

Material Solar Reflectance Index (SRI) Test Report

Report number: OTM2104001



Client:

Company name

Address line 1

Address line 2

Address line 3

Attention: Name

Laboratory:

Optical & Thermal Testing Laboratory

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The Optical & Thermal Testing Laboratory of OTM Solutions Pte Ltd is accredited to ISO/IEC 17025 under the Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme (SAC-SINGLAS, Certificate No: LA-2016-0610-G).

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council.

Report number:

OTM2104001

Job description:

Testing of solar reflectance index (SRI) of a sample.

The sample was delivered by the client and received by OTM on 01/04/2021 and was tested on 01/04/2021.

Approved signatory:

Dr. Chen Fangzhi

Laboratory Manager (Tel: +65 9187 7666; Email: chen.fz@otm.sg)

Date of test:

01/04/2021

Date of report:

01/04/2021

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Test method description

<p><u>Methods:</u></p>	<ul style="list-style-type: none"> • ASTM E903-20 Standard test method for solar absorptance, reflectance, and transmittance of materials using integrating spheres • ASTM C1371-15 Standard test method for determination of emittance of materials near room temperature using portable emissometers <ul style="list-style-type: none"> ○ With D&S Technical Note 11-2: Model AE1 emittance measurement using a port adaptor, Model AE-ADP • ASTM E1980-11 Standard practice for calculating solar reflectance index of horizontal and low-sloped opaque surfaces
<p><u>Instruments</u></p>	<ul style="list-style-type: none"> • PerkinElmer Lambda 950 UV/VIS/NIR spectrophotometer, with 150 mm integrating sphere • Devices and Services emissometer with scaling digital voltmeter, model AE1 RD1
<p><u>Calculation software and method</u></p>	<ul style="list-style-type: none"> • In-house software (SRI@OTM, V1.2.0) based on ASTM E1980 and E903 <ul style="list-style-type: none"> ○ Solar properties were calculated with the weighted ordinate method (Section 8.3 of ASTM E903) ○ The AM1.5 direct normal solar spectral irradiance distribution defined in ASTM E891 was used as the weighting spectrum ○ Surface temperatures were calculated by solving Eq. 1 of ASTM E1980 iteratively
<p><u>Estimated uncertainties</u></p>	<ul style="list-style-type: none"> • ± 0.008 ($\pm 0.8\%$) for solar reflectance and absorptance • ± 0.02 for emittance • ± 2.3 for solar reflectance index (SRI) • The estimated uncertainties do not include uncertainties caused by sample-to-sample variations and sample non-uniformities
<p><u>Notes</u></p>	<p>N/A</p>

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Disclaimer

- The test report shall not be reproduced except in full, without written approval of the laboratory.
- The sampling was not performed by the laboratory. The test results relate only to the samples received and tested.
- The sample description information was declared by the client and it may affect the validity of the results.
- The test report is issued subject to the “Testing Service Terms and Conditions” annexed to OTM official quotation and on request from OTM.

SAMPLE

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Sample ID	2104001																				
Sample description	Sample description																				
Dimension	1 mm × 10 cm × 10 cm																				
Test results	<p>Emittance = 0.90 Solar reflectance = 0.090 (9.0%) Solar absorptance = 0.910 (91.0%)</p> <table border="1"> <thead> <tr> <th>Condition</th> <th>Low-wind (0 – 2 m/s)</th> <th>Medium-wind (2 – 6 m/s)</th> <th>High-wind (6 – 10 m/s)</th> </tr> </thead> <tbody> <tr> <td>Black surface temperature, T_b, [K]</td> <td>376.8</td> <td>355.6</td> <td>334.2</td> </tr> <tr> <td>White surface temperature, T_w, [K]</td> <td>322.4</td> <td>317.8</td> <td>313.9</td> </tr> <tr> <td>Specimen surface temperature, T_s, [K]</td> <td>374.3</td> <td>353.7</td> <td>333.2</td> </tr> <tr> <td>Solar reflectance index, SRI, [-]</td> <td>4.6</td> <td>5.0</td> <td>5.2</td> </tr> </tbody> </table>	Condition	Low-wind (0 – 2 m/s)	Medium-wind (2 – 6 m/s)	High-wind (6 – 10 m/s)	Black surface temperature, T_b , [K]	376.8	355.6	334.2	White surface temperature, T_w , [K]	322.4	317.8	313.9	Specimen surface temperature, T_s , [K]	374.3	353.7	333.2	Solar reflectance index, SRI , [-]	4.6	5.0	5.2
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Spectral curve																					

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<p><u>Photos</u></p>	 <p>Test sample photos</p>
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