Specification

Physical and chemical properties

PCP
B 270®i

B 270®i

D 0092 7

B 270®i is a clear high transmission crown glass (modified soda-lime glass) available in form of sheets.

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.

Values marked with ◊ do not apply to the type of glass or no values are available.

Requirements deviating from these specifications must be defined in writing in a **customer agreement**.

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1. Optical properties

1.1 Refractive indices (20 °C)

Pretreatment of samples	n_g	1.5342
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
	$n_{C'}$	1.5206
	n_C	1.5202

1.1.1 Abbe value

	ν_e	57.7 ± 0.6
	ν_d	58.0

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 mm* (λ = 280 nm to 650 nm)	see annex
d = 2.0 mm* (λ = 280 nm to 2000 nm)	see annex

1.2.1.2 $\tau(\lambda)$ - individual values in % ◊

1.2.1.3 Edge wavelength (d = 2.0 mm*)

Edge wavelength	λ_c (τ = 0.46) in nm	310
Solarization refer to 6.2		
Additional data	λ_S (τ = 0.05) in nm	293
	λ_P (τ = 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 % (*d* = 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 (*d* = 2.0 mm*)**		
		D_{65} x	0.313
	Chromaticity coordinates (colour locus) are referred	y	0.329
	to the namend Standard Illuminant according to	A x	0.448
	CIE 2°-observer	y	0.408
1.3.3			disregarded
1.3.4	**General colour rendering index R_a (*d* = 2.0 mm*)**		100

* Thickness range 0.8 mm to 1.65 mm

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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 *Tg* 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)

α(20 °C;300 °C)	9.4
α(20 °C;200 °C)	9.0
α(20 °C;100 °C)	8.2

2.3.2 Coefficient of mean linear thermal expansion α in 10^{-6} K^{-1} for the indicated temperature range (Dynamic measurement)

α(20 °C;100 °C)	8.6
α(20 °C;150 °C)	8.8
α(20 °C;200 °C)	9.0
α(20 °C;250 °C)	9.2
α(20 °C;300 °C)	9.4
α(20 °C;350 °C)	9.6
α(20 °C;400 °C)	9.7
α(20 °C;450 °C)	9.9
α(20 °C;500 °C)	◊

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2.4	**Fuseability**		disregarded
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**		
		ϑ = 90 °C	1.02
2.7	**Specific thermal stress φ in N/ (mm²·K)**		0.86

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3.	**Mechanical properties**	
3.1	**Density ρ in g/cm³**	2.56
3.2	**Stress optical coefficient C in $1.02 \cdot 10^{-12}$ m²/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/mm²	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 Ds as birefringence in nm/cm	◊
	Penetration depth Nz up to neutral zone in µm	◊
	Further information	◊
3.3.2	**Thermal toughening**	possible
3.4	**Young´s modulus E in kN/mm²**	71.1
3.5	**Poisson´s ratio μ**	0.226
3.6	**Torsion modulus G in kN/mm²**	29.0
3.7	**Knoop hardness HK 0.1/20**	500

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4. Chemical properties

4.1	**Hydrolytic resistance acc. to DIN ISO 719**	
	Hydrolytic class	HGB 3
	Equivalent of alkali (Na_2O) 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/dm²	0.7
4.3	**Alkali resistance acc. to DIN ISO 695**	
	Class	A 1
	Surface weight loss after 3 hours in mg/dm²	71
4.4	**Hazardous Substances**	◊

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

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6. Other properties

6.1 Solarization

Shifting of the edge wavelength λ_c (τ = 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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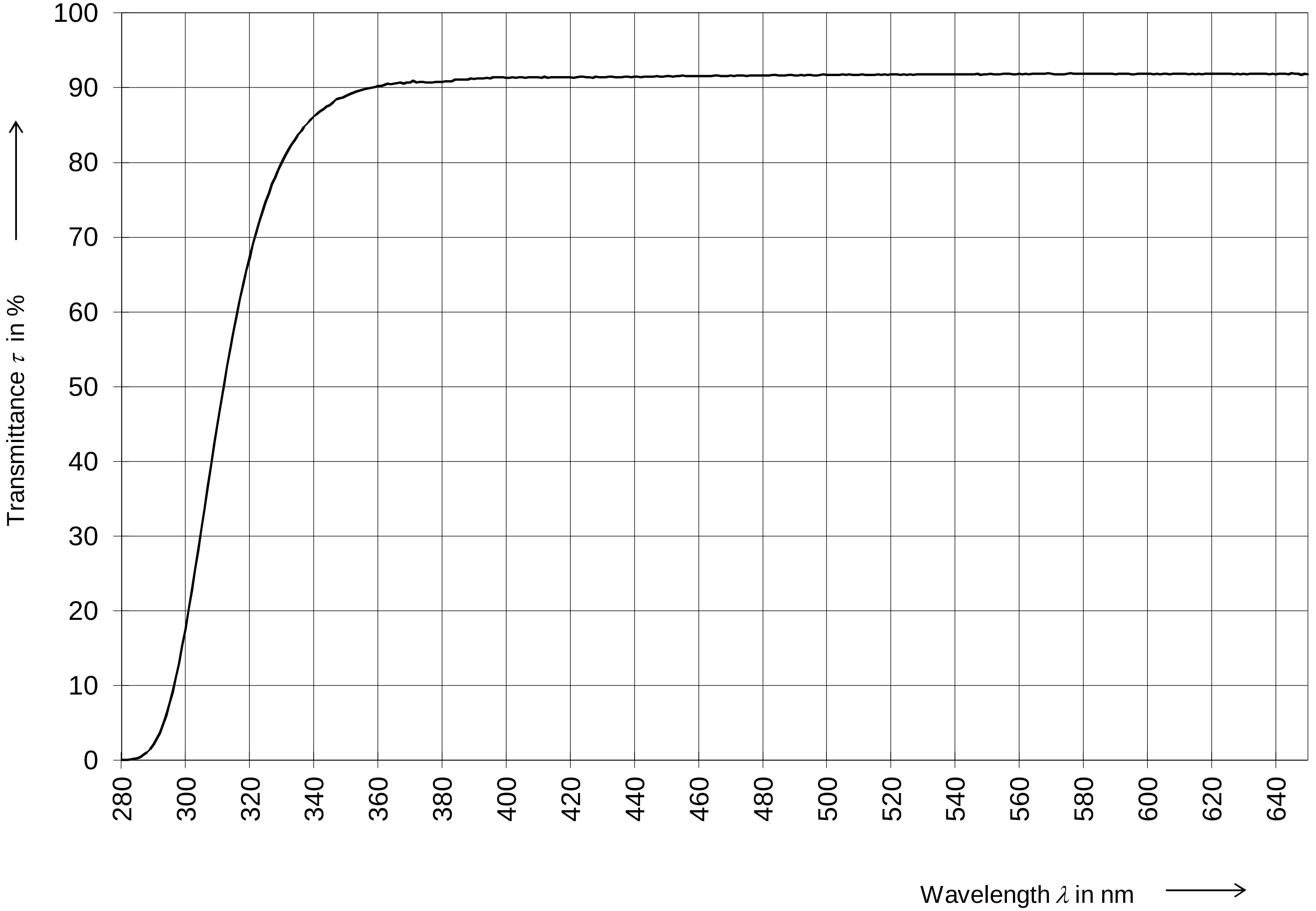
Spectral Transmittance

Type of Glass: B 270®i

Thickness: 2.0 mm



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