi are available.

An approved air/vapor barrier layer is required over Heat-Sheet Radon Remover.

Conforms to the physical properties shown in Tables 2 and 3.

Resists compressive creep and shrinkage. Predicted maximum creep strains of 2.0% (less than 50 yrs) provided compressive stress does not exceed 35% of compressive resistance¹ listed in Table 1.

ENVIRONMENTAL DATA

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

FIRE INFORMATION

Products are 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

Heat-Sheet shall be installed on a flat level base material free of protrusions. Base material can be undisturbed soil, compacted fill or sand.

For detailed installation instructions refer to the Heat-Sheet Radon Remover Installation Guide.

Laying Heat-Sheet Panels

1. Ensure the ground is reasonably level.
2. Remove the interlock from the two sides of the starting panel to avoid an air gap. Cut the interlock along the 4ft length only on the next panel to be placed. Place trimmed panels so they interlock along the 2ft dimension.
3. Continue placing panels with the nodules face down until you come to a wall. You will likely need to cut the final panel in this row to fit.
4. Use the left over segments to start the next rows.

INSTALL AIR/VAPOR BARRIER

An approved air and vapor barrier is required over Heat-Sheet to prevent radon gas ingress into the living space. This air/vapor barrier layer is typically a 6 mil polyethylene or an approved peel-and-stick membrane.

Alternatively, a layer of 1/2" Halo® Subterra Protection Board is more than 7 times radon resistant than 6 mil polyethylene membranes², and is more durable and easier to install than typical air/vapor barrier products. In addition, Subterra provides an extra layer of continuous insulation.

For more information refer to the Subterra Protection Board Installation Guide.

1. "Prediction of Creep Strain of the Expanded Polystyrene (EPS) in Long-term Compression," ISSN 1392-1320 MATERIALS SCIENCE (MEDŽIAGOTYRA). Vol. 13, No. 4. 2007.
2. Based on independent testing by the National Research Council of Canada (NRC), "Comparative Test of Subterra Protection Board with Tuck Tape and 6 mil Polyethylene Membrane for Radon Prevention"

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Table 1: Product Chart

Screed volume rates: To top of Heat-Sheet nodules = 0.043 ft³/ft²
For each additional inch of slab = 0.083 ft³/ft²

Product	Nominal Panel Thickness ¹	Overall Thickness ²	Average R-value ³	Panels/ Bundle ⁷	Sqft/ Bundle ⁷
HS-R10 ^{4,5}	2.0"	2 7/8"	10	8	64
HS-R12 ^{4,5}	2.5"	3 3/8"	12	6	48
HS-R14 ^{4,5}	3.0"	3 7/8"	14	6	48
HS-R16.1 ^{4,5,7}	3.0"	3 7/8"	16.1	6	48
HS-R20 ^{4,5}	4 3/8"	5 1/4"	20	6	48

1. Refers to thickness of the panel minus the nodules (grid height per image shown).
2. Refers to thickness of nodule plus nominal panel thickness.
3. In accordance with ASTM C578, and CAN/ULC S701, at 75°F (24°C). R-value is determined based on weighted average R-value of nodule and panel profile.
4. Additional vapor barrier may not be required when using Type 3 EPS, per CAN/ULC S701, and the National Building Code of Canada.
5. Additional vapor retarder may not be required when using Type IX or XIV EPS, per ASTM C578, and the International Residential Code. Confirm with your local building official prior to use.
6. Panels per bundle may vary. Contact your local Heat-Sheet representative to confirm.
7. Made with Graphite Polystyrene (GPS) to provide an incremental R-2.1.
8. Custom orders may be available upon request. Confirm availability of all Heat-Sheet products with your local supplier.

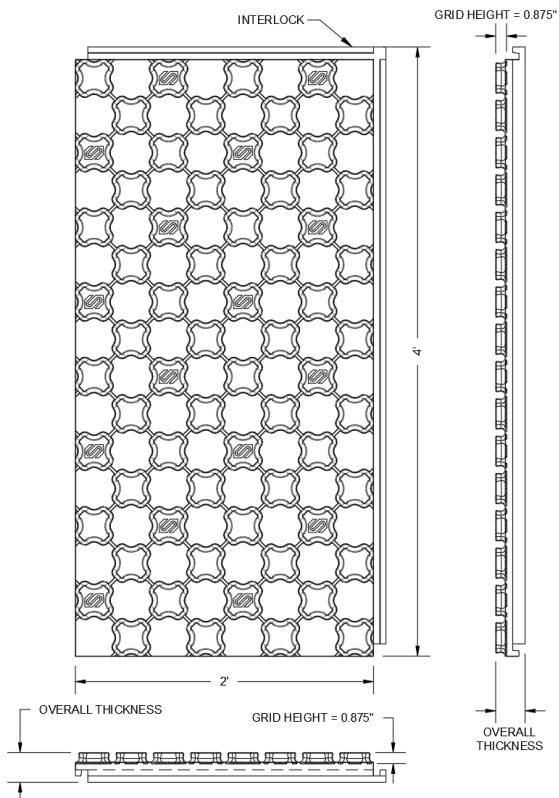


Table 2: Material Properties

ASTM C578 ¹	Type II	Type IX	Type XIV	Type XIV
Thermal Resistance Min. @ 75°F	See Table 1			
Compressive Resistance Min., psi	16 ²	25 ²	40 ²	60 ²
Flexural Resistance Min., psi	35	50	60	> 60
Water Vapor Permeance Max., perms	3.5	2.5	2.5	2.5
Water Absorption Max., %	3	2	2	2
Dimensional Stability Max., %	2	2	2	2
Oxygen Index Min., %	24	24	24	24

CAN/ULC S701 ¹	Type 2	Type 3	Type 3	Type 3
Thermal Resistance Min. @ 24°C	See Table 1			
Compressive Resistance Min., kPa	110 ²	140 ²	276 ²	414 ²
Flexural Resistance Min., kPa	240	300	> 300	> 300
Water Vapor Permeance Max., ng/Pa-s-m ²	200	130	130	130
Water Absorption Max., %	4	2	2	2
Dimensional Stability Max., %	1.5	1.5	1.5	1.5
Oxygen Index Min., %	24	24	24	24

Sub-slab Radon Ventilation³	Acts as a sub-slab gas permeable layer comparable to 4" granular material.
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1. Unless noted otherwise, properties are based on a uniform 1" thickness.
2. Compressive strengths up to 60 psi (414 kPa) are available. Check availability with your local supplier.
3. Based on independent testing by the National Research Council of Canada (NRC), "Characterizing Sub-slab Ventilation of Logix Heat-Sheet Radon Remover"

Table 3: Surface Burning Characteristics

	Flame Spread Index Max.	Smoke Developed Index Max.	Thickness Max.	Density
ASTM E84	≤ 25	≤ 450	4 in.	2.2 pcf
CAN/ULC S102.2	< 230	> 500	102 mm	35 kg/m ³

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