

Glass2Mass

High-Performance, High-Resolution
Optical Components in Fused

PUBLIC SUMMARY

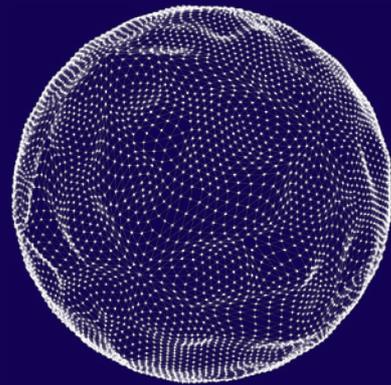
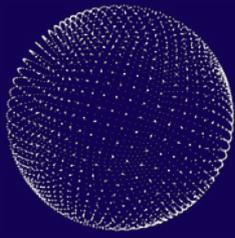
Glass is one of the most important materials of the 21st century and despite millennia of use, its processing techniques have remained largely unchanged for decades. With the advent of the Glassomer Technology, glass has seen one of its most important process innovations so far. Now, glass can be structured as if it was a polymer. However, in order to make glass the go-to material for next-generation optics and photonics, the Glassomer Technology must now become compatible with UV Nanoimprint Lithography (UV-NIL), the method of choice for fast and cost-effective manufacturing of high-performance optical components on an industrial scale.

Compared to techniques such as injection moulding, UV-NIL can be used with cost-effective moulds generated by a fast replication process in elastomeric polymers and thus bypasses the significant costs involved with the manufacturing of optical-grade injection moulding tools. The aim of Glass2Mass is the development of an integrated process workflow for the generation of optical components in fused silica glass, the purest glass available via the Glassomer Technology using UV-NIL. This process will be a first-of-its-kind technology achieving currently inaccessible levels of complexity in structure, optical quality and industrial scalability constituting a game changer for the entire industry.

The project builds on the close interaction of the four relevant players required to make this innovation possible: Firstly, Glassomer GmbH, the company that developed and pioneered the eponymous glass processing technology. Secondly, Nanoscribe GmbH, the market leader in high-resolution Two-Photon Polymerization (2PP) which will be instrumental for prototype manufacturing as well as for the generation of replication masters. Thirdly, EVG, one of the largest players in the field of UV-NIL and fourthly OSRAM who provides direct market access and a directly applicable commercially relevant demonstration application: the development of complex fused silica optics for UV sterilization systems.

These systems have the potential to become an integral part in public healthcare with the ability to sterilize surfaces in the open space to limit the spread of infectious diseases - a problem which has become more and more apparent to the general public in view of the ongoing SARS-CoV2 pandemic. Glass2Mass will showcase the development of material and process technology using relevant demonstrators manufactured at the industrial scale.

These demonstrators are chosen from the fields of advanced refractive optical elements (ROE) and diffractive optical elements (DOE) and will be assembled in form of the so-called ATTRACT Advanced Optics Shim. This credit-card-sized glass shim will contain a selection of suggestive ROEs/DOEs (DOEs which show diffractive patterns of, e.g., the ATTRACT logo, lens arrays, beam shapers, etc.) from which 10,000 units will be produced and disseminated during outreach, school and public events.



© Copyright ATTRACT

All rights, amongst which the copyright, on the materials described in this document rest with the original authors of the text, except where referenced. Without prior permission in writing from the authors and the Fundació Esade, this document may not be used, in whole or in part, for the lodging of claims, for conducting proceedings, for publicity and/or for the benefit or acquisition in a more general sense.

Legal Disclaimer

The European Commission's support does not constitute an endorsement of the contents, which only reflect the views of the author. The Commission is not responsible for any use of the information contained therein.



This project has received funding from the European Union's Horizon 2020 research and innovative programme under grant agreement No. 101004462