

Specification Physical and chemical properties	PCP B 270®i
<p data-bbox="236 539 392 589">B 270®i</p> <p data-bbox="997 546 1177 589">D 0092 7</p> <p data-bbox="236 674 882 741">B 270®i is a clear high transmission crown glass (modified soda-lime glass) available in form of sheets.</p> <p data-bbox="236 1632 1436 1778">The subsequent properties are based primarily on the measuring results of the very latest standards and measuring methods. These are defined in the corresponding "Measuring and Test Procedures". We retain the right to change the data in keeping with the latest technical standards. Non-toleranced numerical values are reference values of a typical production quality.</p> <p data-bbox="236 1823 1206 1854">Values marked with \diamond do not apply to the type of glass or no values are available.</p> <p data-bbox="236 1899 1474 1930">Requirements deviating from these specifications must be defined in writing in a customer agreement.</p>	

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Specification		PCP B 270®i		
Physical and chemical properties				
1.	Optical properties			
1.1	Refractive indices (20 °C)			
	Pretreatment of samples	n_g	1.5341	
	Condition as supplied	$n_{F'}$	1.5297	
	["as drawn"]	n_F	1.5292	
		n_e	1.5251 ± 0.001	
		n_d	1.5230	
		n_D	1.5229	
		$n_{C'}$	1.5207	
		n_C	1.5203	
1.1.1	Abbe value	v_e	58,3 ± 0.6	
		v_d	58.5	
1.2	Transmittance data			
1.2.1	Spectral transmittance $\tau(\lambda)$			
1.2.1.1	$\tau(\lambda)$ - curve			
	Plot of spectral transmittance $\tau(\lambda)$ for $d = 2.0 \text{ mm}^*$ ($\lambda = 280 \text{ nm to } 650 \text{ nm}$)	see annex		
	$d = 2.0 \text{ mm}^*$ ($\lambda = 280 \text{ nm to } 2000 \text{ nm}$)	see annex		
1.2.1.2	$\tau(\lambda)$ - individual values in %	◇		
1.2.1.3	Edge wavelength ($d = 2.0 \text{ mm}^*$)			
	Edge wavelength	$\lambda_c (\tau = 0.46)$ in nm	310	
	Solarization refer to 6.2			
	Additional data	$\lambda_s (\tau = 0.05)$ in nm	293	
		$\lambda_p (\tau = 0.85)$ in nm	338	
1.2.2	Luminous transmittance τ_v			
1.2.2.1	Luminous transmittance			
		Thickness in mm	τ_{vD65} in %	τ_{vA} in %
		2.0*	91.7	91.7
* Thickness range 0.8 mm to 1.65 mm				

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1.2.3	Special transmittance values in % (<i>d</i> = 2.0 mm*)		
1.2.3.1	UV - transmittance	τ_{UVA}	84
		τ_{UVB}	19
1.2.3.2	IR - transmittance	τ_A	91.9
1.2.3.3	Solar direct transmittance	τ_e	91.6
1.3	Colour		
1.3.1	Visual evaluation	disregarded	
1.3.2	Colorimetry (<i>d</i> = 2.0 mm*)		
		D_{65} x	0.313
	Chromaticity coordinates (colour locus) are referred to the named Standard Illuminant according to CIE 2°-observer	y	0.329
		A x	0.448
		y	0.408
1.3.3		disregarded	
1.3.4	General colour rendering index R_a (<i>d</i> = 2.0 mm*)	100	
* Thickness range 0.8 mm to 1.65 mm			

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Specification		PCP B 270®i	
Physical and chemical properties			
2.	Thermal properties		
2.1	Viscosities and corresponding temperatures		
	Designation	Viscosity lg η in dPas	Temperature ϑ in °C
	Strain point	14.5	507 (~945 °F)
	Annealing point	13.0	535 (~995 °F)
	Softening point	7.6	711 (~1312 °F)
	Forming temperature	6.0	811 (~1492 °F)
	Forming temperature	5.0	897 (~1647 °F)
	Forming temperature	4.0	1014 (~1857 °F)
2.2	Transformation temperature T_g in °C		542 (~1008 °F)
2.3	Coefficient of thermal expansion α		
2.3.1	Coefficient of mean linear thermal expansion α in 10^{-6} K^{-1} for the indicated temperature range (Static measurement)		
		$\alpha(20 \text{ °C}; 300 \text{ °C})$	9.4
		$\alpha(20 \text{ °C}; 200 \text{ °C})$	9.0
		$\alpha(20 \text{ °C}; 100 \text{ °C})$	8.6
2.3.2	Coefficient of mean linear thermal expansion α in 10^{-6} K^{-1} for the indicated temperature range (Dynamic measurement)		
		$\alpha(20 \text{ °C}; 100 \text{ °C})$	8.6
		$\alpha(20 \text{ °C}; 150 \text{ °C})$	8.8
		$\alpha(20 \text{ °C}; 200 \text{ °C})$	9.0
		$\alpha(20 \text{ °C}; 250 \text{ °C})$	9.2
		$\alpha(20 \text{ °C}; 300 \text{ °C})$	9.4
		$\alpha(20 \text{ °C}; 350 \text{ °C})$	9.6
		$\alpha(20 \text{ °C}; 400 \text{ °C})$	9.7
		$\alpha(20 \text{ °C}; 450 \text{ °C})$	9.9
		$\alpha(20 \text{ °C}; 500 \text{ °C})$	◇

