

Metal Laser Sintering Hybrid Milling Machine



LUMEX **Avance-25**





LUMEX **Avance-25**

Unique one process solution: Laser sintering and milling.

The **LUMEX Avance-25** is a single machine platform integrating a fiber laser for state of the art metal sintering and a machining center for performing high accuracy, high speed milling.

Revolution of metal processing.

Metal laser sintering is a technique that uses a laser beam to sinter metal powder into a variety of forms. Conventional metal laser sintering has certain limitations on machining accuracy and surface smoothness and requires a large number of post-processing stages, such as electrical discharge processing and milling stages. The **LUMEX Avance-25** performs both metal laser sintering and end-mill finish milling alternately, which provides molds with dimensional accuracy and surface smoothness at almost the same level as machining centers do. Furthermore, the **LUMEX Avance-25** performs deep rib machining, which conventional machining centers cannot perform.

Significantly reducing the required production time of mold dies.

The **LUMEX Avance-25** eliminates conventional processes, such as mold die splitting, electrical discharge processing, electrode designing, the fabrication of additional cooling water pipes, and assembly and adjustment work, thus greatly reducing the required time of mold die designing and processing. The **LUMEX Avance-25** powerfully supports the quick launching of new products and high-mix low-volume production.

Changing common knowledge for mold die making.

The conventional production of mold dies requires advanced skills, such as mold die splitting, electrical discharge processing along with electrode designing for deep rib formation, and the arrangement of internal water pipes. The **LUMEX Avance-25** fabricates complicated mold dies at a stretch without splitting them. The **LUMEX Avance-25** leads to a fundamental change in common knowledge for mold die making.

Advanced sintering functionality - future proof versatility.

The **LUMEX Avance-25** sinters workpieces at near net shape, 3D objects with complex interior structures and creates components with hollows, 3D meshes and free form surfaces. This unique and dynamic production platform is attracting interest from every manufacturing sector looking for new solutions for components and products that currently have no cost effective, reliable method of manufacture.



-  Laser sintering
-  Milling
-  Deep rib processing
-  Porous sintering
-  3D hollow structure
(3D cooling water tube)
-  3D meshes
-  Time shortening
-  Cost reduction
-  3D free-form surface
-  Integrated structure

Revolutionary, unique and dynamic production platform

Manufacturing highly advanced mold dies in a single process.

Creating components with complex internal cooling pipes and performing porous sintering with ease. Rapid production of high performance mold dies.



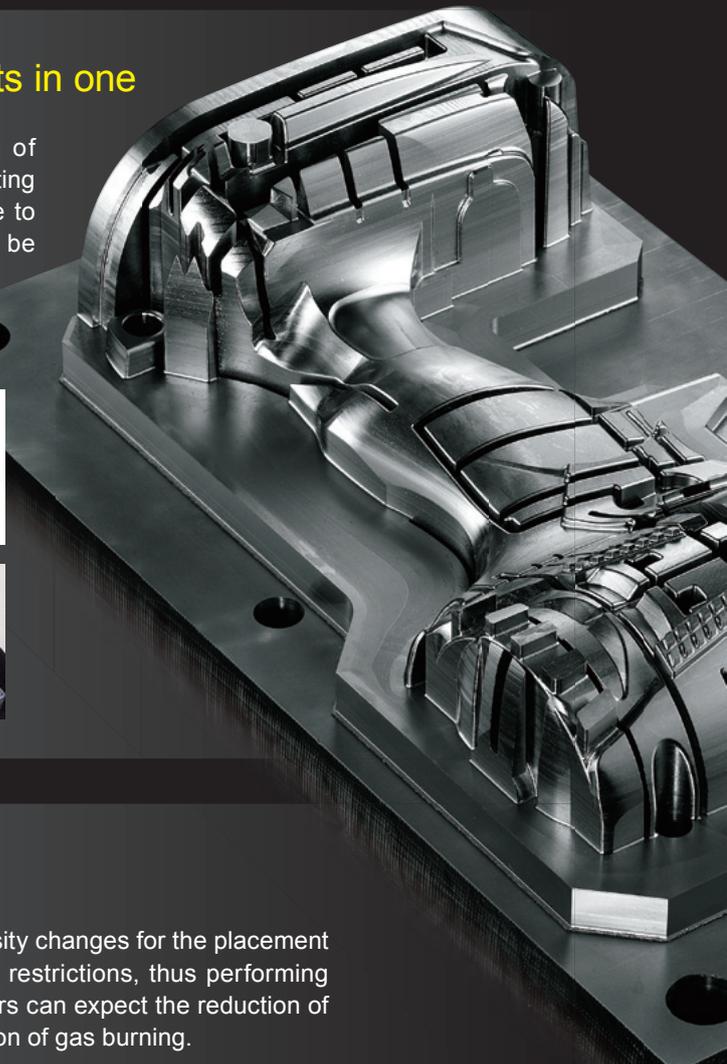
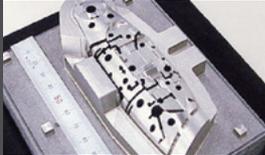
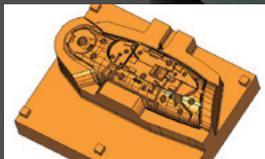
No splitting: Create mold die parts in one

The **LUMEX Avance-25** performs the sintering of complicated mold dies without splitting them, thus eliminating assembly and adjustment stages and making it possible to produce mold dies with no dimensional errors that may be caused by conventional assembly processes.

