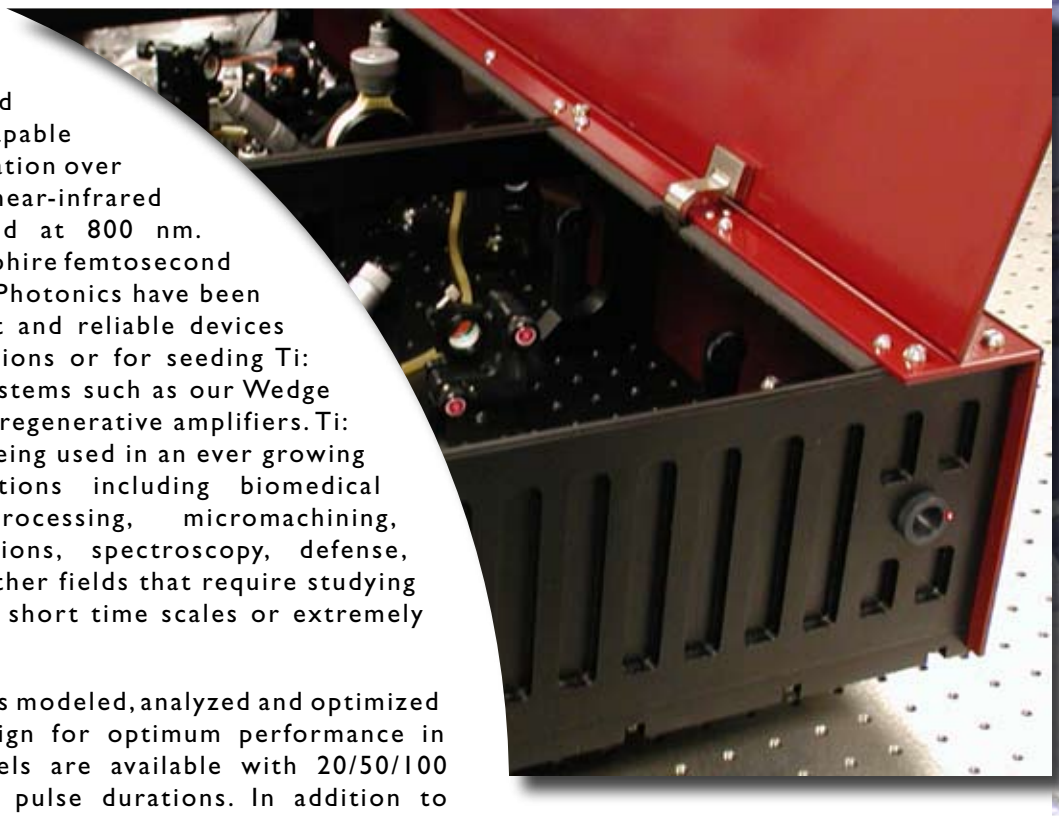
Trestles Ti:sapphire Lasers

20/50/100 Femtosecond Oscillators



Titanium-doped sapphire (Ti:sapphire) is a solid state laser medium capable of tunable laser operation over a broad range of near-infrared wavelengths centered at 800 nm. Trestles series Ti:sapphire femtosecond lasers from Del Mar Photonics have been designed as low-cost and reliable devices for ultrafast applications or for seeding Ti: sapphire amplifier systems such as our Wedge Series multipass and regenerative amplifiers. Ti: sapphire lasers are being used in an ever growing number of applications including biomedical imaging, material processing, micromachining, optical communications, spectroscopy, defense, research and many other fields that require studying physics at extremely short time scales or extremely high powers.

Del Mar Photonics has modeled, analyzed and optimized the laser cavity design for optimum performance in minimal space. Models are available with 20/50/100 femtosecond output pulse durations. In addition to pulsed lasers, continuous wave (CW) Ti:sapphire lasers are also available. All models can be customized to meet costumer needs. Solid-state mode-locked lasers produce femtosecond light pulses using the Kerr lens mode-locking (KLM) principle of operation and continuous wave pumping sources. The KLM principle combines a self-focusing nonlinear optical effect and aperture effect together to reach the shortest optical pulses. Because of its broad absorption band in the green, pumping energy for lasing can be supplied with a continuous wave (CW) diode-pumped solid state (DPSS) laser operating in the green with TEM00 mode. A standard argon ion laser can also be used as a pump. When matched with any 3 - 10 Watt argon-ion or DPSS pump laser, the Trestles Ti:sapphire lasers provide effective and stable femtosecond operation over the 710 - 950 nm spectral range. All Trestles series models are available with Del Mar Photonics installation and training or as a fully tested and configured customer installed kit.

