

Avenue Gouverneur Cornez, 4
B-7000 MONS (Belgique)
Tél. (065)40.34.34
Fax (065)34.80.05

T.V.A. : BE 0413.106.271
RC MONS : 130.828 - Enregistrement : 08/02/01

www.bcrc.be



Accreditation N° : 32-Test
according to ISO 17025

TEST REPORT N° 2010B COU 10085-1

Including 3 pages + 1 annex
Page 1/3

Mons, June 30th, 2010

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

REFERENCE OF THE REQUEST : email Monsieur Philippe Roquiny

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

NUMBER OF SAMPLES AND IDENTIFICATION : Stopray Silver
See page 2

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

SAMPLES RECEIVED ON : 15/06/2010

TESTING DATE : 16/06/2010

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 Silver
Customer's references	:	reference C80 - 1/2/2010
Internal reference	:	CCOU 10085-1
Sampling	:	Under responsibility of the applicant
Sampling information	:	Traceability of the samples is under responsibility of the manufacturer.
Class of Coating	:	/
Coating position	:	2
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

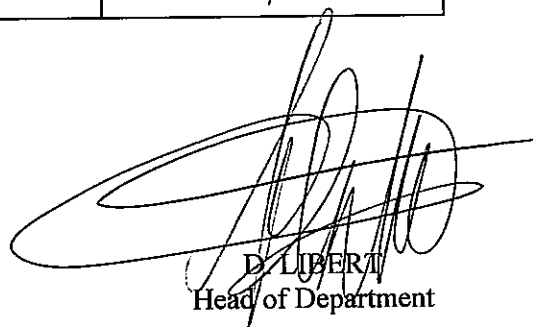
PHOTO-ENERGETIC PROPERTIES - EN 1096-1*

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

10085-1: 5.88 mm

		COATED GLASS (EN 1096-1)	
U.V. range (280 – 380 nm)			
• Transmission	τ_{uv}	16.7	%
Visible range (380 – 780 nm) – Ill D65/obs 2°			
• Transmission	τ_v	46.5	%
• Reflection coated side	ρ_v	43.1	%
• Reflection opposite side	ρ'_v	44.2	%
Solar range (300 – 2500 nm)			
• Transmission	τ_e	28.3	%
• Reflection coated side	ρ_e	60.4	%
• Reflection opposite side	ρ'_e	49.5	%
• Solar factor	g	0.31	
Thermal range (5000 – 50000 nm)			
• Emissivity	ϵ_n	0.019	
• Thermal coefficient	U _g	/	



D. LIBERT
Head of Department

Glazing and Components - INISMa

Identification du vitrage
Vitrage Simple 5.88 mm
10085-1

micron	cm ⁻¹	Reflexion
5.5	1820	97.75
6.6	1504	97.91
7.4	1348	97.99
8.1	1240	98.02
8.6	1158	97.95
9.2	1088	97.99
9.7	1030	98.00
10.2	978	98.12
10.8	930	98.02
11.3	886	97.94
11.8	846	97.94
12.4	808	97.92
13.0	772	97.93
13.6	738	98.00
14.2	706	97.96
14.8	674	97.95
15.6	642	97.97
16.3	612	98.06
17.2	582	98.04
18.1	552	98.08
19.2	522	98.04
20.3	492	97.96
21.7	460	98.33
23.3	430	98.05
25.3	396	98.12
27.8	360	98.10
30.9	324	98.16
35.7	280	98.16
43.9	228	98.33
reflexion Moy Emissivité		98.02 0.0198

reproductibilité
±0.005

micron	cm ⁻¹	Reflexion
5.5	1820	97.81
6.6	1504	97.89
7.4	1348	98.05
8.1	1240	98.08
8.6	1158	98.01
9.2	1088	98.04
9.7	1030	98.07
10.2	978	98.18
10.8	930	98.08
11.3	886	97.99
11.8	846	97.98
12.4	806	97.96
13.0	772	97.96
13.6	738	98.04
14.2	706	98.01
14.8	674	97.97
15.6	642	98.02
16.3	612	98.12
17.2	582	98.08
18.1	552	98.13
19.2	522	98.08
20.3	492	98.02
21.7	460	98.33
23.3	430	98.07
25.3	396	98.30
27.8	360	98.15
30.9	324	98.13
35.7	280	97.99
43.9	228	97.25
reflexion Moy Emissivité		98.03 0.0195

