

Precision Optics for Space Application

Customized solutions in optical systems for satellite telescopes

Complete technology platform for lightweighted satellite optics

Carl Zeiss Jena GmbH is the component fabrication unit for the whole Carl Zeiss Group. We support Zeiss Optronics GmbH, a supplier of satellite telescopes and camera systems for earth observation.

ZERODUR® from Schott, a glass ceramic with a very low coefficient of thermal expansion is the most well known material for these parts and has a large heritage in space application.

ROSAT, Hipparcos, Meteosat Second Generation... just to name a few examples of successful space missions with glass ceramic mirrors from Carl Zeiss.

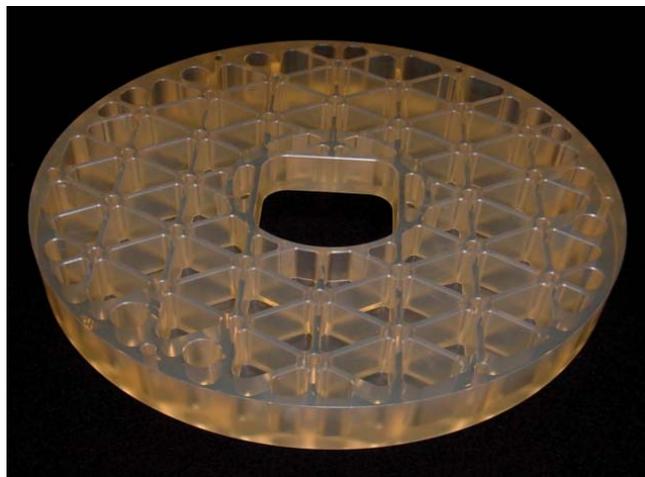
The lightweighting of ZERODUR® mirrors is possible up to 85 %.

Other ceramic materials like SiC or CeSiC® with low weight, exceptional hardness and stiffness enable mirror designs not feasible a few years ago.

Computer controlled polishing (CCP) and ion beam figuring (IBF) allow the fabrication of on- and off-axis aspheres and also free forms.

The machining data for computer controlled polishing and ion beam figuring are generated by using Zeiss in-house equipment for tactile and interferometric metrology. The quality of the manufactured optical surfaces can be less than 5nm rms surface error.

Our space proven HR coating CZ 322 fulfills all requirements in terms of high reflectance, climate resistance and radiation resistance.



Lightweighted Primary Mirror for Earth Observation Telescope
(On-axis asphere, WFE 23 nm rms, ZERODUR®, Ø 415 mm)

Headlines

Lightweighted optical mirrors (Ø 30 mm - Ø 1500 mm)

Lightweighting up to 85 %

ZERODUR® or other ceramic materials

Surface error \leq 5 nm rms

Reflectance of the HR coating $>$ 98%

Coating Technology

5-axis grinding machines for lightweighting and aspherical shaping

Zeiss in-house equipment for tactile and interferometric measurement

Computer controlled polishing (CCP) and ion beam figuring (IBF)

HR-Coating high vacuum evaporation devices

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We make it visible.