

Optical Filter Glass

Data Sheets
Version August 2024

Introduction

This is a data sheet collection for our portfolio glasses in 2024. We have revised the layout of our data sheets: you can find data about the Knoop hardness for all filter glasses, which is given in the section “Mechanical properties” of each data sheet.

The date of the current data status is indicated on each data sheet.

Resistance against humidity

Group “resistant glasses”

No substantial surface change occurs in the filter glass types. A change in the surface is only possible under extreme conditions such as 85 °C and 85 % relative humidity over hundreds of hours.

Group “robust glasses”

These glass types withstand the warm humidity testing at 60 °C and 90 % relative humidity for more than 48 hours.

Group “sensitive glasses”

These glass types should be used and stored in a moderate climate or in closed work and store rooms (constant temperature below 35 °C, relative humidity less than 60%). A desiccant is to be used when wetness is a possibility. For use and storage in open air and tropical climates, it is advisable to apply protective coatings which SCHOTT can provide on request.

Group “delicate glasses”

For these types of optical filter glass, changes in the glass surface are possible after several months of normal storage. These glasses are to be handled with care: Any contact with water or warm humidity should be avoided. A desiccant is to be used for long-term storage of unprotected glass. For this reason, protective coatings are recommended which SCHOTT can provide upon request.

Refractive index

The refractive indices of the glass types are stated as reference values. Due to different annealing conditions, there are deviations from batch to batch. Any refractive indices within the defined wavelength range can be calculated from the Sellmeier dispersion formula.

Note that the wavelength must be entered into the Sellmeier dispersion formula in units of μm in order to calculate the correct refractive index from the given coefficients.

$$n^2 - 1 = \frac{B_1 \lambda^2}{\lambda^2 - C_1} + \frac{B_2 \lambda^2}{\lambda^2 - C_2} + \frac{B_3 \lambda^2}{\lambda^2 - C_3}$$

Transmission

The internal transmittance τ_i is given for the respective reference thickness d .

$$\tau_{i,d_1} = (\tau_{i,d})^{\left(\frac{d_1}{d}\right)}$$

The formula can be used to calculate the internal transmittance for any other thickness d_1 .



Nomenclature

AR	Alkali resistance class in accordance with ISO 10629
d	Reference thickness
B ₁ , B ₂ , B ₃	Coefficients of the Sellmeier dispersion formula
C ₁ , C ₂ , C ₃	Coefficients of the Sellmeier dispersion formula
FR	Stain resistance class in accordance with catalog "SCHOTT Optical Filter Glass"
HK[0,1/20]	Knoop hardness in accordance with ISO 9385
n _d	Refractive index at the d-line
P _e	Excitation purity
SR	Acid resistance class in accordance with ISO 8424
T _g	Transformation temperature in accordance with ISO 7884-8
Tk	Temperature coefficient longpass filter
x, y	Chromaticity coordinates
Y	Tristimulus value of brightness
$\alpha_{-30^{\circ}\text{C}/+70^{\circ}\text{C}}$	Linear coefficient of thermal expansion in 10 ⁻⁶ /K in the temperature range [-30 °C to +70 °C]
$\alpha_{20^{\circ}\text{C}/200^{\circ}\text{C}}$	Linear coefficient of thermal expansion in 10 ⁻⁶ /K in the temperature range [+20 °C to +200 °C]
$\alpha_{20^{\circ}\text{C}/300^{\circ}\text{C}}$	Linear coefficient of thermal expansion in 10 ⁻⁶ /K in the temperature range [+20 °C to +300 °C]. Some glasses have such a low T _g , that the measurement for those glass types is not feasible.
λ	Wavelength
λ_d	Dominant wavelength
τ_i	Internal transmittance
ρ	Density
P _d	Reflection Factor at the d-line

For further explanations, see the catalog "SCHOTT Optical Filter Glass".

Table of contents

Filter type	Glass type	Filter type	Glass type
Bandpass filter	BG3	Longpass filter	N-WG205
	BG7		N-WG280
	BG18		N-WG295
	BG25		N-WG305
	BG38		N-WG320
	BG39		N-WG360
	BG40		GG395
	BG42		GG400
	BG47 <small>NEW</small>		GG420
	BG55		GG435
	BG59		GG455
	BG60		GG475
	BG60HT		GG495
	BG61		OG515
	BG62		OG530
	BG62HT		OG550
	BG63		OG570
	BG64		OG590
	BG66		RG610
	BG66HS		RG630
	BG67		RG645
	BG67HT		RG665
	S8022		RG695
S8023	RG715		
S8612	RG9		
VG9	RG780		
VG20	RG830		
UV-Bandpass filter	UG1	RG850	
	UG2A	RG905	
	UG5	RG1000	
	UG11	S7000	
	Multi-Bandpass filter	BG36	Shortpass filter
S7005		KG2	
S7010N		KG3	
S8008G		KG5	
S8802		Neutral density filter	NG1
S8806A			NG3
S8808			NG4
S8809			NG5
S8851			NG9
	NG11		

BG3

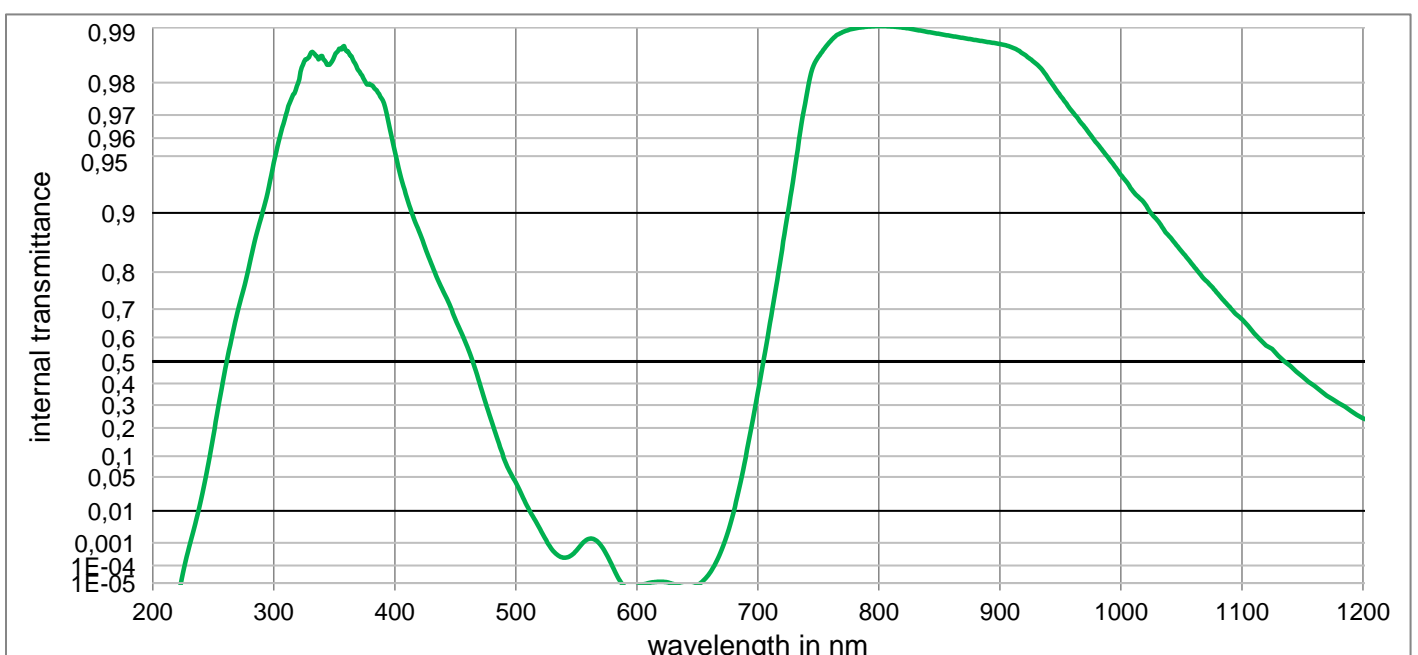
Optical properties	
Reflection factor	
$P_d = 0,921$	
Spectral values guaranteed	
τ_i (365 nm)	$\geq 0,94$
τ_i (633 nm)	$\leq 0,00005$
Refractive indices	
n_F (486 nm)	$= 1,516$
n_e (546 nm)	$= 1,512$
n_d (587,6 nm)	$= 1,51$
Sellmeier coefficients	
valid from 300 nm to 1600 nm	
B_1	0,8735
B_2	0,3716
B_3	1,1076
C_1	9,390E-03 μm^2
C_2	1,0998E-02 μm^2
C_3	145,898 μm^2
Internal quality	
Bubble class	1

Mechanical properties	
Reference thickness	
$d = 1,00 \text{ mm}$	
Density	
$\rho = 2,55 \text{ g/cm}^3$	
Knoop hardness	
HK[0.1/20] = 438	
Thermal properties	
Transformation temperature	
$T_g = 478 \text{ }^\circ\text{C}$	
Thermal expansion in $10^{-6}/\text{K}$	
α (-30°C/+70°C)	= 8,8
α (20°C/300°C)	= 10,1

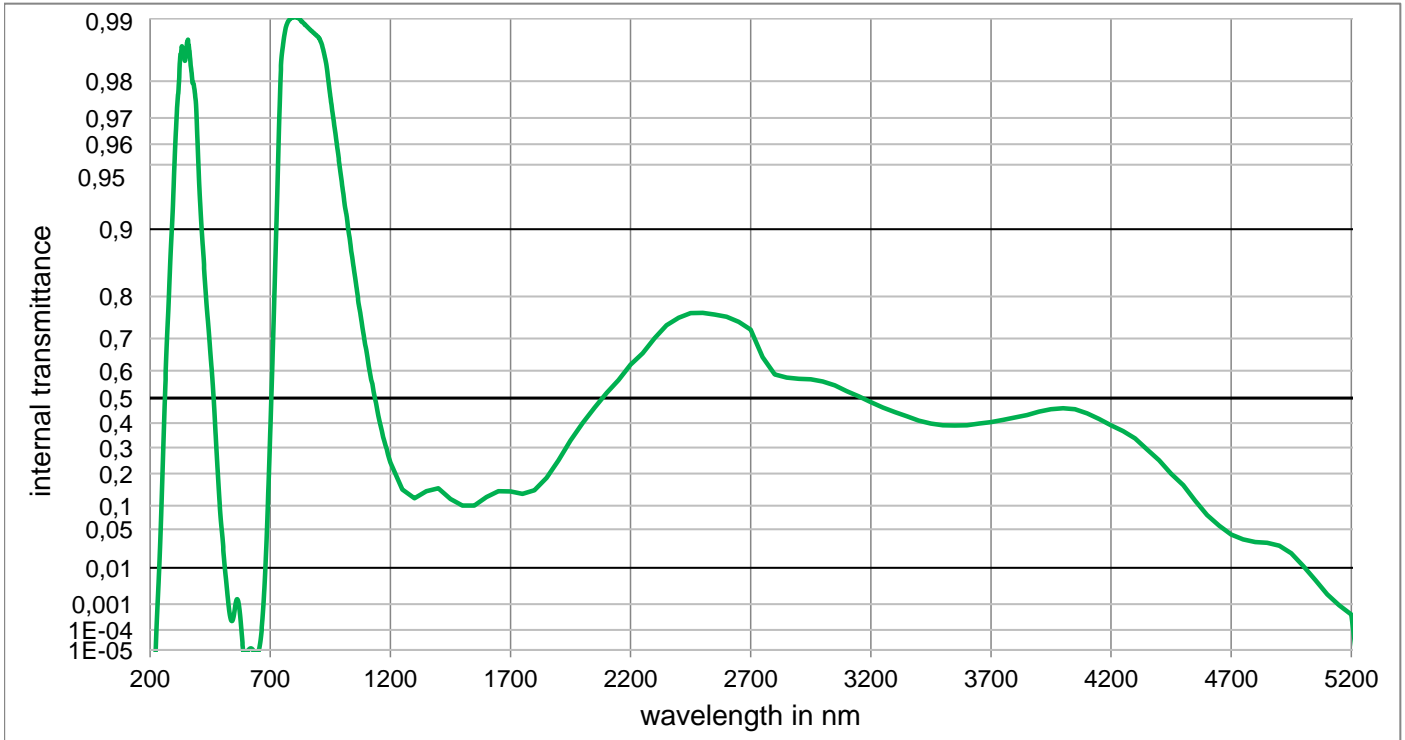
Chemical properties	
Chemical resistance	
FR class	= 0
SR class	= 1
AR class	= 1
Resistance against humidity	
Sensitive glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colormetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,154	0,160	0,163
	y	0,029	0,018	0,014
	Y	2,0	0,8	0,5
	λ_d	455 nm	448 nm	444 nm
	P_e	0,979	0,993	0,996
Illuminant A	x	0,160	0,166	0,170
	y	0,042	0,024	0,020
	Y	0,9	0,3	0,2
	λ_d	458 nm	447 nm	440 nm
P_e	0,958	0,977	0,978	

Notes	
UV	Transmission changes are possible under the action of intense ultraviolet radiation.
Ionically colored glass	
Bandpass filter / Shortpass filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



BG3



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	4,007E-02	800	9,902E-01	1100	6,665E-01	2200	6,200E-01	3700	4,038E-01
210	< 1,000E-05	510	1,201E-02	810	9,901E-01	1110	6,152E-01	2250	6,566E-01	3750	4,132E-01
220	< 1,000E-05	520	2,977E-03	820	9,900E-01	1120	5,680E-01	2300	7,009E-01	3800	4,226E-01
230	6,761E-04	530	5,426E-04	830	9,897E-01	1130	5,247E-01	2350	7,349E-01	3850	4,330E-01
240	1,924E-02	540	2,394E-04	840	9,895E-01	1140	4,800E-01	2400	7,538E-01	3900	4,462E-01
250	1,690E-01	550	4,902E-04	850	9,892E-01	1150	4,319E-01	2450	7,642E-01	3950	4,557E-01
260	4,698E-01	560	1,401E-03	860	9,889E-01	1160	3,884E-01	2500	7,651E-01	4000	4,600E-01
270	6,903E-01	570	8,404E-04	870	9,886E-01	1170	3,432E-01	2550	7,613E-01	4050	4,557E-01
280	8,188E-01	580	8,776E-05	880	9,883E-01	1180	3,081E-01	2600	7,557E-01	4100	4,400E-01
290	8,972E-01	590	< 1,000E-05	890	9,880E-01	1190	2,727E-01	2650	7,434E-01	4150	4,170E-01
300	9,457E-01	600	< 1,000E-05	900	9,877E-01	1200	2,412E-01	2700	7,236E-01	4200	3,915E-01
310	9,700E-01	610	1,013E-05	910	9,872E-01	1250	1,462E-01	2750	6,443E-01	4250	3,670E-01
320	9,798E-01	620	1,227E-05	920	9,860E-01	1300	1,200E-01	2800	5,868E-01	4300	3,368E-01
330	9,859E-01	630	< 1,000E-05	930	9,842E-01	1350	1,406E-01	2850	5,764E-01	4350	2,925E-01
340	9,857E-01	640	< 1,000E-05	940	9,810E-01	1400	1,500E-01	2900	5,717E-01	4400	2,500E-01
350	9,856E-01	650	< 1,000E-05	950	9,764E-01	1450	1,179E-01	2950	5,698E-01	4450	2,000E-01
360	9,865E-01	660	3,783E-05	960	9,712E-01	1500	1,000E-01	3000	5,623E-01	4500	1,600E-01
370	9,829E-01	670	5,207E-04	970	9,651E-01	1550	1,000E-01	3050	5,481E-01	4550	1,132E-01
380	9,794E-01	680	9,561E-03	980	9,574E-01	1600	1,236E-01	3100	5,264E-01	4600	7,780E-02
390	9,750E-01	690	9,566E-02	990	9,484E-01	1650	1,406E-01	3150	5,066E-01	4650	5,610E-02
400	9,527E-01	700	3,590E-01	1000	9,369E-01	1700	1,400E-01	3200	4,840E-01	4700	4,159E-02
410	9,169E-01	710	6,550E-01	1010	9,230E-01	1750	1,330E-01	3250	4,632E-01	4750	3,483E-02
420	8,758E-01	720	8,460E-01	1020	9,099E-01	1800	1,443E-01	3300	4,443E-01	4800	3,170E-02
430	8,192E-01	730	9,380E-01	1030	8,909E-01	1850	1,849E-01	3350	4,274E-01	4850	3,076E-02
440	7,520E-01	740	9,760E-01	1040	8,680E-01	1900	2,500E-01	3400	4,100E-01	4900	2,729E-02
450	6,672E-01	750	9,856E-01	1050	8,428E-01	1950	3,283E-01	3450	3,981E-01	4950	2,004E-02
460	5,617E-01	760	9,881E-01	1060	8,133E-01	2000	4,000E-01	3500	3,915E-01	5000	1,099E-02
470	4,022E-01	770	9,894E-01	1070	7,800E-01	2050	4,623E-01	3550	3,896E-01	5050	5,082E-03
480	2,258E-01	780	9,899E-01	1080	7,463E-01	2100	5,200E-01	3600	3,915E-01	5100	2,032E-03
490	9,487E-02	790	9,901E-01	1090	7,060E-01	2150	5,670E-01	3650	3,981E-01	5150	9,099E-04

BG7

Optical properties	
Reflection factor	
$P_d = 0,919$	
Spectral values guaranteed	
τ_i (365 nm)	$\geq 0,25$
τ_i (488 nm)	$\geq 0,78$
τ_i (633 nm)	$\leq 0,08$
Refractive indices	
n_F (486 nm)	$= 1,526$
n_e (546 nm)	$= 1,521$
n_d (587,6 nm)	$= 1,519$
Sellmeier coefficients	
valid from 440 nm to 1550 nm	
B_1	0,5574
B_2	0,7122
B_3	37,3513
C_2	$1,8447E-02 \mu m^2$
C_3	$5502,533 \mu m^2$
Internal quality	
Bubble class	1

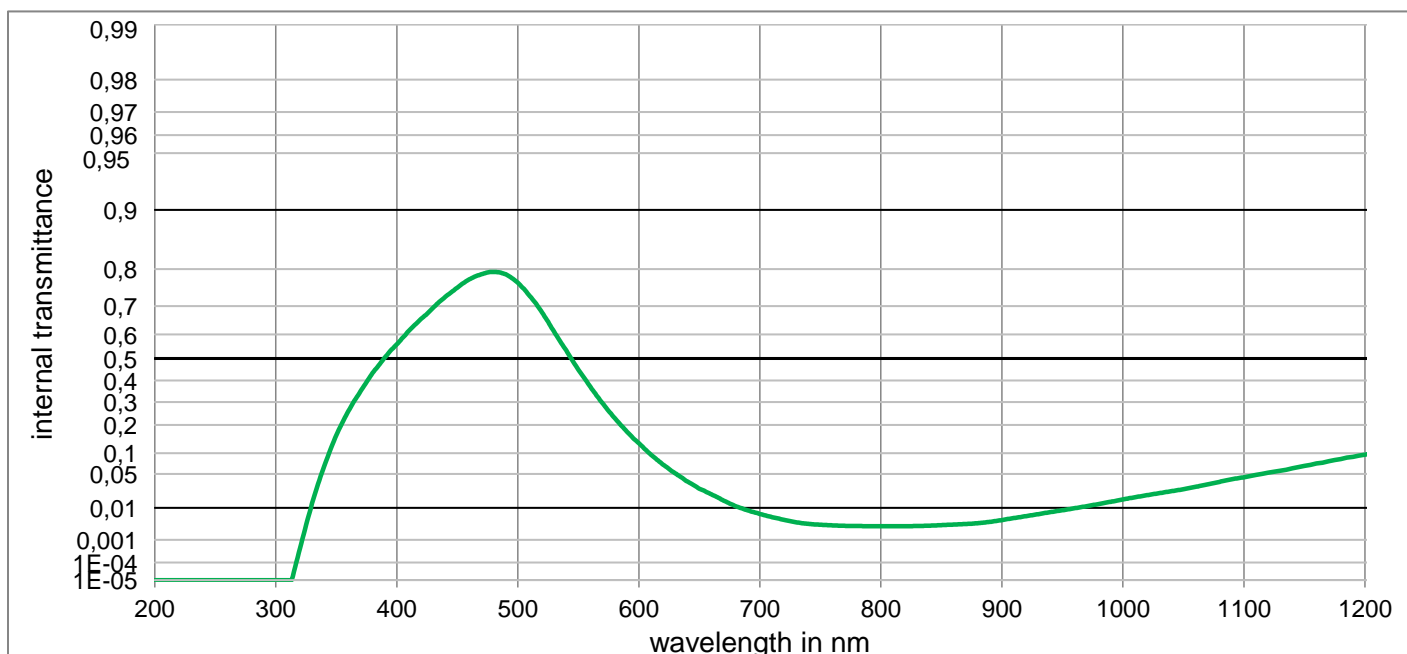
Mechanical properties	
Reference thickness	
$d = 1,00 \text{ mm}$	
Density	
$\rho = 2,60 \text{ g/cm}^3$	
Knoop hardness	
$HK[0.1/20] = 441$	

Thermal properties	
Transformation temperature	
$T_g = 447 \text{ }^\circ\text{C}$	
Thermal expansion in $10^{-6}/K$	
α (-30°C/+70°C)	$= 8,7$
α (20°C/300°C)	$= 10,0$

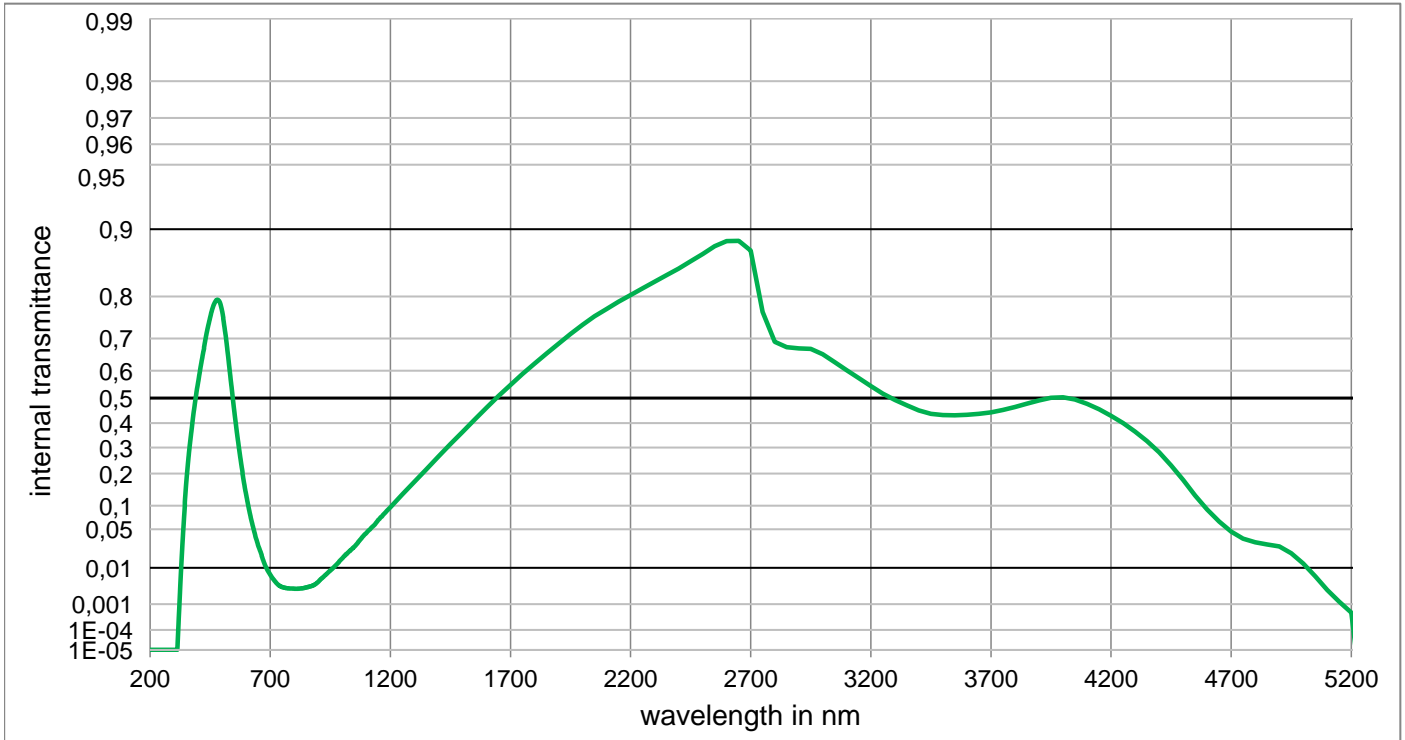
Chemical properties	
Chemical resistance	
FR class	$= 0$
SR class	$= 1$
AR class	$= 1$
Resistance against humidity	
Robust glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colormetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,191	0,152	0,138
	y	0,272	0,229	0,200
	Y	37,9	20,6	12,7
	λ_d	486 nm	484 nm	482 nm
	P_e	0,493	0,675	0,758
Illuminant A	x	0,262	0,179	0,145
	y	0,406	0,360	0,317
	Y	30,1	14,5	8,2
	λ_d	495 nm	492 nm	490 nm
P_e	0,438	0,654	0,755	

Notes	
Ionically colored glass	
Bandpass filter / Shortpass filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



BG7

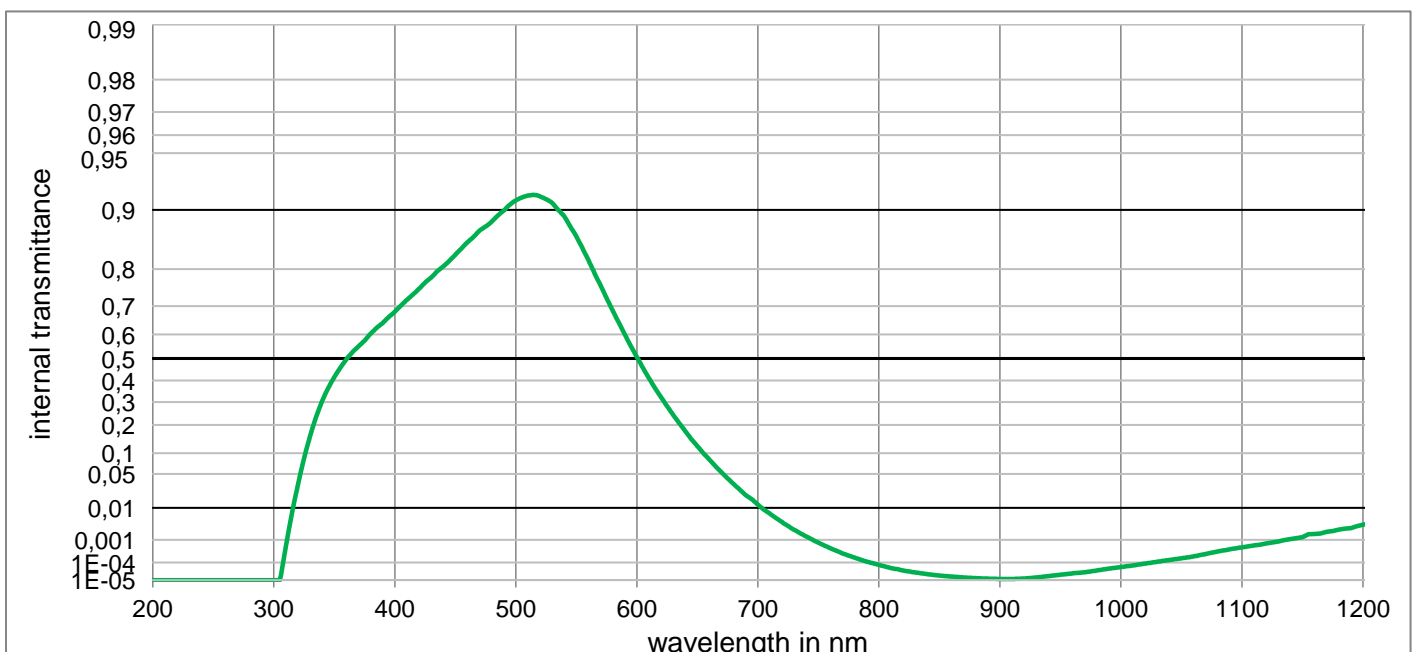


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

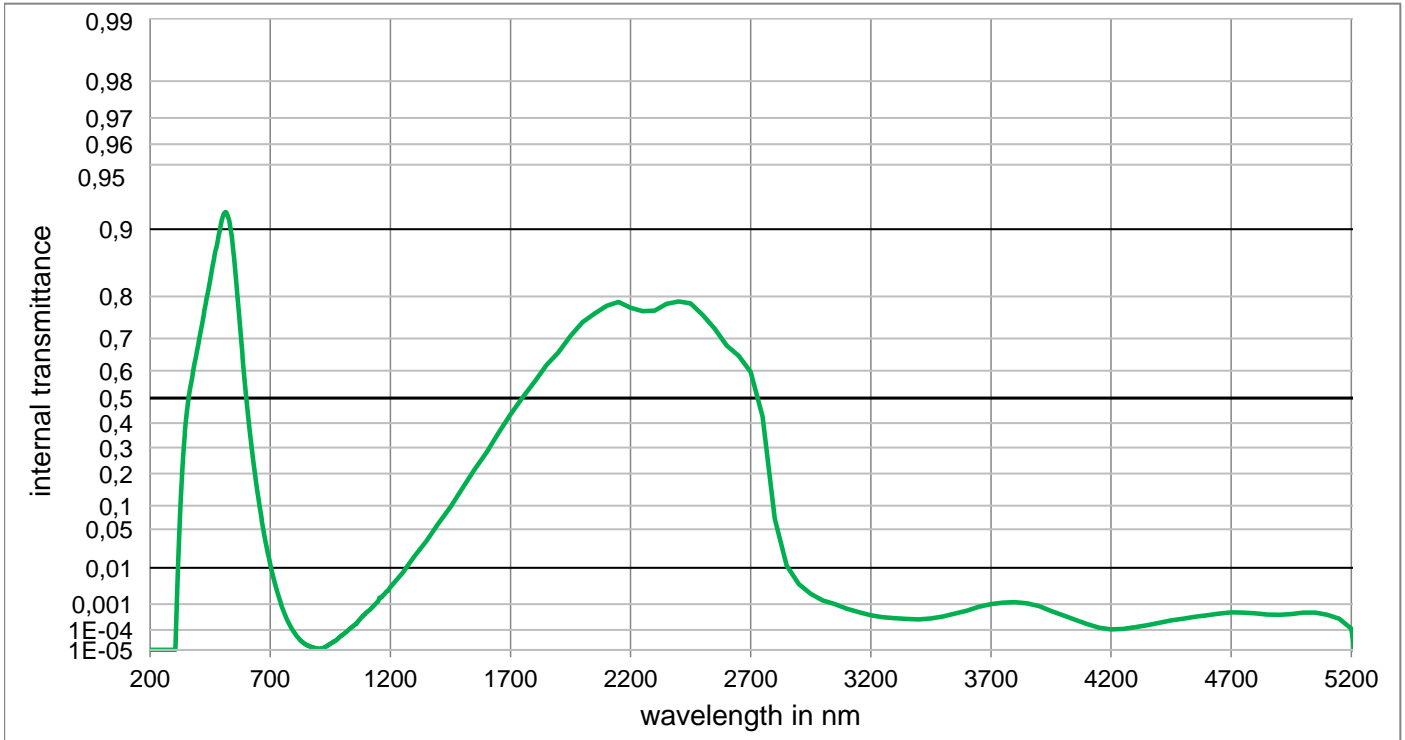
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	7,670E-01	800	2,994E-03	1100	4,400E-02	2200	8,025E-01	3700	4,437E-01
210	< 1,000E-05	510	7,300E-01	810	2,991E-03	1110	4,807E-02	2250	8,157E-01	3750	4,531E-01
220	< 1,000E-05	520	6,790E-01	820	3,000E-03	1120	5,220E-02	2300	8,274E-01	3800	4,648E-01
230	< 1,000E-05	530	6,110E-01	830	3,035E-03	1130	5,630E-02	2350	8,386E-01	3850	4,779E-01
240	< 1,000E-05	540	5,350E-01	840	3,117E-03	1140	6,164E-02	2400	8,493E-01	3900	4,903E-01
250	< 1,000E-05	550	4,500E-01	850	3,240E-03	1150	6,717E-02	2450	8,600E-01	3950	5,013E-01
260	< 1,000E-05	560	3,690E-01	860	3,370E-03	1160	7,262E-02	2500	8,704E-01	4000	5,034E-01
270	< 1,000E-05	570	2,950E-01	870	3,515E-03	1170	7,810E-02	2550	8,805E-01	4050	4,947E-01
280	< 1,000E-05	580	2,290E-01	880	3,723E-03	1180	8,353E-02	2600	8,866E-01	4100	4,778E-01
290	< 1,000E-05	590	1,740E-01	890	4,074E-03	1190	8,971E-02	2650	8,869E-01	4150	4,560E-01
300	< 1,000E-05	600	1,310E-01	900	4,627E-03	1200	9,577E-02	2700	8,749E-01	4200	4,300E-01
310	< 1,000E-05	610	9,600E-02	910	5,299E-03	1250	1,317E-01	2750	7,671E-01	4250	3,997E-01
320	4,675E-04	620	7,000E-02	920	5,997E-03	1300	1,713E-01	2800	6,908E-01	4300	3,656E-01
330	1,289E-02	630	5,100E-02	930	6,812E-03	1350	2,151E-01	2850	6,751E-01	4350	3,263E-01
340	6,592E-02	640	3,700E-02	940	7,737E-03	1400	2,635E-01	2900	6,716E-01	4400	2,809E-01
350	1,600E-01	650	2,700E-02	950	8,668E-03	1450	3,140E-01	2950	6,698E-01	4450	2,297E-01
360	2,600E-01	660	2,070E-02	960	9,771E-03	1500	3,629E-01	3000	6,536E-01	4500	1,774E-01
370	3,490E-01	670	1,500E-02	970	1,100E-02	1550	4,125E-01	3050	6,281E-01	4550	1,280E-01
380	4,350E-01	680	1,103E-02	980	1,244E-02	1600	4,621E-01	3100	6,016E-01	4600	9,050E-02
390	5,040E-01	690	8,610E-03	990	1,407E-02	1650	5,077E-01	3150	5,741E-01	4650	6,410E-02
400	5,610E-01	700	6,910E-03	1000	1,593E-02	1700	5,497E-01	3200	5,456E-01	4700	4,610E-02
410	6,140E-01	710	5,620E-03	1010	1,784E-02	1750	5,885E-01	3250	5,170E-01	4750	3,580E-02
420	6,570E-01	720	4,710E-03	1020	1,981E-02	1800	6,238E-01	3300	4,930E-01	4800	3,122E-02
430	6,950E-01	730	3,974E-03	1030	2,181E-02	1850	6,562E-01	3350	4,715E-01	4850	2,870E-02
440	7,280E-01	740	3,550E-03	1040	2,396E-02	1900	6,854E-01	3400	4,512E-01	4900	2,660E-02
450	7,540E-01	750	3,317E-03	1050	2,634E-02	1950	7,124E-01	3450	4,376E-01	4950	2,000E-02
460	7,755E-01	760	3,182E-03	1060	2,928E-02	2000	7,365E-01	3500	4,328E-01	5000	1,250E-02
470	7,881E-01	770	3,080E-03	1070	3,273E-02	2050	7,569E-01	3550	4,316E-01	5050	6,300E-03
480	7,936E-01	780	3,032E-03	1080	3,649E-02	2100	7,736E-01	3600	4,338E-01	5100	2,760E-03
490	7,880E-01	790	3,009E-03	1090	4,051E-02	2150	7,893E-01	3650	4,378E-01	5150	1,210E-03

BG18

Optical properties		Mechanical properties		Colorimetric properties				
Reflection factor		Reference thickness		1 mm		2 mm	3 mm	
$P_d = 0,915$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,255	0,225	0,206
Spectral values guaranteed		Density			y	0,335	0,340	0,346
$\tau_i (350 \text{ nm}) \geq 0,3$	$\rho = 2,68 \text{ g/cm}^3$		Y		67,6	54,2	45,1	
$\tau_i (405 \text{ nm}) \geq 0,65$	Knoop hardness		λ_d		493 nm	493 nm	493 nm	
$\tau_i (514 \text{ nm}) \geq 0,88$	$HK[0.1/20] = 462$		P_e		0,205	0,312	0,376	
$\tau_i (633 \text{ nm}) \leq 0,25$	Thermal properties		Illuminant A	x	0,361	0,309	0,275	
$\tau_i (694 \text{ nm}) \leq 0,03$	Transformation temperature			y	0,441	0,459	0,472	
$\tau_i (1060 \text{ nm}) \leq 0,0005$	$T_g = 457 \text{ }^\circ\text{C}$			Y	60,8	46,0	36,7	
Refractive indices		Thermal expansion in $10^{-6}/\text{K}$		λ_d	502 nm	501 nm	501 nm	
$n_F (486 \text{ nm}) = 1,539$	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,4$			P_e	0,197	0,315	0,392	
$n_e (546 \text{ nm}) = 1,536$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 8,9$		Chemical properties		Notes			
$n_d (587,6 \text{ nm}) = 1,534$	Sellmeier coefficients		Chemical resistance		Ionically colored glass Bandpass filter / Shortpass filter NIR cutoff filter ISO 23364:2021			
valid from 440 nm to 1550 nm		FR class = 0						
B_1	1,2546	SR class = 2						
B_2	0,0793	AR class = 2						
B_3	90,1178	Resistance against humidity						
C_1	1,531E-03 μm^2	Sensitive glass		Disclaimer				
C_2	7,2019E-02 μm^2	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5		All data without tolerances are to be understood to be reference values.				
C_3	8112,428 μm^2	Internal quality						
Bubble class 2								



BG18

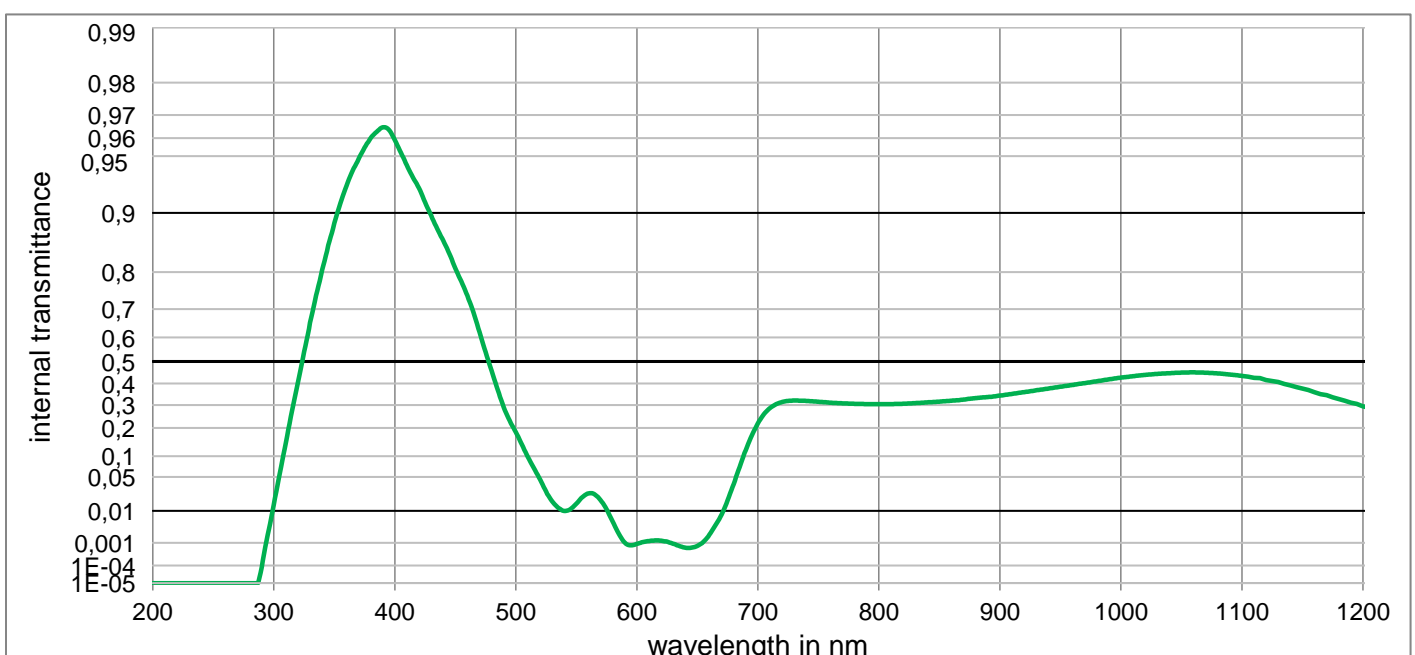


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

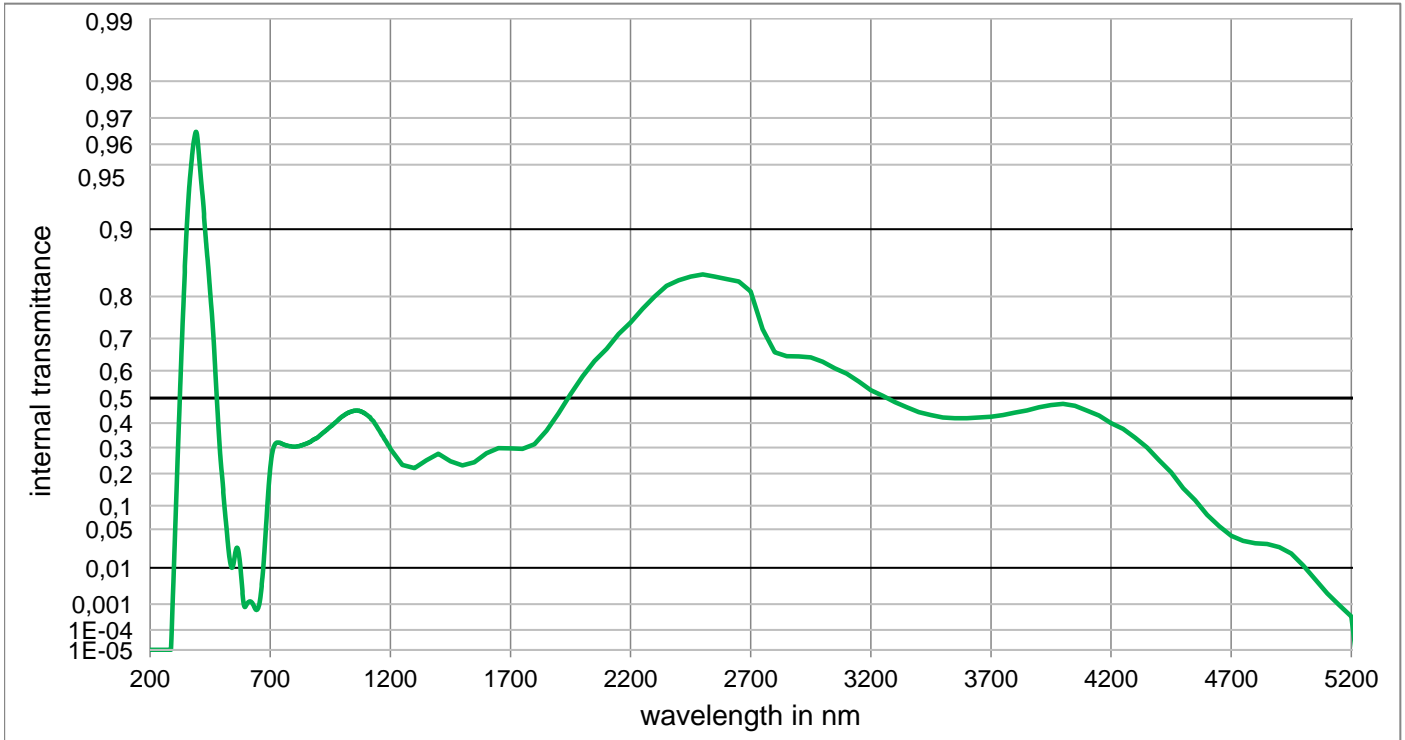
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,109E-01	800	7,603E-05	1100	5,023E-04	2200	7,765E-01	3700	1,000E-03
210	< 1,000E-05	510	9,159E-01	810	5,164E-05	1110	5,957E-04	2250	7,690E-01	3750	1,117E-03
220	< 1,000E-05	520	9,150E-01	820	3,784E-05	1120	7,145E-04	2300	7,700E-01	3800	1,156E-03
230	< 1,000E-05	530	9,081E-01	830	2,904E-05	1130	8,591E-04	2350	7,849E-01	3850	1,072E-03
240	< 1,000E-05	540	8,920E-01	840	2,323E-05	1140	1,056E-03	2400	7,900E-01	3900	8,650E-04
250	< 1,000E-05	550	8,630E-01	850	1,907E-05	1150	1,260E-03	2450	7,858E-01	3950	5,821E-04
260	< 1,000E-05	560	8,190E-01	860	1,661E-05	1160	1,624E-03	2500	7,600E-01	4000	4,000E-04
270	< 1,000E-05	570	7,610E-01	870	1,474E-05	1170	1,940E-03	2550	7,263E-01	4050	2,735E-04
280	< 1,000E-05	580	6,860E-01	880	1,331E-05	1180	2,299E-03	2600	6,800E-01	4100	1,803E-04
290	< 1,000E-05	590	6,000E-01	890	1,245E-05	1190	2,572E-03	2650	6,484E-01	4150	1,256E-04
300	< 1,000E-05	600	5,060E-01	900	1,188E-05	1200	3,303E-03	2700	5,956E-01	4200	1,064E-04
310	5,636E-04	610	4,110E-01	910	1,184E-05	1250	7,500E-03	2750	4,255E-01	4250	1,102E-04
320	3,300E-02	620	3,220E-01	920	1,265E-05	1300	1,760E-02	2800	7,000E-02	4300	1,327E-04
330	1,560E-01	630	2,420E-01	930	1,465E-05	1350	3,270E-02	2850	1,117E-02	4350	1,614E-04
340	3,050E-01	640	1,750E-01	940	1,771E-05	1400	6,000E-02	2900	4,000E-03	4400	2,000E-04
350	4,160E-01	650	1,220E-01	950	2,149E-05	1450	9,630E-02	2950	2,113E-03	4450	2,553E-04
360	4,970E-01	660	8,200E-02	960	2,560E-05	1500	1,500E-01	3000	1,318E-03	4500	2,972E-04
370	5,520E-01	670	5,300E-02	970	3,000E-05	1550	2,136E-01	3050	1,000E-03	4550	3,508E-04
380	6,030E-01	680	3,300E-02	980	3,747E-05	1600	2,800E-01	3100	7,000E-04	4600	4,000E-04
390	6,430E-01	690	1,992E-02	990	4,756E-05	1650	3,594E-01	3150	5,248E-04	4650	4,667E-04
400	6,820E-01	700	1,200E-02	1000	5,807E-05	1700	4,356E-01	3200	4,000E-04	4700	5,140E-04
410	7,190E-01	710	6,990E-03	1010	7,070E-05	1750	5,018E-01	3250	3,412E-04	4750	5,000E-04
420	7,510E-01	720	4,000E-03	1020	8,810E-05	1800	5,600E-01	3300	3,097E-04	4800	4,699E-04
430	7,800E-01	730	2,294E-03	1030	1,098E-04	1850	6,191E-01	3350	2,871E-04	4850	4,266E-04
440	8,060E-01	740	1,333E-03	1040	1,337E-04	1900	6,600E-01	3400	2,793E-04	4900	4,169E-04
450	8,300E-01	750	7,750E-04	1050	1,622E-04	1950	7,070E-01	3450	3,034E-04	4950	4,477E-04
460	8,530E-01	760	4,570E-04	1060	2,000E-04	2000	7,430E-01	3500	3,606E-04	5000	5,000E-04
470	8,720E-01	770	2,754E-04	1070	2,573E-04	2050	7,631E-01	3550	4,634E-04	5050	5,000E-04
480	8,850E-01	780	1,734E-04	1080	3,317E-04	2100	7,807E-01	3600	6,000E-04	5100	4,198E-04
490	8,991E-01	790	1,109E-04	1090	4,133E-04	2150	7,891E-01	3650	8,185E-04	5150	2,931E-04

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Optical properties		Mechanical properties		Colorimetric properties					
Reflection factor		Reference thickness		1 mm		2 mm		3 mm	
$P_d = 0,920$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,150	0,153	0,157	
Spectral values guaranteed		Density			y	0,055	0,027	0,021	
$\tau_i (334 \text{ nm}) \leq 0,8$	$\rho = 2,56 \text{ g/cm}^3$		Y		5,0	1,8	1,1		
$\tau_i (405 \text{ nm}) \geq 0,93$	Knoop hardness		λ_d		463 nm	455 nm	451 nm		
$\tau_i (488 \text{ nm}) \leq 0,39$	$HK[0.1/20] = 434$		P_e		0,934	0,985	0,993		
$\tau_i (725 \text{ nm}) \leq 0,36$	Thermal properties		Illuminant A		x	0,155	0,151	0,155	
Refractive indices		Transformation temperature		y	0,093	0,035	0,024		
$n_F (486 \text{ nm}) = 1,518$	$T_g = 459 \text{ }^\circ\text{C}$		λ_d		2,6	0,7	0,4		
$n_e (546 \text{ nm}) = 1,514$	Thermal expansion in $10^{-6}/\text{K}$		P_e		470 nm	459 nm	454 nm		
$n_d (587,6 \text{ nm}) = 1,512$	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 8,9$		Illuminant A		0,903	0,981	0,992		
Sellmeier coefficients		$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 10,2$		Notes					
valid from 400 nm to 1550 nm		Chemical properties		UV					
$B_1 = 0,8738$	Chemical resistance		Transmission changes are possible under the action of intense ultraviolet radiation.						
$B_2 = 0,3772$	FR class = 0		Ionically colored glass						
$B_3 = 1,1188$	SR class = 1		Bandpass filter / Shortpass filter						
$C_1 = 9,601\text{E-}03 \text{ } \mu\text{m}^2$	AR class = 1		ISO 23364:2021						
$C_2 = 1,1147\text{E-}02 \text{ } \mu\text{m}^2$	Resistance against humidity		Disclaimer						
$C_3 = 145,493 \text{ } \mu\text{m}^2$	Robust glass		All data without tolerances are to be understood to be reference values.						
Internal quality		see pocket catalogue "Optical Filter Glass 2024", chapter 5.5							
Bubble class	1								



BG25



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	1,830E-01	800	3,037E-01	1100	4,350E-01	2200	7,421E-01	3700	4,262E-01
210	< 1,000E-05	510	9,700E-02	810	3,043E-01	1110	4,263E-01	2250	7,743E-01	3750	4,322E-01
220	< 1,000E-05	520	4,500E-02	820	3,060E-01	1120	4,160E-01	2300	8,000E-01	3800	4,424E-01
230	< 1,000E-05	530	1,700E-02	830	3,089E-01	1130	4,069E-01	2350	8,200E-01	3850	4,517E-01
240	< 1,000E-05	540	1,000E-02	840	3,122E-01	1140	3,915E-01	2400	8,300E-01	3900	4,636E-01
250	< 1,000E-05	550	1,500E-02	850	3,157E-01	1150	3,759E-01	2450	8,363E-01	3950	4,721E-01
260	< 1,000E-05	560	2,499E-02	860	3,200E-01	1160	3,598E-01	2500	8,400E-01	4000	4,772E-01
270	< 1,000E-05	570	1,800E-02	870	3,250E-01	1170	3,452E-01	2550	8,363E-01	4050	4,700E-01
280	< 1,000E-05	580	5,153E-03	880	3,320E-01	1180	3,280E-01	2600	8,321E-01	4100	4,500E-01
290	8,492E-05	590	1,014E-03	890	3,368E-01	1190	3,108E-01	2650	8,278E-01	4150	4,305E-01
300	1,400E-02	600	9,099E-04	900	3,438E-01	1200	2,943E-01	2700	8,100E-01	4200	4,000E-01
310	1,439E-01	610	1,170E-03	910	3,517E-01	1250	2,318E-01	2750	7,251E-01	4250	3,761E-01
320	4,080E-01	620	1,212E-03	920	3,598E-01	1300	2,200E-01	2800	6,600E-01	4300	3,400E-01
330	6,550E-01	630	9,256E-04	930	3,683E-01	1350	2,496E-01	2850	6,478E-01	4350	3,006E-01
340	8,050E-01	640	6,433E-04	940	3,764E-01	1400	2,751E-01	2900	6,470E-01	4400	2,500E-01
350	8,870E-01	650	7,603E-04	950	3,850E-01	1450	2,462E-01	2950	6,436E-01	4450	2,046E-01
360	9,280E-01	660	1,998E-03	960	3,932E-01	1500	2,300E-01	3000	6,300E-01	4500	1,500E-01
370	9,480E-01	670	7,995E-03	970	4,017E-01	1550	2,420E-01	3050	6,079E-01	4550	1,146E-01
380	9,600E-01	680	3,800E-02	980	4,106E-01	1600	2,768E-01	3100	5,900E-01	4600	7,834E-02
390	9,650E-01	690	1,180E-01	990	4,192E-01	1650	2,980E-01	3150	5,621E-01	4650	5,508E-02
400	9,590E-01	700	2,190E-01	1000	4,270E-01	1700	2,963E-01	3200	5,300E-01	4700	4,000E-02
410	9,440E-01	710	2,860E-01	1010	4,338E-01	1750	2,946E-01	3250	5,086E-01	4750	3,296E-02
420	9,260E-01	720	3,140E-01	1020	4,398E-01	1800	3,133E-01	3300	4,840E-01	4800	3,000E-02
430	8,970E-01	730	3,205E-01	1030	4,442E-01	1850	3,693E-01	3350	4,636E-01	4850	2,924E-02
440	8,610E-01	740	3,190E-01	1040	4,475E-01	1900	4,400E-01	3400	4,449E-01	4900	2,576E-02
450	8,090E-01	750	3,150E-01	1050	4,501E-01	1950	5,145E-01	3450	4,330E-01	4950	1,968E-02
460	7,400E-01	760	3,109E-01	1060	4,513E-01	2000	5,800E-01	3500	4,228E-01	5000	1,132E-02
470	6,200E-01	770	3,079E-01	1070	4,498E-01	2050	6,325E-01	3550	4,200E-01	5050	5,236E-03
480	4,570E-01	780	3,057E-01	1080	4,465E-01	2100	6,700E-01	3600	4,200E-01	5100	2,178E-03
490	2,910E-01	790	3,043E-01	1090	4,416E-01	2150	7,124E-01	3650	4,228E-01	5150	9,397E-04

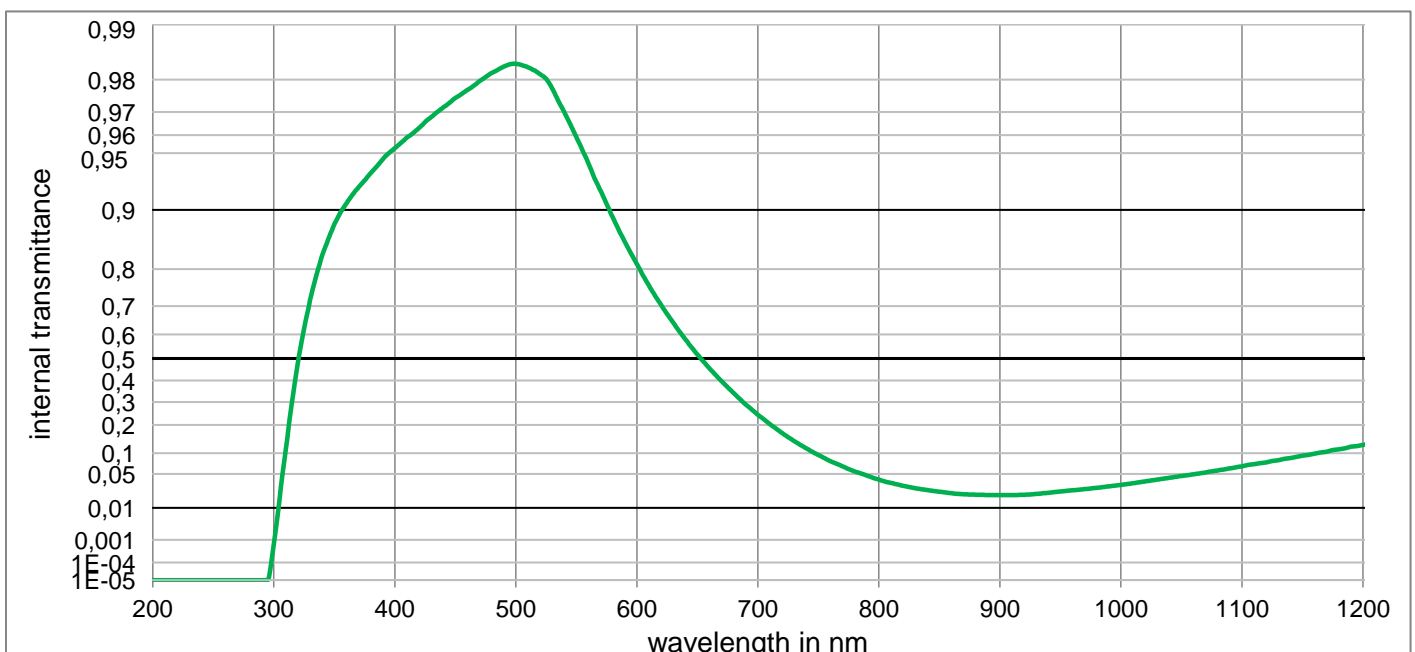
BG38

Optical properties	
Reflection factor	
$P_d = 0,916$	
Spectral values guaranteed	
τ_i (350 nm)	$\geq 0,8$
τ_i (405 nm)	$\geq 0,93$
τ_i (514 nm)	$\geq 0,95$
τ_i (633 nm)	$\leq 0,67$
τ_i (694 nm)	$\leq 0,32$
τ_i (1060 nm)	$\leq 0,06$
Refractive indices	
n_F (486 nm)	$= 1,533$
n_e (546 nm)	$= 1,529$
n_d (587,6 nm)	$= 1,527$
Sellmeier coefficients	
valid from 440 nm to 1550 nm	
B_1	0,3382
B_2	0,9643
B_3	1,7959
C_1	3,475E-03 μm^2
C_2	1,0319E-02 μm^2
C_3	190,755 μm^2
Internal quality	
Bubble class	2

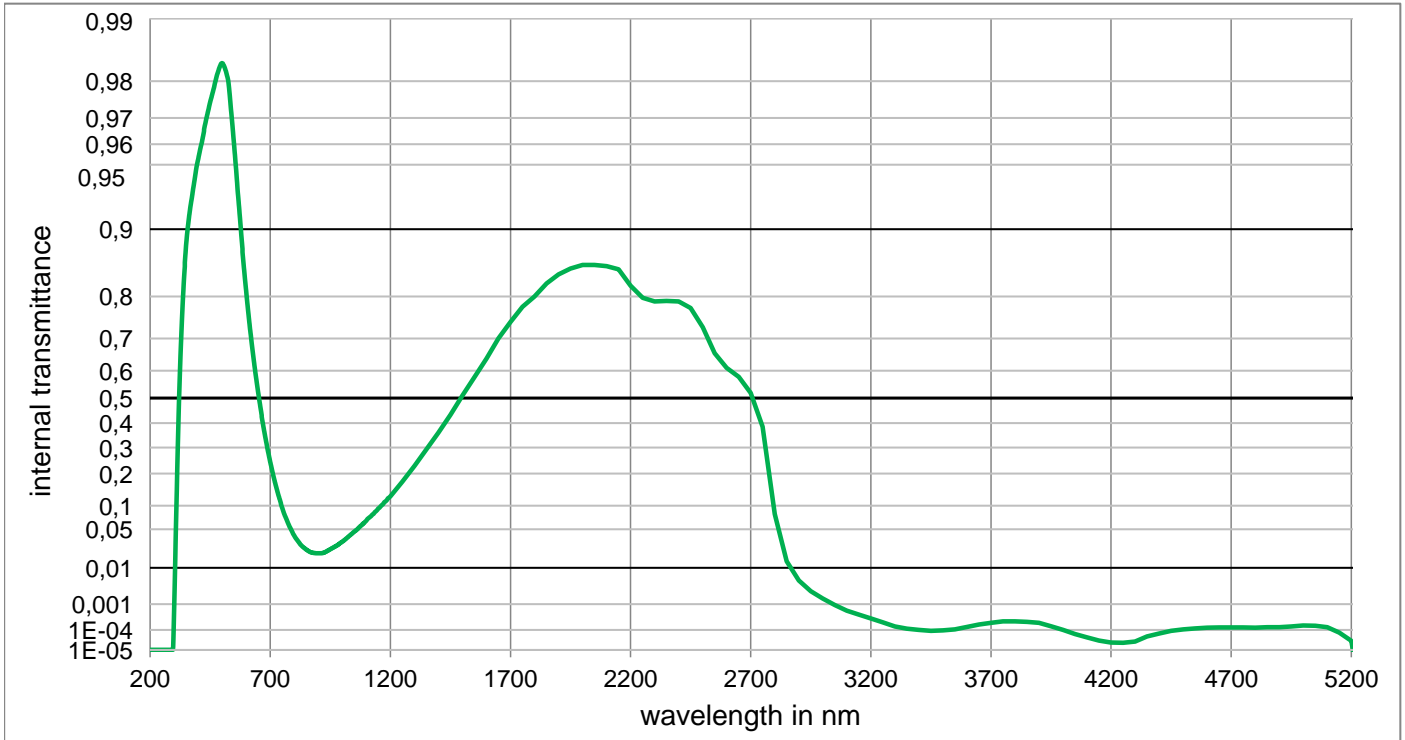
Mechanical properties	
Reference thickness	
$d = 1,00 \text{ mm}$	
Density	
$\rho = 2,66 \text{ g/cm}^3$	
Knoop hardness	
HK[0.1/20] = 472	
Thermal properties	
Transformation temperature	
$T_g = 482 \text{ }^\circ\text{C}$	
Thermal expansion in $10^{-6}/\text{K}$	
α (-30 $^\circ\text{C}/+70^\circ\text{C}$)	$= 7,5$
α (20 $^\circ\text{C}/300^\circ\text{C}$)	$= 8,9$
Chemical properties	
Chemical resistance	
FR class	$= 0$
SR class	$= 2$
AR class	$= 2$
Resistance against humidity	
Sensitive glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colormetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,288	0,268	0,253
	y	0,328	0,326	0,323
	Y	83,2	76,4	70,8
	λ_d	491 nm	491 nm	490 nm
	P_e	0,092	0,164	0,223
Illuminant A	x	0,413	0,384	0,360
	y	0,419	0,427	0,433
	Y	79,7	70,7	63,7
	λ_d	501 nm	500 nm	500 nm
P_e	0,078	0,144	0,200	

Notes	
Ionically colored glass	
Bandpass filter / Shortpass filter	
NIR cutoff filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



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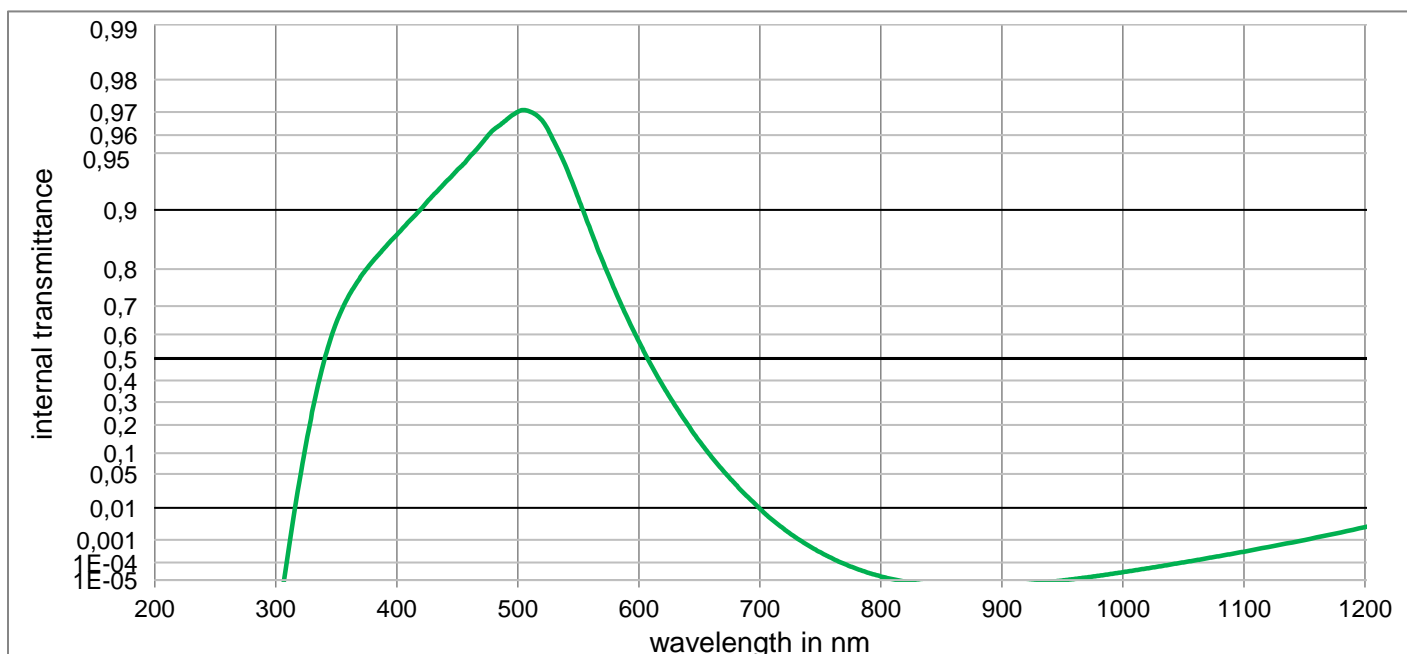


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

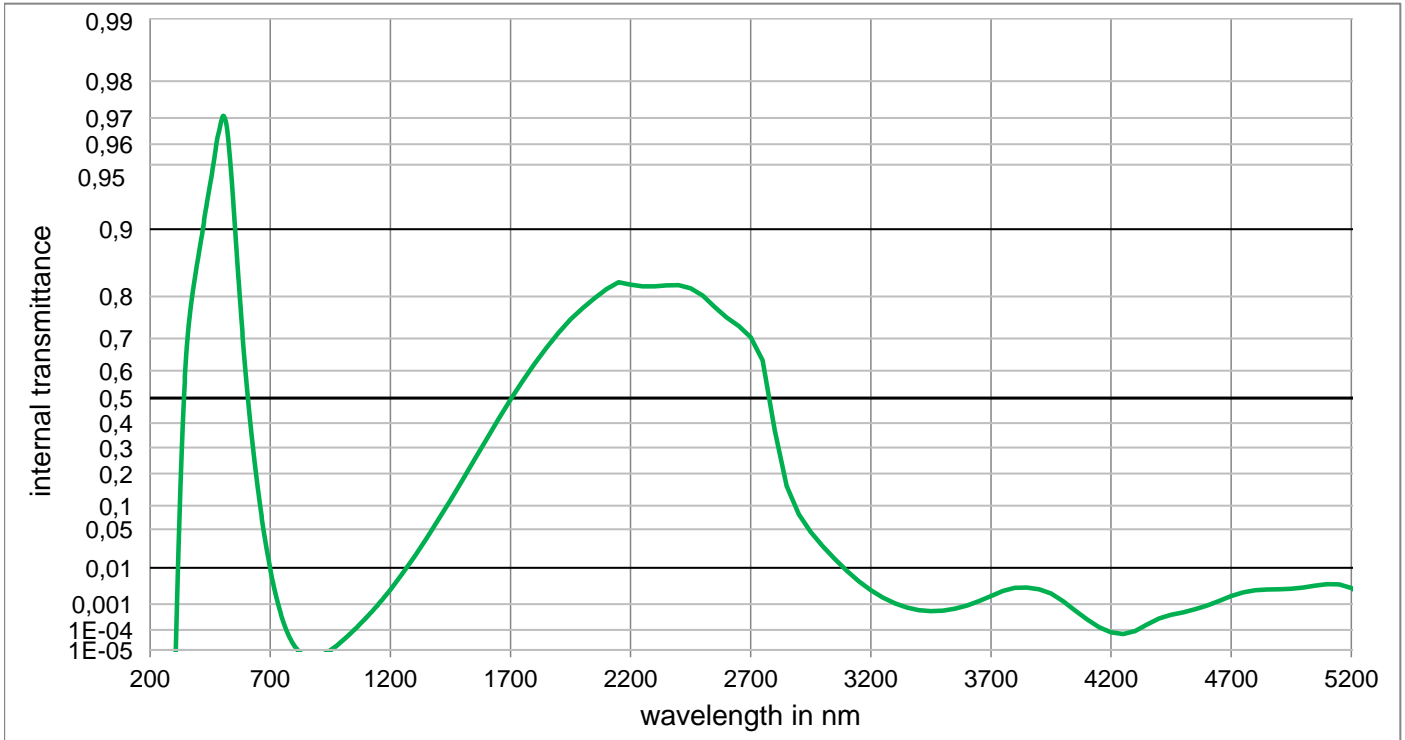
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,836E-01	800	4,002E-02	1100	6,593E-02	2200	8,208E-01	3700	2,000E-04
210	< 1,000E-05	510	9,829E-01	810	3,491E-02	1110	7,111E-02	2250	7,973E-01	3750	2,296E-04
220	< 1,000E-05	520	9,813E-01	820	3,080E-02	1120	7,524E-02	2300	7,897E-01	3800	2,317E-04
230	< 1,000E-05	530	9,777E-01	830	2,761E-02	1130	8,054E-02	2350	7,907E-01	3850	2,193E-04
240	< 1,000E-05	540	9,700E-01	840	2,539E-02	1140	8,631E-02	2400	7,897E-01	3900	2,000E-04
250	< 1,000E-05	550	9,590E-01	850	2,341E-02	1150	9,319E-02	2450	7,756E-01	3950	1,449E-04
260	< 1,000E-05	560	9,430E-01	860	2,183E-02	1160	9,869E-02	2500	7,300E-01	4000	1,000E-04
270	< 1,000E-05	570	9,210E-01	870	2,077E-02	1170	1,044E-01	2550	6,569E-01	4050	6,471E-05
280	< 1,000E-05	580	8,910E-01	880	2,026E-02	1180	1,113E-01	2600	6,100E-01	4100	4,436E-05
290	< 1,000E-05	590	8,540E-01	890	2,000E-02	1190	1,198E-01	2650	5,786E-01	4150	3,090E-05
300	6,457E-04	600	8,110E-01	900	1,991E-02	1200	1,258E-01	2700	5,200E-01	4200	2,500E-05
310	1,140E-01	610	7,600E-01	910	1,996E-02	1250	1,715E-01	2750	3,854E-01	4250	2,410E-05
320	4,870E-01	620	7,040E-01	920	2,020E-02	1300	2,281E-01	2800	8,000E-02	4300	2,818E-05
330	7,180E-01	630	6,440E-01	930	2,103E-02	1350	2,931E-01	2850	1,384E-02	4350	5,047E-05
340	8,290E-01	640	5,810E-01	940	2,227E-02	1400	3,600E-01	2900	5,000E-03	4400	6,776E-05
350	8,813E-01	650	5,180E-01	950	2,371E-02	1450	4,335E-01	2950	2,547E-03	4450	9,036E-05
360	9,077E-01	660	4,560E-01	960	2,505E-02	1500	5,100E-01	3000	1,531E-03	4500	1,047E-04
370	9,239E-01	670	3,970E-01	970	2,650E-02	1550	5,768E-01	3050	9,290E-04	4550	1,169E-04
380	9,359E-01	680	3,410E-01	980	2,805E-02	1600	6,400E-01	3100	6,000E-04	4600	1,247E-04
390	9,460E-01	690	2,890E-01	990	3,000E-02	1650	7,000E-01	3150	4,236E-04	4650	1,294E-04
400	9,530E-01	700	2,430E-01	1000	3,196E-02	1700	7,436E-01	3200	3,000E-04	4700	1,294E-04
410	9,587E-01	710	2,030E-01	1010	3,434E-02	1750	7,784E-01	3250	2,133E-04	4750	1,282E-04
420	9,634E-01	720	1,680E-01	1020	3,707E-02	1800	8,000E-01	3300	1,422E-04	4800	1,259E-04
430	9,680E-01	730	1,390E-01	1030	4,006E-02	1850	8,246E-01	3350	1,138E-04	4850	1,330E-04
440	9,717E-01	740	1,150E-01	1040	4,300E-02	1900	8,400E-01	3400	1,000E-04	4900	1,330E-04
450	9,748E-01	750	9,500E-02	1050	4,610E-02	1950	8,491E-01	3450	9,120E-05	4950	1,409E-04
460	9,772E-01	760	7,800E-02	1060	4,929E-02	2000	8,548E-01	3500	9,550E-05	5000	1,560E-04
470	9,796E-01	770	6,600E-02	1070	5,297E-02	2050	8,548E-01	3550	1,057E-04	5050	1,531E-04
480	9,816E-01	780	5,500E-02	1080	5,700E-02	2100	8,529E-01	3600	1,358E-04	5100	1,318E-04
490	9,830E-01	790	4,700E-02	1090	6,123E-02	2150	8,482E-01	3650	1,694E-04	5150	7,516E-05

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Optical properties		Mechanical properties		Colorimetric properties					
Reflection factor		Reference thickness		1 mm		2 mm		3 mm	
$P_d = 0,914$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,257	0,226	0,207	
Spectral values guaranteed		Density			y	0,326	0,322	0,318	
τ_i (350 nm)	$\geq 0,6$	$\rho = 2,74 \text{ g/cm}^3$			Y	72,8	62,3	55,1	
τ_i (405 nm)	$\geq 0,85$	Knoop hardness			λ_d	491 nm	490 nm	490 nm	
τ_i (514 nm)	$\geq 0,93$	$HK[0.1/20] = 386$			P_e	0,207	0,321	0,395	
τ_i (633 nm)	$\leq 0,3$	Thermal properties		Illuminant A	x	0,365	0,314	0,279	
τ_i (694 nm)	$\leq 0,03$	Transformation temperature			y	0,434	0,445	0,450	
τ_i (1060 nm)	$\leq 0,001$	$T_g = 322 \text{ }^\circ\text{C}$			Y	65,9	53,3	45,2	
Refractive indices		Thermal expansion in $10^{-6}/\text{K}$			λ_d	500 nm	500 nm	499 nm	
n_F (486 nm)	$= 1,542$	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 11,6$			P_e	0,188	0,305	0,385	
n_e (546 nm)	$= 1,538$	$\alpha_{(20^\circ\text{C}/200^\circ\text{C})} = 13,1$		Notes					
n_d (587,6 nm)	$= 1,536$	Chemical properties		Ionically colored glass					
Sellmeier coefficients		Chemical resistance		Bandpass filter / Shortpass filter					
valid from 440 nm to 1550 nm		FR class = 0		NIR cutoff filter					
B_1	0,4382	SR class = 5.1		ISO 23364:2021					
B_2	0,8900	AR class = 3		Disclaimer					
B_3	7,4825	Resistance against humidity		All data without tolerances are to be understood to be reference values.					
C_1	2,508E-02 μm^2	Delicate glass							
C_2	1,2201E-04 μm^2	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5							
C_3	973,996 μm^2								
Internal quality									
Bubble class 2									



BG39

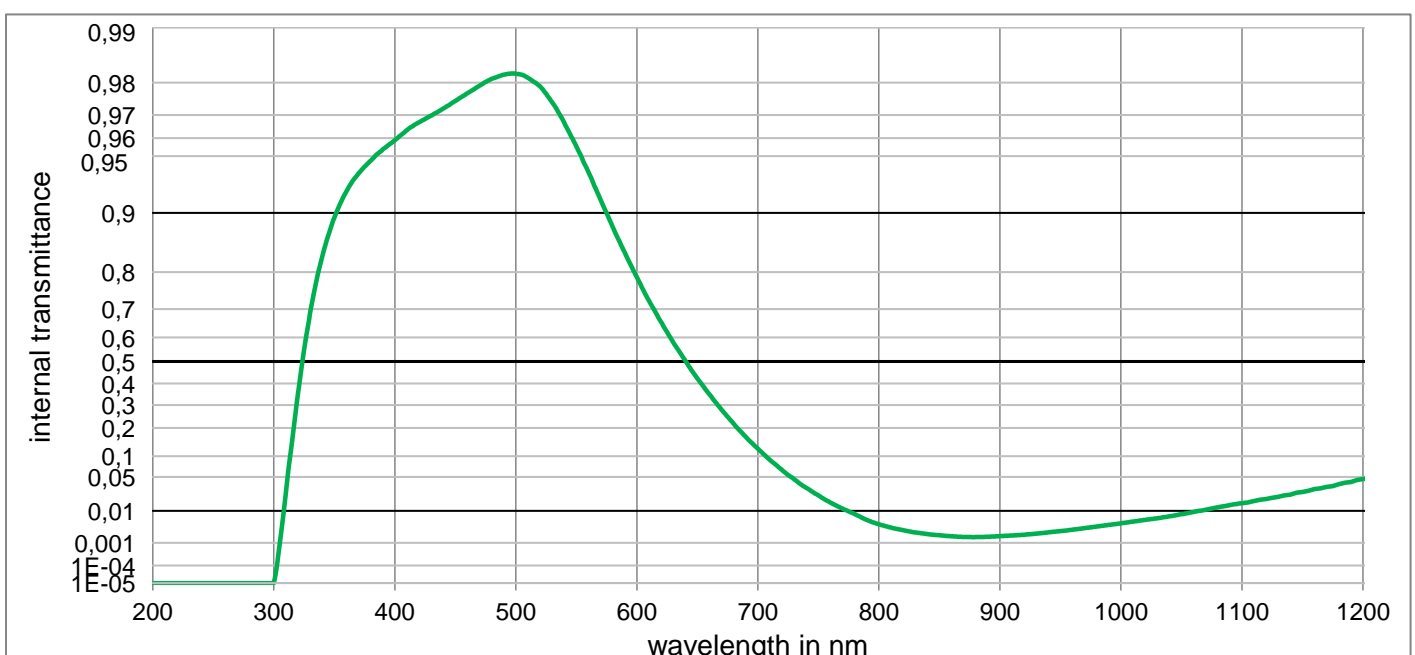


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

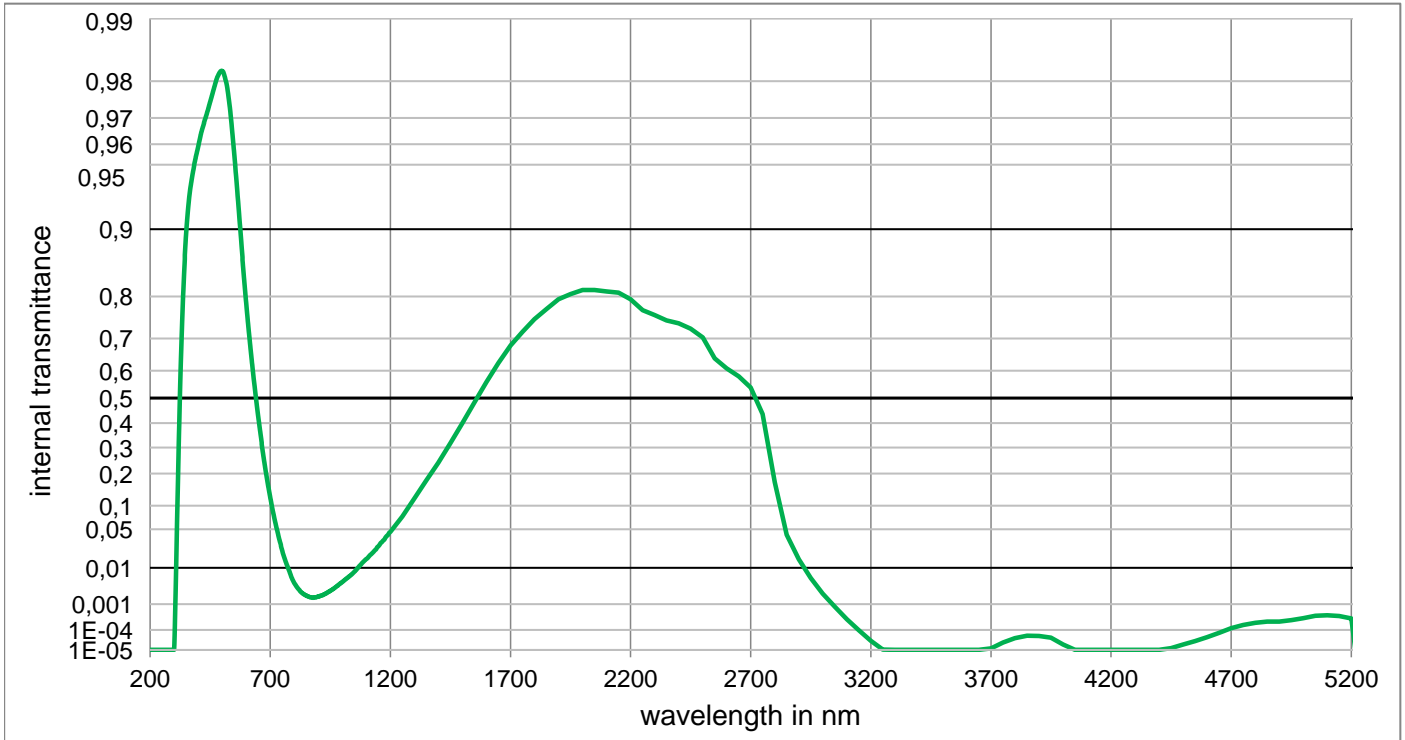
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,701E-01	800	1,679E-05	1100	3,264E-04	2200	8,223E-01	3700	1,829E-03
210	< 1,000E-05	510	9,702E-01	810	1,129E-05	1110	4,120E-04	2250	8,194E-01	3750	2,580E-03
220	< 1,000E-05	520	9,667E-01	820	< 1,000E-05	1120	5,116E-04	2300	8,195E-01	3800	3,154E-03
230	< 1,000E-05	530	9,566E-01	830	< 1,000E-05	1130	6,423E-04	2350	8,210E-01	3850	3,205E-03
240	< 1,000E-05	540	9,404E-01	840	< 1,000E-05	1140	7,952E-04	2400	8,214E-01	3900	2,858E-03
250	< 1,000E-05	550	9,132E-01	850	< 1,000E-05	1150	9,899E-04	2450	8,158E-01	3950	2,168E-03
260	< 1,000E-05	560	8,728E-01	860	< 1,000E-05	1160	1,222E-03	2500	8,015E-01	4000	1,246E-03
270	< 1,000E-05	570	8,184E-01	870	< 1,000E-05	1170	1,508E-03	2550	7,779E-01	4050	6,041E-04
280	< 1,000E-05	580	7,488E-01	880	< 1,000E-05	1180	1,853E-03	2600	7,542E-01	4100	2,775E-04
290	< 1,000E-05	590	6,653E-01	890	< 1,000E-05	1190	2,274E-03	2650	7,335E-01	4150	1,304E-04
300	< 1,000E-05	600	5,718E-01	900	< 1,000E-05	1200	2,781E-03	2700	7,036E-01	4200	7,747E-05
310	2,473E-04	610	4,724E-01	910	< 1,000E-05	1250	7,276E-03	2750	6,343E-01	4250	6,541E-05
320	4,316E-02	620	3,743E-01	920	< 1,000E-05	1300	1,708E-02	2800	3,706E-01	4300	8,895E-05
330	2,547E-01	630	2,834E-01	930	< 1,000E-05	1350	3,605E-02	2850	1,569E-01	4350	1,733E-04
340	4,905E-01	640	2,037E-01	940	< 1,000E-05	1400	6,784E-02	2900	7,906E-02	4400	3,052E-04
350	6,442E-01	650	1,392E-01	950	< 1,000E-05	1450	1,147E-01	2950	4,535E-02	4450	4,169E-04
360	7,297E-01	660	8,981E-02	960	1,176E-05	1500	1,765E-01	3000	2,671E-02	4500	5,160E-04
370	7,811E-01	670	5,537E-02	970	1,474E-05	1550	2,513E-01	3050	1,536E-02	4550	6,651E-04
380	8,163E-01	680	3,258E-02	980	1,859E-05	1600	3,332E-01	3100	8,588E-03	4600	9,006E-04
390	8,436E-01	690	1,825E-02	990	2,366E-05	1650	4,155E-01	3150	4,772E-03	4650	1,277E-03
400	8,658E-01	700	9,545E-03	1000	3,013E-05	1700	4,949E-01	3200	2,711E-03	4700	1,805E-03
410	8,849E-01	710	4,770E-03	1010	3,852E-05	1750	5,633E-01	3250	1,632E-03	4750	2,353E-03
420	9,011E-01	720	2,404E-03	1020	4,902E-05	1800	6,229E-01	3300	1,062E-03	4800	2,719E-03
430	9,162E-01	730	1,205E-03	1030	6,271E-05	1850	6,739E-01	3350	7,617E-04	4850	2,853E-03
440	9,283E-01	740	6,007E-04	1040	7,974E-05	1900	7,158E-01	3400	6,129E-04	4900	2,887E-03
450	9,384E-01	750	3,062E-04	1050	1,018E-04	1950	7,492E-01	3450	5,650E-04	4950	2,973E-03
460	9,475E-01	760	1,568E-04	1060	1,287E-04	2000	7,754E-01	3500	5,886E-04	5000	3,218E-03
470	9,556E-01	770	8,431E-05	1070	1,640E-04	2050	7,963E-01	3550	6,906E-04	5050	3,616E-03
480	9,626E-01	780	4,649E-05	1080	2,067E-04	2100	8,145E-01	3600	8,896E-04	5100	3,971E-03
490	9,666E-01	790	2,707E-05	1090	2,611E-04	2150	8,268E-01	3650	1,246E-03	5150	3,909E-03

BG40

Optical properties		Mechanical properties		Colorimetric properties				
Reflection factor		Reference thickness		1 mm		2 mm	3 mm	
$P_d = 0,916$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,283	0,262	0,246
Spectral values guaranteed		Density			y	0,327	0,324	0,321
τ_i (350 nm)	$\geq 0,8$	$\rho = 2,74 \text{ g/cm}^3$			Y	82,1	74,8	69,0
τ_i (405 nm)	$\geq 0,93$	Knoop hardness			λ_d	491 nm	490 nm	490 nm
τ_i (514 nm)	$\geq 0,97$	$HK[0.1/20] = 383$			P_e	0,108	0,188	0,250
τ_i (633 nm)	$\leq 0,57$	Thermal properties		Illuminant A	x	0,406	0,374	0,348
τ_i (694 nm)	$\leq 0,16$	Transformation temperature			y	0,421	0,430	0,436
τ_i (1060 nm)	$\leq 0,02$	$T_g = 313 \text{ }^\circ\text{C}$			Y	78,0	68,4	61,3
Refractive indices		Thermal expansion in			λ_d	501 nm	500 nm	500 nm
n_F (486 nm)	$= 1,536$	$10^{-6}/\text{K}$		P_e	0,094	0,168	0,227	
n_e (546 nm)	$= 1,532$	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 11,9$		Notes				
n_d (587,6 nm)	$= 1,53$	$\alpha_{(20^\circ\text{C}/200^\circ\text{C})} = 13,7$		Ionically colored glass				
Sellmeier coefficients		Chemical properties						
valid from 435 nm to 1550 nm		Chemical resistance		Bandpass filter / Shortpass filter				
B_1	0,9300	FR class = 0		NIR cutoff filter				
B_2	0,3779	SR class = 5.1		ISO 23364:2021				
B_3	1,0478	AR class = 3		Disclaimer				
C_1	8,617E-03 μm^2	Resistance against humidity						
C_2	1,0398E-02 μm^2	Sensitive glass		All data without tolerances are to be understood to be reference values.				
C_3	149,651 μm^2	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5						
Internal quality		Internal quality						
Bubble class 1								



BG40



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,821E-01	800	4,252E-03	1100	1,533E-02	2200	7,945E-01	3700	1,213E-05
210	< 1,000E-05	510	9,812E-01	810	3,366E-03	1110	1,712E-02	2250	7,709E-01	3750	2,518E-05
220	< 1,000E-05	520	9,790E-01	820	2,780E-03	1120	1,901E-02	2300	7,600E-01	3800	4,169E-05
230	< 1,000E-05	530	9,745E-01	830	2,340E-03	1130	2,123E-02	2350	7,473E-01	3850	5,395E-05
240	< 1,000E-05	540	9,670E-01	840	2,062E-03	1140	2,354E-02	2400	7,400E-01	3900	5,333E-05
250	< 1,000E-05	550	9,556E-01	850	1,880E-03	1150	2,665E-02	2450	7,266E-01	3950	4,335E-05
260	< 1,000E-05	560	9,390E-01	860	1,734E-03	1160	3,051E-02	2500	7,030E-01	4000	2,000E-05
270	< 1,000E-05	570	9,150E-01	870	1,644E-03	1170	3,350E-02	2550	6,408E-01	4050	< 1,000E-05
280	< 1,000E-05	580	8,820E-01	880	1,622E-03	1180	3,747E-02	2600	6,079E-01	4100	< 1,000E-05
290	< 1,000E-05	590	8,400E-01	890	1,670E-03	1190	4,112E-02	2650	5,805E-01	4150	< 1,000E-05
300	< 1,000E-05	600	7,880E-01	900	1,752E-03	1200	4,588E-02	2700	5,400E-01	4200	< 1,000E-05
310	2,600E-02	610	7,260E-01	910	1,850E-03	1250	7,450E-02	2750	4,363E-01	4250	< 1,000E-05
320	3,560E-01	620	6,570E-01	920	1,964E-03	1300	1,200E-01	2800	1,700E-01	4300	< 1,000E-05
330	6,860E-01	630	5,810E-01	930	2,136E-03	1350	1,762E-01	2850	4,150E-02	4350	< 1,000E-05
340	8,320E-01	640	5,030E-01	940	2,360E-03	1400	2,400E-01	2900	1,510E-02	4400	< 1,000E-05
350	8,940E-01	650	4,240E-01	950	2,607E-03	1450	3,185E-01	2950	5,754E-03	4450	1,256E-05
360	9,230E-01	660	3,490E-01	960	2,880E-03	1500	4,000E-01	3000	2,153E-03	4500	2,000E-05
370	9,380E-01	670	2,790E-01	970	3,228E-03	1550	4,825E-01	3050	8,072E-04	4550	2,958E-05
380	9,470E-01	680	2,170E-01	980	3,631E-03	1600	5,600E-01	3100	2,818E-04	4600	4,645E-05
390	9,540E-01	690	1,650E-01	990	4,064E-03	1650	6,258E-01	3150	9,840E-05	4650	7,362E-05
400	9,590E-01	700	1,230E-01	1000	4,527E-03	1700	6,800E-01	3200	3,000E-05	4700	1,197E-04
410	9,638E-01	710	8,900E-02	1010	5,091E-03	1750	7,181E-01	3250	1,033E-05	4750	1,618E-04
420	9,671E-01	720	6,400E-02	1020	5,708E-03	1800	7,500E-01	3300	< 1,000E-05	4800	2,000E-04
430	9,698E-01	730	4,570E-02	1030	6,370E-03	1850	7,737E-01	3350	< 1,000E-05	4850	2,286E-04
440	9,723E-01	740	3,200E-02	1040	7,145E-03	1900	7,945E-01	3400	< 1,000E-05	4900	2,286E-04
450	9,748E-01	750	2,267E-02	1050	8,180E-03	1950	8,048E-01	3450	< 1,000E-05	4950	2,600E-04
460	9,771E-01	760	1,580E-02	1060	9,350E-03	2000	8,124E-01	3500	< 1,000E-05	5000	3,126E-04
470	9,792E-01	770	1,138E-02	1070	1,068E-02	2050	8,124E-01	3550	< 1,000E-05	5050	3,802E-04
480	9,809E-01	780	8,250E-03	1080	1,221E-02	2100	8,100E-01	3600	< 1,000E-05	5100	3,981E-04
490	9,819E-01	790	5,710E-03	1090	1,384E-02	2150	8,076E-01	3650	< 1,000E-05	5150	3,758E-04

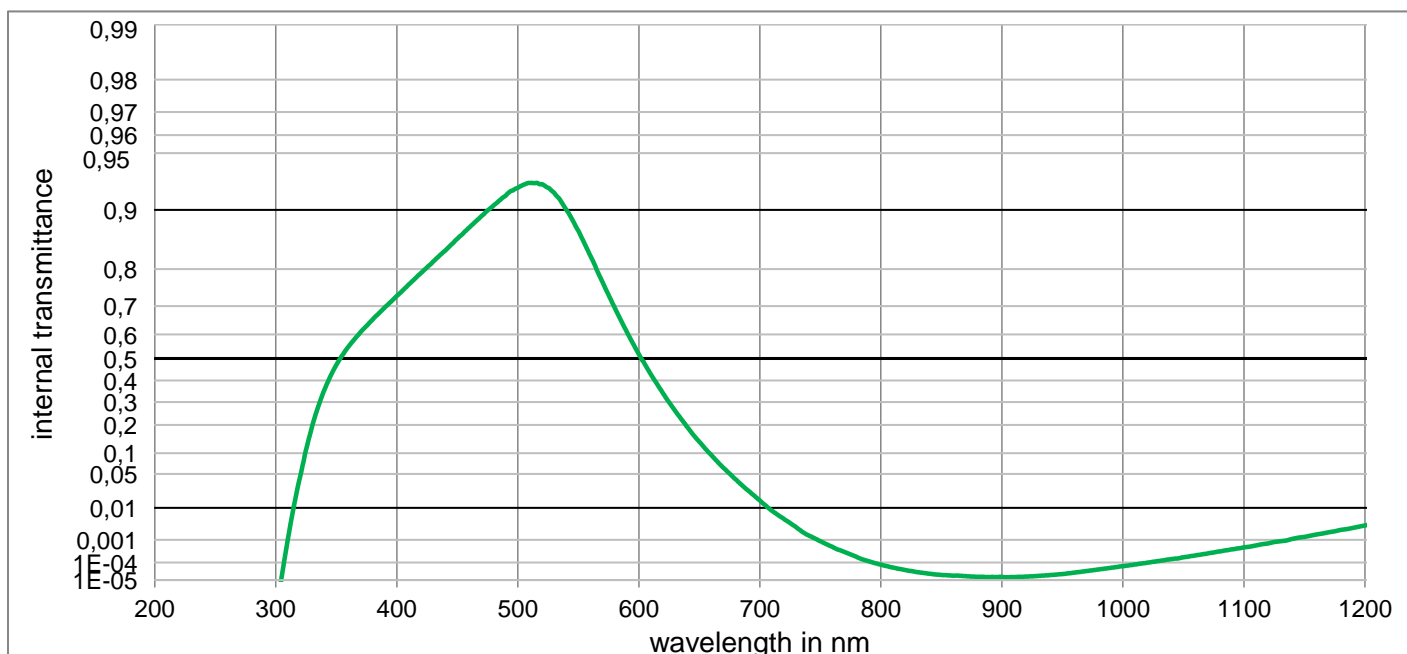
BG42

Optical properties	
Reflection factor	
$P_d = 0,914$	
Spectral values guaranteed	
τ_i (350 nm)	$\geq 0,4$
τ_i (405 nm)	$\geq 0,65$
τ_i (514 nm)	$\geq 0,88$
τ_i (633 nm)	$\leq 0,27$
τ_i (694 nm)	$\leq 0,03$
τ_i (1060 nm)	$\leq 0,002$
Refractive indices	
n_d (587,6 nm) = 1,54	
Sellmeier coefficients	
on request	
Internal quality	
Bubble class	2

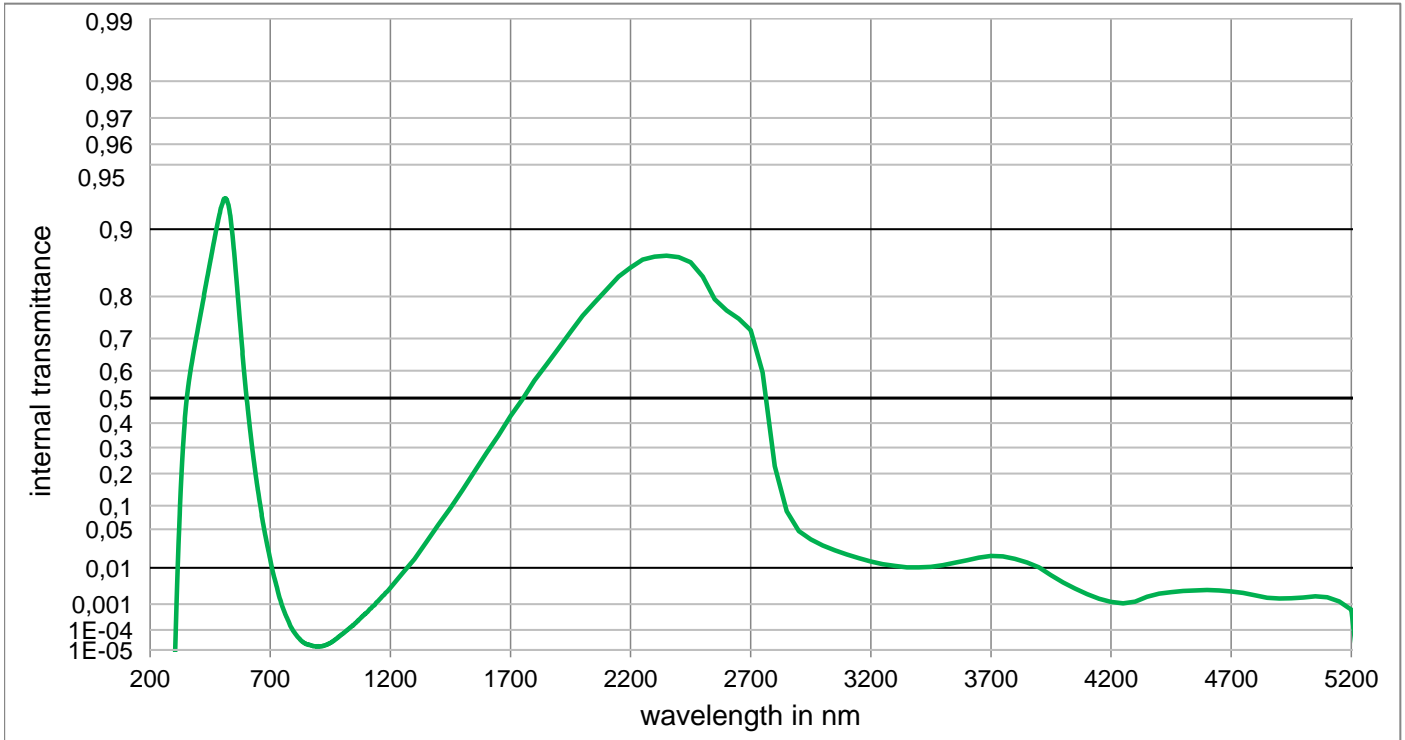
Mechanical properties	
Reference thickness	
$d = 1,00$ mm	
Density	
$\rho = 2,69$ g/cm ³	
Knoop hardness	
HK[0.1/20] = 467	
Thermal properties	
Transformation temperature	
$T_g = 475$ °C	
Thermal expansion in $10^{-6}/K$	
α (-30°C/+70°C)	= 7,3
α (20°C/300°C)	= 8,7
Chemical properties	
Chemical resistance	
FR class	= 0
SR class	= 2
AR class	= 2
Resistance against humidity	
Sensitive glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colormetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,254	0,222	0,203
	y	0,332	0,334	0,337
	Y	68,1	55,2	46,4
	λ_d	492 nm	492 nm	492 nm
	P_e	0,214	0,325	0,393
Illuminant A	x	0,359	0,305	0,270
	y	0,439	0,456	0,466
	Y	61,1	46,6	37,6
	λ_d	501 nm	501 nm	501 nm
P_e	0,201	0,323	0,403	

Notes	
Ionically colored glass	
Bandpass filter / Shortpass filter	
NIR cutoff filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



BG42



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

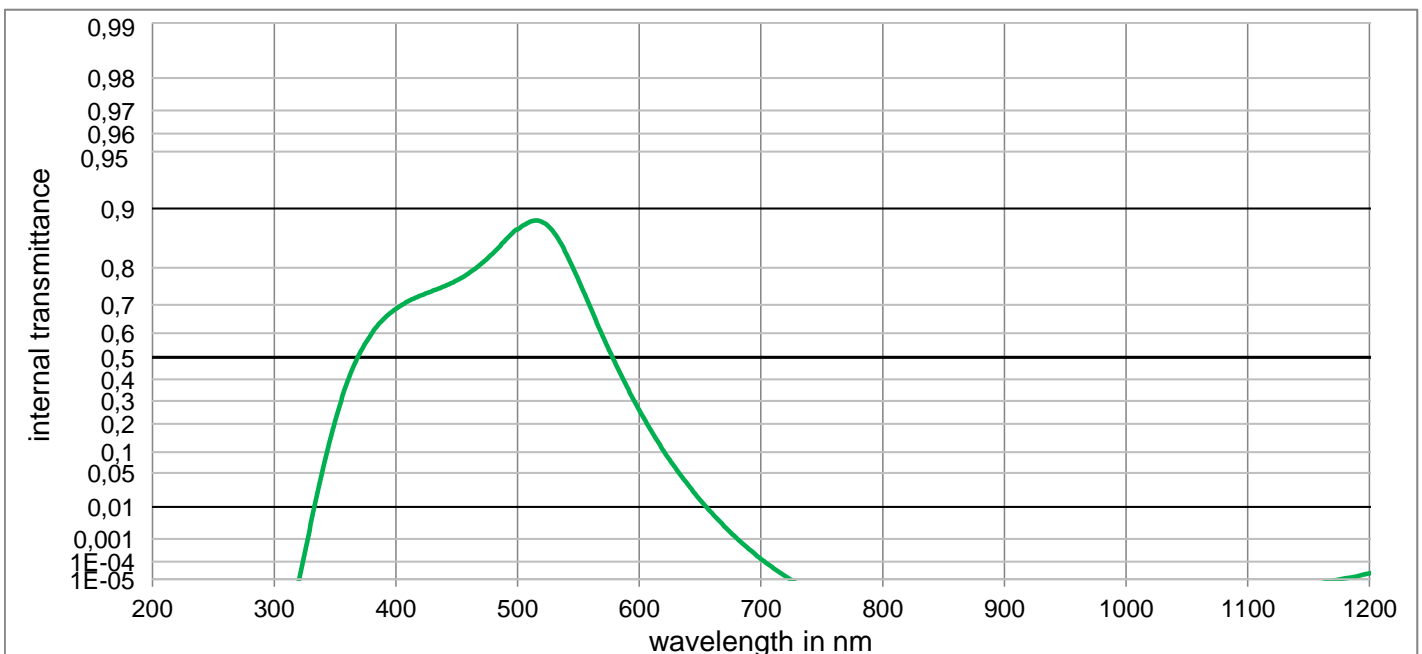
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,234E-01	800	7,768E-05	1100	4,963E-04	2200	8,507E-01	3700	1,775E-02
210	< 1,000E-05	510	9,279E-01	810	5,462E-05	1110	6,033E-04	2250	8,624E-01	3750	1,729E-02
220	< 1,000E-05	520	9,267E-01	820	3,995E-05	1120	7,275E-04	2300	8,665E-01	3800	1,543E-02
230	< 1,000E-05	530	9,188E-01	830	3,059E-05	1130	8,722E-04	2350	8,678E-01	3850	1,301E-02
240	< 1,000E-05	540	9,003E-01	840	2,447E-05	1140	1,095E-03	2400	8,660E-01	3900	1,018E-02
250	< 1,000E-05	550	8,716E-01	850	2,086E-05	1150	1,277E-03	2450	8,588E-01	3950	6,779E-03
260	< 1,000E-05	560	8,276E-01	860	1,861E-05	1160	1,563E-03	2500	8,362E-01	4000	4,415E-03
270	< 1,000E-05	570	7,687E-01	870	1,773E-05	1170	1,864E-03	2550	7,946E-01	4050	3,031E-03
280	< 1,000E-05	580	6,953E-01	880	1,585E-05	1180	2,255E-03	2600	7,705E-01	4100	2,085E-03
290	< 1,000E-05	590	6,101E-01	890	1,546E-05	1190	2,633E-03	2650	7,512E-01	4150	1,498E-03
300	< 1,000E-05	600	5,178E-01	900	1,593E-05	1200	3,171E-03	2700	7,228E-01	4200	1,191E-03
310	1,094E-03	610	4,287E-01	910	1,546E-05	1250	7,380E-03	2750	5,938E-01	4250	1,063E-03
320	4,416E-02	620	3,398E-01	920	1,658E-05	1300	1,533E-02	2800	2,270E-01	4300	1,199E-03
330	1,931E-01	630	2,598E-01	930	1,816E-05	1350	3,166E-02	2850	8,630E-02	4350	1,720E-03
340	3,537E-01	640	1,909E-01	940	2,045E-05	1400	5,808E-02	2900	4,698E-02	4400	2,140E-03
350	4,717E-01	650	1,366E-01	950	2,350E-05	1450	9,389E-02	2950	3,497E-02	4450	2,362E-03
360	5,508E-01	660	9,400E-02	960	2,852E-05	1500	1,440E-01	3000	2,755E-02	4500	2,572E-03
370	6,085E-01	670	6,215E-02	970	3,496E-05	1550	2,069E-01	3050	2,263E-02	4550	2,675E-03
380	6,549E-01	680	4,026E-02	980	4,313E-05	1600	2,781E-01	3100	1,895E-02	4600	2,729E-03
390	6,954E-01	690	2,523E-02	990	5,297E-05	1650	3,496E-01	3150	1,605E-02	4650	2,641E-03
400	7,309E-01	700	1,516E-02	1000	6,464E-05	1700	4,287E-01	3200	1,362E-02	4700	2,506E-03
410	7,626E-01	710	8,398E-03	1010	7,923E-05	1750	4,958E-01	3250	1,195E-02	4750	2,256E-03
420	7,909E-01	720	4,946E-03	1020	9,752E-05	1800	5,652E-01	3300	1,104E-02	4800	1,914E-03
430	8,164E-01	730	2,764E-03	1030	1,198E-04	1850	6,214E-01	3350	1,027E-02	4850	1,621E-03
440	8,385E-01	740	1,476E-03	1040	1,471E-04	1900	6,717E-01	3400	1,018E-02	4900	1,518E-03
450	8,590E-01	750	8,860E-04	1050	1,815E-04	1950	7,173E-01	3450	1,055E-02	4950	1,548E-03
460	8,769E-01	760	5,196E-04	1060	2,215E-04	2000	7,583E-01	3500	1,139E-02	5000	1,632E-03
470	8,923E-01	770	3,134E-04	1070	2,726E-04	2050	7,873E-01	3550	1,284E-02	5050	1,777E-03
480	9,053E-01	780	1,872E-04	1080	3,342E-04	2100	8,136E-01	3600	1,445E-02	5100	1,675E-03
490	9,158E-01	790	1,157E-04	1090	4,095E-04	2150	8,362E-01	3650	1,637E-02	5150	1,231E-03

BG47

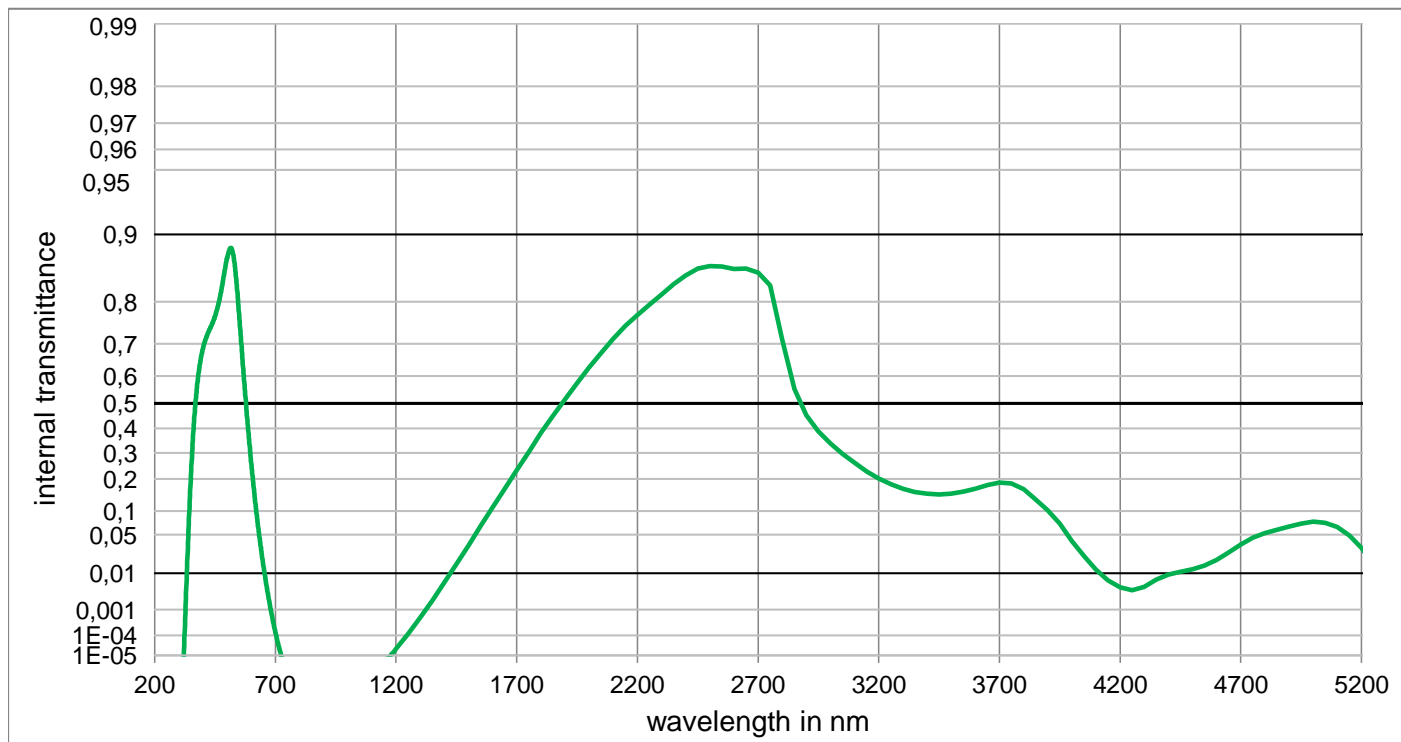
Optical properties	
Reflection factor	
$P_d = 0,914$	
Spectral values guaranteed	
τ_i (405 nm)	$\geq 0,65$
τ_i (430 nm)	$\geq 0,7$
τ_i (514 nm)	$\geq 0,87$
τ_i (565 nm)	$\geq 0,5$
τ_i (633 nm)	$\leq 0,1$
τ_i (1500 nm)	$\leq 0,08$
Refractive indices	
n_F (486 nm)	$= 1,546$
n_e (546 nm)	$= 1,542$
n_d (587,6 nm)	$= 1,54$
Sellmeier coefficients	
valid from 250 nm to 1700 nm	
B_1	0,3196
B_2	1,0166
B_3	0,7150
C_1	$2,355E-02 \mu m^2$
C_2	$4,6055E-03 \mu m^2$
C_3	$100,494 \mu m^2$
Internal quality	
Bubble class	

Mechanical properties	
Reference thickness	
$d = 1,00 \text{ mm}$	
Density	
$\rho = 2,74 \text{ g/cm}^3$	
Knoop hardness	
HK[0.1/20] = 409	
Thermal properties	
Transformation temperature	
$T_g = 416 \text{ }^\circ\text{C}$	
Thermal expansion in $10^{-6}/\text{K}$	
α (-30°C/+70°C)	$= 10,0$
α (20°C/300°C)	$= 11,9$
Chemical properties	
Chemical resistance	
FR class	$= 0$
SR class	$= 4.3$
AR class	$= 3.3$
Resistance against humidity	
Delicate glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colormetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,221	0,189	0,172
	y	0,328	0,329	0,335
	Y	56,6	41,8	32,6
	λ_d	491 nm	492 nm	492 nm
	P_e	0,336	0,452	0,510
Illuminant A	x	0,303	0,243	0,211
	y	0,452	0,466	0,474
	Y	47,7	32,8	24,6
	λ_d	500 nm	500 nm	500 nm
P_e	0,328	0,466	0,540	
Notes				
Ionically colored glass				
Bandpass filter / Shortpass filter				
NIR cutoff filter				
$\lambda_{50\%}(d = 0,20 \text{ mm}) = 633 \text{ nm}$				
ISO 23364:2021				
Disclaimer				
All data without tolerances are to be understood to be reference values.				



BG47

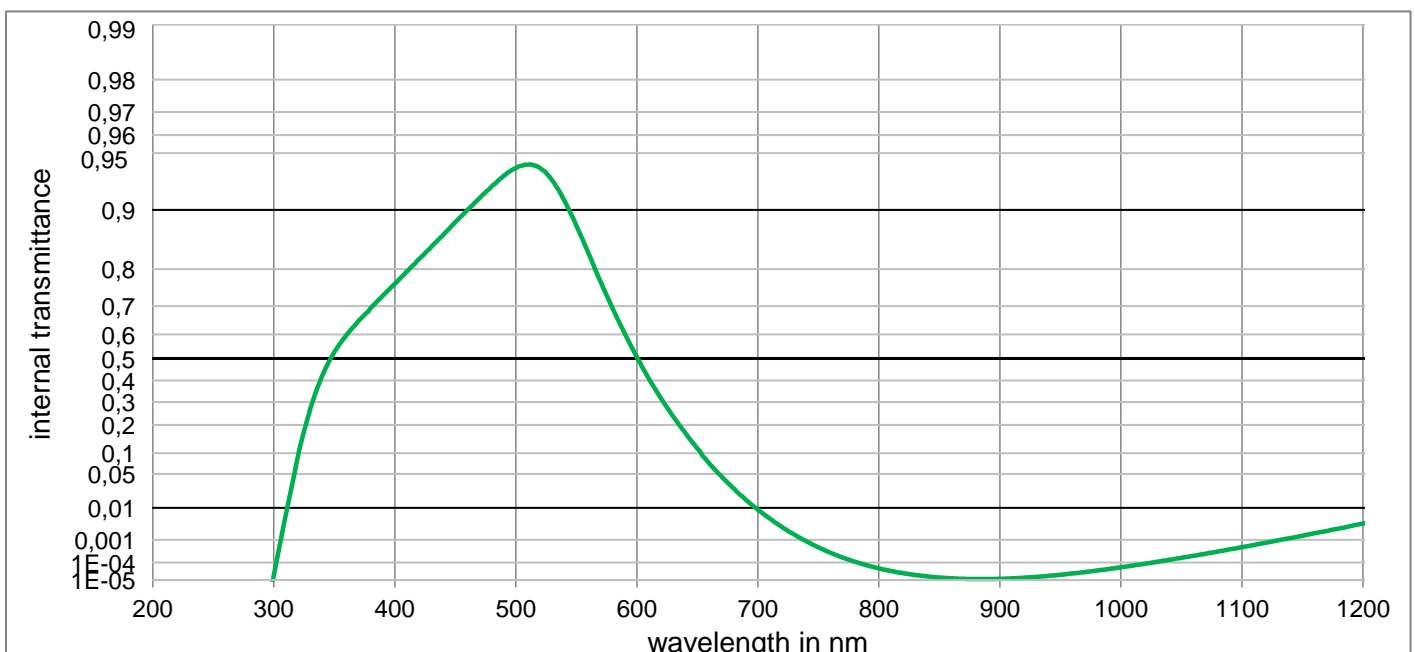


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

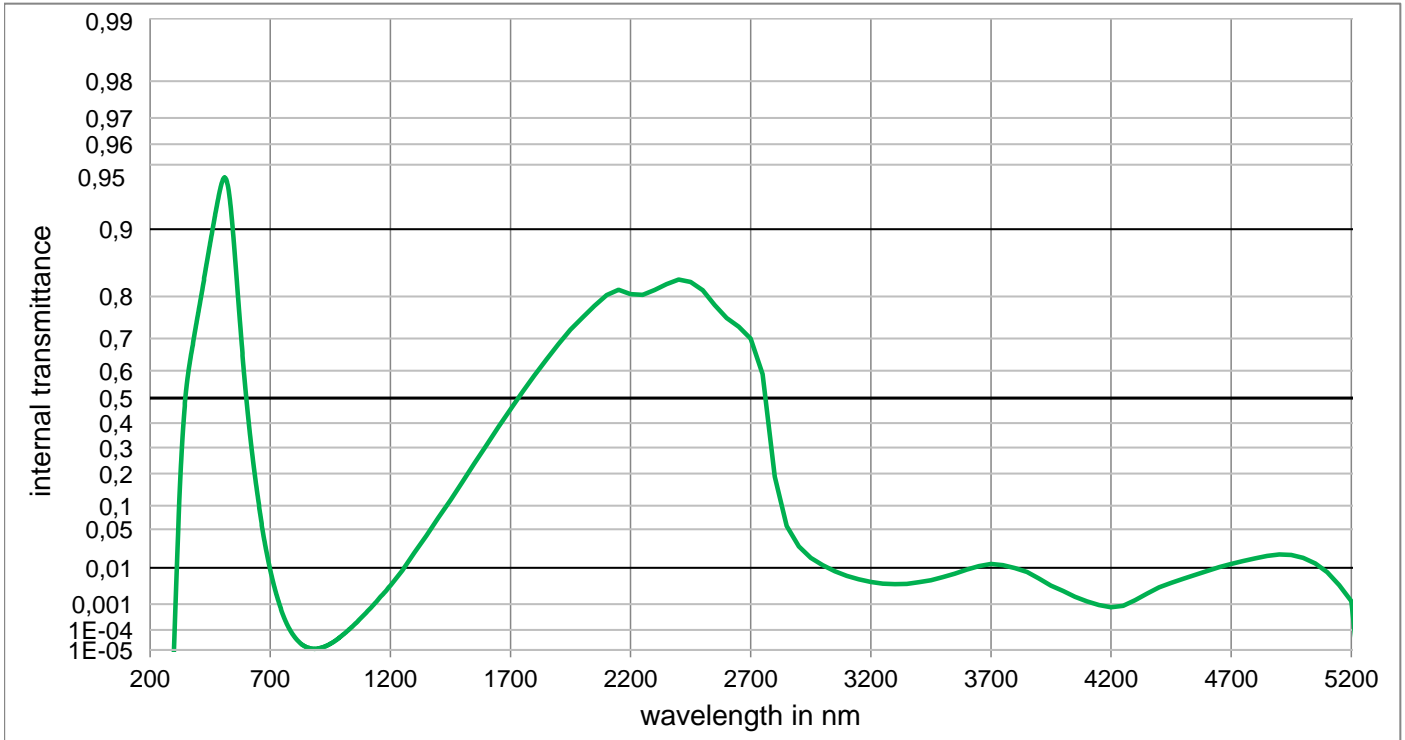
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	8,712E-01	800	< 1,000E-05	1100	< 1,000E-05	2200	7,724E-01	3700	1,875E-01
210	< 1,000E-05	510	8,826E-01	810	< 1,000E-05	1110	< 1,000E-05	2250	7,942E-01	3750	1,847E-01
220	< 1,000E-05	520	8,828E-01	820	< 1,000E-05	1120	< 1,000E-05	2300	8,143E-01	3800	1,640E-01
230	< 1,000E-05	530	8,664E-01	830	< 1,000E-05	1130	< 1,000E-05	2350	8,322E-01	3850	1,327E-01
240	< 1,000E-05	540	8,301E-01	840	< 1,000E-05	1140	< 1,000E-05	2400	8,467E-01	3900	1,027E-01
250	< 1,000E-05	550	7,713E-01	850	< 1,000E-05	1150	< 1,000E-05	2450	8,569E-01	3950	7,051E-02
260	< 1,000E-05	560	6,902E-01	860	< 1,000E-05	1160	< 1,000E-05	2500	8,607E-01	4000	4,036E-02
270	< 1,000E-05	570	5,895E-01	870	< 1,000E-05	1170	< 1,000E-05	2550	8,603E-01	4050	2,220E-02
280	< 1,000E-05	580	4,777E-01	880	< 1,000E-05	1180	1,128E-05	2600	8,567E-01	4100	1,201E-02
290	< 1,000E-05	590	3,640E-01	890	< 1,000E-05	1190	1,573E-05	2650	8,574E-01	4150	6,789E-03
300	< 1,000E-05	600	2,590E-01	900	< 1,000E-05	1200	2,240E-05	2700	8,513E-01	4200	4,526E-03
310	< 1,000E-05	610	1,704E-01	910	< 1,000E-05	1250	1,173E-04	2750	8,303E-01	4250	3,851E-03
320	< 1,000E-05	620	1,042E-01	920	< 1,000E-05	1300	5,203E-04	2800	7,127E-01	4300	4,717E-03
330	3,175E-03	630	5,917E-02	930	< 1,000E-05	1350	1,934E-03	2850	5,538E-01	4350	7,098E-03
340	5,681E-02	640	3,088E-02	940	< 1,000E-05	1400	6,071E-03	2900	4,528E-01	4400	9,395E-03
350	2,113E-01	650	1,489E-02	950	< 1,000E-05	1450	1,552E-02	2950	3,877E-01	4450	1,075E-02
360	3,848E-01	660	6,663E-03	960	< 1,000E-05	1500	3,436E-02	3000	3,388E-01	4500	1,210E-02
370	5,139E-01	670	2,763E-03	970	< 1,000E-05	1550	6,538E-02	3050	2,970E-01	4550	1,458E-02
380	5,989E-01	680	1,072E-03	980	< 1,000E-05	1600	1,094E-01	3100	2,598E-01	4600	1,900E-02
390	6,524E-01	690	3,923E-04	990	< 1,000E-05	1650	1,661E-01	3150	2,275E-01	4650	2,606E-02
400	6,876E-01	700	1,382E-04	1000	< 1,000E-05	1700	2,323E-01	3200	2,010E-01	4700	3,540E-02
410	7,108E-01	710	4,699E-05	1010	< 1,000E-05	1750	3,047E-01	3250	1,807E-01	4750	4,489E-02
420	7,278E-01	720	1,561E-05	1020	< 1,000E-05	1800	3,818E-01	3300	1,659E-01	4800	5,252E-02
430	7,415E-01	730	< 1,000E-05	1030	< 1,000E-05	1850	4,505E-01	3350	1,556E-01	4850	5,874E-02
440	7,544E-01	740	< 1,000E-05	1040	< 1,000E-05	1900	5,163E-01	3400	1,496E-01	4900	6,502E-02
450	7,696E-01	750	< 1,000E-05	1050	< 1,000E-05	1950	5,754E-01	3450	1,478E-01	4950	7,108E-02
460	7,876E-01	760	< 1,000E-05	1060	< 1,000E-05	2000	6,282E-01	3500	1,500E-01	5000	7,464E-02
470	8,083E-01	770	< 1,000E-05	1070	< 1,000E-05	2050	6,744E-01	3550	1,567E-01	5050	7,269E-02
480	8,314E-01	780	< 1,000E-05	1080	< 1,000E-05	2100	7,136E-01	3600	1,662E-01	5100	6,377E-02
490	8,540E-01	790	< 1,000E-05	1090	< 1,000E-05	2150	7,474E-01	3650	1,780E-01	5150	4,872E-02

BG55

Optical properties	Mechanical properties	Colorimetric properties																					
Reflection factor	Reference thickness	1 mm 2 mm 3 mm																					
$P_d = 0,914$	$d = 1,00 \text{ mm}$	<table border="1"> <tr> <td rowspan="5">Illuminant D65</td> <td>x</td> <td>0,252</td> <td>0,220</td> <td>0,201</td> </tr> <tr> <td>y</td> <td>0,329</td> <td>0,328</td> <td>0,328</td> </tr> <tr> <td>Y</td> <td>68,9</td> <td>56,6</td> <td>48,2</td> </tr> <tr> <td>λ_d</td> <td>492 nm</td> <td>491 nm</td> <td>491 nm</td> </tr> <tr> <td>P_e</td> <td>0,223</td> <td>0,339</td> <td>0,409</td> </tr> </table>	Illuminant D65	x	0,252	0,220	0,201	y	0,329	0,328	0,328	Y	68,9	56,6	48,2	λ_d	492 nm	491 nm	491 nm	P_e	0,223	0,339	0,409
Illuminant D65	x			0,252	0,220	0,201																	
	y			0,329	0,328	0,328																	
	Y			68,9	56,6	48,2																	
	λ_d			492 nm	491 nm	491 nm																	
	P_e	0,223	0,339	0,409																			
Spectral values guaranteed	Density	<table border="1"> <tr> <td rowspan="5">Illuminant A</td> <td>x</td> <td>0,356</td> <td>0,302</td> <td>0,267</td> </tr> <tr> <td>y</td> <td>0,438</td> <td>0,452</td> <td>0,460</td> </tr> <tr> <td>Y</td> <td>61,7</td> <td>47,6</td> <td>39,0</td> </tr> <tr> <td>λ_d</td> <td>501 nm</td> <td>500 nm</td> <td>500 nm</td> </tr> <tr> <td>P_e</td> <td>0,208</td> <td>0,331</td> <td>0,413</td> </tr> </table>	Illuminant A	x	0,356	0,302	0,267	y	0,438	0,452	0,460	Y	61,7	47,6	39,0	λ_d	501 nm	500 nm	500 nm	P_e	0,208	0,331	0,413
Illuminant A	x			0,356	0,302	0,267																	
	y			0,438	0,452	0,460																	
	Y			61,7	47,6	39,0																	
	λ_d			501 nm	500 nm	500 nm																	
	P_e	0,208	0,331	0,413																			
$\tau_i (405 \text{ nm}) \geq 0,76$	$\rho = 2,65 \text{ g/cm}^3$																						
$\tau_i (514 \text{ nm}) \geq 0,93$	Knoop hardness																						
$\tau_i (633 \text{ nm}) \geq 0,18$	$HK[0.1/20] = 504$																						
$\tau_i (694 \text{ nm}) \leq 0,016$	Thermal properties																						
$\tau_i (1060 \text{ nm}) \leq 0,0005$	Transformation temperature																						
	$T_g = 453 \text{ }^\circ\text{C}$																						
	Thermal expansion in $10^{-6}/\text{K}$																						
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,2$																						
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,1$																						
Refractive indices	Chemical properties	Notes																					
$n_F (486 \text{ nm}) = 1,546$	Chemical resistance																						
$n_e (546 \text{ nm}) = 1,542$	FR class = 0	Ionically colored glass																					
$n_d (587,6 \text{ nm}) = 1,54$	SR class = 2	Bandpass filter / Shortpass filter																					
	AR class = 2	NIR cutoff filter																					
Sellmeier coefficients	Resistance against humidity																						
valid from 400 nm to 1550 nm	Sensitive glass																						
$B_1 = 1,3373$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	ISO 23364:2021																					
$B_2 = 0,0002$																							
$B_3 = 0,8117$																							
$C_1 = 9,095\text{E-}03 \text{ } \mu\text{m}^2$																							
$C_2 = 1,4952\text{E-}02 \text{ } \mu\text{m}^2$																							
$C_3 = 100,000 \text{ } \mu\text{m}^2$																							
Internal quality		Disclaimer																					
Bubble class 2		All data without tolerances are to be understood to be reference values.																					



