



URL : <http://www.matsuura.co.jp/>  
E-MAIL : [lumex@matsuura.co.jp](mailto:lumex@matsuura.co.jp)

**MATSUURA MACHINERY CORPORATION**  
1-1 Urushihara-cho Fukui City 910-8530, Japan  
TEL : +81-776-56-8106 FAX : +81-776-56-8151

**MATSUURA EUROPE GmbH**  
Berta-Cramer-Ring 21  
D-65205 Wiesbaden-Delkenheim, Germany  
TEL : +49-6122-7803-80 FAX : +49-6122-7803-33  
URL : <http://www.matsuura.de/>  
E-MAIL : [info@matsuura.de](mailto:info@matsuura.de)

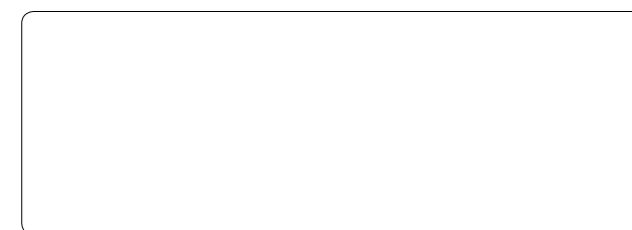
**MATSUURA MACHINERY Ltd.**  
Gee Road, Whitwick Business Park, Coalville Leicestershire, LE67  
4NH, England  
TEL : +44-1530-511-400 FAX : +44-1530-511-440  
URL : <http://www.matsuura.co.uk/>  
E-MAIL : [sales@matsuura.co.uk](mailto:sales@matsuura.co.uk)

**MATSUURA MACHINERY GmbH**  
Berta-Cramer-Ring 21  
D-65205 Wiesbaden-Delkenheim, Germany  
TEL : +49-6122-7803-0 FAX : +49-6122-7803-33  
URL : <http://www.matsuura.de/>  
E-MAIL : [info@matsuura.de](mailto:info@matsuura.de)

**ELLIOTT MATSUURA CANADA INC.**  
2120 Buckingham Road Oakville Ontario L6H 5X2, Canada  
TEL : +1-905-829-2211 FAX : +1-905-829-5600  
URL : <http://www.elliottmachinery.com/>  
E-MAIL : [sales@elliottmachinery.com](mailto:sales@elliottmachinery.com)

**MATSUURA MACHINERY USA INC.**  
325 Randolph Ave., St.Paul, MN 55102, U.S.A.  
TEL : +1-651-289-9700  
URL : <http://www.matsuurausa.com/>  
E-MAIL : [info@matsuurausa.com](mailto:info@matsuurausa.com)

- Product specifications and dimensions are subject to change without prior notice.
- The photos may show optional accessories.



This product is subject to all applicable export control laws and regulations

# 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 of Matsuura Maraging II, the actual performance may vary depending on the part shape and size.



2016  
Release



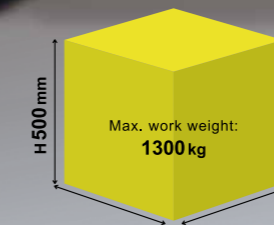
2017  
Release



[ Laser Output ]

Standard 1kW  
Option 500W

[ Spindle Speed ]  
45000 mim<sup>-1</sup>

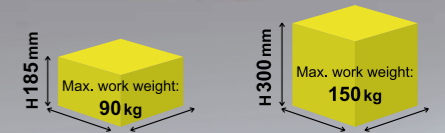


Max. work size W600 mm × D 600 mm

[ Laser Output ]

Standard 500W  
Option 1kW

[ Spindle Speed ]  
45000 mim<sup>-1</sup>



Max. work size W256 mm × D 256 mm [ Standard ]

Max. work size W256 mm × D 256 mm [ Option ]



Laser Sintering



Deep Rib Processing



Hollow Structures



Time Reduction



3D Free-Form Surface



Finish Machining



Milling



Porous Sintering



3D Meshes



Cost Reduction



Integrated Structures



Undercut Machining



2002



2003



2004



2006

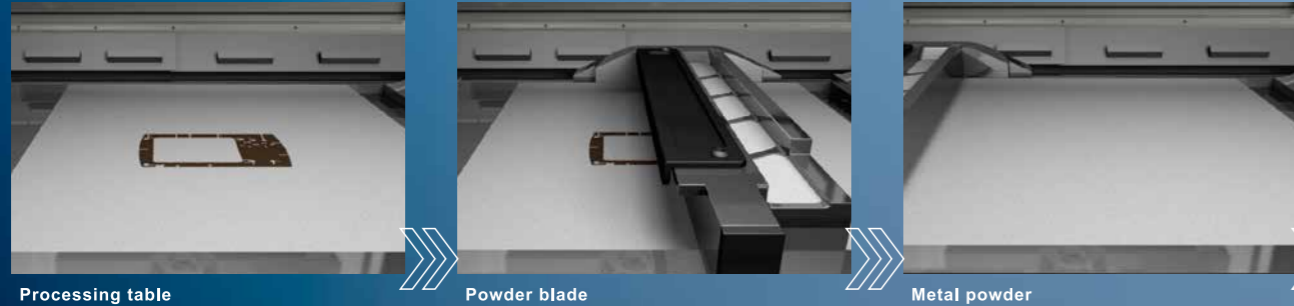
# LUMEX

[ Processes ]

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



### Powder Distribution



### Laser Processing



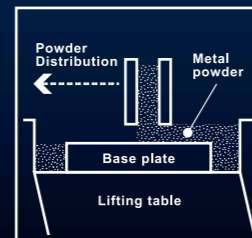
### High-speed milling



Repeated Laser Processing for 10 Layers

Repeated metal laser processing and high-speed milling

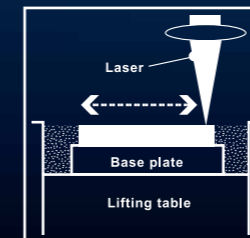
The **LUMEX** series repeats metal laser processing and high-speed, high-precision milling to form metal powder into shapes and makes deep ribs in a single process without EDMs. Dimensional accuracy and comparable to machining centers is achieved.



