



SOLUTION

ENSIS AJ SERIES

UNIQUE BEAM CONTROL FOR HIGHER PRODUCTIVITY



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UNIQUE BEAM CONTROL FOR HIGHER PRODUCTIVITY

FULLY FEATURED FIBRE LASERS PROCESSING THIN TO THICK MATERIALS WITH A SINGLE LENS

AMADA'S ORIGINAL VARIABLE BEAM CONTROL TECHNOLOGY IS NOW COMBINED WITH HIGHER POWER FIBRE LASER ENGINES

Now utilising 3kW, 6kW, 9kW and 12kW fibre laser engines, the ENSIS-AJ series machines significantly increase processing capabilities. 6kW, 9kW and 12kW variants utilise AMADA's Auto Collimation system, to provide unrivalled beam spot control. Linked with AMADA's Variable Beam Control technology, this allows very high speed piercing, fast cutting rates and vastly improved bevel angles on thicker materials.

Utilising a single lens for the entire range of materials and thicknesses reduces machine setup and avoids potential mistakes, providing higher productivity and therefore higher profitability. A high capacity automatic nozzle changer and the simple, intuitive AMNC 3i numerical control are further features ensuring machine setup is reduced to a minimum.



TYPICAL PROCESSING SAMPLES



Mild steel 4.5 mm
180.0 x 180.0 mm

RUNNING COST COMPARISON

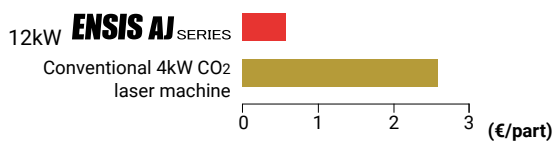
42.0% COST REDUCTION PER PART



Stainless steel 8 mm
200.0 x 200.0 mm

RUNNING COST COMPARISON

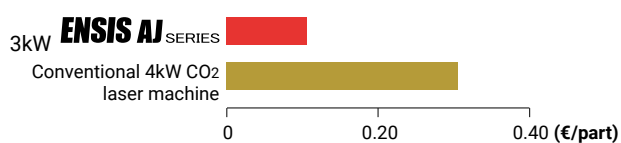
78.0% COST REDUCTION PER PART



Mild steel 9 mm
116.2 x 138.4 mm

RUNNING COST COMPARISON

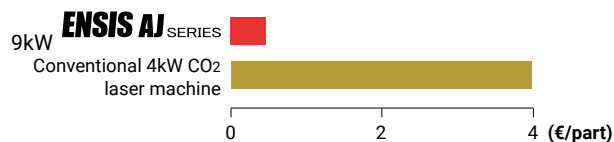
64.7% COST REDUCTION PER PART



Stainless steel 12 mm
223.0 x 195.0 mm

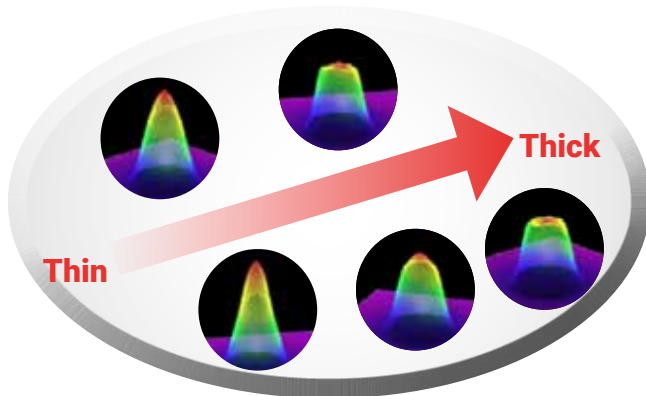
RUNNING COST COMPARISON

83.8% COST REDUCTION PER PART



Running costs include assist gases, electricity and consumables.

