

REPORT No. 061665

CUSTOMER	INDUSTRIA ESPAÑOLA PARA EL DESARROLLO E INVESTIGACIÓN 2100, S.A. (IEdiSA)
APPLICANT	PATRICIA SILVA
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PURPOSE	SRI INDEX IN ACCORDANCE WITH ASTM E1980-11
SAMPLE TESTED	WHITE COATING REF. «BIOSPHERE PREMIUM»
DATE OF RECEIPT	12/09/2016
TEST DATES	20/09/2016
DATE ISSUED	28/09/2016

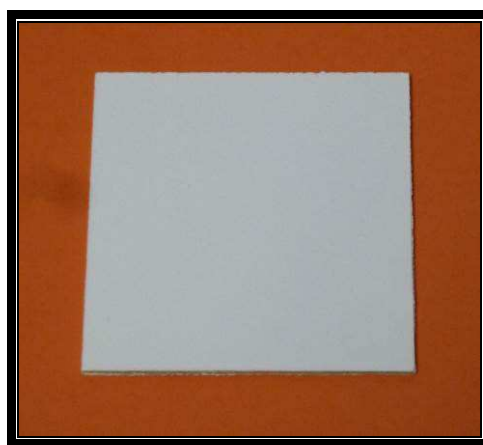
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- * The results of this report solely and exclusively concern the material tested at the time and under the conditions in which the measurements were taken.
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CHARACTERISTICS OF THE SAMPLES

On 12th September 2016, TECNALIA received from the company INDUSTRIA ESPAÑOLA PARA EL DESARROLLO E INVESTIGACIÓN 2100, S.A. (IEdiSA), 6 test specimens of white coating measuring (100 x 100) mm and referred to as:

«BIOSPHERE PREMIUM»



The annex includes the technical data sheet for the product tested supplied by the customer.

CALCULATION REQUESTED

The calculation requested is the determination of the **SRI index** of the test specimen received in accordance with **ASTM E1980-11** «Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces».

Two tests must be done prior to the determination of the SRI index;

- Determination of the **solar reflectance** in accordance with **ASTM E903-12** «Standard Test Method for Solar Absorptance, Reflectance, and Transmittance of Materials Using Integrating Spheres».
- Determination of the **emissivity** in accordance with **ASTM C1371-15** «Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers».

TESTS CARRIED OUT

SOLAR REFLECTANCE

The determination of the reflectance between 280 and 2,500 nm was carried out using a Perkin-Elmer Spectrometer Lambda 900 UV/VIS/NIR spectrophotometer with an integrating sphere of 150 mm in diameter and white standard.

The test was carried out under laboratory conditions at (23 ± 2) °C and a relative humidity of under 70%. The test specimens were conditioned for 24 hours under the laboratory conditions described above.

The method used has the following characteristics:

- Wavelength interval: 5 nm
- Scan speed: 284.6 nm/min
- Slit UV/VIS:1
- Detector gain NIR:4

Six measurements were taken on one of the test specimen received and the average was calculated.

Based on the reflectance average value of the test specimen, solar reflectance has been calculated using the selected ordinate method set out in Section 8.3.4.. Ordinates have been selected from the values of direct normal solar irradiance specified in Table X2.3 of the ASTM E903-12 «50 Selected Ordinates for G173 Direct Normal Irradiance AM 1.5».

EMISSIVITY

The measuring equipment used was an emissometer model AE manufactured by Device & Services Company for low and high emissivity.

The test was carried out under laboratory conditions at (23 ± 2) °C and a relative humidity of under 70%. The test specimens and test device (Emissometer Model AE) were conditioned for 24 hours under the laboratory conditions described above.

Emissivity values are determined by comparing the minimum standard value estimated at 0.06 using a silver and copper alloy disc and the maximum standard value estimated at 0.88 using a black disc close to perfect black with a value of 1, made of galvanized aluminium and coated with Teflon. The values of these materials of reference are described in technical note 78-2 provided by the Device & Services Company, which explains how these standard emissivity values have been reached.

The values obtained have an estimated deviation of ± 0.02 .

Ten measurements were taken on the test specimens received and the average was calculated.

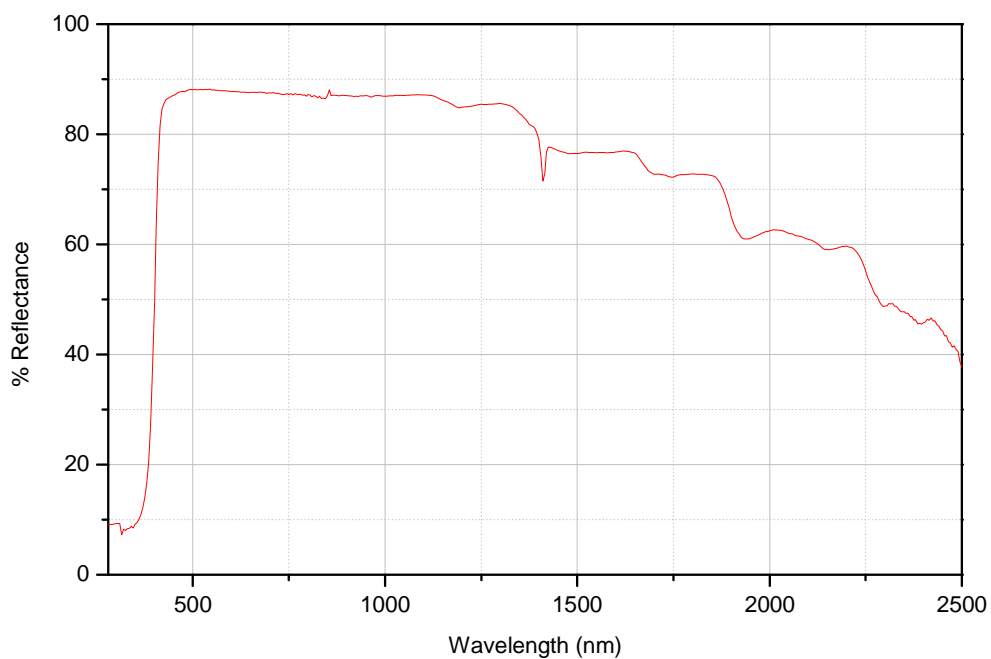
RESULTS

SOLAR REFLECTANCE

The result of solar reflectance of the test specimen referenced as «**BIOSPHERE PREMIUM**» is:

Solar reflectance (%)	82.2 ± 0.2
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The following graph shows the data of the spectral reflectance of the test specimen.



EMISSIVITY

The results of emissivity are:

Measurement	1	2	3	4	5	6	7	8	9	10
Emissivity	0.80	0.78	0.80	0.79	0.79	0.80	0.78	0.78	0.77	0.78

Therefore, the mean emissivity value of the test specimen referenced as «**BIOSPHERE PREMIUM**» is:

Emissivity	0.79 ± 0.03
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SRI

Using the solar reflectance and emissivity values obtained, the following **SRI index** and **surface temperature** values are obtained, in accordance with the ASTM E1980-11 Standard for different convection coefficients:

Convective coefficient	SRI	T _s (K)
Low (0-2 m/s)	100.0 ± 0.3	321,9
Medium(2-6 m/s)	100.8 ± 0.3	317,5
High (6-10 m/s)	101.5 ± 0.3	313,5