reproductibilité
±0.005

micron	cm ⁻¹	Reflexion
5.5	1820	97.79
6.6	1504	97.86
7.4	1348	98.03
8.1	1240	98.07
8.6	1158	98.00
9.2	1088	98.02
9.7	1030	98.03
10.2	978	98.16
10.8	930	98.07
11.3	886	97.97
11.8	846	97.98
12.4	808	97.95
13.0	772	97.95
13.6	738	98.03
14.2	706	98.00
14.8	674	97.91
15.6	642	98.00
16.3	612	98.11
17.2	592	98.09
18.1	552	98.13
19.2	522	98.07
20.3	492	98.00
21.7	460	98.36
23.3	430	98.05
25.3	396	98.42
27.8	360	98.09
30.9	324	98.11
35.7	280	97.90
43.9	228	98.74
reflexion Moy Emissivité		98.00 0.0197

reproductibilité
±0.005

Identification du vitrage

Vitrage Simple couche en position 1
10085-1 5.88 mm

Propriétés Lumineuses

```

*****
* WL * TOTAL * TOTAL * TOTAL ** WL * TOTAL * TOTAL * TOTAL *
* (nm) * TRANS * REFLE * ABSORB ** (nm) * TRANS * REFLE * ABSORB *
*****
* 390 * 33.58 * 53.25 * 13.17 ** 580 * 47.73 * 41.39 * 10.88 *
* 400 * 36.34 * 53.57 * 10.09 ** 590 * 47.56 * 41.12 * 11.32 *
* 410 * 37.52 * 53.25 * 9.24 ** 600 * 47.23 * 40.94 * 11.82 *
* 420 * 38.15 * 52.54 * 9.31 ** 610 * 47.00 * 40.90 * 12.09 *
* 430 * 38.93 * 51.72 * 9.36 ** 620 * 46.32 * 41.02 * 12.66 *
* 440 * 39.55 * 50.84 * 9.61 ** 630 * 45.90 * 41.25 * 12.85 *
* 450 * 40.40 * 49.97 * 9.63 ** 640 * 45.21 * 41.65 * 13.14 *
* 460 * 41.42 * 49.19 * 9.40 ** 650 * 44.38 * 42.20 * 13.42 *
* 470 * 42.31 * 48.43 * 9.26 ** 660 * 43.49 * 42.89 * 13.63 *
* 480 * 43.09 * 47.77 * 9.14 ** 670 * 42.51 * 43.70 * 13.79 *
* 490 * 43.86 * 47.06 * 9.08 ** 680 * 41.51 * 44.60 * 13.89 *
* 500 * 44.67 * 46.37 * 8.96 ** 690 * 40.24 * 45.61 * 14.15 *
* 510 * 45.38 * 45.65 * 8.96 ** 700 * 39.06 * 46.76 * 14.18 *
* 520 * 45.91 * 44.97 * 9.13 ** 710 * 37.78 * 48.04 * 14.18 *
* 530 * 46.44 * 44.25 * 9.31 ** 720 * 36.51 * 49.24 * 14.25 *
* 540 * 46.83 * 43.57 * 9.60 ** 730 * 35.16 * 50.60 * 14.24 *
* 550 * 47.26 * 42.92 * 9.82 ** 740 * 33.87 * 51.96 * 14.16 *
* 560 * 47.55 * 42.33 * 10.13 ** 750 * 32.42 * 53.16 * 14.41 *
* 570 * 47.70 * 41.80 * 10.50 ** 760 * 31.12 * 54.63 * 14.24 *
*****

