ARCHITECTURAL INSULATING PANELS

www.permatherm.net
PermaTherm Architectural Insulating Panels

PermaTherm’s architectural insulating panels offer architects, building owners and design-build firms unmatched flexibility in creating high performance structures.

High performance means: rapid installation time, lower maintenance cost, reliable climate control, and sustained energy savings; all with lower initial construction costs.

PermaTherm’s customized panel systems offer high performance and low cost to architects, building-owners and construction contractors. With PermaTherm Panel Products you save money today and tomorrow.

PermaTherm Panel Applications

- Cold Storage Facilities
- Industrial Buildings
- Food Processing Facilities
- Commercial Buildings
- Partition Walls
- Dairies
- Fire Walls
- Roof Systems

While extensively used for exterior and interior wall systems, PermaTherm panels are utilized through a broad range of building products, including roof systems, floor systems, door assemblies, ductwork, and truck bays. The variety of exterior skins and core material combinations can be blended to accommodate nearly any project or facility needs.

PermaTherm can help you custom tailor your project needs to maximize up-front savings and long-term performance.

Panel Design

PermaTherm panels are formed in a continuous manufacturing process. In the proprietary process, metal or fiberglass skins are laminated to PermaTherm’s pre-shaped expanded polystyrene cores (optional cores available). Edges are fashioned with tongue & groove connections to ensure a tight seal. The resulting composite panel is ready for easy installation, providing the ultimate in structural and thermal performance.

<table>
<thead>
<tr>
<th>EXTERIOR SKINS</th>
<th>OPTIONAL CORES</th>
<th>TEXTURES/COLORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless Steel</td>
<td>Expanded Polystyrene</td>
<td>Please Visit</td>
</tr>
<tr>
<td>Galvanized Steel</td>
<td>Density/Strength Options</td>
<td><a href="http://www.permatherm.net">www.permatherm.net</a></td>
</tr>
<tr>
<td>Aluminum</td>
<td>Polyurethane</td>
<td></td>
</tr>
<tr>
<td>Fiberglass</td>
<td>Mineral Wool</td>
<td></td>
</tr>
</tbody>
</table>
**PermaTherm EPS**

Since 1987, PermaTherm has been an industry leading manufacturer of expanded polystyrene (EPS) products used in a variety of applications. PermaTherm EPS is the core of our building panel system. EPS isn’t just foam insulation; it is an innovative building material that contributes to the design and structural, as well as thermal, integrity of building projects.

PermaTherm produces all of its own EPS, providing our customers with optimum cost value. Our custom-engineered panel products offer superior performance over other panel technologies due to exceptional thermal control, dramatic energy savings, low maintenance, durability, flexible design, and easy installation. Quality control is assured through our state-of-the-art molding and curing facility. PermaTherm panels are being used in food processing, cold storage, and other industrial and commercial buildings throughout North America.

PermaTherm insulation products have been tested by Underwriters Laboratories and meet the requirements of the Standard Mechanical Code and International Mechanical Code.

**Cold Storage**

EPS R-value increases as temperature decreases. The majority of the cold storage industry is focused on the safe storage and transportation of food-related products, yet a large, growing segment of cold storage facilities serves non-food agricultural, pharmaceutical, and floral clients. PermaTherm’s panel systems offer a superior alternative for projects that require stringent environmental control. Architects, construction companies, and owners increasingly turn to PermaTherm for high performance and low life-cycle cost.

**PermaTherm’s Manufacturing Process**

- **INPUT**
  - Modified Polystyrene Resin + Steam
  - Conditioned EPS beads + Pressure & Steam
  - Dimensionally Stable Cured Blocks
  - Cured EPS Blocks Moisture Free
  - EPS Cores + Laminates + Adhesives

- **PROCESS**
  - PRE-EXPANSION
  - CONDITIONING
  - MOLDING
  - CURING
  - TRIMMING & TRUING
  - CLIMATE CONTROLLED STORAGE
  - CUTTING & SHAPING
  - CLIMATE CONTROLLED STORAGE
  - POST-PRODUCTION PROCESSING

- **OUTPUT**
  - Individual closed-cell EPS beads
  - High Fusion EPS Blocks 16.3’ x 4.125’ x 33”
  - Trimmed & Trued Blocks 16’ x 4’ x 32”
  - Finished EPS Insulation Products
  - Laminated Panels for Walls, Roofs and Floors
  - Marine
  - GeoFoam
  - Packaging
  - Panels
<table>
<thead>
<tr>
<th>Physical Properties</th>
<th>ASTM Method</th>
<th>Density, Minimum</th>
<th>Density, as tested</th>
<th>Density, Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>lb/ft³</td>
<td>lb/ft³</td>
<td>lb/ft³</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>D1621</td>
<td>0.9-1.14</td>
<td>1.8-2.2</td>
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<tr>
<td>Shear Strength</td>
<td>C273</td>
<td>18-22</td>
<td>25-33</td>
<td></td>
</tr>
<tr>
<td>Shear Modulus</td>
<td>C273</td>
<td>280-320</td>
<td>600-640</td>
<td></td>
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<tr>
<td>Modulus of Elasticity</td>
<td>C273</td>
<td>180-220</td>
<td>460-500</td>
<td></td>
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<tr>
<td>Tensile Strength</td>
<td>D1623</td>
<td>16-20</td>
<td>23-27</td>
<td></td>
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<tr>
<td>Flexural Strength</td>
<td>C203</td>
<td>25-30</td>
<td>50-75</td>
<td></td>
</tr>
</tbody>
</table>

