DuPont™ Styrofoam™ Brand Extruded Polystyrene Insulation

For Radiant Floor Slab Systems

OVERVIEW

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.

DuPont Performance 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 DuPont 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 slabon-grade radiant floor system insulated with **Styrofoam™ Brand Extruded Polystyrene Insulation**.

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

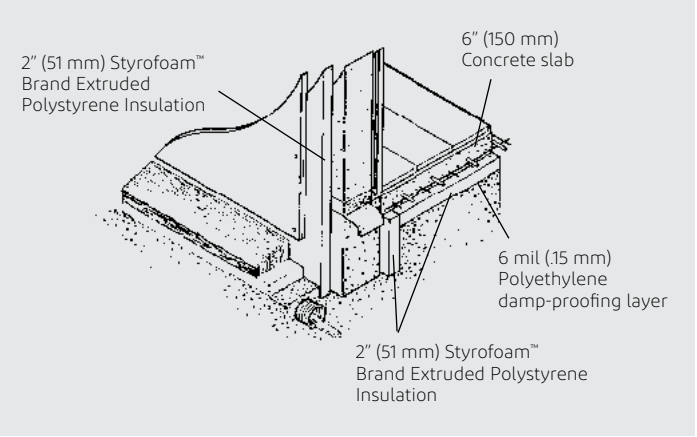

Figure 1

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

TABLE 1: Physical Properties of DuPont™ Styrofoam™ Brand SM, Styrofoam™ Highload 40 and Styrofoam™ Highload 60 Extruded Polystyrene Insulations

Property and Test Method	Value
Long-term Aged R-Value (RSI), ASTM C518, ft^2·h·°F/Btu (m2·°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)	3.5×10^{-5} (6.3×10^{-2})
Water Absorption, ASTM D2842, % by vol., max.	0.7

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Styrofoam™ Brand

For more information visit
building.dupont.com
or call 1-866-583-2583

CAUTION: This product is combustible. Protect from high heat sources. A protective barrier or thermal barrier may be required as specified in the appropriate building code. For more information call the DuPont Contact Center at 866-583-2583 or contact your local building inspector. For emergencies contact Chemtrec 800-424-9300, CCN (Contract Number) 7442.

WARNING: Rigid foam insulation does not constitute a working walkable surface or qualify as a fall protection product.

43-D100628-enCA-0923 CDP