VARIABLE BEAM CONTROL TECHNOLOGY COMPLETE BEAM MODE CONTROL



BEAM SHAPE IMAGES

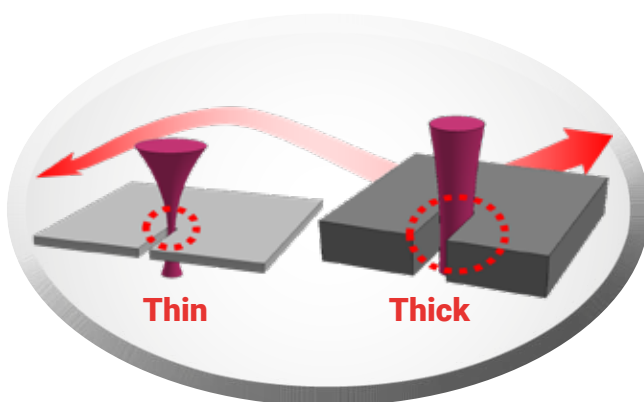
ADAPTING THE BEAM TO SUIT EVERY MATERIAL COMBINATION

AMADA's original Variable Beam Control technology has been in use since 2014, providing highly stable cutting of thin to thick materials by automatically adapting the laser beam mode exactly to the type and thickness of material being processed. The system does not simply switch from a 'thin' mode to a 'thick' mode. It incrementally changes the beam mode to provide complete control over the entire material range. The beam mode can also be instantly changed between piercing and cutting to bring the benefit of high speed piercing and increased productivity.

Another advantage of this system is that a single lens can be used to cut the entire specification range. This reduces the amount of setup required and ensures costly mistakes do not happen.

Now being offered with the increased power of AMADA's 12kW fibre laser engines, as well as the well proven 3kW, 6kW and 9kW engines, Variable Beam Control technology covers every requirement for metal processing, ensuring lower cost-per-part and higher profitability.

AUTO COLLIMATION TECHNOLOGY COMPLETE SPOT SIZE CONTROL



OPTIMUM BEAM DIAMETER AND FOCUS POINT

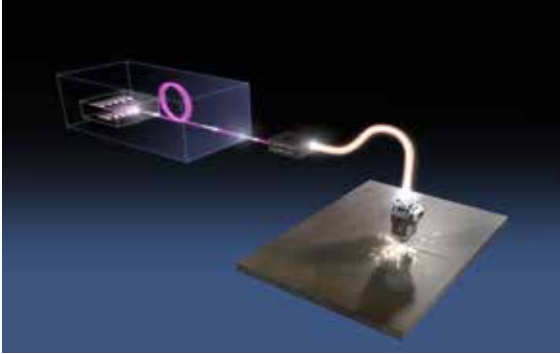
AMADA's original Auto Collimation technology offers the ability to precisely control the laser beam spot size and focus position, allowing the seamless removal of molten metal from within the kerf of the cut. This has solved the issue that standard fibre lasers can have when processing thicker mild steel: If molten material is not removed from the cut quickly enough, the cutting speed needs to be reduced. AMADA's Auto Collimation technology ensures the highest cutting speeds with a high quality cut surface.

Further benefits of the Auto Collimation technology are improved cut edge quality and greatly reduced bevel angles. Also, a wider cut kerf on thicker materials ensures easy part removal to provide increased productivity when parts are removed manually by the operator. This is also the ideal solution when automated part removal is considered, providing highly reliable manufacturing.

Auto Collimation is being utilised for 6kW, 9kW and 12kW ENSIS fibre lasers.

AMADA'S LATEST FIBRE LASER OSCILLATORS

ADVANCED DEVELOPMENT OF OUR IN-HOUSE FIBRE LASER SYSTEM



HIGH POWER DIODE MODULES

All AMADA fibre lasers utilise the in-house developed high power diode modules. Each individual module provides 3kW or 4kW of power, allowing 3kW, 6kW, 9kW and 12kW cutting capabilities.