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Physical and chemical properties		
2.4	Fuseability Fusing with SCHOTT ARTISTA [®] glasstypes using an adapted temperature / time programme results in a technically stressfree compound with a maximum stress birefringence of 70 nm/cm.	
2.5	Mean specific heat capacity c_p (20 °C to 100 °C) in J/ (g·K)	0.8
2.6	Thermal conductivity λ in W/ (m·K) for the indicated temperatures	
	$\vartheta = 90 \text{ °C}$	1.02
2.7	Specific thermal stress φ in N/ (mm²·K)	0.86

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Specification		PCP B 270^{®i}
Physical and chemical properties		
3.	Mechanical properties	
3.1	Density ρ in g/cm ³	2.56
3.2	Stress optical coefficient C in $1.02 \cdot 10^{-12}$ m ² /N	2.7
3.3	Breaking strength	
	Admissible value for the bending strength σ_{zul} of technically annealed glasses as calculation basis (air) in N/mm ²	30
	A higher mechanical strength can be realized by chemical toughening according to the ion exchange procedure or by thermal toughening.	
3.3.1	Chemical toughening	
	Processing temperature ϑ in °C	◇
	Processing time t in h	◇
	Compressive stress D_s as birefringence in nm/cm	◇
	Penetration depth N_z up to neutral zone in μm	◇
	Further information	◇
3.3.2	Thermal toughening	possible
3.4	Young's modulus E in kN/mm ²	71
3.5	Poisson's ratio μ	0.22
3.6	Torsion modulus G in kN/mm ²	29
3.7	Micro hardness	
3.7.1	Knoop hardness HK 0.1/20	500
3.7.2	Vickers hardness HV 0.2/25	510

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Specification		PCP B 270®i	
Physical and chemical properties			
4.	Chemical properties		
4.1	Hydrolytic resistance acc. to DIN ISO 719		
		Hydrolytic class	HGB 3
	Equivalent of alkali (Na ₂ O) per gram of glass grains in µg/g		136
4.2	Acid resistance acc. to DIN 12116		
		Acid class	S 2
	Half surface weight loss after 6 hours in mg/dm ²		0.7
4.3	Alkali resistance acc. to DIN ISO 695		
		Class	A 1
	Surface weight loss after 3 hours in mg/dm ²		71
4.4	Hazardous Substances		
EC-directive 2002/95/EC (RoHS-directive)			
	Test Items	RoHS Limit in mg/kg	RL in mg/kg
	Cadmium (Cd)	100	2
	Lead (Pb)	1000	2
	Mercury (Hg)	1000	2
	Hexavalent Chromium (Cr(VI))	1000	2
	Polybrominated biphenyls (Sum of PBBs)	1000	500
	Polybrominated diphenyl ethers (Sum of PBDEs)	1000	500
* with reference to IEC 62321:2008 for Cadmium content. Analysis was performed by ICP-OES			
** with reference to IEC 62321:2008 for Lead content. Analysis was performed by ICP-OES			
*** with reference to IEC 62321:2008 for Mercury content. Analysis was performed by ICP-OES			
**** with reference to IEC 62321:2008 for Hexavalent Chromium by Colourimetric Method using UV-Vis			
***** with reference to IEC 62321:2008 for PBBs / PBDEs content. Analysis was performed by GC/MS.			
RL = Report Limit, < RL = below Report Limit			

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Specification		PCP B 270®i	
Physical and chemical properties			
5.	Electrical properties		
5.1	Dielectric constant (Permittivity) ϵ_r at 1 MHz	7.5	
5.2	Dissipation factor $\tan \delta$ bei 1 MHz	$31.8 \cdot 10^{-4}$	
5.3	Electric volume resistivity ρ_D in $\Omega \cdot \text{cm}$ at the specified temperatures		
5.3.1	ρ_D for alternating current 50 Hz and 3 kHz		
	Frequency 50 Hz	$\vartheta = 25 \text{ }^\circ\text{C}$	$5.4 \cdot 10^9$
		$\vartheta = 250 \text{ }^\circ\text{C}$	$6.1 \cdot 10^7$
		$\vartheta = 350 \text{ }^\circ\text{C}$	$1.6 \cdot 10^6$
	Frequency 3 kHz	$\vartheta = 25 \text{ }^\circ\text{C}$	$9.1 \cdot 10^7$
		$\vartheta = 250 \text{ }^\circ\text{C}$	$2.7 \cdot 10^7$
		$\vartheta = 350 \text{ }^\circ\text{C}$	$1.5 \cdot 10^6$
5.3.2	ρ_D for direct current		
		$\vartheta = 25 \text{ }^\circ\text{C}$	◇
		$\vartheta = 250 \text{ }^\circ\text{C}$	◇
		$\vartheta = 350 \text{ }^\circ\text{C}$	◇
		$\vartheta = 400 \text{ }^\circ\text{C}$	◇
5.4	Temperature t_{k100} in $^\circ\text{C}$ for a specific electric volume resistivity of $10^8 \Omega \cdot \text{cm}$	◇	

