

::: **METAL 3D** printers with
LASER technology :::

SAMYLABS: The Company



If you can draw it, you can print it

SAMYLABS is a Basque company founded at the end of 2016 with the aim of developing 3D printers in metal laser technology. It is the first Spanish company to design, manufacture and market printers of this technology.

It is currently located in **the BIC Ezkerraldea business development center in Barakaldo, Bizkaia**, and has developed all the required technology for high quality metal 3D printing using laser fusion. **SAMYLABS** goal is to make metal 3D printing accessible by greatly reducing the costs of laser fusion technology, bringing small companies, training centers and universities the possibility of materializing their projects and designs.

::: ADDIMAT PARTNERS

SAMYLABS is one of the partners of **ADDIMAT, the Spanish Association of Additive and 3D Manufacturing Technologies**, which brings together all companies and centers with interests in the development and promotion of **additive and 3D manufacturing**. **ADDIMAT** represents the companies that make up the Additive Manufacturing sector in Spain.



::: COLLABORATIONS WITH INSTITUTIONS, UNIVERSITIES AND CENTRES

SAMYLABS at the institutional level has had the support of the **Ekintzaile program**: Financial support for new business projects of an innovative industrial nature or related services, supervised by a Business and Innovation Center (Bic Bizkaia Ezkerraldea) for the maturation phases, granted by **SPRI- Sociedad para la Transformación Competitiva S.A.**

SAMYLABS has also had **the innovative business creation programme of the Provincial Council of Bizkaia** and along with **Tecnalia** Technology Centre with the **Open Maker** programme, a European project within the H2020 framework that promotes collaboration between companies and the Makerworld.

In turn, it has been one of the companies promoted by the **Bind 4.0** business acceleration program.

Ultimately, it has also received funding from the **NEOTEC program SUBSIDIZED BY THE CDTI** - Project financed by the General State Budgets in charge of the application 27.12.467C.74908.



::: MACHINE AND PRODUCT CERTIFICATIONS

SAMYLABS machines are CE certified, in accordance with the European Directive 2006/42/CE 17/01/2017.

The relevant risk assessment has been carried out by an independent company and the designs have been adapted and the recommended safety systems have been incorporated to comply with the European Directive 2006/42/EC and the safety requirements according to Annex I of the European Directive 17/01/2017 3 2006/42/EC based on UNE, EN, ISO standards.



COLLABORATION WITH ONA ELECTROEROSION – INDUSTRIAL PARTNER

The company has **ONA ELECTROEROSION** as an industrial partner, one of the most important machine tool manufacturers in the Basque Country, which provides **SAMYLABS** with high capacity and productive quality in its equipment, as well as a powerful commercial network and technical service.

ONA is a leading firm in EDM technology. Their more than 65 years of experience have allowed them to be world pioneers and experts in the manufacture of large machines and special EDM solutions.

