

Spitfire® Ace™

Industry Leading Power.
Maximum Stability.



The Spectra-Physics Spitfire Ace is our flagship amplifier system. It is the most technically advanced Ti:Sapphire regenerative amplifier commercially available. Equipped with our proprietary Ace cavity design, the Spitfire Ace provides guaranteed long term performance, low noise and reliable day-to-day operation. The result is consistent OPA performance and nonlinear wavelength conversion – a superior light source for use in the most demanding ultrafast applications.

The Spitfire Ace amplifier builds upon our highly successful Spitfire platform. Each component has been carefully evaluated and selected to maximize stability.

The Spitfire Ace regenerative amplifier produces an industry leading average power of more than 7 W at 1 kHz and 10 kHz, and 8 W at 5 kHz with excellent beam quality.

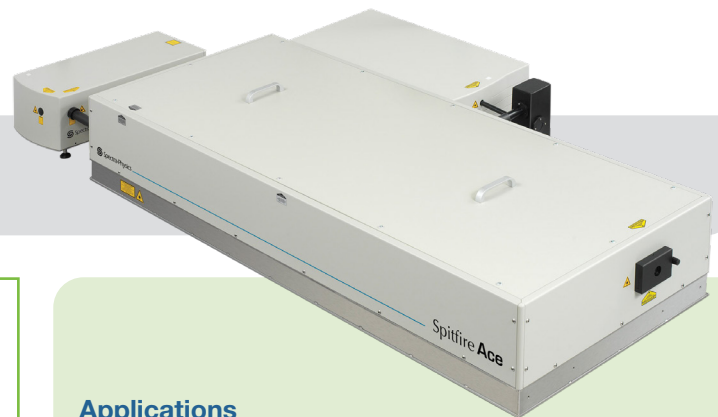
The Spitfire Ace provides the most stable output available from any Ti:Sapphire regenerative amplifier making the Spitfire Ace ideal for pumping multiple OPA systems and driving a wide range of nonlinear spectroscopies. Achieve new levels of performance with the Spitfire Ace.

The Spitfire Ace Advantage

- Revolutionary Ace regenerative cavity design
- More than 8.0 W of output power
- Superior mode quality ($M^2 < 1.3$)
- Digital synchronization electronics
- Supported by the most knowledgeable service team in the industry

Applications

- Multicolor pump-probe spectroscopy
- Coherent control
- Nonlinear optics
- 2D IR spectroscopy
- Four-wave mixing spectroscopy
- High harmonics generation
- Optical parametric amplification
- Material processing

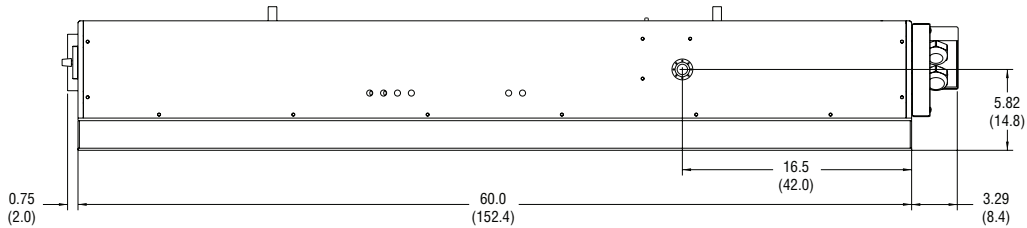


Spitfire Ace Specifications^{1, 11}

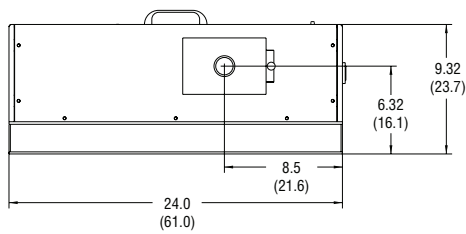
		Spitfire Ace		
Output Characteristics				
Pulse Width ^{2, 3}		<35 fs – <120 fs; <2 ps ⁴		
Repetition Rate ⁵		1 kHz	5 kHz	10 kHz
Average Power ⁴	Ascend 60:	>7.0 W	>8.0 W	>7.0 W
	Ascend 40:	>5.0 W	>6.0 W	>5.0 W
Pulse Energy	Ascend 60:	>7.0 mJ	>1.6 mJ	>0.7 mJ
	Ascend 40:	>5.0 mJ	>1.2 mJ	>0.5 mJ
Pre-Pulse Contrast Ratio ⁶		>1000:1		
Post-Pulse Contrast Ratio ⁷		>100:1		
Energy Stability		<0.5% rms over 24 hours		
Beam Pointing Stability		<5 μ rad rms ⁸		
Wavelength ^{9, 10}		795–805 nm	780–820 nm	780–820 nm
Spatial Mode		TEM ₀₀ (M ² <1.3 on both axes)		
Beam Diameter (1/e ²)		10 mm (nominal)		
Polarization		Linear, Horizontal		

1. Due to our continuous product improvements, specifications subject to change without notice. The specifications only apply when operated with recommended Spectra-Physics seed and pump lasers.
2. A Gaussian pulse shape (0.7 deconvolution factor) is used to determine pulse width (FWHM) from autocorrelation signal as measured with Newport PulseScout[®] autocorrelator.
3. For alternative pulse widths, please contact Spectra-Physics.
4. Specifications apply when pumped using Spectra-Physics Ascend 60 pump laser. The <2 ps option maximum power >5.0 W.
5. The desired optimum repetition rate can be specified at the time of purchase or additional optics sets can be used to reconfigure the amplifier. Any system can be operated (with the same energy per pulse) at reduced repetition rates through internal divide-down electronics.
6. Defined as the ratio between peak intensity of output pulse to peak intensity of any pre-pulse that occurs >1 ns before the output pulse. For higher contrast ratio, please contact Spectra-Physics.
7. Defined as the ratio between peak intensity of output pulse to peak intensity of any post-pulse that occurs >1 ns after the output pulse. For higher contrast ratio, please contact Spectra-Physics.
8. At constant temperature. Variable temperature specification <20 μ rad/ $^{\circ}$ C, peak-to-peak.
9. For wavelength extension through SHG, THG, FHG or OPA, please contact Spectra-Physics.
10. Performance specifications apply at peak of gain curve.
11. The Spitfire Ace is a Class IV – High-Power Laser, whose beam is, by definition, a safety and fire hazard. Take precautions to prevent exposure to direct and reflected beams. Diffuse as well as specular reflections can cause severe skin or eye damage.

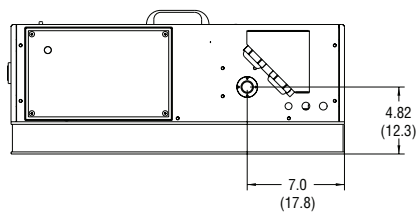
Spitfire Ace Dimensional Drawing



Side View, Seed Input Panel



Output End View



Pump End View

Dimensions in inch (cm)