



T SERIES TUBE



CUTLITE PENTA

**HIGH TECH TUBE
CUTTING LASER MACHINE**

INDUSTRIAL
DIVISION OF

ELEN

GROUP

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THE COMPANY

Cutlite Penta was founded in 1992 as the industrial division of El.En. S.p.A., with the goal of designing and manufacturing advanced laser systems for cutting plastic and wood materials, using CO₂ laser sources developed and produced in-house by the Group. Over the years, the El.En. Group has experienced steady growth, strengthening its presence in both the industrial and medical sectors internationally, and today has become one of the leading Italian players in the field of laser technologies.

Cutlite Penta embodies the industrial expertise of the Group, with production and commercial sites strategically located worldwide. Its extensive experience in the sector, combined with a deep understanding of metal laser cutting processes, has enabled the company to establish itself as a benchmark for the most demanding customers.

Driven by a vision focused on technological innovation and internal control of the entire production cycle—from design to the creation of key system components—Cutlite Penta is consolidating its role as a global leader in the industrial laser cutting sector..

MISSION

Cutlite Penta has always aimed to develop systems that ensure high productivity and quality while keeping operating costs low, allowing its customers to remain highly competitive. Cutlite Penta's R&D department, constantly working on the evolution of the cutting head, proprietary CNC, and front-end software, ensures that Cutlite Penta systems remain state-of-the-art. Flexibility and speed, combined with ease of use and ease of learning, are hallmarks of this new generation of systems, positioning our customers at the forefront of their markets.

OUR NUMBERS

850

employees

80.000 m²

of production areas

HISTORIC EXPERIENCE AND **KNOW-HOW AT YOUR SERVICE**



Strong from the decades-long experience in laser cutting that started with the CO2 sources of the El.En. group, we have transferred and perfected this advanced and transversal know-how to the field of FIBER LASER TECHNOLOGY.

The results that Cutlite Penta has achieved so far have led it to establish itself in the fiber laser

market, and to form solid partnerships with the main source producers for this technology, particularly thanks to the one with the American IPG Photonics, a leading company in the sector, which has the best and most up-to-date fiber laser sources, which allow it to offer high-quality machines and to be the first to introduce ever-increasing power systems.



FIRST IN EUROPE TO
INSTALL HIGH-POWER
**LASER SOURCES ON
CUTTING MACHINE**

TRANSVERSAL TECHNOLOGY

ON ALL OUR MODELS

FLY CUT

Proprietary technology for fly cutting.

SMART MANAGER PLUS

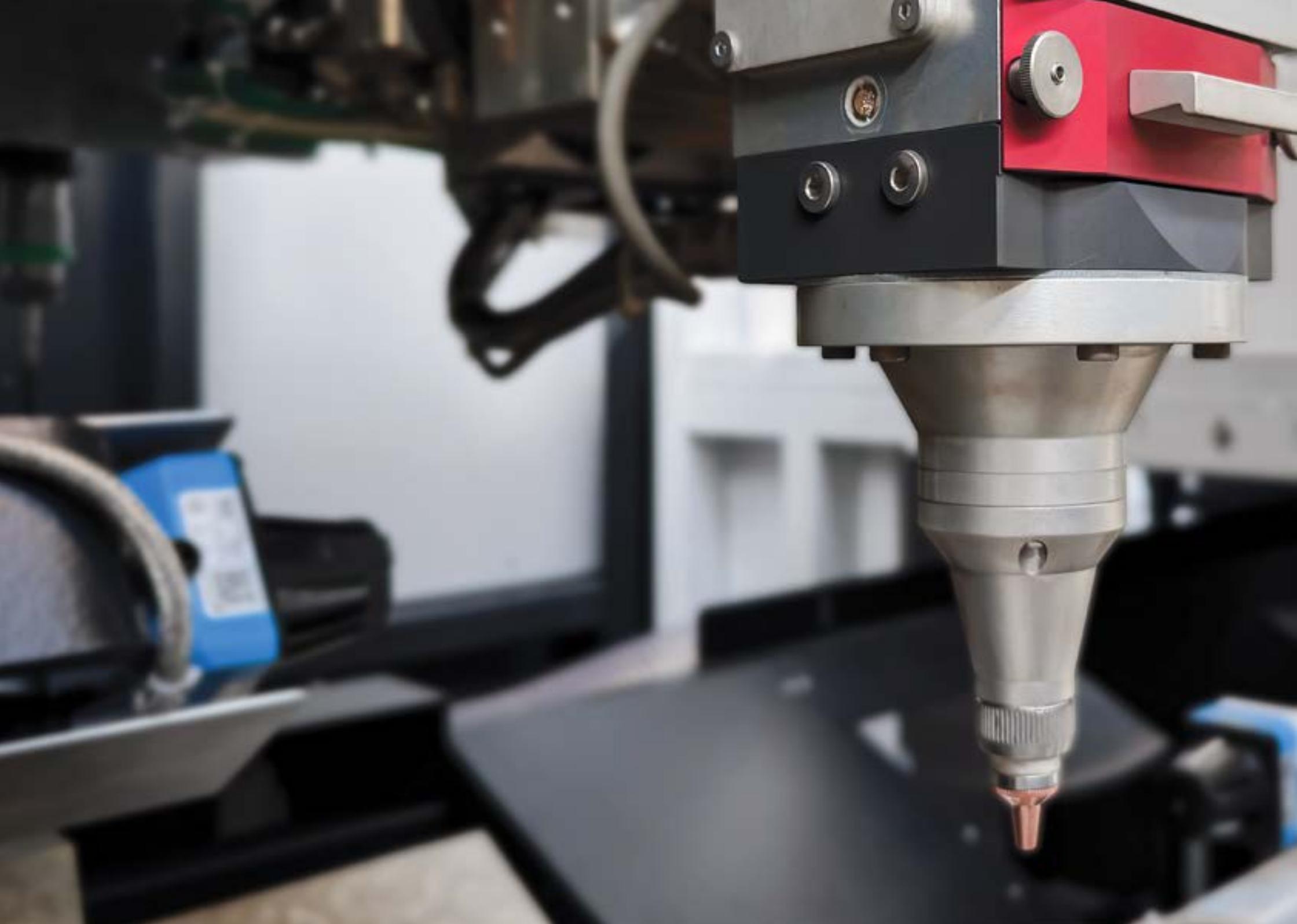
Proprietary machine management software identical on all models.

