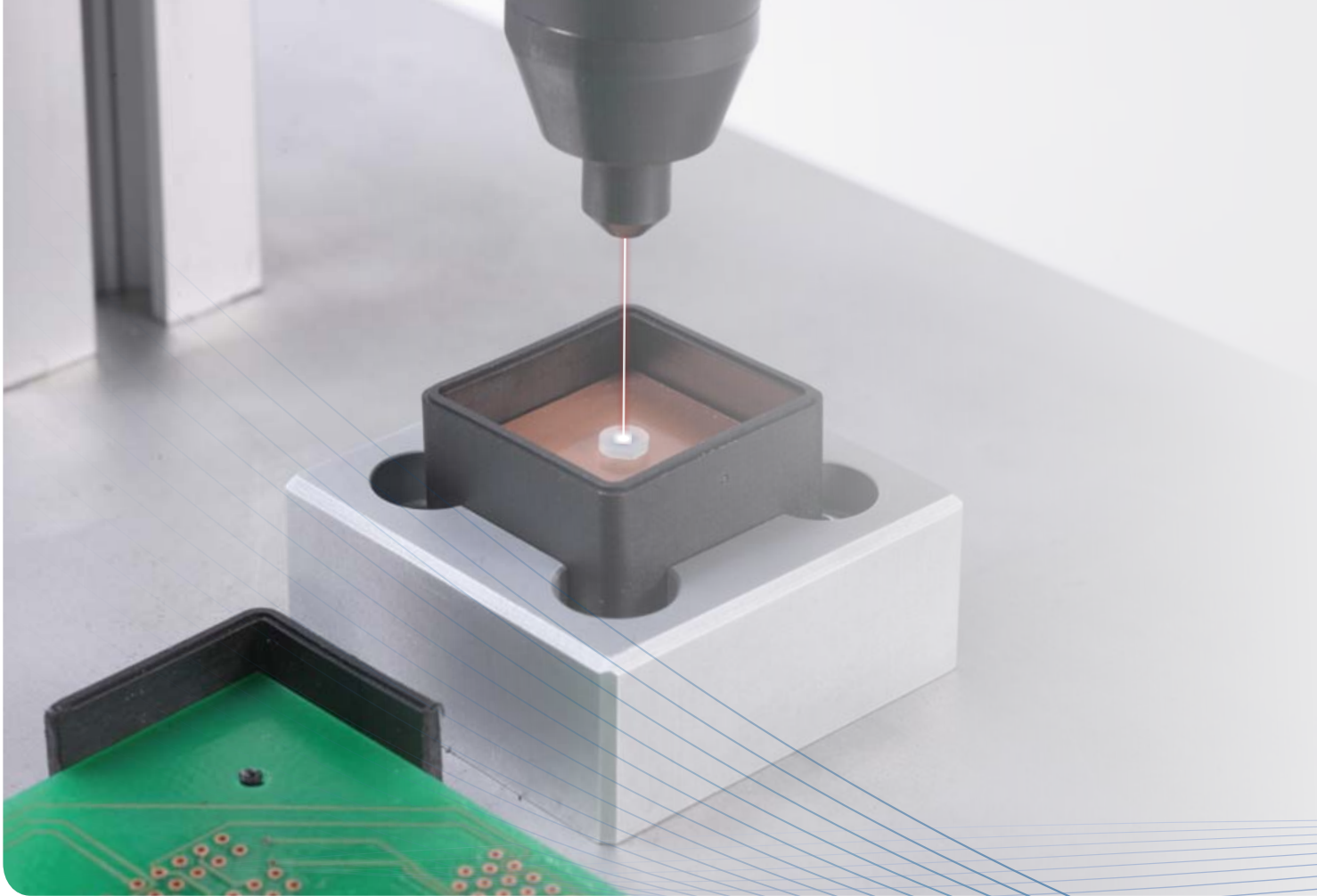


# Laser Staking LPKF LQ-Spot





## LQ-Spot: Laser-supported riveting

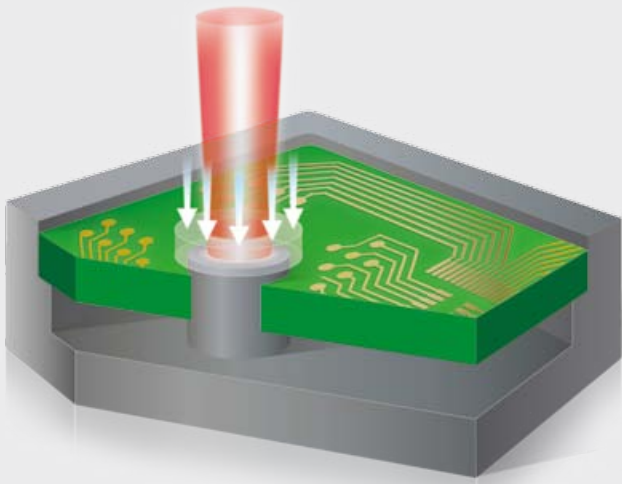
Welding, gluing, screwing together – the LQ-Spot laser hot riveting system is an innovative method for quickly fastening components in plastic housings. It boasts crucial production benefits.

