



**IKATES, s.r.o.**

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**Notified Body No.1394**

**Authorized body No. 225**

## **INITIAL TYPE TEST REPORT**

**from determination of light and solar characteristics**

according to the Regulation (EU) No 305/2011 of the European Parliament and of the Council No.305/2011 of 9 March 2011 (Construction Products Regulation – CPR (AVCP system 3))

**No. : 1394-CPR-203B/2017**

Test item : **Coated glass - antireflective**


Producer (address): «Expo Glass», Limited Liability Company;  
6, Gastello street, Vladimir City, 600026, Russian Federation

Number of pages : 2 incl. front page  
Annexes: 1 (test report No.203B/2017)

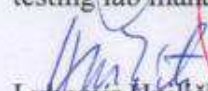
This test report is part document of notified body and cannot replace the summary report from initial type tests.

Date of issue : 2017-09-04

Person responsible for content of this report :

  
Jiří Stránský  
testing lab manager

Person responsible for correctness of this report :

  
Lubomír Hnilčka  
notified body director



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**1. Test item specification**

Product description and intended use: coated drawn sheet glass for use in building

Producer: «Expo Glass», Limited Liability Company;  
6, Gastello street, Vladimir City, 600026, Russian Federation

Specification: ČSN EN 410 (harmonised standard ČSN EN 1096-4)

**2. Sampling**

Following test specimens were supplied to testing:

- Coated (antireflective) drawn sheet glass clear 2 mm – 1 pc. 500x500 mm

**3. ITT performance**

Test was performed by: Jiří Stránský

Date of test end: 2017-09-01

**4. Test results :**

Observed characteristic: light and solar characteristics acc. to ČSN EN 410

Nominal thickness (mm)	Light transmittance $\tau_V(1)$	Light reflectance $\rho_V / \rho'_V(1)$	direct solar energy transmittance $\tau_e(1)$	direct solar reflectance $\rho_e / \rho'_e(1)$	total solar energy transmittance g(1)
2	0,94	0,05/0,06	0,91	0,06/0,06	0,92

**Statement :** Test results, given in this report, apply only to the tested items and do not replace other documents, e.g. administrative character, issued by other bodies, according to particular regulations.





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*Testing laboratory No.1139 accredited by Czech Accreditation Institute  
acc to. ČSN EN ISO/IEC 17025 for glass and selected building products testing*

## TEST REPORT

No. : **203B / 2017**

Test item : **Coated (antireflective) drawn sheet glass  
- ITT according to ČSN EN 572-9**

Client (address): «Expo Glass», Limited Liability Company;  
6, Gastello street, Vladimir City, 600026, Russian Federation

Producer (address): «Expo Glass», Limited Liability Company;  
6, Gastello street, Vladimir City, 600026, Russian Federation

Place of test performance : IKATES, s.r.o., Teplice

Date of sample receiving : 2017-07-18

Date of test performance : 2017-07-20 to 2017-09-01

Date of issue : 2017-09-04

Number of pages : 3 + annex

Page No. : 1

Manager of testing laboratory : Jiří Stránský



Results and/or informations out of accreditation range and subcontracts are in the test report identified. Copying and translating, using of report for other purposes (advertisement, extracts from the report) only with consent of the laboratory. Without consent of the laboratory can be the report reproduced whole only.



No. : 203B / 2017	Number of pages : 3
	Page No. : 2

**Normative foundations :**

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

ČSN EN 1096-2 (2012): Glass in building – Coated glass – Part 2 – requirements and test methods for coatings A, B a S

ČSN EN ISO 9227 (2012): Corrosion tests in the artificial atmospheres – Salt spray tests

**Sampling :**

For tests were used following test specimens coated glass – with coating of A-type:

- drawn sheet glass 2 mm with antireflective coating - 4 pcs. 500x500 mm

**Metrological provision of tests :**

Spectral measurements were carried out using of spectrometer Shimadzu UV3600 with metrological traceability to standards of Czech Institut of Metrology, Shimadzu and Ocean Optics. Calculations of characteristics were carried out using validated software in the laboratory IKATES.

Condensation water and acid resistance were tested in the corrosion chamber Erichsen Hygrotherm controlled by the calibrated thermometer. Neutral salt spray test was carried out as subcontract in the accredited testing laboratory SYNPO a.s. Abrasion resistance was tested by the Tempra abrasion equipment.

