

Power and technique in harmony
BrightLine Weld:
Perfect welding results in record time

Low-spatter welding with TruDisk solid-state lasers and BrightLine Weld



Minimal spatter and top weld quality

BrightLine Weld enables laser welding almost free of spatter. This results in high-quality welding seams showing neither seam collapse nor end scratches while meeting high strength requirements. There is barely any deformation in the component because of the reduced energy input.

Increased productivity

With BrightLine Weld, you increase your productivity with significantly higher feed rates – and this with unchanged seam quality. You can, for example, increase your feed rate with mild steel by about 300% to 20 m/min.

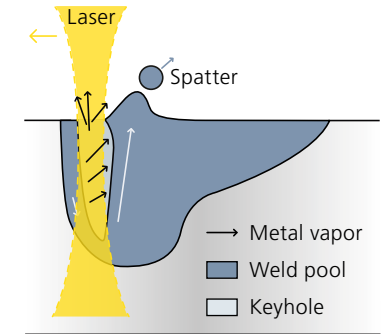
Reduced operating cost

Because of the low spatter formation, there is less dirt on the components, clamping fixtures and optics. You profit from less post-processing of your components, fewer rejects, low machine idle times and a longer protective glass service life.

Welding without BrightLine Weld

Causes of spatter

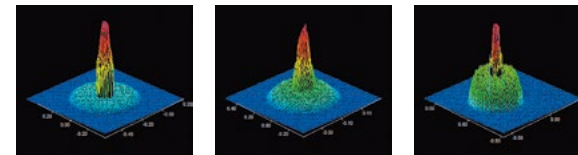
- Metal vapor formed during deep penetration welding flows out of the melt pool, setting it in motion and accelerating it.
- This speeds up the melt at the rear wall of the keyhole towards the upper side of the workpiece.
- With the high acceleration of the melt, spatter particles escape from the rear wall of the keyhole.



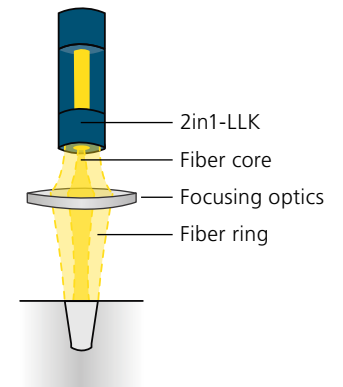
The patented TRUMPF 2-in-1 LLK

Flexibility is the key to success

- Special feature of BrightLine Weld: the use of a 2-in-1 LLK
- Laser power flexibly distributed in fiber core and fiber ring
- Adjustment of the power distribution to the application-specific optimum



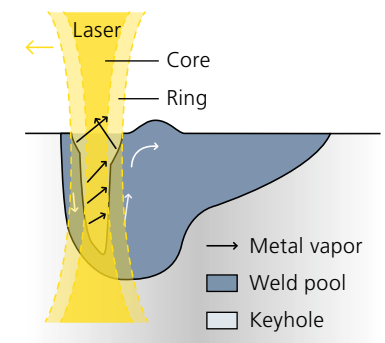
BrightLine Weld intensity distribution in focal plane: Increasing laser power in the fiber ring (left to right figure).



Welding with BrightLine Weld

A convincing result – reduced spatter

- An additional ring-shaped beam is superimposed and enlarges the keyhole opening.
- The metal vapor can escape more easily, and there is less melt at the rear wall of the keyhole.
- The melt accelerating towards the surface is diverted by the ring-shaped beam towards the weld pool.
- Result: no spatter



Flexible use

Different processing modes for maximum application flexibility:

- Welding with 100% laser power in the core fiber
- Welding with 100% laser power in the ring fiber
- Flexible distribution of laser power between core fiber and ring fiber

Modular design

- BrightLine Weld: Standard solid-state laser TruDisk with additional beam guidance and 2in1-LLK
- Retrofit of BrightLine Weld option possible in the field
- Quick and inexpensive qualification for the new welding technology

Plug-in laser light cable (LLK)

- Guarantees a quick and simple change for maximum production reliability

Maximum utilization

- Use of up to 5 outputs with BrightLine Weld possible
- Increased utilization of the laser and reduced part costs
- Increased laser availability thanks to intelligent redundancy concept

Simple programming

BrightLine Weld Basic

- Setting of power distribution in TruControl
- Adjustment range: 10 to 90% share of power in the fiber core at 1% increments



BrightLine Weld Professional

- Contains welding curves for different materials and setups
- Start value recommendations for the optimum power distribution and focus position
- Quick run-in of new welding processes
- Weld even new materials easily



BrightLine Weld is suitable for a variety of materials



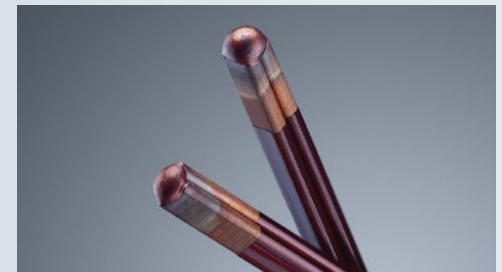
Welding of a battery tray, material: aluminum 6000



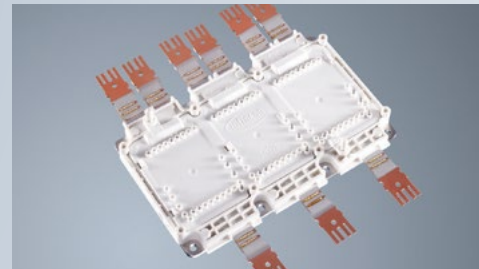
Welding of a gear wheel, material: steel



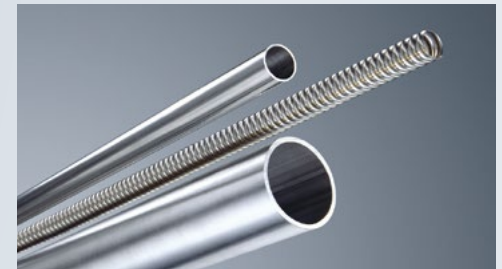
Welding a battery can cap, material: aluminum



Hairpin welding, material: copper



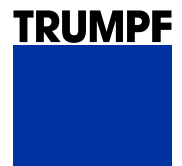
Welding of power electronics, material: copper



Tube and profile welding, material: stainless steel

- Available laser power of TruDisk with BrightLine Weld: 1 kW to 16 kW
- Available fiber diameter (fiber core/fiber ring): 50/200 μm , 100/400 μm , 200/700 μm

TRUMPF is certified to ISO 9001
(Find out more: www.trumpf.com/s/quality)



TRUMPF Laser- und Systemtechnik GmbH
www.trumpf.com