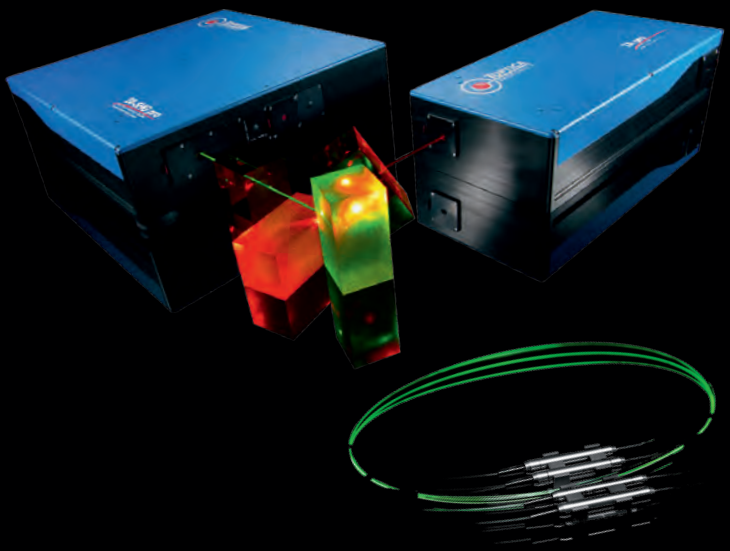
TOPTICA PHOTONICS



All Wavelengths.

190 nm - 0.1 THz

Founded
1998

Employees
300

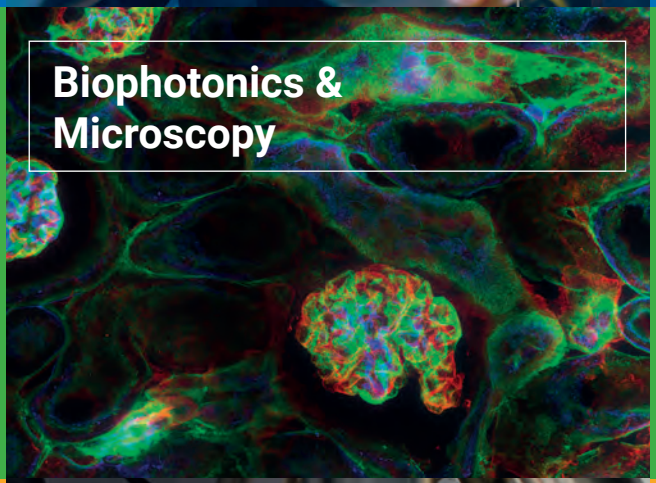
Revenues (TOPTICA Group)
65 Mio €
75 Mio $

Locations
Munich
Berlin
Farmington, NY
Boulder, CO
Tokyo
Shanghai
Beijing

Presidents
Dr. Wilhelm Kaenders
Dr. Thomas Renner
Dr. Thomas Weber

Legal Form
Aktiengesellschaft (AG)
privately owned

Key Technologies
Single Mode & Single Frequency Lasers
Tunable Diode Lasers
Ultrafast Fiber Lasers
Terahertz Systems
Frequency Combs



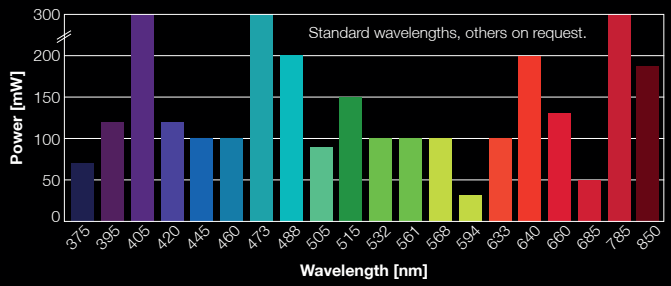
SINGLE MODE & SINGLE FREQUENCY LASERS

IDEAL FOR

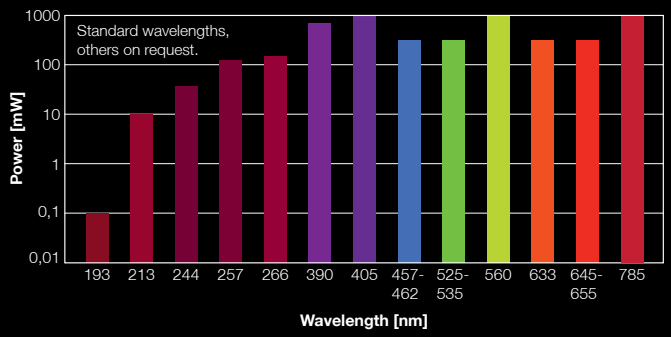
Confocal Microscopy
TIRF, STORM, SIM, SD, SPIM
Flow Cytometry
Metrology
Semicon Inspection
Microlithography
Holography/AR/VR
Interferometry
Raman Microscopy

