Specification

Physical and chemical properties

PCP
D 0891

UV-W 0891 D 0891

Colour:	clear
Application:	UV - absorbing glass for corrective lenses

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".
We retain 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.

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**.

Specification

Physical and chemical properties

PCP
D 0891

1. Optical properties

1.1 Refractive indices (20 °C)

Pretreatment of samples
[x] Condition as supplied
[x] annealed at 40 °C/h for bifocals *± 0.0003

n_g	1.5340
$n_{F'}$	1.5297
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

ν_e	58.4 ± 0.6
ν_d	58.6

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 = 300 nm to 1500 nm): see annex

1.2.1.2 $\tau(\lambda)$ - individual values in % (d = 2.0 mm)

$\tau(\lambda)_{max}$ for the λ - range 280 nm to 315 nm	0.05
$\tau(\lambda)_{max}$ for the λ - range 315 nm to 350 nm	55.5
τ_{380}	90
$\tau(\lambda)_{min}$ for the λ - range 500 nm to 650 nm	◊

1.2.1.3 Edge wavelength (d = 2.0 mm)

Edge wavelength $\lambda_{c\ (\tau = 0.46)}$ in nm: 347 ± 2

1.2.2 Luminous transmittance τ_v

1.2.2.1 Luminous transmittance τ_{vD65} in % at nominal thickness

d = 2.0 mm *** nominal transmittance**: 91.7* ± 0.3

Luminous transmittance as a function of thickness

Thickness in mm	1.4	2.0	3.0	4.0	5.0	6.0
τ_{vD65} in %	91.8	91.7	91.7	91.7	91.7	91.6
τ_{vA} in %	91.8	91.8	91.7	91.7	91.7	91.7
τ_{vC} in %	91.8	91.8	91.7	91.7	91.7	91.6

Specification

Physical and chemical properties

PCP
D 0891

1.2.2.2	**Scale number / Filter category**		
	N for mean thickness *d* = mm (τ_{vD65} = %)		◊
	N for mean thickness *d* = mm (τ_{vD65} = %)		◊
	filter category for nominal transmittance τ_{vD65} = 91.7 %		0
1.2.3	**Special transmittance values in % (*d* = 2.0 mm)**		
1.2.3.1	**UV - transmittance**		
		τ_{UVA}	44.0
		τ_{SUV}	◊
		τ_{SUVA}	32.8
		τ_{SUVB}	0.06
1.2.3.2	**IR - transmittance**	τ_{SIR}	92
1.2.3.3	**Solar blue - light transmittance**	τ_{sb}	◊
1.3	**Colour**		
1.3.1	**Visual evaluation**		
	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
1.3.2	**Colorimetry**		
	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 τ_{vD65} = 91.7 % (refer to 1.2.2.1)		
1.3.3	**Signal light recognition**		
	Relative visual attenuation coefficient (quotient) *Q*	Q_{blue}	1.00
	for signal light recognition referred to the	Q_{green}	1.00
	nominal transmittance τ_{vD65} = 91.7 %	Q_{yellow}	1.00
	(refer to 1.2.2.1)	Q_{red}	1.00
1.3.4	**Yellowness index (*d* = 10 mm)**		
		Y_i	1.1

Specification

Physical and chemical properties

PCP
D 0891

2. Thermal properties

2.1 Viscosities and corresponding temperatures

Designation	Viscosity lg η in dPas	Temperature ϑ in °C
Strain point	14.5	514
Annealing point	13.0	543
Softening point	7.6	725
Forming temperature	6.0	827
Forming temperature	5.0	915
Forming temperature	4.0	1033

2.2	**Transformation temperature *Tg* in °C**	541
2.3	**Coefficient of mean linear thermal expansion α (20 °C;300 °C) in 10^{-6} K^{-1}** (Static measurement)	9.5
2.4	**Fuseability**	
	Stress-free fusing with lower segments from Barberini GmbH, 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
2.5	**Mean specific heat capacity c_p (20 °C to 100 °C) in J/(g · K)**	◊

Specification

Physical and chemical properties

PCP
D 0891

3.	**Mechanical properties**	
3.1	**Density ρ in g/cm³**	2.55
3.2	**Stress optical coefficient *C* in 1.02 · 10^{-12} m²/N**	2.48
3.3	**Breaking strength**	
	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.	
3.3.1	**Chemical toughening**	
	Processing temperature ϑ in °C	450
	Processing time *t* in h	16
	Compressive stress *Ds* as birefringence in nm/cm	10200
	Penetration depth *Nz* up to neutral zone in µm	51
	Further information	see annex
3.3.2	**Thermal toughening**	
	Recommended minimum thickness *d* in mm for toughened safety glass lenses without corrective effect as per ball drop test (DIN EN 168)	2.5
3.4	**Young´s modulus *E* in kN/mm²**	◊
3.5	**Poisson´s ratio μ**	◊
3.6	**Torsion modulus *G* in kN/mm²**	◊
3.7	**Knoop hardness *HK* 0.1/20**	500

