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- The photos may show optional accessories.



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# LUMEX

## Avance-25

## Avance-60

HYBRID METAL 3D PRINTER



## LUMEX Avance-25 / LUMEX Avance-60

# From Vision to Reality

**Matsuura** led the world in 2002 in the commercialization of the "Hybrid Metal 3D Printer". Since then, our technological and competitive strengths have been enhanced significantly through version upgrades.

In 2016, the **LUMEX Avance-60** was introduced to meet the demands for large-size parts and high-speed operation.

In 2017, the technologies introduced for the **LUMEX Avance-60** have been applied to the **LUMEX Avance-25**, further enhancing our competitive strength.

The highly advanced fusion of laser technology and high-precision cutting technology enable revolutionary manufacturing.

## Revolution in Metal Processing

Metal laser sintering using a laser beam to melt metal powder and high-speed high-precision machining using end mills. These processes are repeated to produce the designed shape in one process on a single machine.

**Matsuura's** hybrid technologies achieve machining accuracy and surface finish comparable to machining centers, surpassing the capability of conventional metal 3D printers.

## High-Speed Operation

The build speed is greatly increased by employing high-output laser, optimized galvano control / sintering conditions, improved powder distribution, etc. The latest specifications produce a maximum build speed of 16 cc/h\* with 500 W laser; 35 cc/h\* with 1 kW laser. The milling time is also greatly reduced through pre-milling powder suction and optimal path creation with the **LUMEX CAM** software. The reduction of processing time is achieved in both sintering and milling phases.

## Redefining the Manufacturing Processes

The **LUMEX** series manufactures parts at near net shape, 3D objects with complex interior structures and creates components with hollows, 3D meshes and free-form surfaces. In addition, deep ribs, impossible to machine with machining centers, can be produced without using EDMs.

This advanced technology is gaining attention not only in the die and mold industry but also in the aircraft and medical industries.

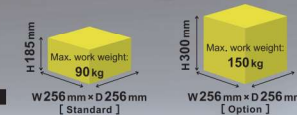
\*This is the result with Matsuura Maraging II. The actual performance may vary depending on the metal powder material, part shape and size.






[ Laser Output ]  
Standard 1kW  
Option 500W  
[ Spindle Speed ]  
45000 mm<sup>3</sup>



[ Laser Output ]  
Standard 500W  
Option 1kW  
[ Spindle Speed ]  
45000 mm<sup>3</sup>



- |   |  |  |   |   |   |
|---|--|--|---|---|---|
| <br>LASER<br>Laser Sintering | <br>NO EDM<br>Deep Rib Processing | <br>HOLLOW<br>Hollow Structures | <br>TIME<br>Time Reduction | <br>COSTOM<br>3D Free-Form Surface | <br>FINISH<br>Finish Machining   |
| <br>MILLING<br>Milling       | <br>POROUS<br>Porous Sintering    | <br>3D MESH<br>3D Meshes        | <br>COST<br>Cost Reduction | <br>MULTI<br>Integrated Structures | <br>ACCESS<br>Undercut Machining |



2002



2003



2004



2006

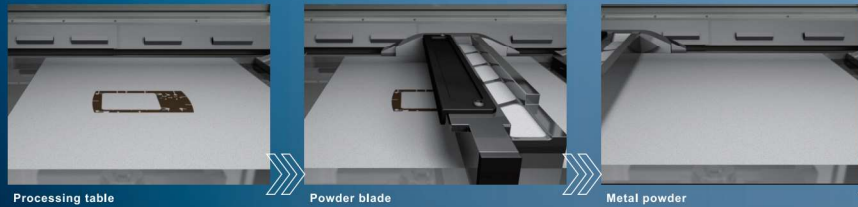
# LUMEX

[ Processes ]

## Hybrid AM Manufacture with metal laser processing and high-speed milling

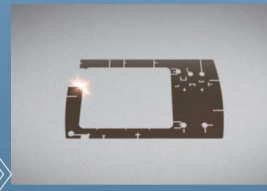


### Powder Distribution



Repeated Laser Processing for 10 Layers

### Laser Processing



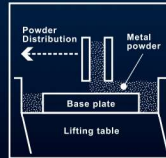
### High-speed milling



High-speed milling is performed per every 10 layers.

Repeated metal laser processing and high-speed milling

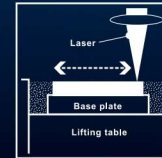
The LUMEX series repeats metal laser processing and high-speed, high-precision milling to form metal powder into shapes and makes deep ribs in a single process without EDMs. Dimensional accuracy and comparable to machining centers is achieved.



### 1. Powder Distribution

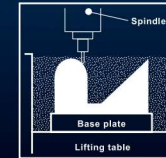
Metal powder is distributed\* on the base plate installed on the table.

With Matsuura Maraging II  
\* 0.05-mm thick for 500 W laser  
\* 0.1-mm thick for 1 kW laser



### 2. Laser Processing

Laser processing solidifies the powder layer on the processing table. When processing is finished, the processing table is lowered and metal powder for the next layer is distributed by the distribution unit. The laser then irradiates this powder to complete the next layer. The processes 1 and 2 are repeated 10 times and then milling starts.



