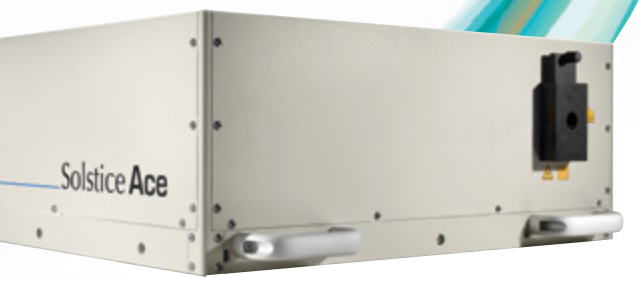
Solstice® Ace™ – EMPOWER PUMPED

HIGH ENERGY, INDUSTRIAL ONE BOX ULTRAFAST AMPLIFIER

The Solstice Ace Advantage

- *Patented Ace regenerative amplifier cavity design*
- *Available in <35 fs and <120 fs configurations*
- *Configurable repetition rate, 1–10 kHz*
- *Exceptional beam quality (M^2 <1.25)*
- *Stable operation in a ±5°C environment*



Applications

- *OPA pumping*
- *2D IR spectroscopy*
- *Ultrafast pump-probe spectroscopy*
- *Nonlinear optics*
- *Four wave mixing spectroscopy*
- *Ultrafast micromachining on a wide variety of materials*

The Spectra-Physics® Solstice® Ace™ furthers the outstanding reputation demonstrated by its predecessor by incorporating the enhanced performance specifications of Spitfire® Ace™ to maximize performance, product reliability and output stability. Introduced in 2007, Solstice was the first femtosecond ultrafast amplifier designed, built and tested to meet rigorous industrial standards and incorporating modular components, adjustment-free mounting hardware, and field proven pump and seed lasers. Solstice Ace builds on this impeccable reputation to provide industry-leading, hands-free performance for a wide range of ultrafast applications.

Industrial Architecture

Unlike traditional lasers that utilize standard optomechanics, Solstice Ace uses adjustment-free EternAlign™ optical mounts to maximize long-term stability and performance. Solstice Ace is capable of reliable operation over a ±5°C temperature range. The EternAlign mounts are housed by 2 independent modules – the regenerative amplifier and the stretcher compressor. Each component is fully enclosed and temperature stabilized to ensure optimal reliability.

Using Spectra-Physics' patented Ace regenerative amplifier cavity, the Solstice Ace delivers >6 W at 1 kHz, >7 W at 5 kHz and >6 W at 10 kHz with pulse width configurations ranging from <35 fs to <120 fs. For every configuration of Solstice Ace, the beam quality is exceptional (M^2 <1.25) making it perfect for OPA pumping and a wide range of nonlinear spectroscopy applications.

Field Proven Mai Tai and Empower Pump Lasers

The Solstice Ace amplifier can be configured for use with all versions of the fully automated Spectra-Physics Mai Tai® femtosecond oscillator which presents additional flexibility and utility to your laboratory. With its ±10°C operating environment and industrial design, Mai Tai is the industry leader in stability and reliability.

The Solstice Ace is pumped by the Empower® diode-pumped solid state pulsed green laser. The field proven Empower design supports the industry leading energy stability specifications of Solstice Ace (<0.5% rms for 24 hours) and provides a complete ultrafast amplifier package capable of high stability and reliability and industry-leading performance.

Spectra-Physics®
A Newport Company

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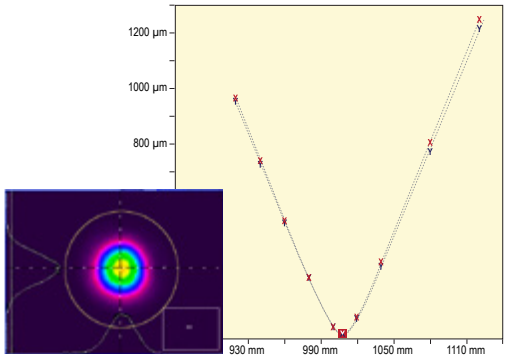
Specifications[1, 10]

Output Characteristics	Solstice Ace35F		Solstice Ace100F
Pulse Width[2, 3]	<35 fs		<120 fs
Repetition Rate[4]	1 kHz	5 kHz	10 kHz
Average Power	>6.0 W	>7.0 W	>6.0 W
Pulse Energy	>6.0 mJ	>1.4 mJ	>0.6 mJ
Pre-Pulse Contrast Ratio[5]	>1000:1		
Post-Pulse Contrast Ratio[6]	>100:1		
Operating Temperature Range	±5°C		
Energy Stability	<0.5% rms over 24 hours		
Beam Pointing Stability	<5 µrad (rms)[7]		
Wavelength[8, 9]	795–805 nm		780–820 nm
Spatial Mode	TEM_{00} (M^2 <1.25, both axes)		
Beam Diameter ($1/e^2$)	10 mm (nominal)		
Polarization	Linear, Horizontal		

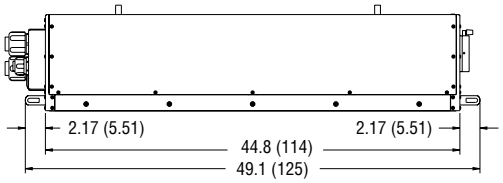
1. Due to our continuous product improvements, specifications are subject to change without notice.
2. A Gaussian pulse shape (0.7 deconvolution factor) is used to determine pulse width (FWHM) from autocorrelation signal as measured with a Newport PulseScout® autocorrelator.
3. For alternate pulse widths, please contact Spectra-Physics.
4. The desired optimum repetition rate can be specified at the time of purchase or additonal 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.
5. 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.
6. 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.
7. At constant temperature. Variable temperature specification <20 µrad/°C, peak-to-peak.
8. For wavelength extension through SHG, THG, FHG or OPA, please contact Spectra-Physics.
9. Performance specifications apply at peak of gain curve.
10. The Solstice 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.

Solstice Ace Beam Quality[1]

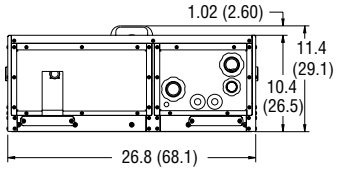


1. Typically measured performance.

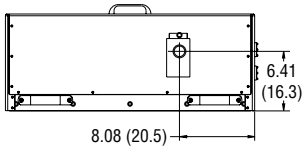
Solstice Ace Dimensions



Left Side View



Rear View



Front View

Dimensions in inch (cm)

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