

# Spirit<sup>®</sup> 1030-100 and Spirit 1030-70

## The Spirit 1030-100 and Spirit 1030-70 Advantage

- High average power (>100 and 70 W), high pulse energy (>100 and 70  $\mu$ J) and high repetition rate (up to 10 MHz) for highest throughput
- <400 fs pulse duration for smallest heat affected zone (HAZ)
- Near diffraction-limited beam quality (typ.  $M^2 < 1.1$ ) for highest resolution and finest features
- >50 W average power @ 515 nm
- User adjustable repetition rate (single shot – 10 MHz)
- Integrated pulse-picker for advanced triggering and burst mode functionality
- 24/7 industrial reliability
- Lowest cost-of-ownership



## SETTING A NEW STANDARD FOR HIGH-PRECISION FEMTOSECOND MACHINING

The Spirit 1030-100 and 1030-70 lasers set new standards for femtosecond lasers in high-precision industrial manufacturing and pumping of non-linear OPA's delivering unprecedented performance for 3-photon microscopy. These lasers deliver high average power, high pulse energy, and high repetition rates for increased throughput. Customers benefit from the shortest industrially available pulse duration and superior beam quality that in turn enables machining complex and challenging parts with highest precision and quality with literally no heat affected zone (HAZ) at the highest throughput. The Spirit 1030-100 and 1030-70 are designed for industrial use and offer reliable and robust 24/7 operation with lowest cost of ownership.

### Highest-Precision Machining of the Finest Features with Highest Throughput

Our new additions to the industry-proven Spirit platform offers impressive versatility and performance, enabling a variety of applications. High average power (>100 W) and high pulse energy (>100  $\mu$ J) combined with high repetition rates push femtosecond micromachining applications to highest levels of throughput at lowest cost-of-ownership. The user-configurable burst mode enables processing with increased ablation efficiency, and thus increased throughput and quality for certain materials. Pulse energy and repetition rate adjustability (single shot – 10 MHz) make the Spirit 1030-100 the ideal source for ablation and cutting. The integrated pulse picker offers full control of the laser output with single pulse selection and fast power control via an analog input signal.

The integrated second harmonic generation (SHG) offers an output power of >50 W and a typical pulse width of <300 fs at a wavelength of 515 nm. At this shorter wavelength, machining of the finest features is possible, depending on the material, at equal or even higher speeds compared to those obtained with other technologies.

### 24/7 Industrial Reliability

The Spirit lasers are designed and tested to rigorous quality standards for reliable 24/7 operation. The built-in data logging and analysis capability allows monitoring of all relevant laser parameters over the life time of the system. As such, this represents an indispensable diagnostics tool for service and preventive maintenance which significantly enhances uptime and thus productivity of the tool.

## Applications

- Polymer cutting
- Metal drilling and cutting
- Precision machining of hard and brittle materials
- Polycrystalline diamond (PCD) cutting and ablation
- Sapphire cutting and drilling
- 3-photon microscopy
- Optical parametric amplifier pumping
- Time resolved femtosecond spectroscopy

# Spirit® 1030-100 and Spirit® 1030-70

## Specifications<sup>1</sup>

	Spirit 1030-100	Spirit 1030-70	Spirit 1030-100-SHG
<b>Output Characteristics</b>			
Wavelength	1030 nm $\pm$ 5 nm		515 nm $\pm$ 3 nm
Output Power	>100 W	>70 W	>50 W <sup>2</sup>
Pulse Energy	>100 $\mu$ J	>70 $\mu$ J	>50 $\mu$ J <sup>2</sup>
Repetition Rates <sup>3</sup>	Single shot to 10 MHz		
Pulse Selection	Integrated Pulse Picker (AOM)		
Pulse Width	<400 fs		
Power Stability	<1% rms over 100 hours		
Pulse-to-Pulse Stability	<2% rms		
Spatial Mode	TEM <sub>00</sub> (M <sup>2</sup> <1.2)		
Beam Diameter	2.5 mm $\pm$ 0.5 mm		
Beam Divergence, full angle	<1 mrad		<0.5 mrad
Pre-Pulse Contrast Ratio	>250:1		
Polarization	Horizontal		
Cold Start Time	<30 min.		
Warm Start Time	<15 min.		
<b>Environmental specifications</b>			
Operating Temperature	15–35°C (59–95 °F)		
Relative Humidity	<65 %, non-condensing		
<b>Cooling Requirements</b>			
Laser Head	Water cooled		
Power Supply	Water cooled		
<b>Utility Requirements</b>			
Voltage	208–230 V, 50/60 Hz		
Current	<16 A		
<b>Laser Head Physical Characteristics</b>			
Dimensions (L x W x H)	39.5 x 14.5 x 8.1 in (1003 x 369 x 205 mm)		
Weight	155 lbs (70 kg)		
<b>Rack with Power Supply and Chiller Physical Characteristics</b>			
Dimensions (L x W x H)	31.5 x 21.8 x 43.4 in ( 800 x 553 x 1102 mm)		
Weight	220 lbs (100 kg)		

