THERMAL 3H... REAL WORLD BUILDING ENVELOPE

Thermal 3H’s unique combination of components create a high performance insulation. It can be used with all types of construction: agricultural, commercial, residential, basement walls and under concrete. To properly insulate any building you must find an insulation that controls all three forms of heat transfer and can perform in any climate zone.

THERMAL 3H... ALL WEATHER SHIELD

CONTINUED

UNDERSTANDING R-VALUE

● Effective or In-Service R-values are the total heat flow resistance provided by all components or materials in a building structure, such as wood or steel framing members, wood sheathing, metal panels, concrete, sheetrock and insulation, etc.

● Effective or In-Service R-values are based on the ASTM-1363 hot box test which is predominantly conduction and convection. This is one step closer to a real world environment.

● The overall predominant form of heat transfer, solar heat (sun) in the form of radiant heat is not included in either Nominal or Effective In-Service R-values.

● For now, the only way to evaluate how well an insulation performs in the real world is by monitoring energy bills, blower door tests and by thermal imaging cameras. (Example on Page 4)

THERMAL BUILDING CONCEPTS

SAVING ENERGY, ONE BUILDING AT A TIME.

Note: Architectural Testing Inc. (ATI), an independent testing laboratory accredited in both the USA and Canada, conducted the following tests according to the ASTM 1363-05 standard.

<table>
<thead>
<tr>
<th>Product</th>
<th>Type of Assembly</th>
<th>Current R-value of Product</th>
<th>Effective R-value of Assembly</th>
<th>Increase/Decrease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1” Thermal 3H</td>
<td>2x4 wood frame</td>
<td>3.85</td>
<td>5.3</td>
<td>+115%</td>
</tr>
<tr>
<td>1” Thermal 3H with a ¾” air space</td>
<td>3.85</td>
<td>10.6</td>
<td>+175%</td>
<td></td>
</tr>
<tr>
<td>½” Thermal 3H</td>
<td>2x6 steel frame</td>
<td>1.93</td>
<td>5.22</td>
<td>+170%</td>
</tr>
<tr>
<td>1” Thermal 3H</td>
<td>2x6 steel frame</td>
<td>3.85</td>
<td>6.85</td>
<td>+78%</td>
</tr>
<tr>
<td>6” Fiberglass</td>
<td>2x6 steel frame</td>
<td>19</td>
<td>7.81</td>
<td>-59%</td>
</tr>
</tbody>
</table>

FAN FOLD

⅝” – ⅜” (4’ x 50’)

Rolls

⁵⁄₁₆”, ⅜” and ½”

4’ x 72’ Standard

SHEETS OR PANELS

4” x 8’, 10’ and 12’

⅝” x 24’ Standard

Custom lengths for rolls are any increments of 8’, 10’, 12’ sheets that make up the roll.

Minimum Requirements – Lead time and prior approval are prerequisites for custom orders.

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UNDERSTANDING BUILDING ENVELOPE PERFORMANCE

HEAT TRANSFER

- There are three forms of heat transfer: conduction, convection, and radiation. High-performance insulation will control all three.
- Conduction is the transfer of heat energy through matter and fluids. Conduction is the least predominant form of heat transfer in a building structure.
- Convection is the transfer of heat energy in a gas, vapor, and/or air infiltration. Convection is the second most predominant form of heat transfer in a building structure.
- Radiation is the transfer of heat energy by infrared rays. Radiation is number one and the most predominant form of heat transfer in a building structure.

THERMAL MASS

- It is any material that has the capacity to absorb, store, or transfer heat energy. Some building materials having that capacity are wood, metal, sheetrock, concrete, etc.
- Building structures vary in the types of thermal mass used. Therefore, the impact of the three forms of heat transfer may be different.
- Heat passing through framing members creates “thermal bridging,” especially when using conventional cavity fill insulation.
- A continuous insulation sheathing controlling all three forms of heat transfer provides a thermal envelope and greatly reduces thermal bridging versus cavity fill insulation only.

MOISTURE

- It is a threat to the durability and long-term performance of buildings and porous insulations. It will cause damage to building materials and lead to unhealthy indoor environments.
- Reaching a dew point, the temperature at which vapor begins to condense, in a building assembly is one of the predominant issues to prevent and lowers the effective thermal resistance of porous insulations significantly.
- A non-porous continuous insulation sheathing controlling all three forms of heat transfer which provides a thermal envelope and greatly reduces thermal bridging versus cavity fill insulation only.

SUSTAINABLE GREEN BUILDING (SGB)

- SBG is the design principle of exceeding current building standards, by increasing the efficiency with which buildings use resources while reducing the impact on human health, environment, and economy.
- One of the simplest, fastest, and most cost-effective ways to achieve a high-performance green building structure is to use a versatile high-performance green insulation.
- The insulation you choose must control all three forms of heat transfer and provide a thermal break with no thermal bridging or drift. It must be environmentally friendly with sustainable, stable performance and benefits.
- Sustainable Green Builders analyze the total building structure to include framing members, insulation, mechanical equipment, and green alternatives to meet their goals.

WHAT IS THERMAL 3Ht?

- Thermal 3Ht is a high-performance, rigid insulation. The combination of a lightweight, sustainable expanded polystyrene (EPS) foam core with advanced polymeric reflective facers on both sides enhances the overall performance.
- Thermal 3Ht is also manufactured with a durable double white woven facing on one side and a polymeric reflective facer on the other side, for an internal exposed finished look or below grade application.
- Thermal 3Ht comes in sheets, rolls, and panels.
- Thermal 3Ht is very versatile. It can be used in residential, commercial, industrial, agriculture, and concrete applications.
- Thermal 3Ht can be used in new or retrofit construction. It can be applied on the exterior or interior of a building structure.

WHY USE THERMAL 3Ht?

- Thermal 3Ht controls all three forms of heat transfer.
- Thermal 3Ht is an air and vapor barrier, radiant blocker, and thermal insulation in all its insulation products.
- Thermal 3Ht is a continuous insulated sheathing or wrap, which eliminates the hot and cold spots in your building structure and creates a controlled environment.
- Thermal 3Ht provides a thermal break and prevents thermal bridging and drifts.
- Thermal 3Ht is water, mold, and insect resistant.
- Thermal 3Ht is durable, flexible, recyclable and non-toxic.
- Thermal 3Ht has dimensional stability, compressive strength, and stable performance.
- Thermal 3Ht saves energy, lowers utility cost, and is environmentally friendly.
- Thermal 3Ht is lightweight, simple to install, and a versatile product.
- Thermal 3Ht can be used on its own or blended with conventional insulation.
- Thermal 3Ht is high-performance insulation with “Real World” results.

UNDERSTANDING RVALUE

- R means resistance to heat flow. The higher the R-value, the greater the insulating value.
- How do they test and evaluate labeled R-values on all insulation products? Important information to know.
- Upon research, we concluded that Nominal R-values are the rated/labeled insulation R-values for insulation products.
- Labeled Nominal R-value is based on the ASTM C-518 hot plate test, which is predominantly conduction only and has life on or no consideration for convection and radiation.
- Nominal R-values do not consider the effectiveness of the insulation when it is combined with framing members and other conventional building materials.

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