Specification

Physical and chemical properties

PCP
D 0891

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	161

4.2 Acid resistance acc. to DIN 12 116

Acid class	S 1
Half surface weight loss after 6 hours in mg/dm²	0.6

4.3 Alkali resistance acc. to DIN ISO 695

Class	A 2
Surface weight loss after 3 hours in mg/dm²	90

4.4 Hazardous Substances

EC-directive 2002/95/EC (RoHS-directive)	on request

5. Electrical properties — disregarded

6. Other properties — disregarded

7. Annex (diagrams, curves)

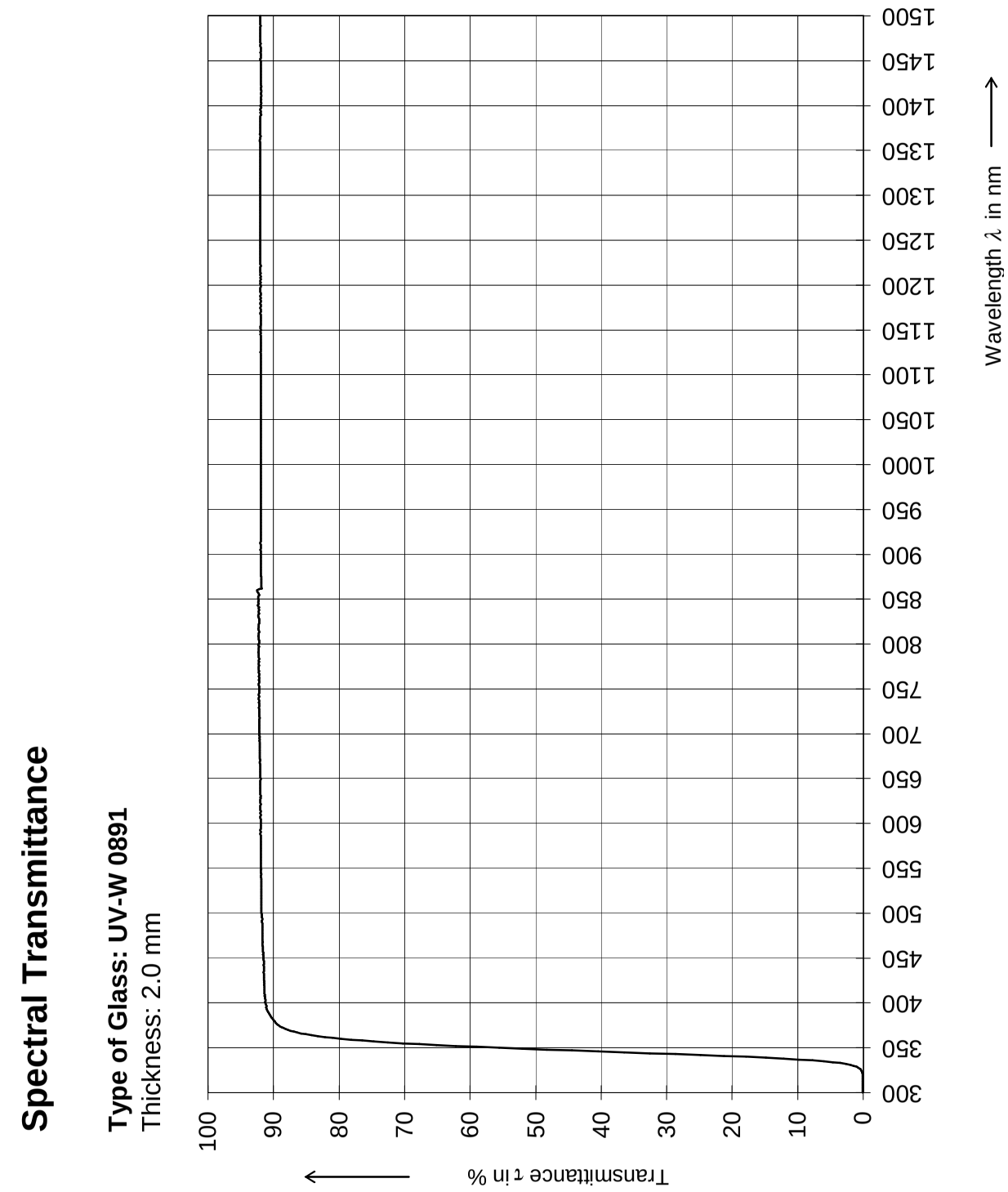
Form 0050/1e

Specification

Physical and chemical properties

PCP

D 0891



Specification

Physical and chemical properties

PCP
D 0891

Chemical toughening parameter

Glass and chemical toughening parameters		
Transformation temperature	°C	541
Glass thickness	mm	3
Processing time	h	16
Processing temperature	°C	450
Salt bath (* weight percentages)	KNO_3 in % *	99.5
	SiO_2 x H_2O in % *	0.5

Chemical toughening results *		
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