

All tests in this report are executed according to the ISO 9001
 certified Quality management system of the BBRI

Test Centre
 Offices
 Head Office

B-1342 Limelette, avenue P. Holoffe 21
 B-1932 Sint-Stevens-Woluwe, Lozenberg 7
 B-1000 Bruxelles, rue du Lombard 42

Tel.: +32 (0)2 655 77 11
 Tel.: +32 (0)2 716 42 11
 Tel.: +32 (0)2 502 66 90

TEST REPORT

Laboratory Energy Characteristics (Labo EN)	O/References	DE 632XC339 EN C472/E Page: 1/11
---	--------------	--

Requested by	REWAH nv Nijverheidsweg 24 B-2240 Zandhoven		
Date of the request	2015.03.31	Sample(s) registration	N-2011-43-014
		Date of receipt of the sample(s)	2011.10.26
Drafting date of report	2015.05.12		
Test carried out	Measurement of the solar and light characteristics of panels coated with an ARDO- COOL coating.		
References	NBN EN 410 (2011), NBN EN 14500 (2008) SP / EN / 6.4		

This report is the English translation of the DE632xB900_ENa622 report of the 12th December 2011, written in Dutch.

*This test report contains 11 pages, it may only be reproduced in its entirety.
 Each page of the original report has been stamped (in red) by the laboratory and initialled by the head of laboratory.
 The results and findings are only valid for the tested samples.*

Sample(s) to be removed from our laboratories 60 calendar days after sending of the report, unless a written request is received from the client.



Technical responsible
 P. Despeer



Reasearcher
 O. Gerin, ir



Assistant Head of Division
 G. Flamant, ir

1. SUBJECT

Determination of the solar and light characteristics of panels coated with an ARDO- COOL coating system. The spectral transmittance and reflectance have been measured in the solar range (wavelengths from 280 nm to 2500 nm).

From these measurements, the following properties were calculated :

- Light reflectance
- Solar reflectance

2. NORMATIVE REFERENCES

- NBN EN 410 (2011) : Glass in building – Determination of luminous and solar characteristics of glazing.

3. SAMPLES

8 samples identified with a distinct identification label placed by the client on one side of each sample. The references of the samples are indicated on table 1.

4. EQUIPMENT

The measurements are carried out on a spectrophotometer “Perkin Elmer Lambda 900 UV-VIS-NIR”. It is a commercial spectrophotometer UV-VIS-NIR (ultraviolet-visible-near infrared) with double beam and double monochromator configuration (serial number : 101N9012992).

This device is equipped with a 150 mm diameter integrating sphere (Perkin-Elmer PELA 1000).

5. REFERENCE STANDARD FOR REFLECTANCE MEASUREMENTS

The reference standard used for reflectance measurements is a spectralon sample calibrated from a primary reference standard (spectralon – reference DQ00), which was calibrated by the metrology laboratory NPL (National Physical Laboratory, UK) .



6. RESULTS OF MEASUREMENTS

The light and solar reflectance values are calculated from the measured spectral values according to NBN EN410 standard.

All the measurements are carried out at normal incidence.

In this report, the side of the sample with the label is called "BACK" side, while the other side is called "FRONT" side.

The reflectance were measured with the beam incident to the "FRONT" side (side with the coating).

The following values are given for the "FRONT" side :

- $\rho_{v,n-h}$: normal-hemispherical light reflectance
- $\rho_{e,n-h}$: normal-hemispherical solar reflectance

All these characteristics are given on a test sheet for each sample, on pages 4/11 to 11/11.

The measurement procedure is the following :

- 10 measurements are carried out at different positions on the sample;
- The average value of these measurements is determined and the solar and light properties are given for this average value in table 1.

BBRI n°	type	Energy	Light
		$\rho_{e,n-h}$	$\rho_{v,n-h}$
ENa622-01	RCP2A	81.1%	90.3%
ENa622-02	RCP3D	19.3%	5.3%
ENa622-03	RCP4A	4.5%	4.5%
ENa622-04	RCP5A	14.6%	5.3%
ENa622-05	RCP6A	18.3%	5.3%
ENa622-06	RCP7A	19.8%	5.4%
ENa622-07	RCP8C	19.3%	5.3%
ENa622-08	RCP9C	19.0%	5.2%

Table1 : Results of the reflectance measurements.



