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RC MONS : 130.828 - Enregistrement : 08/02/01

www.bcrc.be

Accreditation N° : 32-Test
according to ISO 17025

TEST REPORT N° 2010B COU 10319

Including 3 pages + 1 annex
Page 1/3

Mons, July 13nd, 2010

REQUESTED BY : AGC Glass Europe - R&D Centre
2 rue de l'Aurore
B-6040 Jumet
Belgium

REFERENCE OF THE REQUEST : N°450103739

CONCERNED MANUFACTURER: AGC GLASS EUROPE
Chaussée de la Hulpe, 166
1170 BRUXELLES
BELGIUM

NUMBER OF SAMPLES AND IDENTIFICATION : Stopray Neo - see page 2

PURPOSE OF THE REQUESTED : **Initial Type Test**
Determination of the photo-energetic properties
according to EN 1096-1.*

SAMPLES RECEIVED ON : 01/07/2010

TESTING DATE : 08/07/2010

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 SAMPLES

Concerned manufacturer : **AGC Glass Europe - R&D Centre**
2 rue de l'Aurore
B-6040 Jumet
Belgium

Production site : /

Commercial name of the product : **Stopray Neo**

Customer's references : /

Internal reference : COU 10319

Sampling : Under responsibility of the applicant

Sampling information : Traceability of the samples is under responsibility of the manufacturer.

Class of Coating : /

Coating position : /

Low emissivity : yes

Glass Substrate : Clear Float Glass

Normal emissivity of clear glass (ϵ_n) : 0.89

Samples :

 Number of samples : 3 (100 * 100 mm)

 Nominal Thickness : 6 mm

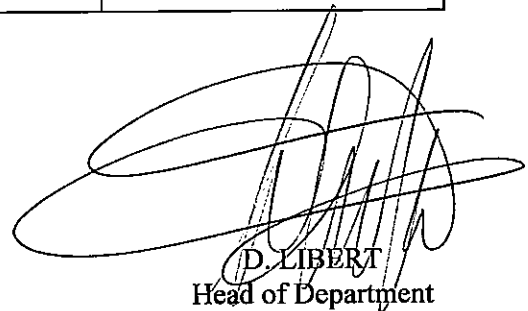
PHOTO-ENERGETIC PROPERTIES - EN 1096-1*

Instruments Description	For emissivity	For optical properties
Spectrophotometer	PerkinElmer SPECTRUM 100	PerkinElmer LAMDA 19
Type	Single Beam (FTIR)	Double Beam
Reflectance accessory	PerkinElmer	
Type of references	SnO ₂ Coated Glass	Primary surface Ag Mirrors
	Gold Mirror	Secondary surface Ag Mirrors
Measurement Responsible	DL	DL

Notes : Uncertainty calculated on emissivity measurement is ± 0.01
Reproducibility on emissivity measurement is estimated to ± 0.005

10319 : 5.86 mm

		COATED GLASS (EN 1096-1)	
U.V. range (280 – 380 nm)			
• Transmission	τ_{uv}	18.9	%
Visible range (380 – 780 nm) – Ill D65/obs 2°			
• Transmission	τ_v	66.7	%
• Reflection coated side	ρ_v	9.7	%
• Reflection opposite side	ρ'_v	20.1	%
Solar range (300 – 2500 nm)			
• Transmission	τ_e	42.3	%
• Reflection coated side	ρ_e	34.3	%
• Reflection opposite side	ρ'_e	31.5	%
• Solar factor	g	0.48	
Thermal range (5000 – 50000 nm)			
• Emissivity	ϵ_n	0.032	
• Thermal coefficient	U_g	/	