### 3. Milling

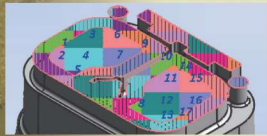
The outer surface of the built part is precision finished at a high speed with a ball endmill. Milling is performed when not after all layers have been completed but during build, after each preset number of layers. This hybrid, layer build process enables manufacture of parts with complicated structures.

## LUMEX dedicated CAM software



### Laser Scan Paths

Automatic creation of laser scan paths by simply selecting a material parameter template for each material



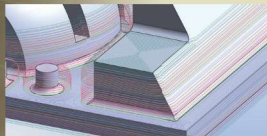
Scanning cell order



Scanning cell size, cell order, and direction can be customized.

### Milling Paths

Milling path creation from milling condition templates



Path point / direction arrow display  
Milling processes in different colors

LUMEX CAM is CAM software dedicated to the LUMEX metal 3D printer series. Metal laser scan and milling paths can be created with ease. The laser scan and milling path simulation function helps to check the created paths before start of processing.

## Processing techniques

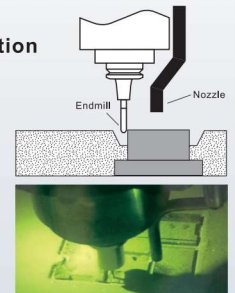
### Back-Taper

Back-taper shaped parts can be produced. After sintering up to layer C, the  $\alpha$  area which is at a distance  $\beta$  can be finished.



### Pre-Milling Powder Suction

By removing metal powder around the built part before starting milling, a faster milling speed and a large-diameter tool can be used to shorten the milling time. At the same time, surface finish is improved with less tool wear, enabling efficient manufacture.

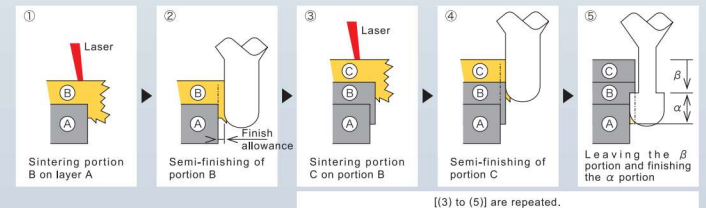


\* Panasonic Corporation owns a patent regarding the "pre-milling powder suction function".

### Step Machining Process

[ Japanese Patent No. 4452692 ]

By repeating the process of "laser processing → semi-finishing → finishing", discoloration of the finish surface as well as steps which may occur between a milled layer and a laser processed layer due to heat shrinkage can be prevented. Such a function has been developed and given the name "Step Machining Process".



# LUMEX

[ Advantages in Mold Manufacture ]

## Manufacturing highly advanced molds in a single process.

Molds with complex internal cooling channels and porous structures are sintered with ease. Enables rapid production of high performance molds.

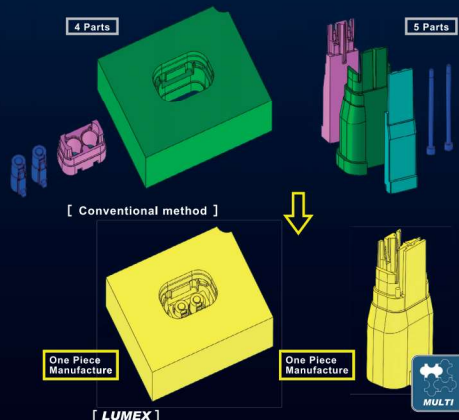
[ SAMPLE WORK ]  
Waterproof Connector  
LUMEX Avance-25



NO EDM

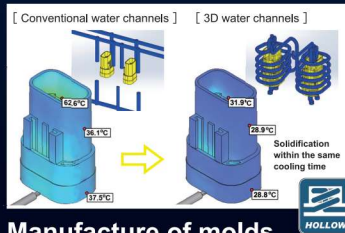
### Creating deep ribs by hybrid processing and without EDM

Deep ribs and thin ribs are created with high precision by the hybrid AM process. Mold manufacture without EDM is possible.



### Integrated one piece mold production

Even complicated molds can be manufactured in one piece, thus eliminating assembly and adjustment, and making it possible to produce molds with no dimensional errors that may be caused by conventional assembly processes.



### Manufacture of molds with 3-dimensional cooling channels

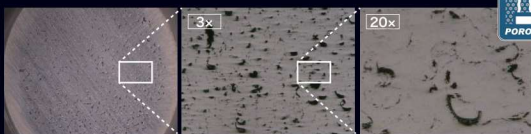
Integrated cooling channels can be created internally on any component or mold. Compared to conventional post process cooling channels, these channels exhibit far superior and efficient cooling, contributing to a significant reduction in injection molding time.