#### 1. Powder Distribution

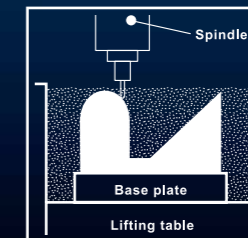
Metal powder is distributed\* on the base plate installed on the table.

\* 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



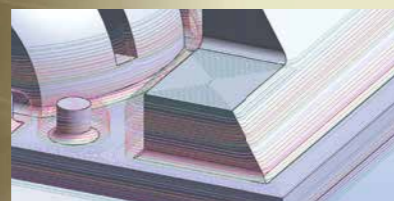
Scanning cell order



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

### Milling Paths

Milling path creation from milling condition templates



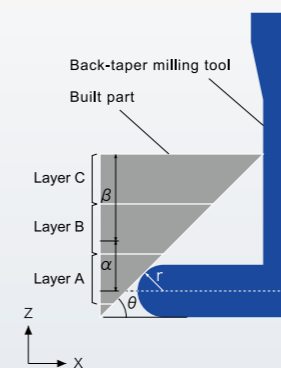
Path point / direction arrow display  
Milling processes in different colors

**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 simulation function helps to check the created paths before the start of processing.

## Processing techniques

### Back-Taper

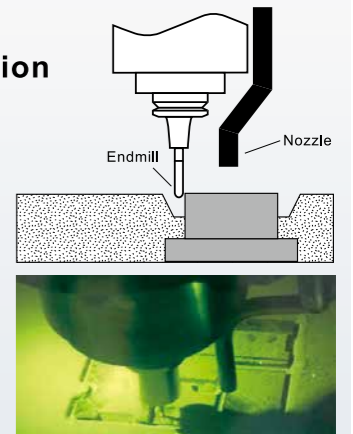
Back-taper shaped parts can be produced. After sintering up to layer C, the  $\alpha$  area which is at a distance  $\beta$  can be finished.



### 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.

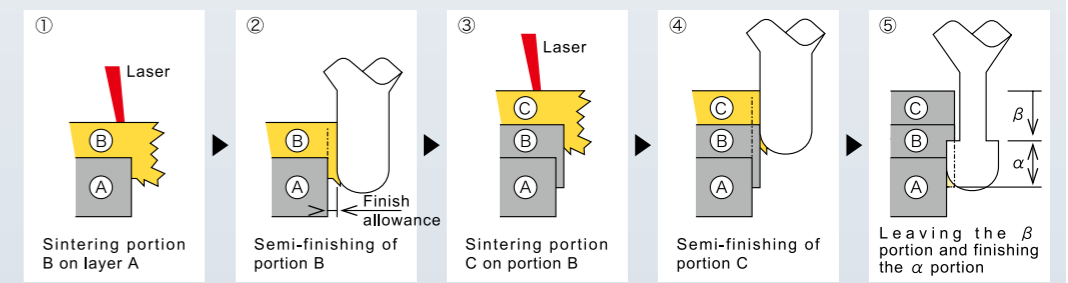
\* For ferrous powders only  
\* Panasonic Corporation owns a patent regarding the "pre-milling powder suction function".



### Step Machining Process

[ Japanese Patent No. 4452692 ]

By repeating processes 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. This function is newly developed and named "Step Machining Process". Fine finishes with high precision can be achieved.



[(3) to (5)] are repeated.

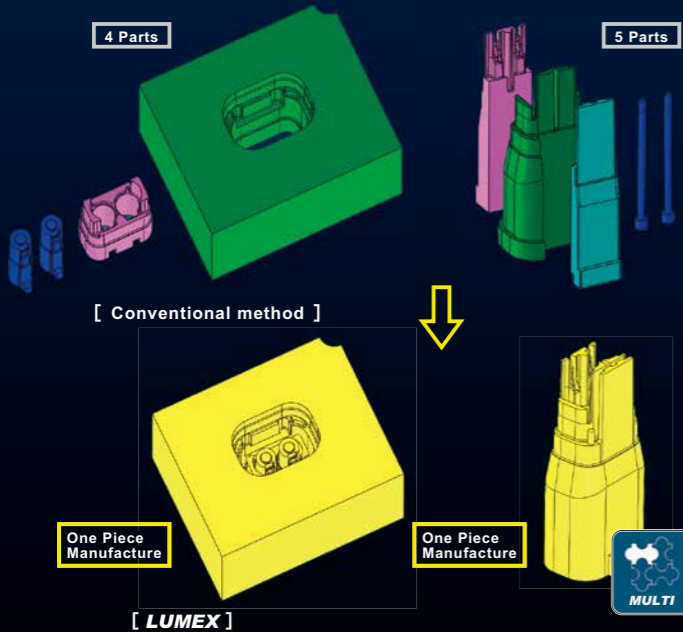
# Manufacturing highly advanced molds in a single process.

