

<b>Specification</b>		<b>PCE - BV</b>
Physical and chemical properties		<b>D 0891</b>
<b>UV-W 0891</b>		<b>D 0891</b>
Colour:	clear	
Application:	UV - absorbing glass for corrective lenses	
<p>The subsequent properties are based primarily upon the measuring results of the very latest standards and measuring methods, which are defined in corresponding "Measuring and Test Procedures". SCHOTT DESAG retains the right to change the data in keeping with the latest technical standards. Non-toleranced numerical values are reference values of an average production quality.</p> <p>Values marked with <math>\diamond</math> do not apply to the type of glass or no values are available.</p> <p>Requirements deviating from these specifications must be defined in writing in a <b>customer agreement</b>.</p> <p><b>Date of release: 21 March 2002</b></p>		

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<b>1.2.2.2</b>	<b>Shade N / Filter category</b>		
	N for mean thickness $d =$ mm ( $t_{vD65} =$ %)		◇
	N for mean thickness $d =$ mm ( $t_{vD65} =$ %)		◇
	filter category for nominal transmittance $t_{vD65} = 91.7$ %		0
<b>1.2.3</b>	<b>Special transmittance values in % (<math>d = 2.0</math> mm)</b>		
<b>1.2.3.1</b>	<b>UV - transmittance</b>		
		$t_{UVA}$	44.0
		$t_{SUV}$	◇
		$t_{SUVA}$	32.8
		$t_{SUVB}$	0.06
<b>1.2.3.2</b>	<b>IR - transmittance</b>	$t_{SIR}$	92
<b>1.2.3.3</b>	<b>Solar blue - light transmittance</b>	$t_{sb}$	◇
<b>1.3</b>	<b>Colour</b>		
<b>1.3.1</b>	<b>Visual evaluation</b>		
	The visual evaluation of the admissible colour differences is to be made by using internal reference samples in transmission mode towards an from the backside illuminated opal screen with uniform luminance. Sample thickness $d$ in mm for the visual colour comparison		90
<b>1.3.2</b>	<b>Colorimetry</b>		
	Chromaticity coordinates	$x_{10}$	0.314
		$y_{10}$	0.332
	Chromaticity coordinates (colour locus) are referred to the Standard Illuminant $D_{65}$ according to CIE 10°-observer for the nominal transmittance $t_{vD65} = 91.7$ % (refer to 1.2.2.1)		
<b>1.3.3</b>	<b>Signal recognition</b>		
	Relative visual attenuation coefficient $Q$ for signal lights referred to the nominal transmittance $t_{vD65} = 91.7$ % (refer to 1.2.2.1)	$Q_{blue}$	1.00
		$Q_{green}$	1.00
		$Q_{yellow}$	1.00
		$Q_{red}$	1.00
<b>1.3.4</b>	<b>Yellowness index (<math>d = 10</math> mm)</b>		
		$Y_i$	1.1

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<b>2.</b>	<b>Thermal properties</b>	
<b>2.1</b>	<b>Viscosities and corresponding temperatures</b>	
	Designation	Viscosity log <i>h</i> in dPas
		Temperature <i>J</i> in °C
	Strain point	14.5
	Annealing point	13.0
	Softening point	7.6
	Forming temperature	6.0
	Forming temperature	5.0
	Forming temperature	4.0
<b>2.2</b>	<b>Transformation temperature <i>Tg</i> in °C</b>	541
<b>2.3</b>	<b>Coefficient of mean linear thermal expansion</b> <i>a</i> (20°C-300°C) in 10 <sup>-6</sup> K <sup>-1</sup> (Static measurement)	9.5
<b>2.4</b>	<b>Fuseability</b>	
	Stress-free fusing with lower segments from SCHOTT DESAG, listed in the margin is possible with a maximum birefringence of 70 nm/cm, measured 0.5 mm from the fusing area in the major blank.	BS - 558 BS - 565 BS - 5670 BS - 5675 BS - 5680
<b>2.5</b>	<b>Mean specific heat capacity <i>c<sub>p</sub></i>(20°C-100°C) in J/(g · K)</b>	◇

