



Industrial
Femtosecond Laser

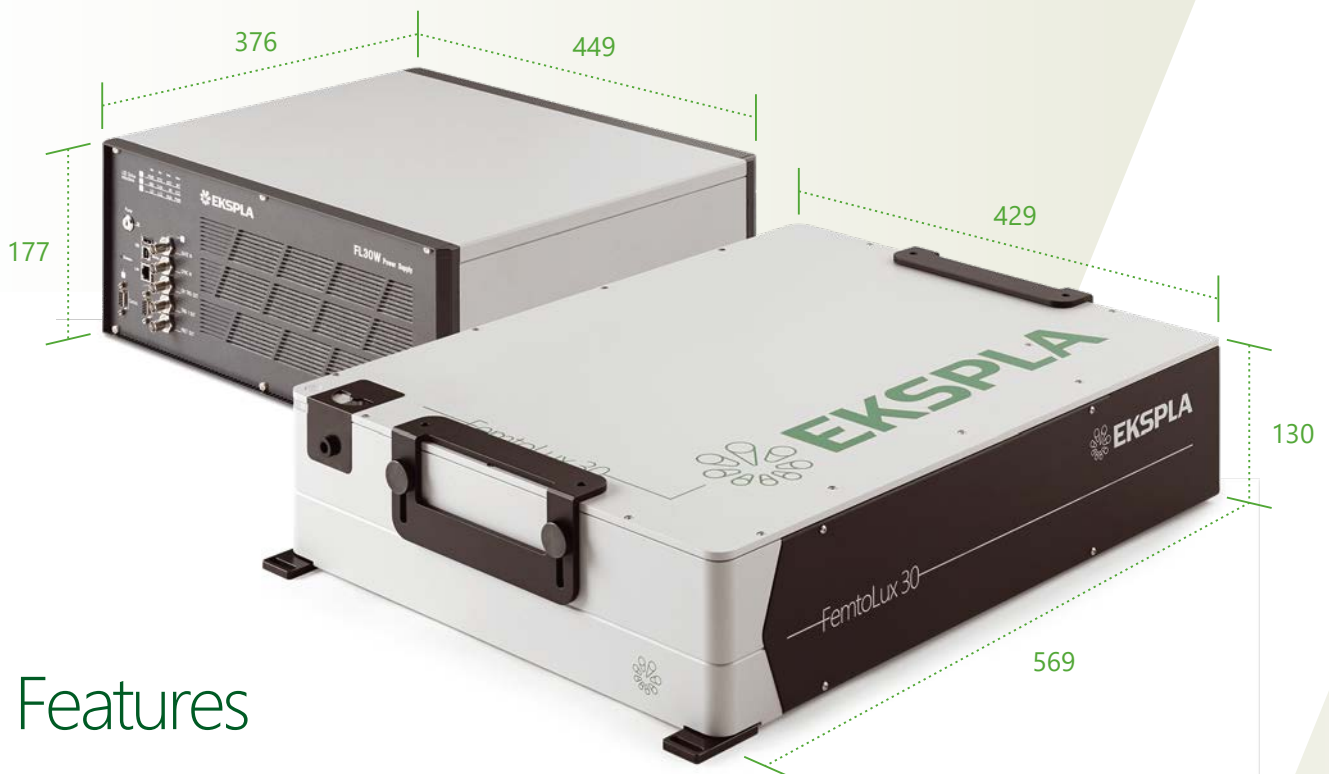
FemtoLux 30

"Dry" cooling 30W Zero maintenance



Reliability redefined

Reliable & Versatile Industrial Laser For Micromachining



Features

- 30 W typical max output power
- >90 μJ max pulse energy
- >250 μJ in a burst mode
- <350 fs – 1 ps
- Single shot to 4 MHz (AOM controlled)
- <0.5% RMS power long term stability over 100 hours
- $M < 1.2$
- Beam circularity > 0.85
- Zero maintenance
- Dry cooling (no water used)
- PSU and cooling unit integrated into a single 4U rack housing
- Easy and quick installation
- Compatible with galvo and Polygon scanners as well as PSO controllers

Applications

- LCD, LED, OLED drilling, cutting and repair
- Microelectronics manufacturing
- Glass, sapphire and ceramics micro processing
- Glass intra-volume structuring
- Micro-processing of different polymers and metals

2 years of total warranty

30W
At 1030 nm

>90 μJ
Max pulse energy

4 MHz
Single shot (up to, AOM)

Innovative "Dry" Cooling System

The **FemtoLux 30** laser employs an innovative cooling system and sets new reliability standards among industrial femtosecond lasers. No additional bulky and heavy water chiller is needed.

The chiller requires periodic maintenance – cooling system draining and rinsing and water and particle filter replacement. Moreover, water leakage can cause damage to the laser head and other equipment. Instead of using water for transferring heat from a laser head, the FemtoLux 30 laser uses an innovative Direct Refrigerant Cooling method.

The refrigerant agent circulates from a PSU-integrated compressor and condenser, to a cooling plate via armored flexible lines.

The entire cooling circuit is permanently hermetically sealed and requires no maintenance.

Simple & reliable cooling plate attachment

The cooling plate is detachable from the laser head for more convenient laser installation.

The laser cooling equipment is integrated with the laser power supply unit into a single 4U rack-mounted housing with a total weight of 15 kg.



