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Interuniversity Institute for Silicates, soils and Materials

Test and Research laboratory

Non-profit-making association



Accreditation N° : 32-Test
according to ISO 17025

TEST REPORT N° 2008B COU 2860-2

Including 3 pages + 1 annex
Page 1/3

Mons, September 9th, 2008

REQUESTED BY : AGC FLAT GLASS EUROPE – CRD PLANT
Rue de l'Aurore, 2
6040 Jumet
BELGIQUE

REFERENCE OF THE REQUEST : E-mail 04/09/08

CONCERNED MANUFACTURER: AGC FLAT GLASS EUROPE
Chaussée de la Hulpe, 166
B-1170 Bruxelles
BELGIQUE

NUMBER OF SAMPLES AND IDENTIFICATION : See page 2

PURPOSE OF THE REQUESTED : Spectrometric properties according to EN 410
(τ_v , τ_e , ρ_v ρ_e & g).

SAMPLES RECEIVED ON : January 29th, 2007

TESTING DATE : January 31st, 2007

REMARKS : - * Test under accreditation



Notified body (Id.N°1174)
according to ART.18 of the « Construction Products Directive » CPD 89/106/EEC

DESCRIPTION OF THE MATERIAL

Concerned manufacturer	AGC FLAT GLASS EUROPE – CRD PLANT Rue de l'Aurore, 2 6040 Jumet BELGIQUE
Production site	see product description
Commercial name of the product	/
Customer's references	Planibel Dark Grey
Internal reference	CCOU2860
Sampling	Under responsibility of the applicant
Sampling information	Traceability of the samples is under responsibility of the applicant
Glass Substrate	Tinted float glass (EN 572-2)
Samples	
Number of samples	4 (100 x 60 mm)
Nominal Thickness	4.0 mm



PHOTO-ENERGETIC PROPERTIES

EN 572-9

Instruments Description	For emissivity	For optical properties
Spectrophotometer	PerkinElmer PARAGON 1000	PerkinElmer LAMDA 19
Type	Single Beam (FTIR)	Double Beam
Reflectance accessory	PerkinElmer	
Type of references	SnO ₂ Coated Glass Gold Mirror	Primary surface Ag Mirrors Secondary surface Ag Mirrors
Measurement Responsible	JS	JS

Notes : Uncertainty calculated on emissivity measurement is ± 0.01

Reproducibility on emissivity measurement is estimated to ± 0.005

- Luminous transmission (τ_v) (EN 572-1 – 6.2 and EN 410).
- Luminous reflection (ρ_v) (EN 410).
- Energetic transmission (τ_e) (EN 410).
- Energetic reflection (ρ_e) (EN 410).

2860-2 : 3.86 mm

PHOTO-ENERGETIC PROPERTIES	RESULTS
U.V. range (280 – 380 nm)	
• Transmission τ_{uv}	3.02 %
Visible range (380 – 780 nm) – III D65/obs 2°	
• Transmission τ_v	17.96 %
• Reflection ρ_v	4.42 %
Solar range (300 – 2500 nm)	
• Transmission τ_e	17.52 %
• Reflection ρ_e	4.37 %
• Solar factor g	0.37
• Shading coefficient SC	0.43

D. LIBERT
Head of Department

Glazing and Components - INISMA

Identification du vitrage

Vitrage Simple
2860-2 3.86 mm

Propriétés Lumineuses

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* WL * TOTAL * TOTAL * TOTAL ** WL * TOTAL * TOTAL * TOTAL *
* (nm) * TRANS * REFLE * ABSORB ** (nm) * TRANS * REFLE * ABSORB *
-----
* 390 * 16.49 * 4.59 * 78.91 ** 580 * 18.29 * 4.40 * 77.31 *
* 400 * 22.10 * 4.68 * 73.23 ** 590 * 15.37 * 4.35 * 80.28 *
* 410 * 22.15 * 4.66 * 73.19 ** 600 * 15.44 * 4.34 * 80.22 *
* 420 * 20.43 * 4.61 * 74.97 ** 610 * 16.27 * 4.35 * 79.38 *
* 430 * 19.12 * 4.57 * 76.32 ** 620 * 16.66 * 4.35 * 78.99 *
* 440 * 17.75 * 4.53 * 77.72 ** 630 * 16.29 * 4.34 * 79.37 *
* 450 * 17.51 * 4.51 * 77.98 ** 640 * 15.52 * 4.32 * 80.16 *
* 460 * 17.86 * 4.50 * 77.64 ** 650 * 15.30 * 4.32 * 80.39 *
* 470 * 17.72 * 4.49 * 77.80 ** 660 * 16.17 * 4.32 * 79.51 *
* 480 * 17.11 * 4.46 * 78.43 ** 670 * 18.35 * 4.35 * 77.29 *
* 490 * 16.56 * 4.44 * 79.00 ** 680 * 21.90 * 4.42 * 73.68 *
* 500 * 16.28 * 4.43 * 79.29 ** 690 * 25.95 * 4.50 * 69.55 *
* 510 * 15.92 * 4.41 * 79.67 ** 700 * 28.91 * 4.57 * 66.52 *
* 520 * 15.77 * 4.40 * 79.82 ** 710 * 29.91 * 4.59 * 65.49 *
* 530 * 16.02 * 4.40 * 79.58 ** 720 * 29.67 * 4.58 * 65.75 *
* 540 * 17.66 * 4.42 * 77.93 ** 730 * 28.62 * 4.55 * 66.83 *
* 550 * 20.64 * 4.46 * 74.90 ** 740 * 27.41 * 4.52 * 68.07 *
* 560 * 22.72 * 4.50 * 72.78 ** 750 * 25.92 * 4.48 * 69.60 *
* 570 * 21.61 * 4.47 * 73.93 ** 760 * 24.49 * 4.44 * 71.06 *
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Propriétés lumineuses
Light properties Illuminant D65
Licht Eigenschaften

