

## Carbon TT relies on pultrusion systems from Pultrex with iPul technology

- iPul\_Technology makes chassis 60 percent lighter yet able to bear high loads
- Profile production at high speeds – just in time
- Meeting deadlines in challenging times

**(Munich, October 21 2021) "We're making vehicles lighter. This will allow them to transport higher cargo loads while using less energy." This is the corporate philosophy of Carbon Truck & Trailer GmbH. A new iPul pultrusion system for lightweight construction profiles made of carbon fiber reinforced plastic (CFRP) is one of the major reasons behind the success of this company based in Stade, Germany. The newly installed pultrusion system, delivered by Pultrex (a British KraussMaffei subsidiary), produces profile parts for around 70,000 vehicle chassis annually.**

KraussMaffei and Pultrex demonstrated their pioneering spirit – and not just by tailoring the system design to customer requirements. "Despite all the obstacles, we managed to deliver and commission the system on schedule," explains KraussMaffei Sales Expert Wolfgang Hinz. The unpredictable political situation in the wake of Brexit as well as the consequences and other limitations caused by COVID-19 were certainly not foreseeable when the system was ordered in mid-2020. "The experience and dedication of the technicians and project managers helped in commissioning the system according to plan," Hinz continues.

### **New location for increasing needs**

Carbon Truck & Trailer GmbH (Carbon TT) is based in the "CFK (CFRP) Valley" in Stade / Lower Saxony. The young company specializes in building carbon-fiber-based chassis for lightweight commercial vehicles. Now the

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CFRP specialists have a new highly automated iPul pultrusion system up and running at their location in Buxtehude near Hamburg. The system was supplied by Pultrex, a KraussMaffei subsidiary. It produces large CFRP profiles in series, which are used in high-load components for vehicles such as buses, small trucks and mobile homes. "The new iPul system makes it possible for us to manufacture components in series at a consistently high level of quality. At the same time, the system gives us another selling point in multi-axial pultrusion – there are only five other systems like this one in the world," says Gerret Kalkoffen, Managing Director of Carbon TT.

### **Lower weight and higher payload**

"Our carbon lightweight construction solutions help in meeting increasingly rigid requirements for sustainability, efficiency and safety. Especially for vehicles powered by batteries and hydrogen fuel cells, carbon fibers provide more material advantages than just their weight," explains Kalkoffen. A CFRP chassis is approximately 60% lighter than comparable steel chassis – this weight reduction lowers CO2 output and increases both the payload and the cruising range. In addition, the CFRP chassis compensates for the additional weight of batteries in electric vehicles and effectively protects them in the event of a crash.

### **Pioneers among their own kind**

"Our customers are automotive OEMs with high standards. Our own standards for the technology and service of our production systems are equally high," says Kalkoffen. "In Pultrex, we've found a partner with decades of experience in pultrusion. In collaboration with KraussMaffei, they offer fast and reliable service."

The innovative gripper concept of the Pultrex system made an especially positive impression. "The grippers operate with precision and without slipping. This is a 'must' for ensuring the consistently high quality of our complex CFRP profiles." And when you do business with Pultrex and KraussMaffei, all system components – both for mixing and metering technology and for injection and pultrusion technology – come from a single source. And when service is required, there is a central contact person.

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## **Production at high speeds – just in time**

Customers of Carbon TT set the pace for production with their order quantities and process requirements. This is where the iPul technology can unleash its full performance potential. Production can run at a speed of up to 2.25 m per minute at 20 tons of pulling force. For large and complex profiles, pultrusion can even be carried out at up to 40 tons in parallel operation.

## **Customized system**

For wrinkle-free reforming of multi-axial roving, CarbonTT developed its own roving guide, which is being used for the first time on the new system. The injection box makes it possible to quickly and flawlessly impregnate the exceptionally large profiles with thick walls and a high fiber volume fraction. The fibers are soaked in the injection box with a polyurethane matrix and then shaped into the approximate final profile form. At the same time, the closed box prevents any unwelcome odors which arise during production with open baths.

The mold was adapted and designed by Carbon TT with spring-in and shrinkage taken into account for the final geometry. The profiles are trimmed down to the final dimensions automatically by the system and then processed further.

## **About Carbon TT**

CarbonTT develops and produces heavy-duty structural components made of carbon fiber reinforced plastic for the automotive industry as well as the corresponding production and assembly methods for manufacturing them cost-effectively. In collaboration with Volkswagen, StreetScooter and Daimler, various chassis designs have successfully made it to the street. Since 2019, the company has had a partnership with Rheinmetall Group with the goal of fast and safe industrialization of developed components and processes. Here, CarbonTT holds utility models and patents in component design, joining processes and automated production.

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KM\_RPM\_211021\_CarbonTT profiles.jpg

Successful start-up: After the initial commissioning, it took only a few minutes before CFRP substrates could be removed from the new iPul system. The roving reforming, mold, gripper and system technology reliably produced high-quality components. (Photo: Carbon TT)

KM\_RPM\_211021\_iPul plant.jpg

An iPul pultrusion system from Pultrex has now been put into operation at Carbon TT in Buxtehude near Hamburg.

It produces heavy-duty CFRP profiles used in lightweight utility vehicle chassis.

KM\_RPM\_211021\_CFK chassis.jpg

The chassis made from CFRP components are up to 60% more lightweight than comparable steel designs that are produced at Carbon TT in Buxtehude. Pultrusion technology from Pultrex is the technical basis of the new production. (Image: CarbonTT)

KM\_RPM\_211021\_iPul plant components.jpg

When you choose Pultrex, the entire pultrusion system comes from a single source. The injection box is the core of the iPul technology. Endless fiber rovings are soaked with a matrix in the box and formed into composite profiles.

KM\_RPM\_211021\_team carbon TT.jpg

The team of Carbon TT is proud of their new Pultrex iPul pultrusion system. On the left: Managing Director Gerret Kalkoffen (Photo: Carbon TT)

Photos: KraussMaffei; Carbon TT

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## **KraussMaffei – Pioneering Plastics**

KraussMaffei is among the world's leading manufacturers of machinery and systems for the production and processing of plastics and rubber. Our brand stands for cutting-edge technologies – for more than 180 years. Our range of services covers all areas of injection molding machinery, extrusion technology and reaction process machinery. This gives KraussMaffei a unique selling point in the industry. With the high innovative power of our standardized and individual product, process, digital and service solutions, we can guarantee customers sustained additional value over the entire value-adding chain. Our range of products and services allow us to serve customers in many sectors including the automotive, packaging, medical and construction industries, as well as manufacturers of electrical and electronic products and household appliances. KraussMaffei employs around 4.700 people all over the world. With more than 30 subsidiaries and over 10 production plants, as well as about 570 commercial and service partners, we are represented internationally close to our customers. Since its foundation in 1838, the company's headquarters have been in Munich.

In April 2016, the Chinese state-owned company China National Chemical Corp. Ltd. ("ChemChina"), one of the leading chemical companies in China, became the majority shareholder of KraussMaffei Group. At the end of 2018, ChemChina listed the KraussMaffei Group as KraussMaffei Company Ltd. in Shanghai. The listing opened up access to the Chinese capital market and local investors.

For more information: [www.kraussmaffei.com](http://www.kraussmaffei.com)

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