

STRUCTURAL COMPONENTS.
HIGH-PRECISION. LIGHT-WEIGHT
STRUCTURE



STRUCTURAL COMPONENTS.

Structural component parts fulfill optical and mechanical functions in high precision systems. Added high reflective coatings on ultra flat polished surface enables the interferometer to adjust the entire system accurately.

Five reasons to choose structural components made by Berliner Glas:

1. High precision flatness
2. Light-weight structures with a weight reduction of up to 90 %
3. Competence to machine various low expansion materials (ceramics and glass ceramics)
4. Integration of structural components and sub-systems
5. Mirror coatings (UV-NIR)

APPLICATIONS

High precision stages for semiconductor industry and interferometric measurement systems

Light-weight mirror and prism systems for industry and space technology

MATERIALS

Material choice – low expansion materials:

Properties	CTE (x 10 ⁻⁶ /K)	Young's modulus (GPa)
Zero expansion glass ceramic material (Zerodur®)	0.02	90
Cordierite	0.02	140
SiSiC (Si infiltrated SiC)	2.44	360
Fused silica	0.57	72
Borosilicate glass	3.25	64

DIMENSIONS

- ▶ Maximal dimension 2,000 x 1,700 x 1,100 mm
- ▶ Water cooling channels with a length of 1,600 mm and an aspect ratio of up to 50 "
- ▶ Rib thickness down to 2 mm

FLATNESS

- ▶ Global flatness of $\leq 2 \mu\text{m PV}$ on a surface of 800 x 800 mm
- ▶ Local flatness of $\leq 2 \mu\text{rad}$ within a die of 26 x 32 mm²

FINE CORRECTING PROCEDURES

- ▶ Mechanical fine correction
- ▶ Ion beam figuring
- ▶ Portal-/robot polishing
- ▶ Magnetorheological finishing (MRF)

COATING & SURFACES

- ▶ Polished roughness $R_q \leq 0.5 \text{ nm}$
- ▶ Mirror faces with a reflectivity of 98 % @ 633 nm
- ▶ Metal layers with customer-specific electrical conductivity

TEST & QUALIFICATION

- ▶ Interferometric flatness qualification up to 24" in diameter
- ▶ Functional interferometric flatness qualification by using a 12" vertical interferometer
- ▶ Sticking up to 2,000 mm edge length
- ▶ Residual gas analysis (RGA)