- Stable Kerr-lens mode-locking operation
- Z-folded compact cavity design
- Tunable wavelength (710-950 nm)
- Designed for maximum customizability
- Full installation and training available
- Real-Time autocorrelator (option)
- SPIDER pulse measurement system (option)
- Prism compression (option)
- SHG, FHG (option)

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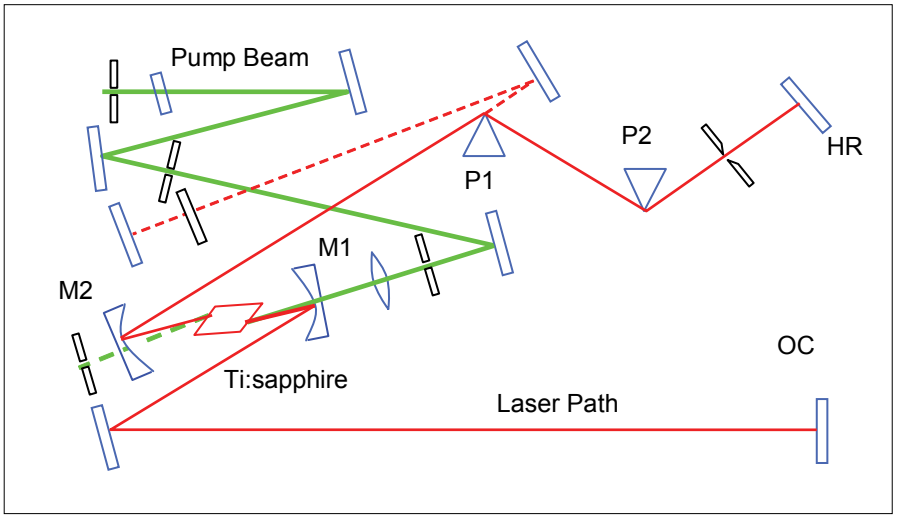
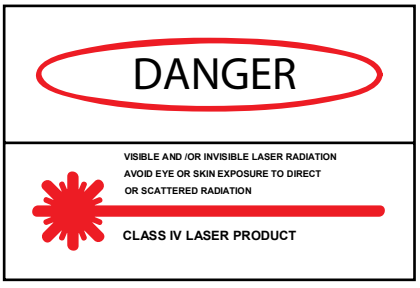
PRODUCT FEATURES

	Trestles-20	Trestles-50	Trestles-100	Trestles-CW
Pulse Length	<20 fs	<50 fs	<100 fs	
Wavelength Range	740-950 nm	740-950 nm	710-950 nm	710-950 nm
Repetition Rate	83 MHz	83 MHz	93 MHz	
Pump Power	3-5 W	3-7 W	3-10 W	2-15 W
Output Power (800nm)	150-250 mW	150-500 mW	150 mW-1.0 W	150 mW-2.5 W
Pulse Energy	3 nJ	6 nJ	10 nJ	
Dimensions (mm)	942(L) x 360(W) x 192(H)	942(L) x 360(W) x 192(H)	822(L) x 360(W) x 192(H)	565(L) x 260(W) x 192(H)

CAVITY SCHEMATIC (TRESTLES-100)





Trestles series femtosecond lasers represent an excellent compromise between user setup time and cost. Femtosecond and continuous wave laser kits contain all optical and mechanical components and can be assembled and adjusted by the user following detailed installation instructions. The Trestles oscillator cavity elements include pump beam mirrors, laser rod, focusing lens and mirrors, an output coupler (OC), high reflector (HR), beam folding mirrors, prisms as dispersion control elements and slit as spectral tuning element. There are several standard cavity configurations corresponding to the Trestles-100/50/20 and Trestles-CW Ti:sapphire lasers, but other configurations are possible, resulting in several advantages over fixed setups, including adjustable repetition rates from 70 to 120 MHz. Trestles series femtosecond laser kits are flexible systems that give the user an opportunity to modify the laser cavity if desired. The ability to make cavity adjustments makes the Trestles series particularly advantageous for educational and research laboratories. Users can improve the laser according to recent and future developments in the field with only minor changes of optical and mechanical components. When properly aligned, the systems will give extended periods of mode locked operation with very little user interaction. Connections to the laser include cooling water, power, and control to electronic module (optional), and power and control to motorized slit driver module (optional).

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