

Contact person	Date	Reference	Page
Stefan Källberg Division Safety and Transport +46 10 516 56 26 stefan.kallberg@ri.se	2023-12-14	105105-1230418	1 (2)

OrganoWood AB
Linjalvägen 9
187 66 TÄBY
Sweden

Determination of Solar Reflectance Index (SRI) according to ASTM E1980-11 (2019)

(2 appendices)

Identification

Object	Wood samples denoted Organowood NOWA (produced). Five pieces of the wood were received, sample size about 55×115×20 mm. See pictures in appendix 1.
Object state	At arrival the samples were without damage.
Location	Borås, Sweden
Measurement date	Nov-Dec, 2023

Measurement methods and procedures

The total spectral reflectance of the wood was measured in the wavelength range 250 nm - 2500 nm in steps of 10 nm using a spectrophotometer Perkin-Elmer Lambda 900. Measuring geometry 8°/total. As a reference a white matt reflectance standard was used. The bandwidth was between 5 nm and 20 nm. Measurements were made on three different samples and the final results were calculated using mean values of these measurements.

In the range 2 to 25 µm, the spectral reflectance of the sample was measured using a FTIR - spectrometer equipped with an integrating sphere, measuring geometry 13°/total. A diffuse gold reflectance standard was used as a reference.

Using the reference solar spectrum ASTM G173, the total solar reflectance of the sample was calculated. Also, the emissivity of the sample was calculated based on the IR-reflectance values and the Planck radiation distribution for a surface temperature of 53 °C.

Finally, based on the calculated values and standard conditions as specified in ASTM E1980, the solar reflectance index (SRI) and the surface temperature of the sample was calculated following the procedure in ASTM E1980.

Measurement conditions

Ambient temperature 23 ±2 °C

RISE Research Institutes of Sweden AB

Postal address	Office location	Phone / Fax / E-mail
Box 857 501 15 BORÅS SWEDEN	Brinellgatan 4 504 62 Borås SWEDEN	+46 10-516 50 00 +46 33-13 55 02 info@ri.se

Confidentiality level
C2 - Internal

This document may not be reproduced other than in full, except with the prior written approval of RISE Research Institutes of Sweden AB.

Results

The results only refer to the objects specified in this document.

Spectral reflectance: See diagrams in appendix 2.

Table 1. Summary of the results.

Sample ID	SRI-value	Solar reflectance	Emissivity	Surface temperature (°C)
NOWA (produced)	77,1 ±2,0	0,63 ±0,02	0,92 ±0,03	53,2 ±1,0

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with EA Publication EA-4/02

Equipment

Spectrophotometer PE Lambda 900 inv.no. 503052

PE Lambda 900 accessory device, integrating sphere Ø 150 mm, inv.no. 503058

White reflectance standard, Spectralon, inv.no. KWP 03007

FTIR Spectrophotometer Bruker Vertex 80, inv.no KWP 13059

FTIR Vertex 80 accessory device, gold coated sphere, s/n 218

RISE Research Institutes of Sweden AB Measurement Science and Technology - Time and Optics

Performed by



Stefan Källberg

Appendices

Sample picture

Spectral reflectance