

21 February 2024

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EMISSIONITY AND SOLAR REFLECTANCE INDEX OF NEOTEX COATINGS

On 16th February 2024 three (3) polymer membrane samples of white shade and dimensions approx. 100x100mm were received from NEOTEX SA marked "NEOPROOF PU FAST" in order to carry out measurements of infrared emissivity and total solar reflectance index.

Methodology:

The measurements were carried out as follows:

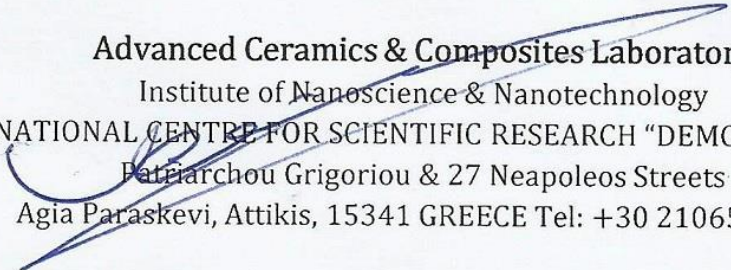
- 1) InfraRed emissivity was determined on the basis of the standard ASTM E408 "Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques", under the following conditions:
 - a. The tests were carried out inside a heated light-proof cavity where the specimen tile was heated to $55\pm 2^{\circ}\text{C}$. The temperature on the surface of the specimen was measured by two type K thermocouples connected in parallel.
 - b. The IR emissivity (emittance, ϵ) was determined using an IR Inspection meter on the centre of the heated tile with an accuracy of 0.01.
 - c. A total of 3 measurements were carried out on separate specimens from each sample
 - d. Calibration was carried out using two standards: a "black body emitter" ($\epsilon=1.0$) and burnished aluminium mirror ($\epsilon=0.05$).
- 2) The total Solar Reflectance Index (SRI) was determined on the basis of the standard ASTM E1980-11 "Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces" after measurement of the solar reflectance (SR) on the basis of standard ASTM C1549 "Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer", under the following conditions.
 - a. The reflectometer used has been constructed according to ASTM C1549 and uses a solar-spectrum high-temperature halogen light source.
 - b. The reflectometer employs a special wide-spectrum sensor sensitive to EM radiation in the range of 350 – 2500nm (UV-Visible-IR).

- c. The instrument is calibrated using a standard black-body and a standard white specimen.
- d. All measurements were carried out at $25 \pm 2^\circ\text{C}$
- e. A total of 3 measurements were carried out on separate specimens from each sample
- f. The theoretical SRI was calculated using the SR and ϵ values obtained using the SRI calculator obtained from Lawrence Berkeley National Laboratory¹ based on ASTM E1980-11.

Results:

The average results for the NEOPROOF PU Fast membranes as delivered are as follows:

Material	IR emissivity at $55 \pm 2^\circ\text{C}$	Solar Reflectance (SR) at $25 \pm 2^\circ\text{C}$	Solar Reflectance Index (SRI) Medium wind (2-6m/s)
NEOPROOF PU FAST	0.96 ± 0.01	0.82 ± 0.02	104 ± 1


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¹ <https://www.usgbc.org/sites/default/files/srivalc10.xls>