



**Thermal Building Concepts**  
 102 First Avenue West  
 Cresco, IA, USA 52136  
 Phone (877) 703-2323  
 Fax (888) 619-0891

**DATE:** July 2, 2009

**SUBJECT:** ASTM 1363-05 Thermal 3Ht Performance Testing (Simulated Pre-Engineered Steel Buildings)

**Description**

Thermal 3Ht is a high-performance superior closed cell Type 1 Expanded Polystyrene (EPS) rigid insulation with factory laminated metallic-reflective facers, white facers or a combination of the two. Thermal 3Ht offers a long-term stable R-value, is an Energy Star qualified insulation and qualifies for LEED points.

**Testing**

Architectural Testing Inc., an accredited independent testing laboratory and has performed the ASTM 1363-05 Wall Assembly R-Value test on a series of simulated steel wall assemblies. On its own or combined with R-19 fiberglass batt insulation, Thermal 3Ht was installed in three of these assemblies.

Temperature Range: 70 °F / 21 C inside and 0 °F / -18 C outside.

Note\* in steel framed wall assemblies, fiberglass insulation does not perform to its labeled R-value. As per the ASTM 1363-05 testing method a 2 X 6 steel stud wall assembly with R-19 fiberglass has an in-service R-Value of only 7.81.

**TEST RESULTS**

**Wall Construction Details**

**In-Service R-Value**

Steel Sheathing Interior, 2 X 6 Steel Stud Frame, Horizontal 2 X 4 Steel Studs (Simulates Steel Girts), R-19 Fiberglass Batt with Vapor Retarder squeezed between Girts and Exterior Steel Sheathing. Labeled R-Value = R-19	<b>7.81</b>
Steel Sheathing Interior, 2 X 6 Steel Stud Frame, Empty Cavity, Horizontal 2 X 4 Steel Studs (Simulates Steel Girts), 1" Thermal 3Ht, No Air Space, Exterior Steel Sheathing. Labeled R-Value = R-3.85	<b>6.85</b>
Steel Sheathing Interior, 2 X 6 Steel Stud Frame, Empty Cavity, Horizontal 2 X 4 Steel Studs (Simulates Steel Girts), 1/2" Thermal 3Ht, No Air Space, Exterior Steel Sheathing Labeled R-Value = R-1.93	<b>5.22</b>
Steel Sheathing Interior, 2 X 6 Steel Stud Frame, 1/2" Thermal 3Ht between 2 X 6 framing and Girts, R-19 Fiberglass Batt squeezed between 2 X 4 Steel Studs (Simulates Steel Girts) Exterior Steel Sheathing.	<b>14.77</b>

Notes\* Horizontal 2 X 4 Steel Girts are 4 feet on center.

1/2" Thermal 3Ht is available in 4' X 72" rolls. 1" Thermal 3Ht is available in 4' X 8', 4' X 10' and 4' X 12' sheets.

### **Additional Information & Observations:**

- The ASTM 1363-05 is a wall assembly R-value test (heat transfer via conduction). The test is conducted in total darkness; consequently, this testing method does not fully utilize the effectiveness of Thermal 3Ht's metallic-reflective facers.
- When installed in a steel framed wall assembly, the in-service R-Value of R-19, 6" fiberglass insulation with a vapor retarder is only R-7.81. Conversely, when the components of a steel framed wall assembly with R-19 fiberglass insulation are combined with 1/2" Thermal 3Ht the in-service R-Value of the wall is enhanced by 87% / R-14.77
- The generic R-Value for 1/2" Thermal 3Ht is R-1.93. However, in empty steel framed wall assembly the in-service R-Value of 1/2" Thermal 3Ht is 5.22; an increase of 150% over its generic R-Value.
- Thermal 3Ht is a highly effective interior insulated vapor retarder, air barrier and radiant barrier.
- Condensation was noticeable in the fiberglass only wall assembly.
- There was no visible condensation in the wall assemblies which contained Thermal 3Ht.
- Additional LEED points may be achieved by utilizing Thermal 3Ht.