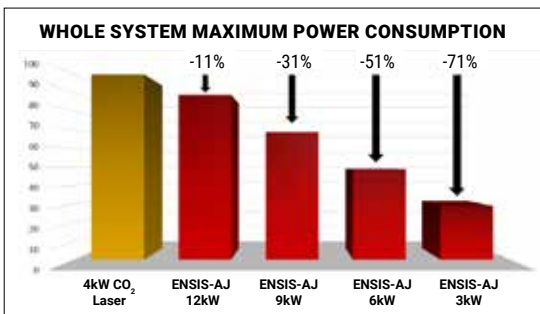
Fujinomiya clean room

IN-HOUSE MANUFACTURING

In order to enhance the production of fibre laser oscillators at AMADA's Fujinomiya facility and to meet ever increasing demand, clean rooms have been created specifically for production and assembly operations.

EFFICIENCY THROUGH ENERGY SAVING

CHOOSE THE CORRECT POWER FOR YOUR APPLICATION



LESS CONSUMPTION, MORE PROFIT

AMADA wants its products to be as environmentally friendly as possible, while still providing the highest levels of productivity. ENSIS-AJ fibre laser technology significantly reduces the power consumption for laser material processing. Maximum power consumption of the entire system (including chiller and dust extractor) is significantly lower than a 4kW CO₂ laser, providing further profit for our customers. Utilising 3kW, 6kW, 9kW or 12kW fibre laser engines, AMADA can help our customers to select the appropriate power level for their individual situation and requirements.

ENSIS AJ SERIES

HIGHER PRODUCTIVITY

HIGH SPEED PIERCING REDUCES PROCESSING TIMES



ENSIS-AJ TECHNOLOGY

Thanks to the combination of the Variable Beam Control and Auto Collimation technologies, the 6kW, 9kW and 12kW ENSIS-AJ can pierce thicker mild steel very quickly. One second piercing of 25mm mild steel is possible with the higher power variants depending on material quality.

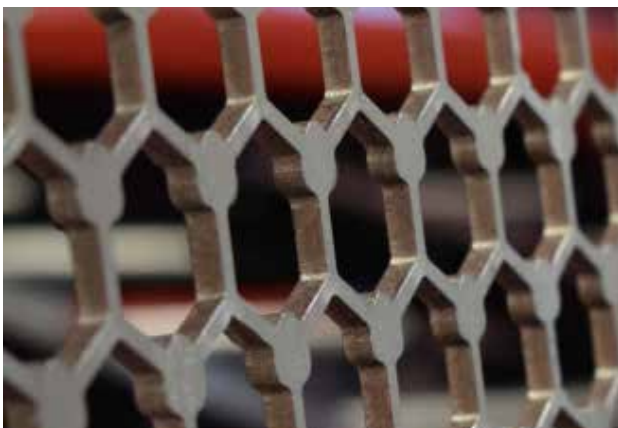
The machine can instantly change between a high power density beam for piercing and the ideal beam mode for high quality, high speed cutting which provides faster processing times.

This high speed piercing can save up to 57% of the processing time for a full sheet of parts.

The 3kW ENSIS-AJ has the same Variable Beam Control technology, which is capable of high speed piercing up to 20mm mild steel, making it a very energy efficient but highly productive proposal.

LOWER COST

AMADA'S ORIGINAL "ECO CUT" TECHNOLOGY



THICK MILD STEEL PRODUCTIVITY

AMADA's original ECO Cut technology is a system that gives high productivity when processing thick mild steel, while reducing the cost-per-part. This has several benefits:

- Reduced running costs
- Faster cutting speeds
- High quality cut edge
- Improved bevel

On previous fibre lasers, ECO Cut was available up to 12mm mild steel. For the ENSIS-AJ series fibre lasers, the ECO Cut specification is:

- 25mm (9kW / 12kW)
- 22mm (6kW)
- 20mm (3kW)

Utilising smaller diameter nozzles and AMADA's extensive knowledge of gas flow dynamics, ECO Cut is the perfect way to increase thick mild steel throughput while getting the added benefit of higher profit.

