

## FEATURES

- Energy conversion into the parametric radiation ~30-35%
- Angular tuning limited by crystal transparency range only
- Upgradability for pump energy, wavelength and pulse width
- Computer controlled operation
- Optional frequency mixers

# TOPAS series

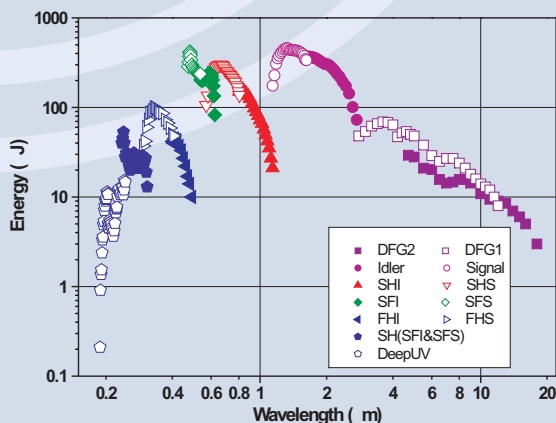
## Optical Parametric Amplifiers



Widest computer controllable wavelength tuning range and highest conversion efficiencies.

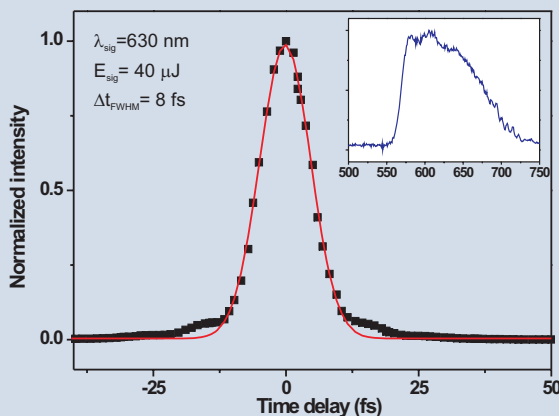
**TOPAS output energy vs wavelength**

Pump: Quantronix Titan,  $E=2.7$  mJ,  $\Delta t \sim 100$  fs,  $\lambda=805$ nm, repetition=1 kHz



**TOPAS-white signal autocorrelation and spectrum (insert)**

Pump: Clark CPA-2001,  $E=0.52$  mJ,  $\Delta t \sim 150$  fs,  $\lambda=777$ nm, repetition=1 kHz



## TOPAS

*Collinear optical parametric amplifier of super-fluorescence.*

- Wavelength tuning range spanning from 189 nm to 20000 nm.
- Conversion efficiency of 30-35%.
- Accepts pump pulses from 25 fs to 50 ps from many laser sources.

TOPAS features the best performance available on the world market during the last years, being the best selling device since 1993.

The tuning range of TOPAS is restricted mainly by the pump wavelength and IR-absorption edge of the particular nonlinear crystal (BBO or LBO). This range is notably extended by the frequency up- and down-conversion of the TOPAS output.

TOPAS consists of an independently pumped superfluorescence generator, preamplifiers, and power amplifier. All these stages are geometrically arranged using a single nonlinear crystal. To achieve high reproducibility of generated pulses, all the amplification stages are driven to saturation.

## TOPAS-C

*Collinear optical parametric amplifier of white-light continuum.*

- All the best features of "TOPAS" parametric amplifiers plus
- High output stability throughout the entire tuning range.

The new modifications of standard TOPAS configuration finally eliminate limitations for output stability in all tuning range. White-light continuum is used as seed source for collinear femto-second parametric amplification. TOPAS-C keeps all broad tuning range of standard TOPAS and its options. Controllable bandwidth pulses can change output pulse duration significantly.

## TOPAS-white

*Non-Collinear optical parametric amplifier of white-light continuum.*

- Pulse duration down to 10 femtoseconds.
- High energy (>200 μJ available) visible output.
- Built in pulse compressor.
- Optional SHG for tuning in the UV.
- Optional NIR tunable compressed idler pulses.
- Adjustable pulse duration.

A non-collinear pumping scheme of an OPA is used when the collinear approach for the OPA reaches its limits in respect to broad spectral bandwidth and / or extremely short pulses (< 20 fs). The basic principle of operation of non-collinear OPA relies on parametric amplification of chirped signal produced by supercontinuum generation in a transparent medium possessing third order nonlinearity.

In the TOPAS-white developed by Light Conversion, the output energy is enhanced by using a pump pulse with appropriate front tilt.

The TOPAS-white offers significant improvement regarding dispersion matching over broad wavelength range, which is necessary for generation of near- transform limited sub-30 fs pulses. The device is a two-stage non-collinear parametric amplifier of white light continuum.

## HE-TOPAS

*High energy TOPAS.*

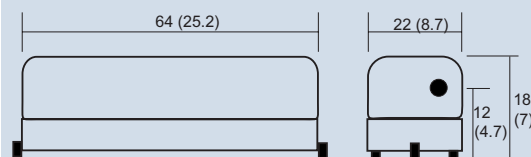
- All the best features of "TOPAS" parametric amplifiers plus
- Input pump energy of up to 20 mJ.

Unmatched dispersion free amplification in the second crystal stage is added to standard TOPAS section in order to accept highest possible pump parameters. Up to 5 mJ 25 fs or 20 mJ 100 fs pulses efficiently pump HE-TOPAS.

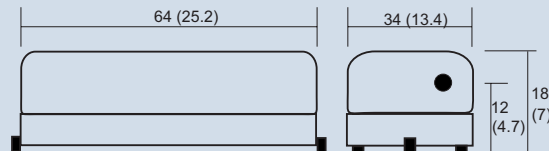
### TOPAS'es pumped by fs pulses at 800 nm

	TOPAS	TOPAS-C	TOPAS-white	HE-TOPAS
Pump energy, mJ	0.1-3	0.1-3	0.1-2.5	3-20
Pump pulse duration, fs	25-200	25-200	80-200	25-200
Pump M <sup>2</sup>	1-1.5	1-1.5	1-1.5	1-1.5
Pump TBWP	(1-1.3) x limit	(1-1.3) x limit	(1-1.3) x limit	(1-1.3) x limit
Pump RMS, %	0.5	0.5	0.5	0.5
Tuning range, nm	189-20000	189-20000	250-1600	240-20000
Pulse duration, fs	30-150	30-150	8-40	30-150
Energy of s&i at peak, mJ	0.01-1	0.01-1	0.005-0.2 (signal)	1-7
s&i efficiency, %	25-35	25-35	5-12 (signal)	25-35
M <sup>2</sup>	1.3x(pump M <sup>2</sup> )	1.3x(pump M <sup>2</sup> )	1.3x(pump M <sup>2</sup> )	1.3x(pump M <sup>2</sup> )
Nonstability RMS, %	2-4	0.5-1	1-2	2-4
TBWP	(1.2-1.5)xlimit	(1.2-1.5)xlimit	(1.2-1.5)xlimit	(1.2-1.5)xlimit

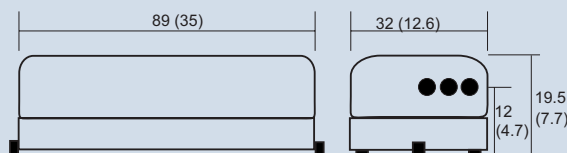
TOPAS and TOPAS-C dimensions in cm (inches)



TOPAS-white dimensions in cm (inches)



HE-TOPAS dimensions in cm (inches)



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