



BONDING TECHNOLOGIES FOR OPTICAL SUBSYSTEMS IN SATELLITE COMMUNICATIONS

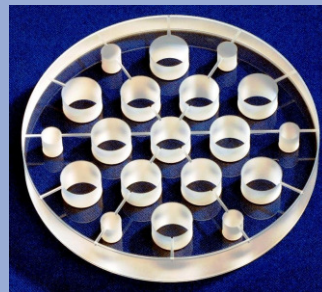
Funding program:

Optical materials and technologies for satellite communication

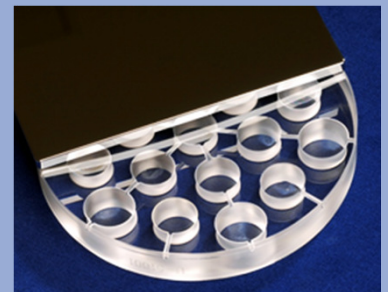
Project no.: 50 YB 0814

Project management: DLR

Duration: 01.09.2008 - 28.02.2012



Demonstrator #1,
plan/plan (ULE, Ø 150 mm,
height ≈ 23 mm)



Demonstrator #2,
plan/spherical (ULE, Ø 150 mm,
height ≈ 23 mm)

MOTIVATION

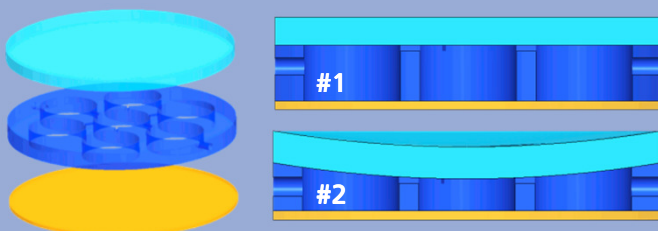
Using suitable bonding techniques, optical materials with particularly low thermal expansion (ULE: *ultra low expansion glass*) are made available for the described application. For the construction of lightweight „sandwich“ structures of glass and glass ceramics, two different types of material adjusted bonding technologies are applied.

RESULTS

With regard to mechanical stability and thermal behavior, both demonstrators (#1 and #2) exhibit outstanding properties. They are especially suited for the application under extreme conditions in space.

APPLICATIONS

- **Optical systems** that conform to the special requirements of construction and joining techniques for use in geostationary orbits and intersatellite laser links
- **Mirror assemblies** with curved and planar surfaces, e.g. for telescopes
- **Long-term stable support structures** for active and passive optical elements, e.g. laser resonators



Sandwich form – Construction via direct bonding (#1) and silicate solution bonding (#2), respectively

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