■ Conventional work method



■ Metal laser sintering and hybrid milling

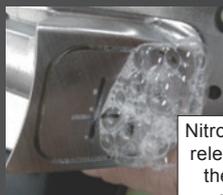


Porous sintering for gas venting

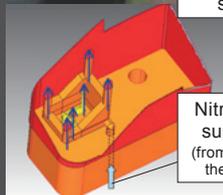
The **LUMEX Avance-25** can freely make sintering density changes for the placement of porous structures and air permeability control without restrictions, thus performing gas venting more effectively than any other machine. Users can expect the reduction of resin filling time, prevention of uneven filling, and elimination of gas burning.



Porous surface



Nitrogen gas is released from the porous surface



Nitrogen gas supply port (from the back of the mold die)



3x

Porous structure (coarse)



3x

Porous structure (fine)



20x



20x

Sample A

Sample A

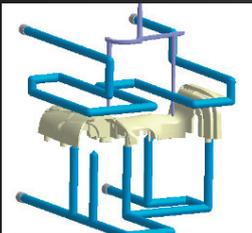


Creation of internal cooling pipes and structures

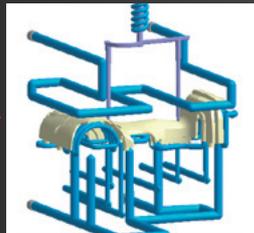
The **LUMEX Avance-25** makes possible the creation of integrated cooling pipes internally on any component, mold or die. Compared to conventional post process cooling pipes, those created on the LUMEX are far superior and efficient at cooling, contributing to a significant reduction in injection molding time.

■ 3D placement of cooling water pipes inside mold dies

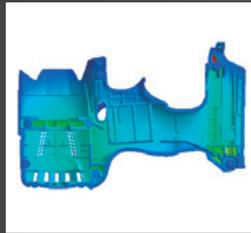
■ Excellent cooling effect: Cooling effect improvement by 30% with a 40% reduction in cooling time.



Conventional water pipes



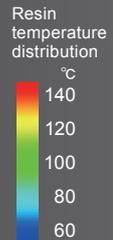
3D cooling water pipes



Conventional water pipes

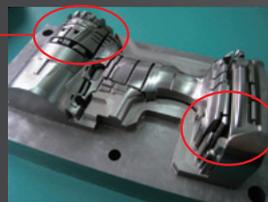


3D cooling water pipes



Performing the sintering of deep ribs with no electrical discharge processing

The **LUMEX Avance-25** builds up laminations of layers by metal laser sintering and cuts them at high speed, thus making it possible to perform the high-precision machining of deep ribs and thin ribs. The **LUMEX Avance-25** allows metal sintering without using electrical discharge processing.



A 60% reduction in working hours required for designing through to machining

The **LUMEX Avance-25** can machine a number of mold dies without splitting them, thus not requiring electrical discharge processing, assembly, or adjustment work. The **LUMEX Avance-25** greatly reduces the required time of designing and computer-aided machining (CAM) time. The **LUMEX Avance-25** saves the required designing time and CAM processing time of mold dies by approximately 23% and 90%, respectively, even if the mold dies have a large number of deep ribs, and reduces the required machining time by at least 50%. The **LUMEX Avance-25** saves a total of 61.5% of metal manufacturing time compared with the conventional work method.

Comparison of mold die production

- Mold die designing
- Mold die NC (PP)
- Electrode NC (PP)
- Electrode designing
- MC (PP)
- Wire (PP)
- Material rough machining
- Lathe machining
- Grinding
- NC processing
- MC processing
- Electrical discharge processing
- Wire machining, and others

Conventional work method

18.0%

23.0%

59.0%

metal laser sintering and hybrid milling

13.9%

2.4%

10.2%

12.0%

- Mold die designing
- Sintering
- Sintering CAM
- Sintering and milling CAM
- Milling
- Wire machining and others

Designing: 23% reduction
Data production: 90% reduction
Machining: 90% reduction

A 61.5% reduction in working hours required for designing through to machining.

■ Designing ■ Production of machining data ■ Sintering ■ Machining

Industry Solutions



Contributing to a significant time reduction and quality improvement.

The **LUMEX Avance-25** significantly reduces the required designing and production time of mold dies. Manufacturers can expect a reduction in molding time but also quality improvements in their molds from the 3D placement of water pipes in the mold dies and porous sintering. The **LUMEX Avance-25** realizes new molding solutions that conventional mold dies could not.

Mold die production



Reducing the required time of work to 1/2 and the cost to 1/2 of conventional work methods.

The **LUMEX Avance-25** designs core mold dies with deep holes and ribs without splitting the mold dies. The **LUMEX Avance-25** can make effective use of 3D CAD design data consistently. Furthermore, no electrical discharge processing is required, which greatly reduces the required time of mold die production.

Conventional work method

On the condition that the conventional work period and cost are both 100.

LUMEX Avance-25

Metal laser sintering and hybrid milling

Work period: 32.5%
Cost: 50.0%

67.5% reduction in work period
50% cost reduction

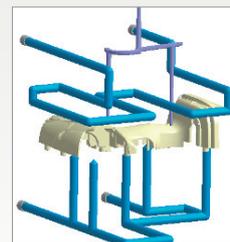


Molding cycle

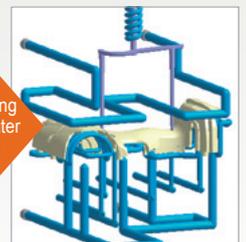
The 3D placement of water pipes in mold dies enables highly efficient cooling within a short time.

The **LUMEX Avance-25** can freely build cooling pipes three-dimensionally into mold dies, and provide excellent cooling efficiency, thus realizing a molding cycle reduction and contributing to productivity improvements.

