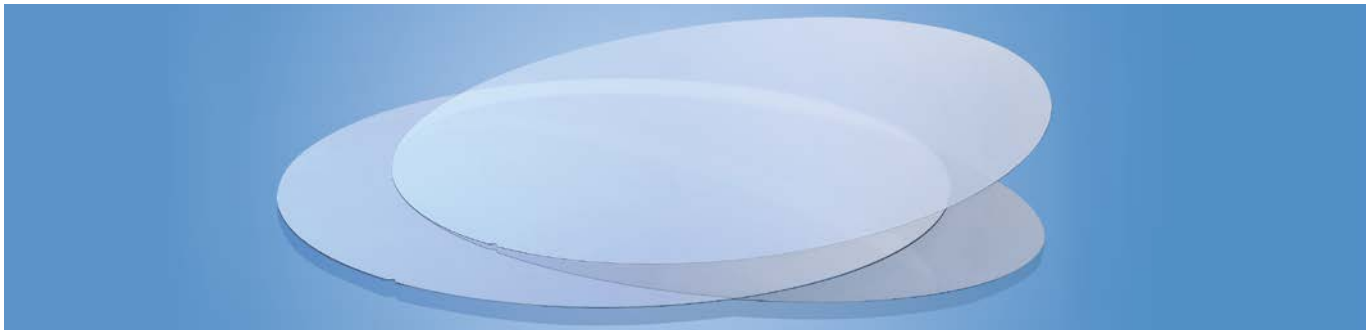
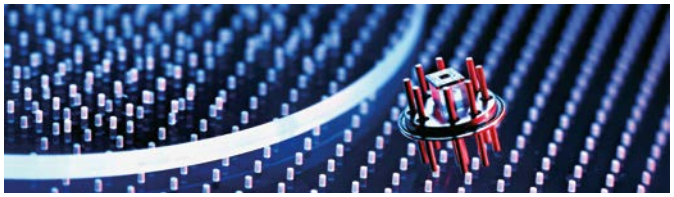
SCHOTT MEMpax® – (Ultra-)Thin borosilicate glass with low CTE



Product Information

The borosilicate glass MEMpax® is manufactured with SCHOTT's unique Down-Draw production process. Therefore, it offers pristine surfaces and thicknesses. The coefficient of linear thermal expansion (CTE) of MEMpax® corresponds with that of silicon, therefore this glass is perfectly suited for use in anodic bonding processes. Its low autofluorescence, combined with its pristine surface quality, flatness and homogeneity, opens up numerous application possibilities for MEMpax® in electronics and biotechnology. The low absorption and dielectric properties measured up to 77 GHz makes MEMpax® suitable for ultra-high frequency applications. Thanks to its low alkaline content, MEMpax® acts as a high-quality insulator. For this reason, it is an extremely appropriate material for applications that require nonconductive characteristics at high temperatures (up to 450 °C).

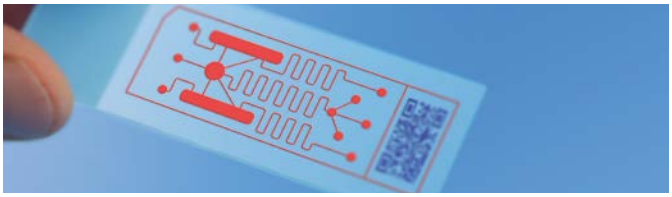
MEMpax® in Semiconductors



Applications

- Pressure Sensors* / MEMS
- GHz substrates
- Carrier Wafer

MEMpax® in Biotechnology



Applications

- Lab On A Chip
- Microfluidics
- Biochip substrates

MEMpax® Benefits

- Various available thicknesses for high design flexibility
- Pristine surfaces on both sides without "tin side" eliminates need for polishing
- Low autofluorescence for best results in optical diagnostics
- Excellent surface quality supporting SEMI architecture handling requirements
- High mechanical strength for MEMS packaging
- Well suited for anodic and other bonding methods in wafer level packaging and processing
- Silicon-matched coefficient of thermal expansion supports glass-to-silicon packaging and bonding
- High (UV-) transmission enables faster adhesive debonding
- High thermal and chemical resistance allows wide range of applications

* more information about MEMpax® for pressure sensors – see separate product flyer

SCHOTT
glass made of ideas

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Technical Data of SCHOTT MEMpax®	
Dimensions	2" to 12", round or rectangular
Surface roughness R_a	< 0.5 nm
Thicknesses*	0.07 mm to 0.55 mm
Standard thicknesses*	0.2 mm, 0.3 mm, 0.4 mm, 0.5 mm
Luminous transmittance τ_{VD65} (thickness = 0.5 mm)	92.9 %
Coefficient of mean linear thermal expansion α (20 °C; 300 °C) (statistic measurement)	3.3 x 10^{-6}/K
Transformation temperature T_g	532 °C
Dielectric constant ε_r at 1 MHz	4.6
Refractive index n_D (as drawn)	1.4714
TTV	< 10 µm**
Warp	< 250 µm**
Density ρ (annealed at 40 °C)	2.22 g/cm³

* other thicknesses available upon request
** other specifications on request

Dielectric properties of SCHOTT MEMpax®		
Dielectric constant ε_r	at 1 GHz [a]	4.4
	at 2 GHz [a]	4.5
	at 5 GHz [a]	4.4
	at 24 GHz [b]	4.4 [c]
	at 77 GHz [b]	4.4 [c]
Dissipation factor *tan(δ)*	at 1 GHz [a]	$57 \cdot 10^{-4}$
	at 2 GHz [a]	$64 \cdot 10^{-4}$
	at 5 GHz [a]	$73 \cdot 10^{-4}$
	at 24 GHz [b]	$100 \cdot 10^{-4}$ [c]
	at 77 GHz [b]	$150 \cdot 10^{-4}$ [c]
Specific electrical volume resistivity ρ_D at 50 Hz	ρ_D at ϑ = 250 °C in Ω · cm	$1.18 \cdot 10^{8}$
	ρ_D at ϑ = 250 °C in Ω · cm	$4.24 \cdot 10^{6}$

[a] measured using split post dielectric resonators (SPDR)
[b] obtained using a hemispherical open resonator technique
[c] Preliminary Data. All data subject to chance.

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