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



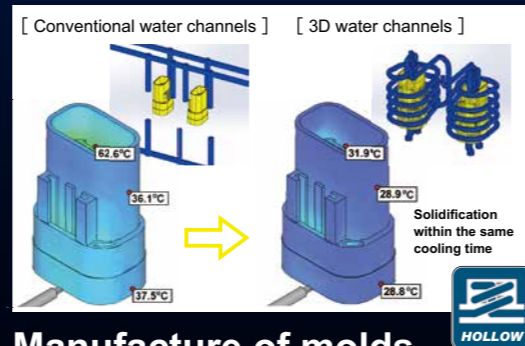
## Creating deep ribs by hybrid processing and without EDM

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.



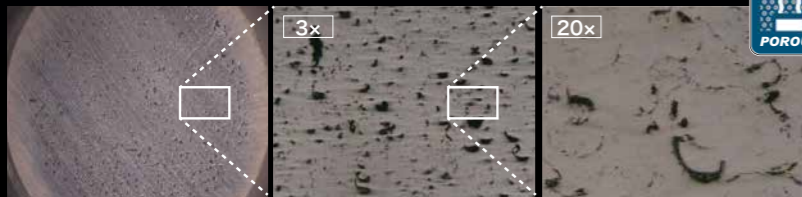
## Manufacture of molds with 3-dimensional cooling channels

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%**

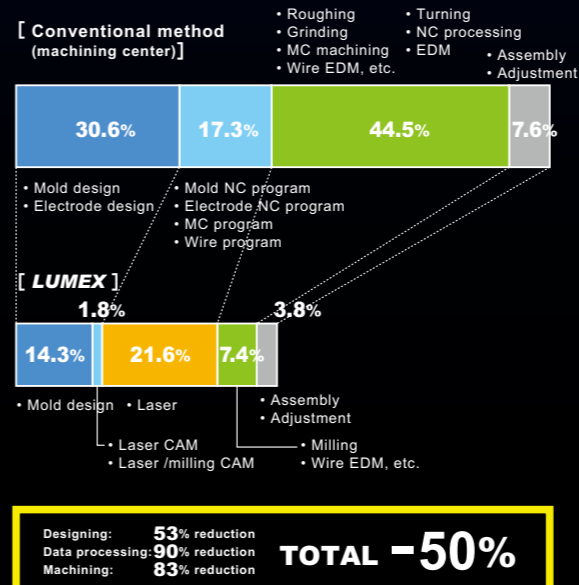
## Porous structure for gas venting

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.



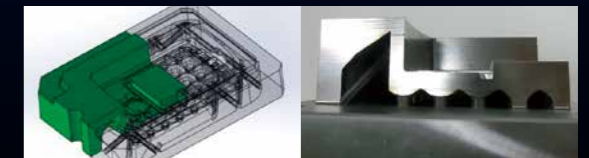
## Reduction in lead time from design to finish