Injection molding cycle time reduction by **33%**

### Porous structure for gas venting

Air permeability can be controlled freely by creating a porous structure, simply by adjusting the density of the built part. This achieves gas venting more effectively than any other machine. Users can expect the reduction of resin filling time, prevention of uneven filling, and elimination of gas burning.

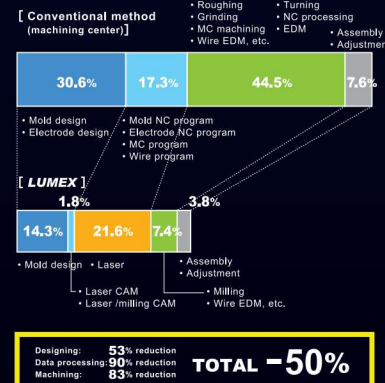
POROUS



COST

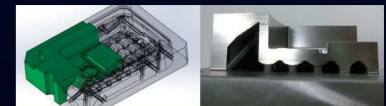
### Reduction in lead time from design to finish

The LUMEX series can produce molds in one piece and eliminates the need for EDM, assembly or adjustment. In addition, the time required for design and CAM processing can be shortened drastically. Even with deep-ribbed molds, the design time is reduced by approx. 53%, CAM time by 90%, and manufacture time by 83%. In total, a 50% reduction in mold production time is achieved compared with conventional methods.



### Application to lattice structures

The LUMEX series can be used to create molds with an internal lattice structure. This reduces the part volume and laser processing time. While maintaining the required strength, hollow portions and surface areas can be increased, improving cooling efficiency.



Cost reduction  
Part volume: **32%** reduction  
Laser processing time: **42%** reduction

Model design  
by static rigidity analysis  
to maintain strength

Increased hollow portions  
and surface areas  
for higher cooling efficiency

[ SAMPLE WORK ]

Digital camera casing

LUMEX Avance-25



# LUMEX

[ Advantages in Part Manufacture ]

## High speed, large part size Internal lattice structures never before possible can be realized.

Significant contribution to innovative manufacturing of highly functional, value-added products, such as parts with complicated internal structures, hollow light-weight parts, large-size parts like engine blocks, etc.



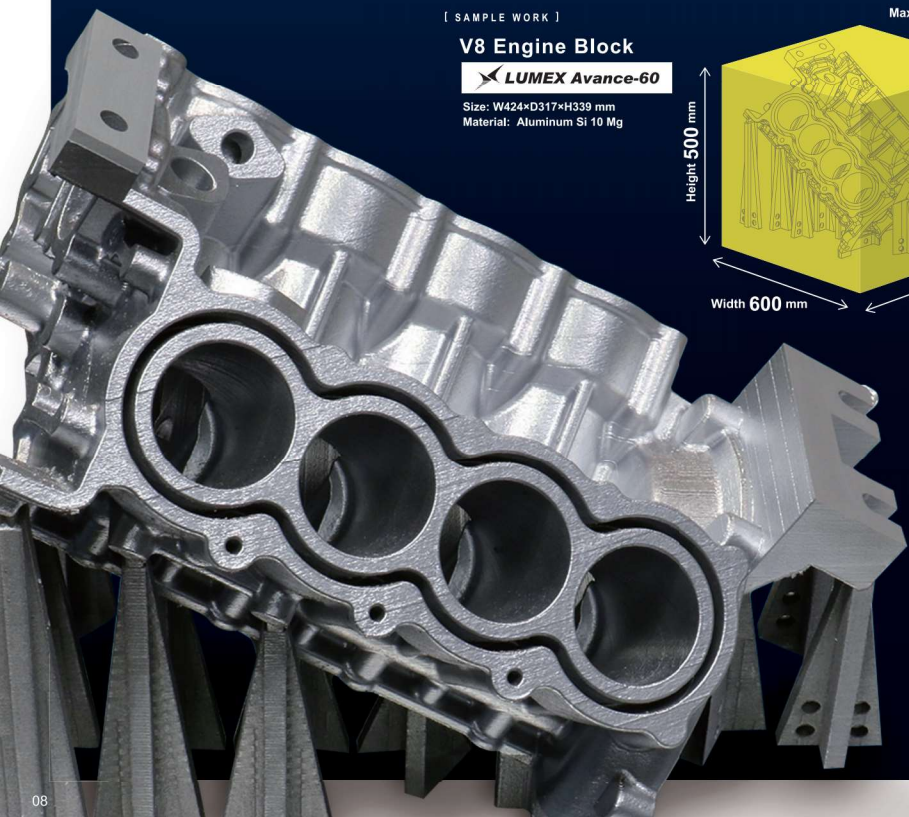
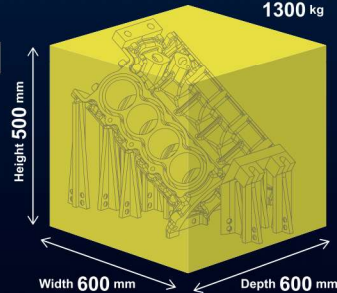
[ SAMPLE WORK ]

