

Material to analyse:

6 samples sun protective material

signed by orderer	code for order processing
fabric for decoration	P2343_15_5
Blackout silver and fabric for decoration	P2343_15_6
silver Voile and fabric for decoration	P2343_15_7
silver Voile	P2343_15_8
uncoated fabric transparent	P2343_15_10
Blackout silver	P2343_15_11

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:April 2011
- (2) Remission and transmission in the global radiation range in accordance with DIN EN 410:April 2011
- (3) Calculation of the total energy permeability degree g_t of window system with sun protective materials, following DIN EN 13363-1 2007 and approximated Calculation of reduce factor F_c following DIN EN 14501 February 2006
- (4) Direct und diffuse transmission measurement in the visible light and global range in accordance with DIN EN 410 April 2011
- (5) Classification of anti-dazzle effect in accordance with DIN EN 14501, February 2006 (Tab. 8)
- (6) Thermal efficiency measurement given by different combinations of fabrics (not in the accreditation methods set)

Conditions 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 degree	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)
Solarabsorptionsgrad	α_e	280...2500 nm
normal / direct 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: Spectral photometer Lambda 900, PERKIN - ELMER Corp., USA
150 mm sphere, 8° slope of the sample area to the light incidence axis

Description of the classification for visual comfort, so sight protection is one parameter in it, is given in DIN EN 14501, 2006, table 5 as following:

Class	0	1	2	3	4
	very small effect	small effect	moderate effect	high effect	very high effect

Test results:

(1) Light range

UV-range

Code	light transmission degree	light remission degree	light absorption coefficient	UV-transmission degree
P2343_15	$\tau_{v,n-h}$	$\rho_{v,n-h}$	α_v	τ_{UV}
5	0,0340	0,3857	0,5803	0,0200
6	0,0000	0,6570	0,3430	0,0010
7	0,0100	0,6620	0,3280	0,0050
8	0,2420	0,6320	0,1260	0,1850
10	0,7110	0,2573	0,0317	0,5893
11	0,0000	0,6600	0,3400	0,0010

(2) Global radiation range

Code	solar transmission degree	solar remission degree	solar absorption coefficient
P2343_15	$\tau_{e,n-h}$	$\rho_{e,n-h}$	α_e
5	0,0597	0,4500	0,4903
6	0,0010	0,6420	0,3570
7	0,0210	0,6670	0,3120
8	0,2420	0,6330	0,1250
10	0,7177	0,2523	0,0300
11	0,0010	0,6450	0,3540

(3) Total energy permeability degree g_t and reduce factor F_c

Code	g_t	F_c
P2343_15		
5	0,45	0,64
6	0,37	0,52
7	0,36	0,51
8	0,38	0,55
10	0,57	0,82
11	0,36	0,52

F_c and g_t results are valid for the following presumptions in accordance with DIN EN 13363-1:

- Double glass with thermal protective covering , thermal permeability degree $U = 1,6 \text{ W/m}^2\text{K}$ and total energy permeability degree $g = 0,70$
- sun protective material inside, closed.

(4) Classification:

Code	light transmission degree normal / hemispheric	light transmission degree normal / diffuse	light transmission degree normal / normal	class anti-dazzle effect
P2343_15	$\tau_{v,n-h}$	$\tau_{v,n-diff}$	$\tau_{v,n-n}$	
5	0,0340	0,0323	0,0017	2
6	0,0000	0,0000	0,0000	4
7	0,0110	0,0110	0,0000	4
8	0,2383	0,1490	0,0893	0
10	0,7110	0,3363	0,3747	0

(6) Thermal efficiency measurement

The equipment had been constructed in accordance with DIN EN ISO 8990. It is able to measure thermal efficiency of window – air – fabric systems. The materials had a distance of 100mm to the glazing (4mm one sheet glazing) in these tests.

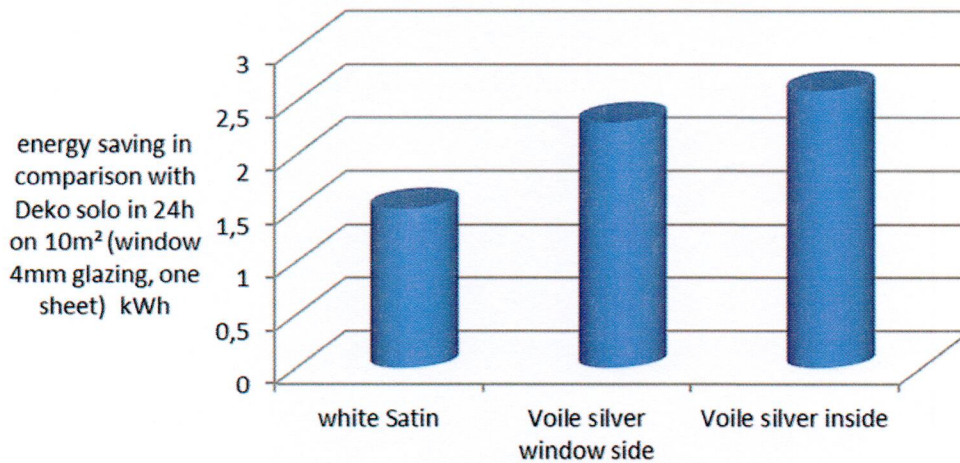
Nominal temperature for the stationary measurement condition: 21°C inside box (heated)
6°C outside box (cooled)

picture 1: opened measurement box including fabric sample, window and temperature sensors

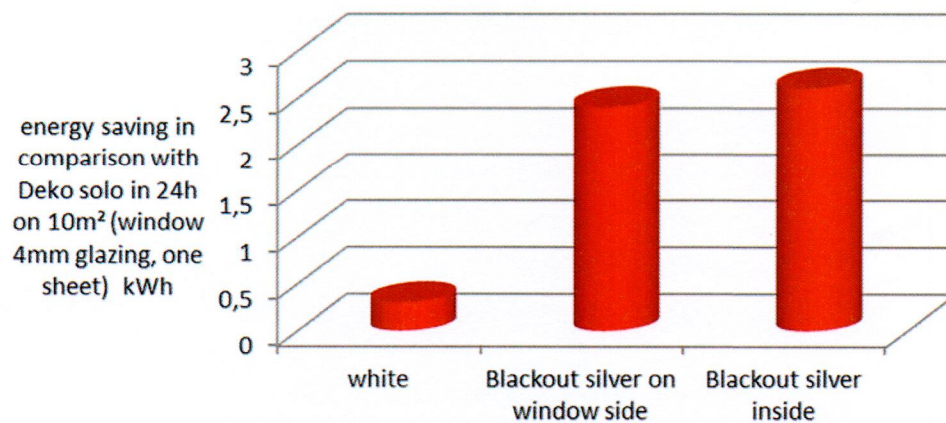


Measurement occurs about the keeping power for stationary condition (error in measurement 0,7W).

fabric for decoration, lined with Voile silber



fabric for decoration, lined with BlackOut silber



The detailed results are to be found in the appendix (test protocols in German).

The test results are referring to the submitted samples.

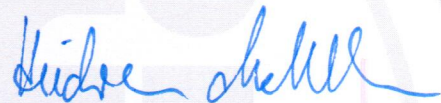
The materials received within this order will be kept for a maximum time of 6 month.

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

These test report is not allowed to copy in parts.



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