Test report: luminous and solar material characteristics

Sample description

Material: *Coating*
 Type: *RCP2A*
 ref. nr. BBRI: *ENa622-01*

Results according to EN 410

Solar energetic properties

	$\tau_{e,n-h}$	$\tau_{e,n-dif}$	$\tau_{e,n-n}$
Transmittance	-	-	-
	$\rho_{e,n-h}$	$\rho'_{e,n-h}$	
Reflectance	81.1%	-	
	α_e	α'_e	
Absorptance	-	-	

Visual properties

	$\tau_{v,n-h}$	$\tau_{v,n-dif}$	$\tau_{v,n-n}$
Transmittance	-	-	-
	$\rho_{v,n-h}$	$\rho'_{v,n-h}$	
Reflectance	90.3%	-	
	α_v	α'_v	
Absorptance	-	-	

UV transmittance

	τ_{UV}	τ_{UV-A}	τ_{UV-B}
Transmittance	-	-	-

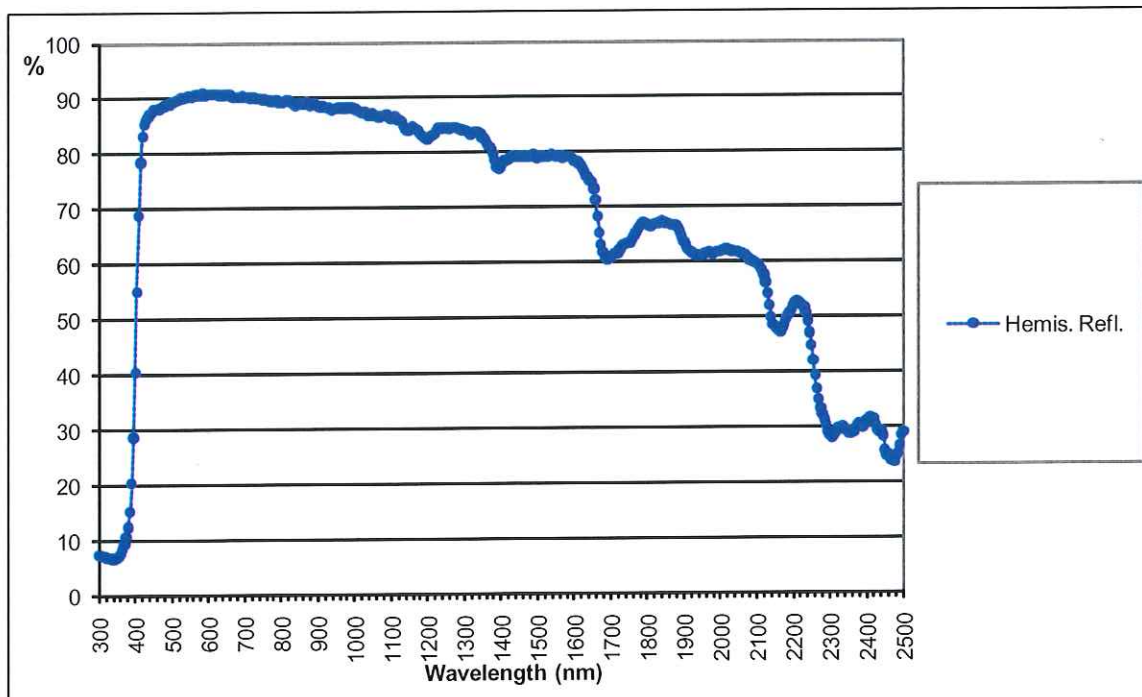
Colour Rendering index

Ra
-

Additional results

Openness factor

OF
-



Test report: luminous and solar material characteristics

Sample description

Material: *Coating*
 Type: *RCP3D*
 ref. nr. BBRI: *ENa622-02*

Results according to EN 410

Solar energetic properties

	$\tau_{e,n-h}$	$\tau_{e,n-dif}$	$\tau_{e,n-n}$
Transmittance	-	-	-
	$\rho_{e,n-h}$	$\rho'_{e,n-h}$	
Reflectance	19.3%	-	
	α_e	α'_e	
Absorptance	-	-	

Visual properties

	$\tau_{v,n-h}$	$\tau_{v,n-dif}$	$\tau_{v,n-n}$
Transmittance	-	-	-
	$\rho_{v,n-h}$	$\rho'_{v,n-h}$	
Reflectance	5.3%	-	
	α_v	α'_v	
Absorptance	-	-	