BG55

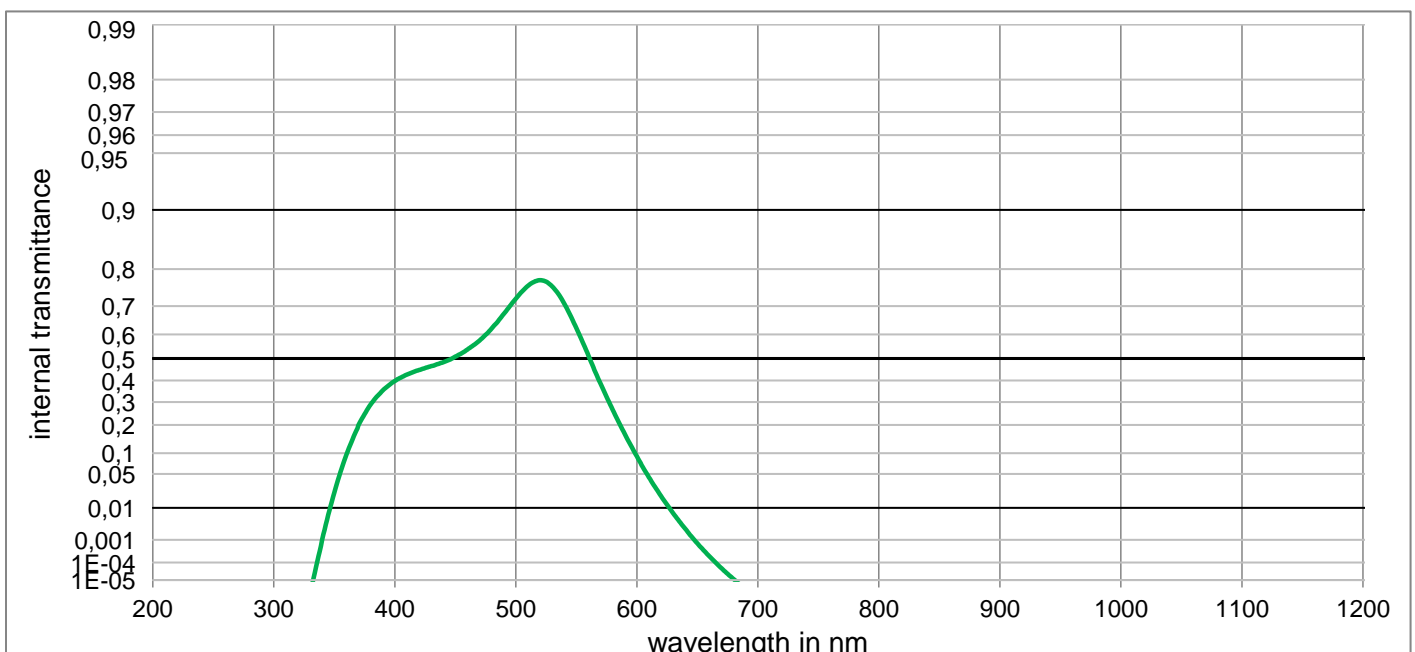


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

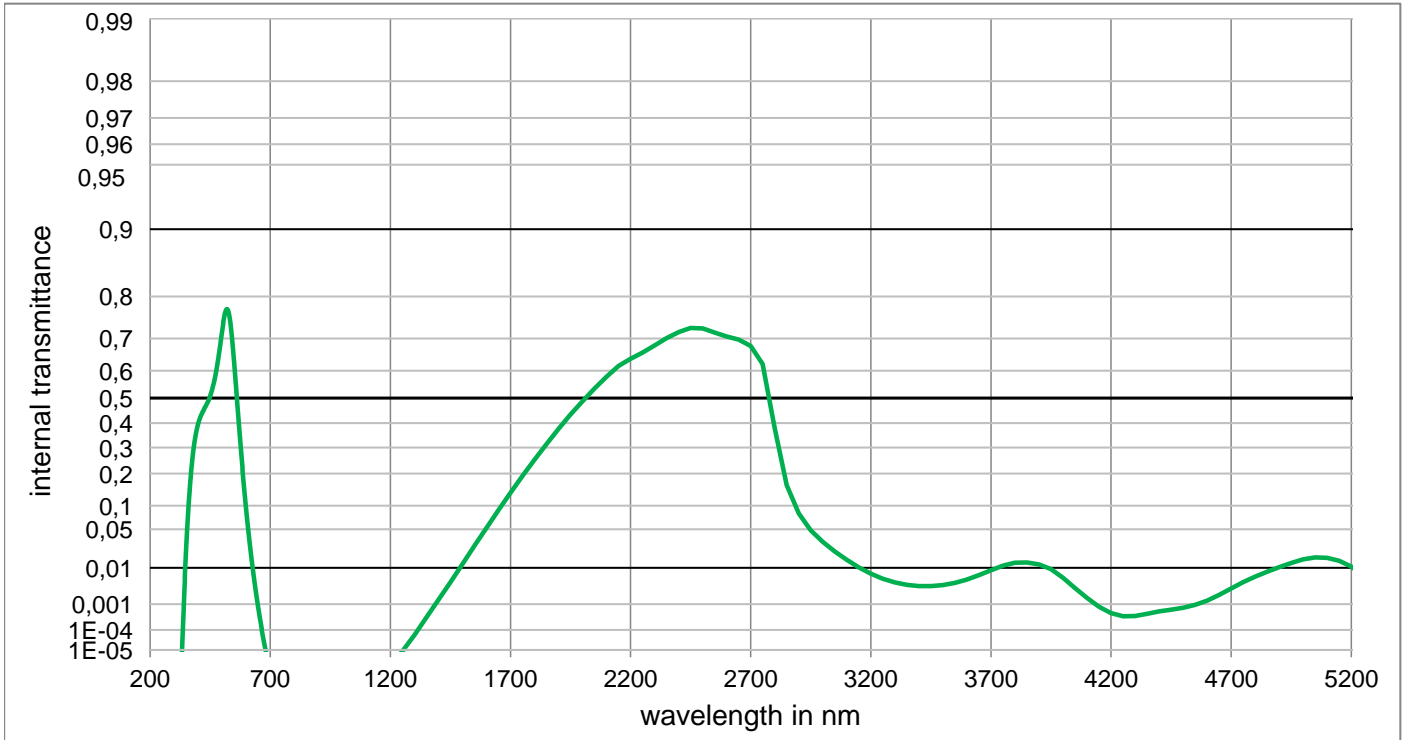
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,399E-01	800	4,934E-05	1100	5,093E-04	2200	8,044E-01	3700	1,209E-02
210	< 1,000E-05	510	9,424E-01	810	3,526E-05	1110	6,294E-04	2250	8,032E-01	3750	1,149E-02
220	< 1,000E-05	520	9,400E-01	820	2,638E-05	1120	7,757E-04	2300	8,123E-01	3800	9,901E-03
230	< 1,000E-05	530	9,303E-01	830	2,067E-05	1130	9,532E-04	2350	8,232E-01	3850	8,076E-03
240	< 1,000E-05	540	9,110E-01	840	1,694E-05	1140	1,167E-03	2400	8,313E-01	3900	5,598E-03
250	< 1,000E-05	550	8,792E-01	850	1,452E-05	1150	1,424E-03	2450	8,272E-01	3950	3,651E-03
260	< 1,000E-05	560	8,329E-01	860	1,297E-05	1160	1,739E-03	2500	8,119E-01	4000	2,558E-03
270	< 1,000E-05	570	7,701E-01	870	1,207E-05	1170	2,078E-03	2550	7,821E-01	4050	1,710E-03
280	< 1,000E-05	580	6,928E-01	880	1,167E-05	1180	2,505E-03	2600	7,532E-01	4100	1,227E-03
290	< 1,000E-05	590	6,029E-01	890	1,169E-05	1190	3,047E-03	2650	7,316E-01	4150	9,269E-04
300	1,878E-05	600	5,057E-01	900	1,211E-05	1200	3,660E-03	2700	6,993E-01	4200	7,882E-04
310	6,724E-03	610	4,085E-01	910	1,292E-05	1250	8,670E-03	2750	5,881E-01	4250	8,827E-04
320	9,213E-02	620	3,166E-01	920	1,416E-05	1300	2,062E-02	2800	1,888E-01	4300	1,344E-03
330	2,650E-01	630	2,354E-01	930	1,590E-05	1350	4,003E-02	2850	5,554E-02	4350	2,158E-03
340	4,212E-01	640	1,677E-01	940	1,824E-05	1400	7,197E-02	2900	2,645E-02	4400	3,245E-03
350	5,277E-01	650	1,149E-01	950	2,132E-05	1450	1,148E-01	2950	1,629E-02	4450	4,293E-03
360	5,980E-01	660	7,208E-02	960	2,533E-05	1500	1,710E-01	3000	1,137E-02	4500	5,522E-03
370	6,500E-01	670	4,508E-02	970	3,049E-05	1550	2,371E-01	3050	8,398E-03	4550	6,840E-03
380	6,932E-01	680	2,711E-02	980	3,711E-05	1600	3,093E-01	3100	6,519E-03	4600	8,465E-03
390	7,313E-01	690	1,583E-02	990	4,557E-05	1650	3,844E-01	3150	5,315E-03	4650	1,031E-02
400	7,648E-01	700	9,032E-03	1000	5,634E-05	1700	4,561E-01	3200	4,538E-03	4700	1,220E-02
410	7,945E-01	710	5,056E-03	1010	7,000E-05	1750	5,236E-01	3250	4,113E-03	4750	1,406E-02
420	8,214E-01	720	2,809E-03	1020	8,728E-05	1800	5,841E-01	3300	3,971E-03	4800	1,587E-02
430	8,447E-01	730	1,576E-03	1030	1,090E-04	1850	6,379E-01	3350	4,064E-03	4850	1,775E-02
440	8,657E-01	740	8,774E-04	1040	1,363E-04	1900	6,841E-01	3400	4,457E-03	4900	1,892E-02
450	8,842E-01	750	5,015E-04	1050	1,705E-04	1950	7,241E-01	3450	5,018E-03	4950	1,854E-02
460	8,999E-01	760	2,924E-04	1060	2,130E-04	2000	7,545E-01	3500	6,034E-03	5000	1,629E-02
470	9,131E-01	770	1,764E-04	1070	2,657E-04	2050	7,807E-01	3550	7,359E-03	5050	1,249E-02
480	9,246E-01	780	1,106E-04	1080	3,308E-04	2100	8,029E-01	3600	9,128E-03	5100	7,925E-03
490	9,338E-01	790	7,226E-05	1090	4,110E-04	2150	8,131E-01	3650	1,095E-02	5150	3,751E-03

BG59

Optical properties		Mechanical properties		Colormetric properties				
Reflection factor		Reference thickness		1 mm		2 mm	3 mm	
$P_d = 0,911$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,200	0,172	0,157
Spectral values guaranteed		Density			y	0,356	0,395	0,440
$\tau_i (405 \text{ nm}) \geq 0,37$		$\rho = 2,82 \text{ g/cm}^3$			Y	42,8	26,7	17,9
$\tau_i (430 \text{ nm}) \geq 0,42$		Knoop hardness			λ_d	494 nm	497 nm	500 nm
$\tau_i (514 \text{ nm}) \geq 0,72$		$HK[0.1/20] = 431$			P_e	0,393	0,474	0,510
$\tau_i (565 \text{ nm}) \geq 0,42$		Thermal properties		Illuminant A	x	0,261	0,208	0,183
$\tau_i (633 \text{ nm}) \leq 0,02$		Transformation temperature			y	0,484	0,523	0,559
$\tau_i (1500 \text{ nm}) \leq 0,02$		$T_g = 411 \text{ }^\circ\text{C}$			Y	34,3	20,1	13,1
Refractive indices		Thermal expansion in			λ_d	502 nm	503 nm	505 nm
$n_F (486 \text{ nm}) = 1,56$		$10^{-6}/\text{K}$			P_e	0,421	0,539	0,597
$n_e (546 \text{ nm}) = 1,553$		$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 9,7$		Notes				
$n_d (587,6 \text{ nm}) = 1,55$		$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 11,6$		Ionically colored glass				
Sellmeier coefficients		Chemical properties		Bandpass filter / Shortpass filter				
valid from 440 nm to 1550 nm		Chemical resistance		NIR cutoff filter				
$B_1 = 1,3353$		FR class		lambda_50%(d=0.11mm) @ 636 nm				
$B_2 = 0,0436$		SR class = 5.2		ISO 23364:2021				
$B_3 = 122,4367$		AR class = 3						
$C_2 = 1,3411\text{E-}01 \text{ } \mu\text{m}^2$		Resistance against humidity		Disclaimer				
$C_3 = 13784,523 \text{ } \mu\text{m}^2$		Sensitive glass		All data without tolerances are to be understood to be reference values.				
Internal quality		see pocket catalogue "Optical Filter Glass 2024", chapter 5.5						
Bubble class	0							



BG59

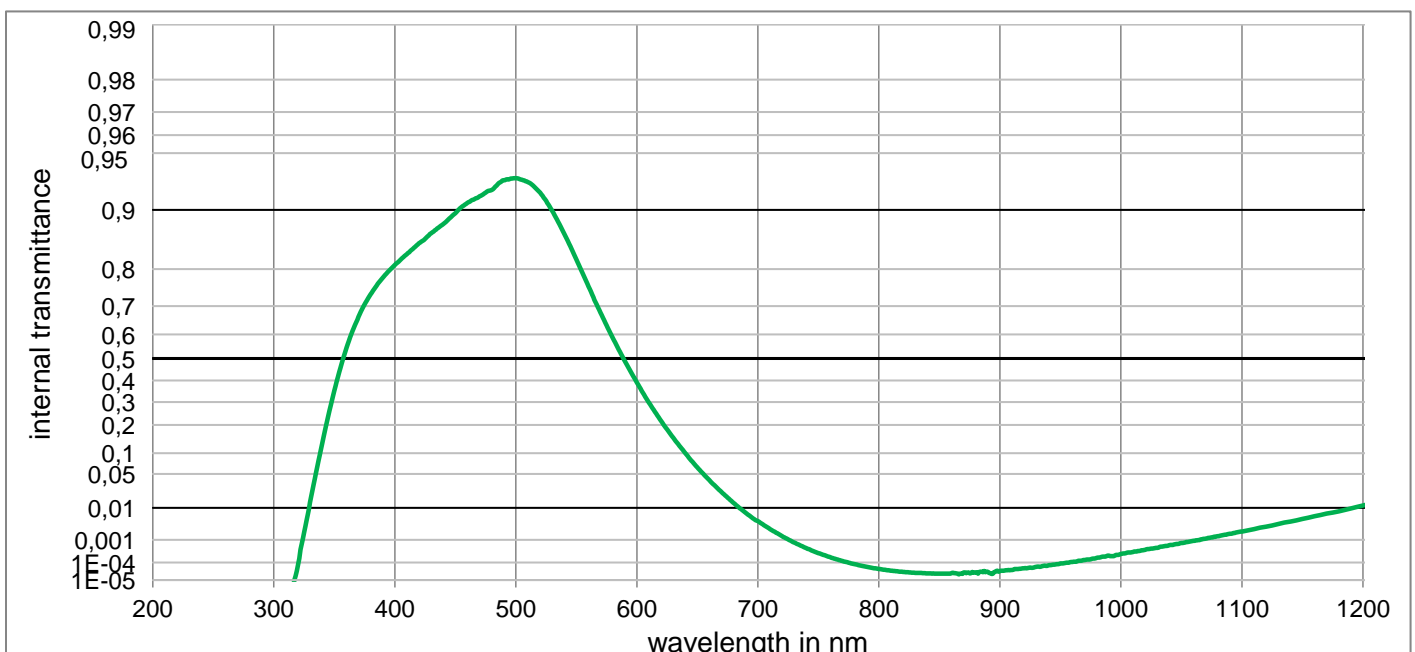


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

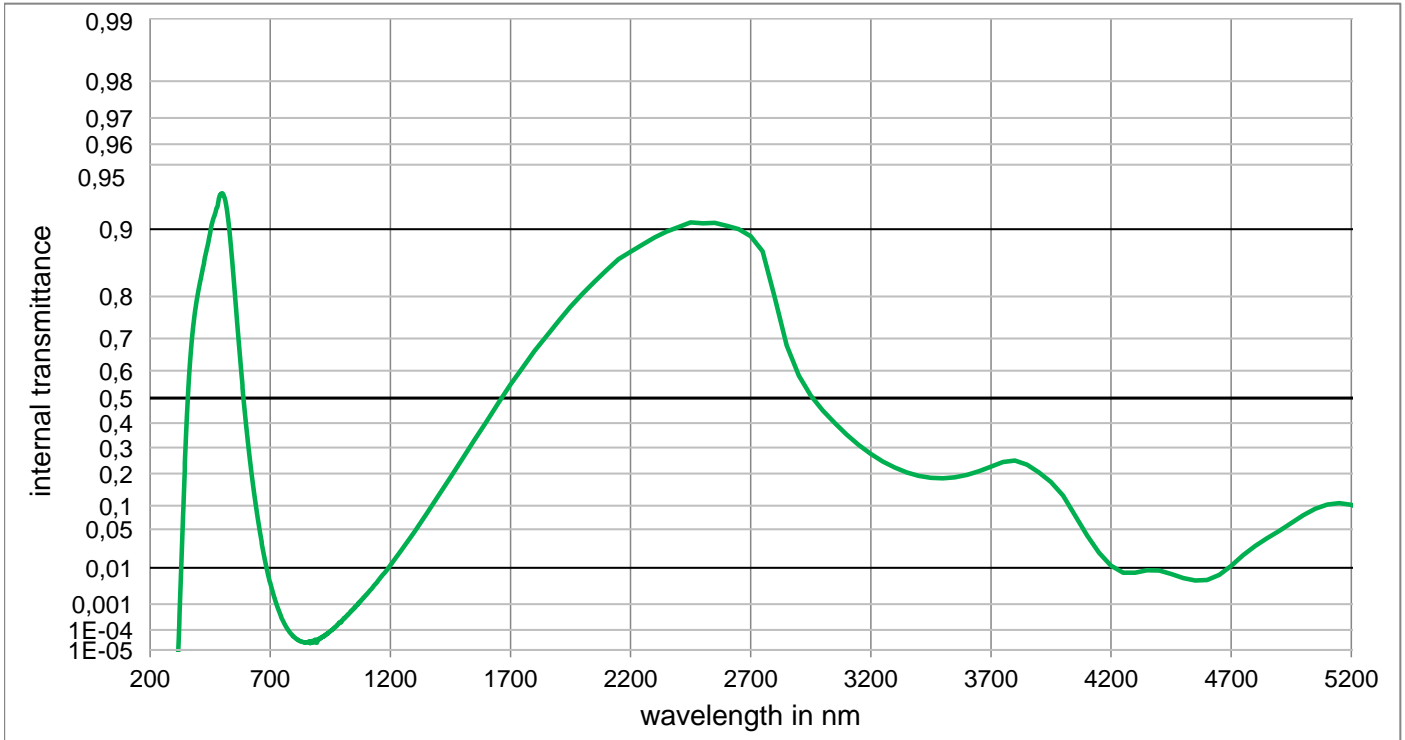
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	7,226E-01	800	< 1,000E-05	1100	< 1,000E-05	2200	6,389E-01	3700	8,820E-03
210	< 1,000E-05	510	7,591E-01	810	< 1,000E-05	1110	< 1,000E-05	2250	6,587E-01	3750	1,117E-02
220	< 1,000E-05	520	7,735E-01	820	< 1,000E-05	1120	< 1,000E-05	2300	6,798E-01	3800	1,287E-02
230	< 1,000E-05	530	7,579E-01	830	< 1,000E-05	1130	< 1,000E-05	2350	7,007E-01	3850	1,311E-02
240	< 1,000E-05	540	7,078E-01	840	< 1,000E-05	1140	< 1,000E-05	2400	7,176E-01	3900	1,192E-02
250	< 1,000E-05	550	6,239E-01	850	< 1,000E-05	1150	< 1,000E-05	2450	7,281E-01	3950	9,336E-03
260	< 1,000E-05	560	5,117E-01	860	< 1,000E-05	1160	< 1,000E-05	2500	7,270E-01	4000	5,822E-03
270	< 1,000E-05	570	3,863E-01	870	< 1,000E-05	1170	< 1,000E-05	2550	7,160E-01	4050	3,096E-03
280	< 1,000E-05	580	2,657E-01	880	< 1,000E-05	1180	< 1,000E-05	2600	7,055E-01	4100	1,568E-03
290	< 1,000E-05	590	1,642E-01	890	< 1,000E-05	1190	< 1,000E-05	2650	6,965E-01	4150	8,159E-04
300	< 1,000E-05	600	9,059E-02	900	< 1,000E-05	1200	< 1,000E-05	2700	6,787E-01	4200	4,886E-04
310	< 1,000E-05	610	4,407E-02	910	< 1,000E-05	1250	< 1,000E-05	2750	6,223E-01	4250	3,681E-04
320	< 1,000E-05	620	1,888E-02	920	< 1,000E-05	1300	5,930E-05	2800	3,784E-01	4300	3,728E-04
330	< 1,000E-05	630	7,188E-03	930	< 1,000E-05	1350	3,273E-04	2850	1,604E-01	4350	4,568E-04
340	1,027E-03	640	2,439E-03	940	< 1,000E-05	1400	1,361E-03	2900	8,072E-02	4400	5,594E-04
350	2,251E-02	650	7,312E-04	950	< 1,000E-05	1450	4,512E-03	2950	4,828E-02	4450	6,493E-04
360	9,632E-02	660	1,998E-04	960	< 1,000E-05	1500	1,204E-02	3000	3,175E-02	4500	7,558E-04
370	1,987E-01	670	4,929E-05	970	< 1,000E-05	1550	2,697E-02	3050	2,156E-02	4550	9,438E-04
380	2,886E-01	680	1,139E-05	980	< 1,000E-05	1600	5,205E-02	3100	1,474E-02	4600	1,304E-03
390	3,537E-01	690	< 1,000E-05	990	< 1,000E-05	1650	8,870E-02	3150	1,021E-02	4650	1,959E-03
400	3,982E-01	700	< 1,000E-05	1000	< 1,000E-05	1700	1,363E-01	3200	7,304E-03	4700	3,029E-03
410	4,273E-01	710	< 1,000E-05	1010	< 1,000E-05	1750	1,914E-01	3250	5,506E-03	4750	4,508E-03
420	4,480E-01	720	< 1,000E-05	1020	< 1,000E-05	1800	2,513E-01	3300	4,428E-03	4800	6,243E-03
430	4,655E-01	730	< 1,000E-05	1030	< 1,000E-05	1850	3,140E-01	3350	3,805E-03	4850	8,173E-03
440	4,836E-01	740	< 1,000E-05	1040	< 1,000E-05	1900	3,758E-01	3400	3,515E-03	4900	1,037E-02
450	5,076E-01	750	< 1,000E-05	1050	< 1,000E-05	1950	4,342E-01	3450	3,501E-03	4950	1,279E-02
460	5,386E-01	760	< 1,000E-05	1060	< 1,000E-05	2000	4,878E-01	3500	3,751E-03	5000	1,509E-02
470	5,759E-01	770	< 1,000E-05	1070	< 1,000E-05	2050	5,362E-01	3550	4,305E-03	5050	1,650E-02
480	6,225E-01	780	< 1,000E-05	1080	< 1,000E-05	2100	5,797E-01	3600	5,247E-03	5100	1,628E-02
490	6,740E-01	790	< 1,000E-05	1090	< 1,000E-05	2150	6,165E-01	3650	6,721E-03	5150	1,419E-02

BG60

Optical properties		Mechanical properties		Colormetric properties					
Reflection factor		Reference thickness		1 mm		2 mm		3 mm	
$P_d = 0,914$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,236	0,201	0,181	
Spectral values guaranteed		Density			y	0,318	0,306		0,297
$\tau_i (405 \text{ nm}) \geq 0,8$	$\rho = 2,83 \text{ g/cm}^3$		Y		63,8	49,9		41,0	
$\tau_i (514 \text{ nm}) \geq 0,91$	Knoop hardness		λ_d		490 nm	489 nm		489 nm	
$\tau_i (633 \text{ nm}) \geq 0,1$	$HK[0.1/20] = 362$		P_e		0,286	0,425		0,506	
$\tau_i (694 \text{ nm}) \leq 0,008$	Thermal properties		Illuminant A	x	0,334	0,271		0,232	
$\tau_i (1060 \text{ nm}) \leq 0,0015$	Transformation temperature			y	0,436	0,441		0,437	
	$T_g = 411 \text{ }^\circ\text{C}$			Y	55,7	40,5		31,7	
	Thermal expansion in $10^{-6}/\text{K}$			λ_d	499 nm	498 nm		497 nm	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 12,0$			P_e	0,259	0,406		0,498	
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 13,9$		Notes						
Refractive indices		Chemical properties		Ionically colored glass					
$n_F (486 \text{ nm}) = 1,544$	Chemical resistance		Bandpass filter / Shortpass filter						
$n_e (546 \text{ nm}) = 1,54$	FR class = 1		NIR cutoff filter						
$n_d (587,6 \text{ nm}) = 1,538$	SR class = 52.3		$\lambda_{50\%}(d=0.3\text{mm}) = 633 \text{ nm}$						
	AR class = 3.3		ISO 23364:2021						
Sellmeier coefficients		Resistance against humidity		Disclaimer					
valid from 340 nm to 1550 nm				All data without tolerances are to be understood to be reference values.					
$B_1 = 1,3298$									
$B_2 = 0,0004$									
$B_3 = 2,5598$									
$C_1 = 9,241\text{E-}03 \text{ } \mu\text{m}^2$									
$C_2 = 1,0918\text{E-}01 \text{ } \mu\text{m}^2$									
$C_3 = 450,591 \text{ } \mu\text{m}^2$									
Internal quality									
Bubble class 2									



BG60

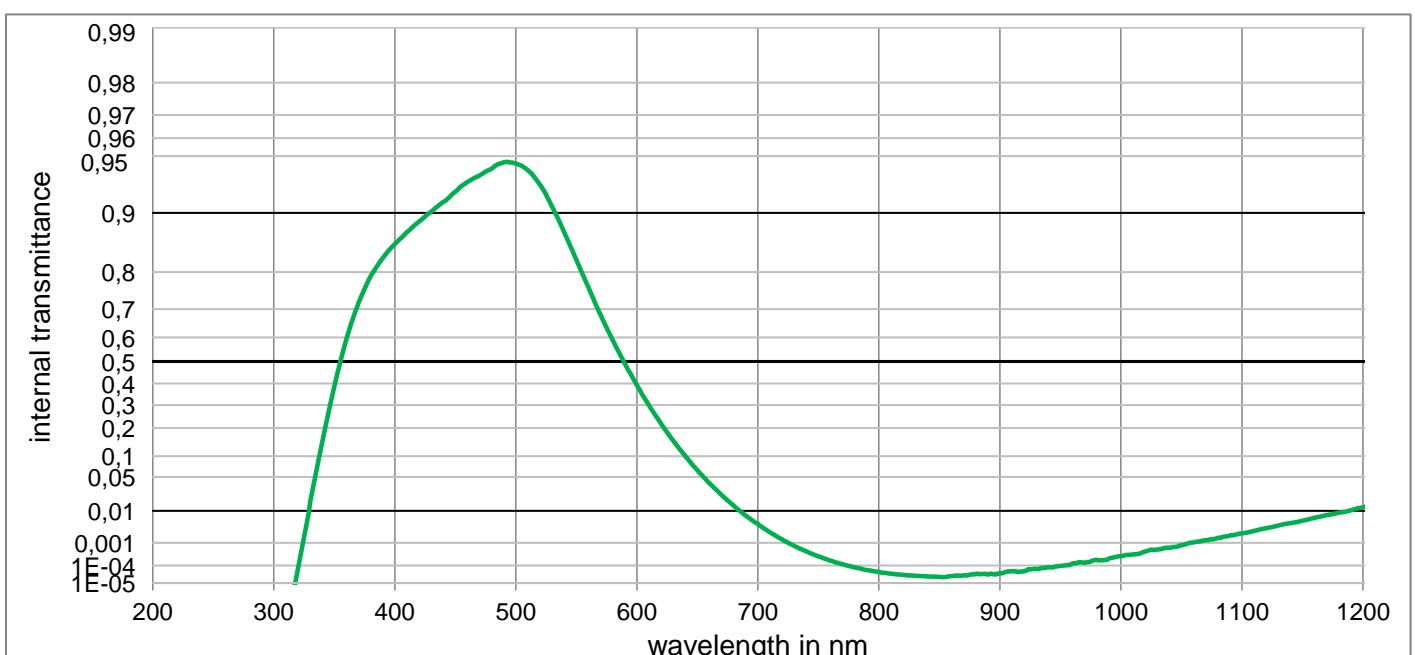


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

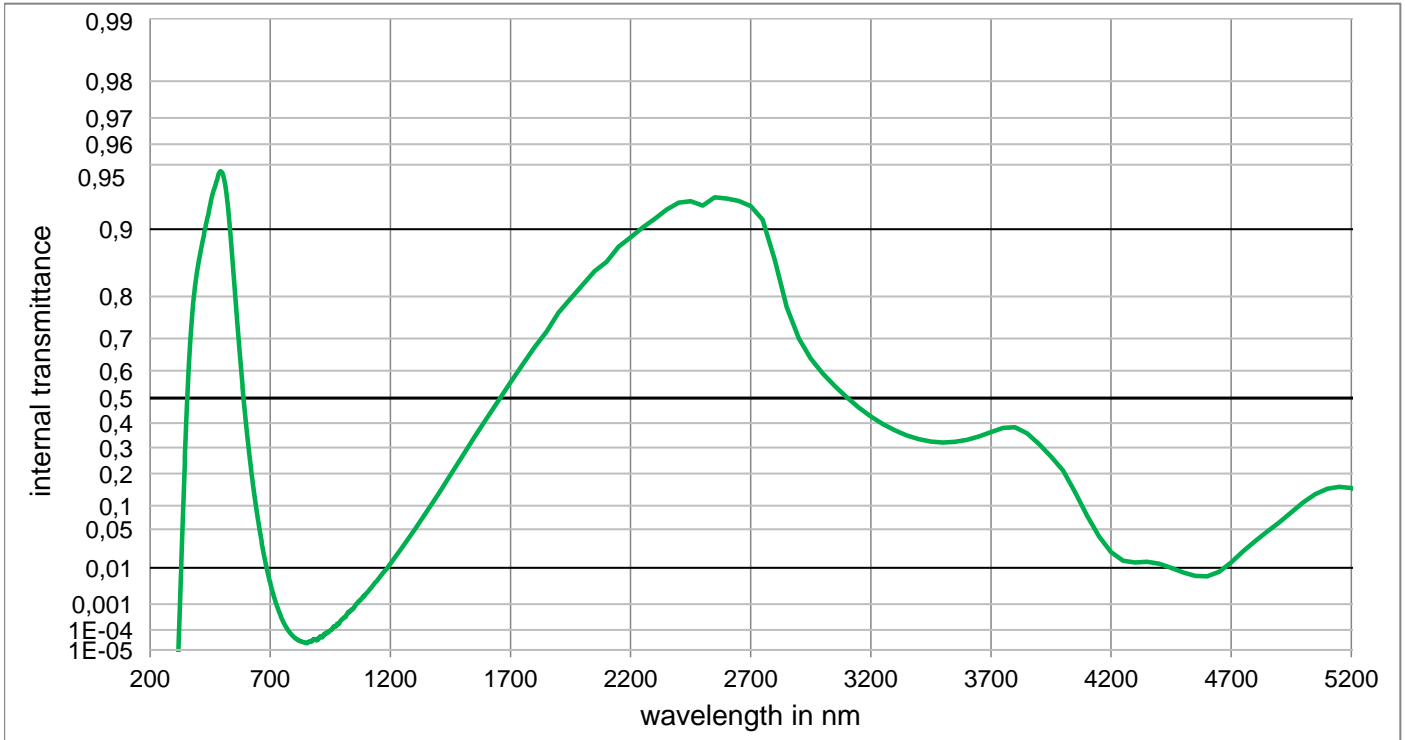
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,319E-01	800	4,553E-05	1100	1,992E-03	2200	8,733E-01	3700	2,259E-01
210	< 1,000E-05	510	9,286E-01	810	3,683E-05	1110	2,416E-03	2250	8,825E-01	3750	2,432E-01
220	< 1,000E-05	520	9,187E-01	820	3,115E-05	1120	2,902E-03	2300	8,910E-01	3800	2,484E-01
230	< 1,000E-05	530	8,991E-01	830	2,752E-05	1130	3,528E-03	2350	8,974E-01	3850	2,331E-01
240	< 1,000E-05	540	8,673E-01	840	2,593E-05	1140	4,192E-03	2400	9,023E-01	3900	2,041E-01
250	< 1,000E-05	550	8,208E-01	850	2,497E-05	1150	4,976E-03	2450	9,069E-01	3950	1,707E-01
260	< 1,000E-05	560	7,573E-01	860	2,632E-05	1160	5,967E-03	2500	9,061E-01	4000	1,275E-01
270	< 1,000E-05	570	6,790E-01	870	2,877E-05	1170	7,049E-03	2550	9,064E-01	4050	7,682E-02
280	< 1,000E-05	580	5,874E-01	880	2,856E-05	1180	8,166E-03	2600	9,035E-01	4100	4,036E-02
290	< 1,000E-05	590	4,892E-01	890	3,182E-05	1190	9,653E-03	2650	9,000E-01	4150	2,037E-02
300	< 1,000E-05	600	3,905E-01	900	3,559E-05	1200	1,142E-02	2700	8,923E-01	4200	1,121E-02
310	< 1,000E-05	610	2,979E-01	910	3,967E-05	1250	2,400E-02	2750	8,737E-01	4250	7,748E-03
320	7,831E-05	620	2,168E-01	920	4,945E-05	1300	4,588E-02	2800	7,977E-01	4300	7,701E-03
330	1,360E-02	630	1,505E-01	930	5,977E-05	1350	7,977E-02	2850	6,805E-01	4350	8,815E-03
340	1,301E-01	640	1,000E-01	940	7,197E-05	1400	1,268E-01	2900	5,825E-01	4400	8,635E-03
350	3,524E-01	650	6,356E-02	950	8,963E-05	1450	1,867E-01	2950	5,097E-01	4450	7,195E-03
360	5,453E-01	660	3,882E-02	960	1,064E-04	1500	2,557E-01	3000	4,513E-01	4500	5,756E-03
370	6,642E-01	670	2,294E-02	970	1,346E-04	1550	3,305E-01	3050	3,996E-01	4550	4,996E-03
380	7,356E-01	680	1,314E-02	980	1,709E-04	1600	4,056E-01	3100	3,524E-01	4600	5,132E-03
390	7,795E-01	690	7,409E-03	990	2,146E-04	1650	4,814E-01	3150	3,104E-01	4650	6,813E-03
400	8,093E-01	700	4,338E-03	1000	2,576E-04	1700	5,511E-01	3200	2,744E-01	4700	1,106E-02
410	8,314E-01	710	2,421E-03	1010	3,170E-04	1750	6,093E-01	3250	2,449E-01	4750	1,826E-02
420	8,515E-01	720	1,378E-03	1020	3,967E-04	1800	6,632E-01	3300	2,218E-01	4800	2,702E-02
430	8,678E-01	730	7,905E-04	1030	4,818E-04	1850	7,071E-01	3350	2,043E-01	4850	3,642E-02
440	8,817E-01	740	4,644E-04	1040	6,148E-04	1900	7,456E-01	3400	1,921E-01	4900	4,731E-02
450	8,959E-01	750	2,818E-04	1050	7,502E-04	1950	7,786E-01	3450	1,852E-01	4950	6,127E-02
460	9,080E-01	760	1,794E-04	1060	9,159E-04	2000	8,056E-01	3500	1,834E-01	5000	7,711E-02
470	9,150E-01	770	1,187E-04	1070	1,118E-03	2050	8,274E-01	3550	1,867E-01	5050	9,209E-02
480	9,214E-01	780	8,223E-05	1080	1,357E-03	2100	8,467E-01	3600	1,950E-01	5100	1,029E-01
490	9,303E-01	790	6,013E-05	1090	1,655E-03	2150	8,632E-01	3650	2,082E-01	5150	1,065E-01

BG60HT

Optical properties		Mechanical properties		Colormetric properties					
Reflection factor		Reference thickness		1 mm		2 mm		3 mm	
$P_d = 0,914$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,233	0,198	0,178	
Spectral values guaranteed		Density			y	0,315	0,300		0,287
$\tau_i (405 \text{ nm}) \geq 0,85$	$\rho = 2,83 \text{ g/cm}^3$		Y		64,1	50,6		42,0	
$\tau_i (514 \text{ nm}) \geq 0,93$	Knoop hardness		λ_d		489 nm	488 nm		488 nm	
$\tau_i (633 \text{ nm}) \geq 0,1$	$HK[0.1/20] = 362$		P_e		0,300	0,442		0,525	
$\tau_i (694 \text{ nm}) \leq 0,008$	Thermal properties		Illuminant A	x	0,330	0,266		0,227	
$\tau_i (1060 \text{ nm}) \leq 0,0015$	Transformation temperature			y	0,435	0,436		0,429	
	$T_g = 411 \text{ }^\circ\text{C}$			Y	55,7	40,8		32,2	
	Thermal expansion in $10^{-6}/\text{K}$			λ_d	499 nm	498 nm		496 nm	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 12,0$			P_e	0,270	0,421		0,514	
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 13,9$		Notes						
Refractive indices		Chemical properties		Ionically colored glass					
$n_F (486 \text{ nm}) = 1,544$	Chemical resistance		Bandpass filter / Shortpass filter						
$n_e (546 \text{ nm}) = 1,54$	FR class = 1		NIR cutoff filter						
$n_d (587,6 \text{ nm}) = 1,538$	SR class = 52.2		$\lambda_{50\%}(d=0.3\text{mm}) = 633 \text{ nm}$						
	AR class = 3.2		ISO 23364:2021						
Sellmeier coefficients		Resistance against humidity		Disclaimer					
valid from 340 nm to 1550 nm				All data without tolerances are to be understood to be reference values.					
$B_1 = 1,3298$									
$B_2 = 0,0004$									
$B_3 = 2,5598$									
$C_1 = 9,241\text{E-}03 \text{ } \mu\text{m}^2$									
$C_2 = 1,0918\text{E-}01 \text{ } \mu\text{m}^2$									
$C_3 = 450,591 \text{ } \mu\text{m}^2$									
Internal quality									
Bubble class 2									



BG60HT

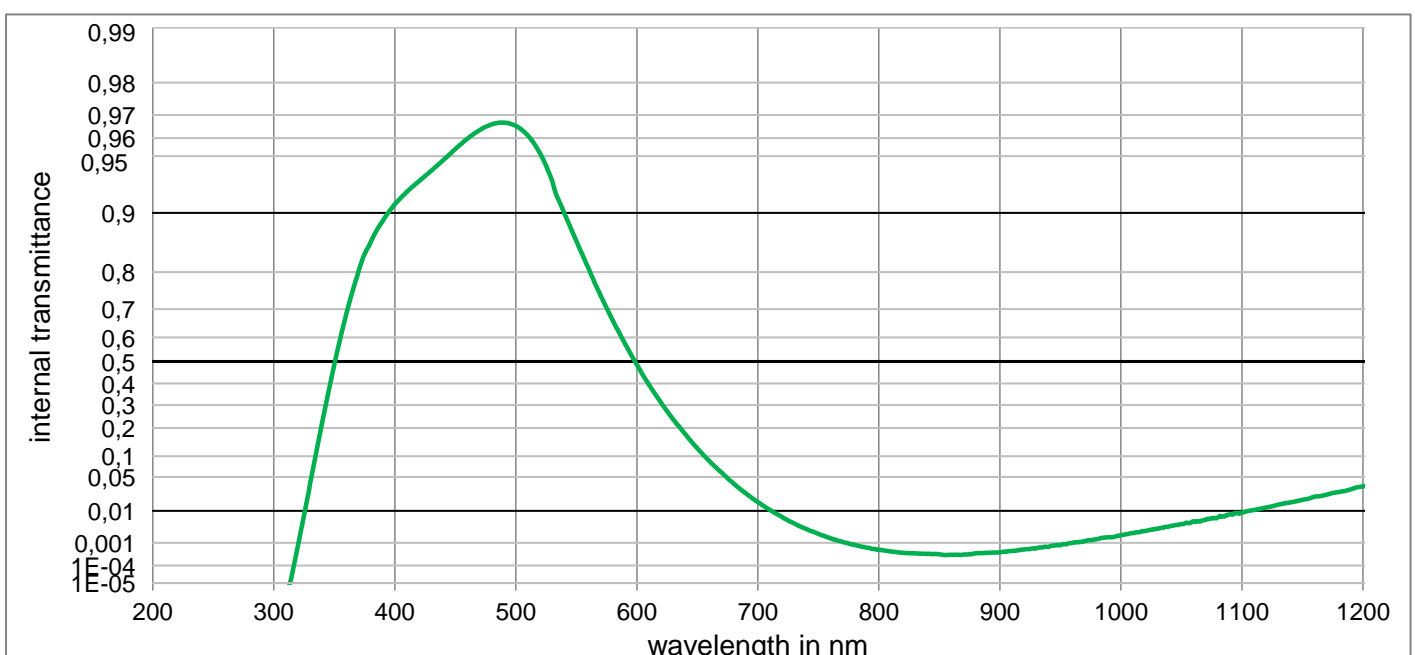


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

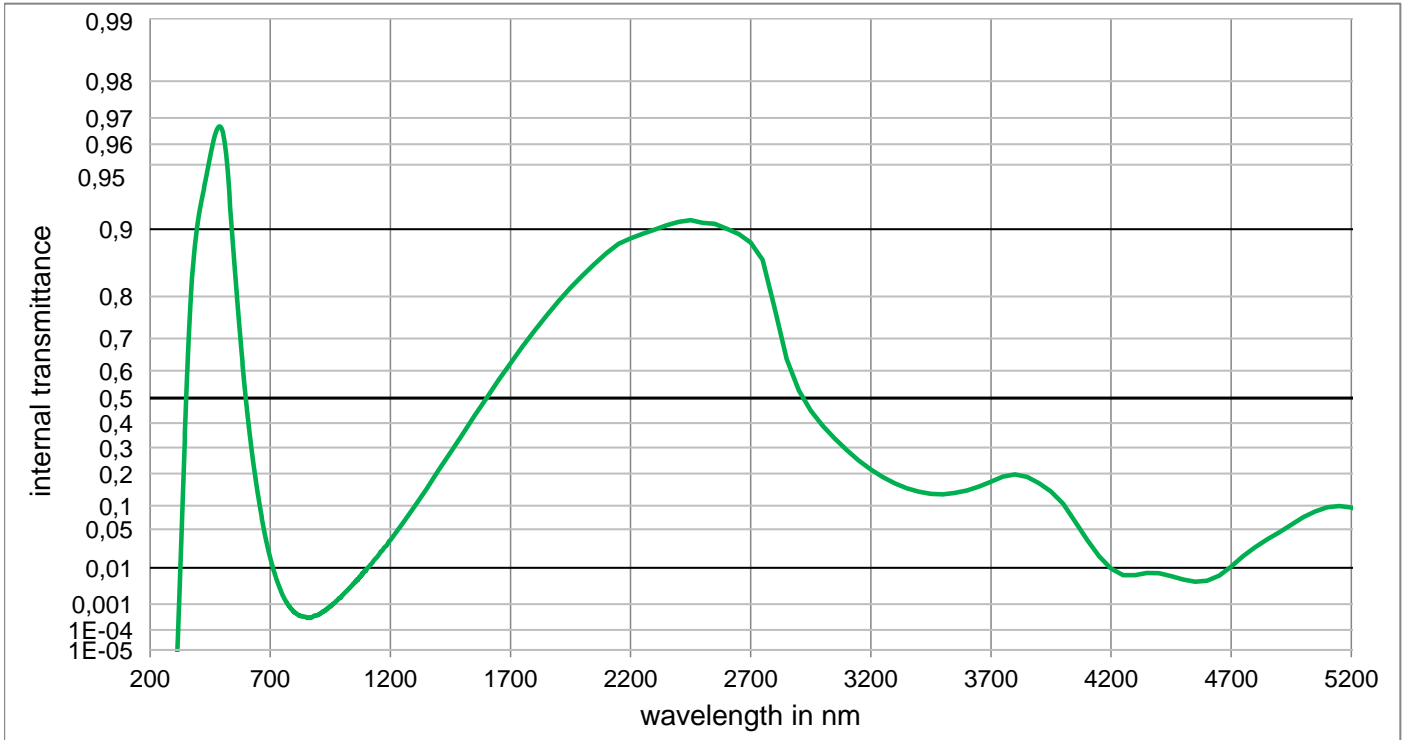
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,452E-01	800	4,502E-05	1100	2,177E-03	2200	8,909E-01	3700	3,635E-01
210	< 1,000E-05	510	9,404E-01	810	3,656E-05	1110	2,626E-03	2250	9,019E-01	3750	3,805E-01
220	< 1,000E-05	520	9,288E-01	820	3,119E-05	1120	3,188E-03	2300	9,103E-01	3800	3,826E-01
230	< 1,000E-05	530	9,073E-01	830	2,793E-05	1130	3,874E-03	2350	9,188E-01	3850	3,583E-01
240	< 1,000E-05	540	8,739E-01	840	2,564E-05	1140	4,603E-03	2400	9,246E-01	3900	3,143E-01
250	< 1,000E-05	550	8,260E-01	850	2,372E-05	1150	5,383E-03	2450	9,257E-01	3950	2,645E-01
260	< 1,000E-05	560	7,618E-01	860	2,639E-05	1160	6,519E-03	2500	9,222E-01	4000	2,114E-01
270	< 1,000E-05	570	6,817E-01	870	2,872E-05	1170	7,711E-03	2550	9,288E-01	4050	1,384E-01
280	< 1,000E-05	580	5,900E-01	880	3,410E-05	1180	8,976E-03	2600	9,279E-01	4100	7,617E-02
290	< 1,000E-05	590	4,908E-01	890	3,233E-05	1190	1,032E-02	2650	9,261E-01	4150	3,905E-02
300	< 1,000E-05	600	3,920E-01	900	3,719E-05	1200	1,224E-02	2700	9,218E-01	4200	2,110E-02
310	< 1,000E-05	610	2,994E-01	910	5,030E-05	1250	2,586E-02	2750	9,096E-01	4250	1,416E-02
320	7,415E-05	620	2,184E-01	920	4,952E-05	1300	4,890E-02	2800	8,624E-01	4300	1,306E-02
330	1,574E-02	630	1,509E-01	930	6,534E-05	1350	8,439E-02	2850	7,781E-01	4350	1,346E-02
340	1,447E-01	640	1,002E-01	940	8,100E-05	1400	1,324E-01	2900	7,003E-01	4400	1,236E-02
350	3,866E-01	650	6,391E-02	950	9,477E-05	1450	1,953E-01	2950	6,400E-01	4450	9,979E-03
360	5,939E-01	660	3,912E-02	960	1,248E-04	1500	2,655E-01	3000	5,905E-01	4500	7,775E-03
370	7,185E-01	670	2,310E-02	970	1,384E-04	1550	3,426E-01	3050	5,454E-01	4550	6,476E-03
380	7,901E-01	680	1,336E-02	980	1,873E-04	1600	4,175E-01	3100	5,027E-01	4600	6,340E-03
390	8,295E-01	690	7,552E-03	990	2,146E-04	1650	4,899E-01	3150	4,626E-01	4650	8,118E-03
400	8,554E-01	700	4,483E-03	1000	2,823E-04	1700	5,594E-01	3200	4,268E-01	4700	1,303E-02
410	8,740E-01	710	2,369E-03	1010	3,353E-04	1750	6,200E-01	3250	3,957E-01	4750	2,161E-02
420	8,890E-01	720	1,335E-03	1020	4,468E-04	1800	6,742E-01	3300	3,700E-01	4800	3,292E-02
430	9,016E-01	730	7,666E-04	1030	5,325E-04	1850	7,188E-01	3350	3,495E-01	4850	4,615E-02
440	9,125E-01	740	4,521E-04	1040	6,468E-04	1900	7,658E-01	3400	3,339E-01	4900	6,232E-02
450	9,226E-01	750	2,747E-04	1050	8,132E-04	1950	7,954E-01	3450	3,245E-01	4950	8,366E-02
460	9,312E-01	760	1,741E-04	1060	1,044E-03	2000	8,219E-01	3500	3,205E-01	5000	1,085E-01
470	9,365E-01	770	1,155E-04	1070	1,248E-03	2050	8,448E-01	3550	3,231E-01	5050	1,318E-01
480	9,417E-01	780	8,046E-05	1080	1,509E-03	2100	8,596E-01	3600	3,311E-01	5100	1,485E-01
490	9,460E-01	790	5,856E-05	1090	1,833E-03	2150	8,797E-01	3650	3,451E-01	5150	1,548E-01

BG61

Optical properties		Mechanical properties		Colorimetric properties				
Reflection factor		Reference thickness		1 mm		2 mm	3 mm	
$P_d = 0,915$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,245	0,210	0,189
Spectral values guaranteed		Density			y	0,319	0,307	0,296
$\tau_i (405 \text{ nm}) \geq 0,84$		$\rho = 2,81 \text{ g/cm}^3$			Y	68,0	55,2	46,7
$\tau_i (514 \text{ nm}) \geq 0,93$		Knoop hardness			λ_d	490 nm	489 nm	488 nm
$\tau_i (633 \text{ nm}) \geq 0,18$		$HK[0.1/20] = 363$			P_e	0,254	0,391	0,476
$\tau_i (694 \text{ nm}) \leq 0,03$		Thermal properties		Illuminant A	x	0,349	0,289	0,250
$\tau_i (1060 \text{ nm}) \leq 0,008$		Transformation temperature			y	0,432	0,438	0,435
		$T_g = 402 \text{ }^\circ\text{C}$			Y	60,4	45,7	36,9
		Thermal expansion in $10^{-6}/\text{K}$			λ_d	499 nm	498 nm	497 nm
		$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 11,9$			P_e	0,225	0,365	0,458
		$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 13,9$		Notes				
Refractive indices		Chemical properties		Ionically colored glass				
$n_F (486 \text{ nm}) = 1,541$		Chemical resistance		Bandpass filter / Shortpass filter				
$n_e (546 \text{ nm}) = 1,537$		FR class = 1		NIR cutoff filter				
$n_d (587,6 \text{ nm}) = 1,535$		SR class = 52.3		$\lambda_{50\%}(d=0.3\text{mm}) = 648 \text{ nm}$				
		AR class = 3.3		ISO 23364:2021				
Sellmeier coefficients		Resistance against humidity		Disclaimer				
valid from 340 nm to 1550 nm				All data without tolerances are to be understood to be reference values.				
$B_1 = 1,3212$								
$B_2 = 0,0004$								
$B_3 = 0,0589$								
$C_1 = 9,180\text{E-}03 \text{ } \mu\text{m}^2$								
$C_2 = 1,1649\text{E-}01 \text{ } \mu\text{m}^2$								
$C_3 = 12,101 \text{ } \mu\text{m}^2$								
Internal quality								
Bubble class 2								



BG61



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,656E-01	800	5,193E-04	1100	9,044E-03	2200	8,897E-01	3700	1,718E-01
210	< 1,000E-05	510	9,612E-01	810	4,547E-04	1110	1,045E-02	2250	8,951E-01	3750	1,889E-01
220	< 1,000E-05	520	9,516E-01	820	3,958E-04	1120	1,210E-02	2300	8,995E-01	3800	1,973E-01
230	< 1,000E-05	530	9,326E-01	830	3,721E-04	1130	1,412E-02	2350	9,042E-01	3850	1,886E-01
240	< 1,000E-05	540	9,001E-01	840	3,530E-04	1140	1,599E-02	2400	9,076E-01	3900	1,668E-01
250	< 1,000E-05	550	8,602E-01	850	3,372E-04	1150	1,819E-02	2450	9,091E-01	3950	1,399E-01
260	< 1,000E-05	560	8,082E-01	860	3,277E-04	1160	2,144E-02	2500	9,064E-01	4000	1,051E-01
270	< 1,000E-05	570	7,417E-01	870	3,291E-04	1170	2,359E-02	2550	9,055E-01	4050	6,433E-02
280	< 1,000E-05	580	6,631E-01	880	3,728E-04	1180	2,664E-02	2600	9,005E-01	4100	3,430E-02
290	< 1,000E-05	590	5,767E-01	890	3,944E-04	1190	3,013E-02	2650	8,947E-01	4150	1,749E-02
300	< 1,000E-05	600	4,848E-01	900	4,116E-04	1200	3,407E-02	2700	8,849E-01	4200	9,654E-03
310	< 1,000E-05	610	3,949E-01	910	4,741E-04	1250	5,972E-02	2750	8,623E-01	4250	6,791E-03
320	8,279E-04	620	3,106E-01	920	5,553E-04	1300	9,768E-02	2800	7,744E-01	4300	6,709E-03
330	3,776E-02	630	2,359E-01	930	6,122E-04	1350	1,471E-01	2850	6,386E-01	4350	7,569E-03
340	2,218E-01	640	1,744E-01	940	6,917E-04	1400	2,110E-01	2900	5,289E-01	4400	7,518E-03
350	4,867E-01	650	1,247E-01	950	8,146E-04	1450	2,800E-01	2950	4,504E-01	4450	6,408E-03
360	6,867E-01	660	8,605E-02	960	9,997E-04	1500	3,528E-01	3000	3,893E-01	4500	5,234E-03
370	8,013E-01	670	5,862E-02	970	1,164E-03	1550	4,286E-01	3050	3,366E-01	4550	4,591E-03
380	8,579E-01	680	3,831E-02	980	1,375E-03	1600	4,994E-01	3100	2,896E-01	4600	4,923E-03
390	8,900E-01	690	2,506E-02	990	1,621E-03	1650	5,662E-01	3150	2,488E-01	4650	6,605E-03
400	9,099E-01	700	1,619E-02	1000	1,899E-03	1700	6,247E-01	3200	2,145E-01	4700	1,066E-02
410	9,225E-01	710	1,049E-02	1010	2,246E-03	1750	6,771E-01	3250	1,871E-01	4750	1,748E-02
420	9,320E-01	720	6,864E-03	1020	2,621E-03	1800	7,210E-01	3300	1,658E-01	4800	2,590E-02
430	9,401E-01	730	4,501E-03	1030	3,084E-03	1850	7,586E-01	3350	1,500E-01	4850	3,480E-02
440	9,475E-01	740	3,032E-03	1040	3,652E-03	1900	7,902E-01	3400	1,394E-01	4900	4,502E-02
450	9,542E-01	750	2,113E-03	1050	4,329E-03	1950	8,168E-01	3450	1,330E-01	4950	5,802E-02
460	9,597E-01	760	1,465E-03	1060	5,237E-03	2000	8,384E-01	3500	1,313E-01	5000	7,262E-02
470	9,638E-01	770	1,094E-03	1070	5,656E-03	2050	8,562E-01	3550	1,359E-01	5050	8,615E-02
480	9,663E-01	780	8,376E-04	1080	6,708E-03	2100	8,717E-01	3600	1,432E-01	5100	9,571E-02
490	9,670E-01	790	6,491E-04	1090	8,091E-03	2150	8,834E-01	3650	1,554E-01	5150	9,889E-02

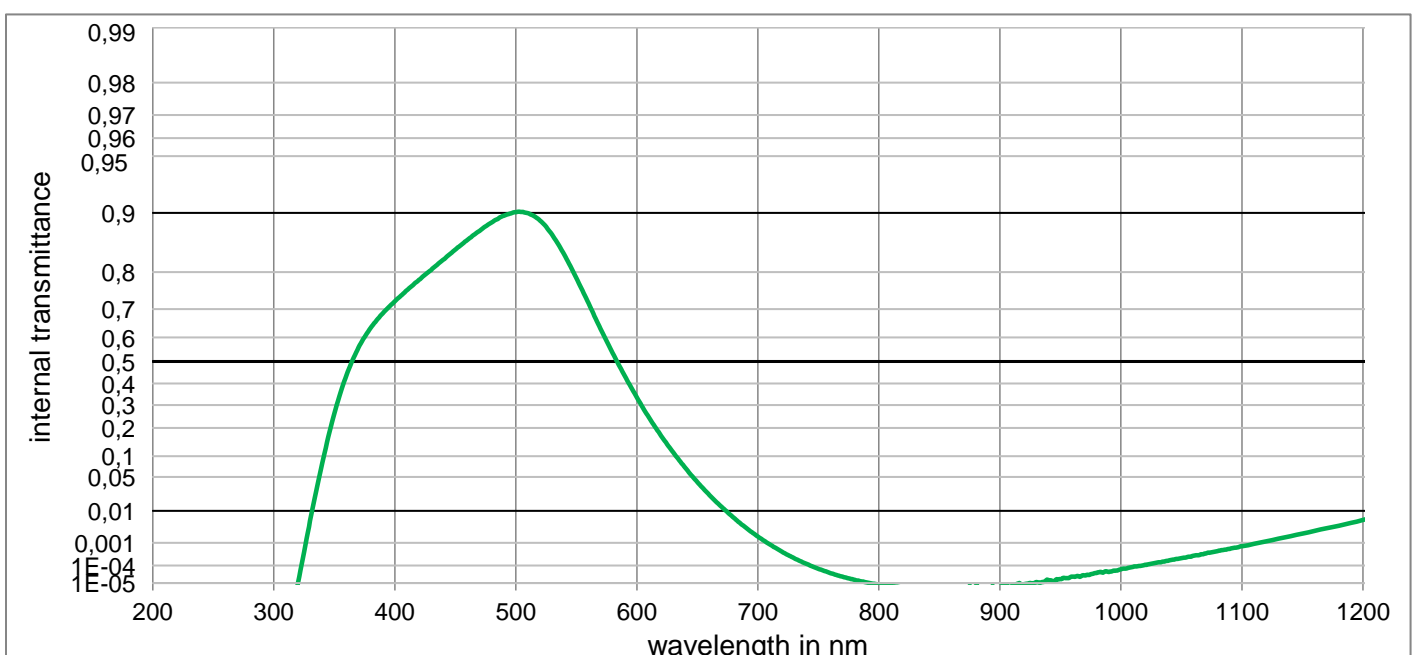
BG62

Optical properties	
Reflection factor	
$P_d = 0,915$	
Spectral values guaranteed	
τ_i (405 nm)	$\geq 0,73$
τ_i (514 nm)	$\geq 0,89$
τ_i (633 nm)	$\geq 0,08$
τ_i (694 nm)	$\leq 0,005$
τ_i (1060 nm)	$\leq 0,0005$
Refractive indices	
n_F (486 nm)	$= 1,546$
n_e (546 nm)	$= 1,542$
n_d (587,6 nm)	$= 1,54$
Sellmeier coefficients	
valid from 340 nm to 1550 nm	
B_1	1,2129
B_2	0,1238
B_3	0,0621
C_1	6,667E-03 μm^2
C_2	3,0034E-02 μm^2
C_3	12,219 μm^2
Internal quality	
Bubble class	2

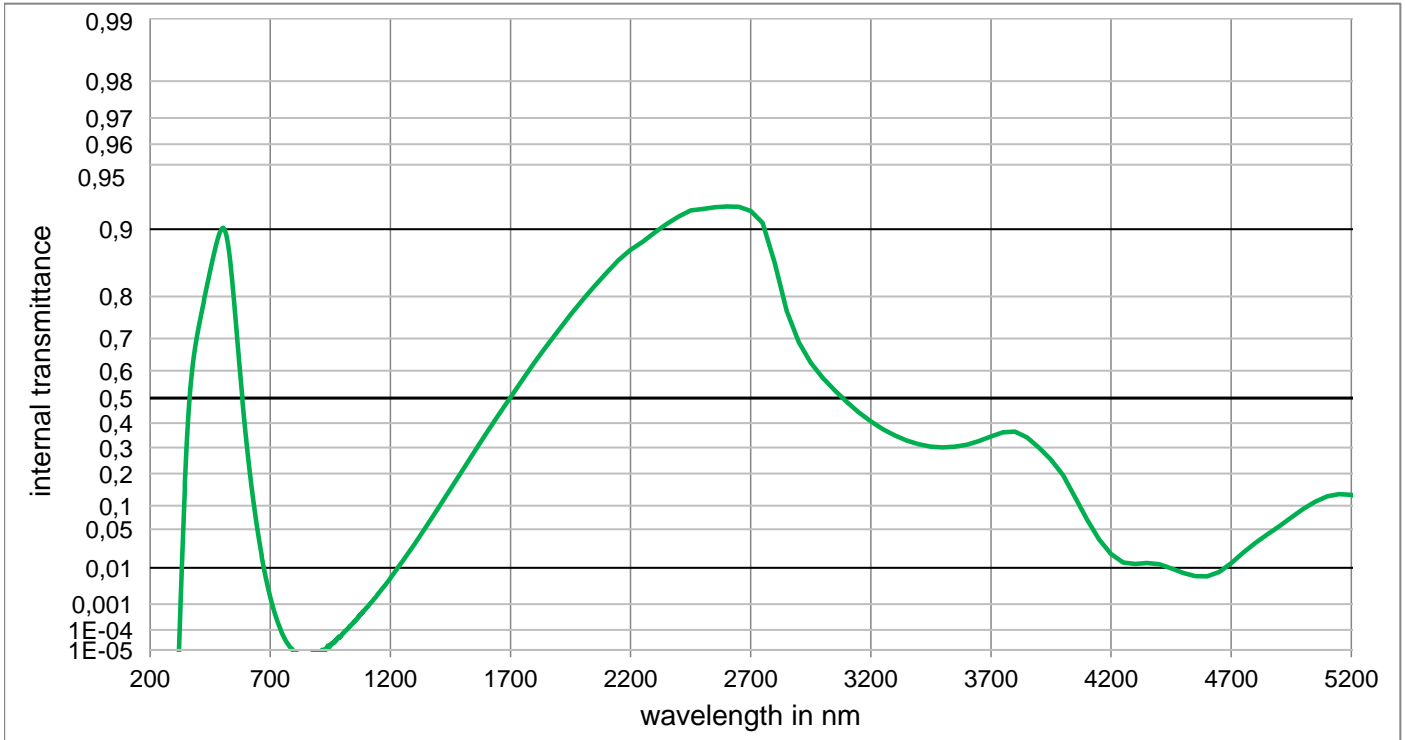
Mechanical properties	
Reference thickness	
$d = 1,00 \text{ mm}$	
Density	
$\rho = 2,85 \text{ g/cm}^3$	
Knoop hardness	
HK[0.1/20] = 368	
Thermal properties	
Transformation temperature	
$T_g = 410 \text{ }^\circ\text{C}$	
Thermal expansion in $10^{-6}/\text{K}$	
α (-30 $^\circ\text{C}/+70^\circ\text{C}$)	$= 11,9$
α (20 $^\circ\text{C}/300^\circ\text{C}$)	$= 13,6$
Chemical properties	
Chemical resistance	
FR class	$= 1$
SR class	$= 52.3$
AR class	$= 3.3$
Resistance against humidity	

Colormetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,229	0,194	0,175
	y	0,320	0,311	0,305
	Y	60,0	45,1	35,8
	λ_d	490 nm	490 nm	489 nm
	P_e	0,312	0,446	0,520
Illuminant A	x	0,321	0,257	0,220
	y	0,441	0,447	0,445
	Y	51,6	36,0	27,2
	λ_d	499 nm	498 nm	498 nm
P_e	0,290	0,438	0,524	

Notes	
Ionically colored glass	
Bandpass filter / Shortpass filter	
NIR cutoff filter	
$\lambda_{d_50\%}(d=0.21\text{mm}) = 644 \text{ nm}$	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



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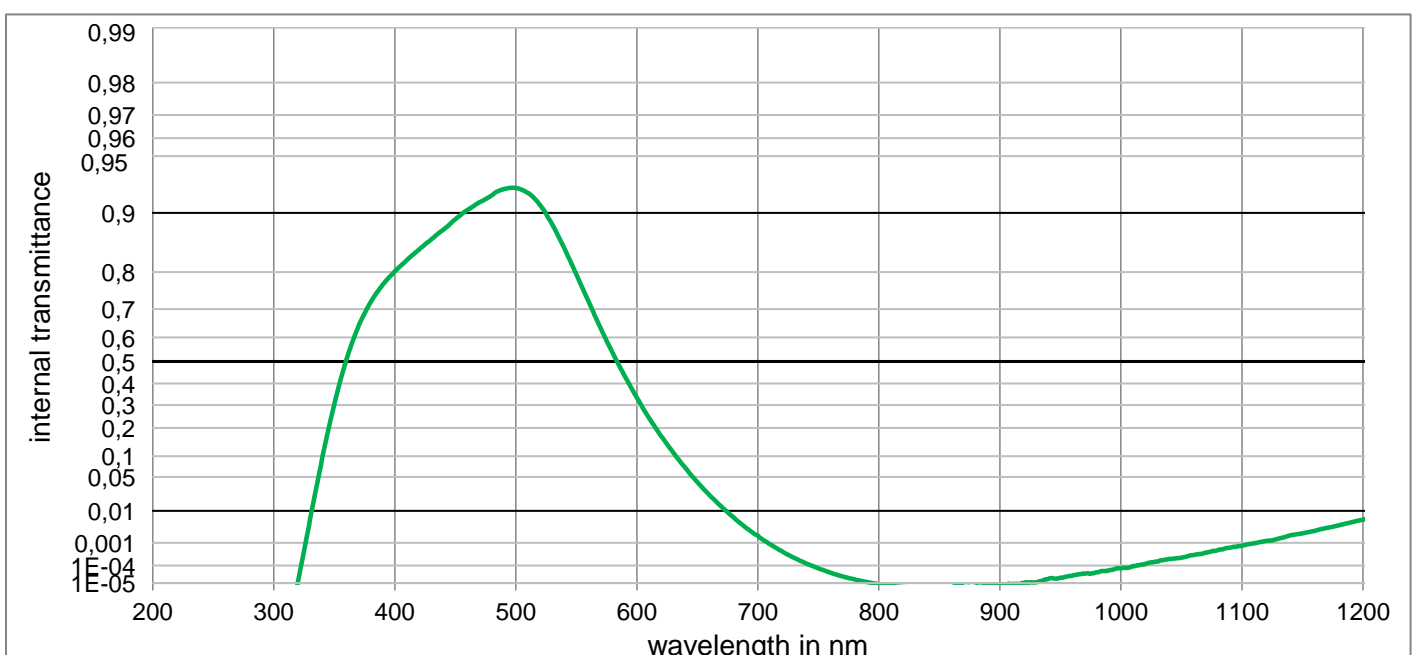


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

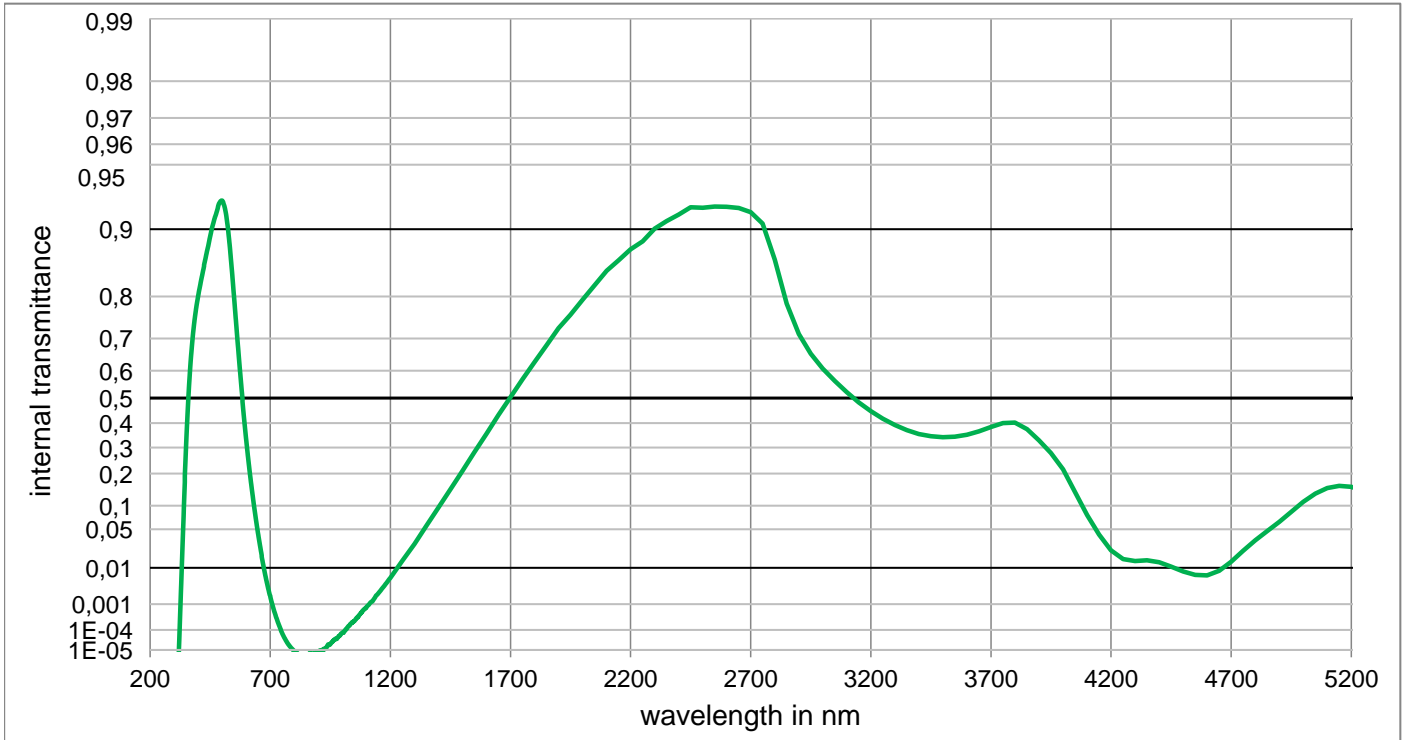
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,010E-01	800	< 1,000E-05	1100	7,390E-04	2200	8,757E-01	3700	3,448E-01
210	< 1,000E-05	510	8,996E-01	810	< 1,000E-05	1110	9,134E-04	2250	8,858E-01	3750	3,621E-01
220	< 1,000E-05	520	8,902E-01	820	< 1,000E-05	1120	1,135E-03	2300	8,963E-01	3800	3,647E-01
230	< 1,000E-05	530	8,704E-01	830	< 1,000E-05	1130	1,415E-03	2350	9,053E-01	3850	3,416E-01
240	< 1,000E-05	540	8,363E-01	840	< 1,000E-05	1140	1,732E-03	2400	9,126E-01	3900	2,998E-01
250	< 1,000E-05	550	7,859E-01	850	< 1,000E-05	1150	2,149E-03	2450	9,180E-01	3950	2,524E-01
260	< 1,000E-05	560	7,179E-01	860	< 1,000E-05	1160	2,620E-03	2500	9,193E-01	4000	1,940E-01
270	< 1,000E-05	570	6,330E-01	870	< 1,000E-05	1170	3,235E-03	2550	9,208E-01	4050	1,235E-01
280	< 1,000E-05	580	5,365E-01	880	< 1,000E-05	1180	3,803E-03	2600	9,215E-01	4100	6,781E-02
290	< 1,000E-05	590	4,347E-01	890	< 1,000E-05	1190	4,695E-03	2650	9,213E-01	4150	3,506E-02
300	< 1,000E-05	600	3,347E-01	900	< 1,000E-05	1200	5,724E-03	2700	9,177E-01	4200	1,926E-02
310	< 1,000E-05	610	2,446E-01	910	< 1,000E-05	1250	1,361E-02	2750	9,065E-01	4250	1,309E-02
320	1,091E-05	620	1,691E-01	920	< 1,000E-05	1300	2,886E-02	2800	8,575E-01	4300	1,218E-02
330	5,414E-03	630	1,115E-01	930	1,165E-05	1350	5,506E-02	2850	7,696E-01	4350	1,280E-02
340	7,963E-02	640	6,907E-02	940	1,541E-05	1400	9,391E-02	2900	6,891E-01	4400	1,197E-02
350	2,609E-01	650	4,086E-02	950	1,755E-05	1450	1,474E-01	2950	6,267E-01	4450	9,752E-03
360	4,385E-01	660	2,302E-02	960	2,479E-05	1500	2,108E-01	3000	5,754E-01	4500	7,643E-03
370	5,592E-01	670	1,251E-02	970	2,870E-05	1550	2,833E-01	3050	5,287E-01	4550	6,426E-03
380	6,359E-01	680	6,564E-03	980	4,020E-05	1600	3,593E-01	3100	4,846E-01	4600	6,306E-03
390	6,861E-01	690	3,364E-03	990	4,506E-05	1650	4,329E-01	3150	4,432E-01	4650	8,001E-03
400	7,241E-01	700	1,703E-03	1000	6,306E-05	1700	5,028E-01	3200	4,065E-01	4700	1,261E-02
410	7,548E-01	710	8,557E-04	1010	8,451E-05	1750	5,686E-01	3250	3,749E-01	4750	2,046E-02
420	7,817E-01	720	4,359E-04	1020	1,094E-04	1800	6,275E-01	3300	3,489E-01	4800	3,035E-02
430	8,047E-01	730	2,284E-04	1030	1,406E-04	1850	6,784E-01	3350	3,284E-01	4850	4,167E-02
440	8,263E-01	740	1,222E-04	1040	1,816E-04	1900	7,221E-01	3400	3,129E-01	4900	5,510E-02
450	8,455E-01	750	6,774E-05	1050	2,297E-04	1950	7,604E-01	3450	3,039E-01	4950	7,229E-02
460	8,620E-01	760	3,935E-05	1060	2,932E-04	2000	7,928E-01	3500	3,002E-01	5000	9,193E-02
470	8,761E-01	770	2,448E-05	1070	3,653E-04	2050	8,197E-01	3550	3,034E-01	5050	1,109E-01
480	8,878E-01	780	1,610E-05	1080	4,627E-04	2100	8,428E-01	3600	3,118E-01	5100	1,255E-01
490	8,965E-01	790	1,109E-05	1090	5,805E-04	2150	8,618E-01	3650	3,260E-01	5150	1,323E-01

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Optical properties		Mechanical properties		Colormetric properties						
Reflection factor		Reference thickness		1 mm		2 mm		3 mm		
$P_d = 0,914$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,226	0,191	0,172		
Spectral values guaranteed		Density			y	0,314	0,299	0,288		
$\tau_i (405 \text{ nm}) \geq 0,8$	$\rho = 2,85 \text{ g/cm}^3$		Y		60,8	46,6	37,7			
$\tau_i (514 \text{ nm}) \geq 0,9$	Knoop hardness		λ_d		489 nm	489 nm	488 nm			
$\tau_i (633 \text{ nm}) \geq 0,08$	$HK[0.1/20] = 368$		P_e		0,326	0,468	0,546			
$\tau_i (694 \text{ nm}) \leq 0,004$	Thermal properties		Illuminant A	x	0,317	0,252	0,215			
$\tau_i (1060 \text{ nm}) \leq 0,0005$	Transformation temperature			y	0,438	0,438	0,430			
	$T_g = 410 \text{ }^\circ\text{C}$			Y	52,0	36,9	28,4			
	Thermal expansion in $10^{-6}/\text{K}$			λ_d	499 nm	497 nm	496 nm			
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 11,8$			P_e	0,299	0,452	0,542			
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 13,7$		Notes							
Refractive indices		Chemical properties		Ionically colored glass						
$n_F (486 \text{ nm}) = 1,546$	Chemical resistance		Bandpass filter / Shortpass filter							
$n_e (546 \text{ nm}) = 1,542$	FR class = 1		NIR cutoff filter							
$n_d (587,6 \text{ nm}) = 1,54$	SR class = 52.3		lambda_50%(d=0.21mm) = 644 nm							
	AR class = 3.3		ISO 23364:2021							
Sellmeier coefficients		Resistance against humidity		Disclaimer						
valid from 340 nm to 1550 nm				All data without tolerances are to be understood to be reference values.						
$B_1 = 1,2129$										
$B_2 = 0,1238$										
$B_3 = 0,0621$										
$C_1 = 6,667\text{E-}03 \text{ } \mu\text{m}^2$										
$C_2 = 3,0034\text{E-}02 \text{ } \mu\text{m}^2$										
$C_3 = 12,219 \text{ } \mu\text{m}^2$										
Internal quality										
Bubble class 2										



BG62HT



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,261E-01	800	< 1,000E-05	1100	7,708E-04	2200	8,764E-01	3700	3,841E-01
210	< 1,000E-05	510	9,214E-01	810	< 1,000E-05	1110	9,495E-04	2250	8,864E-01	3750	4,004E-01
220	< 1,000E-05	520	9,089E-01	820	< 1,000E-05	1120	1,194E-03	2300	9,006E-01	3800	4,015E-01
230	< 1,000E-05	530	8,856E-01	830	< 1,000E-05	1130	1,417E-03	2350	9,081E-01	3850	3,755E-01
240	< 1,000E-05	540	8,483E-01	840	< 1,000E-05	1140	1,889E-03	2400	9,143E-01	3900	3,297E-01
250	< 1,000E-05	550	7,945E-01	850	< 1,000E-05	1150	2,190E-03	2450	9,208E-01	3950	2,780E-01
260	< 1,000E-05	560	7,232E-01	860	< 1,000E-05	1160	2,656E-03	2500	9,204E-01	4000	2,153E-01
270	< 1,000E-05	570	6,361E-01	870	< 1,000E-05	1170	3,280E-03	2550	9,214E-01	4050	1,386E-01
280	< 1,000E-05	580	5,373E-01	880	< 1,000E-05	1180	3,977E-03	2600	9,213E-01	4100	7,754E-02
290	< 1,000E-05	590	4,338E-01	890	< 1,000E-05	1190	4,816E-03	2650	9,202E-01	4150	4,183E-02
300	< 1,000E-05	600	3,335E-01	900	< 1,000E-05	1200	5,792E-03	2700	9,166E-01	4200	2,268E-02
310	< 1,000E-05	610	2,433E-01	910	< 1,000E-05	1250	1,420E-02	2750	9,057E-01	4250	1,526E-02
320	1,339E-05	620	1,683E-01	920	1,017E-05	1300	2,938E-02	2800	8,625E-01	4300	1,405E-02
330	5,930E-03	630	1,110E-01	930	1,146E-05	1350	5,598E-02	2850	7,851E-01	4350	1,440E-02
340	9,512E-02	640	6,912E-02	940	1,861E-05	1400	9,470E-02	2900	7,123E-01	4400	1,317E-02
350	3,042E-01	650	4,089E-02	950	2,151E-05	1450	1,470E-01	2950	6,549E-01	4450	1,057E-02
360	5,087E-01	660	2,308E-02	960	2,868E-05	1500	2,097E-01	3000	6,073E-01	4500	8,216E-03
370	6,420E-01	670	1,259E-02	970	3,657E-05	1550	2,813E-01	3050	5,638E-01	4550	6,843E-03
380	7,214E-01	680	6,615E-03	980	4,364E-05	1600	3,563E-01	3100	5,224E-01	4600	6,690E-03
390	7,694E-01	690	3,406E-03	990	5,597E-05	1650	4,329E-01	3150	4,834E-01	4650	8,518E-03
400	8,016E-01	700	1,849E-03	1000	7,191E-05	1700	5,036E-01	3200	4,482E-01	4700	1,353E-02
410	8,257E-01	710	8,801E-04	1010	9,398E-05	1750	5,702E-01	3250	4,175E-01	4750	2,221E-02
420	8,456E-01	720	4,531E-04	1020	1,185E-04	1800	6,281E-01	3300	3,919E-01	4800	3,359E-02
430	8,627E-01	730	2,360E-04	1030	1,571E-04	1850	6,812E-01	3350	3,714E-01	4850	4,702E-02
440	8,779E-01	740	1,276E-04	1040	2,103E-04	1900	7,279E-01	3400	3,556E-01	4900	6,337E-02
450	8,919E-01	750	7,146E-05	1050	2,391E-04	1950	7,606E-01	3450	3,461E-01	4950	8,489E-02
460	9,036E-01	760	4,179E-05	1060	3,161E-04	2000	7,936E-01	3500	3,419E-01	5000	1,098E-01
470	9,121E-01	770	2,577E-05	1070	4,016E-04	2050	8,208E-01	3550	3,445E-01	5050	1,335E-01
480	9,190E-01	780	1,695E-05	1080	5,109E-04	2100	8,458E-01	3600	3,524E-01	5100	1,508E-01
490	9,251E-01	790	1,170E-05	1090	6,481E-04	2150	8,616E-01	3650	3,662E-01	5150	1,578E-01

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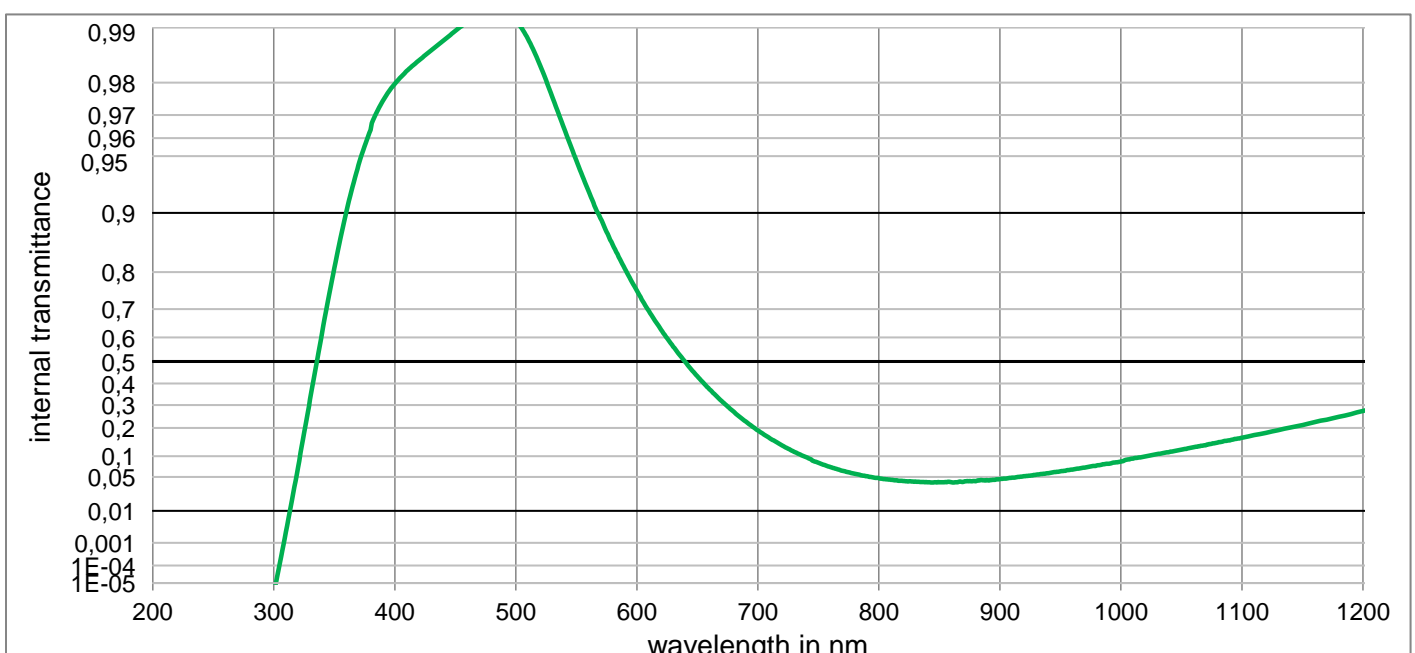
Optical properties	
Reflection factor	
$P_d = 0,916$	
Spectral values guaranteed	
τ_i (405 nm)	$\geq 0,95$
τ_i (514 nm)	$\geq 0,96$
τ_i (633 nm)	$\geq 0,5$
τ_i (694 nm)	$\leq 0,25$
τ_i (1060 nm)	$\leq 0,16$
Refractive indices	
n_F (486 nm)	= 1,538
n_e (546 nm)	= 1,534
n_d (587,6 nm)	= 1,532
Sellmeier coefficients	
valid from 365 nm to 2325 nm	
B_1	1,3115
B_2	0,0046
B_3	0,3087
C_1	8,469E-03 μm^2
C_2	5,7634E-02 μm^2
C_3	46,721 μm^2
Internal quality	
Bubble class	2

Mechanical properties	
Reference thickness	
$d = 1,00 \text{ mm}$	
Density	
$\rho = 2,79 \text{ g/cm}^3$	
Knoop hardness	
HK[0.1/20] = 362	
Thermal properties	
Transformation temperature	
$T_g = 416 \text{ }^\circ\text{C}$	
Thermal expansion in $10^{-6}/\text{K}$	
α (-30 $^\circ\text{C}/+70^\circ\text{C}$)	= 11,9
α (20 $^\circ\text{C}/300^\circ\text{C}$)	= 13,9

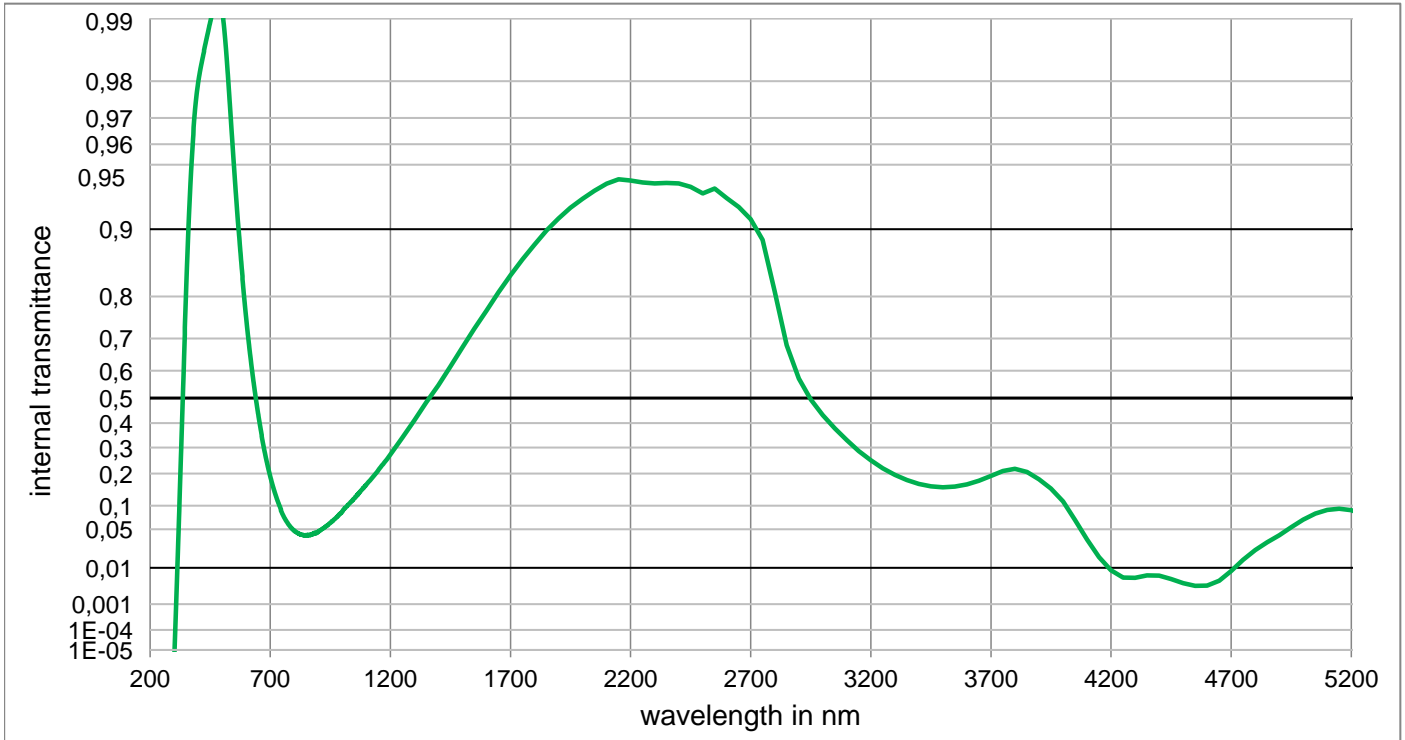
Chemical properties	
Chemical resistance	
FR class	= 1
SR class	= 52.3
AR class	= 3.3
Resistance against humidity	

Colormetric properties				
		1 mm	2 mm	3 mm
Illuminant D65	x	0,280	0,255	0,237
	y	0,325	0,319	0,313
	Y	80,9	73,0	67,0
	λ_d	490 nm	489 nm	489 nm
	P_e	0,123	0,216	0,289
Illuminant A	x	0,403	0,366	0,336
	y	0,420	0,428	0,432
	Y	76,5	66,2	58,6
	λ_d	500 nm	499 nm	499 nm
	P_e	0,102	0,186	0,256

Notes	
Ionically colored glass	
Bandpass filter / Shortpass filter	
NIR cutoff filter	
$\lambda_{d_50\%}(d=1.5\text{mm}) = 614 \text{ nm}$	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



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Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,909E-01	800	4,771E-02	1100	1,621E-01	2200	9,406E-01	3700	1,921E-01
210	< 1,000E-05	510	9,885E-01	810	4,471E-02	1110	1,714E-01	2250	9,393E-01	3750	2,095E-01
220	< 1,000E-05	520	9,839E-01	820	4,271E-02	1120	1,806E-01	2300	9,388E-01	3800	2,171E-01
230	< 1,000E-05	530	9,763E-01	830	4,174E-02	1130	1,912E-01	2350	9,391E-01	3850	2,055E-01
240	< 1,000E-05	540	9,644E-01	840	4,061E-02	1140	2,015E-01	2400	9,387E-01	3900	1,796E-01
250	< 1,000E-05	550	9,471E-01	850	4,057E-02	1150	2,122E-01	2450	9,364E-01	3950	1,492E-01
260	< 1,000E-05	560	9,232E-01	860	4,065E-02	1160	2,240E-01	2500	9,317E-01	4000	1,114E-01
270	< 1,000E-05	570	8,935E-01	870	4,149E-02	1170	2,349E-01	2550	9,352E-01	4050	6,722E-02
280	< 1,000E-05	580	8,543E-01	880	4,238E-02	1180	2,467E-01	2600	9,284E-01	4100	3,475E-02
290	< 1,000E-05	590	8,076E-01	890	4,391E-02	1190	2,591E-01	2650	9,210E-01	4150	1,686E-02
300	< 1,000E-05	600	7,536E-01	900	4,619E-02	1200	2,726E-01	2700	9,101E-01	4200	8,809E-03
310	2,433E-03	610	6,937E-01	910	4,868E-02	1250	3,398E-01	2750	8,881E-01	4250	5,895E-03
320	7,008E-02	620	6,295E-01	920	5,153E-02	1300	4,115E-01	2800	8,095E-01	4300	5,826E-03
330	3,265E-01	630	5,632E-01	930	5,418E-02	1350	4,843E-01	2850	6,807E-01	4350	6,643E-03
340	6,188E-01	640	4,980E-01	940	5,756E-02	1400	5,477E-01	2900	5,725E-01	4400	6,550E-03
350	8,085E-01	650	4,343E-01	950	6,141E-02	1450	6,145E-01	2950	4,941E-01	4450	5,416E-03
360	9,020E-01	660	3,734E-01	960	6,548E-02	1500	6,746E-01	3000	4,325E-01	4500	4,256E-03
370	9,441E-01	670	3,185E-01	970	6,997E-02	1550	7,266E-01	3050	3,786E-01	4550	3,563E-03
380	9,639E-01	680	2,695E-01	980	7,511E-02	1600	7,697E-01	3100	3,298E-01	4600	3,622E-03
390	9,748E-01	690	2,267E-01	990	7,958E-02	1650	8,079E-01	3150	2,863E-01	4650	4,923E-03
400	9,797E-01	700	1,900E-01	1000	8,513E-02	1700	8,387E-01	3200	2,493E-01	4700	8,493E-03
410	9,827E-01	710	1,594E-01	1010	9,301E-02	1750	8,629E-01	3250	2,191E-01	4750	1,485E-02
420	9,849E-01	720	1,340E-01	1020	9,917E-02	1800	8,822E-01	3300	1,952E-01	4800	2,293E-02
430	9,867E-01	730	1,133E-01	1030	1,063E-01	1850	8,987E-01	3350	1,771E-01	4850	3,124E-02
440	9,882E-01	740	9,696E-02	1040	1,124E-01	1900	9,108E-01	3400	1,640E-01	4900	4,079E-02
450	9,896E-01	750	8,151E-02	1050	1,202E-01	1950	9,204E-01	3450	1,564E-01	4950	5,353E-02
460	9,907E-01	760	7,097E-02	1060	1,282E-01	2000	9,277E-01	3500	1,535E-01	5000	6,786E-02
470	9,915E-01	770	6,270E-02	1070	1,348E-01	2050	9,336E-01	3550	1,559E-01	5050	8,079E-02
480	9,919E-01	780	5,639E-02	1080	1,437E-01	2100	9,385E-01	3600	1,629E-01	5100	8,941E-02
490	9,919E-01	790	5,125E-02	1090	1,522E-01	2150	9,414E-01	3650	1,752E-01	5150	9,218E-02

BG64

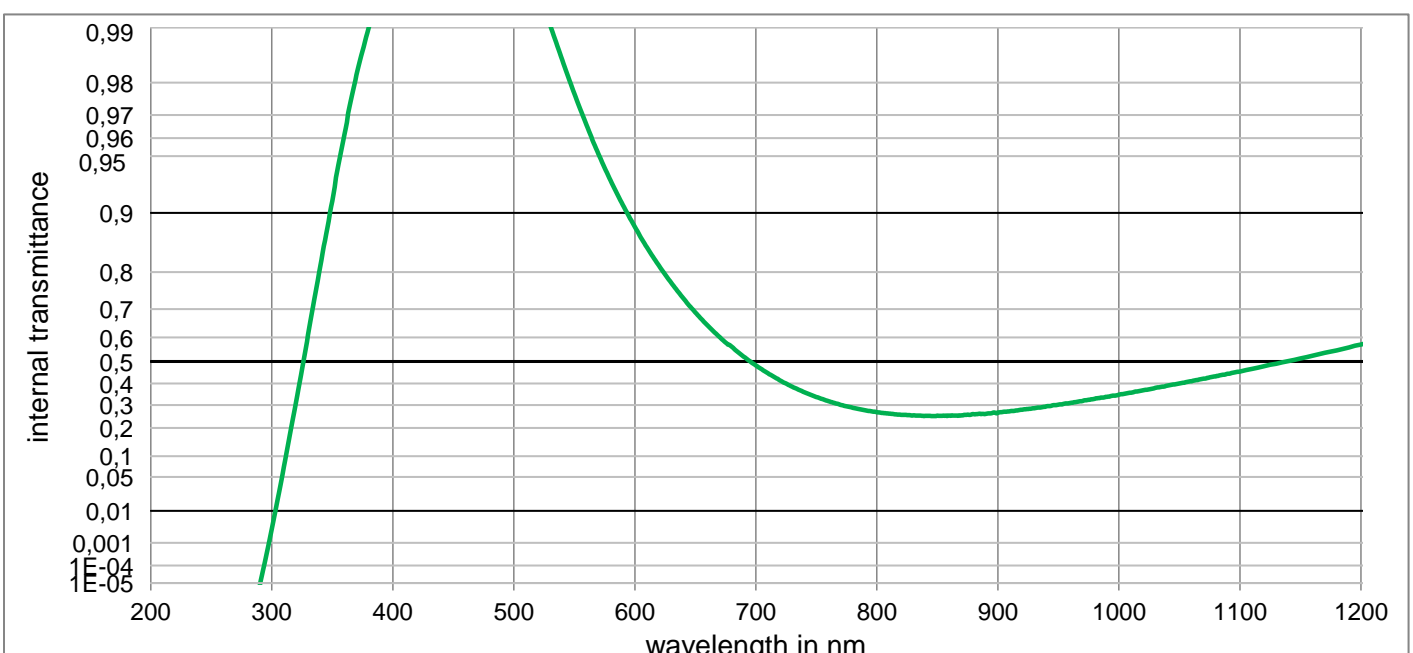
Optical properties	
Reflection factor	
$P_d = 0,916$	
Spectral values guaranteed	
τ_i (405 nm)	$\geq 0,99$
τ_i (514 nm)	$\geq 0,99$
τ_i (633 nm)	$\geq 0,72$
τ_i (694 nm)	$\leq 0,55$
τ_i (1060 nm)	$\leq 0,45$
Refractive indices	
n_F (486 nm)	= 1,535
n_e (546 nm)	= 1,532
n_d (587,6 nm)	= 1,53
Sellmeier coefficients	
valid from 365 nm to 2325 nm	
B_1	1,3031
B_2	0,0067
B_3	0,4940
C_1	8,159E-03 μm^2
C_2	5,5599E-02 μm^2
C_3	69,869 μm^2
Internal quality	
Bubble class	2

Mechanical properties	
Reference thickness	
$d = 1,00 \text{ mm}$	
Density	
$\rho = 2,78 \text{ g/cm}^3$	
Knoop hardness	
HK[0.1/20] = 371	
Thermal properties	
Transformation temperature	
$T_g = 417 \text{ }^\circ\text{C}$	
Thermal expansion in $10^{-6}/\text{K}$	
α (-30 $^\circ\text{C}/+70^\circ\text{C}$)	= 12,0
α (20 $^\circ\text{C}/300^\circ\text{C}$)	= 13,8

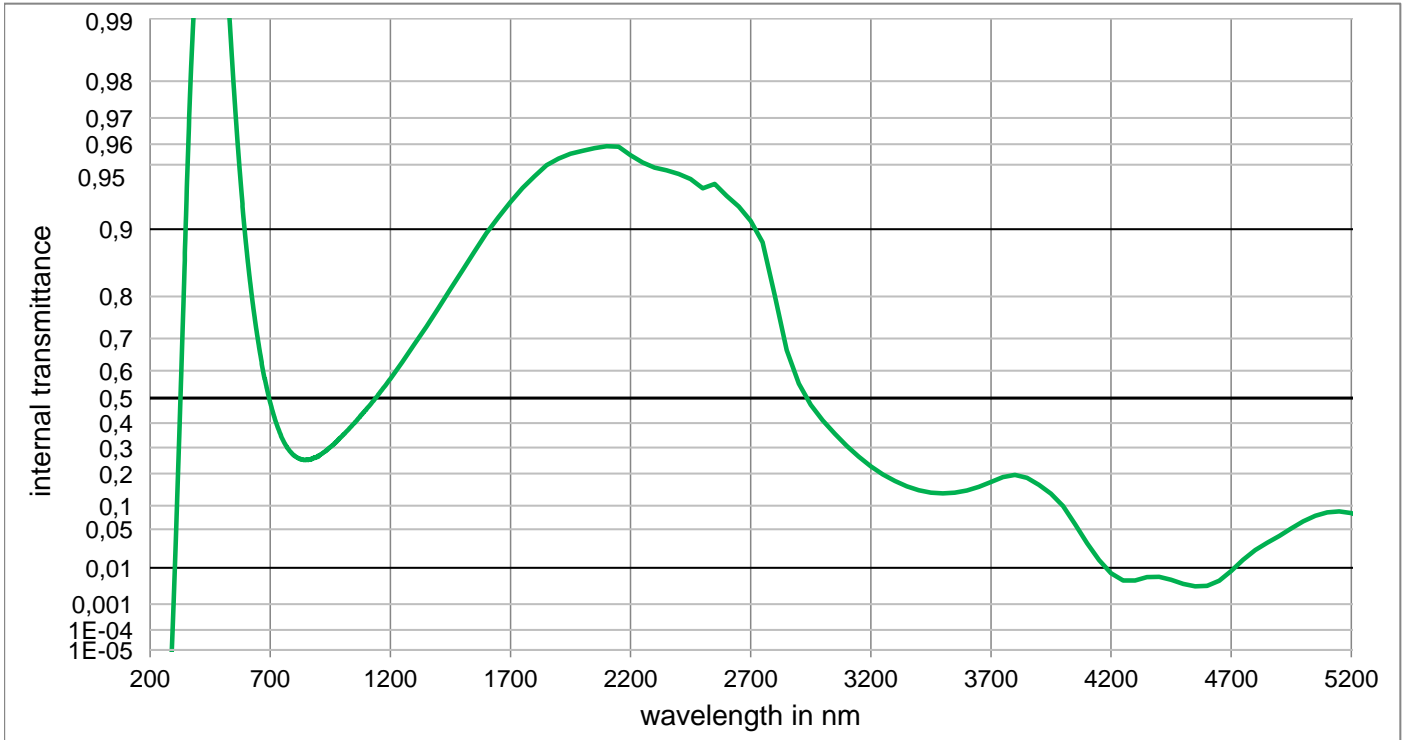
Chemical properties	
Chemical resistance	
FR class	= 1
SR class	= 52.3
AR class	= 3.3
Resistance against humidity	

Colorimetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,297	0,284	0,272
	y	0,327	0,325	0,323
	Y	86,6	82,4	78,6
	λ_d	490 nm	490 nm	490 nm
	P_e	0,058	0,109	0,154
Illuminant A	x	0,427	0,408	0,391
	y	0,414	0,419	0,423
	Y	84,4	78,4	73,3
	λ_d	500 nm	500 nm	500 nm
P_e	0,047	0,089	0,129	

Notes	
Ionically colored glass	
Bandpass filter / Shortpass filter	
NIR cutoff filter	
$\lambda_{d_50\%}(d=3\text{mm}) = 619 \text{ nm}$	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



BG64



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,971E-01	800	2,682E-01	1100	4,553E-01	2200	9,549E-01	3700	1,706E-01
210	< 1,000E-05	510	9,959E-01	810	2,611E-01	1110	4,666E-01	2250	9,512E-01	3750	1,874E-01
220	< 1,000E-05	520	9,938E-01	820	2,558E-01	1120	4,786E-01	2300	9,484E-01	3800	1,951E-01
230	< 1,000E-05	530	9,903E-01	830	2,539E-01	1130	4,896E-01	2350	9,469E-01	3850	1,849E-01
240	< 1,000E-05	540	9,850E-01	840	2,511E-01	1140	5,017E-01	2400	9,447E-01	3900	1,614E-01
250	< 1,000E-05	550	9,770E-01	850	2,523E-01	1150	5,137E-01	2450	9,416E-01	3950	1,338E-01
260	< 1,000E-05	560	9,660E-01	860	2,522E-01	1160	5,248E-01	2500	9,354E-01	4000	9,910E-02
270	< 1,000E-05	570	9,513E-01	870	2,539E-01	1170	5,370E-01	2550	9,383E-01	4050	5,906E-02
280	< 1,000E-05	580	9,324E-01	880	2,592E-01	1180	5,479E-01	2600	9,299E-01	4100	3,025E-02
290	< 1,000E-05	590	9,093E-01	890	2,601E-01	1190	5,602E-01	2650	9,214E-01	4150	1,459E-02
300	2,982E-03	600	8,816E-01	900	2,661E-01	1200	5,719E-01	2700	9,084E-01	4200	7,556E-03
310	7,223E-02	610	8,496E-01	910	2,722E-01	1250	6,292E-01	2750	8,853E-01	4250	4,980E-03
320	3,138E-01	620	8,137E-01	920	2,787E-01	1300	6,842E-01	2800	8,020E-01	4300	4,985E-03
330	6,101E-01	630	7,745E-01	930	2,850E-01	1350	7,313E-01	2850	6,664E-01	4350	6,061E-03
340	8,116E-01	640	7,328E-01	940	2,938E-01	1400	7,753E-01	2900	5,540E-01	4400	6,099E-03
350	9,134E-01	650	6,894E-01	950	3,014E-01	1450	8,142E-01	2950	4,734E-01	4450	5,149E-03
360	9,618E-01	660	6,452E-01	960	3,100E-01	1500	8,461E-01	3000	4,106E-01	4500	4,072E-03
370	9,818E-01	670	6,013E-01	970	3,187E-01	1550	8,733E-01	3050	3,560E-01	4550	3,468E-03
380	9,899E-01	680	5,625E-01	980	3,291E-01	1600	8,959E-01	3100	3,067E-01	4600	3,580E-03
390	9,935E-01	690	5,212E-01	990	3,379E-01	1650	9,119E-01	3150	2,634E-01	4650	4,884E-03
400	9,950E-01	700	4,821E-01	1000	3,475E-01	1700	9,252E-01	3200	2,268E-01	4700	8,466E-03
410	9,959E-01	710	4,471E-01	1010	3,575E-01	1750	9,356E-01	3250	1,972E-01	4750	1,487E-02
420	9,962E-01	720	4,140E-01	1020	3,681E-01	1800	9,432E-01	3300	1,740E-01	4800	2,278E-02
430	9,966E-01	730	3,852E-01	1030	3,793E-01	1850	9,497E-01	3350	1,565E-01	4850	3,076E-02
440	9,970E-01	740	3,593E-01	1040	3,898E-01	1900	9,532E-01	3400	1,440E-01	4900	3,956E-02
450	9,973E-01	750	3,369E-01	1050	3,999E-01	1950	9,556E-01	3450	1,367E-01	4950	5,139E-02
460	9,976E-01	760	3,175E-01	1060	4,107E-01	2000	9,570E-01	3500	1,339E-01	5000	6,452E-02
470	9,977E-01	770	3,011E-01	1070	4,223E-01	2050	9,583E-01	3550	1,362E-01	5050	7,625E-02
480	9,977E-01	780	2,879E-01	1080	4,326E-01	2100	9,591E-01	3600	1,428E-01	5100	8,386E-02
490	9,977E-01	790	2,763E-01	1090	4,452E-01	2150	9,589E-01	3650	1,544E-01	5150	8,586E-02

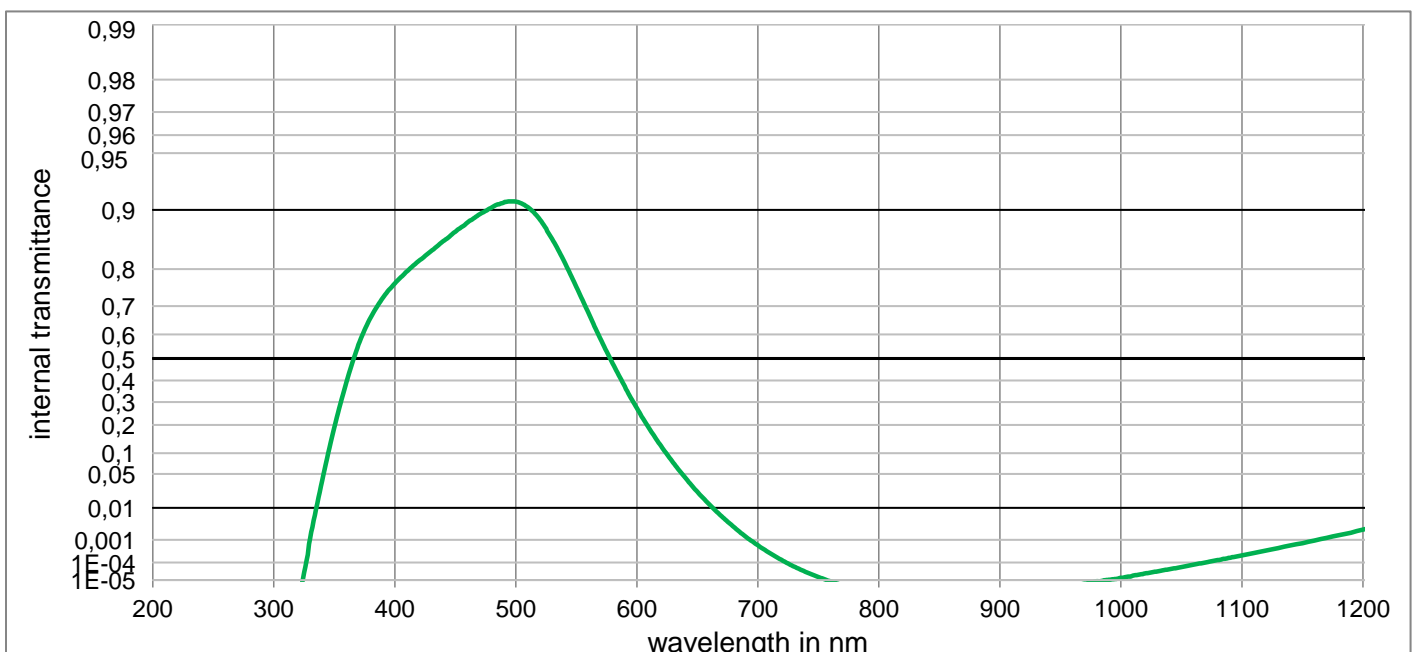
BG66

Optical properties	
Reflection factor	
$P_d = 0,914$	
Spectral values guaranteed	
τ_i (430 nm)	$\geq 0,815$
τ_i (514 nm)	$\geq 0,89$
τ_i (565 nm)	$\geq 0,615$
τ_i (694 nm)	$\leq 0,0015$
τ_i (1060 nm)	$\leq 0,0002$
Refractive indices	
n_F (486 nm)	$= 1,544$
n_e (546 nm)	$= 1,541$
n_d (587,6 nm)	$= 1,539$
Sellmeier coefficients	
valid from 440 nm to 1550 nm	
B_1	1,3353
B_2	0,0004
B_3	0,6203
C_1	$8,684E-03 \mu m^2$
C_2	$2,0582E-02 \mu m^2$
C_3	$100,000 \mu m^2$
Internal quality	
Bubble class	0

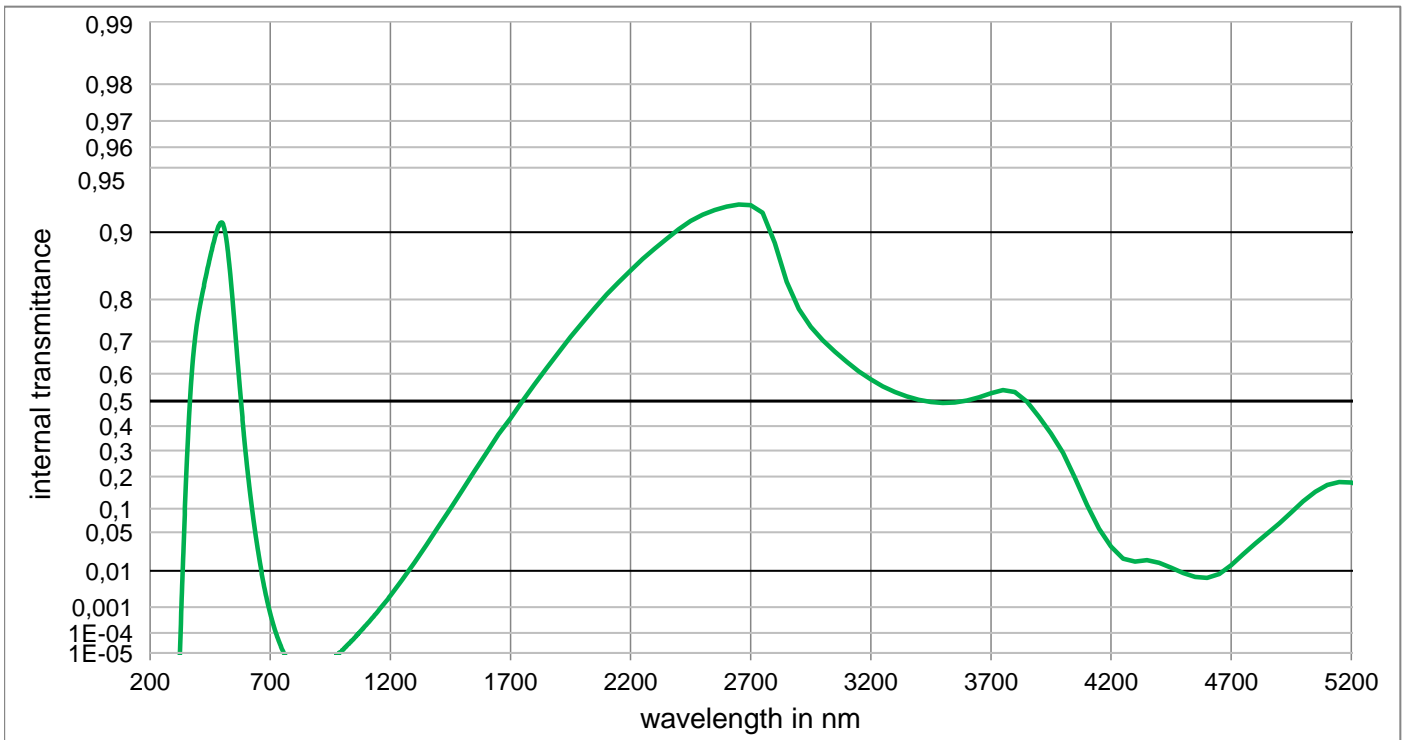
Mechanical properties	
Reference thickness	
$d = 1,00 \text{ mm}$	
Density	
$\rho = 2,85 \text{ g/cm}^3$	
Knoop hardness	
$HK[0.1/20] = 373$	
Thermal properties	
Transformation temperature	
$T_g = 416 \text{ }^\circ\text{C}$	
Thermal expansion in $10^{-6}/K$	
α (-30°C/+70°C)	$= 11,8$
α (20°C/300°C)	$= 13,7$
Chemical properties	
Chemical resistance	
FR class	
SR class $= 52.3$	
AR class $= 3.3$	
Resistance against humidity	

Colormetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,218	0,183	0,165
	y	0,313	0,297	0,286
	Y	57,0	42,1	33,1
	λ_d	489 nm	489 nm	488 nm
	P_e	0,356	0,497	0,571
Illuminant A	x	0,303	0,237	0,202
	y	0,440	0,438	0,429
	Y	48,0	32,8	24,5
	λ_d	499 nm	497 nm	496 nm
P_e	0,332	0,487	0,574	

Notes	
Ionically colored glass	
Bandpass filter / Shortpass filter	
NIR cutoff filter	
$\lambda_{d_50\%}(d=0.21\text{mm}) @ 635 \text{ nm}$	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



BG66

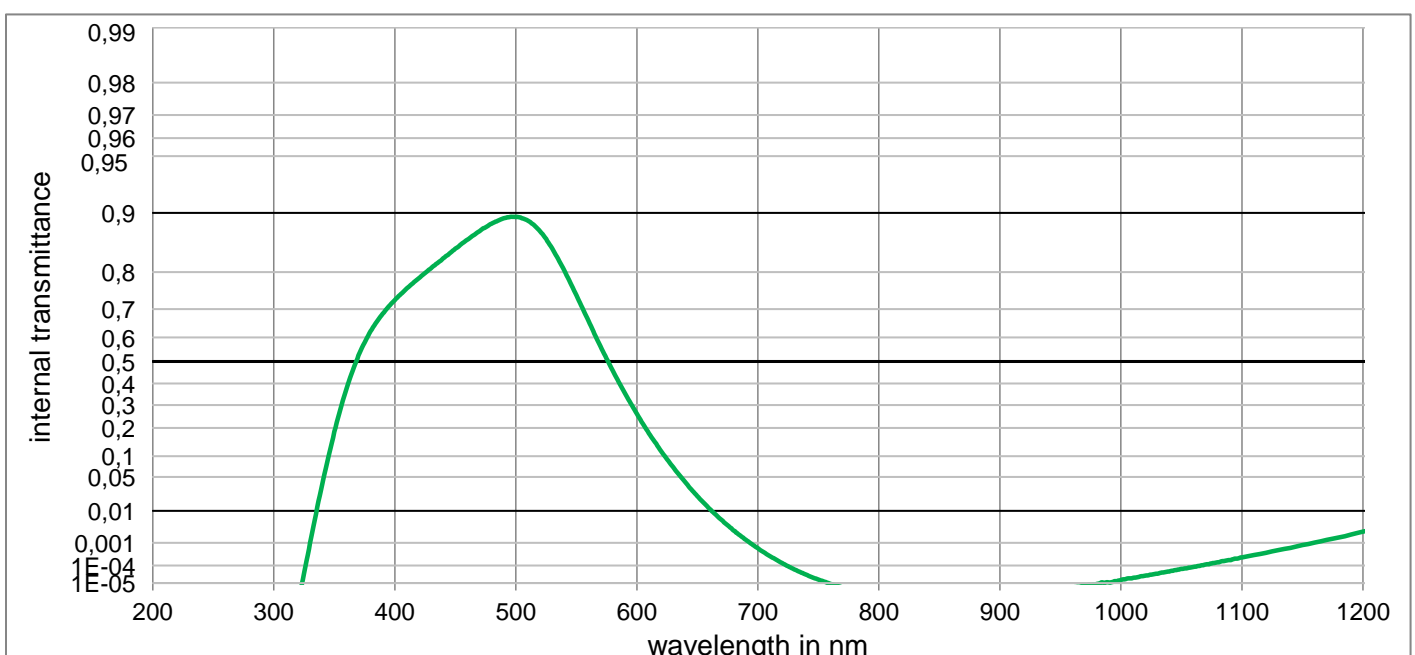


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

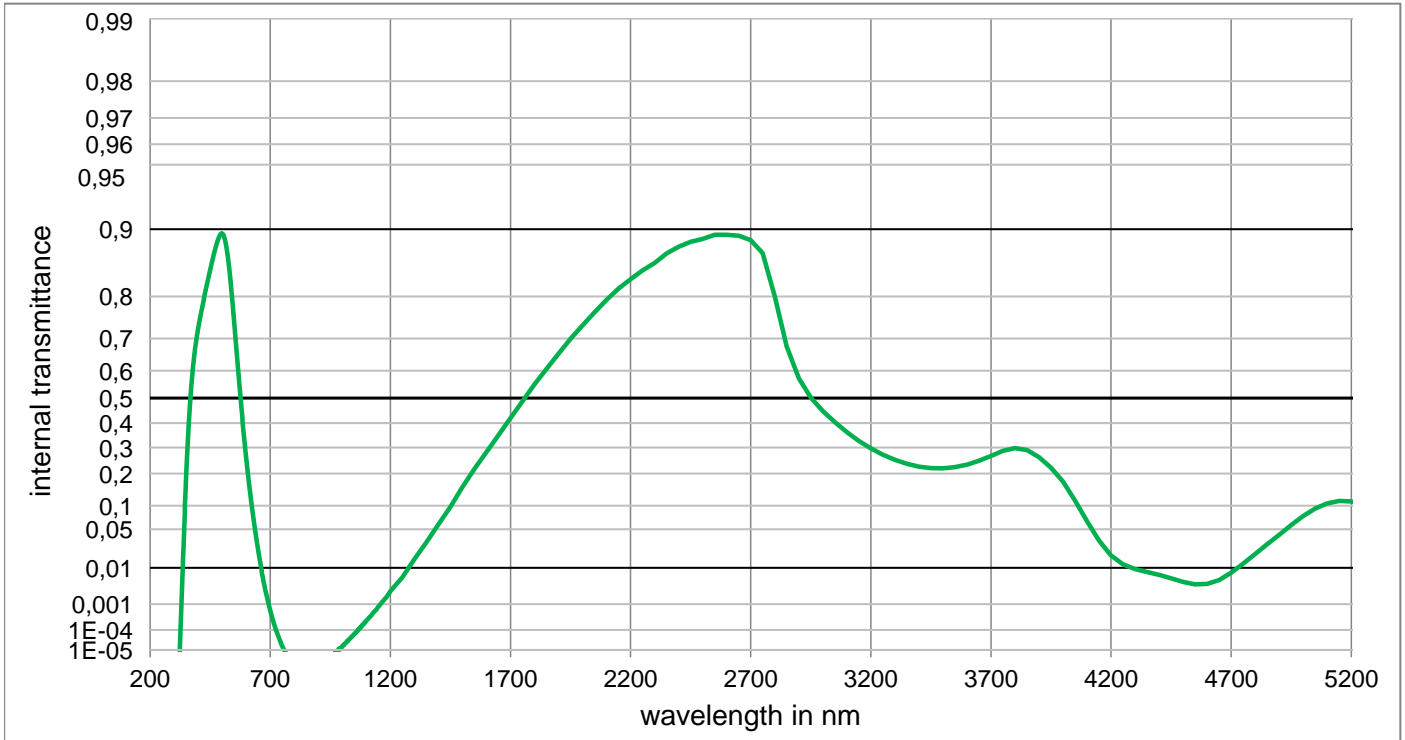
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,094E-01	800	< 1,000E-05	1100	2,196E-04	2200	8,507E-01	3700	5,296E-01
210	< 1,000E-05	510	9,031E-01	810	< 1,000E-05	1110	2,858E-04	2250	8,676E-01	3750	5,413E-01
220	< 1,000E-05	520	8,874E-01	820	< 1,000E-05	1120	3,654E-04	2300	8,810E-01	3800	5,348E-01
230	< 1,000E-05	530	8,590E-01	830	< 1,000E-05	1130	4,675E-04	2350	8,927E-01	3850	4,976E-01
240	< 1,000E-05	540	8,165E-01	840	< 1,000E-05	1140	5,998E-04	2400	9,031E-01	3900	4,373E-01
250	< 1,000E-05	550	7,560E-01	850	< 1,000E-05	1150	7,406E-04	2450	9,113E-01	3950	3,702E-01
260	< 1,000E-05	560	6,770E-01	860	< 1,000E-05	1160	9,407E-04	2500	9,170E-01	4000	2,907E-01
270	< 1,000E-05	570	5,822E-01	870	< 1,000E-05	1170	1,191E-03	2550	9,209E-01	4050	1,956E-01
280	< 1,000E-05	580	4,782E-01	880	< 1,000E-05	1180	1,473E-03	2600	9,239E-01	4100	1,091E-01
290	< 1,000E-05	590	3,726E-01	890	< 1,000E-05	1190	1,816E-03	2650	9,256E-01	4150	5,625E-02
300	< 1,000E-05	600	2,720E-01	900	< 1,000E-05	1200	2,301E-03	2700	9,250E-01	4200	2,989E-02
310	< 1,000E-05	610	1,883E-01	910	< 1,000E-05	1250	6,219E-03	2750	9,187E-01	4250	1,788E-02
320	< 1,000E-05	620	1,222E-01	920	< 1,000E-05	1300	1,501E-02	2800	8,882E-01	4300	1,572E-02
330	1,069E-03	630	7,459E-02	930	< 1,000E-05	1350	3,166E-02	2850	8,326E-01	4350	1,676E-02
340	3,817E-02	640	4,295E-02	940	< 1,000E-05	1400	5,986E-02	2900	7,804E-01	4400	1,484E-02
350	1,903E-01	650	2,347E-02	950	< 1,000E-05	1450	1,006E-01	2950	7,387E-01	4450	1,165E-02
360	3,932E-01	660	1,207E-02	960	< 1,000E-05	1500	1,543E-01	3000	7,035E-01	4500	8,858E-03
370	5,584E-01	670	5,939E-03	970	< 1,000E-05	1550	2,192E-01	3050	6,707E-01	4550	7,190E-03
380	6,617E-01	680	2,832E-03	980	< 1,000E-05	1600	2,908E-01	3100	6,389E-01	4600	6,838E-03
390	7,246E-01	690	1,320E-03	990	1,054E-05	1650	3,659E-01	3150	6,083E-01	4650	8,472E-03
400	7,656E-01	700	6,092E-04	1000	1,418E-05	1700	4,320E-01	3200	5,802E-01	4700	1,325E-02
410	7,944E-01	710	2,779E-04	1010	1,905E-05	1750	4,998E-01	3250	5,554E-01	4750	2,175E-02
420	8,179E-01	720	1,290E-04	1020	2,566E-05	1800	5,622E-01	3300	5,344E-01	4800	3,342E-02
430	8,373E-01	730	6,140E-05	1030	3,340E-05	1850	6,185E-01	3350	5,175E-01	4850	4,796E-02
440	8,553E-01	740	3,033E-05	1040	4,450E-05	1900	6,680E-01	3400	5,044E-01	4900	6,617E-02
450	8,702E-01	750	1,534E-05	1050	5,799E-05	1950	7,125E-01	3450	4,961E-01	4950	9,066E-02
460	8,835E-01	760	< 1,000E-05	1060	7,729E-05	2000	7,496E-01	3500	4,929E-01	5000	1,200E-01
470	8,947E-01	770	< 1,000E-05	1070	1,000E-04	2050	7,815E-01	3550	4,948E-01	5050	1,486E-01
480	9,029E-01	780	< 1,000E-05	1080	1,319E-04	2100	8,096E-01	3600	5,022E-01	5100	1,706E-01
490	9,085E-01	790	< 1,000E-05	1090	1,712E-04	2150	8,319E-01	3650	5,144E-01	5150	1,811E-01

BG66HS

Optical properties		Mechanical properties		Colormetric properties					
Reflection factor		Reference thickness		1 mm		2 mm		3 mm	
$P_d = 0,913$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,217	0,182	0,164	
Spectral values guaranteed		Density			y	0,313	0,298		0,288
$\tau_i (405 \text{ nm}) \geq 0,71$	$\rho = 2,87 \text{ g/cm}^3$		Y		56,0	40,9		31,9	
$\tau_i (514 \text{ nm}) \geq 0,85$	Knoop hardness		λ_d		489 nm	489 nm		488 nm	
$\tau_i (633 \text{ nm}) \geq 0,04$	$HK[0.1/20] = 385$		P_e		0,362	0,502		0,576	
$\tau_i (694 \text{ nm}) \leq 0,0025$	Thermal properties		Illuminant A	x	0,300	0,234		0,198	
$\tau_i (1060 \text{ nm}) \leq 0,0004$	Transformation temperature			y	0,440	0,438		0,430	
	$T_g = 425 \text{ }^\circ\text{C}$			Y	47,0	31,7		23,5	
	Thermal expansion in $10^{-6}/\text{K}$			λ_d	499 nm	497 nm		496 nm	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 11,5$			P_e	0,338	0,495		0,581	
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 13,3$		Notes						
Refractive indices		Chemical properties		Ionically colored glass					
$n_F (486 \text{ nm}) = 1,548$	Chemical resistance		Bandpass filter / Shortpass filter						
$n_e (546 \text{ nm}) = 1,544$	FR class		NIR cutoff filter						
$n_d (587,6 \text{ nm}) = 1,542$	SR class = 52,3		$\lambda_{50\%}(d=0.21\text{mm}) = 634 \text{ nm}$						
	AR class		ISO 23364:2021						
Sellmeier coefficients		Resistance against humidity		Disclaimer					
valid from 365 nm to 1550 nm				All data without tolerances are to be understood to be reference values.					
$B_1 = 0,8063$									
$B_2 = 0,5354$									
$B_3 = 0,7669$									
$C_1 = 3,349\text{E-}03 \text{ } \mu\text{m}^2$									
$C_2 = 1,7804\text{E-}02 \text{ } \mu\text{m}^2$									
$C_3 = 131,310 \text{ } \mu\text{m}^2$									
Internal quality									
Bubble class 2									



