

# Monaco SmartCleave

## Structured Transparent Material Cutting

Monaco SmartCleave is an industrial laser with a MOPA architecture. Based on the Monaco femtosecond platform, the SmartCleave model is configured and specified for cutting structured transparent materials. Seeder burst energies  $>320 \mu\text{J}$  cut materials from 0.1 mm to  $>2$  mm thick in a single pass. Additionally, the ultrashort pulse nature of Monaco allows layered or coated glass and sapphire to be processed with little or no heat affected zone. Monaco SmartCleave further expands the options for glass and film cutting to enable next generation display production.

### FEATURES & BENEFITS

- $>320 \mu\text{J}/\text{pulse}$  for cutting 0.1 mm to  $>2$  mm thick materials
- $>150$  kHz seeder burst mode to enable  $>1$  m/s cutting speeds
- Femtosecond performance for filament and ablative cutting in a single laser
- Femtosecond operation to yield low HAZ in complex, layered materials
- Variable pulsewidth from  $<300$  fs to  $>10$  ps for process tailoring
- Compact single box design for ease of integration
- HALT-designed/HASS-verified for superior quality and reliability

### APPLICATIONS

- Structured Glass Cutting
- Coated Transparent Material Cutting
- Structured Sapphire Cutting
- OLED Stack Cutting
- LCD Cutting and Tailoring
- Display Glass Cutting



OPTICAL SPECIFICATIONS <sup>1</sup>	Monaco SmartCleave 1035-40-40	Monaco SmartCleave 1035-80-60
Fundamental Center Wavelength (nm)	1035 ±5	1035 ±5
Output Power (W)	40	60
Energy (μJ)	40 (at 1 MHz)	80 (at 750 kHz)
Seeder Burst Mode (μJ) (max. energy)	>200	>320
Seeder Burst Count (μJ) (max. energy)	5 x 40	4 x 80
Seeder Burst Mode Repetition Rate (kHz) (max. energy)	200	188
Native Repetition Rate	Single-shot to 1 MHz, higher rep. rates without AOM pulsepicking: 1 to 50 MHz standard	
Pulsewidth (fs)	<350	
Tuning Range	<350 fs to >10 ps	
Spatial Mode	TEM <sub>00</sub> , M <sup>2</sup> <1.2	
Beam Divergence (mrad, 2θ)	<1	
Beam Diameter at Output <sup>2</sup> (mm, 1/e <sup>2</sup> )	2.7 ±0.3	
Beam Circularity (%)	>85	
Polarization Ratio	>100:1	
Polarization Direction <sup>3</sup>	Vertical ±3°	
Beam Pointing Stability (μrad/°C)	<25	
Pulse Energy Stability (%) (RMS)	<1.5	
Power Stability (%) (RMS, 2σ)	<1.5	
Warm-up Time (minutes)		
Cold Start	<45	
Warm Start	<15	
Long-term Pointing Stability (μrad)	±25 over 8 hours	
Head Weight	50 kg (110 lbs.)	
External Comms	RS-232, Ethernet, USB	
Power Consumption <sup>4</sup> (typical)	48VDC, <500W	
OPERATING SPECIFICATIONS		
Temperature (non-condensing)		
Laser Head	+10 to 30°C (50 to 86°F)	
Power Supply	-20 to +60°C (-4 to 140°F)	
Non-Operation (storage)	5 to 65°C (41 to 149°F)	
Relative Humidity (%)	<90, non-condensing	
SHIPPING SPECIFICATIONS		
Temperature	-20 to +60°C (-4 to 140°F)	

<sup>1</sup> All specifications at maximum energy.

