Title: Technical / Sheet Glasses
Range / Description: Schott B270 for 320-2600nm transmission
Material / Specification: TSG-B270

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B 270 Superwite

B 270 Superwite is a clear high transmission crown glass (modified soda-lime glass) available in form of sheets, optical rods, profiled rods, strips and chain moulded rod.

Optical properties

Refractive indices (20 °C)			
Pretreatment of samples	n_g	1.53	
annealed at 40 °C/h	$n_{F'}$	1.53	
	n_F	1.53	
	n_e	1.5251 ± 0.001*	
	n_d	1.52	
	n_D	1.52	
* ± 0.0003 upon request	$n_{C'}$	1.52	
	n_C	1.52	
Further refractive indices in UV and IR (reference values)		see annex	
Abbe value	ν_e	58.3 ± 0.6	
	ν_d	58.5	
Transmittance data			
Spectral transmittance $\tau(\lambda)$			
$\tau(\lambda)$ - curve			
Plot of spectral transmittance $\tau(\lambda)$ for d = 2.0 mm and d = 15 mm (λ = 280 nm to 650 nm) d = 2.0 mm and d = 15 mm (λ = 280 nm to 2000 nm)		see annex see annex	
$\tau(\lambda)$ - individual values in %		see annex	
Edge wavelength (d = 2.0 mm)			
Edge wavelength	λ_c (τ = 0.46) in nm 312	312	
Additional data	λ_S (τ = 0.05) in nm 294	294	
	λ_P (τ = 0.85) in nm 340	340	
Luminous transmittance τ_v			
Luminous transmittance as a function of thickness			
	Thickness in mm	τ_{vD65} in %	τ_{vA} in %
	2	91.7	91.7
	4	91.6	91.6
	15	91	91

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Special transmittance values in % (*d* = 2.0 mm)		
UV - transmittance	τ_{UVA}	84
	τ_{UVB}	19
IR - transmittance	τ_{A}	92.5
Solar direct transmittance	τ_{e}	91.4
Colour		
Visual evaluation		Disregard
Colorimetry (*d* = 2.0 mm)		
Chromaticity coordinates (colour locus) are referred to the namend Standard Illuminant according to CIE 2°-observer	D $_{65}$ x D $_{65}$ Y	0.314 0.332
	A x A y	0.448 0.408
		Disregard
General colour rendering index R_a (*d* = 2.0 mm)		100

Thermal properties

Viscosities and corresponding temperatures		
Designation	Viscosity log η in dPas	Temperature ϑ in °C
Strain point	14.5	**511** (~952 °F)
Annealing point	13	**541** (~1006 °F)
Softening point	7.6	**724** (~1335 °F)
Forming temperature	6	**827** (~1521 °F)
Forming temperature	5	**915** (~1679 °F)
Forming temperature	4	**1033** (~1891 °F)
Transformation temperature *Tg* in °C		**533** (~991 °F)
Coefficient of thermal expansion α		
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
	α (20 °C;100 °C)	8.2

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Coefficient of mean linear thermal expansion α in 10^{-6} K^{-1} for the indicated temperature range (dynamic measurement)		
	α (20 °C;100 °C)	7.8
	α (20 °C;150 °C)	8.4
	α (20 °C;200 °C)	8.8
	α (20 °C;250 °C)	9.1
	α (20 °C;300 °C)	9.4
	α (20 °C;350 °C)	9.6
	α (20 °C;400 °C)	9.8
	α (20 °C;450 °C)	10
	α (20 °C;500 °C)	10.3
Coefficient of mean linear thermal expansion α in 10^{-6} K^{-1} for the mentioned temperature intervals (dynamic measurement)		See annex
Fuseability		
Stress-free fusion with suitable lower segments out of our product range is possible.		
Mean specific heat capacity c_p (20 °C to 100 °C) in J/ (g·K)		0.86
Thermal conductivity λ in W/ (m·K) for the indicated temperatures		
	ϑ = 24.5 °C	0.92
	ϑ = 89 °C	1.01
	ϑ = 127 °C	1.08
	ϑ = 167 °C	1.15
Specific thermal stress φ in N/ (mm²·K)		0.86

Mechanical properties

Density ρ in g/cm³	2.55
Stress optical coefficient C in 1.02 · 10^{-12} m²/N	2.7
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 (refer to annex 3.3.1) or by thermal toughening.	

