

High Power Diode Lasers and Fiber Coupled Modules

Lumics

Lumics GmbH
Schwarze-Pumpe-Weg 16
12681 Berlin
Germany



Laser  made
 in
 Germany

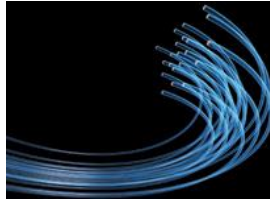
Member of 



Medical & Health



Material Processing



Pumping & Seeding



Analysis



Sensing & Security



Communications

Content



- **Introduction and Company Presentation**
- **High Power Diode Laser Market & Technology**
- **Examples of Applications**
- **Lumics Laser Diode Products**

We manufacture diode lasers.

Member of **B I G**

Key Facts

Member of Berlin.Industrial.Group B.I.G. / Berlin

Founded: 11 / 2000 as a private company

Ownership: Privately held

Headquarters: Berlin, Germany

Employees: > 250

Turnover: > 45 Mio.€

Average growth: 20 % / year

R&D quota: 20 %

R&D staff: 22 %



We manufacture diode lasers.

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Lumics Facilities



Laser Diode Passivation

- **Newly built state-of-the-art facility**
- **ISO 9001:2015 certified**
- **Telcordia qualified**
- **Laser diode chip/module production lines**
- **>1000 sqm facility space, thereof**
- **50 sqm ISO4 clean room**
- **200 sqm ISO5 clean room**
- **250 sqm ISO6 clean room**
- **Additional 100 sqm already planned for 2021**



Die Bonding

We manufacture diode lasers.

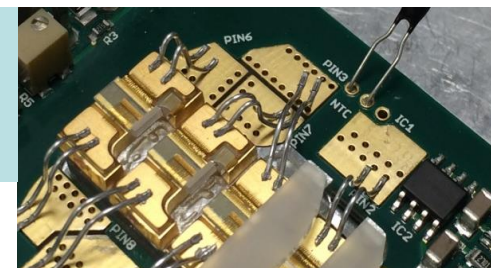
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Lumics Capabilities

- **Laser diode capacity:** >2000 per month
- **Multi chip fiber coupled:** 200 per month / per shift



Burn-in Racks



Glue / Wire Bonding

7xx/8xx nm:

- **Single mode up 0.4W**
- **Broad area lasers diode up 21W**

9xx/10xx nm:

- **Single mode up 1W**
- **Broad area lasers diode up 24W**

14xxx nm:

- **Broad area lasers diode up 7W**

19xxx nm:

- **Broad area lasers diode up 2.3W**

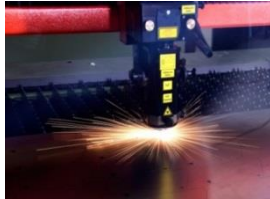
We manufacture diode lasers.

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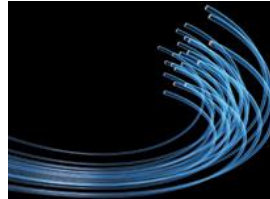




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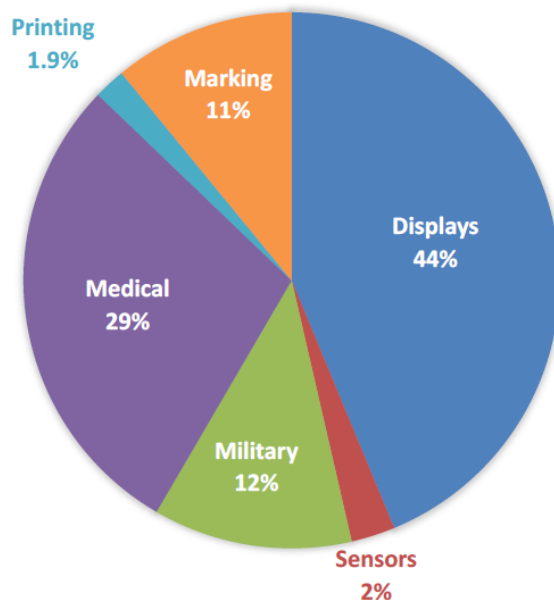


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High-Power Laser Diode Revenue Split by Application in 2017



Source: Strategies Unlimited

Lumics' Main Focus

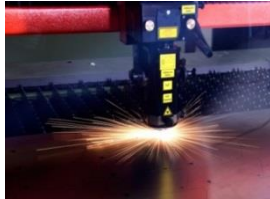
- **Strategic Market #1: Medical**
(LuOcean series)
>70% of Lumics' Business is Medical !
- Micro Material Processing
(LuOcean series)
- Sensing/Analytical/Seeding
(BTF14 & TO220 series)
- The potential laser diode market for Lumics products was >\$425 Mio US\$ in 2017 and is expected to grow by >10% p.a.
- Direct diode lasers will win in all applications for which they are bright enough (cosmetic, surgery, sensing, soldering, illumination, aerospace, etc.)

