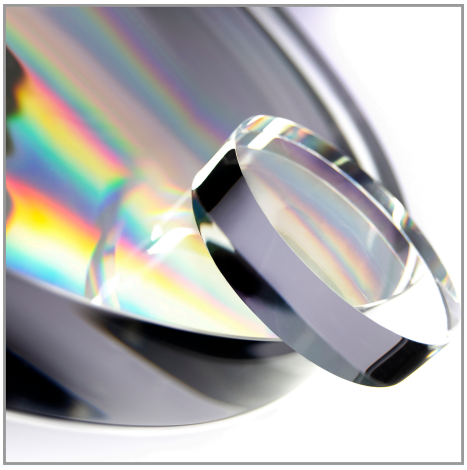
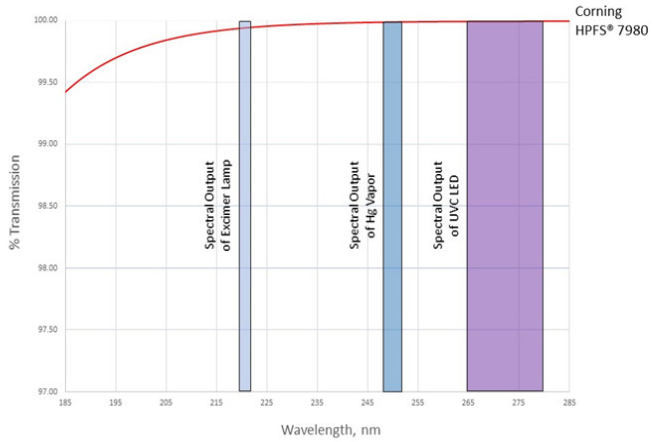
CORNING



HPFS® 7980 for Germicidal Irradiation Devices

High UVC transmission material for devices which sterilize surfaces, air or liquids, available in sizes up to 1,900mm diameter.

UVC (200 – 280nm) light has long been recognized as an effective method for deactivating pathogens on surfaces, in the air or in liquids. The COVID-19 pandemic has highlighted the urgency of implementing solutions to minimize the spread of harmful pathogens. Many new devices are now being commercialized which utilize UVC germicidal irradiation and many of these require components which transmit UVC wavelengths efficiently. Corning High Purity Fused Silica HPFS® 7980 is available in large sized format which is ideal for transmitting energy from sources such as mercury vapor lamps (λ~254), LEDs (λ~265-280), or Excimer Lamps (λ~222nm).



Mechanical Properties

unless otherwise stated, all values @ 25 °C	
Elastic (Young's) Modulus	73 GPa
Shear Modulus	31 GPa
Modulus of Rupture, abraded	52.4 MPa
Bulk Modulus	35.9 GPa
Poisson's Ratio	0.16
Density	2.20 g/cm³
Knoop Hardness (100g load)	522 kg/mm²
Tensile Strength	54 MPa
Compressive Strength	1.14 GPa

Thermal Properties

Glass Code:	7980	Viscosity
Softening Point*	1585 °C	$10^{7.6}$ poises
Annealing Point*	1042 °C	10^{13} poises
Strain Point*	893 °C	$10^{14.5}$ poises
Specific Heat		0.77 J/(g K)
Thermal Conductivity		1.38 W/(m K)
Thermal Diffusivity		0.0075 cm²/s
Thermal Expansion** (ppm/C):		
5 °C to 35 °C		0.52×10^{-6}
0 °C to 200 °C		0.57×10^{-6}
-100 °C to +200 °C		0.48×10^{-6}

ASTM Procedures: *C-598, ** E-228

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Refractive Index and Dispersion: HPFS® 7980

Conditions: 22 °C, 760 mm Hg, N_2

Wavelength [vacuum] [nm]	Refractive Index[2] n	Thermal Coefficient Δn/ΔT3 [ppm/C]	Polynomial Dispersion Equation Constants[1], 22 °C	
1128.950	1.448866	9.6	A_0	2.104025406E+00
1014.260 n_t	1.450241	9.6	A_1	-1.456000330E-04
852.344 n_s	1.452463	9.7	A_2	-9.049135390E-03
706.714 n_r	1.455144	9.9	A_3	8.801830992E-03
656.454 n_C	1.456364	9.9	A_4	8.435237228E-05
632.990	1.457016	10.0	A_5	1.681656789E-06
587.725 n_d	1.458461	10.1	A_6	-1.675425449E-08
546.227 n_e	1.460076	10.2	A_7	8.326602461E-10
486.269 n_F	1.463123	10.4	Sellmeier Dispersion Equation Constants[2], 22 °C	
435.957 n_G	1.466691	10.6		
404.770 n_h	1.469615	10.8	A_1	0.68374049400
365.119 n_i	1.474539	11.2	A_2	0.42032361300
334.244	1.479764	11.6	A_3	0.58502748000
312.657	1.484493	12.0		
253.728	1.505522	13.9	B_1	0.00460352869
228.872	1.521154	15.5	B_2	0.01339688560
214.506	1.533722	17.0	B_3	64.49327320000
206.266	1.542665	18.1	Δn/ΔT Dispersion Equation Constants[3], 20-25 °C	
194.227	1.558918	20.3		
184.950	1.575017	22.7	C_0	9.390590
			C_1	0.235290
			C_2	-1.318560E-03
			C_3	3.028870E-04
			Other Optical Properties	
			nF'-nC'	0.006797
			Stress Coefficient	35.0 nm/cm MPa
			Abbe Constants:	
			V_e	67.6
			V_d	67.8

*1 Polynomial Equation: n2 = A0 + A1 λ4 + A2 λ2 + A3 λ-2 + A4 λ-4 + A5 λ-6 + A6 λ-8 + A7 λ-10 with λ in µm
*2 Sellmeier Equation: n2-1 = A1λ2/(λ2 - B1) + A2 λ2/(λ2 – B2) + A3 λ2/(λ2 – B3) with λ in µm
*3 Δn/ΔT Equation: Δn/ΔT [ppm/C] = C0 + C1λ-2 + C2λ-4 + C3λ-6 with λ in µm
The above dispersion equations were fit to the refractive indices of 20 wavelengths from 1129 nm to 185 nm.

For more information:
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