# **Optical Materials**



## **Optical material / crystals (Ultraviolet)**

**Material / Specification:** Fused quartz, JGS2 for 260-2100nm transmission **Range / Description:** OPMU-JGS2

Different Properties						
Parameter   Value	JGS1	JGS2	JGS3			
Maximum Size	<Φ200mm	<Φ300mm	<Φ200mm			
Transmission Range (Medium transmission ratio)	0.17~2.10um (Tavg>90%)	0.26~2.10um (Tavg>85%)	0.185~3.50um (Tavg>85%)			
OH- Content	1200 ppm	150 ppm	5 ppm			
Fluorescence (ex 254nm)	Virtually Free	Strong v-b	Strong V-B			
Impurity Content	5 ppm	20-40 ppm	40-50 ppm			
Birefringence Constant	2-4 nm/cm	4-6 nm/cm	4-10 nm/cm			
Melting Method	Synthetic CVD	Oxy-hydrogen melting	Electrical melting			
Applications	Laser substrate: Window, lens, prism, mirror	Semiconductor and high temperature window	IR & UV substrate			

Same properties					
Density		2.20g/cm <sup>3</sup>			
Abbe Constant		67.6			
Refractive Index (nd) at 588nm		1.4586			
Wavelength (um)	Refractive Index (n)	Wavelength (um)	Refractive Index (n)		
0.200	1.55051	1.000	1.45042		
0.220	1.52845	1.064	1.44962		
0.250	1.50745	1.100	1.44920		
0.300	1.48779	1.200	1.44805		
0.320	1.48274	1.300	1.44692		
0.360	1.47529	1.500	1.44462		
0.400	1.47012	1.600	1.44342		
0.450	1.46557	1.700	1.44217		
0.488	1.46302	1.800	1.44087		
0.500	1.46233	1.900	1.43951		
0.550	1.46008	2.000	1.43809		
0.588	1.45860	2.200	1.43501		
0.600	1.45804	2.400	1.43163		
0.633	1.45702	2.600	1.42789		
0.650	1.45653	2.800	1.42377		
0.700	1.45529	3.000	1.41925		
0.750	1.45424	3.200	1.41427		
0.800	1.45332	3.370	1.40990		

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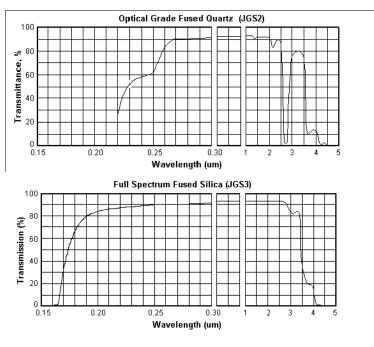
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## **Optical material / crystals (Ultraviolet)**

Material / Specification: Fused guartz, JGS2 for 260-2100nm transmission Range / Description: OPMU-JGS2

0.850	1.45250		3.507	1.40566	
0.900	1.45175		3.707	1.39936	
Hardness		5.5 - 6.5 Mohs' Scale 570 KHN 100			
Design Tensile Strength		4.8x10 <sup>7</sup> Pa (N/mm2) (7000 psi)			
Design Compressive S	Design Compressive Strength		Greater than 1.1x10 <sup>9</sup> Pa (160,000 psi)		
Bulk Modulus		3.7x10 <sup>10</sup> Pa (5.3x10 <sup>6</sup> psi)			
Rigidity Modulus		3.1x10 <sup>10</sup> Pa (4.5x10 <sup>6</sup> psi)			
Young's Modulus	Young's Modulus		7.2x10 <sup>-10</sup> Pa (10.5x10 <sup>6</sup> psi)		
Poisson's Ratio	Poisson's Ratio		0.17		
Coefficient of Thermal	Coefficient of Thermal Expansion		5.5x10 <sup>-7</sup> cm/cm.°C (20°C-320°C)		
Thermal Conductivity		1.4 W/m.°C			
Specific Heat		670 J/kg.°C			
Softening Point		1683°C			
Annealing Point		1215°C			
Strain Point		1120°C			
Electrical Receptivity		7x10 <sup>7</sup> ohm.cm (350°C)		cm (350°C)	
Dielectric Properties (20°C and 1 MHz) Constant Strength Loss Factor Dissipation Factor		3.75 $5x10^7$ V/m Less than $4x10^{-4}$ Less than $1x10^{-4}$			
Velocity of Sound-She	ar Wave	3.75x10 <sup>3</sup> m/s			
Velocity of Sound/Cor	npression Wave	5.90x10 <sup>3</sup> m/s			
Sonic Attenuation			Less than 11	. db/m MHz	
Permeability Constant sec cm of Hg) Helium Hydrogen Deuterium Neon	s (cm³mm/cm²		(700 210x: 21x1 17x1 9.5x1	10 <sup>-10</sup> 0 <sup>-10</sup> 0 <sup>-10</sup>	
Chemical Stability (ex	cept hydrofluoric)		High resistance to	water and acids	



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