ABSOLUTE INDUCTIVE ENCODERS

Axis positioning guaranteed at all times and low maintenance requirements.

CUTTING HEAD

Proprietary technology produced internally capable of managing high power during intensive use.





TUBE CUTTING HEAD

Cutlite Penta offers various configurations for the cutting head Tube, adaptable to the needs of the market.

FIBER TUBE systems boast a unique cutting head, the brainchild of our research and development department. The essential design, optimized to minimize maintenance, is distinguished by the completely sealed optical unit, which guarantees durability over time. The compact and modular configuration of the Tube head is distinguished by the simplicity of the consumables. The protective glass for the optics, easily replaceable thanks to the manually removable drawer, and the nozzles designed by Cutlite Penta reduce the consumption of technical gases, while maintaining impeccable cutting results. The cutting quality is ensured by the capacitive sensor, which keeps the nozzle at a constant distance from the material surface.

STRENGTHS:

- Contact-less maintenance of real-time calibration using an integrated capacitive sensor
- Proprietary design
- Control of technical gases
- Connections and tidy wiring concentrated in the upper part of the system
- Easily replaceable protective glass and ceramics

**We reserve the right to modify the cutting head design according to customer requirements.*

TUBE CUTTING SYSTEMS

- TUBE
- TUBE E
- TUBE F



FN M1001
FN M1001

TUBE



TUBE

TUBE is the result of CUTLITE PENTA's long and consolidated experience in the field of laser machines and represents the future of laser technology applied to metal tube cutting. The TUBE system is an automatic processing system that allows obtaining a finished part, complete with all the cutting operations required, in a single machining cycle.

This approach represents a technological and productive leap compared to traditional methods, which require several steps on different machining centres to subsequently carry out the required cutting, deburring, drilling, end trimming, interlocking and special CNC machining. This is achieved thanks to the speed, quality, accuracy, flexibility and reliability of laser technology. The system allows the automatic machining of round, square, rectangular tubes and open profiles.

Materials

This system allows machining mild steel pipes, alloy steel, stainless steel, aluminium alloys, brass and copper. Different assist gases can be used according to the type of material to be cut. The machine can handle different types of gases. For example, oxygen is normally used for iron and mild steel, whereas nitrogen is used for stainless steel. The machine's CNC manages all operations: from the loading of the bar, to the cutting and unloading of the finished pieces.

Applications

The great flexibility of use and the high cutting performance, both in terms of speed and quality, make it possible to successfully use the TUBE machine in different industrial sectors. Using laser systems

proves to be beneficial when high cutting quality and the possibility of creating prototypes and small/medium-size series as quickly, easily, and economically as large series are required.

The great versatility of the machine, which allows machining tubes of different cross-sections, materials, and thicknesses without the need for expensive specific equipment, is highly appreciated by companies operating in the field of processing on behalf of third parties, and in particular for the execution of processing for the structural sector.

Benefits

Top productivity and a high degree of automation are very important characteristics for tube manufacturers and/or distributors. The possibility of carrying out long and complex processes in a single machine cycle is particularly appreciated by companies operating in the industrial vehicles and agricultural machinery sector.