### V8 Engine Block

**LUMEX Avance-60**

Size: W424×D317×H339 mm  
Material: Aluminum Si 10 Mg

Max. work weight:  
1300 kg



V8 engine block  
with lattice structure



### High output fiber laser for high speed sintering

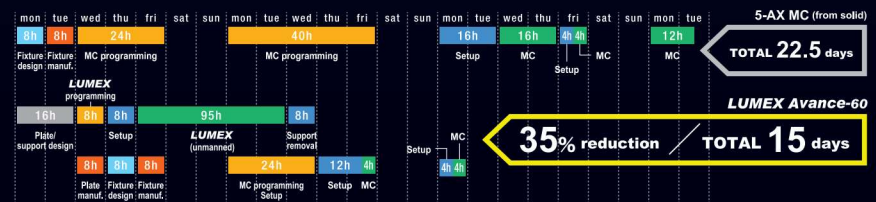
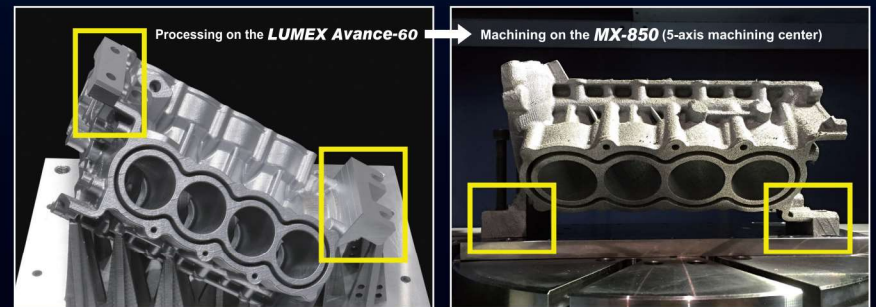
- 1 kW fiber laser installed as standard (**LUMEX Avance-60**)
- Enhanced powder distribution speed
- Increased build speed to 35 cc/h<sup>\*1</sup>
- Milling time reduction by cutting path optimization

\*1: The above is the calculation value, not the guaranteed value.

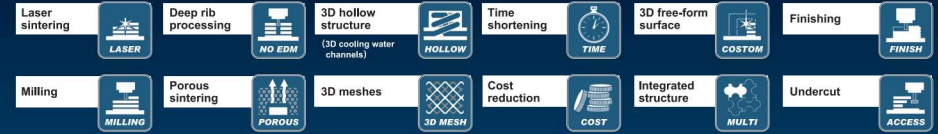
[ Existing LUMEX Avance-25 model ] <small>(400W · simulation)</small>	[ LUMEX Avance-60 ] <small>(1kW)</small>
Total: 409h 50m Sintering: 402h 50m Milling: 7h 00m	Total: 95h 00m Sintering: 90h 00m Milling: 5h 00m
	<b>77% reduction</b>

### Reference surfaces for subsequent processes can be made

When manufacturing parts that require cutting processes on a machining center, the datum surface and base block necessary for such processes can also be built and machined, which reduces the setup time and costs, thereby shortening the lead time drastically.

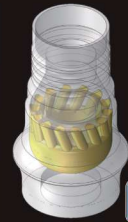


**35% reduction** / **TOTAL 15 days**



## Aerospace Parts

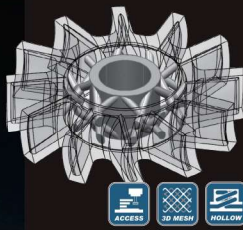
### Engine jet nozzle



[Material] Matsuura Nickel Alloy 718  
 [Cycle time] Sintering: 2 hr 40 min / milling: 13 hr 15 min  
 Total: 15 hr 55 min



- Complicated internal structure  
 Highly functional parts, including aircraft engine parts with complicated internal structures, can be manufactured through free-form sintering with freeheeling thinking not possible with conventional methods.
- Undercut portions  
 A dedicated tool can be used for roughing to finishing.



[Material] Matsuura Stainless 630  
 [Cycle time] Sintering: 9 hr 30 min / milling: 15 hr 50 min  
 Total: 25 hr 20 min

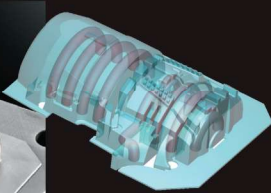


### Blisk

- Light weight design  
 Weight-trimming by 44% compared with conventional parts is achieved by designing the disc with a spoke-shaped mesh structure and hollow blades. This design is possible only with additive manufacturing by laser sintering.

