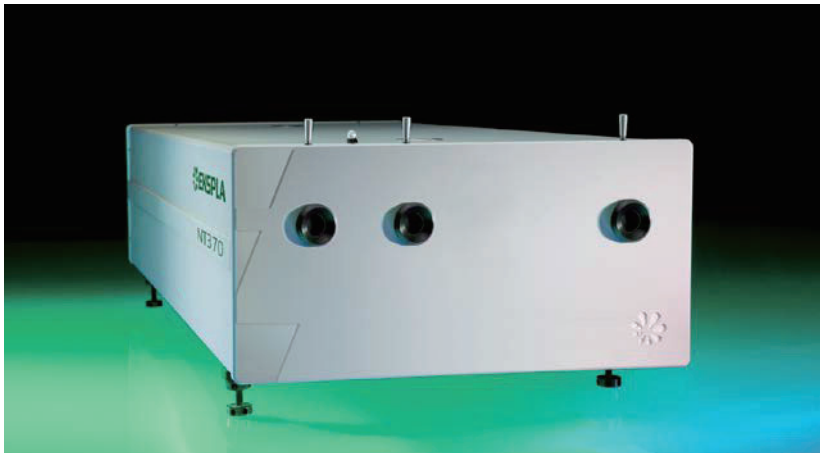
NT370 SERIES

High Energy IR Range Tunable Lasers



BENEFITS

- Wide tuning range in 2500 – 4400 nm or 5500 – 18 000 nm is highly useful for s-SNOM and other IR applications
- NT370 is a cost effective solution covering a wide tuning range from a single source
- Superior tuning resolution (1 cm^{-1}) allows recording of high quality spectra
- High integration level saves on valuable space in the laboratory
- Flashlamps replacement without misalignment of the laser cavity saves on maintenance costs
- In-house design and manufacturing of complete systems, including pump lasers, guarantees on-time warranty and post warranty services and spares supply
- Variety of control interfaces: USB, RS232, LAN and WLAN ensures easy control and integration with other equipment

FEATURES

- *Hands-free, automated wavelength tuning*
- *Up to **15 mJ** pulse energy in mid and **1 mJ** in far IR spectral range*
- *Less than **8 cm^{-1}** linewidth*
- ***3 – 5 ns** pulse duration*
- ***10 or 20 Hz** pulse repetition rate*
- *Remote control via key pad or PC*
- *Separate output port for 1064 nm pump beam option*
- *OPO pump energy monitoring*
- *Replacement of the flashlamps without misalignment of the laser cavity*

APPLICATIONS

- *Vibrational spectroscopy*
- *Cavity ring-down CRDS, cavity ring-down laser absorption CRLAS spectroscopy*
- *Infrared spectroscopy*
- *Gas spectroscopy*

NT370 series tunable laser seamlessly integrates in a compact housing the nanosecond optical parametric oscillator and Nd:YAG Q-switched laser. Pumped by fundamental harmonics output the lasers provides tuning in mid- and far-infrared spectral ranges.

NT373-XIR model uses IR crystal based cascade OPO for tunable output in 5500–18000 nm range. Customized tuning ranges are available upon request. The linewidth of NT373-XIR model is nearly constant across tuning range and it is less than 8 cm^{-1}.

NT377 model produces tunable output in 2500–4400 nm range. Pulse energy is exceeding 10 mJ for wavelengths shorter than 3600 nm, while linewidth is below 8 cm^{-1}. Because of narrow linewidth of output radiation the laser is suitable for many infrared spectroscopic applications, for example cavity ring-down spectroscopy, gas detection and remote sensing.

The device is controlled from the remote keypad or from PC using LabView™ drivers that are supplied together with the system. The remote pad features a backlit display that is easy to read even while wearing laser safety glasses. System is designed for easy and cost-effective maintenance. Replacement of flashlamps can be done without misalignment of the laser cavity and deterioration of laser performance. OPO pump energy monitoring system helps to increase lifetime of the optical components.