UV transmittance

	τ_{UV}	τ_{UV-A}	τ_{UV-B}
Transmittance	-	-	-

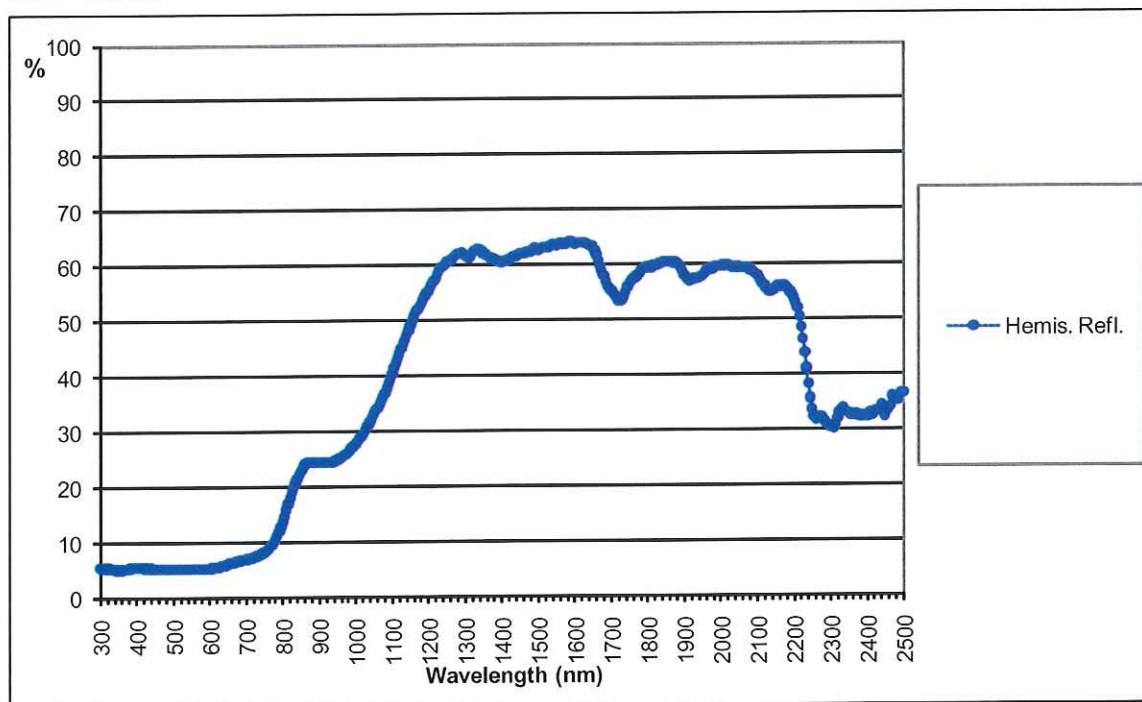
Colour Rendering index

Ra
-

Additional results

Openness factor

OF
-



Test report: luminous and solar material characteristics

Sample description

Material: *Coating*
 Type: *RCP4A*
 ref. nr. BBRI: *ENa622-03*

Results according to EN 410

Solar energetic properties

	$\tau_{e,n-h}$	$\tau_{e,n-dif}$	$\tau_{e,n-n}$
Transmittance	-	-	-
	$\rho_{e,n-h}$	$\rho'_{e,n-h}$	
Reflectance	4.5%	-	
	α_e	α'_e	
Absorptance	-	-	

Visual properties

	$\tau_{v,n-h}$	$\tau_{v,n-dif}$	$\tau_{v,n-n}$
Transmittance	-	-	-
	$\rho_{v,n-h}$	$\rho'_{v,n-h}$	
Reflectance	4.5%	-	
	α_v	α'_v	
Absorptance	-	-	