## Molds

### Electric driver (head)

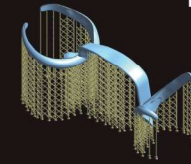
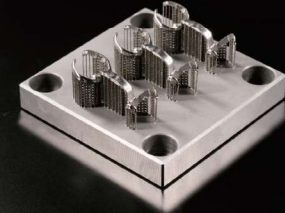


[Material] Matsuura Maraging II  
 [Cycle time] Sintering: 10 hr 30 min / milling: 59 hr 50 min  
 Total: 70 hr 20 min



- 3D water channels  
**Conventional**  
 Linear water channels
- **LUMEX Avance-25**  
 3D water channels can be designed along the part surface.
- Shorter cooling time  
**Conventional (general)**  
 Molding cycle: 53 sec, cooling time: 30 sec  
 Solidification within the same cooling time
- **LUMEX Avance-25**  
 Molding cycle: 43 sec, cooling time: 20 sec  
 Molding cycle time: 33% reduction

## Medical Parts

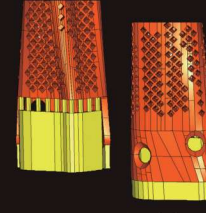


[Material] Matsuura Cobalt Chrome



### Dental framework

- Medical parts made of cobalt chrome  
 One-off parts in different shapes can be manufactured with ease.
- Finishing of difficult-to-cut materials  
 By finishing the portion that requires accuracy with milling tools, the downstream operation time can be shortened.



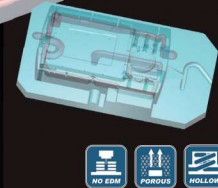
[Material] Matsuura Ti 6Al 4V



### Artificial bone

- Addition of supports  
 Supports allow sintering of free-form parts. Support design is optimized to allow for easy removal while having sufficient strength to resist thermal stress during manufacture. Easy removal ensures minimal secondary processing time.
- Titan (aluminum) sintering  
 In the case of combustible powders, dedicated safety equipment is available.

### Digital camera case (cavity and core)



[Material] Matsuura Maraging II  
 [Cycle time] Cavity part: Sintering: 30 hr 45 min / milling: 24 hr 55 min  
 Total: 55 hr 40 min  
 Core part: Sintering: 14 hr 30 min / milling: 25 hr  
 Total: 39 hr 30 min



- Sintering time reduction using lattice structure  
 Sintering time can be reduced by employing a lattice structure. Hollow sections and surface area increase, making the actual injection molding process efficient.

Cavity part	3D water channels	High speed + lattice structure
Milling time	29h	25h
Sintering time	68h	28h
Total	97h	53h

Cycle time: **45% reduction**

※ Comparison of high speed + lattice structure processing with an existing model

### Standard Machine Specification

	LUMEX Avance-25	LUMEX Avance-60
<b>Traverse</b>		
X-axis travel (Table left/right)	[mm] 250	510
Y-axis travel (Table back/forth)	[mm] 260	510
Z-axis travel (Table up/down)	[mm] 100	100
U-axis travel (Build table)	[mm] 185	500
W-axis travel (Powder Distribution Unit)	[mm] 522	590
Distance from table to spindle end	[mm] -10 ~ -90	-10 ~ -90
<b>Table</b>		
Build table size	[mm] 270×270	620×620
Max. work weight	[kg] 30	1300
Build table size	[mm] 246×246	600×600
Build table surface configuration	Tap MB(P1) × Pitch 50mm × 24 pcs	Tap MB × Pitch 50mm × 120 pcs
Max. work size	[mm] W256×D256×H185 (including the base plate)	W500×D500×H500 (including the base plate)
Distance from floor to table surface	[mm] 980	1250
<b>Spindle</b>		
Spindle speed	[rev.] 450 ~ 45000	450 ~ 45000
Spindle bearing inner diameter	[mm] 25	25
Spindle end	1/10 taper #20	1/10 taper #20
Spindle max. torque	[N·m] 1.31	1.21
Spindle arbor	YES	YES
Spindle orientation	YES	YES
<b>Feedrate</b>		
Rapid traverse rate X / Y / Z	[mm/min] 6000 / 6000 / 3000	6000 / 6000 / 3000
Rapid feed acc. / dec. X / Y / Z	[G] 0.98 / 1.28 / 0.95	0.81 / 0.58 / 0.7
Feedrate X / Y / Z	[mm/min] 1 ~ 60000	1 ~ 60000
Z	[mm/min] 1 ~ 30000	1 ~ 30000
Feedrate acc. / dec. X / Y / Z	[G] 0.77 / 0.73 / 0.68	0.36 / 0.36 / 0.41
<b>Automatic Tool Changer</b>		
Tool shank	Matsaura original #20	Matsaura original #20
Pull stud	Matsaura original #20	Matsaura original #20
Tool storage capacity	[pcs] 20	20
Max. tool diameter	[mm] 10	10
Min. tool diameter	[mm] 0.6	0.6
Max. tool length (with condition)	[mm] $\beta 30 \pm 0.10$	$\beta 30 \pm 0.10$
Tool support length of tool holder: $\alpha$	[mm] $\alpha 23 \pm \phi$ ( $\phi = 0.3, 0.8, 1.0$ )	$\alpha 23 \pm \phi$ ( $\phi = 0.3, 0.8, 1.0$ )
Max. tool protrusion length from tool holder: $\beta$	[mm] $\beta 25 \pm \phi$ ( $\phi = 0.3, 0.8, 1.0$ )	$\beta 25 \pm \phi$ ( $\phi = 0.3, 0.8, 1.0$ )
Max. tool weight	[kg] 0.25 (0.55 incl. holder)	0.25 (0.55 incl. holder)
Tool change time (Tool to Tool)	[sec] 24.4	24.4
Tool change time (Chip to Chip)	[sec] 25.4	25.9
Tool selection method	Fixed address	Fixed address
<b>Motors</b>		
Spindle motor	[kW] AC 2.4 / 4.0 (Continuous 90%)	AC 2.4 / 4.0 (Continuous 90%)
Feed motor		
X-axis	[kW] AC 3.6 / 4.8	AC 4.8 / 6.4
Y-axis	[kW] AC 2.4 / 3.2	AC 3.6 / 4.8
Z-axis	[kW] AC 0.9 / 1.4	AC 0.9 / 1.6
U-axis	[kW] AC 0.75	AC 4.5
W-axis	[kW] AC 0.5	AC 0.5
Tool magazine motor	[kW] AC 0.5	AC 0.5
Material supply motor	[kW] AC 0.03	AC 0.05
Feed axis auto grease supply motor	[kW] AC 0.025	AC 0.025
Oil cooler motor (Spindle, Linear motor)	[kW] AC 0.7	AC 0.7
Chiller motor (Laser system)	[kW] AC 1.18 / 1.54	AC 1.18 / 1.54
<b>Laser</b>		
Laser type	Yb Fiber laser	Yb Fiber laser
Output power range	[W] 50 ~ 500	100 ~ 1000
Beam quality (M2)	[mm] < 1.1	< 1.1
Wavelength	[nm] 1070 ± 5	1070 ± 5
<b>Laser Scanning Module</b>		
Scanning module	X / Y	Galkano scanner system
	Z	Galkano scanner system
		Linear translator
laser wavelength	[nm] 1070±5	1070±5
Max. laser power	[W] 1000	1000
Power supply voltage	[V] AC 200 / DC 24	AC 200 / DC 24