BG66HS

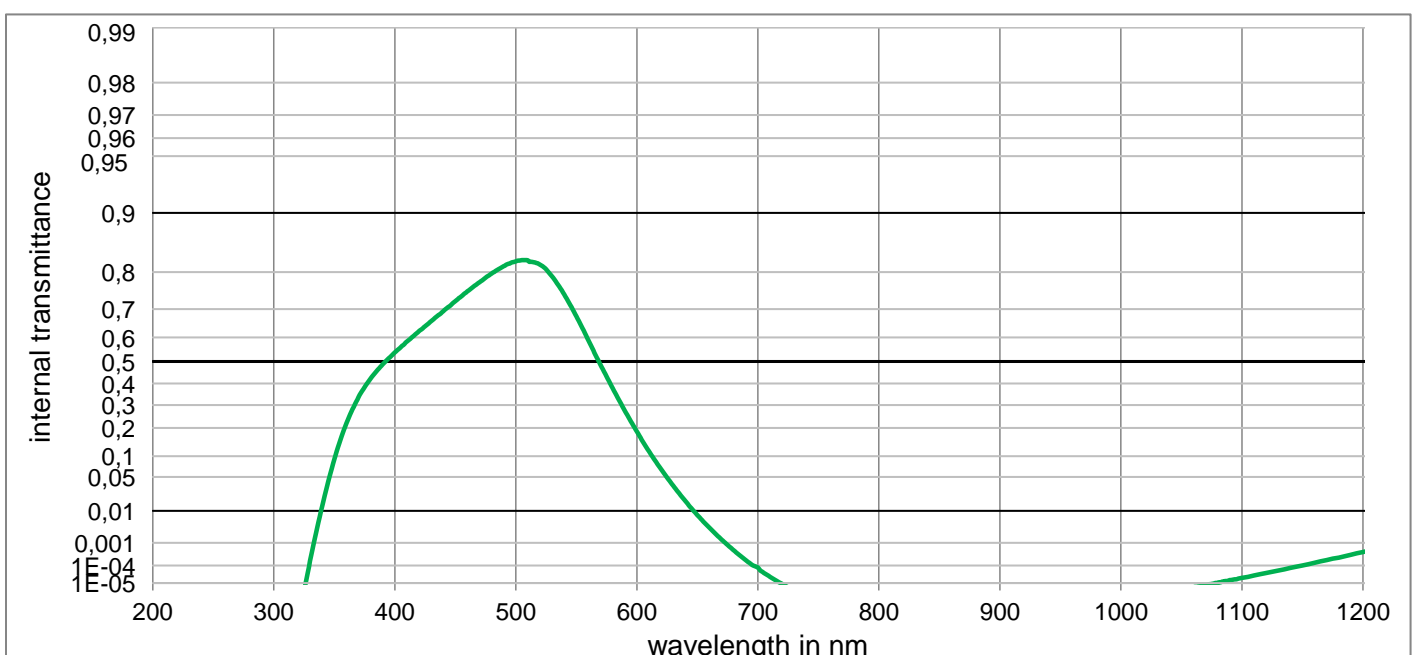


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

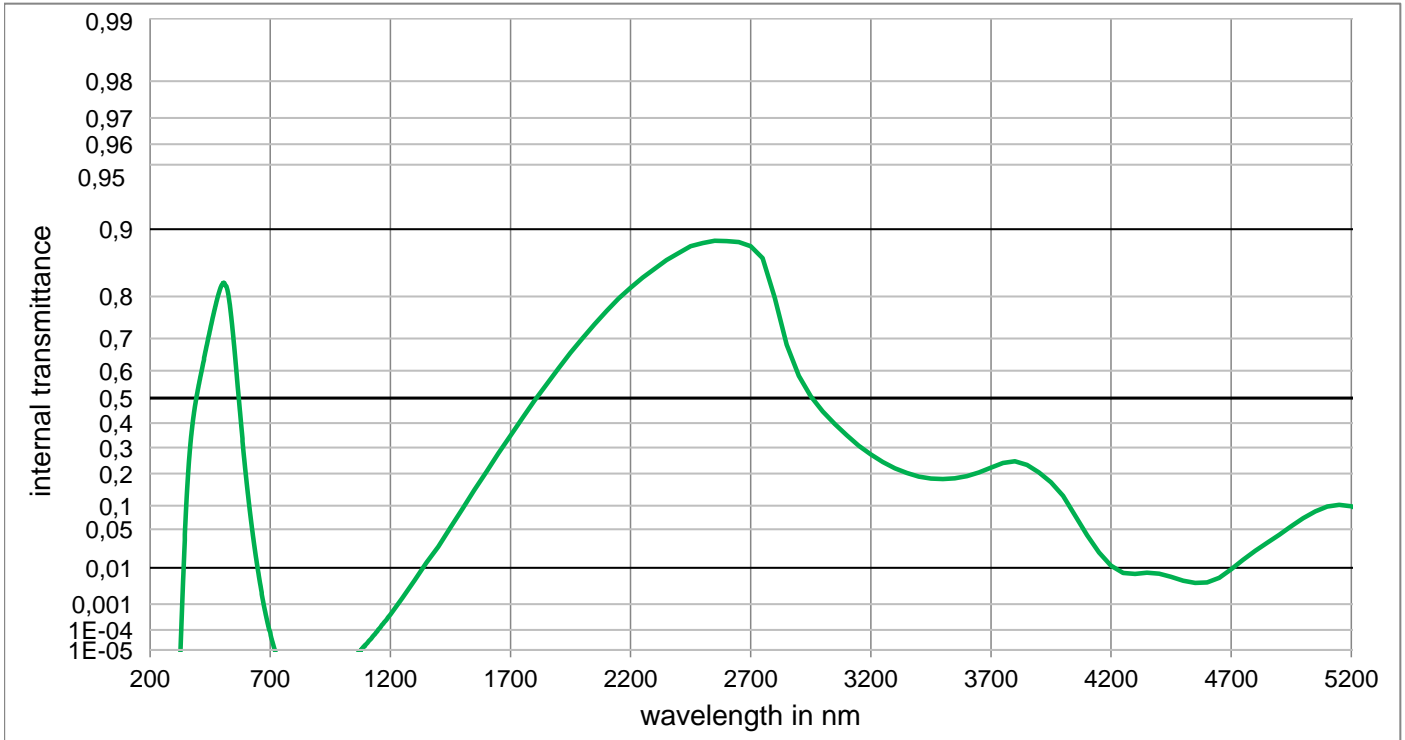
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	8,950E-01	800	< 1,000E-05	1100	2,451E-04	2200	8,318E-01	3700	2,668E-01
210	< 1,000E-05	510	8,901E-01	810	< 1,000E-05	1110	3,149E-04	2250	8,467E-01	3750	2,868E-01
220	< 1,000E-05	520	8,752E-01	820	< 1,000E-05	1120	3,900E-04	2300	8,577E-01	3800	2,981E-01
230	< 1,000E-05	530	8,479E-01	830	< 1,000E-05	1130	5,114E-04	2350	8,709E-01	3850	2,898E-01
240	< 1,000E-05	540	8,039E-01	840	< 1,000E-05	1140	6,304E-04	2400	8,798E-01	3900	2,617E-01
250	< 1,000E-05	550	7,414E-01	850	< 1,000E-05	1150	8,148E-04	2450	8,858E-01	3950	2,215E-01
260	< 1,000E-05	560	6,603E-01	860	< 1,000E-05	1160	1,017E-03	2500	8,891E-01	4000	1,714E-01
270	< 1,000E-05	570	5,644E-01	870	< 1,000E-05	1170	1,283E-03	2550	8,938E-01	4050	1,138E-01
280	< 1,000E-05	580	4,600E-01	880	< 1,000E-05	1180	1,561E-03	2600	8,939E-01	4100	6,435E-02
290	< 1,000E-05	590	3,557E-01	890	< 1,000E-05	1190	1,978E-03	2650	8,927E-01	4150	3,347E-02
300	< 1,000E-05	600	2,598E-01	900	< 1,000E-05	1200	2,514E-03	2700	8,877E-01	4200	1,817E-02
310	< 1,000E-05	610	1,786E-01	910	< 1,000E-05	1250	6,007E-03	2750	8,715E-01	4250	1,184E-02
320	< 1,000E-05	620	1,154E-01	920	< 1,000E-05	1300	1,525E-02	2800	8,004E-01	4300	9,431E-03
330	9,746E-04	630	7,064E-02	930	< 1,000E-05	1350	3,121E-02	2850	6,770E-01	4350	8,061E-03
340	3,686E-02	640	4,057E-02	940	< 1,000E-05	1400	5,831E-02	2900	5,736E-01	4400	6,827E-03
350	1,848E-01	650	2,192E-02	950	< 1,000E-05	1450	9,706E-02	2950	5,020E-01	4450	5,629E-03
360	3,750E-01	660	1,135E-02	960	< 1,000E-05	1500	1,543E-01	3000	4,490E-01	4500	4,562E-03
370	5,257E-01	670	5,713E-03	970	< 1,000E-05	1550	2,162E-01	3050	4,039E-01	4550	3,951E-03
380	6,234E-01	680	2,706E-03	980	< 1,000E-05	1600	2,816E-01	3100	3,635E-01	4600	4,022E-03
390	6,849E-01	690	1,310E-03	990	1,098E-05	1650	3,501E-01	3150	3,275E-01	4650	5,088E-03
400	7,276E-01	700	6,095E-04	1000	1,558E-05	1700	4,212E-01	3200	2,968E-01	4700	7,678E-03
410	7,600E-01	710	2,798E-04	1010	2,078E-05	1750	4,883E-01	3250	2,714E-01	4750	1,229E-02
420	7,860E-01	720	1,318E-04	1020	2,785E-05	1800	5,511E-01	3300	2,513E-01	4800	1,932E-02
430	8,087E-01	730	6,345E-05	1030	3,659E-05	1850	6,065E-01	3350	2,363E-01	4850	2,904E-02
440	8,292E-01	740	3,181E-05	1040	4,852E-05	1900	6,553E-01	3400	2,259E-01	4900	4,150E-02
450	8,471E-01	750	1,671E-05	1050	6,733E-05	1950	6,989E-01	3450	2,202E-01	4950	5,726E-02
460	8,626E-01	760	< 1,000E-05	1060	8,545E-05	2000	7,349E-01	3500	2,192E-01	5000	7,547E-02
470	8,758E-01	770	< 1,000E-05	1070	1,127E-04	2050	7,661E-01	3550	2,233E-01	5050	9,314E-02
480	8,864E-01	780	< 1,000E-05	1080	1,454E-04	2100	7,934E-01	3600	2,327E-01	5100	1,062E-01
490	8,933E-01	790	< 1,000E-05	1090	1,854E-04	2150	8,150E-01	3650	2,474E-01	5150	1,124E-01

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Optical properties		Mechanical properties		Colorimetric properties					
Reflection factor		Reference thickness		1 mm		2 mm		3 mm	
$P_d = 0,913$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,209	0,176	0,159	
Spectral values guaranteed		Density			y	0,321	0,317	0,318	
$\tau_i (450 \text{ nm}) \geq 0,7$	$\rho = 2,85 \text{ g/cm}^3$		Y		49,7	33,4	24,0		
$\tau_i (500 \text{ nm}) \geq 0,8$	Knoop hardness		λ_d		491 nm	490 nm	491 nm		
$\tau_i (550 \text{ nm}) \geq 0,65$	$HK[0.1/20] = 364$		P_e		0,383	0,508	0,569		
$\tau_i (600 \text{ nm}) \leq 0,19$	Thermal properties		Illuminant A	x	0,285	0,222	0,189		
Transformation temperature		$T_g = 390 \text{ }^\circ\text{C}$		y	0,450	0,456	0,457		
Thermal expansion in		$10^{-6}/\text{K}$		Y	40,9	25,4	17,5		
$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 11,8$	Chemical properties			λ_d	499 nm	498 nm	498 nm		
$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 13,7$	Chemical resistance			P_e	0,372	0,519	0,595		
Refractive indices		Chemical resistance		Notes					
$n_F (486 \text{ nm}) = 1,547$	FR class = 1		Ionically colored glass Bandpass filter / Shortpass filter NIR cutoff filter $\lambda_{50\%}(d=0.145\text{mm}) @ 641 \text{ nm}$ ISO 23364:2021						
$n_e (546 \text{ nm}) = 1,543$	SR class = 52.3								
$n_d (587,6 \text{ nm}) = 1,541$	AR class = 3.3								
Sellmeier coefficients		Resistance against humidity							
valid from 400 nm to 1550 nm		Robust glass							
$B_1 = 0,7165$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5		Disclaimer						
$B_2 = 0,6218$			All data without tolerances are to be understood to be reference values.						
$B_3 = 0,6042$									
$C_1 = 1,764\text{E-}09 \text{ } \mu\text{m}^2$									
$C_2 = 1,9422\text{E-}02 \text{ } \mu\text{m}^2$									
$C_3 = 100,000 \text{ } \mu\text{m}^2$									
Internal quality									
Bubble class 2									



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Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	8,231E-01	800	< 1,000E-05	1100	2,071E-05	2200	8,164E-01	3700	2,218E-01
210	< 1,000E-05	510	8,251E-01	810	< 1,000E-05	1110	2,923E-05	2250	8,345E-01	3750	2,392E-01
220	< 1,000E-05	520	8,162E-01	820	< 1,000E-05	1120	3,952E-05	2300	8,488E-01	3800	2,455E-01
230	< 1,000E-05	530	7,899E-01	830	< 1,000E-05	1130	5,505E-05	2350	8,619E-01	3850	2,318E-01
240	< 1,000E-05	540	7,437E-01	840	< 1,000E-05	1140	7,511E-05	2400	8,717E-01	3900	2,036E-01
250	< 1,000E-05	550	6,764E-01	850	< 1,000E-05	1150	1,020E-04	2450	8,803E-01	3950	1,699E-01
260	< 1,000E-05	560	5,876E-01	860	< 1,000E-05	1160	1,362E-04	2500	8,844E-01	4000	1,268E-01
270	< 1,000E-05	570	4,859E-01	870	< 1,000E-05	1170	1,856E-04	2550	8,871E-01	4050	7,709E-02
280	< 1,000E-05	580	3,787E-01	880	< 1,000E-05	1180	2,399E-04	2600	8,867E-01	4100	4,066E-02
290	< 1,000E-05	590	2,747E-01	890	< 1,000E-05	1190	3,271E-04	2650	8,855E-01	4150	2,051E-02
300	< 1,000E-05	600	1,851E-01	900	< 1,000E-05	1200	4,258E-04	2700	8,805E-01	4200	1,109E-02
310	< 1,000E-05	610	1,152E-01	910	< 1,000E-05	1250	1,575E-03	2750	8,647E-01	4250	7,611E-03
320	< 1,000E-05	620	6,630E-02	920	< 1,000E-05	1300	4,935E-03	2800	7,974E-01	4300	7,207E-03
330	1,702E-04	630	3,513E-02	930	< 1,000E-05	1350	1,287E-02	2850	6,825E-01	4350	7,703E-03
340	1,300E-02	640	1,721E-02	940	< 1,000E-05	1400	2,625E-02	2900	5,817E-01	4400	7,300E-03
350	9,108E-02	650	7,798E-03	950	< 1,000E-05	1450	5,320E-02	2950	5,066E-01	4450	6,119E-03
360	2,195E-01	660	3,302E-03	960	< 1,000E-05	1500	9,161E-02	3000	4,476E-01	4500	4,921E-03
370	3,360E-01	670	1,321E-03	970	< 1,000E-05	1550	1,447E-01	3050	3,964E-01	4550	4,292E-03
380	4,226E-01	680	5,023E-04	980	< 1,000E-05	1600	2,069E-01	3100	3,497E-01	4600	4,391E-03
390	4,878E-01	690	1,842E-04	990	< 1,000E-05	1650	2,769E-01	3150	3,079E-01	4650	5,777E-03
400	5,392E-01	700	8,097E-05	1000	< 1,000E-05	1700	3,488E-01	3200	2,721E-01	4700	9,208E-03
410	5,833E-01	710	2,428E-05	1010	< 1,000E-05	1750	4,211E-01	3250	2,426E-01	4750	1,479E-02
420	6,234E-01	720	< 1,000E-05	1020	< 1,000E-05	1800	4,898E-01	3300	2,195E-01	4800	2,212E-02
430	6,594E-01	730	< 1,000E-05	1030	< 1,000E-05	1850	5,517E-01	3350	2,018E-01	4850	3,079E-02
440	6,935E-01	740	< 1,000E-05	1040	< 1,000E-05	1900	6,083E-01	3400	1,895E-01	4900	4,149E-02
450	7,239E-01	750	< 1,000E-05	1050	< 1,000E-05	1950	6,584E-01	3450	1,825E-01	4950	5,501E-02
460	7,523E-01	760	< 1,000E-05	1060	< 1,000E-05	2000	7,010E-01	3500	1,804E-01	5000	7,058E-02
470	7,760E-01	770	< 1,000E-05	1070	< 1,000E-05	2050	7,377E-01	3550	1,834E-01	5050	8,601E-02
480	7,970E-01	780	< 1,000E-05	1080	1,035E-05	2100	7,696E-01	3600	1,913E-01	5100	9,768E-02
490	8,128E-01	790	< 1,000E-05	1090	1,536E-05	2150	7,959E-01	3650	2,044E-01	5150	1,023E-01

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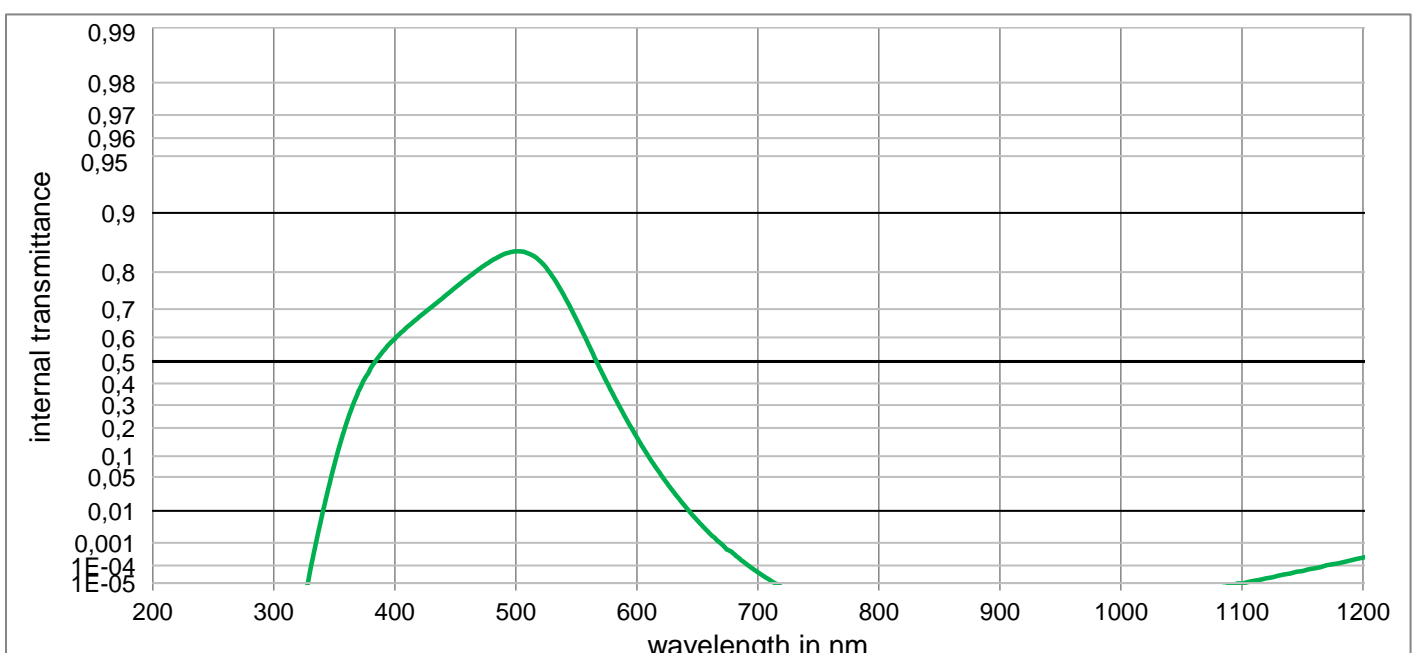
Optical properties	
Reflection factor	
$P_d = 0,913$	
Spectral values guaranteed	
τ_i (450 nm)	$\geq 0,75$
τ_i (500 nm)	$\geq 0,83$
τ_i (550 nm)	$\geq 0,65$
τ_i (600 nm)	$\leq 0,19$
Refractive indices	
n_F (486 nm)	= 1,547
n_e (546 nm)	= 1,543
n_d (587,6 nm)	= 1,541
Sellmeier coefficients	
valid from 400 nm to 1550 nm	
B_1	0,7165
B_2	0,6218
B_3	0,6042
C_1	1,764E-09 μm^2
C_2	1,9422E-02 μm^2
C_3	100,000 μm^2
Internal quality	
Bubble class	2

Mechanical properties	
Reference thickness	
$d = 1,00$ mm	
Density	
$\rho = 2,85$ g/cm ³	
Knoop hardness	
HK[0.1/20] = 364	
Thermal properties	
Transformation temperature	
$T_g = 390$ °C	
Thermal expansion in $10^{-6}/\text{K}$	
α (-30°C/+70°C)	= 11,8
α (20°C/300°C)	= 13,7

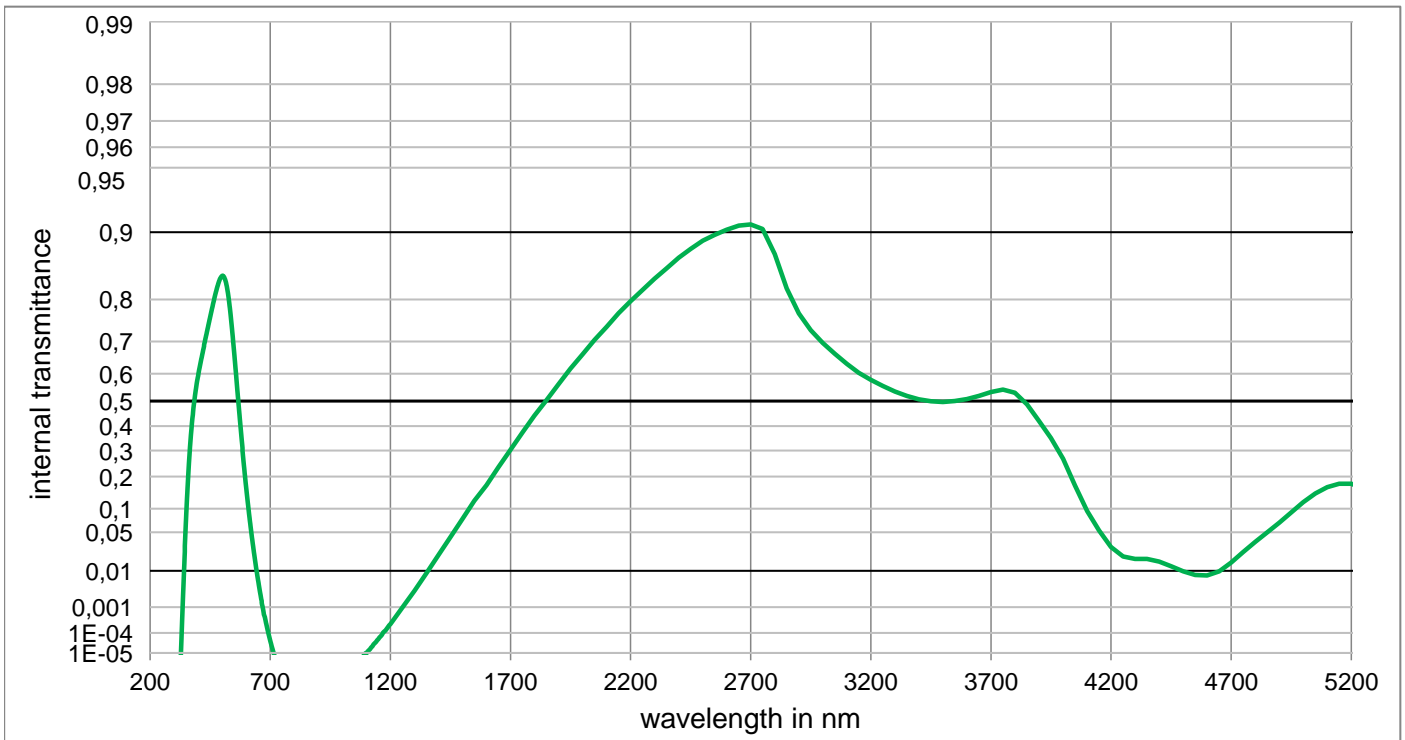
Chemical properties	
Chemical resistance	
FR class	= 1
SR class	= 52.3
AR class	= 3.3
Resistance against humidity	

Colormetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,203	0,170	0,154
	y	0,312	0,300	0,294
	Y	49,0	33,2	24,1
	λ_d	490 nm	489 nm	489 nm
	P_e	0,413	0,543	0,607
Illuminant A	x	0,274	0,211	0,179
	y	0,445	0,441	0,434
	Y	39,9	24,9	17,2
	λ_d	499 nm	497 nm	496 nm
P_e	0,398	0,549	0,625	

Notes	
Ionically colored glass	
Bandpass filter / Shortpass filter	
NIR cutoff filter	
$\lambda_{50\%}(d=0.11\text{mm}) @ 634$ nm	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



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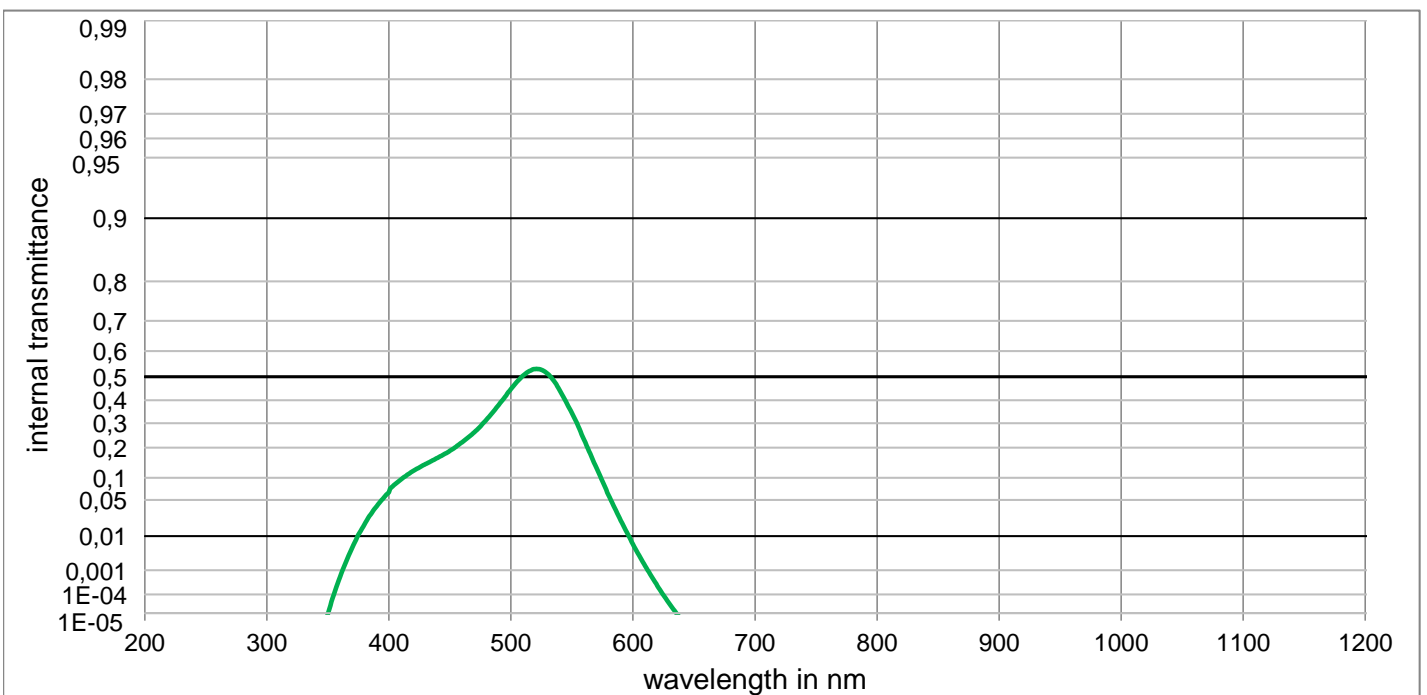


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

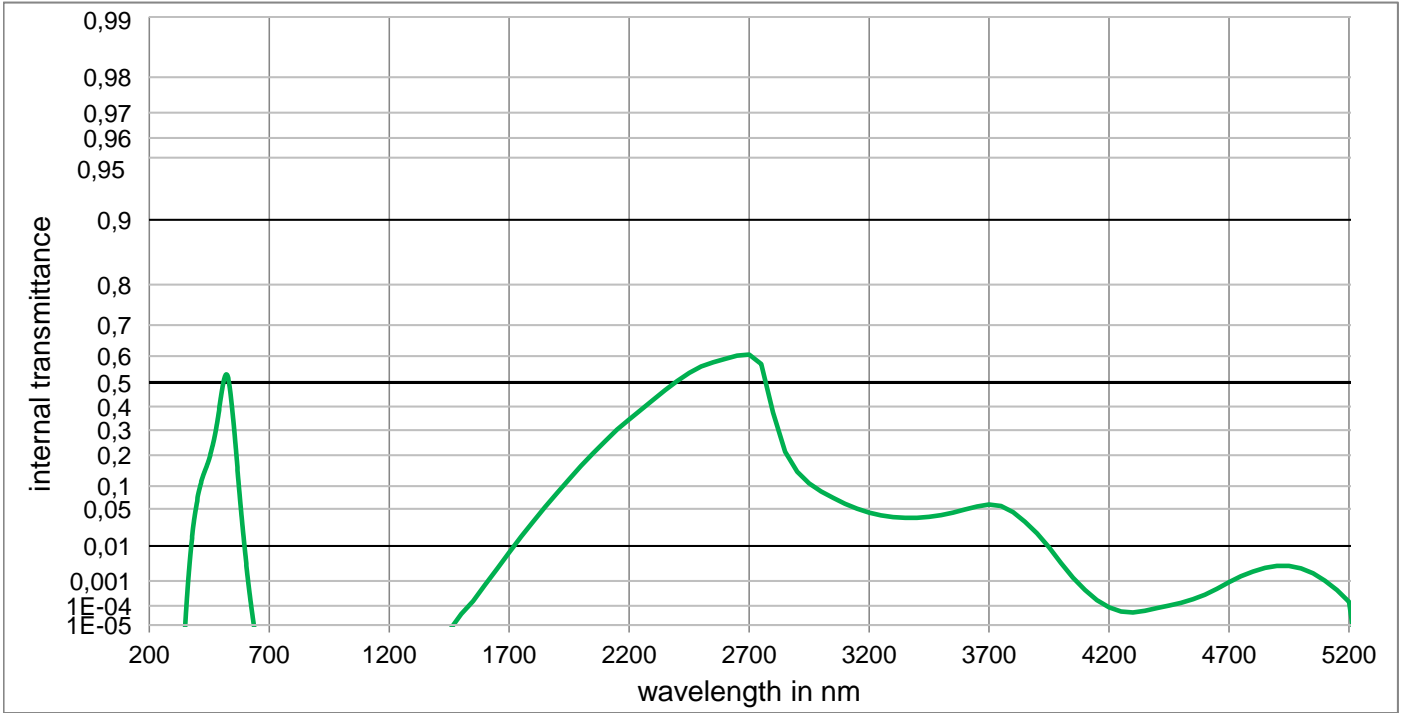
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	8,425E-01	800	< 1,000E-05	1100	< 1,000E-05	2200	7,964E-01	3700	5,342E-01
210	< 1,000E-05	510	8,389E-01	810	< 1,000E-05	1110	1,392E-05	2250	8,185E-01	3750	5,437E-01
220	< 1,000E-05	520	8,236E-01	820	< 1,000E-05	1120	1,999E-05	2300	8,379E-01	3800	5,316E-01
230	< 1,000E-05	530	7,914E-01	830	< 1,000E-05	1130	2,837E-05	2350	8,541E-01	3850	4,866E-01
240	< 1,000E-05	540	7,393E-01	840	< 1,000E-05	1140	3,755E-05	2400	8,694E-01	3900	4,207E-01
250	< 1,000E-05	550	6,655E-01	850	< 1,000E-05	1150	5,176E-05	2450	8,808E-01	3950	3,509E-01
260	< 1,000E-05	560	5,721E-01	860	< 1,000E-05	1160	7,067E-05	2500	8,905E-01	4000	2,676E-01
270	< 1,000E-05	570	4,641E-01	870	< 1,000E-05	1170	1,026E-04	2550	8,973E-01	4050	1,689E-01
280	< 1,000E-05	580	3,534E-01	880	< 1,000E-05	1180	1,293E-04	2600	9,027E-01	4100	9,411E-02
290	< 1,000E-05	590	2,493E-01	890	< 1,000E-05	1190	1,808E-04	2650	9,067E-01	4150	5,303E-02
300	< 1,000E-05	600	1,627E-01	900	< 1,000E-05	1200	2,372E-04	2700	9,079E-01	4200	2,924E-02
310	< 1,000E-05	610	9,760E-02	910	< 1,000E-05	1250	9,582E-04	2750	9,034E-01	4250	1,970E-02
320	< 1,000E-05	620	5,393E-02	920	< 1,000E-05	1300	3,153E-03	2800	8,741E-01	4300	1,772E-02
330	4,871E-05	630	2,735E-02	930	< 1,000E-05	1350	8,739E-03	2850	8,210E-01	4350	1,772E-02
340	7,922E-03	640	1,274E-02	940	< 1,000E-05	1400	2,078E-02	2900	7,707E-01	4400	1,571E-02
350	7,618E-02	650	5,556E-03	950	< 1,000E-05	1450	4,231E-02	2950	7,303E-01	4450	1,258E-02
360	2,203E-01	660	2,205E-03	960	< 1,000E-05	1500	7,563E-02	3000	6,961E-01	4500	9,730E-03
370	3,634E-01	670	8,986E-04	970	< 1,000E-05	1550	1,217E-01	3050	6,643E-01	4550	8,055E-03
380	4,698E-01	680	3,566E-04	980	< 1,000E-05	1600	1,704E-01	3100	6,331E-01	4600	7,823E-03
390	5,425E-01	690	1,258E-04	990	< 1,000E-05	1650	2,347E-01	3150	6,032E-01	4650	9,759E-03
400	5,941E-01	700	4,383E-05	1000	< 1,000E-05	1700	3,036E-01	3200	5,784E-01	4700	1,497E-02
410	6,380E-01	710	1,529E-05	1010	< 1,000E-05	1750	3,737E-01	3250	5,564E-01	4750	2,385E-02
420	6,736E-01	720	< 1,000E-05	1020	< 1,000E-05	1800	4,423E-01	3300	5,361E-01	4800	3,556E-02
430	7,056E-01	730	< 1,000E-05	1030	< 1,000E-05	1850	5,043E-01	3350	5,195E-01	4850	4,991E-02
440	7,350E-01	740	< 1,000E-05	1040	< 1,000E-05	1900	5,627E-01	3400	5,065E-01	4900	6,777E-02
450	7,620E-01	750	< 1,000E-05	1050	< 1,000E-05	1950	6,167E-01	3450	4,991E-01	4950	9,057E-02
460	7,861E-01	760	< 1,000E-05	1060	< 1,000E-05	2000	6,627E-01	3500	4,961E-01	5000	1,170E-01
470	8,074E-01	770	< 1,000E-05	1070	< 1,000E-05	2050	7,040E-01	3550	4,998E-01	5050	1,430E-01
480	8,244E-01	780	< 1,000E-05	1080	< 1,000E-05	2100	7,389E-01	3600	5,074E-01	5100	1,638E-01
490	8,370E-01	790	< 1,000E-05	1090	< 1,000E-05	2150	7,711E-01	3650	5,196E-01	5150	1,750E-01

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Optical properties		Mechanical properties		Colormetric properties				
Reflection factor		Reference thickness		1 mm 2 mm 3 mm				
$P_d = 0,910$		$d = 2 \text{ mm}$		Illuminant D65	x	0,196	0,169	0,154
Values guaranteed		Density			y	0,374	0,432	0,492
The color of glass is within a circle of the CIE Yu'v'UCS(1976) defined by		$\rho = 2,77 \text{ g/cm}^3$			Y	37,3	20,7	12,4
$(u' - 0,088)^2 + (v' - 0,543)^2 = (0,037)^2$		Knoop hardness			λ_d	496,0	500,0	505,0
for any black body radiator 1500K to 3200K		HK[0.1/20]			P_e	0,400	0,470	0,510
Black body radiator	Photopic Transmittance [%]	Thermal properties		Illuminant A	x	0,253	0,203	0,178
2100 K	13,5 ±1.5	Transformation temperature			y	0,498	0,549	0,593
1500 K	9 ±1.5	$T_g = 453 \text{ °C}$			Y	29,6	15,5	9,0
Refractive indices		Thermal expansion in $10^{-6}/K$			λ_d	503,0	505,0	508,0
$n_e (546 \text{ nm}) = 1,56$	$n_d (587,6 \text{ nm}) = 1,555 \pm 0,005$	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,8$			P_e	0,440	0,550	0,610
Sellmeier coefficients		Chemical properties		Notes				
valid from 440 nm to 1550 nm		Chemical resistance		Ionically colored glass Bandpass filter NIR cutoff filter NVIS-Green A - 2 mm bandpass filter according to MIL-STD-3009 ISO 23364:2021 Disclaimer All data without tolerances are to be understood to be reference values.				
B_1	1,0783	FR class = 0						
B_2	0,3094	SR class = 4						
B_3	36,9992	AR class = 3						
C_1	5,301E-09 μm^2	Resistance against humidity						
C_2	3,8950E-02 μm^2	Delicate glass						
C_3	5395,591 μm^2	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5						
Internal quality		Internal quality						
Bubble class	1							



S8022

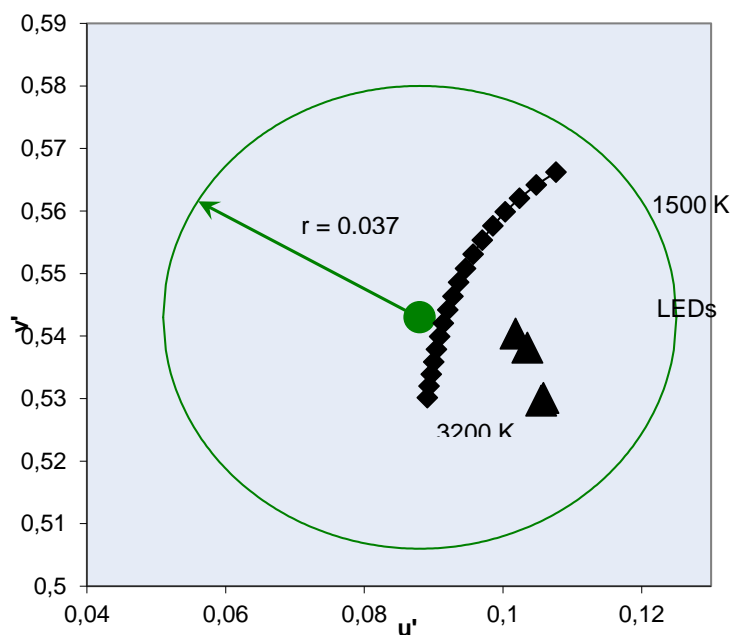


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	4,483E-01	800	< 1,000E-05	1100	< 1,000E-05	2200	3,453E-01	3700	5,800E-02
210	< 1,0E-05	510	5,049E-01	810	< 1,000E-05	1110	< 1,000E-05	2250	3,871E-01	3750	5,505E-02
220	< 1,0E-05	520	5,313E-01	820	< 1,000E-05	1120	< 1,000E-05	2300	4,287E-01	3800	4,448E-02
230	< 1,0E-05	530	5,123E-01	830	< 1,000E-05	1130	< 1,000E-05	2350	4,691E-01	3850	3,093E-02
240	< 1,0E-05	540	4,431E-01	840	< 1,000E-05	1140	< 1,000E-05	2400	5,060E-01	3900	1,879E-02
250	< 1,0E-05	550	3,430E-01	850	< 1,000E-05	1150	< 1,000E-05	2450	5,380E-01	3950	9,286E-03
260	< 1,0E-05	560	2,302E-01	860	< 1,000E-05	1160	< 1,000E-05	2500	5,617E-01	4000	3,658E-03
270	< 1,0E-05	570	1,295E-01	870	< 1,000E-05	1170	< 1,000E-05	2550	5,775E-01	4050	1,282E-03
280	< 1,0E-05	580	5,934E-02	880	< 1,000E-05	1180	< 1,000E-05	2600	5,903E-01	4100	4,598E-04
290	< 1,0E-05	590	2,168E-02	890	< 1,000E-05	1190	< 1,000E-05	2650	6,017E-01	4150	1,798E-04
300	< 1,0E-05	600	6,305E-03	900	< 1,000E-05	1200	< 1,000E-05	2700	6,055E-01	4200	8,400E-05
310	< 1,0E-05	610	1,407E-03	910	< 1,000E-05	1250	< 1,000E-05	2750	5,709E-01	4250	5,361E-05
320	< 1,000E-05	620	2,455E-04	920	< 1,000E-05	1300	< 1,000E-05	2800	3,741E-01	4300	4,785E-05
330	< 1,000E-05	630	3,322E-05	930	< 1,000E-05	1350	< 1,000E-05	2850	2,130E-01	4350	5,774E-05
340	< 1,000E-05	640	< 1,000E-05	940	< 1,000E-05	1400	< 1,000E-05	2900	1,425E-01	4400	7,778E-05
350	< 1,000E-05	650	< 1,000E-05	950	< 1,000E-05	1450	< 1,000E-05	2950	1,074E-01	4450	1,016E-04
360	5,717E-04	660	< 1,000E-05	960	< 1,000E-05	1500	3,995E-05	3000	8,629E-02	4500	1,365E-04
370	5,212E-03	670	< 1,000E-05	970	< 1,000E-05	1550	1,610E-04	3050	7,123E-02	4550	1,958E-04
380	1,815E-02	680	< 1,000E-05	980	< 1,000E-05	1600	7,352E-04	3100	5,950E-02	4600	3,023E-04
390	3,992E-02	690	< 1,000E-05	990	< 1,000E-05	1650	2,520E-03	3150	5,038E-02	4650	5,195E-04
400	6,468E-02	700	< 1,000E-05	1000	< 1,000E-05	1700	6,915E-03	3200	4,380E-02	4700	9,015E-04
410	9,600E-02	710	< 1,000E-05	1010	< 1,000E-05	1750	1,600E-02	3250	3,942E-02	4750	1,433E-03
420	1,198E-01	720	< 1,000E-05	1020	< 1,000E-05	1800	3,121E-02	3300	3,689E-02	4800	2,044E-03
430	1,414E-01	730	< 1,000E-05	1030	< 1,000E-05	1850	5,323E-02	3350	3,594E-02	4850	2,635E-03
440	1,629E-01	740	< 1,000E-05	1040	< 1,000E-05	1900	8,298E-02	3400	3,609E-02	4900	3,028E-03
450	1,883E-01	750	< 1,000E-05	1050	< 1,000E-05	1950	1,197E-01	3450	3,746E-02	4950	3,019E-03
460	2,211E-01	760	< 1,000E-05	1060	< 1,000E-05	2000	1,616E-01	3500	4,005E-02	5000	2,545E-03
470	2,620E-01	770	< 1,000E-05	1070	< 1,000E-05	2050	2,074E-01	3550	4,379E-02	5050	1,799E-03
480	3,155E-01	780	< 1,000E-05	1080	< 1,000E-05	2100	2,550E-01	3600	4,878E-02	5100	1,030E-03
490	3,799E-01	790	< 1,000E-05	1090	< 1,000E-05	2150	3,025E-01	3650	5,436E-02	5150	4,597E-04

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Chromaticity dependence on Incandescent Color Temperature



Chromaticity and NVIS Radiance at reference thickness 2 mm						
Planck [K]	u'	v'	x	y	Y	NR _A
1500	0,108	0,566	0,270	0,631	9,5	6,1E-11
1600	0,105	0,564	0,262	0,627	10,4	5,8E-11
1700	0,102	0,562	0,254	0,621	11,2	5,6E-11
1800	0,100	0,560	0,248	0,615	11,9	5,4E-11
1900	0,099	0,558	0,242	0,608	12,6	5,2E-11
2000	0,097	0,555	0,236	0,601	13,3	5,1E-11
2100	0,096	0,553	0,231	0,594	13,9	5,0E-11
2200	0,095	0,551	0,227	0,587	14,5	4,9E-11
2300	0,094	0,549	0,223	0,580	15,0	4,8E-11
2400	0,093	0,546	0,219	0,573	15,5	4,7E-11
2500	0,092	0,544	0,215	0,566	15,9	4,7E-11
2600	0,091	0,542	0,212	0,559	16,3	4,6E-11
2700	0,091	0,540	0,209	0,553	16,7	4,6E-11
2800	0,090	0,538	0,207	0,547	17,1	4,5E-11
2900	0,090	0,536	0,204	0,540	17,4	4,5E-11
3000	0,090	0,534	0,202	0,535	17,8	4,4E-11
3100	0,089	0,532	0,200	0,529	18,1	4,4E-11
3200	0,089	0,530	0,198	0,523	18,4	4,4E-11
LED	u'	v'	x	y	Y	NR _A
LUXEON rebel A2-RM-G	0,102	0,540	0,231	0,545	21,1	4,2E-11
LUXEON rebel T2-SO-L	0,106	0,530	0,229	0,511	20,9	4,2E-11
LUXEON rebel B5-R0-G	0,106	0,530	0,228	0,510	20,7	4,3E-11
LUXEON rebel Q1-RM-K	0,104	0,538	0,232	0,537	20,7	4,3E-11
other sources of illumination	A service for calculating chromaticity or NVIS radiance can be provided					

NVIS Green A

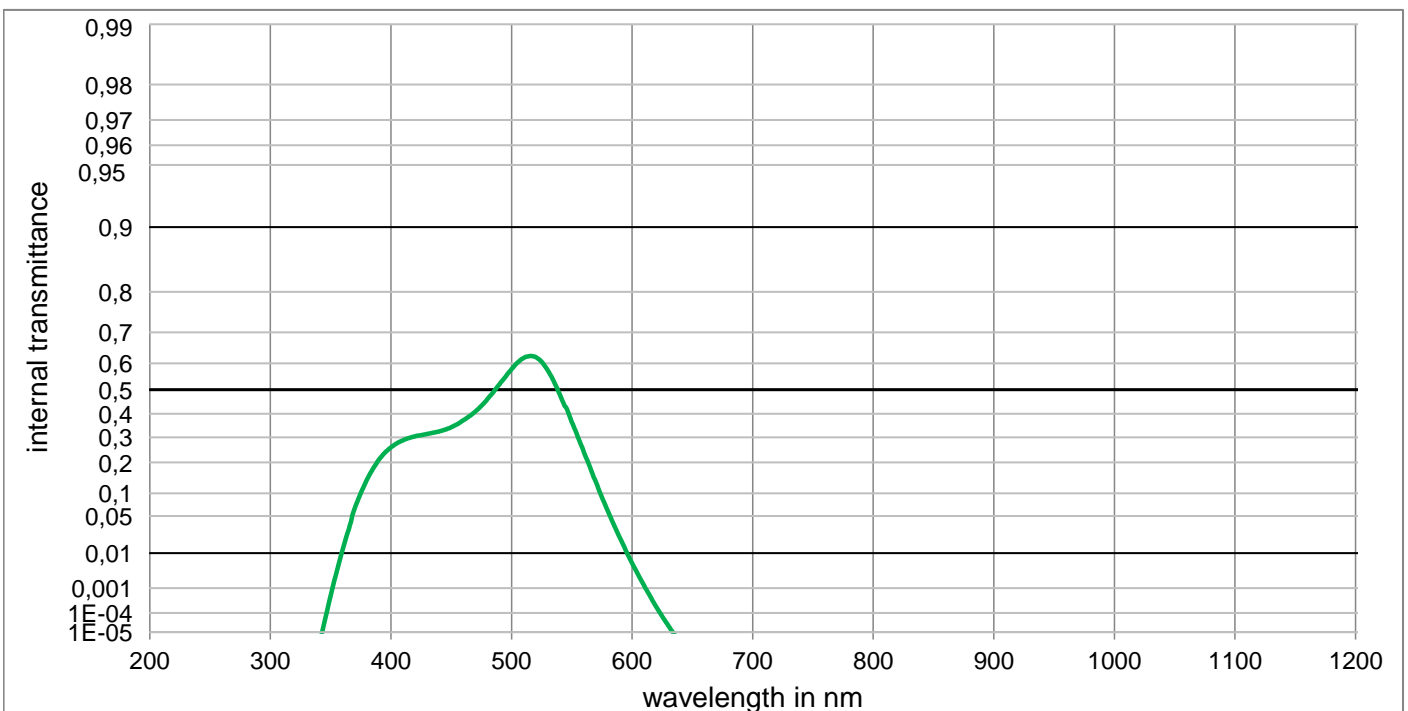
NVIS Green A Chromaticity coordinates
(as defined by MIL-STD-3009)

u' = 0.088
v' = 0.543

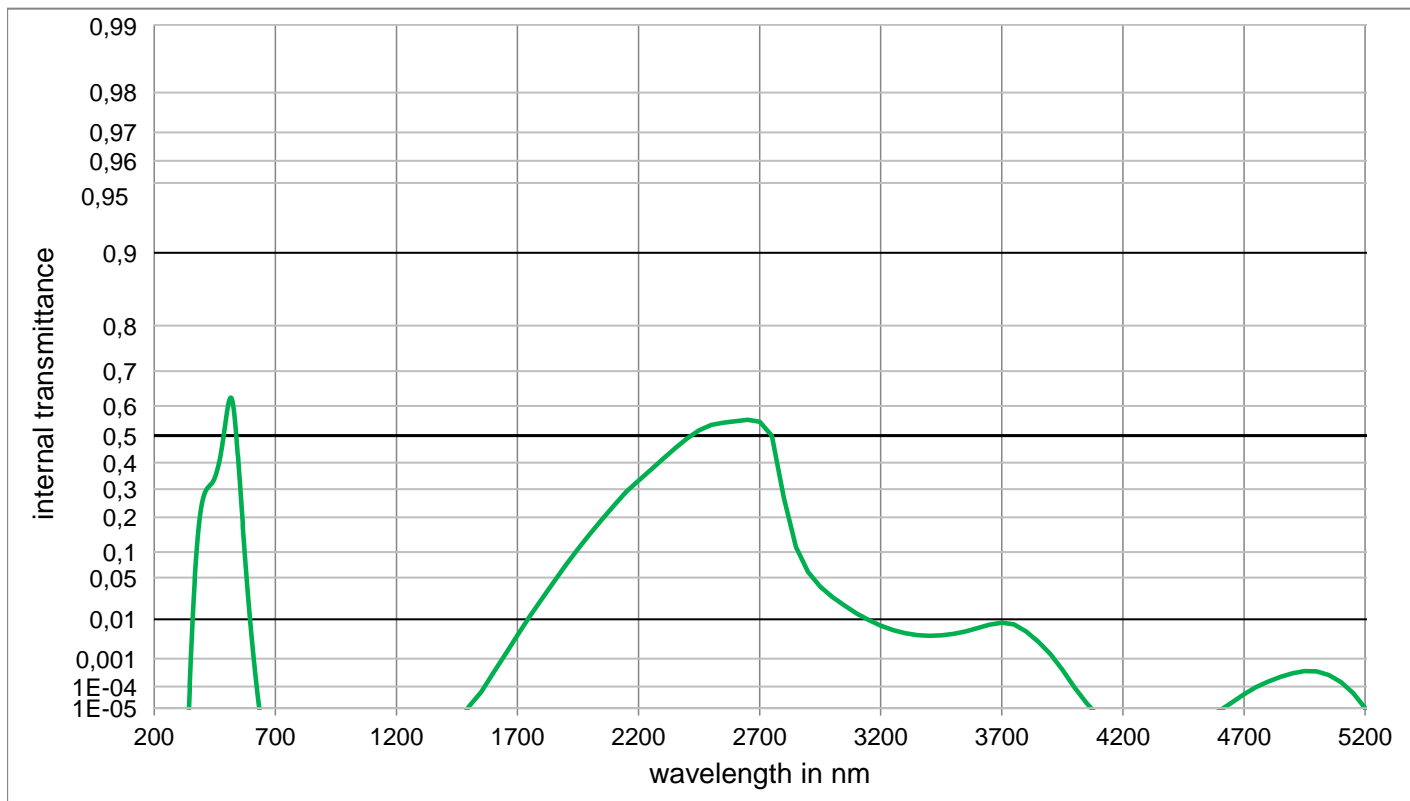
with radius of tolerance r = 0.037

S8023

Optical properties		Mechanical properties		Colorimetric properties				
Reflection factor		Reference thickness		1 mm 2 mm 3 mm				
$P_d = 0,913$		$d = 3 \text{ mm}$		Illuminant D65	x	0,206	0,176	0,160
Values guaranteed		Density			y	0,328	0,334	0,346
The color of the glass is within a circle of the CIE Y u' v' UCS(1976) defined by $(u' - 0,088)^2 + (v' - 0,543)^2 = (0,037)^2$ for any black body radiator 1500K to 3200K		$\rho = 2,75 \text{ g/cm}^3$			Y	50,5	35,3	26,4
Black body radiator		Knoop hardness			λ_d	491,5	492,0	492,9
Photopic Transmittance [%]		HK[0.1/20]			P_e	0,388	0,496	0,544
2100 K	15 ±1.5	Thermal properties		Illuminant A	x	0,277	0,218	0,189
1500 K	10 ±1.5	Transformation temperature			y	0,459	0,474	0,486
Refractive indices		$T_g = 444 \text{ °C}$			Y	41,3	26,9	19,3
$n_e (546 \text{ nm}) = 1,54$		Thermal expansion in $10^{-6}/K$			λ_d	500,1	499,8	500,1
$n_d (587,6 \text{ nm}) = 1,541 \pm 0,005$		$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})}$			P_e	0,388	0,522	0,588
Sellmeier coefficients		$\alpha_{(20^\circ\text{C}/300^\circ\text{C})}$		Notes				
valid from 440 nm to 1550 nm		$\alpha_{(20^\circ\text{C}/200^\circ\text{C})} = 9,7$		Ionically colored glass Bandpass filter NIR cutoff filter NVIS-Green A - 3 mm bandpass filter according to MIL-STD-3009 ISO 23364:2021				
B_1	0,0304	Chemical properties						
B_2	1,3342	Chemical resistance						
B_3	381,6503	$FR \text{ class} = 0$						
C_1	1,246E-01 μm^2	$SR \text{ class} = 4$						
C_3	32646,623 μm^2	$AR \text{ class} = 3$		Disclaimer				
Internal quality		Resistance against humidity		All data without tolerances are to be understood to be reference values.				
Bubble class	1	Delicate glass						
		see pocket catalogue "Optical Filter Glass 2024", chapter 5.5						



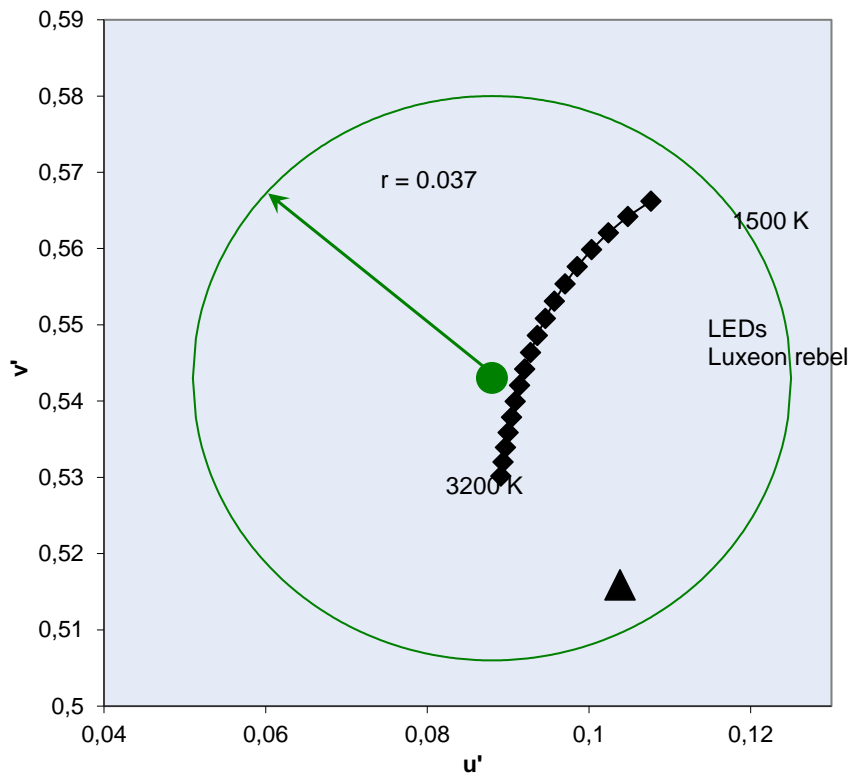
S8023



Internal transmittance τ_i at reference thickness													
The internal transmittance values, tabulated and graphically represented, are reference values only													
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	5,796E-01	800	< 1,000E-05	1100	< 1,000E-05	2200	3,323E-01	3700	8,548E-03		
210	< 1,0E-05	510	6,186E-01	810	< 1,000E-05	1110	< 1,000E-05	2250	3,728E-01	3750	7,773E-03		
220	< 1,0E-05	520	6,216E-01	820	< 1,000E-05	1120	< 1,000E-05	2300	4,136E-01	3800	5,431E-03		
230	< 1,0E-05	530	5,754E-01	830	< 1,000E-05	1130	< 1,000E-05	2350	4,531E-01	3850	3,027E-03		
240	< 1,0E-05	540	4,804E-01	840	< 1,000E-05	1140	< 1,000E-05	2400	4,891E-01	3900	1,397E-03		
250	< 1,0E-05	550	3,646E-01	850	< 1,000E-05	1150	< 1,000E-05	2450	5,187E-01	3950	4,345E-04		
260	< 1,0E-05	560	2,394E-01	860	< 1,000E-05	1160	< 1,000E-05	2500	5,374E-01	4000	9,178E-05		
270	< 1,0E-05	570	1,317E-01	870	< 1,000E-05	1170	< 1,000E-05	2550	5,451E-01	4050	1,790E-05		
280	< 1,0E-05	580	5,863E-02	880	< 1,000E-05	1180	< 1,000E-05	2600	5,502E-01	4100	< 1,000E-05		
290	< 1,0E-05	590	2,067E-02	890	< 1,000E-05	1190	< 1,000E-05	2650	5,547E-01	4150	< 1,000E-05		
300	< 1,0E-05	600	5,710E-03	900	< 1,000E-05	1200	< 1,000E-05	2700	5,481E-01	4200	< 1,000E-05		
310	< 1,0E-05	610	1,196E-03	910	< 1,000E-05	1250	< 1,000E-05	2750	4,994E-01	4250	< 1,000E-05		
320	< 1,000E-05	620	1,920E-04	920	< 1,000E-05	1300	< 1,000E-05	2800	2,689E-01	4300	< 1,000E-05		
330	< 1,000E-05	630	2,354E-05	930	< 1,000E-05	1350	< 1,000E-05	2850	1,121E-01	4350	< 1,000E-05		
340	< 1,000E-05	640	< 1,000E-05	940	< 1,000E-05	1400	< 1,000E-05	2900	5,898E-02	4400	< 1,000E-05		
350	5,305E-04	650	< 1,000E-05	950	< 1,000E-05	1450	< 1,000E-05	2950	3,724E-02	4450	< 1,000E-05		
360	1,243E-02	660	< 1,000E-05	960	< 1,000E-05	1500	1,239E-05	3000	2,578E-02	4500	< 1,000E-05		
370	6,439E-02	670	< 1,000E-05	970	< 1,000E-05	1550	5,810E-05	3050	1,840E-02	4550	< 1,000E-05		
380	1,397E-01	680	< 1,000E-05	980	< 1,000E-05	1600	3,349E-04	3100	1,314E-02	4600	< 1,000E-05		
390	2,098E-01	690	< 1,000E-05	990	< 1,000E-05	1650	1,381E-03	3150	9,636E-03	4650	1,919E-05		
400	2,590E-01	700	< 1,000E-05	1000	< 1,000E-05	1700	4,363E-03	3200	7,306E-03	4700	4,704E-05		
410	2,881E-01	710	< 1,000E-05	1010	< 1,000E-05	1750	1,129E-02	3250	5,847E-03	4750	9,473E-05		
420	3,042E-01	720	< 1,000E-05	1020	< 1,000E-05	1800	2,387E-02	3300	4,945E-03	4800	1,584E-04		
430	3,144E-01	730	< 1,000E-05	1030	< 1,000E-05	1850	4,389E-02	3350	4,463E-03	4850	2,376E-04		
440	3,249E-01	740	< 1,000E-05	1040	< 1,000E-05	1900	7,212E-02	3400	4,260E-03	4900	3,262E-04		
450	3,430E-01	750	< 1,000E-05	1050	< 1,000E-05	1950	1,074E-01	3450	4,380E-03	4950	3,896E-04		
460	3,719E-01	760	< 1,000E-05	1060	< 1,000E-05	2000	1,488E-01	3500	4,740E-03	5000	3,832E-04		
470	4,097E-01	770	< 1,000E-05	1070	< 1,000E-05	2050	1,947E-01	3550	5,450E-03	5050	2,843E-04		
480	4,614E-01	780	< 1,000E-05	1080	< 1,000E-05	2100	2,428E-01	3600	6,450E-03	5100	1,509E-04		
490	5,213E-01	790	< 1,000E-05	1090	< 1,000E-05	2150	2,908E-01	3650	7,713E-03	5150	5,275E-05		

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Chromaticity dependence on Incandescent Color Temperature



Chromaticity and NVIS Radiance at reference thickness 3 mm						
Planck [K]	u'	v'	x	y	Y	NR _A
1500	0,103	0,561	0,254	0,616	10,2	5,5E-11
1600	0,100	0,558	0,245	0,607	11,2	5,3E-11
1700	0,098	0,555	0,237	0,598	12,2	5,1E-11
1800	0,096	0,551	0,231	0,587	13,0	4,9E-11
1900	0,095	0,548	0,224	0,577	13,8	4,8E-11
2000	0,094	0,545	0,219	0,566	14,6	4,7E-11
2100	0,093	0,541	0,214	0,556	15,3	4,6E-11
2200	0,092	0,538	0,209	0,546	15,9	4,6E-11
2300	0,091	0,535	0,205	0,536	16,6	4,5E-11
2400	0,091	0,531	0,202	0,526	17,1	4,4E-11
2500	0,090	0,528	0,198	0,516	17,7	4,4E-11
2600	0,090	0,525	0,196	0,507	18,2	4,3E-11
2700	0,090	0,522	0,193	0,499	18,6	4,3E-11
2800	0,090	0,519	0,190	0,490	19,1	4,3E-11
2900	0,089	0,516	0,188	0,482	19,5	4,2E-11
3000	0,089	0,513	0,186	0,475	19,9	4,2E-11
3100	0,089	0,510	0,184	0,467	20,2	4,2E-11
3200	0,089	0,508	0,182	0,460	20,6	4,2E-11
LED	u'	v'	x	y	Y	NR _A
LUXEON rebel A2-RM-G	0,104	0,516	0,214	0,472	23,0	4,0E-11
other sources of illumination	A service for calculating chromaticity or NVIS radiance can be provided					

NVIS Green A

NVIS Green A Chromaticity coordinates
(as defined by MIL-STD-3009)

u' = 0.088
v' = 0.543

with radius of tolerance r = 0.037

S8612

Optical properties	
Reflection factor	
$P_d = 0,913$	
Spectral values guaranteed	
τ_i (500 nm)	$\geq 0,96$
τ_i (600 nm)	$\geq 0,48$
τ_i (700 nm)	$< 0,02$
λ ($\tau_{i,max}$) [nm]	$= 500 \pm 5$
Refractive indices	
n_F (486 nm)	$= 1,55$
n_e (546 nm)	$= 1,54$
n_d (587,6 nm)	$= 1,54$
Sellmeier coefficients	
valid from 400 nm to 1550 nm	
B_1	0,9589
B_2	0,3811
B_3	1,1938
C_1	8,342E-03 μm^2
C_2	1,0187E-02 μm^2
C_3	134,146 μm^2
Internal quality	
Bubble class	1

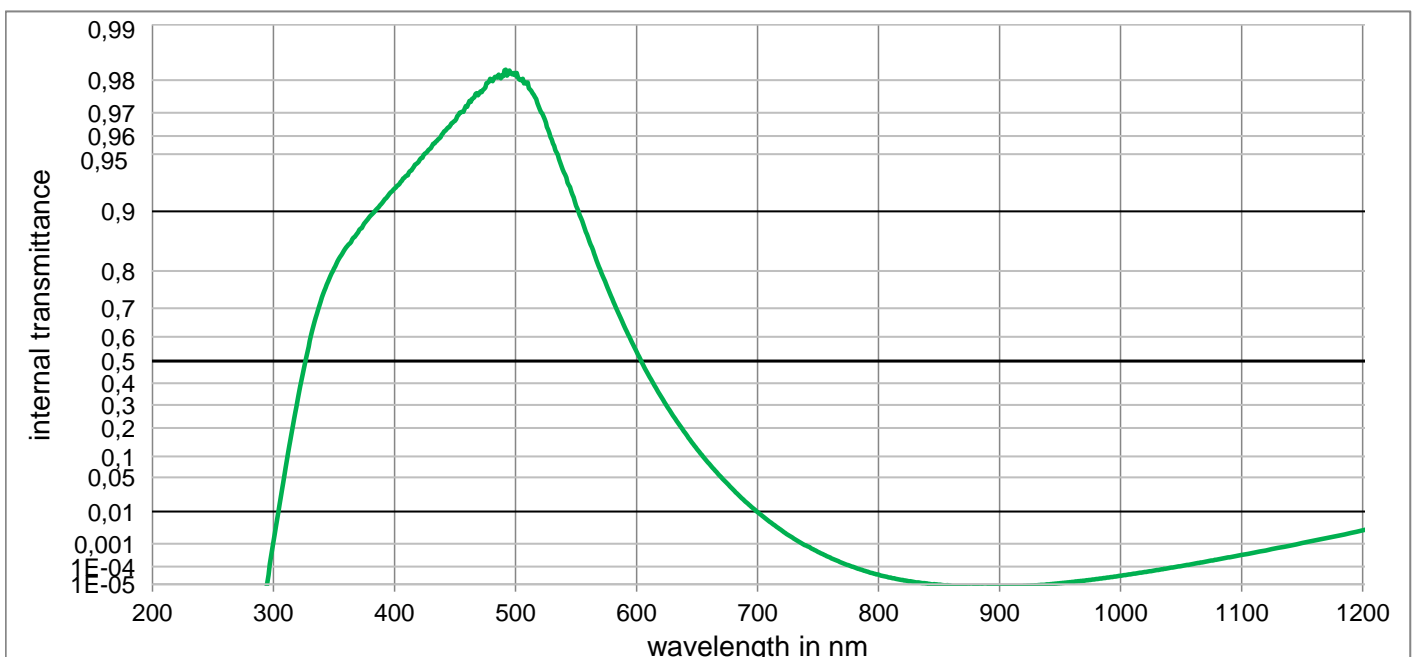
Mechanical properties	
Reference thickness	
$d = 1,00$ mm	
Density	
$\rho = 2,66$ g/cm ³	
Knoop hardness	
HK[0.1/20] = 470	

Thermal properties	
Transformation temperature	
$T_g = 391$ °C	
Thermal expansion in $10^{-6}/\text{K}$	
α (20°C/300°C) = 9,5	

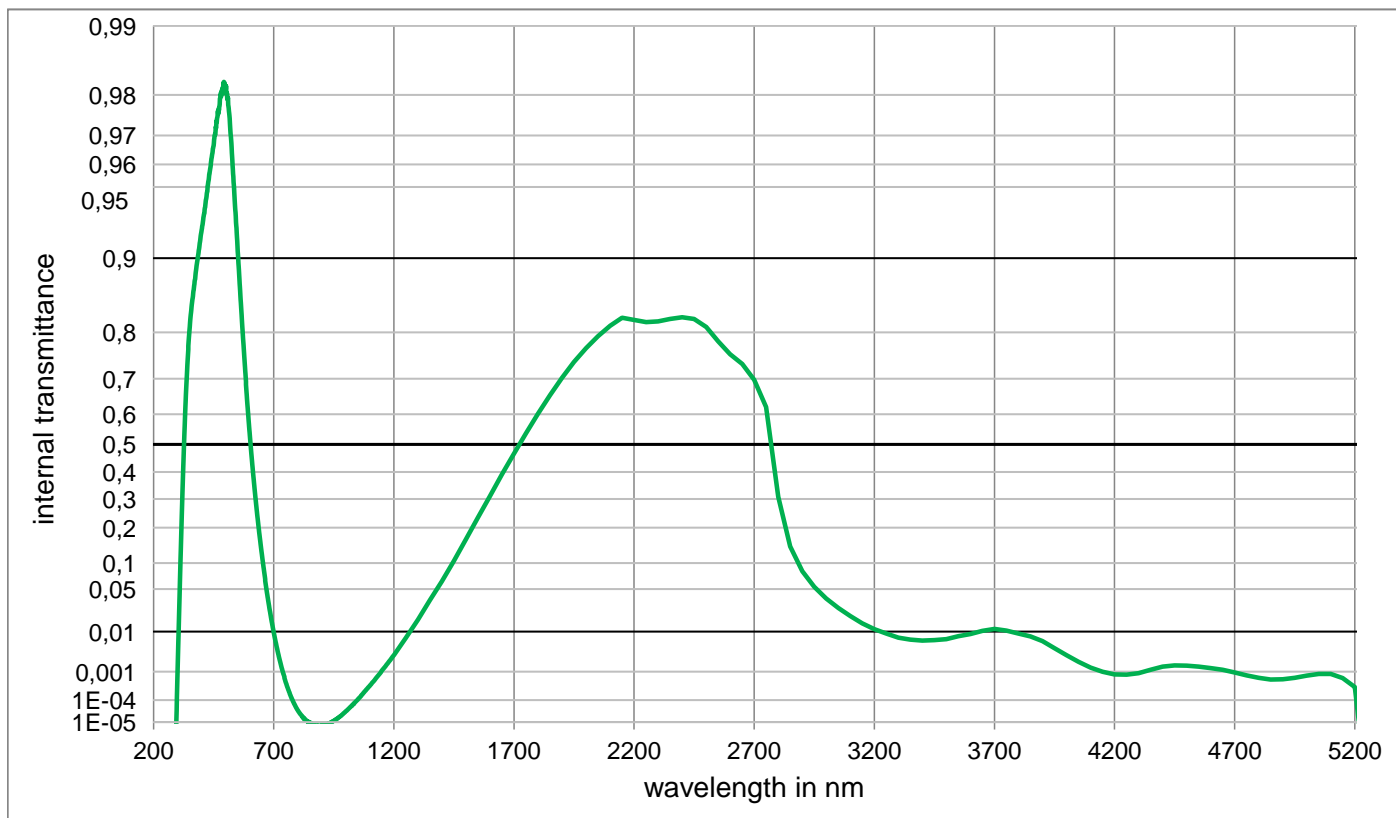
Chemical properties	
Chemical resistance	
FR class	= 0
SR class	= 3
AR class	= 3
Resistance against humidity	
Delicate glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties		1 mm	2 mm	3 mm
Illuminant D65	x	0,251	0,218	0,198
	y	0,321	0,311	0,302
	Y	72,1	61,5	54,4
	λ_d	490 nm	489 nm	489 nm
	P_e	0,232	0,358	0,438
Illuminant A	x	0,356	0,301	0,265
	y	0,433	0,440	0,440
	Y	64,6	51,8	43,9
	λ_d	500 nm	499 nm	498 nm
	P_e	0,208	0,335	0,421

Notes	
Ionically colored glass	
Bandpass filter / Shortpass filter	
NIR cutoff filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



S8612



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,812E-01	800	3,721E-05	1100	3,490E-04	2200	8,214E-01	3700	1,127E-02
210	< 1,0E-05	510	9,794E-01	810	2,547E-05	1110	4,398E-04	2250	8,176E-01	3750	1,048E-02
220	< 1,0E-05	520	9,712E-01	820	1,846E-05	1120	5,462E-04	2300	8,190E-01	3800	9,124E-03
230	< 1,0E-05	530	9,581E-01	830	1,353E-05	1130	6,882E-04	2350	8,230E-01	3850	7,921E-03
240	< 1,0E-05	540	9,376E-01	840	1,144E-05	1140	8,525E-04	2400	8,257E-01	3900	6,253E-03
250	< 1,0E-05	550	9,064E-01	850	< 1,000E-05	1150	1,056E-03	2450	8,228E-01	3950	4,323E-03
260	< 1,0E-05	560	8,634E-01	860	< 1,000E-05	1160	1,303E-03	2500	8,093E-01	4000	2,878E-03
270	< 1,0E-05	570	8,031E-01	870	< 1,000E-05	1170	1,600E-03	2550	7,833E-01	4050	1,922E-03
280	< 1,0E-05	580	7,281E-01	880	< 1,000E-05	1180	1,949E-03	2600	7,570E-01	4100	1,324E-03
290	< 1,0E-05	590	6,380E-01	890	< 1,000E-05	1190	2,376E-03	2650	7,355E-01	4150	9,941E-04
300	1,2E-03	600	5,394E-01	900	< 1,000E-05	1200	2,905E-03	2700	6,974E-01	4200	8,230E-04
310	7,0E-02	610	4,375E-01	910	< 1,000E-05	1250	7,369E-03	2750	6,221E-01	4250	8,062E-04
320	3,262E-01	620	3,402E-01	920	< 1,000E-05	1300	1,688E-02	2800	3,075E-01	4300	8,948E-04
330	5,836E-01	630	2,532E-01	930	< 1,000E-05	1350	3,500E-02	2850	1,427E-01	4350	1,139E-03
340	7,324E-01	640	1,806E-01	940	< 1,000E-05	1400	6,250E-02	2900	8,200E-02	4400	1,405E-03
350	8,052E-01	650	1,227E-01	950	1,169E-05	1450	1,056E-01	2950	5,346E-02	4450	1,517E-03
360	8,471E-01	660	8,015E-02	960	1,407E-05	1500	1,633E-01	3000	3,712E-02	4500	1,498E-03
370	8,719E-01	670	5,011E-02	970	1,696E-05	1550	2,331E-01	3050	2,668E-02	4550	1,412E-03
380	8,942E-01	680	3,002E-02	980	2,080E-05	1600	3,106E-01	3100	1,947E-02	4600	1,288E-03
390	9,098E-01	690	1,724E-02	990	2,577E-05	1650	3,906E-01	3150	1,445E-02	4650	1,134E-03
400	9,241E-01	700	9,713E-03	1000	3,264E-05	1700	4,675E-01	3200	1,116E-02	4700	9,531E-04
410	9,351E-01	710	5,318E-03	1010	4,113E-05	1750	5,384E-01	3250	9,156E-03	4750	7,737E-04
420	9,452E-01	720	2,878E-03	1020	5,209E-05	1800	6,014E-01	3300	7,488E-03	4800	6,368E-04
430	9,536E-01	730	1,550E-03	1030	6,608E-05	1850	6,560E-01	3350	6,807E-03	4850	5,693E-04
440	9,614E-01	740	8,691E-04	1040	8,476E-05	1900	7,019E-01	3400	6,426E-03	4900	5,713E-04
450	9,668E-01	750	4,709E-04	1050	1,072E-04	1950	7,397E-01	3450	6,601E-03	4950	6,405E-04
460	9,722E-01	760	2,680E-04	1060	1,355E-04	2000	7,696E-01	3500	6,905E-03	5000	7,477E-04
470	9,764E-01	770	1,513E-04	1070	1,735E-04	2050	7,930E-01	3550	7,981E-03	5050	8,493E-04
480	9,801E-01	780	9,133E-05	1080	2,205E-04	2100	8,115E-01	3600	8,930E-03	5100	8,478E-04
490	9,810E-01	790	5,627E-05	1090	2,782E-04	2150	8,248E-01	3650	1,037E-02	5150	6,335E-04

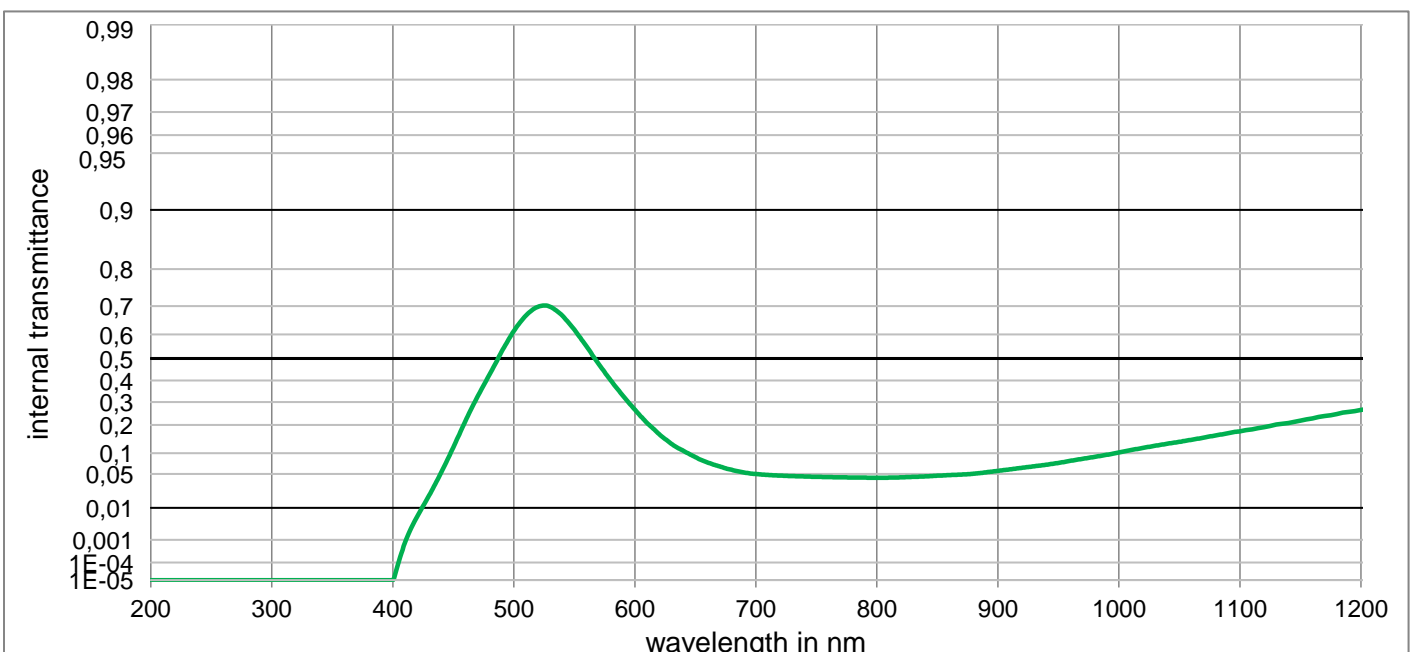
VG9

Optical properties	
Reflection factor	
$P_d = 0,911$	
Spectral values guaranteed	
τ_i (450 nm)	$\leq 0,21$
τ_i (514 nm)	$\geq 0,67$
τ_i (633 nm)	$\leq 0,15$
τ_i (725 nm)	$\leq 0,07$
τ_i (1060 nm)	$\leq 0,18$
Refractive indices	
n_F (486 nm)	$= 1,558$
n_e (546 nm)	$= 1,552$
n_d (587,6 nm)	$= 1,549$
Sellmeier coefficients	
valid from 440 nm to 1550 nm	
B_1	0,3483
B_2	1,0034
B_3	34,8247
C_1	1,326E-02 μm^2
C_2	1,2265E-02 μm^2
C_3	5797,735 μm^2
Internal quality	
Bubble class	1

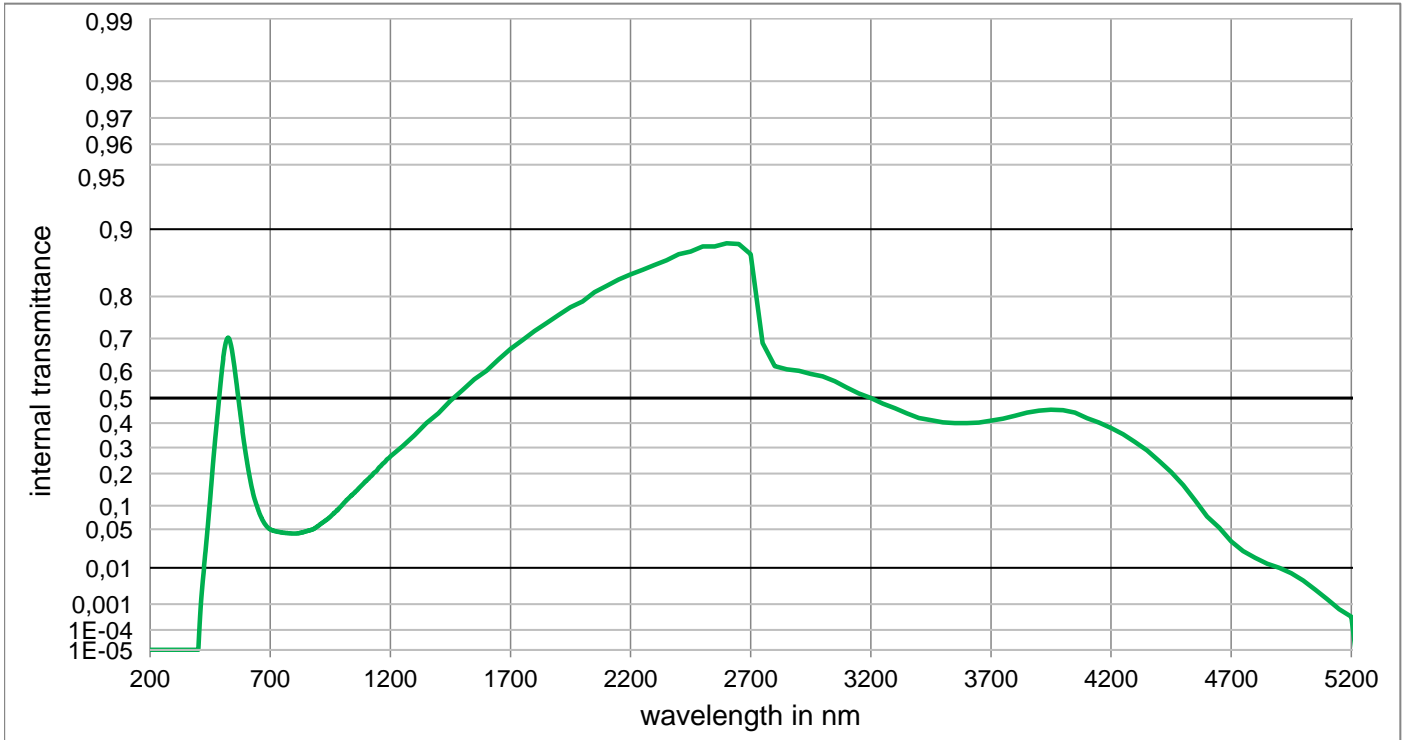
Mechanical properties	
Reference thickness	
$d = 1,00 \text{ mm}$	
Density	
$\rho = 2,87 \text{ g/cm}^3$	
Knoop hardness	
HK[0.1/20] = 449	
Thermal properties	
Transformation temperature	
$T_g = 451 \text{ }^\circ\text{C}$	
Thermal expansion in $10^{-6}/\text{K}$	
α (-30 $^\circ\text{C}/+70^\circ\text{C}$)	$= 9,2$
α (20 $^\circ\text{C}/300^\circ\text{C}$)	$= 10,6$
Chemical properties	
Chemical resistance	
FR class	$= 0$
SR class	$= 1$
AR class	$= 1$
Resistance against humidity	
Robust glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colormetric properties				
		1 mm	2 mm	3 mm
Illuminant D65	x	0,284	0,246	0,220
	y	0,493	0,582	0,637
	Y	44,8	25,2	15,2
	λ_d	541 nm	535 nm	532 nm
	P_e	0,392	0,561	0,660
Illuminant A	x	0,370	0,306	0,265
	y	0,522	0,596	0,645
	Y	39,7	20,9	12,1
	λ_d	535 nm	529 nm	527 nm
	P_e	0,307	0,468	0,576

Notes	
Ionically colored glass	
Bandpass filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



VG9

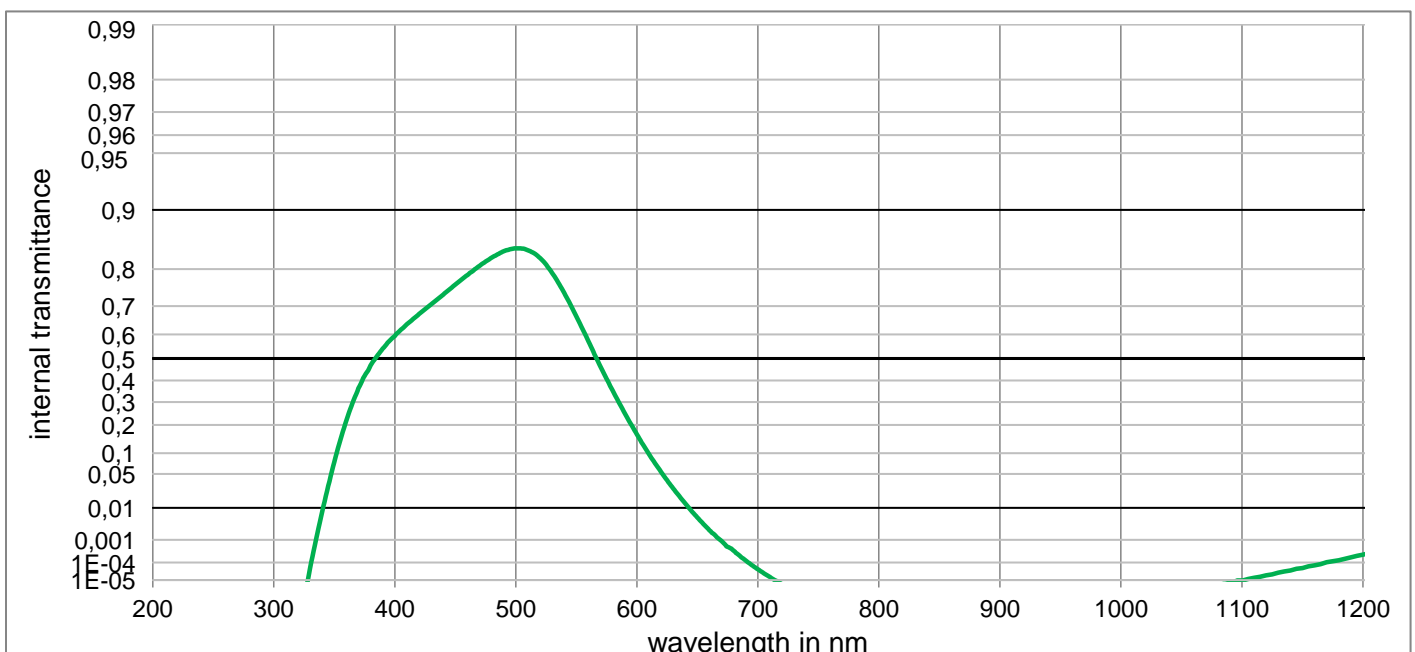


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

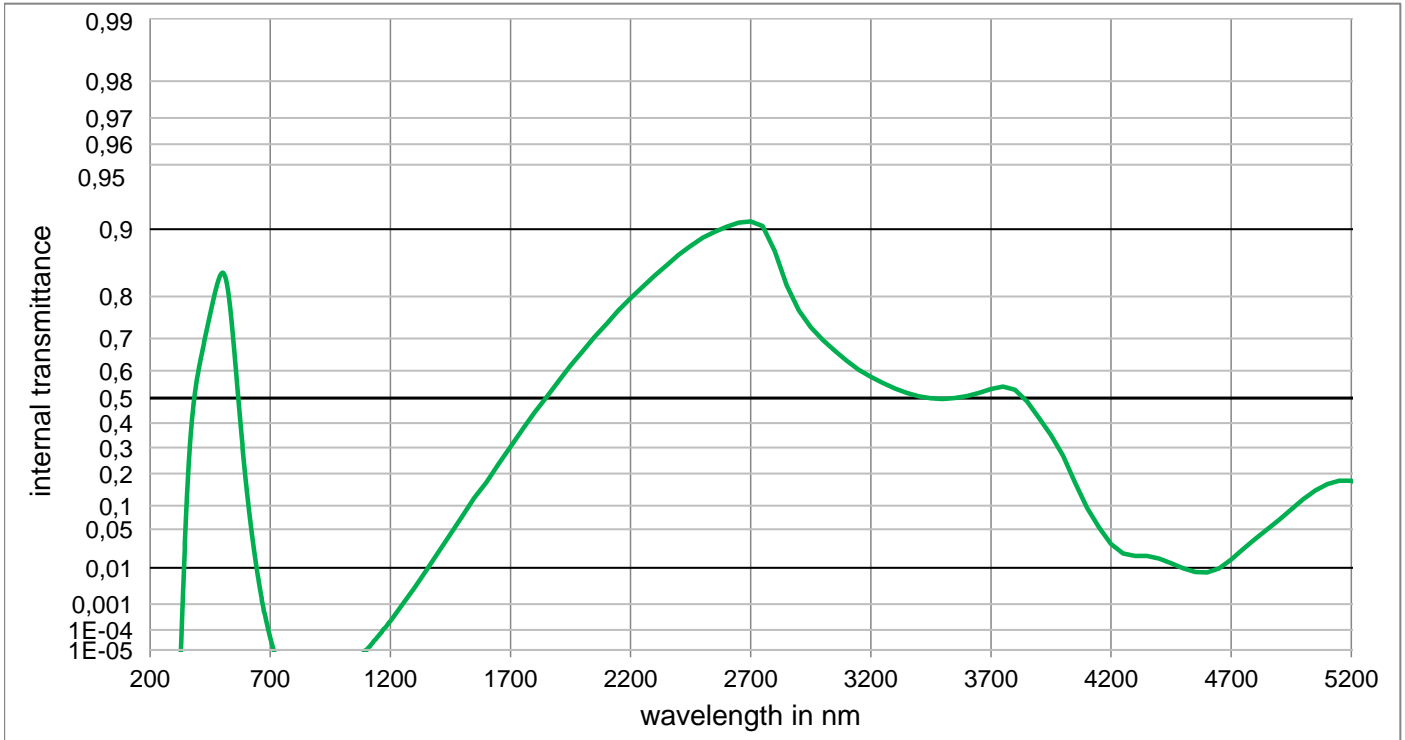
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	6,130E-01	800	4,315E-02	1100	1,745E-01	2200	8,400E-01	3700	4,100E-01
210	< 1,000E-05	510	6,690E-01	810	4,327E-02	1110	1,824E-01	2250	8,472E-01	3750	4,175E-01
220	< 1,000E-05	520	6,980E-01	820	4,381E-02	1120	1,907E-01	2300	8,548E-01	3800	4,300E-01
230	< 1,000E-05	530	6,980E-01	830	4,462E-02	1130	2,013E-01	2350	8,614E-01	3850	4,420E-01
240	< 1,000E-05	540	6,690E-01	840	4,547E-02	1140	2,079E-01	2400	8,700E-01	3900	4,500E-01
250	< 1,000E-05	550	6,180E-01	850	4,674E-02	1150	2,184E-01	2450	8,736E-01	3950	4,542E-01
260	< 1,000E-05	560	5,520E-01	860	4,781E-02	1160	2,273E-01	2500	8,800E-01	4000	4,524E-01
270	< 1,000E-05	570	4,770E-01	870	4,890E-02	1170	2,372E-01	2550	8,800E-01	4050	4,429E-01
280	< 1,000E-05	580	4,010E-01	880	5,036E-02	1180	2,460E-01	2600	8,840E-01	4100	4,200E-01
290	< 1,000E-05	590	3,300E-01	890	5,300E-02	1190	2,562E-01	2650	8,830E-01	4150	4,015E-01
300	< 1,000E-05	600	2,650E-01	900	5,608E-02	1200	2,644E-01	2700	8,700E-01	4200	3,800E-01
310	< 1,000E-05	610	2,090E-01	910	5,926E-02	1250	3,044E-01	2750	6,870E-01	4250	3,543E-01
320	< 1,000E-05	620	1,640E-01	920	6,255E-02	1300	3,500E-01	2800	6,154E-01	4300	3,223E-01
330	< 1,000E-05	630	1,300E-01	930	6,600E-02	1350	4,000E-01	2850	6,050E-01	4350	2,884E-01
340	< 1,000E-05	640	1,070E-01	940	6,967E-02	1400	4,400E-01	2900	6,000E-01	4400	2,469E-01
350	< 1,000E-05	650	8,900E-02	950	7,392E-02	1450	4,901E-01	2950	5,890E-01	4450	2,054E-01
360	< 1,000E-05	660	7,500E-02	960	7,900E-02	1500	5,300E-01	3000	5,800E-01	4500	1,600E-01
370	< 1,000E-05	670	6,558E-02	970	8,434E-02	1550	5,702E-01	3050	5,626E-01	4550	1,140E-01
380	< 1,000E-05	680	5,811E-02	980	8,972E-02	1600	6,000E-01	3100	5,400E-01	4600	7,450E-02
390	< 1,000E-05	690	5,297E-02	990	9,538E-02	1650	6,371E-01	3150	5,183E-01	4650	5,248E-02
400	< 1,000E-05	700	4,985E-02	1000	1,020E-01	1700	6,700E-01	3200	5,000E-01	4700	3,251E-02
410	7,621E-04	710	4,816E-02	1010	1,091E-01	1750	6,955E-01	3250	4,787E-01	4750	2,203E-02
420	5,715E-03	720	4,695E-02	1020	1,162E-01	1800	7,200E-01	3300	4,600E-01	4800	1,614E-02
430	1,963E-02	730	4,597E-02	1030	1,230E-01	1850	7,407E-01	3350	4,392E-01	4850	1,230E-02
440	5,343E-02	740	4,533E-02	1040	1,295E-01	1900	7,600E-01	3400	4,213E-01	4900	1,000E-02
450	1,170E-01	750	4,479E-02	1050	1,360E-01	1950	7,775E-01	3450	4,118E-01	4950	7,534E-03
460	2,160E-01	760	4,422E-02	1060	1,430E-01	2000	7,900E-01	3500	4,034E-01	5000	5,000E-03
470	3,250E-01	770	4,387E-02	1070	1,510E-01	2050	8,086E-01	3550	4,000E-01	5050	2,773E-03
480	4,290E-01	780	4,354E-02	1080	1,590E-01	2100	8,200E-01	3600	4,000E-01	5100	1,455E-03
490	5,300E-01	790	4,328E-02	1090	1,670E-01	2150	8,312E-01	3650	4,024E-01	5150	6,637E-04

VG20

Optical properties		Mechanical properties		Colorimetric properties						
Reflection factor		Reference thickness		1 mm		2 mm		3 mm		
$P_d = 0,913$		$d = 1,00 \text{ mm}$		Illuminant D65	x	0,203	0,170	0,154		
Spectral values guaranteed		Density			y	0,312	0,300		0,294	
$\tau_i (450 \text{ nm}) \geq 0,75$	$\rho = 2,85 \text{ g/cm}^3$		Y		49,0	33,2		24,1		
$\tau_i (500 \text{ nm}) \geq 0,83$	Knoop hardness		λ_d		490 nm	489 nm		489 nm		
$\tau_i (550 \text{ nm}) \geq 0,65$	$HK[0.1/20] = 364$		P_e		0,413	0,543		0,607		
$\tau_i (600 \text{ nm}) \leq 0,19$	Thermal properties		Illuminant A	x	0,274	0,211		0,179		
Transformation temperature		$T_g = 390 \text{ }^\circ\text{C}$		y	0,445	0,441		0,434		
Thermal expansion in		$10^{-6}/\text{K}$		Y	39,9	24,9		17,2		
$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 11,8$		Chemical properties		λ_d	499 nm	497 nm		496 nm		
$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 13,7$		Chemical resistance		P_e	0,398	0,549		0,625		
Refractive indices		Chemical resistance		Notes						
$n_F (486 \text{ nm}) = 1,547$	FR class = 1		Ionically colored glass Bandpass filter NIR cutoff filter $\lambda_{50\%}(d=0.3\text{mm}) @ 604 \text{ nm}$ ISO 23364:2021							
$n_e (546 \text{ nm}) = 1,543$	SR class = 52.3									
$n_d (587,6 \text{ nm}) = 1,541$	AR class = 3.3									
Sellmeier coefficients		Resistance against humidity								
valid from 400 nm to 1550 nm		Robust glass								
$B_1 = 0,7165$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5		Disclaimer							
$B_2 = 0,6218$			All data without tolerances are to be understood to be reference values.							
$B_3 = 0,6042$										
$C_1 = 1,764\text{E-}09 \text{ } \mu\text{m}^2$										
$C_2 = 1,9422\text{E-}02 \text{ } \mu\text{m}^2$										
$C_3 = 100,000 \text{ } \mu\text{m}^2$										
Internal quality										
Bubble class 2										



VG20

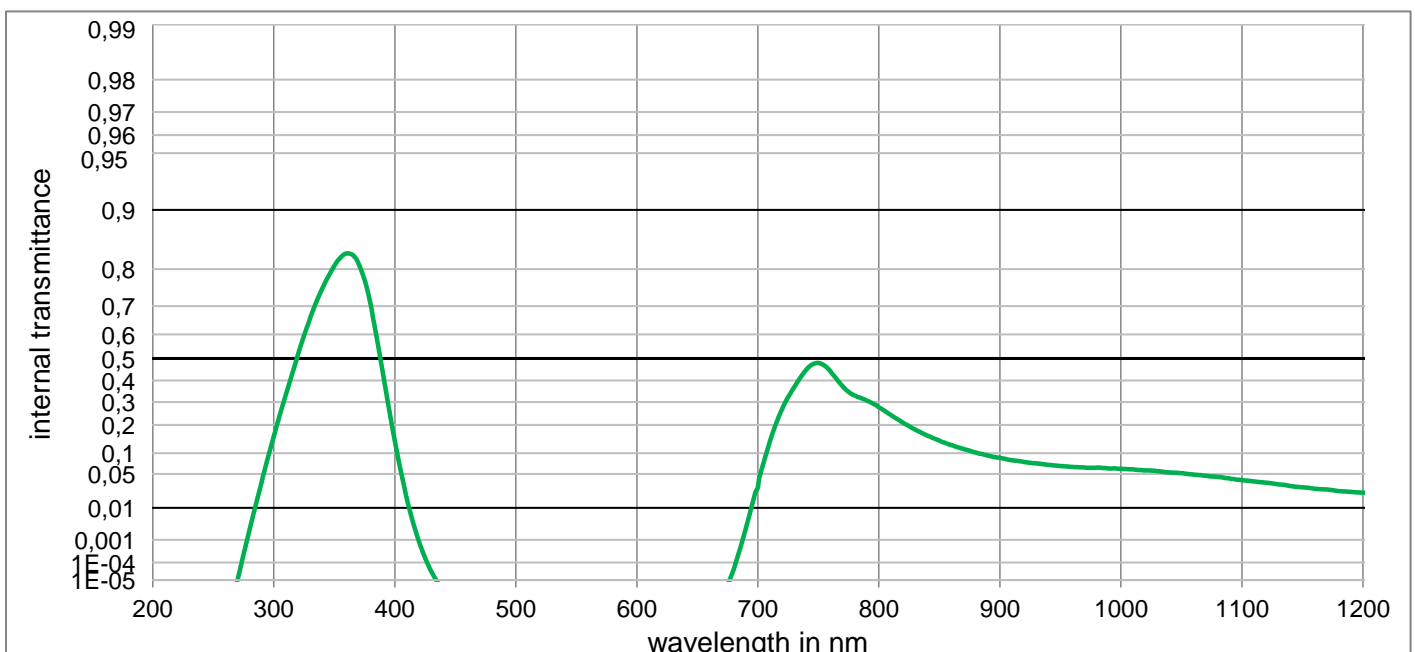


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

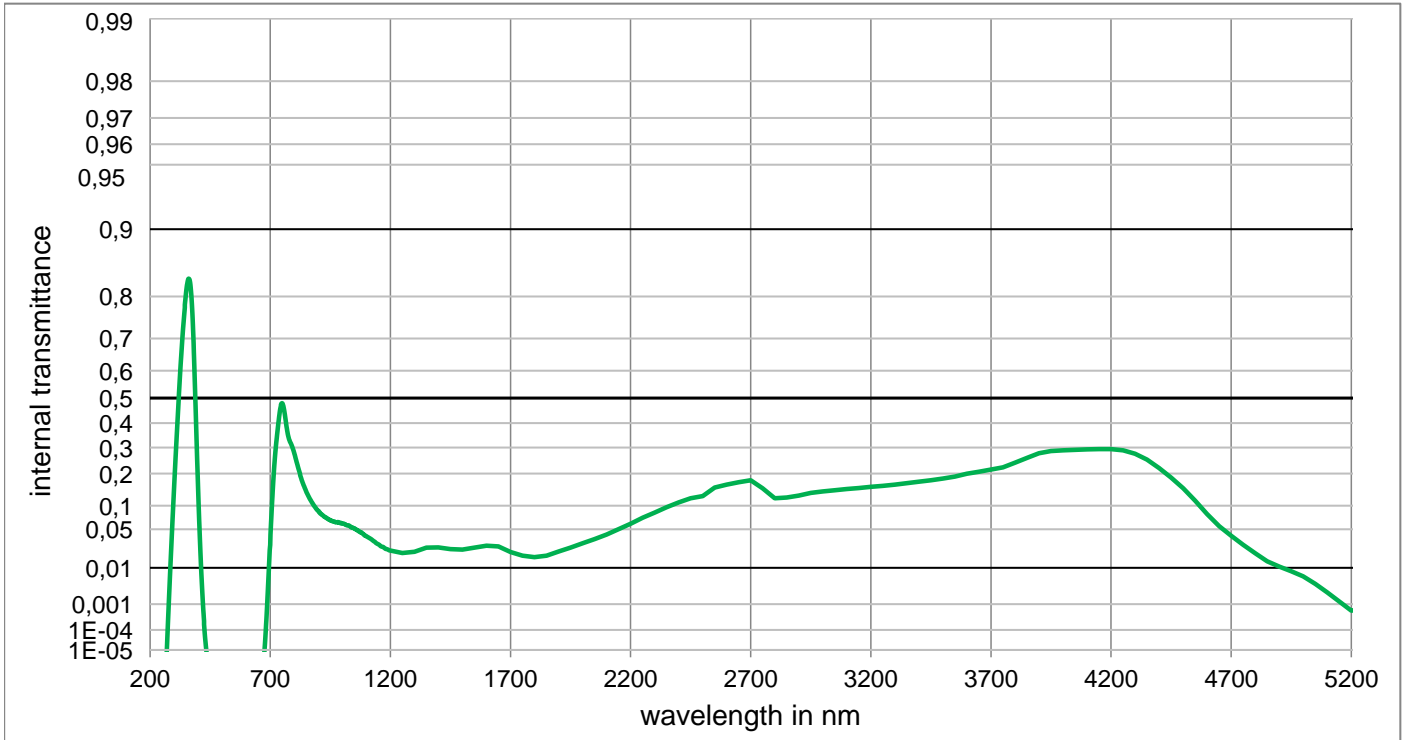
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	8,425E-01	800	< 1,000E-05	1100	< 1,000E-05	2200	7,964E-01	3700	5,342E-01
210	< 1,000E-05	510	8,389E-01	810	< 1,000E-05	1110	1,392E-05	2250	8,185E-01	3750	5,437E-01
220	< 1,000E-05	520	8,236E-01	820	< 1,000E-05	1120	1,999E-05	2300	8,379E-01	3800	5,316E-01
230	< 1,000E-05	530	7,914E-01	830	< 1,000E-05	1130	2,837E-05	2350	8,541E-01	3850	4,866E-01
240	< 1,000E-05	540	7,393E-01	840	< 1,000E-05	1140	3,755E-05	2400	8,694E-01	3900	4,207E-01
250	< 1,000E-05	550	6,655E-01	850	< 1,000E-05	1150	5,176E-05	2450	8,808E-01	3950	3,509E-01
260	< 1,000E-05	560	5,721E-01	860	< 1,000E-05	1160	7,067E-05	2500	8,905E-01	4000	2,676E-01
270	< 1,000E-05	570	4,641E-01	870	< 1,000E-05	1170	1,026E-04	2550	8,973E-01	4050	1,689E-01
280	< 1,000E-05	580	3,534E-01	880	< 1,000E-05	1180	1,293E-04	2600	9,027E-01	4100	9,411E-02
290	< 1,000E-05	590	2,493E-01	890	< 1,000E-05	1190	1,808E-04	2650	9,067E-01	4150	5,303E-02
300	< 1,000E-05	600	1,627E-01	900	< 1,000E-05	1200	2,372E-04	2700	9,079E-01	4200	2,924E-02
310	< 1,000E-05	610	9,760E-02	910	< 1,000E-05	1250	9,582E-04	2750	9,034E-01	4250	1,970E-02
320	< 1,000E-05	620	5,393E-02	920	< 1,000E-05	1300	3,153E-03	2800	8,741E-01	4300	1,772E-02
330	4,871E-05	630	2,735E-02	930	< 1,000E-05	1350	8,739E-03	2850	8,210E-01	4350	1,772E-02
340	7,922E-03	640	1,274E-02	940	< 1,000E-05	1400	2,078E-02	2900	7,707E-01	4400	1,571E-02
350	7,618E-02	650	5,556E-03	950	< 1,000E-05	1450	4,231E-02	2950	7,303E-01	4450	1,258E-02
360	2,203E-01	660	2,205E-03	960	< 1,000E-05	1500	7,563E-02	3000	6,961E-01	4500	9,730E-03
370	3,634E-01	670	8,986E-04	970	< 1,000E-05	1550	1,217E-01	3050	6,643E-01	4550	8,055E-03
380	4,698E-01	680	3,566E-04	980	< 1,000E-05	1600	1,704E-01	3100	6,331E-01	4600	7,823E-03
390	5,425E-01	690	1,258E-04	990	< 1,000E-05	1650	2,347E-01	3150	6,032E-01	4650	9,759E-03
400	5,941E-01	700	4,383E-05	1000	< 1,000E-05	1700	3,036E-01	3200	5,784E-01	4700	1,497E-02
410	6,380E-01	710	1,529E-05	1010	< 1,000E-05	1750	3,737E-01	3250	5,564E-01	4750	2,385E-02
420	6,736E-01	720	< 1,000E-05	1020	< 1,000E-05	1800	4,423E-01	3300	5,361E-01	4800	3,556E-02
430	7,056E-01	730	< 1,000E-05	1030	< 1,000E-05	1850	5,043E-01	3350	5,195E-01	4850	4,991E-02
440	7,350E-01	740	< 1,000E-05	1040	< 1,000E-05	1900	5,627E-01	3400	5,065E-01	4900	6,777E-02
450	7,620E-01	750	< 1,000E-05	1050	< 1,000E-05	1950	6,167E-01	3450	4,991E-01	4950	9,057E-02
460	7,861E-01	760	< 1,000E-05	1060	< 1,000E-05	2000	6,627E-01	3500	4,961E-01	5000	1,170E-01
470	8,074E-01	770	< 1,000E-05	1070	< 1,000E-05	2050	7,040E-01	3550	4,998E-01	5050	1,430E-01
480	8,244E-01	780	< 1,000E-05	1080	< 1,000E-05	2100	7,389E-01	3600	5,074E-01	5100	1,638E-01
490	8,370E-01	790	< 1,000E-05	1090	< 1,000E-05	2150	7,711E-01	3650	5,196E-01	5150	1,750E-01

UG1

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,913$	$d = 1,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed	Density	
$\tau_i (365 \text{ nm}) \geq 0,8$	$\rho = 2,77 \text{ g/cm}^3$	
$\tau_i (405 \text{ nm}) \leq 0,1$	Knoop hardness	
$\tau_i (694 \text{ nm}) \leq 0,06$	$HK[0.1/20] = 482$	
$\tau_i (750 \text{ nm}) \leq 0,53$		Illuminant A x y Y λ_d P_e
	Thermal properties	
	Transformation temperature	
	$T_g = 575 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
Refractive indices	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,9$	Notes UV Transmission changes are possible under the action of intense ultraviolet radiation. Ionically colored glass Bandpass filter ISO 23364:2021
$n_F (486 \text{ nm}) = 1,548$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 8,9$	
$n_e (546 \text{ nm}) = 1,543$		
$n_d (587,6 \text{ nm}) = 1,541$		
Sellmeier coefficients	Chemical properties	Disclaimer All data without tolerances are to be understood to be reference values.
valid from 400 nm to 1550 nm	Chemical resistance	
$B_1 = 0,9475$	FR class = 0	
$B_2 = 0,3895$	SR class = 1	
$B_3 = 1,1076$	AR class = 1	
$C_1 = 9,783\text{E-}03 \text{ } \mu\text{m}^2$	Resistance against humidity	
$C_2 = 1,1182\text{E-}02 \text{ } \mu\text{m}^2$	Sensitive glass	
$C_3 = 147,627 \text{ } \mu\text{m}^2$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
Internal quality		
Bubble class 1		



UG1

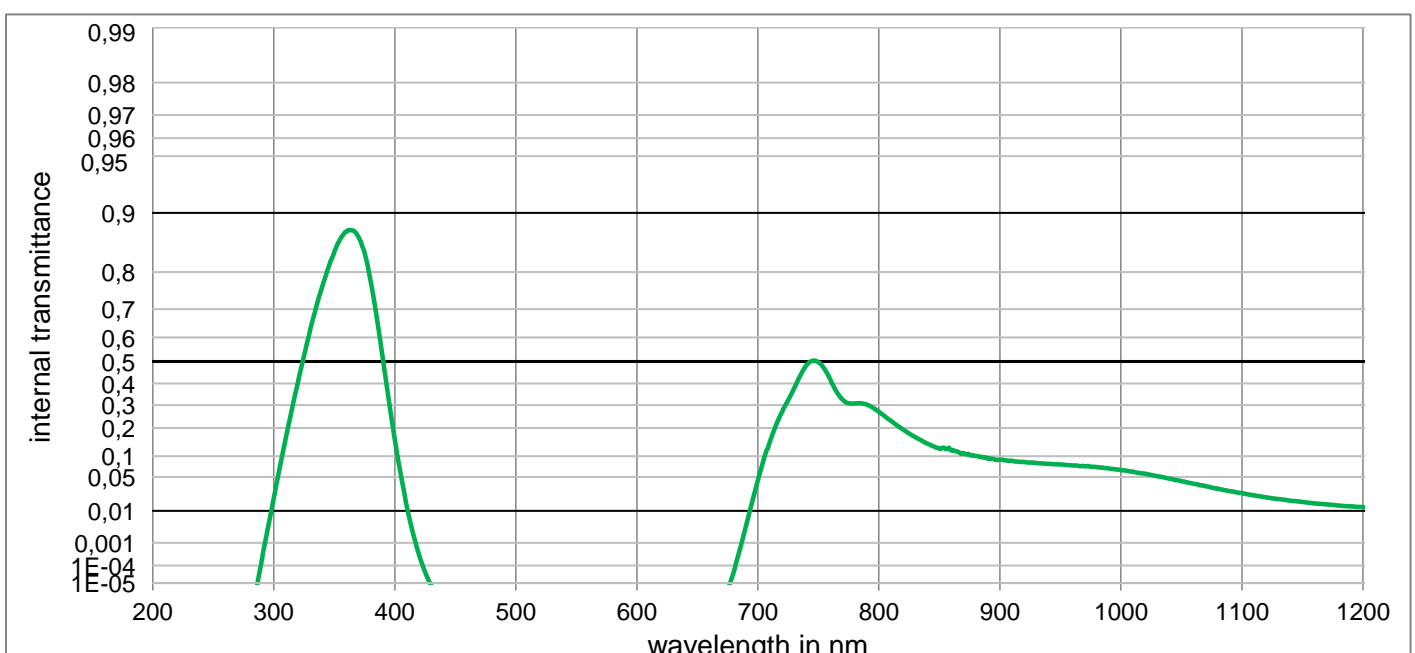


Internal transmittance τ_i at reference thickness
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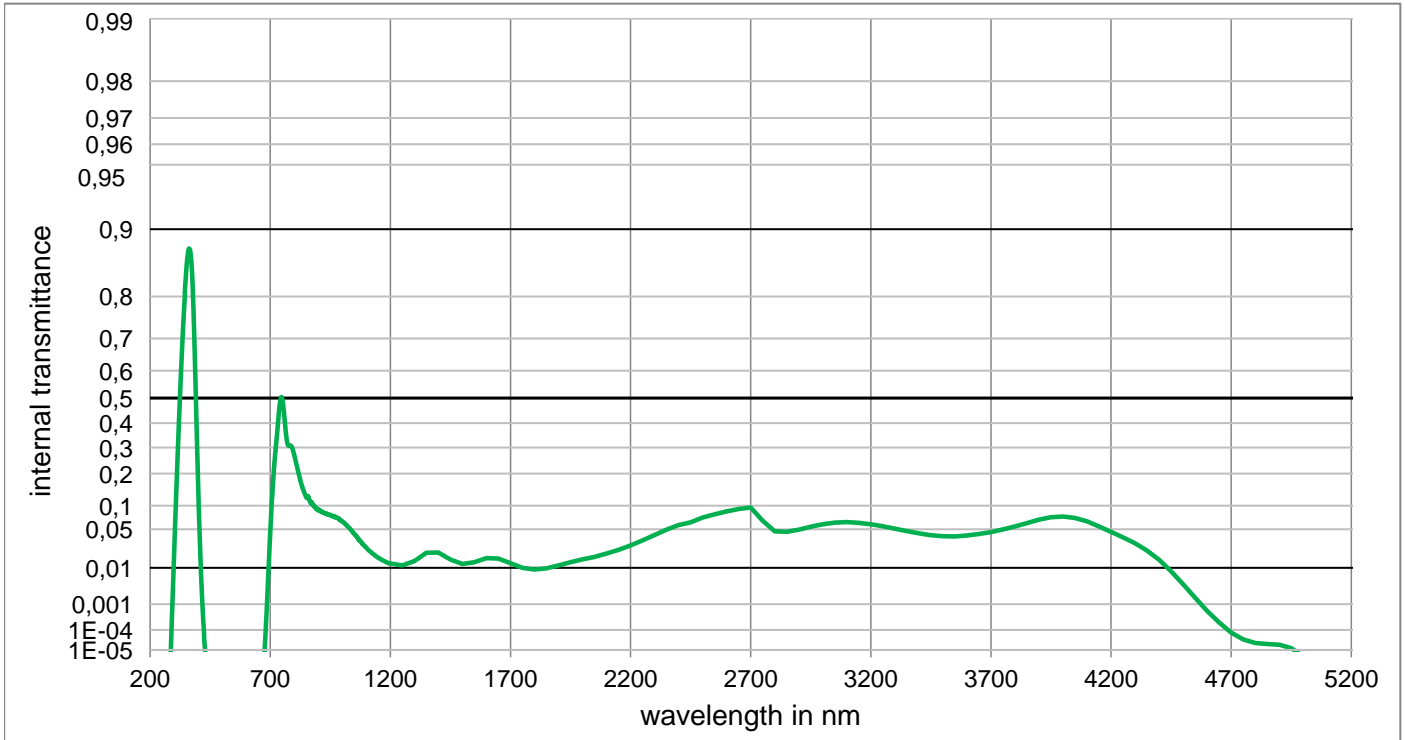
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	< 1,000E-05	800	2,769E-01	1100	3,919E-02	2200	5,979E-02	3700	2,146E-01
210	< 1,000E-05	510	< 1,000E-05	810	2,416E-01	1110	3,721E-02	2250	7,156E-02	3750	2,230E-01
220	< 1,000E-05	520	< 1,000E-05	820	2,091E-01	1120	3,533E-02	2300	8,324E-02	3800	2,400E-01
230	< 1,000E-05	530	< 1,000E-05	830	1,812E-01	1130	3,286E-02	2350	9,590E-02	3850	2,592E-01
240	< 1,000E-05	540	< 1,000E-05	840	1,584E-01	1140	3,046E-02	2400	1,083E-01	3900	2,774E-01
250	< 1,000E-05	550	< 1,000E-05	850	1,402E-01	1150	2,892E-02	2450	1,199E-01	3950	2,859E-01
260	< 1,000E-05	560	< 1,000E-05	860	1,250E-01	1160	2,682E-02	2500	1,262E-01	4000	2,887E-01
270	< 1,000E-05	570	< 1,000E-05	870	1,123E-01	1170	2,601E-02	2550	1,524E-01	4050	2,906E-01
280	2,377E-03	580	< 1,000E-05	880	1,019E-01	1180	2,411E-02	2600	1,615E-01	4100	2,925E-01
290	3,691E-02	590	< 1,000E-05	890	9,311E-02	1190	2,337E-02	2650	1,700E-01	4150	2,934E-01
300	1,551E-01	600	< 1,000E-05	900	8,686E-02	1200	2,243E-02	2700	1,762E-01	4200	2,934E-01
310	3,350E-01	610	< 1,000E-05	910	8,073E-02	1250	2,020E-02	2750	1,498E-01	4250	2,893E-01
320	5,189E-01	620	< 1,000E-05	920	7,633E-02	1300	2,134E-02	2800	1,200E-01	4300	2,755E-01
330	6,591E-01	630	< 1,000E-05	930	7,269E-02	1350	2,534E-02	2850	1,219E-01	4350	2,523E-01
340	7,508E-01	640	< 1,000E-05	940	6,916E-02	1400	2,552E-02	2900	1,279E-01	4400	2,200E-01
350	8,072E-01	650	< 1,000E-05	950	6,633E-02	1450	2,378E-02	2950	1,354E-01	4450	1,860E-01
360	8,327E-01	660	< 1,000E-05	960	6,451E-02	1500	2,337E-02	3000	1,400E-01	4500	1,500E-01
370	8,124E-01	670	< 1,000E-05	970	6,314E-02	1550	2,540E-02	3050	1,439E-01	4550	1,131E-01
380	7,060E-01	680	4,430E-05	980	6,293E-02	1600	2,746E-02	3100	1,476E-01	4600	8,000E-02
390	4,380E-01	690	2,460E-03	990	6,107E-02	1650	2,657E-02	3150	1,508E-01	4650	5,508E-02
400	1,376E-01	700	2,820E-02	1000	6,046E-02	1700	2,106E-02	3200	1,546E-01	4700	4,000E-02
410	1,650E-02	710	1,395E-01	1010	5,929E-02	1750	1,786E-02	3250	1,580E-01	4750	2,838E-02
420	8,618E-04	720	2,686E-01	1020	5,705E-02	1800	1,677E-02	3300	1,621E-01	4800	2,000E-02
430	3,463E-05	730	3,682E-01	1030	5,553E-02	1850	1,793E-02	3350	1,668E-01	4850	1,380E-02
440	< 1,000E-05	740	4,499E-01	1040	5,300E-02	1900	2,145E-02	3400	1,718E-01	4900	1,057E-02
450	< 1,000E-05	750	4,798E-01	1050	5,141E-02	1950	2,515E-02	3450	1,769E-01	4950	8,356E-03
460	< 1,000E-05	760	4,419E-01	1060	4,881E-02	2000	3,012E-02	3500	1,825E-01	5000	6,281E-03
470	< 1,000E-05	770	3,736E-01	1070	4,668E-02	2050	3,544E-02	3550	1,891E-01	5050	4,055E-03
480	< 1,000E-05	780	3,298E-01	1080	4,456E-02	2100	4,160E-02	3600	1,995E-01	5100	2,328E-03
490	< 1,000E-05	790	3,068E-01	1090	4,168E-02	2150	5,012E-02	3650	2,070E-01	5150	1,230E-03

UG2A

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,918$	$d = 3,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed	Density	
$\tau_i (303 \text{ nm}) \leq 0,07$	$\rho = 2,60 \text{ g/cm}^3$	
$\tau_i (365 \text{ nm}) \geq 0,81$	Knoop hardness	
$\tau_i (405 \text{ nm}) \leq 0,1$	HK[0.1/20]	
$\tau_i (694 \text{ nm}) \leq 0,04$	Thermal properties	Illuminant A x y Y λ_d P_e
$\tau_i (750 \text{ nm}) \leq 0,52$	Transformation temperature	
	$T_g = 484 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 8,7$	
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,9$	
Refractive indices	Chemical properties	Notes
$n_F (486 \text{ nm}) = 1,529$	Chemical resistance	UV
$n_e (546 \text{ nm}) = 1,525$	FR class	Transmission changes are possible under the action of intense ultraviolet radiation.
$n_d (587,6 \text{ nm}) = 1,523$	SR class = 1.0	Ionically colored glass
	AR class = 1.3	Bandpass filter
Sellmeier coefficients	Resistance against humidity	
valid from 295 nm to 1600 nm	Sensitive glass	ISO 23364:2021
$B_1 = 0,8819$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
$B_2 = 0,4027$		Disclaimer
$B_3 = 1,2925$		All data without tolerances are to be understood to be reference values.
$C_1 = 4,435\text{E-}03 \text{ } \mu\text{m}^2$		
$C_2 = 2,0863\text{E-}02 \text{ } \mu\text{m}^2$		
$C_3 = 169,418 \text{ } \mu\text{m}^2$		
Internal quality		
Bubble class 2		



UG2A

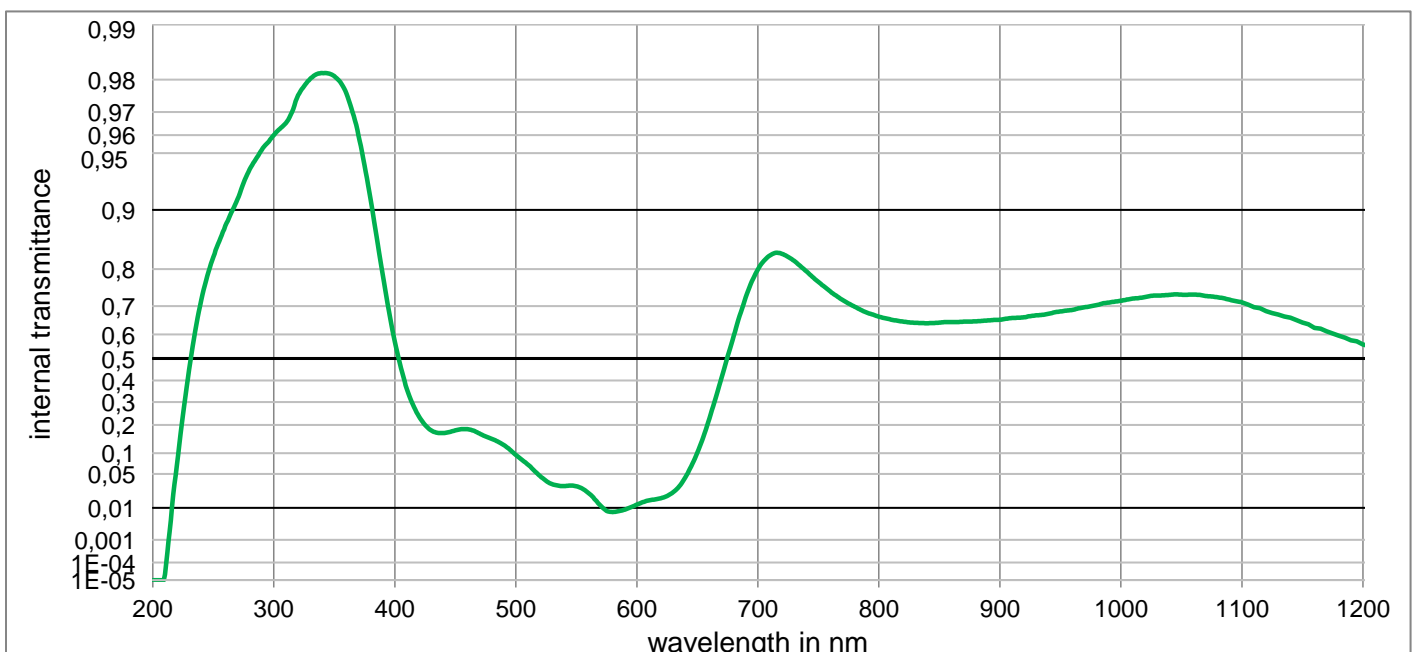


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

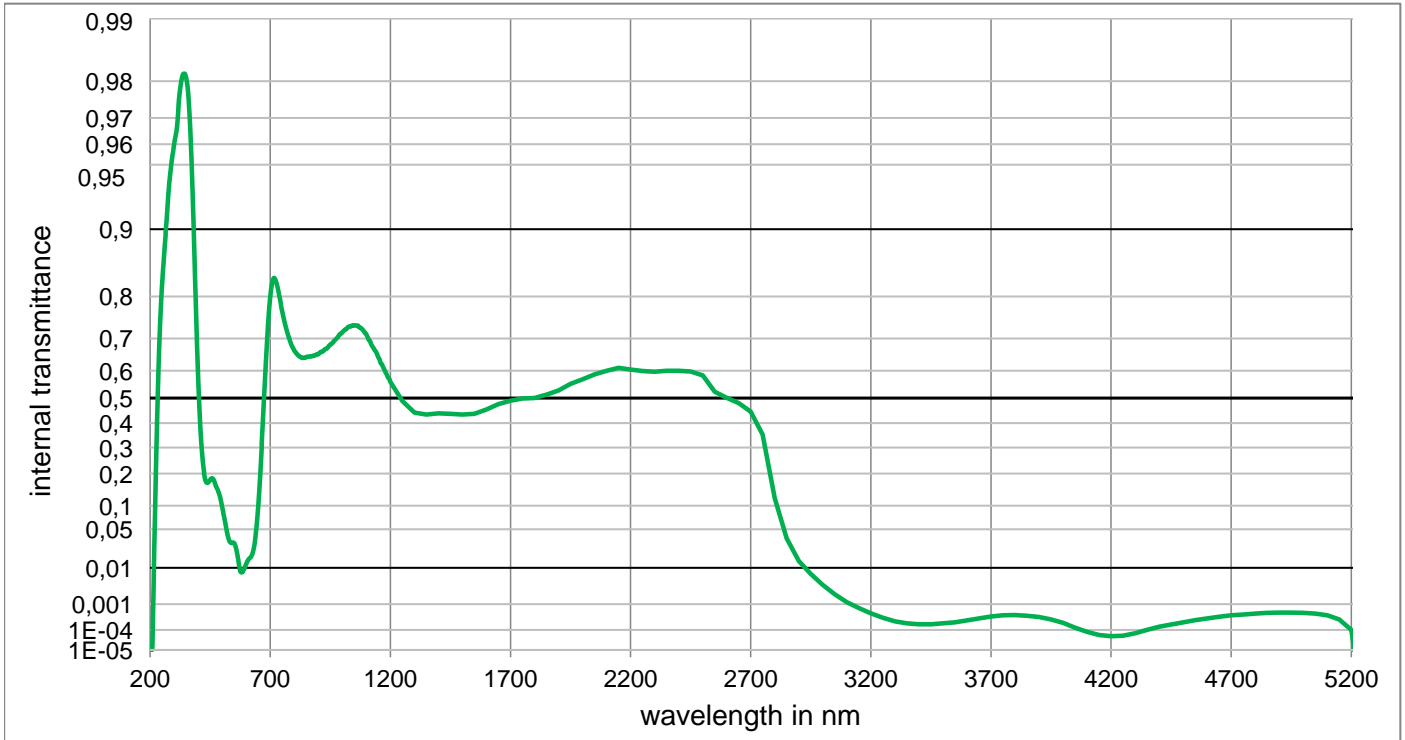
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	< 1,000E-05	800	2,694E-01	1100	2,523E-02	2200	2,753E-02	3700	4,550E-02
210	< 1,000E-05	510	< 1,000E-05	810	2,291E-01	1110	2,269E-02	2250	3,365E-02	3750	4,960E-02
220	< 1,000E-05	520	< 1,000E-05	820	1,934E-01	1120	2,075E-02	2300	4,119E-02	3800	5,487E-02
230	< 1,000E-05	530	< 1,000E-05	830	1,638E-01	1130	1,906E-02	2350	4,948E-02	3850	6,125E-02
240	< 1,000E-05	540	< 1,000E-05	840	1,408E-01	1140	1,742E-02	2400	5,747E-02	3900	6,769E-02
250	< 1,000E-05	550	< 1,000E-05	850	1,232E-01	1150	1,630E-02	2450	6,255E-02	3950	7,273E-02
260	< 1,000E-05	560	< 1,000E-05	860	1,173E-01	1160	1,523E-02	2500	7,233E-02	4000	7,429E-02
270	< 1,000E-05	570	< 1,000E-05	870	1,091E-01	1170	1,438E-02	2550	7,920E-02	4050	7,123E-02
280	< 1,000E-05	580	< 1,000E-05	880	1,008E-01	1180	1,343E-02	2600	8,580E-02	4100	6,414E-02
290	1,820E-04	590	< 1,000E-05	890	9,226E-02	1190	1,285E-02	2650	9,190E-02	4150	5,492E-02
300	1,967E-02	600	< 1,000E-05	900	8,992E-02	1200	1,239E-02	2700	9,526E-02	4200	4,586E-02
310	1,622E-01	610	< 1,000E-05	910	8,713E-02	1250	1,130E-02	2750	6,593E-02	4250	3,757E-02
320	4,089E-01	620	< 1,000E-05	920	8,362E-02	1300	1,398E-02	2800	4,651E-02	4300	3,000E-02
330	6,267E-01	630	< 1,000E-05	930	8,186E-02	1350	2,031E-02	2850	4,580E-02	4350	2,243E-02
340	7,641E-01	640	< 1,000E-05	940	7,948E-02	1400	2,052E-02	2900	4,947E-02	4400	1,481E-02
350	8,415E-01	650	< 1,000E-05	950	7,743E-02	1450	1,494E-02	2950	5,439E-02	4450	8,338E-03
360	8,747E-01	660	< 1,000E-05	960	7,516E-02	1500	1,214E-02	3000	5,885E-02	4500	3,947E-03
370	8,670E-01	670	< 1,000E-05	970	7,294E-02	1550	1,314E-02	3050	6,181E-02	4550	1,607E-03
380	7,794E-01	680	4,743E-05	980	7,087E-02	1600	1,595E-02	3100	6,279E-02	4600	5,872E-04
390	5,154E-01	690	3,525E-03	990	6,786E-02	1650	1,574E-02	3150	6,159E-02	4650	2,055E-04
400	1,524E-01	700	4,381E-02	1000	6,441E-02	1700	1,264E-02	3200	5,873E-02	4700	7,701E-05
410	1,277E-02	710	1,482E-01	1010	6,074E-02	1750	1,000E-02	3250	5,510E-02	4750	3,602E-05
420	3,343E-04	720	2,701E-01	1020	5,634E-02	1800	9,086E-03	3300	5,112E-02	4800	2,360E-05
430	< 1,000E-05	730	3,772E-01	1030	5,164E-02	1850	9,759E-03	3350	4,711E-02	4850	2,090E-05
440	< 1,000E-05	740	4,822E-01	1040	4,693E-02	1900	1,129E-02	3400	4,352E-02	4900	1,931E-05
450	< 1,000E-05	750	4,969E-01	1050	4,254E-02	1950	1,318E-02	3450	4,076E-02	4950	1,251E-05
460	< 1,000E-05	760	4,160E-01	1060	3,842E-02	2000	1,507E-02	3500	3,919E-02	5000	< 1,000E-05
470	< 1,000E-05	770	3,251E-01	1070	3,455E-02	2050	1,693E-02	3550	3,909E-02	5050	< 1,000E-05
480	< 1,000E-05	780	3,076E-01	1080	3,079E-02	2100	1,983E-02	3600	4,021E-02	5100	< 1,000E-05
490	< 1,000E-05	790	3,020E-01	1090	2,776E-02	2150	2,320E-02	3650	4,237E-02	5150	< 1,000E-05

UG5

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,914$	$d = 1,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed	Density	
$\tau_i (254 \text{ nm}) \geq 0,8$	$\rho = 2,84 \text{ g/cm}^3$	
$\tau_i (308 \text{ nm}) \geq 0,94$	Knoop hardness	
$\tau_i (405 \text{ nm}) \leq 0,5$	$HK[0.1/20] = 407$	
$\tau_i (546 \text{ nm}) \leq 0,05$	Thermal properties	Illuminant A x y Y λ_d P_e
$\tau_i (633 \text{ nm}) \leq 0,05$	Transformation temperature	
$\tau_i (725 \text{ nm}) \leq 0,85$	$T_g = 462 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 8,1$	
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,3$	
Refractive indices	Chemical properties	Notes
$n_F (486 \text{ nm}) = 1,548$	Chemical resistance	UV
$n_e (546 \text{ nm}) = 1,545$	FR class = 0	Transmission changes are possible under the action of intense ultraviolet radiation.
$n_d (587,6 \text{ nm}) = 1,543$	SR class = 3	Ionically colored glass
	AR class = 2	Bandpass filter
Sellmeier coefficients	Resistance against humidity	
valid from 250 nm to 1550 nm	Sensitive glass	ISO 23364:2021
$B_1 = 0,8861$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
$B_2 = 0,4613$		Disclaimer
$B_3 = 29,7610$		All data without tolerances are to be understood to be reference values.
$C_1 = 9,024\text{E-}03 \text{ } \mu\text{m}^2$		
$C_2 = 8,3379\text{E-}03 \text{ } \mu\text{m}^2$		
$C_3 = 3197,045 \text{ } \mu\text{m}^2$		
Internal quality		
Bubble class 2		