D. LIBERT
Head of Department

Glazing and Components - INISMa

Identification du vitrage

Vitrage Simple

10319 5.86 mm

micron	cm ⁻¹	Reflexion
5.5	1820	96.01
6.6	1504	96.23
7.4	1348	96.48
8.1	1240	96.69
8.6	1158	96.62
9.2	1088	96.73
9.7	1030	96.72
10.2	978	96.76
10.8	930	96.64
11.3	886	96.57
11.8	846	96.58
12.4	808	96.59
13.0	772	96.61
13.6	738	96.69
14.2	706	96.69
14.8	674	96.71
15.6	642	96.74
16.3	612	96.79
17.2	582	96.74
18.1	552	96.79
19.2	522	96.82
20.3	492	96.79
21.7	460	97.21
23.3	430	98.87
25.3	396	98.94
27.8	360	96.91
30.9	324	96.87
35.7	280	96.79
43.9	228	98.08

reflexion Moy
Emissivité

96.68
0.0330

reproductibilité
±0.005

micron	cm ⁻¹	Reflexion
5.5	1820	96.10
6.6	1504	96.30
7.4	1348	96.54
8.1	1240	96.62
8.6	1158	96.66
9.2	1088	96.80
9.7	1030	96.81
10.2	978	96.83
10.8	930	96.71
11.3	886	96.63
11.8	846	96.63
12.4	808	96.63
13.0	772	96.65
13.6	738	96.74
14.2	706	96.72
14.8	674	96.77
15.6	642	96.77
16.3	612	96.81
17.2	582	96.77
18.1	552	96.80
19.2	522	96.82
20.3	492	96.83
21.7	460	97.24
23.3	430	96.89
25.3	396	98.98
27.8	360	96.82
30.9	324	96.85
35.7	280	96.58
43.9	228	95.83

reflexion Moy
Emissivité

96.69
0.0328

reproductibilité
±0.005

micron	cm ⁻¹	Reflexion
5.5	1820	96.18
6.6	1504	96.39
7.4	1348	96.64
8.1	1240	96.74
8.6	1158	96.76
9.2	1088	96.85
9.7	1030	96.85
10.2	978	96.90
10.8	930	96.77
11.3	886	96.70
11.8	846	96.70
12.4	808	96.72
13.0	772	96.73
13.6	738	96.81
14.2	706	96.81
14.8	674	96.82
15.6	642	96.85
16.3	612	96.93
17.2	582	96.88
18.1	552	96.91
19.2	522	96.92
20.3	492	96.90
21.7	460	97.25
23.3	430	96.92
25.3	396	97.06
27.8	360	96.96
30.9	324	96.99
35.7	280	96.86
43.9	228	96.35

reflexion Moy
Emissivité

96.80
0.0318

reproductibilité
±0.005

Identification du vitrage

Vitrage Simple couche en position 1
10319 5.86 mm

Propriétés Lumineuses

```

*****
* WL * TOTAL * TOTAL * TOTAL ** WL * TOTAL * TOTAL * TOTAL *
* (nm) * TRANS * REFLE * ABSORB ** (nm) * TRANS * REFLE * ABSORB *
*****
* 390 * 46.67 * 24.21 * 29.12 ** 580 * 66.59 * 8.28 * 25.13 *
* 400 * 52.78 * 23.68 * 23.54 ** 590 * 66.13 * 8.20 * 25.67 *
* 410 * 56.83 * 22.48 * 20.69 ** 600 * 65.42 * 8.25 * 26.33 *
* 420 * 59.77 * 21.00 * 19.23 ** 610 * 64.56 * 8.42 * 27.02 *
* 430 * 61.60 * 19.58 * 18.82 ** 620 * 63.80 * 8.70 * 27.51 *
* 440 * 63.23 * 18.23 * 18.54 ** 630 * 62.82 * 9.12 * 28.06 *
* 450 * 64.41 * 16.99 * 18.60 ** 640 * 61.87 * 9.65 * 28.48 *
* 460 * 65.47 * 15.94 * 18.58 ** 650 * 60.85 * 10.31 * 28.83 *
* 470 * 66.15 * 14.96 * 18.89 ** 660 * 59.55 * 11.11 * 29.35 *
* 480 * 66.73 * 14.03 * 19.24 ** 670 * 58.30 * 12.03 * 29.67 *
* 490 * 67.17 * 13.15 * 19.67 ** 680 * 57.04 * 13.00 * 29.95 *
* 500 * 67.51 * 12.37 * 20.12 ** 690 * 55.67 * 14.11 * 30.22 *
* 510 * 67.66 * 11.61 * 20.73 ** 700 * 54.29 * 15.30 * 30.41 *
* 520 * 67.81 * 10.89 * 21.30 ** 710 * 52.96 * 16.56 * 30.48 *
* 530 * 67.94 * 10.24 * 21.82 ** 720 * 51.37 * 17.89 * 30.74 *
* 540 * 67.91 * 9.69 * 22.40 ** 730 * 49.97 * 19.32 * 30.71 *
* 550 * 67.75 * 9.19 * 23.07 ** 740 * 48.55 * 20.73 * 30.73 *
* 560 * 67.44 * 8.78 * 23.78 ** 750 * 47.03 * 22.21 * 30.76 *
* 570 * 67.14 * 8.49 * 24.37 ** 760 * 45.53 * 23.73 * 30.75 *
*****

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Propriétés lumineuses Illuminant D65
Light properties
Licht Eigenschaften

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-----
Transmission lumineuse                      (TL)
Light transmittance                      (LT)                      66.7 +- .5%
Lichtdurchlässigkeit                      (LR)

Reflexion lumineuse                      (RL)
Light reflectance                      (LR)                      9.7 +- .75%
Lichtreflexion                      (LR)

Absorption lumineuse                      (AL)
Light absorption                      (LA)                      23.6 +- 1%
Lichtabsorption                      (LA)