Conventional water pipe



3D cooling water pipe



Designing ideal water pipes

Production Examples

Die Making

Manufacturing highly functional complicatedly shaped dies of integrated construction with ease.

The **LUMEX Avance-25** is a standalone machine that manufactures high-function dies in a single process with cooling water pipes placed three dimensionally inside the dies. The dies manufactured by the **LUMEX Avance-25** are the same with those manufactured by machining centers in dimensional precision, surface smoothness, and life. Furthermore, the **LUMEX Avance-25** performs surface treatment, such as nitride treatment and embossed treatment as well. The **LUMEX Avance-25** is effective to improvements in the precision of injection molding and molding cycle shortening.



Fan (cavity and core)
Material: Matsuura Steel I



Electric screwdriver (head)
Material: Matsuura Steel I



Connector
Material: Matsuura Steel I

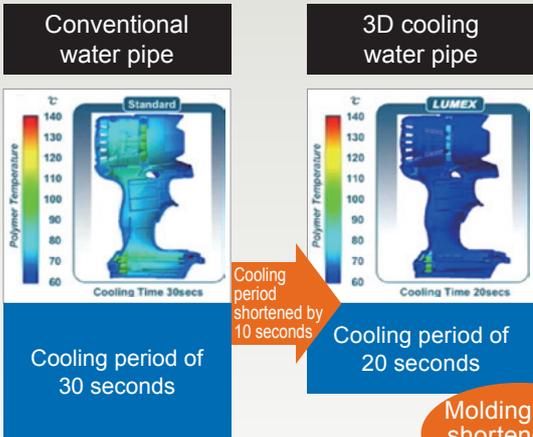


EV electrical component
Material: Matsuura Steel I





Improvement in cooling efficiency



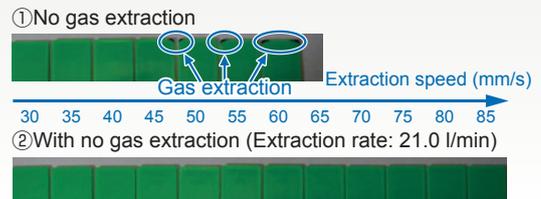
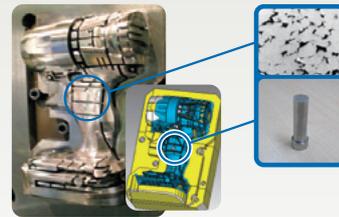
Molding cycle shortened by 20%

Molding quality



The **LUMEX Avance-25** can place porous structures freely, thus making effective gas venting possible and improving the quality of molds.

The **LUMEX Avance-25** can make porous structures for gas venting in any places, thus preventing molding problems, such as gas burning, weld line formation, and shrinkage and contributing to quality improvements.

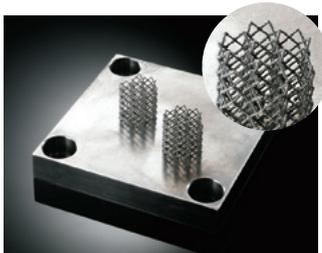


Data provided by OPM Laboratory Co., Ltd.

Molding products of 3D integrated construction

Ideal for molding products that cannot be manufactured by conventional milling and customized products.

The **LUMEX Avance-25** makes it possible to mold products in shapes that cannot be formed in conventional methods, such as products with deep ribs, 3D meshes, hollows, free-form surfaces, or porous structures to be built into desired positions in a single process. The **LUMEX Avance-25** can be used to manufacture customized products, such as artificial bones.