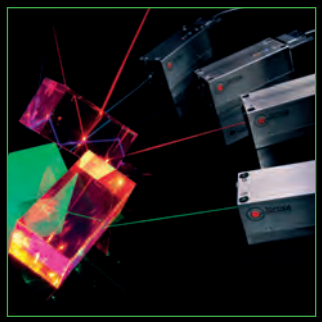
TOPTICA's single-mode diode lasers come with diffraction limited **TEM_{00}** output and reliable spectral properties, as well as optional **robust fiber coupling**. Compact design and low power consumption make them superior to inefficient gas lasers. **Multi laser engines** seamlessly integrate several wavelengths into true one-box laser systems.

Single Mode Lasers (TEM_{00})



Single Frequency Lasers (> 100 m coherence length, TEM_{00})



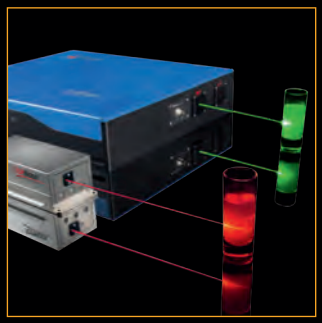


iBeam smart

- Single mode, TEM_{00}
- 375 nm .. 1060 nm
- Up to 300 mW
- CW .. 250 MHz dig. Mod.
- FINE - Noise reduction

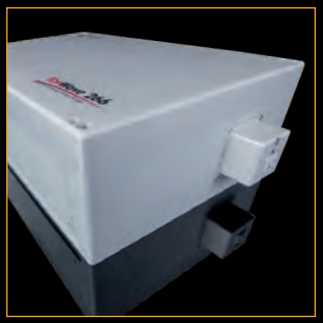
iChrome CLE, MLE, FLE

- Up to 7 colors from one box
- 405 nm .. 640 nm
- Up to 100 mW per color
- One or two SM/PM fiber(s)
- $COOL^{AC}$ automatic alignment



Coherent RGB Lasers

- Single frequency, TEM_{00}
- 405 nm .. 785 nm
- Up to 1000 mW
- > 100 m coherence
- Ideal gas laser replacement



Deep UV Lasers

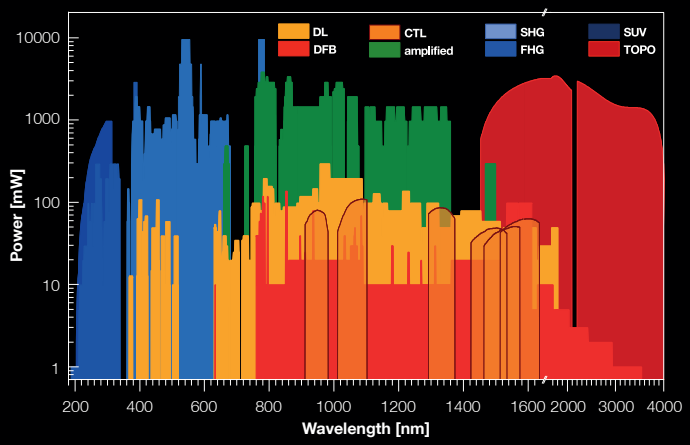
- Single frequency, TEM_{00}
- 193, 213, 257, 266 nm
- Up to 300 mW
- Pure cw operation
- Superior Lifetime

TUNABLE DIODE LASERS

IDEAL FOR

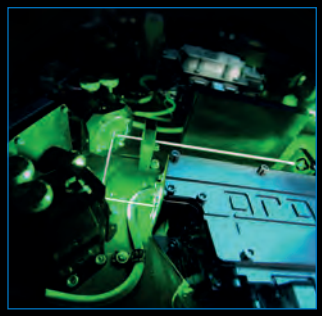
Quantum Sensing & Metrology
Quantum Computing
Quantum Simulation
Quantum Communication
Laser Cooling & Trapping
Rydberg Excitation
Quantum Dots & Microcavities
Spectroscopy
LIDAR Seeding
Astronomy & Geology