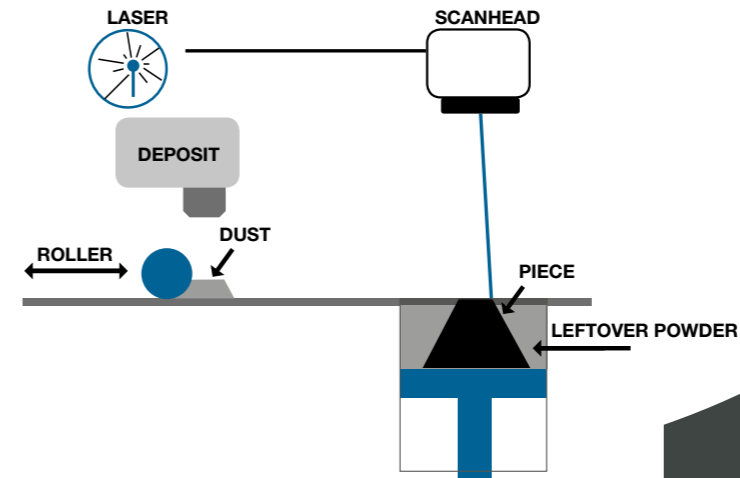
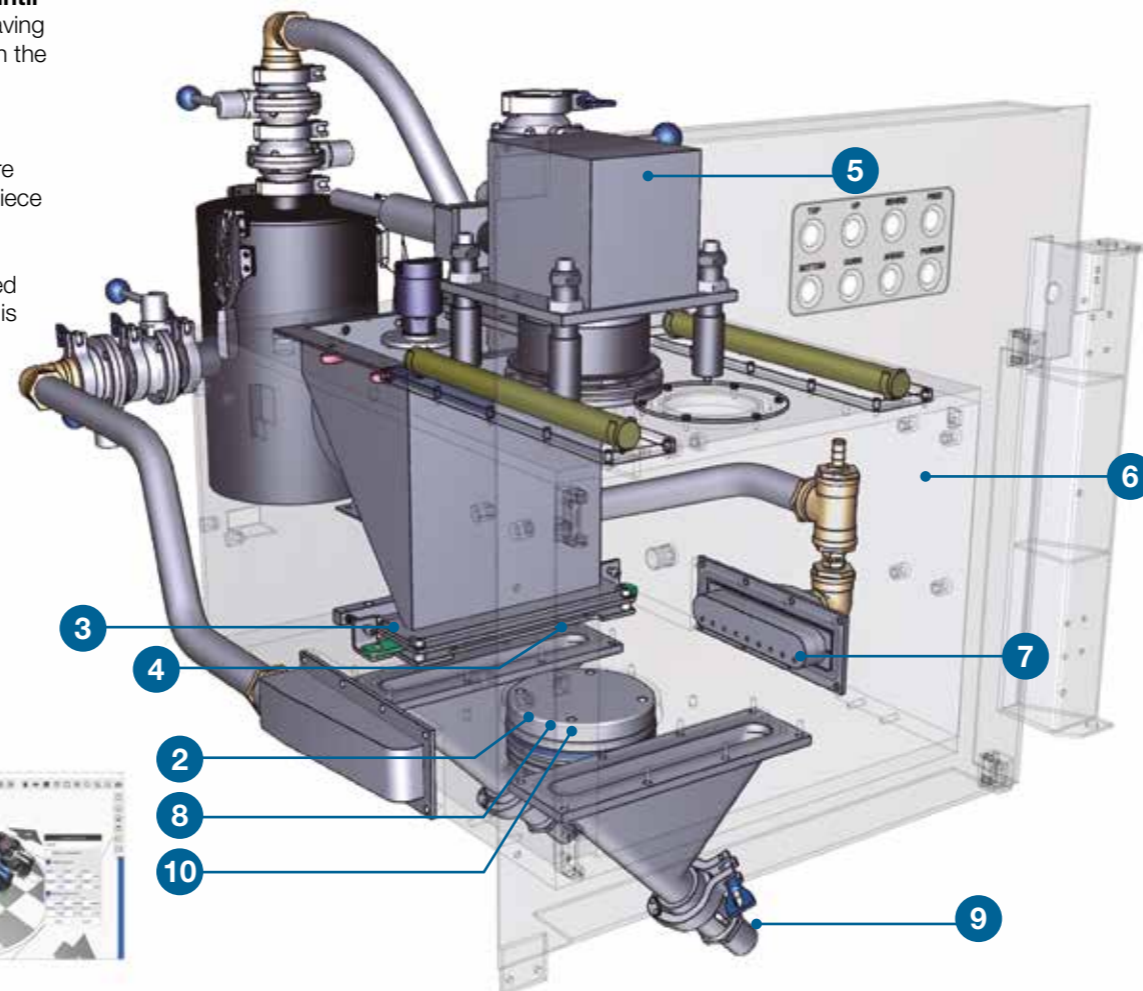
Laser Metal 3D Printing Technology

How does Laser Metal 3D Printing work?

The process starts from a three-dimensional model of the part or set of parts you want to print.

- 1 **Specific software** cuts the model into individual thin layers and calculates the welding paths for each layer.
- 2 During the printing process, **a working base** placed on a piston lowers the microns specified in the layer thickness. Normally 50 – 60 µm.
- 3 A **dust dispensing system** provides enough dust to cover the gap generated in the tank by the descent of the piston.
- 4 A **brush** spreads and shaves the powder homogeneously on the surface.
- 5 A **head of galvos**, directs by means of mirrors, a laser beam on the surface, melting in a specific way the desired areas with the lower base. Support structures (straps) are calculated to prevent the regrowth of some areas of the piece.
- 6 **Welding** is performed in a controlled atmosphere, usually argon, to avoid the presence of oxygen.