The Tube system allows multiple operations to be carried out in a single machining cycle on a single machine. This allows replacing various machining phases, currently carried out on different machines in sequence, such as custom cutting, deburring, punching and/or moulding, drilling, and removal on the machining center. In particular, laser cutting eliminates the deburring operation, normally required in the case of mechanical cutting.

TUBE

This fosters a remarkable reduction in the overall cycle time, which is generally greater when the piece to be produced is very complex. In addition, having only once machine to feed means a reduction in stock. Laser cutting eliminates the use of equipment and dies. The cutting geometry can be changed easily and quickly without having to design, manufacture and assemble rigid and specific equipment: this allows reducing costs and production times, eliminating the equipment warehouse, and making the production of small lots economical.

Laser

The extreme flexibility of the laser tool, combined with the elimination of specific equipment, allows the user to reduce the development time of new products, to quickly, simply and economically produce "special" applications, small series or prototypes. It is possible that what has already happened for the furniture and light carpentry sector, where these potentialities have allowed the industrialization of new product solutions, will be replicated.

The use of laser cutting also reduces costs downstream of the cutting process: the laser approach ensures better uniformity of the pieces, a shorter machine tooling time and therefore greater management savings. Laser cutting guarantees excellent results in terms of cutting quality.

The absence of mechanical actions on the piece, combined with the small size of the laser spot, allows minimizing deformations on the piece, which fosters benefits on the coupling tolerances in the subsequent assembly operations. This is particularly relevant when performing automatic welding operations on the pieces downstream of the cut.

The Tube system was created to ensure maximum productivity in the processing of tubes (round, rectangular, square or open profiles), meeting a whole range of needs in this sector. Tube, in the 2d head and 3d bevel versions, has been designed with the aim of achieving maximum modularity in terms of layout. The automatic loading devices may be positioned both at the rear and at the front, ensuring the optimal flow of materials in each direction.

The machine body is made with a robust electro-welded and stabilized structure, on which the tail carriage, which houses the tube gripping rear spindle, is installed. The axis of the tube is equipped with brackets that support the bar, with automatic adjustment of the cross-sections: they rise during the loading phase and progressively lower as the tail spindle moves forward.

The head spindle is in a fixed position to ensure rigidity, while the cutting head is free to move on three axes, also exploiting the additional X-axis with linear motor: this allows accurate and fast machining of stationary tubes, thus reducing the number of spindle rotations to benefit productivity. The unloading of the cut parts takes place automatically and is supported along the entire length to ensure stability and quality in the process. In short, the Tube system allows obtaining a finished tubular piece, complete with all the cutting processes required, in a single processing cycle.



STRENGTHS

- Compact and customizable thanks to the maximum configurability of the layout
- High productivity: linear motor on additional X axis to allow fast and precise machining with the tube still
- Automatic adjustments to allow efficient machine set-up at section change
- Possibility to load a single bar without engaging the automatic loader
- Great variety of practicable processes due to the possibility of working also open profiles
- Search for welding seam in masked time (without increasing the cycle time)
- Cutting special profiles to be evaluated with our technical department

TECHNICAL SPECIFICATIONS

MODEL	ROUND FORMAT	SQUARE / RECTANGULAR FORMAT
TL 150	min 15 mm* max 152,4 mm ø *Reducible on request	min 15 mm* max 152,4 mm *Reducible on request
TL 220	min 20mm* max 220 mm ø *Reducible on request	min 20mm* max 160/220 mm* *Reducible on request
TL 305	min. 20 mm* max. 305 mm ø *Reducible on request	min 20 mm* max 220 mm *Reducible on request

TUBE FORMAT

Round, square, and rectangular sections with L, C, and U profiles, flat bars (other profiles to be evaluated with our technical department).

MAXIMUM WEIGHT OF THE MACHINABLE BAR

40 Kg/m

LOADABLE / UNLOADABLE BAR LENGTH

Loadable from 6500 mm to 12000 mm
 Unloadable from 3000 mm to 12000 mm

LASER POWER

1000 W
 2000 W
 3000 W
 4000 W
 (Increaseable on request)

Optional: Bevel head.

HARDWARE SOLUTIONS



CAMERA

It is a position camera that allows remotely controlling and viewing the machine during operation.



SMART SPINDLE (OPTIONAL)

Electro spindle with a 10-bay automatic tool change device, to execute flow drilling and tapping up to M12.



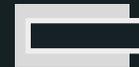
AUTOMATION

The various automation options allow the optimization of the work phases, without significant idle times for loading and unloading operations.



SMART WELD

It allows detecting the position of the weld bead (both external and internal) before the bar is loaded into the machine, while the previous bar is being processed.



SMART CLEANING (OPTIONAL)

Device for collecting internal scraps on a round tube.



