HEAT-SHEET® HEAVY - UNDER-SLAB RADON MITIGATION INSULATION LAYER MATERIAL PROPERTY DATA SHEET

PRODUCT NAME
Heat-Sheet® Heavy expanded polystyrene (EPS) panels

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  1-877-789-7622
- Form Solutions
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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, with grids facing down, provides continuous insulation and 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”.
- Radon Infiltration Building Envelope Test Systems (RIBETS)

CODE EVALUATION APPROVALS
- CCMC 14007-L
- QAI Certification Listing No.B1031-2

PHYSICAL PROPERTIES
Made with Type 3 expanded Polystyrene (EPS), per CAN/ULC S701, and Type IX EPS, per ASTM C578, with minimum compression strengths of 25 psi (higher compression strengths are available).

Available EPS densities can range above 1.8 pcf to produce higher compressive strengths.

An approved air/vapor barrier layer is required over Heat-Sheet Heavy when used as the permeable layer for radon depressurization systems.

Conforms to the physical properties shown in Tables 2 to 4, including as a gas permeable layer for under-slab applications.

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 resistance[1] listed in Table 1.

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

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
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 Heavy Insulated Under Slab Gas Permeable Layer 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 Heavy to prevent radon gas ingress into the living space. This air/vapor barrier layer is typically a minimum 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 membranes[2], 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”

Table 1: Product Chart

Screed volume rates:
To top of Heat-Sheet nodules = 0.069 ft^3/ft^2
For each additional inch of slab = 0.083 ft^3/ft^2

Product	Nominal Panel Thickness [1]	Nominal Overall Thickness [2]	Average R-value [3]	Panels/ Bundle [5]	Sqft/ Bundle
HSH-R10 [4]	2”	3 1/4”	10	8	64
HSH-R12 [4]	2 3/8”	3 5/8”	12	6	48
HSH-R14 [4]	2 7/8”	4 1/8”	14	6	48
HSH-R16.1 [4,6]	2 7/8”	4 1/8”	16	6	48

1. Refers to thickness of the panel minus the nodules (grid height per image).
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. Meets water vapor barrier/retarder in accordance with the National Building Code of Canada, and the International Residential Code. Confirm with local bylaws.
5. Panels per bundle may vary. Contact your local Heat-Sheet representative to confirm.
6. Made with Graphite Polystyrene (GPS) to provide an incremental R-2.1.
7. Confirm availability of products with your local Heat-Sheet supplier.

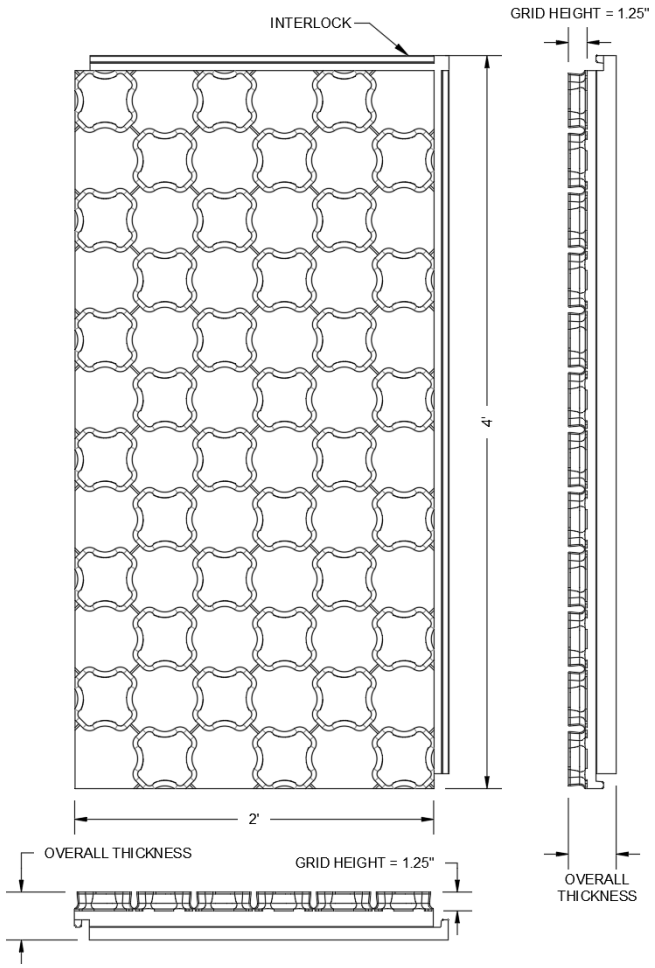

Table 2: Material Properties

	ASTM C578 [1]	CAN/ULC S701 [1]
EPS Type	IX	3
Thermal Resistance Min. @ 75°F (24°C)	See Table 1	See Table 1
Compressive Resistance Min. [2]	25 psi	170 kPa
Flexural Resistance Min.	50 psi	300 kPa
Water Vapor Permeance Max. [3]	0.78 perms	44 ng/Pa-s-m^2
Water Absorption Max., %	2	2
Dimensional Stability Max., %	2	1.5
Oxygen Index Min., %	24	24

1. Unless noted otherwise, properties are based on a uniform 1” thickness.
2. Compressive strengths greater than 25 psi (170 kPa) are available upon request. Confirm availability with your local Heat-Sheet supplier.
3. Tested at 2” thickness by QAI, per ASTM E96.

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

Table 4: Performance as Radon Gas Permeable Layer

Radon Infiltration Building Envelope Test Systems (RIBETS)[1]	Heat-Sheet Heavy, when installed with grids facing down, can be used as an alternative to a layer of 4” granular material as part of a radon depressurization system under slabs, as required by building codes.[2] Test results show performance of Heat-Sheet Heavy can provide over 50% better gas flow than a layer of 4” granular material.

1. Developed and tested by The National Research Council of Canada (NRC).
2. In accordance with IRC2015 , section AF103.2, and NBCC 2015, section 9.13.4.3.