SOLUTION

FLW SERIES

Fiber laser welding system (FLW)

Model 1: Robot
Model 2: Robot and positioner table
Model 3: Robot, positioner table and robot carriage

Implementation example

Machine specifications
Oscillator and chiller specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>Rated power W</th>
<th>Power requirements kVA</th>
<th>Mass of oscillator kg</th>
<th>Outside dimensions W×H×L (partition) mm</th>
<th>Power requirements kVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oscillator</td>
<td>YLS4000-S2T</td>
<td>4000</td>
<td>20</td>
<td></td>
<td>5500 × 3500 × 6600</td>
<td></td>
</tr>
<tr>
<td>Robot carriage</td>
<td>AMNC/PC</td>
<td>3.0 m</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The FLW series is available in the following line-up to suit your specific material sizes and processing applications.

- Model 3: Robot, positioner table and robot carriage*

*Suggested layout

N

Oscillator and robot carriage
Oscillator: 4 kW
Robot carriage: 3.0 m

System specification

N

Oscillator and controller
Oscillator and controller: YLS-4000-S2T
Controller: R-30iA
Transformer: 24kVA
AMNC/PC Control panel
Dust collector
Chiller: R256 8

Fiber laser welding system (FLW)
A new era of laser welding

Multi-functional, high speed and high grade welding

Amada Fiber Laser Welding system achieves high speed and high grade welding that is impossible with conventional laser welding.

Amada provides the solutions to your common welding issues. Features such as a Fiber laser oscillator, Amada’s original processing head and a range of software assist you with the complete welding process and enhance your laser welding productivity.

Fiber laser welding system
Introducing the FLW series!

Fiber laser welding system (FLW)

*FLW is the acronym for fiber laser welding.

Integrated processing
from 3D CAD/CAM to welding

Information

- Product: White goods panel
- Material: SUS
- Thickness: 1.0 mm
- Product size: 250x200x100 mm

Present issues

- Bending of vertical radius fold requires for special tools which add to costs.
- Three-directional radius corner cannot be bent- separate parts must be fabricated.
- Welding distorts the product.
- Bend gauging and dimensional accuracy are unstable.
- Post-weld finishing requires much time and labour increasing costs.

Benefits of integrated processing

- Vertical radius fold can be bent using standard tools.
- Three-directional radius corner can be bent in one hit with special tooling and finished to a high quality.
- 90 mm backgauge fingers achieve consistent angle accuracy.
- Fiber laser welding reduces the distortion of the product and reduces finishing time.

Automatic unfolding to high quality welding of three-directional radius corner

- One-click automatic unfolding of three-directional radius corner
- High quality laser cutting of profiles
- Radius bend achieved without using special tool
- Three-directional radius achieved with one hit using special tool
- Robotic welding provides high quality and consistency

Fiber laser welding system (FLW)

FLW SERIES

2D CAD/CAM
AP100

3D solid sheet metal CAD
SheetWorks

Fully automatic blanking data creation CAM
Dr.ABE_Blank

Fully automatic bending data creation CAM
Dr.ABE_Bend

Fiber laser cutting machine
FOL-3015AJ

Press brake tor ultimate ngr mnx, small-lot pdruction
HG-1003

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Introducing the FLW series!

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FLW Series new technologies

1 High speed and high grade welding

What is a fiber laser?

- Improved welding of highly reflective and difficult to weld materials
  A fiber laser has a short wavelength and high beam absorption against metal. This enables a fiber laser to weld aluminum, copper as well as highly reflective and difficult to weld materials thereby expanding your processing range.

- Realize high grade processing with smooth continuous welding
  Continuous waveform (CW) welding produces highly airtight and smooth welds. The NC auto focus control feature enables a wide range of weld processing from appearance to emphasis on deep penetration and strength.

- Improved efficiency and reduced costs
  A large reduction in electricity costs is made possible due to a high heat exchange efficiency. Maintenance cycles are also improved due to the reduction of mirrors and other optical components.


- Welding performance improvement of highly reflective or difficult-to-weld materials
<table>
<thead>
<tr>
<th>Fiber laser</th>
<th>CO2 laser</th>
<th>Disc laser</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength (µm)</td>
<td>1.07</td>
<td>10.6</td>
</tr>
<tr>
<td>Total efficiency, including chiller</td>
<td>30</td>
<td>6</td>
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<tr>
<td>Beam absorption rate</td>
<td>35</td>
<td>12</td>
</tr>
</tbody>
</table>


2 Amada welding technology package

New original processing head

- Beam weaing system
  The optic system rotates, therefore rotating the laser beam. Amada’s patented beam weaing system allows welding of large-gap parts, filler feeding and aluminum processing.

