

## VG9

<b>Density</b>	
$\rho$ [g/cm <sup>3</sup> ]	2.87

<b>Notes</b>
Ionically colored glass
Bandpass filter

<b>Reflection factor</b>	
$P_d$	0.911

<b>Bubble content</b>	
Bubble class	1

<b>Reference thickness</b>	
d [mm]	1

<b>Chemical Resistance</b>	
FR class	0
SR class	1.0
AR class	1.0

<b>Spectral values guaranteed</b>		
$\tau_i$ (450nm)	$\leq$	0.21
$\tau_i$ (514nm)	$\geq$	0.67
$\tau_i$ (633nm)	$\leq$	0.15
$\tau_i$ (725nm)	$\leq$	0.07
$\tau_i$ (1060nm)	$\leq$	0.18

<b>Transformation temperature</b>	
T <sub>g</sub> [°C]	462

<b>Thermal expansion</b>	
$\alpha_{30/70^\circ\text{C}}$ [10 <sup>-6</sup> /K]	9.2
$\alpha_{20/300^\circ\text{C}}$ [10 <sup>-6</sup> /K]	10.6
$\alpha_{20/200^\circ\text{C}}$ [10 <sup>-6</sup> /K]	

<b>Refractive Index n</b>	
$n_F$ (480.0 nm) = 1.560	
$n_d$ (587.6 nm) = 1.550	

<b>Temperature coefficient</b>	
T <sub>K</sub> [nm/°C]	

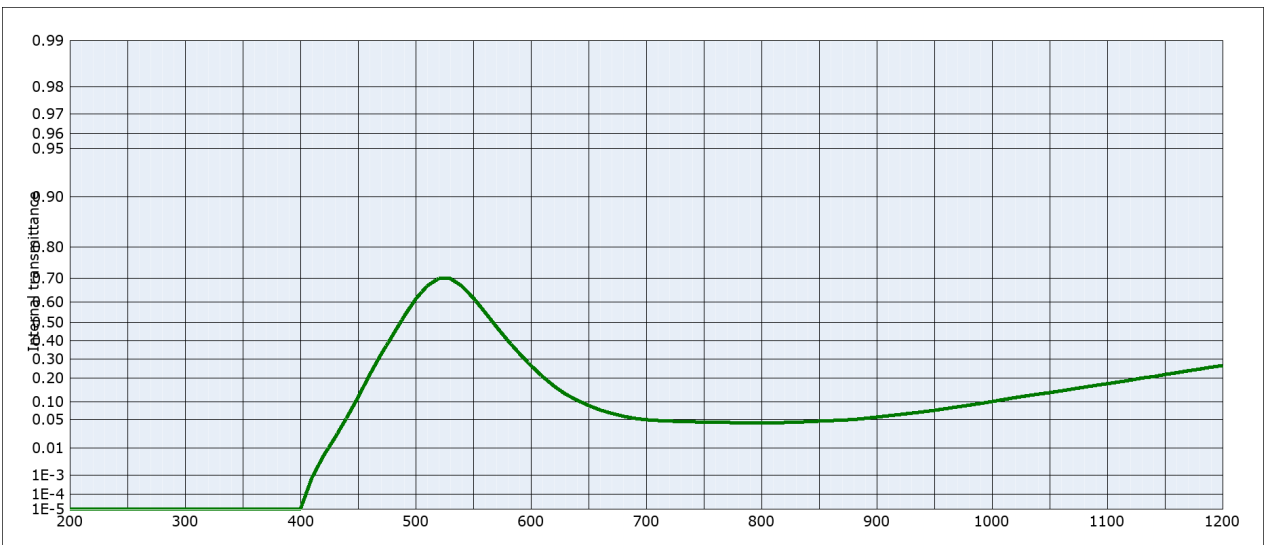
All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".

