

Deliverable 6.7

At least three publications on conferences and journals containing project results

Project acronym: CENTiMO
Project ID: 606105
Project Call: FP7-SME-2013

Fraunhofer IPT

Steinbachstraße 17
52074 Aachen, Germany
Phone: +49 241 8904 454
Fax: +49 241 8904 6454

Authors
Holger Kreilkamp (Fraunhofer IPT)

Aachen, 2015/08/17

1 Objective

The primary aim of the work described in this deliverable was to disseminate the project results. Next to internal and confidential results of the project “CENTiMO” a lot of results can be presented by publications on conferences or journals. At this project all publications were made on conferences so far. One speech was given in the USA (Miami), one in Czech Republik (Velké Karlovice) and one will be given in Germany (Wetzlar). The one in Wetzlar will be in September 2015.

2 List of Publications

American Ceramic Society Glass & Optical Materials Division and Deutsche Glastechnische Gesellschaft Joint Annual Meeting 2015

Title: Non-isothermal Glass Molding - An Integrative Approach for the Numerical Modeling-assisted Design of Non-isothermal Glass Molding Process for High Complex Glass Optics

Speaker: Kreilkamp, Holger (Fraunhofer IPT)

Date and Location: May 17–21, 2015, Miami, Fl, USA

Abstract:

Intensively growing demands for complex yet low-cost precision glass optics motivate industrial companies to develop an efficient and economically viable manufacture of complex shaped optics. Against state-of-the-art replication-based methods, Non-isothermal Glass Molding (NGM) turns out a promising innovative technology for cost-efficient manufacturing because of raw material save, less energy consumption and high throughput from a fast process chain. However, the process dynamic and complexity of glass behavior under extreme process conditions, i.e. high temperature, fast molding with high pressure, pose major challenges for process establishment. This research introduces an innovative design concept whereby numerical modeling-assisted modules are integrated at the early stage to standardize and accelerate the entire NGM process design. Two integrative modules based on the coupled thermo-mechanical modeling are developed. Simulation results are verified by a broad range of experiments with advanced measuring techniques. This modeling provides a systematic approach for glass preform design, mold compensation, and process optimization. In conclusion, the integration of simulation modeling into the entire process chain will significantly increase the manufacturing efficiency of complex optics as well as industrial enterprises' competitiveness.

13th International Seminar on Furnace Design Operation & Process Simulation

Title: Numerical Modeling-based Design of the Newly Developed Non-isothermal Glass Molding Process for Complex Glass Optics

Speaker: Vu, Anh Tuan (Fraunhofer IPT)

Date and Location: June 17-18, 2015, Velké Karlovice, Czech Republic

Abstract:

Glass molding has become a key replication-based technology to satisfy intensively growing demands from the dynamic optic market on high levels of shape accuracy, surface quality and complex geometry of glass optics. However, the state-of-the-art replicative methods remain low efficiency to meet the requirements of mass production. A new generation of glass molding concept, defined as Non-isothermal Glass Molding (NGM), has been recently developed by Fraunhofer IPT whereby the heating and annealing stages of glass are carried out externally. This newly developed NGM technology turns out a promising innovative technology for cost-efficient manufacturing because of raw material save, less energy consumption and high throughput from a fast process chain. Major challenges for further development of NGM process chain derive from the process dynamic itself and complexity of glass behavior under extreme process conditions, i.e. high temperature, fast molding with high pressure.

This research introduces an innovative design concept whereby numerical modeling-assisted modules are introduced at the early stage to standardize and accelerate the NGM process design. The successful modeling, therefore, provides a systematic strategy for glass preform design, mold compensation, and optimization of process parameters. In conclusion, the integration of simulation modeling into the entire NGM process chain will significantly increase the manufacturing efficiency of complex glass optics as well as industrial enterprises' competitiveness.

5. Wetzlarer Herbsttagung "Moderne Optikfertigung"

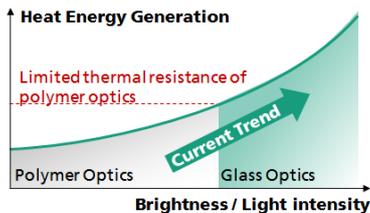
Title: Blankpressen von High-Power LED-Vorsatzoptiken

Speaker: Dr. Dambon, Olaf (Fraunhofer IPT)

Date and Location: September 22 – 23, 2015, Wetzlar, Germany

Abstract:

Themenvorschläge Fraunhofer IPT zur Wetzlarer Herbsttagung 2015 Blankpressen von High-Power LED-Vorsatzoptiken



- Steigender Bedarf an LED-Vorsatzoptiken aus Glas für High-Power Anwendungen
- Fertigungstechnische Herausforderungen:
 - Komplexe, freigeformte optische Oberflächen
 - Wirtschaftliche Fertigung in hoher Stückzahl ohne mechanische Nachbearbeitung
 - Sicherstellung einer hohen Flexibilität der Prozesskette, um der hohen Dynamik im LED-Markt folgen zu können
- Forschungsfokus:
 - Design einer integrierten Prozesskette
 - FE-Simulation zur schnellen und wirtschaftlichen Prozessauslegung
 - Steigerung der Werkzeugstandzeit durch Verwendung alternativer Formwerkstoffe

© WZL/Fraunhofer IPT

Fraunhofer
IPT

WZL
RWTHAACHEN

Seite 1

Besides, the following publications are scheduled:

ELEKTRONIKPRAXIS , Sonderheft LED und OLED

Title: Kostengünstige Optiken aus Glas für die LED-Beleuchtung

Authors: Kreilkamp, Holger, Dr. Dambon, Olaf (Fraunhofer IPT)

Date of publication: October 1, 2015, München, Germany

LED- und OLED-Praxisforum 2015

Title: Nicht-isothermes Blankpressen komplexer LED-Optiken aus Glas

Speaker: Kreilkamp, Holger (Fraunhofer IPT)

Date and Location: October 22, 2015, Würzburg, Germany

HVG-DGG Fachausschusssitzung - Glasformgebungstechnologie und Qualitätssicherung

Title: Formwerkstoffe für das Blankpressen

Speaker: Kreilkamp, Holger (Fraunhofer IPT)

Date and Location: November 4, 2015, Neukenroth, Germany