Test Results | THERMORY® White Ash
Solar Reflectivity

Solar Reflectivity

TESTED

- Solar reflectance index of a sample of THERMORY® White Ash was calculated in compliance with ASTM E 1980.

RESULTS

- The Solar reflectance of THERMORY® White Ash was found to be .351. This is above the .33 required for LEED v4 credits and provides credence to our claims of “no hot feet”.

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LABORATORY TEST RESULTS

JOB # 6641-MP
Date: February 17, 2021

Prepared For: Thermory

Subject: SRI Calculation

Purpose
Solar Reflectance is the fraction of incident solar radiation upon a surface that is reflected from the surface. This report presents the Solar Reflectance Index (SRI) measured for Sample **# GT2517.**

Test Methods
The samples were tested as per procedures described in ASTM C1549: *Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer* and ASTM E408: *Standard Test Method for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.*

Measurement was made in standard ambient temperature and humidity lab conditions. Sample was measured in an **as received** condition. The sample was not cleaned prior to measurement. For the description of the sample, please refer to measurement matrix. The air mass used to calculate values is 1.5.

The solar reflectance index was calculated in compliance with ASTM E 1980: *Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces*. Measurement approach II outlined in ASTM E1980-11 valid for SRI values greater than 0.1, and excluding collector surfaces (surface with high solar absorptance and low thermal emittance, that is, a greater than 0.8 and ´ less than 0.2), Eq 4 estimates SRI with an average error of 0.9 and maximum error of 2. This test method is used to measure the solar reflectance of a flat opaque surface with a slope smaller than 9.5 degrees from horizontal under standard solar and ambient conditions.

The SRI of a test surface depends on two material properties and four environmental conditions. The variables are Solar reflectance, thermal emissivity, solar flux, convection coefficient, air temperature, and sky temperature. SRI accuracy is +/- 1% for solar reflectance for non-metal materials with high emissivity yielding a maximum error of +/- 1.4 in SRI. For non-metal surfaces, SRI is insensitive to changes in convection coefficient. Metallic surfaces characterized with low thermal emissivity varies significantly with convection coefficient.

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Results:

GT2517 – Aged Ash

Calculated Solar Absorbance = 0.649

Calculated Solar Reflectance = 0.351

Calculated Thermal emissivity = 0.930

Convection Coefficient*	SRI value***
5	40.11
12	40.00
30	39.90

* The convection coefficient is the rate of heat transfer from the surface to air induced by the air movement, expressed in watts per square meter per degree kelvin. 5, 12, 30 W/(Km^2) correspond to low, medium and high wind conditions, respectively.

** Disclaimer: Samples that are non-isotropic and/or non-homogenous in color, flatness, or composition may be subject to increased measurement error over standard instrument error margins. Every effort is made to reduce error by finding the most ideal locations on a sample and taking multiple data points to increase confidence in report values. The effect of beam scatter/oblique measurement due to sample flatness and spot size in measuring samples that have varying composition in relation to measurement error is not well defined nor quantified. SRI will be reported in these instances on a best effort basis.

*** ASTM E-1980 defines SRI using a standard “black” surface (SR=0.5, TE=0.9) and a standard “white” surface (SR=0.8, TE=0.9). These properties are very different from a perfect black body (SR=0, TE=1) and perfect white body (SR=1, TE=0). These standards are used to define a scale from 0 to 100 SRI. This means that it is possible for surfaces to have properties which put the SRI above or below the boundaries of the scale.