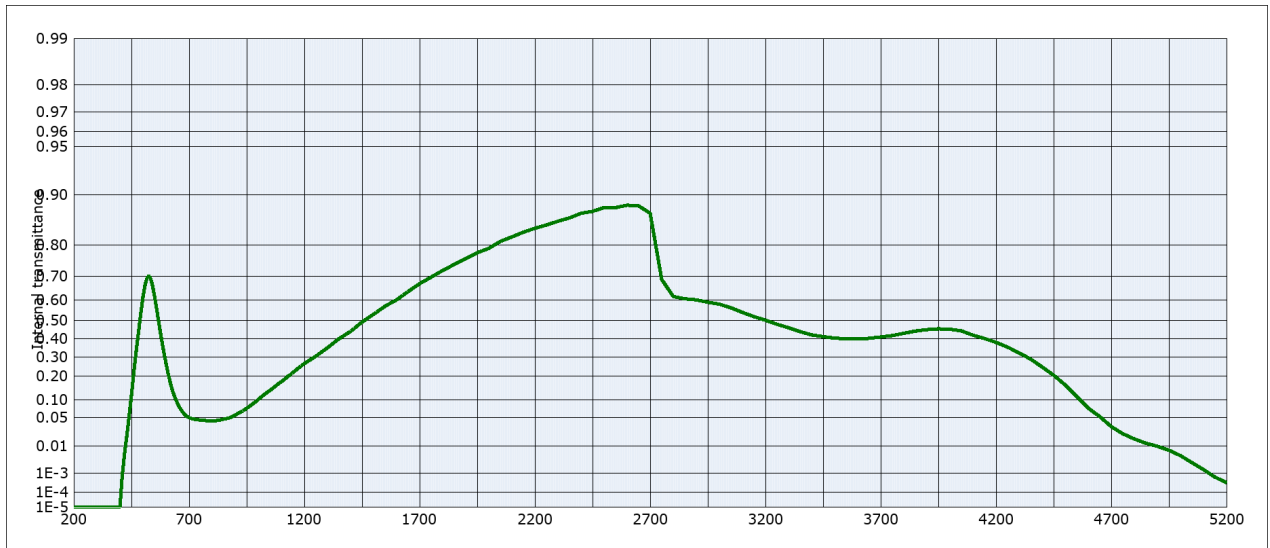
### Colorimetric evaluation

Illuminant	A (Planck T = 2856 K)		
	1	2	3
d [mm]			
x	0.370	0.306	0.265
y	0.522	0.596	0.645
Y	40	21	12
$\lambda_d$ [nm]	535	529	527
P <sub>e</sub>	0.31	0.47	0.58

Illuminant	Planck T = 3200 K		
	1	2	3
d [mm]			
x	0.354	0.295	0.256
y	0.521	0.596	0.645
Y	41	22	13
$\lambda_d$ [nm]	538	531	528
P <sub>e</sub>	0.33	0.49	0.59

Illuminant	D65 (T <sub>C</sub> = 6504 K)		
	1	2	3
d [mm]			
x	0.284	0.246	0.220
y	0.493	0.582	0.637
Y	45	25	15
$\lambda_d$ [nm]	541	535	532
P <sub>e</sub>	0.39	0.56	0.66





**Internal transmittance  $\tau_i$  at reference thickness  $d = 1$  mm**  
**The internal transmittance values, tabulated and graphically represented, are reference values only**