UG5

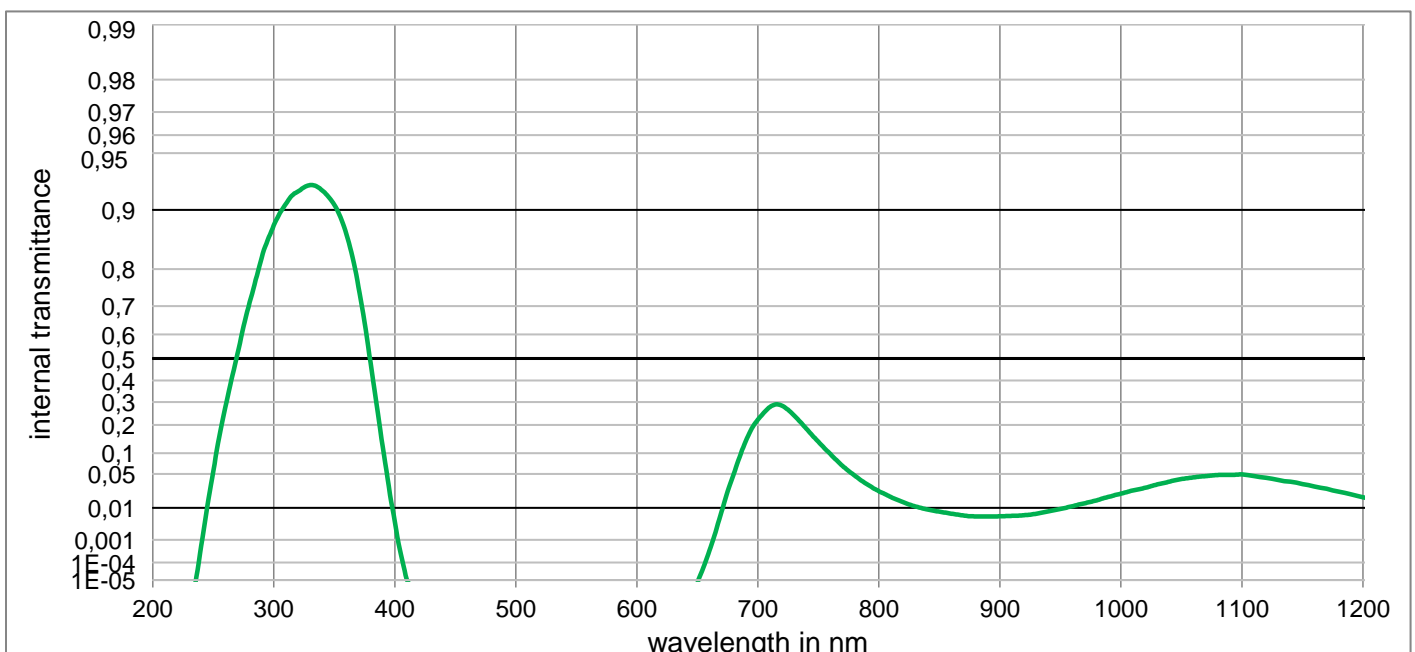


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

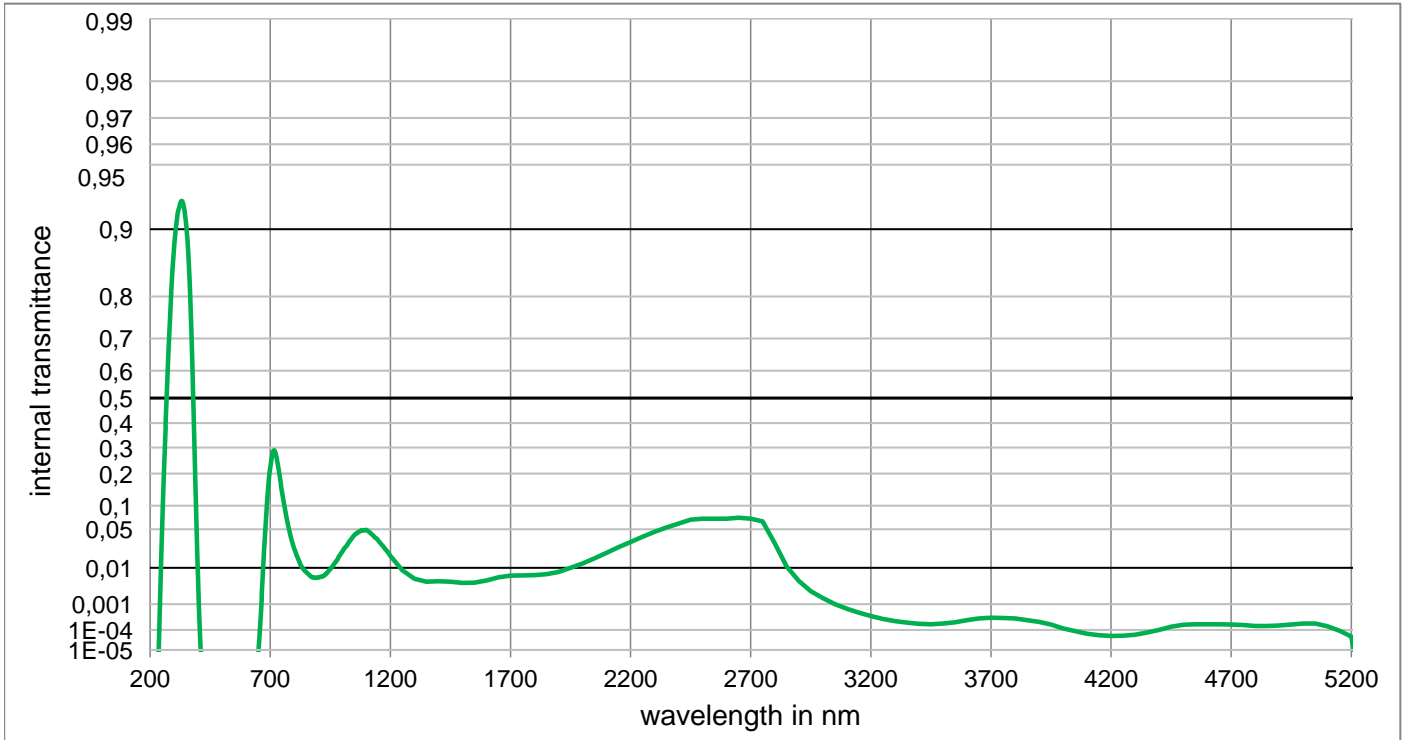
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,500E-02	800	6,650E-01	1100	7,118E-01	2200	6,039E-01	3700	3,581E-04
210	2,234E-05	510	7,000E-02	810	6,550E-01	1110	6,962E-01	2250	5,992E-01	3750	4,036E-04
220	6,900E-02	520	4,600E-02	820	6,476E-01	1120	6,834E-01	2300	5,961E-01	3800	4,130E-04
230	4,500E-01	530	3,300E-02	830	6,436E-01	1130	6,725E-01	2350	6,000E-01	3850	3,873E-04
240	7,180E-01	540	3,041E-02	840	6,420E-01	1140	6,615E-01	2400	6,000E-01	3900	3,451E-04
250	8,260E-01	550	3,015E-02	850	6,443E-01	1150	6,444E-01	2450	5,969E-01	3950	2,780E-04
260	8,790E-01	560	2,200E-02	860	6,463E-01	1160	6,248E-01	2500	5,835E-01	4000	2,000E-04
270	9,120E-01	570	1,136E-02	870	6,476E-01	1170	6,122E-01	2550	5,246E-01	4050	1,271E-04
280	9,390E-01	580	7,810E-03	880	6,487E-01	1180	5,947E-01	2600	5,010E-01	4100	8,166E-05
290	9,520E-01	590	9,020E-03	890	6,518E-01	1190	5,762E-01	2650	4,806E-01	4150	5,902E-05
300	9,600E-01	600	1,203E-02	900	6,543E-01	1200	5,600E-01	2700	4,461E-01	4200	5,093E-05
310	9,656E-01	610	1,514E-02	910	6,606E-01	1250	4,893E-01	2750	3,534E-01	4250	5,433E-05
320	9,757E-01	620	1,703E-02	920	6,628E-01	1300	4,429E-01	2800	1,200E-01	4300	7,000E-05
330	9,802E-01	630	2,304E-02	930	6,694E-01	1350	4,351E-01	2850	3,622E-02	4350	1,009E-04
340	9,816E-01	640	4,400E-02	940	6,745E-01	1400	4,400E-01	2900	1,396E-02	4400	1,371E-04
350	9,809E-01	650	1,010E-01	950	6,826E-01	1450	4,374E-01	2950	7,228E-03	4450	1,726E-04
360	9,761E-01	660	2,270E-01	960	6,876E-01	1500	4,343E-01	3000	3,784E-03	4500	2,113E-04
370	9,600E-01	670	4,140E-01	970	6,962E-01	1550	4,374E-01	3050	2,037E-03	4550	2,570E-04
380	9,120E-01	680	5,950E-01	980	7,030E-01	1600	4,555E-01	3100	1,169E-03	4600	3,000E-04
390	7,870E-01	690	7,270E-01	990	7,112E-01	1650	4,767E-01	3150	7,430E-04	4650	3,516E-04
400	5,700E-01	700	7,990E-01	1000	7,164E-01	1700	4,900E-01	3200	4,775E-04	4700	4,000E-04
410	3,600E-01	710	8,290E-01	1010	7,232E-01	1750	4,979E-01	3250	3,236E-04	4750	4,315E-04
420	2,360E-01	720	8,320E-01	1020	7,278E-01	1800	5,000E-01	3300	2,296E-04	4800	4,688E-04
430	1,780E-01	730	8,180E-01	1030	7,317E-01	1850	5,128E-01	3350	1,910E-04	4850	4,909E-04
440	1,680E-01	740	7,950E-01	1040	7,338E-01	1900	5,293E-01	3400	1,758E-04	4900	5,000E-04
450	1,780E-01	750	7,690E-01	1050	7,344E-01	1950	5,529E-01	3450	1,758E-04	4950	5,000E-04
460	1,830E-01	760	7,430E-01	1060	7,347E-01	2000	5,700E-01	3500	1,910E-04	5000	4,955E-04
470	1,660E-01	770	7,190E-01	1070	7,305E-01	2050	5,874E-01	3550	2,133E-04	5050	4,645E-04
480	1,470E-01	780	6,980E-01	1080	7,267E-01	2100	6,000E-01	3600	2,547E-04	5100	4,000E-04
490	1,260E-01	790	6,789E-01	1090	7,194E-01	2150	6,094E-01	3650	3,000E-04	5150	2,742E-04

UG11

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,908$	$d = 1,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed	Density	
$\tau_i (254 \text{ nm}) \geq 0,06$	$\rho = 2,92 \text{ g/cm}^3$	
$\tau_i (334 \text{ nm}) \geq 0,9$	Knoop hardness	
$\tau_i (405 \text{ nm}) \leq 0,001$	$HK[0.1/20] = 440$	
$\tau_i (694 \text{ nm}) \leq 0,26$	Thermal properties	Illuminant A x y Y λ_d P_e
$\tau_i (725 \text{ nm}) \leq 0,32$	Transformation temperature	
	$T_g = 545 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,8$	
Refractive indices	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,0$	Notes
$n_F (486 \text{ nm}) = 1,569$	Chemical properties	UV
$n_e (546 \text{ nm}) = 1,565$	Chemical resistance	Transmission changes are possible under the action of intense ultraviolet radiation.
$n_d (587,6 \text{ nm}) = 1,563$	FR class = 0	Ionically colored glass
Sellmeier coefficients	SR class = 3	Bandpass filter
valid from 270 nm to 600 nm	AR class = 2.2	
$B_1 = 1,3960$	Resistance against humidity	
$B_2 = 0,0097$	Sensitive glass	ISO 23364:2021
$B_3 = 0,5658$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
$C_1 = 9,230\text{E-}03 \mu\text{m}^2$		Disclaimer
$C_2 = 4,4000\text{E-}02 \mu\text{m}^2$		All data without tolerances are to be understood to be reference values.
$C_3 = 96,000 \mu\text{m}^2$		
Internal quality		
Bubble class 2		



UG11

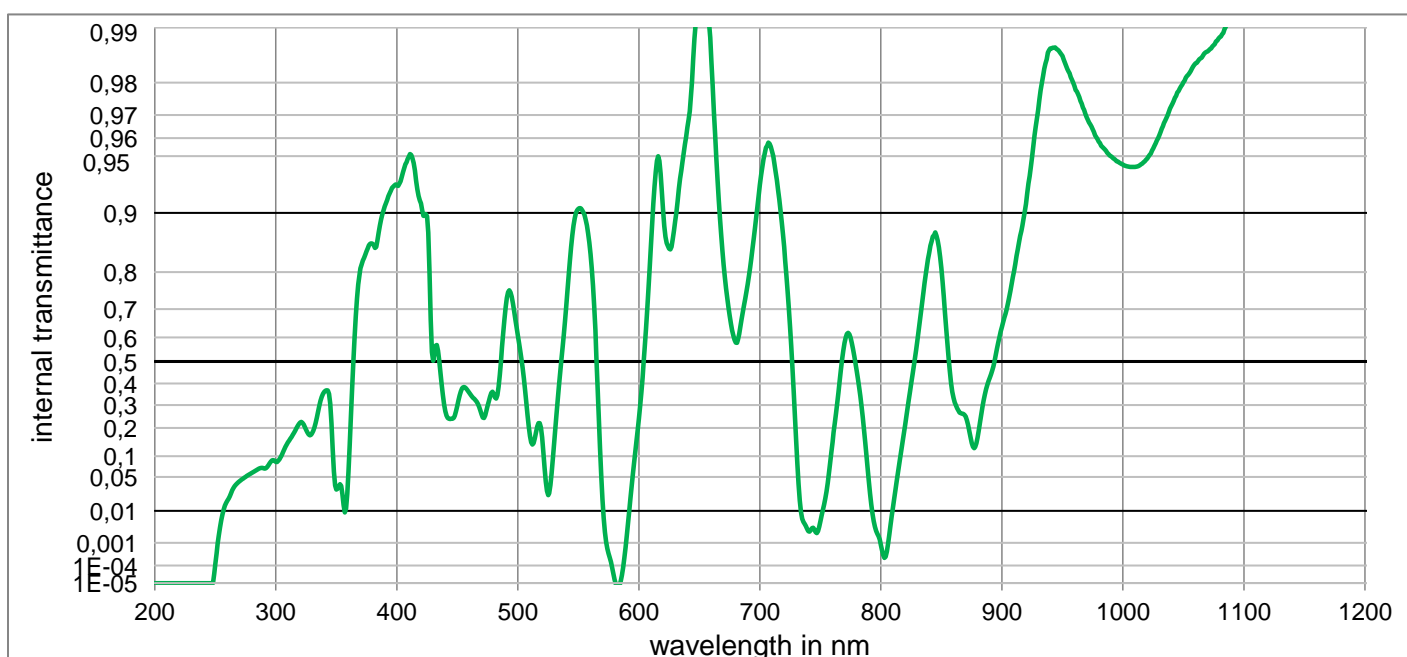


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

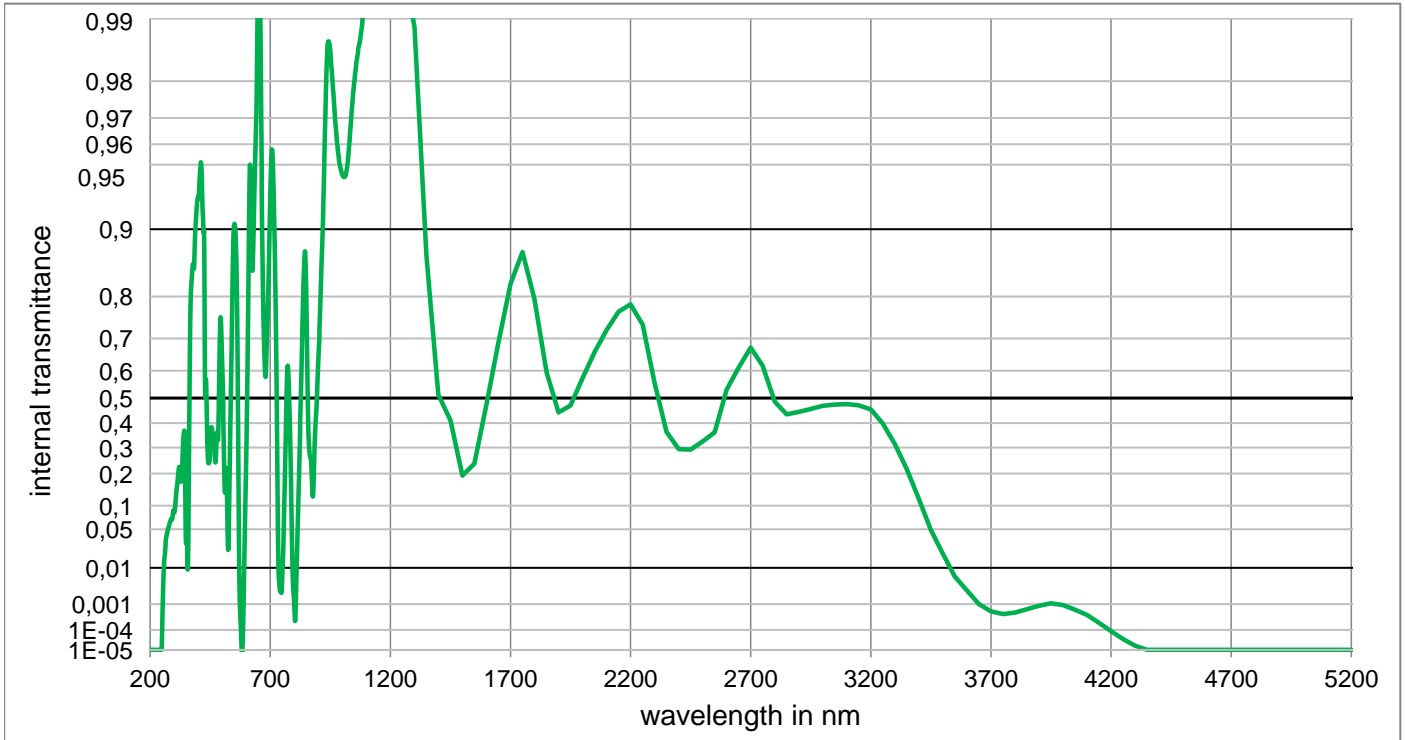
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	< 1,000E-05	800	2,400E-02	1100	4,897E-02	2200	3,160E-02	3700	3,206E-04
210	< 1,000E-05	510	< 1,000E-05	810	1,800E-02	1110	4,608E-02	2250	3,845E-02	3750	3,177E-04
220	< 1,000E-05	520	< 1,000E-05	820	1,382E-02	1120	4,300E-02	2300	4,600E-02	3800	3,000E-04
230	< 1,000E-05	530	< 1,000E-05	830	1,088E-02	1130	3,948E-02	2350	5,309E-02	3850	2,594E-04
240	6,067E-04	540	< 1,000E-05	840	9,121E-03	1140	3,666E-02	2400	6,000E-02	3900	2,213E-04
250	5,610E-02	550	< 1,000E-05	850	7,965E-03	1150	3,325E-02	2450	6,776E-02	3950	1,710E-04
260	2,760E-01	560	< 1,000E-05	860	7,014E-03	1160	2,970E-02	2500	7,000E-02	4000	1,180E-04
270	5,210E-01	570	< 1,000E-05	870	6,255E-03	1170	2,691E-02	2550	7,000E-02	4050	8,954E-05
280	7,120E-01	580	< 1,000E-05	880	5,892E-03	1180	2,354E-02	2600	7,000E-02	4100	6,653E-05
290	8,250E-01	590	< 1,000E-05	890	5,834E-03	1190	2,064E-02	2650	7,161E-02	4150	5,741E-05
300	8,800E-01	600	< 1,000E-05	900	5,948E-03	1200	1,775E-02	2700	7,000E-02	4200	5,236E-05
310	9,070E-01	610	< 1,000E-05	910	6,114E-03	1250	8,800E-03	2750	6,427E-02	4250	5,383E-05
320	9,200E-01	620	< 1,000E-05	920	6,368E-03	1300	5,470E-03	2800	3,000E-02	4300	6,067E-05
330	9,260E-01	630	< 1,000E-05	930	7,000E-03	1350	4,590E-03	2850	1,057E-02	4350	7,621E-05
340	9,210E-01	640	< 1,000E-05	940	8,090E-03	1400	4,770E-03	2900	4,819E-03	4400	1,000E-04
350	9,060E-01	650	< 1,000E-05	950	9,390E-03	1450	4,650E-03	2950	2,547E-03	4450	1,384E-04
360	8,660E-01	660	3,631E-04	960	1,100E-02	1500	4,270E-03	3000	1,589E-03	4500	1,663E-04
370	7,560E-01	670	8,128E-03	970	1,300E-02	1550	4,340E-03	3050	1,000E-03	4550	1,742E-04
380	4,820E-01	680	5,000E-02	980	1,520E-02	1600	5,000E-03	3100	6,966E-04	4600	1,766E-04
390	1,200E-01	690	1,380E-01	990	1,825E-02	1650	5,970E-03	3150	5,000E-04	4650	1,750E-04
400	3,999E-03	700	2,220E-01	1000	2,132E-02	1700	6,600E-03	3200	3,750E-04	4700	1,710E-04
410	1,047E-05	710	2,780E-01	1010	2,498E-02	1750	6,660E-03	3250	2,897E-04	4750	1,633E-04
420	< 1,000E-05	720	2,830E-01	1020	2,809E-02	1800	6,790E-03	3300	2,360E-04	4800	1,503E-04
430	< 1,000E-05	730	2,400E-01	1030	3,263E-02	1850	7,160E-03	3350	2,075E-04	4850	1,496E-04
440	< 1,000E-05	740	1,850E-01	1040	3,673E-02	1900	8,040E-03	3400	1,824E-04	4900	1,560E-04
450	< 1,000E-05	750	1,360E-01	1050	4,100E-02	1950	1,000E-02	3450	1,758E-04	4950	1,726E-04
460	< 1,000E-05	760	9,700E-02	1060	4,375E-02	2000	1,238E-02	3500	1,875E-04	5000	1,866E-04
470	< 1,000E-05	770	6,700E-02	1070	4,599E-02	2050	1,577E-02	3550	2,133E-04	5050	1,875E-04
480	< 1,000E-05	780	4,700E-02	1080	4,800E-02	2100	2,029E-02	3600	2,594E-04	5100	1,435E-04
490	< 1,000E-05	790	3,300E-02	1090	4,828E-02	2150	2,582E-02	3650	3,000E-04	5150	9,376E-05

BG36

Optical properties	Mechanical properties	Colorimetric properties																					
Reflection factor	Reference thickness	1 mm 2 mm 3 mm																					
$P_d = 0,877$	$d = 1,00 \text{ mm}$	<table border="1"> <tr> <td rowspan="5">Illuminant D65</td> <td>x</td> <td>0,344</td> <td>0,395</td> <td>0,429</td> </tr> <tr> <td>y</td> <td>0,327</td> <td>0,356</td> <td>0,370</td> </tr> <tr> <td>Y</td> <td>39,5</td> <td>29,0</td> <td>23,5</td> </tr> <tr> <td>λ_d</td> <td>622 nm</td> <td>591 nm</td> <td>590 nm</td> </tr> <tr> <td>P_e</td> <td>0,082</td> <td>0,305</td> <td>0,437</td> </tr> </table>	Illuminant D65	x	0,344	0,395	0,429	y	0,327	0,356	0,370	Y	39,5	29,0	23,5	λ_d	622 nm	591 nm	590 nm	P_e	0,082	0,305	0,437
Illuminant D65	x			0,344	0,395	0,429																	
	y			0,327	0,356	0,370																	
	Y			39,5	29,0	23,5																	
	λ_d			622 nm	591 nm	590 nm																	
	P_e	0,082	0,305	0,437																			
Spectral values guaranteed	Density	<table border="1"> <tr> <td rowspan="5">Illuminant A</td> <td>x</td> <td>0,495</td> <td>0,534</td> <td>0,557</td> </tr> <tr> <td>y</td> <td>0,387</td> <td>0,390</td> <td>0,389</td> </tr> <tr> <td>Y</td> <td>41,4</td> <td>32,2</td> <td>26,9</td> </tr> <tr> <td>λ_d</td> <td>628 nm</td> <td>600 nm</td> <td>599 nm</td> </tr> <tr> <td>P_e</td> <td>0,185</td> <td>0,478</td> <td>0,628</td> </tr> </table>	Illuminant A	x	0,495	0,534	0,557	y	0,387	0,390	0,389	Y	41,4	32,2	26,9	λ_d	628 nm	600 nm	599 nm	P_e	0,185	0,478	0,628
Illuminant A	x			0,495	0,534	0,557																	
	y			0,387	0,390	0,389																	
	Y			41,4	32,2	26,9																	
	λ_d			628 nm	600 nm	599 nm																	
	P_e	0,185	0,478	0,628																			
$\tau_i (405 \text{ nm}) \geq 0,9$	$\rho = 3,59 \text{ g/cm}^3$																						
$\tau_i (450 \text{ nm}) \leq 0,42$	Knoop hardness																						
$\tau_i (650 \text{ nm}) \geq 0,9$	$HK[0.1/20] = 701$																						
$\tau_i (800 \text{ nm}) \leq 0,01$	Thermal properties																						
	Transformation temperature																						
	$T_g = 657 \text{ }^\circ\text{C}$																						
	Thermal expansion in $10^{-6}/\text{K}$																						
	$\alpha (-30^\circ\text{C}/+70^\circ\text{C}) = 6,1$																						
	$\alpha (20^\circ\text{C}/300^\circ\text{C}) = 7,2$																						
Refractive indices	Chemical properties																						
	Chemical resistance																						
	FR class = 1																						
$n_d (587,6 \text{ nm}) = 1,69$	SR class = 52.2																						
	AR class = 1.2																						
Sellmeier coefficients	Resistance against humidity																						
on request	Resistant glass																						
	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5																						
Internal quality																							
Bubble class 3																							
		Notes																					
		Ionically colored glass																					
		Multi bandpass filter																					
		ISO 23364:2021																					
		Disclaimer																					
		All data without tolerances are to be understood to be reference values.																					



BG36



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	6,084E-01	800	8,615E-04	1100	9,947E-01	2200	7,840E-01	3700	5,636E-04
210	< 1,000E-05	510	1,685E-01	810	1,212E-02	1110	9,956E-01	2250	7,370E-01	3750	4,498E-04
220	< 1,000E-05	520	1,625E-01	820	2,111E-01	1120	9,965E-01	2300	5,570E-01	3800	5,035E-04
230	< 1,000E-05	530	1,386E-01	830	5,842E-01	1130	9,973E-01	2350	3,641E-01	3850	6,764E-04
240	< 1,000E-05	540	7,084E-01	840	8,398E-01	1140	9,979E-01	2400	2,940E-01	3900	8,872E-04
250	1,297E-04	550	9,047E-01	850	8,090E-01	1150	9,981E-01	2450	2,914E-01	3950	1,054E-03
260	1,734E-02	560	8,367E-01	860	3,330E-01	1160	9,979E-01	2500	3,250E-01	4000	9,311E-04
270	4,220E-02	570	1,873E-02	870	2,481E-01	1170	9,974E-01	2550	3,616E-01	4050	6,485E-04
280	5,797E-02	580	1,610E-05	880	1,625E-01	1180	9,966E-01	2600	5,320E-01	4100	4,112E-04
290	6,801E-02	590	1,816E-03	890	4,256E-01	1190	9,956E-01	2650	6,110E-01	4150	2,000E-04
300	8,428E-02	600	2,413E-01	900	6,394E-01	1200	9,946E-01	2700	6,740E-01	4200	8,913E-05
310	1,446E-01	610	8,512E-01	910	8,023E-01	1250	9,950E-01	2750	6,170E-01	4250	3,746E-05
320	2,223E-01	620	9,037E-01	920	9,102E-01	1300	9,890E-01	2800	4,856E-01	4300	1,710E-05
330	1,781E-01	630	8,899E-01	930	9,718E-01	1350	8,689E-01	2850	4,360E-01	4350	< 1,000E-05
340	3,601E-01	640	9,649E-01	940	9,870E-01	1400	5,130E-01	2900	4,455E-01	4400	< 1,000E-05
350	2,978E-02	650	9,962E-01	950	9,857E-01	1450	4,112E-01	2950	4,570E-01	4450	< 1,000E-05
360	6,104E-02	660	9,844E-01	960	9,792E-01	1500	1,930E-01	3000	4,695E-01	4500	< 1,000E-05
370	8,080E-01	670	8,158E-01	970	9,692E-01	1550	2,365E-01	3050	4,748E-01	4550	< 1,000E-05
380	8,558E-01	680	5,792E-01	980	9,582E-01	1600	4,754E-01	3100	4,767E-01	4600	< 1,000E-05
390	9,077E-01	690	7,712E-01	990	9,499E-01	1650	6,889E-01	3150	4,720E-01	4650	< 1,000E-05
400	9,286E-01	700	9,289E-01	1000	9,445E-01	1700	8,240E-01	3200	4,547E-01	4700	< 1,000E-05
410	9,496E-01	710	9,529E-01	1010	9,429E-01	1750	8,730E-01	3250	3,980E-01	4750	< 1,000E-05
420	9,107E-01	720	8,502E-01	1020	9,484E-01	1800	7,951E-01	3300	3,137E-01	4800	< 1,000E-05
430	5,033E-01	730	1,533E-01	1030	9,614E-01	1850	5,949E-01	3350	2,154E-01	4850	< 1,000E-05
440	2,722E-01	740	2,600E-03	1040	9,731E-01	1900	4,433E-01	3400	1,186E-01	4900	< 1,000E-05
450	2,957E-01	750	5,260E-03	1050	9,801E-01	1950	4,709E-01	3450	4,861E-02	4950	< 1,000E-05
460	3,560E-01	760	1,460E-01	1060	9,843E-01	2000	5,741E-01	3500	1,952E-02	5000	< 1,000E-05
470	2,574E-01	770	5,782E-01	1070	9,865E-01	2050	6,600E-01	3550	6,251E-03	5050	< 1,000E-05
480	3,513E-01	780	4,586E-01	1080	9,887E-01	2100	7,230E-01	3600	2,675E-03	5100	< 1,000E-05
490	7,056E-01	790	4,187E-02	1090	9,918E-01	2150	7,680E-01	3650	1,009E-03	5150	< 1,000E-05

S7005

Optical properties	
Reflection factor	
P_d	= 0,908
Spectral values guaranteed	
τ_i (360 nm)	= 0,414 ± 0,12
Refractive indices	
n_d (587,6 nm)	= 1,562
Sellmeier coefficients	
on request	
Internal quality	
Bubble class	-

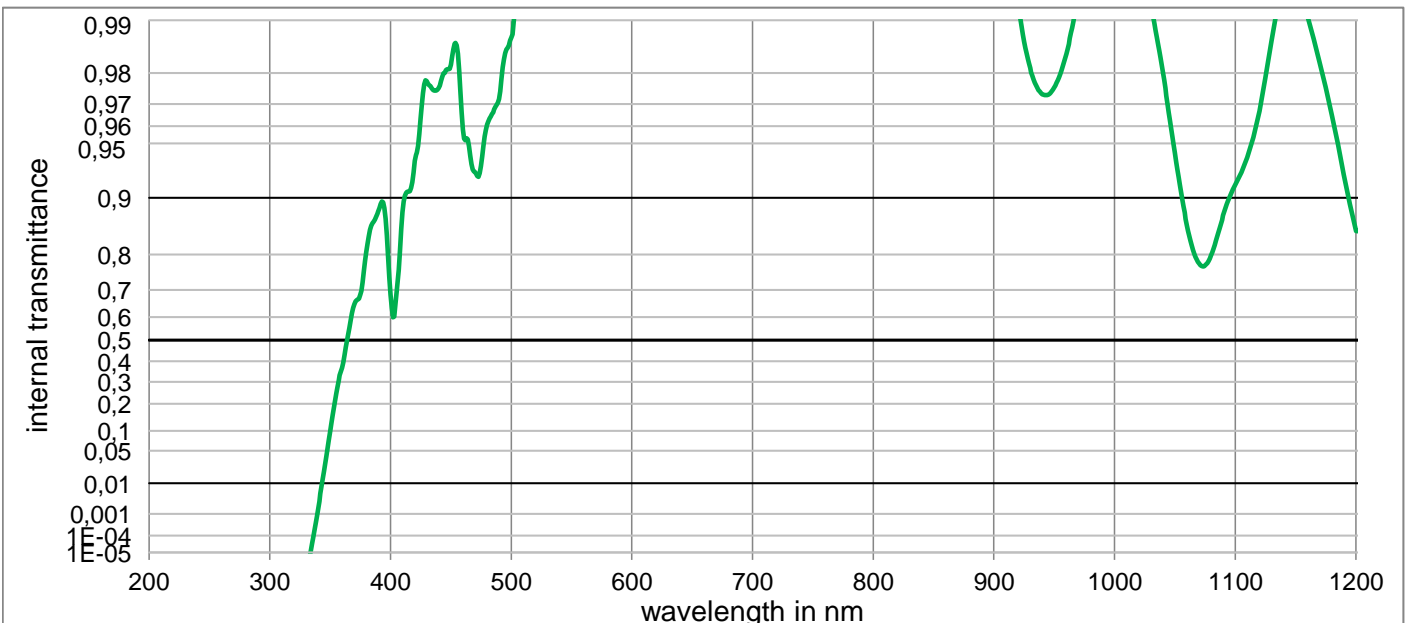
Mechanical properties	
Reference thickness	
d	= 2,00 mm
Density	
ρ	= 2,88 g/cm ³
Knoop hardness	
HK[0.1/20]	= 529

Thermal properties	
Transformation temperature	
T_g	= 452 °C
Thermal expansion in 10⁻⁶/K	
α (20°C/300°C)	= 11,5

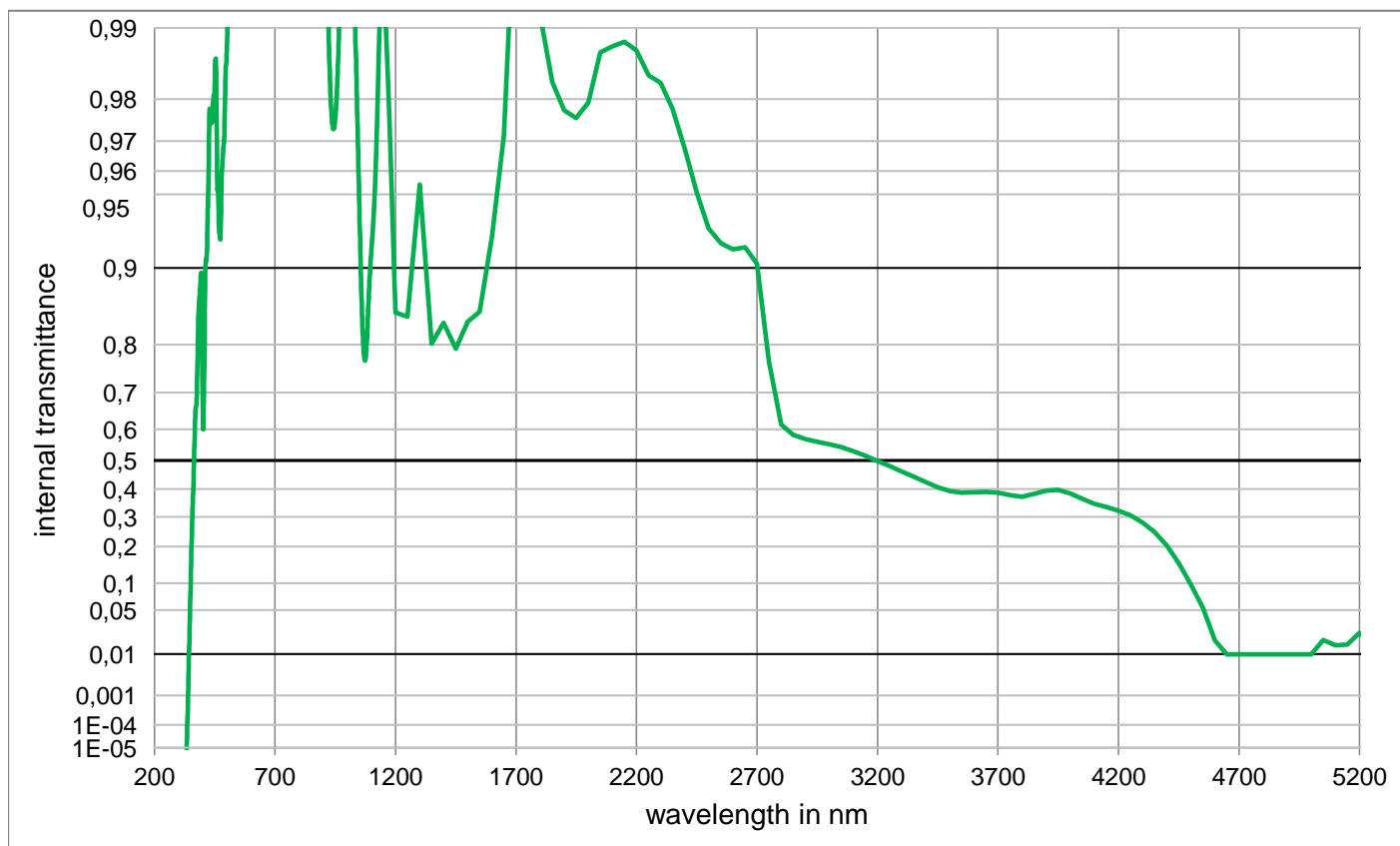
Chemical properties	
Chemical resistance	
FR class	= 1
SR class	= 1.2
AR class	= 1.0
Resistance against humidity	
Resistant glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties				
		1 mm	2 mm	3 mm
Illuminant D65	x	0,314	0,316	0,317
	y	0,331	0,333	0,335
	Y	90,6	90,4	90,2
	λ_d	572,1	572,1	572,2
	P_e	0,010	0,020	0,030
Illuminant A	x	0,449	0,450	0,451
	y	0,408	0,409	0,410
	Y	90,7	90,6	90,4
	λ_d	581,8	581,8	581,9
	P_e	0,014	0,028	0,042

Notes	
Ionically colored glass	
Samarium doped	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



S7005



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,874E-01	800	9,984E-01	1100	9,151E-01	2200	9,875E-01	3700	3,872E-01
210	< 1,0E-05	510	9,967E-01	810	9,987E-01	1110	9,401E-01	2250	9,841E-01	3750	3,775E-01
220	< 1,0E-05	520	9,980E-01	820	9,989E-01	1120	9,671E-01	2300	9,829E-01	3800	3,725E-01
230	< 1,0E-05	530	9,963E-01	830	9,989E-01	1130	9,868E-01	2350	9,781E-01	3850	3,825E-01
240	< 1,0E-05	540	9,981E-01	840	9,981E-01	1140	9,942E-01	2400	9,677E-01	3900	3,944E-01
250	< 1,0E-05	550	9,975E-01	850	9,983E-01	1150	9,941E-01	2450	9,510E-01	3950	3,970E-01
260	< 1,0E-05	560	9,963E-01	860	9,985E-01	1160	9,905E-01	2500	9,310E-01	4000	3,839E-01
270	< 1,0E-05	570	9,980E-01	870	9,989E-01	1170	9,826E-01	2550	9,205E-01	4050	3,641E-01
280	< 1,0E-05	580	9,999E-01	880	9,993E-01	1180	9,653E-01	2600	9,157E-01	4100	3,467E-01
290	< 1,0E-05	590	9,968E-01	890	9,985E-01	1190	9,252E-01	2650	9,175E-01	4150	3,344E-01
300	< 1,0E-05	600	9,969E-01	900	9,977E-01	1200	8,493E-01	2700	9,039E-01	4200	3,220E-01
310	< 1,0E-05	610	9,970E-01	910	9,981E-01	1250	8,438E-01	2750	7,688E-01	4250	3,065E-01
320	< 1,000E-05	620	9,971E-01	920	9,920E-01	1300	9,545E-01	2800	6,136E-01	4300	2,805E-01
330	< 1,000E-05	630	9,973E-01	930	9,813E-01	1350	8,013E-01	2850	5,831E-01	4350	2,469E-01
340	1,598E-03	640	9,973E-01	940	9,737E-01	1400	8,351E-01	2900	5,707E-01	4400	2,034E-01
350	9,824E-02	650	9,975E-01	950	9,758E-01	1450	7,926E-01	2950	5,612E-01	4450	1,508E-01
360	3,675E-01	660	9,979E-01	960	9,844E-01	1500	8,367E-01	3000	5,532E-01	4500	9,816E-02
370	6,496E-01	670	9,975E-01	970	9,930E-01	1550	8,509E-01	3050	5,439E-01	4550	5,334E-02
380	8,064E-01	680	9,978E-01	980	9,984E-01	1600	9,254E-01	3100	5,313E-01	4600	1,783E-02
390	8,817E-01	690	9,982E-01	990	9,973E-01	1650	9,715E-01	3150	5,159E-01	4650	9,925E-03
400	6,832E-01	700	9,983E-01	1000	9,974E-01	1700	9,979E-01	3200	4,984E-01	4700	9,925E-03
410	8,806E-01	710	9,982E-01	1010	9,994E-01	1750	9,968E-01	3250	4,804E-01	4750	9,925E-03
420	9,374E-01	720	9,985E-01	1020	9,969E-01	1800	9,912E-01	3300	4,624E-01	4800	9,925E-03
430	9,777E-01	730	9,986E-01	1030	9,921E-01	1850	9,831E-01	3350	4,439E-01	4850	9,925E-03
440	9,756E-01	740	9,982E-01	1040	9,801E-01	1900	9,778E-01	3400	4,247E-01	4900	9,925E-03
450	9,821E-01	750	9,987E-01	1050	9,434E-01	1950	9,760E-01	3450	4,063E-01	4950	9,925E-03
460	9,584E-01	760	9,978E-01	1060	8,591E-01	2000	9,794E-01	3500	3,930E-01	5000	9,925E-03
470	9,279E-01	770	9,989E-01	1070	7,772E-01	2050	9,873E-01	3550	3,874E-01	5050	1,806E-02
480	9,607E-01	780	9,988E-01	1080	7,978E-01	2100	9,880E-01	3600	3,887E-01	5100	1,447E-02
490	9,718E-01	790	9,983E-01	1090	8,752E-01	2150	9,885E-01	3650	3,896E-01	5150	1,512E-02

S7010N

Optical properties	
Reflection factor	
$P_d = 0,909$	
Spectral values guaranteed	
τ_i (364 nm)	$= 0,414 \pm 0,060$
τ_i (500 nm)	$\geq 0,85$
Refractive indices	
n_d (587,6 nm)	$= 1,56$
Sellmeier coefficients	
on request	
Internal quality	
Bubble class	-

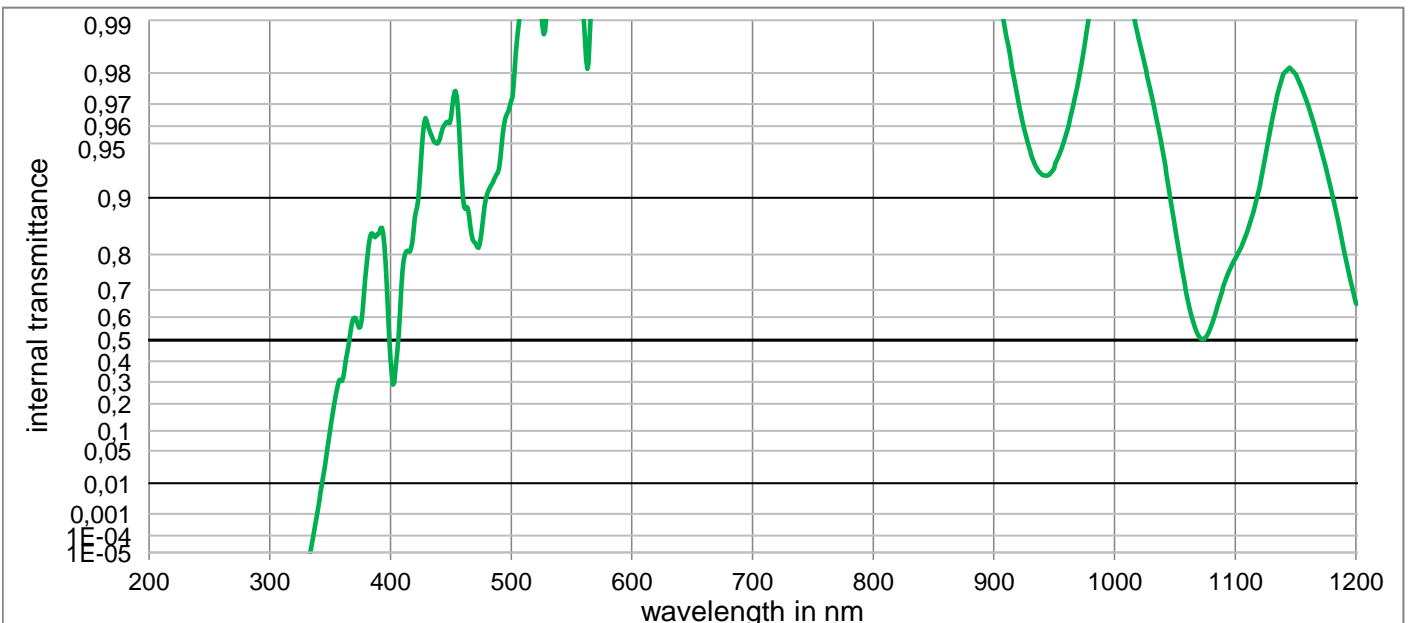
Mechanical properties	
Reference thickness	
$d = 2,00$ mm	
Density	
$\rho = 2,88$ g/cm ³	
Knoop hardness	
HK[0.1/20] = 536	

Thermal properties	
Transformation temperature	
$T_g = 452$ °C	
Thermal expansion in $10^{-6}/K$	
α (20°C/300°C) = 11,5	

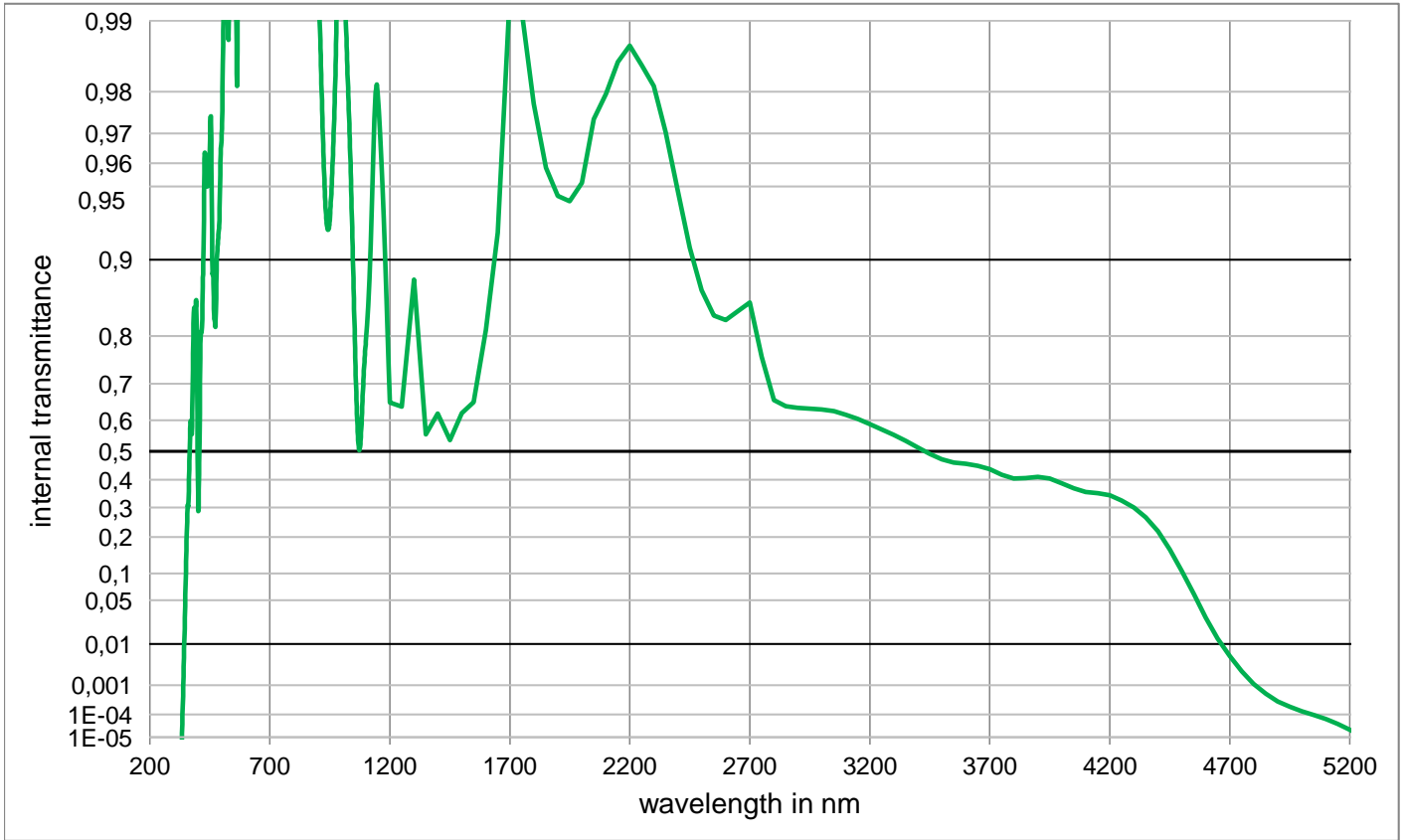
Chemical properties	
Chemical resistance	
FR class	= 1
SR class	= 1.2
AR class	= 1.0
Resistance against humidity	
Resistant glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties				
		1 mm	2 mm	3 mm
Illuminant D65	x	0,316	0,319	0,322
	y	0,334	0,338	0,343
	Y	90,3	89,9	89,4
	λ_d	572,3	572,4	572,5
	P_e	0,023	0,044	0,065
Illuminant A	x	0,450	0,452	0,455
	y	0,410	0,412	0,414
	Y	90,5	90,3	90,0
	λ_d	581,8	581,9	581,9
	P_e	0,033	0,063	0,092

Notes	
Ionically colored glass	
Samarium doped	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



S7010N

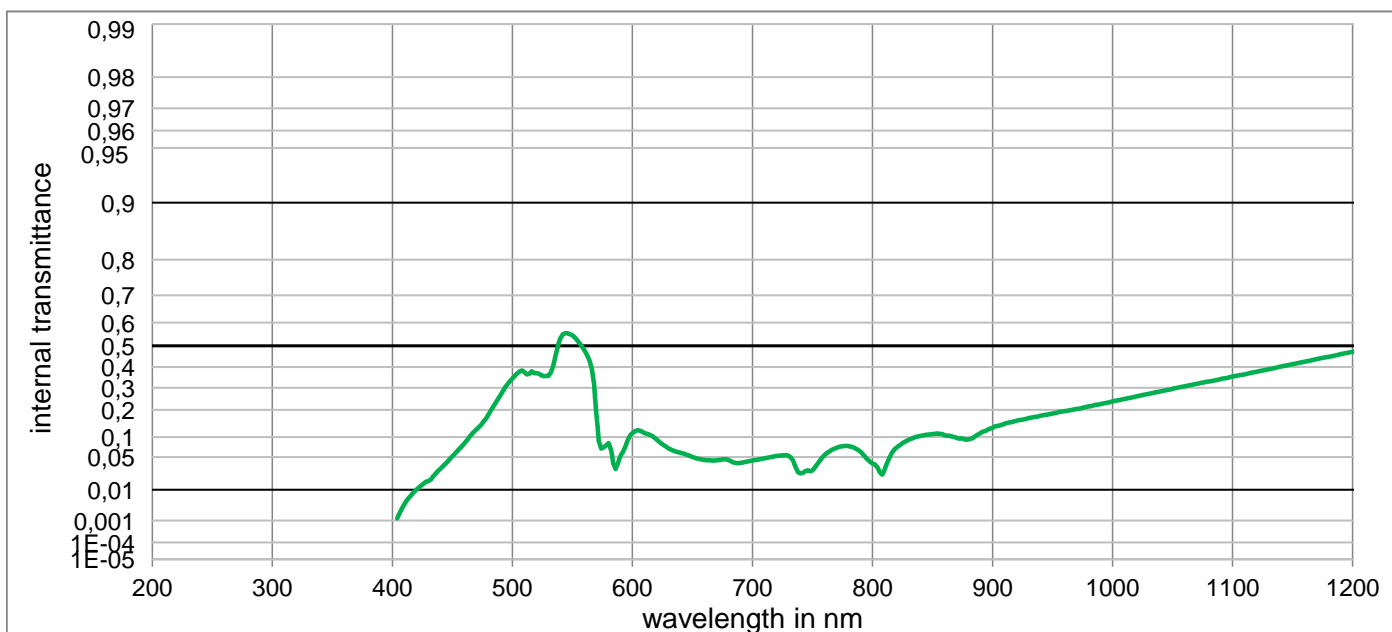


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

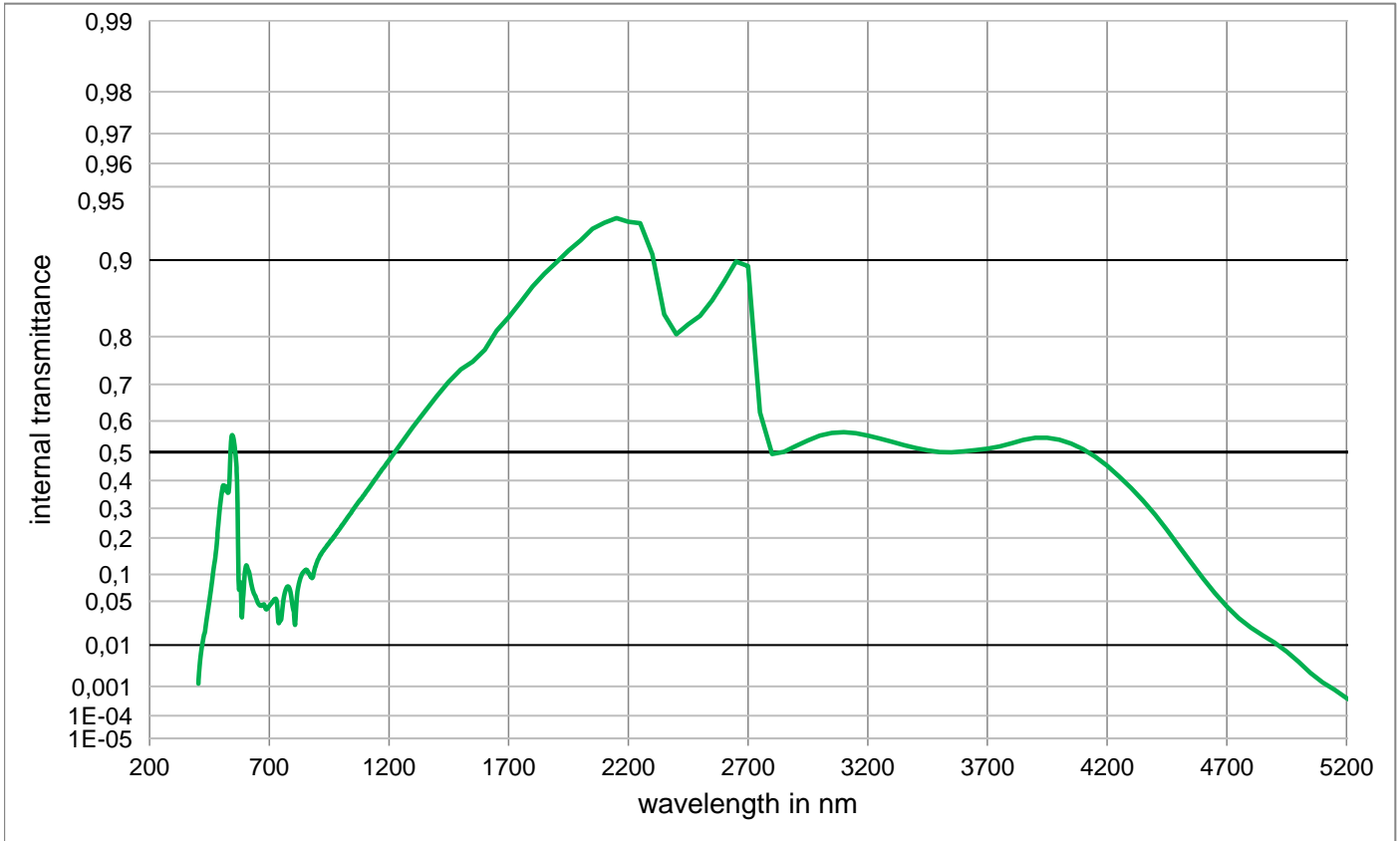
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,713E-01	800	9,992E-01	1100	7,904E-01	2200	9,873E-01	3700	4,375E-01
210	< 1,0E-05	510	9,947E-01	810	9,995E-01	1110	8,478E-01	2250	9,845E-01	3750	4,176E-01
220	< 1,0E-05	520	9,973E-01	820	9,991E-01	1120	9,123E-01	2300	9,811E-01	3800	4,038E-01
230	< 1,0E-05	530	9,927E-01	830	9,993E-01	1130	9,613E-01	2350	9,704E-01	3850	4,062E-01
240	< 1,0E-05	540	9,965E-01	840	9,989E-01	1140	9,799E-01	2400	9,475E-01	3900	4,102E-01
250	< 1,0E-05	550	9,949E-01	850	9,986E-01	1150	9,797E-01	2450	9,106E-01	3950	4,048E-01
260	< 1,0E-05	560	9,903E-01	860	9,977E-01	1160	9,701E-01	2500	8,676E-01	4000	3,874E-01
270	< 1,0E-05	570	9,952E-01	870	9,993E-01	1170	9,496E-01	2550	8,334E-01	4050	3,685E-01
280	< 1,0E-05	580	9,995E-01	880	9,989E-01	1180	9,061E-01	2600	8,267E-01	4100	3,564E-01
290	< 1,0E-05	590	9,999E-01	890	9,976E-01	1190	8,117E-01	2650	8,399E-01	4150	3,516E-01
300	< 1,0E-05	600	9,970E-01	900	9,949E-01	1200	6,513E-01	2700	8,516E-01	4200	3,436E-01
310	< 1,0E-05	610	9,974E-01	910	9,879E-01	1250	6,393E-01	2750	7,606E-01	4250	3,254E-01
320	< 1,000E-05	620	9,975E-01	920	9,718E-01	1300	8,795E-01	2800	6,575E-01	4300	2,994E-01
330	< 1,000E-05	630	9,977E-01	930	9,450E-01	1350	5,560E-01	2850	6,406E-01	4350	2,655E-01
340	1,751E-03	640	9,979E-01	940	9,254E-01	1400	6,197E-01	2900	6,365E-01	4400	2,188E-01
350	1,027E-01	650	9,981E-01	950	9,309E-01	1450	5,378E-01	2950	6,345E-01	4450	1,625E-01
360	3,035E-01	660	9,982E-01	960	9,561E-01	1500	6,209E-01	3000	6,321E-01	4500	1,064E-01
370	5,979E-01	670	9,979E-01	970	9,777E-01	1550	6,524E-01	3050	6,265E-01	4550	5,990E-02
380	7,672E-01	680	9,984E-01	980	9,918E-01	1600	8,107E-01	3100	6,167E-01	4600	2,838E-02
390	8,431E-01	690	9,988E-01	990	9,972E-01	1650	9,225E-01	3150	6,036E-01	4650	1,261E-02
400	4,080E-01	700	9,989E-01	1000	9,973E-01	1700	9,925E-01	3200	5,884E-01	4700	5,539E-03
410	7,567E-01	710	9,988E-01	1010	9,941E-01	1750	9,908E-01	3250	5,718E-01	4750	2,426E-03
420	8,714E-01	720	9,989E-01	1020	9,872E-01	1800	9,775E-01	3300	5,542E-01	4800	1,089E-03
430	9,625E-01	730	9,990E-01	1030	9,746E-01	1850	9,583E-01	3350	5,352E-01	4850	5,416E-04
440	9,508E-01	740	9,987E-01	1040	9,440E-01	1900	9,454E-01	3400	5,126E-01	4900	3,059E-04
450	9,640E-01	750	9,992E-01	1050	8,572E-01	1950	9,425E-01	3450	4,911E-01	4950	1,974E-04
460	9,014E-01	760	9,983E-01	1060	6,792E-01	2000	9,518E-01	3500	4,720E-01	5000	1,355E-04
470	8,266E-01	770	9,990E-01	1070	5,165E-01	2050	9,739E-01	3550	4,617E-01	5050	9,711E-05
480	9,043E-01	780	9,990E-01	1080	5,608E-01	2100	9,796E-01	3600	4,564E-01	5100	6,627E-05
490	9,311E-01	790	9,990E-01	1090	7,086E-01	2150	9,850E-01	3650	4,492E-01	5150	4,091E-05

S8008G

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,912$	$d = 1,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed	Density	
	$\rho = 2,78 \text{ g/cm}^3$	
	Knoop hardness	
	HK[0.1/20] = 569	
	Thermal properties	Illuminant A x y Y λ_d P_e
	Transformation temperature	
	$T_g = 480 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,6$ $\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,0$	
Refractive indices	Chemical properties	Notes
$n_h (404,7 \text{ nm}) = 1,566$	Chemical resistance	Ionically colored glass Contrast enhancement filter ISO 23364:2021
$n_e (546 \text{ nm}) = 1,551$	FR class	
$n_d (587,6 \text{ nm}) = 1,548$	SR class = 1	
	AR class = 1	
	Resistance against humidity	
Sellmeier coefficients	Resistant glass	Disclaimer
valid from 440 nm to 1550 nm	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	All data without tolerances are to be understood to be reference values.
$B_1 = 0,8874$		
$B_2 = 0,4659$		
$B_3 = 21,3145$		
$C_1 = 1,137\text{E-}02 \text{ } \mu\text{m}^2$		
$C_2 = 1,1165\text{E-}02 \text{ } \mu\text{m}^2$		
$C_3 = 3495,165 \text{ } \mu\text{m}^2$		
Internal quality		
Bubble class 0		



S8008G

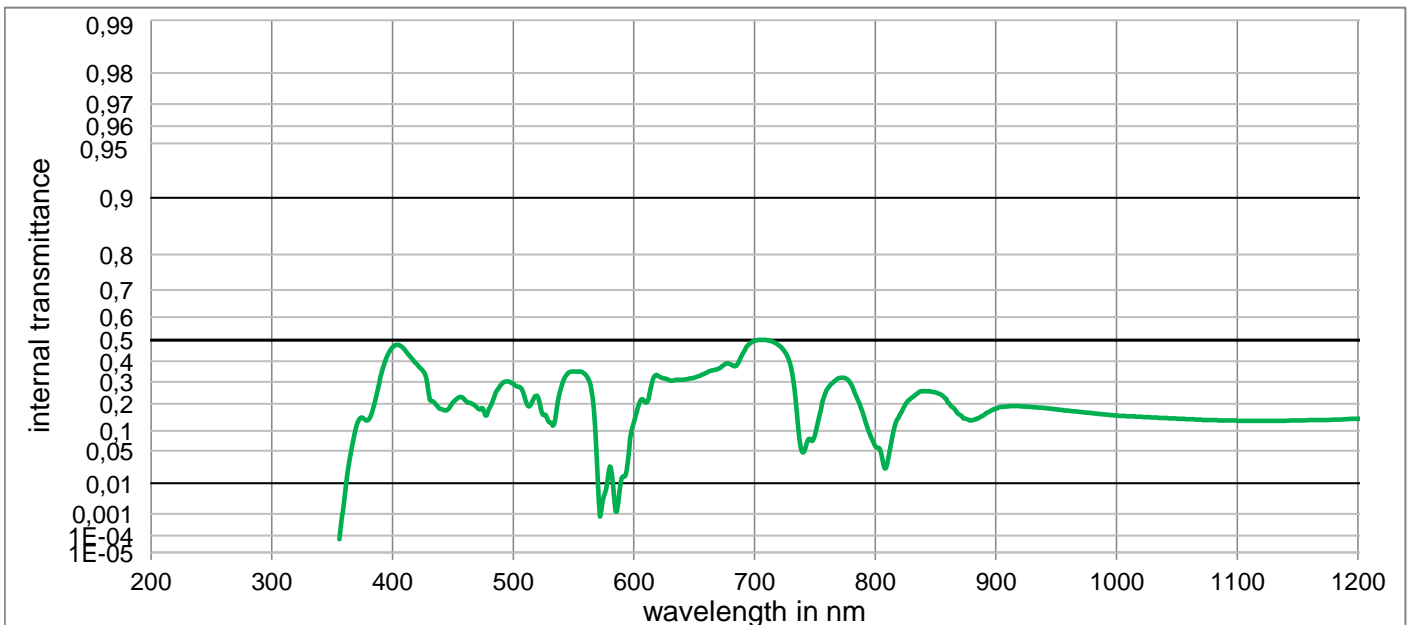


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

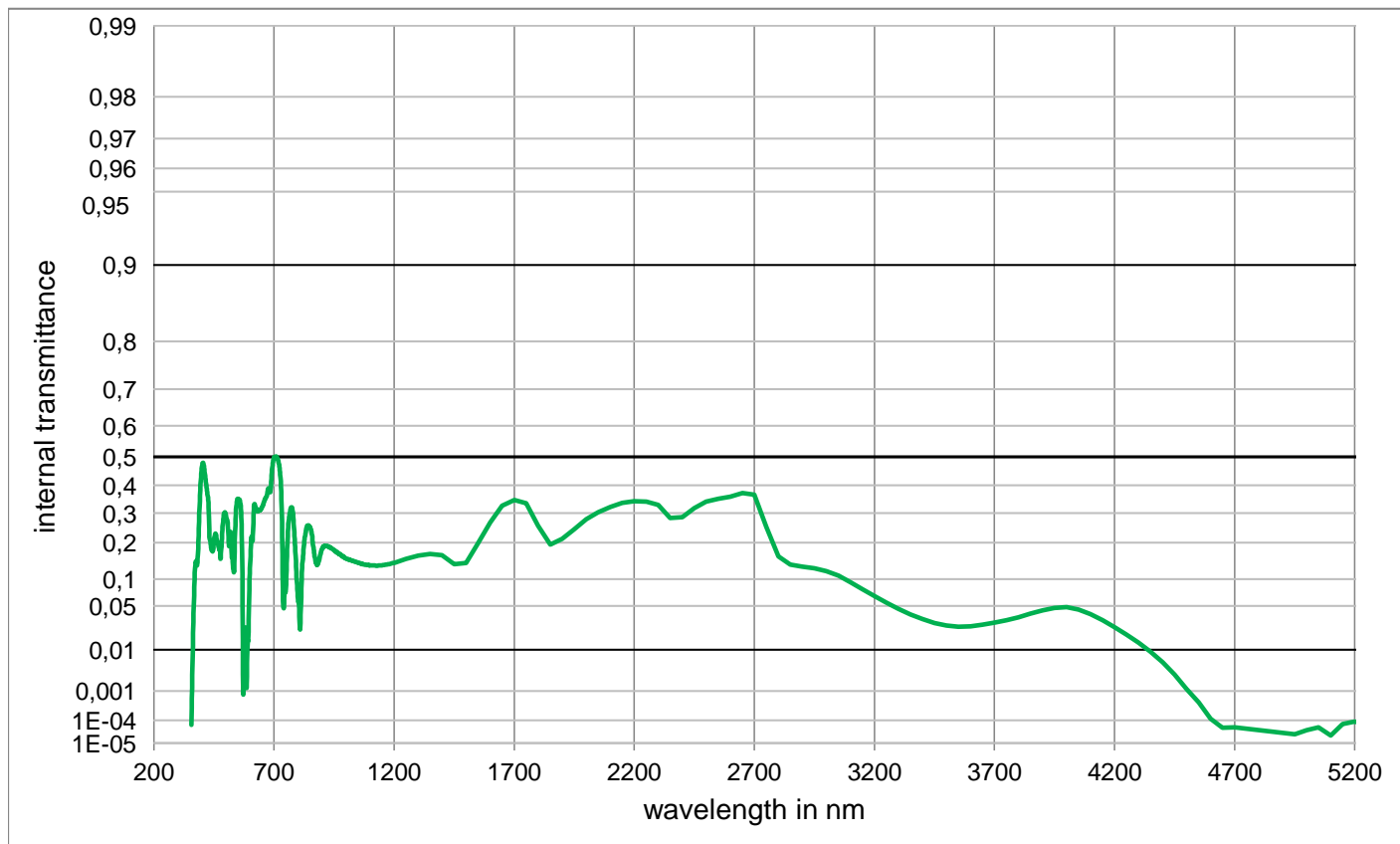
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	3,449E-01	800	3,835E-02	1100	3,535E-01	2200	9,303E-01	3700	5,118E-01
210	< 1,0E-05	510	3,761E-01	810	2,828E-02	1110	3,650E-01	2250	9,292E-01	3750	5,188E-01
220	< 1,0E-05	520	3,701E-01	820	7,119E-02	1120	3,779E-01	2300	9,054E-01	3800	5,291E-01
230	< 1,0E-05	530	3,578E-01	830	9,166E-02	1130	3,891E-01	2350	8,359E-01	3850	5,408E-01
240	< 1,0E-05	540	5,335E-01	840	1,038E-01	1140	4,021E-01	2400	8,040E-01	3900	5,474E-01
250	< 1,0E-05	550	5,462E-01	850	1,097E-01	1150	4,136E-01	2450	8,206E-01	3950	5,475E-01
260	< 1,0E-05	560	4,795E-01	860	1,057E-01	1160	4,259E-01	2500	8,337E-01	4000	5,411E-01
270	< 1,0E-05	570	1,834E-01	870	9,770E-02	1170	4,384E-01	2550	8,554E-01	4050	5,286E-01
280	< 1,0E-05	580	8,299E-02	880	9,302E-02	1180	4,488E-01	2600	8,778E-01	4100	5,098E-01
290	< 1,0E-05	590	5,203E-02	890	1,124E-01	1190	4,617E-01	2650	8,986E-01	4150	4,845E-01
300	< 1,0E-05	600	1,122E-01	900	1,301E-01	1200	4,725E-01	2700	8,943E-01	4200	4,530E-01
310	< 1,0E-05	610	1,127E-01	910	1,449E-01	1250	5,288E-01	2750	6,253E-01	4250	4,152E-01
320	< 1,000E-05	620	9,318E-02	920	1,560E-01	1300	5,811E-01	2800	4,937E-01	4300	3,734E-01
330	< 1,000E-05	630	6,941E-02	930	1,658E-01	1350	6,280E-01	2850	5,009E-01	4350	3,278E-01
340	< 1,000E-05	640	5,888E-02	940	1,757E-01	1400	6,701E-01	2900	5,203E-01	4400	2,778E-01
350	< 1,000E-05	650	5,005E-02	950	1,848E-01	1450	7,065E-01	2950	5,390E-01	4450	2,258E-01
360	< 1,000E-05	660	4,456E-02	960	1,948E-01	1500	7,348E-01	3000	5,543E-01	4500	1,749E-01
370	< 1,000E-05	670	4,374E-02	970	2,037E-01	1550	7,519E-01	3050	5,634E-01	4550	1,294E-01
380	< 1,000E-05	680	4,445E-02	980	2,149E-01	1600	7,756E-01	3100	5,656E-01	4600	9,202E-02
390	< 1,000E-05	690	3,929E-02	990	2,249E-01	1650	8,104E-01	3150	5,620E-01	4650	6,337E-02
400	< 1,000E-05	700	4,328E-02	1000	2,371E-01	1700	8,315E-01	3200	5,546E-01	4700	4,275E-02
410	3,762E-03	710	4,748E-02	1010	2,480E-01	1750	8,530E-01	3250	5,450E-01	4750	2,920E-02
420	9,953E-03	720	5,215E-02	1020	2,598E-01	1800	8,725E-01	3300	5,346E-01	4800	2,065E-02
430	1,650E-02	730	5,249E-02	1030	2,716E-01	1850	8,867E-01	3350	5,240E-01	4850	1,526E-02
440	3,046E-02	740	2,429E-02	1040	2,827E-01	1900	8,979E-01	3400	5,139E-01	4900	1,114E-02
450	5,121E-02	750	2,797E-02	1050	2,950E-01	1950	9,084E-01	3450	5,054E-01	4950	7,390E-03
460	8,230E-02	760	5,401E-02	1060	3,073E-01	2000	9,168E-01	3500	5,000E-01	5000	4,413E-03
470	1,248E-01	770	7,056E-02	1070	3,189E-01	2050	9,254E-01	3550	4,990E-01	5050	2,345E-03
480	1,794E-01	780	7,483E-02	1080	3,307E-01	2100	9,295E-01	3600	5,022E-01	5100	1,315E-03
490	2,659E-01	790	6,097E-02	1090	3,420E-01	2150	9,326E-01	3650	5,062E-01	5150	7,920E-04

S8802

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,915$	$d = 3,50 \text{ mm}$	Illuminant D65
Spectral values guaranteed	Density	x
$\tau_i (445 \text{ nm}) = 0,15 \pm 0,025$	$\rho = 2,70 \text{ g/cm}^3$	y
$\tau_i (555 \text{ nm}) = 0,305 \pm 0,035$	Knoop hardness	Y
$\tau_i (630 \text{ nm}) = 0,275 \pm 0,035$	HK[0.1/20]	λ_d
		P_e
		Illuminant A
		x
		y
		Y
		λ_d
		P_e
Refractive indices	Thermal properties	Notes
	Transformation temperature	
	$T_g = 510 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
$n_d (587,6 \text{ nm}) = 1,533$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 10,8$	
Sellmeier coefficients	Chemical properties	
on request	Chemical resistance	
	FR class = 0	
	SR class = 1.0	
	AR class = 1.0	
	Resistance against humidity	
	Resistant glass	
Internal quality	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
Bubble class 0		



S8802



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	2,896E-01	800	5,938E-02	1100	1,335E-01	2200	3,427E-01	3700	2,912E-02
210	< 1,0E-05	510	2,193E-01	810	2,875E-02	1110	1,334E-01	2250	3,415E-01	3750	3,168E-02
220	< 1,0E-05	520	2,346E-01	820	1,510E-01	1120	1,331E-01	2300	3,298E-01	3800	3,501E-02
230	< 1,0E-05	530	1,277E-01	830	2,257E-01	1130	1,331E-01	2350	2,833E-01	3850	3,929E-02
240	< 1,0E-05	540	2,777E-01	840	2,563E-01	1140	1,334E-01	2400	2,858E-01	3900	4,375E-02
250	< 1,0E-05	550	3,506E-01	850	2,499E-01	1150	1,341E-01	2450	3,180E-01	3950	4,716E-02
260	< 1,0E-05	560	3,339E-01	860	2,056E-01	1160	1,353E-01	2500	3,404E-01	4000	4,799E-02
270	< 1,0E-05	570	1,558E-02	870	1,562E-01	1170	1,361E-01	2550	3,510E-01	4050	4,507E-02
280	< 1,0E-05	580	2,479E-02	880	1,342E-01	1180	1,373E-01	2600	3,584E-01	4100	3,911E-02
290	< 1,0E-05	590	1,384E-02	890	1,547E-01	1190	1,387E-01	2650	3,715E-01	4150	3,192E-02
300	< 1,0E-05	600	1,262E-01	900	1,799E-01	1200	1,407E-01	2700	3,654E-01	4200	2,508E-02
310	< 1,0E-05	610	2,039E-01	910	1,893E-01	1250	1,512E-01	2750	2,525E-01	4250	1,899E-02
320	< 1,000E-05	620	3,306E-01	920	1,902E-01	1300	1,606E-01	2800	1,581E-01	4300	1,370E-02
330	< 1,000E-05	630	3,067E-01	930	1,869E-01	1350	1,656E-01	2850	1,361E-01	4350	9,150E-03
340	< 1,000E-05	640	3,100E-01	940	1,825E-01	1400	1,623E-01	2900	1,305E-01	4400	5,447E-03
350	< 1,000E-05	650	3,202E-01	950	1,769E-01	1450	1,367E-01	2950	1,264E-01	4450	2,797E-03
360	2,721E-03	660	3,436E-01	960	1,712E-01	1500	1,402E-01	3000	1,191E-01	4500	1,146E-03
370	1,147E-01	670	3,631E-01	970	1,663E-01	1550	1,984E-01	3050	1,076E-01	4550	4,483E-04
380	1,358E-01	680	3,854E-01	980	1,615E-01	1600	2,675E-01	3100	9,357E-02	4600	1,161E-04
390	3,197E-01	690	4,354E-01	990	1,568E-01	1650	3,258E-01	3150	7,907E-02	4650	4,912E-05
400	4,675E-01	700	4,973E-01	1000	1,526E-01	1700	3,471E-01	3200	6,593E-02	4700	5,289E-05
410	4,563E-01	710	5,003E-01	1010	1,501E-01	1750	3,352E-01	3250	5,475E-02	4750	-
420	3,863E-01	720	4,765E-01	1020	1,477E-01	1800	2,551E-01	3300	4,581E-02	4800	-
430	2,438E-01	730	3,768E-01	1030	1,454E-01	1850	1,944E-01	3350	3,869E-02	4850	-
440	1,778E-01	740	4,625E-02	1040	1,433E-01	1900	2,119E-01	3400	3,324E-02	4900	-
450	2,059E-01	750	8,774E-02	1050	1,411E-01	1950	2,430E-01	3450	2,897E-02	4950	2,537E-05
460	2,162E-01	760	2,625E-01	1060	1,392E-01	2000	2,785E-01	3500	2,641E-02	5000	3,913E-05
470	1,852E-01	770	3,179E-01	1070	1,368E-01	2050	3,028E-01	3550	2,529E-02	5050	5,170E-05
480	1,795E-01	780	2,880E-01	1080	1,355E-01	2100	3,221E-01	3600	2,587E-02	5100	2,262E-05
490	2,862E-01	790	1,602E-01	1090	1,347E-01	2150	3,373E-01	3650	2,724E-02	5150	7,095E-05

S8806A

Optical properties	
Reflection factor	
$P_d = 0,878$	
Spectral values guaranteed	
τ_i (455 nm)	> 0,71
τ_i (580 nm)	= 0,002 ± 0,002
τ_i (618 nm)	= 0,9 ± 0,030
τ_i (550 nm)	> 0,76
Refractive indices	
n_h (404,7 nm)	= 1,7067
n_e (546 nm)	= 1,6878
n_d (587,6 nm)	= 1,6847
Sellmeier coefficients	
valid from 440 nm to 1550 nm	
B_1	1,1147
B_2	0,6697
B_3	1,3665
C_1	1,721E-02 μm^2
C_2	1,7511E-13 μm^2
C_3	100,000 μm^2
Internal quality	
Bubble class	-

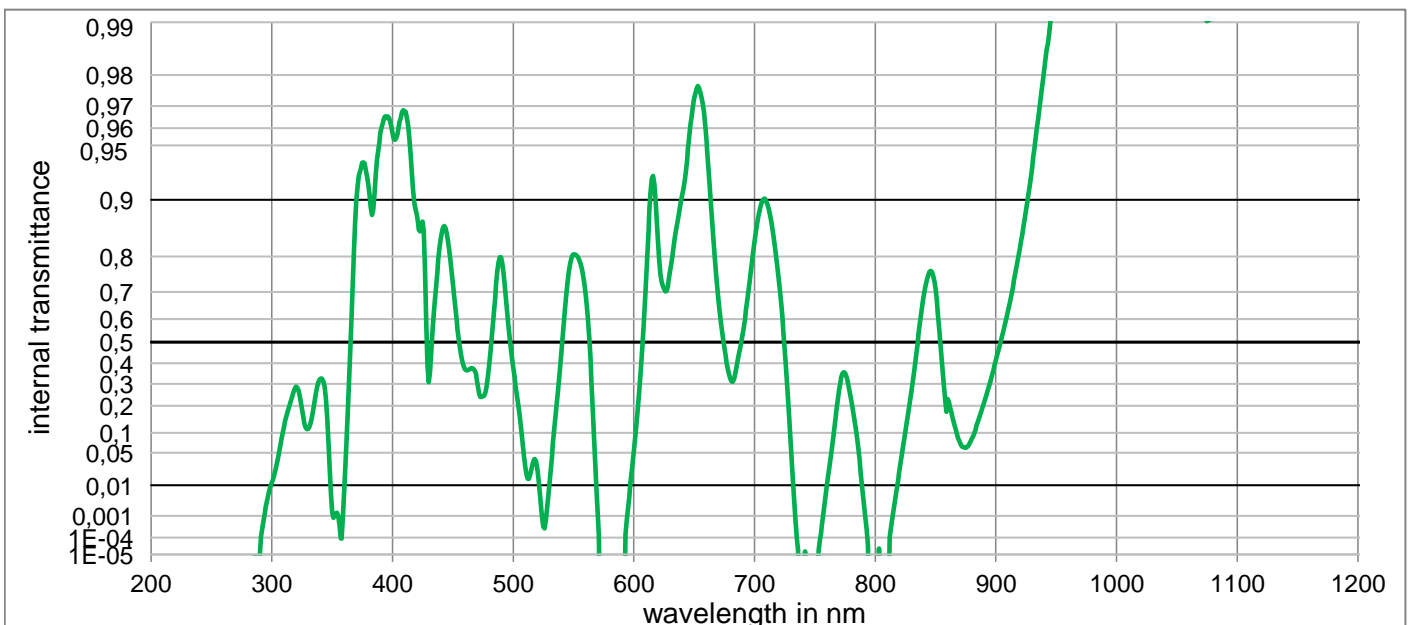
Mechanical properties	
Reference thickness	
$d = 2,50$ mm	
Density	
$\rho = 3,49$ g/cm ³	
Knoop hardness	
HK[0.1/20]	

Thermal properties	
Transformation temperature	
$T_g = 653$ °C	
Thermal expansion in 10 ⁻⁶ /K	
α (-30°C/+70°C)	= 6,1
α (20°C/300°C)	= 7,3

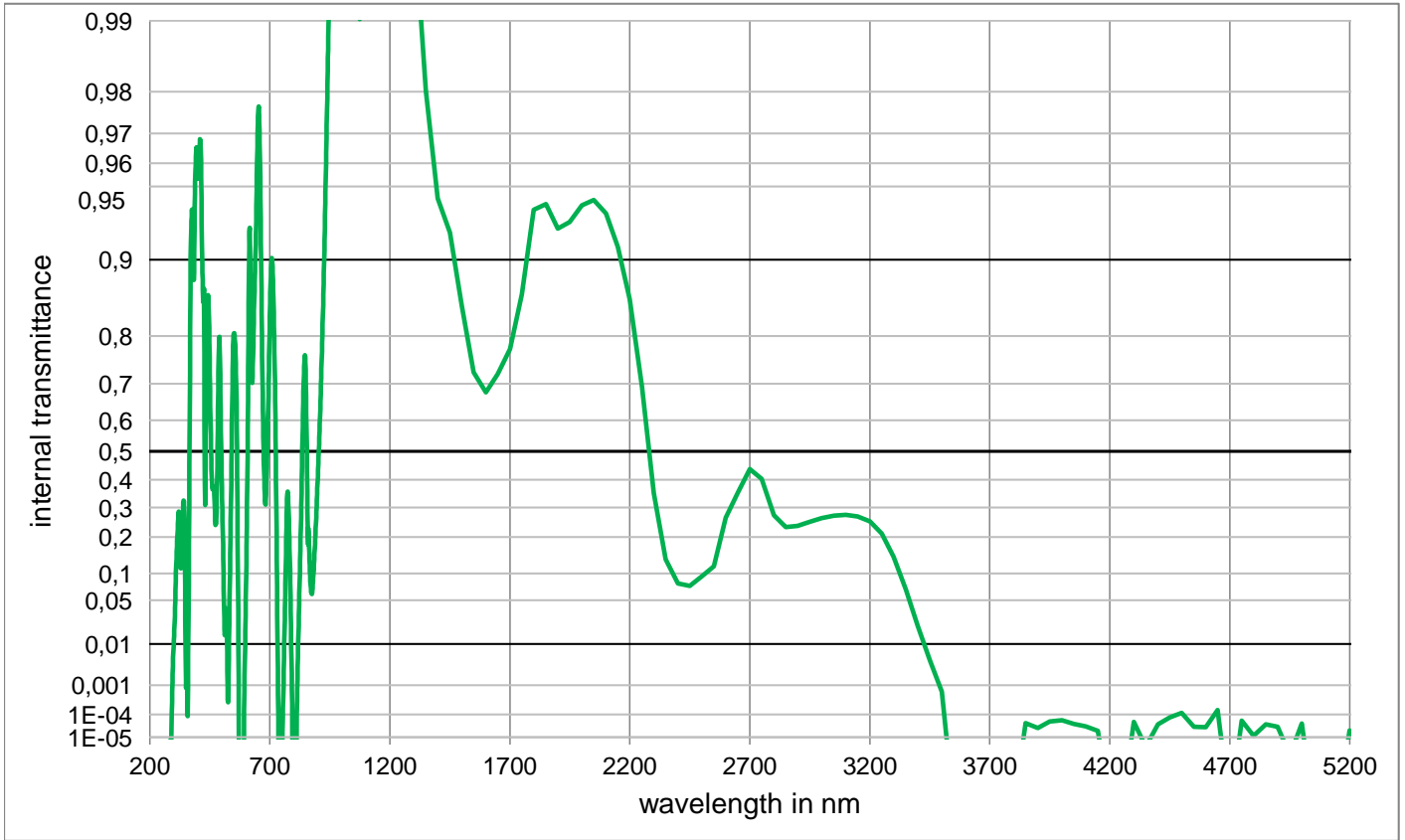
Chemical properties	
Chemical resistance	
FR class	= 4
SR class	= 52.0
AR class	= 1.3
Resistance against humidity	
Resistant glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties			
	1 mm	2 mm	3 mm
Illuminant D65	x		
	y		
	Y		
	λ_d		
	P_e		
Illuminant A	x		
	y		
	Y		
	λ_d		
	P_e		

Notes	
Ionically colored glass	
Contrast enhancement filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



S8806A

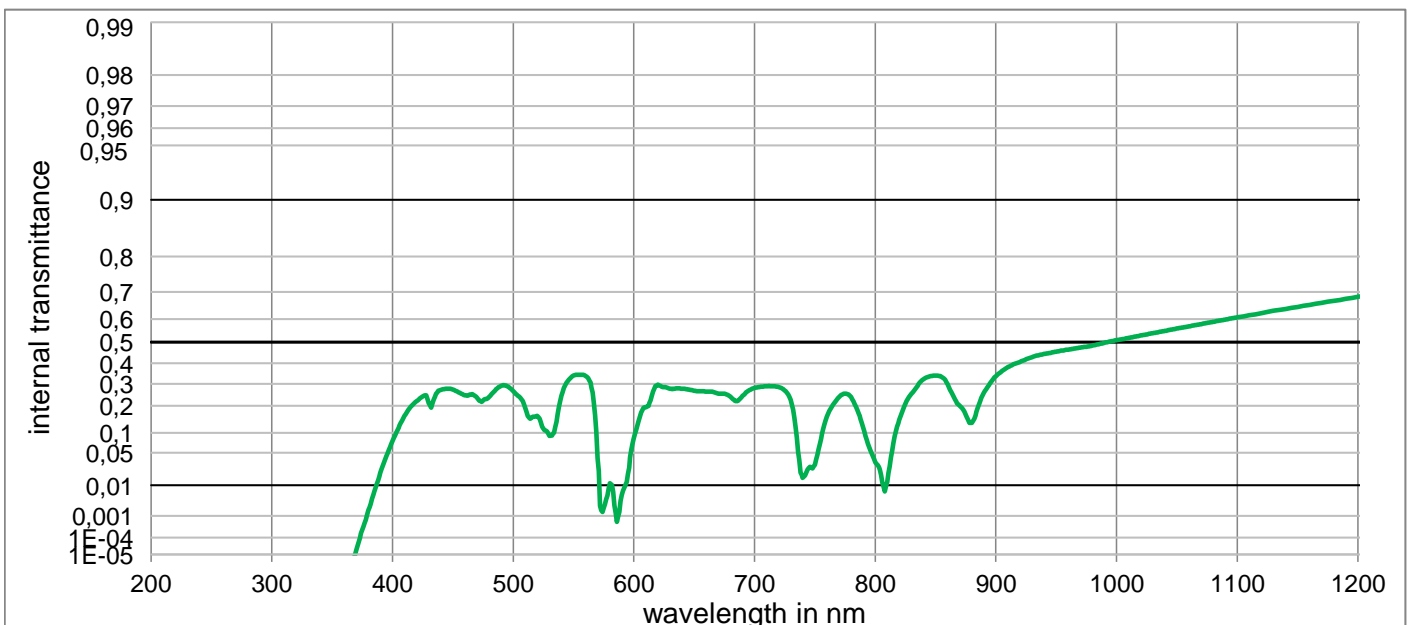


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

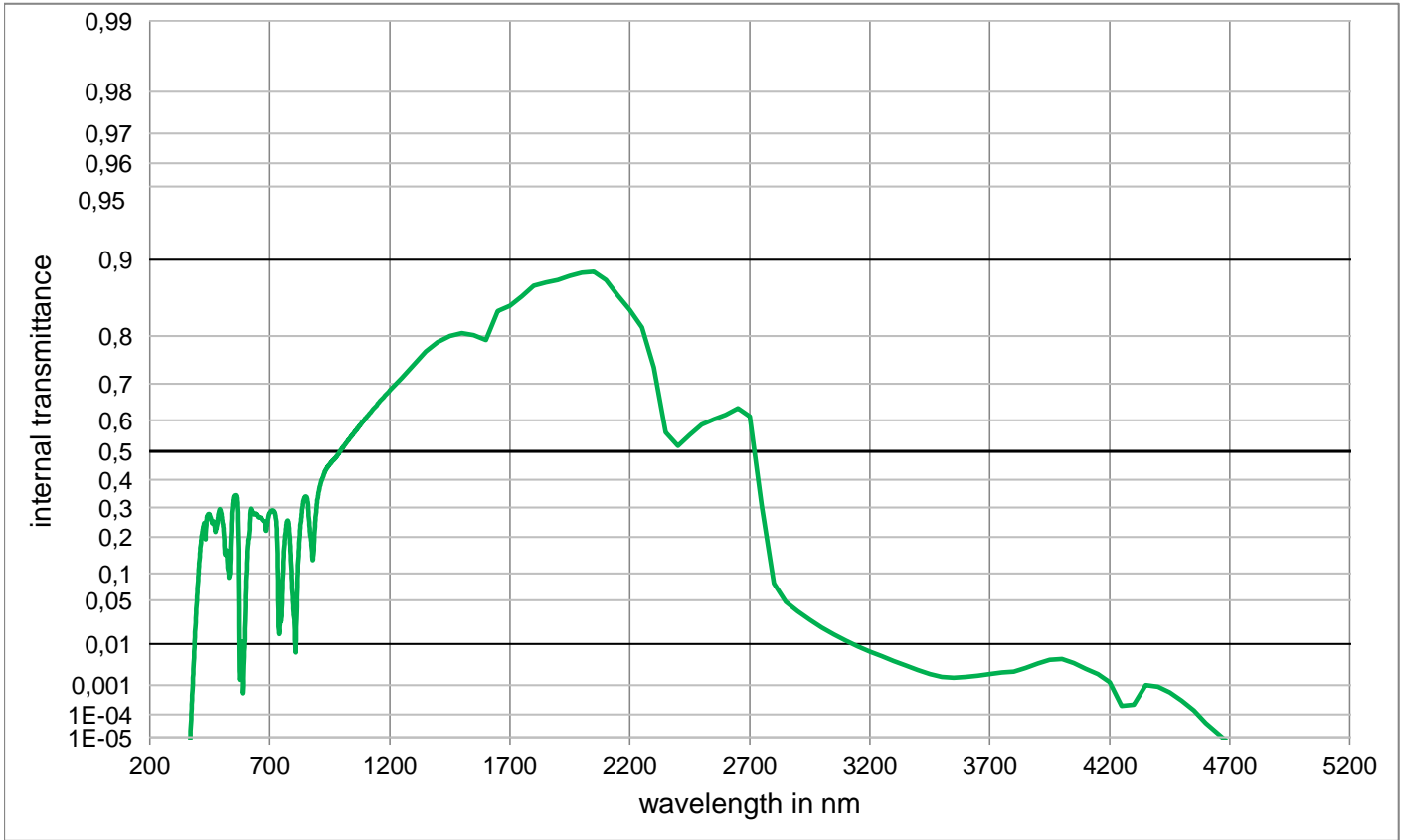
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	3,756E-01	800	< 1,000E-05	1100	9,956E-01	2200	8,562E-01	3700	
210	< 1,0E-05	510	2,712E-02	810	< 1,000E-05	1110	9,973E-01	2250	6,926E-01	3750	
220	< 1,0E-05	520	2,623E-02	820	2,121E-02	1120	9,982E-01	2300	3,511E-01	3800	
230	< 1,0E-05	530	1,110E-02	830	2,662E-01	1130	9,988E-01	2350	1,347E-01	3850	4,460E-05
240	< 1,0E-05	540	4,537E-01	840	6,804E-01	1140	9,994E-01	2400	7,911E-02	3900	2,669E-05
250	< 1,0E-05	550	8,047E-01	850	7,069E-01	1150	9,997E-01	2450	7,437E-02	3950	5,235E-05
260	< 1,0E-05	560	6,925E-01	860	2,300E-01	1160	9,997E-01	2500	9,294E-02	4000	5,942E-05
270	< 1,0E-05	570	1,587E-03	870	7,556E-02	1170	9,992E-01	2550	1,174E-01	4050	4,125E-05
280	< 1,0E-05	580	< 1,000E-05	880	8,345E-02	1180	9,987E-01	2600	2,638E-01	4100	3,178E-05
290	< 1,0E-05	590	< 1,000E-05	890	2,096E-01	1190	9,971E-01	2650	3,548E-01	4150	2,013E-05
300	1,1E-02	600	5,053E-02	900	4,115E-01	1200	9,943E-01	2700	4,376E-01	4200	
310	1,2E-01	610	7,355E-01	910	6,332E-01	1250	9,918E-01	2750	4,029E-01	4250	
320	2,860E-01	620	8,329E-01	920	8,198E-01	1300	9,964E-01	2800	2,729E-01	4300	4,980E-05
330	1,121E-01	630	7,600E-01	930	9,342E-01	1350	9,802E-01	2850	2,329E-01	4350	< 1,000E-05
340	3,242E-01	640	9,060E-01	940	9,813E-01	1400	9,441E-01	2900	2,364E-01	4400	3,969E-05
350	1,408E-03	650	9,729E-01	950	9,930E-01	1450	9,226E-01	2950	2,500E-01	4450	7,509E-05
360	5,762E-03	660	9,540E-01	960	9,957E-01	1500	8,475E-01	3000	2,630E-01	4500	1,168E-04
370	9,007E-01	670	6,750E-01	970	9,957E-01	1550	7,267E-01	3050	2,713E-01	4550	3,056E-05
380	9,175E-01	680	3,253E-01	980	9,960E-01	1600	6,782E-01	3100	2,735E-01	4600	2,932E-05
390	9,571E-01	690	5,335E-01	990	9,954E-01	1650	7,230E-01	3150	2,685E-01	4650	1,461E-04
400	9,573E-01	700	8,328E-01	1000	9,952E-01	1700	7,761E-01	3200	2,512E-01	4700	
410	9,681E-01	710	8,975E-01	1010	9,953E-01	1750	8,624E-01	3250	2,105E-01	4750	5,584E-05
420	8,796E-01	720	7,394E-01	1020	9,956E-01	1800	9,376E-01	3300	1,410E-01	4800	1,183E-05
430	3,086E-01	730	7,187E-02	1030	9,963E-01	1850	9,409E-01	3350	6,710E-02	4850	3,964E-05
440	8,369E-01	740	< 1,000E-05	1040	9,961E-01	1900	9,254E-01	3400	2,100E-02	4900	3,060E-05
450	7,247E-01	750	< 1,000E-05	1050	9,950E-01	1950	9,299E-01	3450	4,390E-03	4950	< 1,000E-05
460	3,727E-01	760	9,719E-03	1060	9,928E-01	2000	9,400E-01	3500	6,351E-04	5000	4,206E-05
470	3,203E-01	770	2,723E-01	1070	9,904E-01	2050	9,430E-01	3550		5050	
480	3,882E-01	780	2,269E-01	1080	9,904E-01	2100	9,352E-01	3600		5100	
490	7,984E-01	790	5,137E-03	1090	9,931E-01	2150	9,113E-01	3650		5150	

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Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,906$	$d = 3,50 \text{ mm}$	Illuminant D65
Spectral values guaranteed	Density	x
$\tau_i (445 \text{ nm}) = 0,256 \pm 0,030$	$\rho = 2,91 \text{ g/cm}^3$	y
$\tau_i (555 \text{ nm}) = 0,32 \pm 0,015$	Knoop hardness	Y
$\tau_i (620 \text{ nm}) = 0,285 \pm 0,030$	HK[0.1/20] = 474	λ_d
$\tau_i (580 \text{ nm}) \leq 0,02$		P_e
		Illuminant A
		x
		y
		Y
		λ_d
		P_e
Refractive indices	Thermal properties	Notes
$n_h (404,7 \text{ nm}) = 1,5895$	Transformation temperature	
$n_e (546 \text{ nm}) = 1,5726$	$T_g = 476 \text{ }^\circ\text{C}$	Ionically colored glass
$n_d (587,6 \text{ nm}) = 1,5698$	Thermal expansion in $10^{-6}/\text{K}$	Contrast enhancement filter
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 13,3$	ISO 23364:2021
Sellmeier coefficients	Chemical properties	Disclaimer
valid from 440 nm to 1550 nm	Chemical resistance	All data without tolerances are to be understood to be reference values.
$B_1 = 0,0144$	FR class = 2	
$B_2 = 1,4016$	SR class = 5.4	
$B_3 = 0,9378$	AR class = 1.0	
$C_1 = 6,842\text{E-}03 \text{ } \mu\text{m}^2$	Resistance against humidity	
$C_2 = 1,2018\text{E-}02 \text{ } \mu\text{m}^2$	Resistant glass	
$C_3 = 128,775 \text{ } \mu\text{m}^2$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
Internal quality		
Bubble class = 0		



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Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	2,658E-01	800	3,340E-02	1100	6,066E-01	2200	8,417E-01	3700	2,024E-03
210	< 1,0E-05	510	1,906E-01	810	1,205E-02	1110	6,152E-01	2250	8,148E-01	3750	2,243E-03
220	< 1,0E-05	520	1,596E-01	820	1,434E-01	1120	6,238E-01	2300	7,380E-01	3800	2,380E-03
230	< 1,0E-05	530	9,089E-02	830	2,533E-01	1130	6,326E-01	2350	5,627E-01	3850	2,934E-03
240	< 1,0E-05	540	2,436E-01	840	3,224E-01	1140	6,399E-01	2400	5,192E-01	3900	3,803E-03
250	< 1,0E-05	550	3,396E-01	850	3,397E-01	1150	6,475E-01	2450	5,543E-01	3950	4,622E-03
260	< 1,0E-05	560	3,388E-01	860	2,978E-01	1160	6,552E-01	2500	5,867E-01	4000	4,753E-03
270	< 1,0E-05	570	3,964E-02	870	2,009E-01	1170	6,624E-01	2550	6,025E-01	4050	3,844E-03
280	< 1,0E-05	580	1,122E-02	880	1,332E-01	1180	6,697E-01	2600	6,161E-01	4100	2,771E-03
290	< 1,0E-05	590	5,390E-03	890	2,573E-01	1190	6,766E-01	2650	6,349E-01	4150	2,056E-03
300	< 1,0E-05	600	8,358E-02	900	3,362E-01	1200	6,835E-01	2700	6,120E-01	4200	1,208E-03
310	< 1,0E-05	610	1,944E-01	910	3,809E-01	1250	7,141E-01	2750	3,092E-01	4250	2,104E-04
320	< 1,000E-05	620	2,958E-01	920	4,066E-01	1300	7,438E-01	2800	7,872E-02	4300	2,283E-04
330	< 1,000E-05	630	2,764E-01	930	4,304E-01	1350	7,714E-01	2850	4,772E-02	4350	1,002E-03
340	< 1,000E-05	640	2,770E-01	940	4,446E-01	1400	7,889E-01	2900	3,552E-02	4400	8,931E-04
350	< 1,000E-05	650	2,671E-01	950	4,556E-01	1450	8,002E-01	2950	2,660E-02	4450	6,020E-04
360	< 1,000E-05	660	2,641E-01	960	4,655E-01	1500	8,052E-01	3000	1,993E-02	4500	3,256E-04
370	1,993E-05	670	2,546E-01	970	4,745E-01	1550	8,012E-01	3050	1,517E-02	4550	1,419E-04
380	1,618E-03	680	2,402E-01	980	4,839E-01	1600	7,926E-01	3100	1,163E-02	4600	4,506E-05
390	1,990E-02	690	2,435E-01	990	4,972E-01	1650	8,400E-01	3150	8,979E-03	4650	1,515E-05
400	7,673E-02	700	2,805E-01	1000	5,088E-01	1700	8,474E-01	3200	6,989E-03	4700	< 1,000E-05
410	1,583E-01	710	2,892E-01	1010	5,192E-01	1750	8,599E-01	3250	5,516E-03	4750	< 1,000E-05
420	2,205E-01	720	2,842E-01	1020	5,300E-01	1800	8,727E-01	3300	4,325E-03	4800	< 1,000E-05
430	2,123E-01	730	2,264E-01	1030	5,402E-01	1850	8,763E-01	3350	3,401E-03	4850	< 1,000E-05
440	2,705E-01	740	1,541E-02	1040	5,502E-01	1900	8,791E-01	3400	2,616E-03	4900	< 1,000E-05
450	2,731E-01	750	3,008E-02	1050	5,604E-01	1950	8,835E-01	3450	2,041E-03	4950	< 1,000E-05
460	2,466E-01	760	1,564E-01	1060	5,696E-01	2000	8,871E-01	3500	1,717E-03	5000	< 1,000E-05
470	2,368E-01	770	2,397E-01	1070	5,794E-01	2050	8,882E-01	3550	1,632E-03	5050	< 1,000E-05
480	2,381E-01	780	2,379E-01	1080	5,887E-01	2100	8,792E-01	3600	1,720E-03	5100	< 1,000E-05
490	2,901E-01	790	1,188E-01	1090	5,980E-01	2150	8,611E-01	3650	1,863E-03	5150	< 1,000E-05

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Optical properties	
Reflection factor	
$P_d = 0,905$	
Spectral values guaranteed	
τ_i (440 nm)	$= 0,196 \pm 0,033$
τ_i (550 nm)	$= 0,234 \pm 0,032$
τ_i (620 nm)	$= 0,229 \pm 0,027$
Refractive indices	
n_h (404,7 nm)	$= 1,5933$
n_e (546 nm)	$= 1,5765$
n_d (587,6 nm)	$= 1,5737$
Sellmeier coefficients	
valid from 440 nm to 1550 nm	
B_1	1,2022
B_2	0,2267
B_3	3,0814
C_1	$1,377E-02 \mu m^2$
C_2	$4,8304E-04 \mu m^2$
C_3	$394,060 \mu m^2$
Internal quality	
Bubble class	-

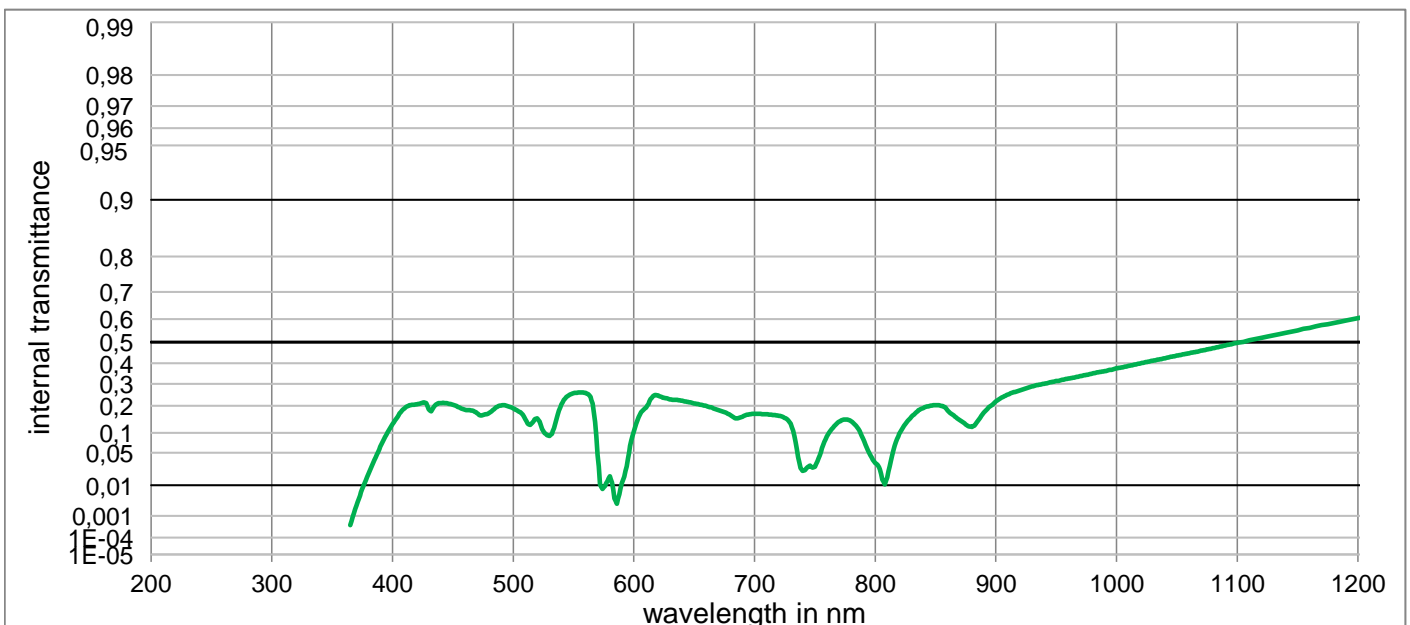
Mechanical properties	
Reference thickness	
$d = 2,20 \text{ mm}$	
Density	
$\rho = 2,91 \text{ g/cm}^3$	
Knoop hardness	
HK[0.1/20]	

Thermal properties	
Transformation temperature	
$T_g = 459 \text{ }^\circ\text{C}$	
Thermal expansion in $10^{-6}/\text{K}$	
$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 11,9$	

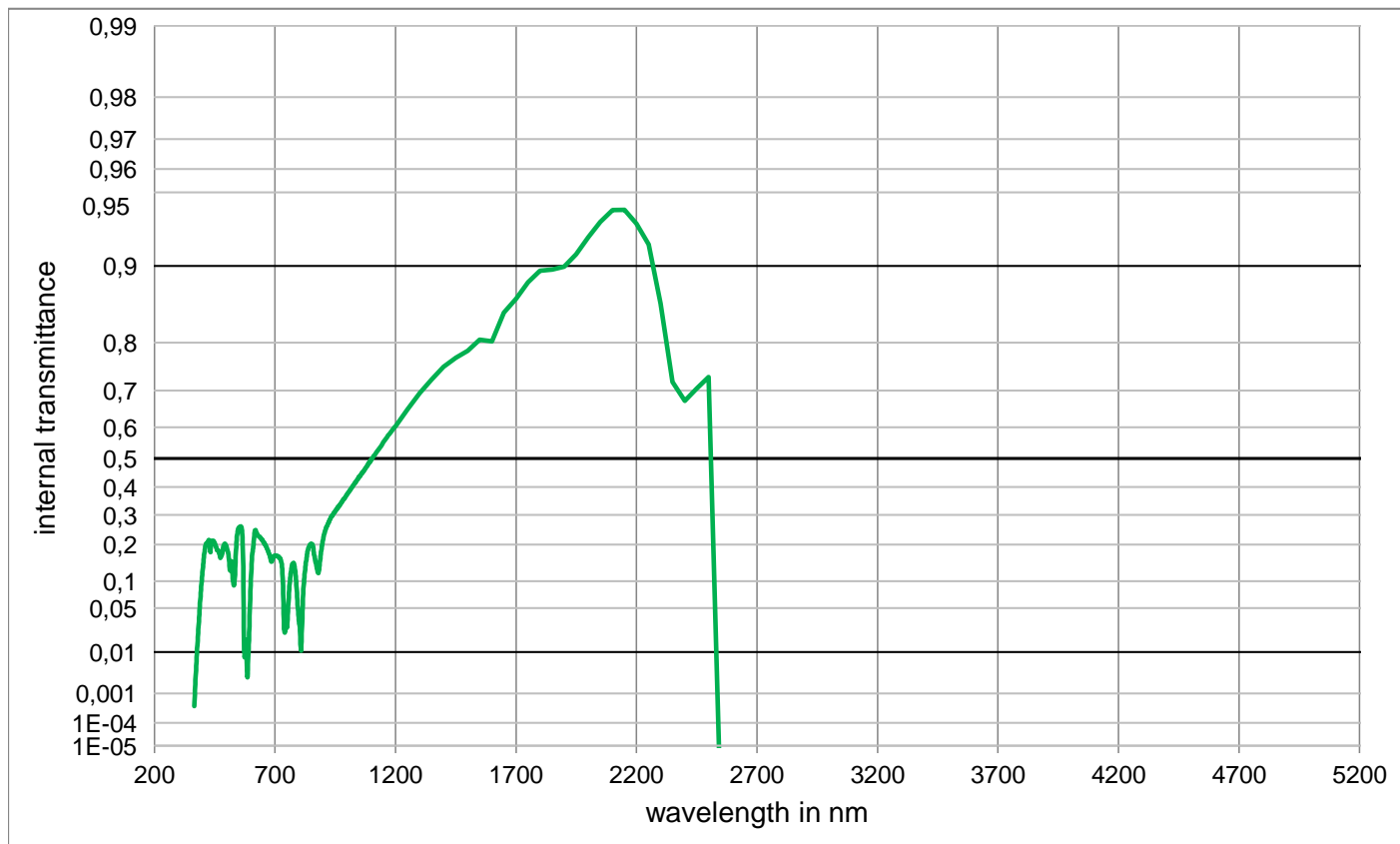
Chemical properties	
Chemical resistance	
FR class	
SR class	
AR class	
Resistance against humidity	
Resistant glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties				
		1 mm	2 mm	3 mm
Illuminant D65	x	0,293	0,366	0,320
	y	0,309	0,406	0,288
	Y	35,9	18,8	12,9
	λ_d	477,2	572,0	
	P_e	0,091	0,365	0,093
Illuminant A	x	0,438	0,480	0,479
	y	0,393	0,436	0,368
	Y	35,1	19,3	13,4
	λ_d		581,7	
	P_e	0,028	0,424	0,083

Notes	
Ionically colored glass	
Contrast enhancement filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



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Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	1,892E-01	800	3,197E-02	1100	4,965E-01	2200	9,327E-01	3700	
210	< 1,0E-05	510	1,470E-01	810	1,562E-02	1110	5,084E-01	2250	9,180E-01	3750	
220	< 1,0E-05	520	1,503E-01	820	9,677E-02	1120	5,200E-01	2300	8,590E-01	3800	
230	< 1,0E-05	530	9,059E-02	830	1,552E-01	1130	5,308E-01	2350	7,200E-01	3850	
240	< 1,0E-05	540	2,057E-01	840	1,911E-01	1140	5,419E-01	2400	6,736E-01	3900	
250	< 1,0E-05	550	2,561E-01	850	2,030E-01	1150	5,532E-01	2450	7,050E-01	3950	
260	< 1,0E-05	560	2,571E-01	860	1,797E-01	1160	5,639E-01	2500	7,315E-01	4000	
270	< 1,0E-05	570	4,613E-02	870	1,442E-01	1170	5,750E-01	2550		4050	
280	< 1,0E-05	580	1,691E-01	880	1,193E-01	1180	5,840E-01	2600		4100	
290	< 1,0E-05	590	1,121E-02	890	1,714E-01	1190	5,946E-01	2650		4150	
300	< 1,0E-05	600	1,025E-01	900	2,190E-01	1200	6,036E-01	2700		4200	
310	< 1,0E-05	610	1,928E-01	910	2,503E-01	1250	6,515E-01	2750		4250	
320	< 1,000E-05	620	2,458E-01	920	2,690E-01	1300	6,941E-01	2800		4300	
330	< 1,000E-05	630	2,280E-01	930	2,877E-01	1350	7,265E-01	2850		4350	
340	< 1,000E-05	640	2,216E-01	940	3,005E-01	1400	7,539E-01	2900		4400	
350	< 1,000E-05	650	2,103E-01	950	3,134E-01	1450	7,724E-01	2950		4450	
360	< 1,000E-05	660	1,988E-01	960	3,256E-01	1500	7,855E-01	3000		4500	
370	2,355E-03	670	1,818E-01	970	3,377E-01	1550	8,051E-01	3050		4550	
380	1,874E-02	680	1,619E-01	980	3,497E-01	1600	8,025E-01	3100		4600	
390	6,302E-02	690	1,566E-01	990	3,610E-01	1650	8,468E-01	3150		4650	
400	1,283E-01	700	1,669E-01	1000	3,748E-01	1700	8,651E-01	3200		4700	
410	1,895E-01	710	1,651E-01	1010	3,870E-01	1750	8,836E-01	3250		4750	
420	2,062E-01	720	1,594E-01	1020	3,999E-01	1800	8,956E-01	3300		4800	
430	1,849E-01	730	1,295E-01	1030	4,119E-01	1850	8,965E-01	3350		4850	
440	2,120E-01	740	2,216E-02	1040	4,244E-01	1900	8,993E-01	3400		4900	
450	2,043E-01	750	2,719E-02	1050	4,365E-01	1950	9,102E-01	3450		4950	
460	1,831E-01	760	8,913E-02	1060	4,478E-01	2000	9,235E-01	3500		5000	
470	1,702E-01	770	1,371E-01	1070	4,601E-01	2050	9,337E-01	3550		5050	
480	1,699E-01	780	1,396E-01	1080	4,717E-01	2100	9,408E-01	3600		5100	
490	2,016E-01	790	8,357E-02	1090	4,848E-01	2150	9,410E-01	3650		5150	

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Optical properties	
Reflection factor	
$P_d = 0,880$	
Spectral values guaranteed	
τ_i (805 nm)	$= 0,414 \pm 0,028$
τ_i (976 nm)	$= 0,578 \pm 0,034$
τ_i (1222 nm)	$= 0,323 \pm 0,023$
τ_i (1945 nm)	$= 0,29 \pm 0,023$
τ_i (710 nm)	$\geq 0,966$
Refractive indices	
n_d (587,6 nm) = 1,678	
Sellmeier coefficients	
on request	
Internal quality	
Bubble class	2

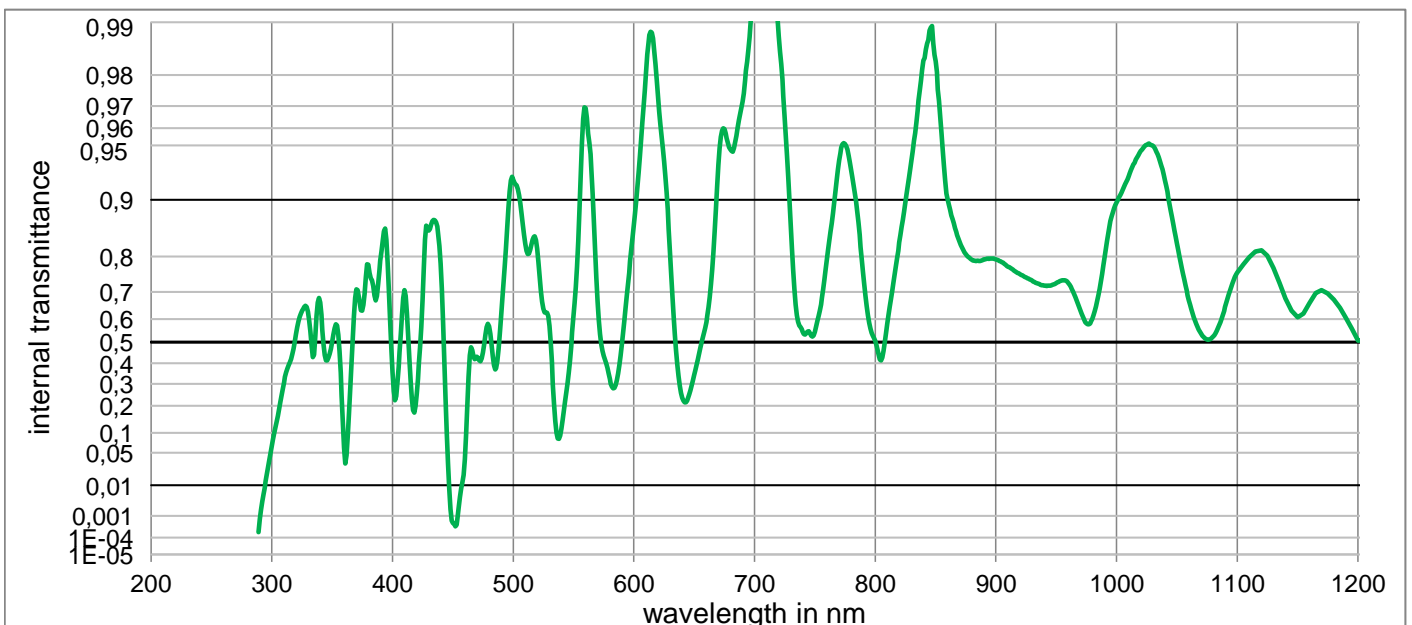
Mechanical properties	
Reference thickness	
$d = 2,00$ mm	
Density	
$\rho = 3,58$ g/cm ³	
Knoop hardness	
HK[0.1/20]	

Thermal properties	
Transformation temperature	
$T_g = 659$ °C	
Thermal expansion in $10^{-6}/K$	
α (20°C/300°C) = 7,2	

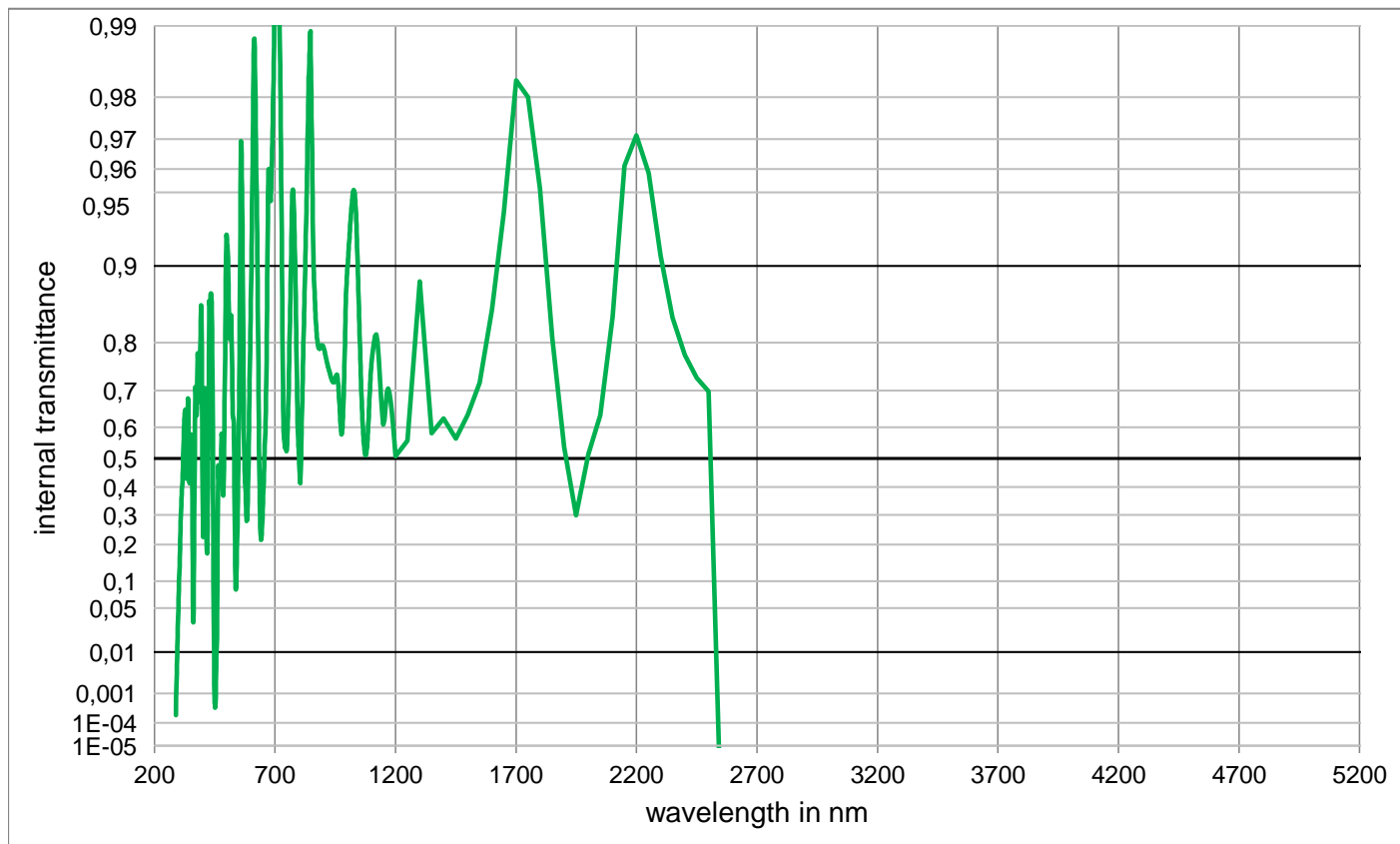
Chemical properties	
Chemical resistance	
FR class	= -
SR class	= -
AR class	= -
Resistance against humidity	
Resistant glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties			
	1 mm	2 mm	3 mm
Illuminant D65	x		
	y		
	Y		
	λ_d		
	P_e		
Illuminant A	x		
	y		
	Y		
	λ_d		
	P_e		

Notes	
Ionically colored glass	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



S8851

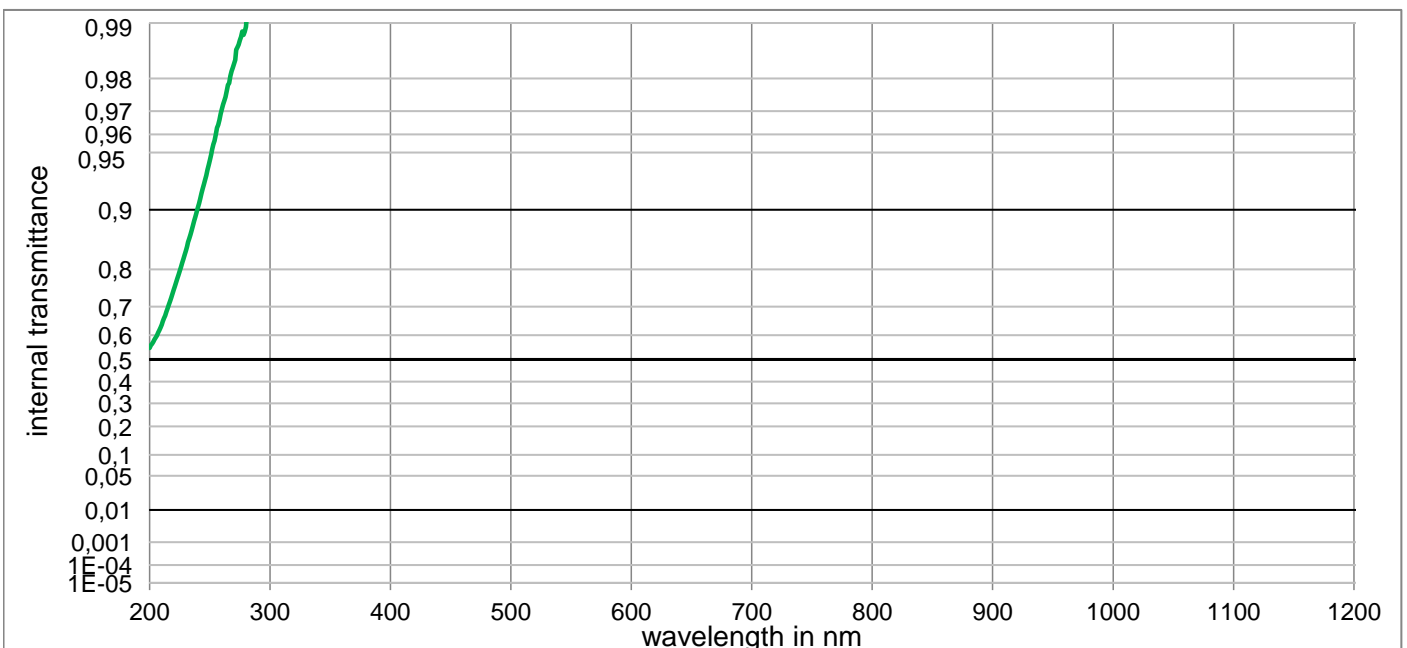


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

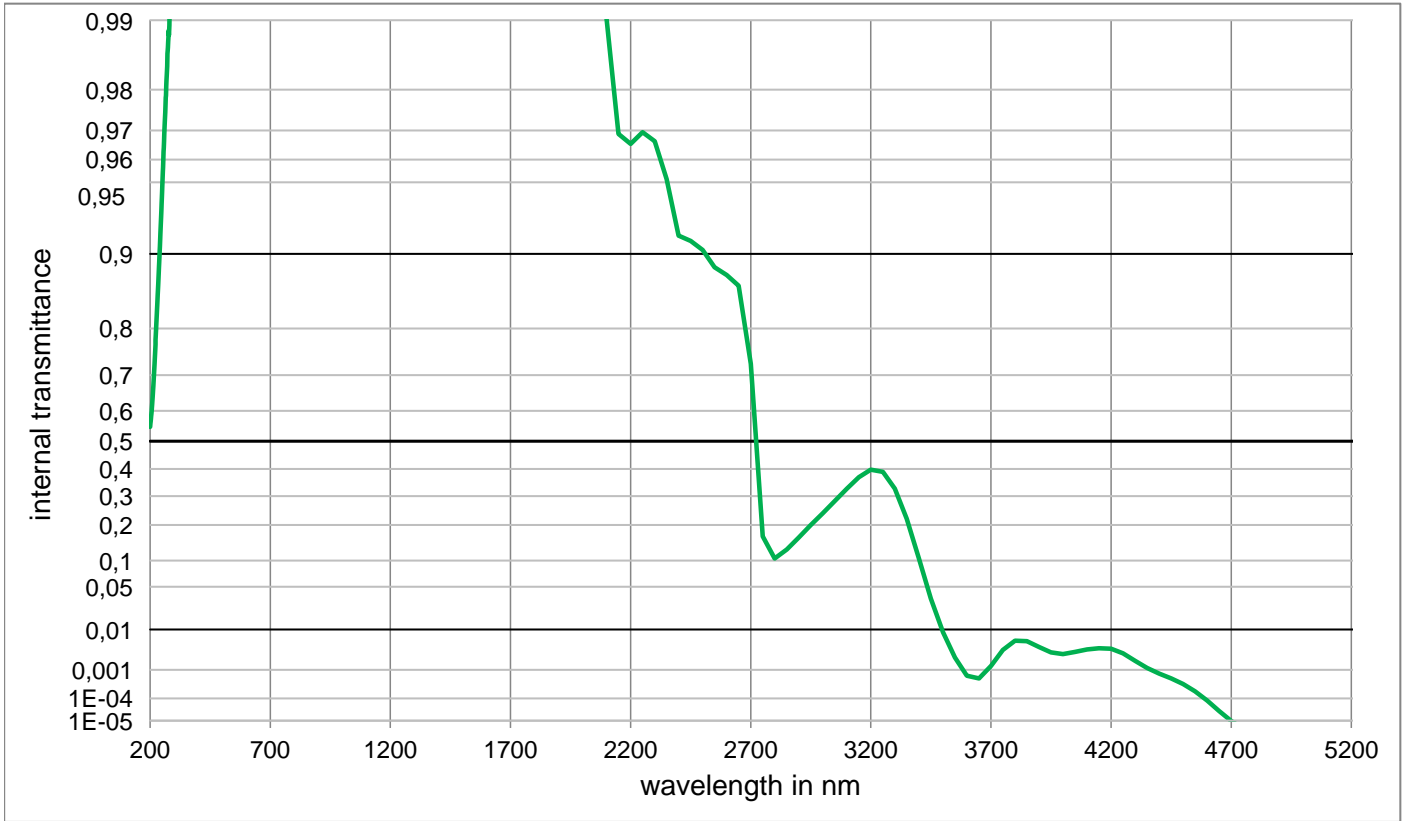
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,223E-01	800	5,049E-01	1100	7,593E-01	2200	9,710E-01	3700	
210	< 1,0E-05	510	8,278E-01	810	5,805E-01	1110	7,978E-01	2250	9,585E-01	3750	
220	< 1,0E-05	520	8,179E-01	820	8,305E-01	1120	8,142E-01	2300	9,092E-01	3800	
230	< 1,0E-05	530	5,710E-01	830	9,396E-01	1130	7,717E-01	2350	8,398E-01	3850	
240	< 1,0E-05	540	1,134E-01	840	9,835E-01	1140	6,787E-01	2400	7,774E-01	3900	
250	< 1,0E-05	550	6,050E-01	850	9,833E-01	1150	6,080E-01	2450	7,296E-01	3950	
260	< 1,0E-05	560	9,692E-01	860	9,003E-01	1160	6,624E-01	2500	6,979E-01	4000	
270	< 1,0E-05	570	6,676E-01	870	8,321E-01	1170	7,053E-01	2550		4050	
280	< 1,0E-05	580	3,229E-01	880	7,920E-01	1180	6,737E-01	2600		4100	
290	7,4E-04	590	4,870E-01	890	7,927E-01	1190	6,053E-01	2650		4150	
300	6,4E-02	600	8,614E-01	900	7,931E-01	1200	5,074E-01	2700		4200	
310	3,1E-01	610	9,807E-01	910	7,746E-01	1250	5,581E-01	2750		4250	
320	5,353E-01	620	9,737E-01	920	7,541E-01	1300	8,846E-01	2800		4300	
330	6,291E-01	630	8,132E-01	930	7,354E-01	1350	5,817E-01	2850		4350	
340	6,630E-01	640	2,353E-01	940	7,207E-01	1400	6,255E-01	2900		4400	
350	5,002E-01	650	3,410E-01	950	7,278E-01	1450	5,655E-01	2950		4450	
360	6,054E-02	660	5,866E-01	960	7,282E-01	1500	6,359E-01	3000		4500	
370	7,091E-01	670	9,356E-01	970	6,340E-01	1550	7,190E-01	3050		4550	
380	7,802E-01	680	9,473E-01	980	6,015E-01	1600	8,507E-01	3100		4600	
390	7,899E-01	690	9,717E-01	990	7,979E-01	1650	9,396E-01	3150		4650	
400	3,551E-01	700	9,941E-01	1000	8,961E-01	1700	9,830E-01	3200		4700	
410	7,061E-01	710	9,983E-01	1010	9,259E-01	1750	9,800E-01	3250		4750	
420	2,536E-01	720	9,879E-01	1020	9,464E-01	1800	9,516E-01	3300		4800	
430	8,538E-01	730	8,645E-01	1030	9,499E-01	1850	8,076E-01	3350		4850	
440	7,831E-01	740	5,461E-01	1040	9,218E-01	1900	5,381E-01	3400		4900	
450	5,000E-04	750	5,475E-01	1050	8,292E-01	1950	2,986E-01	3450		4950	
460	3,825E-02	760	7,924E-01	1060	6,715E-01	2000	5,150E-01	3500		5000	
470	4,309E-01	770	9,394E-01	1070	5,371E-01	2050	6,356E-01	3550		5050	
480	5,707E-01	780	9,316E-01	1080	5,246E-01	2100	8,405E-01	3600		5100	
490	6,053E-01	790	7,605E-01	1090	6,477E-01	2150	9,613E-01	3650		5150	