```

Identification du vitrage

Vitrage Simple couche en position 1
10319 5.86 mm

Propriétés Energétiques

```

*****
* WL * TOTAL * TOTAL * TOTAL *
* (nm) * TRANS * REFLE * ABSORB ** WL * TOTAL * TOTAL * TOTAL *
*****
* 300 * 0.15 * 32.89 * 66.96 ** 950 * 24.30 * 52.59 * 23.11 *
* 320 * 0.92 * 32.42 * 66.66 ** 1000 * 21.04 * 57.90 * 21.06 *
* 340 * 11.46 * 27.53 * 61.01 ** 1050 * 18.37 * 62.67 * 18.96 *
* 360 * 27.17 * 24.03 * 48.81 ** 1100 * 16.18 * 66.69 * 17.12 *
* 380 * 39.48 * 24.10 * 36.42 ** 1150 * 14.37 * 70.06 * 15.57 *
* 400 * 52.78 * 23.68 * 23.54 ** 1200 * 12.89 * 72.98 * 14.12 *
* 420 * 59.77 * 21.00 * 19.23 ** 1250 * 11.63 * 75.38 * 12.99 *
* 440 * 63.23 * 18.23 * 18.54 ** 1300 * 10.57 * 77.43 * 12.00 *
* 460 * 65.47 * 15.94 * 18.58 ** 1350 * 9.69 * 79.22 * 11.09 *
* 480 * 66.73 * 14.03 * 19.24 ** 1400 * 8.95 * 80.68 * 10.37 *
* 500 * 67.51 * 12.37 * 20.12 ** 1450 * 8.40 * 82.20 * 9.40 *
* 520 * 67.81 * 10.89 * 21.30 ** 1500 * 7.87 * 83.36 * 8.77 *
* 540 * 67.91 * 9.69 * 22.40 ** 1550 * 7.28 * 84.38 * 8.34 *
* 560 * 67.44 * 8.78 * 23.78 ** 1600 * 6.79 * 85.40 * 7.82 *
* 580 * 66.59 * 8.28 * 25.13 ** 1650 * 6.35 * 86.17 * 7.48 *
* 600 * 65.42 * 8.25 * 26.33 ** 1700 * 5.89 * 86.96 * 7.15 *
* 620 * 63.80 * 8.70 * 27.51 ** 1750 * 5.53 * 87.68 * 6.79 *
* 640 * 61.87 * 9.65 * 28.48 ** 1800 * 5.08 * 88.37 * 6.55 *
* 660 * 59.55 * 11.11 * 29.35 ** 1850 * 4.55 * 88.97 * 6.47 *
* 680 * 57.04 * 13.00 * 29.95 ** 1900 * 3.84 * 89.73 * 6.43 *
* 700 * 54.29 * 15.30 * 30.41 ** 1950 * 4.15 * 90.24 * 5.61 *
* 720 * 51.37 * 17.89 * 30.74 ** 2000 * 3.81 * 90.63 * 5.56 *
* 740 * 48.55 * 20.73 * 30.73 ** 2050 * 3.54 * 91.04 * 5.42 *
* 760 * 45.53 * 23.73 * 30.75 ** 2100 * 3.07 * 91.48 * 5.45 *
* 780 * 42.67 * 26.82 * 30.51 ** 2200 * 2.33 * 91.77 * 5.90 *
* 800 * 39.89 * 29.95 * 30.16 ** 2300 * 1.54 * 92.60 * 5.86 *
* 850 * 33.35 * 37.87 * 28.77 ** 2400 * 0.56 * 93.33 * 6.11 *
* 900 * 28.58 * 46.09 * 25.33 ** 2500 * 0.00 * 93.96 * 6.04 *
*****

