IPG Photonics’ Robotic Laser Workcell
from the World Leader in Fiber Lasers

Applications
Features
Advantages

www.ipgphotonics.com

The Power to Transform®
System Overview
IPG Photonics’ Robotic Laser Workcell

Standard & Compact Workcells at a Glance
IPG’s Robotic Laser Workcells are modular, highly-configurable workstations comprising IPG’s world-leading fiber lasers, laser processing heads and a 6-axis robot. A 17-inch touchscreen monitor is the operator interface to the integrated control system that provides programmability of motion, laser parameters and processing gas.

Examples of the product range include Standard and Compact Class 1 laser safety workcells. Typically equipped with a 6-axis robot and an optional 2-axis tip/tilt positioner, the robot is used to move the laser processing head around a complex shaped stationary part. These workcells can be optionally equipped with a pneumatically actuated two-station rotary part loading system that is light-guarded and fully interlocked to ensure safe laser operation. IPG can also offer Custom designed equipment such as the 50 kW thick welding system, having a long reach for large part processing.

System Applications

<table>
<thead>
<tr>
<th>Cutting</th>
<th>Cladding</th>
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<tbody>
<tr>
<td>Welding</td>
<td>Marking</td>
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<tr>
<td>Drilling</td>
<td>Thick Welding</td>
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</table>

Typical system capabilities are for reference only. Each primary function such as laser power, process head capabilities and robot capacity and reach is available in a range of sizes and is easily integrated into the base configuration. IPG also offers an option to equip a system for multiple applications, with automatic re-tooling between process heads.

IPG’s modular approach makes systems readily customizable for your specific applications; enabling you to invest in processing capabilities optimally matched to your needs.
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Top: Hole in 380 µm Aluminum Nitride  
Bottom: Cutting and Drilling Stainless Steel Tube

Standard & Compact Workcells at a Glance

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Fiber Lasers & Processing Heads

IPG’s Robotic Workcells enable users to choose a laser source from a unique selection of high-efficiency, high-reliability fiber lasers. IPG’s fiber lasers are entirely solid state, with no mechanical cavity resonators or mirrors and no adjustable or replaceable parts within the laser. Light is outputted along a flexible optical fiber pipe that is plugged directly into the laser processing head, eliminating the need for optics and adjustments in the beam delivery path. Laser options include quasi-CW (QCW) sources having high pulse energy and high peak power for welding and drilling, where penetrating metal with minimal heat affect is important and high-power CW lasers that provide high-speed material processing.

Process Head Versatility

IPG’s Laser Processing Heads are specifically designed to optimize the cutting, drilling or welding performance achieved using fiber lasers. Featuring a wide range of collimator and focus lens options, the processing heads include real-time contamination monitoring, process gas delivery and camera options in a rugged, light-weight unit.

Additional accessories include air knife, gas assist/plume suppression and seam-tracking and wobble modules for extended process flexibility. Robot Workcell options include a programmable laser beam switch and a pneumatic tool coupler to enable selection of processing head and changing of machining process.

50 kW Power  
1.5 inches (38 mm)  
Weld Depth

FLW-D50 Welding Head
**Standard Robotic Laser Workcell**

**Enclosure:**
- CDRH Class 1 Laser
- Dual Wall Aluminum Panels

**Dimensions (WxDxH):**
- 117 x 175 x 106 inches

**Laser:**
- 1 kW up to 50 kW

**Processing Heads:**
- Cutting
- Drilling
- Welding
- Thick Welding
- Cladding

**Robot Reach/Repeatability:**
- 72/0.002 inches

**Laser Work Volume:**
- TBD?? 50 x 50 x 40 inches
System Configurations
Types of Robotic Laser Workcells

Compact Robotic Laser Workcell

- **Enclosure:** CDRH Class 1 Laser
  - Dual Wall Aluminum Panels
- **Dimensions**:
  - (WxDxH): 58 x 100 x 76 inches
- **Laser:** 1 kW up to 10 kW
- **Processing Heads:**
  - Cutting
  - Drilling
  - Welding
  - Thick Welding
  - Cladding
- **Robot Reach/Repeatability:** 88/0.002 inches
- **Laser Work Volume:** 30 x 30 x 30 inches

Custom Robotic Laser Workcell

- **Enclosure:** Class 4 Laser
  - Open or Custom Enclosure
- **Laser:** 1 kW up to 50 kW
- **Processing Heads:**
  - Cutting
  - Drilling
  - Thick Welding
  - Welding
  - Cladding
- **Robot Reach/Repeatability:** To Customers Needs
- **Laser Work Volume:** To Customers Needs
Company Overview

Leader in Innovation
IPG Photonics is the world leader in high power fiber lasers and amplifiers. Founded in 1990, IPG pioneered the development and commercialization of optical fiber-based lasers for use in a wide range of venues such as materials processing, medical, scientific and other advanced applications. Fiber lasers have revolutionized the industry by delivering superior performance, reliability and usability at a lower cost of ownership compared with conventional lasers, allowing end users to increase productivity and decrease operating costs. IPG is headquartered in Oxford, MA with additional facilities throughout the world.