Mesh structure

Material: Matsuura Titanium 6Al7Nb



Implant

Material: Matsuura Titanium 00



Metal frame

Material: Matsuura Titanium 6Al7Nb



Artificial bone

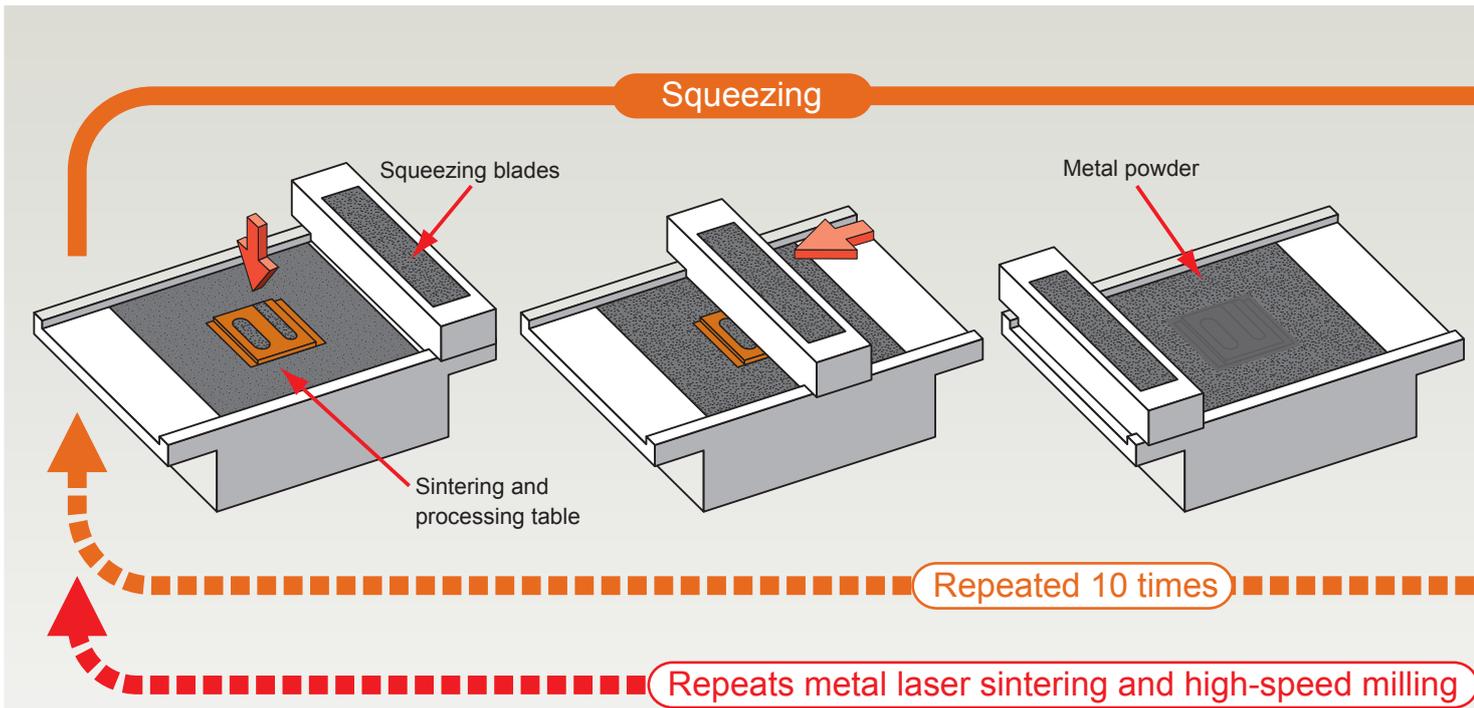
Matsuura Titanium 6Al7Nb



Process

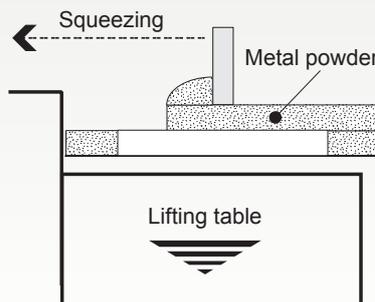
Repeating metal laser sintering and high-speed milling to form metal powder into shapes.

The **LUMEX Avance-25** repeats metal laser sintering and high-speed, high-precision milling to form metal powder into shapes and makes deep ribs with no electric discharge processing in a single process. The **LUMEX Avance-25** provides molds with dimensional accuracy and surface smoothness at almost the same level as machining centers do.



1. Squeezing

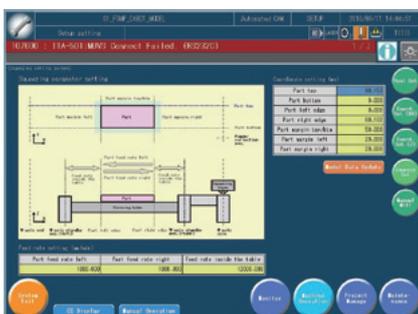
Metal powder as sintering material is laminated to a thickness of 0.05 mm on the base plate located on the table.



2. Laser sintering

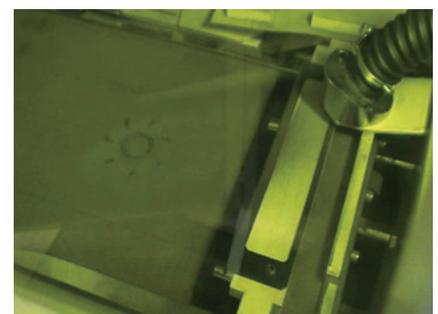


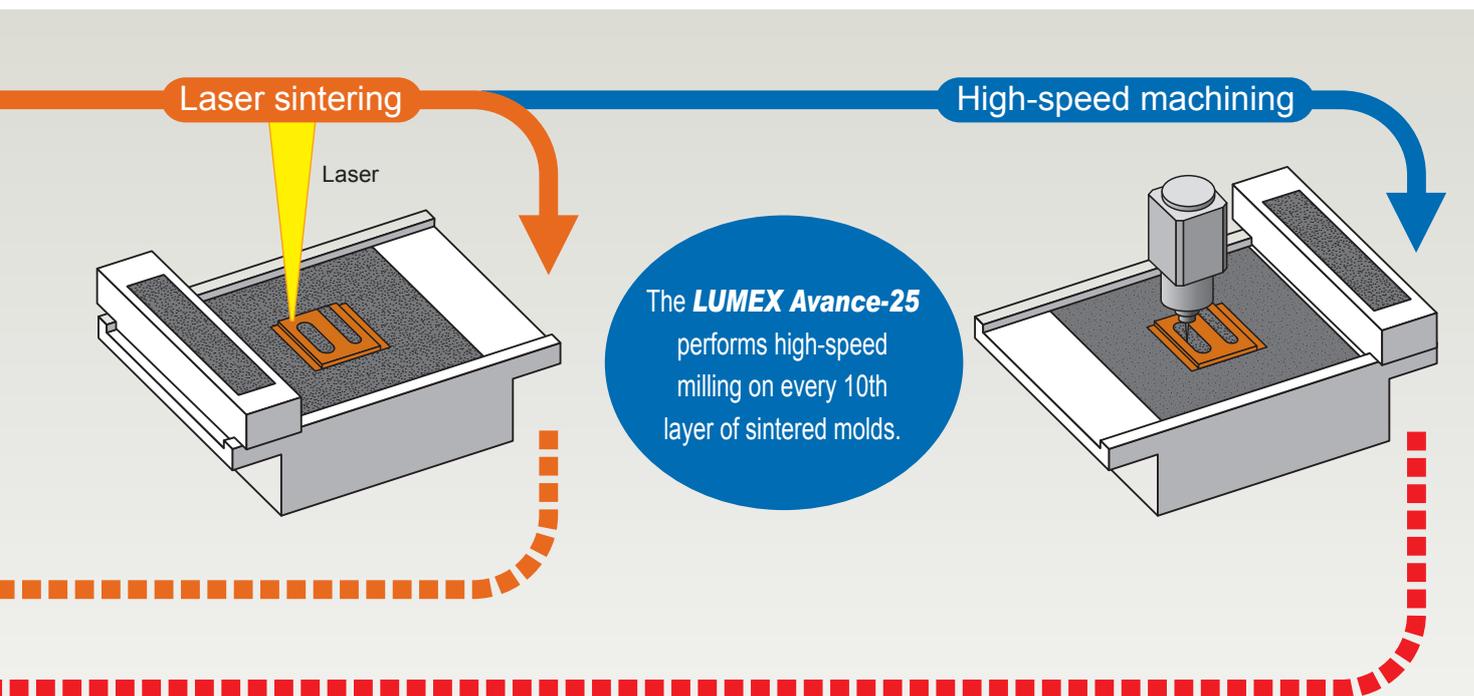
The **LUMEX Avance-25** irradiates the laser beam to sinter the metal powder into the product shape to be bonded to the processing table. After the metal powder is sintered, the **LUMEX Avance-25** squeezes and supplies metal powder with a thickness of 0.05 mm to form the next layer and sinter all the laminated layers. Steps 1 and 2 are repeated 10 times. When the thickness reaches 0.5 mm (0.019 in.), the **LUMEX Avance-25** goes to the stage of milling.



