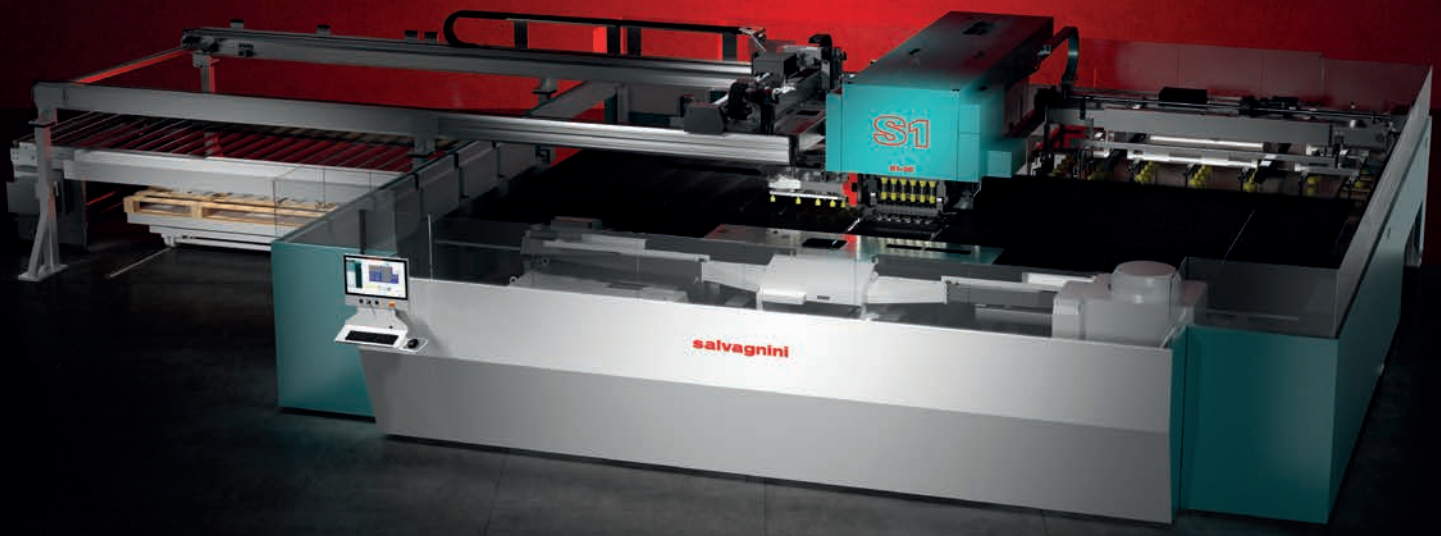
S1



Punch-laser combi machine

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CHANGE

What are the challenges faced by companies today?

Today companies have to cope with many challenges in order to remain competitive in a continuously developing market. These challenges include:

1. The need to automate information distribution, in order to create a **lean, error-proof production environment,** by integrating company ERP/MRP systems with process software for production management.
2. The growing need to **increase the autonomy and efficiency of production systems** by automating loading, unloading and sorting operations.
3. Finally, to prevent programming from becoming a bottleneck for production, the aim of **implementing simple and quick office software solutions,** able to make procedures leaner and improve overall efficiency.

What is Salvagnini's perspective on punching?

For Salvagnini, punching is always a **combined process of forming and separating parts,** with the separation done either by shear or by laser. Part separation allows the punching machine to be integrated in a **modern and efficient production flow.**

How can we justify the investment?

In today's production context, the role of the punching machine depends on the product: **the parts to be produced, their geometries, the machinings necessary, and the productivity required,** are what determine the most suitable technological solution.
The flexibility of laser, the higher cutting speed and the greater versatility of fiber technology have contributed towards increased interest in punch-laser combi machines such as the S1. The S1 is a true work center that punches, forms, taps, cuts and separates the parts. Productivity is guaranteed because the system is able to automatically produce finished parts without the need for regripping and/or re-tooling. The S1 optimizes the production process, reducing waste by concentrating a variety of activities in a single work step, minimizing intermediate handling and operator intervention. A competitive solution for businesses looking for productivity, flexibility, reactivity and efficiency.