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

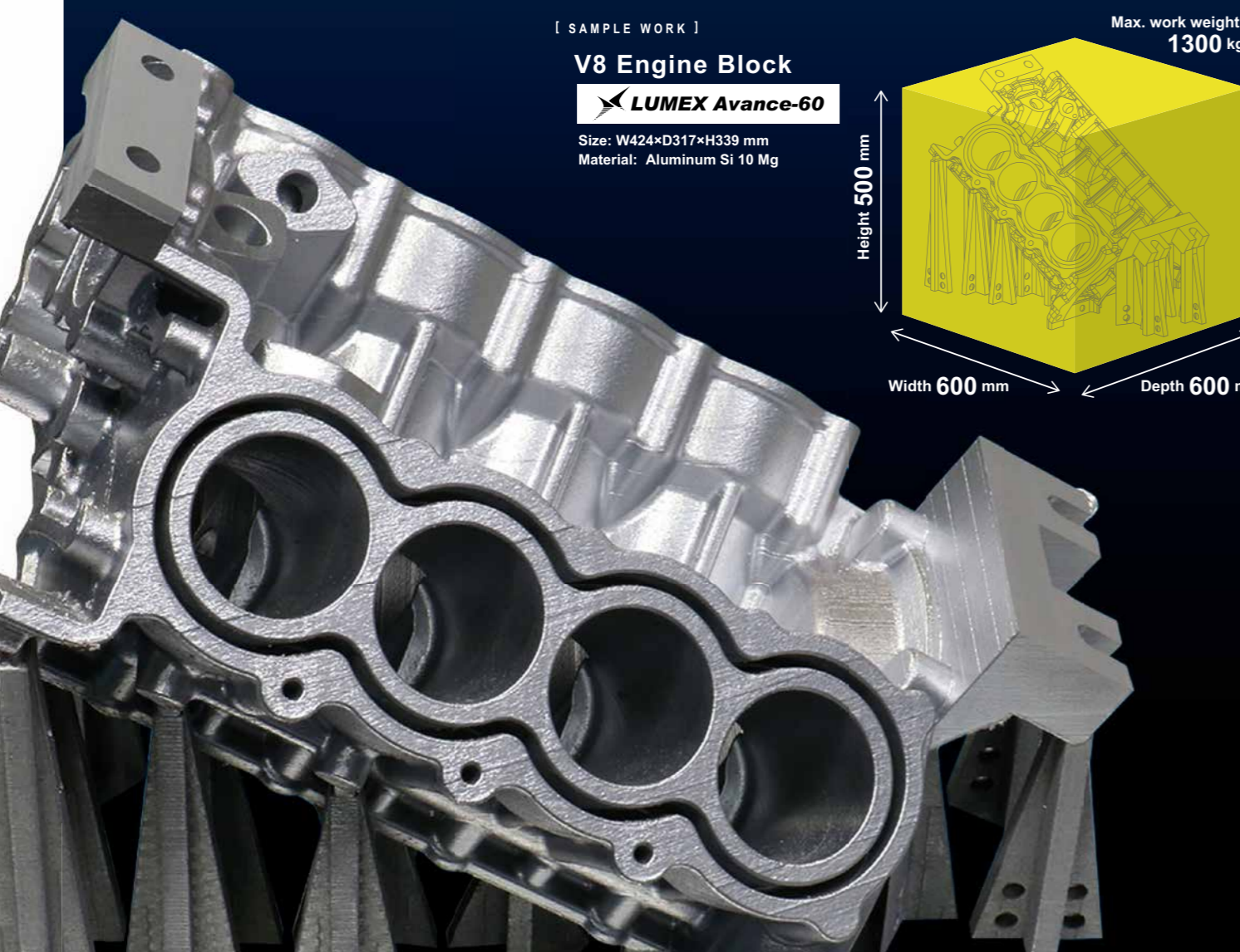
[ SAMPLE WORK ]  
Digital camera casing

LUMEX Avance-25



# 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.



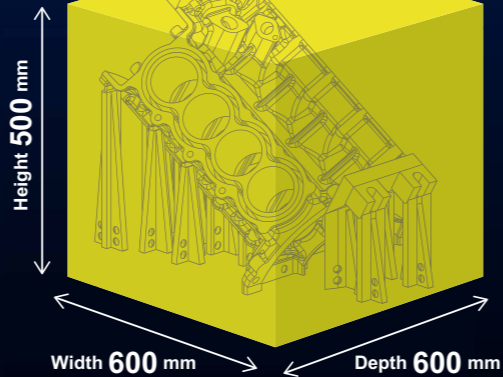
[ SAMPLE WORK ]

## V8 Engine Block



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 \*1
- Milling time reduction by cutting path optimization

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

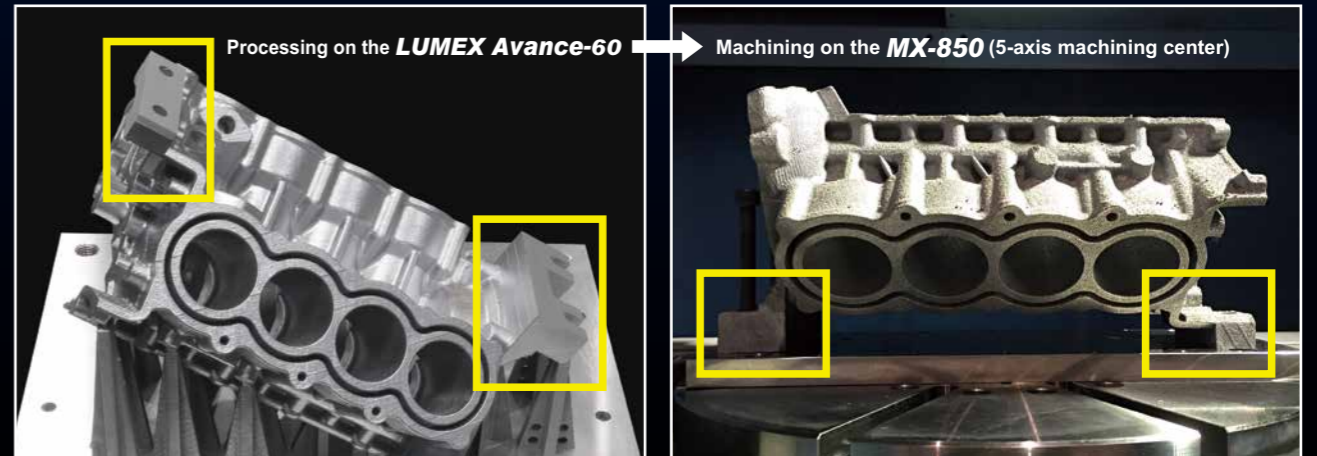


[ Existing LUMEX Avance-25 model ] (400W · simulation)	[ LUMEX Avance-60 ] (1kW)
Total: 409h 50m Sintering: 402h 50m Milling: 7h 00m	Total: 95h 00m Sintering: 90h 00m Milling: 5h 00m
	<b>77% reduction</b>

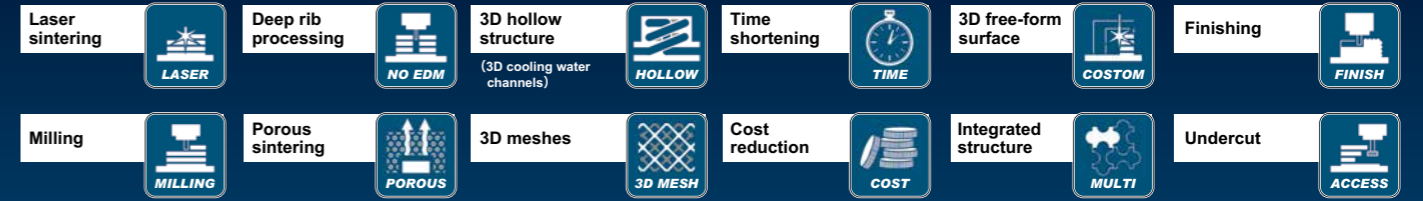


## Reference surfaces for subsequent processes can be made

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.