```

Propriétés lumineuses Illuminant D65
Light properties
Licht Eigenschaften

Transmission lumineuse	(TL)		
Light transmittance	(LT)	46.5	+ - .5%
Lichtdurchlässigkeit	(LR)		

Reflexion lumineuse	(RL)		
Light reflectance	(LR)	43.1	+ - .75%
Lichtreflexion	(LR)		
Absorption lumineuse	(AL)		
Light absorption	(LA)	10.3	+ - 1%
Lichtabsorption	(LA)		

Identification du vitrage

Vitrage Simple couche en position 1
10085-1 5.88 mm

Propriétés Energétiques

```

*****
*  WL  * TOTAL * TOTAL * TOTAL ** WL * TOTAL * TOTAL * TOTAL *
* (nm) * TRANS * REFLE * ABSORB ** (nm) * TRANS * REFLE * ABSORB *
*****
* 300 * 0.08 * 0.00 * 99.92 ** 950 * 13.48 * 77.31 * 9.21 *
* 320 * 0.87 * 0.00 * 99.13 ** 1000 * 11.23 * 80.73 * 8.03 *
* 340 * 12.97 * 36.27 * 50.76 ** 1050 * 9.43 * 83.59 * 6.98 *
* 360 * 23.88 * 45.65 * 30.46 ** 1100 * 8.06 * 85.75 * 6.20 *
* 380 * 29.50 * 52.09 * 18.41 ** 1150 * 6.96 * 87.42 * 5.62 *
* 400 * 36.34 * 53.57 * 10.09 ** 1200 * 6.04 * 88.95 * 5.01 *
* 420 * 38.15 * 52.54 * 9.31 ** 1250 * 5.33 * 90.05 * 4.62 *
* 440 * 39.55 * 50.84 * 9.61 ** 1300 * 4.71 * 90.95 * 4.34 *
* 460 * 41.42 * 49.19 * 9.40 ** 1350 * 4.25 * 91.77 * 3.98 *
* 480 * 43.09 * 47.77 * 9.14 ** 1400 * 3.82 * 92.37 * 3.81 *
* 500 * 44.67 * 46.37 * 8.96 ** 1450 * 3.46 * 93.14 * 3.40 *
* 520 * 45.91 * 44.97 * 9.13 ** 1500 * 3.31 * 93.50 * 3.19 *
* 540 * 46.83 * 43.57 * 9.60 ** 1550 * 3.00 * 93.87 * 3.13 *
* 560 * 47.55 * 42.33 * 10.13 ** 1600 * 2.79 * 94.30 * 2.91 *
* 580 * 47.73 * 41.39 * 10.88 ** 1650 * 2.46 * 94.57 * 2.97 *
* 600 * 47.23 * 40.94 * 11.82 ** 1700 * 2.33 * 94.85 * 2.82 *
* 620 * 46.32 * 41.02 * 12.66 ** 1750 * 2.08 * 95.15 * 2.77 *
* 640 * 45.21 * 41.65 * 13.14 ** 1800 * 1.89 * 95.45 * 2.67 *
* 660 * 43.49 * 42.89 * 13.63 ** 1850 * 1.56 * 95.79 * 2.65 *
* 680 * 41.51 * 44.60 * 13.89 ** 1900 * 1.10 * 96.32 * 2.58 *
* 700 * 39.06 * 46.76 * 14.18 ** 1950 * 1.62 * 96.56 * 1.82 *
* 720 * 36.51 * 49.24 * 14.25 ** 2000 * 1.23 * 96.68 * 2.09 *
* 740 * 33.87 * 51.96 * 14.16 ** 2050 * 1.00 * 96.85 * 2.16 *
* 760 * 31.12 * 54.63 * 14.24 ** 2100 * 0.79 * 97.07 * 2.15 *
* 780 * 28.59 * 57.47 * 13.94 ** 2200 * 0.35 * 97.07 * 2.58 *
* 800 * 26.26 * 60.22 * 13.52 ** 2300 * 0.00 * 97.43 * 2.57 *
* 850 * 20.43 * 66.48 * 13.09 ** 2400 * 0.00 * 97.77 * 2.23 *
* 900 * 16.75 * 72.76 * 10.49 ** 2500 * 0.00 * 98.35 * 1.65 *
*****

