**Safety Warning**

To ensure proper use of the products listed in this catalog, please be sure to read the instruction manual prior to use.
Devoted to Continuous Refinement – That’s Mitsubishi Electric DNA

A standard laser processing machine developed by the comprehensive Japanese manufacturing technology, Mitsubishi Electric’s HVII Series. Reflecting the voices of our customers, the evolution continues.

3 Elements of Evolution

- **High productivity**
  High-speed Z-axis height control and the latest piercing technology drastically reduces cutting time of all materials.

- **Processing performance**
  Optimum beam technology ensures high-quality processing performance for a wide range of materials.

- **Operability/Stability**
  New control system simplifies set-up and maintenance.
High-speed cutting with feedrates up to 50m/min (65m/min for Z axis) and the latest control technology are combined to achieve a dramatic improvement in productivity. In addition, Dross Reduction (DR) Control contributes to high-quality corner processing at high speed.

The evacuation method can be chosen according to the material and sheet thickness. Processing time and stability can be considered when selecting the optimal method.

High-speed cutting of thin materials

<table>
<thead>
<tr>
<th>Processing time (SUS304 t1mm)</th>
<th>Operating cost (SUS304 t1mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HV-20CF3 9.9mm</td>
<td>5,139 yen</td>
</tr>
<tr>
<td>HV-20CF3 9.9mm 10% reduced</td>
<td>5,139 yen</td>
</tr>
</tbody>
</table>

Running costs above are calculated based on the electricity and gas prices in Japan. Please refer to the prices in your country.

Technologies supporting high-speed cutting of thin sheets

Evacuation method

The evacuation method can be chosen according to the material and sheet thickness. Processing time and stability can be considered when selecting the optimal method.

Previous evacuation (NB, HD, HV, HVII)       High-speed evacuation (HV, HVII)       Arc evacuation (HVII)

Z-axis speed increased

In addition to the adoption of the latest control technology, the Z axis transfer speed and acceleration are approximately two and five times faster (compared to previous model), respectively.

Dr Reduction (DR) Control

DR Control reduces the accumulation of dross which is commonly generated during high-speed corner processing. This realizes high-speed, high-quality processing.

Mild-steel cutting

Establishment of high-speed cutting technology using a small-diameter nozzle and development of various piercing technologies have resulted in a remarkable improvement in productivity and impressive reduction in operating cost compared to the previous model.

Cutting mild steel of medium thickness

<table>
<thead>
<tr>
<th>Processing time (SS400 t16mm)</th>
<th>Operating cost (SS400 t16mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HV-20CF3 48min</td>
<td>1,569 yen</td>
</tr>
<tr>
<td>HV-20CF3 48min 10% reduced</td>
<td>1,569 yen</td>
</tr>
</tbody>
</table>

Running costs above are calculated based on the electricity and gas prices in Japan. Please refer to the prices in your country.

Technologies supporting high-speed cutting of medium-thick mild steel

Blow piercing

Controlling the oxidation reaction phenomenon realizes small-diameter piercing in a short time.

Cutting thick mild steel

<table>
<thead>
<tr>
<th>Processing time (SS400 t12mm)</th>
<th>Operating cost (SS400 t12mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HV-20CF3 4hr 48min</td>
<td>3,608 yen</td>
</tr>
<tr>
<td>HV-20CF3 4hr 48min 10% reduced</td>
<td>3,608 yen</td>
</tr>
</tbody>
</table>

Running costs above are calculated based on the electricity and gas prices in Japan. Please refer to the prices in your country.

Technologies supporting high-speed cutting of thick mild steel

Beat piercing

High peak output control realizes a cut quality equivalent to the conventional slope pierce while simultaneously shortening the piercing time of 1mm–16mm thick mild steel by up to 50% compared to the previous model.

Material: SS400 t16mm

<table>
<thead>
<tr>
<th>Processing time (SS400 t16mm)</th>
<th>Operating cost (SS400 t16mm)</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>HV-20CF3 4hr 48min 10% reduced</td>
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</tr>
</tbody>
</table>

Running costs above are calculated based on the electricity and gas prices in Japan. Please refer to the prices in your country.

Data in this catalog is for reference only, and may vary from actual values.

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Electricity cost Laser-gas cost

20 yen/kwh 8.94 yen

Operating cost (SUS304 t1mm)

Running costs above are calculated based on the electricity and gas prices in Japan. Please refer to the prices in your country.

