SCHOTT MEMpax® for Pressure Sensors

Background Information

Some of the main criteria to build a high quality and durable pressure sensor are depending on the used materials. One of these criteria refers to the physical properties of the glass. Most commonly, glass and silicon are jointly used, as they can be strongly bonded via anodic bonding.

In order to minimize stresses created through thermal differences at the bonding interfaces, it is necessary that both materials have the same coefficient of thermal expansion. Additionally, the surface roughness has to be extremely low, since adhesion strongly depends on surface quality. Devices, Modules and Sensors tend to become thinner and lighter, therefore the glass needs to be as thin as possible to fit seamlessly into today's sensor requirements.

Since MEMpax fulfills all these requirements, it is the perfect material to accomplish e.g. the mechanical decoupling of casing and silicon wafer.

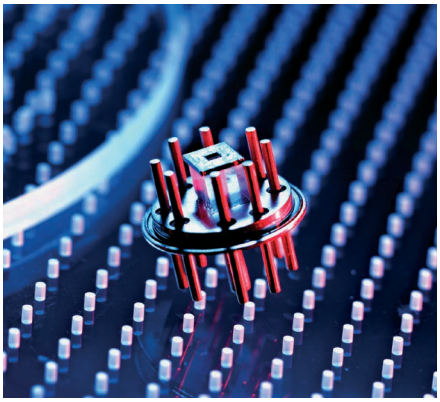
Our solution: MEMpax®

The borosilicate glass MEMpax® is manufactured with SCHOTT's unique Down-Draw production process. Therefore, it offers pristine surfaces and thicknesses.

With its coefficient of linear thermal expansion corresponding to that of silicon, MEMpax® is perfectly suited for use in anodic bonding processes.

MEMpax® has similar characteristics like the well-known SCHOTT BOROFLOAT® 33. However, due to its thickness portfolio and geometrical properties, no grinding or polishing is needed. This leads to thin wafers with pristine surfaces without surface or subsurface damages.

The high mechanical resistance and the great structuring capabilities are two additional properties, which show the superior characteristics of the glass.



Benefits of MEMpax® in pressure sensing

- Coefficient of linear thermal expansion corresponds with that of silicon
- Suited for anodic bonding
- Ultra-thin wafers without polishing
- High thermal and chemical resistance
- No surface or subsurface damages
- High mechanical resistance
- Great structuring capabilities

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
Refractive index n_D (as drawn)	1.4714
Density ρ (annealed at 40° C)	2.22 g/cm³

*other thicknesses available upon request

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