

PRESS RELEASE

PRESS RELEASE

September 17, 2019 || page 1 | 2

Individualization of Products in Mass Production: Development of cutting-edge Technology within the Fraunhofer Lighthouse Project »Go Beyond 4.0«

Six Fraunhofer Institutes have demonstrated the individualization of single products in mass production environments by the employment of digital printing and laser technologies. This substantial progress provides completely new opportunities for design and weight reduction by material savings.

Six Fraunhofer Institutes (ENAS, IFAM, ILT, IOF, ISC and IWU) have succeeded to manufacture electrical conductor patterns, sensors, and high-tech lighting modules, individually integrated into components by using digital printing and laser technologies. The result: individualization of components in mass production environments with new opportunities for design, material savings and weight reduction.

The demand for customized components with sophisticated electrical or optical functionalities in industrial production has been growing for years. By integrating digital printing and laser technologies into existing mass production environments, the challenges of individualization can be faced successfully. Thus, the development of entirely new products becomes feasible.

»At first, it sounds paradoxical to produce unique products in mass production lines. However, if the digital manufacturing technologies of inkjet printing and laser processing are cleverly integrated into mass production environments, the respective products can be individualized in-line«, explains Prof. Reinhard Baumann of Fraunhofer ENAS, project coordinator of the Fraunhofer lighthouse project »Go Beyond 4.0«.

In a short video about the lighthouse project (available online: www.go-beyond-four-point-zero.de), the feasibility of combining digital printing, laser processing and further latest production technologies is pictured based on three technology demonstrators.

Editors

Dr. Martina Vogel | Fraunhofer Institute for Electronic Nano Systems ENAS | Phone +49 371 45001-203 |
Technologie-Campus 3 | 09126 Chemnitz | Germany | www.enas.fraunhofer.de | martina.vogel@enas.fraunhofer.de

Person in charge

Prof. Dr. Reinhard R. Baumann | Fraunhofer Institute for Electronic Nano Systems ENAS | Phone +49 371 45001-234 |
Technologie-Campus 3 | 09126 Chemnitz | Germany | www.enas.fraunhofer.de | reinhard.baumann@enas.fraunhofer.de

Dr. Ralf Zichner | Fraunhofer Institute for Electronic Nano Systems ENAS | Phone +49 371 45001-441 |
Technologie-Campus 3 | 09126 Chemnitz | Germany | www.enas.fraunhofer.de | ralf.zichner@enas.fraunhofer.de

Demonstrator »Smart Door« – manufacturing domain automotive engineering

As a result of the Fraunhofer lighthouse project, the design of automotive body components, here car doors, can be revolutionized. The video shows that conductive tracks can now be directly applied to automotive body parts employing digital printing and laser processes. This makes a complex body part lighter and subsequently the manual installation of a wire harness redundant.

Demonstrator »Smart Wing« – production domain aviation

Lightweight constructions in aviation, here wings, are due to their fiber-reinforced composite materials (CFRP and GFRP) suitable for the integration of printable components as temperature sensors or signal lines. Printed heating structures including sensors will enable chemical-free defrosting of wings and the collection of data for the on-board management.

Demonstrator »Smart Luminaire« – production domain lighting

In the course of the lighthouse project, optically transparent bodies such as lenses, projecting lettering or logos, were manufactured by 3D printing and adjacent laser processing. In addition, these processes allow the integration of electrically conducting paths and LEDs into the volume of the transparent optics. The revolutionizing results are complex lighting elements directly displaying dynamic information.

Background of the lighthouse project:



The lighthouse project »Go Beyond 4.0« is a research project of the Fraunhofer-Gesellschaft, fully financed by Fraunhofer and carried out by the Fraunhofer Institutes ENAS, IFAM, ILT, IOF, ISC and IWU. The aim of the project is to exploit the Fraunhofer synergistic potential by joining the competences of several

Fraunhofer Institutes to take on current industrial challenges. Over a three-year period, the Fraunhofer-Gesellschaft invests eight million euros in the lighthouse project.

Further information can be found at www.go-beyond-four-point-zero.de and www.fraunhofer.de/en/research/lighthouse-projects-fraunhofer-initiatives/fraunhofer-lighthouse-projects.html.

The **Fraunhofer-Gesellschaft** is the leading organization for applied research in Europe. Its research activities are conducted by 72 institutes and research units at locations throughout Germany. The Fraunhofer-Gesellschaft employs a staff of more than 26,600, who work with an annual research budget totaling 2.6 billion euros. Of this sum, 2.2 billion euros is generated through contract research. Around 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. International collaborations with excellent research partners and innovative companies around the world ensure direct access to regions of the greatest importance to present and future scientific progress and economic development.