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<b>3.</b>	<b>Mechanical properties</b>	
<b>3.1</b>	<b>Density <math>r</math> in g/cm<sup>3</sup></b>	2.55
<b>3.2</b>	<b>Stress optical coefficient <math>C</math> in <math>1.02 \times 10^{-12}</math> m<sup>2</sup>/N</b>	2.48
<b>3.3</b>	<b>Breaking strength</b> A higher mechanical strength can be realized by chemical toughening according to the ion exchange procedure (refer to annex 3.3.1) or by thermal toughening.	
<b>3.3.1</b>	<b>Chemical toughening</b>	
	Processing temperature $J$ in °C	450
	Processing time $t$ in h	16
	Compressive stress $D_s$ as birefringence in nm/cm	10200
	Penetration depth $N_z$ up to neutral zone in $\mu\text{m}$	51
	Further information	see annex
<b>3.3.2</b>	<b>Thermal toughening</b>	
	Recommended minimum thickness $d$ in mm for toughened safety glass lenses without corrective effect as per ball drop test (DIN EN 168)	2.5
<b>3.4</b>	<b>Young's modulus <math>E</math> in kN/mm<sup>2</sup></b>	◇
<b>3.5</b>	<b>Poisson's ratio <math>m</math></b>	◇
<b>3.6</b>	<b>Torsion modulus <math>G</math> in kN/mm<sup>2</sup></b>	◇
<b>3.7</b>	<b>Knoop hardness <math>HK_{100}</math></b>	500

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<b>4. Chemical properties</b>			
<b>4.1 Hydrolytic resistance acc. to DIN ISO 719</b>			
		Hydrolytic class	HGB 3
		Equivalent of alkali (Na <sub>2</sub> O) per gram of glass grains in µg/g	161
<b>4.2 Acid resistance acc. to DIN 12 116</b>			
		Acid class	S 1
		Half surface weight loss after 6 hours in mg/dm <sup>2</sup>	0.6
<b>4.3 Alkali resistance acc. to DIN ISO 695</b>			
		Class	A 2
		Surface weight loss after 3 hours in mg/dm <sup>2</sup>	90
<b>5. Electrical properties</b>			disregard
<b>6. Other properties</b>			disregard
<b>7. Annex (diagrams, curves)</b>			

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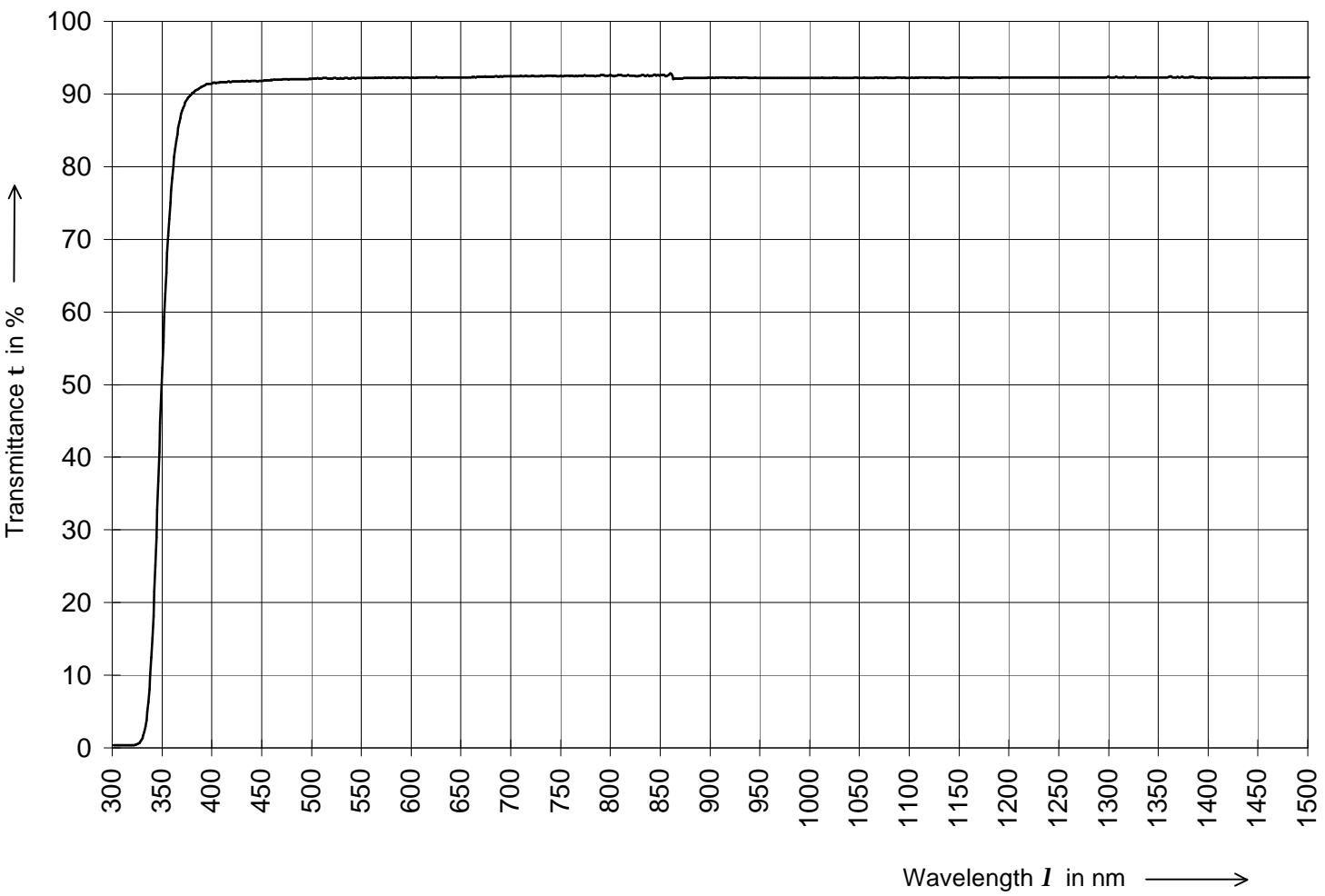
**Specification**

