

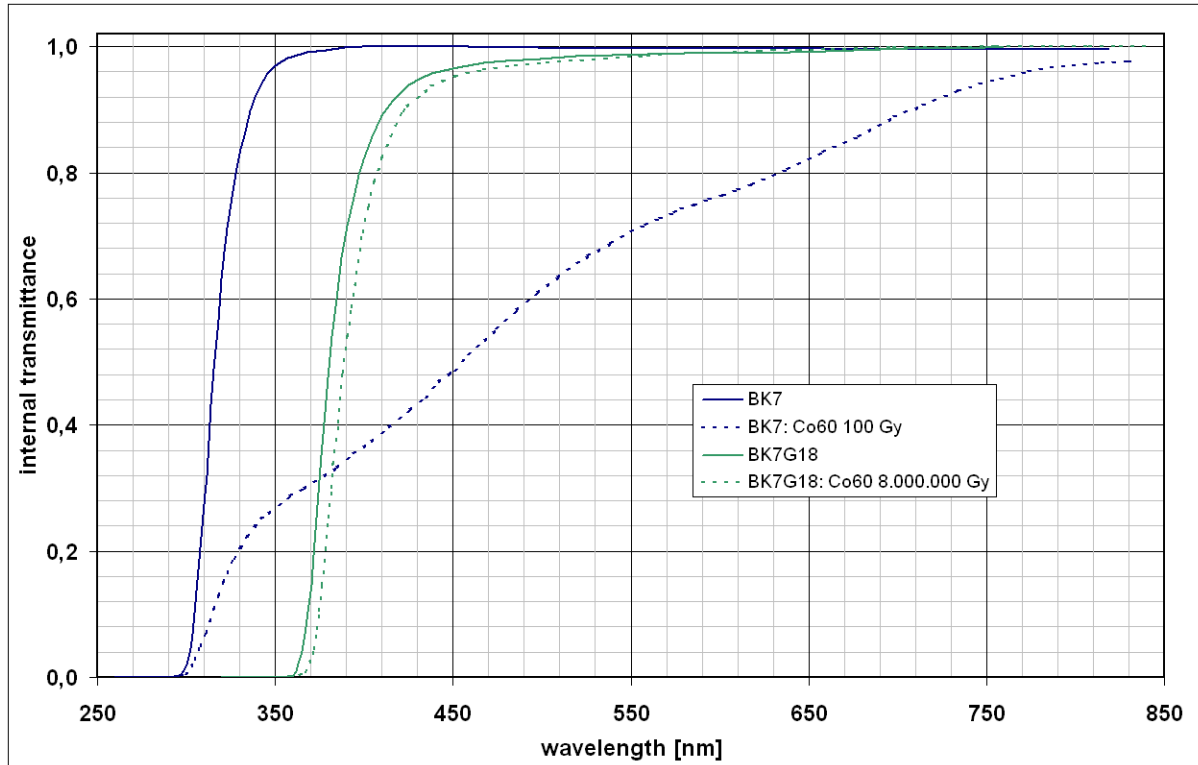
DATA SHEET
SCHOTT N-BK7 G18


Figure 3-3: Transmittance of non stabilized BK7 and stabilized BK7G18 before and after irradiation.

As mentioned before the extent of the coloration depends on the kind of radiation and the radiation dose, which can be clearly derived from Figure 3-4 where the transmittance loss of BK7G18 for different kind of radiation: proton particle radiation, electrons, gamma and neutron radiation is shown. Neutron radiation (fluence $< 0,15 \cdot 10^{21}$ n/m² in the example) has the highest impact on the transmittance of BK7G18. The effect of protons (7 to 50 MeV, dose $1,4 \cdot 10^{18}$ MeV/(m²*s) in the example) and electrons on the transmittance is comparable (fluence: $8,8 \cdot 10^{21}$ e⁻/m², energy 0,05 MeV, radiation duration 20,6 h in the example) and in the same region as the 10^5 and 10^6 gamma radiation.

