

Mechanisms and impact of glass surface modification during classical optics manufacturing

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In the course of classical optics manufacturing, glass surfaces are in permanent direct contact with tool surfaces, operating materials, and aqueous solutions such as lubricants or polishing suspensions. This leads to a modification of the outermost glass layer via leaching of glass constituents, interdiffusion, implantation of contaminants, and the formation of hydrated silica. Such modification causes an alteration of the optical properties of the glass surface and may thus lead to a decrease in performance of optical components or systems.

In this contribution, modification effects and mechanisms of fused silica [1-3] and optical glass surfaces [4-5] in the course of classical optical manufacturing as investigated in recent work via X-ray photoelectron spectroscopy (XPS), laser-induced breakdown spectroscopy (LIBS), and ellipsometry are presented. Moreover, the potential impact of such modifications on coating characteristics [1] and imaging quality [5] is discussed.

References

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