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Specification		PCP B 270®i	
Physical and chemical properties			
6. Other properties			
6.1 Solarization			
Shifting of the edge wavelength λ_c ($\tau = 0.46$) after UV-radiation in the direction of longer wavelength		$\Delta \lambda_c$ in nm	< 1
Measuring and Test Procedures			
The sample will be irradiated with a UV - F 400 floodlamp. The irradiation time amounts to 7h; the distance between floodlamp and samplefastening is 14 cm.			
7. Annex (diagrams, curves)			

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Annex 1.2.1.1

Specification

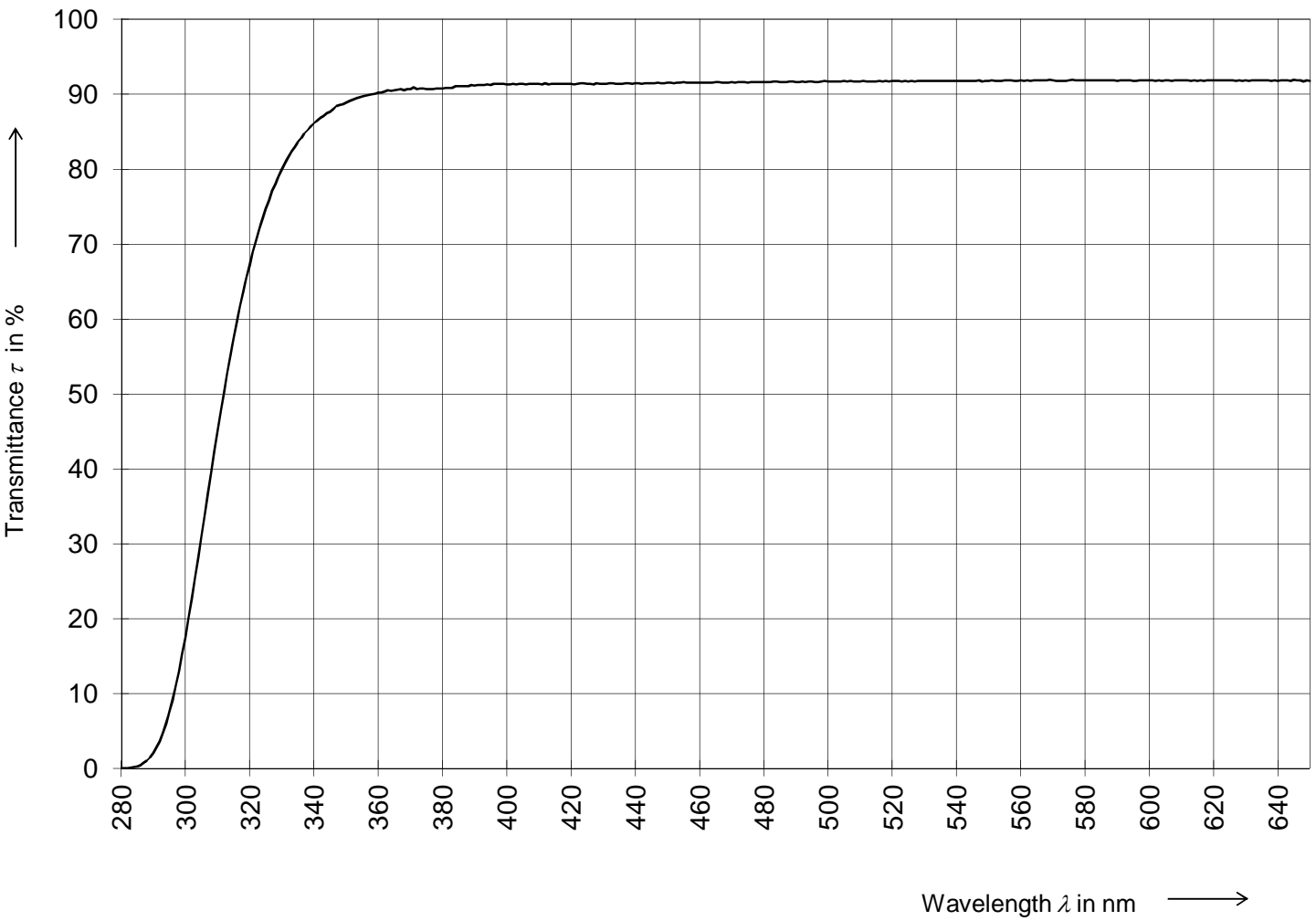
Physical and chemical properties

PCP
B 270®i

Spectral Transmittance

Type of Glass: **B 270®i**

Thickness: 2.0 mm



Anlage 1.2.1.1

Specification

Physical and chemical properties

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Spectral Transmittance

Type of Glass: B 270®i

Thickness: 2.0 mm