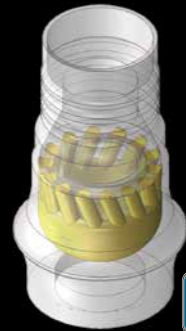


LUMEX Avance-60							5-AX MC (from solid)								
mon 8h	tue 8h	wed 24h	thu	fri	sat	sun	mon 16h	tue 16h	wed 4h	thu 4h	fri	sat	sun	mon 12h	tue
Fixture design	Fixture design	MC programming					Setup	MC			MC			MC	
<b>LUMEX</b> programming 16h 8h 8h 95h 8h Plate/ support design Setup (unmanned) Support removal							TOTAL 22.5 days								
<b>LUMEX</b> Plate/ support design: 8h 8h 8h Fixture design: 24h Fixture design: 12h 4h MC programming: Setup MC							TOTAL 15 days (35% reduction)								



## 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 freewheeling thinking not possible with conventional methods.

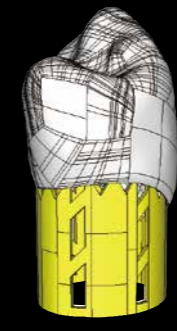
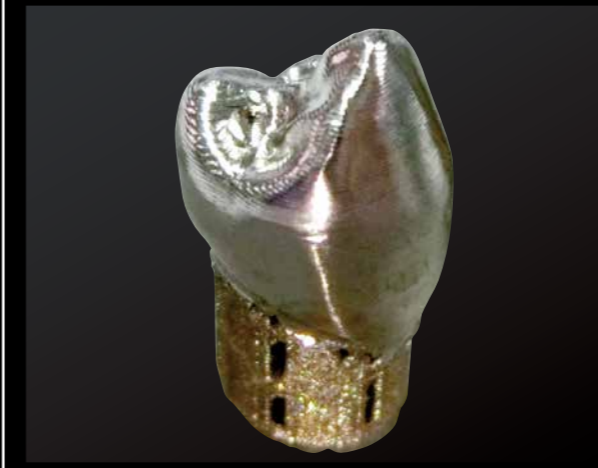
- Undercut portions

A dedicated tool can be used for roughing to finishing.



## Medical Parts

### Artificial tooth



[Material] Matsuura Cobalt Chrome

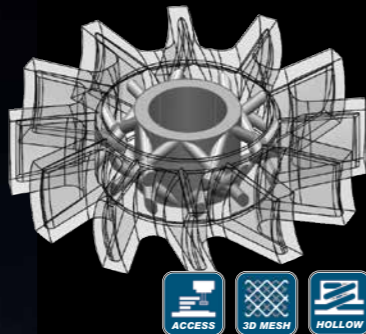
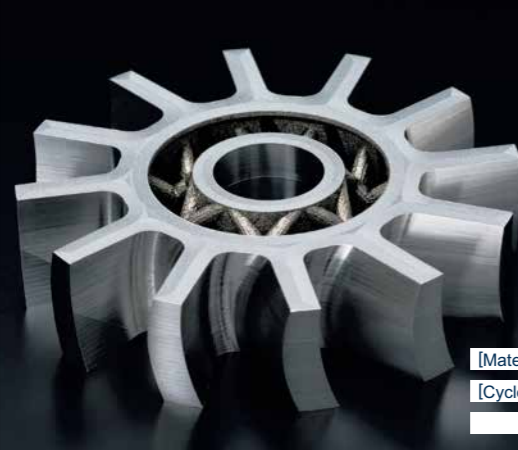


- Medical parts made of cobalt chrome

One-off parts in different shapes can be manufactured with ease.

- Multi-variety multi-cavity configuration

Multiple cavities of the same shape or different shapes can be configured on a plate for efficient sintering/milling operations.



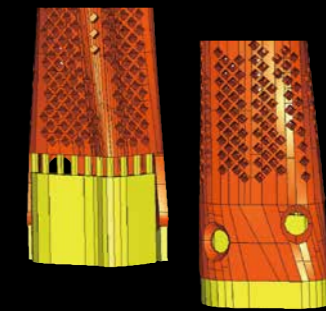
[Material] Matsuura Stainless 630  
 [Cycle time] Sintering: 9 hr 30 min / milling: 15 hr 50 min  
 Total: 25 hr 20 min



### Brisk

- 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.



[Material] Matsuura Ti 6Al 4V



### Artificial bone

- Addition of supports

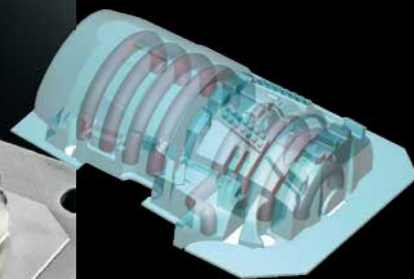
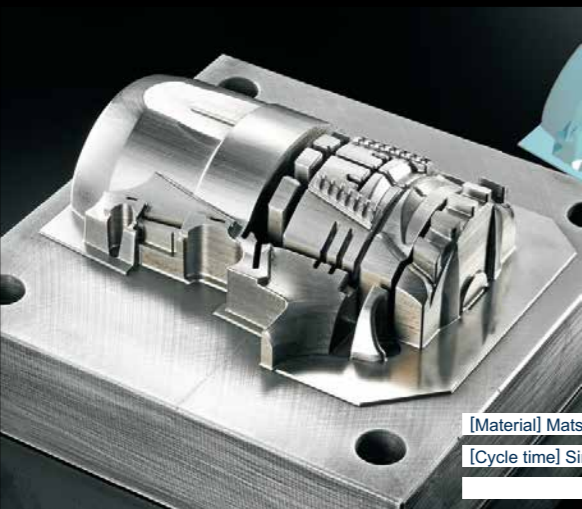
Supports allow sintering of free-form parts. Support design is optimized to allow for easy removal while having sufficient strength to resist thermal stress during manufacture. Easy removal ensures minimal secondary processing time.

