



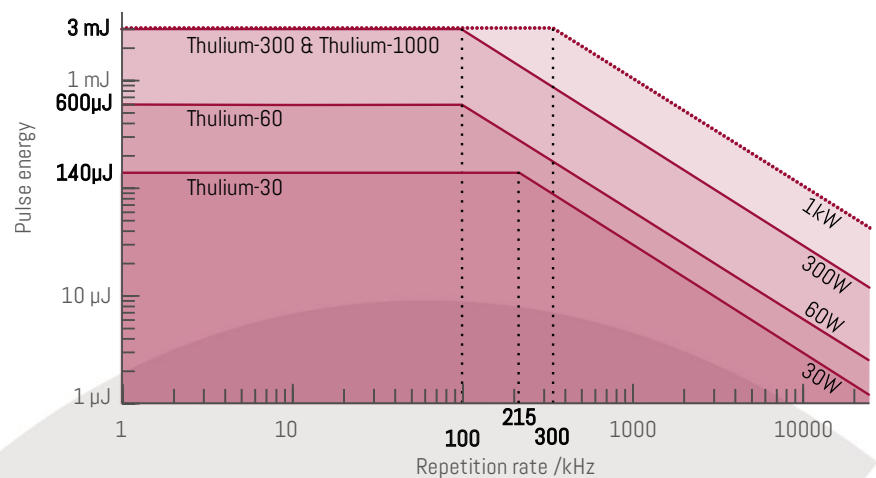
Customized kW and mJ ultrafast Thulium lasers

The quality of any laser application crucially depends on the performance of the driving light source, i.e. the laser itself. In addition, most applications ask for more and more average power from the laser source to be cost-effective or sensitive enough.

AFS's ultrafast fiber lasers are characterized by an outstanding performance combined with flexibility and maximum stability. All essential parameters are software controlled and can be tuned over a wide range, making them an extremely valuable tool in many applications.

APPLICATIONS

- Replacement for complex OPAs emitting at $\sim 2\mu\text{m}$
- Pumping of optical parametric amplifiers (mid-IR OPA)
- Generation of high harmonics (water-window HHG)
- Materials processing



Overview of available laser parameters at $2\mu\text{m}$ central wavelength and $<150\text{fs}$ pulse duration

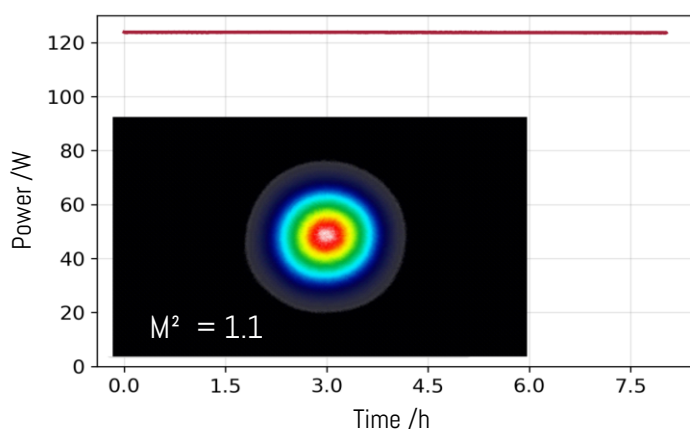




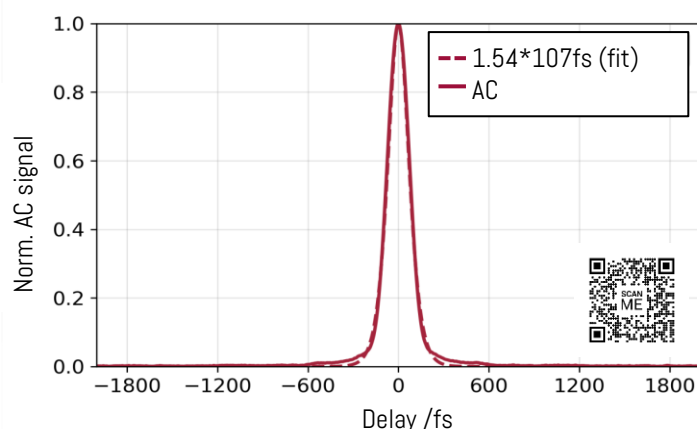
Customized kW and mJ ultrafast Thulium lasers

	Thulium-30	Thulium-60	Thulium-300
Central wavelength	approx. 1950 nm		
Repetition rate	50 kHz (or single pulse via Ext. AOM upgrade) up to 25 MHz, others on request		
Pulse energy	up to 140 μ J	up to 600 μ J	up to 3 mJ
Peak power	up to 0.9 GW	up to 4 GW	up to 20 GW
Average power	up to 30 W	up to 60 W	up to 300 W
Pulse duration	< 150 fs ... 5 ps adjustable, others on request		
Polarization	linear		
Beam quality	close to diffraction-limited, $M^2 < 1.3$		
RIN slow (Average power)	< 0.5% RMS [1/ (24 hours) ... 1 Hz]		< 0.6% RMS [1/ (24 hours) ... 1 Hz]
RIN fast (Pulse energy)	< 0.5% RMS [1 Hz... $f_{rep}/2$]		< 0.6% RMS [1 Hz... $f_{rep}/2$]
Beam pointing	< 20 μ rad RMS (< 10% nat. divergence)		
Beam diameter	approx. 3 mm		approx. 6 mm
Dimensions laser (W x D x H)	112 cm x 41 cm x 25 cm	132 cm x 41 cm x 30 cm	approx. 260 cm x 150 cm x 40 cm
Mass	approx. 90 kg	approx. 200 kg	approx. 700 kg
Add-ons	Mid-IR OPA, HHG, Few-cycle generation, CEP-stability, GHz-Burst, Fast-Switch		
Logging	Logging of all operation parameters via control software, remote monitoring and service access		
Additional features	Turnkey reliability, all parameters software controlled, temperature-stabilized and dust-sealed housing		

The specs above show only our main platforms. We happily customize a system exactly to your needs.



Typical characterization of power stability and beam quality



Typical autocorrelation trace of a Tm-CPA