N-WG205

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,929$	$d = 2,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed (d = 2 mm)	Density	
$\lambda_{i0,5} = 205 \text{ nm} \pm 10 \text{ nm}$	$\rho = 2,22 \text{ g/cm}^3$	
$\lambda_p (\tau_{i,L} = 0,97) = 270 \text{ nm}$	Knoop hardness	
	$HK_{[0.1/20]}$	
	Thermal properties	Illuminant A x y Y λ_d P_e
	Transformation temperature	
	$T_g = 440 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 4,1$	
Refractive indices		Notes
$n_d (587,6 \text{ nm}) = 1,48$		Ionically colored glass Longpass filter contains strong striae ISO 23364:2021 Disclaimer All data without tolerances are to be understood to be reference values.
$n_s (852 \text{ nm}) = 1,47$		
$n_t (1014 \text{ nm}) = 1,47$		
Sellmeier coefficients		
valid from 440 nm to 1550 nm		
$B_1 = 0,0144$		
$B_2 = 1,1393$		
$B_3 = 1,0869$		
$C_1 = 6,822\text{E-}03 \text{ } \mu\text{m}^2$		
$C_2 = 8,6122\text{E-}03 \text{ } \mu\text{m}^2$		
$C_3 = 109,981 \text{ } \mu\text{m}^2$		
Internal quality		
Bubble class -		
	Chemical properties	
	Chemical resistance	
	FR class = -	
	SR class = -	
	AR class = -	
	Resistance against humidity	
	Resistant glass	
	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	



N-WG205

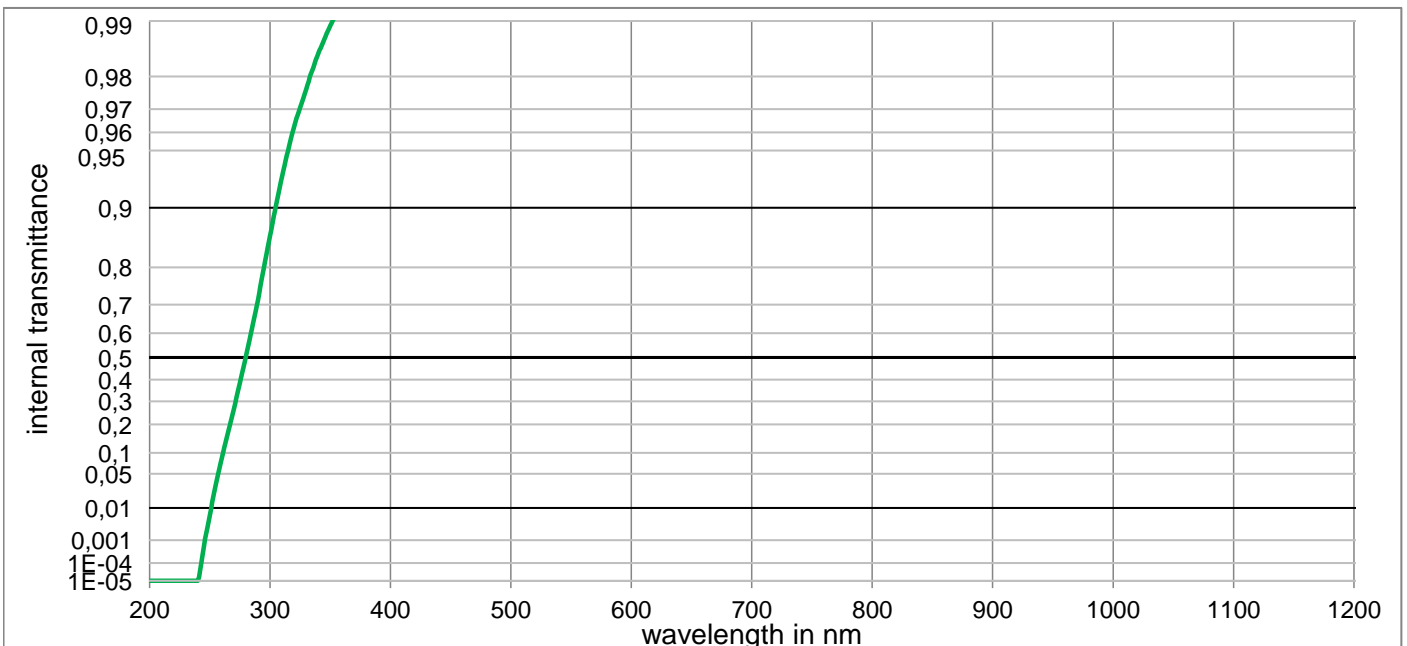


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

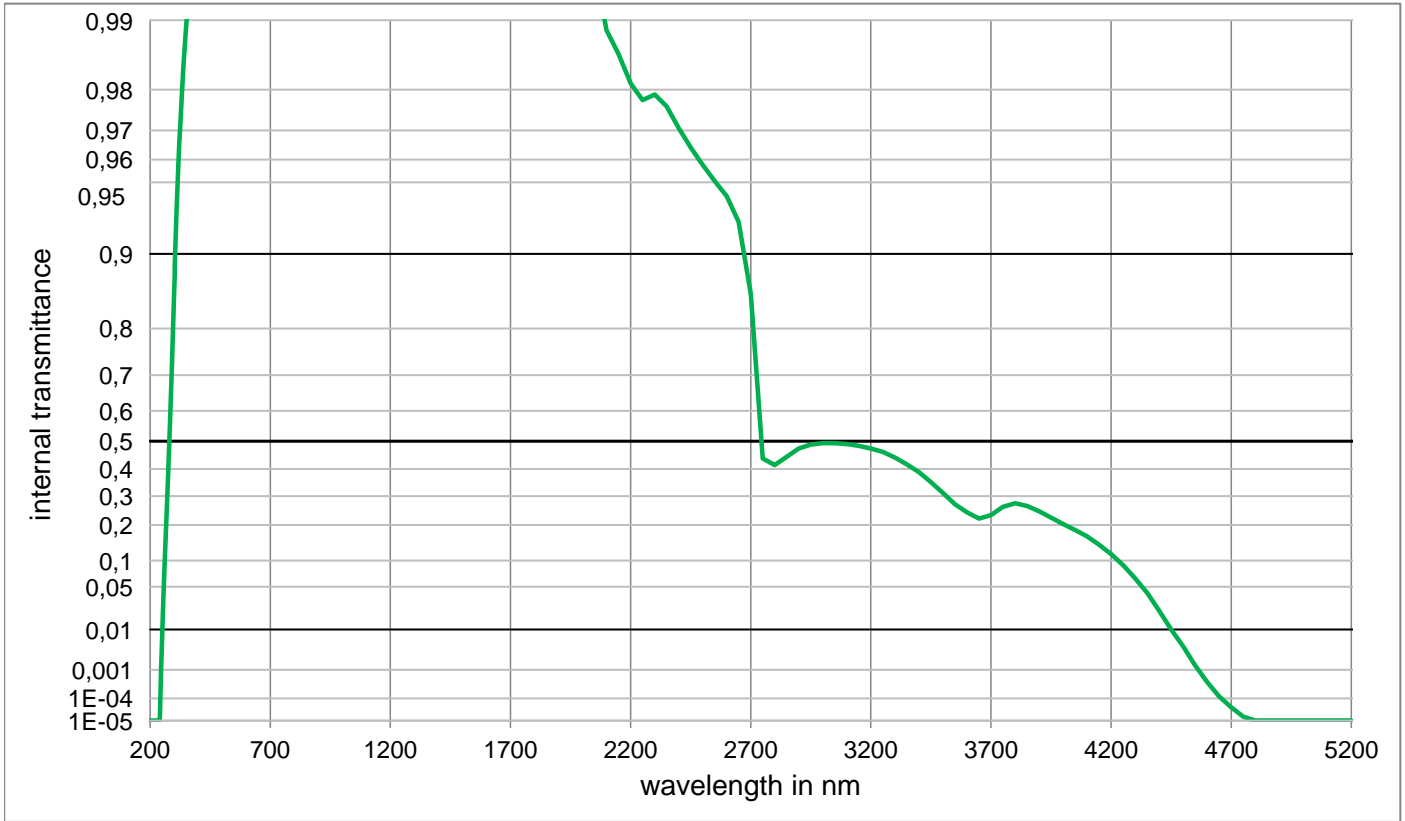
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	5,5E-01	500	1,000E+00	800	1,000E+00	1100	1,000E+00	2200	9,657E-01	3700	1,300E-03
210	6,4E-01	510	1,000E+00	810	1,000E+00	1110	1,000E+00	2250	9,694E-01	3750	3,496E-03
220	7,5E-01	520	1,000E+00	820	1,000E+00	1120	1,000E+00	2300	9,667E-01	3800	5,778E-03
230	8,4E-01	530	1,000E+00	830	1,000E+00	1130	1,000E+00	2350	9,516E-01	3850	5,658E-03
240	9,0E-01	540	1,000E+00	840	1,000E+00	1140	1,000E+00	2400	9,160E-01	3900	4,117E-03
250	9,5E-01	550	1,000E+00	850	1,000E+00	1150	1,000E+00	2450	9,116E-01	3950	3,029E-03
260	9,7E-01	560	1,000E+00	860	1,000E+00	1160	1,000E+00	2500	9,037E-01	4000	2,738E-03
270	9,8E-01	570	1,000E+00	870	1,000E+00	1170	1,000E+00	2550	8,864E-01	4050	3,110E-03
280	9,9E-01	580	1,000E+00	880	1,000E+00	1180	1,000E+00	2600	8,777E-01	4100	3,612E-03
290	9,9E-01	590	1,000E+00	890	1,000E+00	1190	1,000E+00	2650	8,648E-01	4150	3,861E-03
300	9,9E-01	600	1,000E+00	900	1,000E+00	1200	1,000E+00	2700	7,273E-01	4200	3,738E-03
310	9,9E-01	610	1,000E+00	910	1,000E+00	1250	1,000E+00	2750	1,646E-01	4250	2,866E-03
320	9,953E-01	620	1,000E+00	920	1,000E+00	1300	1,000E+00	2800	1,052E-01	4300	1,823E-03
330	9,968E-01	630	1,000E+00	930	1,000E+00	1350	1,000E+00	2850	1,276E-01	4350	1,145E-03
340	9,981E-01	640	1,000E+00	940	1,000E+00	1400	9,929E-01	2900	1,611E-01	4400	7,717E-04
350	9,987E-01	650	1,000E+00	950	1,000E+00	1450	9,988E-01	2950	1,992E-01	4450	5,340E-04
360	9,996E-01	660	1,000E+00	960	1,000E+00	1500	1,000E+00	3000	2,390E-01	4500	3,471E-04
370	9,994E-01	670	1,000E+00	970	1,000E+00	1550	1,000E+00	3050	2,823E-01	4550	1,909E-04
380	9,995E-01	680	1,000E+00	980	1,000E+00	1600	1,000E+00	3100	3,270E-01	4600	8,269E-05
390	9,993E-01	690	1,000E+00	990	1,000E+00	1650	1,000E+00	3150	3,692E-01	4650	2,901E-05
400	9,994E-01	700	1,000E+00	1000	1,000E+00	1700	1,000E+00	3200	3,970E-01	4700	< 1,000E-05
410	9,997E-01	710	1,000E+00	1010	1,000E+00	1750	1,000E+00	3250	3,890E-01	4750	< 1,000E-05
420	9,999E-01	720	1,000E+00	1020	1,000E+00	1800	1,000E+00	3300	3,273E-01	4800	< 1,000E-05
430	1,000E+00	730	1,000E+00	1030	1,000E+00	1850	1,000E+00	3350	2,200E-01	4850	< 1,000E-05
440	1,000E+00	740	1,000E+00	1040	1,000E+00	1900	9,999E-01	3400	1,048E-01	4900	< 1,000E-05
450	1,000E+00	750	1,000E+00	1050	1,000E+00	1950	9,981E-01	3450	3,420E-02	4950	< 1,000E-05
460	1,000E+00	760	1,000E+00	1060	1,000E+00	2000	9,933E-01	3500	8,818E-03	5000	< 1,000E-05
470	1,000E+00	770	1,000E+00	1070	1,000E+00	2050	9,933E-01	3550	2,255E-03	5050	< 1,000E-05
480	1,000E+00	780	1,000E+00	1080	1,000E+00	2100	9,902E-01	3600	6,575E-04	5100	< 1,000E-05
490	1,000E+00	790	1,000E+00	1090	1,000E+00	2150	9,690E-01	3650	5,338E-04	5150	< 1,000E-05

N-WG280

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,919$	$d = 2,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed (d = 2 mm)	Density	
$\lambda_{i0,5} = 280 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,51 \text{ g/cm}^3$	
$\lambda_s (\tau_{i,U} = 1E-05) = 230 \text{ nm}$	Knoop hardness	
$\lambda_p (\tau_{i,L} = 0,99) = 380 \text{ nm}$	$HK_{[0,1/20]} = 610$	
		Illuminant A x y Y λ_d P_e
	Thermal properties	
	Transformation temperature	
	$T_g = 558 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
Refractive indices	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,1$	Notes Base glass Longpass filter ISO 23364:2021 Disclaimer All data without tolerances are to be understood to be reference values.
$n_d (587,6 \text{ nm}) = 1,52$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 8,4$	
$n_s (852 \text{ nm}) = 1,51$		
$n_t (1014 \text{ nm}) = 1,51$	Temperature coefficient	
	$Tk = 0,06 \text{ nm/K}$	
Sellmeier coefficients	Chemical properties	
valid from 440 nm to 1550 nm	Chemical resistance	
$B_1 = 0,0123$	FR class = 0	
$B_2 = 0,5089$	SR class = 1	
$B_3 = 1,8825$	AR class = 2	
$C_1 = 1,388E-02 \text{ } \mu\text{m}^2$	Resistance against humidity	
$C_2 = 1,8223E-05 \text{ } \mu\text{m}^2$	Resistant glass	
$C_3 = 202,101 \text{ } \mu\text{m}^2$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
Internal quality		
Bubble class 1		



N-WG280

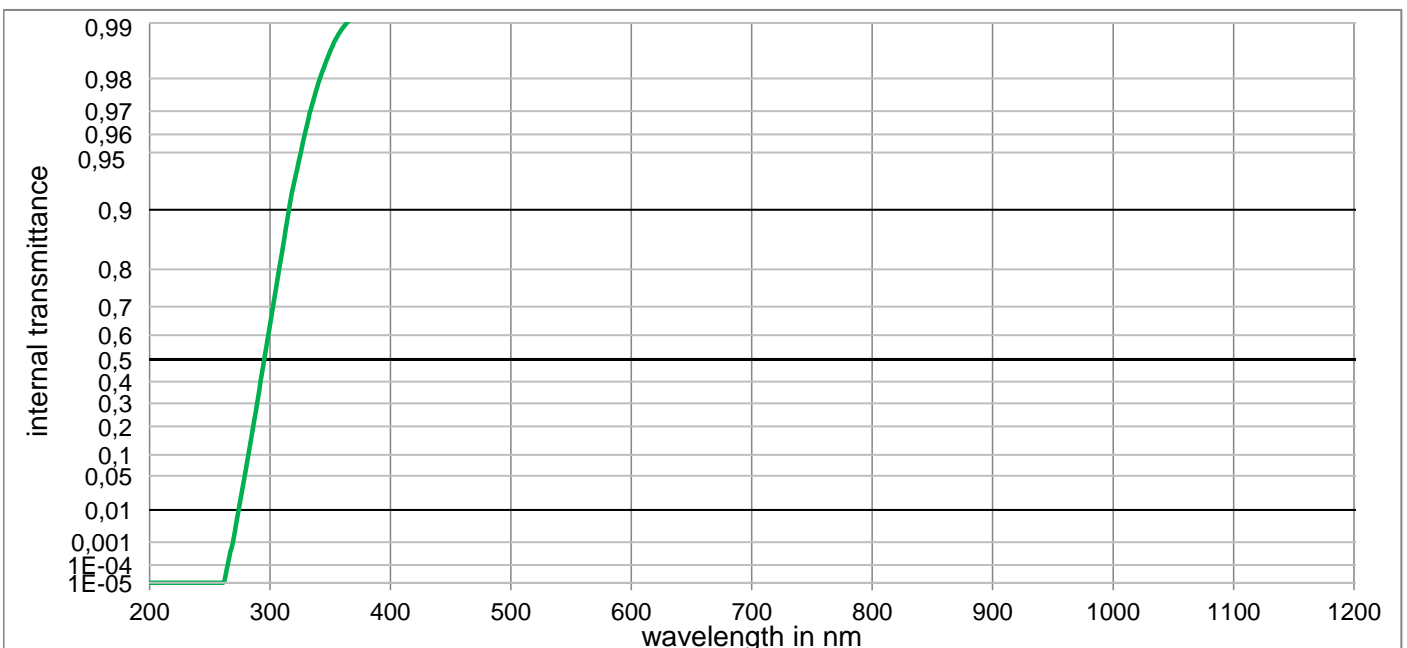


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

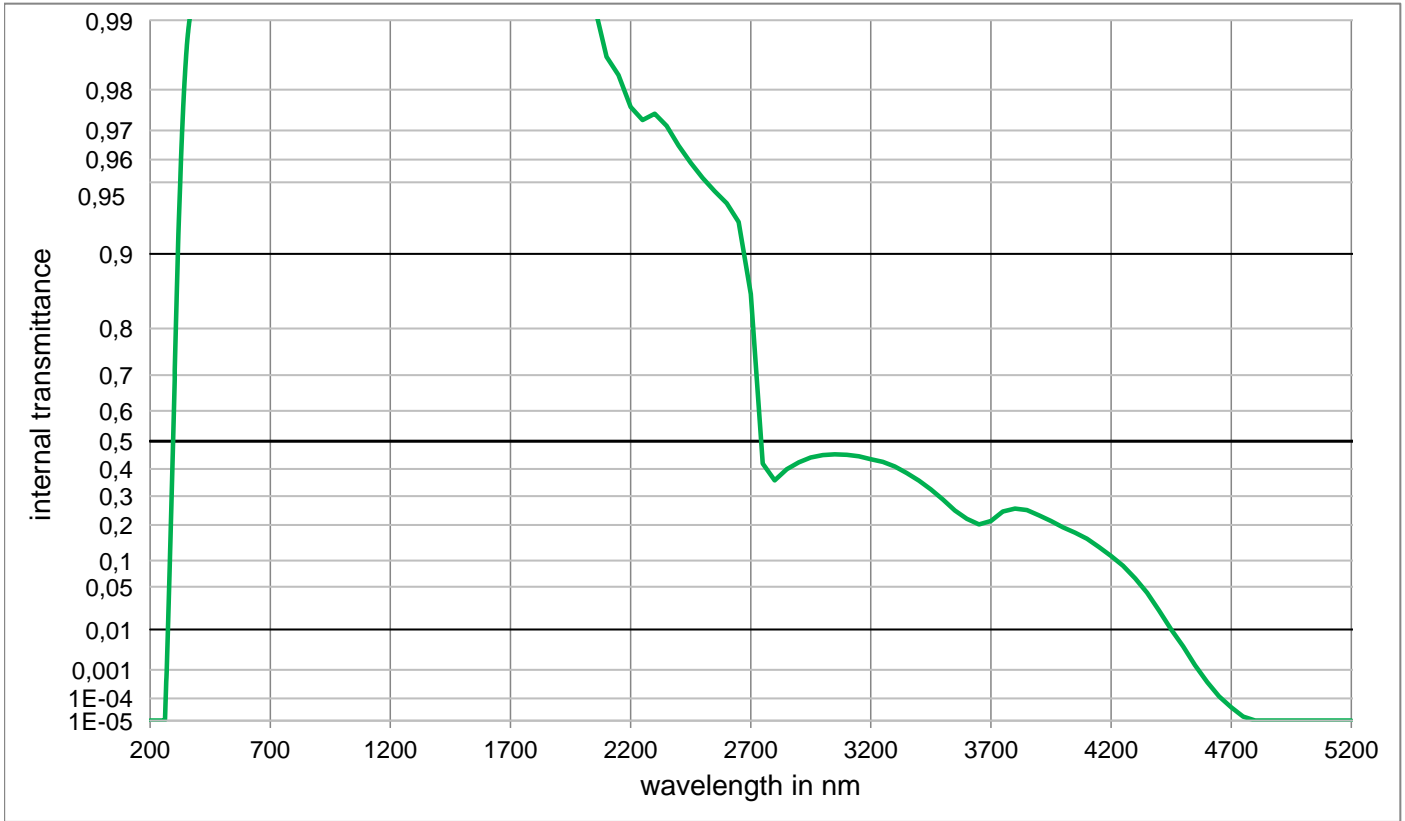
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,974E-01	800	9,999E-01	1100	9,999E-01	2200	9,812E-01	3700	2,325E-01
210	< 1,0E-05	510	9,976E-01	810	9,999E-01	1110	9,999E-01	2250	9,778E-01	3750	2,613E-01
220	< 1,0E-05	520	9,978E-01	820	9,999E-01	1120	9,999E-01	2300	9,790E-01	3800	2,746E-01
230	< 1,0E-05	530	9,980E-01	830	9,999E-01	1130	9,999E-01	2350	9,764E-01	3850	2,651E-01
240	< 1,0E-05	540	9,982E-01	840	9,999E-01	1140	9,999E-01	2400	9,708E-01	3900	2,462E-01
250	6,6E-03	550	9,983E-01	850	9,999E-01	1150	9,999E-01	2450	9,645E-01	3950	2,245E-01
260	8,6E-02	560	9,985E-01	860	9,999E-01	1160	9,999E-01	2500	9,579E-01	4000	2,037E-01
270	2,7E-01	570	9,986E-01	870	9,999E-01	1170	9,999E-01	2550	9,507E-01	4050	1,843E-01
280	5,1E-01	580	9,988E-01	880	9,999E-01	1180	9,999E-01	2600	9,427E-01	4100	1,645E-01
290	7,2E-01	590	9,989E-01	890	9,999E-01	1190	9,999E-01	2650	9,264E-01	4150	1,408E-01
300	8,6E-01	600	9,991E-01	900	9,999E-01	1200	9,999E-01	2700	8,540E-01	4200	1,155E-01
310	9,3E-01	610	9,992E-01	910	9,999E-01	1250	9,999E-01	2750	4,381E-01	4250	8,980E-02
320	9,626E-01	620	9,993E-01	920	9,999E-01	1300	9,999E-01	2800	4,145E-01	4300	6,370E-02
330	9,766E-01	630	9,995E-01	930	9,999E-01	1350	9,999E-01	2850	4,442E-01	4350	4,140E-02
340	9,849E-01	640	9,996E-01	940	9,999E-01	1400	9,993E-01	2900	4,740E-01	4400	2,230E-02
350	9,894E-01	650	9,997E-01	950	9,999E-01	1450	9,999E-01	2950	4,882E-01	4450	1,000E-02
360	9,916E-01	660	9,998E-01	960	9,999E-01	1500	9,999E-01	3000	4,934E-01	4500	4,310E-03
370	9,928E-01	670	9,998E-01	970	9,999E-01	1550	9,999E-01	3050	4,934E-01	4550	1,352E-03
380	9,936E-01	680	9,999E-01	980	9,999E-01	1600	9,999E-01	3100	4,900E-01	4600	4,070E-04
390	9,942E-01	690	9,999E-01	990	9,999E-01	1650	9,999E-01	3150	4,835E-01	4650	1,191E-04
400	9,946E-01	700	9,999E-01	1000	9,999E-01	1700	9,999E-01	3200	4,740E-01	4700	4,227E-05
410	9,950E-01	710	9,999E-01	1010	9,999E-01	1750	9,999E-01	3250	4,622E-01	4750	1,585E-05
420	9,954E-01	720	9,999E-01	1020	9,999E-01	1800	9,999E-01	3300	4,423E-01	4800	< 1,000E-05
430	9,957E-01	730	9,999E-01	1030	9,999E-01	1850	9,995E-01	3350	4,173E-01	4850	< 1,000E-05
440	9,960E-01	740	9,999E-01	1040	9,999E-01	1900	9,984E-01	3400	3,885E-01	4900	< 1,000E-05
450	9,962E-01	750	9,999E-01	1050	9,999E-01	1950	9,974E-01	3450	3,516E-01	4950	< 1,000E-05
460	9,965E-01	760	9,999E-01	1060	9,999E-01	2000	9,961E-01	3500	3,114E-01	5000	< 1,000E-05
470	9,967E-01	770	9,999E-01	1070	9,999E-01	2050	9,941E-01	3550	2,708E-01	5050	< 1,000E-05
480	9,970E-01	780	9,999E-01	1080	9,999E-01	2100	9,889E-01	3600	2,429E-01	5100	< 1,000E-05
490	9,972E-01	790	9,999E-01	1090	9,999E-01	2150	9,860E-01	3650	2,207E-01	5150	< 1,000E-05

N-WG295

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,919$	$d = 2,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed (d = 2 mm)	Density	
$\lambda_{i0,5} = 295 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,51 \text{ g/cm}^3$	
$\lambda_s (\tau_{i,U} = 1E-05) = 250 \text{ nm}$	Knoop hardness	
$\lambda_p (\tau_{i,L} = 0,99) = 400 \text{ nm}$	$HK_{[0,1/20]} = 610$	
		Illuminant A x y Y λ_d P_e
	Thermal properties	
	Transformation temperature	
	$T_g = 565 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
Refractive indices	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,2$	Notes Base glass Longpass filter ISO 23364:2021 Disclaimer All data without tolerances are to be understood to be reference values.
$n_d (587,6 \text{ nm}) = 1,52$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 8,4$	
$n_s (852 \text{ nm}) = 1,51$		
$n_t (1014 \text{ nm}) = 1,51$	Temperature coefficient	
	$Tk = 0,06 \text{ nm/K}$	
Sellmeier coefficients	Chemical properties	
valid from 440 nm to 1550 nm	Chemical resistance	
$B_1 = #####$	FR class = 0	
$B_2 = 0,5097$	SR class = 1	
$B_3 = 1,4617$	AR class = 2	
	Resistance against humidity	
$C_2 = 1,9688E-02 \text{ } \mu\text{m}^2$	Resistant glass	
$C_3 = 100,000 \text{ } \mu\text{m}^2$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
Internal quality		
Bubble class 1		



N-WG295

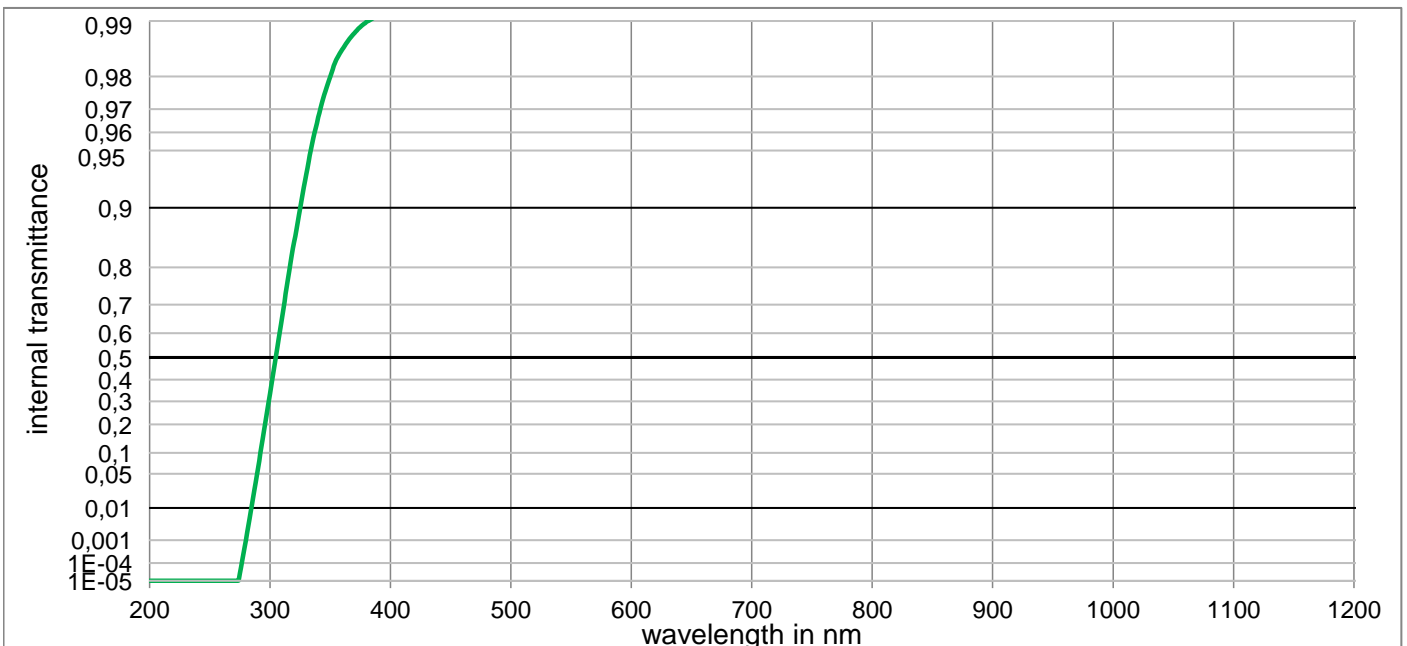


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

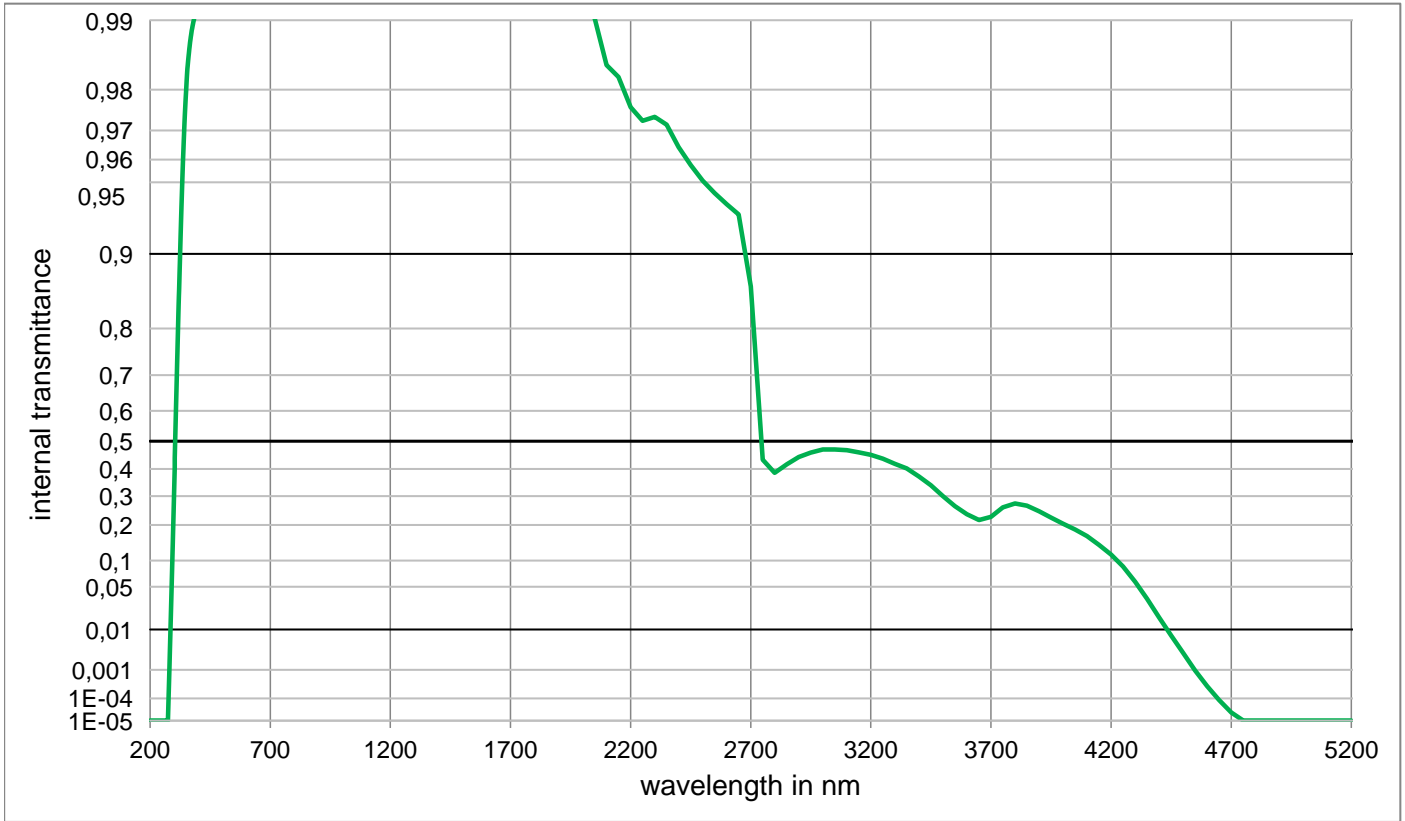
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,966E-01	800	9,999E-01	1100	9,999E-01	2200	9,762E-01	3700	2,127E-01
210	< 1,0E-05	510	9,968E-01	810	9,999E-01	1110	9,999E-01	2250	9,730E-01	3750	2,453E-01
220	< 1,0E-05	520	9,971E-01	820	9,999E-01	1120	9,999E-01	2300	9,746E-01	3800	2,557E-01
230	< 1,0E-05	530	9,973E-01	830	9,999E-01	1130	9,999E-01	2350	9,713E-01	3850	2,500E-01
240	< 1,0E-05	540	9,975E-01	840	9,999E-01	1140	9,999E-01	2400	9,651E-01	3900	2,320E-01
250	< 1,0E-05	550	9,977E-01	850	9,999E-01	1150	9,999E-01	2450	9,587E-01	3950	2,127E-01
260	< 1,0E-05	560	9,978E-01	860	9,999E-01	1160	9,999E-01	2500	9,521E-01	4000	1,921E-01
270	1,6E-03	570	9,980E-01	870	9,999E-01	1170	9,999E-01	2550	9,455E-01	4050	1,753E-01
280	6,4E-02	580	9,981E-01	880	9,999E-01	1180	9,999E-01	2600	9,387E-01	4100	1,574E-01
290	3,3E-01	590	9,982E-01	890	9,999E-01	1190	9,999E-01	2650	9,264E-01	4150	1,342E-01
300	6,4E-01	600	9,984E-01	900	9,999E-01	1200	9,999E-01	2700	8,540E-01	4200	1,111E-01
310	8,4E-01	610	9,985E-01	910	9,999E-01	1250	9,999E-01	2750	4,197E-01	4250	8,840E-02
320	9,279E-01	620	9,986E-01	920	9,999E-01	1300	9,999E-01	2800	3,578E-01	4300	6,370E-02
330	9,630E-01	630	9,987E-01	930	9,999E-01	1350	9,999E-01	2850	3,992E-01	4350	4,140E-02
340	9,787E-01	640	9,988E-01	940	9,999E-01	1400	9,985E-01	2900	4,244E-01	4400	2,230E-02
350	9,859E-01	650	9,989E-01	950	9,999E-01	1450	9,999E-01	2950	4,419E-01	4450	1,000E-02
360	9,893E-01	660	9,991E-01	960	9,999E-01	1500	9,999E-01	3000	4,509E-01	4500	4,310E-03
370	9,909E-01	670	9,992E-01	970	9,999E-01	1550	9,999E-01	3050	4,537E-01	4550	1,352E-03
380	9,919E-01	680	9,993E-01	980	9,999E-01	1600	9,999E-01	3100	4,518E-01	4600	4,070E-04
390	9,928E-01	690	9,994E-01	990	9,999E-01	1650	9,999E-01	3150	4,466E-01	4650	1,191E-04
400	9,934E-01	700	9,995E-01	1000	9,999E-01	1700	9,999E-01	3200	4,357E-01	4700	4,227E-05
410	9,939E-01	710	9,996E-01	1010	9,999E-01	1750	9,997E-01	3250	4,258E-01	4750	1,585E-05
420	9,942E-01	720	9,997E-01	1020	9,999E-01	1800	9,988E-01	3300	4,088E-01	4800	< 1,000E-05
430	9,946E-01	730	9,997E-01	1030	9,999E-01	1850	9,978E-01	3350	3,852E-01	4850	< 1,000E-05
440	9,949E-01	740	9,998E-01	1040	9,999E-01	1900	9,965E-01	3400	3,568E-01	4900	< 1,000E-05
450	9,951E-01	750	9,998E-01	1050	9,999E-01	1950	9,949E-01	3450	3,242E-01	4950	< 1,000E-05
460	9,955E-01	760	9,999E-01	1060	9,999E-01	2000	9,932E-01	3500	2,878E-01	5000	< 1,000E-05
470	9,957E-01	770	9,999E-01	1070	9,999E-01	2050	9,913E-01	3550	2,486E-01	5050	< 1,000E-05
480	9,960E-01	780	9,999E-01	1080	9,999E-01	2100	9,856E-01	3600	2,200E-01	5100	< 1,000E-05
490	9,963E-01	790	9,999E-01	1090	9,999E-01	2150	9,827E-01	3650	2,018E-01	5150	< 1,000E-05

N-WG305

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,918$	$d = 2,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed (d = 2 mm)	Density	
$\lambda_{i0,5} = 305 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,51 \text{ g/cm}^3$	
$\lambda_s (\tau_{i,U} = 1E-05) = 260 \text{ nm}$	Knoop hardness	
$\lambda_p (\tau_{i,L} = 0,99) = 420 \text{ nm}$	$HK_{[0.1/20]} = 610$	
		Illuminant A x y Y λ_d P_e
	Thermal properties	
	Transformation temperature	
	$T_g = 562 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,1$	Notes Base glass Longpass filter ISO 23364:2021 Disclaimer All data without tolerances are to be understood to be reference values.
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 8,4$	
	Refractive indices	
$n_d (587,6 \text{ nm}) = 1,52$		
$n_s (852 \text{ nm}) = 1,52$		
$n_t (1014 \text{ nm}) = 1,51$		
	Temperature coefficient	
	$Tk = 0,06 \text{ nm/K}$	
	Chemical properties	
	Chemical resistance	
	FR class = 0	
	SR class = 1	
	AR class = 2	
	Resistance against humidity	
	Resistant glass	
	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
Sellmeier coefficients		
valid from 440 nm to 1550 nm		
$B_1 = 1,2190$		
$B_2 = 0,0699$		
$B_3 = 106,2629$		
$C_1 = 5,560E-03 \text{ } \mu\text{m}^2$		
$C_2 = 5,5370E-02 \text{ } \mu\text{m}^2$		
$C_3 = 10043,976 \text{ } \mu\text{m}^2$		
Internal quality		
Bubble class 1		



N-WG305

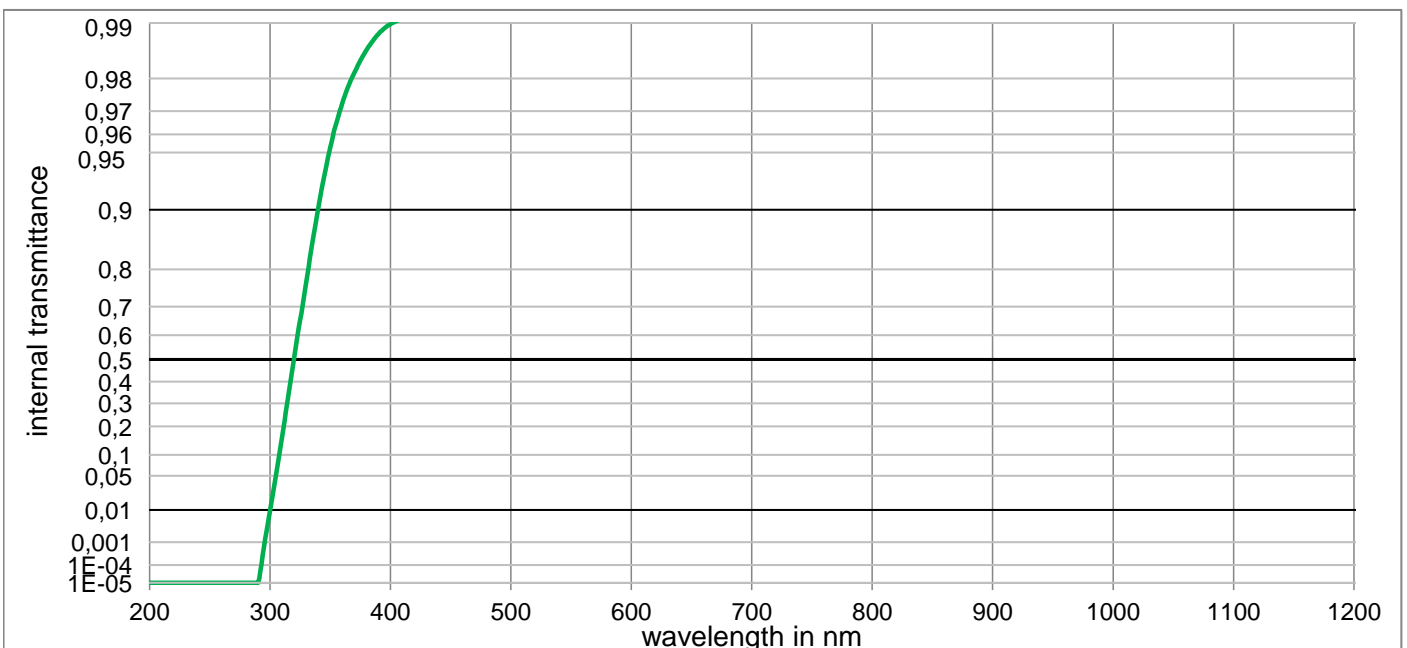


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

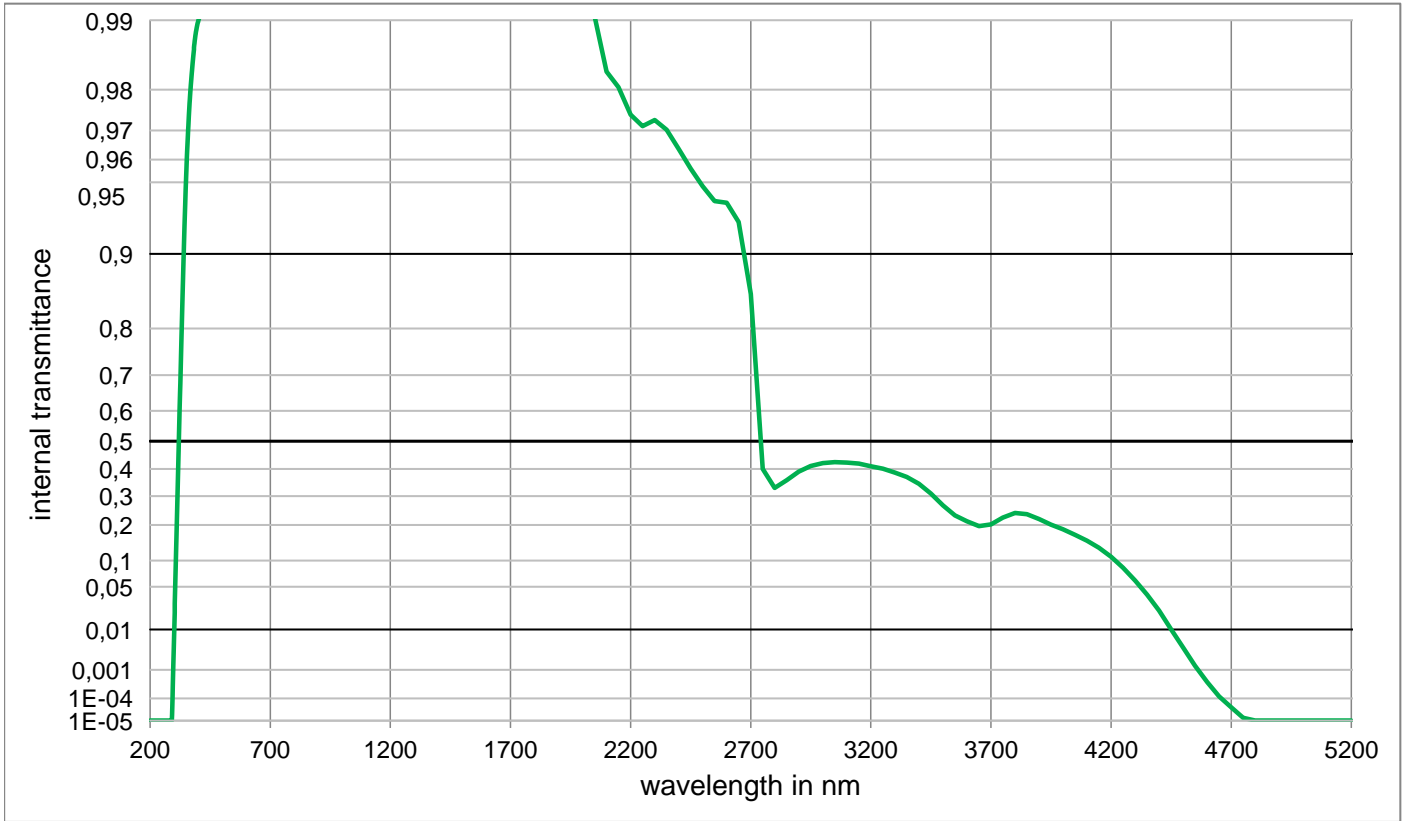
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,949E-01	800	9,987E-01	1100	9,999E-01	2200	9,762E-01	3700	2,268E-01
210	< 1,0E-05	510	9,952E-01	810	9,987E-01	1110	9,999E-01	2250	9,728E-01	3750	2,600E-01
220	< 1,0E-05	520	9,954E-01	820	9,988E-01	1120	9,999E-01	2300	9,738E-01	3800	2,730E-01
230	< 1,0E-05	530	9,957E-01	830	9,988E-01	1130	9,999E-01	2350	9,717E-01	3850	2,656E-01
240	< 1,0E-05	540	9,959E-01	840	9,989E-01	1140	9,999E-01	2400	9,647E-01	3900	2,457E-01
250	< 1,0E-05	550	9,961E-01	850	9,990E-01	1150	9,999E-01	2450	9,577E-01	3950	2,240E-01
260	< 1,0E-05	560	9,962E-01	860	9,990E-01	1160	9,999E-01	2500	9,508E-01	4000	2,042E-01
270	< 1,0E-05	570	9,964E-01	870	9,991E-01	1170	9,999E-01	2550	9,445E-01	4050	1,853E-01
280	1,0E-03	580	9,965E-01	880	9,991E-01	1180	9,999E-01	2600	9,380E-01	4100	1,650E-01
290	6,2E-02	590	9,967E-01	890	9,992E-01	1190	9,999E-01	2650	9,315E-01	4150	1,400E-01
300	3,4E-01	600	9,968E-01	900	9,993E-01	1200	9,999E-01	2700	8,640E-01	4200	1,144E-01
310	6,6E-01	610	9,970E-01	910	9,993E-01	1250	9,999E-01	2750	4,342E-01	4250	8,660E-02
320	8,507E-01	620	9,971E-01	920	9,994E-01	1300	9,999E-01	2800	3,856E-01	4300	5,780E-02
330	9,332E-01	630	9,972E-01	930	9,994E-01	1350	9,999E-01	2850	4,168E-01	4350	3,380E-02
340	9,668E-01	640	9,973E-01	940	9,995E-01	1400	9,970E-01	2900	4,433E-01	4400	1,700E-02
350	9,800E-01	650	9,975E-01	950	9,995E-01	1450	9,994E-01	2950	4,594E-01	4450	7,444E-03
360	9,857E-01	660	9,976E-01	960	9,996E-01	1500	9,999E-01	3000	4,707E-01	4500	2,938E-03
370	9,884E-01	670	9,977E-01	970	9,996E-01	1550	9,999E-01	3050	4,707E-01	4550	9,640E-04
380	9,899E-01	680	9,977E-01	980	9,997E-01	1600	9,999E-01	3100	4,679E-01	4600	2,931E-04
390	9,907E-01	690	9,978E-01	990	9,997E-01	1650	9,995E-01	3150	4,600E-01	4650	8,511E-05
400	9,914E-01	700	9,979E-01	1000	9,998E-01	1700	9,988E-01	3200	4,518E-01	4700	2,483E-05
410	9,920E-01	710	9,980E-01	1010	9,998E-01	1750	9,979E-01	3250	4,376E-01	4750	< 1,000E-05
420	9,924E-01	720	9,981E-01	1020	9,999E-01	1800	9,969E-01	3300	4,188E-01	4800	< 1,000E-05
430	9,928E-01	730	9,982E-01	1030	9,999E-01	1850	9,958E-01	3350	4,017E-01	4850	< 1,000E-05
440	9,931E-01	740	9,983E-01	1040	9,999E-01	1900	9,943E-01	3400	3,724E-01	4900	< 1,000E-05
450	9,935E-01	750	9,983E-01	1050	9,999E-01	1950	9,927E-01	3450	3,401E-01	4950	< 1,000E-05
460	9,937E-01	760	9,984E-01	1060	9,999E-01	2000	9,916E-01	3500	2,997E-01	5000	< 1,000E-05
470	9,940E-01	770	9,985E-01	1070	9,999E-01	2050	9,902E-01	3550	2,637E-01	5050	< 1,000E-05
480	9,943E-01	780	9,985E-01	1080	9,999E-01	2100	9,843E-01	3600	2,360E-01	5100	< 1,000E-05
490	9,946E-01	790	9,986E-01	1090	9,999E-01	2150	9,824E-01	3650	2,164E-01	5150	< 1,000E-05

N-WG320

Optical properties	Mechanical properties	Colorimetric properties	
Reflection factor	Reference thickness	1 mm 2 mm 3 mm	
$P_d = 0,913$	$d = 2,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e	
Spectral values guaranteed (d = 2 mm)	Density		Illuminant A x y Y λ_d P_e
$\lambda_{i0,5} = 320 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,51 \text{ g/cm}^3$		
$\lambda_s (\tau_{i,U} = 1E-05) = 280 \text{ nm}$	Knoop hardness		
$\lambda_p (\tau_{i,L} = 0,99) = 470 \text{ nm}$	$HK_{[0,1/20]} = 610$		
	Thermal properties		
	Transformation temperature		
	$T_g = 563 \text{ }^\circ\text{C}$		
	Thermal expansion in $10^{-6}/\text{K}$		
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,1$		
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 8,4$		
	Temperature coefficient		
	$Tk = 0,06 \text{ nm/K}$		
Refractive indices	Chemical properties	Notes	
$n_d (587,6 \text{ nm}) = 1,54$	Chemical resistance		
$n_s (852 \text{ nm}) = 1,54$	FR class = 0		
$n_t (1014 \text{ nm}) = 1,53$	SR class = 1		
	AR class = 2		
	Resistance against humidity		
	Resistant glass		
	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5		
Sellmeier coefficients		Base glass	
valid from 440 nm to 1550 nm		Longpass filter	
$B_1 = 0,8861$			
$B_2 = 0,4613$			
$B_3 = 29,7610$			
$C_1 = 9,024E-03 \text{ } \mu\text{m}^2$			
$C_2 = 8,3379E-03 \text{ } \mu\text{m}^2$			
$C_3 = 3197,045 \text{ } \mu\text{m}^2$			
		ISO 23364:2021	
Internal quality		Disclaimer	
Bubble class 1		All data without tolerances are to be understood to be reference values.	



N-WG320

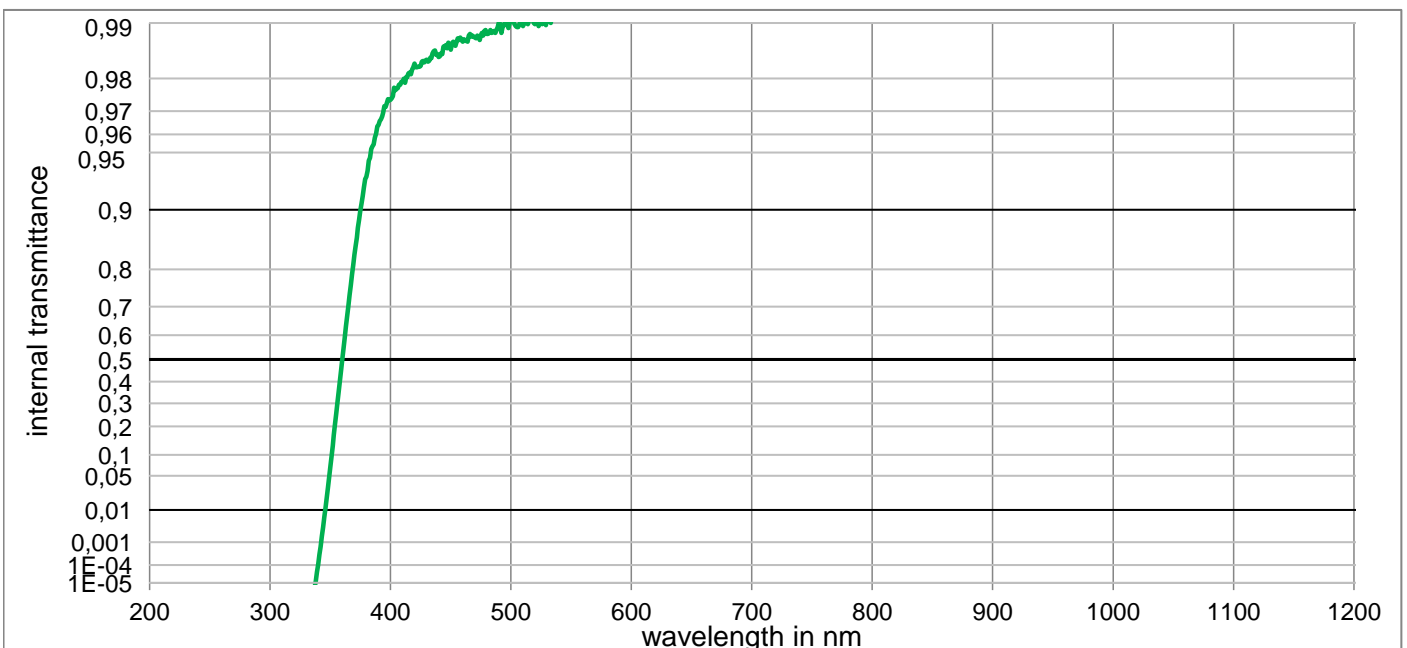


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

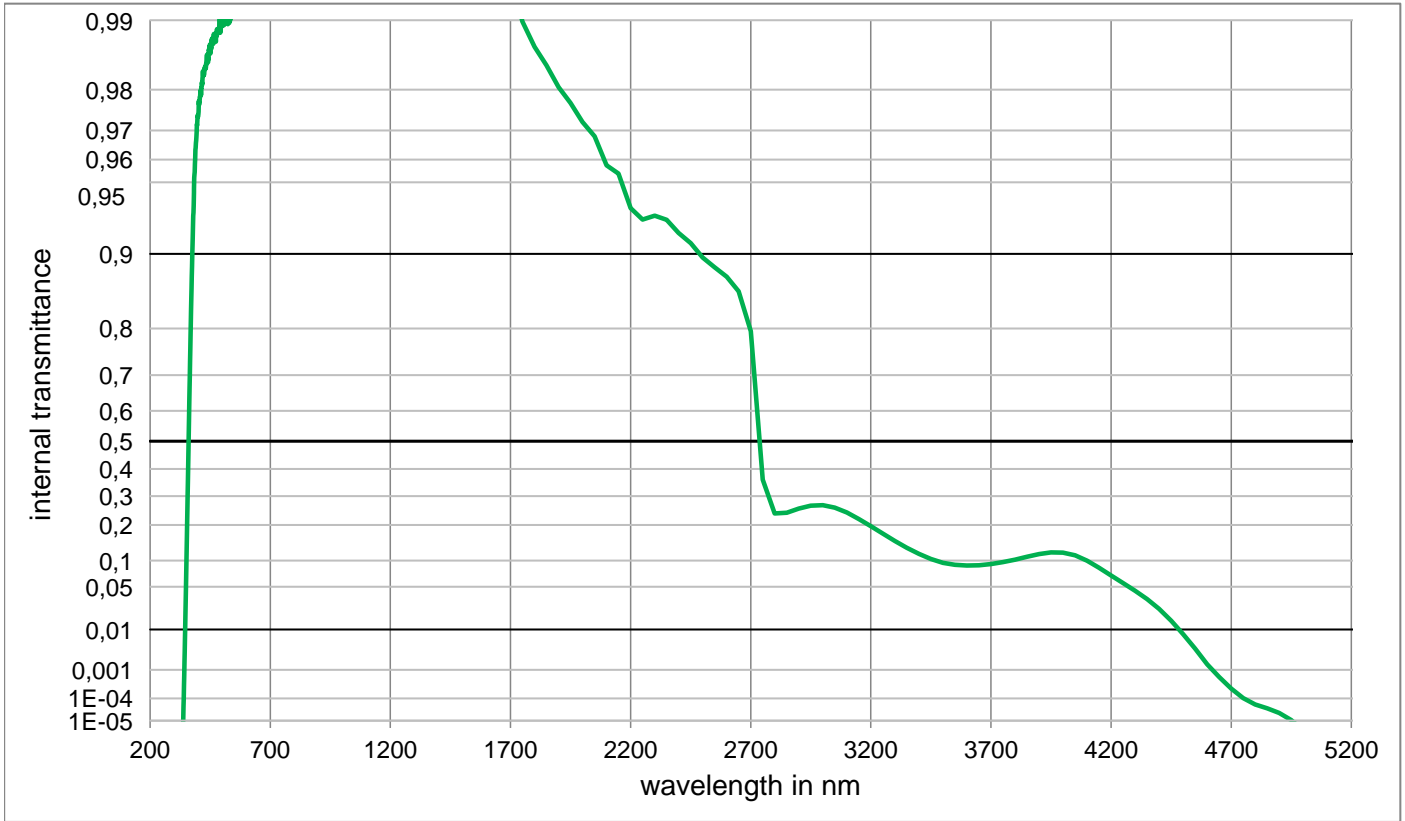
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,940E-01	800	9,983E-01	1100	9,997E-01	2200	9,743E-01	3700	2,020E-01
210	< 1,0E-05	510	9,942E-01	810	9,984E-01	1110	9,998E-01	2250	9,713E-01	3750	2,246E-01
220	< 1,0E-05	520	9,945E-01	820	9,985E-01	1120	9,998E-01	2300	9,729E-01	3800	2,400E-01
230	< 1,0E-05	530	9,948E-01	830	9,985E-01	1130	9,998E-01	2350	9,702E-01	3850	2,356E-01
240	< 1,0E-05	540	9,950E-01	840	9,986E-01	1140	9,999E-01	2400	9,641E-01	3900	2,195E-01
250	< 1,0E-05	550	9,953E-01	850	9,987E-01	1150	9,999E-01	2450	9,562E-01	3950	2,012E-01
260	< 1,0E-05	560	9,955E-01	860	9,987E-01	1160	9,999E-01	2500	9,480E-01	4000	1,864E-01
270	< 1,0E-05	570	9,957E-01	870	9,988E-01	1170	9,999E-01	2550	9,400E-01	4050	1,692E-01
280	< 1,0E-05	580	9,959E-01	880	9,988E-01	1180	9,999E-01	2600	9,389E-01	4100	1,516E-01
290	< 1,0E-05	590	9,960E-01	890	9,989E-01	1190	9,999E-01	2650	9,264E-01	4150	1,323E-01
300	9,6E-03	600	9,962E-01	900	9,989E-01	1200	9,999E-01	2700	8,540E-01	4200	1,092E-01
310	1,6E-01	610	9,964E-01	910	9,990E-01	1250	9,999E-01	2750	4,000E-01	4250	8,440E-02
320	5,066E-01	620	9,965E-01	920	9,990E-01	1300	9,999E-01	2800	3,300E-01	4300	5,970E-02
330	7,700E-01	630	9,967E-01	930	9,990E-01	1350	9,999E-01	2850	3,585E-01	4350	3,896E-02
340	9,013E-01	640	9,968E-01	940	9,991E-01	1400	9,975E-01	2900	3,900E-01	4400	2,230E-02
350	9,533E-01	650	9,969E-01	950	9,991E-01	1450	9,999E-01	2950	4,109E-01	4450	1,000E-02
360	9,728E-01	660	9,970E-01	960	9,992E-01	1500	9,999E-01	3000	4,219E-01	4500	4,000E-03
370	9,814E-01	670	9,971E-01	970	9,992E-01	1550	9,999E-01	3050	4,249E-01	4550	1,318E-03
380	9,859E-01	680	9,972E-01	980	9,993E-01	1600	9,999E-01	3100	4,236E-01	4600	4,070E-04
390	9,885E-01	690	9,973E-01	990	9,993E-01	1650	9,999E-01	3150	4,194E-01	4650	1,191E-04
400	9,899E-01	700	9,974E-01	1000	9,993E-01	1700	9,998E-01	3200	4,100E-01	4700	4,227E-05
410	9,906E-01	710	9,975E-01	1010	9,994E-01	1750	9,990E-01	3250	4,011E-01	4750	1,390E-05
420	9,911E-01	720	9,976E-01	1020	9,994E-01	1800	9,980E-01	3300	3,864E-01	4800	< 1,000E-05
430	9,916E-01	730	9,977E-01	1030	9,995E-01	1850	9,969E-01	3350	3,700E-01	4850	< 1,000E-05
440	9,920E-01	740	9,978E-01	1040	9,995E-01	1900	9,957E-01	3400	3,450E-01	4900	< 1,000E-05
450	9,924E-01	750	9,979E-01	1050	9,995E-01	1950	9,943E-01	3450	3,093E-01	4950	< 1,000E-05
460	9,928E-01	760	9,980E-01	1060	9,996E-01	2000	9,930E-01	3500	2,669E-01	5000	< 1,000E-05
470	9,931E-01	770	9,981E-01	1070	9,996E-01	2050	9,904E-01	3550	2,314E-01	5050	< 1,000E-05
480	9,934E-01	780	9,982E-01	1080	9,996E-01	2100	9,833E-01	3600	2,120E-01	5100	< 1,000E-05
490	9,937E-01	790	9,983E-01	1090	9,997E-01	2150	9,805E-01	3650	1,961E-01	5150	< 1,000E-05

N-WG360

Optical properties	Mechanical properties	Colorimetric properties																					
Reflection factor	Reference thickness	1 mm 2 mm 3 mm																					
$P_d = 0,917$	$d = 2,00 \text{ mm}$	<table border="1"> <tr> <td rowspan="5">Illuminant D65</td> <td>x</td> <td>0,313</td> <td>0,313</td> <td>0,313</td> </tr> <tr> <td>y</td> <td>0,329</td> <td>0,330</td> <td>0,330</td> </tr> <tr> <td>Y</td> <td>91,4</td> <td>91,0</td> <td>90,7</td> </tr> <tr> <td>λ_d</td> <td>575 nm</td> <td>575 nm</td> <td>575 nm</td> </tr> <tr> <td>P_e</td> <td>0,001</td> <td>0,003</td> <td>0,004</td> </tr> </table>	Illuminant D65	x	0,313	0,313	0,313	y	0,329	0,330	0,330	Y	91,4	91,0	90,7	λ_d	575 nm	575 nm	575 nm	P_e	0,001	0,003	0,004
Illuminant D65	x	0,313		0,313	0,313																		
	y	0,329		0,330	0,330																		
	Y	91,4		91,0	90,7																		
	λ_d	575 nm		575 nm	575 nm																		
	P_e	0,001	0,003	0,004																			
Spectral values guaranteed (d = 2 mm)	Density	<table border="1"> <tr> <td rowspan="5">Illuminant A</td> <td>x</td> <td>0,448</td> <td>0,448</td> <td>0,448</td> </tr> <tr> <td>y</td> <td>0,408</td> <td>0,408</td> <td>0,408</td> </tr> <tr> <td>Y</td> <td>91,4</td> <td>91,0</td> <td>90,7</td> </tr> <tr> <td>λ_d</td> <td>585 nm</td> <td>585 nm</td> <td>585 nm</td> </tr> <tr> <td>P_e</td> <td>0,002</td> <td>0,004</td> <td>0,006</td> </tr> </table>	Illuminant A	x	0,448	0,448	0,448	y	0,408	0,408	0,408	Y	91,4	91,0	90,7	λ_d	585 nm	585 nm	585 nm	P_e	0,002	0,004	0,006
Illuminant A	x	0,448		0,448	0,448																		
	y	0,408		0,408	0,408																		
	Y	91,4		91,0	90,7																		
	λ_d	585 nm		585 nm	585 nm																		
	P_e	0,002	0,004	0,006																			
$\lambda_{i0,5} = 360 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,69 \text{ g/cm}^3$																						
$\lambda_s (\tau_{i,U} = 1E-05) = 335 \text{ nm}$	Knoop hardness																						
$\lambda_p (\tau_{i,L} = 0,99) = 535 \text{ nm}$	$HK_{[0,1/20]} = 474$																						
	Thermal properties																						
	Transformation temperature																						
	$T_g = 522 \text{ }^\circ\text{C}$																						
	Thermal expansion in $10^{-6}/\text{K}$																						
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,8$																						
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 8,9$																						
Refractive indices	Chemical properties	Notes																					
$n_d (587,6 \text{ nm}) = 1,53$	Chemical resistance																						
$n_s (852 \text{ nm}) = 1,52$	FR class = 0	Ionically colored glass																					
$n_t (1014 \text{ nm}) = 1,52$	SR class = 1.0	Longpass filter																					
	AR class = 2.0																						
	Resistance against humidity																						
	Resistant glass																						
	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	ISO 23364:2021																					
Sellmeier coefficients		Disclaimer																					
valid from 365 nm to 2325 nm		All data without tolerances are to be understood to be reference values.																					
$B_1 = 1,2534$																							
$B_2 = 0,0409$																							
$B_3 = 0,8749$																							
$C_1 = 8,285E-03 \text{ } \mu\text{m}^2$																							
$C_2 = 3,9133E-02 \text{ } \mu\text{m}^2$																							
$C_3 = 106,087 \text{ } \mu\text{m}^2$																							
Internal quality																							
Bubble class -																							



N-WG360

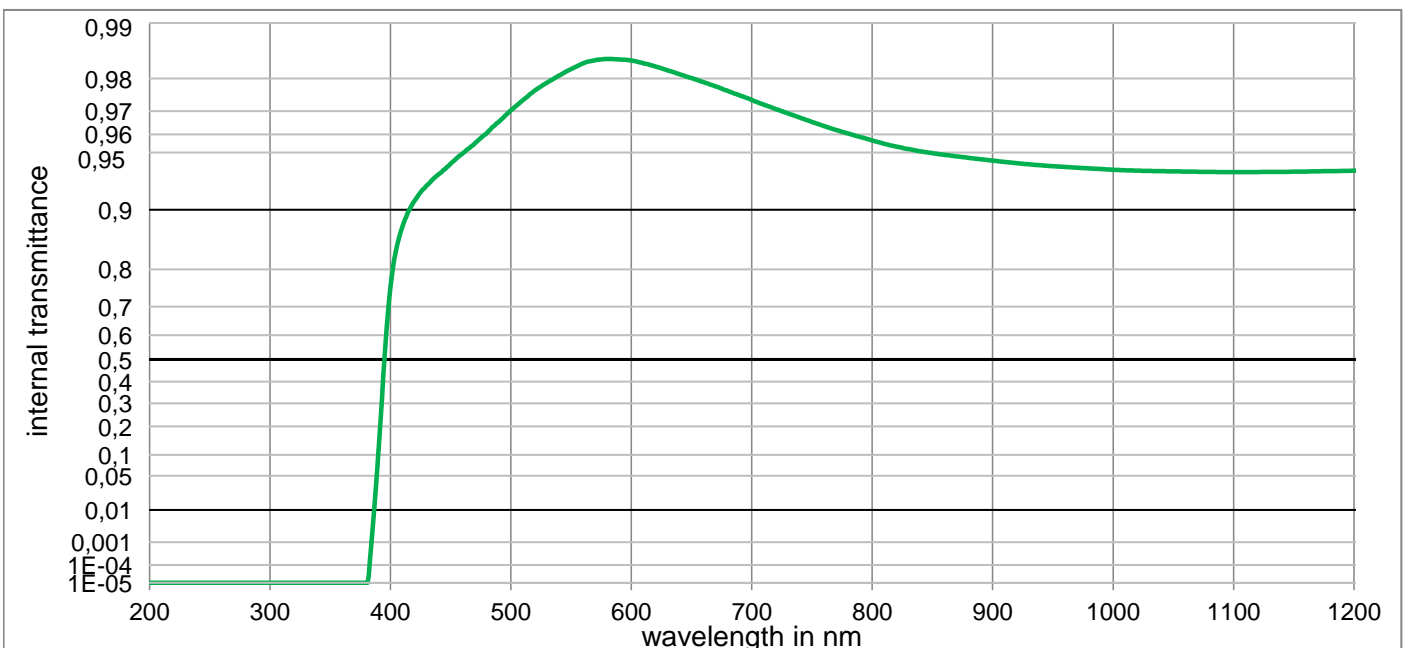


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

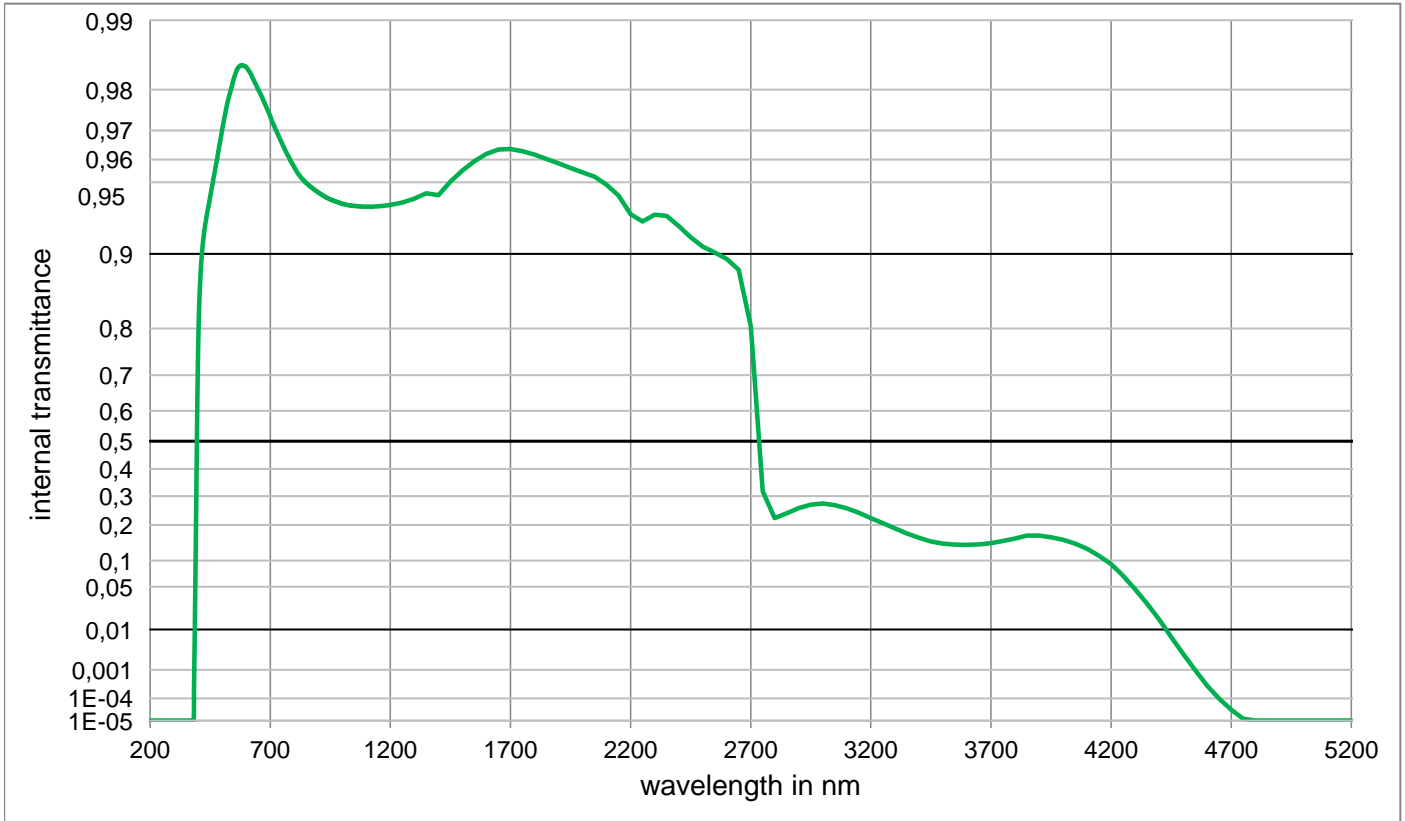
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,905E-01	800	9,965E-01	1100	9,974E-01	2200	9,357E-01	3700	9,206E-02
210	< 1,0E-05	510	9,896E-01	810	9,946E-01	1110	9,970E-01	2250	9,281E-01	3750	9,647E-02
220	< 1,0E-05	520	9,899E-01	820	9,954E-01	1120	9,965E-01	2300	9,308E-01	3800	1,023E-01
230	< 1,0E-05	530	9,907E-01	830	9,921E-01	1130	9,974E-01	2350	9,279E-01	3850	1,092E-01
240	< 1,0E-05	540	9,909E-01	840	9,979E-01	1140	9,967E-01	2400	9,181E-01	3900	1,158E-01
250	< 1,0E-05	550	9,913E-01	850	9,985E-01	1150	9,975E-01	2450	9,097E-01	3950	1,200E-01
260	< 1,0E-05	560	9,913E-01	860	9,952E-01	1160	9,970E-01	2500	8,964E-01	4000	1,195E-01
270	< 1,0E-05	570	9,916E-01	870	9,962E-01	1170	9,974E-01	2550	8,866E-01	4050	1,127E-01
280	< 1,0E-05	580	9,924E-01	880	9,942E-01	1180	9,979E-01	2600	8,759E-01	4100	9,989E-02
290	< 1,0E-05	590	9,920E-01	890	9,952E-01	1190	9,975E-01	2650	8,577E-01	4150	8,423E-02
300	< 1,0E-05	600	9,930E-01	900	9,961E-01	1200	9,974E-01	2700	7,951E-01	4200	6,895E-02
310	< 1,0E-05	610	9,918E-01	910	9,971E-01	1250	9,975E-01	2750	3,602E-01	4250	5,560E-02
320	< 1,000E-05	620	9,925E-01	920	9,965E-01	1300	9,975E-01	2800	2,381E-01	4300	4,425E-02
330	< 1,000E-05	630	9,930E-01	930	9,967E-01	1350	9,969E-01	2850	2,411E-01	4350	3,377E-02
340	1,057E-04	640	9,933E-01	940	9,959E-01	1400	9,942E-01	2900	2,553E-01	4400	2,368E-02
350	6,888E-02	650	9,930E-01	950	9,961E-01	1450	9,954E-01	2950	2,659E-01	4450	1,477E-02
360	5,004E-01	660	9,937E-01	960	9,965E-01	1500	9,971E-01	3000	2,677E-01	4500	8,017E-03
370	8,309E-01	670	9,940E-01	970	9,959E-01	1550	9,971E-01	3050	2,591E-01	4550	3,770E-03
380	9,328E-01	680	9,941E-01	980	9,955E-01	1600	9,950E-01	3100	2,422E-01	4600	1,463E-03
390	9,644E-01	690	9,948E-01	990	9,953E-01	1650	9,952E-01	3150	2,198E-01	4650	5,978E-04
400	9,739E-01	700	9,944E-01	1000	9,969E-01	1700	9,937E-01	3200	1,960E-01	4700	2,356E-04
410	9,792E-01	710	9,953E-01	1010	9,967E-01	1750	9,899E-01	3250	1,727E-01	4750	1,034E-04
420	9,834E-01	720	9,957E-01	1020	9,969E-01	1800	9,870E-01	3300	1,514E-01	4800	5,671E-05
430	9,842E-01	730	9,952E-01	1030	9,966E-01	1850	9,843E-01	3350	1,324E-01	4850	3,765E-05
440	9,847E-01	740	9,959E-01	1040	9,975E-01	1900	9,805E-01	3400	1,163E-01	4900	2,374E-05
450	9,860E-01	750	9,944E-01	1050	9,970E-01	1950	9,772E-01	3450	1,035E-01	4950	1,069E-05
460	9,873E-01	760	9,958E-01	1060	9,971E-01	2000	9,724E-01	3500	9,490E-02	5000	< 1,000E-05
470	9,880E-01	770	9,958E-01	1070	9,965E-01	2050	9,682E-01	3550	9,043E-02	5050	< 1,000E-05
480	9,885E-01	780	9,952E-01	1080	9,969E-01	2100	9,577E-01	3600	8,906E-02	5100	< 1,000E-05
490	9,901E-01	790	9,946E-01	1090	9,971E-01	2150	9,541E-01	3650	8,965E-02	5150	< 1,000E-05

GG395

Optical properties		Mechanical properties		Colorimetric properties				
Reflection factor		Reference thickness		1 mm 2 mm 3 mm				
$P_d = 0,918$		$d = 3,00 \text{ mm}$		Illuminant D65	x	0,314	0,315	0,316
Spectral values guaranteed (d = 3 mm)		Density			y	0,331	0,332	0,334
$\lambda_{i,0,5} = 395 \text{ nm} \pm 6 \text{ nm}$		$\rho = 2,55 \text{ g/cm}^3$			Y	91,1	90,5	89,8
$\lambda_s (\tau_{i,U} = 1E-05) = 340 \text{ nm}$		Knoop hardness			λ_d	570 nm	570 nm	571 nm
$\lambda_p (\tau_{i,L} = 0,92) = 480 \text{ nm}$		$HK_{[0,1/20]} = 409$			P_e	0,008	0,016	0,023
				Illuminant A	x	0,448	0,449	0,450
		Thermal properties			y	0,408	0,409	0,410
		Transformation temperature			Y	91,1	90,6	90,0
		$T_g = 538 \text{ }^\circ\text{C}$			λ_d	581 nm	581 nm	581 nm
		Thermal expansion in $10^{-6}/\text{K}$			P_e	0,010	0,020	0,030
Refractive indices		$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,8$						
$n_d (587,6 \text{ nm}) = 1,52$		$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,0$						
$n_s (852 \text{ nm}) = 1,52$		Temperature coefficient						
$n_t (1014 \text{ nm}) = 1,51$		$Tk = 0,07 \text{ nm/K}$						
Sellmeier coefficients		Chemical properties		Notes				
on request		Chemical resistance						
		FR class = 0		Stricking glass				
		SR class = 1		Longpass filter				
		AR class = 1						
		Resistance against humidity		ISO 23364:2021				
		Robust glass		Disclaimer				
Internal quality		see pocket catalogue "Optical Filter Glass 2024", chapter 5.5		All data without tolerances are to be understood to be reference values.				
Bubble class 3								



GG395

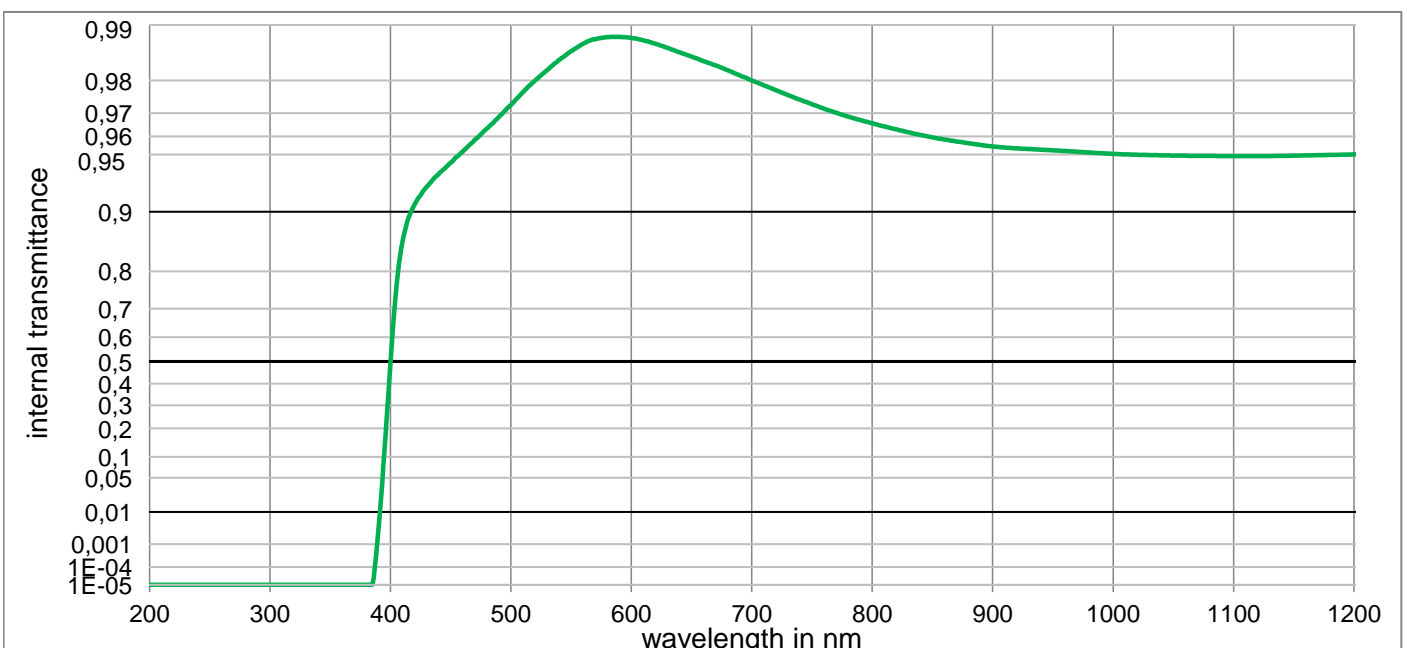


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

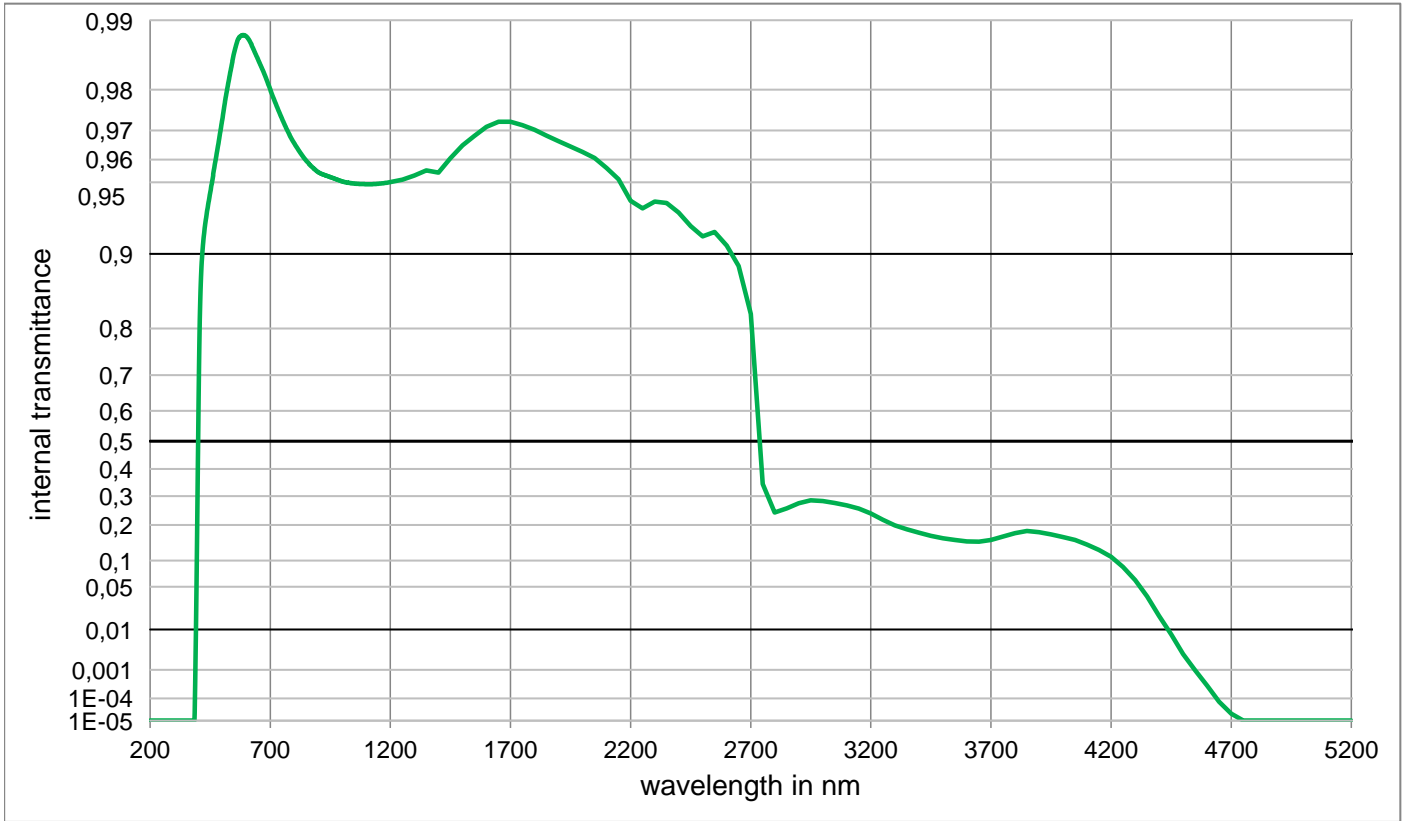
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,703E-01	800	9,569E-01	1100	9,365E-01	2200	9,318E-01	3700	1,448E-01
210	< 1,0E-05	510	9,738E-01	810	9,551E-01	1110	9,365E-01	2250	9,268E-01	3750	1,512E-01
220	< 1,0E-05	520	9,768E-01	820	9,535E-01	1120	9,366E-01	2300	9,315E-01	3800	1,583E-01
230	< 1,0E-05	530	9,789E-01	830	9,521E-01	1130	9,366E-01	2350	9,306E-01	3850	1,667E-01
240	< 1,0E-05	540	9,807E-01	840	9,507E-01	1140	9,367E-01	2400	9,235E-01	3900	1,668E-01
250	< 1,0E-05	550	9,823E-01	850	9,496E-01	1150	9,368E-01	2450	9,147E-01	3950	1,618E-01
260	< 1,0E-05	560	9,835E-01	860	9,486E-01	1160	9,369E-01	2500	9,067E-01	4000	1,544E-01
270	< 1,0E-05	570	9,841E-01	870	9,476E-01	1170	9,371E-01	2550	9,014E-01	4050	1,433E-01
280	< 1,0E-05	580	9,843E-01	880	9,467E-01	1180	9,372E-01	2600	8,950E-01	4100	1,295E-01
290	< 1,0E-05	590	9,842E-01	890	9,457E-01	1190	9,374E-01	2650	8,838E-01	4150	1,116E-01
300	< 1,0E-05	600	9,840E-01	900	9,448E-01	1200	9,376E-01	2700	8,040E-01	4200	9,191E-02
310	< 1,0E-05	610	9,835E-01	910	9,439E-01	1250	9,391E-01	2750	3,176E-01	4250	6,847E-02
320	< 1,000E-05	620	9,828E-01	920	9,431E-01	1300	9,414E-01	2800	2,228E-01	4300	4,612E-02
330	< 1,000E-05	630	9,819E-01	930	9,422E-01	1350	9,443E-01	2850	2,391E-01	4350	2,855E-02
340	< 1,000E-05	640	9,810E-01	940	9,416E-01	1400	9,433E-01	2900	2,571E-01	4400	1,568E-02
350	< 1,000E-05	650	9,801E-01	950	9,409E-01	1450	9,504E-01	2950	2,688E-01	4450	6,940E-03
360	< 1,000E-05	660	9,791E-01	960	9,404E-01	1500	9,555E-01	3000	2,738E-01	4500	2,800E-03
370	< 1,000E-05	670	9,779E-01	970	9,398E-01	1550	9,594E-01	3050	2,675E-01	4550	9,940E-04
380	< 1,000E-05	680	9,766E-01	980	9,393E-01	1600	9,622E-01	3100	2,561E-01	4600	3,013E-04
390	1,131E-01	690	9,753E-01	990	9,388E-01	1650	9,638E-01	3150	2,409E-01	4650	9,863E-05
400	7,568E-01	700	9,739E-01	1000	9,383E-01	1700	9,640E-01	3200	2,224E-01	4700	3,281E-05
410	8,785E-01	710	9,723E-01	1010	9,379E-01	1750	9,632E-01	3250	2,055E-01	4750	1,227E-05
420	9,102E-01	720	9,708E-01	1020	9,376E-01	1800	9,619E-01	3300	1,892E-01	4800	< 1,000E-05
430	9,252E-01	730	9,691E-01	1030	9,374E-01	1850	9,602E-01	3350	1,733E-01	4850	< 1,000E-05
440	9,348E-01	740	9,675E-01	1040	9,372E-01	1900	9,585E-01	3400	1,601E-01	4900	< 1,000E-05
450	9,427E-01	750	9,657E-01	1050	9,370E-01	1950	9,566E-01	3450	1,494E-01	4950	< 1,000E-05
460	9,495E-01	760	9,639E-01	1060	9,369E-01	2000	9,546E-01	3500	1,437E-01	5000	< 1,000E-05
470	9,553E-01	770	9,621E-01	1070	9,368E-01	2050	9,526E-01	3550	1,407E-01	5050	< 1,000E-05
480	9,606E-01	780	9,604E-01	1080	9,366E-01	2100	9,487E-01	3600	1,403E-01	5100	< 1,000E-05
490	9,658E-01	790	9,587E-01	1090	9,365E-01	2150	9,432E-01	3650	1,412E-01	5150	< 1,000E-05

GG400

Optical properties		Mechanical properties		Colorimetric properties				
Reflection factor		Reference thickness		1 mm 2 mm 3 mm				
P _d = 0,918		d = 3,00 mm		Illuminant D65	x	0,314	0,315	0,316
Spectral values guaranteed (d = 3 mm)		Density			y	0,331	0,333	0,335
λ _{i0,5} = 400 nm ± 6 nm		ρ = 2,55 g/cm ³			Y	91,2	90,7	90,2
λ _s (τ _{i,U} = 1E-05) = 340 nm		Knoop hardness			λ _d	570 nm	571 nm	571 nm
λ _p (τ _{i,L} = 0,93) = 480 nm		HK _[0,1/20] = 463			P _e	0,009	0,017	0,025
		Thermal properties		Illuminant A	x	0,448	0,449	0,450
		Transformation temperature			y	0,408	0,409	0,410
		T _g = 537 °C			Y	91,2	90,8	90,4
		Thermal expansion in 10⁻⁶/K			λ _d	581 nm	581 nm	581 nm
		α (-30°C/+70°C) = 7,9			P _e	0,011	0,022	0,032
		α (20°C/300°C) = 9,1						
Refractive indices		Temperature coefficient		Notes				
n _d (587,6 nm) = 1,52		Tk = 0,07 nm/K		Stricking glass				
n _s (852 nm) = 1,52				Longpass filter				
n _t (1014 nm) = 1,51								
Sellmeier coefficients				ISO 23364:2021				
on request				Disclaimer				
				All data without tolerances are to be understood to be reference values.				
		Chemical properties						
		Chemical resistance						
		FR class = 0						
		SR class = 1						
		AR class = 1						
		Resistance against humidity						
		Robust glass						
		see pocket catalogue "Optical Filter Glass 2024", chapter 5.5						
Internal quality								
Bubble class 3								



GG400

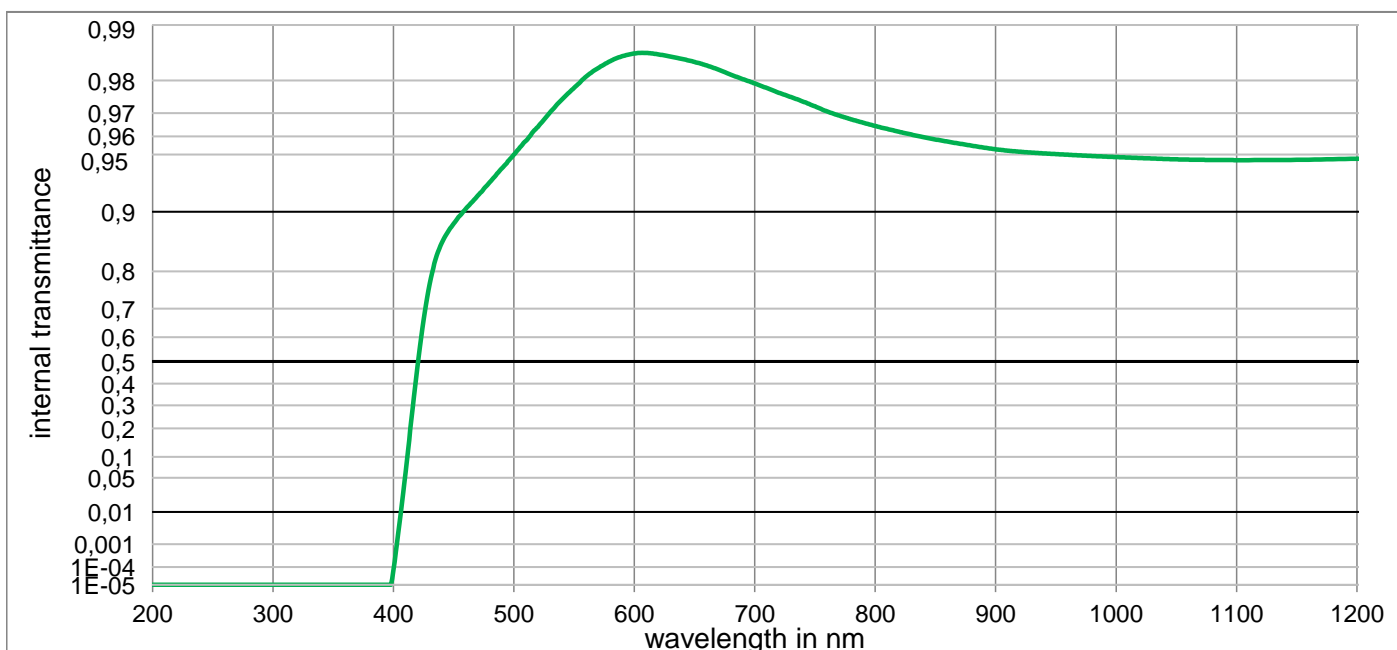


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

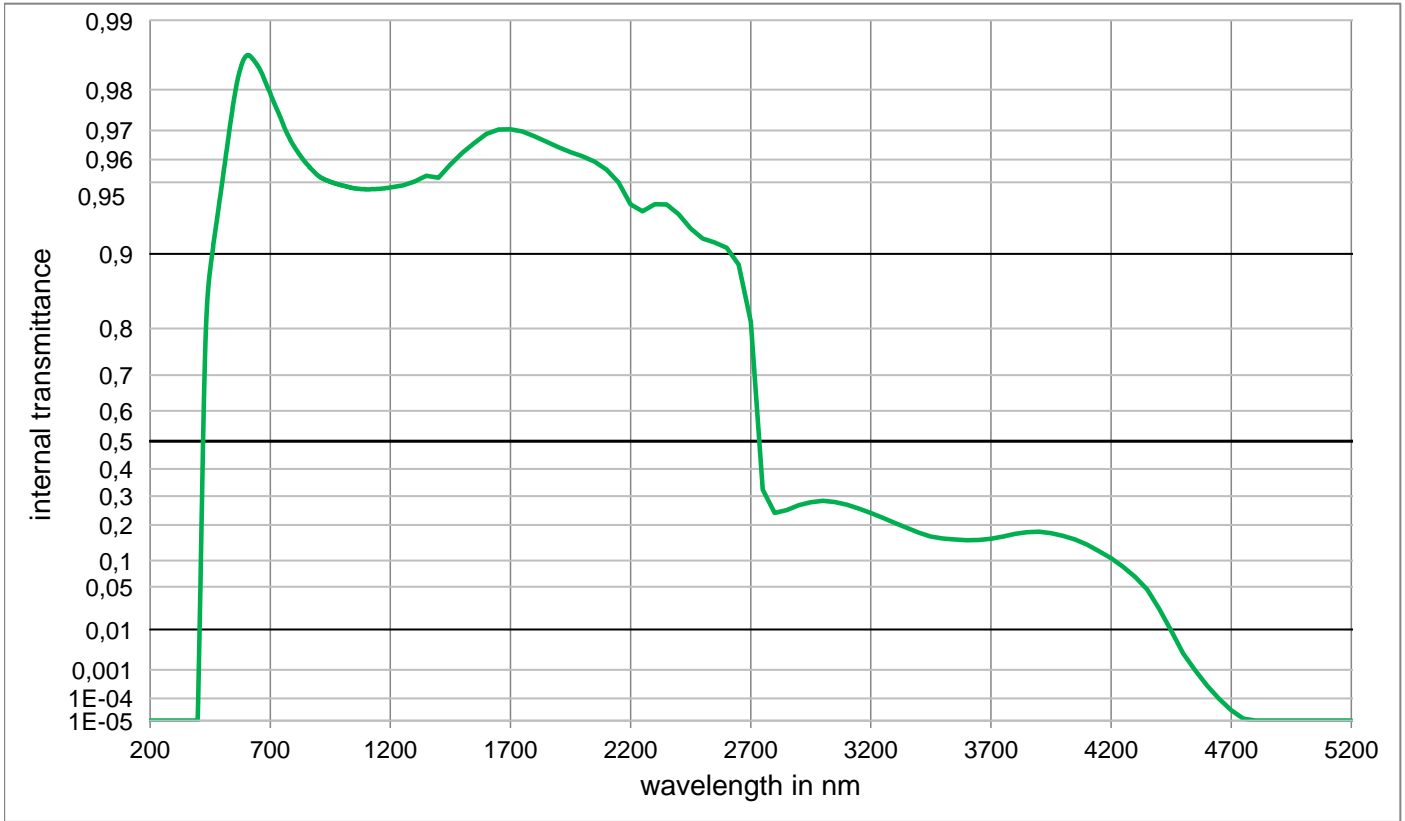
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,729E-01	800	9,660E-01	1100	9,491E-01	2200	9,401E-01	3700	1,537E-01
210	< 1,0E-05	510	9,769E-01	810	9,646E-01	1110	9,491E-01	2250	9,355E-01	3750	1,636E-01
220	< 1,0E-05	520	9,800E-01	820	9,633E-01	1120	9,491E-01	2300	9,397E-01	3800	1,740E-01
230	< 1,0E-05	530	9,825E-01	830	9,620E-01	1130	9,491E-01	2350	9,388E-01	3850	1,810E-01
240	< 1,0E-05	540	9,845E-01	840	9,607E-01	1140	9,492E-01	2400	9,329E-01	3900	1,771E-01
250	< 1,0E-05	550	9,861E-01	850	9,595E-01	1150	9,493E-01	2450	9,234E-01	3950	1,704E-01
260	< 1,0E-05	560	9,873E-01	860	9,584E-01	1160	9,494E-01	2500	9,154E-01	4000	1,625E-01
270	< 1,0E-05	570	9,881E-01	870	9,574E-01	1170	9,496E-01	2550	9,190E-01	4050	1,540E-01
280	< 1,0E-05	580	9,883E-01	880	9,565E-01	1180	9,497E-01	2600	9,076E-01	4100	1,405E-01
290	< 1,0E-05	590	9,884E-01	890	9,555E-01	1190	9,499E-01	2650	8,878E-01	4150	1,266E-01
300	< 1,0E-05	600	9,883E-01	900	9,547E-01	1200	9,501E-01	2700	8,248E-01	4200	1,089E-01
310	< 1,0E-05	610	9,879E-01	910	9,541E-01	1250	9,512E-01	2750	3,440E-01	4250	8,600E-02
320	< 1,000E-05	620	9,874E-01	920	9,537E-01	1300	9,533E-01	2800	2,420E-01	4300	6,050E-02
330	< 1,000E-05	630	9,867E-01	930	9,533E-01	1350	9,555E-01	2850	2,560E-01	4350	3,670E-02
340	< 1,000E-05	640	9,859E-01	940	9,529E-01	1400	9,545E-01	2900	2,740E-01	4400	1,800E-02
350	< 1,000E-05	650	9,852E-01	950	9,525E-01	1450	9,605E-01	2950	2,848E-01	4450	7,910E-03
360	< 1,000E-05	660	9,843E-01	960	9,521E-01	1500	9,652E-01	3000	2,819E-01	4500	2,760E-03
370	< 1,000E-05	670	9,834E-01	970	9,517E-01	1550	9,683E-01	3050	2,755E-01	4550	9,780E-04
380	< 1,000E-05	680	9,824E-01	980	9,512E-01	1600	9,710E-01	3100	2,667E-01	4600	3,000E-04
390	3,430E-03	690	9,812E-01	990	9,508E-01	1650	9,725E-01	3150	2,557E-01	4650	7,345E-05
400	4,907E-01	700	9,800E-01	1000	9,504E-01	1700	9,725E-01	3200	2,381E-01	4700	2,171E-05
410	8,588E-01	710	9,788E-01	1010	9,501E-01	1750	9,715E-01	3250	2,170E-01	4750	< 1,000E-05
420	9,082E-01	720	9,774E-01	1020	9,499E-01	1800	9,702E-01	3300	1,987E-01	4800	< 1,000E-05
430	9,259E-01	730	9,760E-01	1030	9,497E-01	1850	9,684E-01	3350	1,864E-01	4850	< 1,000E-05
440	9,365E-01	740	9,746E-01	1040	9,495E-01	1900	9,666E-01	3400	1,757E-01	4900	< 1,000E-05
450	9,448E-01	750	9,731E-01	1050	9,494E-01	1950	9,648E-01	3450	1,659E-01	4950	< 1,000E-05
460	9,518E-01	760	9,716E-01	1060	9,493E-01	2000	9,629E-01	3500	1,586E-01	5000	< 1,000E-05
470	9,583E-01	770	9,702E-01	1070	9,492E-01	2050	9,606E-01	3550	1,536E-01	5050	< 1,000E-05
480	9,636E-01	780	9,687E-01	1080	9,491E-01	2100	9,565E-01	3600	1,499E-01	5100	< 1,000E-05
490	9,686E-01	790	9,673E-01	1090	9,491E-01	2150	9,515E-01	3650	1,493E-01	5150	< 1,000E-05

GG420

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,918$	$d = 3,00 \text{ mm}$	x 0,317 0,320 0,324
Spectral values guaranteed (d = 3 mm)	Density	y 0,337 0,342 0,348
$\lambda_{i0,5} = 420 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,55 \text{ g/cm}^3$	Y 90,9 90,1 89,2
$\lambda_s (\tau_{i,U} = 1E-05) = 360 \text{ nm}$	Knoop hardness	λ_d 569 nm 570 nm 570 nm
$\lambda_p (\tau_{i,L} = 0,93) = 530 \text{ nm}$	$HK_{[0,1/20]} = 503$	P_e 0,033 0,059 0,082
Refractive indices	Thermal properties	Illuminant D65
$n_d (587,6 \text{ nm}) = 1,52$	Transformation temperature	x 0,450 0,453 0,455
$n_s (852 \text{ nm}) = 1,52$	$T_g = 535 \text{ °C}$	y 0,410 0,412 0,414
$n_t (1014 \text{ nm}) = 1,51$	Thermal expansion in $10^{-6}/K$	Y 91,0 90,4 89,7
	$\alpha_{(-30\text{°C}/+70\text{°C})} = 7,8$	λ_d 581 nm 581 nm 581 nm
	$\alpha_{(20\text{°C}/300\text{°C})} = 9,0$	P_e 0,038 0,068 0,096
Sellmeier coefficients	Temperature coefficient	Illuminant A
on request	$Tk = 0,07 \text{ nm/K}$	x 0,450 0,453 0,455
		y 0,410 0,412 0,414
		Y 91,0 90,4 89,7
		λ_d 581 nm 581 nm 581 nm
		P_e 0,038 0,068 0,096
Internal quality	Chemical properties	Notes
Bubble class 3	Chemical resistance	Stricking glass
	FR class = 0	Longpass filter
	SR class = 1	
	AR class = 1	
	Resistance against humidity	
	Robust glass	ISO 23364:2021
	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	Disclaimer
		All data without tolerances are to be understood to be reference values.



GG420

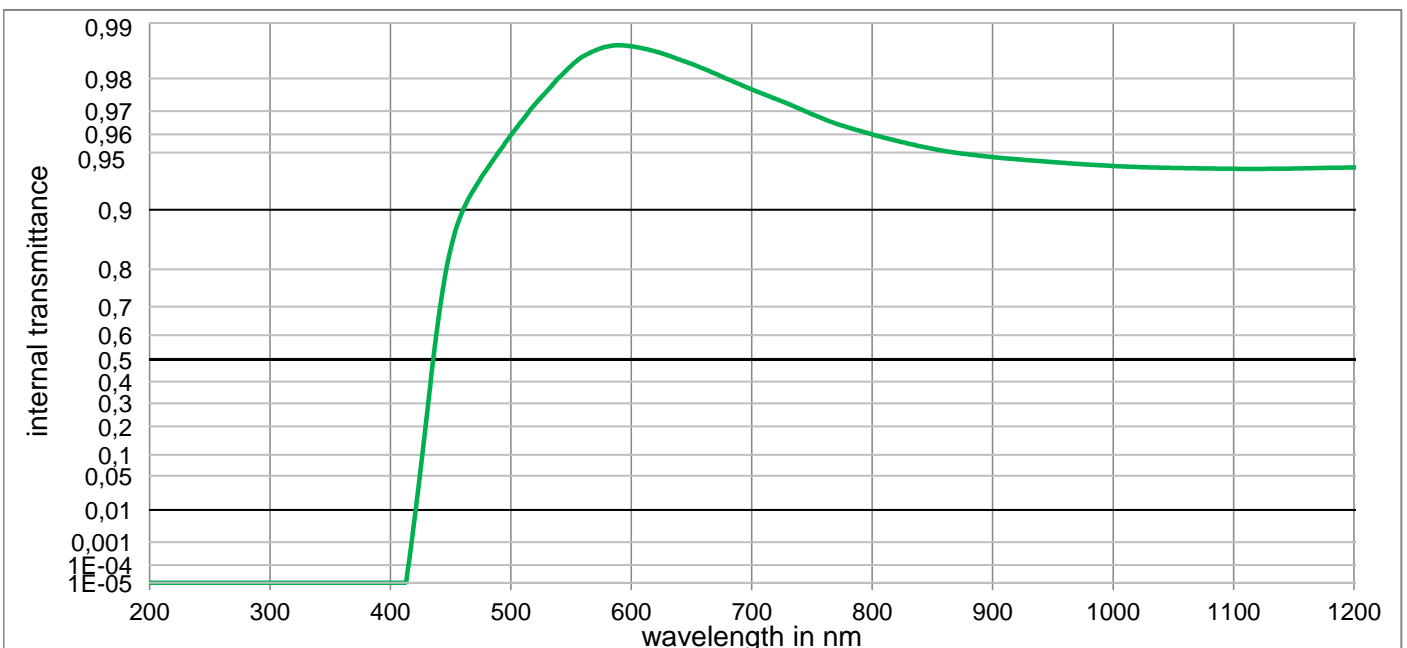


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

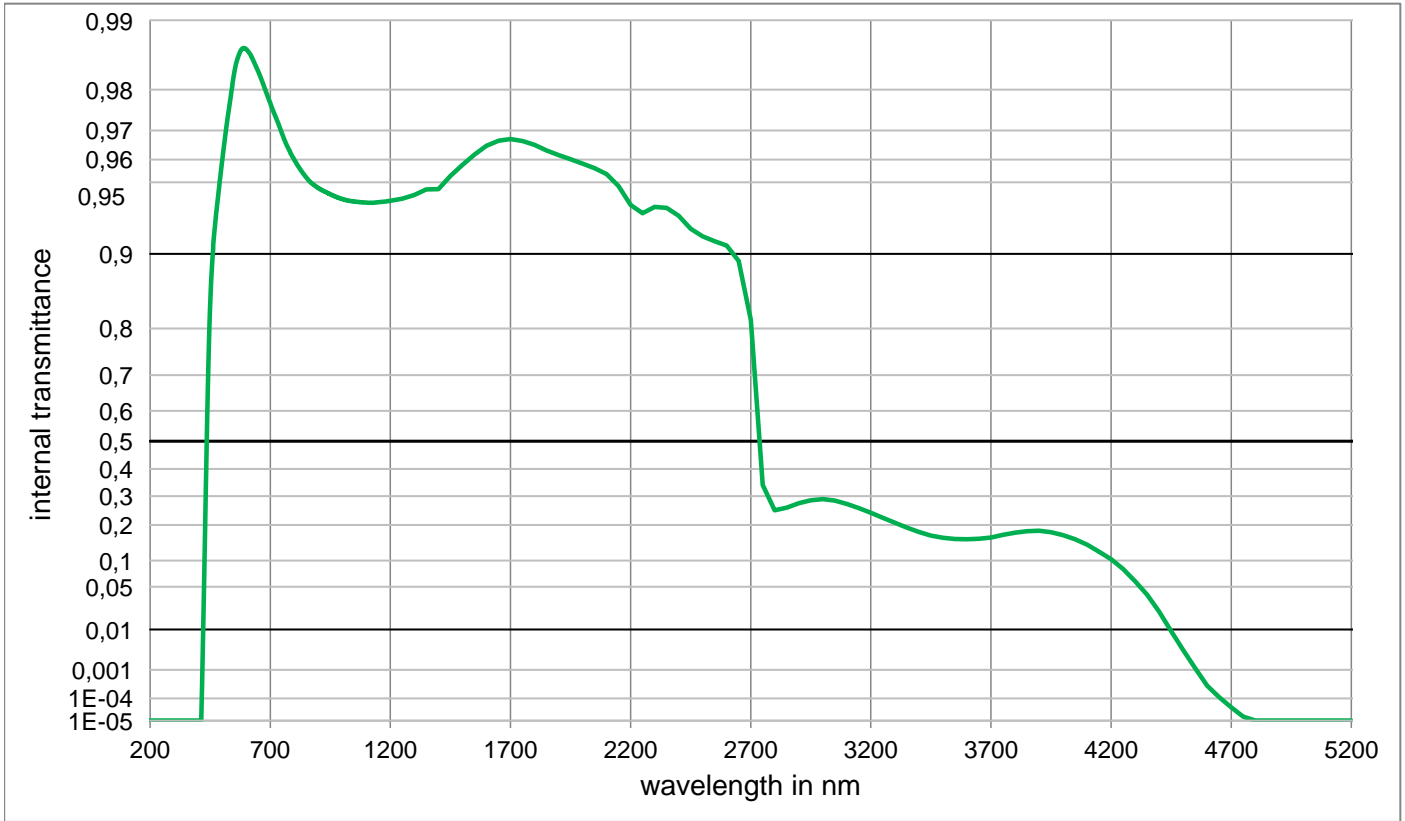
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,500E-01	800	9,649E-01	1100	9,465E-01	2200	9,379E-01	3700	1,571E-01
210	< 1,0E-05	510	9,578E-01	810	9,635E-01	1110	9,465E-01	2250	9,336E-01	3750	1,636E-01
220	< 1,0E-05	520	9,645E-01	820	9,622E-01	1120	9,465E-01	2300	9,381E-01	3800	1,720E-01
230	< 1,0E-05	530	9,703E-01	830	9,609E-01	1130	9,465E-01	2350	9,380E-01	3850	1,772E-01
240	< 1,0E-05	540	9,747E-01	840	9,596E-01	1140	9,466E-01	2400	9,317E-01	3900	1,785E-01
250	< 1,0E-05	550	9,781E-01	850	9,585E-01	1150	9,467E-01	2450	9,215E-01	3950	1,744E-01
260	< 1,0E-05	560	9,809E-01	860	9,574E-01	1160	9,468E-01	2500	9,136E-01	4000	1,660E-01
270	< 1,0E-05	570	9,829E-01	870	9,563E-01	1170	9,469E-01	2550	9,104E-01	4050	1,550E-01
280	< 1,0E-05	580	9,843E-01	880	9,552E-01	1180	9,470E-01	2600	9,056E-01	4100	1,410E-01
290	< 1,0E-05	590	9,852E-01	890	9,541E-01	1190	9,472E-01	2650	8,892E-01	4150	1,232E-01
300	< 1,0E-05	600	9,857E-01	900	9,531E-01	1200	9,474E-01	2700	8,120E-01	4200	1,053E-01
310	< 1,0E-05	610	9,858E-01	910	9,523E-01	1250	9,484E-01	2750	3,239E-01	4250	8,629E-02
320	< 1,000E-05	620	9,856E-01	920	9,517E-01	1300	9,504E-01	2800	2,398E-01	4300	6,632E-02
330	< 1,000E-05	630	9,852E-01	930	9,512E-01	1350	9,531E-01	2850	2,500E-01	4350	4,599E-02
340	< 1,000E-05	640	9,847E-01	940	9,507E-01	1400	9,522E-01	2900	2,672E-01	4400	2,394E-02
350	< 1,000E-05	650	9,841E-01	950	9,503E-01	1450	9,580E-01	2950	2,777E-01	4450	9,460E-03
360	< 1,000E-05	660	9,834E-01	960	9,499E-01	1500	9,626E-01	3000	2,832E-01	4500	2,866E-03
370	< 1,000E-05	670	9,825E-01	970	9,495E-01	1550	9,660E-01	3050	2,786E-01	4550	9,830E-04
380	< 1,000E-05	680	9,814E-01	980	9,491E-01	1600	9,690E-01	3100	2,687E-01	4600	3,006E-04
390	< 1,000E-05	690	9,803E-01	990	9,488E-01	1650	9,703E-01	3150	2,553E-01	4650	9,550E-05
400	7,048E-05	700	9,792E-01	1000	9,484E-01	1700	9,704E-01	3200	2,405E-01	4700	3,112E-05
410	6,112E-02	710	9,780E-01	1010	9,481E-01	1750	9,697E-01	3250	2,235E-01	4750	1,250E-05
420	4,792E-01	720	9,767E-01	1020	9,478E-01	1800	9,682E-01	3300	2,064E-01	4800	< 1,000E-05
430	7,703E-01	730	9,754E-01	1030	9,475E-01	1850	9,665E-01	3350	1,911E-01	4850	< 1,000E-05
440	8,551E-01	740	9,740E-01	1040	9,472E-01	1900	9,646E-01	3400	1,760E-01	4900	< 1,000E-05
450	8,849E-01	750	9,724E-01	1050	9,470E-01	1950	9,628E-01	3450	1,639E-01	4950	< 1,000E-05
460	9,032E-01	760	9,706E-01	1060	9,468E-01	2000	9,612E-01	3500	1,578E-01	5000	< 1,000E-05
470	9,176E-01	770	9,691E-01	1070	9,467E-01	2050	9,591E-01	3550	1,551E-01	5050	< 1,000E-05
480	9,300E-01	780	9,676E-01	1080	9,466E-01	2100	9,559E-01	3600	1,535E-01	5100	< 1,000E-05
490	9,409E-01	790	9,662E-01	1090	9,465E-01	2150	9,500E-01	3650	1,540E-01	5150	< 1,000E-05

GG435

Optical properties		Mechanical properties		Colorimetric properties				
Reflection factor		Reference thickness		1 mm 2 mm 3 mm				
$P_d = 0,918$		$d = 3,00 \text{ mm}$		Illuminant D65	x	0,323	0,328	0,333
Spectral values guaranteed (d = 3 mm)		Density			y	0,350	0,361	0,369
$\lambda_{i,0,5} = 435 \text{ nm} \pm 6 \text{ nm}$		$\rho = 2,55 \text{ g/cm}^3$			Y	90,9	90,2	89,5
$\lambda_s (\tau_{i,U} = 1E-05) = 370 \text{ nm}$		Knoop hardness			λ_d	568 nm	568 nm	568 nm
$\lambda_p (\tau_{i,L} = 0,92) = 520 \text{ nm}$		$HK_{[0,1/20]} = 449$			P_e	0,086	0,132	0,166
				Illuminant A	x	0,453	0,457	0,459
		Thermal properties			y	0,415	0,419	0,422
		Transformation temperature			Y	91,1	90,5	90,0
		$T_g = 537 \text{ }^\circ\text{C}$			λ_d	580 nm	580 nm	580 nm
		Thermal expansion in $10^{-6}/\text{K}$			P_e	0,092	0,143	0,182
Refractive indices		$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,8$						
$n_d (587,6 \text{ nm}) = 1,52$		$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,1$						
$n_s (852 \text{ nm}) = 1,52$		Temperature coefficient						
$n_t (1014 \text{ nm}) = 1,51$		$Tk = 0,08 \text{ nm/K}$						
Sellmeier coefficients		Chemical properties		Notes				
on request		Chemical resistance						
		FR class = 0		Stricking glass				
		SR class = 1		Longpass filter				
		AR class = 1						
		Resistance against humidity		ISO 23364:2021				
		Robust glass		Disclaimer				
Internal quality		see pocket catalogue "Optical Filter Glass 2024", chapter 5.5		All data without tolerances are to be understood to be reference values.				
Bubble class 3								



GG435

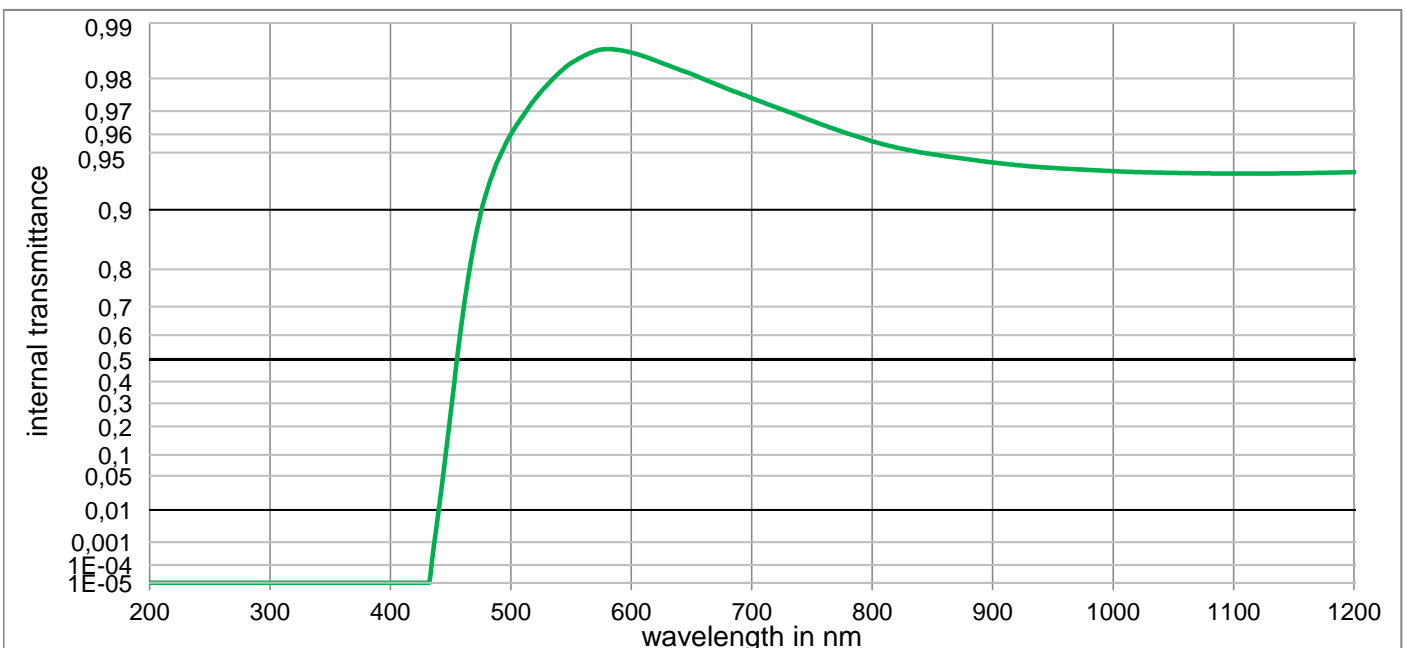


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

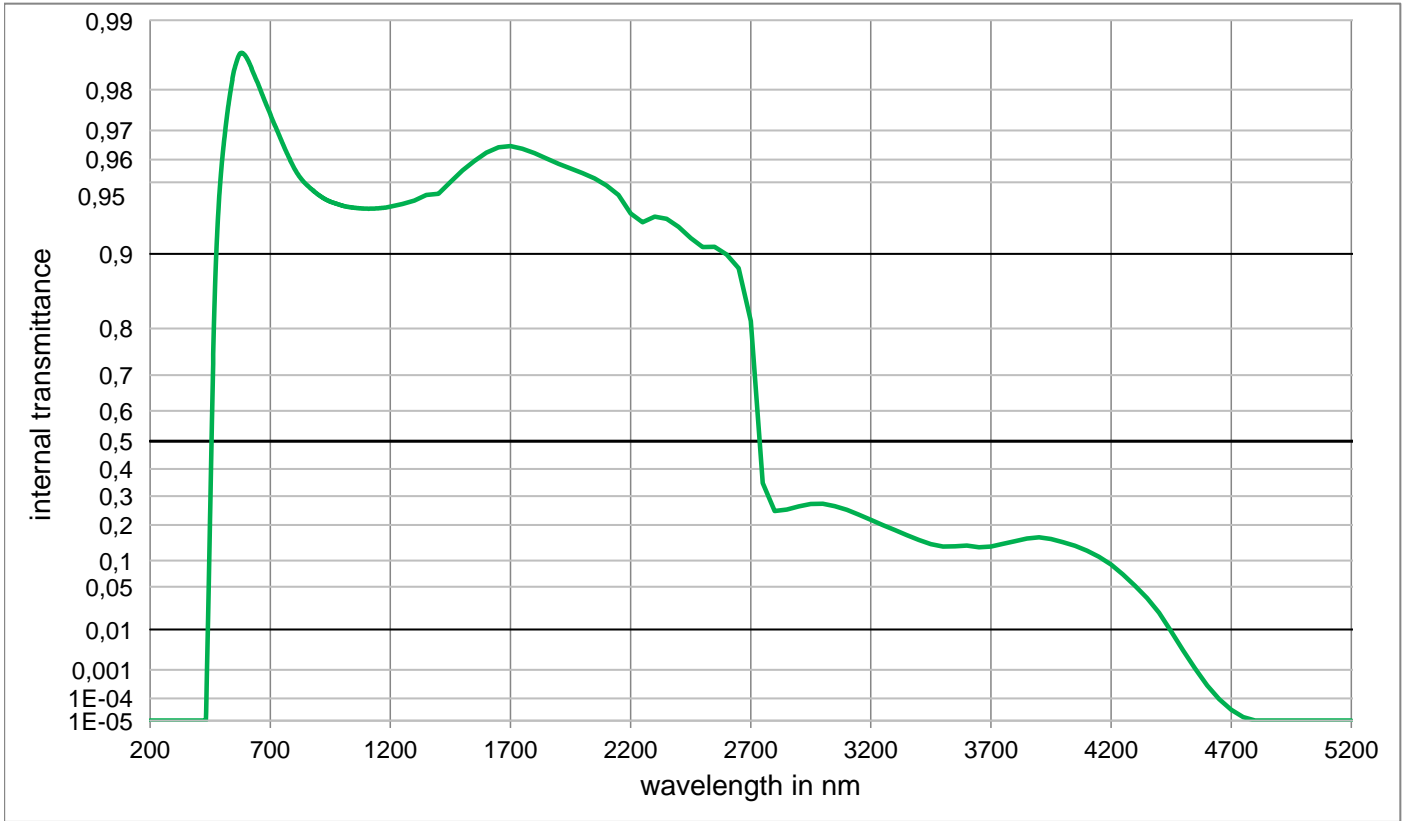
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,596E-01	800	9,600E-01	1100	9,390E-01	2200	9,376E-01	3700	1,608E-01
210	< 1,0E-05	510	9,667E-01	810	9,583E-01	1110	9,390E-01	2250	9,324E-01	3750	1,688E-01
220	< 1,0E-05	520	9,724E-01	820	9,568E-01	1120	9,389E-01	2300	9,365E-01	3800	1,759E-01
230	< 1,0E-05	530	9,767E-01	830	9,552E-01	1130	9,390E-01	2350	9,358E-01	3850	1,802E-01
240	< 1,0E-05	540	9,802E-01	840	9,537E-01	1140	9,391E-01	2400	9,307E-01	3900	1,817E-01
250	< 1,0E-05	550	9,829E-01	850	9,523E-01	1150	9,392E-01	2450	9,214E-01	3950	1,770E-01
260	< 1,0E-05	560	9,848E-01	860	9,510E-01	1160	9,394E-01	2500	9,154E-01	4000	1,683E-01
270	< 1,0E-05	570	9,859E-01	870	9,498E-01	1170	9,395E-01	2550	9,115E-01	4050	1,561E-01
280	< 1,0E-05	580	9,866E-01	880	9,489E-01	1180	9,397E-01	2600	9,076E-01	4100	1,404E-01
290	< 1,0E-05	590	9,868E-01	890	9,480E-01	1190	9,399E-01	2650	8,930E-01	4150	1,219E-01
300	< 1,0E-05	600	9,866E-01	900	9,471E-01	1200	9,401E-01	2700	8,152E-01	4200	1,034E-01
310	< 1,0E-05	610	9,862E-01	910	9,464E-01	1250	9,413E-01	2750	3,405E-01	4250	8,162E-02
320	< 1,000E-05	620	9,857E-01	920	9,457E-01	1300	9,434E-01	2800	2,494E-01	4300	5,873E-02
330	< 1,000E-05	630	9,850E-01	930	9,451E-01	1350	9,464E-01	2850	2,584E-01	4350	3,903E-02
340	< 1,000E-05	640	9,842E-01	940	9,444E-01	1400	9,466E-01	2900	2,745E-01	4400	2,142E-02
350	< 1,000E-05	650	9,833E-01	950	9,438E-01	1450	9,530E-01	2950	2,847E-01	4450	9,220E-03
360	< 1,000E-05	660	9,823E-01	960	9,432E-01	1500	9,579E-01	3000	2,890E-01	4500	3,490E-03
370	< 1,000E-05	670	9,811E-01	970	9,426E-01	1550	9,619E-01	3050	2,838E-01	4550	1,129E-03
380	< 1,000E-05	680	9,799E-01	980	9,420E-01	1600	9,651E-01	3100	2,715E-01	4600	3,010E-04
390	< 1,000E-05	690	9,785E-01	990	9,415E-01	1650	9,668E-01	3150	2,572E-01	4650	1,117E-04
400	< 1,000E-05	700	9,771E-01	1000	9,411E-01	1700	9,673E-01	3200	2,407E-01	4700	4,207E-05
410	< 1,000E-05	710	9,757E-01	1010	9,407E-01	1750	9,668E-01	3250	2,237E-01	4750	1,556E-05
420	5,714E-03	720	9,742E-01	1020	9,403E-01	1800	9,654E-01	3300	2,073E-01	4800	< 1,000E-05
430	2,404E-01	730	9,726E-01	1030	9,401E-01	1850	9,634E-01	3350	1,920E-01	4850	< 1,000E-05
440	6,640E-01	740	9,708E-01	1040	9,398E-01	1900	9,618E-01	3400	1,782E-01	4900	< 1,000E-05
450	8,424E-01	750	9,689E-01	1050	9,397E-01	1950	9,602E-01	3450	1,665E-01	4950	< 1,000E-05
460	8,986E-01	760	9,669E-01	1060	9,395E-01	2000	9,584E-01	3500	1,606E-01	5000	< 1,000E-05
470	9,230E-01	770	9,650E-01	1070	9,394E-01	2050	9,564E-01	3550	1,567E-01	5050	< 1,000E-05
480	9,386E-01	780	9,633E-01	1080	9,392E-01	2100	9,539E-01	3600	1,559E-01	5100	< 1,000E-05
490	9,506E-01	790	9,616E-01	1090	9,391E-01	2150	9,482E-01	3650	1,573E-01	5150	< 1,000E-05

GG455

Optical properties	Mechanical properties	Colorimetric properties																					
Reflection factor	Reference thickness	1 mm 2 mm 3 mm																					
$P_d = 0,918$	$d = 3,00 \text{ mm}$	<table border="1"> <tr> <td rowspan="5">Illuminant D65</td> <td>x</td> <td>0,344</td> <td>0,354</td> <td>0,361</td> </tr> <tr> <td>y</td> <td>0,394</td> <td>0,414</td> <td>0,426</td> </tr> <tr> <td>Y</td> <td>90,5</td> <td>89,7</td> <td>88,9</td> </tr> <tr> <td>λ_d</td> <td>568 nm</td> <td>568 nm</td> <td>568 nm</td> </tr> <tr> <td>P_e</td> <td>0,270</td> <td>0,355</td> <td>0,408</td> </tr> </table>	Illuminant D65	x	0,344	0,354	0,361	y	0,394	0,414	0,426	Y	90,5	89,7	88,9	λ_d	568 nm	568 nm	568 nm	P_e	0,270	0,355	0,408
Illuminant D65	x			0,344	0,354	0,361																	
	y			0,394	0,414	0,426																	
	Y			90,5	89,7	88,9																	
	λ_d			568 nm	568 nm	568 nm																	
	P_e	0,270	0,355	0,408																			
Spectral values guaranteed (d = 3 mm)	Density	<table border="1"> <tr> <td rowspan="5">Illuminant A</td> <td>x</td> <td>0,465</td> <td>0,470</td> <td>0,473</td> </tr> <tr> <td>y</td> <td>0,431</td> <td>0,437</td> <td>0,441</td> </tr> <tr> <td>Y</td> <td>91,0</td> <td>90,4</td> <td>89,8</td> </tr> <tr> <td>λ_d</td> <td>579 nm</td> <td>580 nm</td> <td>580 nm</td> </tr> <tr> <td>P_e</td> <td>0,282</td> <td>0,364</td> <td>0,415</td> </tr> </table>	Illuminant A	x	0,465	0,470	0,473	y	0,431	0,437	0,441	Y	91,0	90,4	89,8	λ_d	579 nm	580 nm	580 nm	P_e	0,282	0,364	0,415
Illuminant A	x			0,465	0,470	0,473																	
	y			0,431	0,437	0,441																	
	Y			91,0	90,4	89,8																	
	λ_d			579 nm	580 nm	580 nm																	
	P_e	0,282	0,364	0,415																			
$\lambda_{i,0,5} = 455 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,56 \text{ g/cm}^3$																						
$\lambda_s (\tau_{i,U} = 1E-05) = 390 \text{ nm}$	Knoop hardness																						
$\lambda_p (\tau_{i,L} = 0,92) = 530 \text{ nm}$	$HK_{[0,1/20]} = 445$																						
	Thermal properties																						
	Transformation temperature																						
	$T_g = 529 \text{ }^\circ\text{C}$																						
	Thermal expansion in $10^{-6}/\text{K}$																						
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 8,2$																						
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,5$																						
Refractive indices	Temperature coefficient																						
$n_d (587,6 \text{ nm}) = 1,52$	$Tk = 0,09 \text{ nm/K}$																						
$n_s (852 \text{ nm}) = 1,52$																							
$n_t (1014 \text{ nm}) = 1,51$																							
	Chemical properties																						
Sellmeier coefficients	Chemical resistance																						
on request	FR class = 0																						
	SR class = 1																						
	AR class = 1																						
	Resistance against humidity																						
	Resistant glass																						
	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5																						
Internal quality																							
Bubble class 3																							
		Notes																					
		Stricking glass																					
		Longpass filter																					
		ISO 23364:2021																					
		Disclaimer																					
		All data without tolerances are to be understood to be reference values.																					



