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## **Determination of solar reflectance index (SRI) according to ASTM E1980-11**

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**Sample: SERIE URBAN BEIGE**

Report no. C204114

No. of pages: 3

GRES DE ARAGÓN, S.A.

Castellón, 6 November 2020

## 1. Background

On 2<sup>nd</sup> November 2020 the Instituto de Tecnología Cerámica (ITC) received one sample of ceramic tile, supplied by GRES DE ARAGÓN, S.A.

The reference (and information) provided by the company, for which ITC is not responsible, is as follows:

- Sample 1: **SERIE URBAN BEIGE**

The determination of the solar reflectance index (SRI), according to *ASTM E1980-11* standard, was requested on the sample. An image of the sample is shown in figure 1.



Figure 1 Sample 1: **SERIE URBAN BEIGE**

## 2. Tests conducted

### 2.1. Determination of solar reflectance index (SRI)

The solar reflectance index (SRI) was determined according to *ASTM E1980-11* standard titled “*Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces*”.

In order to measure the thermal emissivity, an emissometer model *AE1* from *Devices & Services Company* was used. Before carrying out the test, the equipment was calibrated by means of standards of known emissivity according to *ASTM C1371-15* standard titled “*Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers*”.

In order to measure the solar reflectance and absorptance, a solar spectrum reflectometer model *SSR-ER-V6* from *Devices & Services Company* was used. In this test, the parameters were calculated as specified in the *ASTM C1549* standard titled “*Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer*” and using the solar irradiation tables of *ASTM G-173-03* standard titled “*Hemispherical Solar Spectral Irradiance at Air Mass 1.5 for a 37° Tilted Surface*”.

### 3. Results

#### 3.1. Determination of solar reflectance index (SRI)

Results obtained during the determination of the solar reflectance index (SRI), at different wind conditions as detailed in the standard, are shown in the first table. In the next table, it can be observed the data obtained in the determination of the solar reflectance ( $a$ ), the solar absorptance ( $\alpha$ ) and the thermal emissivity ( $\epsilon$ ) of the sample.

Sample 1: **SERIE URBAN BEIGE**

Table 1. Solar reflectance index (SRI) for sample **SERIE URBAN BEIGE**

Convective coefficient (W/(m <sup>2</sup> K))	Solar Reflectance Index
5 (low-wind condition)	<b>54</b>
12 (medium-wind condition)	<b>57</b>
30 (high-wind condition)	<b>59</b>

Table 2. Solar absorptance ( $\alpha$ ), solar reflectance ( $a$ ) and thermal emissivity ( $\epsilon$ ) for sample **SERIE URBAN BEIGE**

Solar absorptance ( $\alpha$ )	Solar reflectance ( $a$ )	Thermal emissivity ( $\epsilon$ )
<b>0.50</b>	<b>0.50</b>	<b>0.84</b>

Report no. C204114, issued at the request of GRES DE ARAGÓN, S.A., consists of a title page and 3 pages.

Castellón, 6 November 2020



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