Mitsubishi eX-F Fiber Laser

Experience the difference of ZOOM Technology

Mitsubishi is proud to unveil its new ZOOM EX Fiber Laser line, which ushers in a new era of laser processing performance. There are plenty of fiber laser systems available, but you’ve never seen one like this before. Our Zoom eX Fiber will change the way you laser cut forever.

What is fiber laser?

Fiber laser technology uses rare-earth elements, in this case, ytterbium, to dope the optical fiber of the active gain medium. The fiber couples the light, and acts as a flexible path for delivering the beam to the processing head. The technology eliminates bend mirrors, so it effectively eliminates the need for beam adjustment and alignment, improving consistency. The process can support high kilowatt inputs, and features accelerated cutting speeds — think more than 2,000 inches per minute.

Smaller footprint

Because fiber laser technology relies on fiber optics to deliver light to the head, as opposed to mirror-directed beams, significant space savings can be realized with fiber laser technology. We know that square footage is at a premium in your facility. The eX Zoom Fiber is built on the same platform as our highly successful eX platform. A true proven workhorse. All of the benefits of this model have been moved over to this new Zoom Fiber technology.

The Mitsubishi Advantage

Fusing our world-leading laser processing machines, rich in history and technical prowess, with an advanced fiber laser beam, we’ve evolved laser processing to an entirely new level of performance. The eX-F Zoom 3015 two-dimensional fiber laser processing system comes standard with a fiber laser resonator, a processing head (preset auto focus for the 4kW and Zoom for the 6kW) and a safety cover. The Mitsubishi 700 series control with 64 bit NC and a 15 inch touch screen NC panel is the latest most sophisticated control from Mitsubishi. The machine also features a Multi-chamber dust-collection mechanism.
Standard Features of the eX-F

- Mitsubishi’s High-Speed Control for Lasers (MHC-L), an original control method which maximizes fiber lasers high speed cutting capability. Controls beam on/off timing in 1 micro-second increments. The system includes a timing calculator that allows the machine to deliver fast rise time when the laser needs power.

- Motion Cut - features the beam on/off time and axial movement simultaneously to eliminate the need for the axes to stop.

- Eco Mode reduces cost during standby by up to 70 percent.

- Power Control System provides power stability of ±1%.

- Automatic Focusing allows for easy and consistent focusing.

- Reduction of cutting time by fast command execution.

- Hot reserve function allows continuous operation.

- Reduced overheating in the resonator from high humid conditions with a built in cooling system.

- Long term stable processing by all fiber composition.
Precise Cutting

- The standard in processing head technology manufactured by and for MITSUBISHI LASER
- Accommodates 5.0” and 8.0” focal lengths
- Cartridge recognition
- Zero focus position is memorized. No need to focus between cartridge changes.
- Quick change lens cartridge
- The focus adjustment uses a motorized lens system. When the cutting condition is searched, the lens adjusts to the focus position automatically.
- Anti-plasma technology fully takes advantage of the fiber laser speed
- HPP (High Peak Piercing) is incorporated for fast piercing of mild steel
- Protective window monitoring provides notification of any failure
- Process lens monitoring provides notification of any failure
6kw Standard Zoom Processing Head:

The All In One Head Design

The Zoom Cutting Head features an "All In One" design with an Auto Focus range from 3.75 ~ 10 inches. This allows multiple sheet thickness cutting up to as much as 1 inch mild steel with no setup. The design includes:

- Auto Focus - Focal Range From 3.75 ~ 10"  
- Automatic Beam Mode Manipulation from Thick to Thin Based on the Material  
- No Lens Cleaning Required  
- No Cartridge Changing Required  
- Reduced Nozzle Centering Time  
- Collision Protection: The Industry’s Best Magnetic Breakaway Fiber Head  
- HPP Pierce Technology

www.mcmachinery.com
The Benefit of Fiber

Fiber lasers deliver their energy through an integrated flexible optical fiber. Fiber lasers have a monolithic, entirely solid state, fiber-to-fiber design that does not require mirrors or optics to align or adjust. These features make fiber lasers easier to integrate and operate in production, medical and other laser-based systems. Fiber lasers are typically smaller than traditional lasers, saving valuable floor space. While conventional lasers can be delicate due to the precise alignment of mirrors, fiber lasers are more rugged and able to perform in variable working environments.

