

3mikronTM - High-power, diode pumped laser technology (2 - 3 μm)

3mikronTM is the technology platform for compact, efficient, fast and reliable lasers for a wide range of potential applications in the field of medical engineering. It enables a new generation of innovative mid-IR lasers based on diode-pumped solid-state technology, operating at wavelengths of 2 to 3 μm using different types of laser crystals (e.g. Er:YAG, Er:YSGG, Tm:YAG, Er:YLF).

BENEFITS

Beam Quality

3mikronTM offers high beam quality and accordingly high focusability.

Speed

3mikronTM enables repetition rates up to 2 kHz.

Efficiency and TCO

Because of higher efficiency electricity consumption and cooling demands are reduced drastically compared to flash lamp pumped lasers. Higher efficiency and lack of consumables reduce the TCO drastically in comparison to CO₂ lasers.

Life time and availability

Compared to flash lamps laser diodes are of longer life time. Compared to CO₂ lasers no consumables like laser gas are needed. Both effects involve longer maintenance intervals and thus higher availability.

Compactness

3mikronTM modules are very compact due to their smaller pump sources and cooling systems, leading to laser devices, which are more convenient to use.

Flexibility

The wider range of adjustable laser parameters (pulse energy, pulse duration, repetition rate) offers a high level of flexibility for different applications.

Reliability

3mikronTM modules are maintenance free and allow for robust construction of laser devices.

Process efficiency

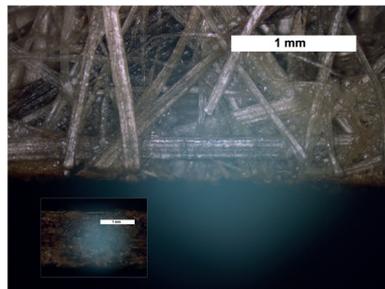
The very good absorption of many organic materials at 3 μm wavelength allows for a very efficient cutting process. The 3 μm technology combines the benefits of CO₂ and solid state lasers.

Potential Applications in organic matter treatment: cutting, perforating, partly scoring

This work was done in cooperation with CHRISTOPH DEININGER, Ingenieurbüro für optische Technologien in Reutlingen, Germany



Cutting of Leather 1.3 mm thick
Speed: 1.0 m / min



Cutting of organic compound 1.5 mm thick
Speed: 1.2 m / min (wood/resin)



Cutting and perforation of wood 0.6 mm
Speed: 7 m / min and 40 m / min

High flexibility: many different materials possible. Leather, wood, compounds ... High cutting quality and speed.

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