

TRW Airbag Systems GmbH: Clearly mark passenger safety systems with fiber lasers

„We need process reliability“



cab fiber lasers as stand-alone device with burst protection. These systems are used for small series or the spare part production.

Today, passive passenger safety systems as airbags and belt pretensioners are standard in every car. To provide a fluent documentation of all steps of production, their manufacture needs to remain traceable at any time.

This is where robust, maintenance-free fiber lasers are starting to play an important role. The lasers mark the parts non-stop in a quick, reliable and efficient manner.

„At four locations world-wide, we are manufacturing gas generators for airbag systems which undergo further processings

within the TRW company group up to complete steering wheels“, Thomas Reisbeck, Manufacturing Engineer of TRW Airbag Systems GmbH explains. The Aschau site includes the international research and development centre for gas generators. The TRW product portfolio contains gas generators for drivers-, passenger-, knee-, lateral- and head-airbags in pyro-, hybrid- and cold gas variations, as well as pretensioners.

The US Company located in Livonia / Michigan is a leading supplier of active and passive safety systems, added by cognitive safety systems, electronic systems and automotive components. TRW supplies all major automotive companies world-wide. There are around 185 branches comprising more than 60 000 employees, resp. trade partners around the world. In Germany alone there are 11 production sites and seven technology centres. About 10 500 people are employed there.

Replacement in just a few hours

„Even if the pressure on prices is very strong in the automotive industry we have to produce in an excellent quality“, Thomas Reisbeck emphasizes in particular the daily tasks. „Our production lines are running non-stop. No downtimes!“ TRW has already been using lasers for many years to mark the gas generators in the course of complex documentation processes.

Some years ago, the company decided, for some reasons, to invest in new laser technology. „We were looking for a system sophisticated and economic at the same time. In addition, guarantee and service become more and more important“, Thomas Reisbeck reports. „This means, in case of a system's downtime, it must be ensured to get a replacement device in just a few hours to be able to keep production running.“

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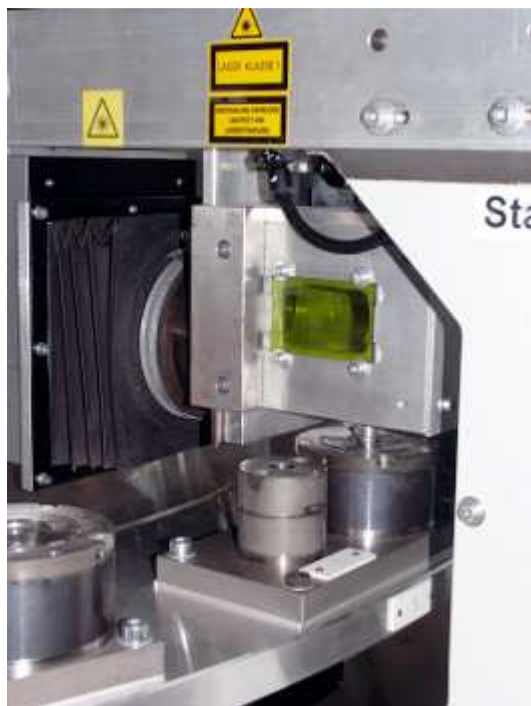


Thomas Reisbeck shows, each gas generator has been marked an identification number and a two-dimensional code by the laser.



cab fiber lasers, fast, economic and safe.

After having tested totally five laser systems, final decision was quickly made towards the diode-pumped Ytterbium fiber lasers FL10 and FL20 supplied by cab Produkttechnik GmbH & Co. KG, Karlsruhe. Currently, seven lasers are used in all. cab is specialized in the identification technology and offers solutions for the integrating the lasers into production lines, safety housings for individual markings, as well as label and type plate marking. The lasers mark on steel, aluminium, various plastics and many other materials with high beam quality and a pulse peak power of 10 W (FL10), respectively 20 W (FL20).



cab laser systems are integrated into all production lines.

The software cablase provides both a multi-lingual user interface as well as a freely programmable COM interface. cablase enables easy input of laser and marking specific data as well as control commands needed for the communication with superior control systems.