Narrow linewidth, extremely low noise and great **ease of use** are the key attributes of TOPTICA's tunable diode lasers. They are available with wavelengths ranging from the **deep UV to the mid IR** (< 190 nm - 4000 nm), which is the widest spectral coverage on the market. All of TOPTICA's tunable diode lasers are driven by the same, **all-digital** platform: One controller for all wavelengths. It combines the best performance with convenient and intuitive local and remote operation. TOPTICA's portfolio for cutting-edge research and applications is complemented by a broad range of intelligent locking solutions for frequency stabilization to external references. Everything from one source.



Direct Diode Lasers

- ECDL and DFB lasers from 369 nm .. 3500 nm
- Amplified diode lasers up to 4000 mW
- Mode-hop-free tuning up to 120 nm
- Linewidth down to < 10 kHz



Frequency-Converted Lasers

- Automatic optimization and stabilization
- 190 nm .. 4000 nm
- 40 GHz mode-hop-free tuning
- Up to 2000 mW
- Linewidth < 1 MHz

Rack-Integrated Systems

- 19-inch-standard subracks
- Compact and transportable
- Fiber-coupled ECDL and DFB lasers
- Drawer slide design enables quick access

Guide Star Laser

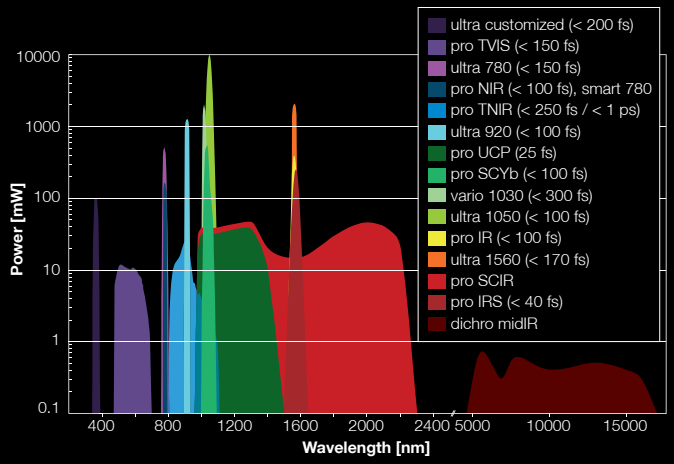
- 589 nm
- Up to 22 W
- Repumper included
- Linewidth < 5 MHz
- RMS wavefront < 25 nm
- Power consumption 700 W

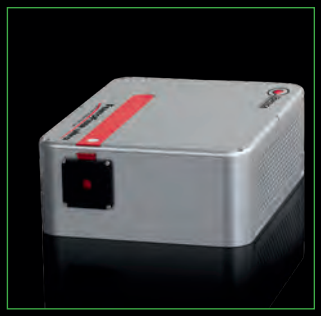
ULTRAFAST FIBER LASERS

IDEAL FOR

Nonlinear Optics and Microscopy
Multi-photon Microscopy
Broadband Spectroscopy
Time-resolved Spectroscopy
Pump-probe Spectroscopy
Material Inspection
Material Processing
Terahertz Spectroscopy
Two-photon Polymerization

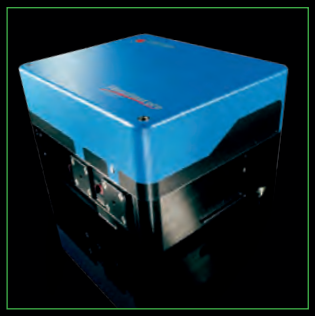
TOPTICA's **femtosecond** and **picosecond fiber lasers** combine robust fiber-laser technology with outstanding laser engineering to provide easy-to-use and turn-key laser engines that are tailored to a diverse array of applications. Based on a modular design concept, TOPTICA's portfolio of Ytterbium-doped and Erbium-doped fiber lasers ranges from low-power **seed oscillators** for OEM integrators, to **complete laser solutions** for state-of-the-art research applications, to **high-power laser systems** for applications in material processing. Using sophisticated methods, TOPTICA is capable of offering laser engines for All Wavelengths, covering the UV to infrared spectral range.