STANDARD EQUIPMENT AND FUNCTIONS



Automatic Nozzle Changer

To ensure fully automatic operation, the ENSIS-AJ is equipped with a multiple station nozzle change system which includes a nozzle cleaning and head calibration unit.



Single Lens Processing

Due to the ENSIS-AJ technology, a single lens is used to process the entire range of materials, which saves setup time and increases productivity.



Front and Side Access

To allow the most flexible access to the cutting area, the ENSIS fibre laser is equipped with front and side opening doors.



WACS II

While cutting thick material, water is sprayed on the material to reduce the thermal effect of cutting, prevent cutting defects, and improve the material yield.



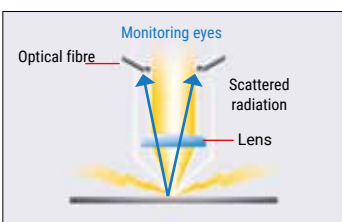
X-Direction Conveyor

Scrap and small parts are unloaded in the X direction by the conveyor installed in the frame of the laser machine.



Dust Air Blow

In order to improve the quality of mild steel parts, the ENSIS-AJ is equipped with the dust air blow system. This continuously feeds a blade of air across the underside of the metal sheet to inhibit any dust created by the cutting process from adhering to it.

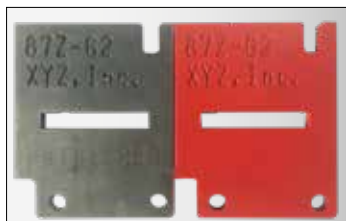


Pierce Monitoring

Pierce Monitoring checks that the pierce is completed before beginning the cutting process. The pierce cycle is automatically altered depending on the material quality.

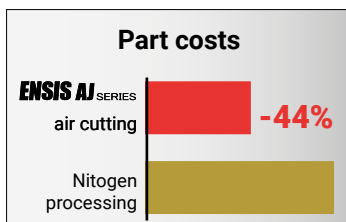
ENSIS AJ SERIES

STANDARD EQUIPMENT AND FUNCTIONS



Deep Etch

The Deep Etch function, completed in a single pass of the laser beam, allows part identification to be readable even after coating. This provides part traceability through the manufacturing process.



Compressed Air Cutting

To keep part cost to a minimum, AMADA fibre lasers allow you to process many materials with the standard compressed air cutting system, giving high quality results. Assist gas costs are, therefore, zero.

AMNC 3i NUMERICAL CONTROL



The AMNC 3i numerical control used on the ENSIS-AJ series fibre lasers is a 21.5" HD touch screen system that provides simple, intuitive operation for higher productivity. It fits perfectly into the VPSS 3i digital suite concept.

Features include:

- Smart phone type operation for zooming.
- On-screen nesting automatic NC generation.
- One touch operation for quick machine setup.
- Machine productivity and history record.

STANDARD MACHINE FEATURES

	standard	fully featured		
	3kW	3kW	6kW	9kW 12kW
ENSIS Technology	■	■		■
Auto Collimation Technology				■
Single lens cutting	■	■		■
Nozzle changer (no. of stations)	8	16		16
Compressed air cutting system	■	■		■
Clean Fast Cut (CFC) compatibility	■	■		■
Oil shot functionality	■	■		■
Front & side access	■	■		■
Deep etch capability	■	■		■
Dust air blow	■	■		■
Water assisted cutting (WACS II)		■		■
Pierce monitoring		■		■
X axis conveyor		■		■

OPTIONAL EQUIPMENT AND FUNCTIONS



Silky Cut

For stainless steel processing, AMADA developed Silky Cut for fibre lasers, giving CO₂ type quality and maintaining the fibre laser savings for electrical consumption (typically 70% less than an equivalent CO₂ laser).