Running costs above are calculated based on the electricity and gas prices in Japan. Please refer to the prices in your country.
The beam quality and gas flow are optimized, increasing the maximum thickness of mild steel that can be cut with 40CF-R from 22mm to 25mm.

Using a f254mm (f10”) lens (option)

- Model HVII Series Resonator ML40CF-R
- Maximum plate thickness: 12mm

- Tube processing
The optional turntable offers a wide range of profile cuts.

- Square-tube processing
The optional turntable enables cutting of notched parts.

- Turntable processing
Additional processing of boxed objects

- Additional processing of boxed objects
The long stroke of the Z-axis simplifies cutting of box-shaped parts.

- Brilliantcut
SUS304 t12mm
The high beam-quality of the CF-R Series realizes a suitable cut-surface roughness equivalent to a standard machined finish (V: less than Rz25µm) when cutting non-oxidized stainless steel sheets.

- Thick-plate processing
SS400 125mm
The beam quality and gas flow are optimized, increasing the maximum thickness of mild steel that can be cut with 40CF-R from 122mm to 125mm.

- Processing using 300mm Z-axis stroke

- Processing performance
Increased freedom and expanded processing possibilities

- Wide and varied processing range

- Acryl t10mm
Comes with acryl processing conditions, pre-installed as standard. Special set-up information can be referenced on the processing help screen.

- Chrome steel plate t11mm
Equipped with processing conditions and processing know-how of colored steel, chrome steel and painted steel plates. Significantly reduces preparation time.

- Pure aluminum
Pre-installed with processing conditions for highly reflective pure aluminum.

- Example processing help screen

- Special CAD/CAM software is required to create NC data.

- Additional processing of boxed objects

- Processing Help: Special Materials Conditions (Reference) List
• After selecting the special material to be processed, reference conditions and processing help can be referenced.
• Confirm the items of caution and adjust conditions according to the specified procedure.

- Ferrite stainless steel (SUS430, SUS405, etc.)
- High-tensile steel (60kg, hi-ten)
- Chrome steel plate, nitrogen cutting (SEHC, galvalume steel plate, etc.)
- Martensite stainless steel (SUS440C, SUS440A, etc.)
- Carbon steel, carbon tool steel (S45C, SK5, etc.)
- Chrome steel plate, oxygen cutting (SEHC, galvalume steel plate, etc.)
- Aluminum (A1100, A1050, etc.)
- Acryl resins
- Titanium, titanium alloys
- Corrugated steel plate (SS400, SUS304, A5052, etc.)

- Additional comments
The above are processing capabilities based on special conditions. Approved conditions are as stated in the specifications.

- Even if the item to be processed is equivalent to a standardized product, variations in processing performance/quality may occur depending on the surface condition and components included.

- Variations in processing performance/quality may occur depending on the processing shape.

- Regarding mild steel (SS400), capacities listed in this catalog are for the LS material (steel plate for laser cutting) of Chubu Steel Plate Co., Ltd.
Further improvements in operability

Production drawings illustrated in seconds
Time required to check the geometries before processing is shortened (1/20 compared to previous model)

Automated support
The auto-focus preset head and high-pressure-gas NC control are standard equipments.

Only 40CF-R

Further improvements in stability

Set-up time reduced by expanding the range of plate thicknesses compatible with single nozzles
Nzzle replacement time drastically reduced during continuous processing of various materials and thicknesses.
E.g., Total processing time reduced when processing three workpieces of various materials and thicknesses.

Approximately 20% shorter

E.g., Changing the vacuum pump oil

Processing lens monitoring function
Status of the processing lens is constantly monitored, contributing to stable processing.

Standard only for 40CF-R

Self-check function
The main components are periodically checked, and the diagnostic results are reported. This supports continuous operation.

Touch screen with one-touch operation

Equivalent to 95% shorter

More assuring, comfortable operation raised to new heights

Operability/Stability
Advancements in our resonator series have resulted in further improvements in processing performance. High reliability is synonymous with Mitsubishi Electric, born from its innovative technologies and attention to quality.

Unique technologies supporting highly reliable processing

A high-speed power sensor developed by the company is installed as standard equipment to monitor laser output in real-time. Output true to the desired setting is stably maintained, with the degree fluctuation being less than ±1%. As a result, continuous processing of highly reflective materials such as aluminum and copper is possible.

High-speed power sensor

To ensure that the composite gas does not easily escape during the sealed-gas cutting operation, each gas tank is designed to last for one year (ML20CF3 operating for 2400hr/yr). One injection of composite gas is sufficient for 24 hours of continuous operation at the rated output, with no need for additional injection. This significantly reduces the operating cost and eliminates the need to exchange tanks.