Automatic settings for squeezing range (Patent pending)

The **LUMEX Avance-25** is provided with a function to set a squeezing range along with the feed speed of the squeezing blade for efficient work. The settings can be manipulated intuitively with icons and buttons displayed on the touch panel.



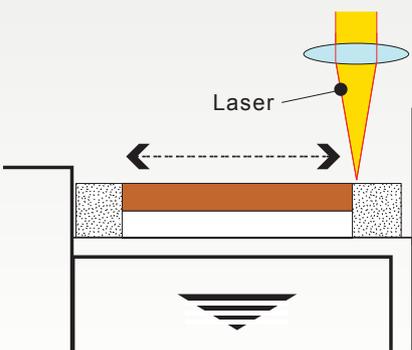
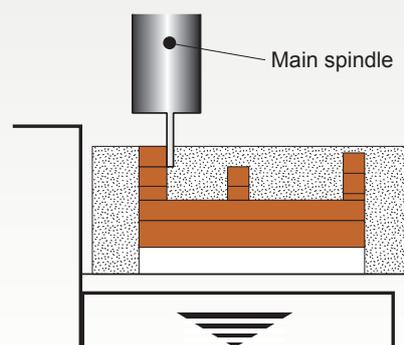


3. Milling



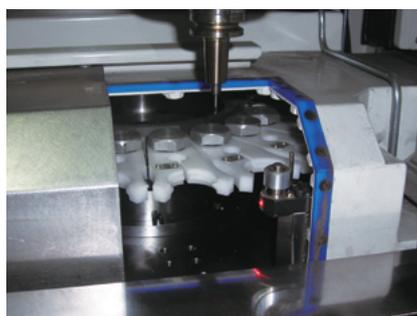
The end mill performs the high-speed milling of the contour of the mold highly precisely to a finish.

The **LUMEX Avance-25** does not cut the product to a finish after all the sintering of the product is finished. Instead, the **LUMEX Avance-25** repeats the sintering and milling of the product to construct the bottom layer to the top layer, no matter how the internal shape is complicated.



Break-in milling function for squeezing overloads

In a rare case, laser sintering causes an undulating upper surface to a workpiece. If this occurs, the squeezing blade can come in contact with the surface at the time of spreading metal powder, in which case the alarm function of the **LUMEX Avance-25** may stop the operation of the **LUMEX Avance-25**. To avoid this, the **LUMEX Avance-25** is provided with a break-in milling function that automatically cuts and removes the protrusions on the surface so that the **LUMEX Avance-25** can continue operating.



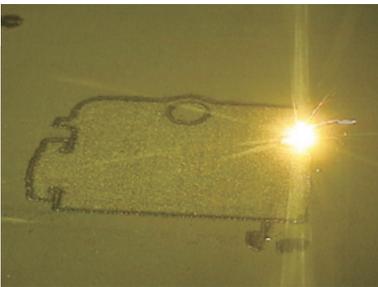
Automatic tool changing function to replace broken tools

If the tool in use is damaged, this function will automatically replace the tool with a reserved one so that the **LUMEX Avance-25** can continue operating.

Reliable specifications to achieve high-speed, high-precision machining.

The **LUMEX Avance-25** consists of Matsuura's time-proven machining center combined with a metal laser sintering function.

The specifications of the **LUMEX Avance-25** realize high-speed, high-precision machining.



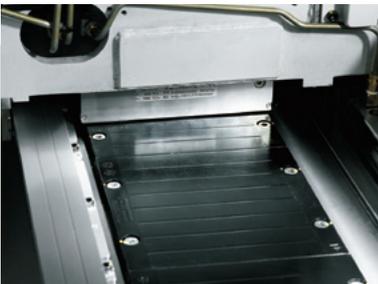
Yb Fiber Laser (400 W)

The **LUMEX Avance-25** incorporates a high-efficiency Yb fiber laser of high beam quality. The beam diameter can be reduced to realize high-power, high-resolution processing. The Yb fiber laser in combination with Matsuura's galvanometer mirror performs finer sintering. Furthermore, the Yb fiber laser ensures ease of maintenance.