	LUMEX Avance-25	LUMEX Avance-60
<b>Power Supply</b>		
Electrical power supply	[kVA] 28 (3axes with option configuration)	43 (3axes with option configuration)
Power supply voltage	[V] AC 200/220V ± 10% Transformer is required in case voltage is other than above	AC 200/220V ± 10% Transformer is required in case voltage is other than above
Power supply frequency	[Hz] 50/60 ± 1	50/60 ± 1
Compressed air supply	[MPa] 0.6 ~ 0.93 (Varies with option configuration)	0.8 ~ 0.93 (machine side) 0.6 ~ 0.93 (APR system side)
Volume of compressed air to be supplied	[Nl/min] 700 (atmospheric pressure) (Varies with option configuration)	1700 (machine + APR system)
<b>Tank Capacity</b>		
Oil cooler tank capacity (Spindle, Linear motor)	[L] 7	7
<b>Machine Size</b>		
Machine height (From floor)	[mm] 2050	3000
Floor space (incl. maintenance area)	[mm] 3200 W×4800 D (Varies with option configuration)	4700 W×6180 D (Varies with option configuration)
Machine weight	[kg] 4500	11000
<b>Accuracy</b>		
Positioning accuracy X / Y / Z	[mm] ±0.0025	±0.0025
Repeatability X / Y / Z	[mm] ±0.001	±0.001
<b>Machine Capability</b>		
Axial thrust (Continuous/Max.) X	[kN] 1.8/4.5	2.4/6.0
Y	[kN] 1.2/3.0	1.8/4.5
Z	[kN] 0.2/0.6	0.2/0.6
<b>LUMEX Avance-25 Standard Accessories</b>		
Total safety guard	Door interlock	
Oil temperature controller	Air dryer	
Linear motor cooler	Z-axis balance cylinder	
Nitrogen generator	Interior temperature sensor	
Oxygen densitometer	Fume collector	
Chiller unit	CCD camera & Image processing apparatus	
Galkano scanner & Laser controller	Auto tool length measurement detection sensor (Touch type)	
Laser integrated run meter	Spindle integrated run meter	
IPC function	Guide light function	
Overly key-arrangement keyboard	15-inch LCD with touch panel	
High table temperature alarm	USB interface 2 ports	
Tools & Tool box	AC 100V Outlet 3 A	
Leveling bolts & Plates	Machine color paint	
Scale feedback X / Y / Z	Heidenhain (AbsOLUTE)	
Feed axis auto grease supply unit	Pre-milling powder suction	
Pre heating heater & Controller for build table		
3 color signal light (red, yellow, green from top)		
Position from top, red alarm, yellow work completion, green auto run. All lights are lighted while laser is operating.		
* 2 years spindle warranty		
<b>LUMEX Avance-60 Standard Accessories</b>		
Total safety guard	Door interlock	
Oil temperature controller	Air dryer	
Linear motor cooler	Z-axis balance cylinder	
Nitrogen generator	Interior temperature sensor	
Oxygen densitometer	Fume collector	
Chiller unit	CCD camera & Image processing apparatus	
Galkano scanner & Laser controller	Auto tool length measurement detection sensor (Touch type)	
Laser integrated run meter	Spindle integrated run meter	
IPC function	Guide light function	
Overly key-arrangement keyboard	19-inch LCD with touch panel	
High table temperature alarm	USB interface 2 ports	
Tools & Tool box	Machine color paint	
Pre-milling powder suction	Leveling bolts & Plates	
Scale feedback X / Y / Z	Heidenhain (AbsOLUTE)	
Feed axis auto grease supply unit		
Pre heating heater & Controller for build table		
3 color signal light (red, yellow, green from top)		
Position from top, red alarm, yellow work completion, green auto run. All lights are lighted while laser is operating.		
APR system (Automatic powder recovery system)		
* 2 years spindle warranty		