TUBE E



TUBE E

TUBE E was created to make CUTLITE PENTA laser technology more accessible to all companies wishing to automate the cutting of metal tubes. Based on the well-established TUBE platform, it retains the fundamental features while evolving them.

The TUBE E system is an automatic system that allows to obtain a finished part in a single processing cycle. The system enables the processing of round, square, rectangular tubes, and open profiles (sections from 20mm to 220mm) with the speed, quality, and precision of laser technology.

Materials

You can process tubes made of mild steel, alloy steel, stainless steel, aluminum alloys, brass, and copper. The machine manages various types of cutting assist gases: oxygen for iron and mild steel, nitrogen for stainless steel. The CNC controls all operations from loading the bar to unloading the finished pieces.

Applications

The flexibility and excellent cutting performance allow TUBE E to be used in various industrial sectors. It is particularly advantageous for companies that require high-quality cutting for prototypes and small/medium series in a fast and economical way. The versatility in processing tubes of different sections and materials without specific tooling is appreciated by SMEs working as subcontractors and in the structural sector.

Advantages

TUBE E enables multiple operations in a single cycle, replacing several phases currently performed on separate machines. Laser cutting eliminates deburring and reduces overall cycle times. It reduces the need for storage and eliminates tooling and molds, allowing easy changes to the cutting geometry. This significantly reduces costs and time.

Laser

The extreme flexibility of the laser tool reduces product development times and enables the rapid creation of special applications and prototypes. Laser cutting ensures excellent quality while minimizing deformations thanks to the absence of mechanical actions. TUBE E is the ideal solution for accessing the advantages of laser technology with an affordable investment.

STRENGTHS

- Compact and customizable thanks to maximum layout configurability;
- Automatic and manual adjustments to allow efficient machine setup when changing sections;
- Possibility to load a single bar without engaging the automatic loader;
- Wide range of machining operations thanks to the ability to process open-section profiles;
- Cutting of special-section profiles to be evaluated with our Technical Department;
- More accessible solution.

HARDWARE SOLUTIONS

CAMERA

It is a position camera that allows remotely controlling and viewing the machine during operation.

AUTOMATION

The various automation options allow optimization of the workflow and are compatible only with the step-by-step loader (minimum diameter 20 mm – maximum 220 mm; minimum length 3000 mm – maximum 6500 mm).

MODEL	ROUND FORMAT	SQUARE / RECTANGULAR FORMAT
TE 150	min \varnothing 15 mm* max \varnothing 150 mm *Reducible on request	min 15 x 15 mm* max 150 x 150 mm *Reducible on request
TE 220	min \varnothing 20 mm* max \varnothing 220 mm *Reducible on request	min 20 x 20 mm* max 160 x 160 mm* *Reducible on request

TUBE FORMAT	MAXIMUM WEIGHT OF THE MACHINABLE BAR	LOADABLE / UNLOADABLE BAR LENGTH	LASER POWER
Round, square and rectangular sections with L, C, and U profiles, flat bar (other profiles to be evaluated with our technical department).	40 Kg/m	Loadable from 6500 mm Unloadable from 3000 mm to 6000 mm	1000 W 2000 W 3000 W 4000 W 6000 W 8000 W (Increaseable on request)

TUBE F



TUBE F

TUBE F represents the specialized evolution of Cutlite Penta's TUBE system, specifically designed for cutting flat metal profiles. This machine was developed to meet the growing market needs in the flat profile processing sector. The TUBE F is an automatic system that allows you to obtain a finished part in a single processing cycle. The system enables the processing of flat profiles with widths from 40mm to 220mm and a minimum thickness of 8mm, guaranteeing the speed, quality, and precision of CUTLITE PENTA laser technology.

Materials

You can process flat profiles made of mild steel, alloy steel, stainless steel, aluminum alloys, brass, and copper. The machine manages various types of cutting assist gases: oxygen for iron and mild steel, nitrogen for stainless steel. The CNC controls all operations from loading the bar to unloading the finished pieces, with the ability to process bars up to 40 kg/m in weight and loadable lengths to 8000mm.

Applications

The specialization in cutting flat profiles makes TUBE F particularly effective in sectors requiring processing of linear structural elements, such as metal carpentry, shipbuilding, automotive, and the railway sector. The ability to process profiles with widths ranging from 40mm to 220mm covers a wide range of applications.

Advantages

TUBE F enables multiple operations in a single cycle, replacing several phases currently performed on separate machines, specifically for flat profile cutting. Laser cutting eliminates deburring and reduces overall cycle times. The machine stands out for its compactness and customizability, offering the possibility of manual loading and customizable multiple unloading modes. It is also possible to pair and integrate the machine with automatic loading/unloading systems.

