

TEST LABORATORY



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The test laboratory is accredited in compliance with DIN EN ISO/IEC 17025 by the Deutsche Akkreditierungsstelle GmbH. The accreditation is also valid for products of Regulation EU 2016/425. Test methods not included in the scope of accreditation are marked by a *.



Authorized for the testing of heat and flame-resistant protective clothing for car racers according to FIA 8856-2000 standard by the Fédération Internationale de l'Automobile (FIA) Paris.

TEST REPORT

Order number STFI: 20182895

Report date: 24 January 2019
Person responsible:

Orderer: Création Baumann AG
Mario Klaus
Bern-Zürich-Str. 23
4901 LANGENTHAL
SCHWEIZ

Test order:

Date: 26 November 2018
Order received: 29 November 2018
Material received: 29 November 2018

Material to analyse:

5 samples sun protective material

signed by client	Colour
SCRENO R	7301
SCRENO R	7302
SCRENO R	7303
SCRENO R	7304
SCRENO R	7305

The sampling was supplied by the client. The test department is not informed about the sampling procedure.

Analysis content:

- (1) Remission and transmission in the visible light range in accordance with DIN EN 410: 2011-04 (DIN EN 14500: 2008-08)
- (2) Remission and transmission in the global radiation range in accordance with DIN EN 410: 2011-04 (DIN EN 14500: 2008-08)
- (3)* Calculation of the total energy permeability degree g_{tot} of a window system with sun protective material, following DIN EN ISO 52022-1: 2018-01 and approximate calculation of the reduce factor F_c following DIN EN 14501: 2006-02
- (4) Direct und diffuse transmission measurement in the visible light range in accordance with DIN EN 410: 2011-04 (DIN EN 14500: 2008-08)

* Standards for calculation and assessment are not allowed for accreditation

Conditions and equipment for optical tests:

test parameter	symbol	range of radiation
light transmission degree	$\tau_{v,n-h}$	380...780 nm (standard light D65)
light remission degree	$\rho_{v,n-h}$	380...780 nm (standard light D65)
light absorption coefficient	α_v	380...780 nm
UV - transmission degree	τ_{uv}	280...380 nm (UV-radiation)
solar transmission degree	$\tau_{e,n-h}$	280...2500 nm (global radiation)
solar remission degree	$\rho_{e,n-h}$	280...2500 nm (global radiation)
solar absorption coefficient	α_e	280...2500 nm
normal/normal light transmission degree	$\tau_{v,n-n}$	380...780 nm (standard light D65)
normal/diffuse light transmission degree	$\tau_{v,n-dif}$	380...780 nm (standard light D65)

Equipment: UV/Visible/NIR spectrophotometer Lambda 900, PERKIN - ELMER Corp., USA; 150 mm integrating sphere; irradiation perpendicular to the integrating sphere opening; 8° slope of the sample area to the light incidence axis for remission measurements

For each material sample of the client three samples in the format (55 x 75) mm are taken, one in the machine direction, one in the cross machine direction and one diagonally. The irradiation takes place, if not otherwise noted, on the material side which is faced to the window system (marked by the client). During the measurement an circular area with a diameter of 25 mm (integrating sphere port) is covered by the sample.

Test results:
(1) Light range
UV-range

Colour	light transmission degree	light remission degree	light absorption coefficient	UV-transmission degree
	$\tau_{v,n-h}$	$\rho_{v,n-h}$	α_v	τ_{uv}
7301	0,3623	0,6113	0,0264	0,1467
7302	0,2593	0,4960	0,2447	0,1143
7303	0,2087	0,3967	0,3946	0,1037
7304	0,0977	0,2383	0,6640	0,0577
7305	0,0423	0,0660	0,8917	0,0393

(2) Global radiation range

Colour	solar transmission degree	solar remission degree	solar absorption coefficient
	$\tau_{e,n-h}$	$\rho_{e,n-h}$	α_e
7301	0,3637	0,5793	0,0570
7302	0,2813	0,4893	0,2294
7303	0,2403	0,4083	0,3514
7304	0,1037	0,2263	0,6700
7305	0,0443	0,0703	0,8854

(3)* Total energy permeability degree g_{tot} and reduce factor F_c

Colour	Double glazing with low emission degree and argon interspace		Triple glazing with low emission degree and argon interspace	
	$U_g=1,2 \text{ W/(m}^2\text{K)}$ $g=0,59$		$U_g=0,8 \text{ W/(m}^2\text{K)}$ $g=0,55$	
	g_{tot}	F_c	g_{tot}	F_c
7301	0,39	0,66	0,37	0,68
7302	0,41	0,70	0,40	0,72
7303	0,44	0,75	0,42	0,77
7304	0,50	0,84	0,47	0,86
7305	0,55	0,92	0,52	0,94

Mounting assumptions:

- sun protective material inside and closed
- aerated interspace to the glazing

The mathematical model in DIN EN ISO 52022-1: 2018-01 (simplified method) for calculation of g_{tot} is appropriated to a coarse compare of sun protection materials. The model is only valid for the following boundary requirements:

- $0 \leq \tau_{e,n-h} \leq 0,5$
- $0,1 \leq \rho_{e,n-h} \leq 0,8$

If the above mentioned boundary requirements are not fulfilled, the calculation of F_c from g_{tot} and g is not guaranteed either. The calculation is recommended in accordance with DIN EN ISO 52022-3: 2018-01 (detailed calculation method). Therefore it is necessary to measure reflection to the not the radiation exposed side and thickness at least in addition to the data of this order. In case of known conditions to be used at a building it is unalterable.

(4) Diffuse und normal transmission in the visible light range

Colour	normal/hemispherical light transmission degree	normal/diffuse light transmission degree	normal/normal light transmission degree
	$\tau_{v,n-h}$	$\tau_{v,n-dif}$	$\tau_{v,n-n}$
7301	0,3623	0,3180	0,0443
7302	0,2593	0,2170	0,0423
7303	0,2087	0,1637	0,0450
7304	0,0977	0,0577	0,0400
7305	0,0423	0,0080	0,0343

The results are mean values from three measurements; spectrograms are kept in the test department.

Unless otherwise agreed, all materials we received within this order will be kept for a maximum time of 6 month. Materials which are not stored because of technical or safety reasons are excluded from that

The testing period is defined as timeframe between receipt of samples and issue date of test report.

The test results are referring to the submitted samples. These test report is not allowed to copy in parts.

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