Gas Mixer

When processing aluminium, a mix of nitrogen and oxygen allows the perfect combination of improving the cut quality compared to nitrogen, while keeping the weldability of the material, which is a problem when processing with oxygen.



OVS-D

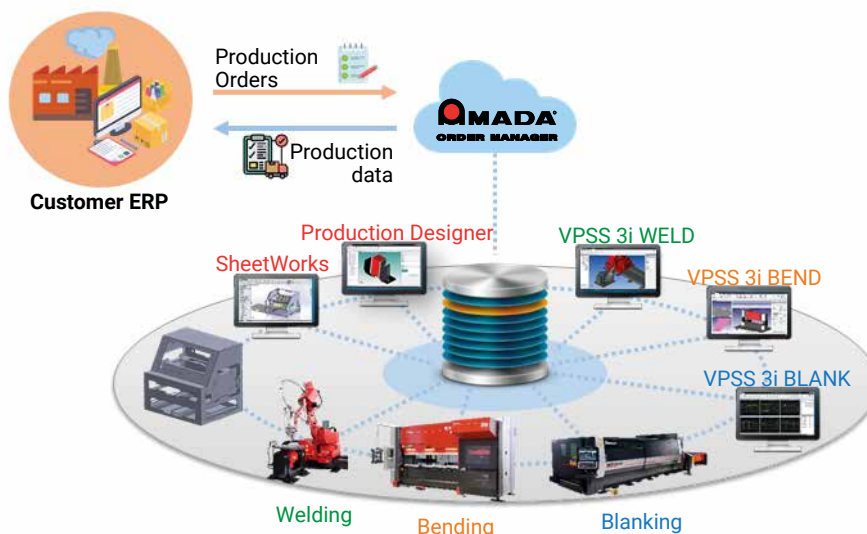
The OVS-D system measures the pitch of two reference holes and automatically compensates for any origin deviation when transferring a sheet of parts from the punch machine. The pitch and circularity of the cut holes are also measured. When the measured values fall outside the specified limits, an alarm is activated.

A BRIDGE BETWEEN ERP AND AMADA ECO-SYSTEM

AMADA Order Manager (AOM) is the new Cloud-based platform created by AMADA.

Thanks to the AMADA standard data exchange interface, the customer's existing ERP system can be easily connected to AOM to allow the production data to be sent to the AMADA machines and for collecting the machine production data.

AMADA provides a suite of perfectly integrated software products. Each software technology can take advantage of the VPSS concept (Virtual Prototype Simulation System) to lead to a total, enhanced and error-free production with AMADA machines.



AUTOMATION SYSTEMS

FROM AUTOMATIC PALLET CHANGERS TO FULL STOCKYARD SYSTEMS

AUTOMATIC PALLET CHANGER (LST-E)

AMADA's standard automation module for 3m and 4m sheet formats is a fully electric system that consists of 2 cutting pallets capable of supporting a full size sheet of 25mm thick material. This is the ideal setup for customers with space restrictions and lower volume production. Continuous operation can be achieved as the next job can be setup while the machine is cutting and parts can be easily sorted from the skeleton.

A free bearing table (FBT) option is extremely useful for customers processing thicker materials, reducing the burden on the operator as it supports the loading and positioning of the heavy sheet. It also allows fast loading of large, thin sheets with a single operator.



MP FLEXIT – AUTOMATIC SHEET LOAD/UNLOAD

The MP Flexit automation module provides continuous, automatic loading and unloading operations to increase machine utilisation. A 3000kg pack of raw material can be loaded into the system, and finished sheets are unloaded via a chain drive fork system onto a pallet at the front of the cell. The chain drive system ensures high quality parts compared to other automation systems as the finished parts are not dragged over the unload forks. Cut parts can be quickly removed by a fork lift truck while the laser is working and moved to the next stage of the manufacturing process. MP Flexit is the perfect solution for mid level volume production for 3m sheet lengths in a factory with height restrictions.



