

TOPAS

Optical Parametric Amplifiers for Ti:Sapphire Lasers



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

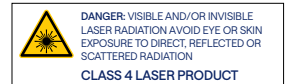
Comparison table

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⁾					n/a	High energy, high conversion efficiency			
TOPAS-TWINS ³⁾	0.3 – 6 mJ ²⁾					HE-STAGE	Two independently tunable CEP- stable outputs			
SHBC	0.3 – 5 mJ					\approx 400 nm	240 nm – 2.4 μm	1 – 5 ps	TOPAS-SHBC-400	Narrow bandwidth, picosecond output, generated from broadband femtosecond pump pulses
TOPAS-SHBC-400	0.2 – 2.5 mJ					480 – 2400 nm			n/a	
TOPAS-PS-800	0.2 – 5 mJ					1 – 2 ps	1160 – 2600 nm	240 nm – 20 μm	0.7 – 2 ps	HE-STAGE

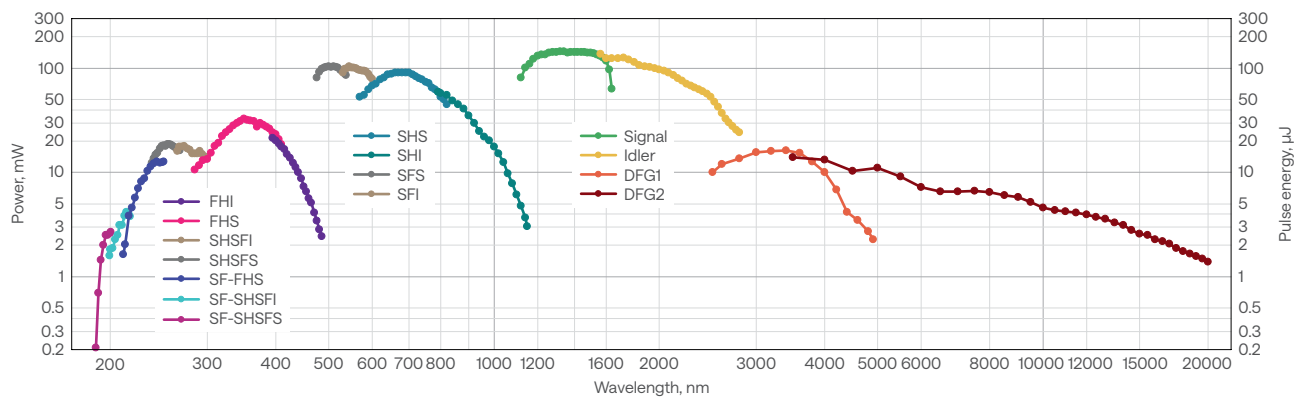
¹⁾ Custom solutions are available, contact sales@lightcon.com for more details.

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

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



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



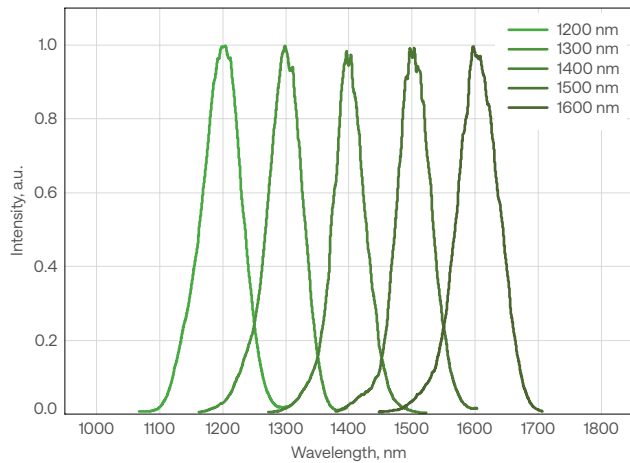
Wavelength extensions and upgrades

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, the same output port for the entire wavelength range, motorized wavelength tuning, single housing
NDFG	2600 nm – 20 μ m	Noncolinear generator for background-free mid-IR pulses
External crystal stages	240 nm – 20 μ m	Cost-efficient separate crystal stages (1, 2, or 3, depending on the tuning range)
SIG-SIG NDFG	4500 nm – 16 μ m	Noncolinear generator for CEP-stable mid-IR pulses used with TOPAS-TWINS, CEP slow drift compensation-ready 1)

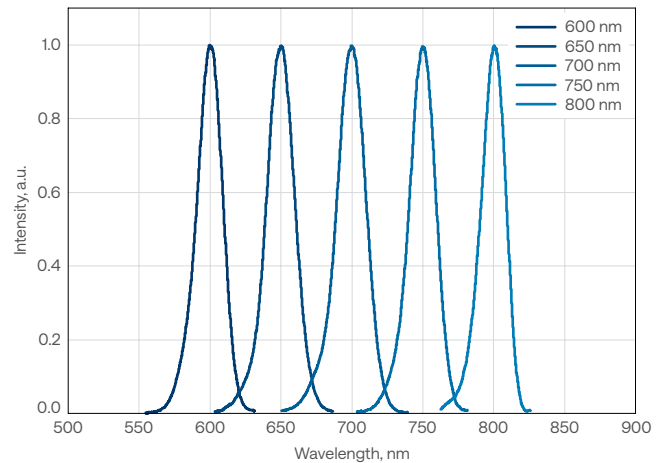
¹⁾ CEP slow drift is available upon request.

Performance

TOPAS-PRIME typical signal spectra set



TOPAS-PRIME SHS typical signal spectra set

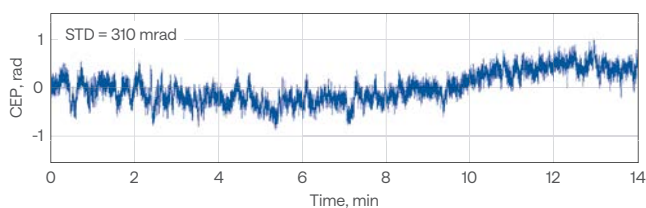


CEP stabilization of idler

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 the seed and pump in the power amplification stage of TOPAS-PRIME and TOPAS-PRIME-HE.

CEP stability of idler over 14 min
(a) without drift compensation



(b) with drift compensation with a slow loop