```

Te	42.3	±0.5%	g	48.4	±1%	Tuv	18.9	±0.50%
Re	34.3	±0.75%	SC	0.56		Ruv	26.8	±0.75%

COLOUR DETERMINATION ACCORDING TO CIE 1976			
VISIBLE RANGE (380 – 780 NM) – ILL D65/OBS 2°			
	L*	a*	b*
Transmission	85.4	-3.70	2.06
Reflection	37.3	5.67	-18.1

Identification du vitrage

Vitrage Simple couche en position 2
10319 5.86 mm

Propriétés Lumineuses

```

*****
*  WL  * TOTAL * TOTAL * TOTAL ** WL * TOTAL * TOTAL * TOTAL *
* (nm) * TRANS * REFLE * ABSORB ** (nm) * TRANS * REFLE * ABSORB *
*****
* 390 * 46.67 * 29.65 * 23.68 ** 580 * 66.59 * 18.93 * 14.48 *
* 400 * 52.78 * 28.93 * 18.30 ** 590 * 66.13 * 18.72 * 15.14 *
* 410 * 56.83 * 27.49 * 15.68 ** 600 * 65.42 * 18.62 * 15.96 *
* 420 * 59.77 * 26.26 * 13.97 ** 610 * 64.56 * 18.54 * 16.90 *
* 430 * 61.60 * 25.40 * 13.00 ** 620 * 63.80 * 18.57 * 17.64 *
* 440 * 63.23 * 24.68 * 12.08 ** 630 * 62.82 * 18.67 * 18.51 *
* 450 * 64.41 * 24.26 * 11.33 ** 640 * 61.87 * 18.86 * 19.27 *
* 460 * 65.47 * 23.95 * 10.58 ** 650 * 60.85 * 19.14 * 20.00 *
* 470 * 66.15 * 23.55 * 10.29 ** 660 * 59.55 * 19.49 * 20.97 *
* 480 * 66.73 * 23.14 * 10.13 ** 670 * 58.30 * 19.91 * 21.79 *
* 490 * 67.17 * 22.67 * 10.16 ** 680 * 57.04 * 20.36 * 22.60 *
* 500 * 67.51 * 22.24 * 10.25 ** 690 * 55.67 * 20.83 * 23.49 *
* 510 * 67.66 * 21.77 * 10.57 ** 700 * 54.29 * 21.38 * 24.33 *
* 520 * 67.81 * 21.30 * 10.89 ** 710 * 52.96 * 21.97 * 25.06 *
* 530 * 67.94 * 20.81 * 11.25 ** 720 * 51.37 * 22.58 * 26.05 *
* 540 * 67.91 * 20.36 * 11.73 ** 730 * 49.97 * 23.18 * 26.85 *
* 550 * 67.75 * 19.95 * 12.31 ** 740 * 48.55 * 23.81 * 27.64 *
* 560 * 67.44 * 19.55 * 13.02 ** 750 * 47.03 * 24.40 * 28.57 *
* 570 * 67.14 * 19.24 * 13.62 ** 760 * 45.53 * 25.01 * 29.46 *
*****

```

Propriétés lumineuses Illuminant D65
Light properties
Licht Eigenschaften

```

-----
Transmission lumineuse                      (TL)
Light transmittance                      (LT)                      66.7 +- .5%
Lichtdurchlässigkeit                      (LR)

Reflexion lumineuse                      (RL)
Light reflectance                      (LR)                      20.1 +- .75%
Lichtreflexion                      (LR)

Absorption lumineuse                      (AL)
Light absorption                      (LA)                      13.3 +- 1%
Lichtabsorption                      (LA)