Main Features

- Excellent Beam Parameter Product (BPP)
- Constant BPP Over Entire Power Range
- Small Focus over Large Working Distance
- Over 35% Wall-Plug Efficiency
- Maintenance Free Operation
- Compact, Rugged & Easy to Install
Motion Cut Advantage

For maximum production on a fiber laser, especially when running components with complex geometries or in smooth curves, Mitsubishi has upped the traditional ante to introduce the Motion Cut (M-Cut) technology.

Strong Control Lineage

Mitsubishi’s industry leading laser control expertise has once again been brought into play in designing controls for the eX-F 3015 laser. The Mitsubishi High Speed Control for Lasers (MHC-L) is an original control method that is now being applied to fiber optic laser technology to maximize the fiber laser’s number one attribute – speed.

Blazing Speed

New software calculates the timing to control the resonator according to the position of the axis. A high-speed communication unit between the CNC and the control board allows for ultra-fast serial communication thanks to signal delay reduction. The laser power control, exclusive to fiber lasers, provides fast rise times, and the resonator itself is customized to control the beam ON/OFF timing, even at high speeds.

Tough Geometries

Traditional technologies worked fine for square or rectangular cutting in fiber lasers, as they relied on the axes perpendicular travel coincides with the 90 degree right angles of these types of shapes. But when faced with complex geometries or smooth curves, traditional controls slowed down the process due to axial stoppage at start point. These MHC-L M-Cut controls the ON/OFF timing to eliminate the need for axes to stop. This increased speed in difficult geometries increases process speed, and ultimately, the bottom line.

It All Adds Up

Power isn’t the sole determinant of process time. The M-Cut time-saving controls allow an operator to cut multiple shapes without the axes having to stop, providing industry-leading speed with less power input, and greater cost efficiency per part.
Abandon One-Step-At-A-Time Processes with Automated Solutions from Mitsubishi

Automation changes everything. Mitsubishi Laser has more automated installations than any other manufacturer. From modular cells to fully automated storage and inventory systems, our automation systems allow you to run back-to-back jobs with virtually no supervision. The right automated system can drive incredible profits, and no one knows laser automation like Mitsubishi.

If you’re already automated, the eX-F Series is fully compatible with all new Mitsubishi MSCV, EL4 and River System automation, making it easy to integrate into existing automated operations.

Mitsubishi River Systems

The River System precisely handles and inventories sheet metal through every stage of the fabrication process, enabling 24/7 material tracking, as well as extended periods of unattended operation. It dramatically improves production efficiency by virtually eliminating the non value-added activities associated with material management.

- Improves flow of material workers and information in the factory
- Flexible for any fabrication equipment
- Expandable and upgradable in the future
- Reduces materials/products, search/transfer time
- Space saving and easy inventory control
- Efficient production process
- Reduces liability risk
- Reduces damaged material
- Stores partial remnant sheets
Versatile And Expandable Automation

Auto-Flex MCV (Multiple Shelf Changer) Series is versatile and expandable. Mitsubishi offers several high-production options that can transform and expand the eX-F System for maximum versatility and throughput. Current Mitsubishi users can add an eX-F to an existing automated system. That’s the expandability of Mitsubishi.

Tandem Load/Unload System
- Full load/unload cycle in approximately 65 seconds
- Heavy duty with up to 1 inch full sheet load/unload capacity
- Second material pickup loading station allows simultaneous preparation
- 4 motorized carts 2 load, 2 unload working simultaneously to increase throughput
- 11,000 lb per cart capacity
- 5x10 machines can accept raw material in 4x4, 4x8, 4x10 and 5x10 sizes

Multiple Shelf Tower
- Integrates a low-profile storage tower with 6,000 lb shelf capacity
- Up to 20 shelves can be added to one tower for a total of 120,000 lbs. of material capacity
- Heavy duty with up to 1 inch full sheet load and unload capacity
- Full load/unload cycle time in approximately 65 seconds
- 11,000 lb per cart capacity

