



PRESS RELEASE

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Dr.-Ing. Larissa Born receives the Manfred Hirschvogel Prize

PhD student of ITFT at the University of Stuttgart awarded for her outstanding doctoral thesis

On 2nd July 2021, during the graduation ceremony for Master's students from the mechanical engineering faculties at the University of Stuttgart, Dr.-Ing. Larissa Born, research associate at the Institute of Textile and Fiber Technologies (ITFT), was awarded the Manfred Hirschvogel Prize 2021. The prize, endowed with 5,000 euros, is awarded annually at all TU9 universities – the nine leading technical universities in Germany – for the best dissertation in the field of mechanical engineering. The award-winning doctoral thesis is entitled "Principles for the layout and design of a hybrid material to be used in exterior, adaptive facade components made of fiber-reinforced plastic". Dr.-Ing. Marc Hirschvogel, Chairman of the Board of Trustees of the Frank Hirschvogel Foundation, especially highlighted the innovative approach and the scientific depth of the thesis during the award ceremony.

Since her student days, Larissa Born has been interested in fibre composites and their potential for a wide range of innovative applications. As part of her final theses during her studies as well as in her subsequent professional positions, she conducted intensive research on various material- and process-specific issues in context of fibre-reinforced composites. Since the beginning of her work at the ITFT, she has supervised numerous research projects on the development of adaptive fibre-reinforced composite components for shading systems with her textile-technological expertise. Within this research activity, she developed the topic of her dissertation: "Principles for the layout and design of a hybrid material to be used in exterior, adaptive facade components made of fiber-reinforced plastic".

With her doctoral thesis, Larissa Born provides a basic methodology for the development of adaptive fibre-reinforced plastics and exemplarily applied it to a hybrid material made of glass-fibre reinforced plastic, elastomer and thermoplastic polyurethane. Locally flexible areas (hinges) are integrated between stiff component areas by adapting the material set-up. Furthermore, to be able to analyse the adaptive material properties, she developed a new test method that allows a test specimen to be bent by up to 180°. The novel hybrid material allows a continuous load of 5,000 bending cycles by 180° with only marginal loss of tensile strength. A data base including a regression model to predict and adjust the mechanical properties of a hinge component is the result of the analyses performed within the thesis.

The hybrid material has already found application in different demonstrators, which were awarded the AVK Innovation Award (Flectofold) and the Materialica Gold Award (Flexafold). "With her work, Larissa Born has succeeded in establishing a completely new, material-



technical basis for the development of adaptive fibre-reinforced plastics," lauded Prof. Dr.-Ing. Götz T. Gresser, doctoral supervisor and head of ITFT, at the award ceremony. "The application is not limited to the architectural context, but can also be transferred to other fields such as automotive and aviation. In this way, mechanical, high-maintenance joints can be replaced by low-wear, compliant mechanisms."

Larissa Born's remarkable professional career started at Reutlingen University in the Textile Technology/Management programme. As part of her bachelor's thesis, she developed flectofin®, the first adaptive façade shading component made of fibre-reinforced composites. This became the starting point for subsequent developments in this field, which she has accompanied and driven forward as a research associate at the ITFT since 2014, after working at the BMW Group and the Bremen Fibre Institute, the ITV Denkendorf and the Fraunhofer PYCO facility. The large-scale demonstrators Flectofold and ITECH Research Demonstrator 2018-19 were important milestones on this path.

After having finished her doctorate, Larissa Born will continue her research work at the ITFT as deputy director of the institute. The aim now is to deepen the existing research field together with Prof. Gresser and to open up new research topics in the field of fibre-reinforced composites. One important issue for Larissa Born is the promotion and support of young researchers and future doctoral students. Her diverse experience and expertise should inspire others to pursue a scientific career and support them on their way.

About the ITFT

ITFT was founded in 2013 with the appointment of Götz T. Gresser as a professor at the University of Stuttgart. A small, young team researches fundamentals of fiber-reinforced composite technology.

The development of materials, structures and processes that meet the new requirements for resource conservation, material efficiency and adaptive production technology is the focus of the publicly funded project work.

About the Frank Hirschvogel Stiftung

In 2007, the Frank Hirschvogel Foundation was established by Dr. Manfred Hirschvogel and the family shareholders of Hirschvogel Holding GmbH. The name was chosen in memory of Frank Hirschvogel, the son of Dr. Manfred and Anne Marie Hirschvogel (née Kennedy), who died in an accident in 2006 at the age of only 18 years. With the establishment of the Frank Hirschvogel Foundation, the family shareholders set an example for the future for safeguarding the company as an economically independent and autonomous family business and for its responsibility as a committed sponsor of innovative projects in science and research as well as school and vocational training around the plant locations.

In memory of Dr Manfred Hirschvogel and his work, the Manfred Hirschvogel Award for the best dissertation in mechanical engineering was introduced at selected technical universities in 2013. Since 2015, the Frank Hirschvogel Foundation has awarded the prize, which is endowed with 5,000 euros, at all TU9 universities in Germany.



Image caption: Award-winner Dr.-Ing. Larissa Born loading the mirror plates (tool for the for the production of test specimens) into the hot press ©DITF Denkendorf

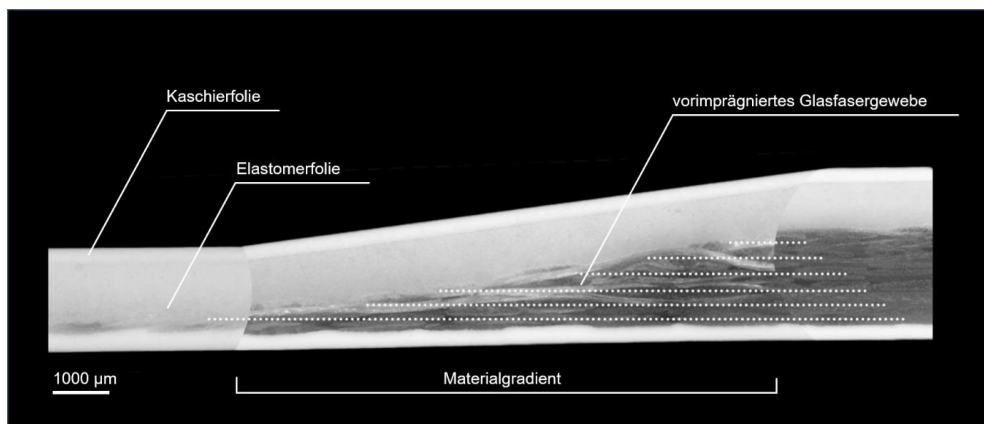


Image caption: Cross-section (micrograph image) of the transition from the flexible hinge to the rigid component area in a hinge component made of the hybrid material ©University of Stuttgart (ITFT) L. Born

Further information on this topic:

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