```

Identification du vitrage

Vitrage Simple couche en position 2
10319 5.86 mm

Propriétés Energétiques

```

*****
* WL * TOTAL * TOTAL * TOTAL ** WL * TOTAL * TOTAL * TOTAL *
* (nm) * TRANS * REPLE * ABSORB ** (nm) * TRANS * REPLE * ABSORB *
*****
* 300 * 0.15 * 5.68 * 94.17 ** 950 * 24.30 * 36.78 * 38.92 *
* 320 * 0.92 * 5.54 * 93.53 ** 1000 * 21.04 * 38.89 * 40.07 *
* 340 * 11.46 * 16.35 * 72.20 ** 1050 * 18.37 * 41.17 * 40.47 *
* 360 * 27.17 * 31.08 * 41.75 ** 1100 * 16.18 * 43.24 * 40.57 *
* 380 * 39.48 * 29.86 * 30.66 ** 1150 * 14.37 * 45.23 * 40.40 *
* 400 * 52.78 * 28.93 * 18.30 ** 1200 * 12.89 * 47.31 * 39.79 *
* 420 * 59.77 * 26.26 * 13.97 ** 1250 * 11.63 * 49.32 * 39.05 *
* 440 * 63.23 * 24.68 * 12.08 ** 1300 * 10.57 * 51.62 * 37.81 *
* 460 * 65.47 * 23.95 * 10.58 ** 1350 * 9.69 * 54.12 * 36.19 *
* 480 * 66.73 * 23.14 * 10.13 ** 1400 * 8.95 * 56.34 * 34.71 *
* 500 * 67.51 * 22.24 * 10.25 ** 1450 * 8.40 * 59.45 * 32.15 *
* 520 * 67.81 * 21.30 * 10.89 ** 1500 * 7.87 * 62.27 * 29.86 *
* 540 * 67.91 * 20.36 * 11.73 ** 1550 * 7.28 * 64.67 * 28.05 *
* 560 * 67.44 * 19.55 * 13.02 ** 1600 * 6.79 * 66.61 * 26.61 *
* 580 * 66.59 * 18.93 * 14.48 ** 1650 * 6.35 * 67.85 * 25.80 *
* 600 * 65.42 * 18.62 * 15.96 ** 1700 * 5.89 * 68.54 * 25.56 *
* 620 * 63.80 * 18.57 * 17.64 ** 1750 * 5.53 * 68.83 * 25.64 *
* 640 * 61.87 * 18.86 * 19.27 ** 1800 * 5.08 * 68.94 * 25.97 *
* 660 * 59.55 * 19.49 * 20.97 ** 1850 * 4.55 * 68.90 * 26.55 *
* 680 * 57.04 * 20.36 * 22.60 ** 1900 * 3.84 * 69.07 * 27.08 *
* 700 * 54.29 * 21.38 * 24.33 ** 1950 * 4.15 * 69.52 * 26.33 *
* 720 * 51.37 * 22.58 * 26.05 ** 2000 * 3.81 * 69.50 * 26.69 *
* 740 * 48.55 * 23.81 * 27.64 ** 2050 * 3.54 * 69.72 * 26.74 *
* 760 * 45.53 * 25.01 * 29.46 ** 2100 * 3.07 * 69.96 * 26.97 *
* 780 * 42.67 * 26.26 * 31.06 ** 2200 * 2.33 * 65.53 * 32.14 *
* 800 * 39.89 * 27.50 * 32.60 ** 2300 * 1.54 * 67.59 * 30.87 *
* 850 * 33.35 * 30.61 * 36.03 ** 2400 * 0.56 * 67.74 * 31.70 *
* 900 * 28.58 * 34.10 * 37.32 ** 2500 * 0.00 * 63.48 * 36.52 *
*****

```

Te	42.3	±0.5%	g	49.1	±1%	Tuv	18.9	±0.50%
Re	31.5	±0.75%	SC	0.56		Ruv	21.3	±0.75%

COLOUR DETERMINATION ACCORDING TO CIE 1976			
VISIBLE RANGE (380 – 780 NM) – ILL D65/OBS 2°			
	L*	a*	b*
Transmission	85.4	-3.70	2.06
Reflection	51.9	0.16	-7.53