- Titan (aluminum) sintering

In the case of combustible powders, dedicated safety equipment is available.

## 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

### 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
<b>Total</b>	<b>97h</b>	<b>53h</b>

**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>Traverses</b>		
X-axis travel (Table left/right) [mm]	260	610
Y-axis travel (Table back/forth) [mm]	260	610
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	990
Distance from table to spindle end [mm]	-10 ~ 90	-10 ~ 90
<b>Table</b>		
Build tank size [mm]	270×270	630×630
Max. work weight [kg]	90	1300
Build table size [mm]	246×246	600×600
Build table surface configuration	Tap M6(P1) × Pitch 50mm × 24 pcs	Tap M8 × Pitch 50mm × 120 pcs
Max. work size [mm]	W256×D256×H185 (including the base plate)	W600×D600×H500 (including the base plate)
Distance from floor to table surface [mm]	980	1250
<b>Spindle</b>		
Spindle speed [min <sup>-1</sup> ]	450 ~ 45000	450 ~ 45000
Spindle bearing inner diameter [φmm]	25	25
Spindle end	1/10 taper #20	1/10 taper #20
Spindle max. torque [N·m]	1.31	1.31
Spindle airblow	YES	YES
Spindle orientation	YES	YES
<b>Feederate</b>		
Rapid traverse rate X / Y / Z [mm/min]	60000 / 60000 / 30000	60000 / 60000 / 30000
Rapid feed acc. / dec. X / Y / Z [G]	0.98 / 1.28 / 0.95	0.61 / 0.58 / 0.7
Feederate X / Y [mm/min]	1 ~ 60000	1 ~ 60000
Z [mm/min]	1 ~ 30000	1 ~ 30000
Feederate acc. / dec. X / Y / Z [G]	0.77 / 0.73 / 0.66	0.36 / 0.36 / 0.41
<b>Automatic Tool Changer</b>		
Tool shank	Matsura original #20	Matsura original #20
Tool stud	Matsura original #20	Matsura original #20
Tool storage capacity [pcs]	20	20
Max. tool diameter [φmm]	10	10
Min. tool diameter [φmm]	0.6	0.6
Max. tool length (with condition) [mm]	Specified Tool holder: Matsura special α≥3×φ (φ=3.4,6.8,10)	Specified Tool holder: Matsura special α≥3×φ (φ=3.4,6.8,10)
Tool support length of tool holder: α [mm]		
Max. tool protrusion length from tool holder: β [mm]	β≤5×φ (φ=3.4,6.8)	β≤5×φ (φ=3.4,6.8)
[mm]	β≤30(φ=10)	β≤30(φ=10)
Max. tool weight [kg]	0.25 (0.55) (incl. holder)	0.25 (0.55) (incl. holder)
[kg]	0.05 (0.11) (Tool only)	0.05 (0.11) (Tool only)
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/ 50%)	AC 2.4 / 4.0 (Continuous/ 50%)
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 0.8 / 1.4	AC 0.96 / 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 0.75	AC 0.7
Chiller motor (Laser, Optical system cooling) [kW]	AC 1.18 / 1.54	AC 1.18 / 1.54
<b>Laser</b>		
Laser type	Yb Fiber laser	Yb Fiber laser
Oscillator output range [W]	50 ~ 500	100 ~ 1000
Beam mode quality value (M2)	< 1.1	< 1.1
Wavelength [nm]	1070 ± 5	1070 ± 5
<b>Laser Scanning Module</b>		
Scanning module X / Y	Galvano scanner system	Galvano scanner system
Z	Linear translator	Linear translator
laser wavelength [nm]	1070±5	1070±5
Max. laser power [W]	500	1000
Drive power supply [V]	DC 24	AC 200 / DC 24

	LUMEX Avance-25	LUMEX Avance-60
<b>Power Supply</b>		
Electrical power supply [kVA]	28 (Varies with option configuration)	43 (Varies 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	0.6 ~ 0.93
Volume of compressed air to be supplied [NL/min]	500 (atmospheric pressure)	1100 (550 (atm.) + 550 (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×5500 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

LUMEX Avance-25 Standard Accessories	
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
Galvano scanner & Laser controller	Auto tool length measurement detection sensor (Touch type)
Work light	Spindle integrated run meter
Laser integrated run meter	Guide light function
IPC function	15-inch LCD with touch panel
Qwerty key-arrangement keyboard	USB interface 2 ports
High table temperature alarm	AC 100V Outlet 3 A
Tools & Tool box	Machine color paint
Leveling bolts & Plates	Pre-milling powder suction
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 oscillating	
* 2 years spindle warranty	