Accessories and optional add-ons

Option	Features
-AW	Water-air cooling option
-20	20 Hz PRR option
-H	Optional 1064 nm output

SPECIFICATIONS [1]

Model	NT377	NT373-XIR
OPO		
Wavelength range	2 500–4 400 nm	5 500–18 000 nm [2]
Output pulse energy [3]	15 mJ	1 mJ
Linewidth [4]	< 8 cm^{-1}	
Tuning resolution [5]	1 cm^{-1}	
Typical pulse duration [6]	3–5 ns	
Typical beam diameter [7]	8 mm	10 mm
Polarization	horizontal	
PUMP LASER [8]		
Pump wavelength	1064 nm	
Typical pump pulse energy	250 mJ	300 mJ
Pulse duration	4–6 ns	
Beam quality	"Hat-Top" in near field	
Beam divergence	< 0.5 mrad	
Pulse energy stability (StdDev)	< 1 %	
Pulse repetition rate	10 or 20 Hz	
PHYSICAL CHARACTERISTICS		
Unit size (W × L × H)	456 × 820 × 274 mm	456 × 1030 × 274 mm
Power supply size (W × L × H)	330 × 490 × 585 mm	
Umbilical length	2.5 m	
OPERATING REQUIREMENTS		
Water consumption (max 20 °C) [9]	<10 l/min	
Room temperature	18–27 °C	
Relative humidity	20–80 % (non-condensing)	
Power requirements [10]	200 – 240 VAC, single phase, 50/60 Hz	
Power consumption	< 1.5 kVA	

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. Unless stated otherwise all specifications are measured at 3000 nm for NT377 unit and at 7000 nm for NT373-XIR unit and for basic system without options.

2) Additional output in 1780 – 2010 nm and 2300 – 2645 nm ranges is possible. Please contact Ekspla for more detailed specifications.

3) Output is specified at wavelengths defined in note 1. See tuning curves for typical outputs at other wavelengths.

4) Linewidth is specified at wavelengths defined in note 1.

5) When wavelength is controlled from PC. When wavelength is controlled from keypad, tuning resolution is 1 nm

6) Measured art FWHM level with photodiode featuring 1 ns rise time and 300 MHz bandwidth oscilloscope.

7) Beam diameter is measured at the $1/e^2$ level and varies depending on the wavelength.

8) Laser output will be optimized for the best OPO operation and specification may vary with each unit we manufacture.

9) Air cooled power supply is available as an option.

10) Should be specified when ordering.

Note: Laser must be connected to the mains electricity all the time. If there will be no mains electricity for longer that 1 hour then laser (system) needs warm up for a few hours before switching on.

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PERFORMANCE

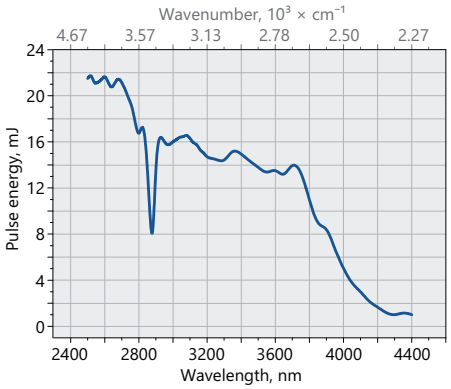

Fig 1. Typical output energy of the NT377 tunable wavelength laser

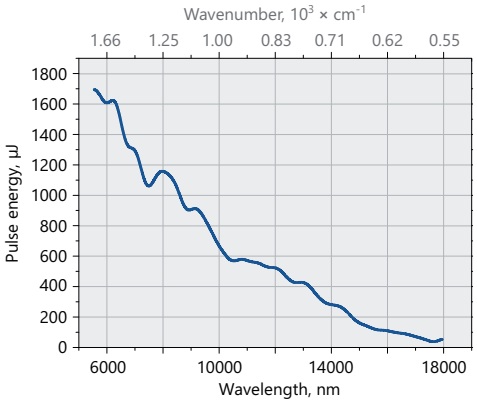

Fig 2. Typical output pulse energy of the NT373-XIR tunable wavelength laser

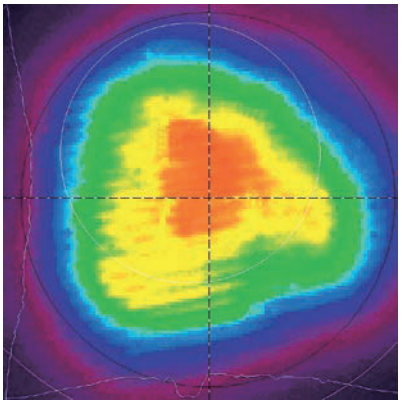

Fig 3. Typical beam profile at 3000 nm and 7000 nm wavelengths in near field