



Bröking-Plastex: A company relies on plastics – in many variants

The Hessian company Bröking-Plastex specializes in the processing of plastics. With its laser systems, it focuses primarily on the assembly of injection moulded components for the automotive industry. For the company's specialty, variant (mass customization) production, a CO₂ laser from ROFIN (now Coherent) is used as the beam source. In addition to cost-effective variant production, this laser also enables the high quality for visible components required by automobile manufacturers.

Front and rear aprons, headlight covers, air filter housings, side panels, radiator grills or sun visors are made of polypropylene, polyurethane, polyethylene, polyamide or polymethyl methacrylate. The list of plastics and their products in automotive engineering is long – about a quarter of all components in passenger cars now consist of a wide variety of plastics. The reasons for this are as varied as the possible applications: considerable weight savings and corrosion resistance compared to metals, greater comfort thanks to better noise absorption, more flexible design options and, of course, lower costs.



Laser-cut front bumper

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As Armin Buchsteiner, Managing Director and co-owner of Bröking-Plastex, moves through the production halls where acrylic glass, polycarbonate and polyester are used for automotive and mechanical engineering, as well as for shop fitting, exhibition stand construction and advertising, he explains, "Our main market is clearly the automotive industry. Years ago, we specialized in large-format components for trucks such, as sun visors, wind deflectors and glazing, and qualified as a TIER-1 supplier for almost all countries worldwide for special components."

The fact that the automotive industry plays an important role is also underlined by the many pallets from well-known automotive suppliers on the company premises for which Bröking-Plastex processes parts. "We call our specialty *Variant Production from Standard Injection Moulded Parts*," explains the 40-year-old industrial engineer, who worked in the automotive industry

before joining his father's company and therefore knows the market well. He explains what he means by this: "Today, for example, there is a much greater variety. Virtually every passenger car model is delivered in manifold variations. Although this only results in a few changes to



The CO₂ Slab laser ensures clean cut edges without burrs



Plastic bumper with trim for a passenger car model

individual assemblies or parts, it always leads to smaller production lot sizes. And this is where we come in. With our focus on variant generation, we save injection moulding manufacturers the investment in dedicated tools and knowledge by using lasers to produce special parts for the various models from standard components. For example, we cut the recesses in front and rear aprons, on which finished trim strips are mounted. Technologically, we are so well positioned that we can meet the high demands of automobile manufacturers."

The Griesheim-based company, which now has 30 employees, does indeed have a considerable array of machinery: in addition to classic thermal processing stations, there are numerous milling and sawing systems as well as a 2D laser cutting station and, for the last few months now, an impressive, linear-driven 5-axis laser cutting system from the plant manufacturer Geiss AG.

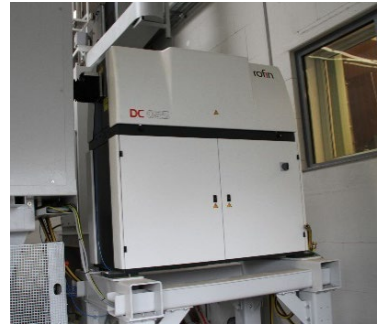


The large working chamber of the tandem system can accommodate large truck components

The tandem system is equipped with a 2.5 kW CO₂ Slab laser from Coherent and can also economically handle smaller batch sizes. Bröking-Plastex can produce everything from batch size 1 - x, but typical batch sizes in one clamping are between 30 and 500 pieces, whereby multiple clamps are used for smaller workpieces in order to make optimum use of the system.

"In 2013, we used a laser in the production of a truck sun visor for the first time," reports Armin Buchsteiner. "The result was so convincing that today we process 50% of all parts with the laser. We operate the new system with the diffusion-cooled CO₂ laser from Coherent, as other laser beam sources and milling produced edges that were too sharp on numerous components," explains Buchsteiner. "This laser, on the other hand, allows easy melting at the leading edge and no large burr at the trailing edge – this eliminates the need for time-consuming post-processing such as deburring, which considerably reduces costs."