UV transmittance

	τ_{UV}	τ_{UV-A}	τ_{UV-B}
Transmittance	-	-	-

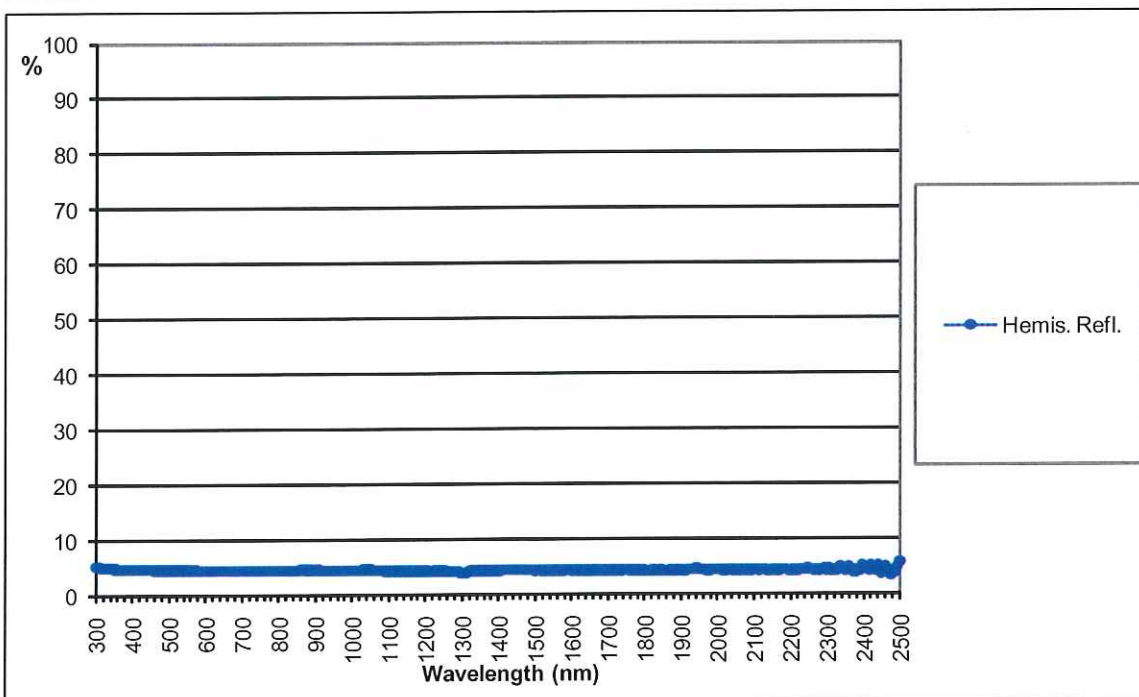
Colour Rendering index

Ra
-

Additional results

Openness factor

OF
-



Test report: luminous and solar material characteristics

Sample description

Material: *Coating*
 Type: *RCP5A*
 ref. nr. BBRI: *ENa622-04*

Results according to EN 410

Solar energetic properties

	$\tau_{e,n-h}$	$\tau_{e,n-dif}$	$\tau_{e,n-n}$
Transmittance	-	-	-
	$\rho_{e,n-h}$	$\rho'_{e,n-h}$	
Reflectance	14.6%	-	
	α_e	α'_e	
Absorptance	-	-	

Visual properties

	$\tau_{v,n-h}$	$\tau_{v,n-dif}$	$\tau_{v,n-n}$
Transmittance	-	-	-
	$\rho_{v,n-h}$	$\rho'_{v,n-h}$	
Reflectance	5.3%	-	
	α_v	α'_v	
Absorptance	-	-	