- NC auto focus control
  The NC focus control feature automatically controls the focus lens to the optimum position based on the processing condition. This simultaneously enables butt welding with a small beam and radius finishing of corners by focusing on a wide area.

- Movable filler and gas nozzle
  The filler reel can carry a maximum of 20 kg. The gas nozzle automatically retracts when the TAS function is used (Teaching assist system).

3 Enhanced efficiency by digitalization

Supporting high quality welding with advanced technology

- AMNC/PC
  Amada’s original controller is used to:
  - Download processing programs from CAD
  - Visualize setup information
  - Database of processing conditions

- TAS (Teaching assist system)
  The TAS function saves you the difficult task of manually teaching the robot the welding paths. The deviation between the welding path and target is compensated using a high resolution CCD camera and stored to memory.

4 Enhanced efficiency by digitalisation 2

Dedicated off-line programming software

- FLW-CAM
  The AMADA FLW-CAM software improves your efficiency through off-line robot teaching, simulating movements based on 3D data.
Other functions and options

Peripheral units

Positioner table
Reduction of set-up time and jig change is made possible by rotating and tilting the workpiece plus weld line to the desired position.

Robot carriage
The robot can be automatically moved to the best welding position for large or complex parts, this also reduces manual handling of workpieces.

Safeguarding - Implementation of safety measures
To ensure the safe use of our laser welding machines, safety equipment is installed to meet all appropriate laws and regulations in Japan and abroad. For your safe use of our laser welding machines, appropriate equipment safeguarding measures are undertaken by considering applicable laws and regulations.

Safety partition
Door interlock
Safety stop button

Protecting the Environment

Environmentally friendly design
The Amada environmental management team create eco products with a low environmental impact for our customers benefit.

Path change: Machining to sheet metal fabrication

<table>
<thead>
<tr>
<th>Product</th>
<th>Gear cam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material type</td>
<td>SUS304</td>
</tr>
<tr>
<td>and thickness</td>
<td>10.0 mm</td>
</tr>
<tr>
<td>Product size</td>
<td>200×200×30 mm</td>
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<tr>
<td>Processing speed</td>
<td>F2000</td>
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<tr>
<td>Laser power</td>
<td>800 W</td>
</tr>
<tr>
<td>Processing time</td>
<td>30 sec</td>
</tr>
</tbody>
</table>

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<tr>
<td>and thickness</td>
<td>10.0 mm</td>
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<tr>
<td>Product size</td>
<td>200×200×18 mm</td>
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<tr>
<td>Processing speed</td>
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<tr>
<td>Laser power</td>
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<tr>
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<table>
<thead>
<tr>
<th>Product</th>
<th>Gear cam</th>
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<td>TP550</td>
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<td>and thickness</td>
<td>8.0 mm</td>
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<td>Product size</td>
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<td>Laser power</td>
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<table>
<thead>
<tr>
<th>Product</th>
<th>Heat sink</th>
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<tbody>
<tr>
<td>Material type</td>
<td>C1100</td>
</tr>
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<td>and thickness</td>
<td>2.0 mm</td>
</tr>
<tr>
<td>Product size</td>
<td>100×80×10 mm</td>
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<td>Processing speed</td>
<td>F600</td>
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<td>Laser power</td>
<td>4000 W</td>
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<td>Processing time</td>
<td>51 sec</td>
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<table>
<thead>
<tr>
<th>Product</th>
<th>Heat pipe</th>
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<tbody>
<tr>
<td>Material types</td>
<td>C1100+SUS304</td>
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<tr>
<td>Product size</td>
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<td>Processing speed</td>
<td>F1000</td>
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<td>Laser power</td>
<td>2000 W</td>
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<td>Processing time</td>
<td>12 sec</td>
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Sample data

Line up
The FLW series is available in the following layouts to suit your specific material sizes and processing applications.

Model 1
Robot
Model 2
Robot and positioner table
Model 3
Robot, positioner table and robot carriage

Fiber laser welding system FLW SERIES
For Your Safe Use

Be sure to read the manual carefully before use.

- Dedicated partitions are required for hazard-free operation of the system.
- The system requires 1.07 μm wavelength barriers.

* The specifications described in this catalogue are for the Japanese domestic market.

This laser product uses a Class 4 invisible laser for processing and a Class 3R visible laser for positioning.

- Class 4 invisible laser: Avoid eye or skin exposure to direct or scattered radiation. Never look into the radiation nor touch it.
- Class 3R visible laser: Avoid direct eye exposure.