High-speed spindle (45,000min⁻¹)

The **LUMEX Avance-25** incorporates Matsuura's time-proven high-speed, high-rigidity oil-air lubricated spindle that rotates at 45,000 min⁻¹ and a 1/10 taper special BT20 tool shank.



Linear motor drive

The **LUMEX Avance-25** incorporates a linear motor provided with Matsuura's unique control technology to perform high-speed feeding (X/Y: 60 m/min (2.36 ipm) and 30 m/min (1.18 ipm)) and attains high-precision machining.



Sintering table

Metal laser sintering is processed at this stage. The upper surface of the table is heated to alleviate rapid temperature changes resulting from laser sintering, thus increasing the sintering precision of the **LUMEX Avance-25**.



Squeezing unit

The squeezing unit is used to supply sintering material (metal powder) to the sintering table. It is possible to specify the operating range of the squeezing unit, which enables speedy squeezing without waste. 【Patent pending】



CCD camera

The **LUMEX Avance-25** incorporates a high-precision CCD camera with dedicated software. Matsuura's visual sensing with feedback technology realizes unprecedentedly high-precision laser sintering.



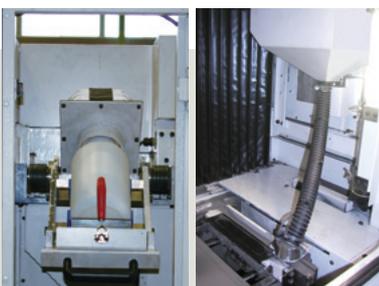
Tool magazine

The **LUMEX Avance-25** incorporates a tool magazine that can accommodate 20 milling tools. The **LUMEX Avance-25** also incorporates an automatic measuring device to measure the length of a tool when the tool is mounted to the spindle. The tool magazine makes it possible to set up tools externally when the chamber is filled with nitrogen so that work efficiency will be improved.



Oxygen concentration and temperature display

The metal powder in the chamber becomes very hot during the sintering process. Therefore, the chamber is filled with inert gas, such as nitrogen. The concentration and temperature of the oxygen in the chamber are strictly controlled and displayed on the control panel. The **LUMEX Avance-25** is provided with a safety function that will alert errors, if any, and stop the operation of the **LUMEX Avance-25**.



Supply of sintering material

Sintering material (metal powder) is supplied automatically regardless of whether the **LUMEX Avance-25** is in sintering or milling operation. magazine makes it possible to set up tools externally when the chamber is filled with nitrogen so that work efficiency will be improved.

Operability

Intuitive, Ergonomic Interface

The **LUMEX Avance-25** employs the **I-Tech Avance**, a new system dedicated to metal laser sintering and hybrid milling. The touch panel of the **LUMEX Avance-25** can display 3D models, thus ensuring high operability.



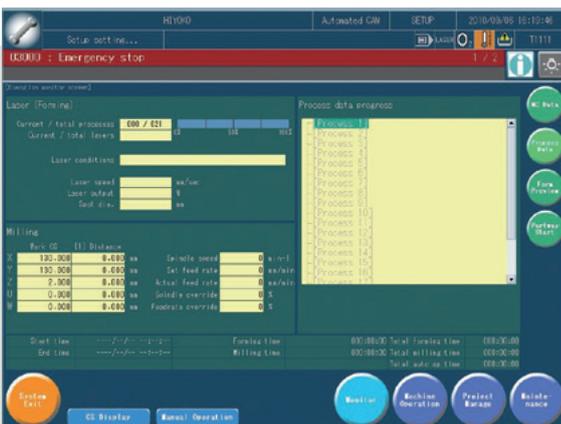
Operation panel

The operation panel placed on the front side of the machine is used for NC control with the new system **I-Tech Avance**. The operation panel is of touch panel type displaying 3D models, and realizes excellent operability. The **LUMEX Avance-25** does not incorporate external switches that are unused while the **LUMEX Avance-25** is in automatic sintering or milling operation. All switches necessary for setup and milling checks are concentrated into the hard switch blocks inside the panel.



Operation screen

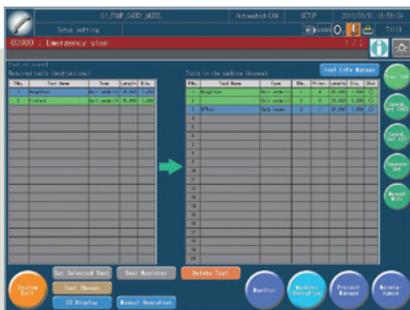
The operation screen is a 15-inch touch panel with function and purpose buttons located on the bottom of the screen and submenu buttons on the right-hand side. The operation screen has a user-friendly design.





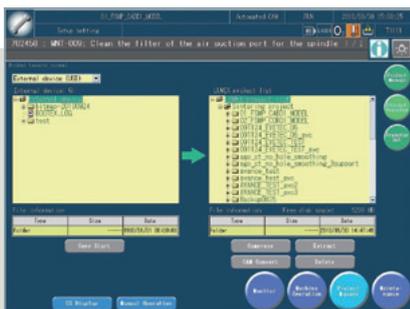
Run monitor screen

The **LUMEX Avance-25** allows the monitoring of sintering images and a variety of data, such as NC data and process data at the time of laser sintering and milling. The NC data screen displays the progress of machining and tool information. The process data screen shows the process of laser sintering and milling in a tree, ranging from the first layer to the nth layer.