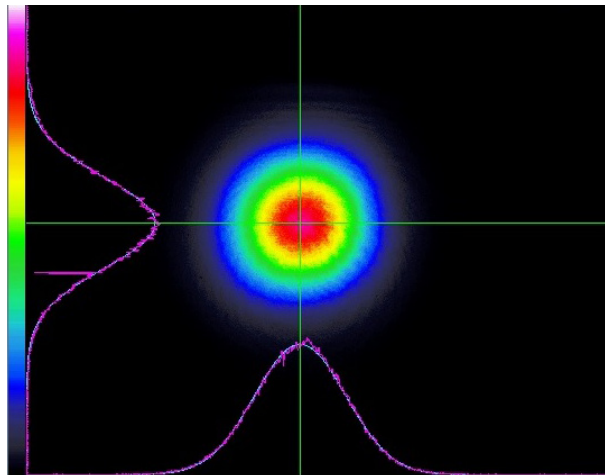
<sup>2</sup> Measured at 1m from laser output window.

<sup>3</sup> External isolation required depending on application.

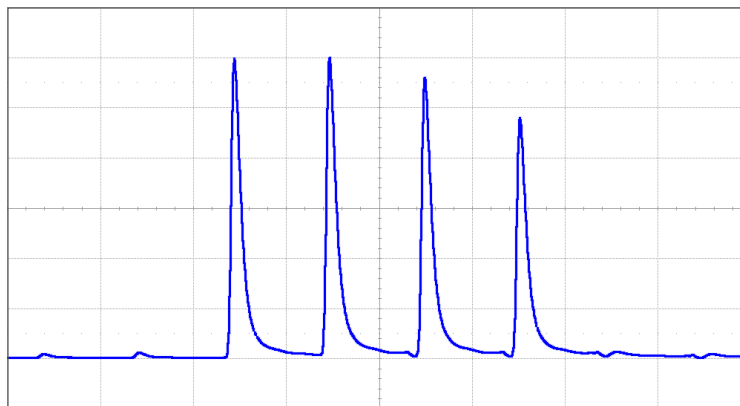
<sup>4</sup> Optional 110 to 240VAC power supply available.

