PROPERTY MATRIX / GRADES

Quartz glass - Main properties

Comparison of JGS-1, JGS-2 and JGS-3

DIFFERENCE PROPERTIES

Parameter / Value	JGS-1	JGS-2	JGS-3
Maximum Size	<Φ200mm	<Φ300mm	<Φ200mm
Transmission Range (Medium transmission ratio)	0.17~2.10um (Tavg>90%)	0.26~2.10um (Tavg>85%)	0.25~3.50um (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 substrate

SAME PROPERTIES / OPTICAL

Property	Value
Density	2.20g/cm³
Abbe Constant	67.6
Refractive Index (nd) at 588nm	1.4586

REFRACTIVE INDEX / WAVELENGTH (UM)

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	1.4462
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
0.850	1.45250	3.507	1.40566
0.900	1.45175	3.707	1.39936

PROPERTY MATRIX / SHARED DATA

Same properties

Physical, thermal, electrical and chemical data

MECHANICAL, THERMAL AND ELECTRICAL PROPERTIES

Property	Value
Hardness	5.5 - 6.5 Mohs' Scale 570 KHN 100
Design Tensile Strength	$4.8x10^{7}$ Pa (N/mm²) (7000 psi)
Design Compressive Strength	Greater than $1.1x10^{9}$ Pa (160,000 psi)
Bulk Modulus	$3.7x10^{10}$ Pa ($5.3x10^{6}$ psi)
Rigidity Modulus	$3.1x10^{10}$ Pa ($4.5x10^{6}$ psi)
Young's Modulus	$7.2x10^{-10}$ Pa ($10.5x10^{6}$ psi)
Poisson's Ratio	0.17
Coefficient of Thermal Expansion	$5.5x10^{-7}$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	7x107 ohm.cm (350°C)
Dielectric Properties (20°C and 1 MHz) / Constant	3.75
Dielectric Properties (20°C and 1 MHz) / Strength	$5x10^{7}$ V/m
Dielectric Properties (20°C and 1 MHz) / Loss Factor	Less than $4x10^{-4}$
Dielectric Properties (20°C and 1 MHz) / Dissipation Factor	Less than $1x10^{-4}$
Velocity of Sound-Shear Wave	$3.75x10^{3}$ m/s
Velocity of Sound/Compression Wave	$5.90x10^{3}$ m/s
Sonic Attenuation	Less than 11 db/m MHz
Permeability Constants (cm³mm/cm² sec cm of Hg) / Temperature	(700°C)
Helium	$210x10^{-10}$
Hydrogen	$21x10^{-10}$
Deuterium	$17x10^{-10}$
Neon	9.5×10^{-17}
Chemical Stability (except hydrofluoric)	High resistance to water and acids

OPTICAL DATA / TRANSMISSION

Transmission curves

Source plots retained from the supplied HITEGLA information sheet





