

## **TRUMPF introduces new concepts for the use of lasers in the automotive manufacturing during EALA**

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The laser's position as a key tool in building automobiles was highlighted at this year's European Automotive Laser Applications (EALA) trade show to be held in Bad Nauheim, February 3–4, 2010. Technology supplier TRUMPF introduced its new concepts for the use of laser in the automotive industry. TRUMPF laser experts gave their insights on the cost-benefits of various lasers for use in automotive production.

### Diode instead of lamp?

Exchange or keep? Many automotive manufacturers are currently asking this question when they consider whether to continue using their lamp-pumped solid-state lasers. These lasers, most of which have an output of 4 kilowatts, have been used for welding, cutting and soldering car bodies for about ten years. "The answer to this question is really very easy," says Rüdiger Brockmann, automotive branch manager at TRUMPF Laser- und Systemtechnik, Ditzingen/Germany. After all, new technologies have become available, including diode-pumped disk lasers and diode lasers that are many times more efficient than lamp-pumped lasers. "While lamp-pumped solid-state lasers demonstrate efficiency factors of only about 3 percent, the TRUMPF TruDisk disk lasers achieve more than 25 percent and the TRUMPF TruDiode diode lasers more than 35 percent," mentioned Brockmann. The possible savings in electricity usage alone are immense and could amount to several tens of thousands of Euros per laser per year for a three-shift operation.

"This cost benefits are also preserved if you include the investment costs for the laser and accessories," he adds. Whether the disk laser or the diode laser is the better technology depends on the needs of the customer. "Disk lasers are somewhat higher in terms of energy costs due to the lower efficiency factor compared to the diode lasers," Brockmann said. However, the disk laser is the more flexible tool because it can be used not only for deep welding and soldering, but also for remote welding and cutting. TRUMPF works closely with its customers to determine which technology will benefit the customer more when replacing their lamp-pumped laser. "Because we are the laser company with the most comprehensive platform when it comes to laser beam sources, we can offer customers the best laser solution for their application," Brockmann emphasized.

### Innovative tube and profile designs reduce component costs

"Less weight, lower costs, better material utilization, fewer parts and a one-piece flow." That is how Klaus Löffler, head of branch management at TRUMPF Laser- und Systemtechnik, Ditzingen/Gemany, described the key benefits of innovative tube and profile design in automotive manufacturing that would not be possible without laser welding and cutting. "That is why the laser should play an important role as a tool in tube and profile design," said Löffler. This design will allow for flange-free structures, that can be manufactured and easily joined together using a interlocked feature. "No special equipment is necessary to accurately join the tubes," he said. In addition, special tube-bending technologies make it possible to reduce the number of parts needed to produce a structure. This saves material costs and even three-dimensional structures are possible using this method. The process chain that is necessary for manufacturing innovative designs begins with tube welding, laser cutting, bending, assembling the tube with interlocked features and laser welding. The finished component is then sent just-in-time to the assembly line. "Due to its standardized production systems, the process chain can also be used for newly designed components without additional tooling," added Löffler. The laser also results in considerable cost savings per component compared to conventional welding methods.

### Optimized laser weld shapes for body-in-white joining: a step further for improved performances

Together with the steel company ArcelorMittal, TRUMPF has investigated the effect of weld seam geometries optimization on the stability of advanced high strength steel based assemblies. Those steel grades are becoming increasingly important in car body construction because they demonstrate better crash properties at reduced weights and thus comply with current

challenges of the automotive industry. As Aurélien Pic from the Automotive Applications Research Center at ArcelorMittal, Montataire/France, has shown, remote laser welding can produce the widest variety of seam geometries – without having to sacrifice production times. Resistance spot welding does not offer this freedom. "That is why the results of the study clearly speak in favor of the laser as an effective complementary welding tool for high-tensile steels. C- or S-shaped geometries produce the best stability for these steels. They are a good complementary design to straight seams which could show weaknesses in some specific solicitation modes", said Aurélien Pic.

#### About TRUMPF

With sales totaling US \$ 2.28 billion (€ 1.66 billion) and about 8,000 employees, the TRUMPF Group ranks among the leading manufacturing companies worldwide. The three following business divisions are combined under the umbrella of a holding company: Machine Tools/Power Tools, Laser Technology/Electronics and Medical Technology. Its core business is machine tools for flexible sheet metal processing for punching and forming, laser processing and bending. In the field of industrial lasers and laser systems, the company is the technological leader in the world market. With about 60 subsidiaries and branch offices, the Group is represented in almost every European country, in North and South America as well as in Asia. Production locations can be found in Germany, Austria, China, Czech Republic, France, Great Britain, Japan, Mexico, Poland, Switzerland and the USA.

For further information about the company, please visit [www.trumpf.com](http://www.trumpf.com)

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