Dental Laser
Mid-IR DPSSL Module

3 m.i.k.r.o.n.™
Innovative Laser Systems

HIGHLIGHTS

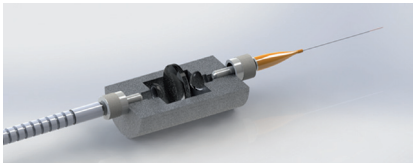
- **Perfect for replacement of flashlamp pumped lasers**
- **Design of small and convenient lasers systems possible**
- **Faster healing and minor thermal damage**

TECHNICAL SPECIFICATIONS

Optical Parameters	**High Power**
Wavelength	2940 nm
Average Output Power (max)	20 W
Pulse Energy (Laser energy)	450 mJ
Pulse Repetition Rate	up to 2 kHz
Pulse Duration	1 µs to 1 ms
Average Current (max)	25 A
Mode of Operation	Pulsed
Beam Quality	$M^2 < 20$
Efficieny (optical-optical)	~ 10 %
Divergence (half angle)	< 25 mrad
Beam Diameter	1.6 mm
Beam Shape (focus)	top hat like
Cooling Requirements	
Coolant	Distilled Water with Algaecide and Corrosion Inhibitor
Coolant Temperature	20 to 25 °C
Coolant Flow Rate	> 5 lpm
Coolant Pressure	(2 - 5) bar
Required Cooling Power	≥ 540 W @ 25 °C Environment Temperature
Mechanical Dimensions	
W x D x H	120 x 96 x 75 mm
Emission Height	47.5 mm
Weight	1.5 kg

. Max. average output power from 2 W up to 40 W
. Ideal for fiber coupling into ~ 200 µm
. Pulse energy up to 300 mJ
. Repetition rates up to 2 kHz
. Optical design
. Contract development & manufacturing

Example for fiber:
. SMA Connector
. Quartz fibre with fibre tip length of 40 mm (autoclavable)
. Minimal core diameter of delivery fibre: 150 µm and NA = 0.2 ± 0.02



pantec
medical laser

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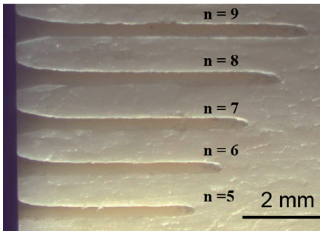
Medical Applications & Benefits

Ideal for soft and hard tissue treatments, Oral and Maxillofacial Surgery

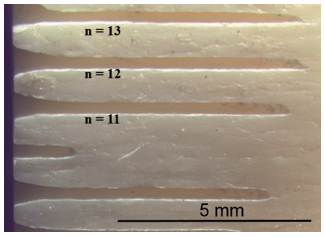
APPLICATION BENEFITS

. Precise treatments (cutting width ‹ 100 µm)
. Controllable thermal impact by laser parameters
. Cold ablation (cut like a scalpel)
. Hot ablation (coagulation) by stacked pulses
. Selective ablation
. Maintains healthy tooth structure
. Peridontal treatment
. Minor lateral thermal damage
. No unwanted vibrations to the patient
. Short operation time
. Faster healing
. Optimized for soft and hard tissue treatment

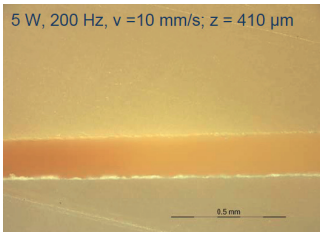
No more dentophobia, painless treatments, no drilling, less injections and narcotics, maintains healthy tooth structure



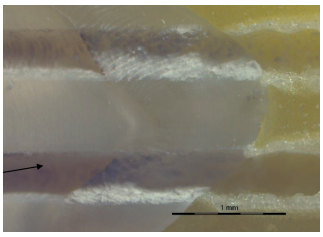
Bone ablation

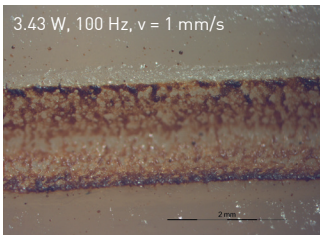


Bone ablation

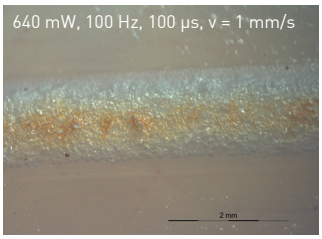


Tooth (Dentin), with waterspray

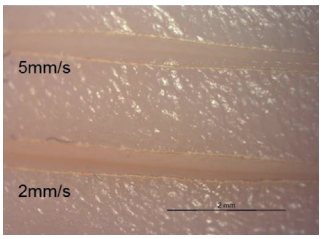

Tooth (Enamel), with waterspray



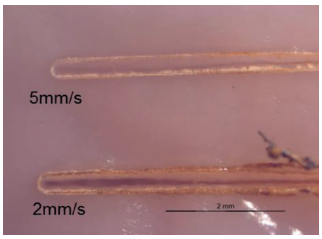
Soft Tissue, Coagulation



Soft Tissue, Coagulation



Porcine mucosa
2.17 W, 300 Hz, 250 µs



Porcine mucosa
1.4 W, 300 Hz, 250 µs

RESULTS

. Smooth and homogeneous cuts with slight carbonization on the cut border (in case of the fiber tip) --› good ablation

. High cutting depth: › 6 mm

. Thermal impact controllable by laser parameters and cutting speed

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