Specification
Physical and chemical properties (PCP)
D 263® bio

Non-toleranced numerical values are reference values of a typical production quality.

D 263® bio is a colorless borosilicate glass with a homogeneous, low intrinsic auto fluorescence across the spectrum. Tight, controlled refractive index tolerances ensure consistent, high optical transmission properties and diagnostic results. It offers great chemical stability and resistance to reagents as used in microarray and diagnostic protocols.
D 263® bio is produced in a SCHOTT-specific down-draw method, which results in non-porous, ultra-flat fire-polished surface quality on both sides at target thicknesses without polishing. The glass is available in round wafer dimensions or custom-cut rectangular substrates, cleaned inspected and packaged to meet demanding standards of the Biotechnology and Semiconductor industries.

Chemically toughenable and easy to structure, this glass can used in numerous applications in demand of high optical and chemical qualities such as substrate glass for optical diagnostics, microfluidic components or other consumer and industrial applications.

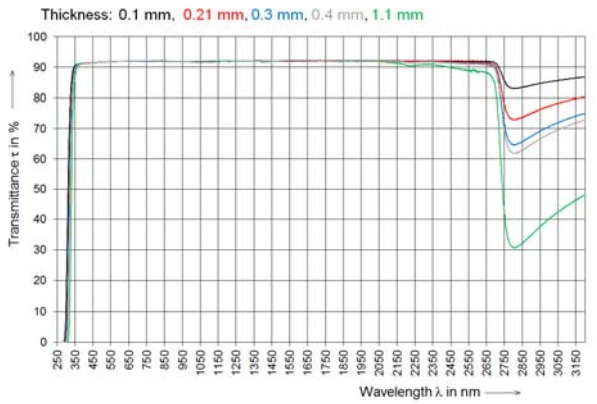
D 263® bio has certified biocompatibility (Cytotoxicity as per DIN EN ISO 10993-5:2009 and Haemocompatibility as per DIN EN ISO 10993-4:2009)

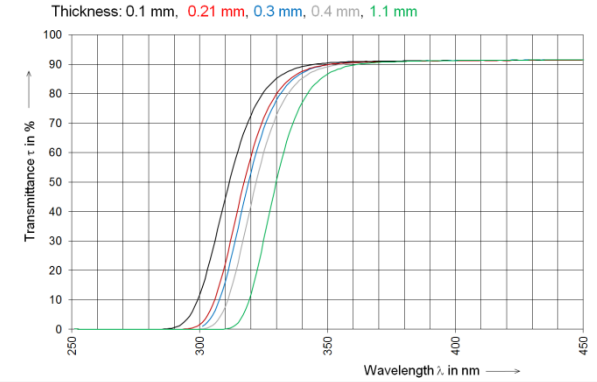
Optical properties		
Refractive indices Pretreatment of samples Condition as supplied ["as drawn"]	n_g	1.5354
	$n_{F'}$	1.5305
	n_F	1.5300
	n_e	1.5255 ± 0.0015
	n_d	1.5231
	n_D	1.5230
	$n_{C'}$	1.5209
	n_C	1.5204
Abbe value	v_e	55

Thermal properties		
CTE (Coefficient of thermal expansion) α	in $10^{-6}\cdot K^{-1}$ (20 °C;300 °C)	7.2
Mean specific heat capacity c_p	in J/(g·K) (20 °C to 100 °C)	0.8
Transformation temperature T_g	in °C	557
Viscosities	Viscosity lg η in dPas	Temperature in °C
Strain point	14.5	529
Annealing point	13.0	557
Softening point	7.6	736

Mechanical properties		
Density ρ (annealed at 40 °C/h)	in g/cm³	2.51
Stress optical coefficient C	in $1.02\cdot10^{-12}$ m²/N	3.4
Chemical toughening (d = 0.3 mm)	temperature ϑ in °C	410
	time t in h	4
	Compressive Stress (CS) in MPa	317
	Depth of Layer (DoL) in µm	18
Young's modulus E	in kN/mm²	72.9
Poisson's ratio μ		0.21
Torsion modulus G	in kN/mm²	30
Knoop hardness	HK 0.1/20	470
Vickers hardness	HV 0.2/25	510

Spectral transmittance (λ = 250 nm to 3200 nm and λ = 250 nm to 450 nm)





Transmittance values		
Thickness 0.3 mm	Wavelength	τ (λ) in %
	at 254 nm	< 0.1
	at 380 nm	91.2
	at 632.8 nm	92
	at 1064 nm	92
Edge wavelength λ_c (τ = 0.46)	Thickness in mm	Wavelength in nm
	0.10	308
	0.21	315
	0.30	318
	0,40	321
	1.10	329
Luminous transmittance	Thickness in mm	τ_{vD65} in %
	0.3	91.7 ± 0.3

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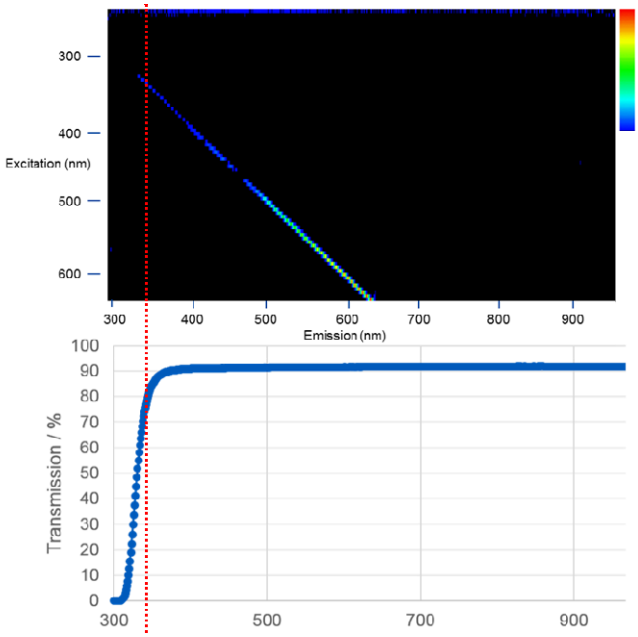
Electrical properties		
Dielectric constant ε_r (at ϑ = 25 °C)	at 1 MHz	6.7
	at 1 GHz	6.4
	at 5 GHz	6.3
Dissipation factor tan δ (at ϑ = 25 °C)	at 1 MHz	$61 \cdot 10^{-4}$
	at 1 GHz	$74 \cdot 10^{-4}$
	at 5 GHz	$101 \cdot 10^{-4}$
Electric volume resistivity ρ_D	in Ω·cm alternate current 50 Hz	$1.6 \cdot 10^{8}$ (ϑ = 250 °C)
		$3.5 \cdot 10^{6}$ (ϑ = 350 °C)

Chemical properties		
Hydrolytic resistance (acc. to DIN ISO 719)	Class	HGB 1
	Equivalent of alkali per gram glass grains in µg/g	20
Acid resistance (acc. to DIN 12116)	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	88

Auto fluorescence in >80% transmission spectrum



The left graph shows a homogeneously low level of fluorescence emission spectra when excited at wavelengths above the 80% transmission threshold (red dotted line) of the glass. The colored diagonal line represents the excitation wavelength itself, with no emittance of fluorescence above and below.

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