Service & Support
As the world leader in fiber lasers, IPG Photonics is your ideal partner to provide service and support for your precision laser processing system. IPG has over 100 field service engineers, specializing in servicing industrial lasers and laser systems used in 24x7 manufacturing. North American applications and field service offices are located in Oxford, MA, Santa Clara, CA and Novi, MI. IPG’s Field Service Team is comprised of experienced and highly-skilled engineers, supported by a global infrastructure including parts warehousing, applications scientists and the design and manufacturing teams that build the products.

IPG understands the rigors of today’s manufacturing line and can provide customer support 24/7 depending on your needs. In addition to warranty coverage, IPG offers support packages ranging from on-demand and hourly paid service to scheduled preventive maintenance and guaranteed response times. Whatever your service preference, IPG has an option that will meet your needs.
## System Specifications
### IPG Photonics’ Robotic Laser Workcell

### Specification Summary

<table>
<thead>
<tr>
<th>Feature</th>
<th>Standard Robotic Laser Workcell</th>
<th>Compact Robotic Laser Workcell</th>
<th>Custom Robotic Laser Workcell*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enclosure - Class 1 Laser Safety Dual Wall</td>
<td>✓</td>
<td></td>
<td>✓</td>
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<tr>
<td>Aluminum Extrusion Panels</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Laser Safe Viewing Window</td>
<td></td>
<td></td>
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<tr>
<td>Enclosure - Class 4 Steel Wire Mesh Machine Guarding</td>
<td></td>
<td>✓</td>
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<tr>
<td>Workcell Dimensions, WxDxH, inches</td>
<td>117 x 175 x 106</td>
<td>58 x 100 x 76</td>
<td>Custom Design</td>
</tr>
<tr>
<td>Laser Power Options (avg power), kW</td>
<td>1-10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laser Process Head Options:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>FLC-D30 Cutting Head (12 kW)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>FLW-D30 Welding Head (6 kW)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>FLW-D50 Welding Head (10 kW)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>FLW-D50HP Welding Head (50 kW)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Wobble &amp; Seam Track Module</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Cladding Head (Application Dependent)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Beam Delivery Options</td>
<td>Selectable Collimator/ Focus Lenses</td>
<td>Integrated Air-knife/ Cross-jet</td>
<td>Integrated Shield Gas Delivery Nozzle</td>
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<td>Electronic Flow Control</td>
<td>Water-cooled Optics</td>
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<td></td>
<td></td>
<td>Engineered Cable Management</td>
<td></td>
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<tr>
<td>Robot Capabilities (Typical)</td>
<td>Includes Robot Controller with Motion Package &amp; Safety Position Check</td>
<td></td>
<td></td>
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<tr>
<td>Reach/ Repeatability, inches</td>
<td>61/ 0.002</td>
<td>88/ 0.002</td>
<td>121/ 0.003</td>
</tr>
<tr>
<td>Laser Work Envelope, inches</td>
<td>50 x 50 x 40</td>
<td>30 x 30 x 30</td>
<td>Custom Design</td>
</tr>
<tr>
<td>Controls/ Interface Options</td>
<td>Stand-alone Mobile HMI Stand, Industrial PC with 17” Color Touchscreen.</td>
<td>IPG Cell Control Interface. Front panel Controls for Emergency Stop, Laser Mode, System Reset, Cycle Start, Cycle Stop</td>
<td></td>
</tr>
<tr>
<td>Tooling</td>
<td>Heavy Duty Table to Mount Machine Tooling</td>
<td></td>
<td></td>
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<tr>
<td>System Integration</td>
<td>Electrical Integration of all Components; Software Integration of Robot, Laser, Cell Safety</td>
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</tbody>
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*Specifications for the Custom Robotic Workcell are typical values. IPG will configure equipment to meet specific customer needs.*

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