Laser

The extreme flexibility of the laser tool, specifically applied to flat profiles, reduces product development times and enables the rapid creation of special applications and prototypes. Laser cutting ensures excellent quality while minimizing deformations thanks to the absence of mechanical actions, which is particularly critical when processing flat profiles where flatness is essential.

STRENGTHS

- Compact and customizable;
- Manual loading option;
- Multiple unloading modes;
- Possibility to pair/integrate the machine with automatic loading/unloading systems.

HARDWARE SOLUTIONS

SMART SPINDLE (OPTIONAL)

Electro spindle with from 6 to 10 station bay automatic tool change device, to execute flow drilling and tapping.

CAMERA

It is a position camera that allows remotely controlling and viewing the machine during operation.

AUTOMATION

The various automation options allow optimization of the workflow and are compatible only with the step-by-step loader (minimum diameter 20 mm – maximum 220 mm; minimum length 3000 mm – maximum 6500 mm).

FLAT FORMAT	THICKNESS
flat width min 40 mm flat width max 220 mm	min 8 mm

TUBE FORMAT	MAXIMUM WEIGHT OF THE MACHINABLE BAR	LOADABLE / UNLOADABLE BAR LENGTH	LASER POWER
Flat sections	25/35/40 Kg/m	Loadable to 8000 mm; Unloadable: customizable	1000W 2000W 3000W 4000W 6000W 8000W 12000W 15000W

TUBE SYSTEM SOFTWARE

- SMART MANAGER PLUS

```
..._mod.use_z = True
... at the end -add back the de
..._ob.select= 1
..._ob.select=1
...context.scene.objects.active = modifier
...selected" + str(modifier_ob)) # mod
..._ob.select = 0
...context.selected_objects[0]
...objects[one.name].select = 1
print("please select exactly two object
OPERATOR CLASSES -----
...operator):
...error to the selected object""
...x"
...x"
```

Our systems **ARE COMPATIBLE** with
the main **TUBE CAD/Cam** software on the market

SMART MANAGER PLUS

The PLUS machine control system consists of a **numerical control** unit and **Smart Manager Plus**, an innovative software for machine management and supervision. With Internet access, the system can be monitored via **remote assistance using TeamViewer**. Smart Manager Plus takes advantage of the potential of Cutlite Penta cutting systems, ensuring maximum performance and intuitive management. The customizable interface and integrated database facilitate daily use and integration with external applications via SQL. The **3D graphic viewer** and interconnection features with Industry 4.0 complete the picture of this cutting-edge software.

Job Report: automatically stores data and details of each production cycle and information useful for verifying programming efficiency.

Work resumption: allows recovery of operations interrupted due to force majeure or priority changes.

Preview: allows quick verification of selected operations, sheet size verification, and cutting simulation, also estimating execution time.

Cutting technology database: manages cutting parameters and organizes data in intuitive and easily consultable tables.

N.U.R.B.S.: allows managing fourth-degree curves in their primitive form (splines).

Box Nester: used for manual preparation of composite operations, with positioning in bounding boxes.

Automatic sheet edge acquisition: automatic recognition of sheet position and adaptation of the part program with millimeter accuracy, without needing to move the sheet.

Scheduling: manages cutting parameters and organizes data in intuitive and easily consultable tables.

Cutting Lost: automatic recognition and restart in case of cutting loss.

Smart Focus: ultra-rapid autofocus for positioning during cutting.

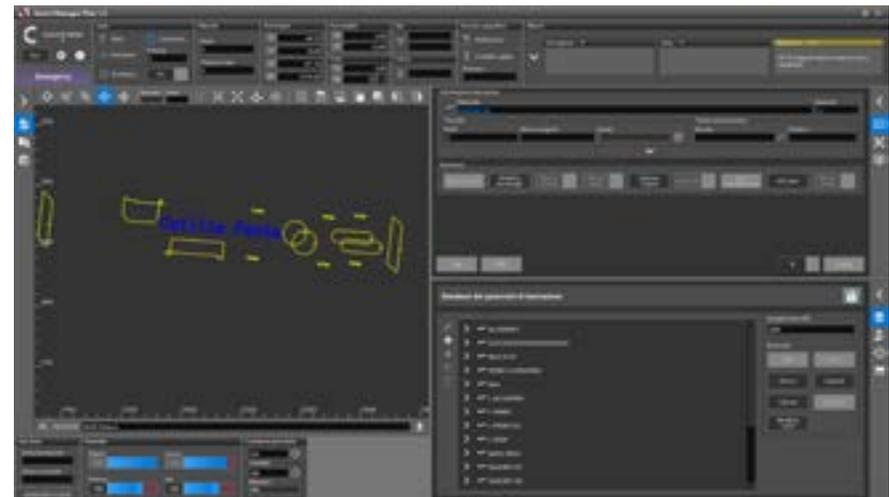
Auto Power Off: automatic machine shutdown system.