MP-4020 – LARGE FORMAT SHEET LOAD/UNLOAD

The MP-4020 is ideal for customers with low roof height and/or limited floor space. Equipped with 2 load and 1 unload shelves, the MP-4020 provides fully automated processing. A full sized 25mm thick sheet of material can be loaded and unloaded in automatic mode, reducing the burden on the operator. The system also incorporates the ability to bring the cutting pallet to the front of the system. This allows processing of urgent jobs quickly and easily without having to load material directly onto a loading shelf.



ASF-EU – SINGLE TOWER OR DOUBLE TOWER

The ASF-EU was designed to compliment the advance in laser technology and the increased speed of manufacture that higher power fibre lasers achieve. With a sheet changeover time of less than 90 seconds, the ASF-EU ensures the highest levels of machine utilisation and flexibility for high volume manufacturing of 3m sheet formats.

Standard (10 shelves in total), low (7 shelves in total) and high (14 shelves in total) variants are available to satisfy all customer requirements. Double tower versions are also available.

Cut sheets are unloaded by a chain drive system to maintain the part quality, while a new sheet of material is loaded. Cut parts / raw material can be removed / loaded while the laser is still in operation.



AS LUL – SINGLE TOWER OR DOUBLE TOWER

To satisfy customers with mid to high volume production requirements, the AS LUL tower was introduced with great success in Europe. It has a compact footprint for minimal impact on factory space, while providing fully automatic, continuous part flow. One feature that is particularly useful for sub contractors is the ability to bring the cutting pallet to the front of the tower and manually load a sheet of material as well as unloading finished parts. This allows the interruption of a long running schedule for an urgent job to be processed. The schedule can then be resumed afterwards.

Available as single or double towers, the AS LUL is also available in 3m or 4m sheet length configurations.



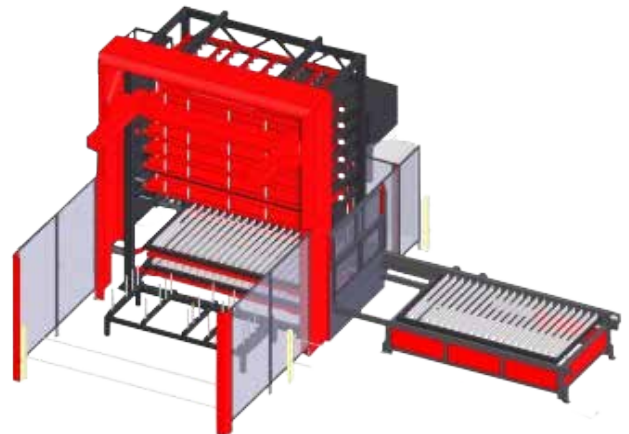
SECOND OUTPUT STATION

Sometimes, there is a requirement to immediately unload cut parts from the manufacturing cell, while allowing other cut sheets to be stored within it. This is where the second output station proves to be a big benefit.

Once the sheet of parts has been processed, it can be automatically moved through the cell to its home position and manually unloaded from 3 sides. After the parts have been removed, the skeleton can either be removed manually, or sent back into the storage tower to be removed later.

When combined with an ASF-EU automatic tower system, it provides the possibility to interrupt a long running schedule with an urgent job, process the sheet and remove the parts simply and quickly, before restarting the schedule.

The second output station is available for 3m sheet formats.



TK – PART REMOVER

Modern manufacturing requirements demand high machine efficiency and quick part turnaround. AMADA's TK part removal system satisfies both these requirements. Parts can be removed from the cut sheet in-cycle and stacked on pallets at the front of the cell, with the skeleton returned to the storage system. Individual suction cup activation, extendable arm configurations, 180 degree head rotation and simple offline programming ensure a wide range of part sizes and shapes can be removed automatically. The TK is available for 3m and 4m sheet formats.