### Machine Optional Specifications

	LUMEX Avance-25	LUMEX Avance-60
Input command	Inch system	Inch system
Frequency	50Hz	50Hz
Plate display	English, overseas standard	English, overseas standard
	German	German
<b>Safety standard</b>	CE mark specification	CE mark specification
	China GB standard	China GB standard
<b>Special machine color</b>	Special color (NC box: std)	Special color (NC box: std)
	Special color (NC box: same)	Special color (NC box: same)
	Special color (NC box: specified separately)	Special color (NC box: specified separately)
<b>Spare spindle</b>	Option	Option
<b>Travel</b>	U-axis travel (build table) 300mm	—
<b>Max. Work weight</b>	150 kg (with U-axis travel 300 mm spec.)	—
<b>Power supply voltage</b>	380 V Machine & NC are 200 V, Exterior transformer is required	380 V Machine & NC are 200 V, Exterior transformer is required
	415 V Machine & NC are 200 V, Exterior transformer is required	415 V Machine & NC are 200 V, Exterior transformer is required
<b>Power sieving machine</b>	No titanium and aluminum powder specification	—
<b>Laser oscillator</b>	1 kW fiber laser oscillator	500 W fiber laser oscillator Chiller required
<b>Powder vacuum unit</b>	Powder vacuum unit (External vacuum)	Powder vacuum unit (External vacuum)
	Automatic powder recovery system	—
<b>Technical support</b>	1st year maintenance A: Laser inspection / Laser inspection & adjustment (twice / year) 1st year maintenance B: Machine software version upgrades 1st year maintenance C: Laser inspection + machine software version update / Laser inspection & adjustment (twice a year) + machine software version update	1st year maintenance A: Laser inspection / Laser inspection & adjustment (twice / year) 1st year maintenance B: Machine software version upgrades 1st year maintenance C: Laser inspection + machine software version update / Laser inspection & adjustment (twice a year) + machine software version update
<b>CAM</b>	Laser & machining program CAM software, LUMEX CAM	Laser & machining program CAM software, LUMEX CAM
	Laser & machining program Operation instruction	Laser & machining program Operation instruction
<b>Tool</b>	Matsaura original #20 tool holder	Matsaura original #20 tool holder
	Matsaura Original endmill for finishing	Matsaura Original endmill for finishing
<b>APR system</b>	Automatic powder recovery system	Standard
<b>Table temperature controller</b>	Option	Option
<b>Fume collector</b>	Fume collector for reactive powder	Standard

### Metal Powder Materials

Materials (work)	JIS
	Equivalent(Component)
Matsaura Maraging II	—
Novel / Matsaura Maraging Cobalt Free	—
Matsaura Stainless 316L	SUS316L
Matsaura Stainless 630	SUS630
Matsaura Titanium 6AlV	TAB6400 (Ti6Al4V)
Matsaura Cobalt Chrome	T7402
Matsaura Nickel Alloy 718	H4553
Matsaura Aluminum Si10Mg	ACAA (AB10Mg)

\* When using titanium/aluminum powders, contact Matsaura for the information about the conditions of use in advance.  
 \* Orders in 10 kg units  
 \* Machine specifications are subject to change without prior notice.  
 \* Materials other than those specified cannot be used. Please purchase materials from Matsaura.  
 \* There may be additional applicable metal powder materials. Contact Matsaura for the latest information.



#### Tool magazine

A tool magazine that accommodates 20 milling tools is provided by standard. An automatic measuring device to measure the length of a tool when the tool is mounted to the spindle is also provided. The tool magazine makes it possible to set up tools externally when the chamber is filled with nitrogen, thereby improving work efficiency.



#### High-speed spindle (45000 min<sup>-1</sup>)

Equipped with Matsaura's time-proven high-speed, high-rigidity grease lubricated spindle that rotates at 45000 min<sup>-1</sup> and a 1/10 taper special BT20 tool shank.



#### Linear motor drive

High-precision machining is achieved through high-speed feeding (X/Y: 60 m/min (2.36 ipm) and Z: 30 m/min (1.18 ipm)) by linear drive incorporating Matsaura control technology.



