

Apple leaf miner inspires new processes for composite construction

- Construction of a pavilion made of carbon-glass fiber reinforced composites
- SGL Group delivers 104 kilometers SIGRAFIL® 50k carbon fiber to the Institute for Computational Design at the University of Stuttgart

Wiesbaden, June 26, 2017. Our SIGRAFIL® 50k carbon fiber is often used today as basis for applications in the fields Mobility and Energy – from the automotive industry to aerospace, through to wind energy. The new generation of these large-tow fibers is ideally suited for automated production processes and already in use as standard in the BMW i3, i8, and the new BMW 7 Series, among others. In the future, the use in further applications is conceivable.

The Institute for Computational Design and Construction (ICD) and the Institute of Building Structures and Structural Design (ITKE) at the University of Stuttgart are currently researching a novel production process for architectonic structures based on 50k fibers. An initial installation from the project can currently be seen on the University of Stuttgart’s inner courtyard. For this endeavor, 104 kilometers of carbon fibers were provided and delivered from our Moses Lake site in the state of Washington to Stuttgart.

The focus of the project is investigating natural biological construction processes of long span fiber composite structures. Serving as a model here were the larvae of the apple leaf miner moth (“*Lyonetia Clerkella*”), which spin cocoons on cherry and apple tree leaves using long threads of fiber. Researchers at the ICD and ITKE, together with students of the master study program ITECH, are now trying to apply this special technique to the construction of architectonic structures made of carbon-glass-fiber-reinforced composites and develop a new production process based for fiber composite constructions. As carbon fibers are lightweight and have a high tensile strength, a radically different approach becomes possible involving new production processes with multiple robot systems that communicate with each other, precisely processing the fibers while handling high tension forces. This approach enables a scalable production process for long span fiber composite constructions as they could be used in architectural design in the future.

“In this case, we use the glass fibers purely as a formwork on which we apply the carbon fibers. Loads in parts subject to both tension and pressure are primarily transferred through the carbon fibers. With its long spanning cantilever form, this year’s pavilion places a special focus on the options offered by this material,” says Benjamin Felbrich, research assistant at the ICD.

Andreas Wuellner, Head of the business unit Composites – Fibers and Materials (CFM) of SGL Group: “For us as a company the continuous development of production processes of carbon fibers is an important topic, that’s why we are having a lively exchange with the project team at

the University of Stuttgart. Furthermore, the construction of the pavilion is a stress test in practice for our fiber and demonstrates its' unique characteristics.”

Further information and pictures of the project can be found [here](#).

About the SGL Group – The Carbon Company

The SGL Group is a leading manufacturer worldwide of products and materials made from carbon. The extensive product portfolio ranges from carbon and graphite products, carbon fibers all the way through to composites. The SGL Group's core expertise comprises the control of high-temperature technologies as well as the deployment of many years' application and engineering know-how. This is used to exploit the company's wide materials base. These carbon-based materials combine a number of unique material properties such as very good conductivity of electricity and heat, resistance to heat and corrosion as well as lightweight construction coupled with high firmness. The level of demand for the SGL Group's high-performance materials and products is increasing due to the industrialization of the growth regions of Asia and Latin America and the ongoing substitution of traditional construction materials by new materials. The SGL Group's products are deployed in the automotive and chemicals industries as well as in the semiconductor, solar, LED industry segments and in the field of lithium-ion batteries. Carbon-based materials and products are also used in wind energy, aviation and space travel as well as in the defense industry.

With 33 production locations in Europe, North America and Asia as well as a service network in over 100 countries, the SGL Group is an enterprise with a global orientation. In the 2016 financial year, approx. 4,000 employees generated 769.8 million euros in sales revenue. Its Head Office is based in Wiesbaden / Germany.

Further particulars on the SGL Group can be found in the Newsroom of the SGL Group at www.sglgroup.com/press and at www.sglgroup.com.

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To the extent that our press release contains forward-looking statements, the latter are based on information that is available at present and on our current forecasts and assumptions. Forward-looking statements, by their very nature, entail known as well as unknown risks and uncertainties that may lead to actual developments and events differing substantially from the forward-looking assessments. Forward-looking statements must not be understood to be guarantees. Instead, future developments and events depend on a large number of factors; they comprise various risks and imponderables and are based on assumptions that may possibly turn out not to be appropriate. These include unforeseeable changes to fundamental political, economic, legal and societal conditions, particularly in the context of our main customers' industries, such as electric steelmaking, the competitive situation, interest and exchange rate trends, technological developments as well as other risks and uncertainties. We perceive additional risks e.g. in pricing developments, unforeseeable events in the environment of companies acquired and Group member companies as well as in current cost savings programs from time to time. The SGL Group assumes no obligation and does not intend to adjust or otherwise update these forward-looking statements either.

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