In addition, there are some materials in which only the laser, unlike other processes, achieves good results. In the case of acrylic glass, for example, which has been impact-resistant modified with glass fiber, the edges turn blue during punching and white during milling. On the other hand, the plastic color remains beautifully shiny when processed with the laser. Glass fiber reinforced plastics can also be cut with the laser and harmful dust can be avoided. Due to their wavelength of 10.6 μm , CO₂ lasers are the right choice because that wavelength is well absorbed by the material, thus enabling excellent results. A challenge when processing with the laser is the prevention of smoke deposits on the material, but this is easily controlled by the correct processing speed and a powerful extraction system.



The 2.5 kW CO₂ Slab laser delivers good beam quality

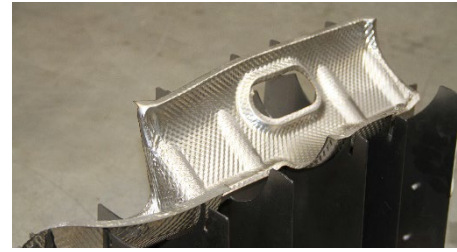


Cutting recesses for distance sensors and decorative strips using CO₂ laser

Buchsteiner praises the good cooperation with the laser manufacturer, who was able to offer a wide range of possible laser beam sources. "The most difficult thing in selecting the right system was to find a way to carry out cutting tests on a 5-axis system," explains the managing director of Bröking-Plastex. "Coherent enabled us to carry out tests in the multidimensional space at the Institute for Joining Technology and Materials Testing in Jena (Germany). Coherent explained the functionality and important process parameters to us in an understandable and comprehensible way – this is how our new plant was developed in close cooperation with the plant manufacturer Geiss."

Thanks to the retrofitting of a protective gas device, shielding plates made of thin sheet can now also be processed in the new plant for prototypes, and small production runs made of thin sheet.

This is the case, for example, with heat protection plates made of thin stainless-steel foil for prototypes or for diesel engine emergency power generators.



"Plastics can be injection moulded into almost any shape required in automotive engineering. Thanks to the laser, we can produce the desired variants quickly and economically from the standard injection moulded parts. In addition, the introduction of laser technology has enabled us to definitely expand our addressable markets, since variant production from standard plastic parts and sheet metal processing would not have been possible without the laser systems," Buchsteiner reveals.

The laser and system are flexible enough to process both plastic and sheet metal parts

At Bröking-Plastex, one thing becomes clear: the trend towards ever greater variant diversity requires specialists who can produce the smallest to large batch sizes flexibly and economically. And Armin Buchsteiner is certain that variant production will not be limited to the automotive industry, but will also play a role in many other areas where visible parts made of injection moulded parts are used.

About the companies

Bröking-Plastex GmbH & Co. KG

Since 1978, Bröking-Plastex has specialized in the processing of plastics and is regarded as a high-performance, flexible and competent supplier to the automotive industry, machine tool, shop and exhibition construction as well as advertising. With distinctive development and project competence, quality and state-of-the-art machinery, the company manufactures everything from single pieces to large series on schedule and according to the specific requirements of its customers.

Geiss AG

The company GEISS offers worldwide complete solutions for the plastics processing and further processing and has been market leader in the sector of thermoforming and plastics processing for years. The range of services includes the design and construction of thermoforming machines, CNC machining centres, horizontal band saws as well as model, tool and mould making for vacuum forming.

Coherent

Coherent is one of the technology leaders in industrial laser material processing and has one of the most comprehensive solution and service portfolios in the market as well as in-depth application knowledge. With its lasers and laser systems, which cover a broad spectrum of technologies, wavelengths and output powers, the company advances the production processes of its customers in numerous core industries worldwide. The company's CO₂ Slab lasers are available in powers from 1 kW - 8 kW for numerous applications.