



- 1 Simulated correlation between refractive index n , shift and stress σ .
- 2 TEM cross sectional image of the tantalum pentoxide sample marked in Fig. 3 by the arrow.
- 3 Experimental data for tantalum pentoxide layers (APS-technique).

NANOPOROUS OXIDE COATINGS WITH BALANCED PROPERTIES

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Motivation

The optical as well as mechanical properties of coatings are crucial for their applicability in practice. It is however problematic to optimize all these characteristics independently from each other. Thereby a tailored pore fraction can be extremely helpful to achieve a suitable compromise between optical and mechanical layer properties. In that context, IOF research activities focus on identifying coating preparation conditions that result in a nanoporous layer structure with reasonably balanced macroscopic properties.

Our competence

R&D at IOF is concentrated on optimizing PIAD and sputter processes in order to

obtain almost shift- and stress-free coatings with still acceptable refractive indices. Corresponding samples could be manufactured, for example, optimising deposition conditions for the APS-assisted electron beam evaporation technique. Investigations of the nanostructure by transmission electron microscopy verify the predicted nanoporosity of the layers.

Our offer

- Coating characterization with respect to optical constants, thermal or vacuum shift, and mechanical stress
- Process optimization with respect to a pre-defined spectrum of optical and mechanical layer properties