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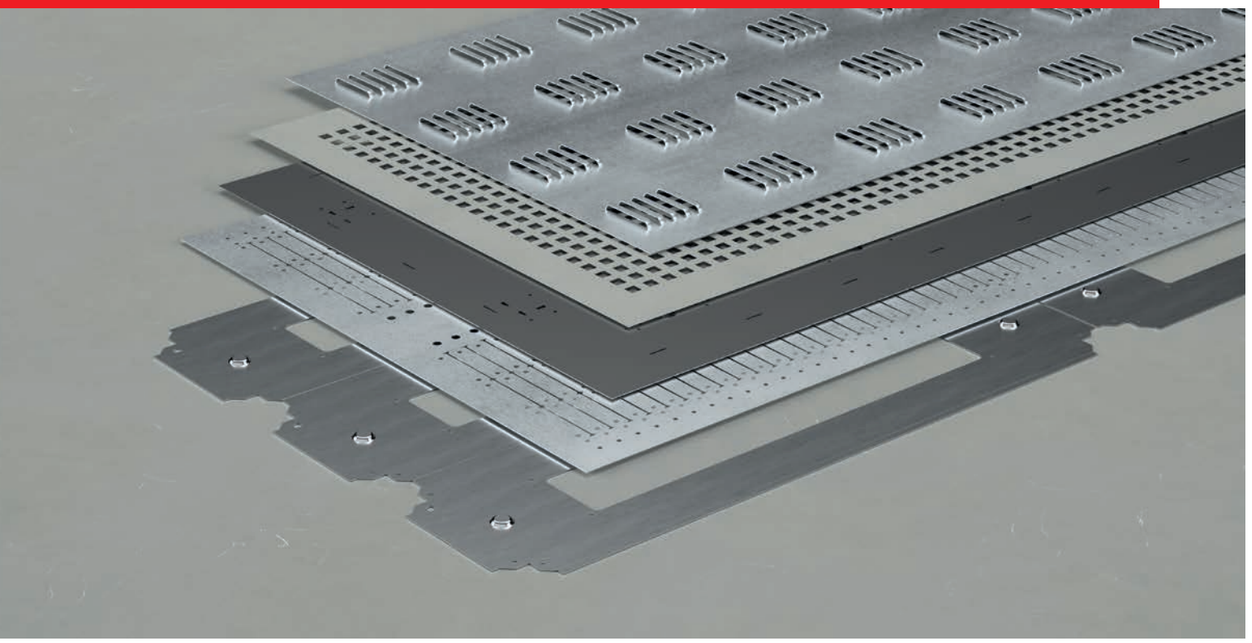
Process efficiency.

What is the S1 formula for productivity?

The S1 integrates the punching and cutting operations and automatically manages repositioning and separation. With the patented multi-press head, the tools are always available for nesting and multiple jobs, with no re-tooling in-cycle or manual intervention. The controlled stroke of the tools, it **extends the range of machinings available**, including offset, ribbing and tapping.

How to combine productivity and flexibility?

With conventional punching, productivity and flexibility depend on the number of tool changes in-cycle and the times for moving the sheet underneath the turret or single punch, influenced by the time required for the sorting operations downstream. The S1, on the other hand, natively combines **productivity and flexibility**. **Productivity** is maximized by the multi-press head with evolved hybrid technology, which makes the tools always available, and the two-carriage manipulator with variable set-up which guarantees maximum sheet reachability. These unique solutions also improve the **flexibility** of the S1 as – whatever the geometries and materials being machined – they do not require re-tooling and can produce large batches, kits or batch one with equal ease. STREAM.COMBI, the programming software for generating the punching and cutting program, includes proprietary algorithms for optimizing nests and parts, while reducing scrap and improving performance. STREAM.COMBI makes it easy to choose the best production strategy, and simplifies the programmer's job with a simple and immediate user-interface and its automatic programming, interactive work process editing and simulation functions.



Salvagnini hybrid technology: high performance, low consumption

Salvagnini has always worked to propose solutions with low environmental impacts, guaranteeing maximum operator safety and resource optimization.

ENERGY CONSUMPTION

S1 implements differentiated solutions that reduce consumption while guaranteeing the same performance and reliability.

Advanced hybrid actuators

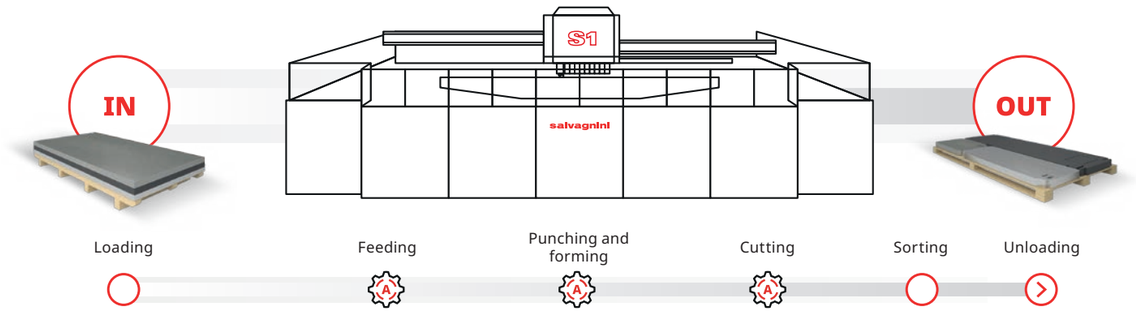
The S1 is equipped with advanced hybrid actuators: a proprietary solution used to reduce average consumption by up to 20% compared to the corresponding electrical solutions. This original solution has made it possible to eliminate mechanical parts, to the benefit of a structural simplification that eliminates maintenance due to worn moving parts in electrical actuators, and guarantees extremely stable performance and at 100% in stress tests. In addition, this solution does not require a cooling system, as there are no moving parts that could overheat, so further reducing consumption, today the lowest on the market for punch-laser combi machines.

ERGONOMIC DESIGN

The head is extremely accessible for simple and agile tool change and extraction, meeting not only the user's' requests but also the ergonomic usage requirements set by the current standards.