Two Laser System
- Add a second laser to maximize productivity. A two laser FMS system allows up to six product carts for total capacity of 66,000 lbs. Compatible with eX-F, NX and eX models.
- Heavy duty with up to 1 inch full sheet load and unload capacity
- Full load/unload cycle time in approximately 65 seconds
- 11,000 lb per cart capacity

New Fsc Compact System
- Completely modular and expandable
- Lighting-fast system cycle time – full load/unload cycle in approximately 75 seconds
- Vacuum load system with thickness detection and sheet separator features
- Heavy-duty clamshell fork unload system with built in sheet raking system
- Heavy-duty up to 1” full size sheet load/unload capacity
Mitsubishi 700 Series Control

Take Control Of Your Cutting

Competing manufacturers’ PC-based controls can’t touch the sophistication of the new Mitsubishi 700 Series CNC controls. Mitsubishi has utilized its vast experience developing the most sophisticated and accurate controls for laser machines and implemented new nanotechnology for finer, faster interpolation with greater power. Our CNC controls include a 15-inch touch screen, 64-bit Windows XP, ethernet for input/output and a USB port for further flexibility.

700 series cnc also features:

• Dedicated nano-control for highest precision machining
• Newest RISC-CPU and high-performance ASIC
• Improved and accelerated graphics with superior NC design simplify operations
• Network function adaptable for diverse factory environments
• USB Compatible
• Sheet detection
• LAN-Ethernet connectivity
• Decreased graphic time
• Increased cutting condition database
• Improved help diagnostic functions
• Micro-joint function
• 20 GB Hard Drive
• 2 Action Cutting provides automatic setup and easy operator interface
  Step 1 - use barcode reader and automatically load onto NC from CAD/CAM computer
  Step 2 - once data loaded, head moves to start positions, automatically measures the tilt, the size and the edge of the workpiece, and starts cutting
• New Reset - Restart Function
• Simple Nesting - rectangular nesting of dissimilar parts at control
• Advanced help and maintenance screens are a great aid for operators
• Sheet cut offs
• Email notification
• Multiple cutting with sheet size detection
The Industry's Most Responsive Service And Support

With more than 100 employees, our regionalized Service Network is the most advanced and responsive team in the industry. We’re here for you with phone support, operation training, on-site service, parts inventory and a robust, interactive website. With 20 locations throughout North America, and more scheduled to open, we can respond promptly to your service needs. For the best on-site customer service capabilities, we have more than 25 vans in the field – three times more than any other company in the industry.

From installation and on-site training to support and service throughout the life of your system, our national service network is just a phone call away. No other company has a greater depth of experience and resources than Mitsubishi and MC Machinery Systems. Access 24/7 support with our interactive website, a detailed interactive parts catalog, printable machine manuals and software.

At MC Machinery Systems our number 1 goal is customer satisfaction. We have invested greatly in our infrastructure to better serve our customer base with a state of the art call center, regional service and support and millions of dollars of parts inventory. Now we are excited to introduce the next generation of service tools from MC Machinery systems, Inc. MC Remote 360. This is a robust production monitoring and support solution geared to provide transparency to your laser cutting process. MC Remote 360 provides real-time data to help increase productivity, improve efficiency, and reduce down time for your MC Remote 360 enabled machine.

MC Remote 360 provides
- End User machine monitoring through web enabled device
- MMS Remote Diagnostics & Fault Monitoring Service
- MMS Remote Support Service

Your MC Remote 360 machine can be monitored from many different devices
- Java based PC dashboard
- Mobile Android devices (V2.3+)
- Mobile Apple devices (iOS V4+)
- Apple Tablets (iOS V4+)
- Android tablets (V2.3+)

