

# Materials processing of metals

WELDING, CUTTING, MARKING OR SURFACE  
TREATMENT WITH LIMO LASER SYSTEMS (MICRO / MACRO)

**LIMO**  
Lissotschenko Mikrooptik

Automotive • Electronics • Semiconductor • Metal-Working Industry • MST

## FAST AND ECONOMICAL

- Applications tests executed at LIMOs Applications Center guarantee optimised process parameters
- Laser spot geometry precisely optimised for the welding job by the use of micro-optics
- Very good access, even to complex 3D-shapes, due to non-contact processing, no complicated handling systems necessary
- Diode lasers with highest brightness and excellent power stability ensure fast processing and very good repeatability in comparison to traditional joining technologies



### Example: Welding disc and rod onto a sphere

Laser system	ILS200-F400-808
Optics	1:1 process-head
Material	stainless steel
Fiber	400 µm, N.A: 0.22
Welding speed (rotation)	20 U/min
Welding time	3.7 s

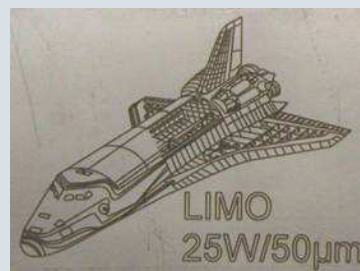


## AESTHETIC AND SAFE

- high-grade visual appearance of the welding seam
- small width and heat affected zone
- no pores or sparks, excellent surface finish
- constant welding quality on the complete contour
- no oxide or heat colours, no rework necessary
- very little distortion at high welding speeds
- sealed welding tracks in line with ISO 6892 1998-03
- non-destructive processing close to sensitive components / sub-assemblies

### Example: Marking stainless steel:

Laser system	Fiber-coupled industrial laser system 25 W integrated with galvanometer scanner
Material	stainless steel 1.4301
Output power	25 W
Marking speed	30 mm/ s
Spot size	180 µm



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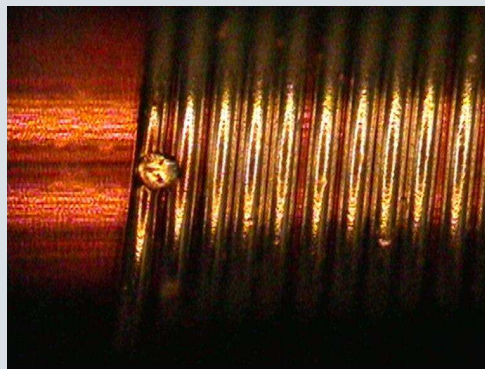
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Test our Applications Center – send us your sample

### Example: Spot-welding of two micro-springs

Laser system	LIMO25-F75-DL976
Optics	1:1 process-head
Material	stainless steel
Fiber	75 $\mu\text{m}$ , N.A: 0.22
Welding time	4 ms
Welding Gas	Noxal (Ar 4.6; 7.5% H <sub>2</sub> )

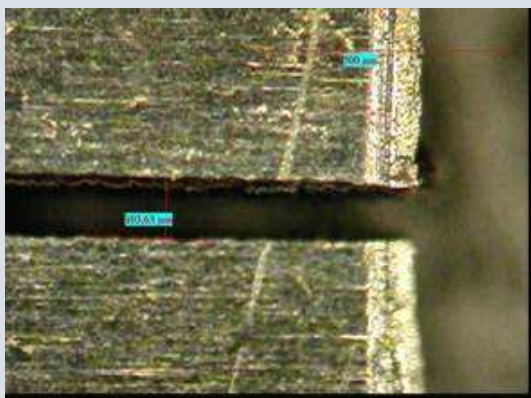


## RELIABLE

- Welding seams reach highest tensile strength according to:
  - transverse tensile test (DIN EN 895 1995-05)
  - longitudinal tensile test (DIN EN 876 1995-10)
  - fracture test (DIN EN 1320 119-12)
  - bend testing of welds (DIN EN 910 1996-05)
- Process stability
- Reproducibility

## SIMPLE

- Process parameters provided by LIMO
- Systems integration and installation service
- Modular design of all components
- No wear parts
- Passive air- or water-cooling, no DI water necessary
- Remote maintenance available
- Flexible delivery of laser beam via optical fiber to poorly accessible places with little space



### Example: Laser fusion-cutting

Laser system	LIMO50-F100-DL980
Optics	1:1 cutting process head
Material	Kovar
Fiber	100 $\mu\text{m}$ , N.A: 0.22
Cutting Speed	1 m/min
Cutting Gas	N <sub>2</sub>

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