Machine operation screen

This screen is used to help the operator set machine tools in the machine. The left-hand side of the screen displays a tool list sent from a CAD/CAM system. The operator selects sintering tools on the left-hand side of the screen and sets them on the right-hand side of the screen. Then the machine recognizes and displays the tools on the right-hand side of the screen. Besides, the machine operation screen allows tool life management, coordinate system, squeezing coordinate value, and speed settings.



Project management screen

The project management screen is used to manage and select sintering projects. Data on sintering projects can be transferred from external devices (e.g., USB memory sticks) and LANs. A thumbnail display function is provided so that the final sintering image of each project will be displayed.



Maintenance screen

The maintenance screen allows a variety of function settings, such as basic galvano controller basic settings and PLC parameter settings, and makes PLC status monitoring possible. Besides, the screen can display check items on ATC, daily, and periodical inspections and tool information. The process data screen shows the process of laser sintering and milling in a tree, ranging from the first layer to the nth layer.

Machine Standard Specifications

■ Movement And Ranges		
X-Axis Travel (Table Left/Right)	mm (in.)	260 (10.23)
Y-Axis Travel (Table Back/Forth)	mm (in.)	260 (10.23)
Z-Axis Travel (Head Up/Down)	mm (in.)	100 (3.93)
U-Axis Travel (Sintering Table)	mm (in.)	185 (7.28)
W-Axis Travel (Material Layer Sintering Blade)	mm (in.)	522 (20.55)
Distance from Table to Spindle End	mm (in.)	-10 - 90 (-0.39 - 3.54)
■ Table		
Table Working Surface	mm (in.)	270 × 270 (10.62 × 10.62)
Table Loading Capacity	kg (lb.)	90 (198)
Max. Table Size	mm	246 × 246 (9.68 × 9.68)
Table Surface Configuration		M6(P1) × 50mm Pitch × 24
Max. Workpiece Size	mm (in.)	250 × 250 (9.84 × 9.84)
Distance from Floor to Table Surface	mm (in.)	980 (38.58)
■ Spindle		
Spindle Speed Range	min ⁻¹	450 - 45000
Spindle Bearing Inner Dia.	mm	φ 25
Spindle End		1/10 Taper #20
Spindle Max. Torque	N · m	0.7
Spindle Air Blow	YES	
■ Feedrate		
Rapid Traverse Rate(X/Y/Z)	mm/min (ipm)	60000 / 60000 / 30000 (2,362.2 / 2,362.2 / 1,181.1)
Feedrate (X/Y)	mm/min (ipm)	1 - 60000 (0.03 - 2,362.2)
Feedrate (Z)	mm/min (ipm)	1 - 30000 (0.03 - 1,181.1)
Feedrate Max. Acceleration(X/Y/Z)	G	1.0 / 1.0 / 0.5
■ Automatic Tool Changer		
Type Of Tool Shank		Matsuura Special #20
Pull Stud		Matsuura Special #20
Tool Storage Capacity	PCS.	20
Max. Tool Diameter	mm	φ 10
Max. Tool Length (Conditions Attached)	mm	Specified: Matsuura Special
Tool Support Length of Tool Holder: A	mm	α ≥ 3 × φ (φ=3,4,6,8,10)
Tool Max. Protrusion Length from Tool Holder: B	mm	β ≤ 5 × φ (φ=3,4,6,8) β ≤ 30 (φ=10)
Max. Tool Weight	kg (lb.)	0.25 (0.55) (Including holder) 0.05 (0.11) (Tool only)
Tool Changing Time (Tool To Tool)	sec	25
Tool Changing Time (Tip To Tip)	sec	30
Method of Tool Selection		Fixed Address

■ Motors		
Spindle Motor: Uaasih-05Emu21	kW	AC 2.3 / 3.3
Feed Motors		
Z-Axis: Model 1Fn3450-2Wd00-0Aa1		
1Fn3450-4Sa00-0Aa0	kW	AC 5.0
Z-Axis: Model 1Fn3300-2Wc00-0Aa0		
1Fn3300-4Sa00-0Aa0	kW	AC 2.0
Z-Axis: Model 1Fn3150-1We00-0Aa1		
1Fn3150-4Sa00-0Aa0	kW	AC 1.0
U-Axis: Model Sgmph-08A4a2d	kW	AC 0.85
W-Axis: Model Sgmah-04A1a21	kW	AC 0.4
Tool Magazine Motor Model Sgmah-02A4a21	kW	AC 0.2
Material Feed Motor	kW	AC 0.03
Feed Axis Grease Auto Feeder Motor	kW	AC 0.025
Oil Cooler (Spindle/Linear Motor Cooling) Motor	kW	AC 0.75
■ Laser		
Laser Type		Yb Fiber Laser
Oscillator Output Range	W	40 - 400
Beam Mode Quality Value (M2)		< 1.1
Beam Spread Angle (Full Width)	mrad	0.5
Wavelength	nm	1070 ± 5
■ Laser Scanning Module		
Scanning Module X-Axis And Y-Axis		Galvano Scanner System
Z-Axis		Linear Translator
Applicable Laser Wavelength	nm	1070 ± 5
Max. Input Laser Power	W	400
Drive Power Supply		DC 24V
■ Power Supply		
Electrical Power Supply	kVA	39 (varies with option configuration)
Power Supply Voltage	V	AC 200/220V±10% Transformer required if supply voltage is other than above
Power Supply Frequency	Hz	50 / 60 ± 1
Compressed Air Supply	MPa	0.6 - 0.93
Volume Of Compressed Air To Be Supplied	NL/min	500 (Atmospheric Pressure)
■ Tank Capacity		
Spindle Oil Cooler Tank Capacity	L	7
■ Machine Size		
Machine Height (From Floor)	mm (in.)	2050 (80.70)
Floor Space (Incl. Maintenance Area)	mm (in.)	3200 W × 4650 D (125.98 W × 183.07 D) (varies with option configuration)
Mass Of Machine	kg (lb.)	4500 (9900)

External view (Unit: mm (in.))



