

TOPAS

Optical Parametric Amplifiers for Ti:Sapphire Lasers

FEATURES

- Tuning range 1160 – 2600 nm, extendable to 189 nm – 20 μm
- Conversion efficiency of > 25%
- Wavelength extensions and high-energy upgrades
- Nearly bandwidth- and diffraction-limited output
- CEP stabilization of the idler (1600 – 2600 nm)
- High output stability



TOPAS is a series of femtosecond optical parametric amplifiers (OPAs) for Ti:Sapphire lasers which delivers continuous wavelength tunability from 189 nm to 20 μm , high conversion efficiency, high output stability, and full computer control.

With more than 2000 units installed worldwide, TOPAS has become an OPA market leader for numerous scientific applications.

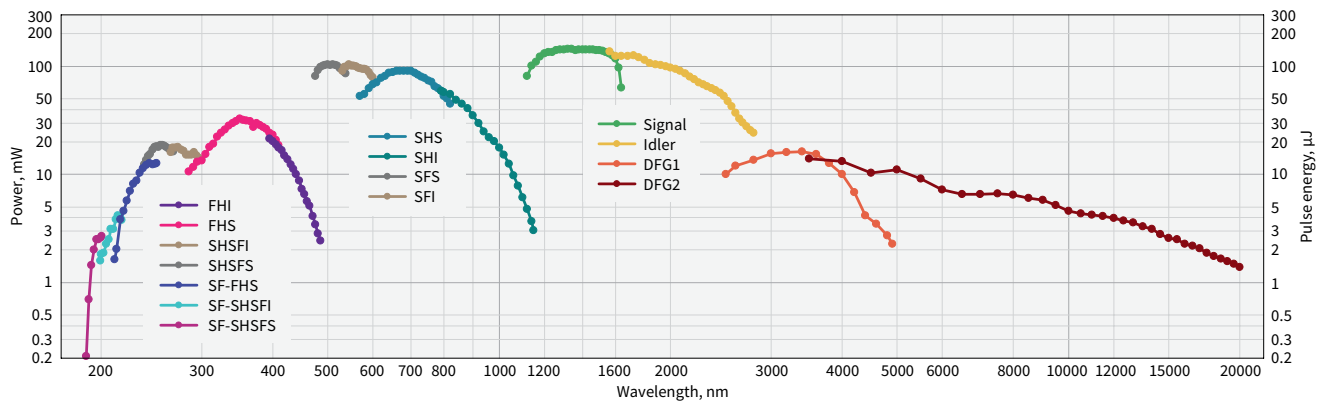
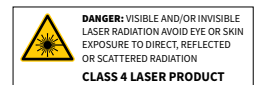
COMPARISON TABLE

Product ¹⁾	Pump pulse energy	Pump pulse duration	Tuning range	Extended tuning range	Output pulse duration	Upgrades	Features
TOPAS-PRIME	0.15 – 6 mJ ²⁾	20 – 200 fs	1160 – 2600 nm	189 nm – 20 μm	30 – 150 fs	HE-STAGE	Motorized wavelength control, hands-free operation
TOPAS-PRIME-HE	2 – 60 mJ ²⁾		1160 – 2600 nm				High energy, high conversion efficiency
TOPAS-TWINS ³⁾	0.3 – 6 mJ ²⁾		1160 – 2600 nm				Two simultaneous independent outputs
SHBC	0.3 – 5 mJ	1 – 2 ps	\approx 400 nm	240 nm – 10 μm	1 – 5 ps	TOPAS-400-PS	Narrow bandwidth, picosecond output
TOPAS-400-PS	0.2 – 2.5 mJ		480 – 2400 nm	240 nm – 10 μm	1 – 5 ps	n/a	
TOPAS-PS-800	0.2 – 5 mJ		1160 – 2600 nm	240 nm – 20 μm	0.7 – 2 ps	HE-STAGE	

¹⁾ Custom solutions are available, contact sales@lightcon.com for details.

²⁾ Maximum pump pulse energy depends on pump pulse duration.

³⁾ TWINS consists of two OPAs, seeded by the same WLG. Specifications and upgrades are applicable for each output.

