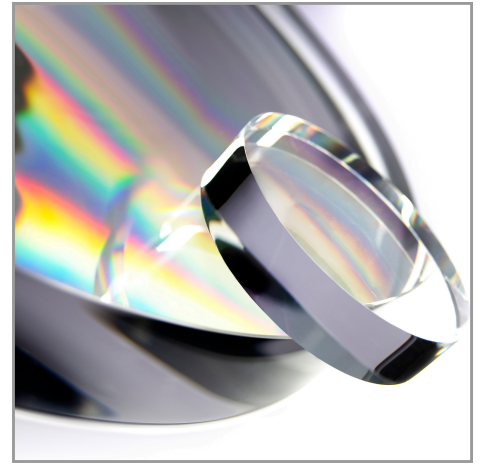


CORNING



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 ($\lambda \sim 254$), LEDs ($\lambda \sim 265-280$), or Excimer Lamps ($\lambda \sim 222$ nm).

Mechanical Properties

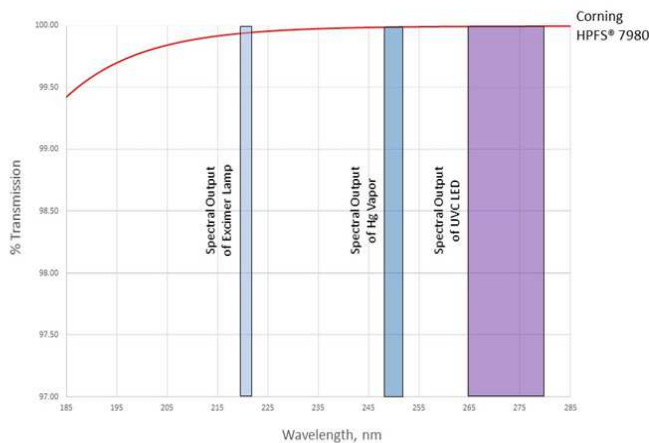
unless otherwise stated, all values @ 25 °C

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/cm ³
Knoop Hardness (100g load)	522 kg/mm ²
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 cm ² /s	
Thermal Expansion** (ppm/C):		
5 °C to 35 °C	0.52 x 10 ⁻⁶	
0 °C to 200 °C	0.57 x 10 ⁻⁶	
-100 °C to +200 °C	0.48 x 10 ⁻⁶	

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



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Refractive Index and Dispersion: HPFS® 7980

Conditions: 22 °C, 760 mm Hg, N₂

Wavelength [vacuum] [nm]	Refractive Index ² n	Thermal Coefficient $\Delta n/\Delta T$ [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	$\Delta n/\Delta T$ Dispersion Equation Constants ³ , 20-25 °C			
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	Other Optical Properties			
194.227	1.558918	20.3			C ₀	9.390590
184.950	1.575017	22.7			C ₁	0.235290
					C ₂	-1.318560E-03
					C ₃	3.028870E-04
					nF'·nC'	0.006797
					Stress Coefficient	35.0 nm/cm MPa
			Abbe Constants:			
			V _e	67.6		
			V _d	67.8		

*1 Polynomial Equation: $n_2 = A_0 + A_1 \lambda^4 + A_2 \lambda^2 + A_3 \lambda^{-2} + A_4 \lambda^{-4} + A_5 \lambda^{-6} + A_6 \lambda^{-8} + A_7 \lambda^{-10}$ with λ in μm

*2 Sellmeier Equation: $n_2 - 1 = A_1 \lambda^2 / (\lambda^2 - B_1) + A_2 \lambda^2 / (\lambda^2 - B_2) + A_3 \lambda^2 / (\lambda^2 - B_3)$ with λ in μm

*3 $\Delta n/\Delta T$ Equation: $\Delta n/\Delta T$ [ppm/C] = $C_0 + C_1 \lambda^{-2} + C_2 \lambda^{-4} + C_3 \lambda^{-6}$ 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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