- 7 A **recirculation system** is responsible for generating gas blades that sweep and filter the spatters that occur during the printing process.
- 8 **The process is repeated until the printing is finished**, leaving the piece finely submerged in the dust pool.
- 9 Once the printing is finished, **the piston** ascends its entire stroke. At this moment the piece emerges on the work plate.
- 10 The excess **dust** is evacuated for later reuse and the piece is extracted.



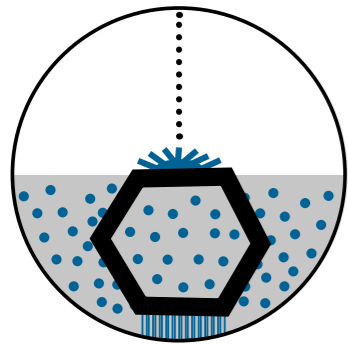
LASER BEAM POWDER BED FUSION TECHNOLOGY

The technology of 3D printing in metal by laser allows to obtain final parts with excellent mechanical qualities, which in many cases are impossible to manufacture by other means. Powder bed melting is the leading technology for the manufacture of precision metal objects with complex geometries. It allows to reproduce practically any geometric shape in different metallic materials such as Stainless Steel, Tool Steel, Inconel, Cobalt-Chrome and many other alloys.

High density values are achieved, above other additive manufacturing techniques in metal. This technology is very useful for manufacturing final parts with very complex geometries and structures with thin walls and/or hollows or hidden channels.



::: POWDER BED MELTING

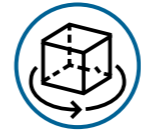


ADDITIVE MANUFACTURING

LASER TECHNOLOGY



- **Final parts with excellent mechanical** qualities and that in many cases are impossible to manufacture by other means.
- It allows to generate within the parts, **support structures and internal filling** that provide an important resistance to pressure, torsion, and traction tests, with a considerable reduction in weight. These types of structures are known as "bird bone".
- The technique allows to **play with the density of the material** avoiding the internal pores that occur, for example, in the injection processes.
- Printing by means of a **high-power laser beam** (>200 W) on a bed of metal powder, using a galvo head that moves two mirrors at high speed.
- The layer ranges from 20 to 100 microns.
- **Long machine life** which has much less mechanical wear.
- Manufacture of high precision parts in **stainless steel** (A316L), **tool steel** (C300) and **inconel** (IN718).



PERFECT DESIGN

It allows engineers to complete numerous design iterations, improving the product quickly until the perfect design is obtained.



COMPLEX SHAPES

It enables the manufacture of objects with very complex and highly specialized shapes.



LIGHTWEIGHT OBJECTS

It favors the creation of very light objects that support the loads to which they will be subjected.



COMPONENT REDUCTION

It reduces the number of components to be manufactured, avoiding having to produce numerous individual components that need to be assembled later.

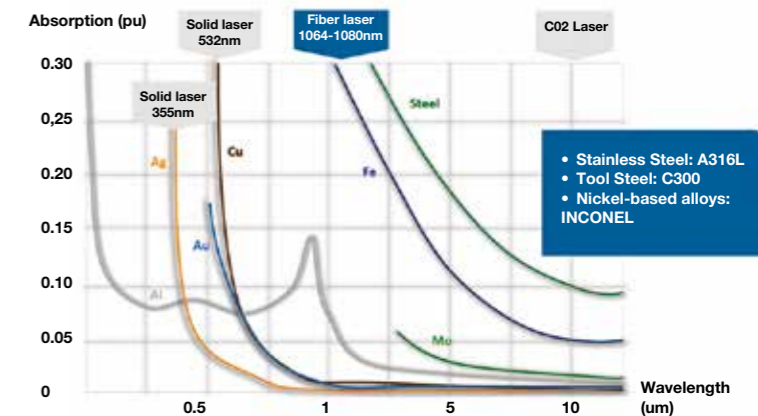
Manufacture of parts impossible to obtain with traditional techniques



::: MATERIALS

With a metal 3D printing machine it is possible to manufacture high-precision parts in steel alloys that are often impossible to manufacture by any other technique.