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Adaptive hybrid punch-laser combi machine.



The different S1 loading/unloading solutions and the evolved programming respond to **different production needs**.

What is the minimum level of automation for an S1?

In its basic configuration, the S1 is a semi-automatic solution: the operator loads the sheet manually on the worktable and then unloads it once processing is complete. The manipulator automatically manages all repositioning, with extreme precision, during the entire work cycle.

Salvagnini offers **feeding and unloading solutions** with an increasing level of automation that permits unmanned processing by optimizing each single work phase and promoting the in-line or in-system integration of multi-technology processing.

AUTOMATION	PRODUCTION STRATEGY	CONFIGURATION
Automatic loading, unloading, manual sorting	Parts (multiples and nests) microjointed to the skeleton.	Stand-alone (UC)
Automatic loading, unloading, automatic sorting	Parts (multiples and nests) separated from the skeleton automatically.	Stand-alone (TM/UC or TML/UC)
Automatic loading, unloading, automatic and in-line sorting	Parts (multiples and nests) separated from the skeleton automatically and in-line.	In line TML/PCU

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When is the S1 the best choice?

The S1 is not a punching machine with cutting function, nor is it a laser, but it is a combination of two different technologies with the addition of advanced cycles, guaranteeing the optimization of workpiece movements. It is the parts to be produced, their geometries, materials, thicknesses, the machinings necessary and the levels of productivity required, that determine the choice of the most suitable technology and automation solution: the decision to choose the S1 must be evaluated on the basis of these criteria.

How can we recover efficiency?

In addition to solutions that optimize the efficiency of each operation, Salvagnini supplies **automation and process software** which, by suitably organizing the whole production flow, help to **achieve greater autonomy** for unmanned and lights-out jobs, reducing the impact of labor costs and the return-on-investment time.

How can we maximize autonomy?

Salvagnini supplies a wide range of **store-towers** and **automatic loading/unloading/sorting devices** which, when coupled together, increase system autonomy and efficiency. These devices mean that different materials and thicknesses are always available for just-in-time jobs, minimizing waiting times for sheet metal feeding and reducing the risk of error or damage to the material resulting from human intervention. These are modular and customizable solutions that can be extended and/or modified even after they are first installed.

What is the best configuration?

The S1 is available in two sizes, for machining 3 or 4 meter sheets. Both models can be configured by selecting from among the numerous loading/unloading automations. The model is chosen on the basis of an **in-depth feasibility study**. Salvagnini's specialists help each customer to define the most suitable configuration for their production needs, evaluating a number of variables including the field of application, the production strategy and the production mix.

What are the challenges faced by the companies of tomorrow?

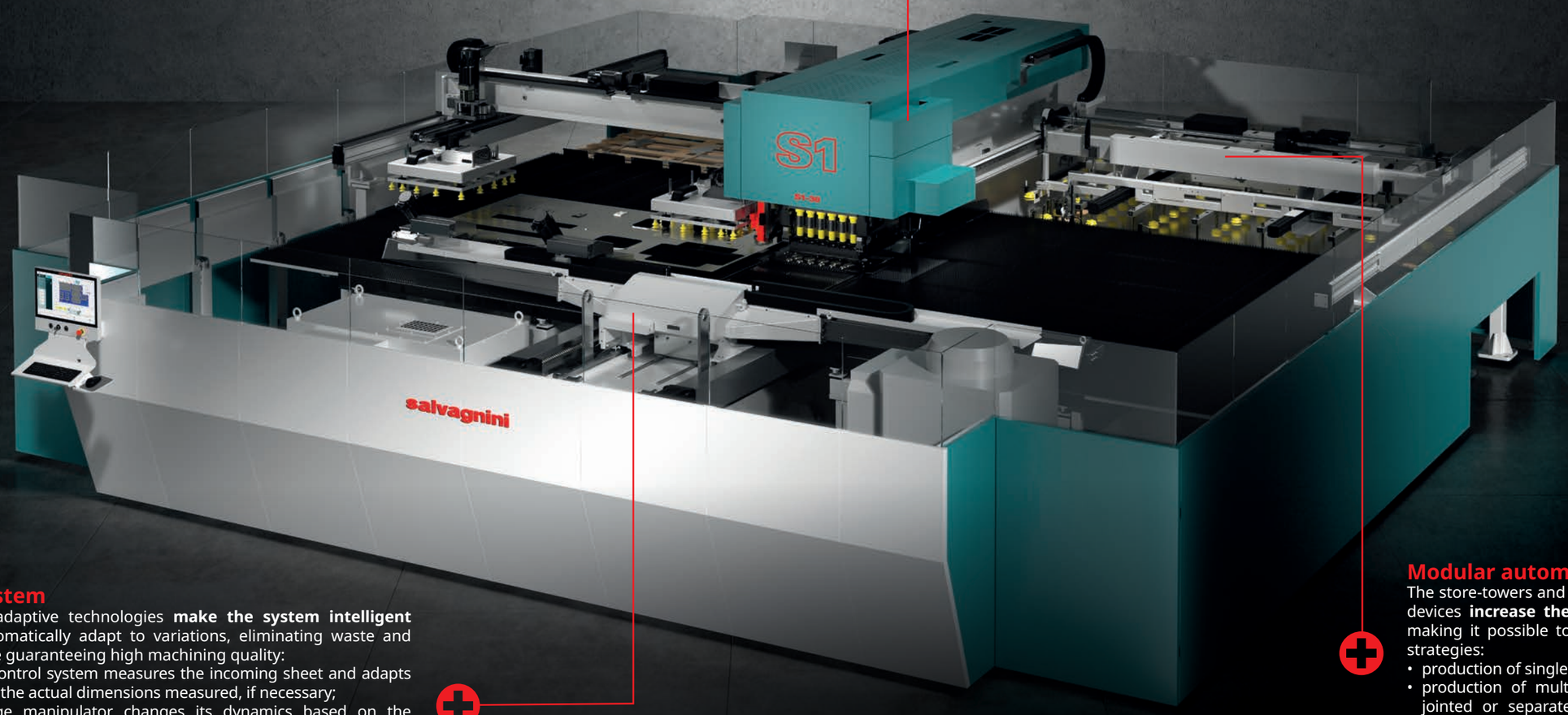
These challenges relate in particular to the **recovery of autonomy and efficiency**. Automating the loading/unloading/sorting operations brings benefits to the entire manufacturing chain. Implementing simple, quick office software reduces the risk of turning programming into the bottleneck of production. Integrating ERP/MRP and process software for managing production automates the distribution of information, helping to create a lean, error-proof production environment.