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Chemical toughening	
Processing temperature ϑ in °C	420
Processing time *t* in h	16
Compressive stress *Ds* as birefringence in nm/cm	7200
Penetration depth *Nz* up to neutral zone in µm	48
Further information	see annex
Thermal toughening	
Recommended minimum thickness *d* in mm for toughened safety glass for building purposes according to DIN 1249 T10 - 1990	4
Young´s modulus *E* in kN/mm²	71.5
Poisson´s ratio μ	0.22
Torsion modulus *G* in kN/mm²	29.3
Knoop hardness HK_{100}	542

Chemical properties

Hydrolytic resistance acc. to DIN ISO 719	
Hydrolytic class	HGB 3
Equivalent of alkali (Na_2O) per gram of glass grains in µg/g	170
Acid resistance acc. to DIN 12 116	
Acid class	S 2
Half surface weight loss after 6 hours in mg/dm²	1.4
Alkali resistance acc. to DIN ISO 695	
Class	A 2
Surface weight loss after 3 hours in mg/dm²	140

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Electrical properties

Dielectric constant (Permittivity) ε_r at 1 MHz	7
Dissipation factor tan δ bei 1 MHz	$30 \cdot 10^{-4}$
Electric volume resistivity ρ_D in $\Omega \cdot$ cm at the specified temperatures	
ρ_D for alternating current 50 Hz and 3 kHz	
ϑ = 1260 °C	10.2
ϑ = 1386 °C	6.8
ρ_D for direct current	
ϑ = 250 °C	10^9
ϑ = 350 °C	$1.6 \cdot 10^7$
ϑ = 400 °C	$2 \cdot 10^6$
Temperature t_{k100} in °C for a specific electric volume resistivity of 10^8 $\Omega \cdot$ cm	301

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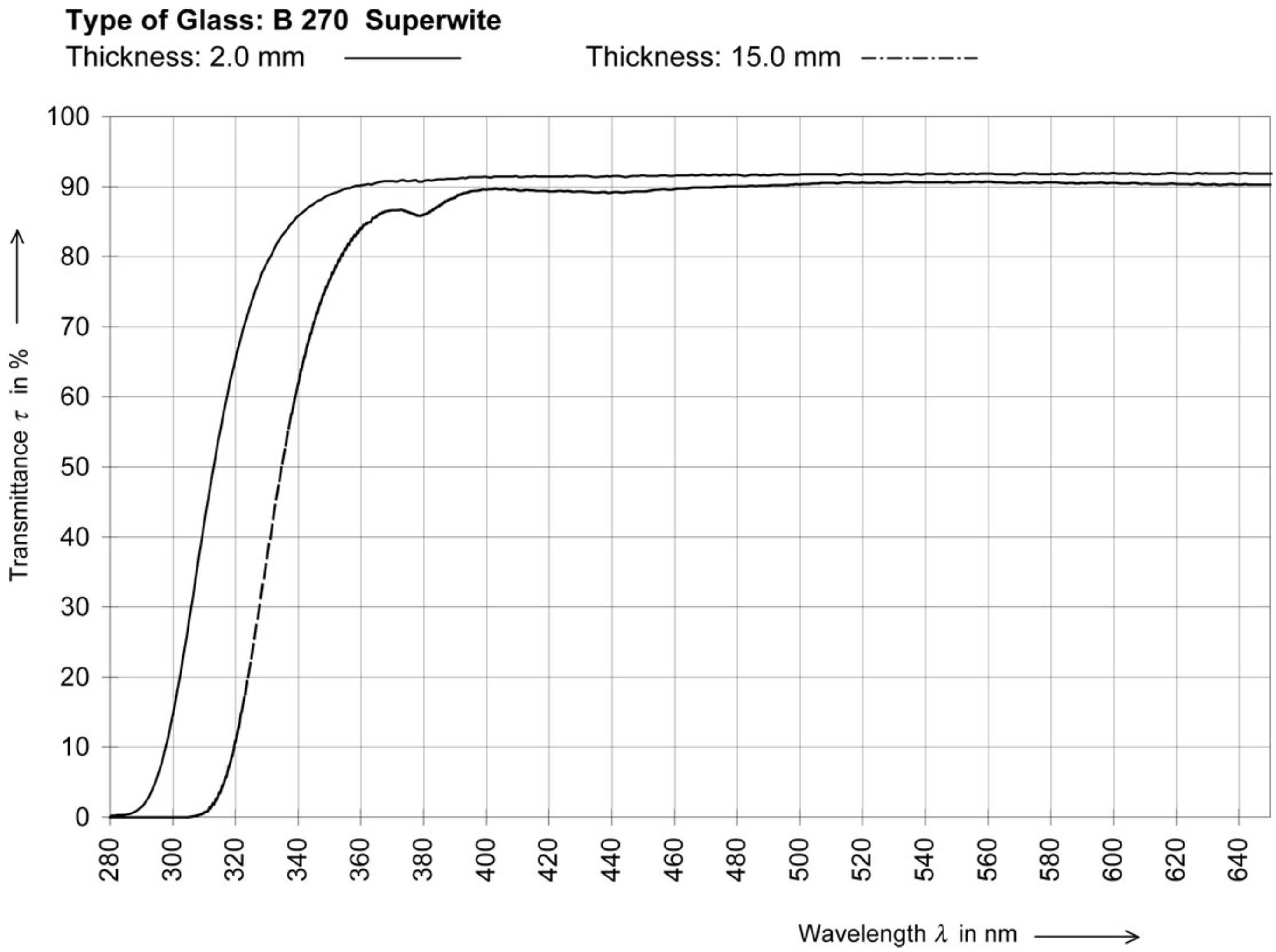
Spectral Transmittance from 280 – 640 nm



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Spectral Transmittance from 280 – 2000 nm