OHARA®

High Quality Silica Glass

OHARA QUARTZ

VAD-process Synthetic Fused Silica SK-1300

Our Company successfully developed synthetic fused silica SK-1300 as a result of significant improvements made to the conventional VAD (vapor-phase axial deposition) method of optical fiber manufacturing technology.

SK-1300 is extremely high in purity and much lower in OH content than the traditional direct method, thus making it the first synthetic fused silica usable in the semiconductor and liquid crystal display industries.

SK-1300 is the state-of-the-art technology in optical characteristics because it provides a high ultraviolet transmission, no micro inclusion and a solarization resistance, in addition to heat resistance, mechanical strength, and chemical resistance.

These products can be used in a wide variety of industrial applications for semiconductors, optical and all physical or chemical related research featuring these applications:

1. Wafers for various types of devices such TFT (poly-Si thin-film transistor LCD), SOI (Silicon on Insulator), etc.
2. Photomask substrates for ultra-LSI and LCD.
3. Reactor furnace tubes, jigs and tools for ULSI manufacturing processes.
4. Electrical-discharge lamp tubes.
5. Optical elements, lenses, mirrors and windows, for ultraviolet and vacuum ultraviolet.

Typical Characteristics

Typical Impurity Analysis

	Element	Analytical value	Element	Analytical value
ppb	Al	<0.2	Co	<0.01
	Fe	<0.5	Ni	<1.0
	Ti	<0.1	P	<1.0
	Ca	<0.5	B	<0.01
	Mg	<0.1	Na	<0.5
	Mn	<0.1	K	<0.2
	Cr	<0.2	Li	<0.1
	Cu	<0.2	Zr	<0.1
	OH	<200 (ppm)		

Chemical Resistance

Solution	Treatment temperatures (°C)	& hours (H)	Weight loss (mg/cm^2)
H_2O	95	45	0.0001~0.0002
1/100 N HNO_3	115	24	0.005~0.01
5% NaOH	100	10	1.35

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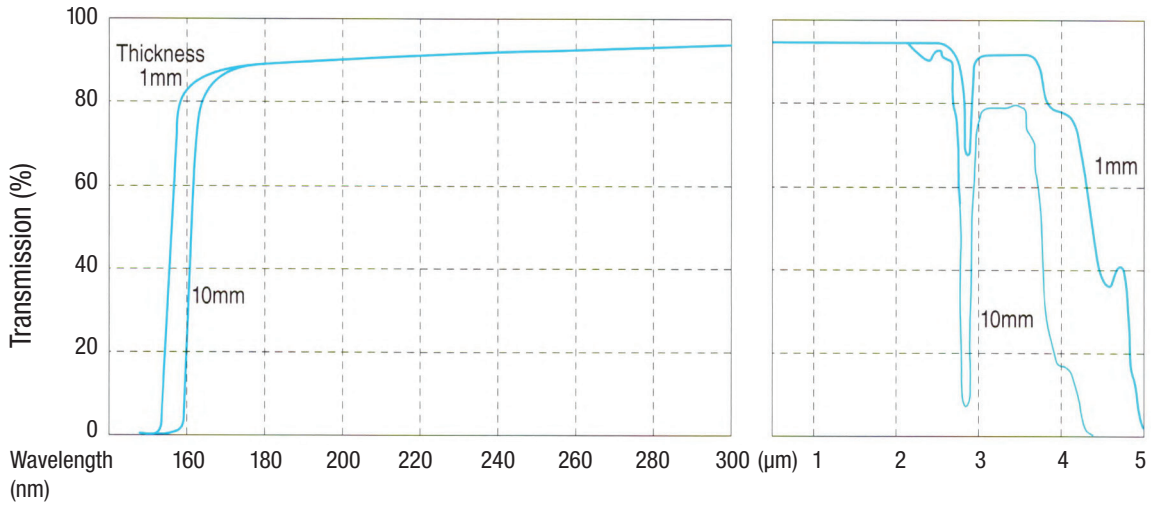
Transmission



Refractive Index

Wavelength (nm, in air)	25°C in air	20°C in air
365.015(i)	1.474710	1.474655
404.656(h)	1.469786	1.469731
435.835(g)	1.466860	1.466807
486.133(F)	1.463293	1.463240
546.075(e)	1.460245	1.460194
587.562(d)	1.458631	1.458580
656.273(C)	1.456535	1.456484

Measuring accuracy ± $1X10^{-6}$

Wavelength (nm, in air)	25°C in air dn/dt
365.015(i)	11.3
404.656(h)	11.0
435.835(g)	10.7
486.133(F)	10.5
546.075(e)	10.2
587.562(d)	10.3
656.273(C)	10.1

Measuring accuracy ± $1X10^{-6}$

Optical Qualities

Item	Grade
Bubbles	0~0.03mm^2/100cm^3
Striae	Grade A in one direction (As per Mil-G-174)
Birefrengence (Strain)	10nm/cm and under
Fluorescence	Not permitted (Excited wavelength 254nm)

Physical Properties

Item	Unit	Value	Item	Unit	Value
Density	g/cm^3	2.201	Coefficient of thermal expansion	cm/cm°C	$5.5X10^{-7}$
Young's module	kg/mm^2	7280			
Poisson's ratio		0.17	Softening point	°C	1700
Compression strength	kg/mm^2	115	Annealing point	°C	1160
Bending strength	kg/mm^2	7.0	Strain point	°C	1060
Tensile strength	kg/mm^2	5.6			
Torsional rigidity	kg/mm^2	3150	Specific heat (26°C)	cal/g • °C	0.176
Vickers hardness	kg/mm^2	900~1030	Thermal conductivity ratio (26°C)	cal/cm • sec • °C	$2.65X10^{-3}$
Knoop hardness	kg/mm^2	650~710	Thermal conductivity ratio (100°C)	cal/cm • sec • °C	$3.27X10^{-3}$

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