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A cutting-edge solution.

Process efficiency

The S1 laser punching machine **maximizes process efficiency**: all the punching, forming and separation operations are automatic, done by a single system that eliminates semi-finished parts, does not require manual intervention and assures extreme repeatability.



Adaptive system

The integrated adaptive technologies **make the system intelligent** and able to automatically adapt to variations, eliminating waste and corrections, while guaranteeing high machining quality:

- the centering control system measures the incoming sheet and adapts the program to the actual dimensions measured, if necessary;
- the two-carriage manipulator changes its dynamics based on the dimensions and weight of the sheet;
- an automatic system checks the thermal expansion of the manipulator's axes and compensates any variations, guaranteeing extreme positioning precision;
- the tool movement drive with controlled descent reduces cycle times and improves punching quality.

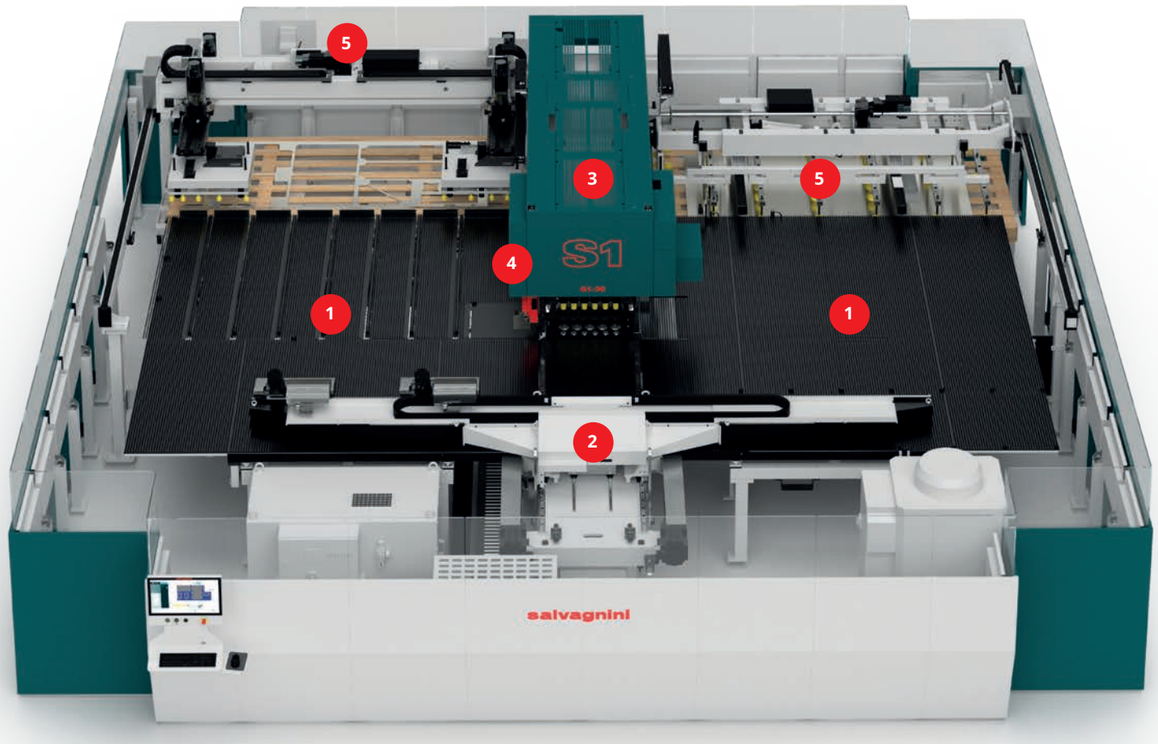
Modular automation

The store-towers and automatic loading/unloading devices **increase the autonomy of the system**, making it possible to select from among various strategies:

- production of single parts;
- production of multiple parts and nests, micro-jointed or separated, with preservation of the scrap and unloading of the skeleton;
- production of multiple parts and separated nests, with destruction of the skeleton.