```

Te	28.3	±0.5%	g	31.2	±1%	Tuv	16.7	±0.50%
Re	60.4	±0.75%	SC	0.36		Ruv	36.3	±0.75%

COLOUR DETERMINATION ACCORDING TO CIE 1976			
VISIBLE RANGE (380 – 780 NM) – ILL D65/OBS 2°			
	L*	a*	b*
Transmission	73.9	-2.62	6.45
Reflection	71.6	0.47	-7.22

Identification du vitrage

Vitrage Simple couche en position 2
10085-1 5.88 mm

Propriétés Lumineuses

```

*****
*  WL  * TOTAL * TOTAL * TOTAL ** WL * TOTAL * TOTAL * TOTAL *
* (nm) * TRANS * REFLE * ABSORB ** (nm) * TRANS * REFLE * ABSORB *
*****
* 390 * 33.58 * 42.40 * 24.02 ** 580 * 47.73 * 42.89 * 9.38 *
* 400 * 36.34 * 46.31 * 17.35 ** 590 * 47.56 * 42.50 * 9.93 *
* 410 * 37.52 * 47.23 * 15.26 ** 600 * 47.23 * 42.21 * 10.56 *
* 420 * 38.15 * 47.04 * 14.82 ** 610 * 47.00 * 41.93 * 11.06 *
* 430 * 38.93 * 46.92 * 14.15 ** 620 * 46.32 * 41.75 * 11.93 *
* 440 * 39.55 * 46.74 * 13.71 ** 630 * 45.90 * 41.71 * 12.39 *
* 450 * 40.40 * 46.96 * 12.65 ** 640 * 45.21 * 41.74 * 13.05 *
* 460 * 41.42 * 47.22 * 11.36 ** 650 * 44.38 * 41.89 * 13.73 *
* 470 * 42.31 * 47.30 * 10.38 ** 660 * 43.49 * 42.14 * 14.37 *
* 480 * 43.09 * 47.21 * 9.69 ** 670 * 42.51 * 42.54 * 14.95 *
* 490 * 43.86 * 46.96 * 9.18 ** 680 * 41.51 * 43.01 * 15.49 *
* 500 * 44.67 * 46.69 * 8.64 ** 690 * 40.24 * 43.39 * 16.37 *
* 510 * 45.38 * 46.32 * 8.30 ** 700 * 39.06 * 43.86 * 17.08 *
* 520 * 45.91 * 45.91 * 8.18 ** 710 * 37.78 * 44.36 * 17.86 *
* 530 * 46.44 * 45.37 * 8.18 ** 720 * 36.51 * 44.82 * 18.66 *
* 540 * 46.83 * 44.89 * 8.28 ** 730 * 35.16 * 45.31 * 19.53 *
* 550 * 47.26 * 44.45 * 8.29 ** 740 * 33.87 * 45.68 * 20.45 *
* 560 * 47.55 * 43.87 * 8.58 ** 750 * 32.42 * 46.05 * 21.52 *
* 570 * 47.70 * 43.37 * 8.92 ** 760 * 31.12 * 46.46 * 22.42 *
*****

```

Propriétés lumineuses
Light properties Illuminant D65
Licht Eigenschaften

```

-----
Transmission lumineuse            (TL)
Light transmittance                (LT)        46.5 +- .5%
Lichtdurchlässigkeit               (LR)

Reflexion lumineuse                (RL)
Light reflectance                   (LR)        44.2 +- .75%
Lichtreflexion                      (LR)

Absorption lumineuse               (AL)
Light absorption                    (LA)        9.3 +- 1%
Lichtabsorption                     (LA)