GG455



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,600E-01	800	9,565E-01	1100	9,353E-01	2200	9,323E-01	3700	1,353E-01
210	< 1,0E-05	510	9,681E-01	810	9,547E-01	1110	9,353E-01	2250	9,263E-01	3750	1,428E-01
220	< 1,0E-05	520	9,741E-01	820	9,530E-01	1120	9,353E-01	2300	9,301E-01	3800	1,502E-01
230	< 1,0E-05	530	9,783E-01	830	9,515E-01	1130	9,354E-01	2350	9,287E-01	3850	1,579E-01
240	< 1,0E-05	540	9,813E-01	840	9,501E-01	1140	9,355E-01	2400	9,228E-01	3900	1,614E-01
250	< 1,0E-05	550	9,835E-01	850	9,489E-01	1150	9,356E-01	2450	9,141E-01	3950	1,566E-01
260	< 1,0E-05	560	9,848E-01	860	9,478E-01	1160	9,357E-01	2500	9,062E-01	4000	1,474E-01
270	< 1,0E-05	570	9,858E-01	870	9,467E-01	1170	9,358E-01	2550	9,066E-01	4050	1,372E-01
280	< 1,0E-05	580	9,861E-01	880	9,457E-01	1180	9,360E-01	2600	8,992E-01	4100	1,244E-01
290	< 1,0E-05	590	9,860E-01	890	9,446E-01	1190	9,363E-01	2650	8,855E-01	4150	1,092E-01
300	< 1,0E-05	600	9,855E-01	900	9,436E-01	1200	9,365E-01	2700	8,129E-01	4200	9,100E-02
310	< 1,0E-05	610	9,849E-01	910	9,426E-01	1250	9,381E-01	2750	3,480E-01	4250	7,064E-02
320	< 1,000E-05	620	9,840E-01	920	9,417E-01	1300	9,402E-01	2800	2,470E-01	4300	5,106E-02
330	< 1,000E-05	630	9,831E-01	930	9,409E-01	1350	9,434E-01	2850	2,521E-01	4350	3,463E-02
340	< 1,000E-05	640	9,821E-01	940	9,402E-01	1400	9,440E-01	2900	2,632E-01	4400	2,040E-02
350	< 1,000E-05	650	9,811E-01	950	9,396E-01	1450	9,502E-01	2950	2,713E-01	4450	9,120E-03
360	< 1,000E-05	660	9,798E-01	960	9,391E-01	1500	9,556E-01	3000	2,723E-01	4500	3,420E-03
370	< 1,000E-05	670	9,786E-01	970	9,386E-01	1550	9,595E-01	3050	2,640E-01	4550	1,100E-03
380	< 1,000E-05	680	9,772E-01	980	9,382E-01	1600	9,627E-01	3100	2,507E-01	4600	3,097E-04
390	< 1,000E-05	690	9,759E-01	990	9,377E-01	1650	9,646E-01	3150	2,344E-01	4650	9,484E-05
400	< 1,000E-05	700	9,745E-01	1000	9,372E-01	1700	9,650E-01	3200	2,168E-01	4700	3,236E-05
410	< 1,000E-05	710	9,730E-01	1010	9,368E-01	1750	9,640E-01	3250	1,998E-01	4750	1,500E-05
420	< 1,000E-05	720	9,714E-01	1020	9,365E-01	1800	9,625E-01	3300	1,836E-01	4800	< 1,000E-05
430	< 1,000E-05	730	9,698E-01	1030	9,363E-01	1850	9,605E-01	3350	1,681E-01	4850	< 1,000E-05
440	9,602E-03	740	9,680E-01	1040	9,361E-01	1900	9,583E-01	3400	1,540E-01	4900	< 1,000E-05
450	2,603E-01	750	9,662E-01	1050	9,359E-01	1950	9,563E-01	3450	1,421E-01	4950	< 1,000E-05
460	6,726E-01	760	9,643E-01	1060	9,357E-01	2000	9,543E-01	3500	1,357E-01	5000	< 1,000E-05
470	8,568E-01	770	9,623E-01	1070	9,356E-01	2050	9,519E-01	3550	1,359E-01	5050	< 1,000E-05
480	9,199E-01	780	9,604E-01	1080	9,355E-01	2100	9,484E-01	3600	1,378E-01	5100	< 1,000E-05
490	9,464E-01	790	9,585E-01	1090	9,354E-01	2150	9,434E-01	3650	1,333E-01	5150	< 1,000E-05

GG475

Optical properties	
Reflection factor	
P_d	= 0,918
Spectral values guaranteed (d = 3 mm)	
$\lambda_{i0,5}$	= 475 nm \pm 6 nm
λ_s ($\tau_{i,U} = 1E-05$)	= 410 nm
λ_p ($\tau_{i,L} = 0,92$)	= 550 nm
Refractive indices	
n_d (587,6 nm)	= 1,52
n_s (852 nm)	= 1,52
n_t (1014 nm)	= 1,51
Sellmeier coefficients	
on request	
Internal quality	
Bubble class	3

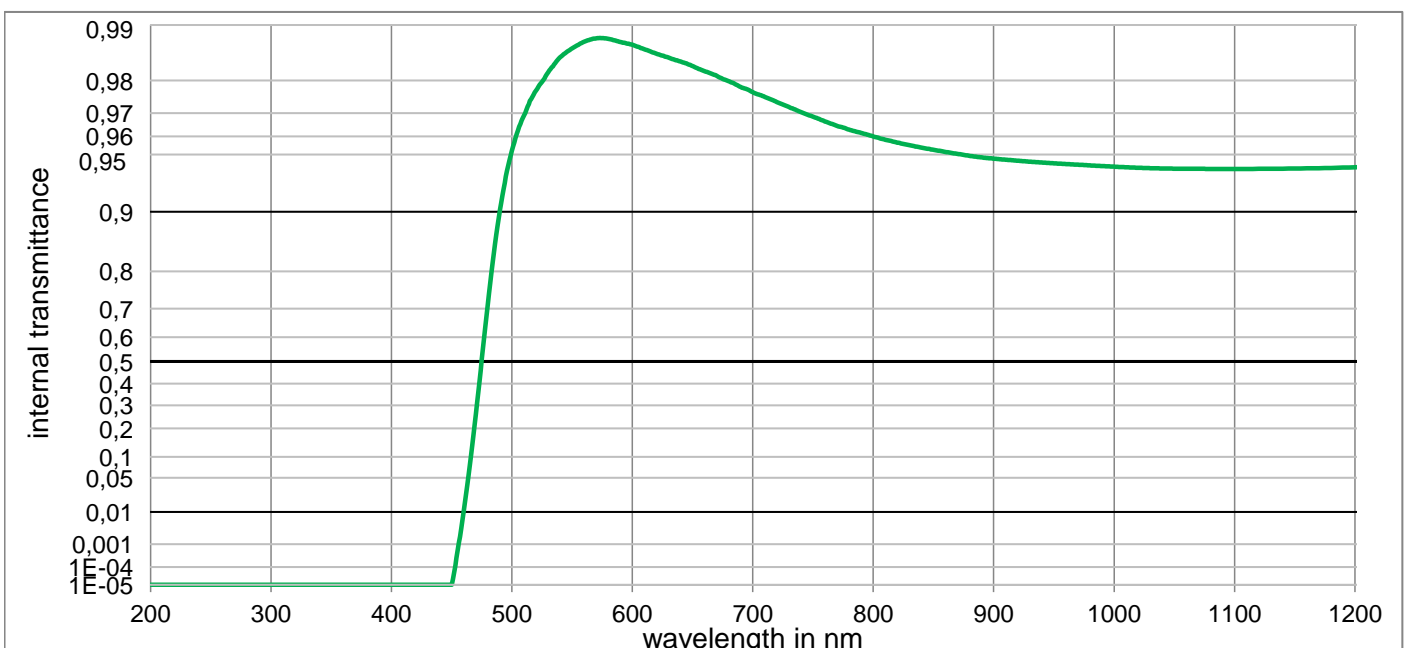
Mechanical properties	
Reference thickness	
d	= 3,00 mm
Density	
ρ	= 2,56 g/cm ³
Knoop hardness	
$HK_{[0,1/20]}$	= 451

Thermal properties	
Transformation temperature	
T_g	= 531 °C
Thermal expansion in $10^{-6}/K$	
α (-30°C/+70°C)	= 8,2
α (20°C/300°C)	= 9,4
Temperature coefficient	
Tk	= 0,09 nm/K

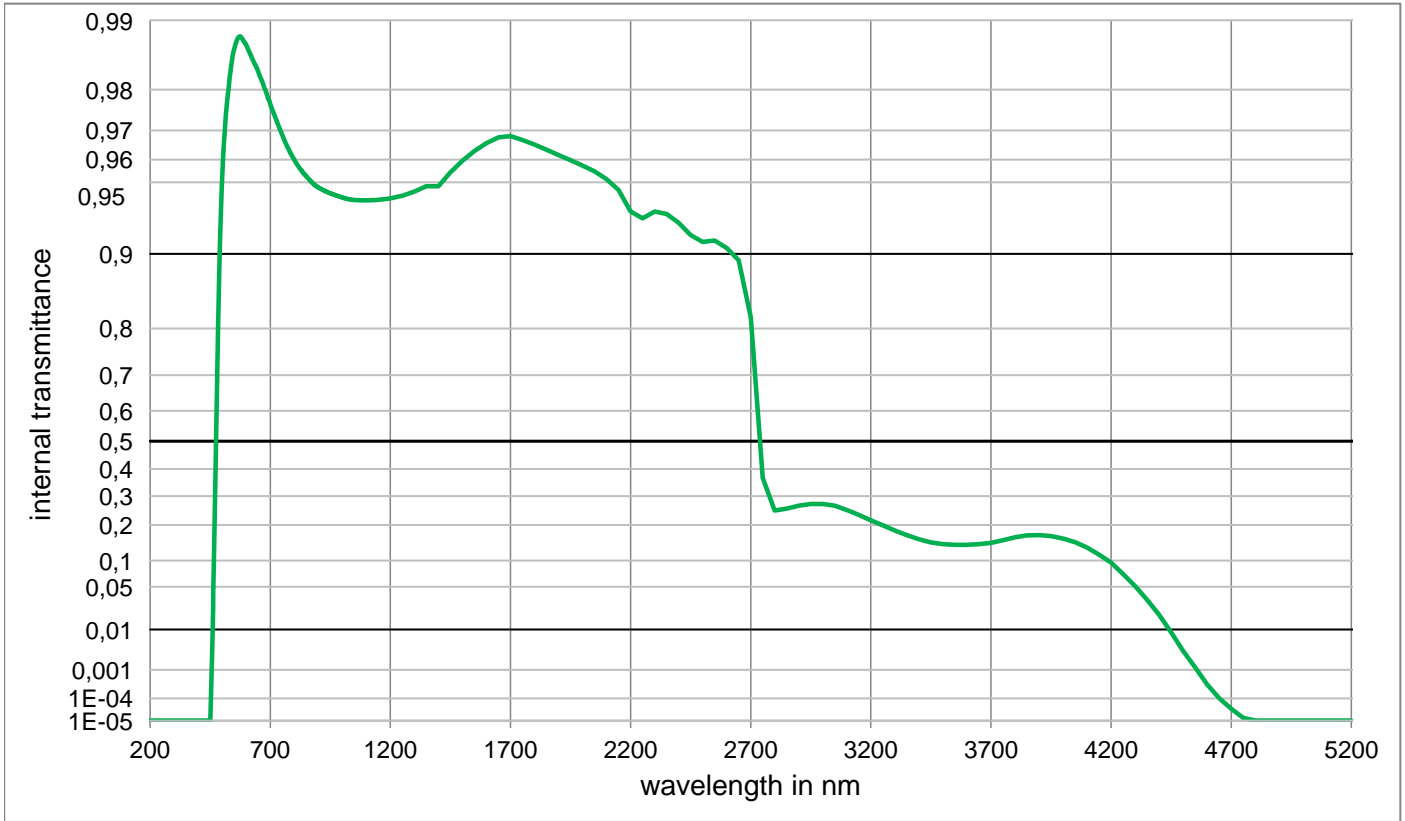
Chemical properties	
Chemical resistance	
FR class	= 0
SR class	= 1
AR class	= 1
Resistance against humidity	
Resistant glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties				
		1 mm	2 mm	3 mm
Illuminant D65	x	0,381	0,394	0,401
	y	0,463	0,485	0,494
	Y	89,5	88,5	87,7
	λ_d	568 nm	569 nm	569 nm
	P_e	0,567	0,664	0,709
Illuminant A	x	0,483	0,489	0,492
	y	0,453	0,460	0,463
	Y	90,7	90,0	89,4
	λ_d	580 nm	580 nm	580 nm
	P_e	0,560	0,648	0,689

Notes	
Stricking glass	
Longpass filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



GG475



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,523E-01	800	9,600E-01	1100	9,404E-01	2200	9,336E-01	3700	1,458E-01
210	< 1,0E-05	510	9,691E-01	810	9,583E-01	1110	9,404E-01	2250	9,290E-01	3750	1,530E-01
220	< 1,0E-05	520	9,773E-01	820	9,568E-01	1120	9,404E-01	2300	9,335E-01	3800	1,617E-01
230	< 1,0E-05	530	9,819E-01	830	9,554E-01	1130	9,405E-01	2350	9,320E-01	3850	1,674E-01
240	< 1,0E-05	540	9,850E-01	840	9,541E-01	1140	9,406E-01	2400	9,259E-01	3900	1,685E-01
250	< 1,0E-05	550	9,866E-01	850	9,529E-01	1150	9,407E-01	2450	9,164E-01	3950	1,656E-01
260	< 1,0E-05	560	9,877E-01	860	9,516E-01	1160	9,408E-01	2500	9,109E-01	4000	1,582E-01
270	< 1,0E-05	570	9,882E-01	870	9,504E-01	1170	9,409E-01	2550	9,120E-01	4050	1,473E-01
280	< 1,0E-05	580	9,881E-01	880	9,492E-01	1180	9,411E-01	2600	9,054E-01	4100	1,326E-01
290	< 1,0E-05	590	9,876E-01	890	9,482E-01	1190	9,413E-01	2650	8,939E-01	4150	1,147E-01
300	< 1,0E-05	600	9,872E-01	900	9,474E-01	1200	9,415E-01	2700	8,190E-01	4200	9,520E-02
310	< 1,0E-05	610	9,864E-01	910	9,468E-01	1250	9,430E-01	2750	3,672E-01	4250	7,140E-02
320	< 1,000E-05	620	9,857E-01	920	9,461E-01	1300	9,453E-01	2800	2,487E-01	4300	5,080E-02
330	< 1,000E-05	630	9,850E-01	930	9,454E-01	1350	9,481E-01	2850	2,550E-01	4350	3,277E-02
340	< 1,000E-05	640	9,842E-01	940	9,449E-01	1400	9,481E-01	2900	2,658E-01	4400	1,894E-02
350	< 1,000E-05	650	9,833E-01	950	9,443E-01	1450	9,546E-01	2950	2,713E-01	4450	8,760E-03
360	< 1,000E-05	660	9,822E-01	960	9,438E-01	1500	9,596E-01	3000	2,719E-01	4500	3,295E-03
370	< 1,000E-05	670	9,811E-01	970	9,434E-01	1550	9,633E-01	3050	2,657E-01	4550	1,200E-03
380	< 1,000E-05	680	9,799E-01	980	9,429E-01	1600	9,660E-01	3100	2,506E-01	4600	3,357E-04
390	< 1,000E-05	690	9,783E-01	990	9,424E-01	1650	9,679E-01	3150	2,333E-01	4650	1,035E-04
400	< 1,000E-05	700	9,769E-01	1000	9,420E-01	1700	9,683E-01	3200	2,158E-01	4700	3,656E-05
410	< 1,000E-05	710	9,754E-01	1010	9,416E-01	1750	9,671E-01	3250	1,989E-01	4750	1,393E-05
420	< 1,000E-05	720	9,739E-01	1020	9,412E-01	1800	9,655E-01	3300	1,827E-01	4800	< 1,000E-05
430	< 1,000E-05	730	9,722E-01	1030	9,409E-01	1850	9,638E-01	3350	1,680E-01	4850	< 1,000E-05
440	< 1,000E-05	740	9,704E-01	1040	9,407E-01	1900	9,618E-01	3400	1,558E-01	4900	< 1,000E-05
450	< 1,000E-05	750	9,686E-01	1050	9,406E-01	1950	9,598E-01	3450	1,467E-01	4950	< 1,000E-05
460	1,043E-02	760	9,667E-01	1060	9,405E-01	2000	9,575E-01	3500	1,419E-01	5000	< 1,000E-05
470	2,606E-01	770	9,649E-01	1070	9,404E-01	2050	9,551E-01	3550	1,402E-01	5050	< 1,000E-05
480	7,129E-01	780	9,632E-01	1080	9,404E-01	2100	9,516E-01	3600	1,403E-01	5100	< 1,000E-05
490	9,022E-01	790	9,616E-01	1090	9,404E-01	2150	9,462E-01	3650	1,418E-01	5150	< 1,000E-05

GG495

Optical properties	
Reflection factor	
P_d	0,917
Spectral values guaranteed (d = 3 mm)	
$\lambda_{i0,5}$	495 nm \pm 6 nm
$\lambda_s(\tau_{i,U} = 1E-05)$	430 nm
$\lambda_p(\tau_{i,L} = 0,92)$	560 nm
Refractive indices	
$n_d(587,6 \text{ nm})$	1,52
$n_s(852 \text{ nm})$	1,52
$n_t(1014 \text{ nm})$	1,51
Sellmeier coefficients	
valid from 400 nm to 2400 nm	
B_1	1,2863
B_2	0,0012
B_3	0,8815
C_1	9,397E-03 μm^2
C_2	1,5104E-01 μm^2
C_3	106,389 μm^2
Internal quality	
Bubble class	3

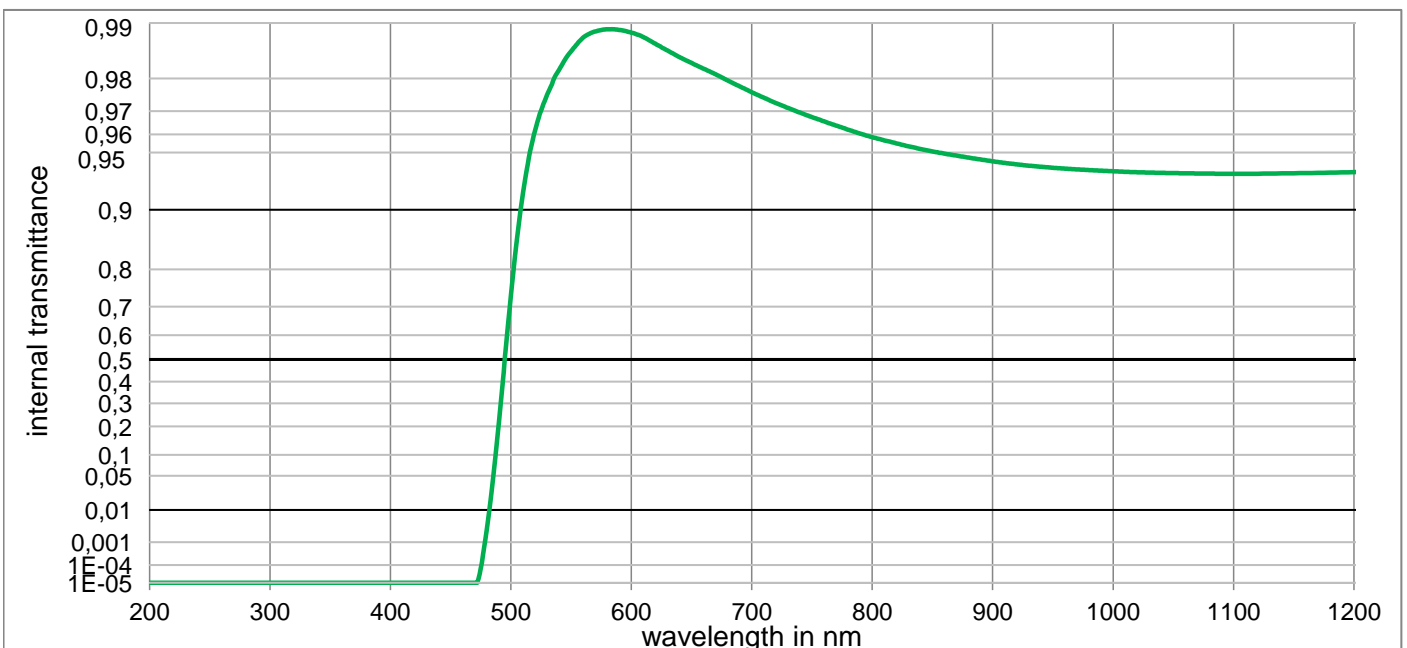
Mechanical properties	
Reference thickness	
d	3,00 mm
Density	
ρ	2,56 g/cm ³
Knoop hardness	
$HK_{[0,1/20]}$	501

Thermal properties	
Transformation temperature	
T_g	535 °C
Thermal expansion in 10⁻⁶/K	
$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})}$	8,1
$\alpha_{(20^\circ\text{C}/300^\circ\text{C})}$	9,4
Temperature coefficient	
Tk	0,1 nm/K

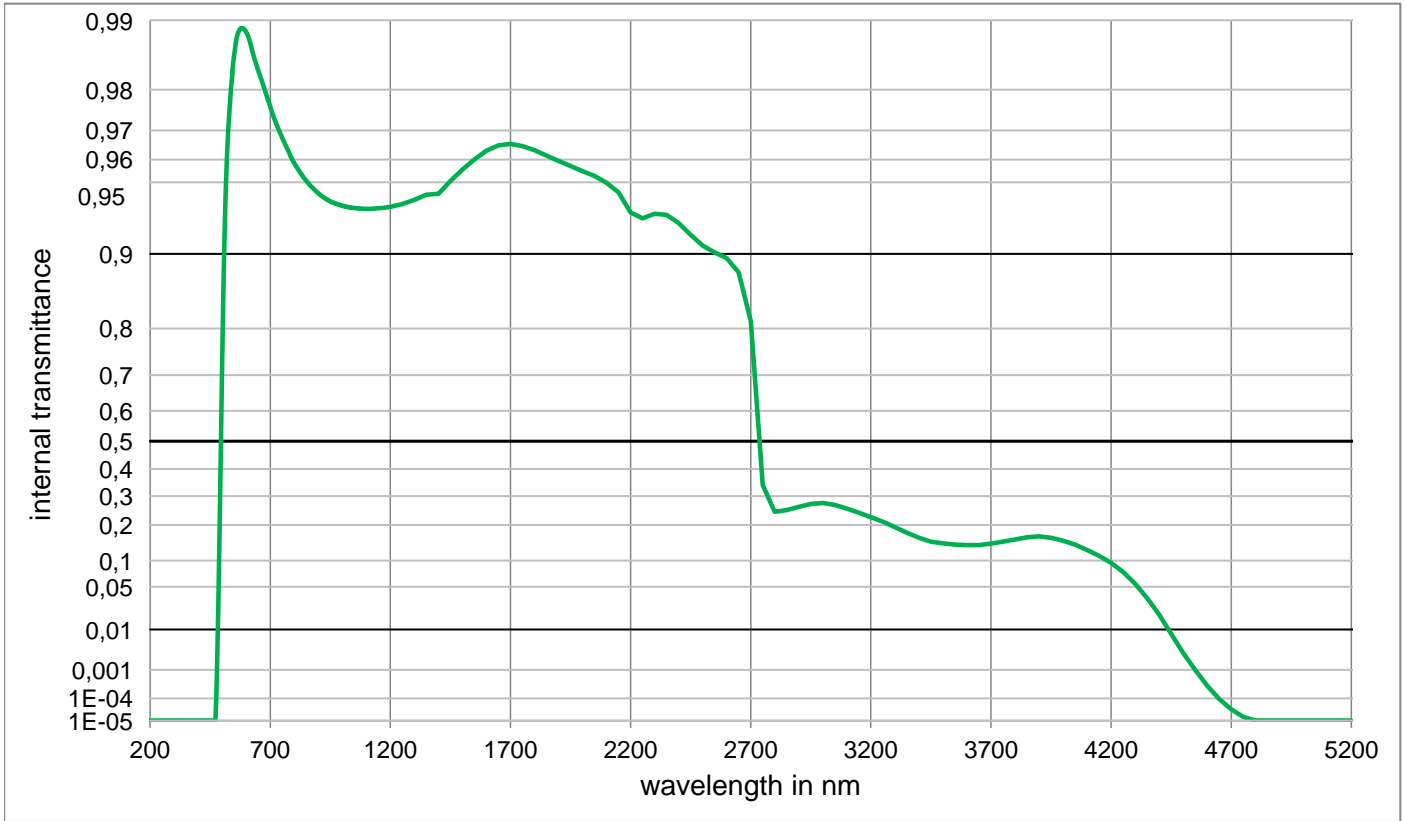
Chemical properties	
Chemical resistance	
FR class	0
SR class	1
AR class	1
Resistance against humidity	
Resistant glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties				
		1 mm	2 mm	3 mm
Illuminant D65	x	0,422	0,433	0,438
	y	0,514	0,525	0,527
	Y	86,7	85,1	84,0
	λ_d	570 nm	571 nm	571 nm
	P_e	0,824	0,887	0,904
Illuminant A	x	0,502	0,507	0,509
	y	0,469	0,472	0,472
	Y	89,5	88,5	87,7
	λ_d	580 nm	581 nm	581 nm
	P_e	0,807	0,862	0,880

Notes	
Striking glass	
Longpass filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



GG495

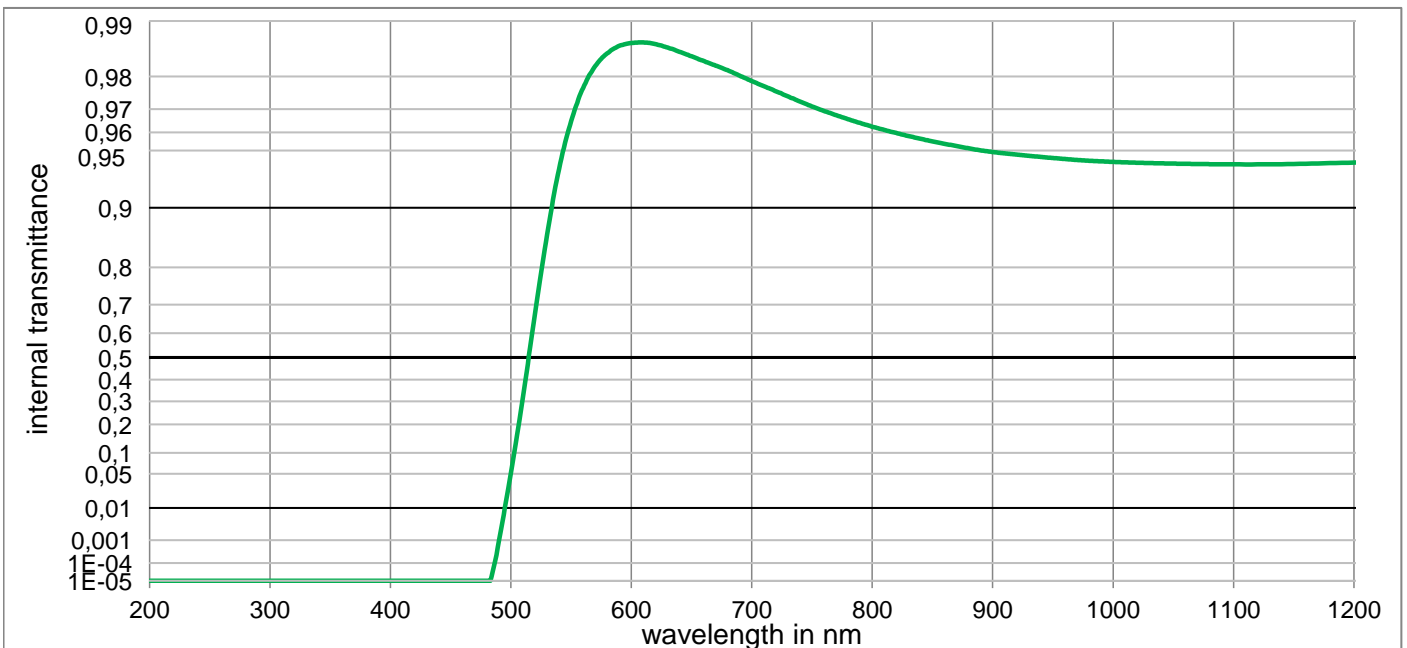


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

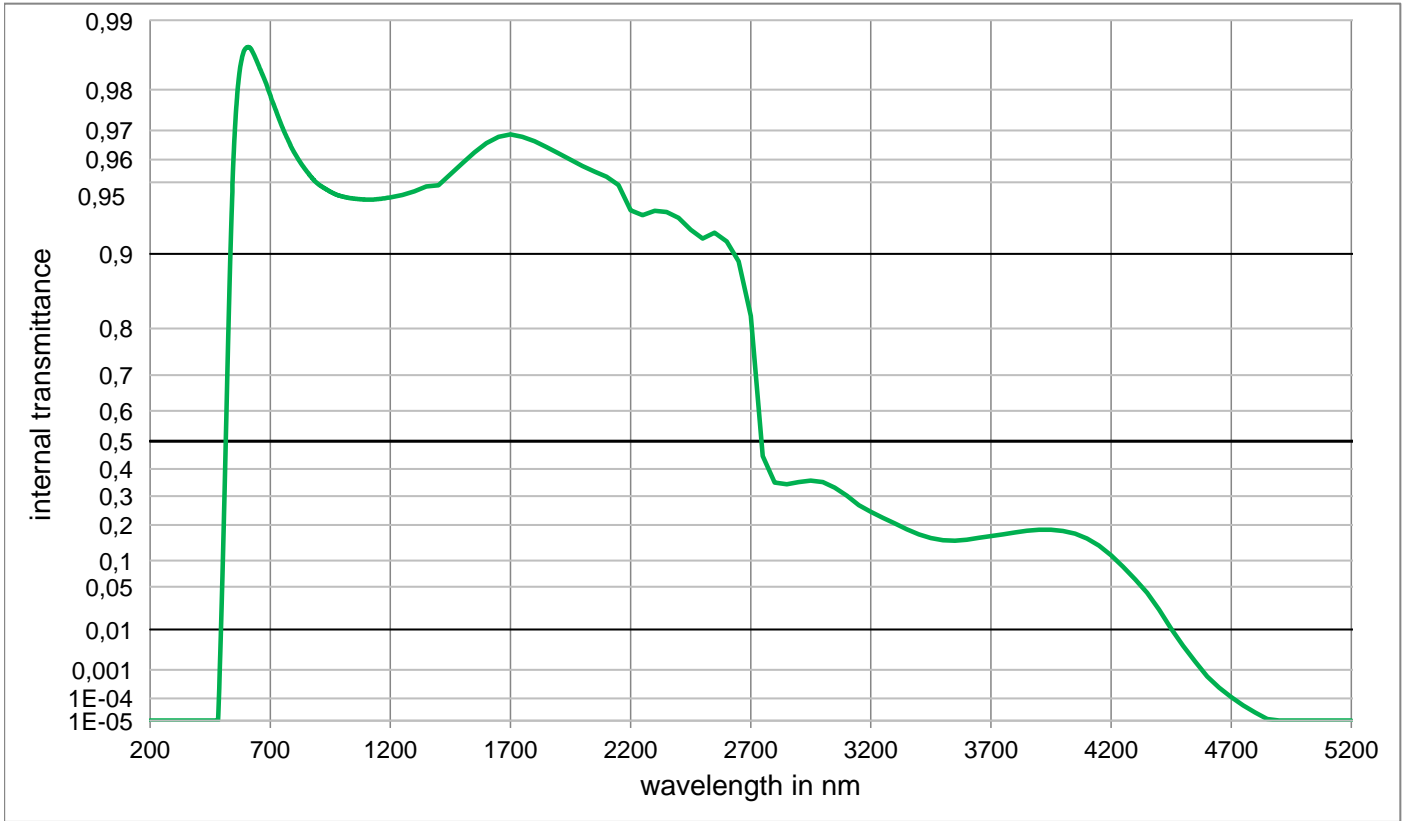
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	7,321E-01	800	9,586E-01	1100	9,352E-01	2200	9,329E-01	3700	1,435E-01
210	< 1,0E-05	510	9,185E-01	810	9,569E-01	1110	9,352E-01	2250	9,289E-01	3750	1,488E-01
220	< 1,0E-05	520	9,617E-01	820	9,553E-01	1120	9,352E-01	2300	9,320E-01	3800	1,553E-01
230	< 1,0E-05	530	9,755E-01	830	9,537E-01	1130	9,353E-01	2350	9,313E-01	3850	1,619E-01
240	< 1,0E-05	540	9,821E-01	840	9,522E-01	1140	9,355E-01	2400	9,256E-01	3900	1,643E-01
250	< 1,0E-05	550	9,858E-01	850	9,507E-01	1150	9,356E-01	2450	9,166E-01	3950	1,600E-01
260	< 1,0E-05	560	9,880E-01	860	9,493E-01	1160	9,357E-01	2500	9,077E-01	4000	1,521E-01
270	< 1,0E-05	570	9,889E-01	870	9,481E-01	1170	9,359E-01	2550	9,014E-01	4050	1,405E-01
280	< 1,0E-05	580	9,892E-01	880	9,468E-01	1180	9,360E-01	2600	8,958E-01	4100	1,265E-01
290	< 1,0E-05	590	9,891E-01	890	9,456E-01	1190	9,362E-01	2650	8,808E-01	4150	1,113E-01
300	< 1,0E-05	600	9,887E-01	900	9,443E-01	1200	9,364E-01	2700	8,125E-01	4200	9,490E-02
310	< 1,0E-05	610	9,881E-01	910	9,432E-01	1250	9,382E-01	2750	3,410E-01	4250	7,570E-02
320	< 1,000E-05	620	9,870E-01	920	9,422E-01	1300	9,407E-01	2800	2,445E-01	4300	5,470E-02
330	< 1,000E-05	630	9,859E-01	930	9,413E-01	1350	9,435E-01	2850	2,499E-01	4350	3,490E-02
340	< 1,000E-05	640	9,847E-01	940	9,405E-01	1400	9,441E-01	2900	2,611E-01	4400	1,910E-02
350	< 1,000E-05	650	9,835E-01	950	9,398E-01	1450	9,506E-01	2950	2,714E-01	4450	8,150E-03
360	< 1,000E-05	660	9,823E-01	960	9,391E-01	1500	9,560E-01	3000	2,751E-01	4500	2,939E-03
370	< 1,000E-05	670	9,810E-01	970	9,386E-01	1550	9,601E-01	3050	2,686E-01	4550	1,008E-03
380	< 1,000E-05	680	9,795E-01	980	9,381E-01	1600	9,634E-01	3100	2,558E-01	4600	3,020E-04
390	< 1,000E-05	690	9,779E-01	990	9,376E-01	1650	9,653E-01	3150	2,409E-01	4650	9,616E-05
400	< 1,000E-05	700	9,763E-01	1000	9,371E-01	1700	9,657E-01	3200	2,257E-01	4700	3,420E-05
410	< 1,000E-05	710	9,746E-01	1010	9,367E-01	1750	9,650E-01	3250	2,105E-01	4750	1,528E-05
420	< 1,000E-05	720	9,729E-01	1020	9,364E-01	1800	9,636E-01	3300	1,931E-01	4800	< 1,000E-05
430	< 1,000E-05	730	9,712E-01	1030	9,361E-01	1850	9,616E-01	3350	1,754E-01	4850	< 1,000E-05
440	< 1,000E-05	740	9,695E-01	1040	9,359E-01	1900	9,595E-01	3400	1,601E-01	4900	< 1,000E-05
450	< 1,000E-05	750	9,677E-01	1050	9,357E-01	1950	9,574E-01	3450	1,487E-01	4950	< 1,000E-05
460	< 1,000E-05	760	9,659E-01	1060	9,356E-01	2000	9,552E-01	3500	1,438E-01	5000	< 1,000E-05
470	< 1,000E-05	770	9,641E-01	1070	9,354E-01	2050	9,530E-01	3550	1,410E-01	5050	< 1,000E-05
480	2,765E-03	780	9,623E-01	1080	9,353E-01	2100	9,498E-01	3600	1,393E-01	5100	< 1,000E-05
490	2,183E-01	790	9,604E-01	1090	9,352E-01	2150	9,449E-01	3650	1,396E-01	5150	< 1,000E-05

OG515

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,921$	$d = 3,00 \text{ mm}$	x 0,448 0,465 0,473
Spectral values guaranteed (d = 3 mm)	Density	y 0,516 0,519 0,515
$\lambda_{i0,5} = 515 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,56 \text{ g/cm}^3$	Y 81,5 77,9 75,4
$\lambda_s (\tau_{i,U} = 1E-05) = 440 \text{ nm}$	Knoop hardness	λ_d 573 nm 574 nm 575 nm
$\lambda_p (\tau_{i,L} = 0,93) = 580 \text{ nm}$	$HK_{[0,1/20]} = 455$	P_e 0,902 0,958 0,969
		Illuminant D65
		x 0,516 0,525 0,530
		y 0,468 0,466 0,463
		Y 86,5 84,1 82,3
		λ_d 582 nm 583 nm 583 nm
		P_e 0,896 0,945 0,957
		Illuminant A
		x 0,516 0,525 0,530
		y 0,468 0,466 0,463
		Y 86,5 84,1 82,3
		λ_d 582 nm 583 nm 583 nm
		P_e 0,896 0,945 0,957
Refractive indices	Thermal properties	Notes
$n_d (587,6 \text{ nm}) = 1,51$	Transformation temperature	
$n_s (852 \text{ nm}) = 1,51$	$T_g = 509 \text{ }^\circ\text{C}$	
$n_t (1014 \text{ nm}) = 1,50$	Thermal expansion in $10^{-6}/\text{K}$	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,9$	
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,0$	
	Temperature coefficient	
	$Tk = 0,11 \text{ nm/K}$	
Sellmeier coefficients	Chemical properties	Stricking glass
on request	Chemical resistance	Longpass filter
	FR class = 0	
	SR class = 1	
	AR class = 1	
	Resistance against humidity	
	Resistant glass	
	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	ISO 23364:2021
Internal quality		Disclaimer
Bubble class 3		All data without tolerances are to be understood to be reference values.



OG515

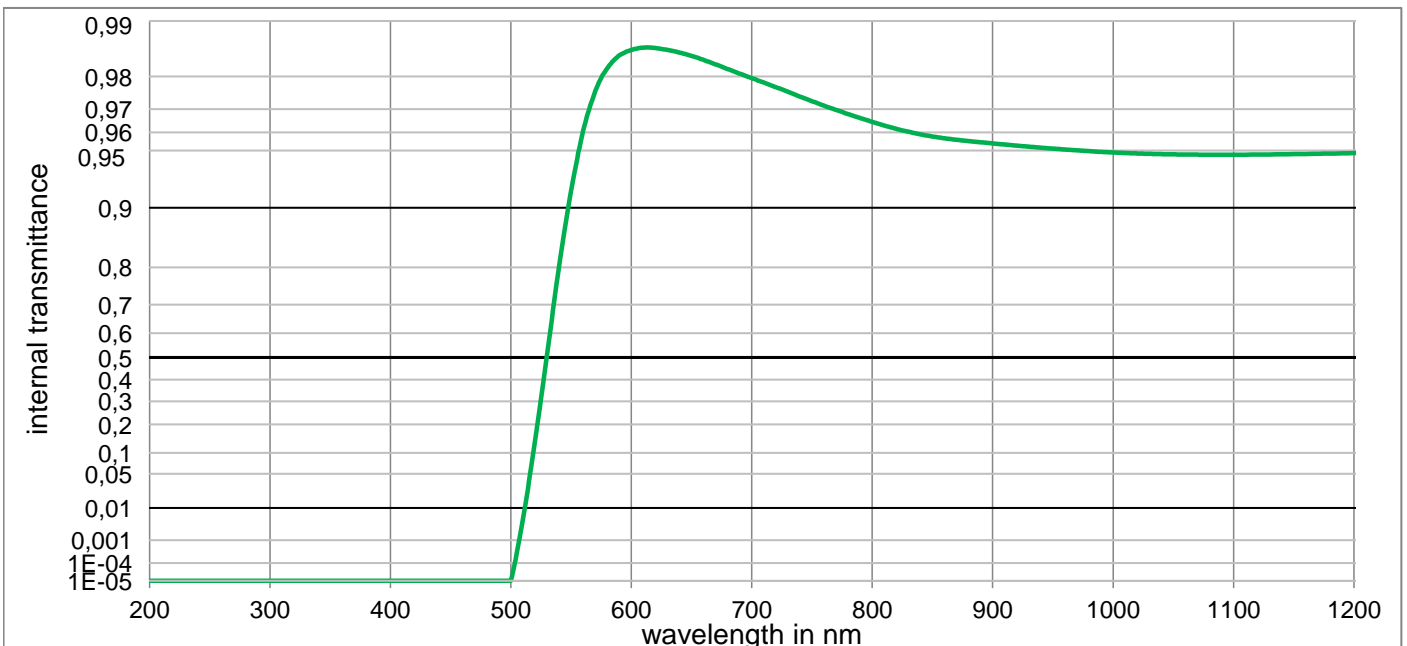


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

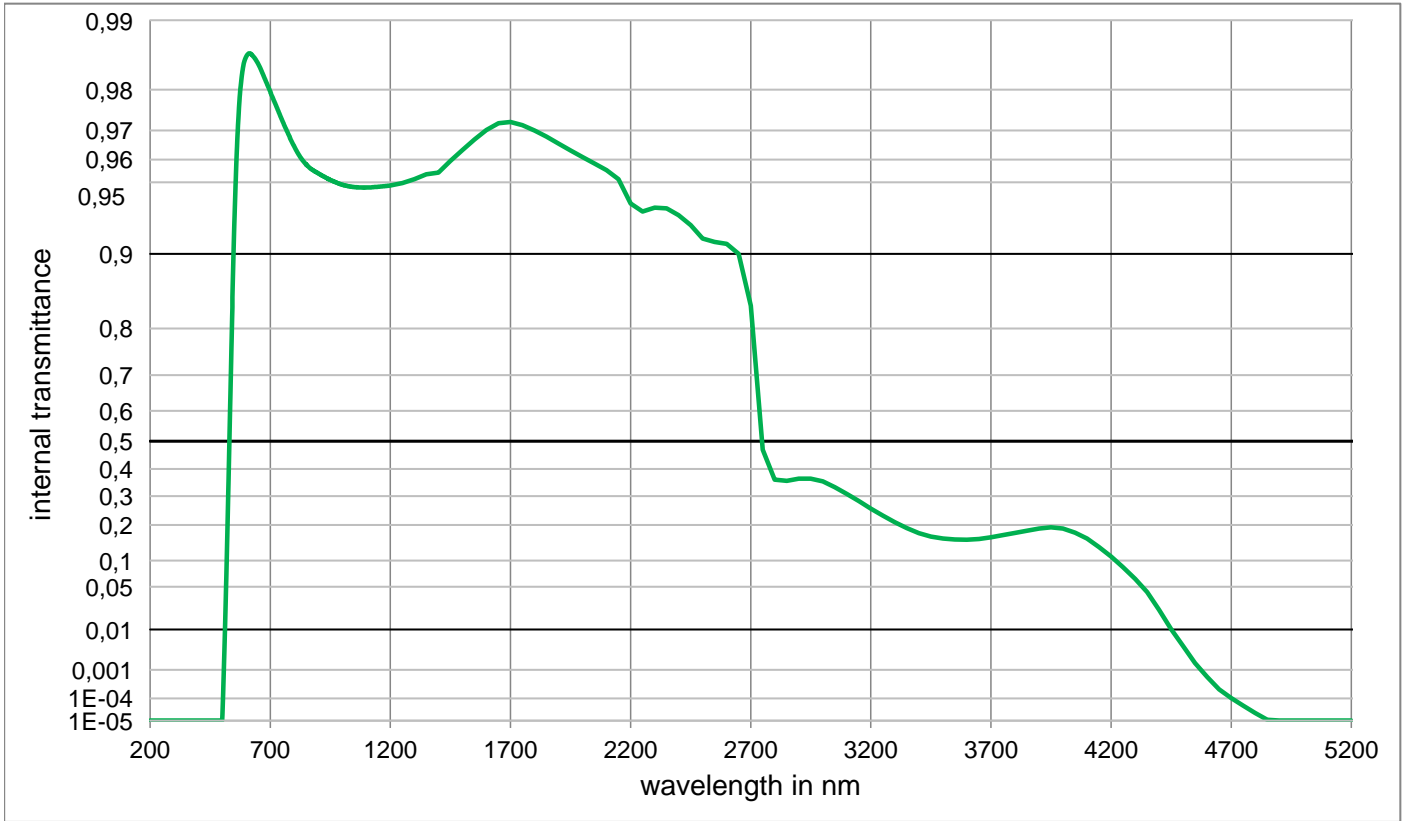
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	5,093E-02	800	9,627E-01	1100	9,408E-01	2200	9,342E-01	3700	1,653E-01
210	< 1,0E-05	510	3,219E-01	810	9,612E-01	1110	9,408E-01	2250	9,311E-01	3750	1,708E-01
220	< 1,0E-05	520	6,692E-01	820	9,597E-01	1120	9,408E-01	2300	9,339E-01	3800	1,767E-01
230	< 1,0E-05	530	8,627E-01	830	9,582E-01	1130	9,408E-01	2350	9,332E-01	3850	1,817E-01
240	< 1,0E-05	540	9,370E-01	840	9,568E-01	1140	9,409E-01	2400	9,292E-01	3900	1,850E-01
250	< 1,0E-05	550	9,652E-01	850	9,553E-01	1150	9,411E-01	2450	9,207E-01	3950	1,850E-01
260	< 1,0E-05	560	9,769E-01	860	9,540E-01	1160	9,413E-01	2500	9,136E-01	4000	1,811E-01
270	< 1,0E-05	570	9,824E-01	870	9,527E-01	1170	9,414E-01	2550	9,185E-01	4050	1,729E-01
280	< 1,0E-05	580	9,850E-01	880	9,514E-01	1180	9,416E-01	2600	9,111E-01	4100	1,582E-01
290	< 1,0E-05	590	9,864E-01	890	9,501E-01	1190	9,418E-01	2650	8,926E-01	4150	1,380E-01
300	< 1,0E-05	600	9,868E-01	900	9,491E-01	1200	9,421E-01	2700	8,215E-01	4200	1,127E-01
310	< 1,0E-05	610	9,869E-01	910	9,482E-01	1250	9,434E-01	2750	4,471E-01	4250	8,609E-02
320	< 1,00E-05	620	9,867E-01	920	9,474E-01	1300	9,454E-01	2800	3,500E-01	4300	6,209E-02
330	< 1,00E-05	630	9,861E-01	930	9,467E-01	1350	9,479E-01	2850	3,433E-01	4350	4,140E-02
340	< 1,00E-05	640	9,853E-01	940	9,459E-01	1400	9,486E-01	2900	3,513E-01	4400	2,314E-02
350	< 1,00E-05	650	9,844E-01	950	9,452E-01	1450	9,538E-01	2950	3,569E-01	4450	1,039E-02
360	< 1,00E-05	660	9,835E-01	960	9,445E-01	1500	9,586E-01	3000	3,519E-01	4500	4,394E-03
370	< 1,00E-05	670	9,825E-01	970	9,439E-01	1550	9,628E-01	3050	3,310E-01	4550	1,743E-03
380	< 1,00E-05	680	9,815E-01	980	9,433E-01	1600	9,660E-01	3100	3,011E-01	4600	6,152E-04
390	< 1,00E-05	690	9,802E-01	990	9,429E-01	1650	9,680E-01	3150	2,673E-01	4650	2,588E-04
400	< 1,00E-05	700	9,789E-01	1000	9,426E-01	1700	9,688E-01	3200	2,440E-01	4700	1,117E-04
410	< 1,00E-05	710	9,774E-01	1010	9,422E-01	1750	9,681E-01	3250	2,238E-01	4750	5,117E-05
420	< 1,00E-05	720	9,760E-01	1020	9,419E-01	1800	9,666E-01	3300	2,048E-01	4800	2,449E-05
430	< 1,00E-05	730	9,744E-01	1030	9,417E-01	1850	9,647E-01	3350	1,862E-01	4850	1,211E-05
440	< 1,00E-05	740	9,727E-01	1040	9,415E-01	1900	9,624E-01	3400	1,707E-01	4900	< 1,00E-05
450	< 1,00E-05	750	9,710E-01	1050	9,413E-01	1950	9,599E-01	3450	1,598E-01	4950	< 1,00E-05
460	< 1,00E-05	760	9,693E-01	1060	9,412E-01	2000	9,574E-01	3500	1,533E-01	5000	< 1,00E-05
470	< 1,00E-05	770	9,676E-01	1070	9,410E-01	2050	9,549E-01	3550	1,517E-01	5050	< 1,00E-05
480	< 1,00E-05	780	9,660E-01	1080	9,409E-01	2100	9,526E-01	3600	1,549E-01	5100	< 1,00E-05
490	9,674E-04	790	9,644E-01	1090	9,408E-01	2150	9,486E-01	3650	1,601E-01	5150	< 1,00E-05

OG530

Optical properties	Mechanical properties	Colorimetric properties																					
Reflection factor	Reference thickness	1 mm 2 mm 3 mm																					
$P_d = 0,921$	$d = 3,00 \text{ mm}$	<table border="1"> <tr> <td rowspan="5">Illuminant D65</td> <td>x</td> <td>0,476</td> <td>0,496</td> <td>0,505</td> </tr> <tr> <td>y</td> <td>0,501</td> <td>0,498</td> <td>0,490</td> </tr> <tr> <td>Y</td> <td>73,6</td> <td>68,7</td> <td>65,6</td> </tr> <tr> <td>λ_d</td> <td>576 nm</td> <td>578 nm</td> <td>579 nm</td> </tr> <tr> <td>P_e</td> <td>0,938</td> <td>0,985</td> <td>0,990</td> </tr> </table>	Illuminant D65	x	0,476	0,496	0,505	y	0,501	0,498	0,490	Y	73,6	68,7	65,6	λ_d	576 nm	578 nm	579 nm	P_e	0,938	0,985	0,990
Illuminant D65	x			0,476	0,496	0,505																	
	y			0,501	0,498	0,490																	
	Y			73,6	68,7	65,6																	
	λ_d			576 nm	578 nm	579 nm																	
	P_e	0,938	0,985	0,990																			
Spectral values guaranteed (d = 3 mm)	Density	<table border="1"> <tr> <td rowspan="5">Illuminant A</td> <td>x</td> <td>0,534</td> <td>0,545</td> <td>0,550</td> </tr> <tr> <td>y</td> <td>0,457</td> <td>0,452</td> <td>0,447</td> </tr> <tr> <td>Y</td> <td>81,4</td> <td>77,8</td> <td>75,4</td> </tr> <tr> <td>λ_d</td> <td>584 nm</td> <td>585 nm</td> <td>586 nm</td> </tr> <tr> <td>P_e</td> <td>0,943</td> <td>0,979</td> <td>0,984</td> </tr> </table>	Illuminant A	x	0,534	0,545	0,550	y	0,457	0,452	0,447	Y	81,4	77,8	75,4	λ_d	584 nm	585 nm	586 nm	P_e	0,943	0,979	0,984
Illuminant A	x			0,534	0,545	0,550																	
	y			0,457	0,452	0,447																	
	Y			81,4	77,8	75,4																	
	λ_d			584 nm	585 nm	586 nm																	
	P_e	0,943	0,979	0,984																			
$\lambda_{i0,5} = 530 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,56 \text{ g/cm}^3$																						
$\lambda_s (\tau_{i,U} = 1E-05) = 460 \text{ nm}$	Knoop hardness																						
$\lambda_p (\tau_{i,L} = 0,93) = 600 \text{ nm}$	$HK_{[0,1/20]} = 450$																						
	Thermal properties																						
	Transformation temperature																						
	$T_g = 506 \text{ °C}$																						
	Thermal expansion in $10^{-6}/\text{K}$																						
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,9$																						
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,0$																						
Refractive indices	Temperature coefficient																						
$n_d (587,6 \text{ nm}) = 1,51$	$Tk = 0,11 \text{ nm/K}$																						
$n_s (852 \text{ nm}) = 1,51$	Chemical properties																						
$n_t (1014 \text{ nm}) = 1,50$	Chemical resistance																						
	FR class = 0																						
Sellmeier coefficients	SR class = 1																						
on request	AR class = 1																						
	Resistance against humidity																						
	Resistant glass																						
	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5																						
Internal quality																							
Bubble class 3																							
		Notes																					
		Stricking glass																					
		Longpass filter																					
		ISO 23364:2021																					
		Disclaimer																					
		All data without tolerances are to be understood to be reference values.																					



OG530



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	9,649E-01	1100	9,474E-01	2200	9,385E-01	3700	1,617E-01
210	< 1,0E-05	510	5,189E-03	810	9,633E-01	1110	9,474E-01	2250	9,335E-01	3750	1,681E-01
220	< 1,0E-05	520	1,364E-01	820	9,617E-01	1120	9,475E-01	2300	9,360E-01	3800	1,751E-01
230	< 1,0E-05	530	5,140E-01	830	9,603E-01	1130	9,476E-01	2350	9,356E-01	3850	1,819E-01
240	< 1,0E-05	540	8,018E-01	840	9,591E-01	1140	9,477E-01	2400	9,311E-01	3900	1,888E-01
250	< 1,0E-05	550	9,191E-01	850	9,579E-01	1150	9,478E-01	2450	9,242E-01	3950	1,925E-01
260	< 1,0E-05	560	9,608E-01	860	9,570E-01	1160	9,479E-01	2500	9,136E-01	4000	1,884E-01
270	< 1,0E-05	570	9,760E-01	870	9,562E-01	1170	9,480E-01	2550	9,108E-01	4050	1,758E-01
280	< 1,0E-05	580	9,819E-01	880	9,555E-01	1180	9,481E-01	2600	9,091E-01	4100	1,579E-01
290	< 1,0E-05	590	9,846E-01	890	9,548E-01	1190	9,482E-01	2650	8,999E-01	4150	1,342E-01
300	< 1,0E-05	600	9,856E-01	900	9,542E-01	1200	9,484E-01	2700	8,375E-01	4200	1,099E-01
310	< 1,0E-05	610	9,861E-01	910	9,536E-01	1250	9,496E-01	2750	4,700E-01	4250	8,523E-02
320	< 1,000E-05	620	9,860E-01	920	9,529E-01	1300	9,515E-01	2800	3,608E-01	4300	6,292E-02
330	< 1,000E-05	630	9,856E-01	930	9,523E-01	1350	9,537E-01	2850	3,563E-01	4350	4,250E-02
340	< 1,000E-05	640	9,852E-01	940	9,517E-01	1400	9,545E-01	2900	3,638E-01	4400	2,287E-02
350	< 1,000E-05	650	9,845E-01	950	9,512E-01	1450	9,595E-01	2950	3,642E-01	4450	1,006E-02
360	< 1,000E-05	660	9,837E-01	960	9,506E-01	1500	9,637E-01	3000	3,540E-01	4500	4,333E-03
370	< 1,000E-05	670	9,828E-01	970	9,501E-01	1550	9,672E-01	3050	3,325E-01	4550	1,581E-03
380	< 1,000E-05	680	9,818E-01	980	9,497E-01	1600	9,701E-01	3100	3,076E-01	4600	5,943E-04
390	< 1,000E-05	690	9,807E-01	990	9,492E-01	1650	9,721E-01	3150	2,820E-01	4650	2,254E-04
400	< 1,000E-05	700	9,796E-01	1000	9,488E-01	1700	9,725E-01	3200	2,556E-01	4700	1,028E-04
410	< 1,000E-05	710	9,784E-01	1010	9,484E-01	1750	9,716E-01	3250	2,313E-01	4750	4,932E-05
420	< 1,000E-05	720	9,771E-01	1020	9,482E-01	1800	9,700E-01	3300	2,090E-01	4800	2,377E-05
430	< 1,000E-05	730	9,758E-01	1030	9,479E-01	1850	9,681E-01	3350	1,900E-01	4850	1,109E-05
440	< 1,000E-05	740	9,743E-01	1040	9,477E-01	1900	9,658E-01	3400	1,744E-01	4900	< 1,000E-05
450	< 1,000E-05	750	9,728E-01	1050	9,476E-01	1950	9,634E-01	3450	1,637E-01	4950	< 1,000E-05
460	< 1,000E-05	760	9,713E-01	1060	9,475E-01	2000	9,610E-01	3500	1,583E-01	5000	< 1,000E-05
470	< 1,000E-05	770	9,697E-01	1070	9,474E-01	2050	9,584E-01	3550	1,556E-01	5050	< 1,000E-05
480	< 1,000E-05	780	9,681E-01	1080	9,474E-01	2100	9,556E-01	3600	1,548E-01	5100	< 1,000E-05
490	< 1,000E-05	790	9,665E-01	1090	9,474E-01	2150	9,515E-01	3650	1,570E-01	5150	< 1,000E-05

OG550

Optical properties	
Reflection factor	
P_d	0,920
Spectral values guaranteed (d = 3 mm)	
$\lambda_{i,0,5}$	550 nm \pm 6 nm
$\lambda_s (\tau_{i,U} = 1E-05)$	480 nm
$\lambda_p (\tau_{i,L} = 0,93)$	620 nm
Refractive indices	
n_d (587,6 nm)	1,51
n_s (852 nm)	1,5
n_t (1014 nm)	1,50
Sellmeier coefficients	
valid from 580 nm to 2330 nm	
B_1	1,2525
B_2	0,0009
B_3	0,8269
C_1	9,542E-03 μm^2
C_2	1,8891E-01 μm^2
C_3	101,937 μm^2
Internal quality	
Bubble class	3

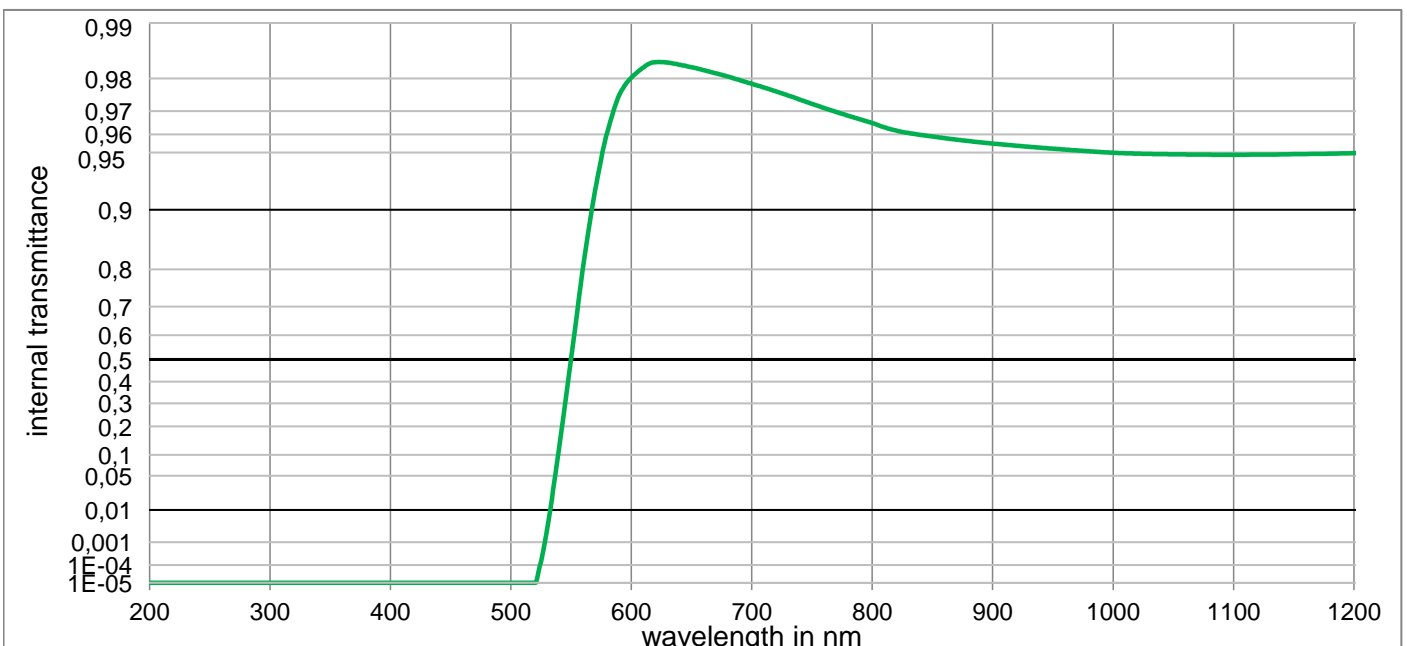
Mechanical properties	
Reference thickness	
d	3,00 mm
Density	
ρ	2,56 g/cm ³
Knoop hardness	
HK _[0,1/20]	462

Thermal properties	
Transformation temperature	
Tg	507 °C
Thermal expansion in 10⁻⁶/K	
α (-30°C/+70°C)	7,9
α (20°C/300°C)	9,0
Temperature coefficient	
Tk	0,12 nm/K

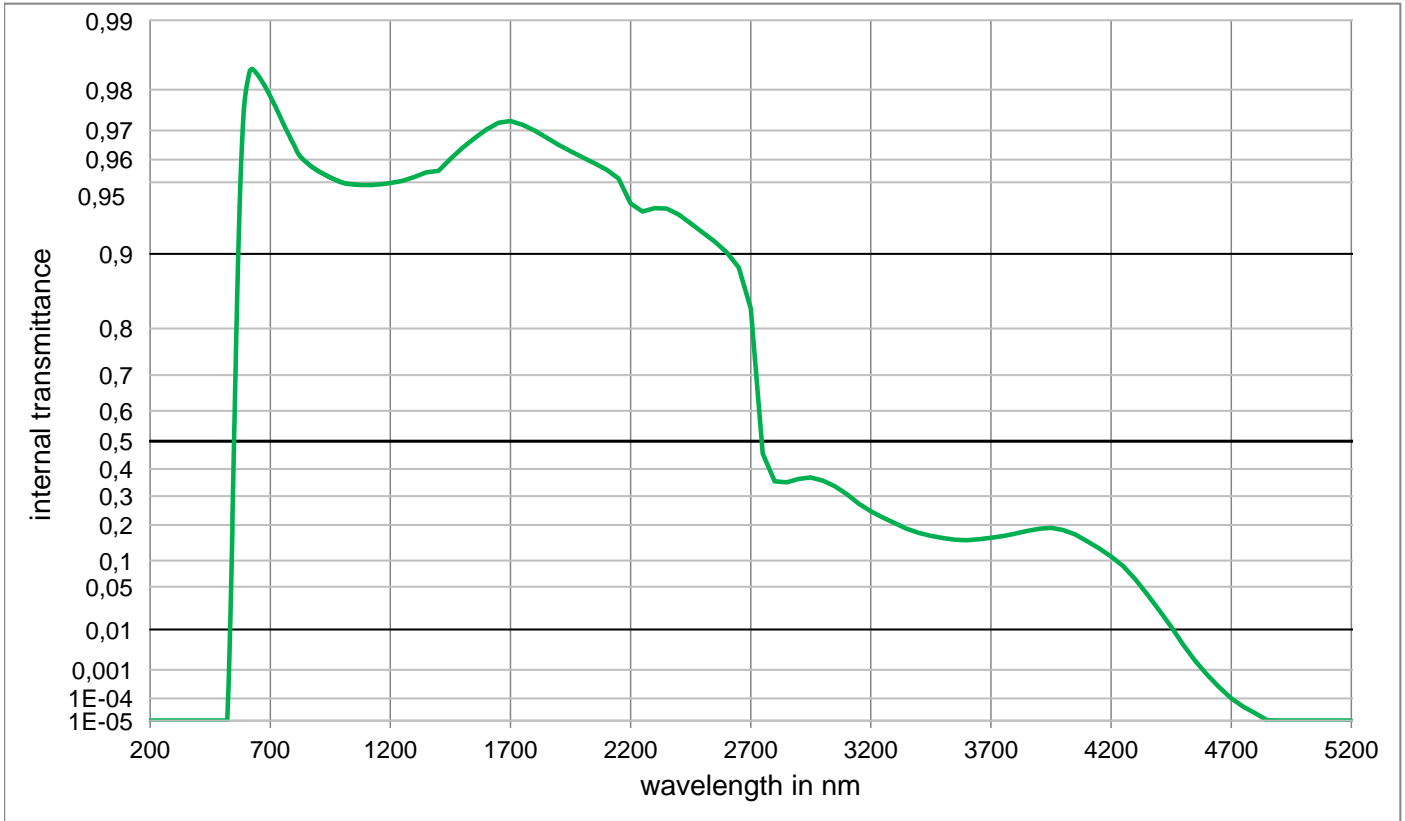
Chemical properties	
Chemical resistance	
FR class	0
SR class	1
AR class	1
Resistance against humidity	
Resistant glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties		1 mm	2 mm	3 mm
Illuminant D65	x	0,521	0,547	0,557
	y	0,459	0,451	0,441
	Y	58,3	52,3	48,9
	λ_d	583 nm	586 nm	587 nm
	P _e	0,948	0,996	0,998
Illuminant A	x	0,565	0,580	0,587
	y	0,429	0,419	0,412
	Y	69,8	64,8	61,7
	λ_d	589 nm	591 nm	592 nm
	P _e	0,963	0,995	0,997

Notes	
Stricking glass	
Longpass filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



OG550

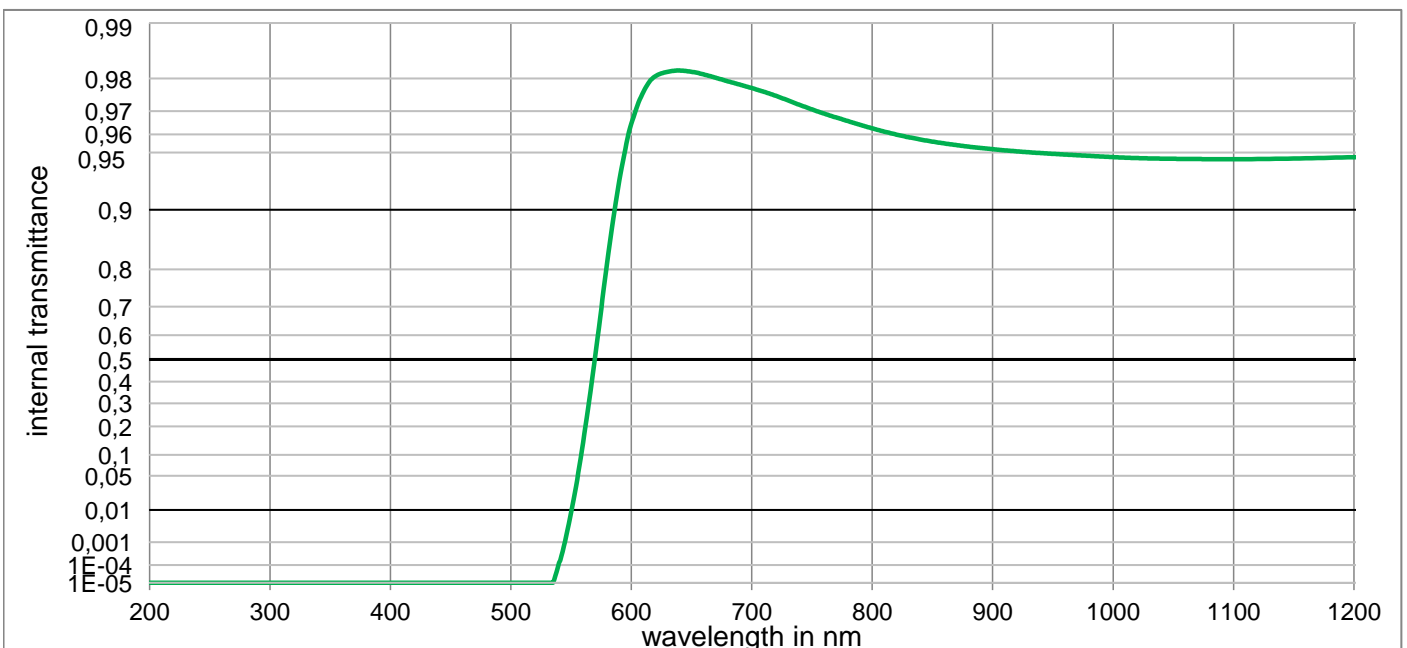


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

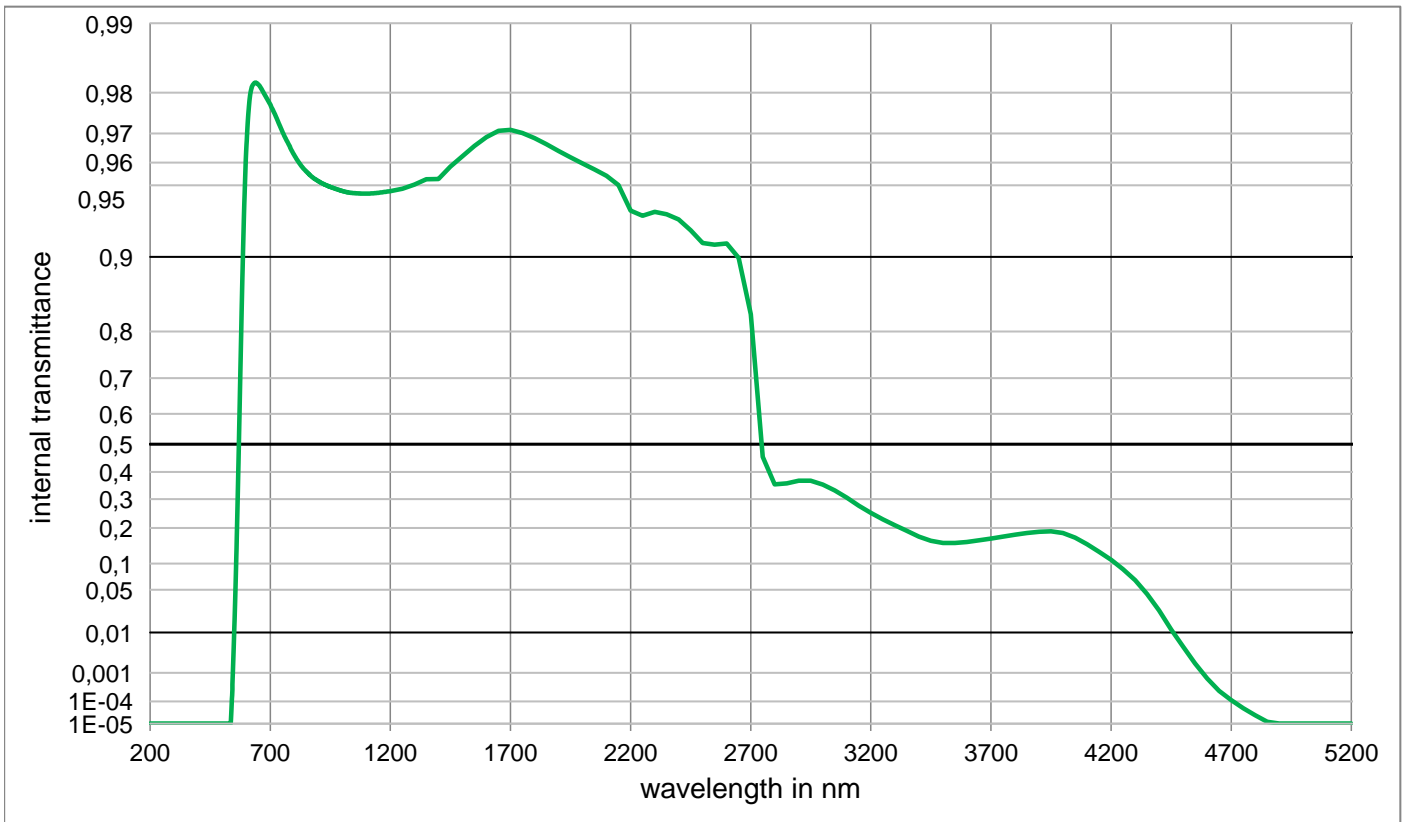
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	9,652E-01	1100	9,486E-01	2200	9,385E-01	3700	1,601E-01
210	< 1,0E-05	510	< 1,000E-05	810	9,633E-01	1110	9,486E-01	2250	9,335E-01	3750	1,653E-01
220	< 1,0E-05	520	< 1,000E-05	820	9,618E-01	1120	9,487E-01	2300	9,356E-01	3800	1,725E-01
230	< 1,0E-05	530	2,837E-03	830	9,607E-01	1130	9,488E-01	2350	9,353E-01	3850	1,806E-01
240	< 1,0E-05	540	1,194E-01	840	9,597E-01	1140	9,489E-01	2400	9,316E-01	3900	1,878E-01
250	< 1,0E-05	550	5,076E-01	850	9,589E-01	1150	9,490E-01	2450	9,254E-01	3950	1,905E-01
260	< 1,0E-05	560	8,065E-01	860	9,581E-01	1160	9,491E-01	2500	9,186E-01	4000	1,842E-01
270	< 1,0E-05	570	9,217E-01	870	9,573E-01	1170	9,492E-01	2550	9,112E-01	4050	1,706E-01
280	< 1,0E-05	580	9,608E-01	880	9,566E-01	1180	9,493E-01	2600	9,015E-01	4100	1,507E-01
290	< 1,0E-05	590	9,755E-01	890	9,559E-01	1190	9,495E-01	2650	8,864E-01	4150	1,305E-01
300	< 1,0E-05	600	9,802E-01	900	9,552E-01	1200	9,496E-01	2700	8,330E-01	4200	1,098E-01
310	< 1,0E-05	610	9,826E-01	910	9,546E-01	1250	9,507E-01	2750	4,559E-01	4250	8,790E-02
320	< 1,000E-05	620	9,837E-01	920	9,540E-01	1300	9,525E-01	2800	3,545E-01	4300	6,225E-02
330	< 1,000E-05	630	9,836E-01	930	9,534E-01	1350	9,547E-01	2850	3,508E-01	4350	3,942E-02
340	< 1,000E-05	640	9,832E-01	940	9,529E-01	1400	9,553E-01	2900	3,630E-01	4400	2,259E-02
350	< 1,000E-05	650	9,826E-01	950	9,523E-01	1450	9,602E-01	2950	3,684E-01	4450	1,125E-02
360	< 1,000E-05	660	9,820E-01	960	9,518E-01	1500	9,644E-01	3000	3,570E-01	4500	4,721E-03
370	< 1,000E-05	670	9,813E-01	970	9,513E-01	1550	9,676E-01	3050	3,358E-01	4550	1,845E-03
380	< 1,000E-05	680	9,805E-01	980	9,508E-01	1600	9,703E-01	3100	3,065E-01	4600	7,031E-04
390	< 1,000E-05	690	9,796E-01	990	9,503E-01	1650	9,722E-01	3150	2,725E-01	4650	2,704E-04
400	< 1,000E-05	700	9,786E-01	1000	9,499E-01	1700	9,727E-01	3200	2,459E-01	4700	9,979E-05
410	< 1,000E-05	710	9,776E-01	1010	9,496E-01	1750	9,717E-01	3250	2,244E-01	4750	4,519E-05
420	< 1,000E-05	720	9,765E-01	1020	9,493E-01	1800	9,700E-01	3300	2,055E-01	4800	2,259E-05
430	< 1,000E-05	730	9,753E-01	1030	9,492E-01	1850	9,678E-01	3350	1,881E-01	4850	1,052E-05
440	< 1,000E-05	740	9,740E-01	1040	9,490E-01	1900	9,655E-01	3400	1,749E-01	4900	< 1,000E-05
450	< 1,000E-05	750	9,726E-01	1050	9,489E-01	1950	9,632E-01	3450	1,660E-01	4950	< 1,000E-05
460	< 1,000E-05	760	9,711E-01	1060	9,488E-01	2000	9,609E-01	3500	1,599E-01	5000	< 1,000E-05
470	< 1,000E-05	770	9,697E-01	1070	9,487E-01	2050	9,585E-01	3550	1,546E-01	5050	< 1,000E-05
480	< 1,000E-05	780	9,682E-01	1080	9,487E-01	2100	9,558E-01	3600	1,533E-01	5100	< 1,000E-05
490	< 1,000E-05	790	9,668E-01	1090	9,486E-01	2150	9,519E-01	3650	1,558E-01	5150	< 1,000E-05

OG570

Optical properties		Mechanical properties		Colorimetric properties				
Reflection factor		Reference thickness		1 mm 2 mm 3 mm				
$P_d = 0,921$		$d = 3,00 \text{ mm}$		Illuminant D65	x	0,566	0,600	0,611
Spectral values guaranteed (d = 3 mm)		Density			y	0,412	0,399	0,389
$\lambda_{i,0,5} = 570 \text{ nm} \pm 6 \text{ nm}$		$\rho = 2,74 \text{ g/cm}^3$			Y	42,7	36,1	32,9
$\lambda_s (\tau_{i,U} = 1E-05) = 500 \text{ nm}$		Knoop hardness			λ_d	591 nm	595 nm	597 nm
$\lambda_p (\tau_{i,L} = 0,93) = 640 \text{ nm}$		$HK_{[0,1/20]} = 455$			P_e	0,941	0,998	1,000
				Illuminant A	x	0,600	0,619	0,627
		Thermal properties			y	0,394	0,380	0,372
		Transformation temperature			Y	55,7	49,4	46,0
		$T_g = 510 \text{ }^\circ\text{C}$			λ_d	596 nm	598 nm	600 nm
		Thermal expansion in $10^{-6}/\text{K}$			P_e	0,964	0,999	1,000
Refractive indices		$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,9$						
$n_d (587,6 \text{ nm}) = 1,51$		$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,0$						
$n_s (852 \text{ nm}) = 1,51$								
$n_t (1014 \text{ nm}) = 1,50$		Temperature coefficient						
		$Tk = 0,12 \text{ nm/K}$						
Sellmeier coefficients		Chemical properties		Notes				
on request		Chemical resistance						
		FR class = 0		Stricking glass				
		SR class = 1		Longpass filter				
		AR class = 1						
		Resistance against humidity						
		Resistant glass		ISO 23364:2021				
		see pocket catalogue "Optical Filter Glass 2024", chapter 5.5		Disclaimer				
Internal quality				All data without tolerances are to be understood to be reference values.				
Bubble class 3								



OG570



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

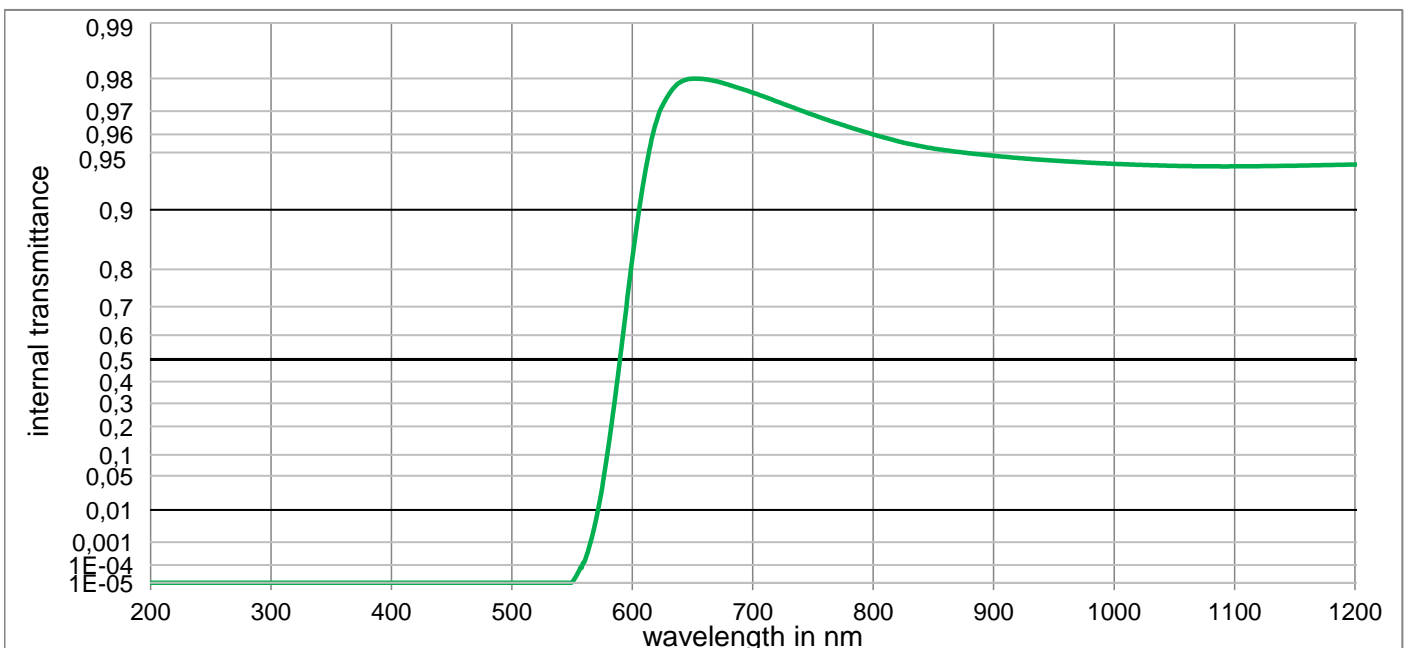
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	9,629E-01	1100	9,457E-01	2200	9,360E-01	3700	1,671E-01
210	< 1,0E-05	510	< 1,000E-05	810	9,613E-01	1110	9,458E-01	2250	9,328E-01	3750	1,730E-01
220	< 1,0E-05	520	< 1,000E-05	820	9,599E-01	1120	9,458E-01	2300	9,352E-01	3800	1,787E-01
230	< 1,0E-05	530	< 1,000E-05	830	9,586E-01	1130	9,459E-01	2350	9,337E-01	3850	1,839E-01
240	< 1,0E-05	540	1,275E-04	840	9,574E-01	1140	9,461E-01	2400	9,302E-01	3900	1,879E-01
250	< 1,0E-05	550	8,832E-03	850	9,563E-01	1150	9,462E-01	2450	9,224E-01	3950	1,893E-01
260	< 1,0E-05	560	1,386E-01	860	9,553E-01	1160	9,464E-01	2500	9,125E-01	4000	1,838E-01
270	< 1,0E-05	570	5,166E-01	870	9,544E-01	1170	9,465E-01	2550	9,111E-01	4050	1,700E-01
280	< 1,0E-05	580	8,155E-01	880	9,535E-01	1180	9,467E-01	2600	9,121E-01	4100	1,503E-01
290	< 1,0E-05	590	9,299E-01	890	9,527E-01	1190	9,469E-01	2650	8,991E-01	4150	1,297E-01
300	< 1,0E-05	600	9,649E-01	900	9,520E-01	1200	9,470E-01	2700	8,288E-01	4200	1,090E-01
310	< 1,0E-05	610	9,764E-01	910	9,513E-01	1250	9,483E-01	2750	4,551E-01	4250	8,758E-02
320	< 1,000E-05	620	9,806E-01	920	9,507E-01	1300	9,503E-01	2800	3,544E-01	4300	6,582E-02
330	< 1,000E-05	630	9,816E-01	930	9,502E-01	1350	9,529E-01	2850	3,574E-01	4350	4,375E-02
340	< 1,000E-05	640	9,819E-01	940	9,497E-01	1400	9,529E-01	2900	3,675E-01	4400	2,518E-02
350	< 1,000E-05	650	9,816E-01	950	9,492E-01	1450	9,584E-01	2950	3,676E-01	4450	1,145E-02
360	< 1,000E-05	660	9,810E-01	960	9,488E-01	1500	9,625E-01	3000	3,531E-01	4500	4,940E-03
370	< 1,000E-05	670	9,802E-01	970	9,483E-01	1550	9,661E-01	3050	3,320E-01	4550	1,875E-03
380	< 1,000E-05	680	9,793E-01	980	9,479E-01	1600	9,689E-01	3100	3,052E-01	4600	6,610E-04
390	< 1,000E-05	690	9,784E-01	990	9,475E-01	1650	9,708E-01	3150	2,759E-01	4650	2,500E-04
400	< 1,000E-05	700	9,775E-01	1000	9,471E-01	1700	9,711E-01	3200	2,507E-01	4700	1,134E-04
410	< 1,000E-05	710	9,764E-01	1010	9,468E-01	1750	9,701E-01	3250	2,286E-01	4750	5,284E-05
420	< 1,000E-05	720	9,752E-01	1020	9,465E-01	1800	9,686E-01	3300	2,093E-01	4800	2,512E-05
430	< 1,000E-05	730	9,737E-01	1030	9,463E-01	1850	9,666E-01	3350	1,906E-01	4850	1,226E-05
440	< 1,000E-05	740	9,722E-01	1040	9,461E-01	1900	9,643E-01	3400	1,730E-01	4900	< 1,000E-05
450	< 1,000E-05	750	9,706E-01	1050	9,460E-01	1950	9,620E-01	3450	1,604E-01	4950	< 1,000E-05
460	< 1,000E-05	760	9,691E-01	1060	9,459E-01	2000	9,597E-01	3500	1,540E-01	5000	< 1,000E-05
470	< 1,000E-05	770	9,676E-01	1070	9,458E-01	2050	9,572E-01	3550	1,536E-01	5050	< 1,000E-05
480	< 1,000E-05	780	9,661E-01	1080	9,458E-01	2100	9,544E-01	3600	1,568E-01	5100	< 1,000E-05
490	< 1,000E-05	790	9,644E-01	1090	9,457E-01	2150	9,502E-01	3650	1,618E-01	5150	< 1,000E-05

OG590

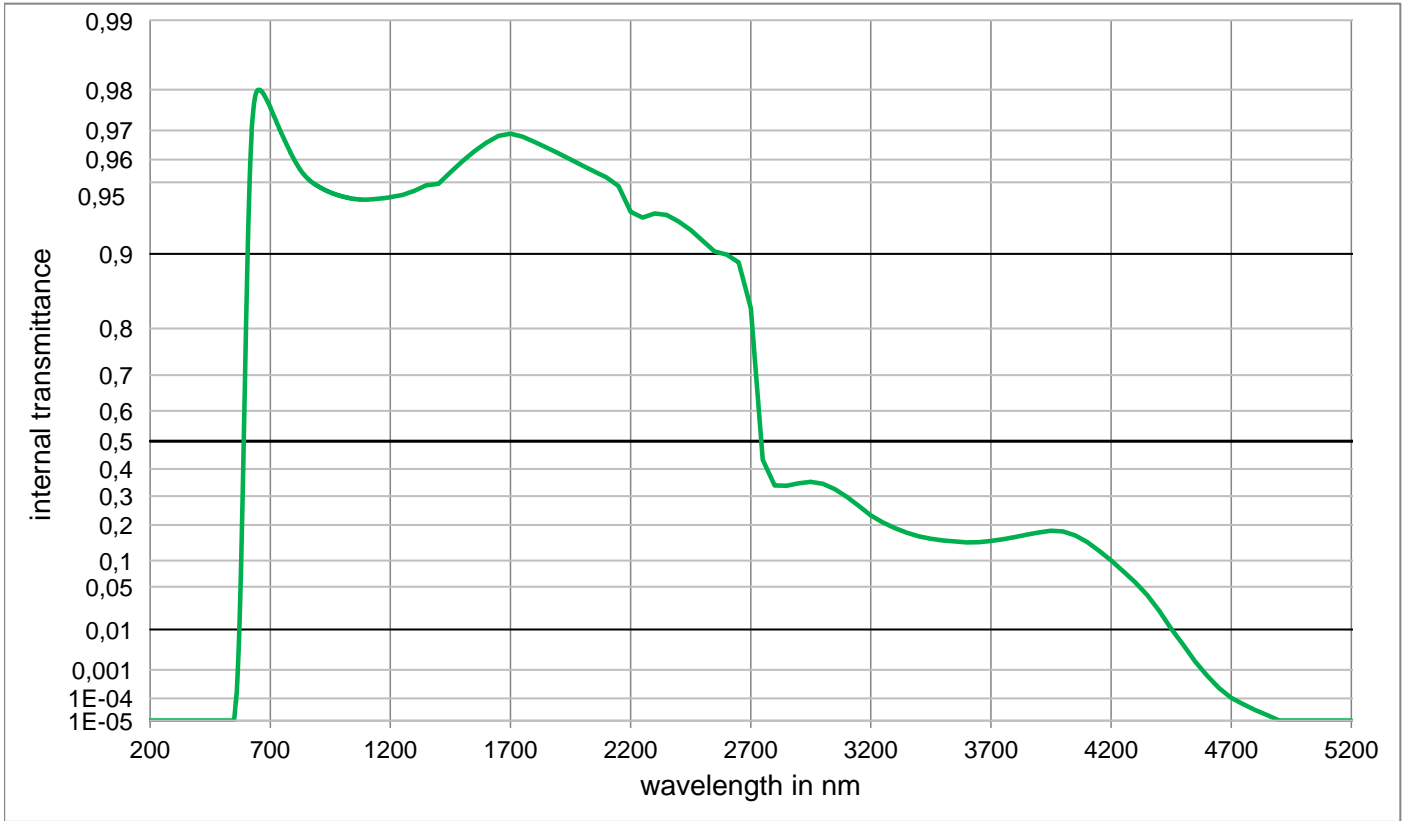
Optical properties	
Reflection factor	$P_d = 0,921$
Spectral values guaranteed (d = 3 mm)	
$\lambda_{i,0,5} = 590 \text{ nm} \pm 6 \text{ nm}$	
$\lambda_s (\tau_{i,U} = 1E-05) = 510 \text{ nm}$	
$\lambda_p (\tau_{i,L} = 0,93) = 660 \text{ nm}$	
Refractive indices	
$n_d (587,6 \text{ nm}) = 1,51$	
$n_s (852 \text{ nm}) = 1,51$	
$n_t (1014 \text{ nm}) = 1,50$	
Sellmeier coefficients	
on request	
Internal quality	
Bubble class	3

Mechanical properties	
Reference thickness	d = 3,00 mm
Density	$\rho = 2,56 \text{ g/cm}^3$
Knoop hardness	$HK_{[0.1/20]} = 448$
Thermal properties	
Transformation temperature	Tg = 506 °C
Thermal expansion in	$10^{-6}/K$
$\alpha_{(-30^\circ C/+70^\circ C)} = 7,9$	
$\alpha_{(20^\circ C/300^\circ C)} = 9,0$	
Temperature coefficient	Tk = 0,13 nm/K
Chemical properties	
Chemical resistance	
FR class = 0	
SR class = 1	
AR class = 1	
Resistance against humidity	
Resistant glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,610	0,652	0,661
	y	0,361	0,347	0,338
	Y	27,3	21,5	19,2
	λ_d	602 nm	606 nm	609 nm
	P_e	0,920	0,998	1,000
Illuminant A	x	0,639	0,662	0,669
	y	0,354	0,338	0,331
	Y	39,2	32,7	29,8
	λ_d	605 nm	609 nm	611 nm
	P_e	0,956	0,998	0,999
Notes				
Stricking glass				
Longpass filter				
ISO 23364:2021				
Disclaimer				
All data without tolerances are to be understood to be reference values.				



OG590

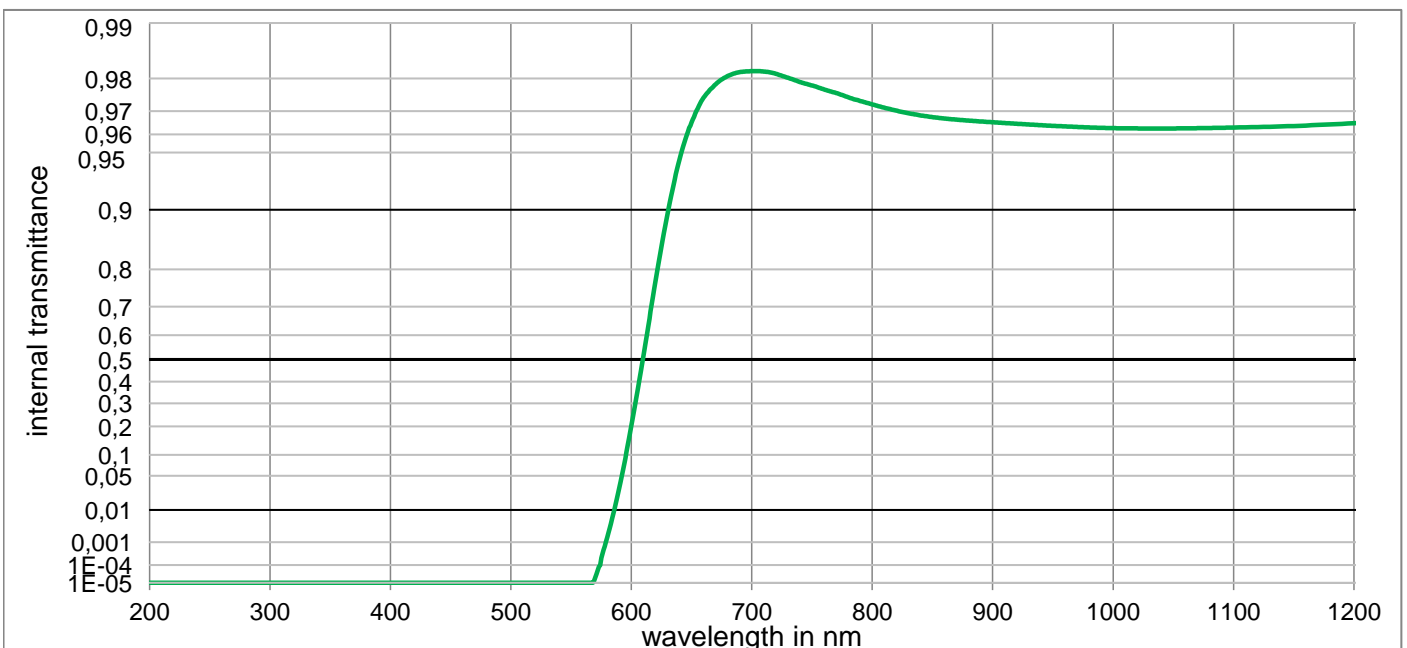


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

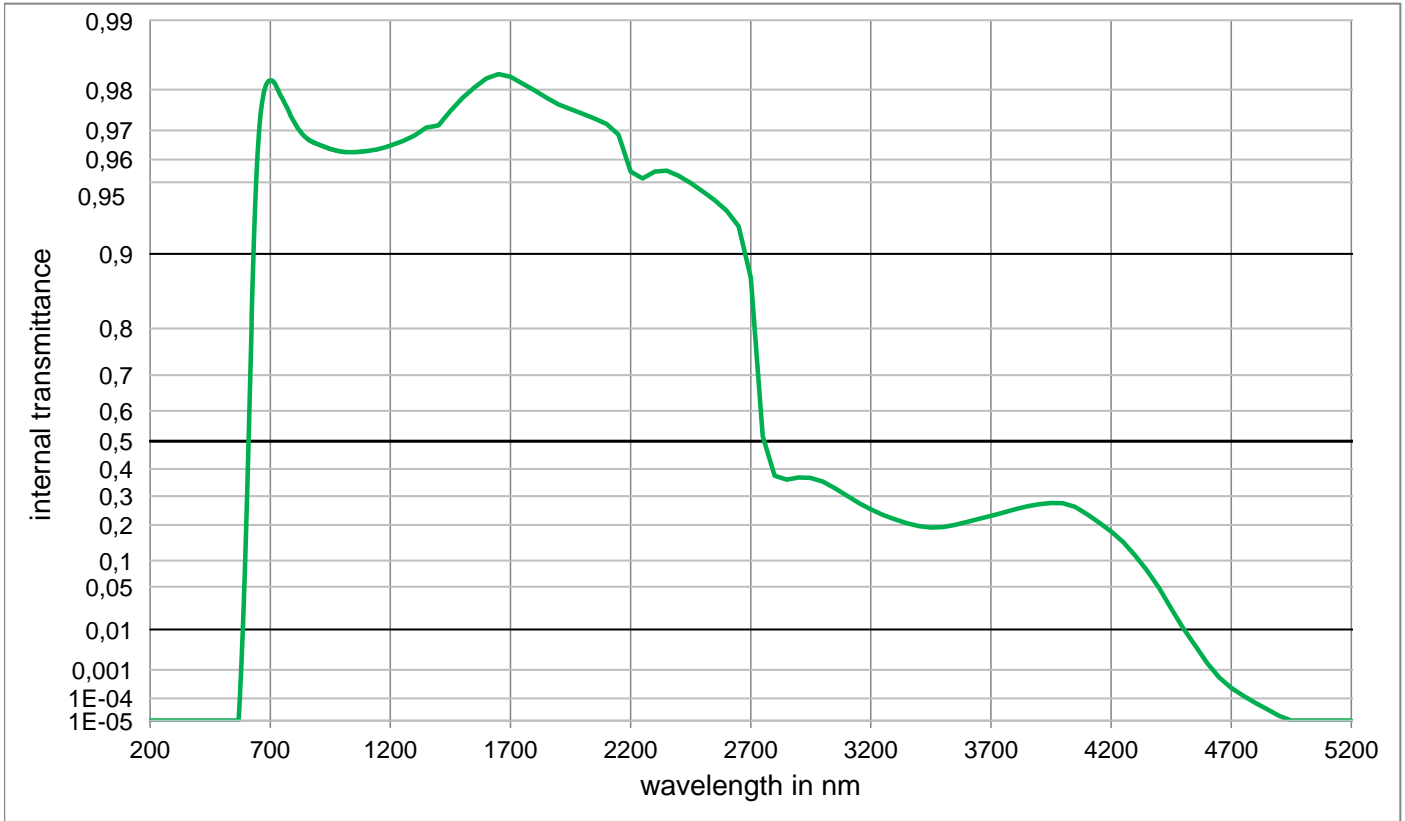
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	9,600E-01	1100	9,408E-01	2200	9,334E-01	3700	1,509E-01
210	< 1,0E-05	510	< 1,000E-05	810	9,583E-01	1110	9,408E-01	2250	9,295E-01	3750	1,558E-01
220	< 1,0E-05	520	< 1,000E-05	820	9,566E-01	1120	9,409E-01	2300	9,323E-01	3800	1,624E-01
230	< 1,0E-05	530	< 1,000E-05	830	9,551E-01	1130	9,410E-01	2350	9,313E-01	3850	1,697E-01
240	< 1,0E-05	540	< 1,000E-05	840	9,537E-01	1140	9,411E-01	2400	9,267E-01	3900	1,765E-01
250	< 1,0E-05	550	1,060E-05	850	9,524E-01	1150	9,413E-01	2450	9,205E-01	3950	1,813E-01
260	< 1,0E-05	560	1,311E-04	860	9,514E-01	1160	9,414E-01	2500	9,117E-01	4000	1,794E-01
270	< 1,0E-05	570	5,941E-03	870	9,504E-01	1170	9,416E-01	2550	9,024E-01	4050	1,678E-01
280	< 1,0E-05	580	1,208E-01	880	9,495E-01	1180	9,418E-01	2600	8,992E-01	4100	1,480E-01
290	< 1,0E-05	590	5,150E-01	890	9,488E-01	1190	9,420E-01	2650	8,917E-01	4150	1,246E-01
300	< 1,0E-05	600	8,226E-01	900	9,480E-01	1200	9,421E-01	2700	8,337E-01	4200	1,006E-01
310	< 1,0E-05	610	9,329E-01	910	9,473E-01	1250	9,434E-01	2750	4,344E-01	4250	7,750E-02
320	< 1,000E-05	620	9,658E-01	920	9,466E-01	1300	9,457E-01	2800	3,392E-01	4300	5,680E-02
330	< 1,000E-05	630	9,755E-01	930	9,459E-01	1350	9,485E-01	2850	3,381E-01	4350	3,854E-02
340	< 1,000E-05	640	9,791E-01	940	9,454E-01	1400	9,493E-01	2900	3,473E-01	4400	2,229E-02
350	< 1,000E-05	650	9,800E-01	950	9,448E-01	1450	9,547E-01	2950	3,524E-01	4450	1,033E-02
360	< 1,000E-05	660	9,798E-01	960	9,443E-01	1500	9,594E-01	3000	3,453E-01	4500	4,710E-03
370	< 1,000E-05	670	9,793E-01	970	9,438E-01	1550	9,632E-01	3050	3,252E-01	4550	1,742E-03
380	< 1,000E-05	680	9,784E-01	980	9,434E-01	1600	9,662E-01	3100	2,969E-01	4600	6,577E-04
390	< 1,000E-05	690	9,773E-01	990	9,430E-01	1650	9,684E-01	3150	2,648E-01	4650	2,483E-04
400	< 1,000E-05	700	9,762E-01	1000	9,426E-01	1700	9,690E-01	3200	2,322E-01	4700	1,059E-04
410	< 1,000E-05	710	9,748E-01	1010	9,422E-01	1750	9,681E-01	3250	2,078E-01	4750	5,728E-05
420	< 1,000E-05	720	9,734E-01	1020	9,419E-01	1800	9,664E-01	3300	1,899E-01	4800	3,214E-05
430	< 1,000E-05	730	9,718E-01	1030	9,416E-01	1850	9,645E-01	3350	1,755E-01	4850	1,832E-05
440	< 1,000E-05	740	9,702E-01	1040	9,414E-01	1900	9,623E-01	3400	1,643E-01	4900	< 1,000E-05
450	< 1,000E-05	750	9,686E-01	1050	9,412E-01	1950	9,600E-01	3450	1,571E-01	4950	< 1,000E-05
460	< 1,000E-05	760	9,669E-01	1060	9,410E-01	2000	9,576E-01	3500	1,528E-01	5000	< 1,000E-05
470	< 1,000E-05	770	9,652E-01	1070	9,409E-01	2050	9,550E-01	3550	1,494E-01	5050	< 1,000E-05
480	< 1,000E-05	780	9,635E-01	1080	9,408E-01	2100	9,523E-01	3600	1,469E-01	5100	< 1,000E-05
490	< 1,000E-05	790	9,617E-01	1090	9,408E-01	2150	9,482E-01	3650	1,478E-01	5150	< 1,000E-05

RG610

Optical properties		Mechanical properties		Colorimetric properties				
Reflection factor		Reference thickness		1 mm 2 mm 3 mm				
$P_d = 0,920$		$d = 3,00 \text{ mm}$		Illuminant D65	x	0,629	0,684	0,693
Spectral values guaranteed (d = 3 mm)		Density			y	0,330	0,315	0,307
$\lambda_{i,0,5} = 610 \text{ nm} \pm 6 \text{ nm}$		$\rho = 2,65 \text{ g/cm}^3$			Y	17,4	11,9	9,9
$\lambda_s (\tau_{i,U} = 1E-05) = 530 \text{ nm}$		Knoop hardness			λ_d	611 nm	617 nm	621 nm
$\lambda_p (\tau_{i,L} = 0,94) = 690 \text{ nm}$		$HK_{[0.1/20]} = 448$			P_e	0,886	0,996	1,000
				Illuminant A	x	0,663	0,690	0,697
		Thermal properties			y	0,328	0,310	0,303
		Transformation temperature			Y	26,5	19,7	16,8
		$T_g = 520 \text{ }^\circ\text{C}$			λ_d	614 nm	619 nm	623 nm
		Thermal expansion in $10^{-6}/\text{K}$			P_e	0,939	0,998	0,999
Refractive indices		$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 8,0$		Notes				
$n_d (587,6 \text{ nm}) = 1,51$		$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,2$		Stricking glass				
$n_s (852 \text{ nm}) = 1,51$		Temperature coefficient		Longpass filter				
$n_t (1014 \text{ nm}) = 1,50$		$Tk = 0,14 \text{ nm/K}$						
Sellmeier coefficients		Chemical properties		ISO 23364:2021				
valid from 580 nm to 2330 nm		Chemical resistance		Disclaimer				
$B_1 = 1,2549$		FR class		All data without tolerances are to be understood to be reference values.				
$B_2 = 0,0002$		SR class = 1						
$B_3 = 0,7981$		AR class = 1						
$C_1 = 9,761E-03 \text{ } \mu\text{m}^2$		Resistance against humidity						
$C_2 = 2,8886E-01 \text{ } \mu\text{m}^2$		Resistant glass						
$C_3 = 98,991 \text{ } \mu\text{m}^2$		see pocket catalogue "Optical Filter Glass 2024", chapter 5.5						
Internal quality								
Bubble class 3								



RG610

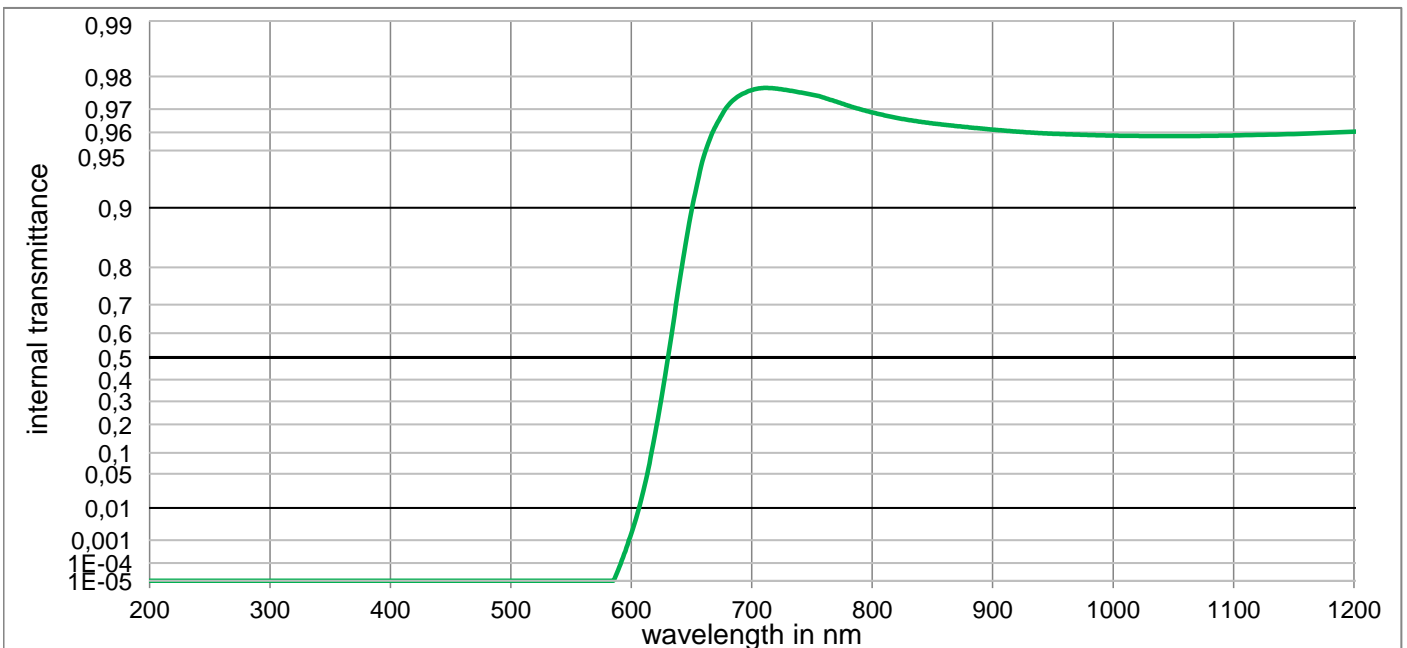


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

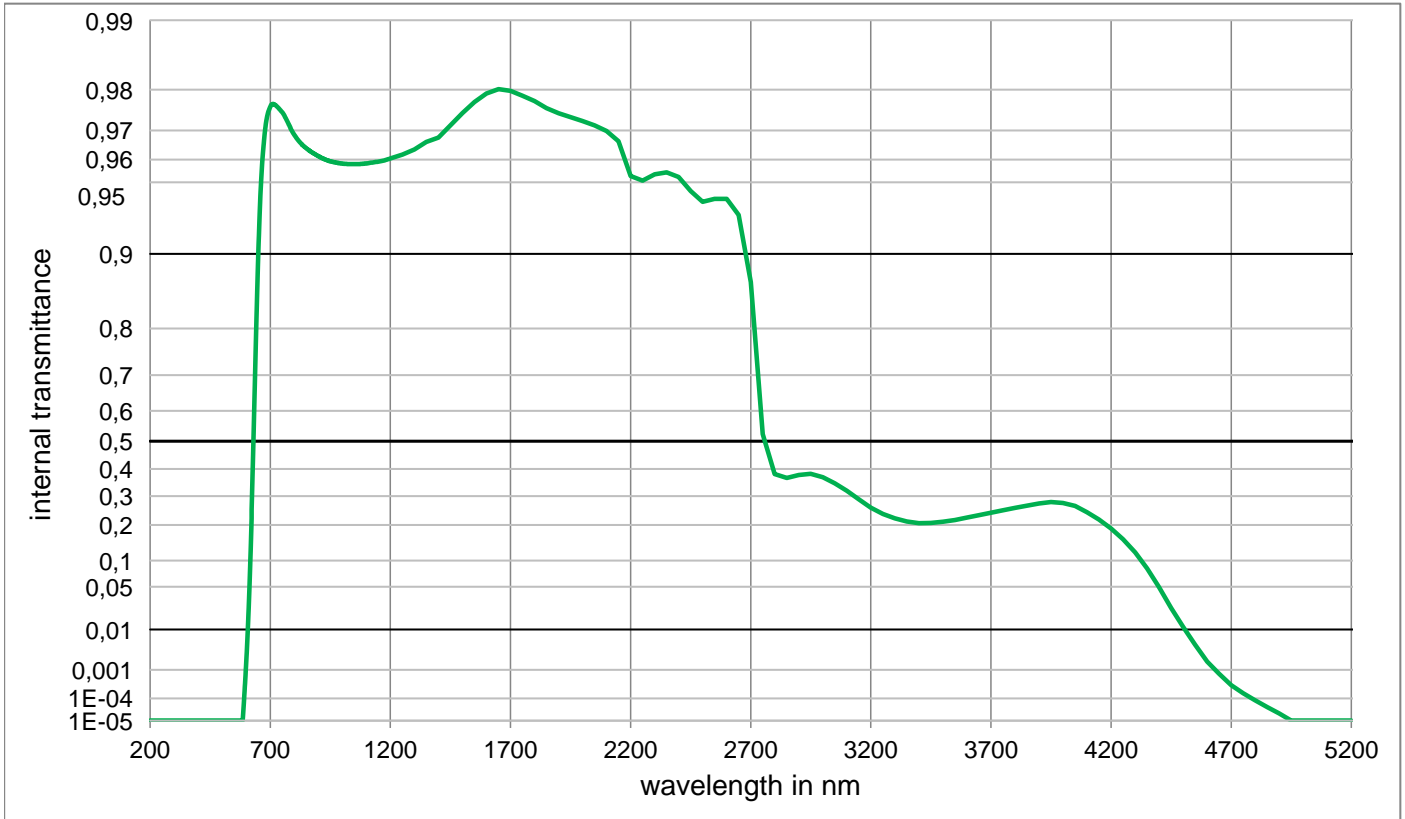
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	9,724E-01	1100	9,632E-01	2200	9,550E-01	3700	2,302E-01
210	< 1,0E-05	510	< 1,000E-05	810	9,713E-01	1110	9,633E-01	2250	9,519E-01	3750	2,411E-01
220	< 1,0E-05	520	< 1,000E-05	820	9,702E-01	1120	9,635E-01	2300	9,550E-01	3800	2,527E-01
230	< 1,0E-05	530	< 1,000E-05	830	9,692E-01	1130	9,636E-01	2350	9,554E-01	3850	2,631E-01
240	< 1,0E-05	540	< 1,000E-05	840	9,684E-01	1140	9,637E-01	2400	9,532E-01	3900	2,708E-01
250	< 1,0E-05	550	< 1,000E-05	850	9,677E-01	1150	9,639E-01	2450	9,496E-01	3950	2,756E-01
260	< 1,0E-05	560	< 1,000E-05	860	9,671E-01	1160	9,641E-01	2500	9,454E-01	4000	2,742E-01
270	< 1,0E-05	570	2,118E-05	870	9,667E-01	1170	9,644E-01	2550	9,405E-01	4050	2,614E-01
280	< 1,0E-05	580	1,470E-03	880	9,663E-01	1180	9,646E-01	2600	9,339E-01	4100	2,362E-01
290	< 1,0E-05	590	3,112E-02	890	9,659E-01	1190	9,649E-01	2650	9,232E-01	4150	2,080E-01
300	< 1,0E-05	600	2,019E-01	900	9,656E-01	1200	9,652E-01	2700	8,746E-01	4200	1,793E-01
310	< 1,0E-05	610	5,164E-01	910	9,653E-01	1250	9,666E-01	2750	5,165E-01	4250	1,482E-01
320	< 1,000E-05	620	7,703E-01	920	9,649E-01	1300	9,685E-01	2800	3,748E-01	4300	1,123E-01
330	< 1,000E-05	630	8,948E-01	930	9,646E-01	1350	9,708E-01	2850	3,606E-01	4350	7,840E-02
340	< 1,000E-05	640	9,454E-01	940	9,643E-01	1400	9,715E-01	2900	3,684E-01	4400	4,815E-02
350	< 1,000E-05	650	9,655E-01	950	9,640E-01	1450	9,753E-01	2950	3,671E-01	4450	2,387E-02
360	< 1,000E-05	660	9,746E-01	960	9,638E-01	1500	9,783E-01	3000	3,529E-01	4500	1,073E-02
370	< 1,000E-05	670	9,785E-01	970	9,635E-01	1550	9,804E-01	3050	3,291E-01	4550	4,530E-03
380	< 1,000E-05	680	9,806E-01	980	9,633E-01	1600	9,821E-01	3100	3,018E-01	4600	1,580E-03
390	< 1,000E-05	690	9,815E-01	990	9,631E-01	1650	9,829E-01	3150	2,753E-01	4650	5,741E-04
400	< 1,000E-05	700	9,817E-01	1000	9,630E-01	1700	9,824E-01	3200	2,529E-01	4700	2,512E-04
410	< 1,000E-05	710	9,817E-01	1010	9,629E-01	1750	9,812E-01	3250	2,334E-01	4750	1,279E-04
420	< 1,000E-05	720	9,812E-01	1020	9,628E-01	1800	9,799E-01	3300	2,183E-01	4800	6,668E-05
430	< 1,000E-05	730	9,802E-01	1030	9,628E-01	1850	9,783E-01	3350	2,060E-01	4850	3,420E-05
440	< 1,000E-05	740	9,791E-01	1040	9,628E-01	1900	9,768E-01	3400	1,965E-01	4900	1,687E-05
450	< 1,000E-05	750	9,782E-01	1050	9,628E-01	1950	9,757E-01	3450	1,917E-01	4950	< 1,000E-05
460	< 1,000E-05	760	9,771E-01	1060	9,629E-01	2000	9,746E-01	3500	1,933E-01	5000	< 1,000E-05
470	< 1,000E-05	770	9,761E-01	1070	9,630E-01	2050	9,733E-01	3550	1,999E-01	5050	< 1,000E-05
480	< 1,000E-05	780	9,748E-01	1080	9,630E-01	2100	9,719E-01	3600	2,098E-01	5100	< 1,000E-05
490	< 1,000E-05	790	9,736E-01	1090	9,631E-01	2150	9,688E-01	3650	2,201E-01	5150	< 1,000E-05

RG630

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,918$	$d = 3,00 \text{ mm}$	Illuminant D65 x 0,624 0,708 0,716 y 0,305 0,289 0,284 Y 9,3 5,1 4,0 λ_d 625 nm 633 nm 637 nm P_e 0,802 0,992 1,000
Spectral values guaranteed (d = 3 mm)	Density	
$\lambda_{i0,5} = 630 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,65 \text{ g/cm}^3$	
$\lambda_s (\tau_{i,U} = 1E-05) = 540 \text{ nm}$	Knoop hardness	
$\lambda_p (\tau_{i,L} = 0,94) = 710 \text{ nm}$	$HK_{[0,1/20]} = 456$	
		Illuminant A x 0,678 0,712 0,718 y 0,307 0,287 0,282 Y 14,8 9,4 7,6 λ_d 627 nm 634 nm 639 nm P_e 0,899 0,996 0,999
	Thermal properties	
	Transformation temperature	
	$T_g = 527 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
Refractive indices	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 8,0$	Notes Stricking glass Longpass filter ISO 23364:2021 Disclaimer All data without tolerances are to be understood to be reference values.
$n_d (587,6 \text{ nm}) = 1,52$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,2$	
$n_s (852 \text{ nm}) = 1,52$		
$n_t (1014 \text{ nm}) = 1,51$	Temperature coefficient	
	$Tk = 0,14 \text{ nm/K}$	
Sellmeier coefficients	Chemical properties	
on request	Chemical resistance	
	FR class = 0	
	SR class = 1	
	AR class = 1	
	Resistance against humidity	
	Resistant glass	
Internal quality	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
Bubble class 3		



RG630

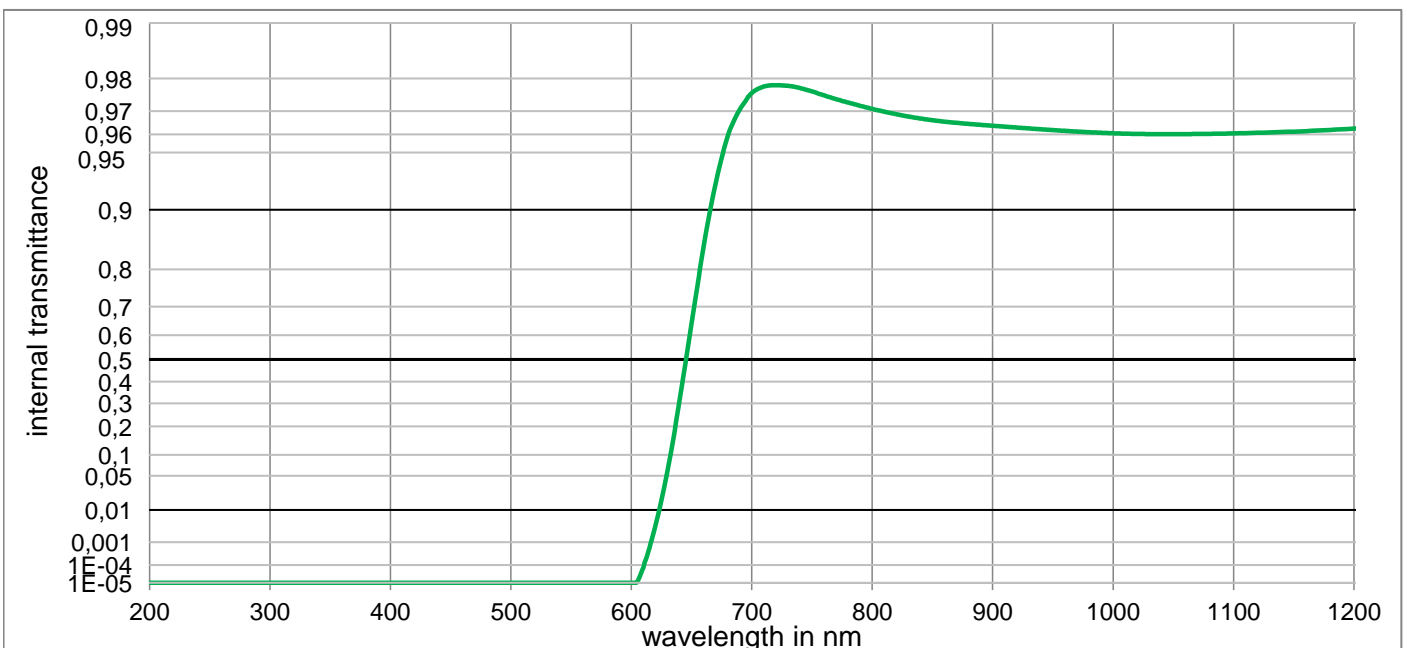


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

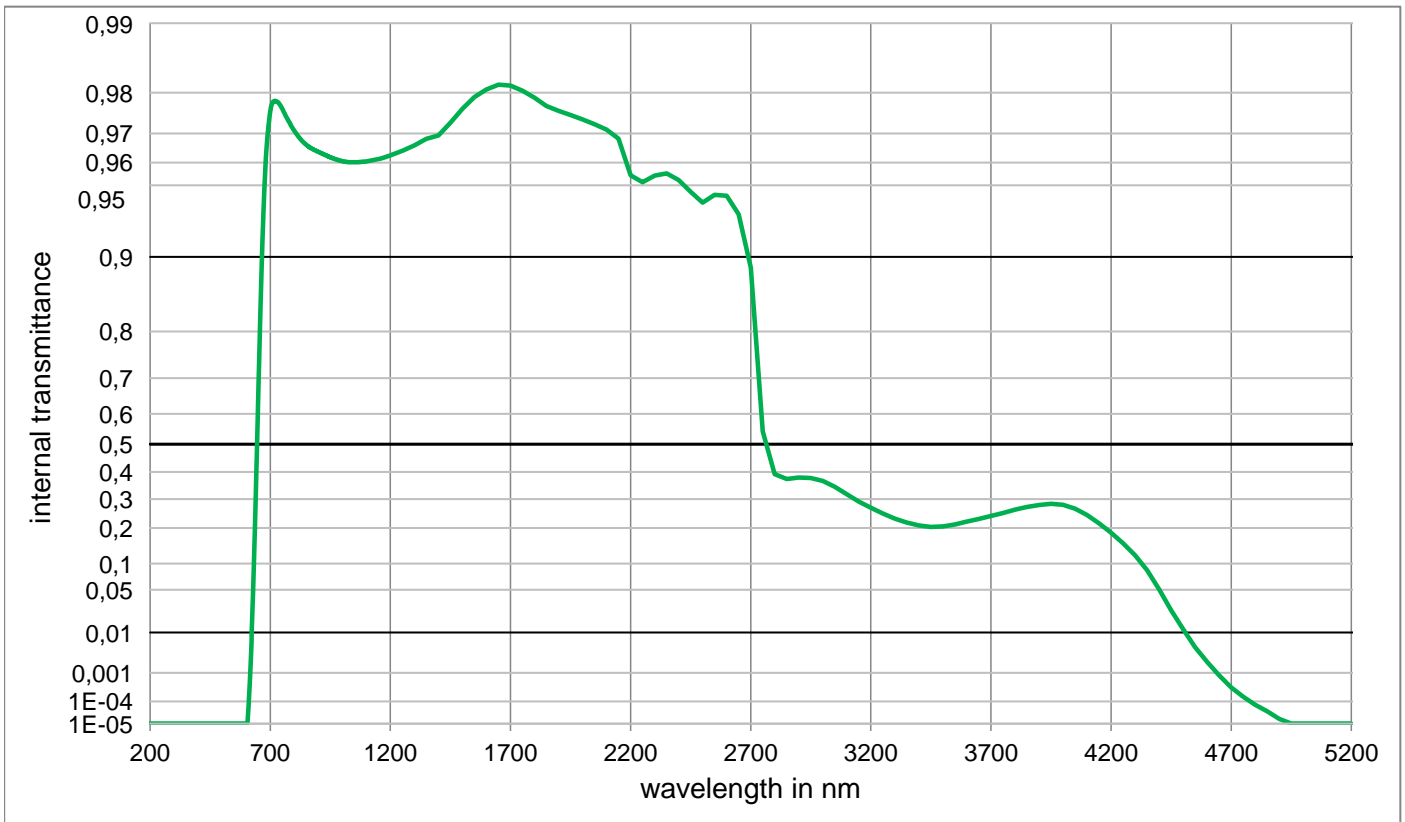
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	9,688E-01	1100	9,585E-01	2200	9,530E-01	3700	2,410E-01
210	< 1,0E-05	510	< 1,000E-05	810	9,676E-01	1110	9,586E-01	2250	9,509E-01	3750	2,495E-01
220	< 1,0E-05	520	< 1,000E-05	820	9,666E-01	1120	9,587E-01	2300	9,537E-01	3800	2,579E-01
230	< 1,0E-05	530	< 1,000E-05	830	9,657E-01	1130	9,589E-01	2350	9,546E-01	3850	2,660E-01
240	< 1,0E-05	540	< 1,000E-05	840	9,649E-01	1140	9,590E-01	2400	9,525E-01	3900	2,735E-01
250	< 1,0E-05	550	< 1,000E-05	850	9,642E-01	1150	9,592E-01	2450	9,456E-01	3950	2,783E-01
260	< 1,0E-05	560	< 1,000E-05	860	9,636E-01	1160	9,594E-01	2500	9,395E-01	4000	2,755E-01
270	< 1,0E-05	570	< 1,000E-05	870	9,630E-01	1170	9,596E-01	2550	9,412E-01	4050	2,645E-01
280	< 1,0E-05	580	< 1,000E-05	880	9,625E-01	1180	9,598E-01	2600	9,412E-01	4100	2,425E-01
290	< 1,0E-05	590	6,236E-05	890	9,619E-01	1190	9,601E-01	2650	9,312E-01	4150	2,177E-01
300	< 1,0E-05	600	1,716E-03	900	9,614E-01	1200	9,604E-01	2700	8,695E-01	4200	1,884E-01
310	< 1,0E-05	610	2,467E-02	910	9,608E-01	1250	9,619E-01	2750	5,243E-01	4250	1,559E-01
320	< 1,000E-05	620	1,692E-01	920	9,604E-01	1300	9,638E-01	2800	3,813E-01	4300	1,198E-01
330	< 1,000E-05	630	4,871E-01	930	9,600E-01	1350	9,664E-01	2850	3,670E-01	4350	8,250E-02
340	< 1,000E-05	640	7,652E-01	940	9,596E-01	1400	9,678E-01	2900	3,776E-01	4400	4,948E-02
350	< 1,000E-05	650	8,970E-01	950	9,593E-01	1450	9,715E-01	2950	3,817E-01	4450	2,448E-02
360	< 1,000E-05	660	9,457E-01	960	9,591E-01	1500	9,748E-01	3000	3,698E-01	4500	1,133E-02
370	< 1,000E-05	670	9,631E-01	970	9,589E-01	1550	9,774E-01	3050	3,471E-01	4550	4,684E-03
380	< 1,000E-05	680	9,711E-01	980	9,587E-01	1600	9,792E-01	3100	3,189E-01	4600	1,739E-03
390	< 1,000E-05	690	9,747E-01	990	9,585E-01	1650	9,801E-01	3150	2,884E-01	4650	7,540E-04
400	< 1,000E-05	700	9,763E-01	1000	9,584E-01	1700	9,798E-01	3200	2,589E-01	4700	3,162E-04
410	< 1,000E-05	710	9,769E-01	1010	9,583E-01	1750	9,788E-01	3250	2,366E-01	4750	1,596E-04
420	< 1,000E-05	720	9,768E-01	1020	9,582E-01	1800	9,776E-01	3300	2,219E-01	4800	8,375E-05
430	< 1,000E-05	730	9,763E-01	1030	9,582E-01	1850	9,760E-01	3350	2,117E-01	4850	4,355E-05
440	< 1,000E-05	740	9,756E-01	1040	9,582E-01	1900	9,747E-01	3400	2,061E-01	4900	2,203E-05
450	< 1,000E-05	750	9,749E-01	1050	9,581E-01	1950	9,737E-01	3450	2,064E-01	4950	< 1,000E-05
460	< 1,000E-05	760	9,740E-01	1060	9,582E-01	2000	9,727E-01	3500	2,103E-01	5000	< 1,000E-05
470	< 1,000E-05	770	9,727E-01	1070	9,582E-01	2050	9,715E-01	3550	2,160E-01	5050	< 1,000E-05
480	< 1,000E-05	780	9,713E-01	1080	9,583E-01	2100	9,698E-01	3600	2,240E-01	5100	< 1,000E-05
490	< 1,000E-05	790	9,700E-01	1090	9,584E-01	2150	9,666E-01	3650	2,323E-01	5150	< 1,000E-05