Designed by Guido Salvagnini in 1978, the multi-press punching machine is natively developed for integration into automatic manufacturing systems.

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Performance greater than the sum of its parts.

1. Worktable
2. Manipulator
3. Multi-press head
4. Laser head
5. Automation

Large, versatile worktables

The worktable, covered with brushes to guarantee noiseless operation, includes a device for centering the incoming sheets. If the detected width is larger than expected, the program adapts the new dimension to the workpiece.

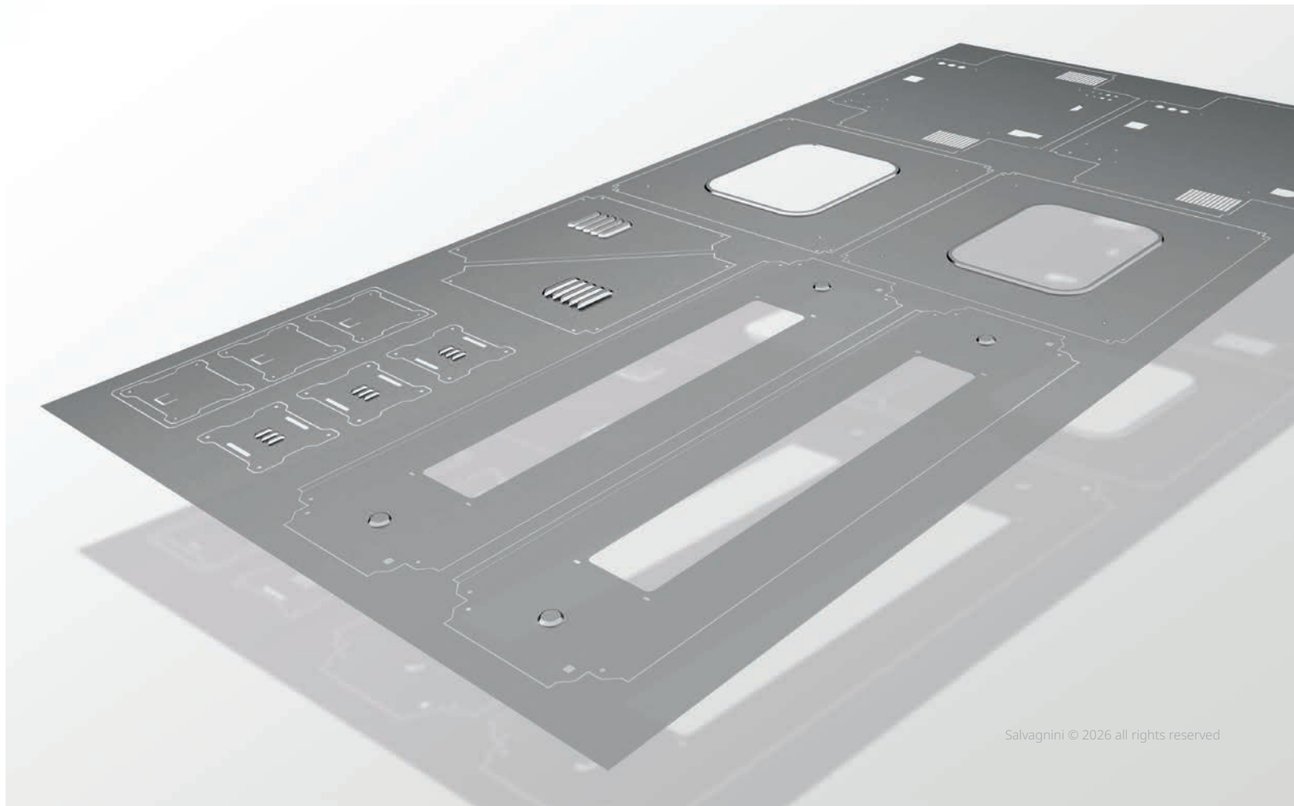
The dimensions are such as to contain the maximum sheet during all machining phases.

Beneath the worktable there is space for one or more bins for unloading good parts, with maximum size 250x250 mm.

An optional conveyor is built into the right or left side of the worktable for incoming blanks or outgoing machined sheets.

TECHNICAL DATA		
Models	**S1.30**	**S1.40**
Maximum sheet dimensions (mm)	3048 x 1524	4064 x 1524
Minimum sheet dimensions (mm)	670 x 400	670 x 400

TECHNICAL DATA		
	Punching	**Laser cutting**
Technology	Multi-press head	Fiber laser
Source power (W)	-	3000-4000
Assist gas	-	Nitrogen, compressed air
Maximum material thickness (mm)		
Aluminum, UTS 265 N/mm²	5.0	5.0
Steel, UTS 410 N/mm²	5.0	5.0
Stainless steel, UTS 660 N/mm²	5.0	5.0
Minimum material thickness (mm)	0.5	0.5



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Multi-press head: tools always available.