The marking laser system consists of a laser source as desktop unit or 19" rack and a fiber-coupled galvo head for beam deflection. The marking head provides to integrate different plano-spherical lenses. The laser sources have integrated air-cooling and are designed modularly. The development of the FL series especially focuses on industrial use. The high focused laser beam provides marking results up to a resolution of 1000 dpi.

15 years documentation security

„As soon as the decision on cab fiber lasers has been made, the cab lasers have been included in our AABs that mean our general implementation provisions. There, it is precisely defined which components the plant manufacturers are allowed to use. Only these types of laser printers have since been used in our assembly lines“, tells Thomas Reisbeck.

Basically, production flow is always the same for all gas generators. The assembly starts by the operator's loading the line with various parts, pushing the start button and is completed by the marking. This is where the laser starts playing the main role. „Each generator out of our assembly gets its own identification number, a unique feature for assigning the parts“, so Thomas Reisbeck. „This number helps us to identify the flow of parts and components in the production.“ Documentation of these data is required for a period of 15 years. This identification number ensures traceability of every single step in production.

Easy data connection

There are five fiber laser systems in the 19" rack integrated in various assembly lines. They are easily mounted and exchanged, if necessary and save lots of space. „Our old water-cooled laser systems are a lot bigger and are placed as single unit next to the production line. And today, place means money“, Thomas Reisbeck makes clear.

Data connection for this application is very easy. The laser is integrated in the production line as a kind of track-and-trace solution. Based on potential-free, digital input- and output signals the laser communicates with the primary control system. The controller helps to start and supervise the marking process. Additionally, there is an interface with safety-relevant contacts available. Basically, the laser can be set up and used for the data base connection, however this is not required. All process data are controlled centrally, but are not read back. "We rely on the laser to mark the correct data", so Thomas Reisbeck. „Although the Data Matrix Code is finally scanned by a camera system, this means a control scan that is not stored.“

Then, the gas generator is internally forwarded for further processing where the code is read again. In case of identification problems documentation of the part can be verified by the help of the number. „Using the two-dimensional code has two major advantages“, Thomas Reisbeck explains. „First, the human factor, meaning a reading error at the data input, is eliminated and bad parts can be separated at any time. So, we are able to compile and guarantee a fluent documentation on every step of the entire supply chain.“



cab fiber lasers in the 19"-Rack save lots of space and are easily integrated into existing plants.



Dieter Kehret (left, cab), Thomas Reisbeck (TRW)

Further fiber lasers in use

"And a fast return on investment is guaranteed as there is process reliability at any time!"

Thomas Reisbeck, Manufacturing Engineering, TRW Airbag Systems GmbH

Besides the laser systems integrated in lines, two other lasers are used as stand-alone devices. These lasers are needed for small quantities or the spare part production. „While the line-integrated lasers only have one task, this changes almost every hour for these systems“, Thomas Reisbeck explains.

The decision for using the fiber lasers was an easy one to make. They ensure high-quality markings of two-dimensional codes on the metallic surface. Even at high ambient temperatures the lasers are operating fast and precise. Small fonts, graphics or logos - everything is marked in correct

position and true to the original. Power output is more than 50.000 hours. The integrated live preview always shows the laser's status. Assemblies can be exchanged easily and quickly. „In fact, the systems are maintenance-free and, in particular, ready to operate at all times,“ Thomas Reisbeck confirms.

And, no consumables are needed. „In the beginning, we thought about using label material,“ so Thomas Reisbeck. „But, problems occurred during handling due to their small size.“ The use of labels involves high follow-up costs. So, durable labels out of polyester are very expensive. Ribbon and printheads, parts which are subject to wear are to be added. The exchange of consumables requires a downtime of the line. „A higher quantity is worth investing in laser technology,“ Thomas Reisbeck concludes. „And a fast return on investment is guaranteed as there is process reliability at any time!“

Dipl. Ing. Dieter Kehret, Sales Manager South, Laser Marking Systems, cab Produkttechnik GmbH & Co. KG, Karlsruhe

- Products: Fiber Laser FL10 / FL20
<http://www.cab.de/marking-laser/fiber-laser-fl10-fl20>
- Any questions? Contact us.
<http://www.cab.de/englisch/innen.cfm?rubrik=70>

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