Sealed laser-gas cutting operation

The adoption of just-in-time discharge method which reduces the power consumption during beam OFF substantially reduces the overall power consumption.

Just-in-time discharge

### Equipment

**Main Features/Options**

- **Auto-focus preset processing head (standard)**
  - The NC (input) automatically controls the focal point. The processing head does not have to be readjusted when the workpiece is replaced.

- **Chip conveyer (option)**
  - Carries cut pieces and scraps that fall during processing.

- **Foot switch (for work clamp)**
  - Ensures a high yield rate at high speed.

- **RemoteMagic (alarm mail notification, etc.)**

- **BANKIN Navigator (production management support)**

- **ME (MEL’S EYE) function (option)**

- **Simple contact type height sensor (option)**
  - Contact-type emulation enables the processing of non-metal materials such as textiles and rubber.

- **Auto-focus preset processing head (option)**
  - Increases the processing capability of non-oxidized cutting of stainless steel.

- **O2 and N2 NC data table (option)**
  - Used for cutting tubes.

- **Auto-focus extraction (option)**
  - Together with the auto-focus preset head, the processing machine automatically aligns the focus.

### Option Compatibility Chart

#### Model name

<table>
<thead>
<tr>
<th>Model name</th>
<th>ML20CF3</th>
<th>ML20CF1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto-focus preset processing head</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>(For ML20CF1) lens specifications</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Single contact emulation</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>High-pressure gas specifications</td>
<td>○ (base model)</td>
<td>○ (base model)</td>
</tr>
<tr>
<td>NSF function</td>
<td>○ (base model)</td>
<td>○ (base model)</td>
</tr>
<tr>
<td>Chip conveyer</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Dust switch (for work clamp)</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Magnet</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Processing machine specifications</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>High-speed processing</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>High-speed control</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Work clamp</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>MEL’S EYE function</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Processing machine monitoring function</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Network control</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Network communication</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

### Resonator

**Triple-axis SD Excitation Orthogonal Resonator**

[Diagram of resonator setup]

- **Total reflector (TR)**
- **Discharge electrode**
- **Partial reflector (PR)**
- **Heat exchanger**
- **Laser beam**
- **Axial-flow blow to circulates gas**
- **Gas flow**

#### Advancements in resonator series

- **Beam path optimization**
  - Ensures a high yield rate at high speed.

- **Contact-type emulator enable**
  - Processing of non-metal materials such as resins and wood.

- **“High-speed free nesting function”**
  - Unique to Mitsubishi Electric such as the high-speed free nesting function which ensures a high yield rate at high speed.

- **Equipped with diverse functions and knowledge**

- **Lens cartridge**
  - f254mm (f10") and f127mm (f5.0") lens specifications, f254mm (f10") adapter is attached.

- **Beam optimizer unit**
  - Adjusted to suppress plasma generation.

- **Network contact unit**
  - Network contact unit for network download function.

- **ME (MEL’S EYE) function (option)**

- **Auto-focus preset processing head**
  - Fine piercing and the chip conveyer cannot be installed at the same time.

- **Burn-out detection**
  - Detects burn-outs generated when cutting mild steel, enabling continuous processing.

- **Pierce detection**
  - Picking function (option) is detected in plates of intermediate thickness. Compared to previous delivery-type piercing control, stable piercing is enabled.

- **Chip conveyer**
  - Carries cut pieces and scraps that fall during processing.

- **Contact type height sensor (option)**
  - Contact-type emulation enables the processing of non-metal materials such as textiles and rubber.

- **Auto-focus preset processing head (standard)**
  - The NC (input) automatically controls the focal point. The processing head does not have to be readjusted when the workpiece is replaced.

- **Chip conveyer (option)**
  - Carries cut pieces and scraps that fall during processing.

- **Contact type height sensor (option)**
  - Contact-type emulation enables the processing of non-metal materials such as textiles and rubber.

- **Auto-focus preset processing head (option)**
  - Increases the processing capability of non-oxidized cutting of stainless steel.
Regarding mild steel (SS400) with a thickness over 19mm, capacities listed in this catalog are for the LS material (steel plate for laser cutting) of Chubu Steel Plate Co., Ltd.

Variations in processing performance/quality may occur depending on the processing shape.

Even if the item to be processed is equivalent to a standardized product, variations in processing performance/quality may occur depending on the surface condition and components included.

