

# Product Information Bulletin

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## DuroFoam® HD Insulation for Radiant Floor Heating Systems Page 1 of 2

DuroFoam® HD insulation board is a moulded expanded polystyrene (EPS) insulation with a thin reflective film laminated to the top and bottom surfaces. The EPS insulation meets or exceeds material properties CAN/ULC-S701, Type 2 (see note 1). The addition of the laminated film to DuroFoam HD insulation results in a more durable product that is less susceptible to handling damage.

Material Property (see Note 2)	Test Method	Units	Type 2
<b>Thermal Resistance (Note 3)</b> <i>Minimum @ Mean temperature 24 °C (75 °F)</i>	ASTM C518	m <sup>2</sup> •°C/W Ft <sup>2</sup> •hr•°F/BTU	RSI-0.70 R-4.04
<b>Water Vapour Permeance (Note 4)</b> <i>Maximum</i>	ASTM E96	ng/Pa•s•m <sup>2</sup> perms	30 0.5
<b>Compressive Strength</b> <i>Minimum @ 10% Deformation</i>	ASTM D1621	kPa psi	110 16
<b>Flexural Strength</b> <i>Minimum</i>	ASTM C203 <i>Procedure B</i>	kPa psi	240 35
<b>Dimensional Stability</b> <i>Maximum</i>	ASTM D2126 <i>7 Days @ 70 ± 2 °C</i>	% Linear Change	1.5
<b>Water Absorption (note 5)</b> <i>Maximum</i>	ASTM D2842	% By volume	4.0
<b>Limiting Oxygen Index</b> <i>Minimum</i>	ASTM D2863	%	24

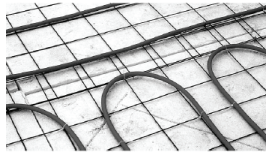
### Table Notes:

1. CAN/ULC-S701, **Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering**, is the National Standard of Canada for EPS insulation.
2. The properties of DuroFoam HD insulation board manufactured to CAN/ULC-S701 under a quality control and third party certification program listed with Intertek Testing Services.
3. **Minimum** thermal resistance is stated for 25-mm {m<sup>2</sup>•°C/W} or 1-inch {Ft<sup>2</sup>•hr•°F/BTU} thick sample.
4. **Maximum** vapour permeance for type 2 EPS insulation is 200 ng/Pa•s•m<sup>2</sup> per 25-mm {3.5 perms per inch} of thickness. The vapour permeance value provided above for DuroFoam HD insulation is significantly lower as a result of laminated films. Where water vapour permeance is a design issue, contact Plasti-Fab technical services for additional information.
5. Water absorption % by volume is determined using ASTM D2842 which involves complete submersion under a head of water for 96 hours. The value provided in the table above is the **maximum** for CAN/ULC-S701, type 2 EPS insulation without facers.

Typical installation instructions to assist with this application can be downloaded from the Plasti-Fab website at [www.plastifab.com](http://www.plastifab.com).

### DuroFoam HD Insulation for Basement Floor Radiant Heating System

DuroFoam HD insulation board is installed on a prepared ground surface as the first component in the radiant floor heating system. Radiant floor heating system use thermoplastic tubing that is cast into the concrete floor slab above the insulation. Hot water is circulated through the tubing to keep all areas warm. DuroFoam HD insulation ensures that heat loss will be minimized and the entire floor area will be warmed faster.

DuroFoam HD System – OBC Zone 1 and Zone 2		
Typical construction using DuroFoam HD insulation installed with radiant floor heating system below the basement slab		<b>R-value</b>
	Horizontal Air Film (above floor)	0.91
	Floor Finish (carpet and rubber pad)	2.05
	4" (102 mm) Concrete Slab	0.23
	6 mil polyethylene moisture barrier	---
	DuroFoam HD insulation @ 2 ½" (63 mm) thickness	10.10
	<b>Effective R-Value for Below Slab System</b>	<b>R-12.49</b>

Conventional forced air heating systems rely upon convection to force hot air towards the ceiling resulting in non-uniform heat distribution throughout the room area. With radiant floor heating systems, there are no vents blowing air into specific areas. The tubing cast into the concrete slab covers the entire room and DuroFoam HD insulation provides a monolithic insulation layer to ensure that heat is spread uniformly throughout the entire floor area.

DuroFoam HD insulation with its reflective film on both faces is ideal for use with radiant floor heating systems. The closed cellular structure of DuroFoam HD insulation provides excellent resistance to moisture and the long-term insulating value is not subject to thermal drift.

The advantages of radiant floor heating systems using DuroFoam HD insulation include

- Provides monolithic insulation layer to ensure uniform heat distribution throughout room areas.
- Floor area will be noticeably warmer to anyone standing on it.
- Insulation installs quickly and easily.
- No special skills, tools or equipment are required
- No mechanical attachment is required.
- Eliminates need for air vents that can circulate allergens or dust.
- Energy efficient method of heating the basement area.

### DuroFoam HD Insulation Typical Dimensions and R-values

DuroFoam HD insulation used in radiant floor heating systems is available in various thicknesses to provide the required thermal resistance value for the application.

DuroFoam HD Insulation Board Size	Thickness	R-value
4-foot x 8-foot (1220 mm x 2440 mm)	2" (51 mm)	R-8
	2 ½" (63 mm)	R-10
	3" (76 mm)	R-12