FemtoFiber ultra

- 780, 920, 1050, 1560 nm
- Up to 10 Watt
- Down to 100 fs
- 80 MHz
- All air-cooled

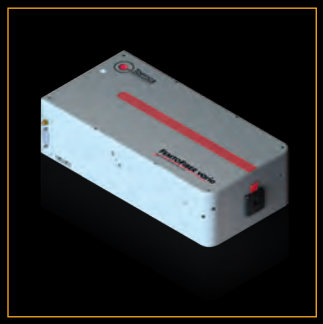


FemtoFiber pro/dichro

- Reliable mode-locking
- 390 nm .. 15000 nm
- Up to 350 mW
- Down to 25 fs
- Custom-tailored configurations

FemtoFiber smart

- 1030, 1064, 1550, 1950 nm
- Up to 50 mW
- 400 fs, 800 fs, 6 ps
- 20, 30, 100 MHz
- Cost effective



FemtoFiber vario

- 1030 nm
- 2 µJ
- < 300 fs
- 1 MHz down to single pulse
- Variable laser characteristics

FREQUENCY COMBS

IDEAL FOR
Laser Reference
Optical Clocks
High-resolution Spectroscopy
Microwave Generation

TOPTICA's Difference Frequency Comb (DFC) is a **compact, robust, high-end** solution featuring turn-key operation in a 19-inch format. All driving and locking electronics for RF references are integrated into the robust 19-inch housing of the Erbium-fiber-based frequency comb DFC CORE. It features 4 or optionally 8 intrinsically carrier envelop offset-free (f_{CEO}=0) outputs at 1560 nm which can be equipped with wavelength extension modules (DFC EXT) converting the comb light to any wavelength between 420 nm and 2200 nm.
With its intrinsic stability and ease of use the DFC is the number one choice for anyone looking for high-end performance combined with a high level of robustness.

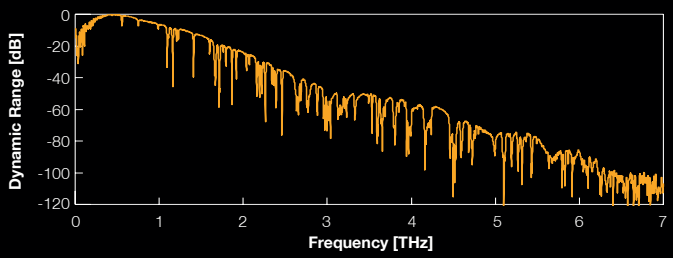
DFC CORE+
- Compact high-performance frequency comb
- Turn-key operation
- Intrinsically stable
- Ultra-low phase noise
- Highest stability

DFC SDL
- Frequency-comb-stabilized laser systems
- All from one single source
- Designed to work together
- Convenient user interface
- Ready to work from day one

TERAHERTZ SYSTEMS

IDEAL FOR
Terahertz Spectroscopy
Non-destructive Testing
Layer Thickness Measurements
Material Research

TOPTICA has become one of the most successful suppliers of terahertz technologies worldwide. The portfolio includes continuous-wave systems with **outstanding frequency resolution**, as well as **versatile time-domain** instruments with ultrabroad bandwidth and unprecedented measurement speed.



TeraScan
- Frequency-domain THz system
- Up to 3 THz, peak dynamic range > 90 dB
- Frequency resolution < 10 MHz
- Ideal for high-resolution spectroscopy

TeraFlash pro/smart
- Time-domain THz systems
- TF pro: Up to 6 THz, > 90 dB
- TF smart: 1600 pulse traces per second
- Robust, high-performance systems ready for industrial use

TOPTICA Worldwide

Australia & New Zealand
Lastek Pty. Ltd.
www.lastek.com.au

France
Opton Laser International
www.optonlaser.com

India
Simco Global Technology & Systems Ltd.
www.simco-groups.com

Israel
Lahat Technologies Ltd.
www.lahat.com

Russia
EuroLase Ltd.
www.eurolase.ru

Singapore & Malaysia & Thailand
Precision Technologies Pte Ltd
www.pretech.com.sg

South Korea
JINSUNG INSTRUMENTS, INC.
www.jinsunginst.com

Spain
Delta Optics
www.deltaoptics.es

Taiwan
Luxton Inc.
www.luxton.com.tw

United Kingdom & Ireland
TOPTICA Photonics UK
www.toptica.com

BR-at-a-glance-2019-06

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