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BK7G18
520636.252

$n_d = 1.51975$	$v_d = 63.58$	$n_F - n_C = 0.008174$
$n_e = 1.52170$	$v_e = 63.36$	$n_F - n_C = 0.008233$

Refractive Indices		
	λ [nm]	
$n_{2325.4}$	2325.4	1.49203
$n_{1970.1}$	1970.1	1.49777
$n_{1529.6}$	1529.6	1.50373
$n_{1060.0}$	1060.0	1.50953
n_i	1014.0	1.51015
n_s	852.1	1.51267
n_r	706.5	1.51579
n_c	656.3	1.51724
$n_{c'}$	643.8	1.51764
$n_{632.8}$	632.8	1.51802
n_D	589.3	1.51968
n_d	587.6	1.51975
n_e	546.1	1.52170
n_F	486.1	1.52541
$n_{F'}$	480.0	1.52587
n_g	435.8	1.52981
n_h	404.7	1.53345
n_i	365.0	1.53970
$n_{334.1}$	334.1	
$n_{312.6}$	312.6	
$n_{296.7}$	296.7	
$n_{280.4}$	280.4	
$n_{248.3}$	248.3	

Constants of Dispersion Formula	
B_1	1.26538542
B_2	0.014419107
B_3	1.003230280
C_1	0.00813104078
C_2	0.0543303226
C_3	102.8211660

Constants of Formula for dn/dT	
D_0	1.52E-06
D_1	1.37E-08
D_2	-1.26E-11
E_0	4.36E-07
E_1	4.17E-10
λ_{TK} [μm]	0.194

Temperature Coefficients of the Refractive Index						
[°C]	$\Delta n_{rel}/\Delta T$ [$10^{-6}/K$]			$\Delta n_{abs}/\Delta T$ [$10^{-6}/K$]		
	1060.0	e	g	1060.0	e	g
-40/-20	2.2	2.7	3.3	0.2	0.7	1.2
+20/+40	2.2	2.8	3.4	0.9	1.5	2.1
+60/+80	2.4	3.0	3.7	1.4	2.0	2.6

Internal Transmittance τ_i		
λ [nm]	τ_i [10mm]	τ_i [25mm]
2500	0.630	0.320
2325	0.780	0.540
1970	0.930	0.840
1530	0.992	0.979
1060	0.999	0.998
700	0.997	0.993
660	0.995	0.988
620	0.994	0.984
580	0.992	0.979
546	0.989	0.973
500	0.982	0.957
460	0.970	0.930
436	0.950	0.870
420	0.910	0.780
405	0.820	0.600
400	0.760	0.510
390	0.600	0.280
380	0.360	0.080
370	0.080	
365	0.020	
350		
334		
320		
310		
300		
290		
280		
270		
260		
250		

Color Code	
$\lambda_{80} / \lambda_{5}$	41/37

Remarks	
inquiry glass	
radiation resistant glass	

Relative Partial Dispersion	
$P_{s,t}$	0.3077
$P_{C,s}$	0.5591
$P_{d,C}$	0.3071
$P_{e,d}$	0.2385
$P_{g,F}$	0.5376
$P_{l,h}$	
$P'_{s,t}$	0.3055
$P'_{C,s}$	0.6040
$P'_{d,C'}$	0.2561
$P'_{e,d}$	0.2368
$P'_{g,F'}$	0.4777
$P'_{l,h}$	

Deviation of Relative Partial Dispersion ΔP from the normal line	
$\Delta P_{C,t}$	0.0203
$\Delta P_{C,s}$	0.0080
$\Delta P_{F,e}$	-0.0006
$\Delta P_{g,F}$	0.0007
$\Delta P_{l,g}$	

Other Properties	
$\alpha_{-30/+70^\circ\text{C}}$ [$10^{-6}/K$]	7.0
$\alpha_{+20/+300^\circ\text{C}}$ [$10^{-6}/K$]	8.2
T_g [°C]	585
T_{10}^{13} [°C]	570
$T_{10}^{7.6}$ [°C]	722
c_p [J/(g·K)]	0.820
λ [W/(m·K)]	1.190
ρ [g/cm ³]	2.52
E [10^3 N/mm ²]	82
μ	0.205
K [10^{-6} mm ² /N]	2.77
$HK_{0.1/20}$	580
CR	
FR	0
SR	1
AR	2
PR	

As of 01-Feb-2014 , subject to change