LUMEX Avance-60 Standard Accessories	
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
Galvano scanner & Laser controller	Auto tool length measurement detection sensor (Touch type)
Work light	Spindle integrated run meter
Laser integrated run meter	Guide light function
IPC function	19-inch LCD with touch panel
Qwerty key-arrangement keyboard	USB interface 2 ports
High table temperature alarm	Machine color paint
Tools & Tool box	Leveling bolts & Plates
Pre-milling powder suction	
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 oscillating	
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
Safety standard	CE mark specification	CE mark specification
	China GB standard	China GB standard
Special machine color	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)
Spare spindle	Option	Option
Travel	U-axis travel (built table) 300mm	—
Max. Work weight	150 kg (with U-axis travel 300 mm spec.)	—
Weekly timer	Option	Option
Power supply voltage	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
Powder sieving machine	No titanium and aluminum powder specification	—
Laser oscillator	1 kW fiber laser oscillator	500 W fiber laser oscillator Chiller required
Powder vacuum unit	Powder vacuum unit (External vacuum)	Powder vacuum unit (External vacuum)
	Automatic powder recovery system	—
Technical support	1st year maintenance A: Laser inspection Laser inspection & adjustment (twice / year)	1st year maintenance A: Laser inspection Laser inspection & adjustment (twice / year)
	1st year maintenance B: Machine software version upgrades	1st year maintenance B: Machine software version upgrades
	Machine software version upgrades	Machine software version upgrades
	1st year maintenance C: Laser inspection + machine software version update	1st year maintenance C: Laser inspection + machine software version update
	Laser inspection and adjustment (twice a year) + machine software version update	Laser inspection and adjustment (twice a year) + machine software version update
CAM	Laser & machining program CAM software, LUMEX CAM	Laser & machining program CAM software, LUMEX CAM
	Laser & machining program Operation instruction	Laser & machining program Operation instruction
Tool	Matsura original #20 tool holder	Matsura original #20 tool holder
	Matsura Original endmill for finishing	Matsura Original endmill for finishing
APR system	Automatic powder recovery system	Standard
Table temperature controller	Option	Option

### Metal Powder Materials

Materials (work)	Name
Matsura Maraging II	Maraging material powder
Matsura Titanium 6Al4V	Ti-6Al-4V material powder
Matsura Stainless 630	SUS630 material powder
Matsura Stainless 316L	SUS316L material powder
Matsura Cobalt Chrome	Co-Cr material powder
Matsura Nickel Alloy 718	Nickel alloy 718 material powder
Matsura Aluminum Si10Mg	Aluminum Si10Mg material powder

- \* 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 Matsura.
- \* There may be additional applicable metal powder materials. Contact Matsura for the latest information.



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

Equipped with Matsura'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.



#### 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 Matsura's galvanometer mirror, even finer sintering is available. Furthermore, the Yb fiber laser ensures ease of maintenance.



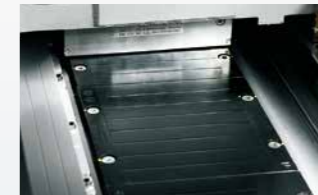
#### Tool magazine

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.



#### 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]



#### Linear motor drive

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



#### CCD camera

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



#### 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.

## 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.

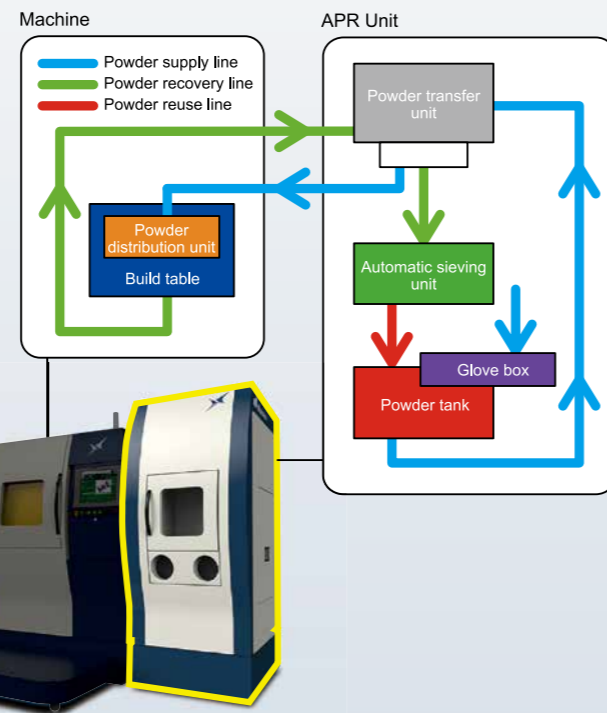
\* Option for **Avance-25**, standard for **Avance-60**

### APR System



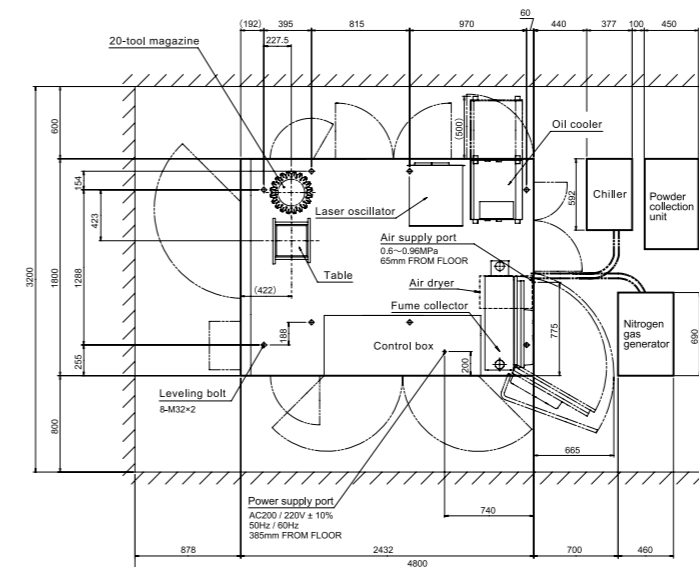
Powder supply (APR system inside)

- < Powder Supply > Supply the powder material to the build chamber via the suction system.
- < Powder Recovery > Collect the unused powder material after completion of build.
- < Powder Reuse > Collected powder material is automatically filtered by the sieving unit to allow reuse.