UV transmittance

	τ_{UV}	τ_{UV-A}	τ_{UV-B}
Transmittance	-	-	-

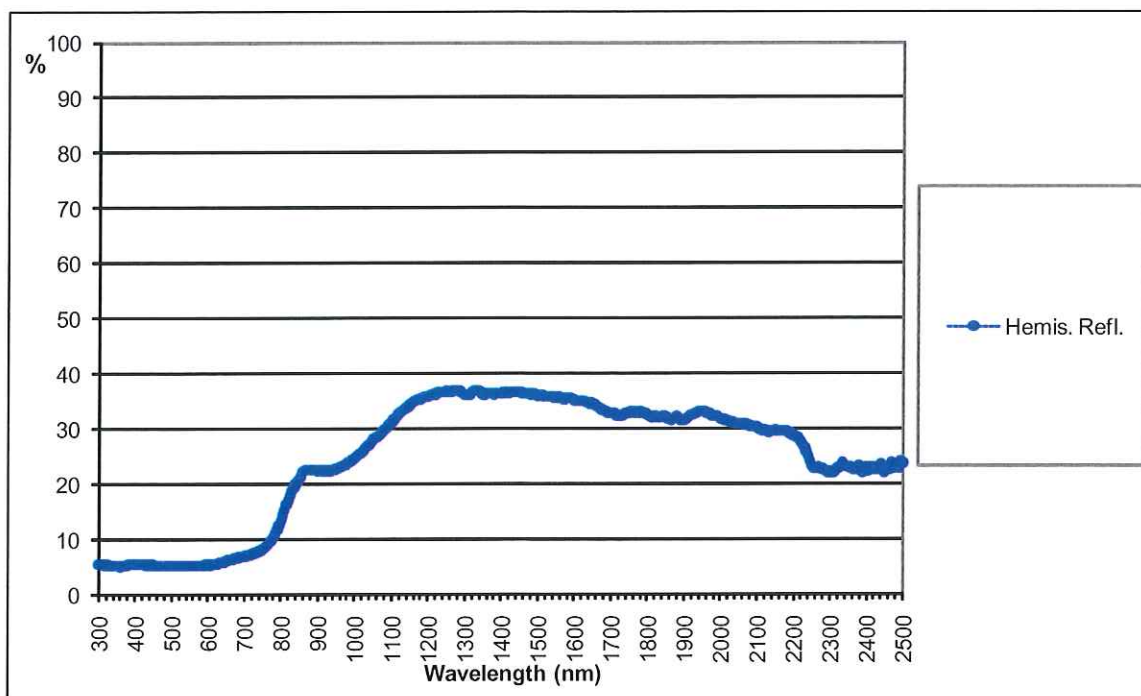
Colour Rendering index

Ra
-

Additional results

Openness factor

OF
-



Test report: luminous and solar material characteristics

Sample description

Material: *Coating*
 Type: *RCP6A*
 ref. nr. BBRi: *ENa622-05*

Results according to EN 410

Solar energetic properties

	$\tau_{e,n-h}$	$\tau_{e,n-dif}$	$\tau_{e,n-n}$
Transmittance	-	-	-
	$\rho_{e,n-h}$	$\rho'_{e,n-h}$	
Reflectance	18.3%	-	
	α_e	α'_e	
Absorptance	-	-	

Visual properties

	$\tau_{v,n-h}$	$\tau_{v,n-dif}$	$\tau_{v,n-n}$
Transmittance	-	-	-
	$\rho_{v,n-h}$	$\rho'_{v,n-h}$	
Reflectance	5.3%	-	
	α_v	α'_v	
Absorptance	-	-	