The multi-press head has a **die-structure** that houses **up to 59 tools** needed for production. **Each tool is actuated individually and is always available**. The multi-press head guarantees high punch-die alignment precision, and thus machining quality, with reduced cycle times, eliminating in-cycle set-ups and the related waiting times. Tool lubrication is automatic and standard.

The multi-press head offers several advantages:

- **performs both single and multiple punchings;**
- **minimizes the repositioning needed to move the sheet to the tool;**
- **reduces cycle time and tool wear;**
- **improves punching flexibility;**
- **maximizes productivity in nests that require punchings of different shapes and sizes.**

Tool change is simple and extremely quick. To allow the operator to easily replace the dies and punches, the lower part of the head exits automatically from the structure, whereas the upper part is extracted **manually**.



B-TYPE STATIONS



C-TYPE STATIONS



D-TYPE STATIONS

TYPE OF THICK TURRET PUNCHES					
Type station	**Force**	**Diameter**	**Inserts**	**Punching**	**Forming**
B	120 kN	31.7 mm		✔	✔
C	200 kN	50.8 mm		✔	✔
D	200 kN 300kN	88.9 mm	single	✔	✔
		31.7 mm	Multitool 3		✔
		31.7 mm	Multitool 4	✔	
		24.0 mm	Multitool 6	✔	
		18.0 mm	Multitool 10	✔	
		12.7 mm	Multitool 16	✔	

HEAD CONFIGURATION	
Max. number of punching stations	14
Max. number of tools	59
Lower and upper head clearance (mm)	18
Maximum embossing height (mm)	16
Type of thick turret tools:	B, C, D
Number of B-type stations Ø 31.7 mm	6
Number of C-type stations Ø 50.8 mm	5
Number of D-type indexing stations Ø 88.9 mm	3
Options	
Embossing stations with lower cylinder	6 (2B, 2C, 2D)
Electrical tapping unit	installed on the side of the head

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High-performance tools



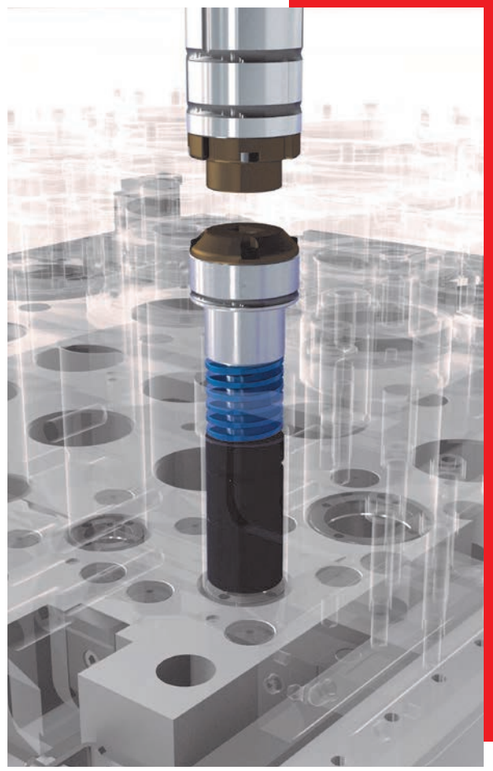
The thick turret tools recommended for S1 are those designed and manufactured by Matrix Tools. On the market for over 40 years, the company covers the whole production chain manufacturing standard, parametric and tailored solutions to meet specific needs, always guaranteeing the highest standards of quality and reliability.

The **punching line** comes from the **Premium series** and offers high performance without compromising on flexibility and simplicity.
Punch-holders B, C and D are equipped with the innovative iEM insert.

Jetform and **Rollform** are the specific forming lines. Ventilation fins, extruded holes, clips, hinges and logos are just some of the forming operations possible with Jetform: unique pieces, designed according to the required forming. On the other hand, the Rollform series quickly performs incisions, ribbing and offsets.

MultiMATRIX is the multitool line that reduces re-tooling times while increasing the punching machine flexibility. Each multitool for punching can hold from 4 to 16 tools with variable diameter, from 12.7 to 31.7 mm. The multitools for forming are available in stations of 3 tools, each with a diameter of 31.7 mm. All the tools available in the multitool are rotating and indexable.

Options



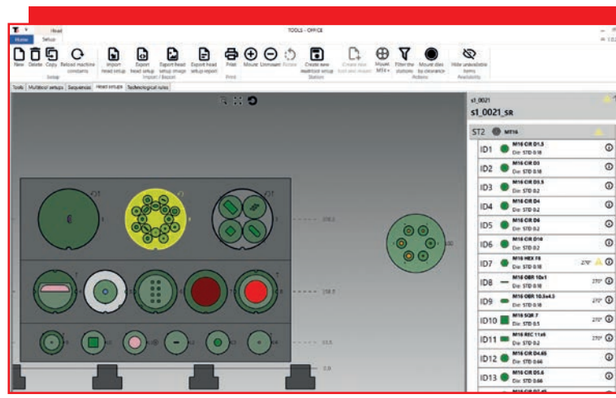
The **lower cylinders** are mounted on hollow cylinders that can also be used as conventional punching stations.