Advantages of direct refrigerant cooling

Military- grade reliability

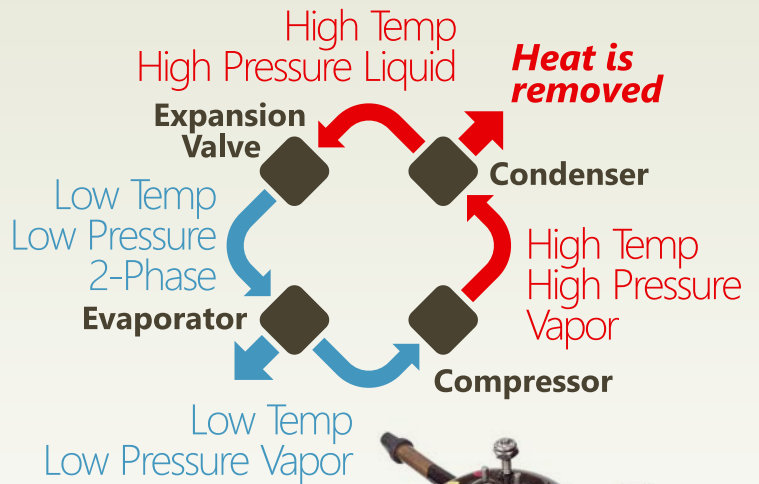
Permanently hermetically sealed system
>90,000 hour MTBF

No maintenance

High cooling efficiency

>45% lower power consumption compared to water cooling equipment

Compact and light



Compressor picture courtesy of Aspen Systems Inc.



<350 fs - 1 ps

Zero maintenance

The **FemtoLux 30** femtosecond laser has a tunable pulse duration from <350 fs to 1 ps and can operate in a broad AOM controlled range of pulse repetition rates from a single shot to 4 MHz.

The maximum pulse energy is more than 90µJ operating with single pulses and can reach 250µJ in burst mode, ensuring higher ablation rates and processing throughput for different materials.

The FemtoLux 30 beam parameters will meet the requirements of the most demanding materials and micro-machining applications.

Innovative laser control electronics ensure simple control of the FemtoLux 30 laser by external controllers that could run on different platforms, be it Windows, Linux or others using REST API commands.

This makes easy integration and reduces the time and human resources required to integrate this laser into any laser micromachining equipment.

Specifications¹⁾

MAIN SPECIFICATIONS

Wavelength	1030 nm
Pulse Repetition Rate (PRR) ²⁾	200 kHz – 4 MHz
Pulse repetition frequency (PRF) after frequency divider	PRF = PRR / N, N=1, 2, 3, ... , 65000; single shot
Maximal average output power	> 27 W (typical 30 W)
Maximal pulse energy	> 90 µJ
Maximal total energy in a burst mode ³⁾	> 250 µJ
Power long term stability (Std. dev.) ⁴⁾	< 0.5 %
Pulse energy stability (Std. dev.) ⁵⁾	< 1 %
Pulse duration (FWHM)	Tunable, < 350 fs ⁶⁾ – 1 ps
Beam quality	M ² < 1.2 (typical < 1.1)
Beam circularity, far field	> 0.85
Beam divergence (full angle)	< 1 mrad
Beam pointing thermal stability	< 20 µrad/°C
Triggering mode	internal / external
Pulse output control	frequency divider, pulse picker, burst mode, packet triggering, power attenuation
Control interfaces	USB / RS232 / LAN
Length of the umbilical cord	3 m, detachable
Laser head cooling type	dry (direct refrigerant cooling through detachable cooling plate)

OPERATING REQUIREMENTS

Mains requirements	100 – 240 V AC, single phase, 50/60 Hz
Operating ambient temperature	18 – 27 °C
Relative humidity	10–80 % (non-condensing)
Air contamination level	ISO 9 (room air) or better

Seamless User Experience

Easy integration

Remote control using REST API commands via USB, RS232 and LAN.

Reduced integration time

Demo electronics is available for laser control programming in advance.

Easy and quick installation

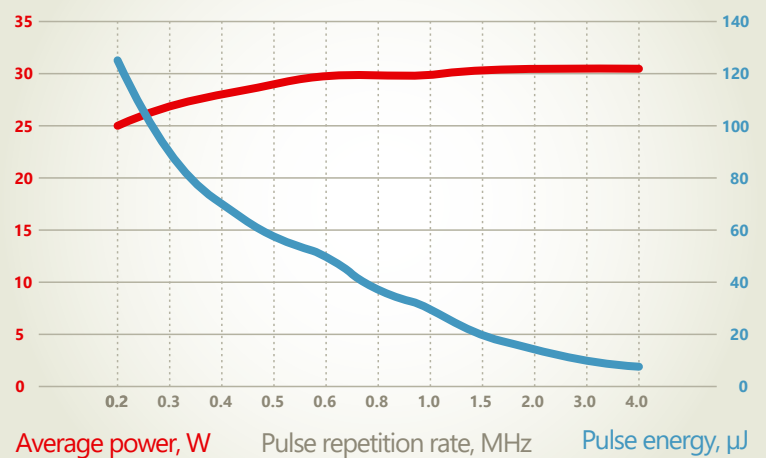
No water, fully disconnected laser head. Can be installed by the end-user.

Easy troubleshooting

Integrated detectors and constant system status logging.

No periodic maintenance required

Power & Energy



1) Due to continuous improvement, all specifications are subject to change without notice.

Parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture.

All parameters are specified for a shortest pulse duration.

2) When frequency divider is set to transmit every pulse. Fully controllable by integrated AOM.

3) When number of pulses within a burst is set to 10 and PRR is set to a minimum value. Separation between pulses within a burst - ~20 ns.

4) Over 100 h after warm-up under constant environmental conditions.

5) Under constant environment conditions.

6) At PRR >500 kHz. At PRR <500 kHz shortest pulse duration is <400 fs.