#### Powder distribution unit

The powder distribution unit is used to spread sintering material (metal powder) on the build table. The operating range of the distribution unit can be specified, thereby achieving speedy and efficient powder distribution. [Japanese Patent No. 4351218]



#### Yb fiber laser

Yb fiber laser with high beam quality and high efficiency is employed. A small spot diameter can be set to achieve sintering with high power and high resolution. In combination with Matsaura's galvanometer motor, even finer sintering is available. Furthermore, the Yb fiber laser ensures ease of maintenance.



#### Sintering table

Metal laser sintering is done on this table. The upper surface of the table is heated to alleviate rapid temperature changes resulting from laser sintering, thus increasing the sintering precision.



#### Oxygen concentration and temperature display

Since metal powder becomes very hot during sintering, the processing chamber is filled with inert gas such as nitrogen. The oxygen concentration and temperature in the chamber is strictly controlled and indicated on the operation panel. If any abnormal condition is detected, the safety function generates an alarm and stops the machine.



#### CCD camera

A high-precision CCD camera with dedicated software realizes unprecedentedly high-precision laser sintering by incorporating Matsaura's visual sensing and feedback technology.



#### Automatic collection unit

Extra powder on the table is automatically recovered. Operators do not contact with the powder material.

## Automation with an APR system

### [ Automatic powder recovery system ]

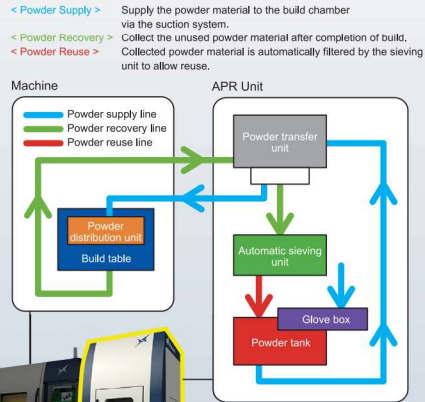
- Fully automated supply, collection and reuse of powder material.
- Maintains a safe working environment to prevent fine powder dispersal.
- Easy and safe material setup is possible with no direct contact with powder.

\* Option for **Avance-25**, standard for **Avance-60**

### APR System



Powder supply (APR system inside)



## Safety features for titanium or aluminum sintering

For combustible powders, dedicated safety equipment is available to ensure safety.

\* Option for **Avance-25**, standard for **Avance-60**

### Automatic sieving unit

Ultrasonic sieving is employed. This unit sieves materials efficiently with a low noise level and is less susceptible to mesh clogging. All components have conduction preventive and antistatic effects and inert gas is circulated during operation to prevent powder explosions.

### Antistatic devices & mats

Antistatic mats are laid in the working area, setup area and maintenance areas. Wrist straps for operators are also provided.

### Disposable type Fume collector

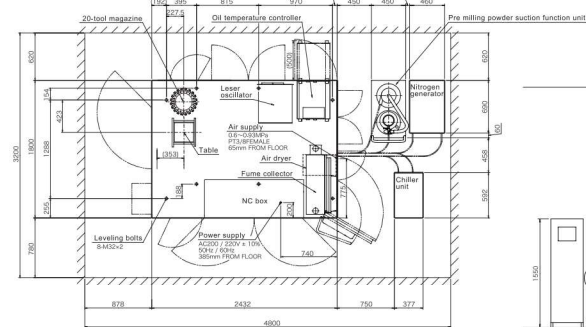
Fumes are collected powerfully while circulating inert gas inside. By automatically switching between two lines, there is no need to stop the collector when replacing the filter. The airflow monitoring and automatic adjustment functions enable stable laser processing.



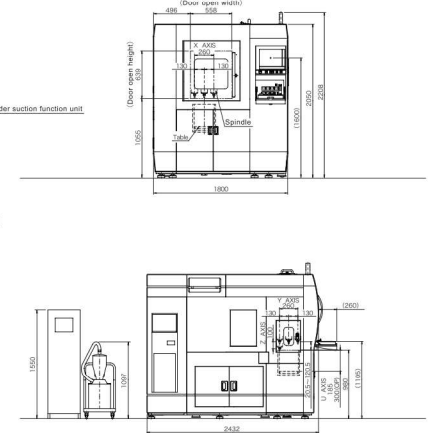
※Photo shows **Avance-25**

## LUMEX Avance-25 Standard specifications

### [ Floor plan ]

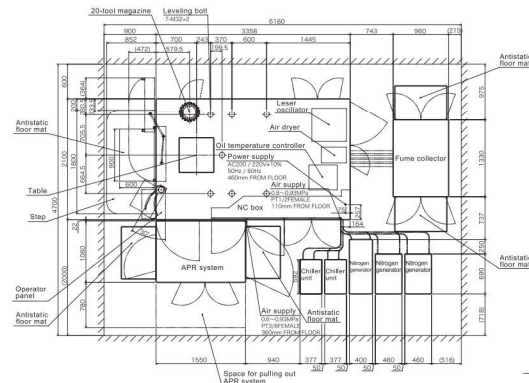


### [ External view ]



## LUMEX Avance-60 Standard specifications

### [ Floor plan ]



### [ External view ]