RG645

Optical properties		Mechanical properties		Colorimetric properties				
Reflection factor		Reference thickness		1 mm 2 mm 3 mm				
$P_d = 0,918$		$d = 3,00 \text{ mm}$		Illuminant D65	x	0,584	0,717	0,726
Spectral values guaranteed (d = 3 mm)		Density			y	0,298	0,278	0,274
$\lambda_{i0,5} = 645 \text{ nm} \pm 6 \text{ nm}$		$\rho = 2,65 \text{ g/cm}^3$			Y	5,4	2,4	1,8
$\lambda_s (\tau_{i,U} = 1E-05) = 560 \text{ nm}$		Knoop hardness			λ_d	638 nm	645 nm	650 nm
$\lambda_p (\tau_{i,L} = 0,94) = 720 \text{ nm}$		$HK_{[0,1/20]} = 456$			P_e	0,670	0,984	0,999
				Illuminant A	x	0,672	0,722	0,726
		Thermal properties			y	0,303	0,277	0,274
		Transformation temperature			Y	8,6	4,7	3,6
		$T_g = 519 \text{ }^\circ\text{C}$			λ_d	640 nm	647 nm	651 nm
		Thermal expansion in $10^{-6}/\text{K}$			P_e	0,828	0,993	0,999
Refractive indices		$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 8,0$						
$n_d (587,6 \text{ nm}) = 1,52$		$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,2$						
$n_s (852 \text{ nm}) = 1,52$		Temperature coefficient						
$n_t (1014 \text{ nm}) = 1,51$		$Tk = 0,16 \text{ nm/K}$						
Sellmeier coefficients		Chemical properties		Notes				
on request		Chemical resistance						
		FR class = 0		Stricking glass				
		SR class = 1		Longpass filter				
		AR class = 1						
		Resistance against humidity		ISO 23364:2021				
		Resistant glass		Disclaimer				
Internal quality		see pocket catalogue "Optical Filter Glass 2024", chapter 5.5		All data without tolerances are to be understood to be reference values.				
Bubble class 3								



RG645



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	9,708E-01	1100	9,605E-01	2200	9,547E-01	3700	2,399E-01
210	< 1,0E-05	510	< 1,000E-05	810	9,698E-01	1110	9,606E-01	2250	9,516E-01	3750	2,503E-01
220	< 1,0E-05	520	< 1,000E-05	820	9,688E-01	1120	9,608E-01	2300	9,545E-01	3800	2,623E-01
230	< 1,0E-05	530	< 1,000E-05	830	9,679E-01	1130	9,610E-01	2350	9,555E-01	3850	2,714E-01
240	< 1,0E-05	540	< 1,000E-05	840	9,671E-01	1140	9,611E-01	2400	9,525E-01	3900	2,787E-01
250	< 1,0E-05	550	< 1,000E-05	850	9,664E-01	1150	9,613E-01	2450	9,466E-01	3950	2,827E-01
260	< 1,0E-05	560	< 1,000E-05	860	9,658E-01	1160	9,616E-01	2500	9,408E-01	4000	2,792E-01
270	< 1,0E-05	570	< 1,000E-05	870	9,653E-01	1170	9,618E-01	2550	9,451E-01	4050	2,656E-01
280	< 1,0E-05	580	< 1,000E-05	880	9,649E-01	1180	9,621E-01	2600	9,447E-01	4100	2,436E-01
290	< 1,0E-05	590	< 1,000E-05	890	9,644E-01	1190	9,624E-01	2650	9,337E-01	4150	2,152E-01
300	< 1,0E-05	600	< 1,000E-05	900	9,641E-01	1200	9,628E-01	2700	8,894E-01	4200	1,844E-01
310	< 1,0E-05	610	7,607E-05	910	9,636E-01	1250	9,644E-01	2750	5,439E-01	4250	1,529E-01
320	< 1,000E-05	620	3,586E-03	920	9,632E-01	1300	9,662E-01	2800	3,916E-01	4300	1,199E-01
330	< 1,000E-05	630	6,056E-02	930	9,628E-01	1350	9,684E-01	2850	3,738E-01	4350	8,517E-02
340	< 1,000E-05	640	3,112E-01	940	9,624E-01	1400	9,694E-01	2900	3,791E-01	4400	5,083E-02
350	< 1,000E-05	650	6,454E-01	950	9,621E-01	1450	9,730E-01	2950	3,779E-01	4450	2,517E-02
360	< 1,000E-05	660	8,449E-01	960	9,617E-01	1500	9,765E-01	3000	3,671E-01	4500	1,162E-02
370	< 1,000E-05	670	9,271E-01	970	9,614E-01	1550	9,791E-01	3050	3,455E-01	4550	4,841E-03
380	< 1,000E-05	680	9,589E-01	980	9,611E-01	1600	9,806E-01	3100	3,177E-01	4600	2,037E-03
390	< 1,000E-05	690	9,706E-01	990	9,608E-01	1650	9,815E-01	3150	2,911E-01	4650	8,337E-04
400	< 1,000E-05	700	9,760E-01	1000	9,605E-01	1700	9,814E-01	3200	2,687E-01	4700	3,327E-04
410	< 1,000E-05	710	9,779E-01	1010	9,604E-01	1750	9,804E-01	3250	2,482E-01	4750	1,524E-04
420	< 1,000E-05	720	9,783E-01	1020	9,602E-01	1800	9,789E-01	3300	2,309E-01	4800	7,289E-05
430	< 1,000E-05	730	9,781E-01	1030	9,602E-01	1850	9,772E-01	3350	2,176E-01	4850	3,837E-05
440	< 1,000E-05	740	9,775E-01	1040	9,601E-01	1900	9,760E-01	3400	2,081E-01	4900	1,694E-05
450	< 1,000E-05	750	9,765E-01	1050	9,601E-01	1950	9,750E-01	3450	2,036E-01	4950	< 1,000E-05
460	< 1,000E-05	760	9,754E-01	1060	9,602E-01	2000	9,739E-01	3500	2,049E-01	5000	< 1,000E-05
470	< 1,000E-05	770	9,742E-01	1070	9,602E-01	2050	9,726E-01	3550	2,113E-01	5050	< 1,000E-05
480	< 1,000E-05	780	9,730E-01	1080	9,603E-01	2100	9,711E-01	3600	2,208E-01	5100	< 1,000E-05
490	< 1,000E-05	790	9,719E-01	1090	9,604E-01	2150	9,684E-01	3650	2,302E-01	5150	< 1,000E-05

RG665

Optical properties	
Reflection factor	
P_d	0,918
Spectral values guaranteed (d = 3 mm)	
$\lambda_{i,0,5}$	665 nm \pm 6 nm
$\lambda_s (\tau_{i,U} = 1E-05)$	580 nm
$\lambda_p (\tau_{i,L} = 0,96)$	750 nm
Refractive indices	
n_d (587,6 nm)	1,52
n_s (852 nm)	1,51
n_t (1014 nm)	1,51
Sellmeier coefficients	
valid from 350 nm to 2400 nm	
B_1	0,7958
B_2	0,4847
B_3	0,8880
C_1	5,130E-03 μm^2
C_2	1,8116E-02 μm^2
C_3	117,823 μm^2
Internal quality	
Bubble class	3

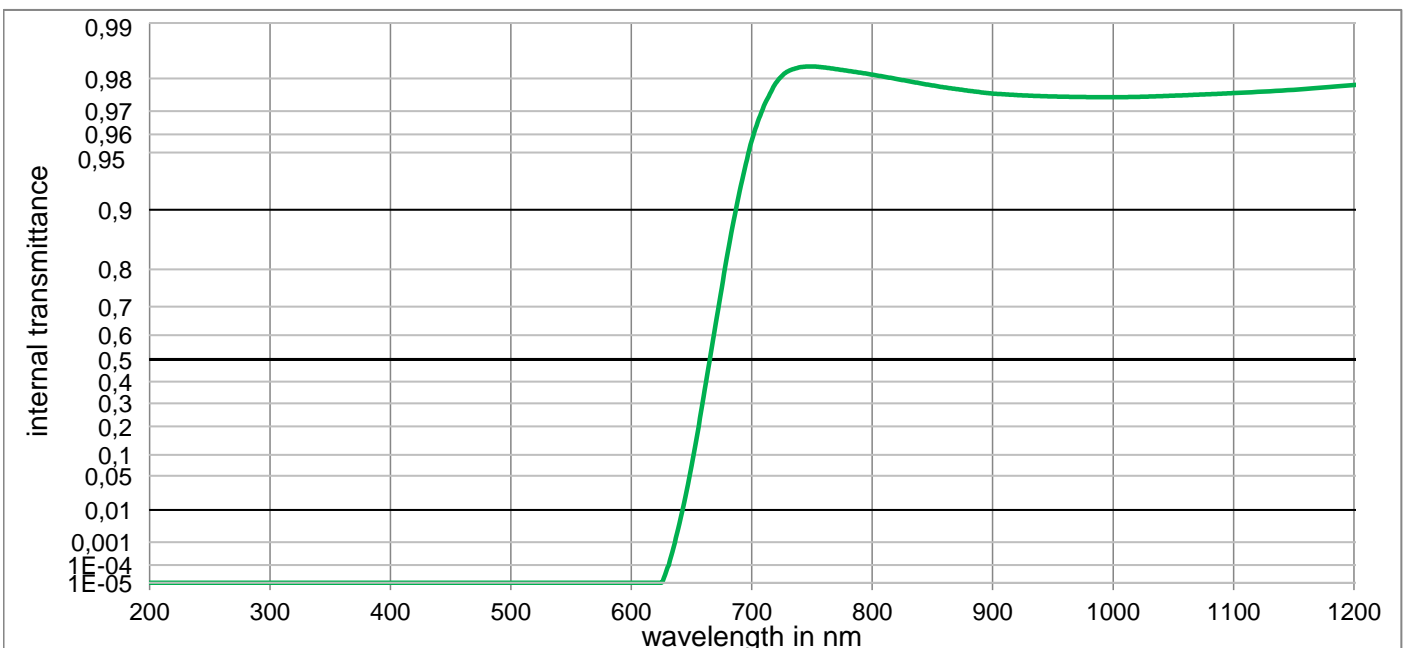
Mechanical properties	
Reference thickness	
d	3,00 mm
Density	
ρ	2,77 g/cm ³
Knoop hardness	
$HK_{[0,1/20]}$	453

Thermal properties	
Transformation temperature	
T_g	527 °C
Thermal expansion in $10^{-6}/K$	
α (-30°C/+70°C)	8,1
α (20°C/300°C)	9,4
Temperature coefficient	
Tk	0,17 nm/K

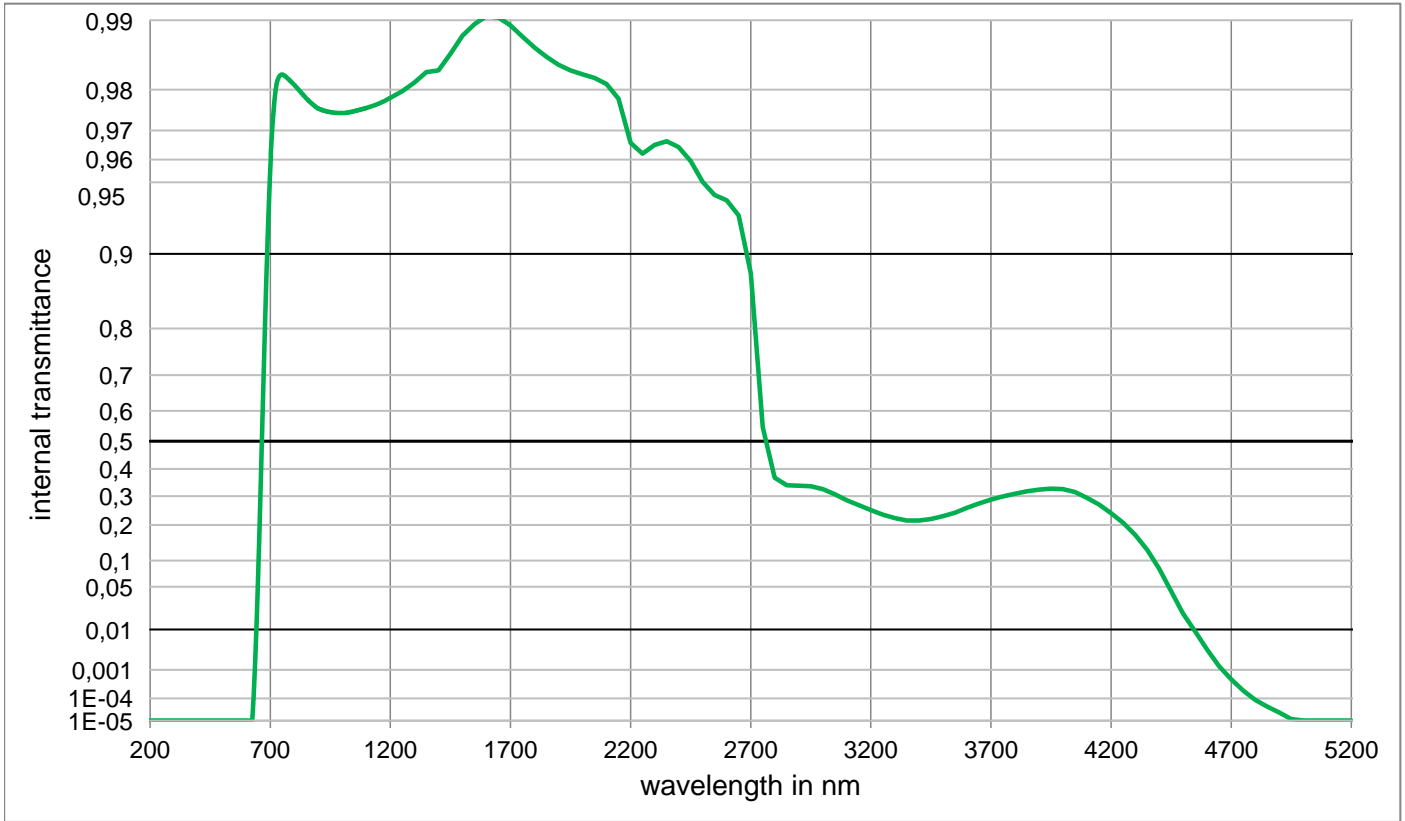
Chemical properties	
Chemical resistance	
FR class	0
SR class	1
AR class	1
Resistance against humidity	
Robust glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,487	0,711	0,731
	y	0,305	0,272	0,268
	Y	3,2	0,8	0,5
	λ_d	654 nm	662 nm	668 nm
	P_e	0,420	0,954	0,998
Illuminant A	x	0,631	0,726	0,732
	y	0,318	0,272	0,268
	Y	4,5	1,6	1,2
	λ_d	656 nm	664 nm	671 nm
	P_e	0,654	0,982	0,999

Notes	
Stricking glass	
Longpass filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



RG665

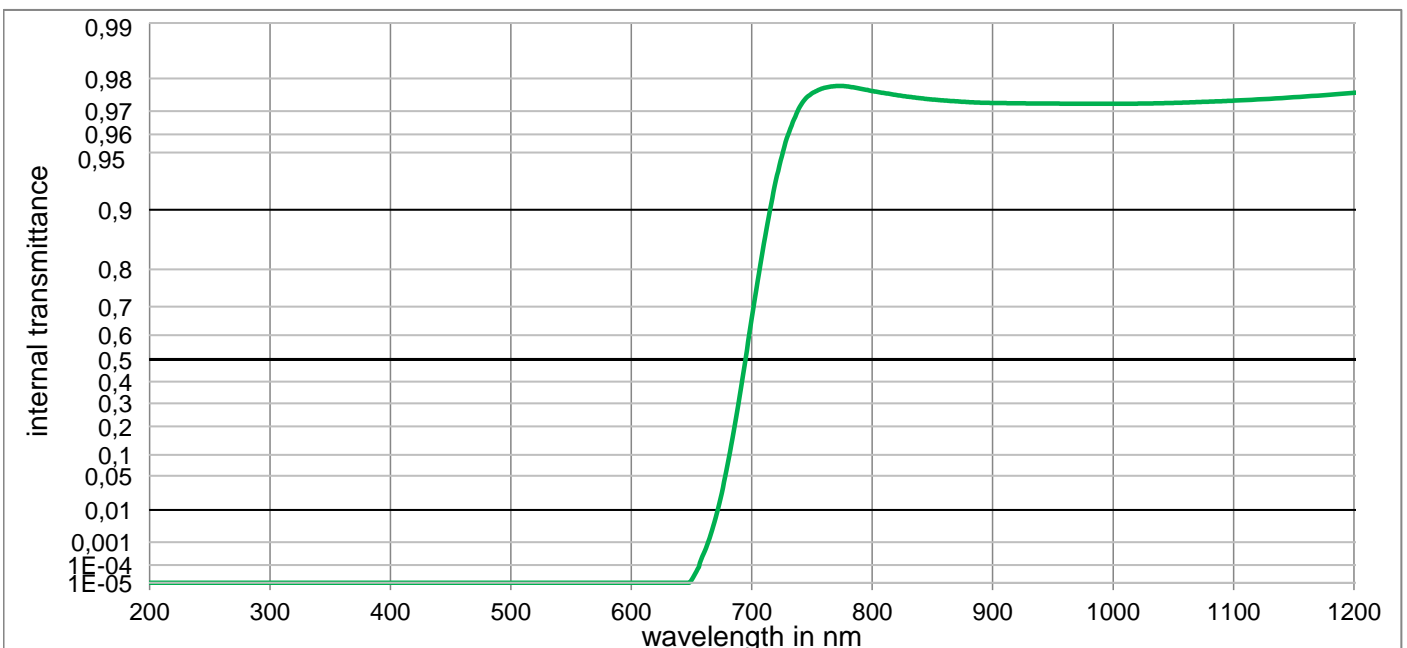


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

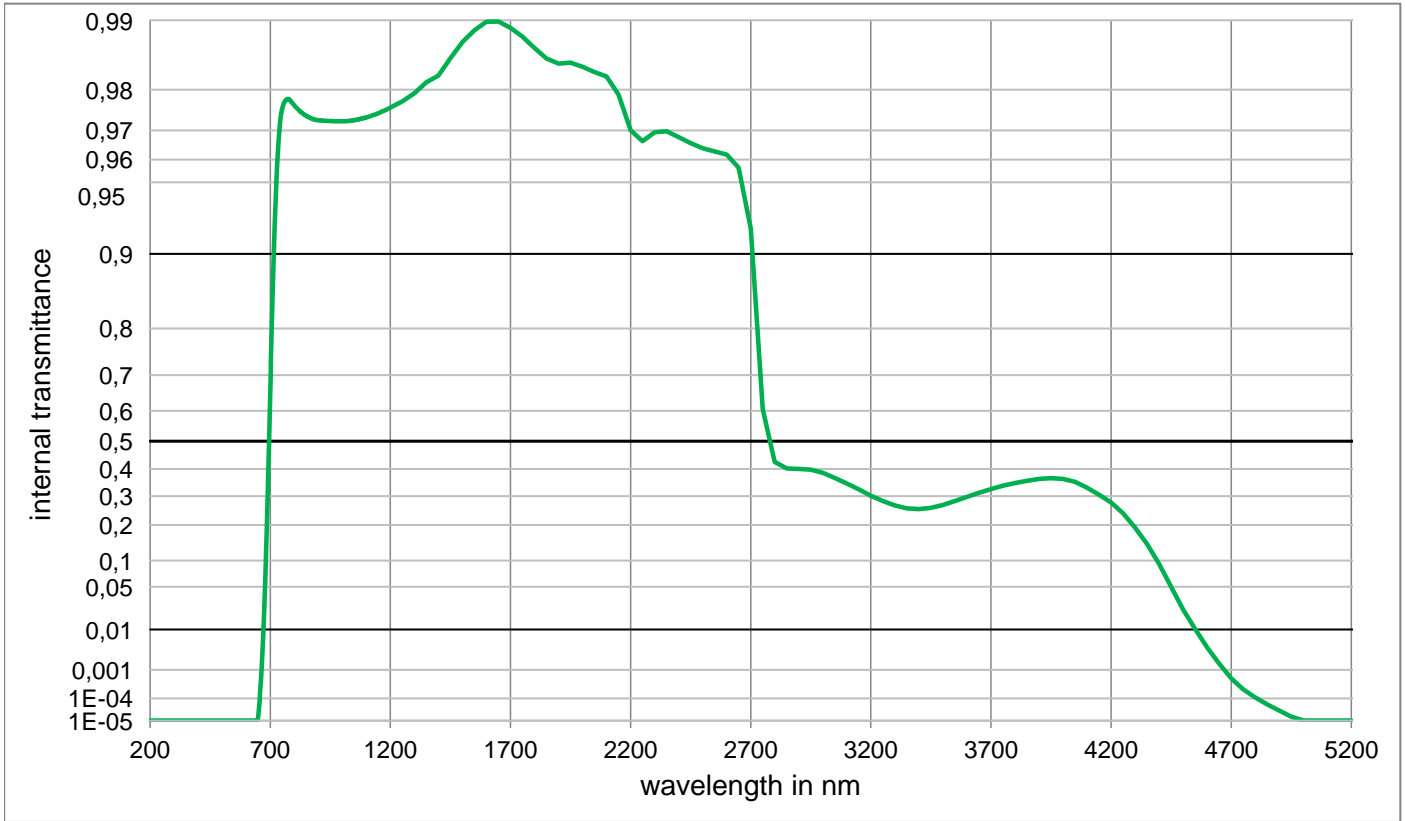
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	9,809E-01	1100	9,760E-01	2200	9,661E-01	3700	2,872E-01
210	< 1,0E-05	510	< 1,000E-05	810	9,804E-01	1110	9,762E-01	2250	9,623E-01	3750	2,991E-01
220	< 1,0E-05	520	< 1,000E-05	820	9,799E-01	1120	9,764E-01	2300	9,655E-01	3800	3,090E-01
230	< 1,0E-05	530	< 1,000E-05	830	9,793E-01	1130	9,766E-01	2350	9,666E-01	3850	3,173E-01
240	< 1,0E-05	540	< 1,000E-05	840	9,788E-01	1140	9,768E-01	2400	9,646E-01	3900	3,241E-01
250	< 1,0E-05	550	< 1,000E-05	850	9,782E-01	1150	9,770E-01	2450	9,594E-01	3950	3,273E-01
260	< 1,0E-05	560	< 1,000E-05	860	9,777E-01	1160	9,772E-01	2500	9,503E-01	4000	3,259E-01
270	< 1,0E-05	570	< 1,000E-05	870	9,772E-01	1170	9,775E-01	2550	9,434E-01	4050	3,147E-01
280	< 1,0E-05	580	< 1,000E-05	880	9,767E-01	1180	9,777E-01	2600	9,403E-01	4100	2,940E-01
290	< 1,0E-05	590	< 1,000E-05	890	9,763E-01	1190	9,780E-01	2650	9,310E-01	4150	2,697E-01
300	< 1,0E-05	600	< 1,000E-05	900	9,759E-01	1200	9,783E-01	2700	8,797E-01	4200	2,395E-01
310	< 1,0E-05	610	< 1,000E-05	910	9,756E-01	1250	9,797E-01	2750	5,478E-01	4250	2,072E-01
320	< 1,000E-05	620	< 1,000E-05	920	9,754E-01	1300	9,814E-01	2800	3,680E-01	4300	1,688E-01
330	< 1,000E-05	630	7,438E-05	930	9,752E-01	1350	9,832E-01	2850	3,399E-01	4350	1,267E-01
340	< 1,000E-05	640	4,275E-03	940	9,751E-01	1400	9,835E-01	2900	3,380E-01	4400	8,260E-02
350	< 1,000E-05	650	7,177E-02	950	9,750E-01	1450	9,860E-01	2950	3,359E-01	4450	4,350E-02
360	< 1,000E-05	660	3,297E-01	960	9,749E-01	1500	9,883E-01	3000	3,259E-01	4500	1,970E-02
370	< 1,000E-05	670	6,426E-01	970	9,748E-01	1550	9,896E-01	3050	3,067E-01	4550	9,240E-03
380	< 1,000E-05	680	8,339E-01	980	9,748E-01	1600	9,904E-01	3100	2,847E-01	4600	3,528E-03
390	< 1,000E-05	690	9,205E-01	990	9,748E-01	1650	9,903E-01	3150	2,670E-01	4650	1,277E-03
400	< 1,000E-05	700	9,567E-01	1000	9,748E-01	1700	9,895E-01	3200	2,501E-01	4700	4,966E-04
410	< 1,000E-05	710	9,719E-01	1010	9,748E-01	1750	9,882E-01	3250	2,347E-01	4750	2,028E-04
420	< 1,000E-05	720	9,788E-01	1020	9,749E-01	1800	9,869E-01	3300	2,224E-01	4800	8,730E-05
430	< 1,000E-05	730	9,817E-01	1030	9,750E-01	1850	9,856E-01	3350	2,148E-01	4850	4,477E-05
440	< 1,000E-05	740	9,826E-01	1040	9,751E-01	1900	9,844E-01	3400	2,144E-01	4900	2,472E-05
450	< 1,000E-05	750	9,828E-01	1050	9,752E-01	1950	9,835E-01	3450	2,198E-01	4950	1,183E-05
460	< 1,000E-05	760	9,826E-01	1060	9,754E-01	2000	9,828E-01	3500	2,290E-01	5000	< 1,000E-05
470	< 1,000E-05	770	9,822E-01	1070	9,755E-01	2050	9,822E-01	3550	2,412E-01	5050	< 1,000E-05
480	< 1,000E-05	780	9,818E-01	1080	9,757E-01	2100	9,811E-01	3600	2,577E-01	5100	< 1,000E-05
490	< 1,000E-05	790	9,814E-01	1090	9,758E-01	2150	9,781E-01	3650	2,734E-01	5150	< 1,000E-05

RG695

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,915$	$d = 3,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed (d = 3 mm)	Density	
$\lambda_{i0,5} = 695 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,76 \text{ g/cm}^3$	
$\lambda_s (\tau_{i,U} = 1E-05) = 610 \text{ nm}$	Knoop hardness	
$\lambda_p (\tau_{i,L} = 0,96) = 780 \text{ nm}$	$HK_{[0.1/20]} = 459$	
		Illuminant A x y Y λ_d P_e
	Thermal properties	
	Transformation temperature	
	$T_g = 532 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
Refractive indices	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 8,1$	Notes Stricking glass Longpass filter ISO 23364:2021 Disclaimer All data without tolerances are to be understood to be reference values.
$n_d (587,6 \text{ nm}) = 1,53$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,4$	
$n_s (852 \text{ nm}) = 1,53$		
$n_t (1014 \text{ nm}) = 1,52$	Temperature coefficient	
	$Tk = 0,18 \text{ nm/K}$	
Sellmeier coefficients	Chemical properties	
valid from 440 nm to 1550 nm	Chemical resistance	
$B_1 = 0,6009$	FR class = 0	
$B_2 = 0,7114$	SR class = 1	
$B_3 = 25,2603$	AR class = 1	
$C_1 = 1,682E-02 \text{ } \mu\text{m}^2$	Resistance against humidity	
$C_2 = 4,0132E-03 \text{ } \mu\text{m}^2$	Resistant glass	
$C_3 = 4853,501 \text{ } \mu\text{m}^2$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
Internal quality		
Bubble class 3		



RG695

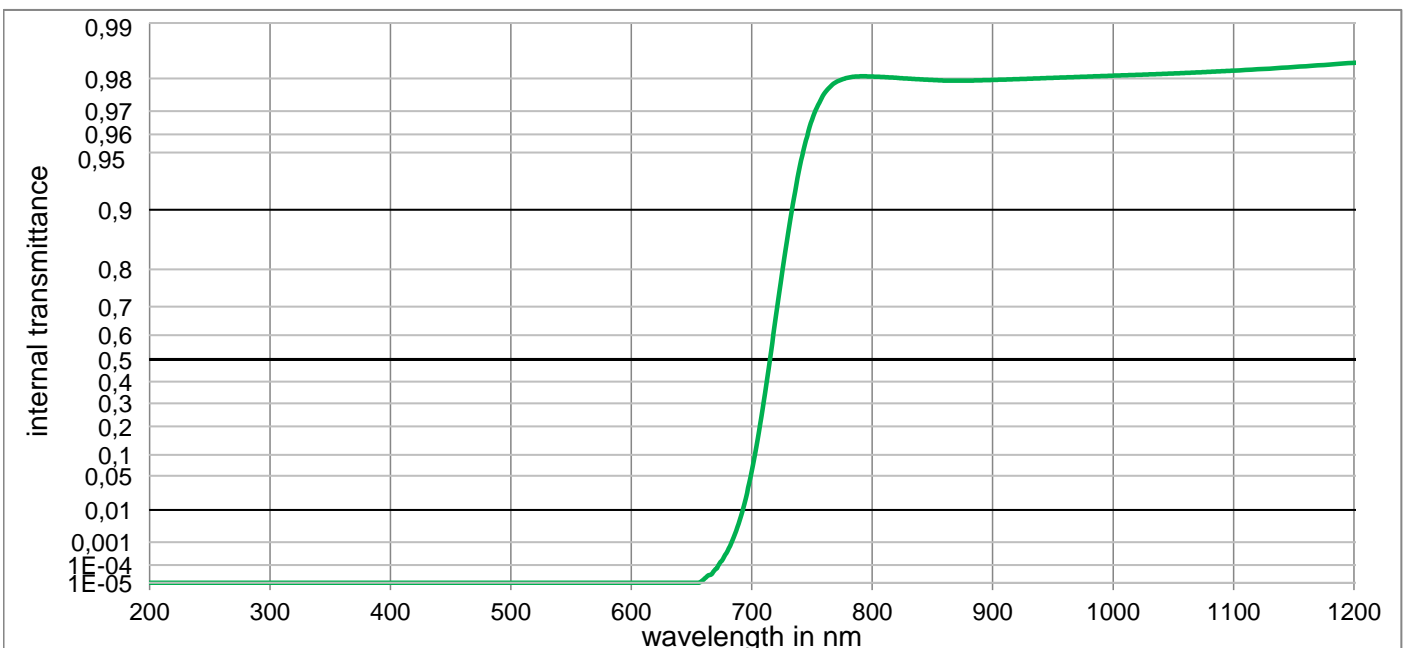


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

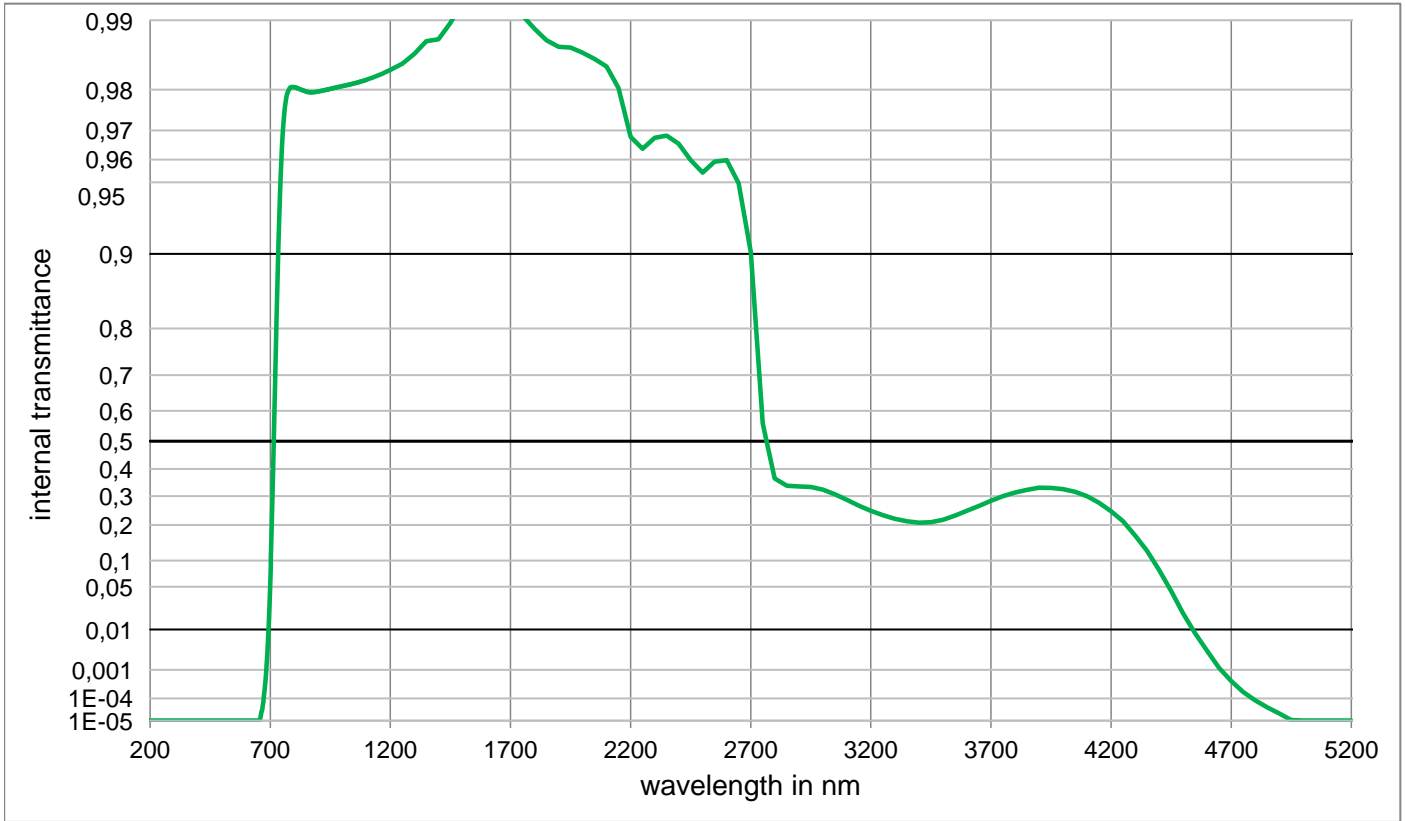
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	9,766E-01	1100	9,736E-01	2200	9,700E-01	3700	3,257E-01
210	< 1,0E-05	510	< 1,000E-05	810	9,760E-01	1110	9,738E-01	2250	9,666E-01	3750	3,377E-01
220	< 1,0E-05	520	< 1,000E-05	820	9,754E-01	1120	9,740E-01	2300	9,695E-01	3800	3,478E-01
230	< 1,0E-05	530	< 1,000E-05	830	9,749E-01	1130	9,743E-01	2350	9,698E-01	3850	3,564E-01
240	< 1,0E-05	540	< 1,000E-05	840	9,744E-01	1140	9,745E-01	2400	9,679E-01	3900	3,633E-01
250	< 1,0E-05	550	< 1,000E-05	850	9,740E-01	1150	9,747E-01	2450	9,660E-01	3950	3,659E-01
260	< 1,0E-05	560	< 1,000E-05	860	9,737E-01	1160	9,750E-01	2500	9,642E-01	4000	3,632E-01
270	< 1,0E-05	570	< 1,000E-05	870	9,734E-01	1170	9,752E-01	2550	9,631E-01	4050	3,523E-01
280	< 1,0E-05	580	< 1,000E-05	880	9,732E-01	1180	9,755E-01	2600	9,619E-01	4100	3,308E-01
290	< 1,0E-05	590	< 1,000E-05	890	9,730E-01	1190	9,758E-01	2650	9,567E-01	4150	3,050E-01
300	< 1,0E-05	600	< 1,000E-05	900	9,729E-01	1200	9,761E-01	2700	9,214E-01	4200	2,770E-01
310	< 1,0E-05	610	< 1,000E-05	910	9,728E-01	1250	9,775E-01	2750	6,057E-01	4250	2,394E-01
320	< 1,000E-05	620	< 1,000E-05	920	9,728E-01	1300	9,793E-01	2800	4,261E-01	4300	1,911E-01
330	< 1,000E-05	630	< 1,000E-05	930	9,727E-01	1350	9,814E-01	2850	4,014E-01	4350	1,424E-01
340	< 1,000E-05	640	< 1,000E-05	940	9,727E-01	1400	9,826E-01	2900	4,002E-01	4400	9,250E-02
350	< 1,000E-05	650	1,534E-05	950	9,727E-01	1450	9,854E-01	2950	3,970E-01	4450	4,970E-02
360	< 1,000E-05	660	3,350E-04	960	9,727E-01	1500	9,876E-01	3000	3,859E-01	4500	2,317E-02
370	< 1,000E-05	670	6,330E-03	970	9,726E-01	1550	9,889E-01	3050	3,665E-01	4550	1,037E-02
380	< 1,000E-05	680	7,498E-02	980	9,726E-01	1600	9,899E-01	3100	3,462E-01	4600	4,025E-03
390	< 1,000E-05	690	3,367E-01	990	9,726E-01	1650	9,899E-01	3150	3,243E-01	4650	1,530E-03
400	< 1,000E-05	700	6,612E-01	1000	9,726E-01	1700	9,892E-01	3200	3,018E-01	4700	5,346E-04
410	< 1,000E-05	710	8,508E-01	1010	9,726E-01	1750	9,882E-01	3250	2,824E-01	4750	2,234E-04
420	< 1,000E-05	720	9,295E-01	1020	9,727E-01	1800	9,868E-01	3300	2,667E-01	4800	1,104E-04
430	< 1,000E-05	730	9,596E-01	1030	9,727E-01	1850	9,853E-01	3350	2,563E-01	4850	5,636E-05
440	< 1,000E-05	740	9,716E-01	1040	9,728E-01	1900	9,846E-01	3400	2,535E-01	4900	3,062E-05
450	< 1,000E-05	750	9,759E-01	1050	9,729E-01	1950	9,847E-01	3450	2,581E-01	4950	1,570E-05
460	< 1,000E-05	760	9,775E-01	1060	9,730E-01	2000	9,841E-01	3500	2,681E-01	5000	< 1,000E-05
470	< 1,000E-05	770	9,780E-01	1070	9,732E-01	2050	9,832E-01	3550	2,819E-01	5050	< 1,000E-05
480	< 1,000E-05	780	9,779E-01	1080	9,733E-01	2100	9,825E-01	3600	2,973E-01	5100	< 1,000E-05
490	< 1,000E-05	790	9,773E-01	1090	9,735E-01	2150	9,790E-01	3650	3,121E-01	5150	< 1,000E-05

RG715

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,914$	$d = 3,00 \text{ mm}$	illuminant D65
Spectral values guaranteed (d = 3 mm)	Density	x
$\lambda_{i0,5} = 715 \text{ nm} \pm 9 \text{ nm}$	$\rho = 2,76 \text{ g/cm}^3$	y
$\lambda_s (\tau_{i,U} = 1E-05) = 620 \text{ nm}$	Knoop hardness	Y
$\lambda_p (\tau_{i,L} = 0,96) = 810 \text{ nm}$	$HK_{[0.1/20]} = 545$	λ_d
		P_e
		illuminant A
		x
		y
		Y
		λ_d
		P_e
Refractive indices	Thermal properties	Notes
$n_d (587,6 \text{ nm}) = 1,54$	Transformation temperature	
$n_s (852 \text{ nm}) = 1,53$	$T_g = 532 \text{ }^\circ\text{C}$	
$n_t (1014 \text{ nm}) = 1,53$	Thermal expansion in $10^{-6}/\text{K}$	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 8,1$	
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,4$	
	Temperature coefficient	
	$Tk = 0,18 \text{ nm/K}$	
Sellmeier coefficients	Chemical properties	
valid from 440 nm to 1550 nm	Chemical resistance	Stricking glass
$B_1 = 0,8330$	FR class = 0	Longpass filter
$B_2 = 0,4883$	SR class = 1	
$B_3 = 6,5998$	AR class = 1	
$C_1 = 1,082E-02 \text{ } \mu\text{m}^2$	Resistance against humidity	
$C_2 = 1,1301E-02 \text{ } \mu\text{m}^2$	Resistant glass	ISO 23364:2021
$C_3 = 855,262 \text{ } \mu\text{m}^2$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	Disclaimer
Internal quality		All data without tolerances are to be understood to be reference values.
Bubble class 3		



RG715

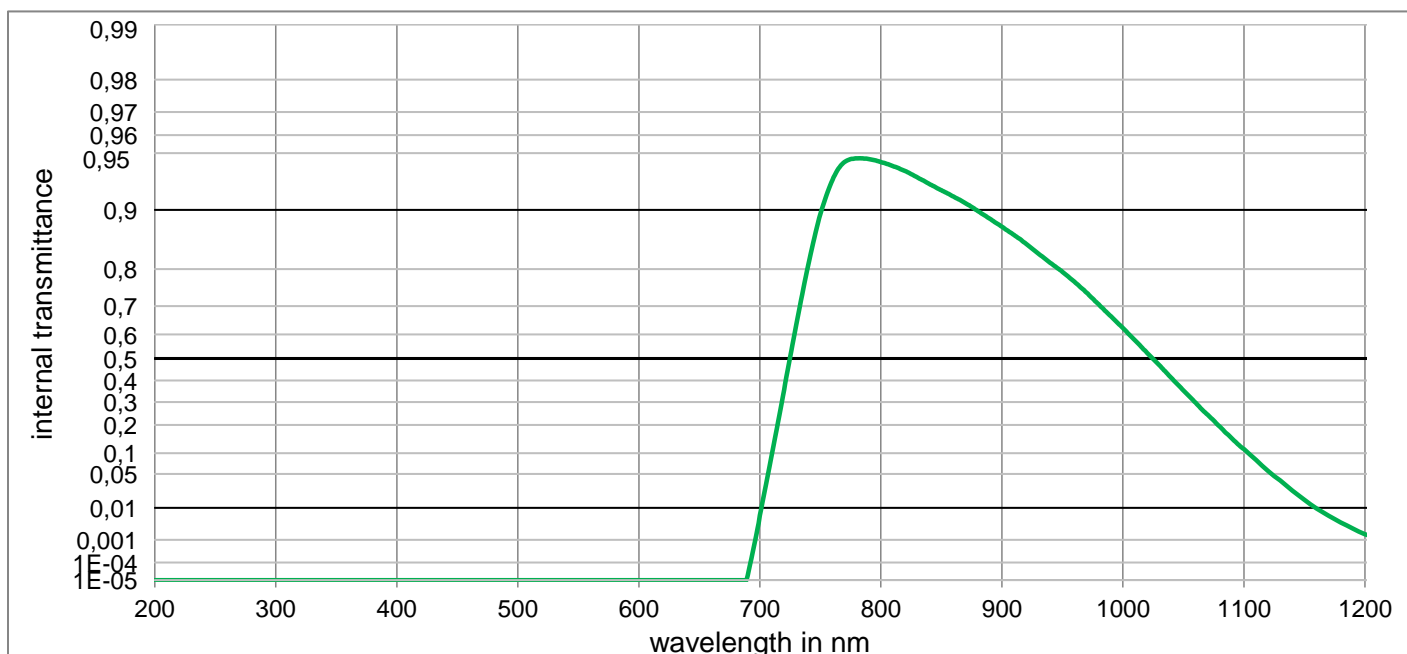


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

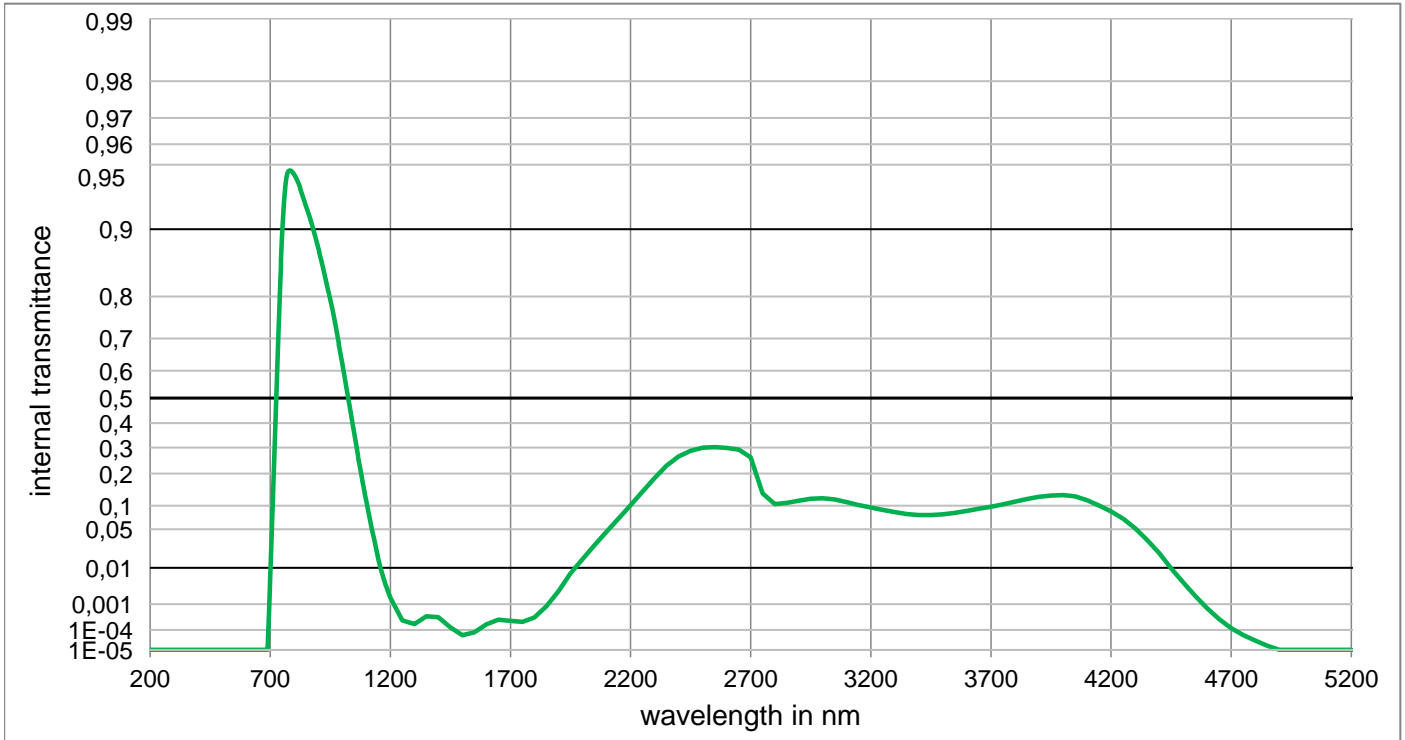
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	9,805E-01	1100	9,819E-01	2200	9,680E-01	3700	2,827E-01
210	< 1,0E-05	510	< 1,000E-05	810	9,804E-01	1110	9,820E-01	2250	9,641E-01	3750	2,995E-01
220	< 1,0E-05	520	< 1,000E-05	820	9,802E-01	1120	9,822E-01	2300	9,678E-01	3800	3,127E-01
230	< 1,0E-05	530	< 1,000E-05	830	9,800E-01	1130	9,823E-01	2350	9,684E-01	3850	3,232E-01
240	< 1,0E-05	540	< 1,000E-05	840	9,798E-01	1140	9,825E-01	2400	9,658E-01	3900	3,305E-01
250	< 1,0E-05	550	< 1,000E-05	850	9,796E-01	1150	9,827E-01	2450	9,598E-01	3950	3,302E-01
260	< 1,0E-05	560	< 1,000E-05	860	9,795E-01	1160	9,828E-01	2500	9,545E-01	4000	3,252E-01
270	< 1,0E-05	570	< 1,000E-05	870	9,794E-01	1170	9,830E-01	2550	9,592E-01	4050	3,154E-01
280	< 1,0E-05	580	< 1,000E-05	880	9,795E-01	1180	9,832E-01	2600	9,597E-01	4100	2,993E-01
290	< 1,0E-05	590	< 1,000E-05	890	9,795E-01	1190	9,834E-01	2650	9,495E-01	4150	2,758E-01
300	< 1,0E-05	600	< 1,000E-05	900	9,796E-01	1200	9,836E-01	2700	9,017E-01	4200	2,464E-01
310	< 1,0E-05	610	< 1,000E-05	910	9,797E-01	1250	9,846E-01	2750	5,597E-01	4250	2,120E-01
320	< 1,000E-05	620	< 1,000E-05	920	9,798E-01	1300	9,860E-01	2800	3,653E-01	4300	1,666E-01
330	< 1,000E-05	630	< 1,000E-05	930	9,799E-01	1350	9,877E-01	2850	3,378E-01	4350	1,238E-01
340	< 1,000E-05	640	< 1,000E-05	940	9,801E-01	1400	9,879E-01	2900	3,356E-01	4400	7,960E-02
350	< 1,000E-05	650	< 1,000E-05	950	9,802E-01	1450	9,897E-01	2950	3,336E-01	4450	4,376E-02
360	< 1,000E-05	660	1,589E-05	960	9,803E-01	1500	9,917E-01	3000	3,236E-01	4500	1,980E-02
370	< 1,000E-05	670	6,257E-05	970	9,804E-01	1550	9,927E-01	3050	3,067E-01	4550	8,430E-03
380	< 1,000E-05	680	4,487E-04	980	9,805E-01	1600	9,932E-01	3100	2,864E-01	4600	3,292E-03
390	< 1,000E-05	690	5,351E-03	990	9,806E-01	1650	9,929E-01	3150	2,660E-01	4650	1,132E-03
400	< 1,000E-05	700	5,900E-02	1000	9,807E-01	1700	9,919E-01	3200	2,477E-01	4700	4,375E-04
410	< 1,000E-05	710	3,110E-01	1010	9,808E-01	1750	9,905E-01	3250	2,325E-01	4750	1,791E-04
420	< 1,000E-05	720	6,665E-01	1020	9,809E-01	1800	9,891E-01	3300	2,202E-01	4800	8,337E-05
430	< 1,000E-05	730	8,663E-01	1030	9,810E-01	1850	9,878E-01	3350	2,120E-01	4850	4,236E-05
440	< 1,000E-05	740	9,410E-01	1040	9,811E-01	1900	9,869E-01	3400	2,072E-01	4900	2,218E-05
450	< 1,000E-05	750	9,666E-01	1050	9,812E-01	1950	9,869E-01	3450	2,093E-01	4950	1,076E-05
460	< 1,000E-05	760	9,757E-01	1060	9,813E-01	2000	9,862E-01	3500	2,171E-01	5000	< 1,000E-05
470	< 1,000E-05	770	9,791E-01	1070	9,815E-01	2050	9,853E-01	3550	2,313E-01	5050	< 1,000E-05
480	< 1,000E-05	780	9,802E-01	1080	9,816E-01	2100	9,841E-01	3600	2,476E-01	5100	< 1,000E-05
490	< 1,000E-05	790	9,805E-01	1090	9,817E-01	2150	9,803E-01	3650	2,649E-01	5150	< 1,000E-05

RG9

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,920$	$d = 3,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed	Density	
$\tau_i (720 \text{ nm}) \leq 0,45$	$\rho = 2,58 \text{ g/cm}^3$	
$\tau_i (800 \text{ nm}) \geq 0,92$	Knoop hardness	
$\tau_i (1060 \text{ nm}) \leq 0,4$	$HK[0.1/20] = 459$	
	Thermal properties	Illuminant A x y Y λ_d P_e
	Transformation temperature	
	$T_g = 519 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 7,9$	
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 9,0$	Notes Bandpass filter / Longpass filter ISO 23364:2021 Disclaimer All data without tolerances are to be understood to be reference values.
Refractive indices	Temperature coefficient	
$n_F (486 \text{ nm}) = 1,521$	$Tk = 0,06 \text{ nm/K}$	
$n_e (546 \text{ nm}) = 1,517$	Chemical properties	
$n_d (587,6 \text{ nm}) = 1,515$	Chemical resistance	
	$FR \text{ class} = 0$	
Sellmeier coefficients	$SR \text{ class} = 1$	
valid from 440 nm to 1550 nm	$AR \text{ class} = 1$	
$B_1 = 0,6332$	Resistance against humidity	
$B_2 = 0,6287$	Robust glass	
$B_3 = 64,3526$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
$C_1 = 9,656E-03 \mu\text{m}^2$		
$C_2 = 9,6564E-03 \mu\text{m}^2$		
$C_3 = 7257,357 \mu\text{m}^2$		
Internal quality		
Bubble class 3		



RG9

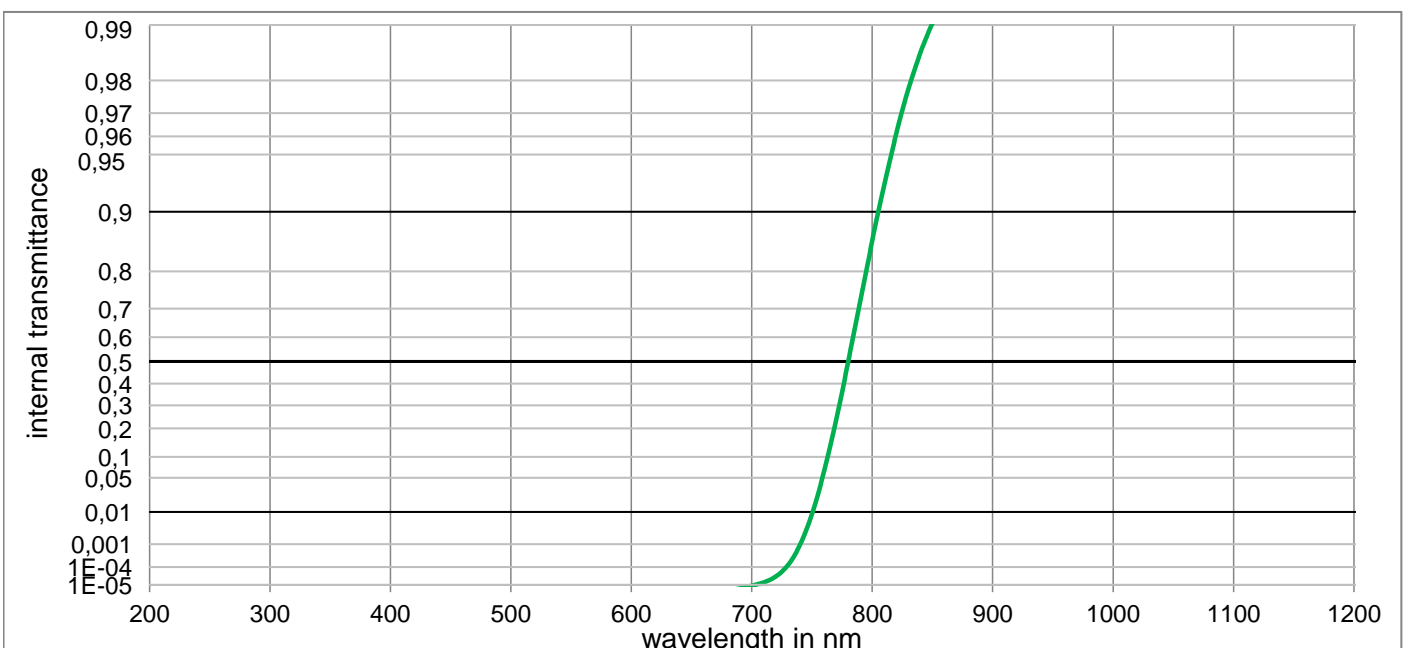


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

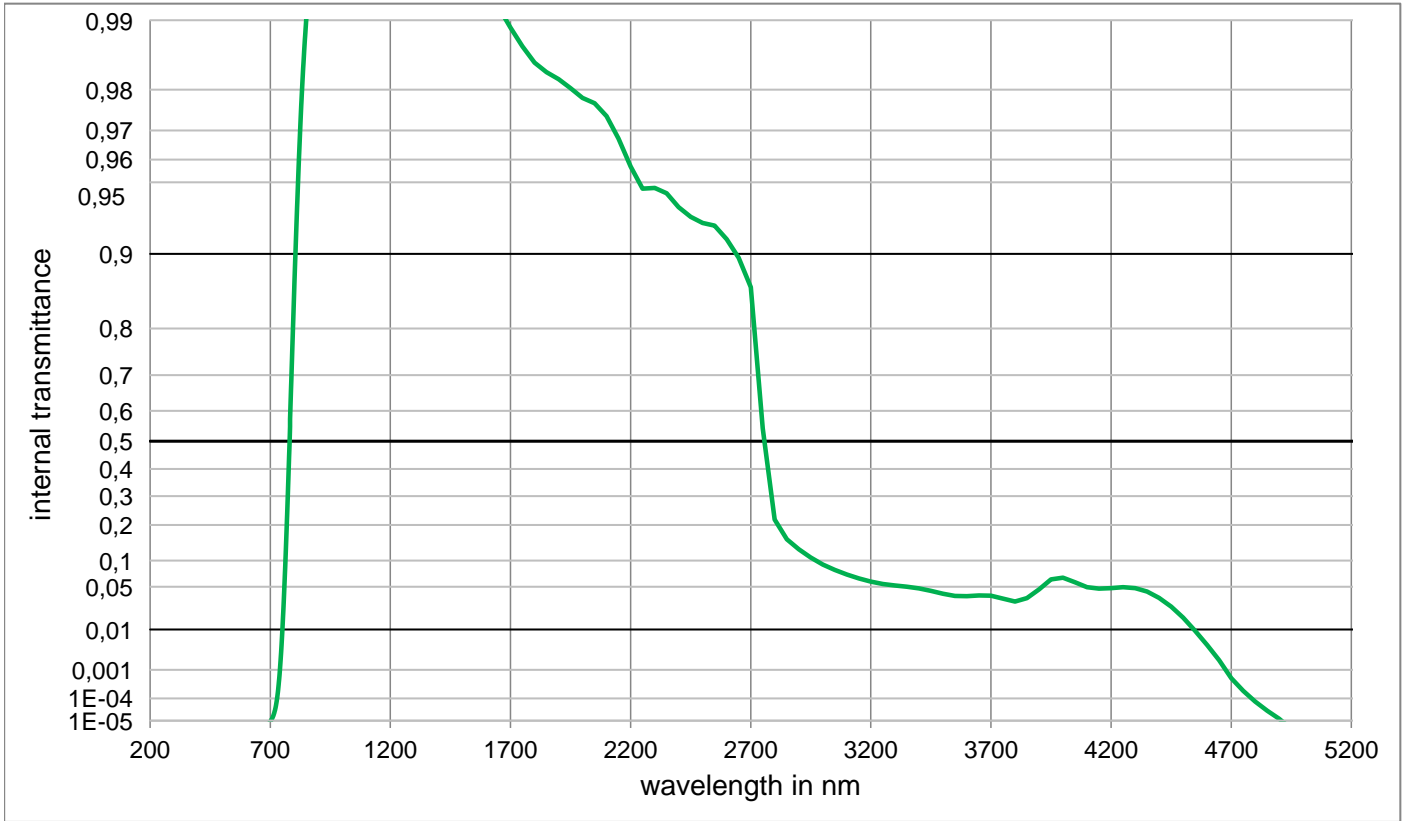
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	< 1,000E-05	800	9,442E-01	1100	1,124E-01	2200	1,008E-01	3700	9,734E-02
210	< 1,000E-05	510	< 1,000E-05	810	9,414E-01	1110	8,093E-02	2250	1,400E-01	3750	1,032E-01
220	< 1,000E-05	520	< 1,000E-05	820	9,377E-01	1120	5,559E-02	2300	1,844E-01	3800	1,105E-01
230	< 1,000E-05	530	< 1,000E-05	830	9,327E-01	1130	3,853E-02	2350	2,288E-01	3850	1,182E-01
240	< 1,000E-05	540	< 1,000E-05	840	9,271E-01	1140	2,454E-02	2400	2,643E-01	3900	1,239E-01
250	< 1,000E-05	550	< 1,000E-05	850	9,212E-01	1150	1,553E-02	2450	2,870E-01	3950	1,281E-01
260	< 1,000E-05	560	< 1,000E-05	860	9,148E-01	1160	9,600E-03	2500	2,997E-01	4000	1,292E-01
270	< 1,000E-05	570	< 1,000E-05	870	9,076E-01	1170	6,124E-03	2550	3,020E-01	4050	1,255E-01
280	< 1,000E-05	580	< 1,000E-05	880	8,989E-01	1180	3,890E-03	2600	2,991E-01	4100	1,144E-01
290	< 1,000E-05	590	< 1,000E-05	890	8,889E-01	1190	2,500E-03	2650	2,922E-01	4150	1,006E-01
300	< 1,000E-05	600	< 1,000E-05	900	8,776E-01	1200	1,611E-03	2700	2,612E-01	4200	8,570E-02
310	< 1,000E-05	610	< 1,000E-05	910	8,651E-01	1250	2,518E-04	2750	1,342E-01	4250	6,981E-02
320	< 1,000E-05	620	< 1,000E-05	920	8,505E-01	1300	1,782E-04	2800	1,042E-01	4300	5,190E-02
330	< 1,000E-05	630	< 1,000E-05	930	8,328E-01	1350	3,698E-04	2850	1,074E-01	4350	3,430E-02
340	< 1,000E-05	640	< 1,000E-05	940	8,137E-01	1400	3,388E-04	2900	1,136E-01	4400	2,019E-02
350	< 1,000E-05	650	< 1,000E-05	950	7,936E-01	1450	1,272E-04	2950	1,185E-01	4450	9,760E-03
360	< 1,000E-05	660	< 1,000E-05	960	7,697E-01	1500	5,674E-05	3000	1,203E-01	4500	4,410E-03
370	< 1,000E-05	670	< 1,000E-05	970	7,403E-01	1550	7,805E-05	3050	1,164E-01	4550	1,840E-03
380	< 1,000E-05	680	< 1,000E-05	980	7,052E-01	1600	1,738E-04	3100	1,094E-01	4600	7,240E-04
390	< 1,000E-05	690	1,925E-05	990	6,662E-01	1650	2,710E-04	3150	1,016E-01	4650	2,825E-04
400	< 1,000E-05	700	6,397E-03	1000	6,249E-01	1700	2,449E-04	3200	9,522E-02	4700	1,191E-04
410	< 1,000E-05	710	9,896E-02	1010	5,770E-01	1750	2,216E-04	3250	8,942E-02	4750	5,808E-05
420	< 1,000E-05	720	3,571E-01	1020	5,244E-01	1800	3,322E-04	3300	8,429E-02	4800	3,162E-05
430	< 1,000E-05	730	6,334E-01	1030	4,702E-01	1850	8,561E-04	3350	7,998E-02	4850	1,690E-05
440	< 1,000E-05	740	8,095E-01	1040	4,126E-01	1900	2,534E-03	3400	7,746E-02	4900	< 1,000E-05
450	< 1,000E-05	750	8,952E-01	1050	3,537E-01	1950	7,370E-03	3450	7,752E-02	4950	< 1,000E-05
460	< 1,000E-05	760	9,306E-01	1060	2,968E-01	2000	1,525E-02	3500	7,945E-02	5000	< 1,000E-05
470	< 1,000E-05	770	9,442E-01	1070	2,425E-01	2050	2,800E-02	3550	8,240E-02	5050	< 1,000E-05
480	< 1,000E-05	780	9,467E-01	1080	1,938E-01	2100	4,638E-02	3600	8,704E-02	5100	< 1,000E-05
490	< 1,000E-05	790	9,462E-01	1090	1,483E-01	2150	7,040E-02	3650	9,214E-02	5150	< 1,000E-05

RG780

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,908$	$d = 3,00 \text{ mm}$	illuminant D65
Spectral values guaranteed (d = 3 mm)	Density	x
$\lambda_{i0,5} = 780 \text{ nm} \pm 9 \text{ nm}$	$\rho = 2,94 \text{ g/cm}^3$	y
$\lambda_s (\tau_{i,U} = 1E-05) = 610 \text{ nm}$	Knoop hardness	Y
$\lambda_p (\tau_{i,L} = 0,97) = 900 \text{ nm}$	$HK_{[0.1/20]}$	λ_d
		P_e
		illuminant A
		x
		y
		Y
		λ_d
		P_e
Refractive indices	Thermal properties	Notes
$n_d (587,6 \text{ nm}) = 1,56$	Transformation temperature	
$n_s (852 \text{ nm}) = 1,55$	$T_g = 552 \text{ }^\circ\text{C}$	
$n_t (1014 \text{ nm}) = 1,55$	Thermal expansion in $10^{-6}/\text{K}$	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 9,5$	
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 10,5$	
	Temperature coefficient	
	$Tk = 0,22 \text{ nm/K}$	
Sellmeier coefficients	Chemical properties	Stricking glass
valid from 440 nm to 1550 nm	Chemical resistance	Longpass filter
$B_1 = 0,4066$	FR class = 5	
$B_2 = 0,9852$	SR class = 53.4	
$B_3 = 0,3548$	AR class = 1.3	
$C_1 = 1,139E-02 \text{ } \mu\text{m}^2$	Resistance against humidity	
$C_2 = 1,2050E-02 \text{ } \mu\text{m}^2$	Robust glass	ISO 23364:2021
$C_3 = 55,081 \text{ } \mu\text{m}^2$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	Disclaimer
Internal quality		All data without tolerances are to be understood to be reference values.
Bubble class 3		



RG780

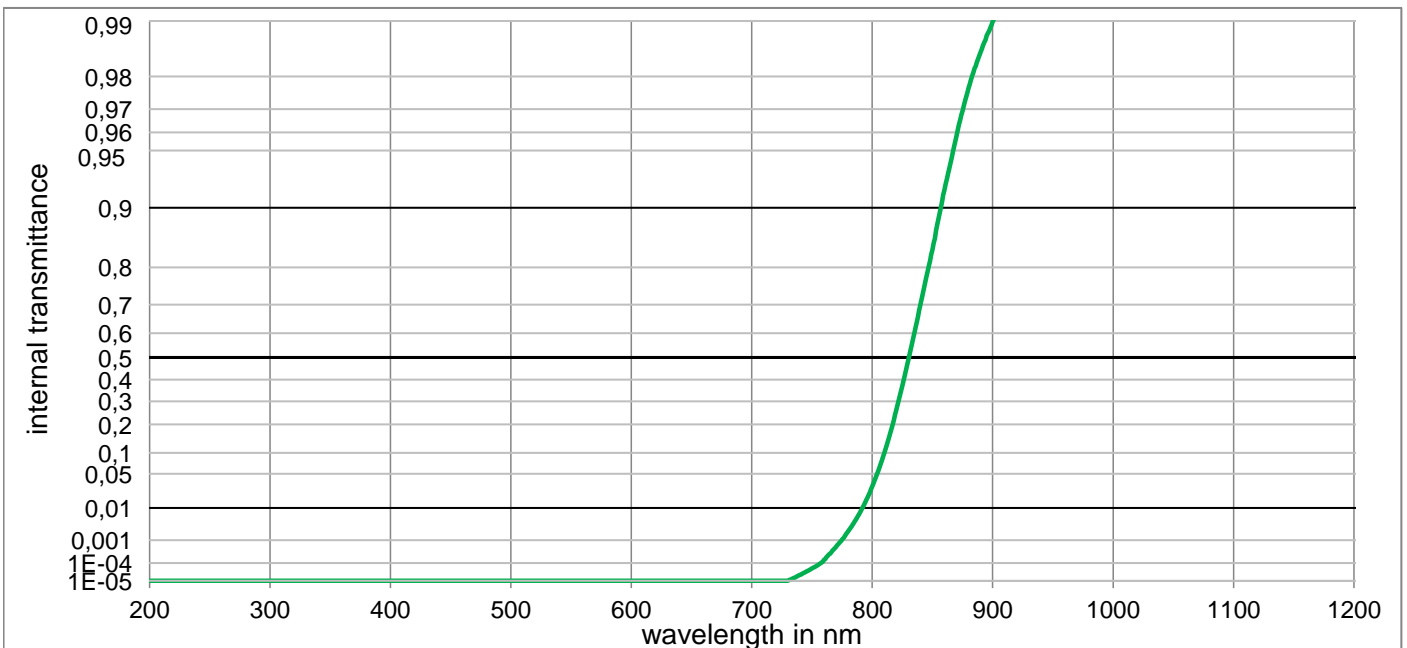


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

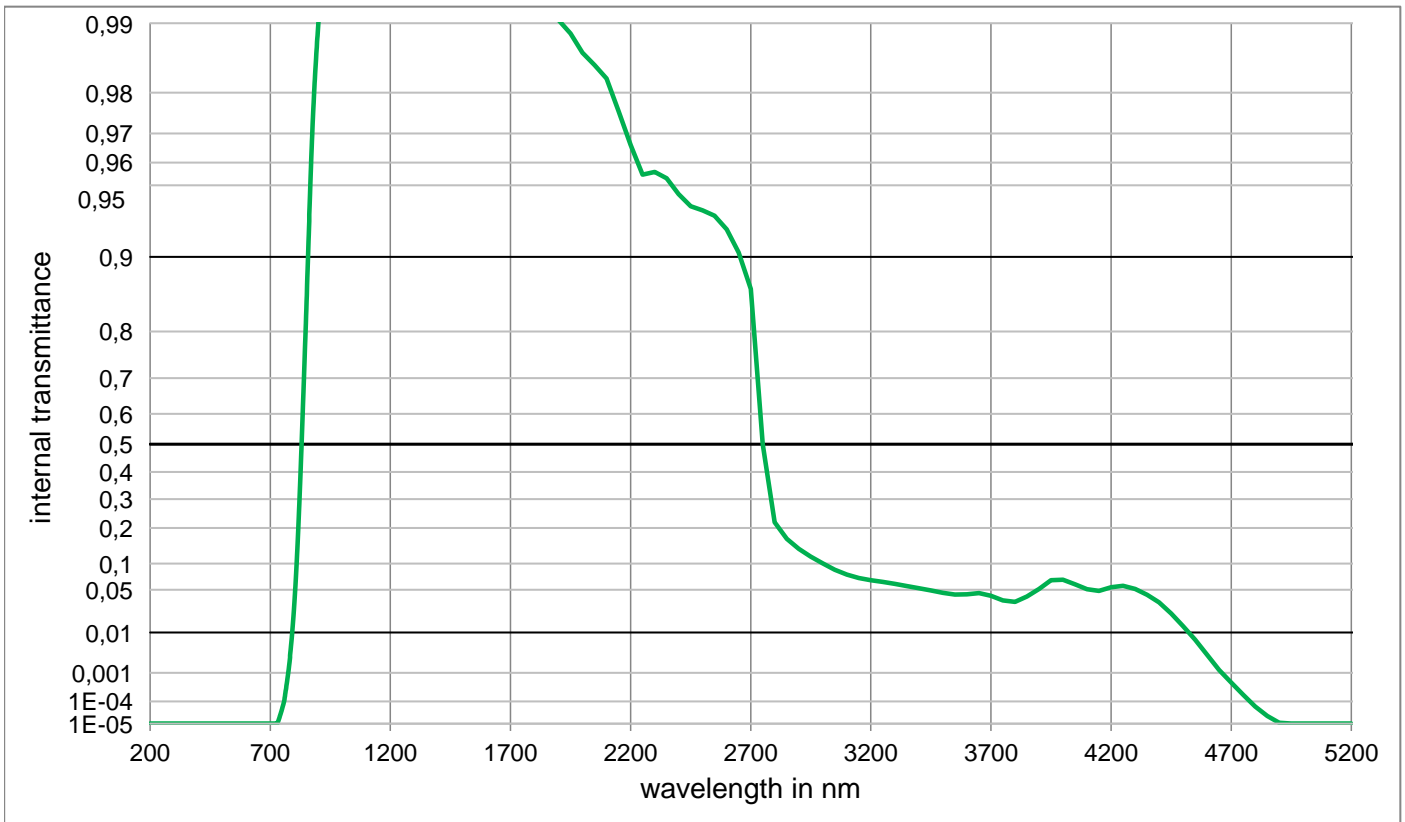
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	8,585E-01	1100	9,944E-01	2200	9,571E-01	3700	3,777E-02
210	< 1,0E-05	510	< 1,000E-05	810	9,277E-01	1110	9,944E-01	2250	9,468E-01	3750	3,428E-02
220	< 1,0E-05	520	< 1,000E-05	820	9,614E-01	1120	9,944E-01	2300	9,472E-01	3800	3,105E-02
230	< 1,0E-05	530	< 1,000E-05	830	9,778E-01	1130	9,945E-01	2350	9,443E-01	3850	3,484E-02
240	< 1,0E-05	540	< 1,000E-05	840	9,858E-01	1140	9,945E-01	2400	9,363E-01	3900	4,632E-02
250	< 1,0E-05	550	< 1,000E-05	850	9,902E-01	1150	9,945E-01	2450	9,300E-01	3950	6,186E-02
260	< 1,0E-05	560	< 1,000E-05	860	9,910E-01	1160	9,945E-01	2500	9,257E-01	4000	6,493E-02
270	< 1,0E-05	570	< 1,000E-05	870	9,919E-01	1170	9,945E-01	2550	9,238E-01	4050	5,684E-02
280	< 1,0E-05	580	< 1,000E-05	880	9,924E-01	1180	9,946E-01	2600	9,131E-01	4100	4,949E-02
290	< 1,0E-05	590	< 1,000E-05	890	9,927E-01	1190	9,946E-01	2650	8,962E-01	4150	4,707E-02
300	< 1,0E-05	600	< 1,000E-05	900	9,929E-01	1200	9,947E-01	2700	8,629E-01	4200	4,802E-02
310	< 1,0E-05	610	< 1,000E-05	910	9,930E-01	1250	9,948E-01	2750	5,436E-01	4250	4,921E-02
320	< 1,000E-05	620	< 1,000E-05	920	9,931E-01	1300	9,950E-01	2800	2,180E-01	4300	4,794E-02
330	< 1,000E-05	630	< 1,000E-05	930	9,931E-01	1350	9,951E-01	2850	1,559E-01	4350	4,304E-02
340	< 1,000E-05	640	< 1,000E-05	940	9,931E-01	1400	9,930E-01	2900	1,279E-01	4400	3,517E-02
350	< 1,000E-05	650	< 1,000E-05	950	9,930E-01	1450	9,933E-01	2950	1,071E-01	4450	2,583E-02
360	< 1,000E-05	660	< 1,000E-05	960	9,930E-01	1500	9,942E-01	3000	9,129E-02	4500	1,685E-02
370	< 1,000E-05	670	< 1,000E-05	970	9,933E-01	1550	9,938E-01	3050	7,961E-02	4550	9,430E-03
380	< 1,000E-05	680	< 1,000E-05	980	9,937E-01	1600	9,927E-01	3100	7,064E-02	4600	4,586E-03
390	< 1,000E-05	690	< 1,000E-05	990	9,939E-01	1650	9,912E-01	3150	6,354E-02	4650	1,887E-03
400	< 1,000E-05	700	< 1,000E-05	1000	9,940E-01	1700	9,892E-01	3200	5,827E-02	4700	5,470E-04
410	< 1,000E-05	710	1,422E-05	1010	9,941E-01	1750	9,870E-01	3250	5,439E-02	4750	1,991E-04
420	< 1,000E-05	720	3,155E-05	1020	9,942E-01	1800	9,847E-01	3300	5,195E-02	4800	7,430E-05
430	< 1,000E-05	730	1,255E-04	1030	9,942E-01	1850	9,832E-01	3350	5,008E-02	4850	2,958E-05
440	< 1,000E-05	740	9,334E-04	1040	9,942E-01	1900	9,820E-01	3400	4,755E-02	4900	1,222E-05
450	< 1,000E-05	750	8,941E-03	1050	9,943E-01	1950	9,803E-01	3450	4,414E-02	4950	< 1,000E-05
460	< 1,000E-05	760	6,268E-02	1060	9,943E-01	2000	9,783E-01	3500	4,020E-02	5000	< 1,000E-05
470	< 1,000E-05	770	2,345E-01	1070	9,943E-01	2050	9,771E-01	3550	3,737E-02	5050	< 1,000E-05
480	< 1,000E-05	780	4,959E-01	1080	9,943E-01	2100	9,739E-01	3600	3,722E-02	5100	< 1,000E-05
490	< 1,000E-05	790	7,222E-01	1090	9,944E-01	2150	9,675E-01	3650	3,809E-02	5150	< 1,000E-05

RG830

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,909$	$d = 3,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed (d = 3 mm)	Density	
$\lambda_{i0,5} = 830 \text{ nm} \pm 9 \text{ nm}$	$\rho = 2,94 \text{ g/cm}^3$	
$\lambda_s (\tau_{i,U} = 1E-05) = 670 \text{ nm}$	Knoop hardness	
$\lambda_p (\tau_{i,L} = 0,97) = 950 \text{ nm}$	$HK_{[0.1/20]} = 436$	
		Illuminant A x y Y λ_d P_e
	Thermal properties	
	Transformation temperature	
	$T_g = 554 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
Refractive indices	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 9,5$	Notes Stricking glass Longpass filter ISO 23364:2021 Disclaimer All data without tolerances are to be understood to be reference values.
$n_d (587,6 \text{ nm}) = 1,56$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 10,5$	
$n_s (852 \text{ nm}) = 1,55$		
$n_t (1014 \text{ nm}) = 1,55$	Temperature coefficient	
	$Tk = 0,23 \text{ nm/K}$	
Sellmeier coefficients		
on request	Chemical properties	
	Chemical resistance	
	FR class = 5	
	SR class = 53.4	
	AR class = 1.3	
	Resistance against humidity	
	Robust glass	
Internal quality	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
Bubble class 3		



RG830

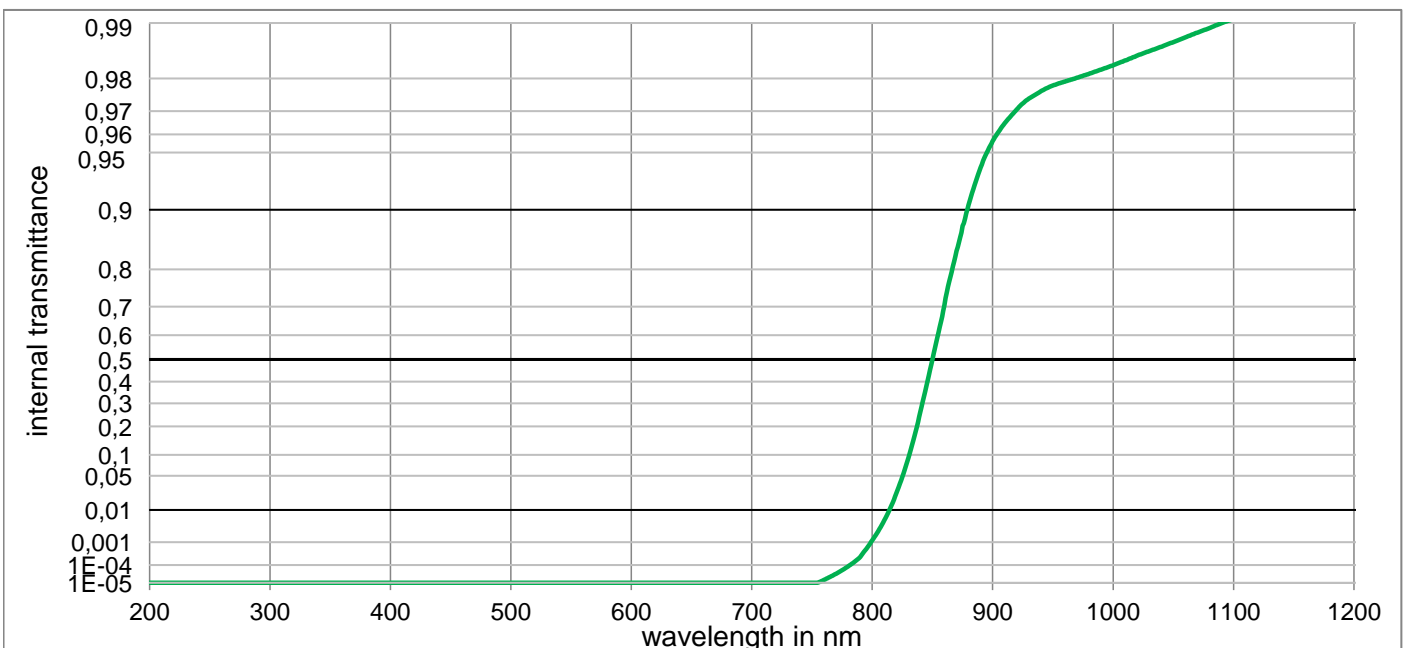


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

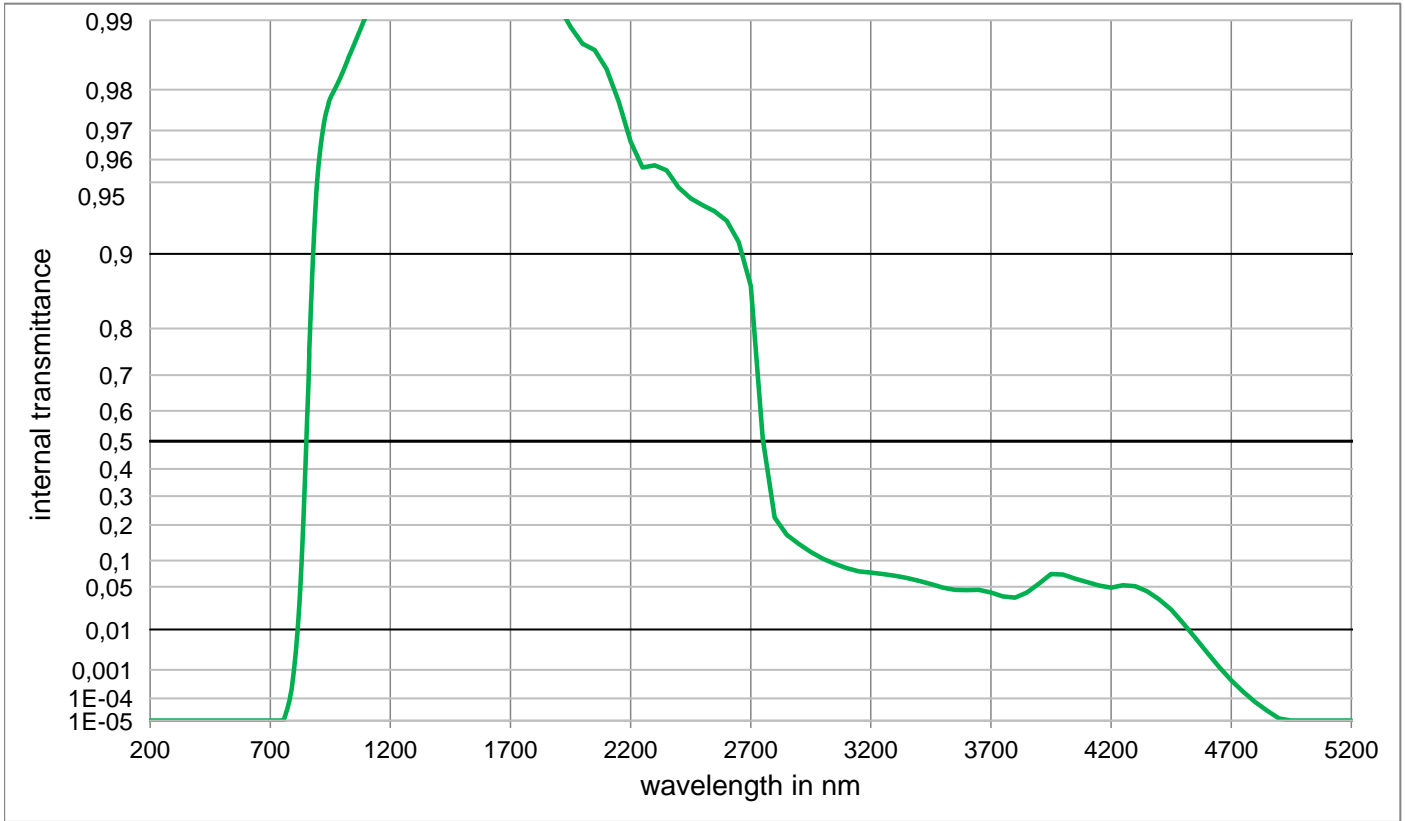
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	2,968E-02	1100	9,971E-01	2200	9,664E-01	3700	4,138E-02
210	< 1,0E-05	510	< 1,000E-05	810	9,936E-02	1110	9,971E-01	2250	9,550E-01	3750	3,550E-02
220	< 1,0E-05	520	< 1,000E-05	820	2,604E-01	1120	9,972E-01	2300	9,562E-01	3800	3,400E-02
230	< 1,0E-05	530	< 1,000E-05	830	4,901E-01	1130	9,973E-01	2350	9,533E-01	3850	4,058E-02
240	< 1,0E-05	540	< 1,000E-05	840	6,987E-01	1140	9,973E-01	2400	9,455E-01	3900	5,135E-02
250	< 1,0E-05	550	< 1,000E-05	850	8,366E-01	1150	9,974E-01	2450	9,387E-01	3950	6,590E-02
260	< 1,0E-05	560	< 1,000E-05	860	9,189E-01	1160	9,975E-01	2500	9,361E-01	4000	6,660E-02
270	< 1,0E-05	570	< 1,000E-05	870	9,582E-01	1170	9,976E-01	2550	9,326E-01	4050	5,851E-02
280	< 1,0E-05	580	< 1,000E-05	880	9,768E-01	1180	9,976E-01	2600	9,232E-01	4100	5,083E-02
290	< 1,0E-05	590	< 1,000E-05	890	9,852E-01	1190	9,977E-01	2650	9,041E-01	4150	4,831E-02
300	< 1,0E-05	600	< 1,000E-05	900	9,899E-01	1200	9,978E-01	2700	8,646E-01	4200	5,371E-02
310	< 1,0E-05	610	< 1,000E-05	910	9,927E-01	1250	9,983E-01	2750	5,000E-01	4250	5,637E-02
320	< 1,000E-05	620	< 1,000E-05	920	9,943E-01	1300	9,989E-01	2800	2,183E-01	4300	5,122E-02
330	< 1,000E-05	630	< 1,000E-05	930	9,951E-01	1350	9,997E-01	2850	1,663E-01	4350	4,271E-02
340	< 1,000E-05	640	< 1,000E-05	940	9,954E-01	1400	9,985E-01	2900	1,371E-01	4400	3,328E-02
350	< 1,000E-05	650	< 1,000E-05	950	9,956E-01	1450	9,987E-01	2950	1,170E-01	4450	2,234E-02
360	< 1,000E-05	660	< 1,000E-05	960	9,958E-01	1500	9,998E-01	3000	1,002E-01	4500	1,333E-02
370	< 1,000E-05	670	< 1,000E-05	970	9,959E-01	1550	9,999E-01	3050	8,620E-02	4550	7,120E-03
380	< 1,000E-05	680	< 1,000E-05	980	9,960E-01	1600	9,997E-01	3100	7,650E-02	4600	3,120E-03
390	< 1,000E-05	690	< 1,000E-05	990	9,961E-01	1650	9,984E-01	3150	6,962E-02	4650	1,208E-03
400	< 1,000E-05	700	< 1,000E-05	1000	9,962E-01	1700	9,965E-01	3200	6,599E-02	4700	4,875E-04
410	< 1,000E-05	710	< 1,000E-05	1010	9,963E-01	1750	9,942E-01	3250	6,294E-02	4750	1,828E-04
420	< 1,000E-05	720	< 1,000E-05	1020	9,964E-01	1800	9,924E-01	3300	5,949E-02	4800	6,152E-05
430	< 1,000E-05	730	1,025E-05	1030	9,965E-01	1850	9,911E-01	3350	5,595E-02	4850	2,366E-05
440	< 1,000E-05	740	2,262E-05	1040	9,966E-01	1900	9,903E-01	3400	5,237E-02	4900	1,099E-05
450	< 1,000E-05	750	5,207E-05	1050	9,967E-01	1950	9,889E-01	3450	4,889E-02	4950	< 1,000E-05
460	< 1,000E-05	760	1,421E-04	1060	9,967E-01	2000	9,866E-01	3500	4,561E-02	5000	< 1,000E-05
470	< 1,000E-05	770	5,562E-04	1070	9,968E-01	2050	9,848E-01	3550	4,294E-02	5050	< 1,000E-05
480	< 1,000E-05	780	2,044E-03	1080	9,969E-01	2100	9,826E-01	3600	4,356E-02	5100	< 1,000E-05
490	< 1,000E-05	790	7,784E-03	1090	9,970E-01	2150	9,760E-01	3650	4,528E-02	5150	< 1,000E-05

RG850

Optical properties	Mechanical properties	Colorimetric properties						
Reflection factor	Reference thickness	1 mm 2 mm 3 mm						
$P_d = 0,909$	$d = 3,00 \text{ mm}$	<table border="1"> <tr><td rowspan="5">Illuminant D65</td><td>x</td></tr> <tr><td>y</td></tr> <tr><td>Y</td></tr> <tr><td>λ_d</td></tr> <tr><td>P_e</td></tr> </table>	Illuminant D65	x	y	Y	λ_d	P_e
Illuminant D65	x							
	y							
	Y							
	λ_d							
	P_e							
Spectral values guaranteed (d = 3 mm)	Density	<table border="1"> <tr><td rowspan="5">Illuminant A</td><td>x</td></tr> <tr><td>y</td></tr> <tr><td>Y</td></tr> <tr><td>λ_d</td></tr> <tr><td>P_e</td></tr> </table>	Illuminant A	x	y	Y	λ_d	P_e
Illuminant A	x							
	y							
	Y							
	λ_d							
	P_e							
$\lambda_{i0,5} = 850 \text{ nm} \pm 9 \text{ nm}$	$\rho = 2,93 \text{ g/cm}^3$							
$\lambda_s (\tau_{i,U} = 1E-05) = 700 \text{ nm}$	Knoop hardness							
$\lambda_p (\tau_{i,L} = 0,90) = 950 \text{ nm}$	$HK_{[0,1/20]} = 441$							
$\lambda_p (\tau_{i,L} = 0,97) = 1200 \text{ nm}$								
	Thermal properties							
	Transformation temperature							
	$T_g = 554 \text{ }^\circ\text{C}$							
	Thermal expansion in $10^{-6}/\text{K}$							
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 9,4$							
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 10,4$							
	Temperature coefficient							
	$Tk = 0,24 \text{ nm/K}$							
Refractive indices	Chemical properties	Notes						
$n_d (587,6 \text{ nm}) = 1,56$	Chemical resistance	Stricking glass						
$n_s (852 \text{ nm}) = 1,55$	FR class = 5	Longpass filter						
$n_t (1014 \text{ nm}) = 1,55$	SR class = 53.4							
	AR class = 1.3							
	Resistance against humidity	ISO 23364:2021						
Sellmeier coefficients	Robust glass	Disclaimer						
on request	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	All data without tolerances are to be understood to be reference values.						
Internal quality								
Bubble class 3								



RG850

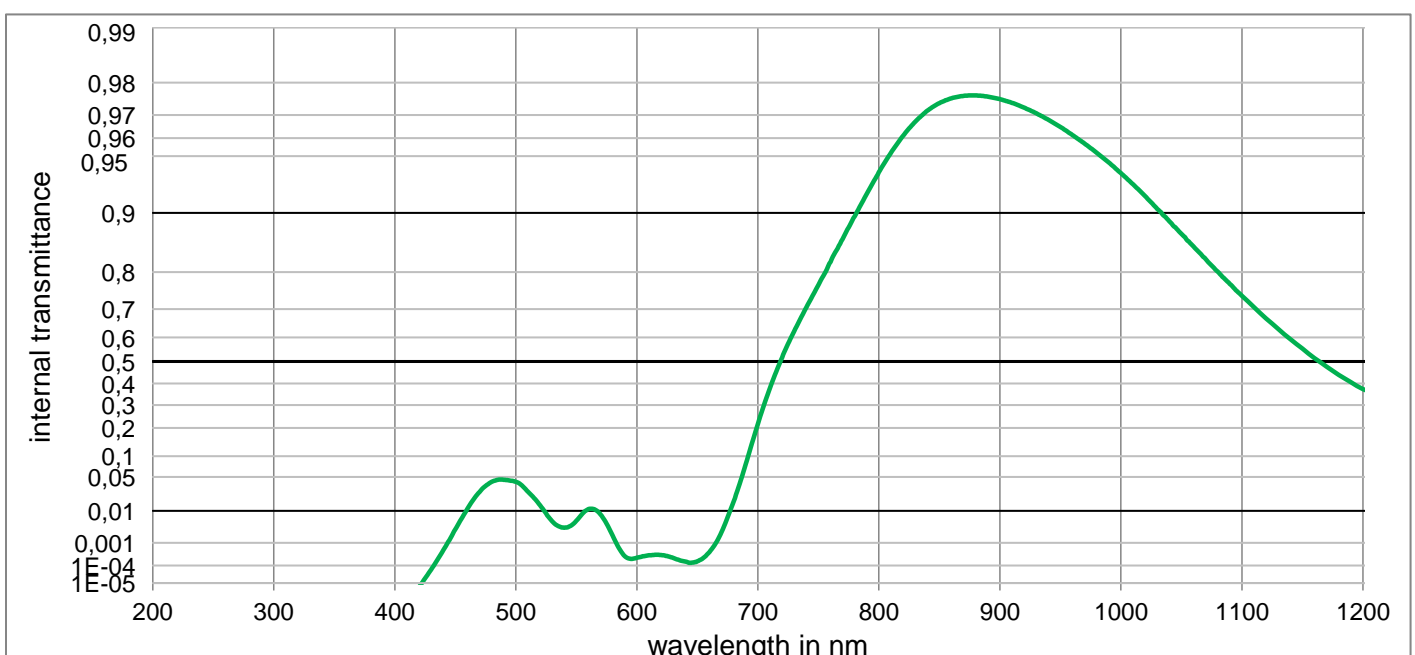


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	1,156E-03	1100	9,905E-01	2200	9,665E-01	3700	4,170E-02
210	< 1,0E-05	510	< 1,000E-05	810	5,250E-03	1110	9,909E-01	2250	9,567E-01	3750	3,687E-02
220	< 1,0E-05	520	< 1,000E-05	820	2,363E-02	1120	9,914E-01	2300	9,577E-01	3800	3,540E-02
230	< 1,0E-05	530	< 1,000E-05	830	9,140E-02	1130	9,918E-01	2350	9,555E-01	3850	4,188E-02
240	< 1,0E-05	540	< 1,000E-05	840	2,610E-01	1140	9,923E-01	2400	9,474E-01	3900	5,486E-02
250	< 1,0E-05	550	< 1,000E-05	850	5,003E-01	1150	9,927E-01	2450	9,414E-01	3950	7,151E-02
260	< 1,0E-05	560	< 1,000E-05	860	7,037E-01	1160	9,931E-01	2500	9,375E-01	4000	7,070E-02
270	< 1,0E-05	570	< 1,000E-05	870	8,376E-01	1170	9,935E-01	2550	9,336E-01	4050	6,328E-02
280	< 1,0E-05	580	< 1,000E-05	880	9,053E-01	1180	9,939E-01	2600	9,272E-01	4100	5,719E-02
290	< 1,0E-05	590	< 1,000E-05	890	9,399E-01	1190	9,943E-01	2650	9,108E-01	4150	5,179E-02
300	< 1,0E-05	600	< 1,000E-05	900	9,565E-01	1200	9,946E-01	2700	8,646E-01	4200	4,878E-02
310	< 1,0E-05	610	< 1,000E-05	910	9,651E-01	1250	9,960E-01	2750	5,095E-01	4250	5,219E-02
320	< 1,000E-05	620	< 1,000E-05	920	9,706E-01	1300	9,973E-01	2800	2,243E-01	4300	5,097E-02
330	< 1,000E-05	630	< 1,000E-05	930	9,743E-01	1350	9,984E-01	2850	1,689E-01	4350	4,352E-02
340	< 1,000E-05	640	< 1,000E-05	940	9,765E-01	1400	9,974E-01	2900	1,425E-01	4400	3,343E-02
350	< 1,000E-05	650	< 1,000E-05	950	9,782E-01	1450	9,984E-01	2950	1,212E-01	4450	2,305E-02
360	< 1,000E-05	660	< 1,000E-05	960	9,792E-01	1500	9,997E-01	3000	1,043E-01	4500	1,334E-02
370	< 1,000E-05	670	< 1,000E-05	970	9,802E-01	1550	9,999E-01	3050	9,268E-02	4550	6,780E-03
380	< 1,000E-05	680	< 1,000E-05	980	9,811E-01	1600	9,998E-01	3100	8,310E-02	4600	2,980E-03
390	< 1,000E-05	690	< 1,000E-05	990	9,821E-01	1650	9,986E-01	3150	7,685E-02	4650	1,211E-03
400	< 1,000E-05	700	< 1,000E-05	1000	9,830E-01	1700	9,968E-01	3200	7,425E-02	4700	4,656E-04
410	< 1,000E-05	710	< 1,000E-05	1010	9,840E-01	1750	9,950E-01	3250	7,161E-02	4750	1,803E-04
420	< 1,000E-05	720	< 1,000E-05	1020	9,850E-01	1800	9,933E-01	3300	6,837E-02	4800	7,194E-05
430	< 1,000E-05	730	< 1,000E-05	1030	9,858E-01	1850	9,922E-01	3350	6,445E-02	4850	2,958E-05
440	< 1,000E-05	740	< 1,000E-05	1040	9,865E-01	1900	9,914E-01	3400	5,946E-02	4900	1,282E-05
450	< 1,000E-05	750	< 1,000E-05	1050	9,873E-01	1950	9,893E-01	3450	5,405E-02	4950	< 1,000E-05
460	< 1,000E-05	760	1,507E-05	1060	9,880E-01	2000	9,874E-01	3500	4,881E-02	5000	< 1,000E-05
470	< 1,000E-05	770	3,444E-05	1070	9,887E-01	2050	9,865E-01	3550	4,544E-02	5050	< 1,000E-05
480	< 1,000E-05	780	8,542E-05	1080	9,894E-01	2100	9,837E-01	3600	4,510E-02	5100	< 1,000E-05
490	< 1,000E-05	790	2,412E-04	1090	9,900E-01	2150	9,776E-01	3650	4,534E-02	5150	< 1,000E-05

RG905

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,921$	$d = 4,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed	Density	
$\tau_i (405 \text{ nm}) \leq 0,002$	$\rho = 2,54 \text{ g/cm}^3$	
$\tau_i (490 \text{ nm}) \leq 0,08$	Knoop hardness	
$\tau_i (645 \text{ nm}) \leq 0,002$	$HK[0.1/20] = 438$	
$\tau_i (905 \text{ nm}) \geq 0,97$		Illuminant A x y Y λ_d P_e
	Thermal properties	
	Transformation temperature	
	$T_g = 481 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
Refractive indices	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 8,7$	Notes
$n_F (486 \text{ nm}) = 1,516$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 10,0$	
$n_e (546 \text{ nm}) = 1,512$		
$n_d (587,6 \text{ nm}) = 1,51$		
Sellmeier coefficients	Chemical properties	
valid from 440 nm to 1550 nm	Chemical resistance	
$B_1 = 0,6150$	FR class = 0	
$B_2 = 0,6285$	SR class = 1.0	
$B_3 = 13,7990$	AR class = 1.0	
$C_1 = 1,035\text{E-}02 \text{ } \mu\text{m}^2$	Resistance against humidity	
$C_2 = 1,0302\text{E-}02 \text{ } \mu\text{m}^2$		
$C_3 = 1939,581 \text{ } \mu\text{m}^2$		
Internal quality		Bandpass filter / Longpass filter
Bubble class -		
		ISO 23364:2021
		Disclaimer
		All data without tolerances are to be understood to be reference values.



RG905

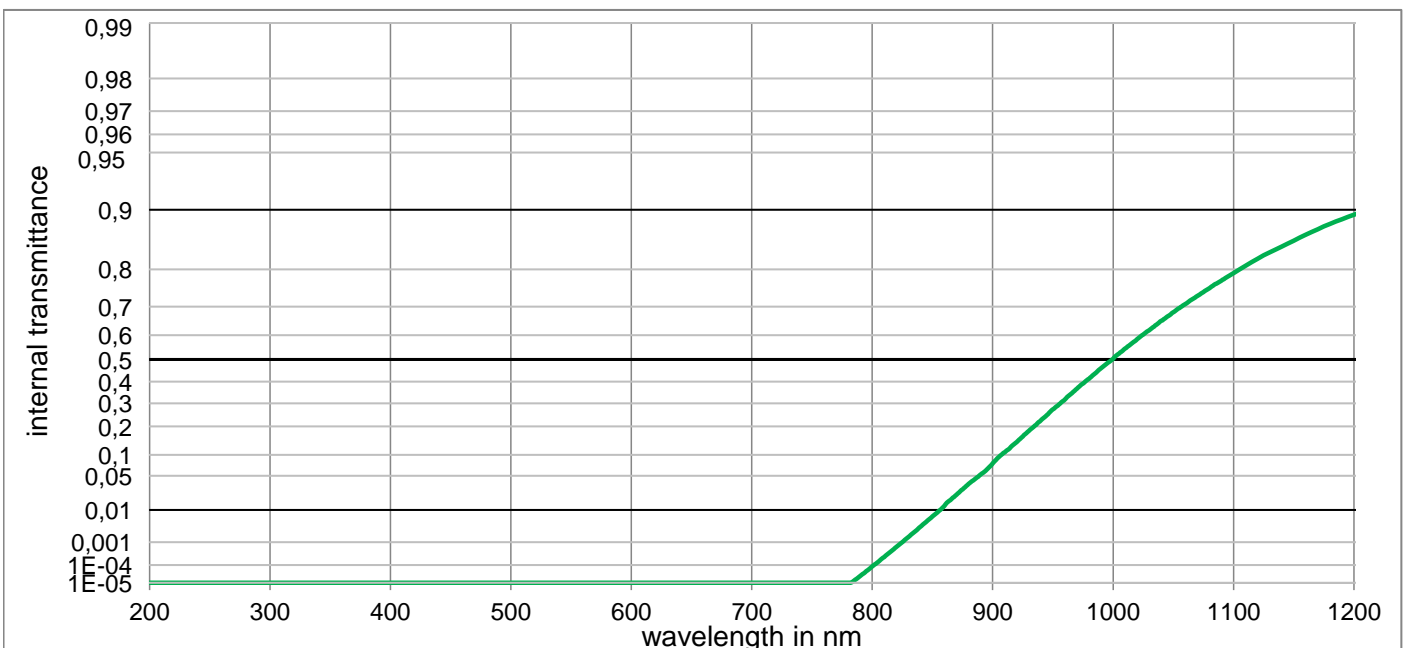


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

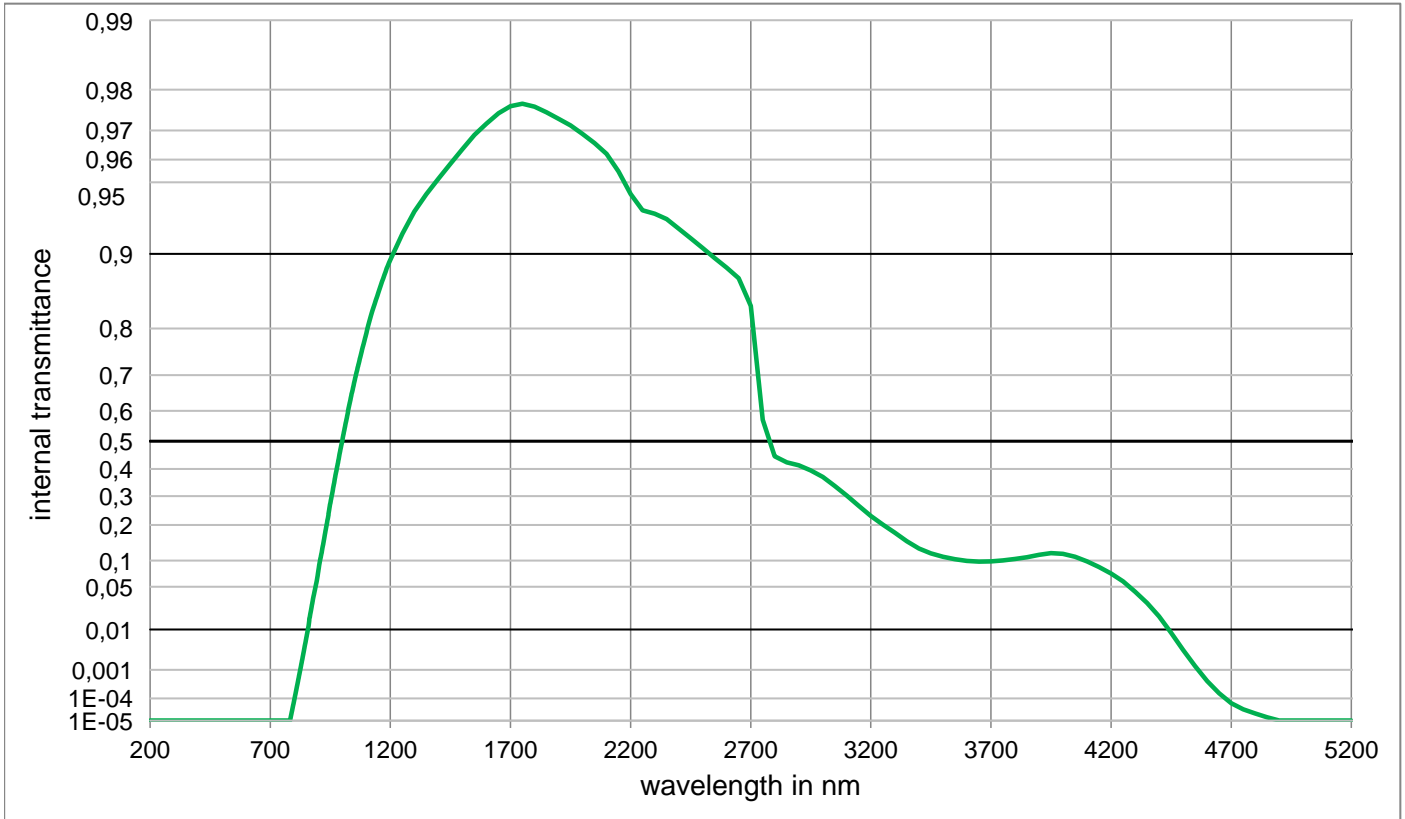
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	4,144E-02	800	9,390E-01	1100	7,396E-01	2200	6,679E-01	3700	4,391E-02
210	< 1,000E-05	510	2,703E-02	810	9,520E-01	1110	7,055E-01	2250	6,951E-01	3750	4,577E-02
220	< 1,000E-05	520	1,361E-02	820	9,611E-01	1120	6,691E-01	2300	7,234E-01	3800	4,874E-02
230	< 1,000E-05	530	5,249E-03	830	9,674E-01	1130	6,316E-01	2350	7,420E-01	3850	5,293E-02
240	< 1,000E-05	540	3,344E-03	840	9,715E-01	1140	5,930E-01	2400	7,535E-01	3900	5,778E-02
250	< 1,000E-05	550	5,402E-03	850	9,741E-01	1150	5,546E-01	2450	7,528E-01	3950	6,183E-02
260	< 1,000E-05	560	1,107E-02	860	9,757E-01	1160	5,149E-01	2500	7,462E-01	4000	6,292E-02
270	< 1,000E-05	570	8,130E-03	870	9,764E-01	1170	4,769E-01	2550	7,382E-01	4050	5,930E-02
280	< 1,000E-05	580	1,843E-03	880	9,765E-01	1180	4,398E-01	2600	7,270E-01	4100	5,118E-02
290	< 1,000E-05	590	2,794E-04	890	9,762E-01	1190	4,054E-01	2650	7,110E-01	4150	4,086E-02
300	< 1,000E-05	600	2,365E-04	900	9,754E-01	1200	3,741E-01	2700	6,734E-01	4200	3,081E-02
310	< 1,000E-05	610	3,064E-04	910	9,742E-01	1250	2,610E-01	2750	4,409E-01	4250	2,192E-02
320	< 1,000E-05	620	3,155E-04	920	9,727E-01	1300	2,294E-01	2800	3,043E-01	4300	1,498E-02
330	< 1,000E-05	630	2,321E-04	930	9,706E-01	1350	2,554E-01	2850	2,767E-01	4350	9,436E-03
340	< 1,000E-05	640	1,576E-04	940	9,682E-01	1400	2,637E-01	2900	2,666E-01	4400	5,022E-03
350	< 1,000E-05	650	1,604E-04	950	9,651E-01	1450	2,237E-01	2950	2,536E-01	4450	2,197E-03
360	< 1,000E-05	660	4,276E-04	960	9,615E-01	1500	1,946E-01	3000	2,324E-01	4500	7,882E-04
370	< 1,000E-05	670	2,431E-03	970	9,572E-01	1550	2,015E-01	3050	2,053E-01	4550	2,409E-04
380	< 1,000E-05	680	1,696E-02	980	9,520E-01	1600	2,316E-01	3100	1,763E-01	4600	6,732E-05
390	< 1,000E-05	690	7,804E-02	990	9,458E-01	1650	2,511E-01	3150	1,484E-01	4650	1,888E-05
400	< 1,000E-05	700	2,159E-01	1000	9,384E-01	1700	2,453E-01	3200	1,232E-01	4700	< 1,000E-05
410	< 1,000E-05	710	3,800E-01	1010	9,293E-01	1750	2,398E-01	3250	1,019E-01	4750	< 1,000E-05
420	< 1,000E-05	720	5,179E-01	1020	9,183E-01	1800	2,556E-01	3300	8,420E-02	4800	< 1,000E-05
430	6,155E-05	730	6,230E-01	1030	9,046E-01	1850	3,022E-01	3350	7,017E-02	4850	< 1,000E-05
440	5,118E-04	740	7,044E-01	1040	8,896E-01	1900	3,686E-01	3400	5,923E-02	4900	< 1,000E-05
450	2,924E-03	750	7,693E-01	1050	8,716E-01	1950	4,445E-01	3450	5,152E-02	4950	< 1,000E-05
460	1,124E-02	760	8,221E-01	1060	8,510E-01	2000	5,108E-01	3500	4,635E-02	5000	< 1,000E-05
470	2,674E-02	770	8,634E-01	1070	8,273E-01	2050	5,626E-01	3550	4,383E-02	5050	< 1,000E-05
480	4,130E-02	780	8,957E-01	1080	8,012E-01	2100	6,059E-01	3600	4,281E-02	5100	< 1,000E-05
490	4,486E-02	790	9,207E-01	1090	7,714E-01	2150	6,425E-01	3650	4,292E-02	5150	< 1,000E-05

RG1000

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,913$	$d = 3,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed (d = 3 mm)	Density	
$\lambda_{i0,5} = 1000 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,73 \text{ g/cm}^3$	
$\lambda_s (\tau_{i,U} = 1E-05) = 730 \text{ nm}$	Knoop hardness	
$\lambda_p (\tau_{i,L} = 0,90) = 1300 \text{ nm}$	$HK_{[0.1/20]} = 460$	
		Illuminant A x y Y λ_d P_e
	Thermal properties	
	Transformation temperature	
	$T_g = 476 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
Refractive indices	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 9,0$	Notes Ionically colored glass Longpass filter ISO 23364:2021 Disclaimer All data without tolerances are to be understood to be reference values.
$n_d (587,6 \text{ nm}) = 1,54$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 10,2$	
$n_s (852 \text{ nm}) = 1,53$		
$n_t (1014 \text{ nm}) = 1,53$	Temperature coefficient	
	$Tk = 0,41 \text{ nm/K}$	
Sellmeier coefficients	Chemical properties	
valid from 440 nm to 1550 nm	Chemical resistance	
$B_1 = 0,8970$	FR class = 0	
$B_2 = 0,4353$	SR class = 1	
$B_3 = 1,1960$	AR class = 1	
$C_1 = 1,087E-02 \text{ } \mu\text{m}^2$	Resistance against humidity	
$C_2 = 1,1835E-02 \text{ } \mu\text{m}^2$	Robust glass	
$C_3 = 142,345 \text{ } \mu\text{m}^2$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
Internal quality		
Bubble class 3		



RG1000

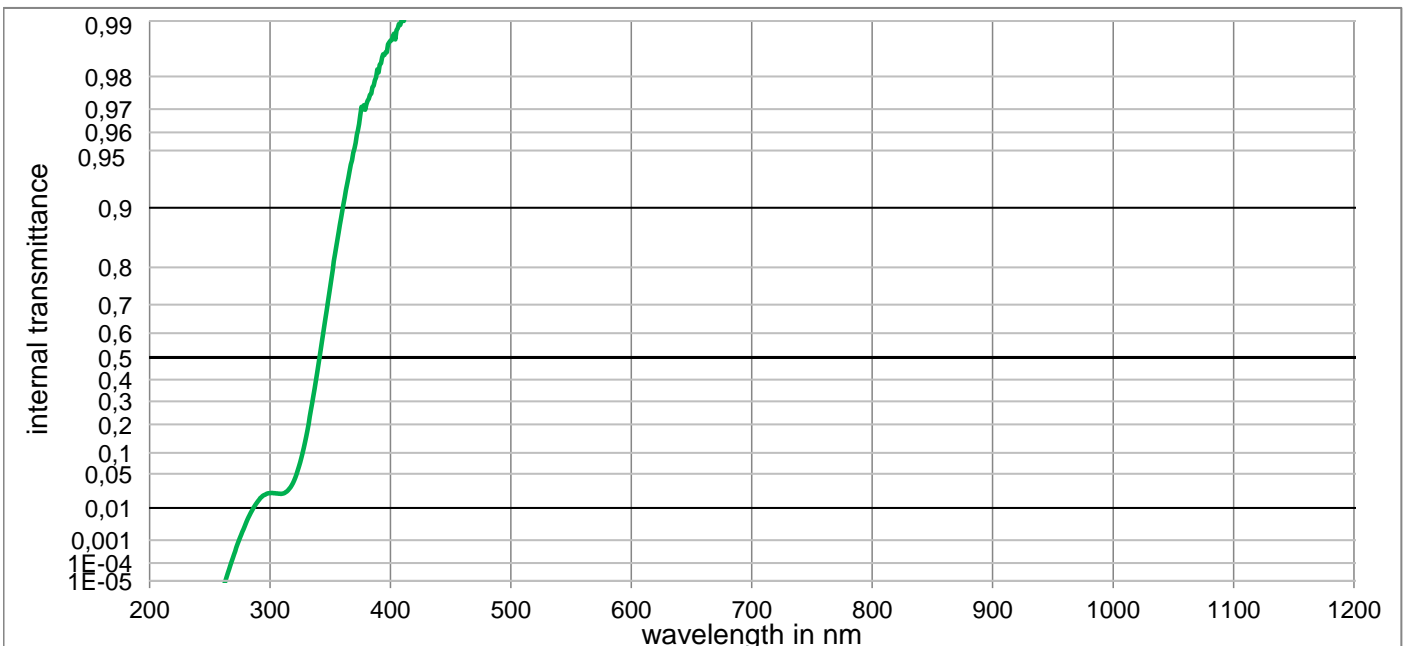


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

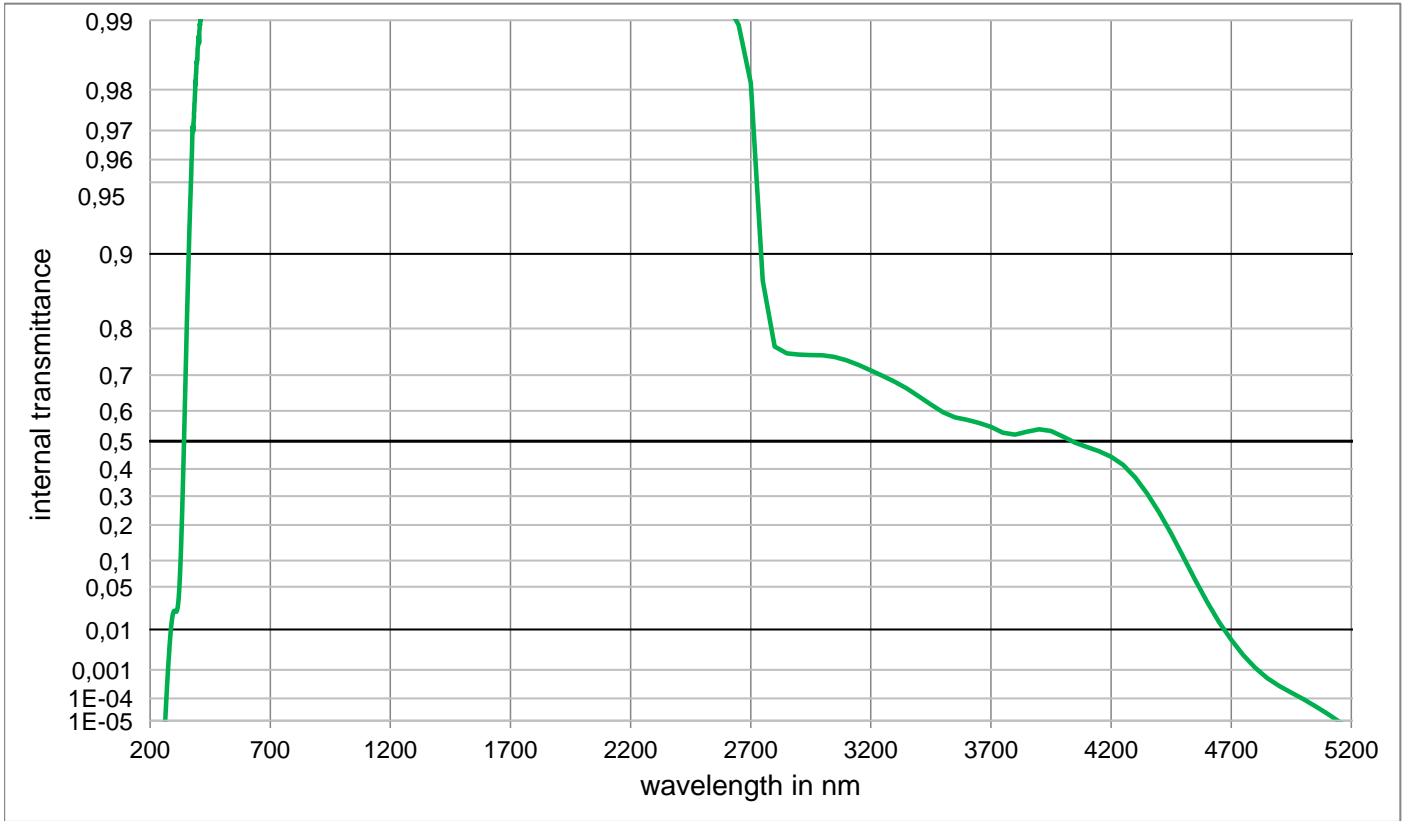
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	< 1,000E-05	800	8,394E-05	1100	7,917E-01	2200	9,439E-01	3700	9,800E-02
210	< 1,0E-05	510	< 1,000E-05	810	2,455E-04	1110	8,080E-01	2250	9,342E-01	3750	1,002E-01
220	< 1,0E-05	520	< 1,000E-05	820	6,502E-04	1120	8,226E-01	2300	9,320E-01	3800	1,036E-01
230	< 1,0E-05	530	< 1,000E-05	830	1,551E-03	1130	8,350E-01	2350	9,284E-01	3850	1,080E-01
240	< 1,0E-05	540	< 1,000E-05	840	3,371E-03	1140	8,459E-01	2400	9,216E-01	3900	1,136E-01
250	< 1,0E-05	550	< 1,000E-05	850	6,757E-03	1150	8,561E-01	2450	9,138E-01	3950	1,179E-01
260	< 1,0E-05	560	< 1,000E-05	860	1,254E-02	1160	8,656E-01	2500	9,054E-01	4000	1,161E-01
270	< 1,0E-05	570	< 1,000E-05	870	2,229E-02	1170	8,739E-01	2550	8,959E-01	4050	1,089E-01
280	< 1,0E-05	580	< 1,000E-05	880	3,617E-02	1180	8,816E-01	2600	8,861E-01	4100	9,840E-02
290	< 1,0E-05	590	< 1,000E-05	890	5,218E-02	1190	8,879E-01	2650	8,740E-01	4150	8,574E-02
300	< 1,0E-05	600	< 1,000E-05	900	7,670E-02	1200	8,940E-01	2700	8,370E-01	4200	7,245E-02
310	< 1,0E-05	610	< 1,000E-05	910	1,073E-01	1250	9,176E-01	2750	5,716E-01	4250	5,855E-02
320	< 1,000E-05	620	< 1,000E-05	920	1,407E-01	1300	9,335E-01	2800	4,462E-01	4300	4,286E-02
330	< 1,000E-05	630	< 1,000E-05	930	1,822E-01	1350	9,438E-01	2850	4,240E-01	4350	2,926E-02
340	< 1,000E-05	640	< 1,000E-05	940	2,248E-01	1400	9,518E-01	2900	4,138E-01	4400	1,762E-02
350	< 1,000E-05	650	< 1,000E-05	950	2,726E-01	1450	9,583E-01	2950	3,942E-01	4450	8,530E-03
360	< 1,000E-05	660	< 1,000E-05	960	3,177E-01	1500	9,640E-01	3000	3,704E-01	4500	3,477E-03
370	< 1,000E-05	670	< 1,000E-05	970	3,676E-01	1550	9,687E-01	3050	3,373E-01	4550	1,300E-03
380	< 1,000E-05	680	< 1,000E-05	980	4,135E-01	1600	9,720E-01	3100	3,015E-01	4600	4,406E-04
390	< 1,000E-05	690	< 1,000E-05	990	4,614E-01	1650	9,747E-01	3150	2,644E-01	4650	1,603E-04
400	< 1,000E-05	700	< 1,000E-05	1000	5,029E-01	1700	9,764E-01	3200	2,303E-01	4700	6,397E-05
410	< 1,000E-05	710	< 1,000E-05	1010	5,464E-01	1750	9,770E-01	3250	2,013E-01	4750	3,404E-05
420	< 1,000E-05	720	< 1,000E-05	1020	5,848E-01	1800	9,763E-01	3300	1,753E-01	4800	2,249E-05
430	< 1,000E-05	730	< 1,000E-05	1030	6,192E-01	1850	9,750E-01	3350	1,507E-01	4850	1,445E-05
440	< 1,000E-05	740	< 1,000E-05	1040	6,527E-01	1900	9,733E-01	3400	1,302E-01	4900	< 1,000E-05
450	< 1,000E-05	750	< 1,000E-05	1050	6,821E-01	1950	9,715E-01	3450	1,174E-01	4950	< 1,000E-05
460	< 1,000E-05	760	< 1,000E-05	1060	7,085E-01	2000	9,690E-01	3500	1,088E-01	5000	< 1,000E-05
470	< 1,000E-05	770	< 1,000E-05	1070	7,320E-01	2050	9,660E-01	3550	1,030E-01	5050	< 1,000E-05
480	< 1,000E-05	780	< 1,000E-05	1080	7,538E-01	2100	9,622E-01	3600	9,915E-02	5100	< 1,000E-05
490	< 1,000E-05	790	2,575E-05	1090	7,734E-01	2150	9,551E-01	3650	9,763E-02	5150	< 1,000E-05

S7000

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,908$	$d = 2,00 \text{ mm}$	Illuminant D65 x 0,313 0,313 0,313 y 0,329 0,329 0,330 Y 90,8 90,7 90,7 λ_d 574 nm 574 nm 575 nm P_e 0,001 0,002 0,004
Spectral values guaranteed (d = 2 mm)	Density	
$\lambda_{i0,5} = 340 \text{ nm} \pm 6 \text{ nm}$	$\rho = 2,83 \text{ g/cm}^3$	
$\lambda_s (\tau_{i,U} = 1E-05) = 260 \text{ nm}$	Knoop hardness	
$\lambda_p (\tau_{i,L} = 0,99) = 420 \text{ nm}$	$HK_{[0.1/20]} = 525$	
		Illuminant A x 0,448 0,448 0,448 y 0,408 0,408 0,408 Y 90,8 90,7 90,7 λ_d 584 nm 584 nm 584 nm P_e 0,002 0,003 0,005
	Thermal properties	
	Transformation temperature	
	$T_g = 452 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
Refractive indices		Notes Ionically colored glass Cerium doped ISO 23364:2021 Disclaimer All data without tolerances are to be understood to be reference values.
$n_d (587,6 \text{ nm}) = 1,56$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 11,1$	
Sellmeier coefficients	Chemical properties	
on request	Chemical resistance	
	FR class = 1	
	SR class = 1.2	
	AR class = 1.0	
	Resistance against humidity	
	Resistant glass	
Internal quality	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	
Bubble class -		



