

LEISTER

LASERSYSTEMS

GLOBO- welding

Laser welding of plastics –
innovative and flexible.

The universal processing concept
for 3D and continuous applications.

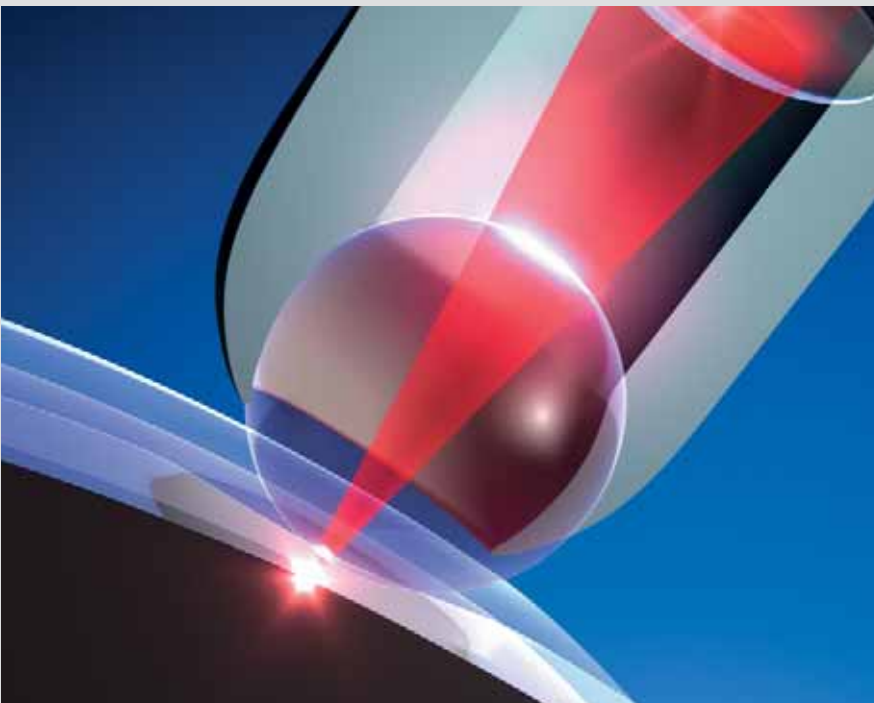
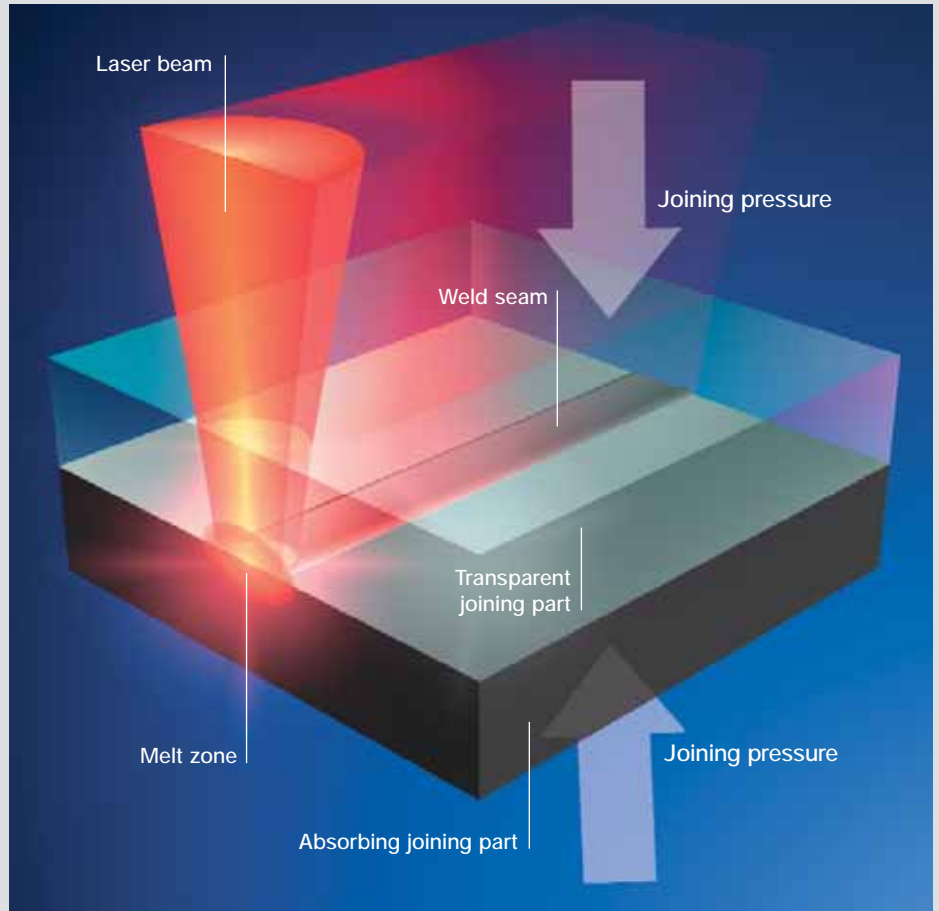


NOVOLAS™

Laser welding concept

In laser welding of thermoplastics, sometimes referred to as «laser transmission welding» or «through transmission IR welding (TTIr)», transparent and absorbing parts are bonded together. The laser beam penetrates the transparent plastic and is converted to heat in the absorbing plastic. Since both parts are pressed together during the welding process, heat is conducted from the absorbing to the transparent plastic, allowing both materials to melt and create a bond. Internal joining pressure is also generated through the local warming and thermal expansion. The internal and external joining pressures ensure strong welding of both parts.