An optional electrical **tapping** unit, which can house up to 6 different tools, can be installed to the side of the operating head. It does not steal any room from the tools as it is positioned outside the head.



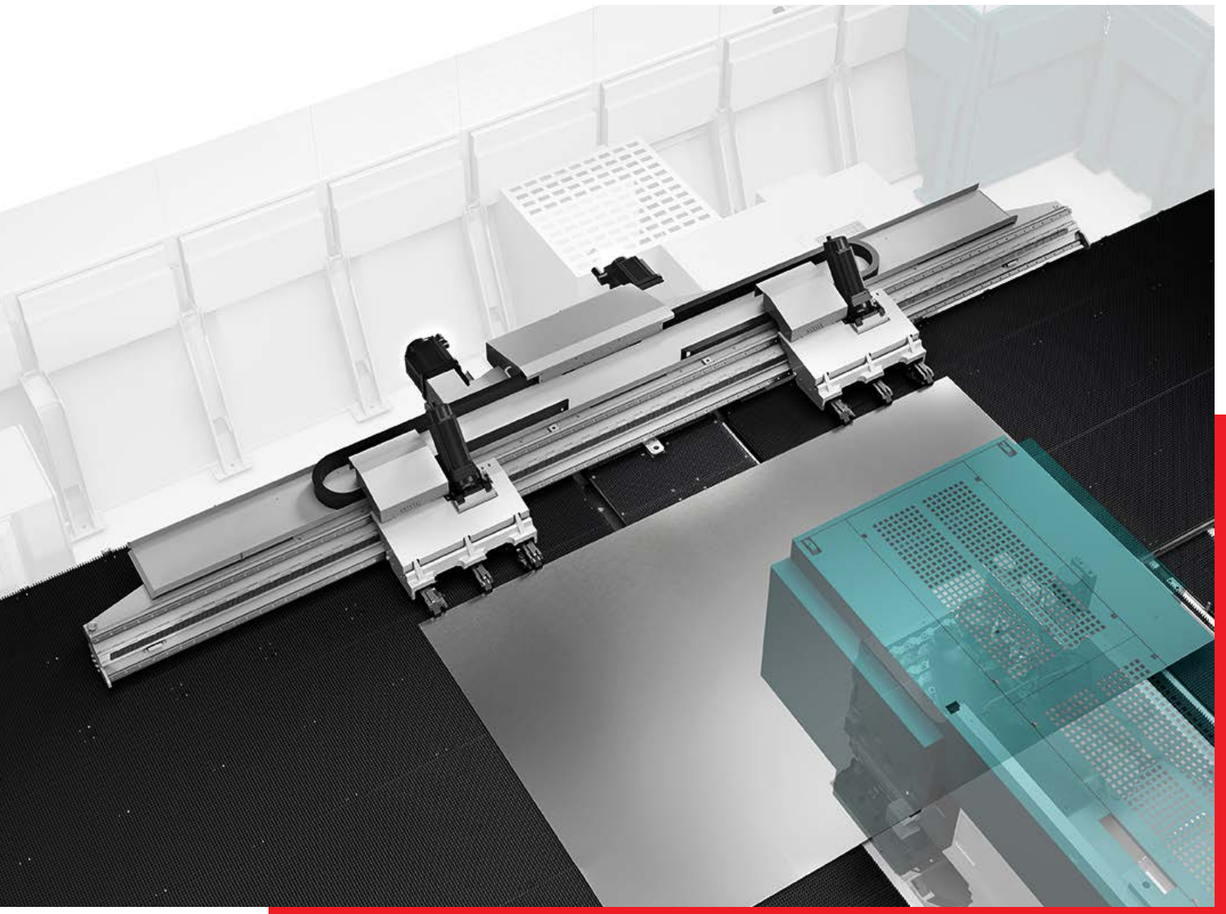
TOOLS

TOOLS is the new Salvagnini software **module for the graphic management of the punching tool database** in punching-shearing centers and punch-laser combi machine. TOOLS defines the tools interactively and graphically, simplifying the insertion of punches of various shapes (including special shapes) and creating set-ups for punching heads, as well as the agile management of the behavior of each punch and die when associated with different materials and thicknesses. It is also used to correct the punch stroke, edit waiting times for forming, use scrap extraction and control the tapping dynamics, where present in the configuration.



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Manipulator: accurate centering and fast processing.

