



Substrate Specifications

PARAMETER	SUBSTRATE MATERIAL			
	GREEN SODA LIME (SL)	WHITE CROWN (270)	BOROFLOAT	QUARTZ (QZ)
COMPOSITION (%)				
SiO ₂	73	70	60	100
B ₂ O ₃	-	-	5	-
Al ₂ O ₃	1	-	15	-
Na ₂ O	15	8	1	-
K ₂ O	1	9	1	-
RO	10	14	18	-
THERMAL PROPERTIES				
COEFFICIENT OF EXPANSION OVER 50-200°C	94 X 10 ⁻⁷ /°C	93 X 10 ⁻⁷ /°C	37 X 10 ⁻⁷ /°C	4-5 X 10 ⁻⁷ /°C
SOFTENING POINT (°C)	740	710	900	1600
TRANSFORMATION TEMP. (°C)	562	520	673	-
STRAIN POINT (°C)	511	505	636	1000
OPTICAL PROPERTIES				
LIGHT TRANSMITTANCE (%) d=2.3mm, l =400nm	90	91	91	90 (l =400nm)
REFRACTIVE INDEX (n _d)	1.52	1.52	1.53	1.46
CHEMICAL PROPERTIES (WEIGHT LOSS mg/cm²)				
WATER (25°C/4h)	1.2 X 10 ⁻³	1.2 X 10 ⁻³	8.0 X 10 ⁻⁴	8.0 X 10 ⁻⁵
NaOH 5% (100°C/6h)	1.1	1.1	1.4	0.9
HCl 5% (80°C/1h)	1.0 X 10 ⁻²	1.0 X 10 ⁻²	5.0 X 10 ⁻³	4.0 X 10 ⁻⁴
MECHANICAL PROPERTIES				
SPECIFIC GRAVITY	2.49	2.55	2.58	2.20
YOUNG MODULUS (kg/mm ²)	7000	7340	7540	7413
SHEER MODULUS (kg/mm ²)	2870	2980	3260	33170
KNOOP HARDNESS (kg/mm ²)	540	530	657	615
ELECTRICAL PROPERTIES				
BULK RESISTIVITY AT 200°C	7.7	9.6	10.6	12.5
DIELECTRIC CONSTANT AT 1MHz, R.T.	7.5	7.1	6.1	4.0

