

# TOPAS

## Optical Parametric Amplifiers for Ti:Sapphire Lasers



- Tuning range 1160 – 2600 nm, extendable to 189 nm – 20  $\mu\text{m}$
- 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

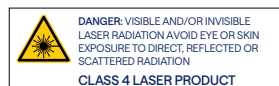
### Comparison table

Product <sup>1)</sup>	Pump pulse energy	Pump pulse duration	Tuning range	Extended tuning range	Output pulse duration	Upgrades	Features			
TOPAS-PRIME	0.15 – 6 mJ <sup>2)</sup>	20 – 200 fs	1160 – 2600 nm	189 nm – 20 $\mu\text{m}$	30 – 150 fs	HE-STAGE	Motorized wavelength control, hands-free operation			
TOPAS-PRIME-HE	2 – 60 mJ <sup>2)</sup>						High energy, high conversion efficiency			
TOPAS-TWINS <sup>3)</sup>	0.3 – 6 mJ <sup>2)</sup>						Two simultaneous independent outputs			
SHBC	0.3 – 5 mJ					$\approx$ 400 nm	240 nm – 10 $\mu\text{m}$	1 – 5 ps	TOPAS-400-PS	Narrow bandwidth, picosecond output
TOPAS-400-PS	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 $\mu\text{m}$	0.7 – 2 ps	

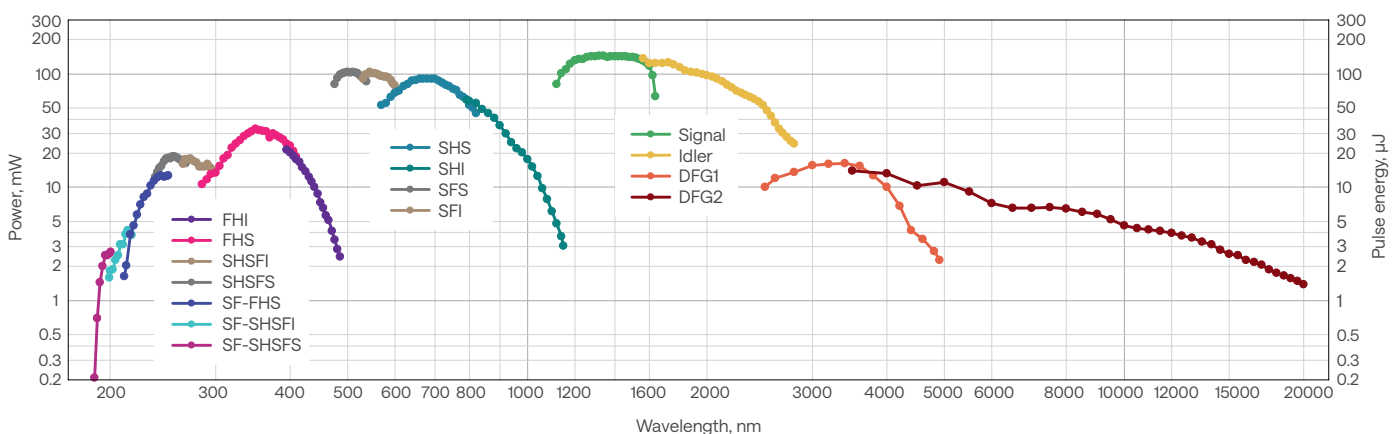
<sup>1)</sup> Custom solutions are available, contact sales@lightcon.com for details.

<sup>2)</sup> Maximum pump pulse energy depends on pump pulse duration.

<sup>3)</sup> TWINS consists of two OPAs, seeded by the same WL. Specifications and upgrades are applicable for each output.



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

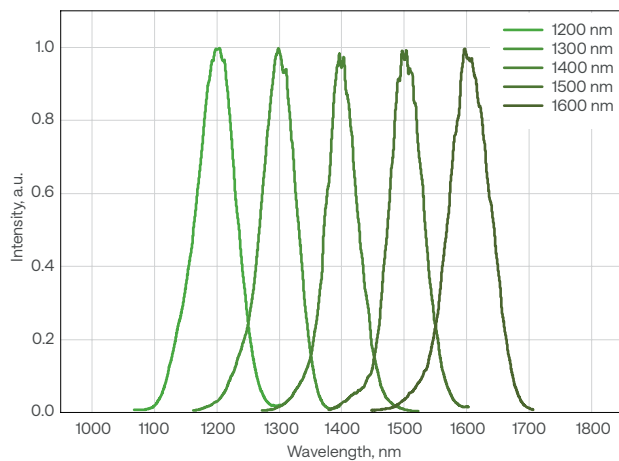


## Wavelength extensions and upgrades

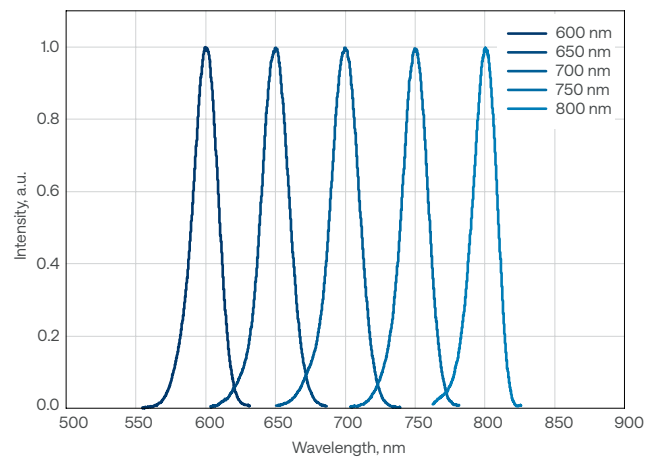
Product	Tuning range	Features
HE-STAGE	1160 – 2600 nm	High-energy upgrade for TOPAS-PRIME, TOPAS-TWINS, or TOPAS-PS-800 for 4 – 60 mJ pump
NIRUVIS	240 – 2600 nm	Motorized wavelength tuning, single housing
NIRUVIS-DUV-HE	189 – 2600 nm	High-energy version, broadest tuning range, motorized wavelength tuning,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

## Performance

TOPAS-PRIME typical signal spectra set



TOPAS-PRIME SHS typical signal spectra set

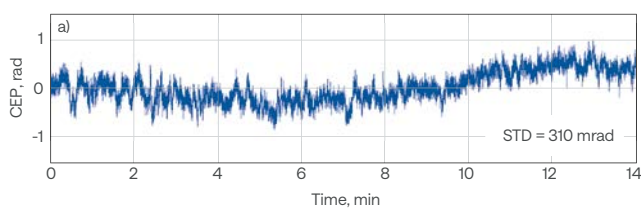


## CEP stabilization of idler

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 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