Synchronous release function: optimizes releases based on the distance of operations by moving the vertical axis synchronously with the X-Y plane axes.

Loading and unloading systems interface: a module to interface with the loading/unloading devices and the sheet metal storage.

Interface with management systems and MES: used for monitoring operating states and machine production according to the Industry 4.0 model.

Fly Cut: to perform fly cutting operations with Fly-Piercing capability, without interrupting the axis movement.





AUTOMATION

- AUTOMATIC STEP LOADER
- AUTOMATIC BUNDLE LOADER





AUTOMATIC STEP LOADER

Maximum capacity 6 tubes having a \varnothing 305 mm diameter or maximum side 220 mm.

Automatic loading of tubes from \varnothing 20mm - up to \varnothing 305 mm.

Automatic loading lengths from 1500 mm to 6500 mm, which can be increased on request.

Sliding surfaces entirely covered in plastic material to avoid damaging and scratching delicate tubes.

Possibility of mounting on the operator or rear side.

STEP/BUNDLE LOADER



STEP/BUNDLE LOADER



UNLOAD



AUTOMATIC BUNDLE LOADER

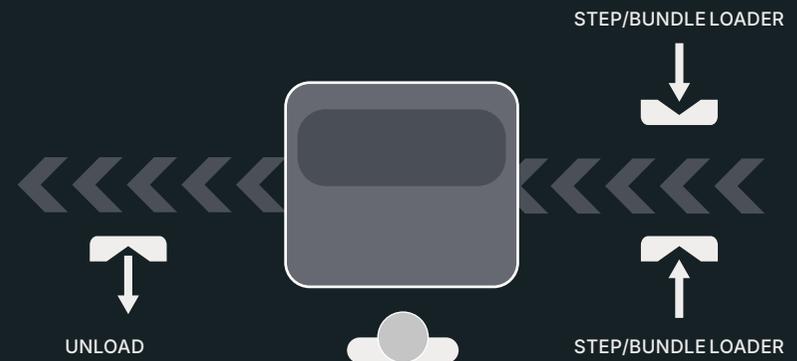
Loading Maximum 2000/4000 Kg

Automatic loading of \varnothing 20mm tubes max. \varnothing 220mm, which be reduced on request

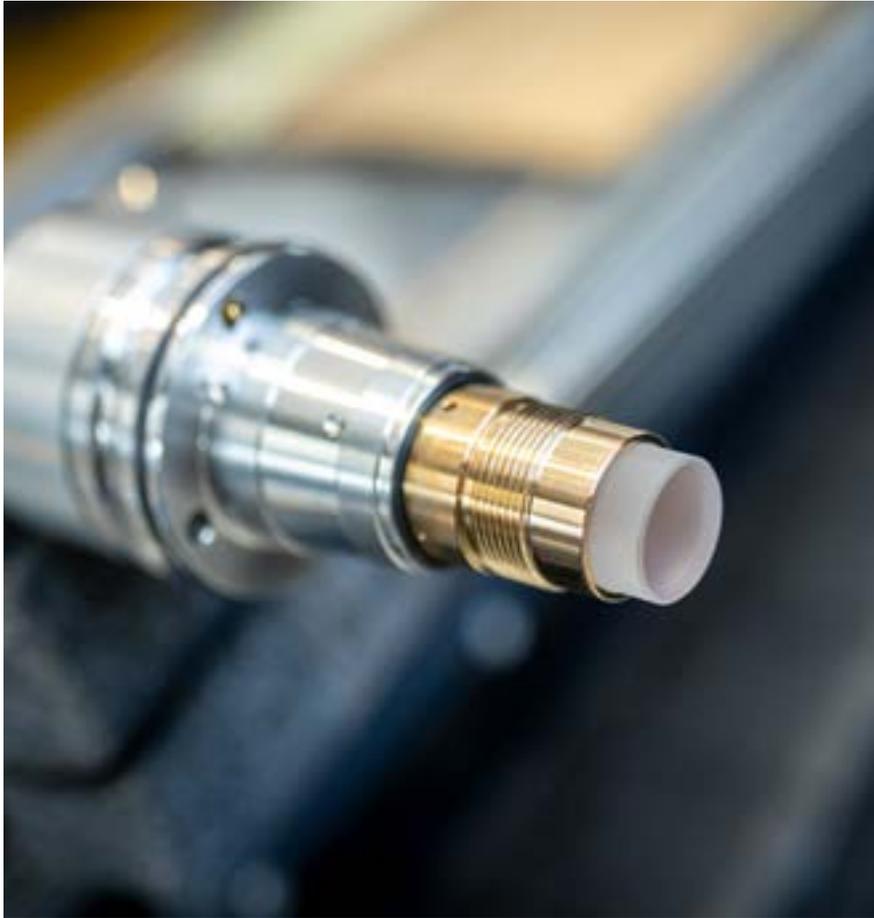
Automatic loading lengths from 1200 mm to 6500 mm, which can be increased on request.

