

# Plastic cutting applications

**3mikron**<sup>TM</sup>  
Innovative Laser Systems

## 3mikron<sup>TM</sup> - High-power, diode pumped laser technology (2 - 3 $\mu$ m)

3mikron<sup>TM</sup> 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  $\mu$ m using different types of laser crystals (e.g. Er:YAG, Er:YSGG, Tm:YAG, Er:YLF).

### BENEFITS

#### Beam Quality

3mikron<sup>TM</sup> offers high beam quality and accordingly high focusability.

#### Speed

3mikron<sup>TM</sup> 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 CO<sub>2</sub> lasers.

#### Life time and availability

Compared to flash lamps laser diodes are of longer life time. Compared to CO<sub>2</sub> lasers no consumables like laser gas are needed. Both effects involve longer maintenance intervals and thus higher availability.

#### Compactness

3mikron<sup>TM</sup> 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

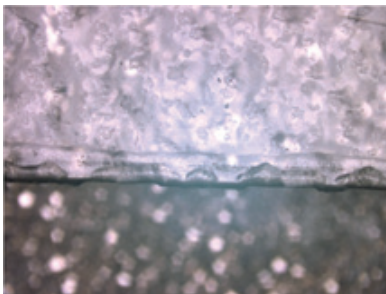
3mikron<sup>TM</sup> modules are maintenance free and allow for robust construction of laser devices.

#### Process efficiency

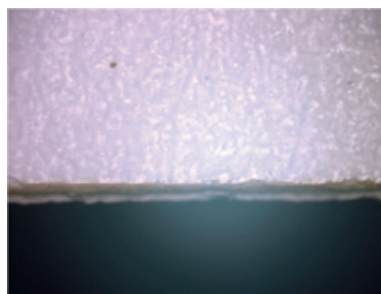
The very good absorption of many plastic materials at 3  $\mu$ m wavelength allows for a very efficient cutting process. The 3  $\mu$ m technology combines the benefits of CO<sub>2</sub> and solid state lasers.

### Potential Applications in plastics treatment: cutting, perforating and in special cases even welding

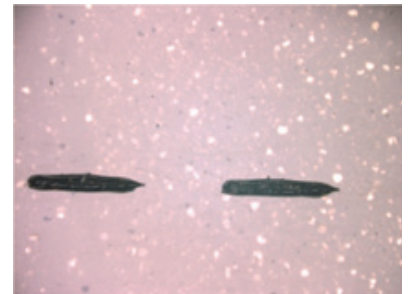
This work was done in cooperation with CHRISTOPH DEININGER, Ingenieurbüro für optische Technologien in Reutlingen, Germany



Cutting of PP  
Speed: 10 m / min



Cutting of PE low density  
Speed: 8 m / min



Long hole perforation of PEN  
Speed: 20 m / min

High flexibility: many different materials possible. PP, PE, PEN, PET, antistatics, etc. High cutting quality and speed.



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**Pantec Medical Laser** strives for innovative solutions in the field of minimal-invasive laser based medical engineering. As exclusive supplier of unique laser technologies - 3mikron<sup>TM</sup> and fam<sup>TM</sup> - Pantec Medical Laser provides customized solutions from laser unit to complete application devices. Pantec Medical Laser is a business unit of Pantec Engineering AG.

**Pantec Engineering AG** provides solutions in automation and mechatronics for the mechanical engineering and medical device industries worldwide. Through its rigorous focus on niche strategies and high degree of service orientation, the company has become a world leader in its five primary markets.

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