

## Test Data for HeatSaver® Thermal Shades

At the end of February 2011 a HeatSaver® Thermal Shade specimen underwent clinical testing at the Architectural Testing facility in St. Paul, MN. The sample shade used consisted of a Thinsulate® C150 core with layers of 1/2 mil aluminized mylar on either side, finished with standard cotton polyester lining and 300 denier nylon. The tests, NFRC 102-2010, are the most recent - and stringent - industry standard.

The glazed unit measured 47 1/4" wide x 59" tall (1200mm x 1499mm) and consisted of 2 layers of 1/8" DS Clear with a 1/4" dead air space, wrapped with an aluminum frame. Thus it closely replicated a window configuration common from the 1960s onward.

Base Window Test Date: 02/22/11  
Base with Attachment Test Date: 02/23/11  
Report Date: 03/23/11

**Test Procedure:** U-factor tests were performed in a Guarded Hot Box in accordance with NFRC 102-2010, *Test Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems*.

The average metering indoor air temperature established was 70.41 F. The average cold side air temperature was -0.10 with a side wind velocity of 14.56 mph.

### Test Duration - Base Window:

1. The test parameters for the base unit were considered stable for two consecutive four hour periods on 02/21/11 and 02/22/11.
2. The thermal test results were derived over a four hour period on 02/22/11.

### Test Duration - Base with Attachment:

1. The test parameters were considered stable for two consecutive four hour periods on 02/22/11 and 02/23/11.
2. The thermal performance test results were derived over a four hour period on 02/23/11.

### Results

1. Thermal Transmittance of Test Specimen (Us) 0.82 0.27 Btu/hr·ft<sup>2</sup>·F
2. Standardized Thermal Transmittance of Test Specimen (Ust) 0.75 0.26 Btu/hr·ft<sup>2</sup>·F

The reported Standardized Thermal Transmittance (Ust) was determined using CTS Method, per Section 8.2(A) of NFRC 102.

### Test Results Summary:

Standardized U-factor (Ust) - Base Window: 0.75 Btu/hr·ft<sup>2</sup>·F CTS Method  
Standardized U-factor (Ust) - Base with Attachment: 0.26 Btu/hr·ft<sup>2</sup>·F CTS Method  
Percent Reduction Heat Transfer 65.18 %

## Conclusions:

The U Factor of 0.26 listed above equals an R-Value of 3.85. Hence we extrapolate the following.

1.87	Dbl. Glazed Window	0.86	Single Glazed Window
0.68	Air film	0.68	
1.00	Dead Air Space	1.00	
+ <u>3.85</u>	HeatSaver®	+ <u>3.85</u>	
<b>7.40</b>	<b>Total R-Values</b>	<b>6.39</b>	
<b>0.13</b>	<b>U-Factors</b>	<b>0.15</b>	

The additional values listed are established through [ColoradoENERGY.org](http://ColoradoENERGY.org) research and accepted standards. The dead air space between the shades and the glass will equal approximately 1 per inch, up to 2 inches after which a convection cycle would negate further gains.

These tests cover conduction losses only. Gains or losses due to air infiltration, convection and radiation have not been factored in. As a consequence actual performance is likely to be greater than what is listed here.

\* The test method above does not include procedures to determine the heat flow due to either air movement through the specimen or solar radiation effects. As a consequence, the thermal transmittance results obtained do not reflect performances which may be expected from field installations due to not accounting for solar radiation, air leakage effects, and the thermal bridge effects that may occur due to the specific design and construction of the fenestration system opening. Therefore, it should be recognized that the thermal transmittance results obtained from this test method are for ideal laboratory conditions and should only be used for fenestration product comparisons and as input to thermal performance analyses which also include solar, air leakage and thermal bridge effects.

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