Measurement of tube length before loading into the machine.

Sliding surfaces entirely covered in plastic material to avoid damaging and scratching delicate pipes.



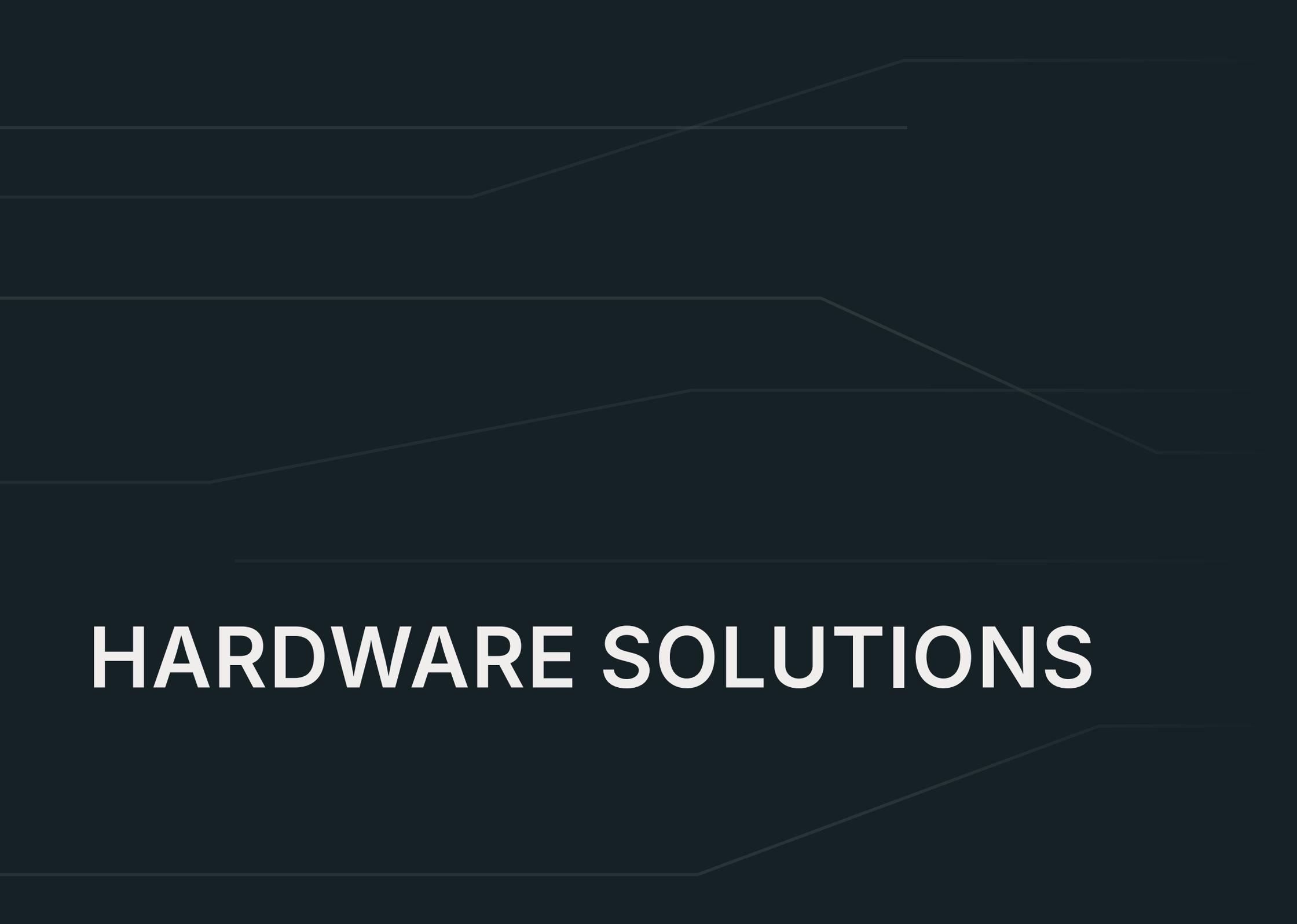
LASER SOURCES



FIBER LASER TECHNOLOGY

With the development of the EVO series, Cutlite Penta's control over its cutting head, from the design phase to its manufacture, has established itself in the marketplace as a synonym for performance, reliability and versatility, arousing the interest of leading fiber laser cutting source manufacturers, with whom it has over time built a synergistic relationship that ensures agility and variety for its offerings in the marketplace.