As long as a live internet connection is accessible, the machines can be monitored from virtually anywhere.
Resonator Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>YLS-4000</th>
<th>YLS-6000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excitation method</td>
<td>Yb doped on Fiber</td>
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<tr>
<td>Rated Output Power</td>
<td>4000</td>
<td>6000</td>
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<tr>
<td>Power stability</td>
<td>(+/-) 1%</td>
<td></td>
</tr>
<tr>
<td>Beam mode</td>
<td>TEM00</td>
<td>Multi-Mode</td>
</tr>
<tr>
<td>Beam diameter (inch)</td>
<td>.75<del>1.0 (20</del>25mm) (throng lens)</td>
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<tr>
<td>Wave length (µm)</td>
<td>1.07</td>
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<tr>
<td>Frequency setting range (Hz)</td>
<td>100-3000 (100-3000 with power control)</td>
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</tr>
<tr>
<td>Duty range (%)</td>
<td>0-100</td>
<td></td>
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<tr>
<td>Output power adjustable range (%)</td>
<td>0-100</td>
<td></td>
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<tr>
<td>Standard Features</td>
<td>Randomly polarized, 1070-1080 nm emission wavelength, ytterbium doped, red aiming diode</td>
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<tr>
<td>Chiller power requirements</td>
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<td></td>
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<tr>
<td>Laser Power</td>
<td>28090 (12741kg)</td>
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<td>Processing Machine Specifications</td>
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<tr>
<td>Model Name</td>
<td>3015eX-F40 / 3015eX-FZ 60</td>
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<tr>
<td>Machine structure</td>
<td>XY - Precision Rack &amp; Pinion - Z=Precision Ball Screw</td>
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<tr>
<td>Travel drive method</td>
<td>X-Y-Z simultaneous 3 axes (Z axis height control is also possible)</td>
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</tr>
<tr>
<td>Max. workpiece size (inch)</td>
<td>3050mm x 1525mm</td>
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<tr>
<td>Table pass height (inch)</td>
<td>34.6 (879mm)</td>
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<tr>
<td>Processing access</td>
<td>Powered Manual Door</td>
<td></td>
</tr>
<tr>
<td>Pallet changer</td>
<td>Provided</td>
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</tr>
<tr>
<td>Stroke</td>
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<tr>
<td>X-axis stroke (inch)</td>
<td>122 (3,100 mm)</td>
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</tr>
<tr>
<td>Y-axis stroke (inch)</td>
<td>61 (1,565 mm)</td>
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<tr>
<td>Z-axis stroke (inch)</td>
<td>5.9 (150 mm)</td>
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<tr>
<td>Rapid travel speed (X,Y) (inch / min)</td>
<td>3540 (single axis), 5550 (simultaneous)</td>
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<tr>
<td>Precision</td>
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<tr>
<td>Max. processing feedrate (inch / min)</td>
<td>1970 (50 m/min)</td>
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<tr>
<td>Positioning precision (inch)</td>
<td>.0019/20 (0.05/508mm)</td>
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<tr>
<td>Drive motor type</td>
<td>Intelligent AC Servo</td>
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<tr>
<td>Max. workpiece weight (lb)</td>
<td>2060 (930 kg)</td>
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<tr>
<td>Machine unit dimensions (W x H x D) (inch)</td>
<td>408.3 x 88.6 x 116.2</td>
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<tr>
<td>Machine system weight (lb)</td>
<td>28000 (12741kg)</td>
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<tr>
<td>Machine power requirements</td>
<td>28 KVA 3Ø 208 VAC +5% 60Hz 82 Full Load Amps</td>
<td>35 KVA 3Ø 208 VAC +5% 60Hz 90 Full Load Amps</td>
</tr>
<tr>
<td>Specifications and Performance</td>
<td></td>
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Processing Capability

<table>
<thead>
<tr>
<th>Oscillator Model</th>
<th>Material</th>
<th>Assist gas</th>
<th>Thickness (mm)</th>
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<tbody>
<tr>
<td>6W</td>
<td>Mild steel (SS400)</td>
<td>Oxygen</td>
<td>0 2 4 6 8 10 12 14 16 18 20 22 24 26 28</td>
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<tr>
<td></td>
<td>Stainless steel (SUS304)</td>
<td>Nitrogen</td>
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<tr>
<td></td>
<td>Aluminum alloy (A5052)</td>
<td>Oxygen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Copper (C1100)</td>
<td>Oxygen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brass (C2801)</td>
<td>Nitrogen</td>
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</tr>
<tr>
<td>4W</td>
<td>Mild steel (SS400)</td>
<td>Oxygen</td>
<td>0 2 4 6 8 10 12 14 16 18 20 22 24 26 28</td>
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<td></td>
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