UV transmittance

	τ_{UV}	τ_{UV-A}	τ_{UV-B}
Transmittance	-	-	-

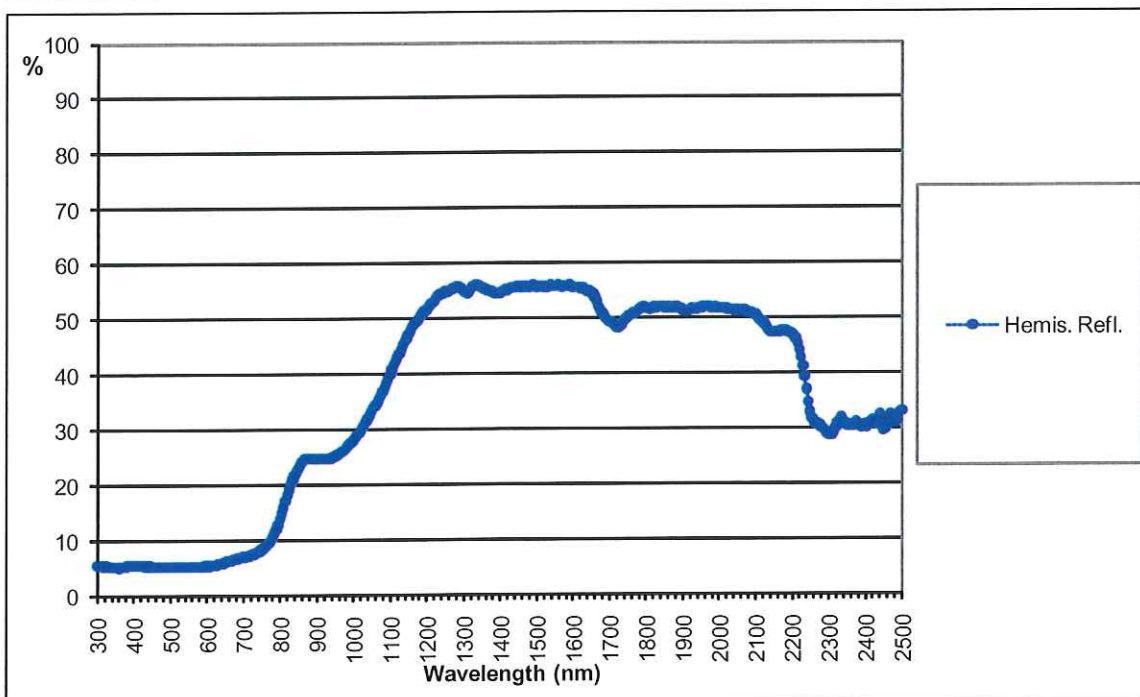
Colour Rendering index

Ra
-

Additional results

Openness factor

OF
-



Test report: luminous and solar material characteristics

Sample description

Material: *Coating*
 Type: *RCP7A*
 ref. nr. BBRI: *ENa622-06*

Results according to EN 410

Solar energetic properties

	$\tau_{e,n-h}$	$\tau_{e,n-dif}$	$\tau_{e,n-n}$
Transmittance	-	-	-
	$\rho_{e,n-h}$	$\rho'_{e,n-h}$	
Reflectance	19.8%	-	
	α_e	α'_e	
Absorptance	-	-	

Visual properties

	$\tau_{v,n-h}$	$\tau_{v,n-dif}$	$\tau_{v,n-n}$
Transmittance	-	-	-
	$\rho_{v,n-h}$	$\rho'_{v,n-h}$	
Reflectance	5.4%	-	
	α_v	α'_v	
Absorptance	-	-	

UV transmittance

	τ_{UV}	τ_{UV-A}	τ_{UV-B}
Transmittance	-	-	-

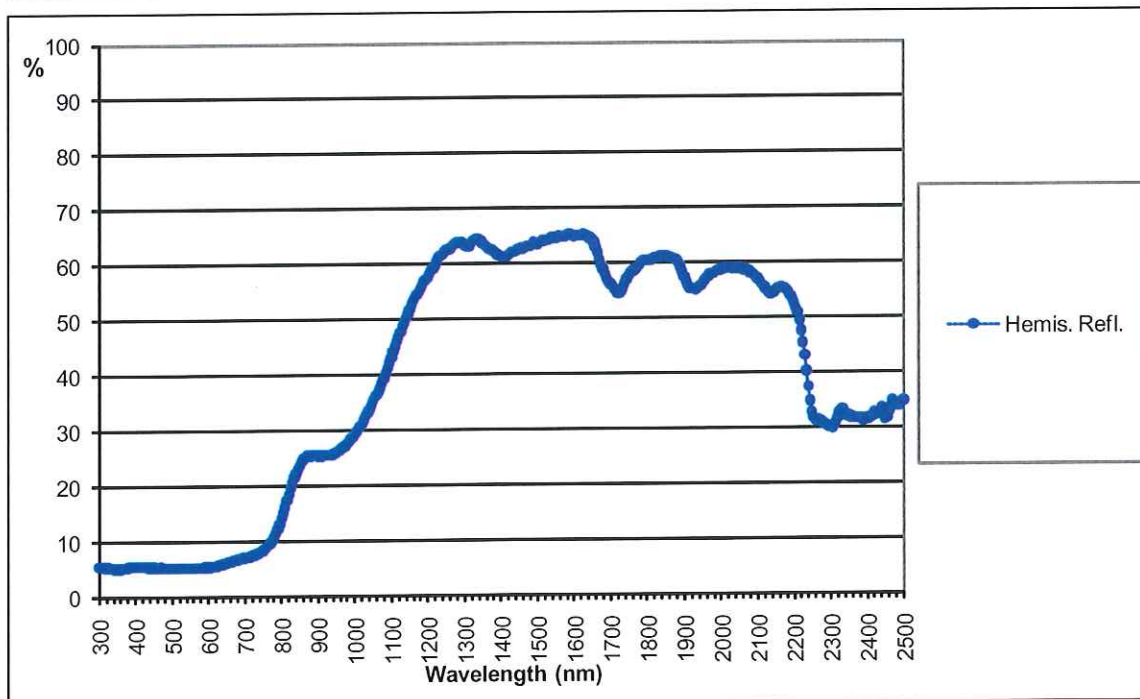
Colour Rendering index

Ra
-

Additional results

Openness factor

OF
-



Test report: luminous and solar material characteristics

Sample description

Material: *Coating*
 Type: *RCP8C*
 ref. nr. BBRI: *ENa622-07*

Results according to EN 410

Solar energetic properties

	$\tau_{e,n-h}$	$\tau_{e,n-dif}$	$\tau_{e,n-n}$
Transmittance	-	-	-
	$\rho_{e,n-h}$	$\rho'_{e,n-h}$	
Reflectance	19.3%	-	
	α_e	α'_e	
Absorptance	-	-	