**Test results :**

**1. Luminous and solar characteristics (ČSN EN 410)**

Nominal thickness (mm)	Light transmittance $\tau_V(1)$	Light reflectance $\rho_V / \rho'_V(1)$	direct solar energy transmittance $\tau_e(1)$	direct solar reflectance $\rho_e / \rho'_e(1)$	total solar energy transmittance $g(1)$
2	0,94	0,05/0,06	0,91	0,06/0,06	0,92

**2. Acid resistance (ČSN EN 1096-2) Test duration : 5 cycles**

glass		reference piece	test piece No.1	test piece No.2	test piece No.3	test piece No.4	max. difference
2 mm	$\tau(550\text{ nm})$	0,944	0,939	0,946	0,944	0,944	0,005
	$\tau(900\text{ nm})$	0,886	0,903	0,888	0,905	0,904	0,019

Measurement geometry: 0/0

**3. Condensation water resistance (ČSN EN 1096-2)**

Test duration: 20 days

glass		reference piece	test piece No.1	test piece No.2	test piece No.3	test piece No.4	max. difference
2 mm	$\tau(550\text{ nm})$	0,936	0,936	0,936	0,937	0,935	0,001
	$\tau(900\text{ nm})$	0,906	0,903	0,904	0,906	0,907	0,003
	defects	—	no	no	no	no	0

Measurement geometry: 0/0





<b>No. : 203B / 2017</b>	<b>Number of pages : 3</b>
	<b>Page No. : 3</b>

#### 4. Neutral salt spray resistance (ČSN ISO 9227, ČSN EN 1096-2)

Test duration: 20 days (in SYNPO accredited lab)

glass		reference piece	test piece No.1	test piece No.2	test piece No.3	test piece No.4	max. difference
2 mm	$\tau$ (550 nm)	0,935	0,928	0,927	0,930	0,929	0,008
	$\tau$ (900 nm)	0,886	0,875	0,875	0,870	0,878	0,011
	defects	—	no	no	no	no	—

Measurement geometry: 0/0

#### 5. Abrasion resistance (ČSN EN 1096-2)

Test duration: 500 strokes

glass		reference piece	test piece No.1	test piece No.2	test piece No.3	test piece No.4	max. difference
2 mm	$\tau$ (550 nm)	0,957	0,953	0,957	0,957	0,955	0,004
	$\tau$ (900 nm)	0,916	0,916	0,916	0,914	0,914	0,002

Measurement geometry: 0/d

#### Expert opinion:

requirement: EN 1096-2 (condensation water resistance, acid resistance, neutral salt spray resistance, abrasion resistance)

Conclusion: **These samples met the requirements of EN 1096-2 for the coating - class A**

**Statement :** Test results, given in this report, apply only to the tested items and do not replace other documents, e.g. administrative character, issued by other bodies, according to particular regulations. The official version is in Czech language.

#### Distribution list :

2 x «Expo Glass», Limited Liability Company

1 x Laboratory for glass and building products testing IKATES, s.r.o. (archive)

Tests were carried out by :

*Jiří Šnajdr, Jiří Stránský*

Report was prepared by :

For correctness and validity of report is responsible :

end of the test report

*Jiří Stránský*







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**Summary of report No.203BS-1/2017 Date: 2017-09-04**  
**Coated glass - A, B and S coatings - Durability according to EN 1096-2**  
For details, see the test report 203B/2017

Company: «Expo Glass», Limited Liability Company  
6, Gastello street, Vladimir City, 600026, Russian Federation

Name of the coating: **Antireflective coating**

Coating:	A	B	S
Low emissivity coating:	YES	NO	

Photometric measurements	Reference test piece (1)	Exposed test piece (2)					Difference (3)=(1) - (2)				Difference limit value
<b>Condensation resistance</b>											
- transmittance at 550 nm	0,936	0,936	0,936	0,937	0,935	0,000	0,000	-0,001	0,001	± 0,03	
- transmittance at 900 nm	0,906	0,903	0,904	0,906	0,907	0,003	0,002	0,000	-0,001	± 0,03	
<b>Acid resistance</b>											
- transmittance at 550 nm	0,944	0,939	0,946	0,944	0,944	0,005	-0,002	0,000	0,000	± 0,03	
- transmittance at 900 nm	0,886	0,903	0,888	0,905	0,904	-0,017	-0,002	-0,019	-0,018	± 0,03	
<b>Neutral salt spray resistance</b>											
- transmittance at 550 nm	0,935	0,928	0,927	0,930	0,929	0,007	0,008	0,005	0,006	± 0,03	
- transmittance at 900 nm	0,886	0,875	0,875	0,875	0,878	0,011	0,011	0,011	0,008	± 0,03	
<b>Abrasion resistance</b>											
- transmittance at 550 nm	0,957	0,953	0,957	0,957	0,955	0,004	0,000	0,000	0,002	± 0,05	
- transmittance at 900 nm	0,916	0,916	0,916	0,914	0,914	0,000	0,000	0,002	0,002	± 0,05	

**Visual inspection:** Deviations caused by

- condensation resistance

NONE	YES
NONE	YES

- neutral salt spray

Conclusion of the photometric measures:

The results conform to the criteria:

YES	NO
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**Jiří Stránský**

Name and signature