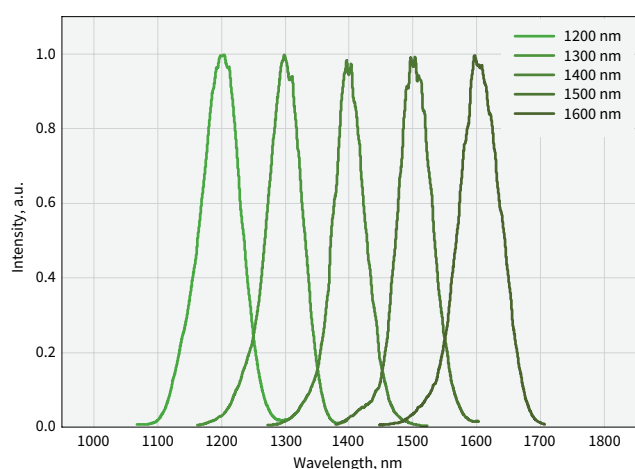


TOPAS-PRIME tuning curves. Pump: 1 mJ, 100 fs, 800 nm

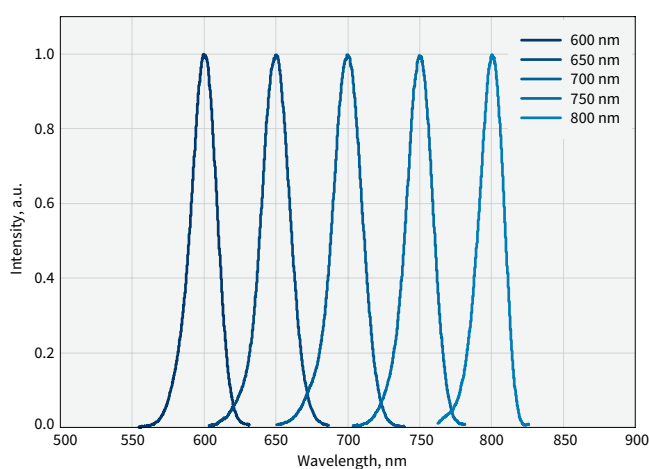
WAVELENGTH EXTENSIONS AND UPGRADES

Product	Tuning range	Features
HE-STAGE	1160 – 2600 nm	High-energy upgrade for TOPAS-PRIME, TOPAS-TWINS, or TOPAS-PS-800 for 4 – 60 mJ pump
NIRUVIS	240 – 2600 nm	Motorized wavelength tuning, single housing
NIRUVIS-DUV-HE	189 – 2600 nm	High-energy version, broadest tuning range, motorized wavelength tuning, single housing
NIRUVIS-DUV	189 – 2600 nm	Broadest tuning range, motorized wavelength tuning, single housing
NIRUVIS-MW	240 – 2600 nm	Fully automated version, same output port for all the wavelength range, motorized wavelength tuning, single housing
NDFG	2600 nm – 20 μ m	Noncolinear amplification for background-free IR pulses
External crystal stages	240 nm – 20 μ m	Cost-efficient separate crystal stages (1, 2, or 3 depends on the tuning range)
SIG-SIG NDFG	4500 nm – 16 μ m	For TOPAS-TWINS CEP-stable IR pulses, CEP slow drift compensation-ready, noncolinear amplification for background-free IR pulses

PERFORMANCE



Set of typical TOPAS-PRIME signal spectra

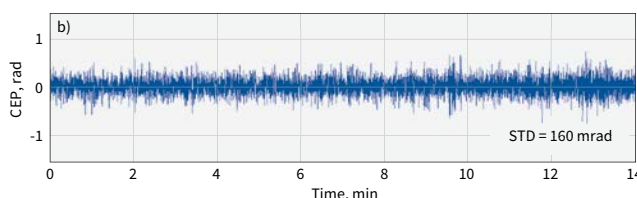
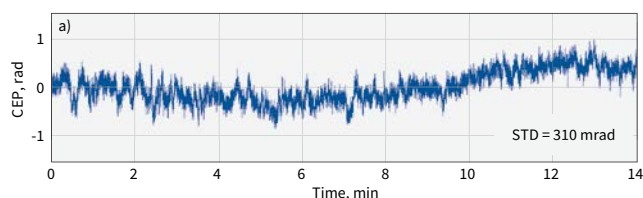


Set of typical TOPAS-PRIME SHS spectra

CEP STABILIZATION OF IDLER

TOPAS Idler (1600 – 2600 nm) is passively CEP locked due to a three-wave interaction. However, a slow CEP drift may persist because of changes in pump beam pointing or environmental conditions. Such a drift can be compensated by employing

an f-2f interferometer and a feedback loop controlling the temporal delay between seed and pump in the power amplification stage of TOPAS-PRIME and TOPAS-PRIME-HE.



CEP stability of Idler over 14 min.
 (a) without compensation of drift, (b) with compensation of drift with a slow loop