Visual properties

	$\tau_{v,n-h}$	$\tau_{v,n-dif}$	$\tau_{v,n-n}$
Transmittance	-	-	-
	$\rho_{v,n-h}$	$\rho'_{v,n-h}$	
Reflectance	5.3%	-	
	α_v	α'_v	
Absorptance	-	-	

UV transmittance

	τ_{UV}	τ_{UV-A}	τ_{UV-B}
Transmittance	-	-	-

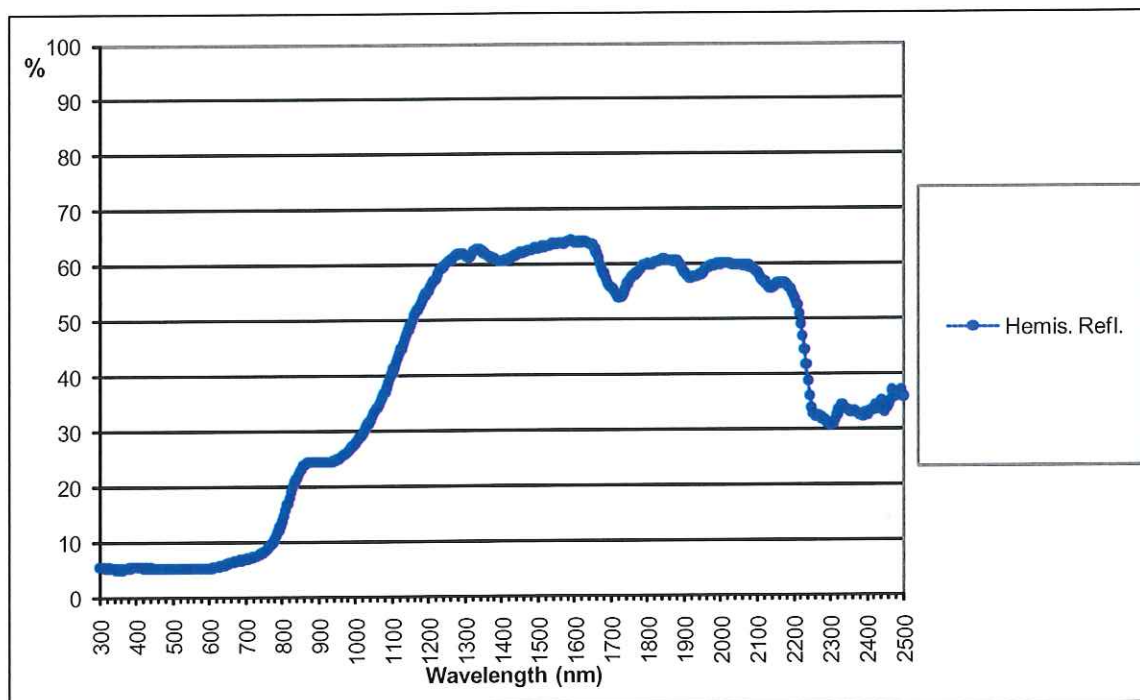
Colour Rendering index

Ra
-

Additional results

Openness factor

OF
-



Test report: luminous and solar material characteristics

Sample description

Material: *Coating*
 Type: *RCP9C*
 ref. nr. BBRi: *ENa622-08*

Results according to EN 410

Solar energetic properties

	$\tau_{e,n-h}$	$\tau_{e,n-dif}$	$\tau_{e,n-n}$
Transmittance	-	-	-
	$\rho_{e,n-h}$	$\rho'_{e,n-h}$	
Reflectance	19.0%	-	
	α_e	α'_e	
Absorptance	-	-	

Visual properties

	$\tau_{v,n-h}$	$\tau_{v,n-dif}$	$\tau_{v,n-n}$
Transmittance	-	-	-
	$\rho_{v,n-h}$	$\rho'_{v,n-h}$	
Reflectance	5.2%	-	
	α_v	α'_v	
Absorptance	-	-	

UV transmittance

	τ_{UV}	τ_{UV-A}	τ_{UV-B}
Transmittance	-	-	-

Colour Rendering index

Ra
-

Additional results

Openness factor

OF
-