The advent of the optical fiber in cutting technology has produced a revolutionary impact on laser manufacturing. From the simplicity and elegance of the fiber laser spring efficiency, compactness, robustness and low operating costs, thus leading its enormous success in the marketplace.

The background features several thin, light-colored lines that create a sense of depth and movement. These lines are arranged in a way that suggests a 3D perspective, with some lines receding into the distance and others appearing to be in the foreground. The overall effect is clean and modern.

HARDWARE SOLUTIONS

HARDWARE SOLUTIONS



AUTOMATION

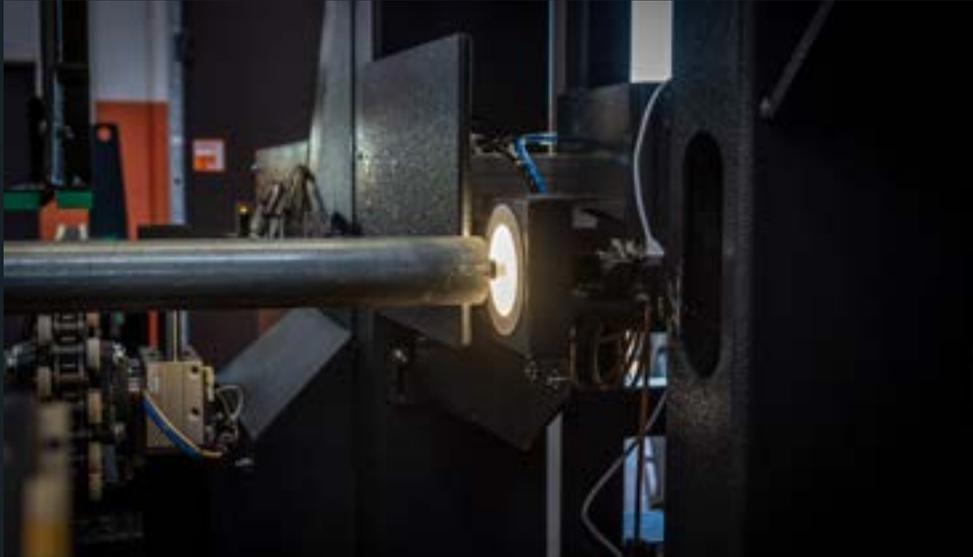
This option allows optimisation of processing times, almost entirely masking loading and unloading times.



SMART SPINDLE (OPTIONAL)

Electro spindle with from 6 to 10 station bay automatic tool change device, to execute flow drilling and tapping up to M12.

HARDWARE SOLUTIONS



SMART WELD

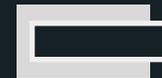
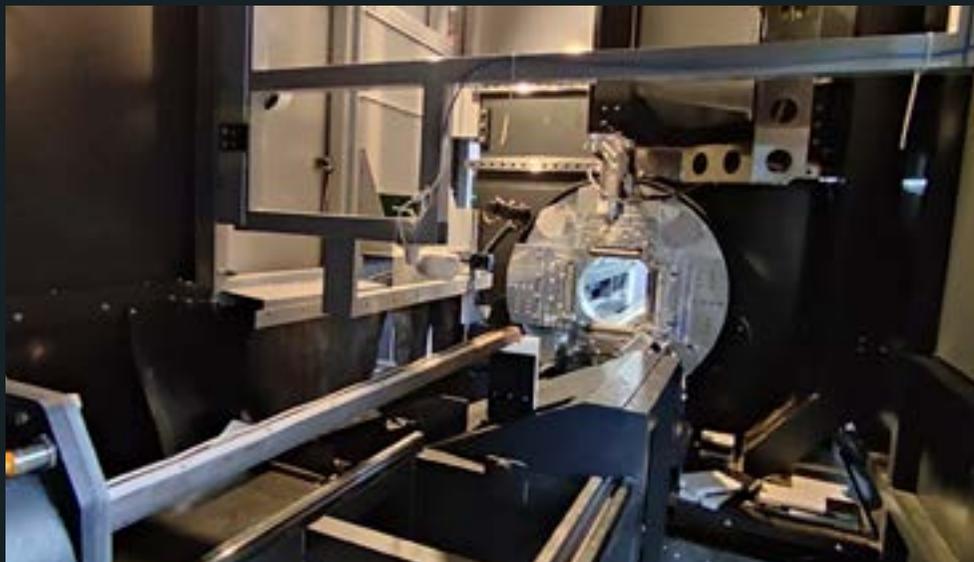
It allows detecting the position of the weld bead (both external and internal) before the bar is loaded into the machine, while the previous bar is being processed.



CAMERA

It is a position camera that allows remotely controlling and viewing the machine during operation.

HARDWARE SOLUTIONS



SMART CLEANING (OPTIONAL)

Device for collecting internal scraps on a round tube.







ENGLISH



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