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## Glass optics replication in a digitalized production environment

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Digitalization, adaptivity and networked production are dominant issues for state of the art manufacturing technologies and will continue to have a substantial impact on their advancement and development. This applies especially to complex process chains, characterized by multiple and non-trivial interdependencies, such as the replicative manufacturing of optical components. Ranging from the optical design, the FEM simulation and the mold manufacturing, down to the actual molding process and the assembly of the optical system, this process chain today reveals a low level of automation as well as insufficient (data-)standards and an inadequate information flow over the different process steps. Since most of the single technologies are at the brink of technical feasibility, future components will need the ability to exploit the vast potential of interconnected and adaptive process chains. In order to promote and advance this transition in the field of replicative optics manufacturing the Fraunhofer IPT has elaborated an innovative and comprehensive data solution concept, which has been implemented within the precision glass molding process (PGM). In a specially equipped glass molding machine, tailored sensor systems are collecting multiple data concerning the molding process, such as temperature, force and pressure profiles. This information is acquired in real time and serves the purpose of immediate visualization. Beyond this, all data are fed into a superior data backbone, allowing the reconstruction of an exact digital image of the component, highly valuable to adapt downstream and upstream processes, granting a glance on what future optics production in a totally digitalized production environment will look like.

### Biography

Holger Kreilkamp is Group Manager of "Optics" at Fraunhofer Institute for Production Technology IPT. He studied Mechanical Engineering specialized in Production Technology at RWTH Aachen University and received his Diploma degree in 2011. He got a second Diploma in Economics in 2012. Since then, he has worked as a Research Assistant at Fraunhofer IPT in the field of Optics Manufacturing. His research focuses on technology development for glass optics production with special interests in replicative manufacturing.

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