



STYROFOAM™ Brand Extruded Polystyrene Insulation

For Radiant Floor Slab Systems

Radiant floor heating has been used in aesthetic and energy efficient building designs since the Romans channeled hot air under the floors of their villas centuries ago. Today, advances in materials and technology are increasing the appeal of radiant floors, offering the promise of cost-efficient comfort for commercial and residential applications.

ADVANTAGES

Radiant floor heating directs heat upward into the room and minimizes vapour drive into the structure. To ensure effective operation of the system, particularly for under-slab floor designs, insulation is an important consideration.

Properly insulating radiant floor systems makes it possible to provide maximum comfort at minimum cost. A hot water tank can act as the boiler, enabling the system to operate at a fairly low water temperature – below 140°F (60°C). Typical fluid temperatures of at or below 85°F (29°C) normally result in the mid-60s (~18°C) at the ceiling. Various under-slab floor designs have slightly different insulation requirements for effective operation.

Dow Building Solutions offers a number of STYROFOAM™ Brand Extruded Polystyrene products with high compressive strength, excellent resistance to moisture and proven longterm R-value (RSI)** for radiant floor applications. Several edge treatments, board sizes and thicknesses, and compressive strengths are available.

This variety of compressive strengths allows designers to select the right product for their design loads. Your Dow sales representative can help you identify the right product to meet your specifications.

DESIGN CONSIDERATIONS

The slab-on-grade floor design is perhaps the most widely used when installing hydronic (water) radiant floor heating. With polymeric tubing installed in a concrete slab, the concrete becomes the conductive medium, dispersing hot water heat across the surface of the floor. Without adequate insulation, however, heat can be lost as it flows horizontally to the edges of the slab and the outside of the building, or downward to the soil beneath the slab.

Rigid foam insulation, such as STYROFOAM™ Brand Extruded Polystyrene Insulation, at floor edges and under the slab helps keep heat in the floor and in the building. STYROFOAM™ Brand Extruded Polystyrene Insulation helps the floor temperature stay above the dew point, reducing the potential for condensation on the floor surface, especially around the outside perimeters. Vapour retarders under the slab are an important part of this system, and a moisture barrier installed beneath the foam insulation is also often advised. Consult your local code.

Figure 1 shows a typical slab-on-grade radiant floor system insulated with STYROFOAM™ Brand Extruded Polystyrene Insulation.

Consult your Dow representative for additional installation information as well as for application and product information for radiant floors over the slab or subfloor.

Figure 1

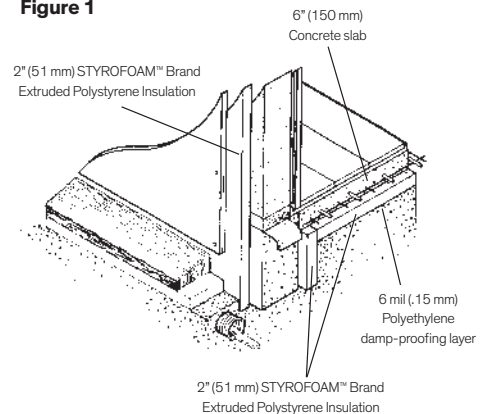


TABLE 1: Physical Properties of STYROFOAM™ SM, STYROFOAM™ Highload 40 and STYROFOAM™ Highload 60 Extruded Polystyrene Insulation

Property and Test Method	Value
Long-term Aged R-Value (RSI), ASTM C518, ft ² •h•°F/Btu (m ² •°C/W) per inch	5.0 (0.88)
Vertical Compressive Strength, ASTM D1621, psi (kPa)	
STYROFOAM™ SM	30 (207)
STYROFOAM™ Highload 40	40 (276)
STYROFOAM™ Highload 60	60 (414)
Maximum Use Temperature, °F (°C)	165 (74)
Coefficient of Linear Thermal Expansion, ASTM D696, in/in•°F (mm/m•°C)	3.5 x 10 ⁻⁵ (6.3 x 10 ⁻²)
Water Absorption, ASTM D2842, % by vol., max.	0.7

**R means resistance to heat flow. The higher the R-value or RSI, the greater the insulating power.



In Canada
Dow Chemical Canada ULC
Dow Building Solutions
450 – 1st St. SW
Suite 2100
Calgary, AB T2P 5H1

For Technical Information:
1-866-583-BLUE (2583) (English)
1-800-363-6210 (French)

dowstyrofoam.ca/4architects

For Sales Information:
1-800-232-2436 (English)
1-800-565-1255 (French)

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Combustible: Protect from high heat sources. Local building codes may require a protective or thermal barrier. For more information, consult MSDS, call Dow at 1-866-583-BLUE (2583) or contact your local building inspector. In an emergency, call 1-519-339-3711. Building and/or construction practices unrelated to building materials could greatly affect moisture and the potential for mould formation. No material supplier including Dow can give assurance that mould will not develop in any specific system.

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