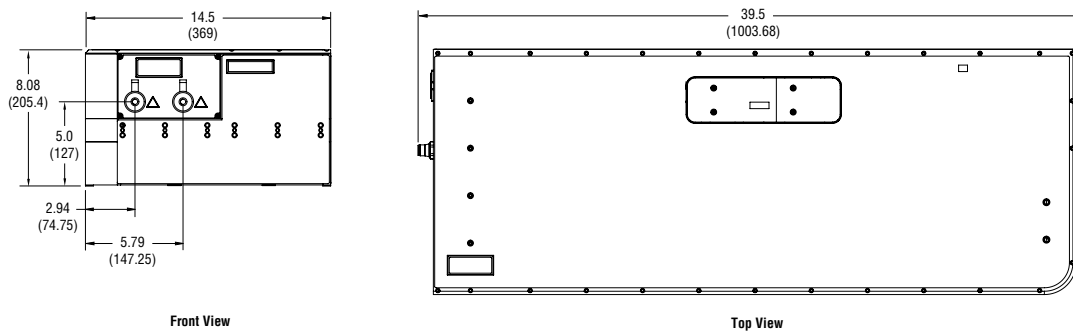
1. Due to our continuous product improvement program, specifications may change without notice.

2. Maximum conversion efficiency of 50% for SHG up to 1 MHz.

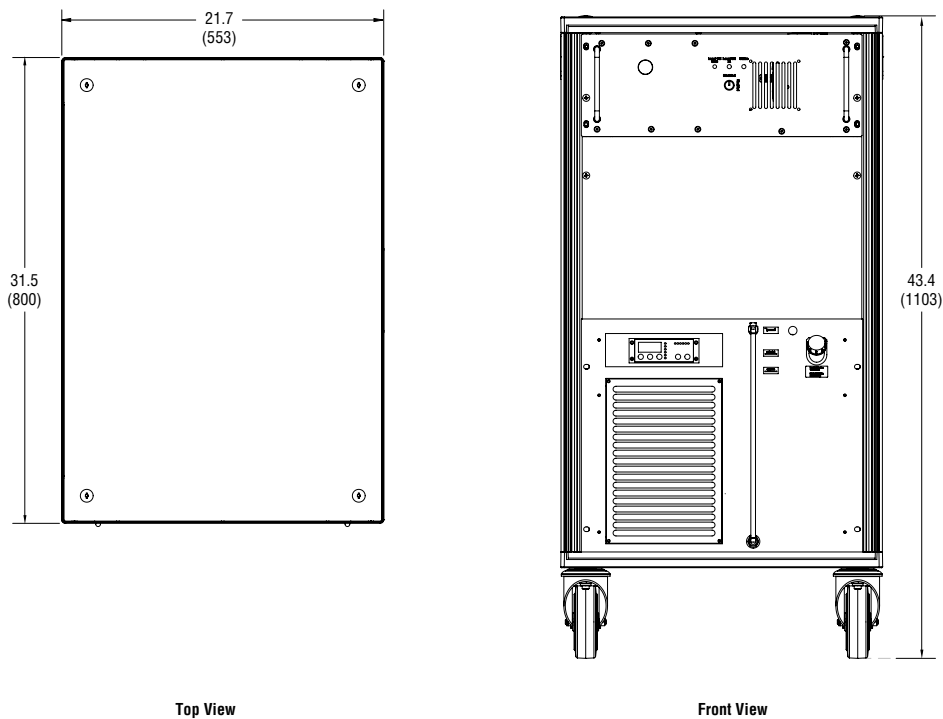
3. Specific pre-calibrated repetition rates are available; please contact Spectra-Physics.

# Spirit® 1030-100 and Spirit® 1030-70

## Spirit 1030-100 and Spirit 1030-70 Laser Dimensions



## Rack with Power Supply and Chiller Dimensions



Dimensions in inch (mm)



[www.spectra-physics.com](http://www.spectra-physics.com)

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