

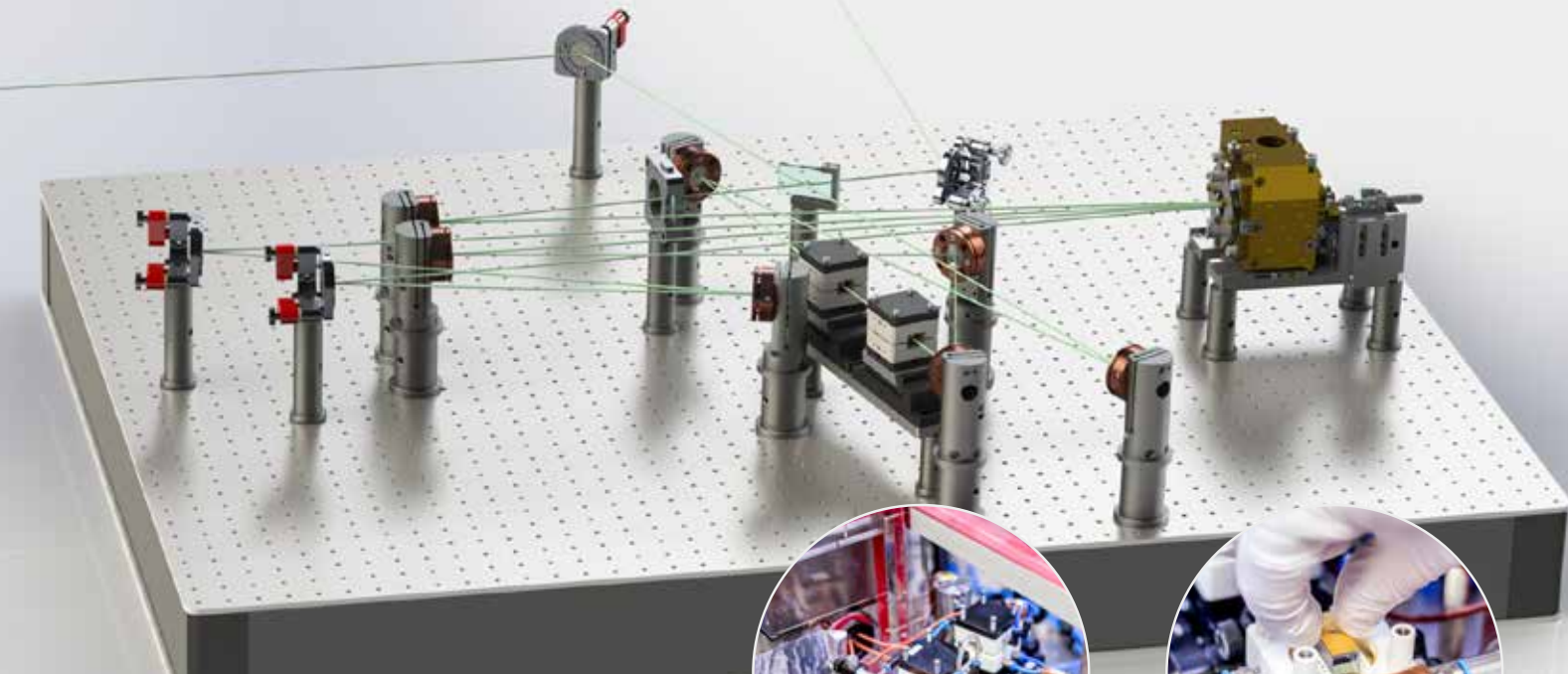


SUPERLASERS FOR THE REAL WORLD

## 500 W COMPACT PICOSECOND LASER

The high-repetition-rate picosecond laser system PERLA is based on the Yb:YAG thin-disk laser technology, offering an optimum combination of high average power and nearly diffraction-limited beam quality at picosecond pulse duration. Such laser source is an indispensable tool mainly in advanced material processing applications (drilling, cutting or surface microstructuring of various materials).

The average output power of our laser system can be specified according to customer's needs up to 500 W and pulse repetition rate can be adjusted in range from 50 kHz to 800 kHz. Pulse duration is shorter than 2 ps, longer pulses are available upon request. The operational wavelength of the laser is 1030 nm and output conversion to second, third, fourth, and fifth harmonics (515 nm, 343.3 nm, 257.5 nm, and 206 nm) is also available.



DETAIL OF THE MAIN  
AMPLIFIER CAVITY



POCKELS CELL IN THE  
MAIN AMPLIFIER

## FEATURES / ADVANTAGES

- Small footprint (area < 1 m<sup>2</sup>)
- High beam quality
- Adjustable repetition rate
- Compact chirped volume Bragg grating compressor
- Optional wavelengths: 515 nm, 343 nm, 258 nm, 206 nm

## SPECIFICATIONS

- Fundamental wavelength 1030 nm
- Average power up to 500 W
- Pulse energy up to 10 mJ
- Repetition rate from 50 kHz to 800 kHz
- M<sup>2</sup> < 1.5
- Pulse duration < 2 ps
- Energy stability < 1.5% RMS

## APPLICATIONS

- Drilling and cutting of composites, ceramics, plastics, metals, and alloys
- Surface microstructuring
- Pump source for mid-IR optical parametric amplifiers (OPAs)

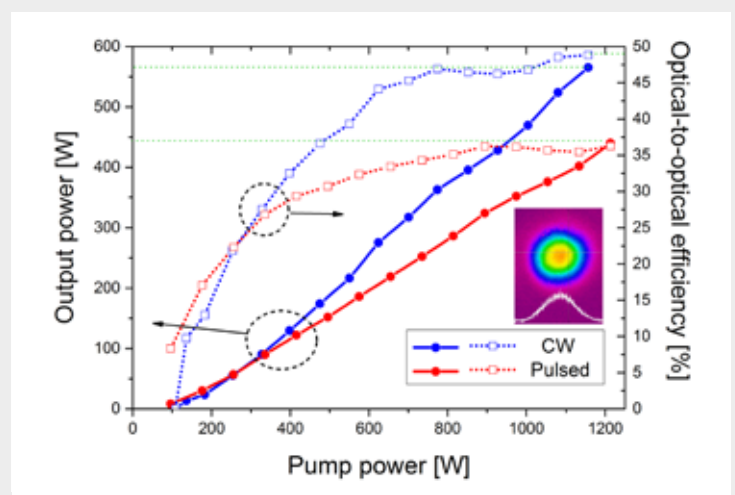
## OFFERED SERVICES

- Complete laser systems
- Laser beam time rental with diagnostics and expertise

For more information please contact: [solutions@hilase.cz](mailto:solutions@hilase.cz)

### Laser Setup

The laser system design employs the Chirped Pulse Amplification technique (CPA). The initial sub-picosecond, low-energy pulses are generated in fiber oscillator and stretched in time several hundred times using a chirped fiber Bragg grating pulse stretcher. After several fiber-based amplification stages, the main thin-disk regenerative amplifier boosts the pulse energy from  $\mu\text{J}$ -level up to 10 mJ (500 W at 50 kHz repetition rate). Its unique ring cavity design provides high-power performance with excellent beam quality in a very compact setup (less than 1 m<sup>2</sup> footprint). For pulse compression back to picosecond duration, a small-scale and virtually alignment-free chirped volume Bragg grating is used.



AVERAGE OUTPUT POWER, EFFICIENCY AND BEAM PROFILE OF THE PROTOTYPE LASER SYSTEM AT 50 kHz REPETITION RATE