

FEATHERWEIGHT PRODUCTION

Our customer for this project found great acceptance and recognition in the automobile industry with the development of a reach spring made of fibreglass reinforced plastic – with Metzner, the company found a reliable partner in order to produce the reach springs in large quantities.

Its technical director of our customer is not a man who does every-thing on the computer or likes to study theo-retical objectives.

He prefers working directly where the work is done. He observes how something changes; this usual-ly concerns materials made of fibreglass reinforced plastic in his case. He says it is only by observations that you see how a material really works or changes by the varia-tion of a few parameters.

The technical director has won Germany's IQ Innovation Prize 2006 with his

observations. An automatic production system from Metzner was also involved in this success.

GRP benefits

Glass-fibre reinforced plastic (GRP) has existed for a long time. The first, continuous glass fibres were manufactured industrially in the USA as early as 1935 and the first aeroplane made of GRP, the Phoenix from Akaflieg Stuttgart, was produced in 1957. The bene-fits of GRP are obvious: the material can be highly stressed, it

does not corrode and thus does not break during coldness and never when pulled, a property which ensures a lot of safety. However, the essential characteris-tic is the weight: GRP is many times lighter than other stable materials such as steel for example. Nevertheless, many plans to use GRP components in the past got stuck at the start or never came to anything as machining GRP is anything but simple.

However, the customer has risen to the challenge. It developed the first prototypes of

The Facts

Customer profile

The customer is a medium-sized business with almost 100 employees. The company has been developing and producing components using prepreg moulding components for the automobile industry, racing, aviation, shipbuilding, for wind power generators and sporting and leisure products.

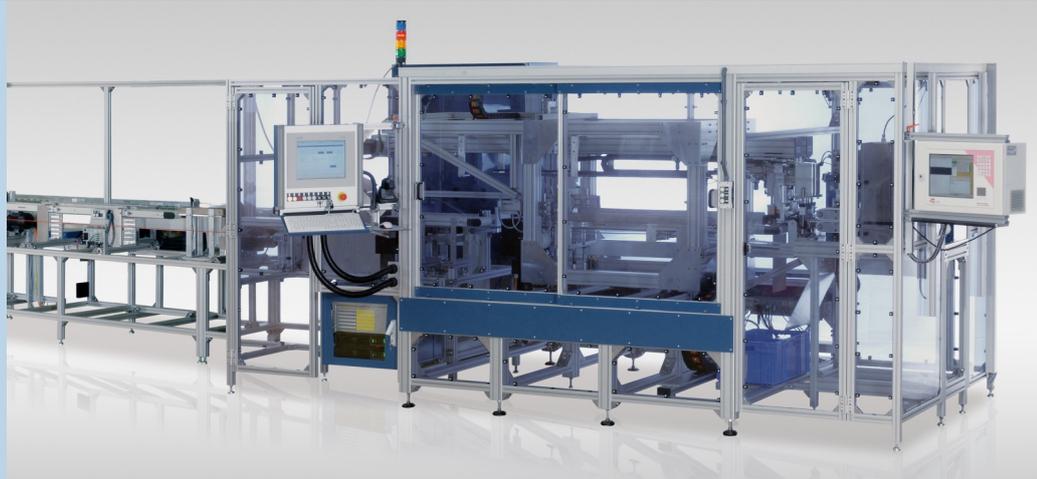
Requirements

As well as numerous technical specifications, there were the following major requirements to be satisfied:

- Air-free cutting and laying of fibreglass reinforced plastic
- Freely programmable length and laying settings for the production of different GFRP leaf springs for individual vehicle types
- Cutting without fraying
- Machining moist, sticky material
- Check and reading out possible material or production faults
- High productivity (1000 pieces / day)

Benefits

It was not possible until the automatic production line from Metzner for our customer to manufacture the GFRP leaf springs in quantities of around 1000 pieces per day and thus effectively function as a supplier for the automobile industry.



a reach spring made of GRP in collaboration with the University of Darmstadt. The reach springs should be installed in commercial vehicles later and replace the five times as heavy steel springs. In order to achieve an optimum result, just under 60 thin GRP layers were cut out manually, placed on top of each other and compressed afterwards. The processing for a single reach spring took about one hour. When a world wide leading automobile manufacturer showed interest in this product, a solution was sought for manufacturing the reach springs in series production. The solution was: an automatic production line from Metzner.

Searching for solutions together

The requirements of our customer were clear. The system must be designed so that the 60 thin GRP layers are laid on top of each other automatically in the correct position in order to guarantee ideal quality later which was, however, a challenge due to the sticky material. The cutting length and the



laying afterwards must be freely programmable in order to be able to produce different springs for various types of vehicle. In order to ensure cutting the fibreglass reinforced plastic without fraying, the shearing method was applied. As safety and quality are the most important for the automobile manufacturer, the material had to be checked for possible errors with a camera system after the machining. Metzner looked for the optimum solution for every requirement jointly with our customer; four months later, the first – of in the meantime three – production systems was successfully delivered.

Technology for the future

Due to the worldwide unique production method of our customer and the system developed for it by Metzner, the GRP reach springs achieve weight savings of up to 500 percent as compared with conventional steel reach springs with an output of just under 1000 GRP reach springs per day.

The GRP reach springs thus provide not only a benefit as concerns safety but also for the environment. The reach springs provide a reduction of the CO2 values due to the low weight. That could be a significant benefit for commercial vehicles in the future because not only the environment but also the respective transport company benefits from the lower energy consumption.