$\lambda$ [nm]	$\tau_i$	$\lambda$ [nm]	$\tau_i$	$\lambda$ [nm]	$\tau_i$	$\lambda$ [nm]	$\tau_i$	$\lambda$ [nm]	$\tau_i$	$\lambda$ [nm]	$\tau_i$
200	$< 10^{-5}$	500	0.613	800	$4.3 \cdot 10^{-2}$	1100	0.174	2200	0.840	3700	0.410
210	$< 10^{-5}$	510	0.669	810	$4.3 \cdot 10^{-2}$	1110	0.182	2250	0.847	3750	0.418
220	$< 10^{-5}$	520	0.698	820	$4.4 \cdot 10^{-2}$	1120	0.191	2300	0.855	3800	0.430
230	$< 10^{-5}$	530	0.698	830	$4.5 \cdot 10^{-2}$	1130	0.201	2350	0.861	3850	0.442
240	$< 10^{-5}$	540	0.669	840	$4.5 \cdot 10^{-2}$	1140	0.208	2400	0.870	3900	0.450
250	$< 10^{-5}$	550	0.618	850	$4.7 \cdot 10^{-2}$	1150	0.218	2450	0.874	3950	0.454
260	$< 10^{-5}$	560	0.552	860	$4.8 \cdot 10^{-2}$	1160	0.227	2500	0.880	4000	0.452
270	$< 10^{-5}$	570	0.477	870	$4.9 \cdot 10^{-2}$	1170	0.237	2550	0.880	4050	0.443
280	$< 10^{-5}$	580	0.401	880	$5.0 \cdot 10^{-2}$	1180	0.246	2600	0.884	4100	0.420
290	$< 10^{-5}$	590	0.330	890	$5.3 \cdot 10^{-2}$	1190	0.256	2650	0.883	4150	0.402
300	$< 10^{-5}$	600	0.265	900	$5.6 \cdot 10^{-2}$	1200	0.264	2700	0.870	4200	0.380
310	$< 10^{-5}$	610	0.209	910	$5.9 \cdot 10^{-2}$	1250	0.304	2750	0.687	4250	0.354
320	$< 10^{-5}$	620	0.164	920	$6.3 \cdot 10^{-2}$	1300	0.350	2800	0.615	4300	0.322
330	$< 10^{-5}$	630	0.130	930	$6.6 \cdot 10^{-2}$	1350	0.400	2850	0.605	4350	0.288
340	$< 10^{-5}$	640	0.107	940	$7.0 \cdot 10^{-2}$	1400	0.440	2900	0.600	4400	0.247
350	$< 10^{-5}$	650	$8.9 \cdot 10^{-2}$	950	$7.4 \cdot 10^{-2}$	1450	0.490	2950	0.589	4450	0.205
360	$< 10^{-5}$	660	$7.5 \cdot 10^{-2}$	960	$7.9 \cdot 10^{-2}$	1500	0.530	3000	0.580	4500	0.160
370	$< 10^{-5}$	670	$6.6 \cdot 10^{-2}$	970	$8.4 \cdot 10^{-2}$	1550	0.570	3050	0.563	4550	0.114
380	$< 10^{-5}$	680	$5.8 \cdot 10^{-2}$	980	$9.0 \cdot 10^{-2}$	1600	0.600	3100	0.540	4600	$7.4 \cdot 10^{-2}$
390	$< 10^{-5}$	690	$5.3 \cdot 10^{-2}$	990	$9.5 \cdot 10^{-2}$	1650	0.637	3150	0.518	4650	$5.2 \cdot 10^{-2}$
400	$< 10^{-5}$	700	$5.0 \cdot 10^{-2}$	1000	0.102	1700	0.670	3200	0.500	4700	$3.3 \cdot 10^{-2}$
410	$7.6 \cdot 10^{-4}$	710	$4.8 \cdot 10^{-2}$	1010	0.109	1750	0.696	3250	0.479	4750	$2.2 \cdot 10^{-2}$
420	$5.7 \cdot 10^{-3}$	720	$4.7 \cdot 10^{-2}$	1020	0.116	1800	0.720	3300	0.460	4800	$1.6 \cdot 10^{-2}$
430	$2.0 \cdot 10^{-2}$	730	$4.6 \cdot 10^{-2}$	1030	0.123	1850	0.741	3350	0.439	4850	$1.2 \cdot 10^{-2}$
440	$5.3 \cdot 10^{-2}$	740	$4.5 \cdot 10^{-2}$	1040	0.130	1900	0.760	3400	0.421	4900	$1.0 \cdot 10^{-2}$
450	0.117	750	$4.5 \cdot 10^{-2}$	1050	0.136	1950	0.778	3450	0.412	4950	$7.5 \cdot 10^{-3}$
460	0.216	760	$4.4 \cdot 10^{-2}$	1060	0.143	2000	0.790	3500	0.403	5000	$5.0 \cdot 10^{-3}$
470	0.325	770	$4.4 \cdot 10^{-2}$	1070	0.151	2050	0.809	3550	0.400	5050	$2.8 \cdot 10^{-3}$
480	0.429	780	$4.4 \cdot 10^{-2}$	1080	0.159	2100	0.820	3600	0.400	5100	$1.5 \cdot 10^{-3}$
490	0.530	790	$4.3 \cdot 10^{-2}$	1090	0.167	2150	0.831	3650	0.402	5150	$6.6 \cdot 10^{-4}$