

# FOTURAN® II

## Photo-Sensitive Glass Wafer

FOTURAN® II is an improved photo-sensitive glass based on the well-known FOTURAN®. It is produced in a continuous melting process with optimal homogeneity.

FOTURAN® II is a technical, photo-sensitive glass that crystallizes after UV exposure and temperature processes. The crystallized areas can be etched with a high aspect ratio, resulting in extremely fine structures and vias. After a second exposure and tempering process, the glass can be transformed into a glass ceramic. Anodic bonding is possible, too.

Structured FOTURAN® II substrates can be applied in the semiconductor chip and semiconductor packaging processes. The process flow works without photo resist and can be used with standard semiconductor equipment.

### Applications

- Interposer
- RF/MEMS, Sensor, Advanced Packaging
- Micro-Fluidics
- Micro-Optics
- Optical Waveguides/Interconnects

### Standard supply forms

Supply form	Sizes*
Round (wafer)	6"
	8"
	12" (in preparation)
Square (substrate)	93 x 93 mm
	130 x 130 mm
	150 x 150 mm
	175 x 175 mm

\* Standard thicknesses for each format: 0.5/0.7/1.0/1.3 mm.  
Other formats and thicknesses available upon request.

Mechanical Properties	
Density $\rho$ in g/cm <sup>3</sup>	2.37
Knoop hardness HK 0.1/20	480
Vickers hardness HV 0.2/25	520

### Thermal Properties

Transformation temperature T <sub>g</sub> in °C	455
Coefficient of mean linear thermal expansion $\alpha$ (20°C; 300°C) in 10 <sup>-6</sup> K <sup>-1</sup> (Static measurement)	8.49
Thermal conductivity $\lambda$ in W/(m*K)( $\vartheta = 90^\circ\text{C}$ )	1.28

### Electrical Properties (Glass State)

Frequency	1 MHz	1 GHz	2 GHz	5 GHz
Dielectric constant (Permittivity) $\epsilon_r$	6.8	6.4	6.4	6.3
Dissipation factor $\tan \delta$ (*10 <sup>-4</sup> )	69	84	90	109

### Chemical Properties

	Class		
Hydrolytic resistance acc. to DIN ISO 719	( $\mu\text{g}$ ) Na <sub>2</sub> O/g	578	HGB 4
Acid resistance acc. to DIN 12116	mg/dm <sup>2</sup>	0.48	S 1
Alkali resistance acc. to DIN ISO 695	mg/dm <sup>2</sup>	100	A 2

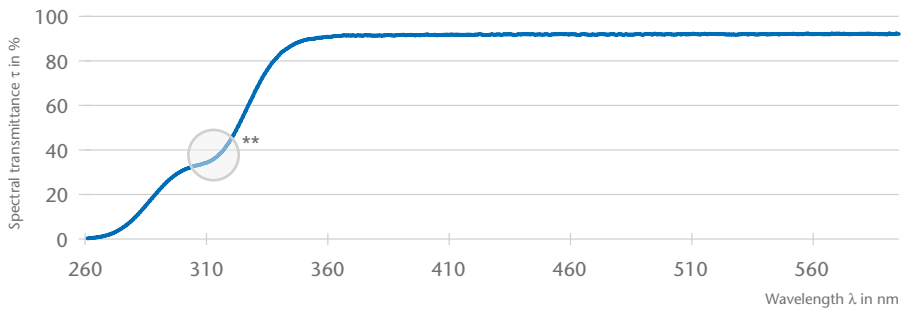
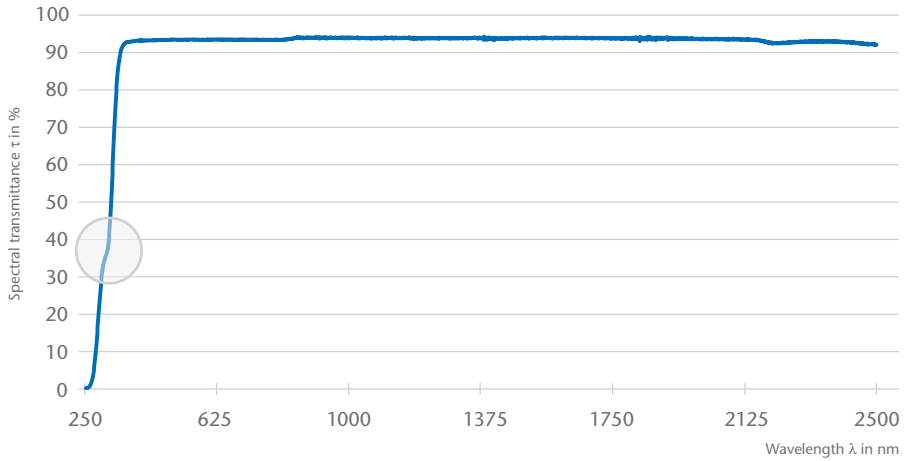
### Optical Properties

Wavelength in nm	Refractive index (annealed at 40°C/h)	
300.0	1.549	
486.1	1.518	$n_f$
546.1	1.515	$n_e$
587.6	1.512	$n_d$
656.3	1.510	$n_c$

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Spectral Transmittance (Glass Thickness = 1.00 mm)



\*\* Relevant range for exposure of FOTURAN® II

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