

The innovative solar sail is an alternative, environmentally friendly power source which uses impulse transfer of photons onto a wide-range surface reflector

## Fibre technology for the future

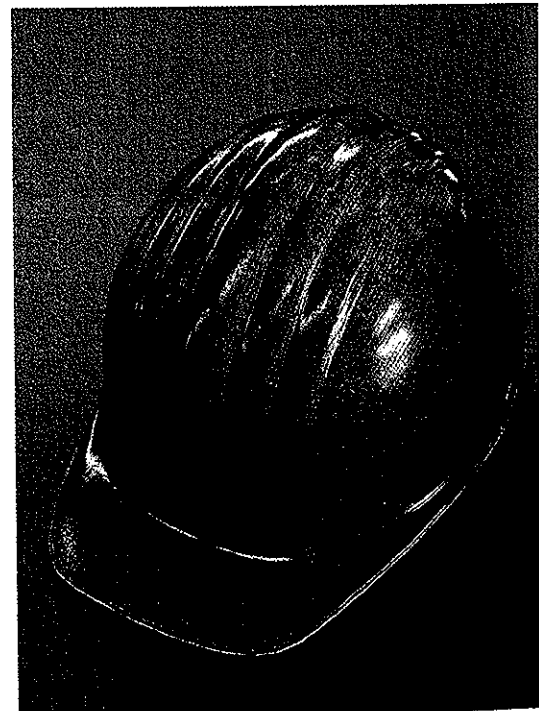
*Fibre is not just something you eat in your cereal in the mornings. It is also valid material used in manufacturing technical components, construction materials, and lightweight structures. The German company Invent GmbH specialises in designing and producing customised fibre composite systems, and is involved in a wide variety of aircraft construction, space technology, mechanical and process engineering, and traffic technology projects.*

Invent GmbH is currently involved in developing a device known as a solar sail, which uses impulse transfer of photons onto a wide-range surface reflector as an alternative power concept. With this new system, the need for an active power system and fuel is eliminated. The solar sail is a thermo-mechanically highly loaded deployment module, and has a complex integration and deployment mechanism for CFRP booms. The sail itself is thin and has a high reflection capacity. In addition to the innovative solar sail project, Invent has developed industrial safety helmets which are 85% made of renewable raw materials in cooperation with Schuberth Helme GmbH

and the German Aerospace Research Centre (DLR). The enterprise has also used fibre composites in creating a robot arm for an assembly automat.

"We are specialised in developing customised solutions which we then produce in limited-lot production," says Henning Wichmann, managing director and a certified engineer. "We offer expertise backed up by a strong scientific background. Our equipment is modern and we are always technologically up to date."

A typical development process begins with an idea and continues to the design, construction, and building a prototype phases. Invent has a great deal of experience in manu-



An industrial helmet developed by Invent GmbH which is 85% made of renewable raw materials

## INVENT

Christian-Pommer-Str. 34  
38112 Braunschweig  
Germany

phone: +49 531 24466-0

fax: +49 531 24466-88

info@invent-gmbh.de

www.invent-gmbh.de

contact:

Henning Wichmann +49 531 24466-10

Carsten Schöppinger +49 531 24466-50



Developing fibre technology for the future:  
Managing director Henning Wichmann  
and authorised officer Carsten Schöppinger

facturing sample products which provide accurate information about the capability of the prototype early on. After an appropriate design has been tested, the lot is processed using fibre composites. "There is a distinct weight advantage to using carbon fibre, or CFRP, as opposed to metal or other synthetic materials," states Carsten Schöppinger, an authorised officer at Invent and a certified engineer. "The rigidity, cohesiveness, and temperature resistance of carbon fibre are also superior."

Invent has participated in developing components for transrapid high-speed magnetic-levitation trains and has produced test parts for airbuses. In addition, the enterprise has processed satellite components for Astrium. Other companies with which Invent has worked include Volkswagen, ESA in the Nether-

lands, Siemens, and MAN Technologie. Overall, most products are developed for the aeronautics and space flight sectors as well as other high technology areas.

Invent itself is composed of five departments. The space flight department deals with high precision structural and functional components for thermal systems, optic systems, and antenna and reflector systems. The aeronautics division deals with wing structure, and steering and landing gear. There is also a sustainable and natural fibre amplifying department, which creates athletic and leisure articles and traffic technology from renewable resources. The technical services section takes care of quality control and accounting, and the final division develops individually tailored lightweight construction products. These devices have applications in mobile

bridge systems and drive engineering technology, among other uses. Invent was founded in 1996 by Professors Elmar Breitbach, Axel Herrmann, and Holger Hanselka of the German Aerospace Research Centre and Institute for Structural Mechanics in Braunschweig. Today, the three founders are both partners in the firm and an important part of Invent's expertise. The business's workforce has grown to a total of 26 employees over the last eight years. Turnover has grown as well, rising from EUR 1.8 million in 2001 to a projected EUR 3 million in 2004. The firm expects to continue growing in the future, and predicts that it will expand by 15% in the next few years. "We intend to grow while maintaining the flexibility of a small enterprise," remarks Mr. Wichmann. Currently, 10% of all contracts are due to foreign contracts, mainly

with the Netherlands, France, and Austria. However, along with growing internally as a company, Invent plans to strengthen its foothold in European markets. "We want to internationalise our business," states Mr. Schöppinger. Other future products include developing more products which use sustainable materials. At the moment, Invent is in the process of creating a canoe, a trade fair stand, and a motorcycle helmet for car racing circuit, all made completely of renewable primary products. With these innovative projects in the works, Invent GmbH is developing fibre technology for the future. ■



INVENT