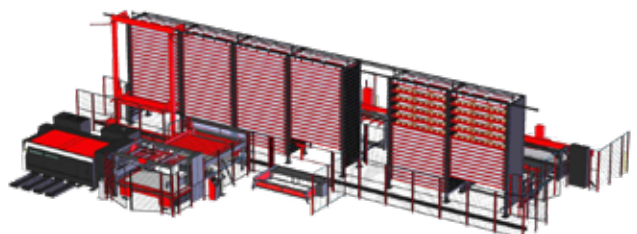
With the ENSIS-AJ technology, a very wide cut kerf is produced when processing thick mild steel. This makes it much easier to remove parts when compared to standard solid state lasers that produce a much narrower kerf.



CS II – FULL WAREHOUSE STORAGE

The very highest volume requirements can be fulfilled by AMADA's CS II warehouse automation system. Up to 999 shelves are possible, with both single row or double row configurations available. Lasers, punching and combination machines can all be connected, with input/output (I/O) stations positioned according to the customer requirements.

The stacker crane delivers raw materials to the individual machine cells and removes finished parts either back to the storage or to an I/O station for removal to the next manufacturing stage. CS II warehouse systems are available for 3m sheet formats.



DIMENSIONS

L x W x H

ENSIS-3015AJ + shuttle table (LST-E)

3/6kW: 10136 x 2840 x 2432

9kW: 10136 x 2840 x 2730

12kW: 10136 x 2840 x 2500

ENSIS-4020AJ + shuttle table (LST-E)

3/6kW: 12080 x 3360 x 2432

9kW: 12080 x 3360 x 2730

12kW: 12080 x 3360 x 2500



Unit: mm

MACHINE SPECIFICATIONS

			ENSIS-3015AJ	ENSIS-4020AJ
Numerical Control			AMNC 3i	
Controlled axes			X, Y, Z axes (three axes controlled simultaneously) + B axis	
Axis travel distance	X x Y x Z	mm	3070 x 1550 x 100	4070 x 2050 x 100
Maximum processing dimensions	X x Y	mm	3070 x 1550	4070 x 2050
Maximum simultaneous feed rate	X/Y	m/min	170	
Repeatable positioning accuracy			± 0.01	
Maximum material mass			920	1570
Processing surface height			940	
Machine mass	3kW	kg	9100	12200
	6kW		9500	12800
	9kW		9600	12900
	12kW		9700	13000

OSCILLATOR SPECIFICATIONS

		ENSIS-3000	ENSIS-6000	ENSIS-9000	ENSIS-12000
Beam generation		Laser diode-pumped fibre laser			
Maximum power	W	3000	6000	9000	12000
Wavelength		µm			
		1.08			
Maximum processing thickness*	Mild steel	25**	25	25	25
	Stainless steel	15	25	25	25
	Aluminium	12	25	25	25
	Brass	8	15	18	18
	Copper	6	12	12	12


* Maximum value depends on material quality and environmental conditions


** With WACS. Without WACS = 20mm

SHUTTLE TABLE SPECIFICATIONS

		LST-3015E	LST-4020E
Max. material dimensions X x Y	mm	3070 x 1550	4070 x 2050
Number of pallets		2	

Specifications, appearance, and equipment are subject to change without notice by reason of improvement.

 For your safe use
Be sure to read the user manual carefully before use.
When using this product, appropriate personal protection equipment must be used.

 Laser class 1 when operated in accordance to EN 60825-1

The official model name of the machines and units described in this catalogue are non-hyphenated like ENSIS3015AJ. Use this registered model names when you contact the authorities for applying for installation, exporting, or financing.
The hyphenated spellings like ENSIS-3015AJ are used in some portions of the catalogue for sake of readability. This also applies to other machines.
Hazard prevention measures are removed in the photos used in this catalogue.

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