



## High-precision micro-machining of optical functional surfaces

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### Oltmann Riemer

High tech and consumer products nowadays include very often components with highly precise functional surfaces for optical key purposes. For mass production of glass or polymer optics dedicated replication processes are usually applied and therefore particular precision molds are required. High-precision micro-machining processes like diamond turning and milling processes are established manufacturing technologies to deliver those kind of optical and mechanical high precision components and structured surfaces. This presentation will introduce and discuss the relevant machining processes from the field of ultra-precision manufacturing with respect to achievable surface finish, figure accuracy and surface integrity as well as the flexibility regarding the geometrical spectrum of forms and structures. Depending on the process kinematics applied, various geometries, including freeform and structured surfaces, can be generated; for brittle materials abrasive processes like precision grinding and polishing processes are applied.

#### SHORT BIO:

Oltmann Riemer is a mechanical engineer and he graduated from the Technical University Braunschweig. Since 1993 he is working as a research engineer and teaching assistant at the Laboratory for Precision Machining LFM at the University of Bremen (since 2018 Leibniz Institute for Materials Engineering, Bremen). He received his Dr.-Ing. degree from Bremen University in 2001. The focus of his research work is in the area of ultra-precision and micro-machining processes, i.e. specifically diamond turning and milling processes, cutting mechanics, micro machining technologies, and characterization of the surface integrity. Since 2005 he is the responsible head of the Laboratory for Precision Machining and has experience from managing national and international projects; he is principal investigator of national and European funded projects.