S7000



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	9,965E-01	800	9,939E-01	1100	9,973E-01	2200	9,949E-01	3700	5,490E-01
210	< 1,0E-05	510	9,972E-01	810	9,958E-01	1110	9,972E-01	2250	9,915E-01	3750	5,293E-01
220	< 1,0E-05	520	9,979E-01	820	9,942E-01	1120	9,975E-01	2300	9,923E-01	3800	5,223E-01
230	< 1,0E-05	530	9,982E-01	830	9,951E-01	1130	9,976E-01	2350	9,915E-01	3850	5,329E-01
240	< 1,0E-05	540	9,989E-01	840	9,956E-01	1140	9,974E-01	2400	9,995E-01	3900	5,403E-01
250	< 1,0E-05	550	9,994E-01	850	9,939E-01	1150	9,975E-01	2450	9,976E-01	3950	5,346E-01
260	< 1,0E-05	560	9,919E-01	860	9,940E-01	1160	9,975E-01	2500	9,945E-01	4000	5,156E-01
270	2,5E-04	570	9,997E-01	870	9,964E-01	1170	9,976E-01	2550	9,931E-01	4050	4,951E-01
280	3,8E-03	580	9,995E-01	880	9,970E-01	1180	9,975E-01	2600	9,915E-01	4100	4,796E-01
290	1,5E-02	590	9,998E-01	890	9,965E-01	1190	9,978E-01	2650	9,895E-01	4150	4,652E-01
300	2,2E-02	600	9,916E-01	900	9,965E-01	1200	9,976E-01	2700	9,813E-01	4200	4,449E-01
310	2,1E-02	610	9,917E-01	910	9,967E-01	1250	9,977E-01	2750	8,713E-01	4250	4,150E-01
320	3,831E-02	620	9,915E-01	920	9,973E-01	1300	9,977E-01	2800	7,654E-01	4300	3,683E-01
330	1,542E-01	630	9,920E-01	930	9,970E-01	1350	9,988E-01	2850	7,508E-01	4350	3,098E-01
340	4,615E-01	640	9,923E-01	940	9,970E-01	1400	9,980E-01	2900	7,483E-01	4400	2,423E-01
350	7,547E-01	650	9,927E-01	950	9,973E-01	1450	9,978E-01	2950	7,474E-01	4450	1,724E-01
360	8,962E-01	660	9,930E-01	960	9,970E-01	1500	9,983E-01	3000	7,466E-01	4500	1,097E-01
370	9,511E-01	670	9,926E-01	970	9,969E-01	1550	9,983E-01	3050	7,431E-01	4550	6,139E-02
380	9,717E-01	680	9,933E-01	980	9,965E-01	1600	9,984E-01	3100	7,354E-01	4600	3,030E-02
390	9,810E-01	690	9,933E-01	990	9,968E-01	1650	9,983E-01	3150	7,247E-01	4650	1,385E-02
400	9,872E-01	700	9,933E-01	1000	9,968E-01	1700	9,978E-01	3200	7,118E-01	4700	6,063E-03
410	9,906E-01	710	9,923E-01	1010	9,970E-01	1750	9,977E-01	3250	6,980E-01	4750	2,611E-03
420	9,929E-01	720	9,933E-01	1020	9,971E-01	1800	9,975E-01	3300	6,829E-01	4800	1,160E-03
430	9,933E-01	730	9,942E-01	1030	9,973E-01	1850	9,969E-01	3350	6,653E-01	4850	5,507E-04
440	9,946E-01	740	9,930E-01	1040	9,974E-01	1900	9,969E-01	3400	6,429E-01	4900	2,942E-04
450	9,947E-01	750	9,944E-01	1050	9,972E-01	1950	9,969E-01	3450	6,193E-01	4950	1,688E-04
460	9,951E-01	760	9,922E-01	1060	9,972E-01	2000	9,981E-01	3500	5,955E-01	5000	9,375E-05
470	9,968E-01	770	9,949E-01	1070	9,971E-01	2050	9,977E-01	3550	5,800E-01	5050	4,751E-05
480	9,978E-01	780	9,933E-01	1080	9,971E-01	2100	9,955E-01	3600	5,717E-01	5100	2,188E-05
490	9,968E-01	790	9,928E-01	1090	9,973E-01	2150	9,949E-01	3650	5,619E-01	5150	< 1,000E-05

KG1

Optical properties	
Reflection factor	
$P_d = 0,920$	
Spectral values guaranteed	
τ_i (365 nm)	$\geq 0,89$
τ_i (500 nm)	$\geq 0,92$
τ_i (600 nm)	$\geq 0,88$
τ_i (700 nm)	$\leq 0,68$
τ_i (800 nm)	$\leq 0,33$
τ_i (900 nm)	$\leq 0,1$
τ_i (1060 nm)	$\leq 0,02$
τ_i (2200 nm)	$\leq 0,06$
Refractive indices	
n_F (486 nm)	$= 1,516$
n_e (546 nm)	$= 1,513$
n_d (587,6 nm)	$= 1,511$
Sellmeier coefficients	
valid from 400 nm to 1550 nm	
B_1	0,3376
B_2	0,9188
B_3	1,8816
C_1	3,461E-03 μm^2
C_2	9,9076E-03 μm^2
C_3	181,405 μm^2
Internal quality	
Bubble class	3

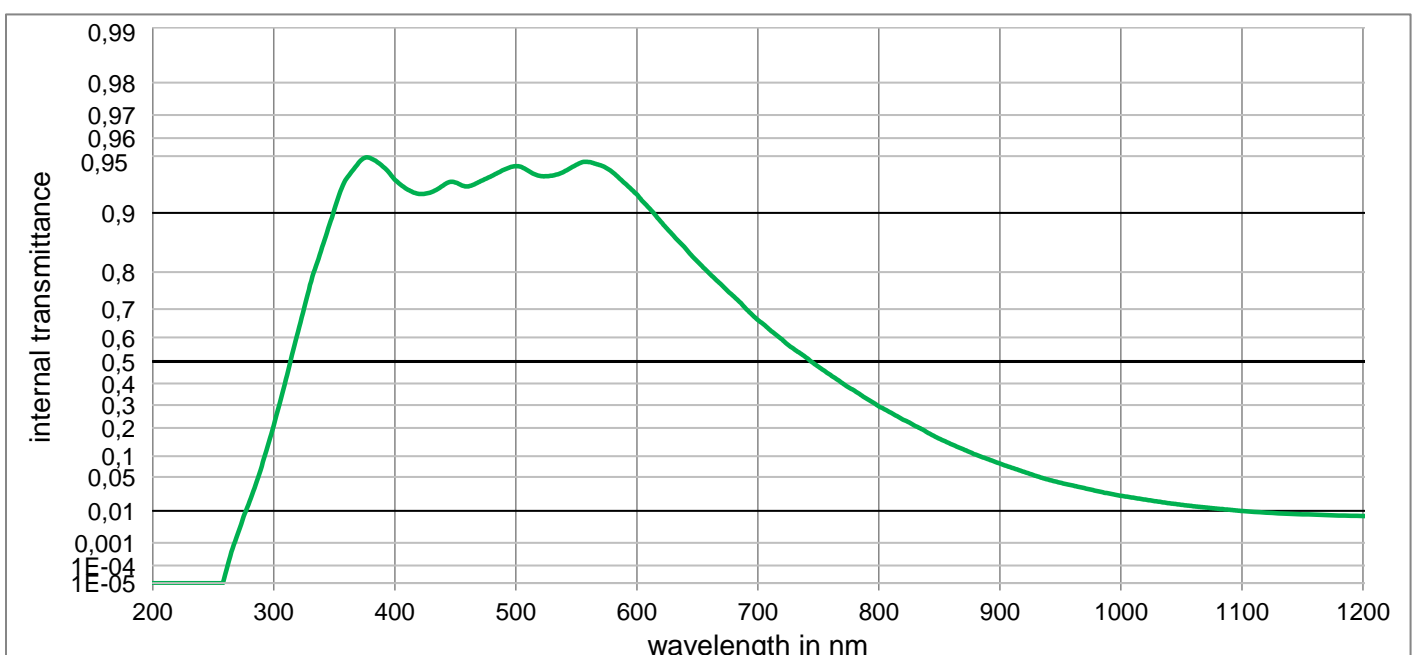
Mechanical properties	
Reference thickness	
$d = 2,00 \text{ mm}$	
Density	
$\rho = 2,52 \text{ g/cm}^3$	
Knoop hardness	
HK[0.1/20] = 456	

Thermal properties	
Transformation temperature	
$T_g = 599 \text{ }^\circ\text{C}$	
Thermal expansion in $10^{-6}/\text{K}$	
α (-30 $^\circ\text{C}/+70^\circ\text{C}$)	$= 5,3$
α (20 $^\circ\text{C}/300^\circ\text{C}$)	$= 6,1$

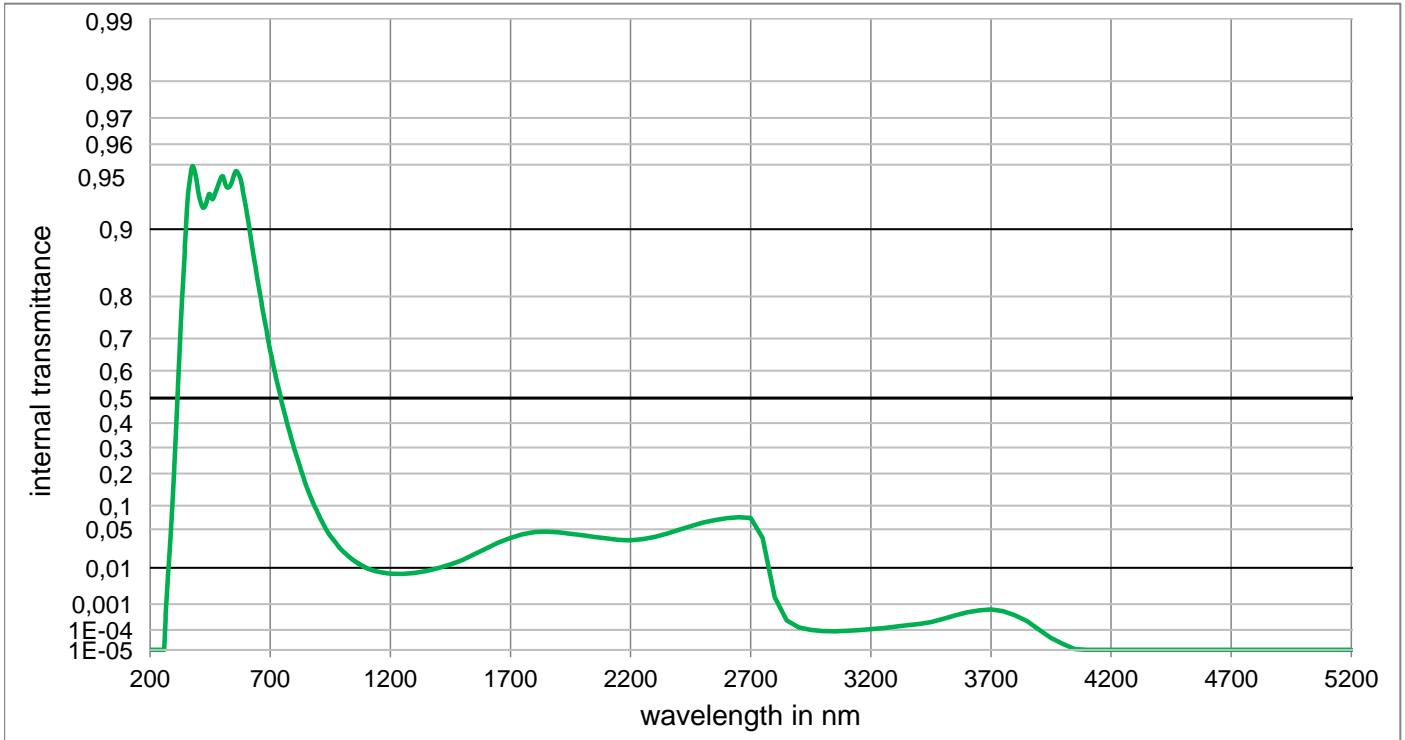
Chemical properties	
Chemical resistance	
FR class	$= 0$
SR class	$= 2$
AR class	$= 3$
Resistance against humidity	
Delicate glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colormetric properties				
	1 mm	2 mm	3 mm	
Illuminant D65	x	0,311	0,309	0,307
	y	0,330	0,331	0,332
	Y	88,7	85,6	82,6
	λ_d	497 nm	497 nm	498 nm
	P_e	0,006	0,013	0,018
Illuminant A	x	0,444	0,441	0,438
	y	0,409	0,411	0,413
	Y	88,4	84,9	81,6
	λ_d	505 nm	505 nm	505 nm
P_e	0,007	0,014	0,021	

Notes	
UV	Transmission changes are possible under the action of intense ultraviolet radiation.
Ionically colored glass	
Shortpass filter	
Heat protection filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



KG1



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,434E-01	800	2,936E-01	1100	9,948E-03	2200	3,377E-02	3700	6,632E-04
210	< 1,000E-05	510	9,402E-01	810	2,650E-01	1110	9,410E-03	2250	3,523E-02	3750	5,698E-04
220	< 1,000E-05	520	9,362E-01	820	2,349E-01	1120	8,986E-03	2300	3,829E-02	3800	3,991E-04
230	< 1,000E-05	530	9,364E-01	830	2,082E-01	1130	8,642E-03	2350	4,292E-02	3850	2,350E-04
240	< 1,000E-05	540	9,395E-01	840	1,824E-01	1140	8,360E-03	2400	4,886E-02	3900	1,033E-04
250	< 1,000E-05	550	9,444E-01	850	1,581E-01	1150	8,157E-03	2450	5,536E-02	3950	4,236E-05
260	3,483E-05	560	9,463E-01	860	1,377E-01	1160	7,950E-03	2500	6,181E-02	4000	2,104E-05
270	2,000E-03	570	9,440E-01	870	1,206E-01	1170	7,750E-03	2550	6,692E-02	4050	1,117E-05
280	1,701E-02	580	9,389E-01	880	1,047E-01	1180	7,580E-03	2600	7,069E-02	4100	< 1,000E-05
290	7,300E-02	590	9,302E-01	890	9,150E-02	1190	7,453E-03	2650	7,279E-02	4150	< 1,000E-05
300	2,100E-01	600	9,199E-01	900	7,971E-02	1200	7,350E-03	2700	7,150E-02	4200	< 1,000E-05
310	4,189E-01	610	9,060E-01	910	6,939E-02	1250	7,200E-03	2750	3,692E-02	4250	< 1,000E-05
320	6,222E-01	620	8,887E-01	920	6,017E-02	1300	7,570E-03	2800	1,650E-03	4300	< 1,000E-05
330	7,690E-01	630	8,693E-01	930	5,187E-02	1350	8,490E-03	2850	2,541E-04	4350	< 1,000E-05
340	8,500E-01	640	8,481E-01	940	4,499E-02	1400	9,840E-03	2900	1,282E-04	4400	< 1,000E-05
350	9,040E-01	650	8,230E-01	950	3,971E-02	1450	1,182E-02	2950	9,931E-05	4450	< 1,000E-05
360	9,340E-01	660	7,970E-01	960	3,543E-02	1500	1,472E-02	3000	8,892E-05	4500	< 1,000E-05
370	9,456E-01	670	7,690E-01	970	3,157E-02	1550	1,909E-02	3050	8,612E-05	4550	< 1,000E-05
380	9,487E-01	680	7,380E-01	980	2,790E-02	1600	2,463E-02	3100	9,044E-05	4600	< 1,000E-05
390	9,433E-01	690	7,020E-01	990	2,477E-02	1650	3,097E-02	3150	9,750E-05	4650	< 1,000E-05
400	9,330E-01	700	6,640E-01	1000	2,230E-02	1700	3,707E-02	3200	1,074E-04	4700	< 1,000E-05
410	9,251E-01	710	6,280E-01	1010	2,029E-02	1750	4,196E-02	3250	1,208E-04	4750	< 1,000E-05
420	9,205E-01	720	5,921E-01	1020	1,846E-02	1800	4,558E-02	3300	1,397E-04	4800	< 1,000E-05
430	9,222E-01	730	5,530E-01	1030	1,677E-02	1850	4,635E-02	3350	1,594E-04	4850	< 1,000E-05
440	9,284E-01	740	5,170E-01	1040	1,525E-02	1900	4,488E-02	3400	1,805E-04	4900	< 1,000E-05
450	9,309E-01	750	4,770E-01	1050	1,404E-02	1950	4,284E-02	3450	2,178E-04	4950	< 1,000E-05
460	9,274E-01	760	4,393E-01	1060	1,300E-02	2000	4,076E-02	3500	2,881E-04	5000	< 1,000E-05
470	9,315E-01	770	4,012E-01	1070	1,212E-02	2050	3,830E-02	3550	3,919E-04	5050	< 1,000E-05
480	9,362E-01	780	3,658E-01	1080	1,133E-02	2100	3,616E-02	3600	5,113E-04	5100	< 1,000E-05
490	9,408E-01	790	3,290E-01	1090	1,062E-02	2150	3,447E-02	3650	6,113E-04	5150	< 1,000E-05

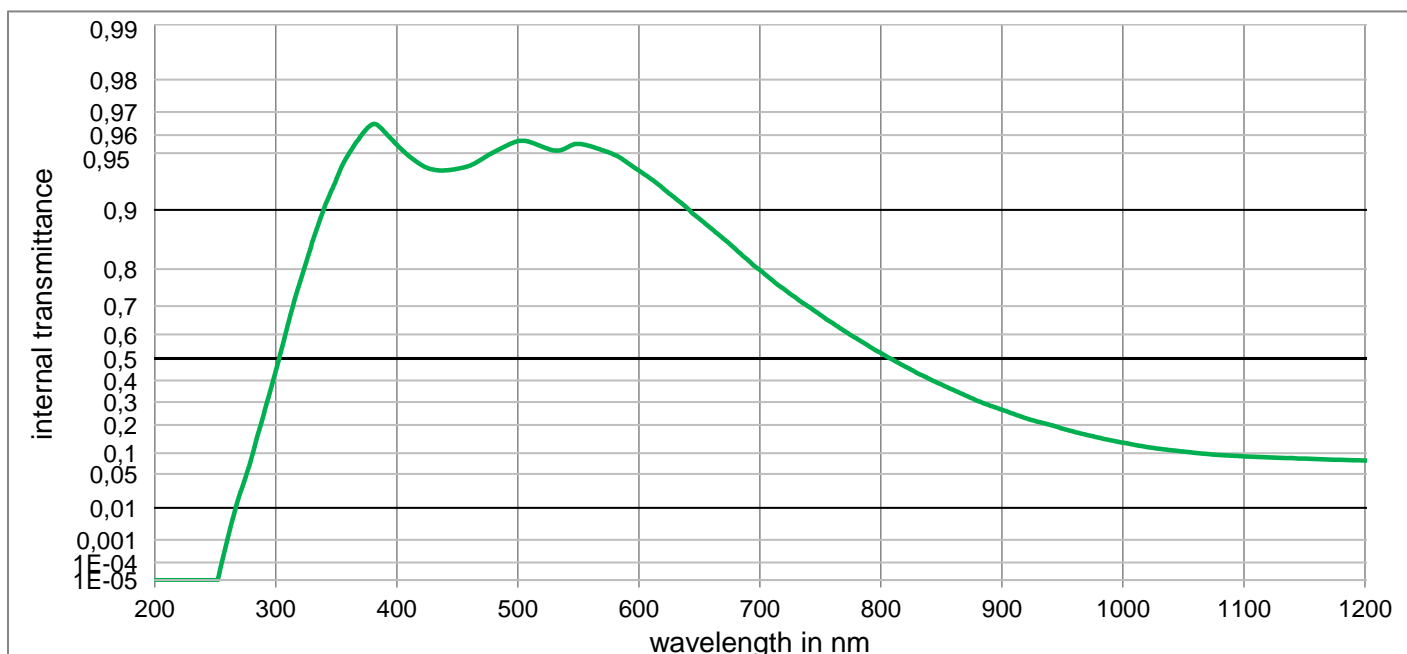
KG2

Optical properties	
Reflection factor	
$P_d = 0,920$	
Spectral values guaranteed	
τ_i (365 nm)	$\geq 0,93$
τ_i (500 nm)	$\geq 0,94$
τ_i (600 nm)	$\geq 0,92$
τ_i (700 nm)	$\leq 0,83$
τ_i (800 nm)	$\leq 0,55$
τ_i (900 nm)	$\leq 0,28$
τ_i (1060 nm)	$\leq 0,12$
τ_i (2200 nm)	$\leq 0,2$
Refractive indices	
n_d (587,6 nm) = 1,51	
Sellmeier coefficients	
on request	
Internal quality	
Bubble class	3

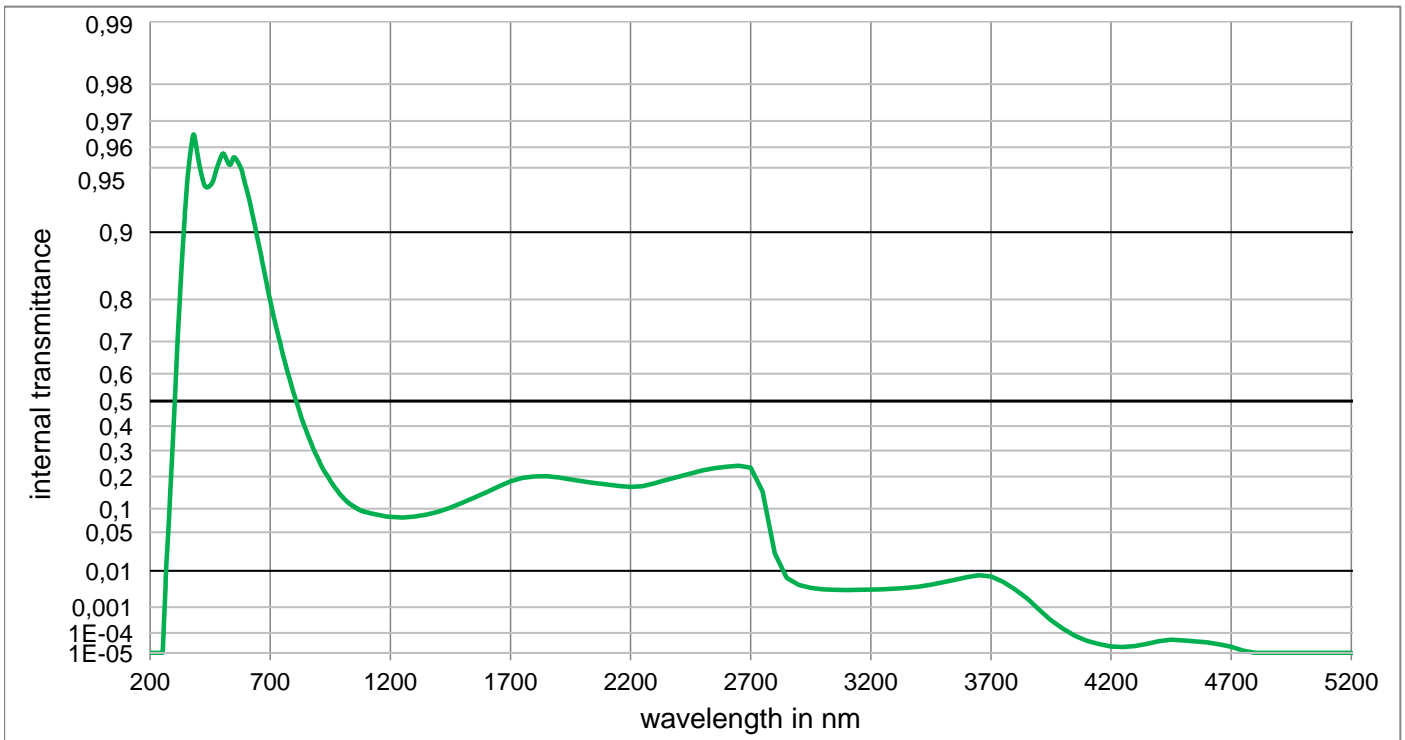
Mechanical properties	
Reference thickness	
$d = 2,00$ mm	
Density	
$\rho = 2,52$ g/cm ³	
Knoop hardness	
HK[0.1/20] = 444	
Thermal properties	
Transformation temperature	
$T_g = 605$ °C	
Thermal expansion in $10^{-6}/K$	
α (-30°C/+70°C)	= 5,4
α (20°C/300°C)	= 6,3
Chemical properties	
Chemical resistance	
FR class	= 0
SR class	= 2
AR class	= 3
Resistance against humidity	
Delicate glass	
see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	

Colorimetric properties		1 mm	2 mm	3 mm
Illuminant D65	x	0,312	0,311	0,310
	y	0,330	0,331	0,331
	Y	89,5	87,1	84,7
	λ_d	501 nm	501 nm	501 nm
	P_e	0,003	0,007	0,010
Illuminant A	x	0,446	0,444	0,442
	y	0,409	0,410	0,411
	Y	89,3	86,7	84,2
	λ_d	506 nm	507 nm	507 nm
P_e	0,004	0,008	0,012	

Notes	
UV	
Transmission changes are possible under the action of intense ultraviolet radiation.	
Ionically colored glass	
Shortpass filter	
Heat protection filter	
ISO 23364:2021	
Disclaimer	
All data without tolerances are to be understood to be reference values.	



KG2

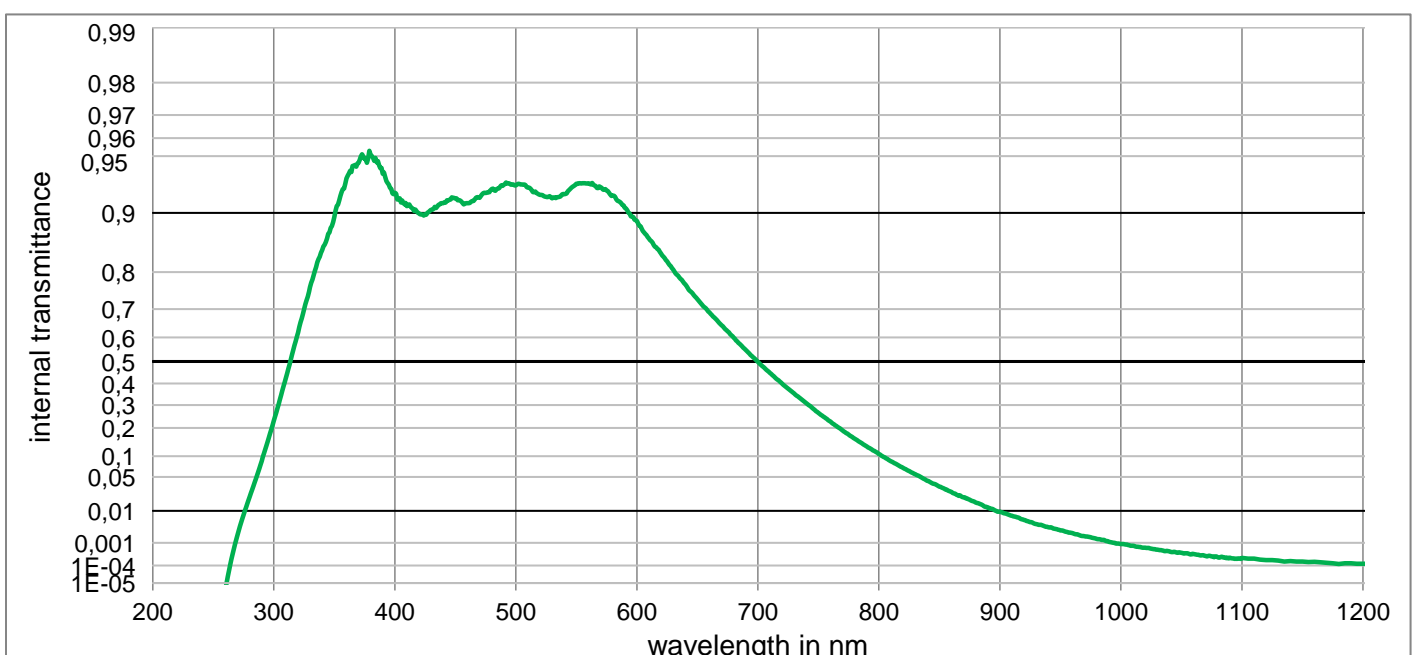


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

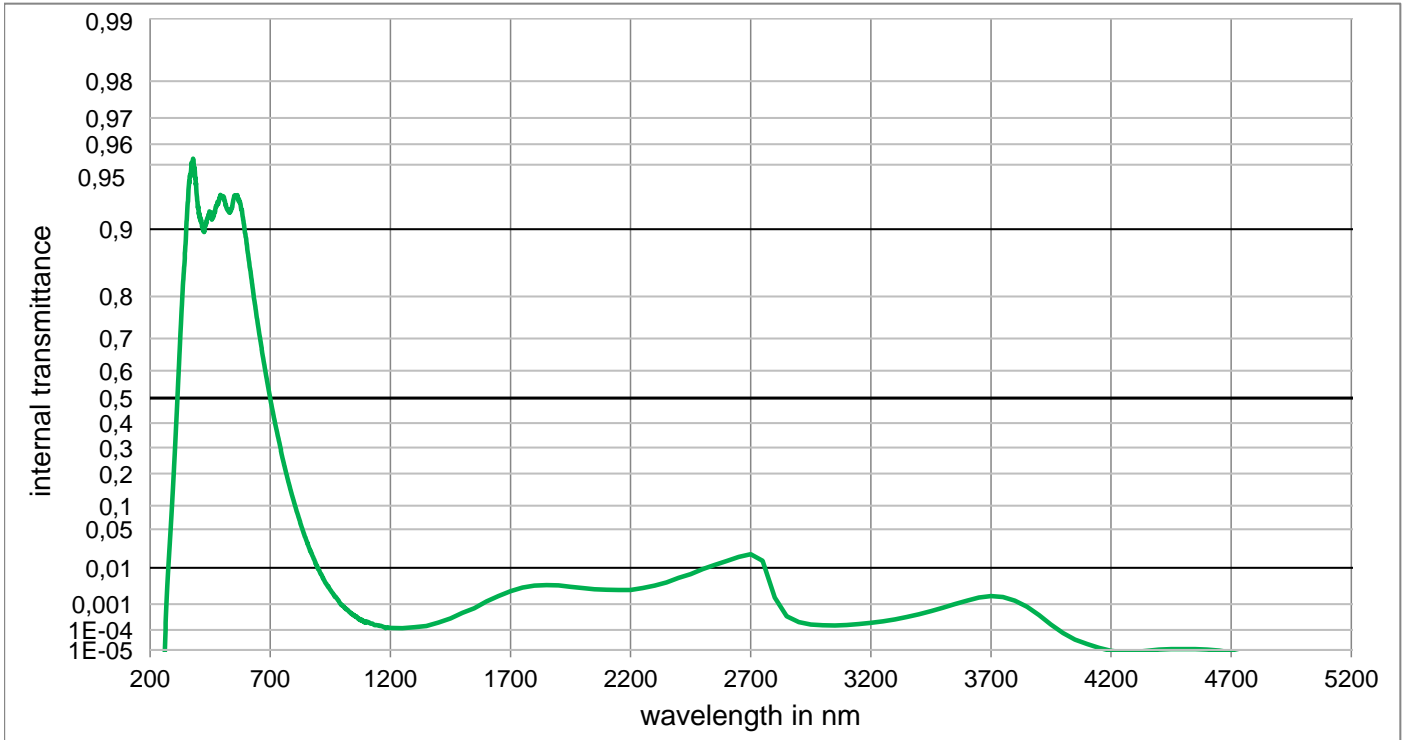
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,569E-01	800	5,237E-01	1100	9,099E-02	2200	1,647E-01	3700	7,376E-03
210	< 1,000E-05	510	9,564E-01	810	4,940E-01	1110	8,975E-02	2250	1,671E-01	3750	5,454E-03
220	< 1,000E-05	520	9,538E-01	820	4,640E-01	1120	8,844E-02	2300	1,764E-01	3800	3,463E-03
230	< 1,000E-05	530	9,516E-01	830	4,342E-01	1130	8,715E-02	2350	1,885E-01	3850	1,917E-03
240	< 1,000E-05	540	9,531E-01	840	4,080E-01	1140	8,600E-02	2400	1,997E-01	3900	8,350E-04
250	< 1,000E-05	550	9,554E-01	850	3,822E-01	1150	8,470E-02	2450	2,114E-01	3950	3,360E-04
260	1,000E-03	560	9,541E-01	860	3,557E-01	1160	8,350E-02	2500	2,227E-01	4000	1,525E-04
270	2,000E-02	570	9,518E-01	870	3,300E-01	1170	8,252E-02	2550	2,311E-01	4050	7,328E-05
280	8,800E-02	580	9,489E-01	880	3,054E-01	1180	8,150E-02	2600	2,370E-01	4100	4,198E-05
290	2,450E-01	590	9,440E-01	890	2,840E-01	1190	8,070E-02	2650	2,404E-01	4150	2,924E-05
300	4,440E-01	600	9,380E-01	900	2,652E-01	1200	8,005E-02	2700	2,327E-01	4200	2,239E-05
310	6,372E-01	610	9,314E-01	910	2,457E-01	1250	7,868E-02	2750	1,493E-01	4250	2,065E-05
320	7,690E-01	620	9,230E-01	920	2,280E-01	1300	8,103E-02	2800	2,260E-02	4300	2,344E-05
330	8,522E-01	630	9,132E-01	930	2,130E-01	1350	8,550E-02	2850	6,823E-03	4350	3,020E-05
340	9,020E-01	640	9,020E-01	940	2,001E-01	1400	9,250E-02	2900	4,519E-03	4400	4,162E-05
350	9,310E-01	650	8,891E-01	950	1,850E-01	1450	1,028E-01	2950	3,811E-03	4450	4,823E-05
360	9,492E-01	660	8,750E-01	960	1,726E-01	1500	1,157E-01	3000	3,483E-03	4500	4,508E-05
370	9,593E-01	670	8,590E-01	970	1,611E-01	1550	1,305E-01	3050	3,357E-03	4550	4,009E-05
380	9,651E-01	680	8,407E-01	980	1,510E-01	1600	1,471E-01	3100	3,334E-03	4600	3,556E-05
390	9,615E-01	690	8,199E-01	990	1,415E-01	1650	1,651E-01	3150	3,357E-03	4650	2,884E-05
400	9,549E-01	700	7,980E-01	1000	1,333E-01	1700	1,835E-01	3200	3,420E-03	4700	2,143E-05
410	9,482E-01	710	7,740E-01	1010	1,259E-01	1750	1,951E-01	3250	3,491E-03	4750	1,346E-05
420	9,423E-01	720	7,499E-01	1020	1,189E-01	1800	2,007E-01	3300	3,614E-03	4800	< 1,000E-05
430	9,388E-01	730	7,250E-01	1030	1,133E-01	1850	2,011E-01	3350	3,793E-03	4850	< 1,000E-05
440	9,382E-01	740	6,990E-01	1040	1,089E-01	1900	1,971E-01	3400	4,130E-03	4900	< 1,000E-05
450	9,393E-01	750	6,710E-01	1050	1,047E-01	1950	1,905E-01	3450	4,645E-03	4950	< 1,000E-05
460	9,416E-01	760	6,428E-01	1060	1,009E-01	2000	1,834E-01	3500	5,333E-03	5000	< 1,000E-05
470	9,461E-01	770	6,130E-01	1070	9,748E-02	2050	1,776E-01	3550	6,109E-03	5050	< 1,000E-05
480	9,506E-01	780	5,840E-01	1080	9,478E-02	2100	1,724E-01	3600	7,119E-03	5100	< 1,000E-05
490	9,542E-01	790	5,530E-01	1090	9,283E-02	2150	1,676E-01	3650	7,893E-03	5150	< 1,000E-05

KG3

Optical properties		Mechanical properties		Colormetric properties					
Reflection factor		Reference thickness		1 mm		2 mm		3 mm	
$P_d = 0,920$		$d = 2,00 \text{ mm}$		Illuminant D65	x	0,309	0,306	0,303	
Spectral values guaranteed		Density			y	0,330	0,332	0,333	
$\tau_i (365 \text{ nm}) \geq 0,86$	$\rho = 2,52 \text{ g/cm}^3$		Y		87,1	82,4	78,1		
$\tau_i (500 \text{ nm}) \geq 0,88$	Knoop hardness		λ_d		496 nm	496 nm	496 nm		
$\tau_i (600 \text{ nm}) \geq 0,83$	$HK[0.1/20] = 442$		P_e		0,012	0,023	0,033		
$\tau_i (700 \text{ nm}) \leq 0,55$	Thermal properties		Illuminant A	x	0,442	0,437	0,432		
$\tau_i (800 \text{ nm}) \leq 0,14$	Transformation temperature			y	0,410	0,413	0,416		
$\tau_i (900 \text{ nm}) \leq 0,03$	$T_g = 581 \text{ }^\circ\text{C}$			Y	86,4	81,3	76,6		
$\tau_i (1060 \text{ nm}) \leq 0,001$	Thermal expansion in			λ_d	504 nm	505 nm	505 nm		
$\tau_i (2200 \text{ nm}) \leq 0,01$	$10^{-6}/\text{K}$			P_e	0,012	0,024	0,035		
Refractive indices		$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 5,3$		Notes					
$n_F (486 \text{ nm}) = 1,522$	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 6,1$		UV						
$n_e (546 \text{ nm}) = 1,518$			Transmission changes are possible under the action of intense ultraviolet radiation.						
$n_d (587,6 \text{ nm}) = 1,516$			Ionically colored glass						
Sellmeier coefficients		Chemical properties		Shortpass filter					
valid from 400 nm to 1600 nm		Chemical resistance		Heat protection filter					
$B_1 = 1,1717$	FR class = 0		ISO 23364:2021						
$B_2 = 0,0980$	SR class = 2								
$B_3 = 0,0713$	AR class = 4								
$C_1 = 6,324\text{E-}03 \text{ } \mu\text{m}^2$	Resistance against humidity								
$C_2 = 3,1092\text{E-}02 \text{ } \mu\text{m}^2$	Delicate glass								
$C_3 = 10,066 \text{ } \mu\text{m}^2$	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5								
Internal quality				Disclaimer					
Bubble class	3		All data without tolerances are to be understood to be reference values.						



KG3

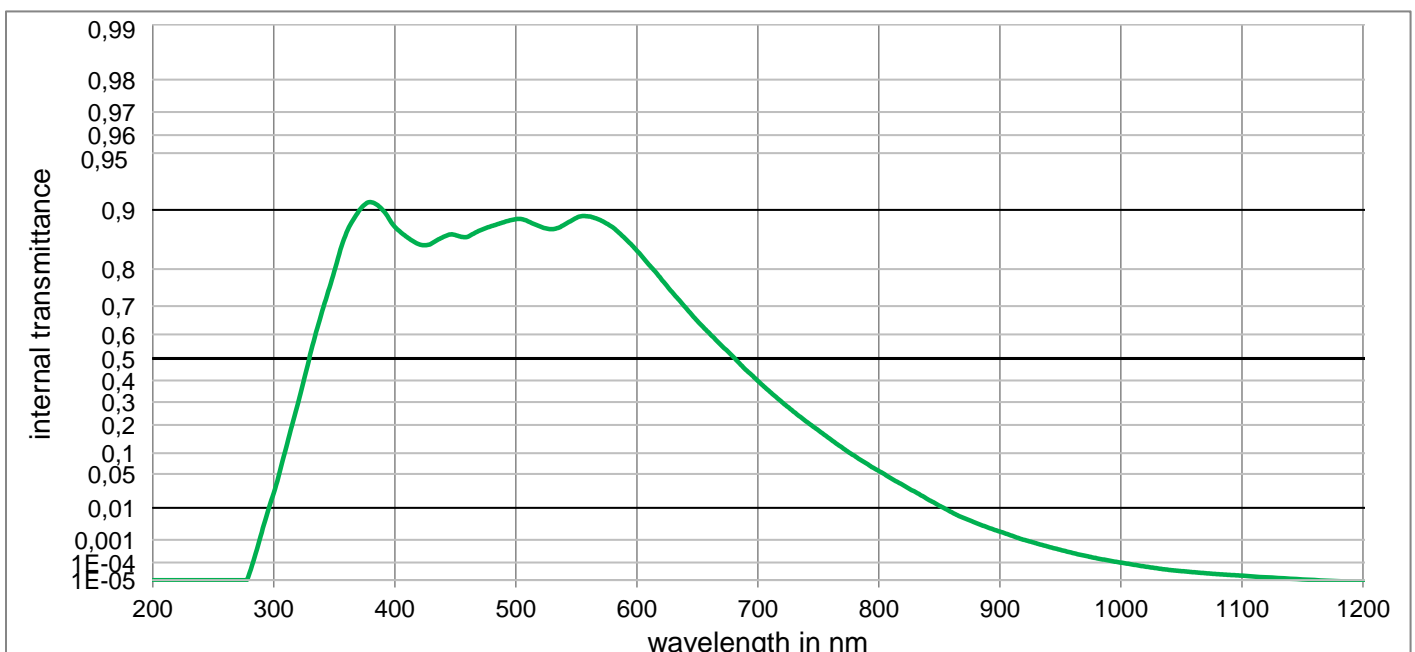


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

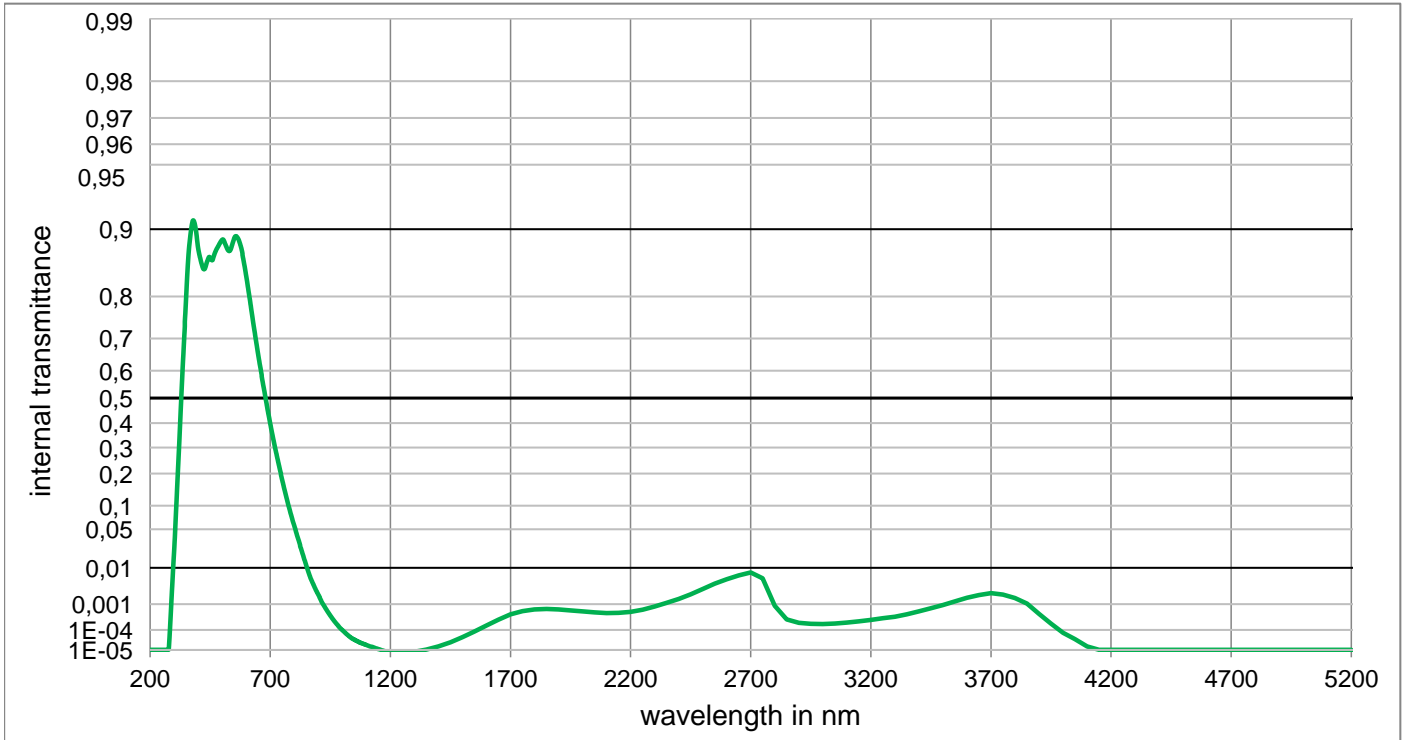
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	9,282E-01	800	1,066E-01	1100	2,334E-04	2200	2,727E-03	3700	1,822E-03
210	< 1,000E-05	510	9,265E-01	810	8,548E-02	1110	2,163E-04	2250	3,103E-03	3750	1,693E-03
220	< 1,000E-05	520	9,194E-01	820	6,913E-02	1120	1,828E-04	2300	3,642E-03	3800	1,292E-03
230	< 1,000E-05	530	9,162E-01	830	5,533E-02	1130	1,729E-04	2350	4,394E-03	3850	8,111E-04
240	< 1,000E-05	540	9,202E-01	840	4,313E-02	1140	1,649E-04	2400	5,839E-03	3900	4,055E-04
250	< 1,000E-05	550	9,298E-01	850	3,387E-02	1150	1,586E-04	2450	7,150E-03	3950	1,710E-04
260	< 1,000E-05	560	9,303E-01	860	2,668E-02	1160	1,510E-04	2500	9,398E-03	4000	7,230E-05
270	1,919E-03	570	9,267E-01	870	2,066E-02	1170	1,379E-04	2550	1,160E-02	4050	3,512E-05
280	2,114E-02	580	9,189E-01	880	1,585E-02	1180	1,201E-04	2600	1,403E-02	4100	2,115E-05
290	8,698E-02	590	9,059E-01	890	1,195E-02	1190	1,309E-04	2650	1,687E-02	4150	1,291E-05
300	2,288E-01	600	8,899E-01	900	9,471E-03	1200	1,227E-04	2700	1,917E-02	4200	< 1,000E-05
310	4,257E-01	610	8,645E-01	910	7,401E-03	1250	1,188E-04	2750	1,420E-02	4250	< 1,000E-05
320	6,184E-01	620	8,381E-01	920	5,677E-03	1300	1,322E-04	2800	1,641E-03	4300	< 1,000E-05
330	7,634E-01	630	8,054E-01	930	4,323E-03	1350	1,495E-04	2850	3,690E-04	4350	< 1,000E-05
340	8,445E-01	640	7,704E-01	940	3,458E-03	1400	2,072E-04	2900	2,146E-04	4400	1,042E-05
350	8,948E-01	650	7,303E-01	950	2,746E-03	1450	3,025E-04	2950	1,725E-04	4450	1,106E-05
360	9,343E-01	660	6,891E-01	960	2,212E-03	1500	4,975E-04	3000	1,586E-04	4500	1,106E-05
370	9,455E-01	670	6,451E-01	970	1,740E-03	1550	7,248E-04	3050	1,571E-04	4550	1,106E-05
380	9,509E-01	680	5,988E-01	980	1,401E-03	1600	1,222E-03	3100	1,649E-04	4600	1,042E-05
390	9,379E-01	690	5,497E-01	990	1,092E-03	1650	1,812E-03	3150	1,794E-04	4650	< 1,000E-05
400	9,217E-01	700	4,982E-01	1000	9,072E-04	1700	2,542E-03	3200	2,000E-04	4700	< 1,000E-05
410	9,079E-01	710	4,482E-01	1010	7,715E-04	1750	3,228E-03	3250	2,324E-04	4750	< 1,000E-05
420	8,992E-01	720	3,989E-01	1020	6,422E-04	1800	3,652E-03	3300	2,755E-04	4800	< 1,000E-05
430	9,037E-01	730	3,535E-01	1030	5,357E-04	1850	3,770E-03	3350	3,430E-04	4850	< 1,000E-05
440	9,112E-01	740	3,084E-01	1040	4,512E-04	1900	3,681E-03	3400	4,356E-04	4900	< 1,000E-05
450	9,159E-01	750	2,645E-01	1050	3,972E-04	1950	3,366E-03	3450	5,699E-04	4950	< 1,000E-05
460	9,109E-01	760	2,263E-01	1060	3,472E-04	2000	3,121E-03	3500	7,511E-04	5000	< 1,000E-05
470	9,167E-01	770	1,901E-01	1070	2,827E-04	2050	2,861E-03	3550	9,992E-04	5050	< 1,000E-05
480	9,250E-01	780	1,584E-01	1080	2,515E-04	2100	2,785E-03	3600	1,302E-03	5100	< 1,000E-05
490	9,288E-01	790	1,302E-01	1090	2,367E-04	2150	2,752E-03	3650	1,630E-03	5150	< 1,000E-05

KG5

Optical properties		Mechanical properties		Colormetric properties		
Reflection factor		Reference thickness		1 mm 2 mm 3 mm		
$P_d = 0,920$		$d = 2,00 \text{ mm}$		Illuminant D65	x	0,308 0,304 0,300
Spectral values guaranteed		Density			y	0,331 0,332 0,334
τ_i (365 nm)	$\geq 0,8$	$\rho = 2,53 \text{ g/cm}^3$			Y	85,4 79,3 73,7
τ_i (500 nm)	$\geq 0,86$	Knoop hardness			λ_d	496 nm 496 nm 496 nm
τ_i (600 nm)	$\geq 0,8$	$HK[0.1/20] = 435$			P_e	0,015 0,029 0,042
τ_i (700 nm)	$\leq 0,43$	Thermal properties		Illuminant A	x	0,440 0,434 0,427
τ_i (800 nm)	$\leq 0,09$	Transformation temperature			y	0,411 0,415 0,418
τ_i (900 nm)	$\leq 0,008$	$T_g = 565 \text{ }^\circ\text{C}$			Y	84,6 77,9 71,9
τ_i (1060 nm)	$\leq 0,0001$	Thermal expansion in $10^{-6}/\text{K}$			λ_d	504 nm 505 nm 505 nm
τ_i (2200 nm)	$\leq 0,001$	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 5,4$			P_e	0,016 0,031 0,045
Refractive indices		$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 6,2$		Notes		
n_F (486 nm)	$= 1,518$	Chemical properties		UV		
n_e (546 nm)	$= 1,515$	Chemical resistance		Transmission changes are possible under the action of intense ultraviolet radiation.		
n_d (587,6 nm)	$= 1,513$	FR class = 0		Ionically colored glass		
Sellmeier coefficients		SR class = 3		Shortpass filter		
valid from 400 nm to 1550 nm		AR class = 4		Heat protection filter		
B_1	1,0371	Resistance against humidity		ISO 23364:2021		
B_2	0,2237	Delicate glass		Disclaimer		
B_3	33,7882	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5		All data without tolerances are to be understood to be reference values.		
C_1	9,265E-03 μm^2					
C_2	5,0235E-03 μm^2					
C_3	3577,611 μm^2					
Internal quality						
Bubble class	3					



KG5

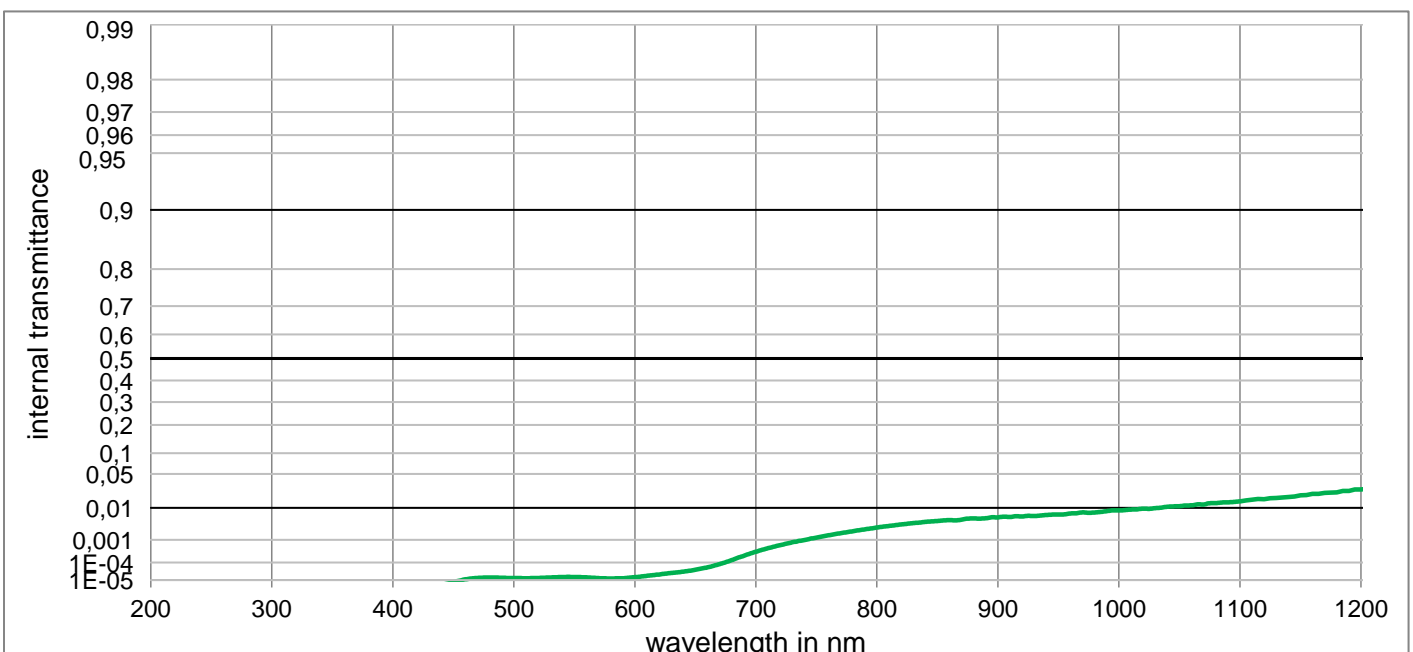


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

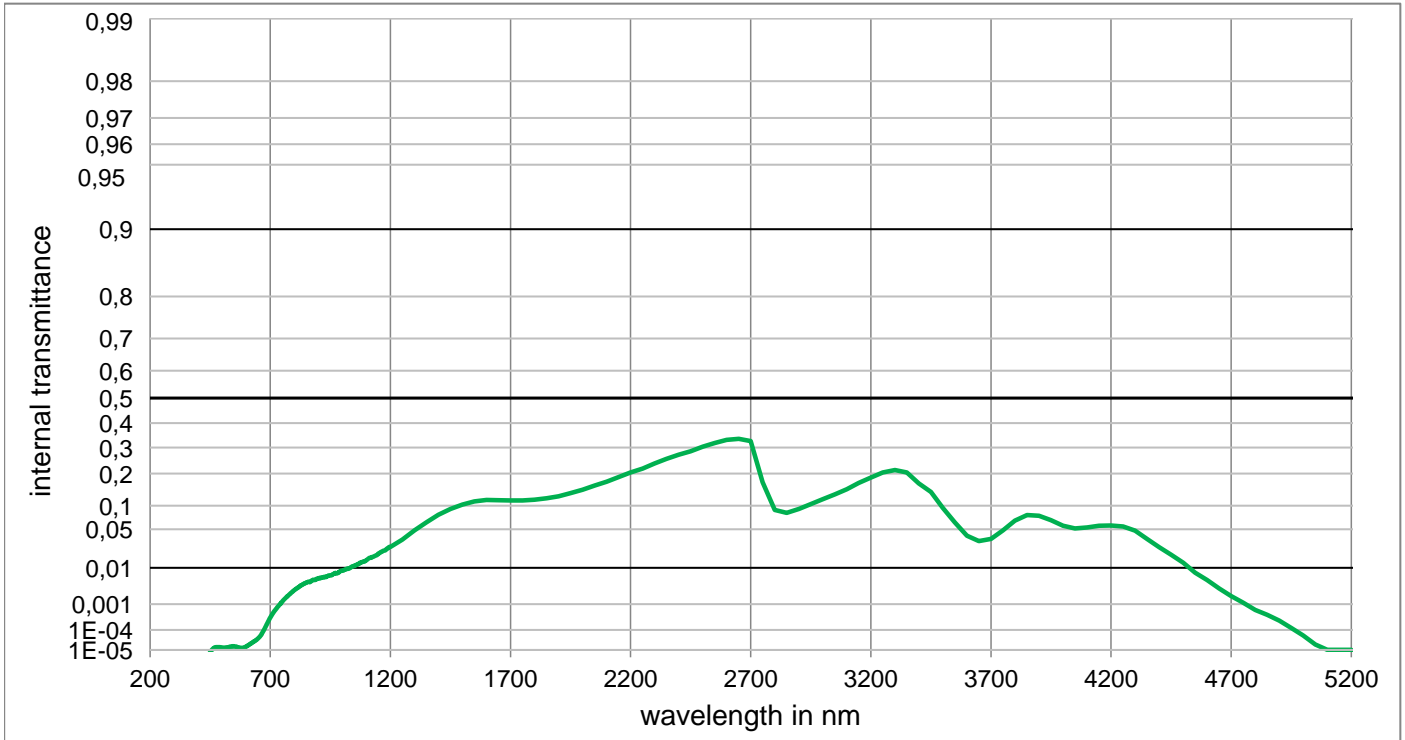
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	8,883E-01	800	5,600E-02	1100	1,875E-05	2200	5,413E-04	3700	2,208E-03
210	< 1,000E-05	510	8,854E-01	810	4,211E-02	1110	1,667E-05	2250	6,482E-04	3750	2,015E-03
220	< 1,000E-05	520	8,781E-01	820	3,171E-02	1120	1,500E-05	2300	8,290E-04	3800	1,577E-03
230	< 1,000E-05	530	8,743E-01	830	2,311E-02	1130	1,370E-05	2350	1,095E-03	3850	1,039E-03
240	< 1,000E-05	540	8,806E-01	840	1,632E-02	1140	1,239E-05	2400	1,479E-03	3900	4,560E-04
250	< 1,000E-05	550	8,900E-01	850	1,135E-02	1150	1,109E-05	2450	2,058E-03	3950	1,861E-04
260	< 1,000E-05	560	8,919E-01	860	7,720E-03	1160	1,007E-05	2500	2,914E-03	4000	7,390E-05
270	< 1,000E-05	570	8,870E-01	870	5,300E-03	1170	< 1,000E-05	2550	4,090E-03	4050	3,650E-05
280	2,793E-05	580	8,770E-01	880	3,839E-03	1180	< 1,000E-05	2600	5,337E-03	4100	1,570E-05
290	1,880E-03	590	8,600E-01	890	2,716E-03	1190	< 1,000E-05	2650	6,620E-03	4150	< 1,000E-05
300	2,200E-02	600	8,380E-01	900	1,990E-03	1200	< 1,000E-05	2700	7,858E-03	4200	< 1,000E-05
310	1,138E-01	610	8,100E-01	910	1,410E-03	1250	< 1,000E-05	2750	5,622E-03	4250	< 1,000E-05
320	2,950E-01	620	7,770E-01	920	1,000E-03	1300	< 1,000E-05	2800	8,872E-04	4300	< 1,000E-05
330	5,160E-01	630	7,380E-01	930	7,311E-04	1350	1,050E-05	2850	2,754E-04	4350	< 1,000E-05
340	6,840E-01	640	6,960E-01	940	5,320E-04	1400	1,549E-05	2900	2,037E-04	4400	< 1,000E-05
350	7,950E-01	650	6,500E-01	950	3,917E-04	1450	2,588E-05	2950	1,856E-04	4450	< 1,000E-05
360	8,690E-01	660	6,040E-01	960	2,877E-04	1500	4,550E-05	3000	1,817E-04	4500	< 1,000E-05
370	8,980E-01	670	5,550E-01	970	2,153E-04	1550	8,507E-05	3050	1,894E-04	4550	< 1,000E-05
380	9,090E-01	680	5,050E-01	980	1,633E-04	1600	1,545E-04	3100	2,083E-04	4600	< 1,000E-05
390	8,998E-01	690	4,500E-01	990	1,256E-04	1650	2,683E-04	3150	2,330E-04	4650	< 1,000E-05
400	8,774E-01	700	3,980E-01	1000	9,931E-05	1700	4,375E-04	3200	2,670E-04	4700	< 1,000E-05
410	8,619E-01	710	3,470E-01	1010	7,816E-05	1750	5,757E-04	3250	3,098E-04	4750	< 1,000E-05
420	8,497E-01	720	2,990E-01	1020	6,166E-05	1800	6,608E-04	3300	3,557E-04	4800	< 1,000E-05
430	8,505E-01	730	2,550E-01	1030	4,932E-05	1850	6,868E-04	3350	4,320E-04	4850	< 1,000E-05
440	8,619E-01	740	2,140E-01	1040	4,055E-05	1900	6,537E-04	3400	5,640E-04	4900	< 1,000E-05
450	8,651E-01	750	1,780E-01	1050	3,467E-05	1950	6,034E-04	3450	7,280E-04	4950	< 1,000E-05
460	8,620E-01	760	1,450E-01	1060	3,006E-05	2000	5,593E-04	3500	9,320E-04	5000	< 1,000E-05
470	8,720E-01	770	1,160E-01	1070	2,630E-05	2050	5,136E-04	3550	1,222E-03	5050	< 1,000E-05
480	8,787E-01	780	9,200E-02	1080	2,323E-05	2100	4,851E-04	3600	1,604E-03	5100	< 1,000E-05
490	8,841E-01	790	7,200E-02	1090	2,075E-05	2150	4,927E-04	3650	1,950E-03	5150	< 1,000E-05

NG1

Optical properties	Mechanical properties	Colorimetric properties
Reflection factor	Reference thickness	1 mm 2 mm 3 mm
$P_d = 0,918$	$d = 1,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e
Spectral values guaranteed	Density	
$\tau_i (546 \text{ nm}) < 0,0001$	$\rho = 2,48 \text{ g/cm}^3$	
	Knoop hardness	
	$HK[0.1/20] = 418$	
	Thermal properties	Illuminant A x y Y λ_d P_e
	Transformation temperature	
	$T_g = 461 \text{ }^\circ\text{C}$	
	Thermal expansion in $10^{-6}/\text{K}$	
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 6,5$ $\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 7,0$	
Refractive indices		Notes
$n_F (486 \text{ nm}) = 1,527$		
$n_e (546 \text{ nm}) = 1,526$		Ionically colored glass
$n_d (587,6 \text{ nm}) = 1,522$		Neutral density filter
Sellmeier coefficients		
valid from 440 nm to 1550 nm		
$B_1 = 0,8361$		
$B_2 = 0,4344$		
$B_3 = 0,8624$		
$C_1 = 1,081\text{E-}02 \text{ } \mu\text{m}^2$		
$C_2 = 1,1185\text{E-}02 \text{ } \mu\text{m}^2$		
$C_3 = 100,000 \text{ } \mu\text{m}^2$		
		ISO 23364:2021
Internal quality		
Bubble class 2		Disclaimer
		All data without tolerances are to be understood to be reference values.
	Chemical properties	
	Chemical resistance	
	FR class = 1	
	SR class = 2.2	
	AR class = 1	
	Resistance against humidity	



NG1

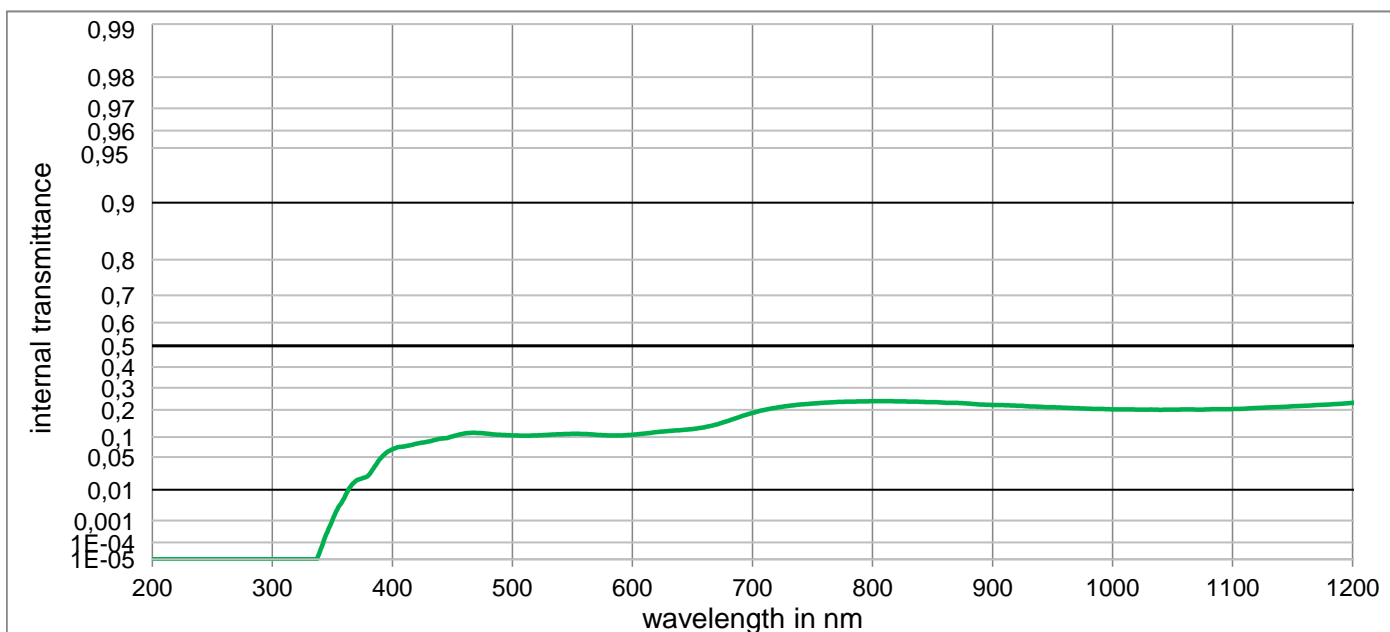


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

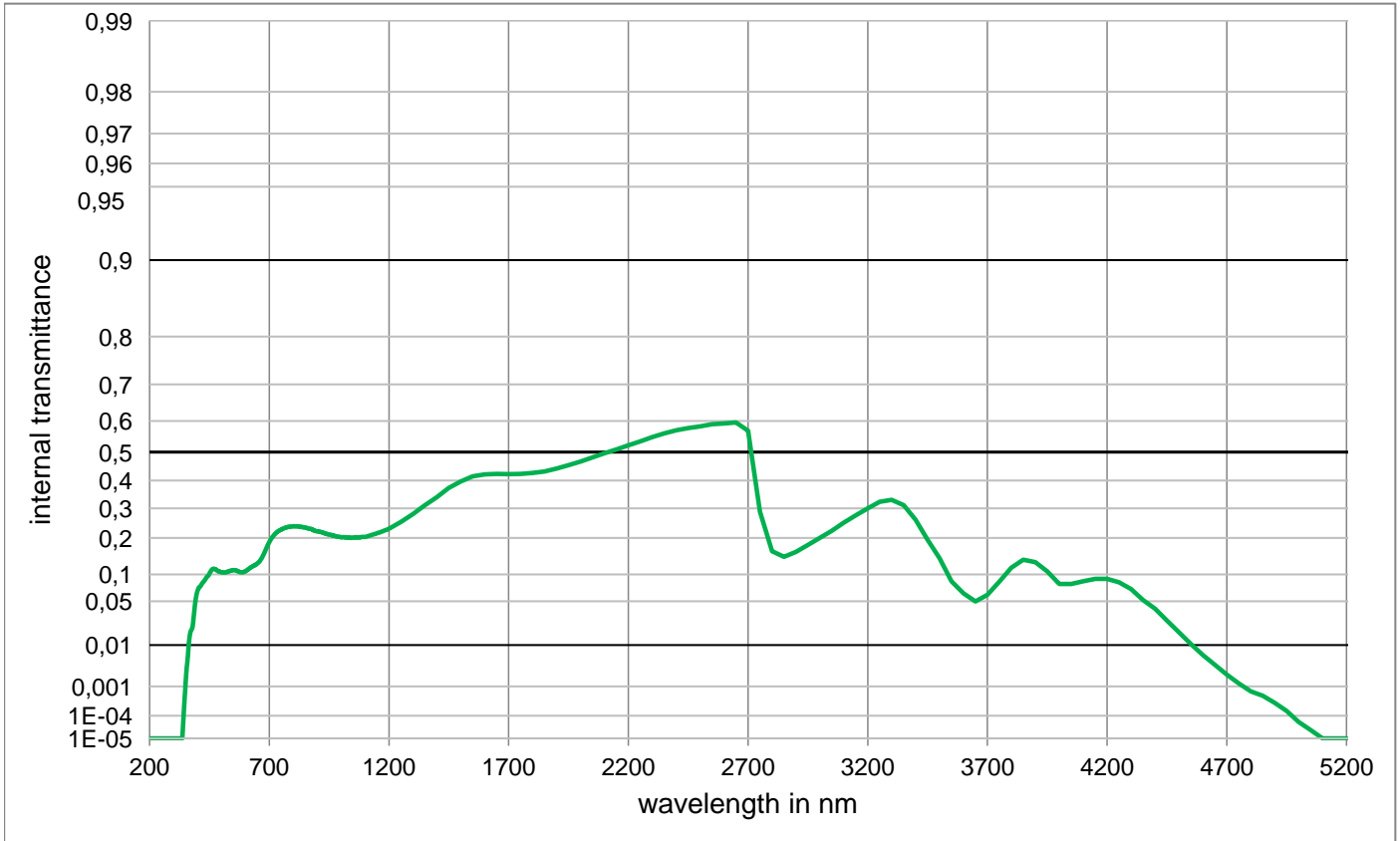
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,000E-05	500	1,340E-05	800	2,710E-03	1100	1,444E-02	2200	2,037E-01	3700	3,550E-02
210	< 1,000E-05	510	1,317E-05	810	3,039E-03	1110	1,580E-02	2250	2,186E-01	3750	4,830E-02
220	< 1,000E-05	520	1,365E-05	820	3,391E-03	1120	1,615E-02	2300	2,378E-01	3800	6,600E-02
230	< 1,000E-05	530	1,459E-05	830	3,730E-03	1130	1,720E-02	2350	2,555E-01	3850	7,740E-02
240	< 1,000E-05	540	1,559E-05	840	4,067E-03	1140	1,811E-02	2400	2,719E-01	3900	7,590E-02
250	< 1,000E-05	550	1,559E-05	850	4,328E-03	1150	1,976E-02	2450	2,853E-01	3950	6,660E-02
260	< 1,000E-05	560	1,482E-05	860	4,614E-03	1160	2,103E-02	2500	3,031E-01	4000	5,590E-02
270	< 1,000E-05	570	1,338E-05	870	4,761E-03	1170	2,212E-02	2550	3,186E-01	4050	5,129E-02
280	< 1,000E-05	580	1,272E-05	880	5,150E-03	1180	2,265E-02	2600	3,308E-01	4100	5,300E-02
290	< 1,000E-05	590	1,315E-05	890	5,234E-03	1190	2,446E-02	2650	3,354E-01	4150	5,610E-02
300	< 1,000E-05	600	1,533E-05	900	5,543E-03	1200	2,600E-02	2700	3,265E-01	4200	5,670E-02
310	< 1,000E-05	610	1,841E-05	910	5,665E-03	1250	3,480E-02	2750	1,700E-01	4250	5,495E-02
320	< 1,000E-05	620	2,208E-05	920	5,865E-03	1300	4,830E-02	2800	8,940E-02	4300	4,786E-02
330	< 1,000E-05	630	2,692E-05	930	6,039E-03	1350	6,230E-02	2850	8,230E-02	4350	3,548E-02
340	< 1,000E-05	640	3,251E-05	940	6,463E-03	1400	7,810E-02	2900	9,160E-02	4400	2,570E-02
350	< 1,000E-05	650	4,074E-05	950	6,682E-03	1450	9,190E-02	2950	1,043E-01	4450	1,862E-02
360	< 1,000E-05	660	5,559E-05	960	7,102E-03	1500	1,029E-01	3000	1,171E-01	4500	1,288E-02
370	< 1,000E-05	670	8,318E-05	970	7,607E-03	1550	1,114E-01	3050	1,313E-01	4550	7,762E-03
380	< 1,000E-05	680	1,321E-04	980	7,578E-03	1600	1,150E-01	3100	1,469E-01	4600	5,129E-03
390	< 1,000E-05	690	2,104E-04	990	8,216E-03	1650	1,143E-01	3150	1,675E-01	4650	3,020E-03
400	< 1,000E-05	700	3,243E-04	1000	8,560E-03	1700	1,136E-01	3200	1,860E-01	4700	1,820E-03
410	< 1,000E-05	710	4,624E-04	1010	9,052E-03	1750	1,136E-01	3250	2,040E-01	4750	1,122E-03
420	< 1,000E-05	720	6,152E-04	1020	9,580E-03	1800	1,157E-01	3300	2,129E-01	4800	6,310E-04
430	< 1,000E-05	730	7,998E-04	1030	9,838E-03	1850	1,200E-01	3350	2,044E-01	4850	4,169E-04
440	< 1,000E-05	740	9,863E-04	1040	1,064E-02	1900	1,256E-01	3400	1,661E-01	4900	2,455E-04
450	< 1,000E-05	750	1,208E-03	1050	1,101E-02	1950	1,349E-01	3450	1,384E-01	4950	1,230E-04
460	1,119E-05	760	1,469E-03	1060	1,158E-02	2000	1,455E-01	3500	9,440E-02	5000	5,495E-05
470	1,365E-05	770	1,738E-03	1070	1,212E-02	2050	1,590E-01	3550	6,250E-02	5050	1,995E-05
480	1,434E-05	780	2,046E-03	1080	1,309E-02	2100	1,718E-01	3600	4,000E-02	5100	< 1,000E-05
490	1,409E-05	790	2,360E-03	1090	1,361E-02	2150	1,876E-01	3650	3,270E-02	5150	< 1,000E-05

NG3

Optical properties	Mechanical properties	Colorimetric properties	
Reflection factor	Reference thickness	1 mm 2 mm 3 mm	
$P_d = 0,921$	$d = 1,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e	
Spectral values guaranteed	Density		Illuminant A x y Y λ_d P_e
$\tau_i (405 \text{ nm}) = 0,06 \pm 0,02$	$\rho = 2,44 \text{ g/cm}^3$		
$\tau_i (546 \text{ nm}) = 0,1 \pm 0,02$	Knoop hardness		
$\tau_i (694 \text{ nm}) = 0,17 \pm 0,03$	$HK[0.1/20] = 443$		
	Thermal properties		
	Transformation temperature		
	$T_g = 462 \text{ }^\circ\text{C}$		
	Thermal expansion in $10^{-6}/\text{K}$		
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 6,5$		
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 7,3$		
Refractive indices	Chemical properties	Notes	
$n_h (404,7 \text{ nm}) = 1,523$	Chemical resistance		
$n_e (546 \text{ nm}) = 1,509$	FR class = 1	Ionically colored glass	
$n_d (587,6 \text{ nm}) = 1,507$	SR class = 2.2	Neutral density filter	
	AR class = 1		
	Resistance against humidity	ISO 23364:2021	
Sellmeier coefficients	Resistant glass		
valid from 440 nm to 1550 nm	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	Disclaimer	
$B_1 = 0,8995$		All data without tolerances are to be understood to be reference values.	
$B_2 = 0,3364$			
$B_3 = 32,4433$			
$C_1 = 9,703\text{E-}03 \text{ } \mu\text{m}^2$			
$C_2 = 1,2385\text{E-}02 \text{ } \mu\text{m}^2$			
$C_3 = 4153,754 \text{ } \mu\text{m}^2$			
Internal quality			
Bubble class 2			



NG3

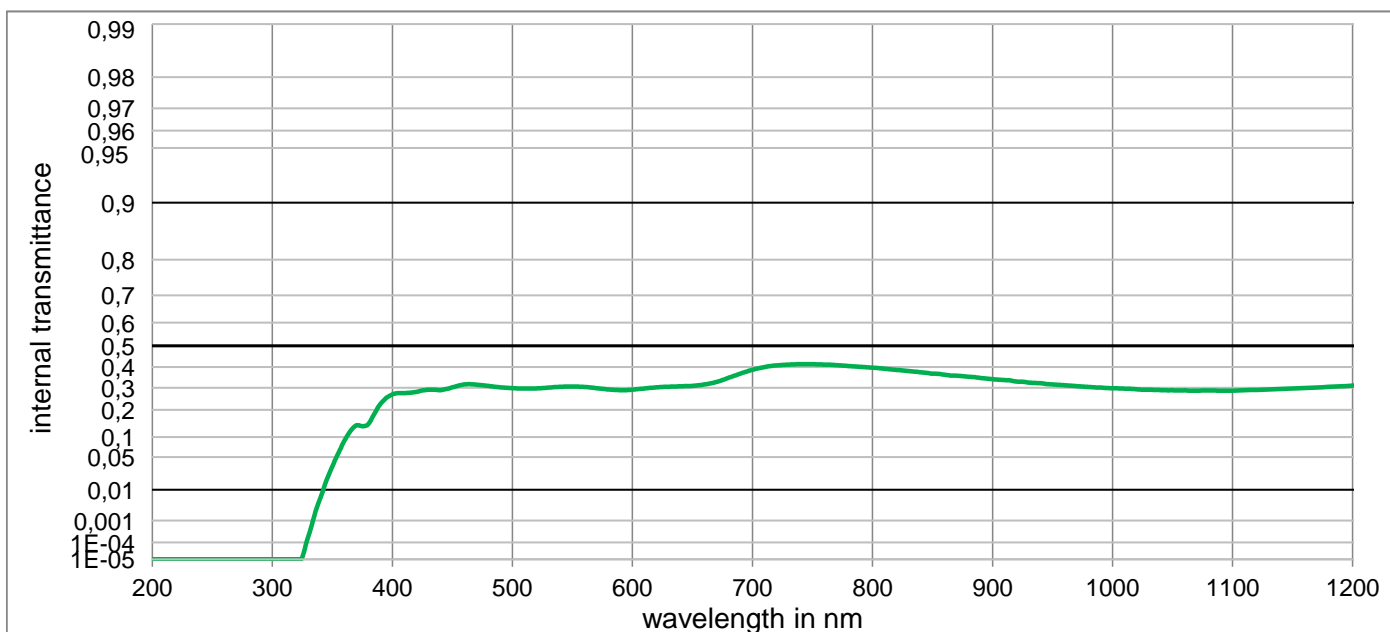


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

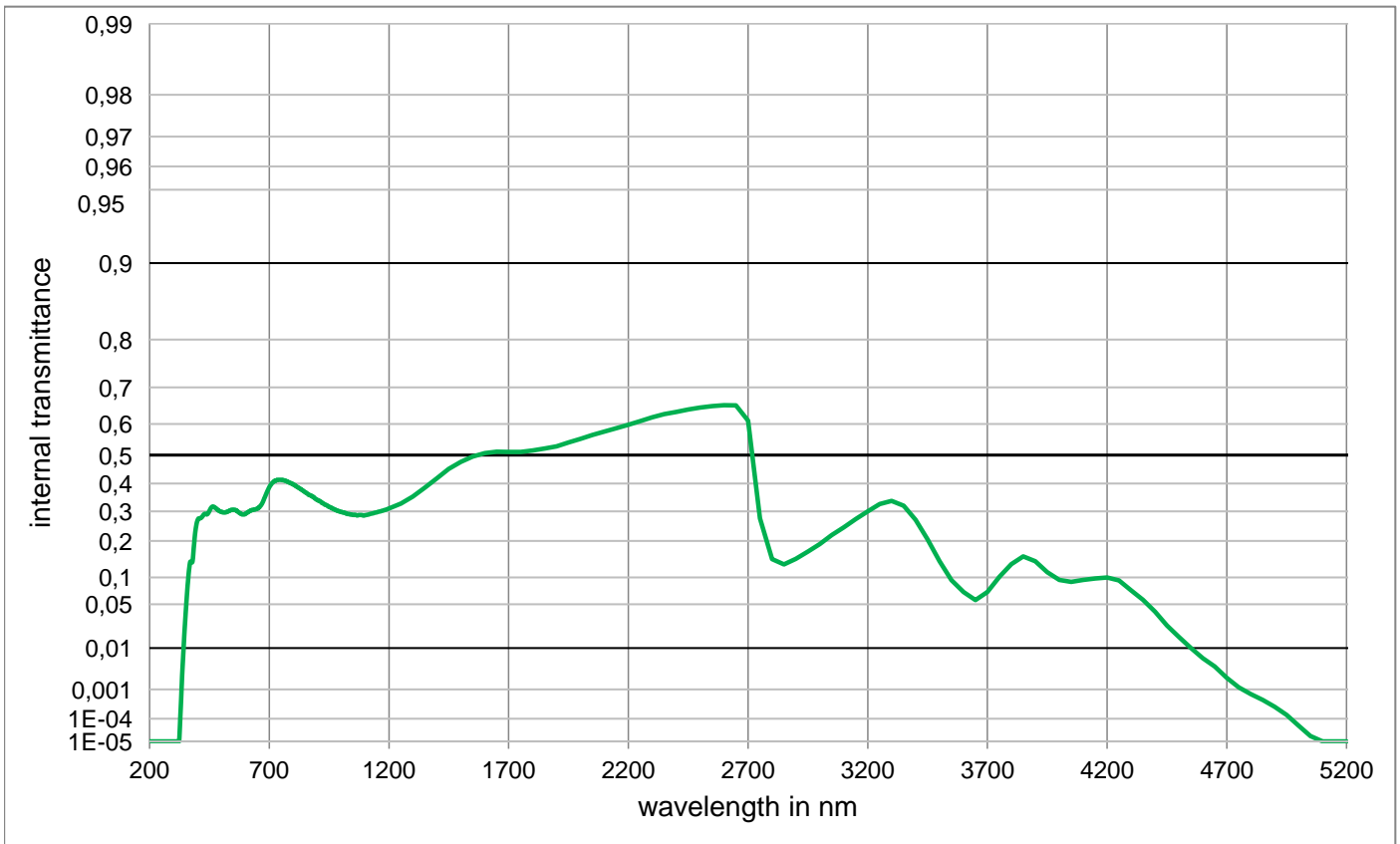
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	1,050E-01	800	2,380E-01	1100	2,034E-01	2200	5,225E-01	3700	6,000E-02
210	< 1,0E-05	510	1,043E-01	810	2,375E-01	1110	2,054E-01	2250	5,360E-01	3750	8,480E-02
220	< 1,0E-05	520	1,050E-01	820	2,370E-01	1120	2,077E-01	2300	5,500E-01	3800	1,156E-01
230	< 1,0E-05	530	1,070E-01	830	2,360E-01	1130	2,100E-01	2350	5,617E-01	3850	1,363E-01
240	< 1,0E-05	540	1,090E-01	840	2,350E-01	1140	2,124E-01	2400	5,711E-01	3900	1,300E-01
250	< 1,0E-05	550	1,100E-01	850	2,340E-01	1150	2,149E-01	2450	5,786E-01	3950	1,068E-01
260	< 1,0E-05	560	1,095E-01	860	2,310E-01	1160	2,175E-01	2500	5,837E-01	4000	8,000E-02
270	< 1,0E-05	570	1,071E-01	870	2,300E-01	1170	2,202E-01	2550	5,900E-01	4050	8,000E-02
280	< 1,0E-05	580	1,050E-01	880	2,270E-01	1180	2,232E-01	2600	5,925E-01	4100	8,511E-02
290	< 1,0E-05	590	1,049E-01	890	2,230E-01	1190	2,263E-01	2650	5,956E-01	4150	9,016E-02
300	< 1,0E-05	600	1,070E-01	900	2,210E-01	1200	2,300E-01	2700	5,700E-01	4200	9,000E-02
310	< 1,0E-05	610	1,110E-01	910	2,200E-01	1250	2,532E-01	2750	2,880E-01	4250	8,318E-02
320	< 1,000E-05	620	1,157E-01	920	2,180E-01	1300	2,800E-01	2800	1,600E-01	4300	7,000E-02
330	< 1,000E-05	630	1,192E-01	930	2,150E-01	1350	3,110E-01	2850	1,439E-01	4350	5,176E-02
340	3,855E-05	640	1,222E-01	940	2,130E-01	1400	3,400E-01	2900	1,574E-01	4400	4,000E-02
350	1,040E-03	650	1,260E-01	950	2,110E-01	1450	3,732E-01	2950	1,784E-01	4450	2,679E-02
360	5,900E-03	660	1,319E-01	960	2,090E-01	1500	3,970E-01	3000	2,000E-01	4500	1,726E-02
370	1,704E-02	670	1,420E-01	970	2,070E-01	1550	4,147E-01	3050	2,224E-01	4550	1,050E-02
380	2,199E-02	680	1,560E-01	980	2,050E-01	1600	4,216E-01	3100	2,500E-01	4600	6,237E-03
390	4,696E-02	690	1,720E-01	990	2,040E-01	1650	4,241E-01	3150	2,752E-01	4650	3,750E-03
400	6,691E-02	700	1,871E-01	1000	2,020E-01	1700	4,230E-01	3200	3,000E-01	4700	2,128E-03
410	7,402E-02	710	2,000E-01	1010	2,022E-01	1750	4,241E-01	3250	3,236E-01	4750	1,222E-03
420	8,105E-02	720	2,094E-01	1020	2,010E-01	1800	4,273E-01	3300	3,300E-01	4800	7,096E-04
430	8,703E-02	730	2,170E-01	1030	2,012E-01	1850	4,325E-01	3350	3,116E-01	4850	5,200E-04
440	9,500E-02	740	2,230E-01	1040	2,000E-01	1900	4,425E-01	3400	2,600E-01	4900	2,985E-04
450	1,019E-01	750	2,270E-01	1050	2,010E-01	1950	4,546E-01	3450	1,948E-01	4950	1,528E-04
460	1,110E-01	760	2,310E-01	1060	2,020E-01	2000	4,674E-01	3500	1,400E-01	5000	5,649E-05
470	1,130E-01	770	2,340E-01	1070	2,010E-01	2050	4,813E-01	3550	8,540E-02	5050	2,518E-05
480	1,100E-01	780	2,360E-01	1080	2,020E-01	2100	4,957E-01	3600	6,220E-02	5100	< 1,000E-05
490	1,070E-01	790	2,370E-01	1090	2,029E-01	2150	5,090E-01	3650	4,960E-02	5150	< 1,000E-05

NG4

Optical properties	Mechanical properties	Colorimetric properties	
Reflection factor	Reference thickness	1 mm 2 mm 3 mm	
$P_d = 0,922$	$d = 1,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e	
Spectral values guaranteed	Density		Illuminant A x y Y λ_d P_e
$\tau_i (405 \text{ nm}) = 0,27 \pm 0,03$	$\rho = 2,42 \text{ g/cm}^3$		
$\tau_i (546 \text{ nm}) = 0,31 \pm 0,03$	Knoop hardness		
$\tau_i (694 \text{ nm}) = 0,39 \pm 0,04$	$HK[0.1/20] = 423$		
	Thermal properties		
	Transformation temperature		
	$T_g = 470 \text{ }^\circ\text{C}$		
	Thermal expansion in $10^{-6}/\text{K}$		
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 6,5$		
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 7,1$		
Refractive indices	Chemical properties	Notes	
$n_h (404,7 \text{ nm}) = 1,517$	Chemical resistance		
$n_e (546 \text{ nm}) = 1,505$	FR class = 1	Ionically colored glass	
$n_d (587,6 \text{ nm}) = 1,503$	SR class = 2.2	Neutral density filter	
	AR class = 1		
	Resistance against humidity	ISO 23364:2021	
Sellmeier coefficients	Resistant glass		
valid from 440 nm to 1550 nm	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5	Disclaimer	
$B_1 = 0,6033$		All data without tolerances are to be understood to be reference values.	
$B_2 = 0,6255$			
$B_3 = 54,9099$			
$C_1 = 4,261\text{E-}03 \text{ } \mu\text{m}^2$			
$C_2 = 1,4068\text{E-}02 \text{ } \mu\text{m}^2$			
$C_3 = 5448,332 \text{ } \mu\text{m}^2$			
Internal quality			
Bubble class 2			



NG4

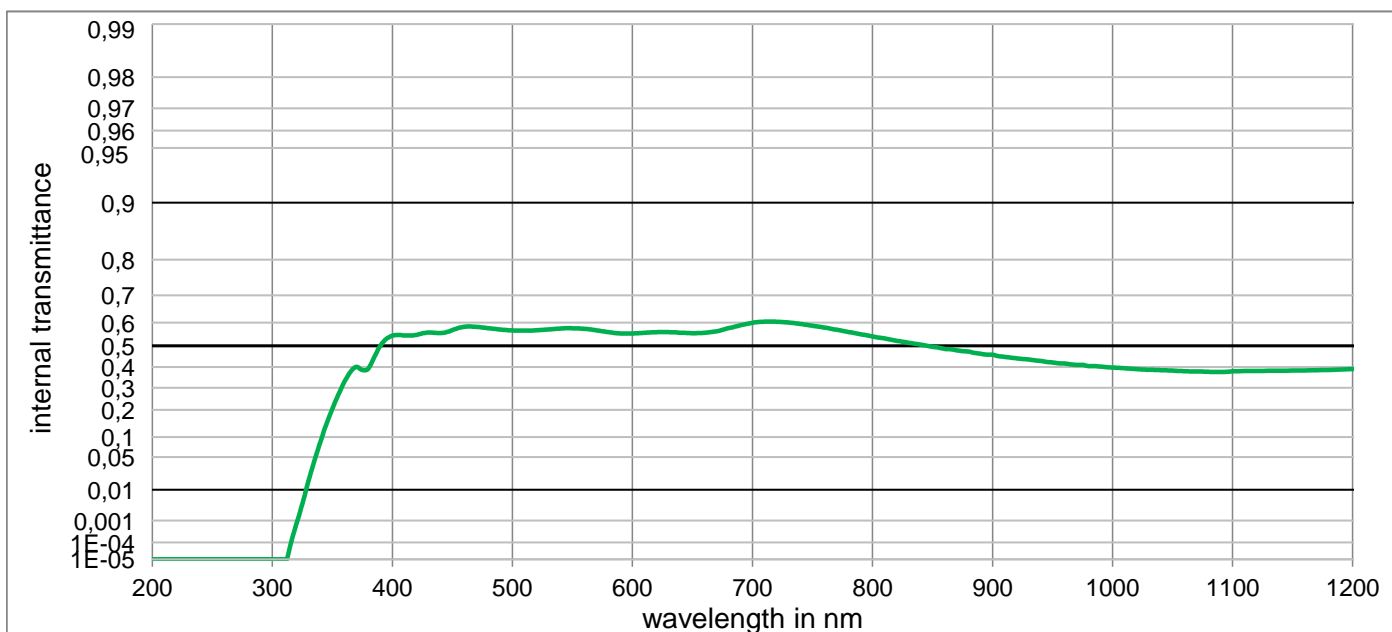


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

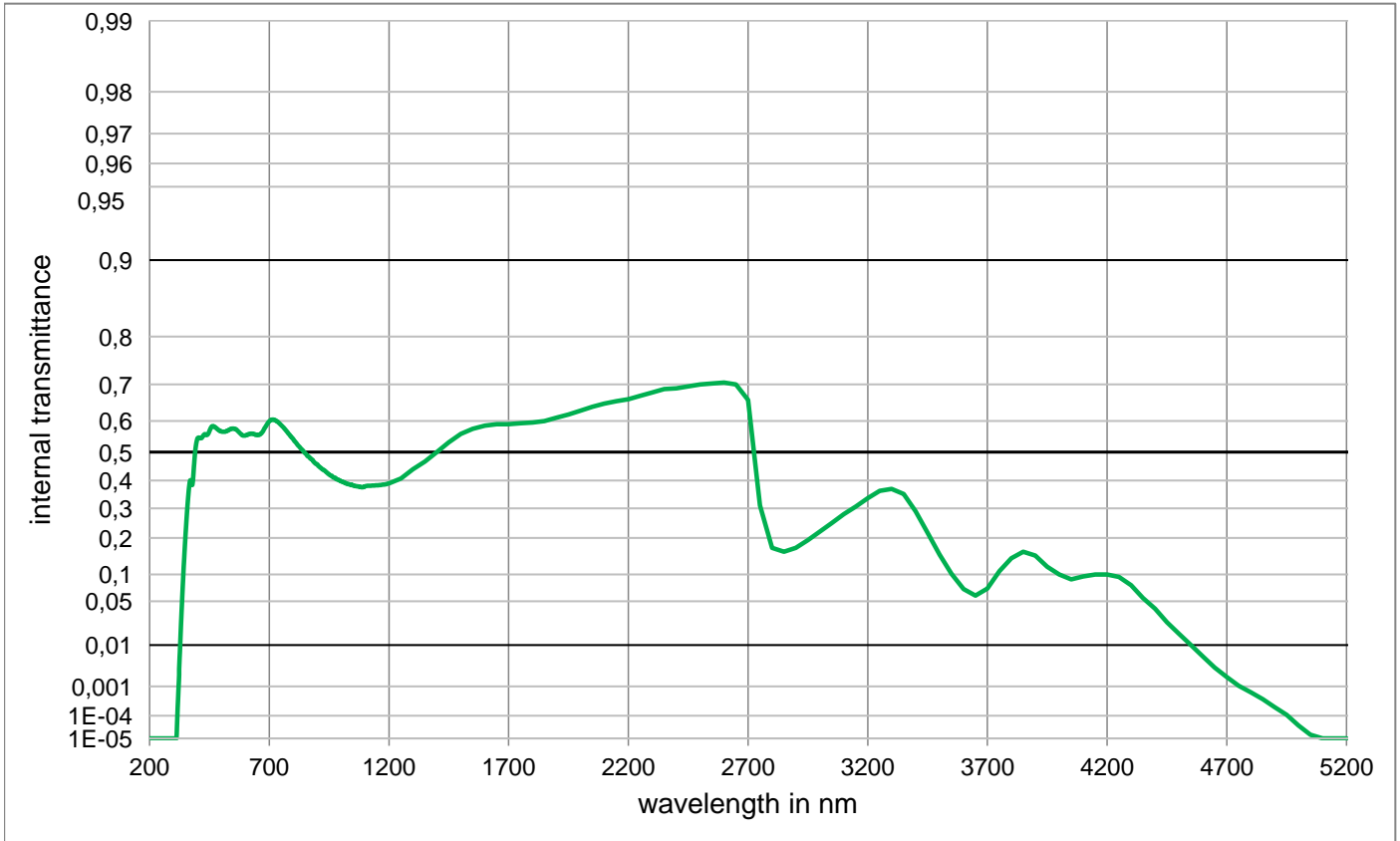
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	2,980E-01	800	3,970E-01	1100	2,860E-01	2200	5,974E-01	3700	7,000E-02
210	< 1,0E-05	510	2,962E-01	810	3,920E-01	1110	2,882E-01	2250	6,084E-01	3750	1,012E-01
220	< 1,0E-05	520	2,971E-01	820	3,860E-01	1120	2,902E-01	2300	6,200E-01	3800	1,327E-01
230	< 1,0E-05	530	3,007E-01	830	3,807E-01	1130	2,924E-01	2350	6,289E-01	3850	1,539E-01
240	< 1,0E-05	540	3,046E-01	840	3,750E-01	1140	2,945E-01	2400	6,355E-01	3900	1,400E-01
250	< 1,0E-05	550	3,060E-01	850	3,680E-01	1150	2,968E-01	2450	6,421E-01	3950	1,121E-01
260	< 1,0E-05	560	3,040E-01	860	3,630E-01	1160	2,991E-01	2500	6,472E-01	4000	9,441E-02
270	< 1,0E-05	570	2,983E-01	870	3,580E-01	1170	3,016E-01	2550	6,516E-01	4050	9,000E-02
280	< 1,0E-05	580	2,920E-01	880	3,530E-01	1180	3,042E-01	2600	6,538E-01	4100	9,441E-02
290	< 1,0E-05	590	2,890E-01	890	3,470E-01	1190	3,069E-01	2650	6,531E-01	4150	9,772E-02
300	< 1,0E-05	600	2,910E-01	900	3,410E-01	1200	3,100E-01	2700	6,100E-01	4200	1,000E-01
310	< 1,0E-05	610	2,966E-01	910	3,370E-01	1250	3,276E-01	2750	2,750E-01	4250	9,333E-02
320	< 1,000E-05	620	3,018E-01	920	3,300E-01	1300	3,533E-01	2800	1,459E-01	4300	7,330E-02
330	1,991E-04	630	3,050E-01	930	3,250E-01	1350	3,855E-01	2850	1,319E-01	4350	5,675E-02
340	6,039E-03	640	3,070E-01	940	3,220E-01	1400	4,185E-01	2900	1,466E-01	4400	4,000E-02
350	3,390E-02	650	3,090E-01	950	3,160E-01	1450	4,523E-01	2950	1,679E-01	4450	2,500E-02
360	8,880E-02	660	3,159E-01	960	3,120E-01	1500	4,764E-01	3000	1,900E-01	4500	1,611E-02
370	1,391E-01	670	3,279E-01	970	3,080E-01	1550	4,948E-01	3050	2,184E-01	4550	1,000E-02
380	1,439E-01	680	3,480E-01	980	3,040E-01	1600	5,065E-01	3100	2,448E-01	4600	6,166E-03
390	2,250E-01	690	3,685E-01	990	3,010E-01	1650	5,116E-01	3150	2,727E-01	4650	4,000E-03
400	2,689E-01	700	3,870E-01	1000	2,980E-01	1700	5,109E-01	3200	3,000E-01	4700	2,104E-03
410	2,750E-01	710	4,000E-01	1010	2,960E-01	1750	5,109E-01	3250	3,262E-01	4750	1,153E-03
420	2,809E-01	720	4,080E-01	1020	2,930E-01	1800	5,153E-01	3300	3,372E-01	4800	7,261E-04
430	2,910E-01	730	4,117E-01	1030	2,910E-01	1850	5,219E-01	3350	3,200E-01	4850	4,688E-04
440	2,890E-01	740	4,134E-01	1040	2,890E-01	1900	5,292E-01	3400	2,700E-01	4900	2,786E-04
450	3,020E-01	750	4,135E-01	1050	2,880E-01	1950	5,417E-01	3450	2,052E-01	4950	1,393E-04
460	3,160E-01	760	4,115E-01	1060	2,880E-01	2000	5,534E-01	3500	1,400E-01	5000	5,212E-05
470	3,150E-01	770	4,090E-01	1070	2,860E-01	2050	5,659E-01	3550	9,380E-02	5050	1,820E-05
480	3,089E-01	780	4,050E-01	1080	2,870E-01	2100	5,769E-01	3600	7,000E-02	5100	< 1,000E-05
490	3,020E-01	790	4,010E-01	1090	2,860E-01	2150	5,871E-01	3650	5,640E-02	5150	< 1,000E-05

NG5

Optical properties	Mechanical properties	Colorimetric properties	
Reflection factor	Reference thickness	1 mm 2 mm 3 mm	
$P_d = 0,923$	$d = 1,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e	
Spectral values guaranteed	Density		Illuminant A x y Y λ_d P_e
$\tau_i (405 \text{ nm}) = 0,56 \pm 0,03$	$\rho = 2,42 \text{ g/cm}^3$		
$\tau_i (546 \text{ nm}) = 0,57 \pm 0,03$	Knoop hardness		
$\tau_i (694 \text{ nm}) = 0,62 \pm 0,03$	HK[0.1/20] = 435		
	Thermal properties		
	Transformation temperature		
	$T_g = 474 \text{ }^\circ\text{C}$		
	Thermal expansion in $10^{-6}/\text{K}$		
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 6,6$		
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 7,1$		
Refractive indices	Chemical properties	Notes	
$n_h (404,7 \text{ nm}) = 1,514$	Chemical resistance		
$n_e (546 \text{ nm}) = 1,502$	FR class = 1	Ionically colored glass	
$n_d (587,6 \text{ nm}) = 1,5$	SR class = 3.2	Neutral density filter	
	AR class = 2		
	Resistance against humidity		
Sellmeier coefficients	Resistant glass	ISO 23364:2021	
valid from 440 nm to 1550 nm	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5		
$B_1 = 0,7916$		Disclaimer	
$B_2 = 0,4296$		All data without tolerances are to be understood to be reference values.	
$B_3 = 36,0098$			
$C_1 = 7,310\text{E-}03 \text{ } \mu\text{m}^2$			
$C_2 = 1,2655\text{E-}02 \text{ } \mu\text{m}^2$			
$C_3 = 3759,685 \text{ } \mu\text{m}^2$			
Internal quality			
Bubble class 2			



NG5

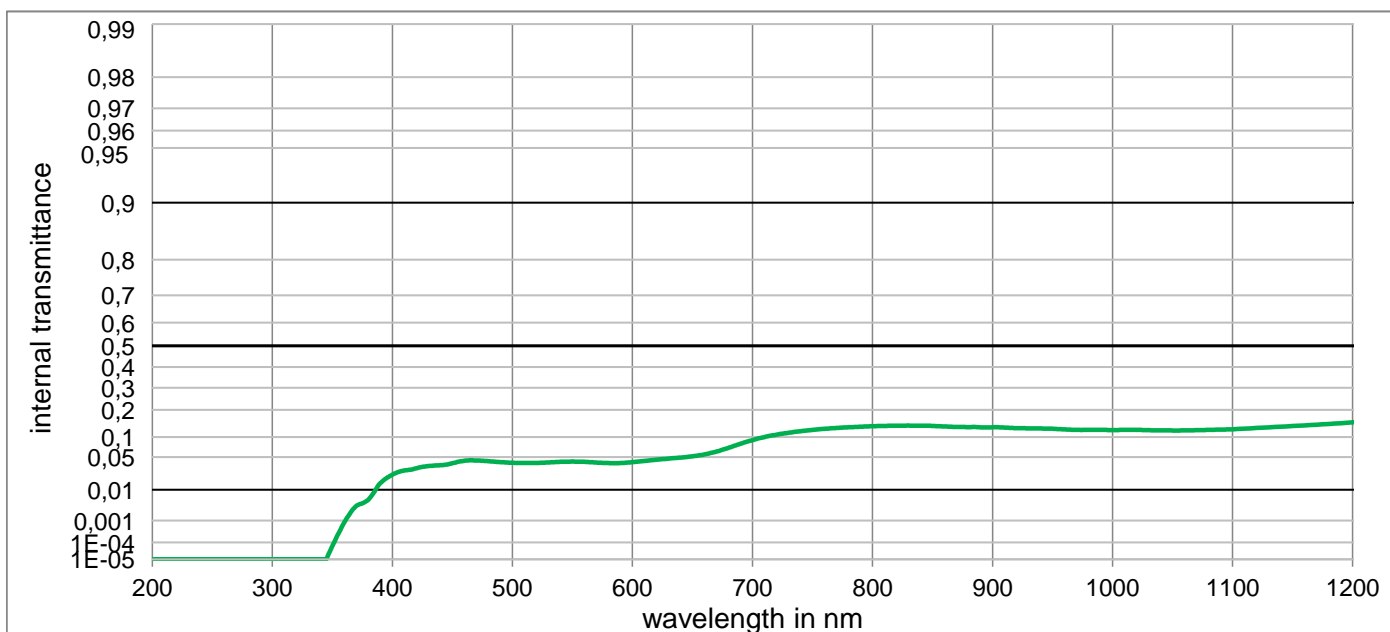


Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

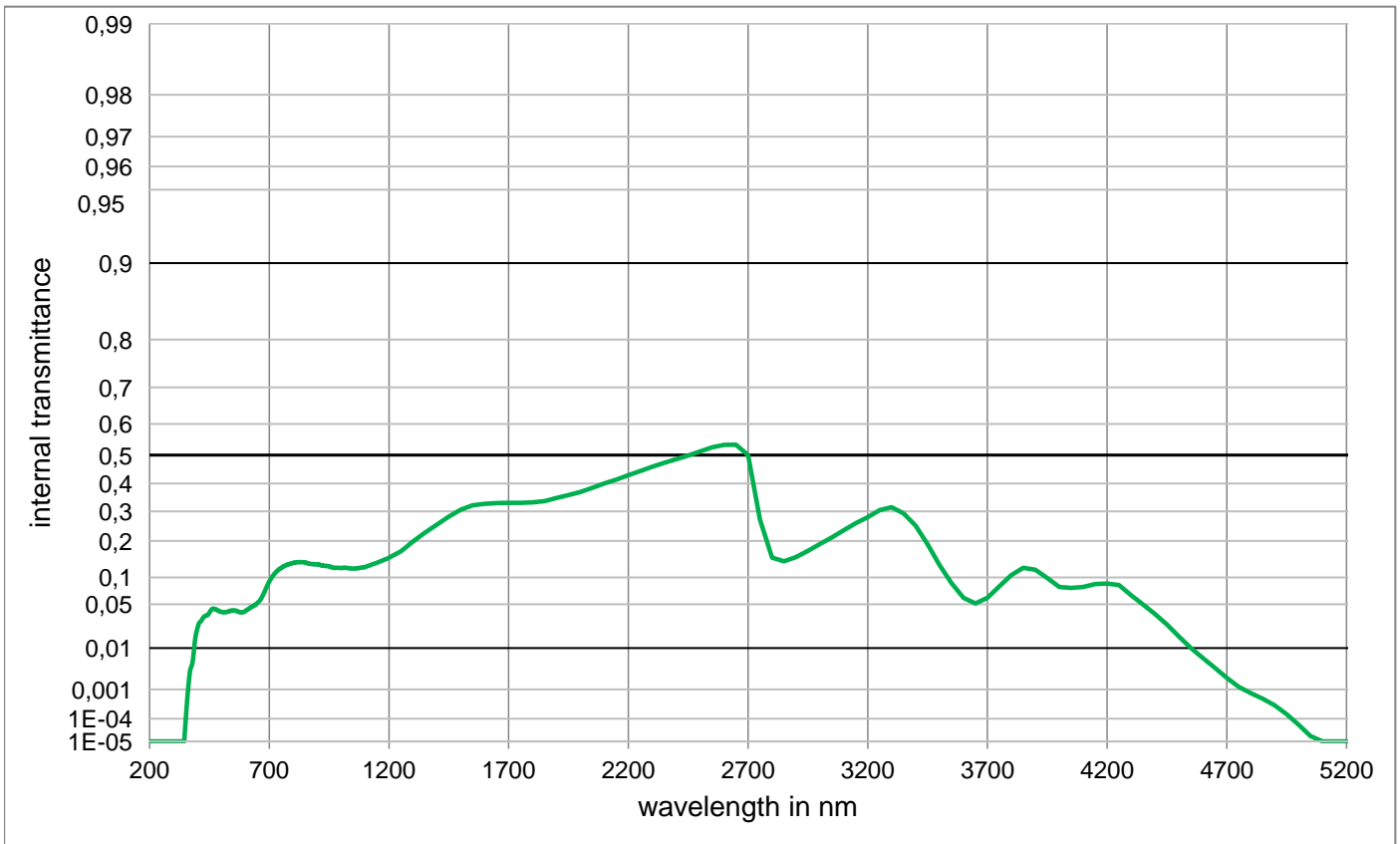
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	5,677E-01	800	5,424E-01	1100	3,794E-01	2200	6,619E-01	3700	7,110E-02
210	< 1,0E-05	510	5,667E-01	810	5,337E-01	1110	3,808E-01	2250	6,707E-01	3750	1,077E-01
220	< 1,0E-05	520	5,684E-01	820	5,230E-01	1120	3,812E-01	2300	6,800E-01	3800	1,400E-01
230	< 1,0E-05	530	5,717E-01	830	5,142E-01	1130	3,816E-01	2350	6,883E-01	3850	1,583E-01
240	< 1,0E-05	540	5,757E-01	840	5,055E-01	1140	3,821E-01	2400	6,900E-01	3900	1,473E-01
250	< 1,0E-05	550	5,767E-01	850	4,955E-01	1150	3,827E-01	2450	6,949E-01	3950	1,180E-01
260	< 1,0E-05	560	5,747E-01	860	4,857E-01	1160	3,835E-01	2500	7,000E-01	4000	1,000E-01
270	< 1,0E-05	570	5,682E-01	870	4,796E-01	1170	3,845E-01	2550	7,022E-01	4050	8,913E-02
280	< 1,0E-05	580	5,605E-01	880	4,735E-01	1180	3,858E-01	2600	7,044E-01	4100	9,550E-02
290	< 1,0E-05	590	5,549E-01	890	4,636E-01	1190	3,875E-01	2650	7,000E-01	4150	1,000E-01
300	< 1,0E-05	600	5,548E-01	900	4,585E-01	1200	3,900E-01	2700	6,600E-01	4200	1,000E-01
310	< 1,0E-05	610	5,579E-01	910	4,487E-01	1250	4,075E-01	2750	3,108E-01	4250	9,441E-02
320	7,413E-04	620	5,602E-01	920	4,416E-01	1300	4,400E-01	2800	1,700E-01	4300	7,762E-02
330	1,600E-02	630	5,604E-01	930	4,364E-01	1350	4,676E-01	2850	1,583E-01	4350	5,495E-02
340	8,600E-02	640	5,578E-01	940	4,293E-01	1400	5,000E-01	2900	1,700E-01	4400	4,000E-02
350	2,050E-01	650	5,558E-01	950	4,220E-01	1450	5,321E-01	2950	1,935E-01	4450	2,512E-02
360	3,280E-01	660	5,576E-01	960	4,175E-01	1500	5,600E-01	3000	2,200E-01	4500	1,622E-02
370	4,012E-01	670	5,643E-01	970	4,104E-01	1550	5,761E-01	3050	2,485E-01	4550	1,000E-02
380	3,930E-01	680	5,773E-01	980	4,050E-01	1600	5,857E-01	3100	2,800E-01	4600	5,821E-03
390	5,000E-01	690	5,891E-01	990	4,022E-01	1650	5,900E-01	3150	3,057E-01	4650	3,192E-03
400	5,456E-01	700	5,993E-01	1000	3,974E-01	1700	5,900E-01	3200	3,364E-01	4700	1,820E-03
410	5,460E-01	710	6,038E-01	1010	3,941E-01	1750	5,930E-01	3250	3,628E-01	4750	1,038E-03
420	5,487E-01	720	6,035E-01	1020	3,900E-01	1800	5,952E-01	3300	3,700E-01	4800	6,561E-04
430	5,587E-01	730	6,003E-01	1030	3,870E-01	1850	6,000E-01	3350	3,511E-01	4850	3,981E-04
440	5,564E-01	740	5,948E-01	1040	3,850E-01	1900	6,100E-01	3400	2,900E-01	4900	2,104E-04
450	5,690E-01	750	5,873E-01	1050	3,830E-01	1950	6,194E-01	3450	2,170E-01	4950	1,079E-04
460	5,833E-01	760	5,797E-01	1060	3,800E-01	2000	6,300E-01	3500	1,500E-01	5000	3,917E-05
470	5,828E-01	770	5,707E-01	1070	3,790E-01	2050	6,414E-01	3550	1,012E-01	5050	1,503E-05
480	5,770E-01	780	5,610E-01	1080	3,770E-01	2100	6,500E-01	3600	7,000E-02	5100	< 1,000E-05
490	5,715E-01	790	5,511E-01	1090	3,760E-01	2150	6,568E-01	3650	5,860E-02	5150	< 1,000E-05

NG9

Optical properties	Mechanical properties	Colorimetric properties	
Reflection factor	Reference thickness	1 mm 2 mm 3 mm	
$P_d = 0,921$	$d = 1,00 \text{ mm}$	Illuminant D65 x y Y λ_d P_e	
Spectral values guaranteed	Density		Illuminant A x y Y λ_d P_e
$\tau_i (405 \text{ nm}) = 0,025 \pm 0,01$	$\rho = 2,44 \text{ g/cm}^3$		
$\tau_i (546 \text{ nm}) = 0,04 \pm 0,02$	Knoop hardness		
$\tau_i (694 \text{ nm}) = 0,08 \pm 0,02$	HK[0.1/20] = 420		
	Thermal properties		
	Transformation temperature		
	$T_g = 469 \text{ }^\circ\text{C}$		
	Thermal expansion in $10^{-6}/\text{K}$		
	$\alpha_{(-30^\circ\text{C}/+70^\circ\text{C})} = 6,5$		
	$\alpha_{(20^\circ\text{C}/300^\circ\text{C})} = 7,0$		
Refractive indices	Chemical properties	Notes	
$n_h (404,7 \text{ nm}) = 1,525$	Chemical resistance		
$n_e (546 \text{ nm}) = 1,511$	FR class = 1	Ionically colored glass	
$n_d (587,6 \text{ nm}) = 1,509$	SR class = 3.2	Neutral density filter	
	AR class = 2		
	Resistance against humidity		
Sellmeier coefficients	Resistant glass	ISO 23364:2021	
valid from 440 nm to 1550 nm	see pocket catalogue "Optical Filter Glass 2024", chapter 5.5		
$B_1 = 0,7032$		Disclaimer	
$B_2 = 0,5370$		All data without tolerances are to be understood to be reference values.	
$B_3 = 30,3108$			
$C_1 = 1,067\text{E-}02 \text{ } \mu\text{m}^2$			
$C_2 = 1,0492\text{E-}02 \text{ } \mu\text{m}^2$			
$C_3 = 3524,129 \text{ } \mu\text{m}^2$			
Internal quality			
Bubble class 2			



NG9



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

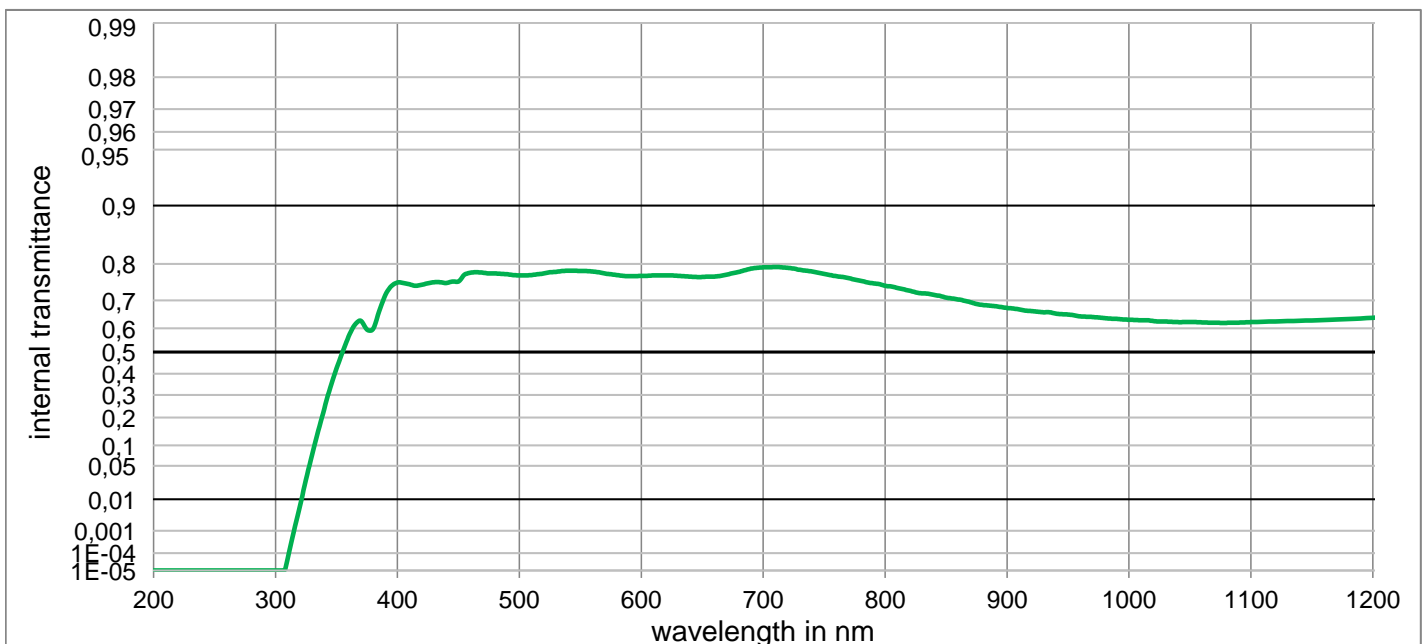
λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	3,959E-02	800	1,359E-01	1100	1,250E-01	2200	4,300E-01	3700	6,000E-02
210	< 1,0E-05	510	3,908E-02	810	1,369E-01	1110	1,273E-01	2250	4,442E-01	3750	8,100E-02
220	< 1,0E-05	520	3,933E-02	820	1,376E-01	1120	1,295E-01	2300	4,600E-01	3800	1,055E-01
230	< 1,0E-05	530	4,021E-02	830	1,381E-01	1130	1,318E-01	2350	4,731E-01	3850	1,231E-01
240	< 1,0E-05	540	4,120E-02	840	1,377E-01	1140	1,340E-01	2400	4,857E-01	3900	1,181E-01
250	< 1,0E-05	550	4,158E-02	850	1,368E-01	1150	1,364E-01	2450	4,982E-01	3950	9,860E-02
260	< 1,0E-05	560	4,120E-02	860	1,350E-01	1160	1,389E-01	2500	5,120E-01	4000	8,000E-02
270	< 1,0E-05	570	3,995E-02	870	1,330E-01	1170	1,414E-01	2550	5,259E-01	4050	7,810E-02
280	< 1,0E-05	580	3,908E-02	880	1,325E-01	1180	1,440E-01	2600	5,340E-01	4100	8,000E-02
290	< 1,0E-05	590	3,908E-02	890	1,319E-01	1190	1,469E-01	2650	5,347E-01	4150	8,590E-02
300	< 1,0E-05	600	4,067E-02	900	1,320E-01	1200	1,501E-01	2700	5,000E-01	4200	8,650E-02
310	< 1,0E-05	610	4,276E-02	910	1,310E-01	1250	1,686E-01	2750	2,710E-01	4250	8,356E-02
320	< 1,000E-05	620	4,500E-02	920	1,290E-01	1300	1,980E-01	2800	1,500E-01	4300	6,457E-02
330	< 1,000E-05	630	4,700E-02	930	1,280E-01	1350	2,268E-01	2850	1,404E-01	4350	4,966E-02
340	< 1,000E-05	640	4,900E-02	940	1,280E-01	1400	2,538E-01	2900	1,514E-01	4400	3,698E-02
350	6,412E-05	650	5,159E-02	950	1,270E-01	1450	2,814E-01	2950	1,700E-01	4450	2,590E-02
360	8,472E-04	660	5,537E-02	960	1,246E-01	1500	3,060E-01	3000	1,900E-01	4500	1,637E-02
370	3,404E-03	670	6,155E-02	970	1,229E-01	1550	3,217E-01	3050	2,112E-01	4550	1,000E-02
380	5,284E-03	680	7,039E-02	980	1,231E-01	1600	3,273E-01	3100	2,347E-01	4600	6,223E-03
390	1,464E-02	690	8,100E-02	990	1,231E-01	1650	3,292E-01	3150	2,582E-01	4650	3,784E-03
400	2,301E-02	700	9,104E-02	1000	1,226E-01	1700	3,300E-01	3200	2,800E-01	4700	2,089E-03
410	2,795E-02	710	1,000E-01	1010	1,231E-01	1750	3,300E-01	3250	3,040E-01	4750	1,186E-03
420	3,108E-02	720	1,074E-01	1020	1,232E-01	1800	3,317E-01	3300	3,149E-01	4800	7,727E-04
430	3,435E-02	730	1,134E-01	1030	1,221E-01	1850	3,368E-01	3350	2,923E-01	4850	5,176E-04
440	3,555E-02	740	1,186E-01	1040	1,214E-01	1900	3,474E-01	3400	2,500E-01	4900	3,148E-04
450	3,872E-02	750	1,228E-01	1050	1,211E-01	1950	3,581E-01	3450	1,900E-01	4950	1,493E-04
460	4,308E-02	760	1,268E-01	1060	1,213E-01	2000	3,700E-01	3500	1,300E-01	5000	5,754E-05
470	4,356E-02	770	1,297E-01	1070	1,220E-01	2050	3,845E-01	3550	8,770E-02	5050	1,820E-05
480	4,231E-02	780	1,320E-01	1080	1,229E-01	2100	4,000E-01	3600	6,000E-02	5100	< 1,000E-05
490	4,069E-02	790	1,340E-01	1090	1,240E-01	2150	4,140E-01	3650	5,110E-02	5150	< 1,000E-05

NG11

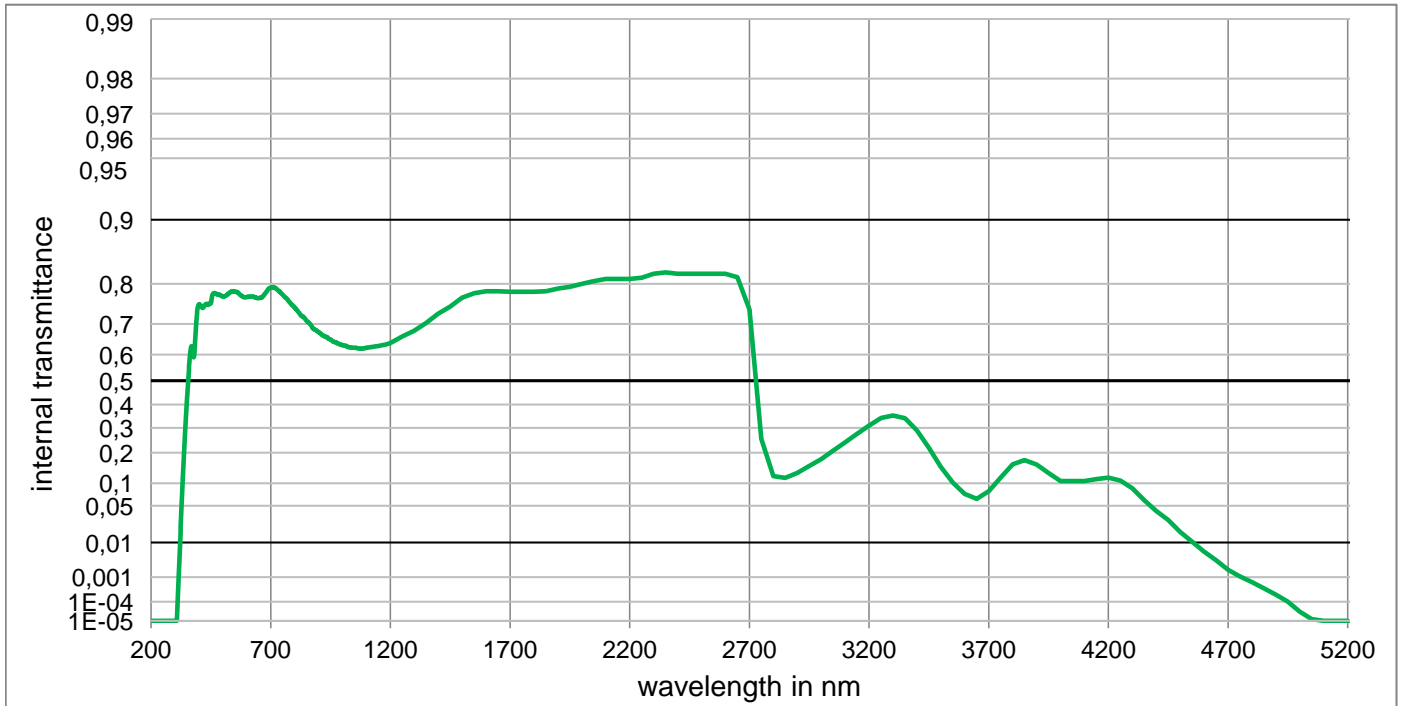
Optical properties	
Reflection factor	
P_d	= 0,923
Spectral values guaranteed	
τ_i (405 nm)	= 0,76 ± 0,02
τ_i (546 nm)	= 0,77 ± 0,02
τ_i (694 nm)	= 0,79 ± 0,02
Refractive indices	
n_F (486 nm)	= 1,504
n_e (546 nm)	= 1,5
n_d (587,6 nm)	= 1,499
Sellmeier coefficients	
valid from 365 nm to 1530 nm	
B_1	1,1839
B_2	0,0336
B_3	1,1111
C_1	7,634E-03 μm^2
C_2	4,3272E-02 μm^2
C_3	116,448 μm^2
Internal quality	
Bubble class	2

Mechanical properties	
Reference thickness	
d	= 1,00 mm
Density	
ρ	= 2,41 g/cm ³
Knoop hardness	
HK[0.1/20]	= 460
Thermal properties	
Transformation temperature	
T_g	= 481 °C
Thermal expansion in 10⁻⁶/K	
α (-30°C/+70°C)	= 6,7
α (20°C/300°C)	= 7,2
α (20°C/200°C)	= 7
Chemical properties	
Chemical resistance	
FR class	= 1
SR class	= 3.4
AR class	= 2
Resistance against humidity	
Resistant glass	
see pocket catalogue "Optical Filter Glass 2020", chapter 5.5	

Colormetric properties				
		1 mm	2 mm	3 mm
Illuminant D65	x			
	y			
	Y			
	λ_d			
	P_e			
Illuminant A	x			
	y			
	Y			
	λ_d			
	P_e			
Notes				
Ionically colored glass				
Neutral density filter				
DIN 58131				
Disclaimer				
All data without tolerances are to be understood to be reference values.				



NG11



Internal transmittance τ_i at reference thickness
 The internal transmittance values, tabulated and graphically represented, are reference values only

λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i	λ /nm	τ_i
200	< 1,0E-05	500	7,720E-01	800	7,440E-01	1100	6,240E-01	2200	8,100E-01	3700	8,000E-02
210	< 1,0E-05	510	7,730E-01	810	7,380E-01	1110	6,254E-01	2250	8,124E-01	3750	1,159E-01
220	< 1,0E-05	520	7,770E-01	820	7,300E-01	1120	6,266E-01	2300	8,200E-01	3800	1,583E-01
230	< 1,0E-05	530	7,810E-01	830	7,220E-01	1130	6,278E-01	2350	8,227E-01	3850	1,725E-01
240	< 1,0E-05	540	7,840E-01	840	7,170E-01	1140	6,290E-01	2400	8,200E-01	3900	1,574E-01
250	< 1,0E-05	550	7,830E-01	850	7,090E-01	1150	6,304E-01	2450	8,200E-01	3950	1,300E-01
260	< 1,0E-05	560	7,820E-01	860	7,030E-01	1160	6,318E-01	2500	8,200E-01	4000	1,060E-01
270	< 1,0E-05	570	7,770E-01	870	6,940E-01	1170	6,335E-01	2550	8,200E-01	4050	1,060E-01
280	< 1,0E-05	580	7,730E-01	880	6,850E-01	1180	6,353E-01	2600	8,200E-01	4100	1,058E-01
290	< 1,0E-05	590	7,700E-01	890	6,810E-01	1190	6,375E-01	2650	8,133E-01	4150	1,117E-01
300	< 1,0E-05	600	7,710E-01	900	6,750E-01	1200	6,400E-01	2700	7,400E-01	4200	1,162E-01
310	5,1E-05	610	7,720E-01	910	6,700E-01	1250	6,616E-01	2750	2,545E-01	4250	1,072E-01
320	6,622E-03	620	7,720E-01	920	6,640E-01	1300	6,800E-01	2800	1,200E-01	4300	8,710E-02
330	7,396E-02	630	7,710E-01	930	6,600E-01	1350	7,030E-01	2850	1,150E-01	4350	6,012E-02
340	2,387E-01	640	7,690E-01	940	6,550E-01	1400	7,285E-01	2900	1,300E-01	4400	4,169E-02
350	4,241E-01	650	7,680E-01	950	6,520E-01	1450	7,473E-01	2950	1,527E-01	4450	2,904E-02
360	5,667E-01	660	7,690E-01	960	6,450E-01	1500	7,690E-01	3000	1,762E-01	4500	1,720E-02
370	6,290E-01	670	7,740E-01	970	6,430E-01	1550	7,794E-01	3050	2,073E-01	4550	1,038E-02
380	5,968E-01	680	7,810E-01	980	6,390E-01	1600	7,841E-01	3100	2,400E-01	4600	6,000E-03
390	7,166E-01	690	7,890E-01	990	6,360E-01	1650	7,841E-01	3150	2,752E-01	4650	3,459E-03
400	7,530E-01	700	7,920E-01	1000	6,330E-01	1700	7,831E-01	3200	3,091E-01	4700	1,778E-03
410	7,480E-01	710	7,930E-01	1010	6,310E-01	1750	7,831E-01	3250	3,421E-01	4750	1,052E-03
420	7,470E-01	720	7,910E-01	1020	6,280E-01	1800	7,831E-01	3300	3,525E-01	4800	6,607E-04
430	7,540E-01	730	7,860E-01	1030	6,260E-01	1850	7,841E-01	3350	3,412E-01	4850	3,846E-04
440	7,520E-01	740	7,820E-01	1040	6,240E-01	1900	7,900E-01	3400	2,900E-01	4900	2,089E-04
450	7,559E-01	750	7,760E-01	1050	6,240E-01	1950	7,935E-01	3450	2,186E-01	4950	1,007E-04
460	7,790E-01	760	7,700E-01	1060	6,230E-01	2000	8,000E-01	3500	1,500E-01	5000	3,236E-05
470	7,790E-01	770	7,650E-01	1070	6,220E-01	2050	8,058E-01	3550	1,018E-01	5050	1,271E-05
480	7,770E-01	780	7,580E-01	1080	6,210E-01	2100	8,100E-01	3600	7,350E-02	5100	< 1,000E-05
490	7,750E-01	790	7,510E-01	1090	6,220E-01	2150	8,100E-01	3650	6,310E-02	5150	< 1,000E-05

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