

**CLASS 5**

# The Black Dwarf

High-power femtosecond laser



## Compact high-power laser system for micromachining and EUV generation

The Black Dwarf redefines ultrafast micromachining and EUV generation with high pulse energies and femtosecond pulse durations

### Features

**High pulse energy and average power**  
> 1.5 mJ at 60 W

**Shortest pulse durations**  
< 25 fs

**Excellent power stability**  
> 0.5% over 12 h

**Compact design with industrial pump laser**  
Full laser system in < 1 m<sup>2</sup> footprint

### Applications

- Advanced micromachining and surface processing
- High-flux EUV HHG sources
- Time-resolved ARPES
- Compact source for large scale facilities
- Strong-field non-linear phenomena

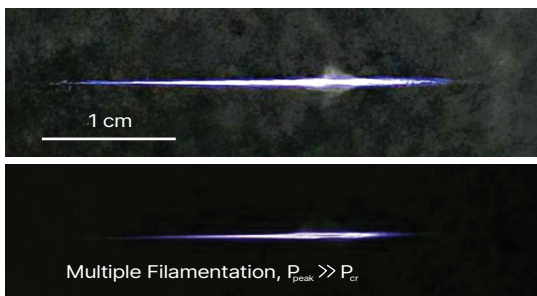


## Product specifications

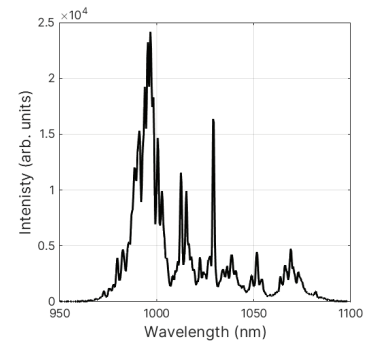
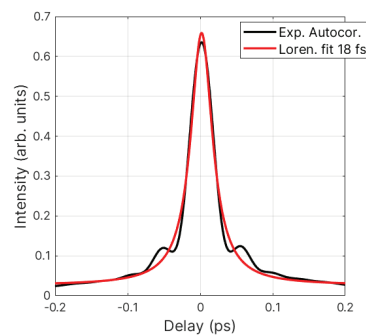
PRODUCT	PULSE ENERGY	REPETITION RATE	PULSE DURATION	AVERAGE POWER
Black Dwarf 200	45-200 $\mu$ J	Up to 2 MHz	35 fs	60 W
Black Dwarf Pro-300	0.3 mJ	100 kHz	25 fs	30 W
Black Dwarf Pro-500	0.5 mJ	100 kHz	25 fs	50 W
Black Dwarf Ultra-1500	0.5 – 1.5 mJ	40 kHz	25 fs	60 W

## Performance examples

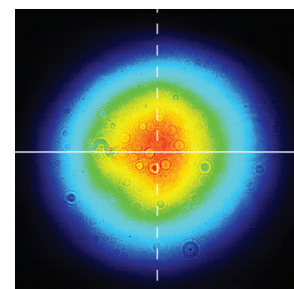
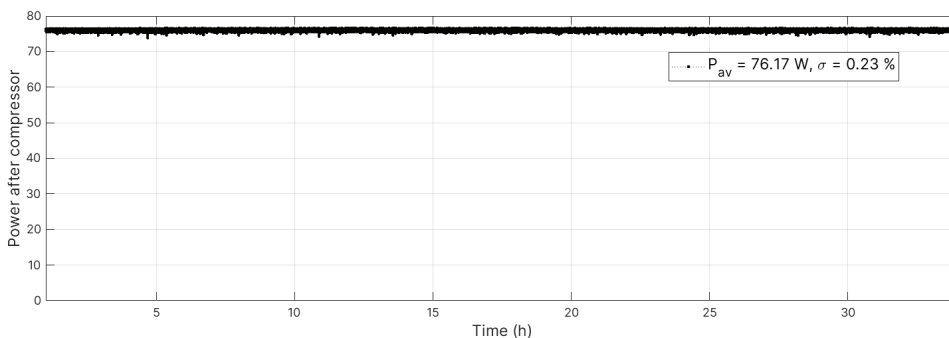
Filamentation in air



Pulse duration and spectrum



Power stability



"Measurement data are examples. Specifications are subject to change without notice. Copyright 2022 Class 5 Photonics GmbH"

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