**Thermal Conductivity:**
- K-Factor @ 25°F (-3.9°C): 0.23
- K-Factor @ 40°F (4.4°C): 0.24
- K-Factor @ 75°F (43.3°C): 0.26

**Thermal Resistance:**
- R-Factor @ 25°F (-3.9°C): 4.35
- R-Factor @ 40°F (4.4°C): 4.17
- R-Factor @ 75°F (43.3°C): 3.85

**Water Absorption:**
- @ 25°F (-3.9°C): 0.000035
- @ 40°F (4.4°C): 0.000035

**Water Vapor Transmission:**
- @ 25°F (-3.9°C): 2.0-5.0 perm-in
- @ 40°F (4.4°C): 2.0-5.0 perm-in

**Capillarity:**
- None

**Coefficient, Thermal Exp.:**
- @ 25°F (-3.9°C): 0.20
- @ 40°F (4.4°C): 0.20

**Long Term Service Temp:**
- @ 25°F (-3.9°C): 167°F
- @ 40°F (4.4°C): 167°F

**Maximum Exposure Temp:**
- @ 25°F (-3.9°C): 180°F
- @ 40°F (4.4°C): 180°F

**Oxygen Index:**
- @ 25°F (-3.9°C): 2.40
- @ 40°F (4.4°C): 2.40

<table>
<thead>
<tr>
<th>Core Thickness</th>
<th>Total Uniform Load (lb/sq ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 inch</td>
<td>18 13 9 7 6 5 3</td>
</tr>
<tr>
<td>3 inch</td>
<td>22 16 10 9 6 5 4</td>
</tr>
<tr>
<td>4 inch</td>
<td>25 18 13 10 8 7 6</td>
</tr>
<tr>
<td>5 inch</td>
<td>30 22 15 12 9 8 7</td>
</tr>
<tr>
<td>6 inch</td>
<td>32 23 16 13 10 9 8</td>
</tr>
<tr>
<td>8 inch</td>
<td>36 25 19 15 12 11 10</td>
</tr>
<tr>
<td>10 inch</td>
<td>41 29 20 17 14 12 11</td>
</tr>
</tbody>
</table>

**Thermal Resistance (1 lb Density @ 40F):**

<table>
<thead>
<tr>
<th>Thickness (inches)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-Value</td>
<td>8</td>
<td>13</td>
<td>17</td>
<td>25</td>
<td>33</td>
<td>42</td>
<td>50</td>
</tr>
</tbody>
</table>

**Panel Manufacturing Tolerances:**
- **Length:**
  - Up to 20 feet: +/- 1/8 inch
  - Over 20 feet: +/- 3/16 inch
- **Width:**
  - 32-48 inches: +/- 1/8 inch
- **Thickness:**
  - 2-12 inches: +/- 1/8 inch
- **Squareness:**
  - +/- 1/8 inch (measured 6 inches from end)
- **Lateral Bow:**
  - Up to 10 feet: +/- 3/32 inch
  - 10 ft to 20 ft: +/- 3/16 inch
  - Over 20 feet: +/- 3/8 inch
- **Flatness:**
  - +/- 3/16 inch per 2 foot span
- **Joints:**
  - Male/female joint edges flush, with no more than 1/8 inch deviation

**Surface Panel Burning Characteristics:**

<table>
<thead>
<tr>
<th>Core Thickness</th>
<th>2 inch</th>
<th>3 inch</th>
<th>4 inch</th>
<th>5 inch</th>
<th>6 inch</th>
<th>8 inch</th>
<th>10 inch</th>
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<td>8</td>
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<td>25</td>
<td>33</td>
<td>42</td>
<td>50</td>
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</table>

**ASTM Method UL Rating**
- Flame Spread @ 6": E 84 0
- Smoke Density @ 6": E 84 100
- Hot Surface: C 41 Pass

**Maximum Wall Spans for Uniform Loads**
(Units in Feet for 26-Gauge Steel Panel Skins)
Time Tested Performance

PermaTherm panels have been used in food processing, cold storage, floral, pharmaceutical, warehouse, and other building applications across the Nation. Thousands of structures, from 10,000 to over 350,000 ft² are testimony to the quality and reliability of our products. PermaTherm has worked closely with its clients in perfecting its panel products through a broad range of commercial & industrial building applications. This dynamic continues today as our clients’ challenges shape our constantly evolving panel products of tomorrow.

The PermaTherm Panel Advantage
- EPS R-value increases as temperature decreases
- Lowest operating cost over building life
- Greater span capability with less steel
- Permanent R-value over panel life
- Lowest cost R-value/square foot
- Heat-reflective external finishes
- EPS is HCFC and CFC-free
- Void-free cores and joints
- Rapid Installation

PermaTherm Panel Approvals
- ASTM E84 25/50 Flame/Smoke certification
- Florida Building Code product approvals
- UL listed insulation material
- USDA approved surfaces
- UL listed fire panels

Accessories
- Doors
- U Channels
- Inside Trim
- Outside Trim
- Roof Coatings
- Ceiling Hangars
- Attachment Items
Environmental Attributes

PermaTherm’s Insulating Panels not only contribute points under the requirements of the U.S. Green Building Council’s LEED (Leadership in Energy & Environmental Design) Green Building Rating System, but can also qualify under the National Institute of Standards and Technology’s BEES program (Building for Economic and Environmental Stability).

PermaTherm’s commitment to energy efficiency, sustainability and environmental responsibility is evident in the products and services offered by the Company. For additional information on environmental attributes or our commitment, visit us at www.permatherm.net.