Inox A316L STAINLESS STEEL	Tool C300 TOOL STEEL	Ni-Cr IN718 INCONEL
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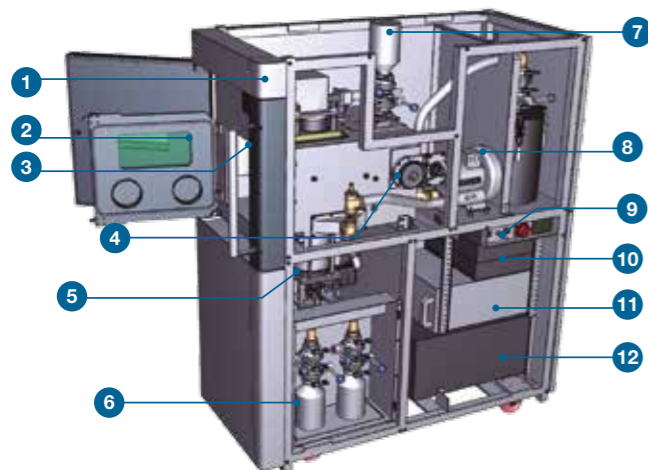


SAMYLABS ALBA 300

Compact and Economical Machine.
State of the art technology



Inside of the **Alba 300** machine



- 1 Galvos head
- 2 Security door
- 3 Inert Camera
- 4 Brush mechanism
- 5 Tank/Lift
160 mm x h 200 mm
Capacity: 25-30 kg
- 6 Evacuation bottles
- 7 Feeding bottles
- 8 Argon/ Nitrogen recirculation motor
- 9 Gas Inlet
- 10 Control Equipment
- 11 Fiber laser unit
- 12 Refrigeration unit

Competitive Advantages

Ergonomics and simplicity

TECHNOLOGICAL DEVELOPMENT

- One of the main competitive advantages of SAMYLABS is its complete technological development.
- **Lamination and control software integrated into the machine itself.** It allows the operator to work directly on the machine without the need for a desktop computer. The machine also supports the option to work from a technical office, networked or upload files through the USB port.
- **Able to interact with the process in real time.** The machine allows to change the process parameters

- in real time, while the machine is printing, as well as the grating paths and energy distribution in the part.
- **Generation of detailed process logs, for later analysis.**
- **Significant reduction in the size of machine files.** SAMYLABS technology only considers contour paths and generates the fill structure on the fly. This significantly lightens the weight of the files, optimizing the storage space in the technical office and exchange times, either internally or through the internet.

ERGONOMICS IN A SIMPLE AND ELEGANT DESIGN

- The machine is designed to operate not only in an **industrial environment but also in an office environment.** With all the interior made of stainless steel and a simple and elegant aesthetic design works with domestic current and the width of its front allows it to pass between conventional doors:
- All the measurements of the machine are carefully studied to facilitate the work of the operator.
 - Extraction from a wide front door that facilitates the operator's task.

- Front button with the main maneuvers of the machine.
- High quality finish.
- Ease of use and cleanliness. The machine is designed to make its operation as simple and agile as possible, as well as its cleaning process.