(1) When combined with ML40CF-R resonator

### Processing Machine Specifications

<table>
<thead>
<tr>
<th>Processing Machine Specifications</th>
<th>ML2512HV-20CF3</th>
<th>ML3015HV-20CF3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model name</td>
<td>LCU10AIX</td>
<td>LCU20AIX</td>
</tr>
<tr>
<td>Weight (cooling system main unit) (kg)</td>
<td>1,100</td>
<td>1,000</td>
</tr>
<tr>
<td>Power input (cooling system main unit) (kVA)</td>
<td>3.36</td>
<td>3.36</td>
</tr>
<tr>
<td>Specifications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model name</td>
<td>ML20CF3</td>
<td>ML40CF-R</td>
</tr>
<tr>
<td>Weight (processing machine main unit) (kg)</td>
<td>1,200</td>
<td>1,200</td>
</tr>
<tr>
<td>Power input (processing machine main unit) (kVA)</td>
<td>7.600</td>
<td>7.600</td>
</tr>
<tr>
<td>Adaptable resonator</td>
<td>ML20CF3, ML30CF-R, ML40CF-R</td>
<td></td>
</tr>
</tbody>
</table>

### Processing Capabilities

- When combined with ML40CF-R resonator

### Resonator Specifications

<table>
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<tr>
<th>Resonator Specifications</th>
<th>ML2512HV-20CF3</th>
<th>ML3015HV-20CF3</th>
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<tr>
<td>Weight (processing machine main unit) (kg)</td>
<td>1,200</td>
<td>1,200</td>
</tr>
<tr>
<td>Power input (cooling system main unit) (kVA)</td>
<td>7.600</td>
<td>7.600</td>
</tr>
</tbody>
</table>

### Cooling System Specifications

<table>
<thead>
<tr>
<th>Cooling System Specifications</th>
<th>Model name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water-cooling system main unit and high-speed laser head</td>
<td>LCU10WIX</td>
</tr>
<tr>
<td>Weight (cooling system main unit) (kg)</td>
<td>440</td>
</tr>
<tr>
<td>Power input (cooling system main unit) (kVA)</td>
<td>3.21</td>
</tr>
</tbody>
</table>

### Control System Specifications

<table>
<thead>
<tr>
<th>Control System Specifications</th>
<th>Model name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display monitor</td>
<td>LCU10</td>
</tr>
<tr>
<td>Operation method</td>
<td>Memory operation, No motion operation</td>
</tr>
</tbody>
</table>

Please contact us regarding piping for the cooling unit.

- Maximum installation height: 2,315mm.
HVII P Inherits the DNA of Best-Selling Processing Machines
Offers maximized production efficiency of laser processing

Utilizing the palette changer system, productivity and efficiency is fully maximized. The HVII P Series raises the performance of the HVII to impressive new heights.

Features

- Exterior setup work
- Laser processing

Dramatic increase in productivity and efficiency

The addition of a pallet changer makes it possible to insert and remove workpieces during the machining process, raising productivity and efficiency to levels never before imagined.

Specifications and Layout

<table>
<thead>
<tr>
<th>Processing Machine Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model name</td>
</tr>
<tr>
<td>Control system</td>
</tr>
<tr>
<td>Workpiece dimensions</td>
</tr>
<tr>
<td>Worktable size (mm)</td>
</tr>
<tr>
<td>Performance specifications</td>
</tr>
<tr>
<td>Spindle</td>
</tr>
<tr>
<td>Rapid travel speed</td>
</tr>
<tr>
<td>Feed speed (mm/min)</td>
</tr>
<tr>
<td>Accuracy</td>
</tr>
<tr>
<td>Positioning accuracy (mm)</td>
</tr>
<tr>
<td>Repetitive accuracy (mm)</td>
</tr>
<tr>
<td>Feed rate (m/min)</td>
</tr>
<tr>
<td>Rapid travel speed</td>
</tr>
<tr>
<td>Maximum processing feedrate (m/min)</td>
</tr>
<tr>
<td>Processing head</td>
</tr>
<tr>
<td>Auto-focus preset processing head</td>
</tr>
<tr>
<td>Robotic manipulator arm (machine tool)</td>
</tr>
<tr>
<td>Workpiece dimensions (mm)</td>
</tr>
<tr>
<td>Weight (kg)</td>
</tr>
</tbody>
</table>

Specifications and Layout

- ML2512HVII P-20CF3
- ML3015HVII P-20CF3
- ML2512HVII P-40CF-R
- ML3015HVII P-40CF-R

Maximum installation height: 2,315mm. Please contact us regarding piping for the cooling unit.