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Conformal antireflection coatings

Functionalization of complex-shaped optical components by atomic layer deposition (ALD)

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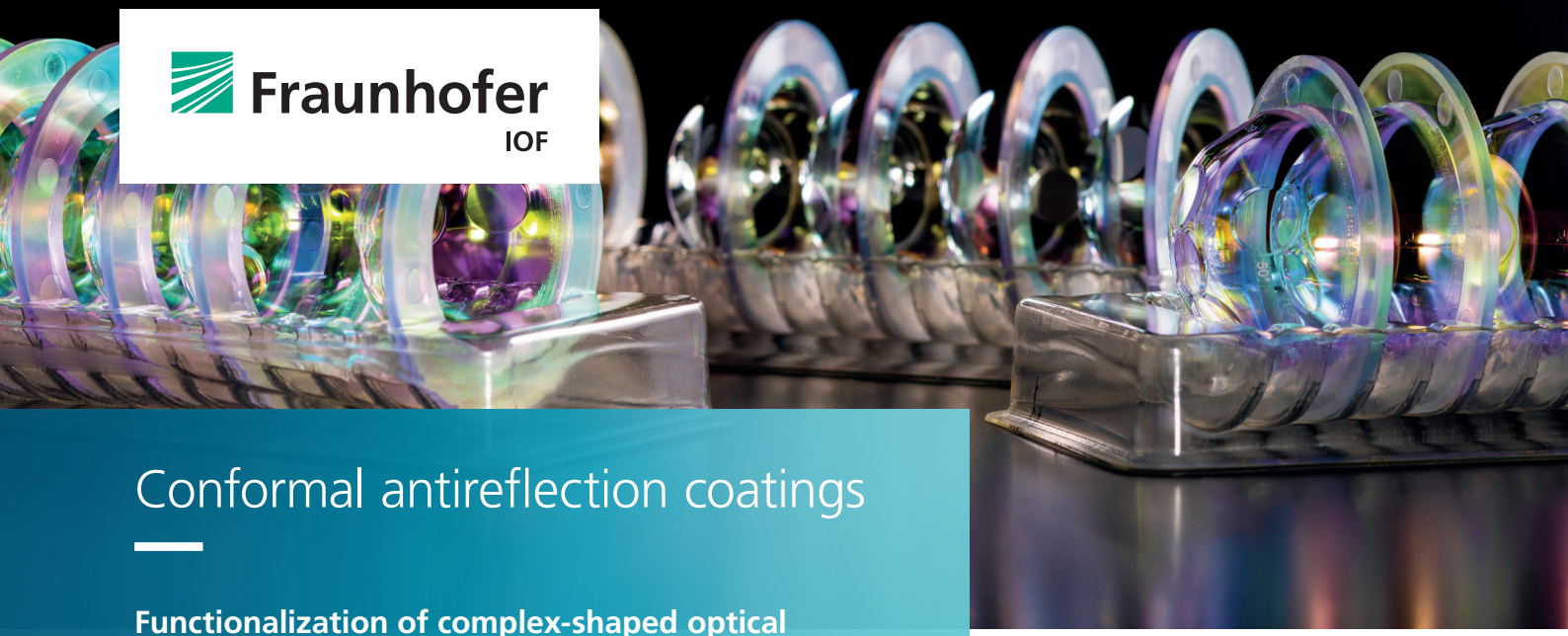


Conformal antireflection coatings

Functionalization of complex-shaped optical components by atomic layer deposition (ALD)

Cover: Preparation of dome component for ALD coating.

Top: AR coated domes for LIDAR applications.

Atomic layer deposition

Atomic layer deposition (ALD) is a particular suitable technology to meet the high uniformity requirements of optical coatings on complex-shaped components. ALD is a chemical deposition process based on cyclic self-limiting surface reactions. The key advantage is the precise control of layer growth independent of the substrate geometry.

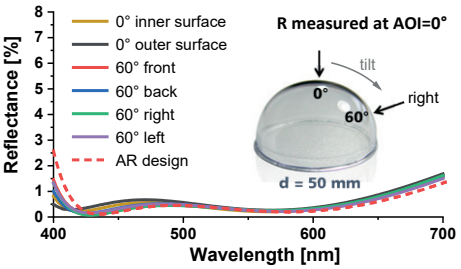
Advantages

- Conformal coatings on substrates with geometrically complex shapes (such as lenses, cylinders, hemispheres, etc.)
- Functionalization of temperature-sensitive substrates at low deposition temperatures using plasma enhanced ALD
- Very low optical losses
- High LIDT values

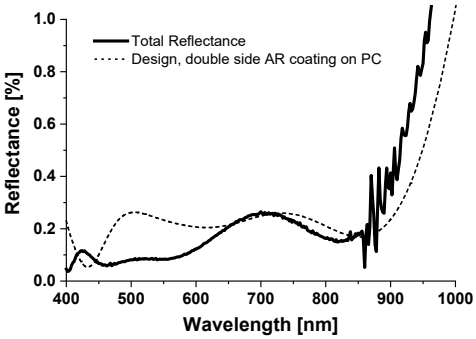
Expertise and applications

- Process development and optimization
- Oxides : SiO_2, Al_2O_3, Ta_2O_5, HfO_2, TiO_2
- Low-n nanoporous oxides: SiO_2, Al_2O_3
- Antireflection coatings from DUV to NIR
- Single- wavelength or multi-wavelength (e.g. 1064, 532, 355, and 266 nm)

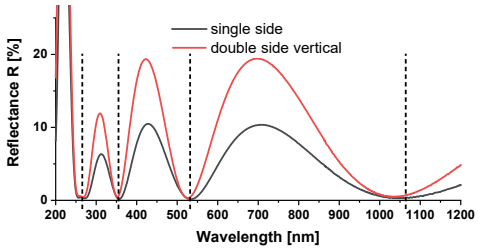
Highlights



AR coatings on inner and outer dome surfaces.



Broadband, omnidirectional AR Coatings.



Multi-wavelength AR performance for laser applications.

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