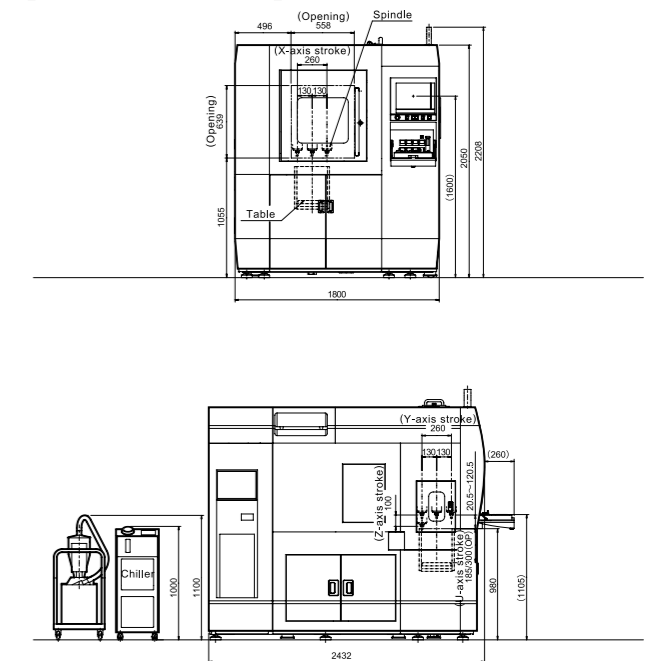


## LUMEX Avance-25 Standard specifications

### [ Floor plan ]

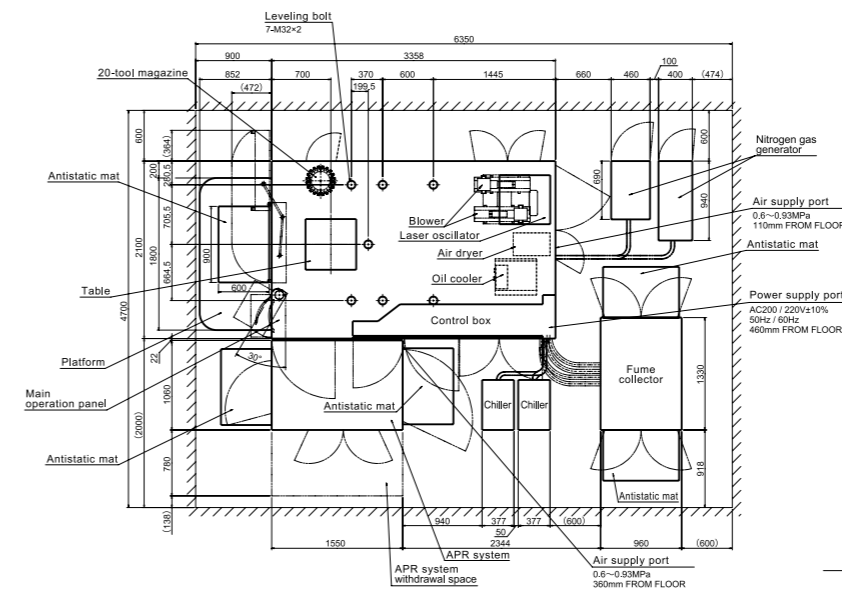


### [ External view ]

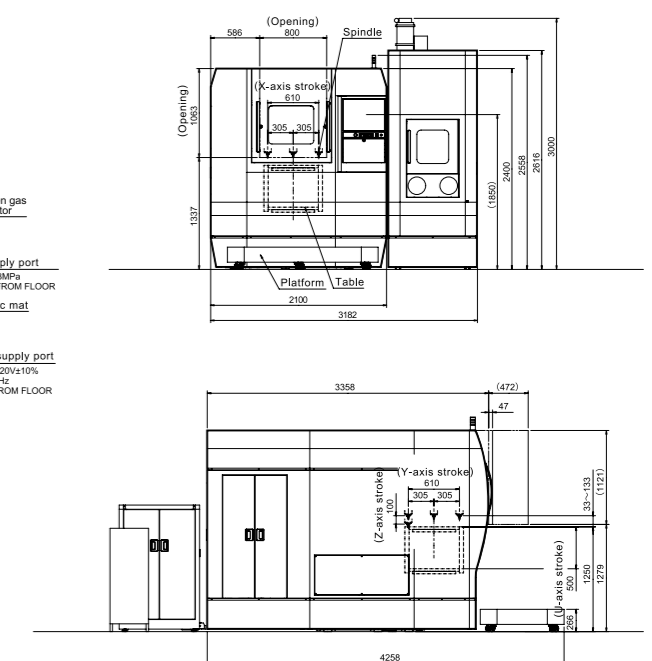


## LUMEX Avance-60 Standard specifications

### [ Floor plan ]



### [ External view ]



## Safety features for titanium or aluminum sintering

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

### Option

#### Automatic sieving unit

Inert gas circulation prevents powder explosion. Including an explosion-proof motor, all components are powder explosion proof with conduction prevention and antistatic effects.



#### Fume collector

Fume is collected powerfully while circulating inert gas inside. A powder-explosion-proof motor and antistatic filter are installed. The fume collector has a completely sealed structure equipped with check valves and explosion venting to prevent external impact even if an internal explosion occurs.



#### Automatic collecting unit / vacuum cleaner

This unit collects powder safely when sintering is finished. Equipped with a powder explosion proof motor and antistatic filter, the unit is completely sealed to prevent external impact with check valves and explosion venting in case of an internal explosion.



#### Antistatic devices & mats

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