Almost all thermoplastic materials and elastomers can be welded with the laser beam – including ABS, PA, PC, PP, PMMA, PS, PBT, as well as glass fibre reinforced plastics. The strength of the welding seam is comparable with the basic material strength.



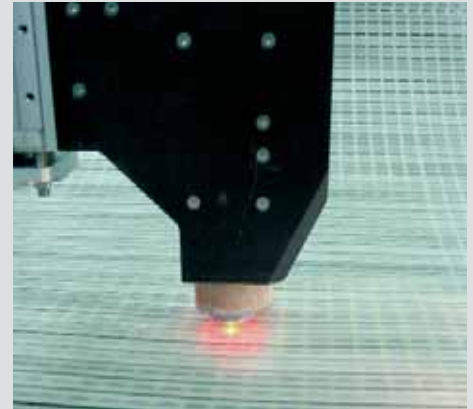
GLOBO welding

GLOBO welding works in the same way as contour welding. A laser beam is focused at a point on the joining plane via a glass sphere, rotating on a friction-free air bearing. The glass sphere not only focuses – it also serves as a mechanical clamping tool. While the sphere rolls on the component, it applies a continuous pressure at the point on the joining plane. This ensures that the laser beam is only incident at the point at which the contact pressure is also applied. The glass sphere replaces the conventional mechanical clamping device and expands the scope of laser welding for both continuous and three-dimensional applications.

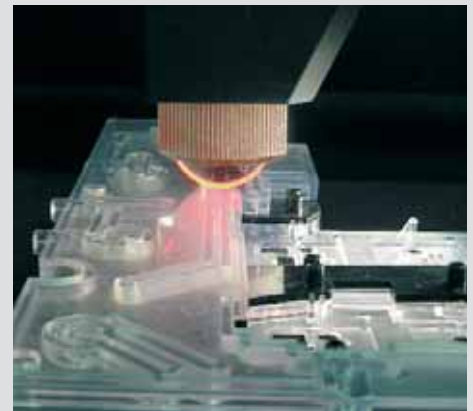
Typical applications

GLOBO welding is versatile in its application. Its areas of application include three-dimensional interior and exterior automobile components, as well as large technical components and continuous applications from the broad field of industrial textiles. Numerous additional applications, including those in medical technologies, are conceivable.

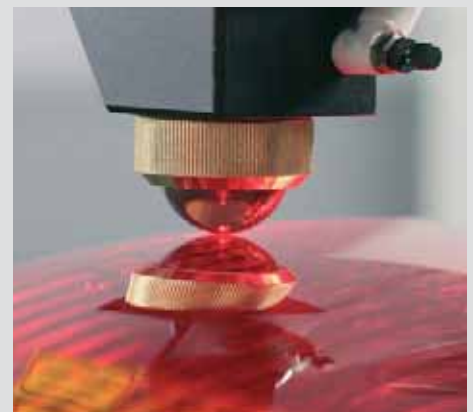
Using conventional methods, clamping pressure cannot be applied for continuous foils and technical textiles. Here GLOBO welding produces perfect synchronization between the laser beam and the clamping pressure.



Large surface complex 2D components require considerable design complexity when using a conventional clamping pressure system. Thanks to the GLOBO head's gap-free contact, high quality welding seams are achieved at significantly lower costs.



Taillights are typical 3D applications from the automotive industry. High quality visually attractive welding seams can be achieved.



Design guidelines

The same rules as to weldable materials that apply for laser plastic welding in general apply also to GLOBO welding. In principle the preparation of the joining zone is simpler than conventional methods due to the omission of complex design elements.

The following points are to be taken into consideration:

- The transparent welding part should have a certain flexibility (e. g. wall thickness ≤ 2.5 mm). This ensures that good clamping pressure is achieved between the welding parts with the pressure of the GLOBO head.
- The joining zone must be vertically accessible for the GLOBO head above the transparent component.
- The joining surfaces should be smooth and free of ejector marks and sink marks.

Laser systems

The GLOBO head can be supplemented with the NOVOLAS Basic AT and NOVOLAS WS laser systems to produce complete production systems. The laser beam is guided through an optical fiber.



Globo head

The GLOBO processing head is the core component for GLOBO welding. It is an integrated optical and contact pressure system equipped with an air bearing glass sphere. The beam diameter may be adapted depending on the application and welding seam width required. A pyrometer may be optionally integrated to deliver a temperature signal, which can be used for process control.

NOVOLAS Basic AT

The NOVOLAS Basic AT series is designed for integration into production lines. It can be easily configured for various requirements, due to its consequent modular design. Almost any welding concept can be realized with the different diode laser and optic modules. The mutually matched components ensure a high degree of process reliability as well as cost-effective production. The use of multiple diode laser and optic modules in one single system (also multiple GLOBO heads) enables an efficient way to increase throughput which also helps reducing costs. The combination of the GLOBO processing head with the NOVOLAS Basic AT laser system and a 6-axis robot for example, provides an extremely high degree of flexibility for 3D applications.



NOVOLAS WS

With the NOVOLAS WS laser system, the customer obtains a complete, turn-key laser welding system. All components required for processing are contained in its central supply unit. It is ready for connecting all options. Those additional components required and useful for the process can therefore be selected. The software provided is designed for the systems and the process. It includes all the required process control and monitoring modules and is designed for the integration of additional options and accessory parts. The NOVOLAS WS laser system is outstandingly well suited for small and medium-sized joining parts. The system is very flexible. This reduces the change over time. Especially for small series the productivity will be increased.

Customer-specific integration

Leister offers customer-specific support for the integration of GLOBO welding technology. This includes advisory services, as well as the development of processes and techniques. The manufacture of prototypes and small series is just part of our daily work.

NOVOLAS™

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