STATE-OF-THE-ART TECHNOLOGY



PROFESSIONAL FINISH



HIGH QUALITY LASER SYSTEM

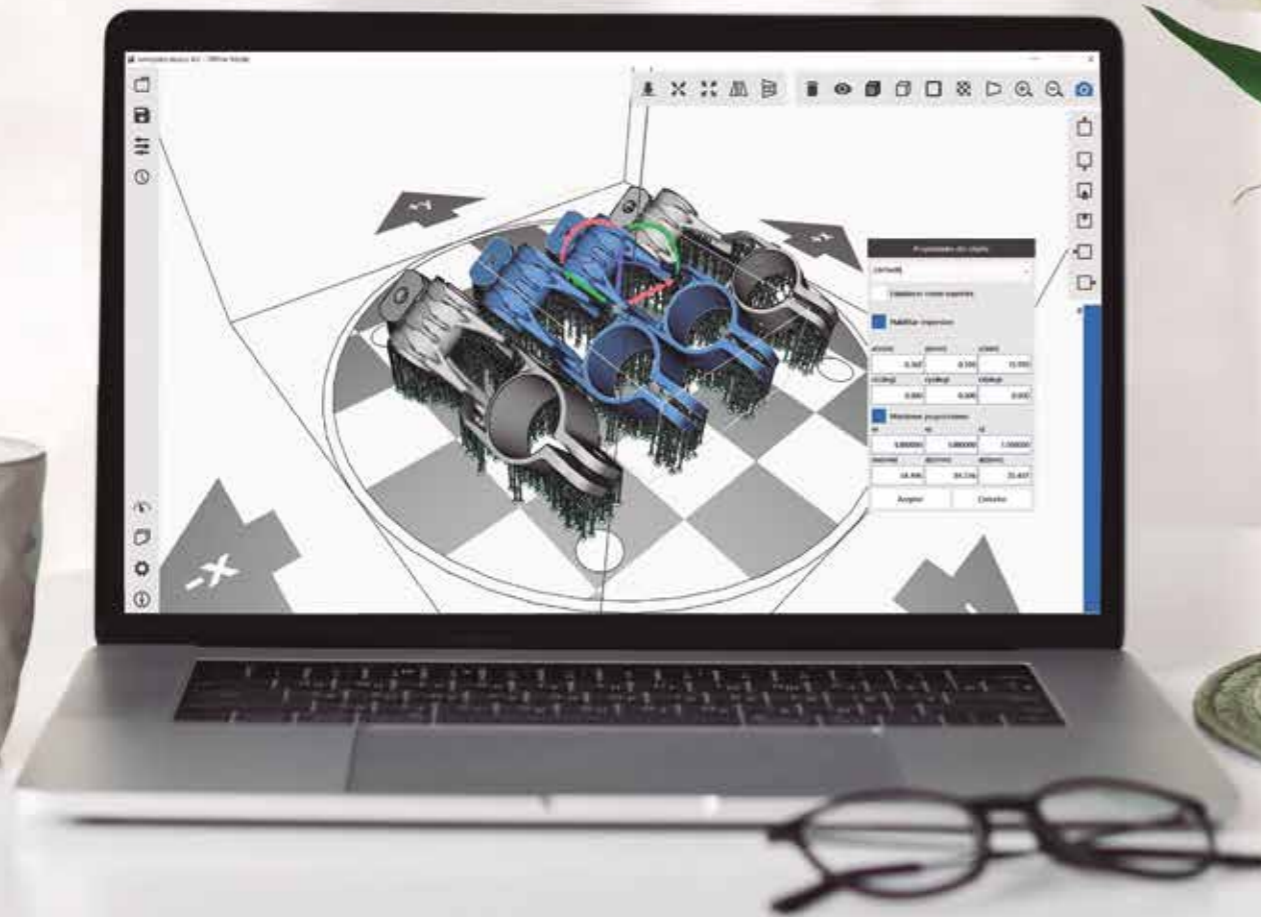


POWERFUL CONTROL SOFTWARE

SAMY STUDIO 4.0 - Software

SamyLabs Studio 4.0

Faster Printing Process



3D PROPRIETARY LAMINATION SOFTWARE

The **SAMYLABS STUDIO 4.0** lamination software allows you to quickly and intuitively calculate the printing paths of the machine, as well as perform the different control maneuvers and monitor the process variables in real time. The print process-oriented program improves quality and speeds up the printing process.

SAMYLABS has opted to develop its own lamination software with special emphasis on functionalities that facilitate the composition of a scene, the calculation of trajectories, internal filling structures, supports and the control of printing parameters.