Machine Optional Specifications

■ Accuracy		
Positioning Accuracy (X/Y/Z)	mm (in.)	± 0.0025 (0.000098)
Repeatability (X/Y/Z)	mm (in.)	± 0.001 (0.000039)
■ Machine Capabilities		
X-Axis Thrust	kN	4 (4000 N)
Y-Axis Thrust	kN	2.3 (2300 N)
Z-Axis Thrust	kN	0.38 (380 N)
■ Nc Equipment		
Nc System		I-Tech Avance
■ Standard Accessories		
01. Total Enclosure Guard		+Top Side Cover
02. Door Interlock		
03. Oil Temperature Controller		
04. Air Dryer		
05. Linear Motor Cooler		
06. Scale Feedback X/Y/Z		Heidenhain (absolute)
07. Z-Axis Balance Cylinder		
08. Nitrogen Gas Separator		
09. Interior Temperature Sensor		
10. Oxygen Densitometer		
11. Hume Collector		
12. Chiller Unit		
13. Feed Axis Great Auto Feeder		X/Y/Z-Axis Guide Only
14. CCD Camera/Image Processor		
15. Galvanor Scanner/Laser Controller		
16. Preheating Heater/Controller		Sintering Table Use
17. Sensor for Auto Tool Measurement (Contact type)		
18. Work Lighting Apparatus		
19. 3-Tier Patlite (Red/Yellow/Green from Top)		Red (Alarm)/Yellow (work completion)/ Green (auto run). All lights are lit while laser is oscillating.
20. Spindle Integrated Run Meter		
21. Laser Integrated Run Meter		
22. Guide Light Function		
23. IPC Function		
24. 15-inch LCD with Touch Panel		
25. Qwerty Key-Arrangement Keyboard		
26. USB Interface		2 Ports
27. Table High Temperature Alarm		
28. 100-VAC Outlet 3 A		
29. Tools/Tool Box		
30. Machine Color Paint		
31. Leveling Pads/Bolts		

■ Spindle Speed Per Min		
60000min ⁻¹ (φ 6 dia. Straight Shank)		φ 6 dia. Straight Shank, S5000-S60000, 2.0- kW motor with grease filled (Simultaneously select atc for φ 6 dia. Straight shank use)
■ Number of Tools Accommodated		
20 Tool (Dia. φ 6 Straight Shank, Address Code)		Select spindle for φ 6 dia. Straight shank as well
■ Power Supply Frequency		
Frequency 50Hz		
■ Language		
Plate Display English Overseas Standard		
Plate Display German		
■ European Safety Regulation		
Ce Mark Specifications		
■ Special Machine Color		
Special Machine Color (NC Box: Std.)		
Special Machine Color (NC Box: Same)		
Special Machine Color (NC Box: Specified Separately)		
■ Spare Spindle		
Spare Spindle		
■ Auto Measure+Tool Breakage		
Broken Tool Detection/Full-Auto Tool Length Measurement (Laser System)		Bloom-Made Laser Tool Breakage
■ Weekly Timer		
Weekly Timer		
■ Material		
Powder Material 10kg Unit		
■ Aspirator For Metal Powder		
Vacuum Unit For Iron Powder		
Iron Powder Auto Collector		
■ Sintering And Milling		
1st-Year Maintenance A: Laser Inspection		Laser Inspections/Adjustments (twice/year)
1st-Year Maintenance B: Machine Software Version Upgrading		Version Upgrading
1st-Year C: Laser Maintenance + Machine Software Version Upgrading		Laser Inspection/Adjustment (twice/year) + Version Upgrading
■ Cam		
Sinter Form Cutting Program/Cam Soft		
Sinter Form Cutting Program/Cam Operation Instructions		
■ Startup Parts		
Start Up Parts		Parts for Preparatory Work (Spray Glue, Cleaner, Gloves, Dustproof Mask, Vise, etc.)

Metal Powder Material

■ Material	■ Name
Steel	Matsuura Steel I
Maraging	Matsuura Maraging I
Pure Titanium	Matsuura Titanium 00 (*1)
Ti-6Al-7Nb	Matsuura Titanium 6Al7Nb (*1)
Ti-6Al-4V	Matsuura Titanium 6Al4V (*1)
SUS630	Matsuura Stainless 630
SUS316L	Matsuura Stainless 316L

* Use only specified sintering materials. Order required sintering materials from Matsuura Machinery Corporation.
*1 Argon gas is required.

Peripheral device



Nitrogen gas generator

The nitrogen gas generator is used to generate nitrogen to be filled into the chamber in laser sintering process. The nitrogen gas generator can separate and provide nitrogen from the atmosphere within a short time whenever required. The nitrogen gas generator is so compact that it will be easy to find a place to locate the nitrogen gas generator.



Chiller

The chiller is used to cool the laser oscillator and prevent equipment damage resulting from heat radiation.



Fume collector

The fume collector eliminates fume (metal vapor agglomerate) and odor generated at the time of laser processing. The fume collector eliminates flux, oil, and adhesive ingredients, thus preventing clogging.



Cyclone cleaner

OPTION

Unused material (metal powder) can be collected and reused. Usually, such material is collected manually. If the cyclone cleaner as an optional device is mounted to the **LUMEX Avance-25**, however, the **LUMEX Avance-25** will collect the material automatically with the cyclone cleaner promptly and powerfully.



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



Products are subject to all applicable export control laws and regulations.