Physical and chemical properties

**PCE - BV**  
**D 0891**

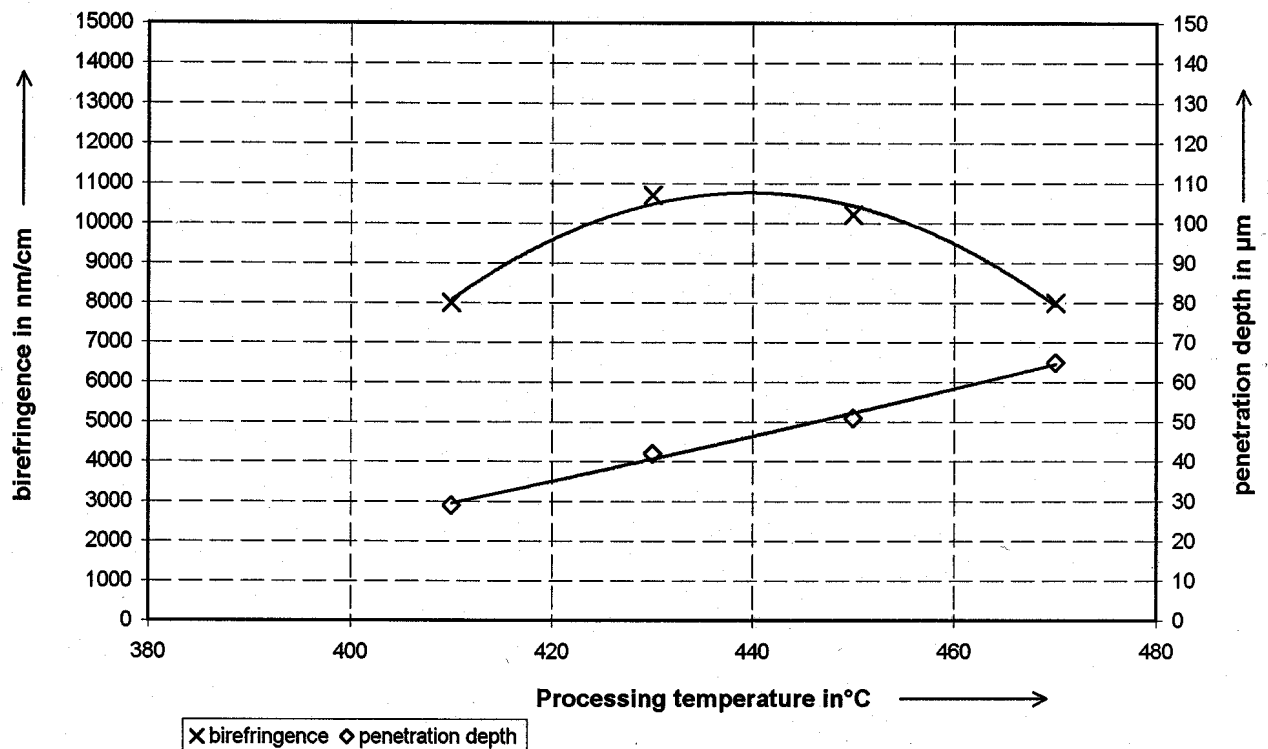
**Spectral Transmittance**

**Type of Glass: UV-W 0891**  
Thickness: 2.0 mm



Annex 3.3.1

<b>Specification</b>		<b>PCE - BV</b>	
Physical and chemical properties		<b>D 0891</b>	
<b>Chemical toughening parameter</b>			
<b>Glass and chemical toughening parameters</b>			
Transformation temperature	°C	541	
Glass thickness	mm	3	
Processing time	h	16	
Processing temperature	°C	450	
Salt bath (* weight percentages)	KNO <sub>3</sub> in % *	99.5	
	SiO <sub>2</sub> x H <sub>2</sub> O in % *	0.5	
<b>Chemical toughening results *</b>			
Penetration depth	µm	51	
Birefringence	nm/cm	10200	
* measured across at a sample piece ground down to 0.3 mm ± 0.05 mm			
Ball drop test acc. FDA	% failed	not carried out	
Ball drop test acc. DIN	% failed	not carried out	



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