

The Laser laboratory

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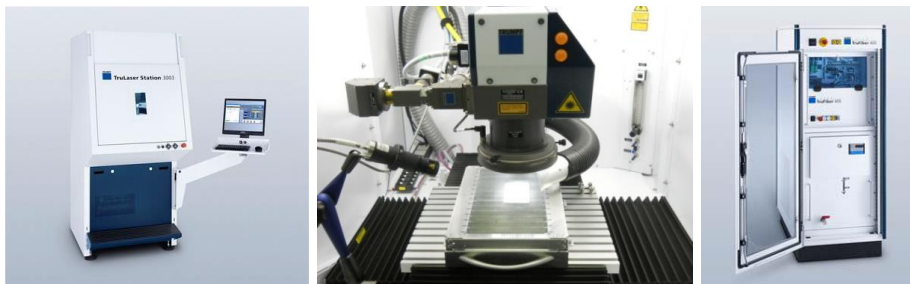
The TRUMPF TruLaser Station 3003 model with a source TruFiber 400 is a laser system to influence the magnetic properties of electrical steels by modification of the domain structure by the method of surface treatment. This is an experimental device for use in the field of materials research, preferably in research of magnetic properties of electrical steels, such as. transformer sheets or dynamo sheets, other possible use is in applications, for example. modification of microstructure and morphology, improving mechanical and friction properties, creating layers on metals and ceramics, or accurate microcutting and microwelding metal / ceramic / plastic.

Main technical data:

- solid-state fiber laser 3-400 W, wavelength 1070 nm
- beam quality $M^2 < 1.1$
- Continuous / pulse modulated laser beam, $f_{\max.} = 50$ kHz with setting pulse shape
- a scanner programmable optical head PFO 20 with high speed motion
- cutting head BEO D35 with cutting gas supply N_2 / O_2
- diameter of the beam at the focus from $17\mu\text{m}$ to $200\mu\text{m}$
- working chamber with Ar shielding gas supply.
- sample size max. W 680 x D 700 x H 500 mm with a weight of max. 25 kg
- stepping movement in the XYZ axes: 300 x 300 x 500 mm
- Rotary axis D = 150 mm for rotationally-symmetrical samples
- IR sensor process (pyrometer) in the range $350-1800^\circ\text{C}$
- CCD camera to capture the process chamber

Applications:

- Laser Scribing for influencing the size of the magnetic domains
- Laser microstructured surface materials
- creating layers on metals and ceramics (Laser Cladding / Sintering)
- alloying materials (Laser alloying)
- accurate microwelding / soldering metal / ceramic / plastic
- accurate microcutting
- precise marking and engraving materials by laser
- quenching / thermal effects on the surfaces of materials



The Laser device TruLaser Station 3003, the laser beam source TruFiber 400