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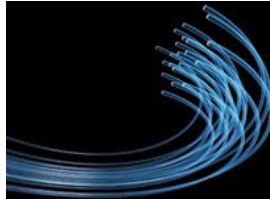
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Benefits of Diode Lasers for Medical Applications:



- No bleeding, minimal swelling, minimal or no scars
- Minimal or no need for anesthesia
- Significantly reduced or non-existent post-surgical pain
- Cost-effective concentrated light energy for ultra-precise results
- Significantly less tissue removal for improved post-operative performance
- Adjustable power allows multiple treatments with same module (e.g. cutting + coagulation)



We manufacture diode lasers.

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Examples of Applications:

Varicose Vein Treatment, Vascular Lesions, Pigmented Lesions, Hair Removal, Wrinkle Removal, Acne Treatment, Laser Skin Resurfacing, Dental Surgery, ENT, General Surgery, Urology, Liposuction, Body Contouring, Therapy Lasers, and many more...

Example Aesthetic: Acne Treatment



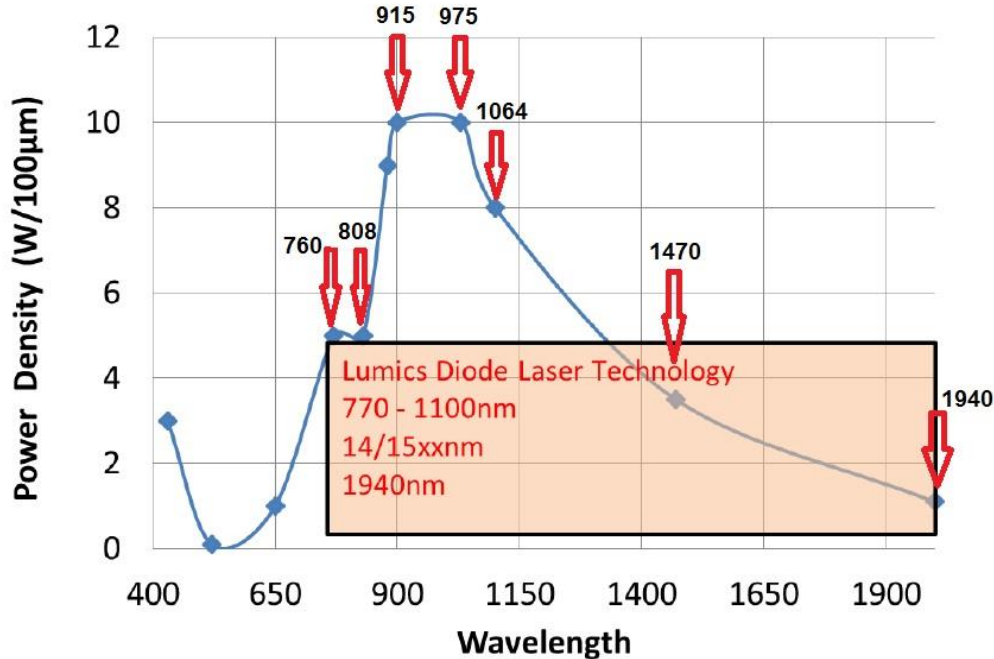
Example Surgery: Benign Prostatic Hyperplasia (BPH)



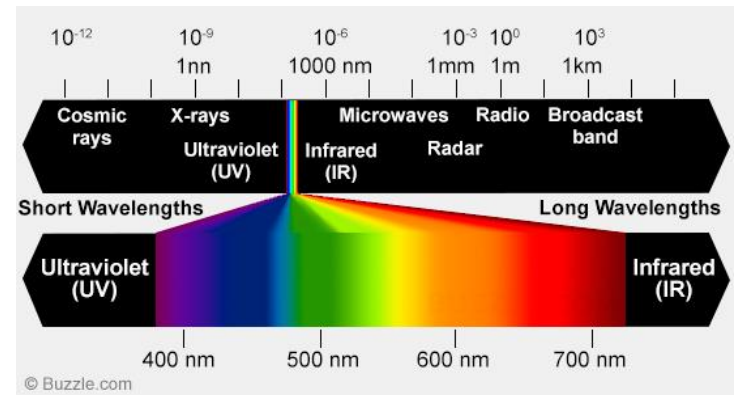
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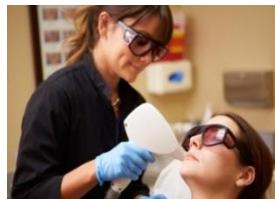
Power Level = Power Density of Multi Mode Laser Diodes:



- Highest power at 9xxnm + 10xxnm
- Green very difficult
- Direct yellow unavailable
- Blue power significant only at ~450nm
- Above 2μm very low power



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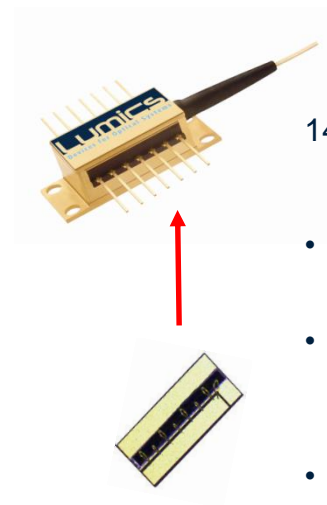
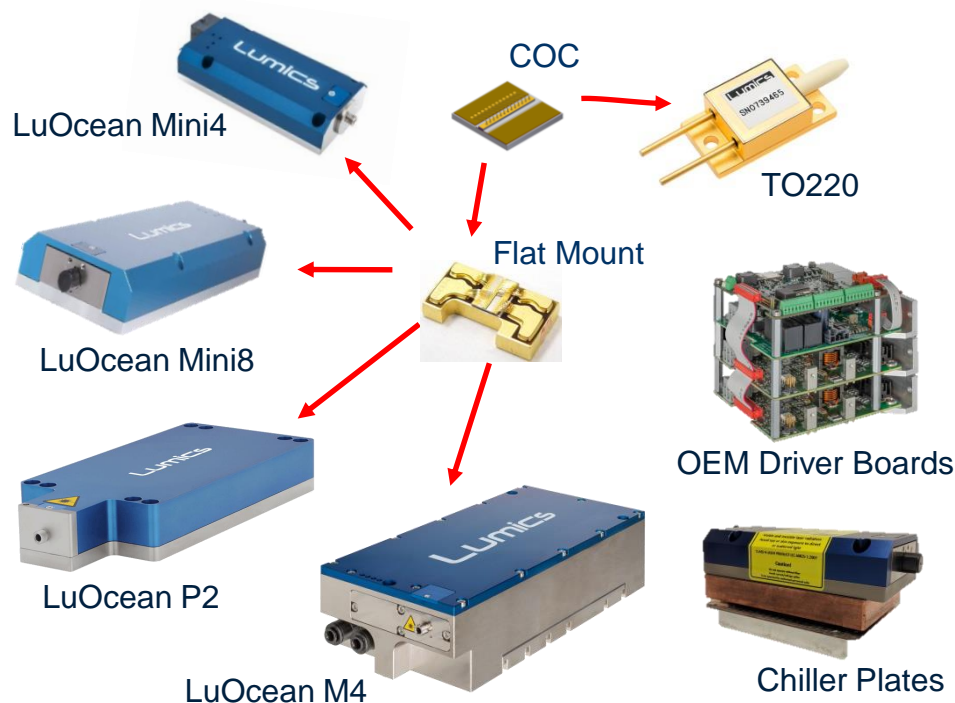
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14pin Butterfly Modules

- Seed lasers for fiber lasers
- Special wavelength lasers for sensing and communication
- Telecom pump lasers

Multi-Mode and Turnkey Solutions

Single Mode

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Start designing!

Add your pilot beam of choice

- red or green
- fixed or adjustable intensity

Select more options

- choose preferred temperature sensor
- add fiber detection sensor

Add more accessories

- heat management
- driver solutions
- fibers

Choose your specific

- wavelength(s)
- power(s)
- fiber core diameter

Add your power monitor of choice

- voltage signal
- current signal

Add additional protection

- user-changeable exit window

Ask Lumics to build and set the stage for your device!

LuOcean™ Series

Unmatched Choice of Configurations

- Combine any two or three wavelengths of choice
- Total flexibility for selection of accessories to ideally match customer's specific requirements
- Ultimate performance/cost ratio

We manufacture diode lasers.

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