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Transmission lumineuse            (TL)
Light transmittance                (LT)            18.0   +- .5%
Lichtdurchlässigkeit               (LR)

Reflexion lumineuse                (RL)
Light reflectance                   (LR)            4.4   +- .75%
Lichtreflexion                      (LR)

Absorption lumineuse                (AL)
Light absorption                    (LA)            77.6   +- 1%
Lichtabsorption                     (LA)

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Identification du vitrage

Vitrage Simple
2860-2 3.86 mm

Propriétés Energétiques

```

*****
* WL * TOTAL * TOTAL * TOTAL ** WL * TOTAL * TOTAL * TOTAL *
* (nm) * TRANS * REFLE * ABSORB ** (nm) * TRANS * REFLE * ABSORB *
*****
* 300 * 0.00 * 4.75 * 95.25 ** 950 * 10.68 * 4.18 * 85.14 *
* 320 * 0.10 * 4.67 * 95.24 ** 1000 * 9.82 * 4.16 * 86.02 *
* 340 * 0.05 * 4.59 * 95.36 ** 1050 * 9.38 * 4.15 * 86.47 *
* 360 * 3.25 * 4.54 * 92.22 ** 1100 * 9.09 * 4.14 * 86.77 *
* 380 * 10.10 * 4.53 * 85.36 ** 1150 * 8.93 * 4.13 * 86.94 *
* 400 * 22.10 * 4.68 * 73.23 ** 1200 * 9.13 * 4.12 * 86.75 *
* 420 * 20.43 * 4.61 * 74.97 ** 1250 * 9.77 * 4.12 * 86.11 *
* 440 * 17.75 * 4.53 * 77.72 ** 1300 * 11.12 * 4.12 * 84.75 *
* 460 * 17.86 * 4.50 * 77.64 ** 1350 * 12.86 * 4.14 * 83.01 *
* 480 * 17.11 * 4.46 * 78.43 ** 1400 * 15.06 * 4.16 * 80.78 *
* 500 * 16.28 * 4.43 * 79.29 ** 1450 * 17.46 * 4.18 * 78.36 *
* 520 * 15.77 * 4.40 * 79.82 ** 1500 * 20.26 * 4.22 * 75.52 *
* 540 * 17.66 * 4.42 * 77.93 ** 1550 * 23.30 * 4.28 * 72.43 *
* 560 * 22.72 * 4.50 * 72.78 ** 1600 * 25.92 * 4.33 * 69.76 *
* 580 * 18.29 * 4.40 * 77.31 ** 1650 * 27.79 * 4.36 * 67.85 *
* 600 * 15.44 * 4.34 * 80.22 ** 1700 * 28.61 * 4.38 * 67.01 *
* 620 * 16.66 * 4.35 * 78.99 ** 1750 * 29.07 * 4.38 * 66.55 *
* 640 * 15.52 * 4.32 * 80.16 ** 1800 * 29.33 * 4.38 * 66.29 *
* 660 * 16.17 * 4.32 * 79.51 ** 1850 * 29.74 * 4.38 * 65.88 *
* 680 * 21.90 * 4.42 * 73.68 ** 1900 * 30.13 * 4.39 * 65.49 *
* 700 * 28.91 * 4.57 * 66.52 ** 1950 * 31.56 * 4.42 * 64.02 *
* 720 * 29.67 * 4.58 * 65.75 ** 2000 * 32.50 * 4.44 * 63.06 *
* 740 * 27.41 * 4.52 * 68.07 ** 2050 * 33.71 * 4.47 * 61.82 *
* 760 * 24.49 * 4.44 * 71.06 ** 2100 * 35.04 * 4.50 * 60.46 *
* 780 * 21.85 * 4.38 * 73.77 ** 2200 * 37.28 * 4.55 * 58.17 *
* 800 * 19.47 * 4.33 * 76.20 ** 2300 * 40.08 * 4.63 * 55.29 *
* 850 * 14.76 * 4.24 * 80.99 ** 2400 * 41.90 * 4.68 * 53.42 *
* 900 * 12.54 * 4.21 * 83.25 ** 2500 * 41.70 * 4.66 * 53.64 *
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Te	17.5	±0.5%	g	37.2	±1%	Tuv	3.0	±0.50%
Re	4.4	±0.75%	SC	0.43		Ruv	4.6	±0.75%

COLOUR DETERMINATION ACCORDING TO CIE 1976			
VISIBLE RANGE (380 – 780 NM) – ILL D65/OBS 2°			
	L*	a*	b*
Transmission	49.5	-1.43	0.11
Reflection	25.0	-0.08	-0.49