Laser staking is similar to laser plastic welding. It has the typical benefits of this technology, such as low mechanical stress of the parts being joined, a very localized area affected by heat, and high reproducibility.

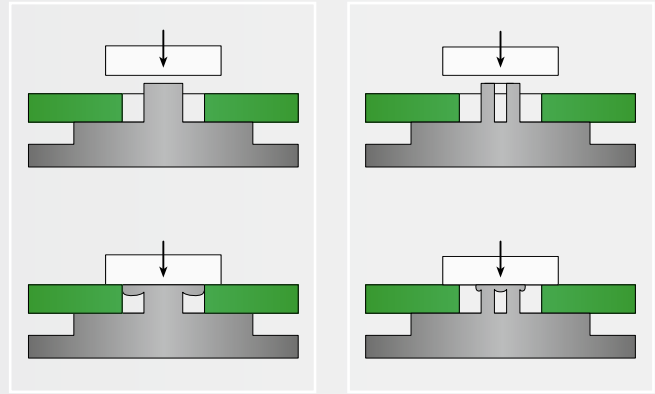
Riveting by heating is actually a tried and tested process. In the case of hot gas or ultrasonic welding, domes are positioned on the injection molded part which stands proud at the centre of a fastening hole in the printed circuit board. After heating, these domes are shaped into a rivet head by a hot stamp. They hold the board in place when the head has hardened.

One of the risks of this process is excess material sticking to the wrong place, which requires extra cleaning during mass production. The direct impact of the process means there is a risk of damaging components located close to the fastening.

Thankfully, this risk does not exist during laser staking: the laser beam penetrates the laser-transparent rivet head and hits the rivet dome - which then melts. Heat is only generated on the inside of the joint. Slight pressure is applied to join the two parts together. The melted plastic in the weld also helps hold the printed circuit board in place.



The laser welding process involves joining a laser-transparent plastic with a laser-absorbent plastic. The laser light passes through the transparent part to hit the surface of the absorbent part almost completely unhindered. The energy of the laser beam



Dome geometries

is converted to heat at this surface, causing the absorbent plastic to melt. Only a moderate amount of pressure has to be applied to guarantee thermal conduction. This melts the laser-transparent part and creates a permanent bond.

### Compact system technology:

- No cleaning required
- No mechanical stress on the components

The LQ-Spot is ideal for quickly and reliably joining together a whole range of materials. The compact machine – hardly bigger than an industrial screwdriver – can be used without any problems at various positions in automatic production processes. The module and process control system include all the necessary components and a 19" insert housing. All the relevant input and output signals are supplied by an external interface.

In addition to fastening printed circuit boards, it can be used for a whole range of applications where different materials need to be safely joined together by riveting, e.g. even for fastening magnets.

- Melt travel monitoring and documentation
- Process documentation at component level
- Precise energy input dosing, regulatable process

Use can be made of almost all thermoplastics suitable for laser welding, e.g. PA, PP, PBT, POM, PC, and PE.

LPKF can optionally feed the riveting materials directly into the production process – making movement of the head unnecessary. This enables the LQ-Spot hot riveting system to be easily integrated into every production line while at the same time ensuring high productivity.

# Service & Support

Innovative laser technologies for more economical production – one of the big strengths of LPKF Laser & Electronics AG. Well trained service staff are available around the world for commissioning and customer care services. An Application Center provides valuable support for feasibility studies and machine concepts. More than just laser systems. LPKF creates customized solutions – working together with its clients.

Technical Data: LPKF LQ-Spot	
<b>Laser power</b>	Diode laser 20 W – 100 W
<b>Laser wavelength</b>	980 nm (other options available)
<b>Voltage</b>	Electrical power supply welding head: 230 V/3 A Electrical power supply oscillating conveyor: 230 V/50 Hz Electrical power supply control system: 110 V/240 V 50 Hz/60 Hz  Power consumption: up to 0.5 kW
<b>Air supply</b>	6 bar dried filtered air (filter fineness <40 µ)
<b>Ambient conditions</b>	Operating temperature: 10 °C – 60 °C (50 °F – 140 °F) Maximum humidity: 80 % at 25 °C (77 °F)
<b>Cooling system</b>	Air cooled
<b>Options</b>	Feeder for rivet top Process data monitoring
<b>Dimensions (W x H x D)</b>	Welding head with laser module: 75 mm x 333 mm x 230 mm (2,5“ x 11“ x 7,5“) 19” chassis: 19” unit with 4 units of height (482 mm x 180 mm x 340 mm) (16“ x 6“ x 11“)
<b>Weight</b>	approx. 15 kg (33 pounds)

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