```

Identification du vitrage

Vitrage Simple **couche en position 2**
10085-1 5.88 mm

Propriétés Energétiques

```

*****
* WL * TOTAL * TOTAL * TOTAL ** WL * TOTAL * TOTAL * TOTAL *
* (nm) * TRANS * REFLE * ABSORB ** (nm) * TRANS * REFLE * ABSORB *
*****
* 300 * 0.08 * 0.00 * 99.92 ** 950 * 13.48 * 53.46 * 33.06 *
* 320 * 0.87 * 0.00 * 99.13 ** 1000 * 11.23 * 54.73 * 34.04 *
* 340 * 12.97 * 10.64 * 76.39 ** 1050 * 9.43 * 56.11 * 34.47 *
* 360 * 23.88 * 26.34 * 49.77 ** 1100 * 8.06 * 57.39 * 34.56 *
* 380 * 29.50 * 36.16 * 34.35 ** 1150 * 6.96 * 58.68 * 34.37 *
* 400 * 36.34 * 46.31 * 17.35 ** 1200 * 6.04 * 60.17 * 33.79 *
* 420 * 38.15 * 47.04 * 14.82 ** 1250 * 5.33 * 61.73 * 32.95 *
* 440 * 39.55 * 46.74 * 13.71 ** 1300 * 4.71 * 63.63 * 31.66 *
* 460 * 41.42 * 47.22 * 11.36 ** 1350 * 4.25 * 65.68 * 30.07 *
* 480 * 43.09 * 47.21 * 9.69 ** 1400 * 3.82 * 67.21 * 28.96 *
* 500 * 44.67 * 46.69 * 8.64 ** 1450 * 3.46 * 70.03 * 26.52 *
* 520 * 45.91 * 45.91 * 8.18 ** 1500 * 3.31 * 72.45 * 24.24 *
* 540 * 46.83 * 44.89 * 8.28 ** 1550 * 3.00 * 74.33 * 22.67 *
* 560 * 47.55 * 43.87 * 8.58 ** 1600 * 2.79 * 75.75 * 21.46 *
* 580 * 47.73 * 42.89 * 9.38 ** 1650 * 2.46 * 76.45 * 21.09 *
* 600 * 47.23 * 42.21 * 10.56 ** 1700 * 2.33 * 76.55 * 21.12 *
* 620 * 46.32 * 41.75 * 11.93 ** 1750 * 2.08 * 76.30 * 21.62 *
* 640 * 45.21 * 41.74 * 13.05 ** 1800 * 1.89 * 75.91 * 22.21 *
* 660 * 43.49 * 42.14 * 14.37 ** 1850 * 1.56 * 75.43 * 23.01 *
* 680 * 41.51 * 43.01 * 15.49 ** 1900 * 1.10 * 75.29 * 23.61 *
* 700 * 39.06 * 43.86 * 17.08 ** 1950 * 1.62 * 75.33 * 23.05 *
* 720 * 36.51 * 44.82 * 18.66 ** 2000 * 1.23 * 74.88 * 23.89 *
* 740 * 33.87 * 45.68 * 20.45 ** 2050 * 1.00 * 74.76 * 24.25 *
* 760 * 31.12 * 46.46 * 22.42 ** 2100 * 0.79 * 74.51 * 24.70 *
* 780 * 28.59 * 47.29 * 24.12 ** 2200 * 0.35 * 67.34 * 32.31 *
* 800 * 26.26 * 47.93 * 25.81 ** 2300 * 0.00 * 69.27 * 30.73 *
* 850 * 20.43 * 49.69 * 29.88 ** 2400 * 0.00 * 68.80 * 31.20 *
* 900 * 16.75 * 51.89 * 31.36 ** 2500 * 0.00 * 62.17 * 37.83 *
*****

```

Te	28.3	±0.5%	g	34.1	±1%	Tuv	16.7	±0.50%
Re	49.5	±0.75%	SC	0.39		Ruv	18.2	±0.75%

COLOUR DETERMINATION ACCORDING TO CIE 1976			
VISIBLE RANGE (380 – 780 NM) – ILL D65/OBS 2°			
	L*	a*	b*
Transmission	73.9	-2.62	6.45
Reflection	72.3	-1.78	-3.16