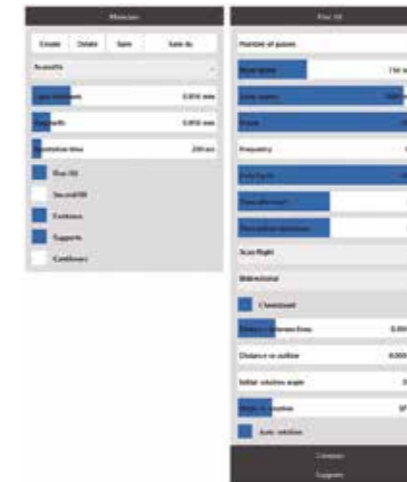
INTERFACE

Simple and intuitive, oriented to the printing process



PARAMETERIZATION

Predefined parameters by material, with full control over them by the user



DYNAMIC CONTROL

It allows to dynamically control the 3D printing process, facilitating the parameterization of new materials.



SIMULATION

It includes a simulation module that allows you to visualize all the layers and estimate the printing time.

SOFTWARE FUNCTIONS

- Import of 3D files in STL, ASC, 3MF, SAMY format.
- Importing 2D files in DXF format.
- Editing and saving scenes: STL BINARY, STL ASCII, SAMY.
- Lamination of the scene.
- Calculation of hollow parts.
- Calculation of fill structures: star and square mesh.
- Calculation of reinforcement walls.
- Calculation of supports.
- 2D Elevation.
- Layer repair.
- Creation and editing of parameters / materials.
- Assignment of different materials to each piece of the scene.
- Modify print parameters in real time (while printing).
- Sorting algorithms for trajectories.
- Unidirectional, bidirectional, concentric and checkerboard hatching.
- Process simulation.
- Calculation of printing time.
- Export to G-CODE.
- Pre-marked with a red pointer.
- Control of the printing process.
- O2 Establishment.
- Gas recirculation power.
- Tracking of process variables. O2 level, Temperature, Pressure, Dust level, Recirculation filter usage time.
- Generation of process logs.
- Available in different languages (Spanish, English, Portuguese ...).

Machine Ecosystem

Turnkey Solution

SAMYLABS offers together with your machine the entire ecosystem necessary for the printing process.



SAFETY PPE



VACUUM CLEANER



SIEVE



BLASTING STATION

Services and Technology 4.0

Remote control of the printing process

OWN SERVICE OF EXPERTS

SAMYLABS is committed to the own development of all technology. From laser lamination and control software to electrical and mechanical design, which allows us to have full control of the technology and directly manage particular demands of our customers.



Highly automated equipment



Export and storage of data.



Analysis of the printing process.



Intuitive and friendly interface.



Remote monitoring of the process.



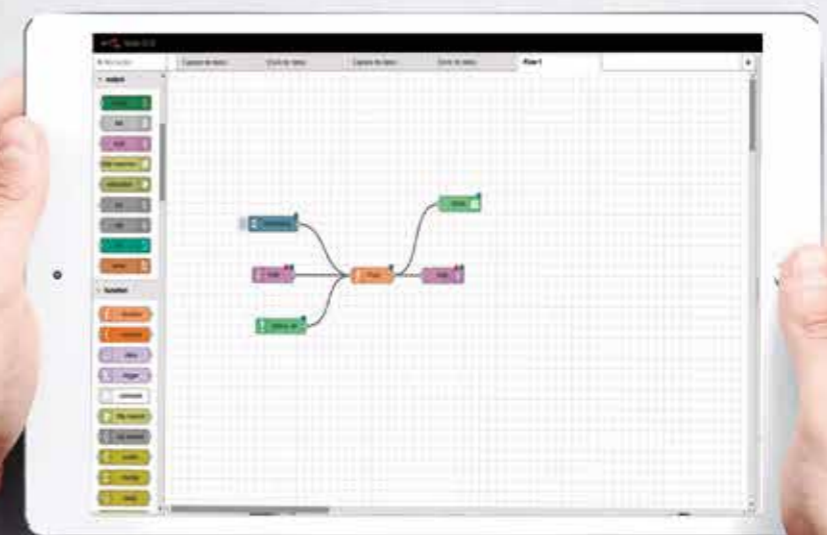
Notification of alerts. Online decision making.



Lamination software integrated into the machine.

