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

(1 appendix)

Identification

Object	One sample of OrganoWood, pressure impregnated pine wood, 50×50 mm ² .
Object state	Without compliant.
Arrival date	Sept 10, 2014
Location	Borås
Measurement date	Sept 23–24, 2014

Measurement conditions

Ambient temperature 23 ±2 °C

Measurement methods and procedures

The total spectral reflectance of the sample was measured in the wavelength range 280 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.

In the range 2 µm to about 16 µm, the spectral reflectance of the sample was measured using a FTIR -spectrometer equipped with an integrating sphere. A 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 about 50°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.

Results

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

Spectral reflectance: See diagrams in appendix 1.

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Table 1. Summary of the results.

Sample ID	SRI-value	Solar reflectance	Emissivity	Surface temperature (K)
OrganoWood	82,4 ±3	0,67 ±0,02	0,93 ±0,04	324,4 ±1,5

Comment: The stated uncertainties do not include possible variations in the wood surface.

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 (formerly EAL-R2). measurement.

Traceability

The spectrophotometric quantity reflectance ρ°/t is realized by use of an accurately characterized spectrophotometer together with reference standards traceable to MIKES, Finland.

Equipment

Spectrophotometer PE Lambda 900 SP inv.no. 503052
Accessory device with integrating sphere \varnothing 150 mm, SP inv.no. 503058
FTIR Spectrophotometer Thermo Electron, Nicolet 6700, SP inv.no 301197

SP Technical Research Institute of Sweden Measurement Technology - Communication

Performed by

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Appendix

Spectral transmittance

Appendix 1

Spectral transmittance

Diagram 1. Spectral transmittance, 280 – 2500 nm.

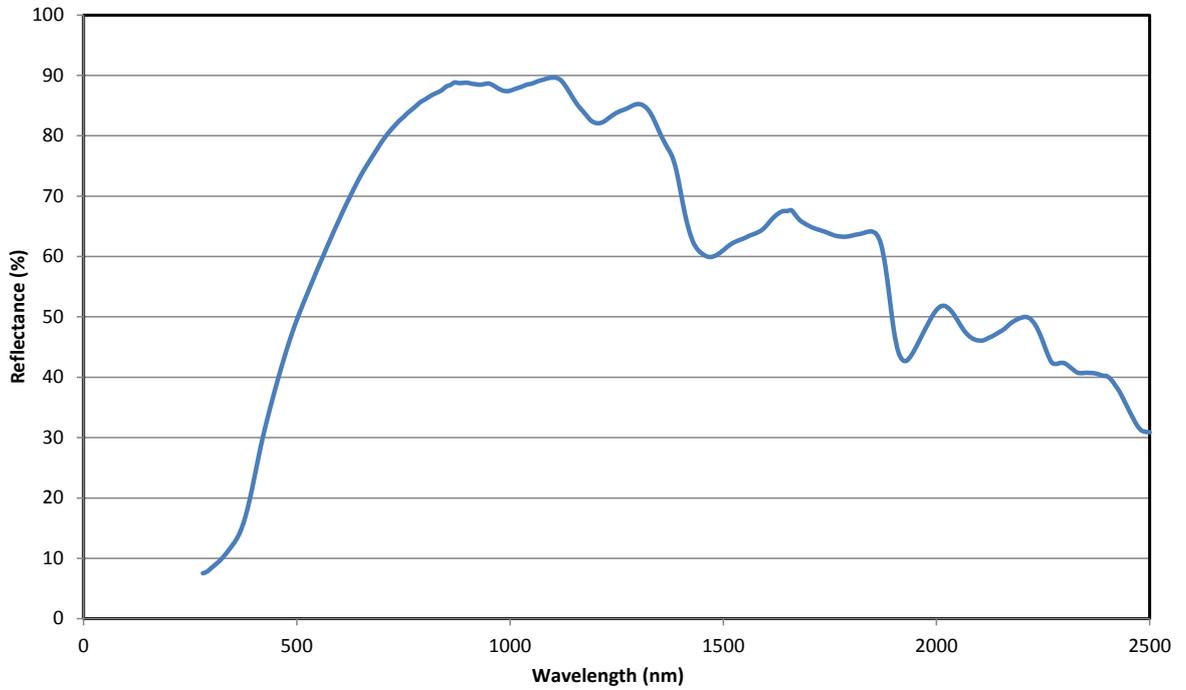


Diagram 2. Spectral transmittance, 2 – 20 μm