**TYPICAL PERFORMANCE DATA**

**Monaco SmartCleave Sample Spatial Mode**

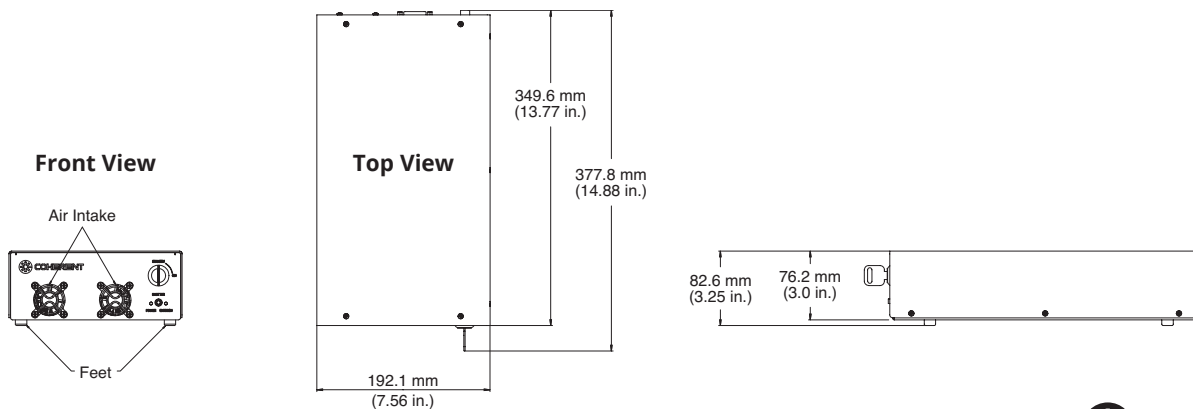


**Monaco SmartCleave Sample Seeder Burst with 20 ns Spacing**



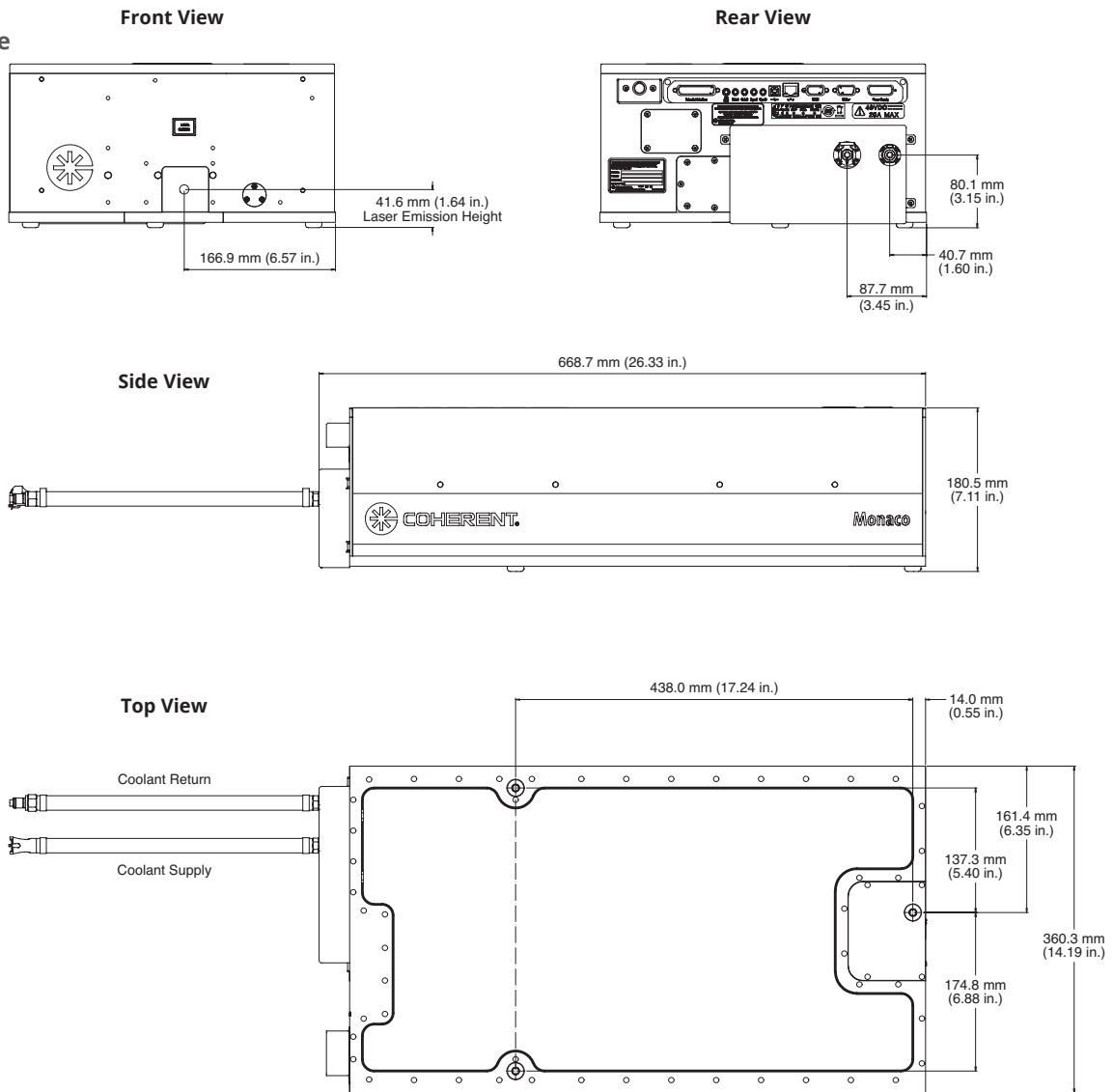
**MECHANICAL SPECIFICATIONS**

**Monaco SmartCleave  
Power Supply**



## MECHANICAL SPECIFICATIONS

### Monaco SmartCleave



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Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice. Coherent's scientific and industrial lasers are certified to comply with the Federal Regulations (21 CFR Subchapter J) as administered by the Center for Devices and Radiological Health on all systems ordered for shipment after August 2, 1976.

Coherent offers a limited warranty for all Monaco SmartCleave Lasers. For full details of this warranty coverage, please refer to the Service section at [www.Coherent.com](http://www.Coherent.com) or contact your local Sales or Service Representative. MC-007-18-0M0318 Copyright ©2018 Coherent, Inc.