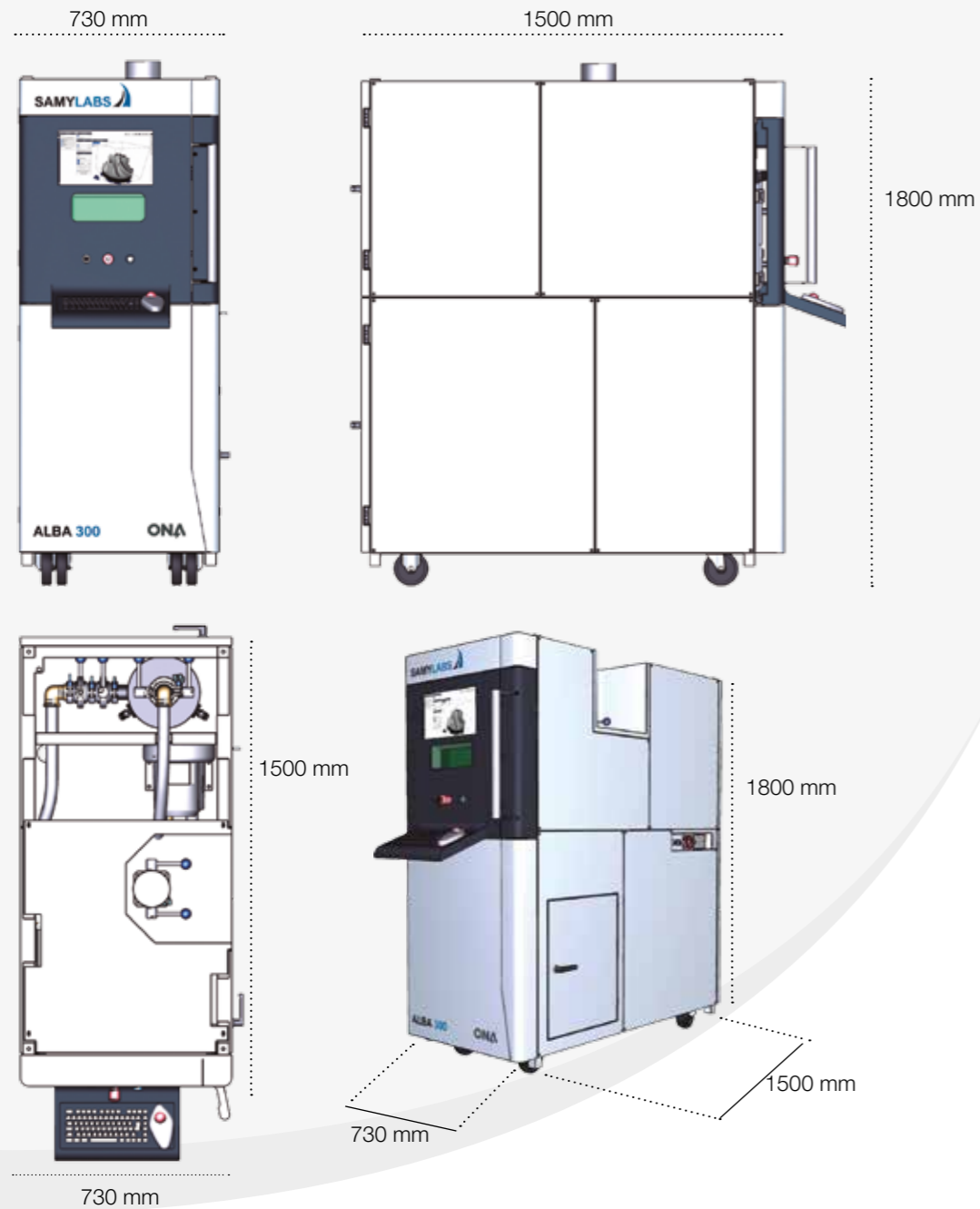


Simulation and estimation of printing time.



Technical Specifications

Alba 300



SPECIFICATIONS

ALBA 300

MACHINE

Laser Power	250 W
Wavelength	1080 nm
Tank size	D160 mm x 200 mm
Scan speed	2 m/s
Positioning speed	up to 7m/s
Protective Gas	Argon/Nitrogen
Layer thickness	20 – 100 um
Spot diameter	< 100 um
Power Supply	230V 50-60Hz 2.7kW
Dimensions	730x1550x1850 mm
Weight (without dust)	800 kg
Data file format	STL, ASC, 3MF, DXF



METAL 3D Printers

SAMYLABS

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