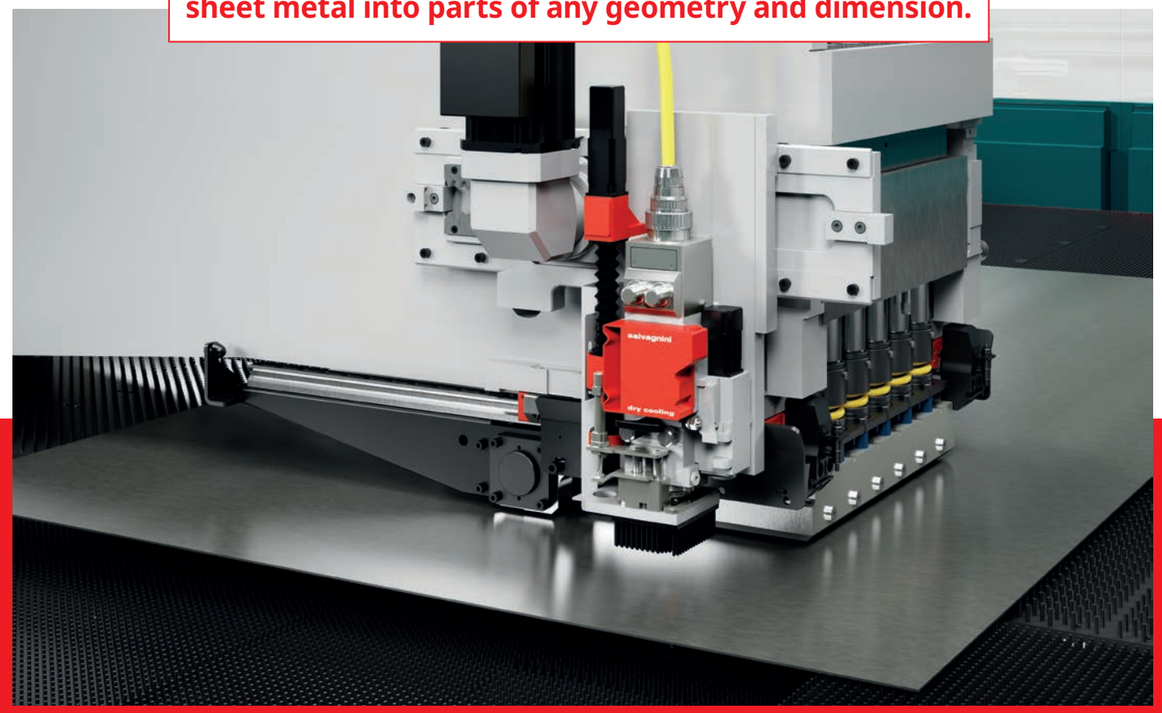


The manipulator with two independent carriages centers the sheet when machining begins, and keeps it clamped during the punching and cutting operations. The carriages can function simultaneously or alternately. Each carriage has 3 independently opening extended grippers, one with variable set-up, to make it possible to machine all **areas of the sheet.** The stroke of the X axis of the two carriages is 3450 mm and permits processing without regripping.

Freedom of choice.

The fiber laser head, positioned to the side of the multi-press head, moves on a carriage along the Y axis with a 290 mm stroke: it performs the cutting operations on the sheet, guaranteeing maximum freedom in cutting geometries and also ensures the final separation of the part.
The available sources, 3000 or 4000 W, make it possible to achieve high linear cutting speeds as well as absolute precision when making irregular contours.

The laser makes it possible to produce and separate the sheet metal into parts of any geometry and dimension.



ACUT

ACUT is standard on the S1 and **allows cutting with compressed air** that is suitably treated. Productivity is similar to cutting with nitrogen, but with much lower costs.

AQM/APM

These are turnkey devices that are complementary to ACUT and connect directly to the factory pneumatic supply or to a compressor upstream of the system.

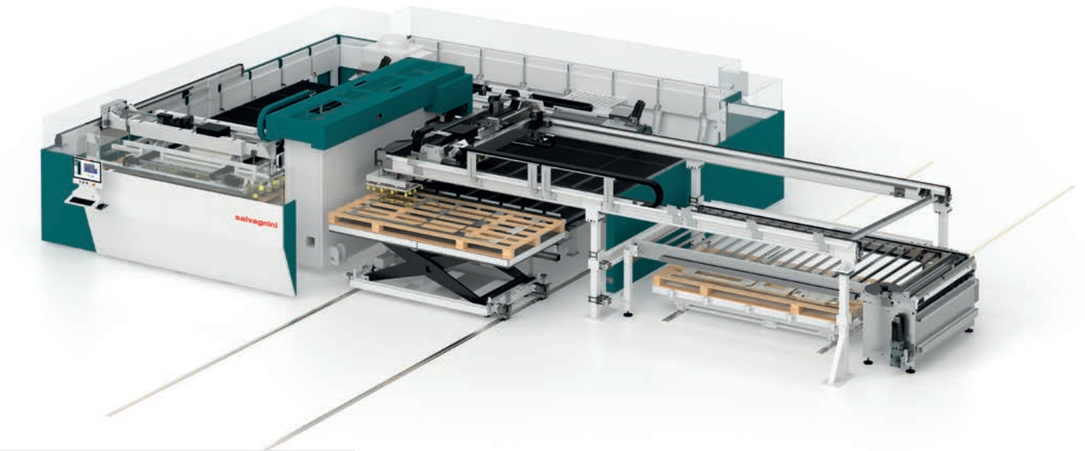
AQM filters the air, while APM ensures the pressure values required for the cutting process.

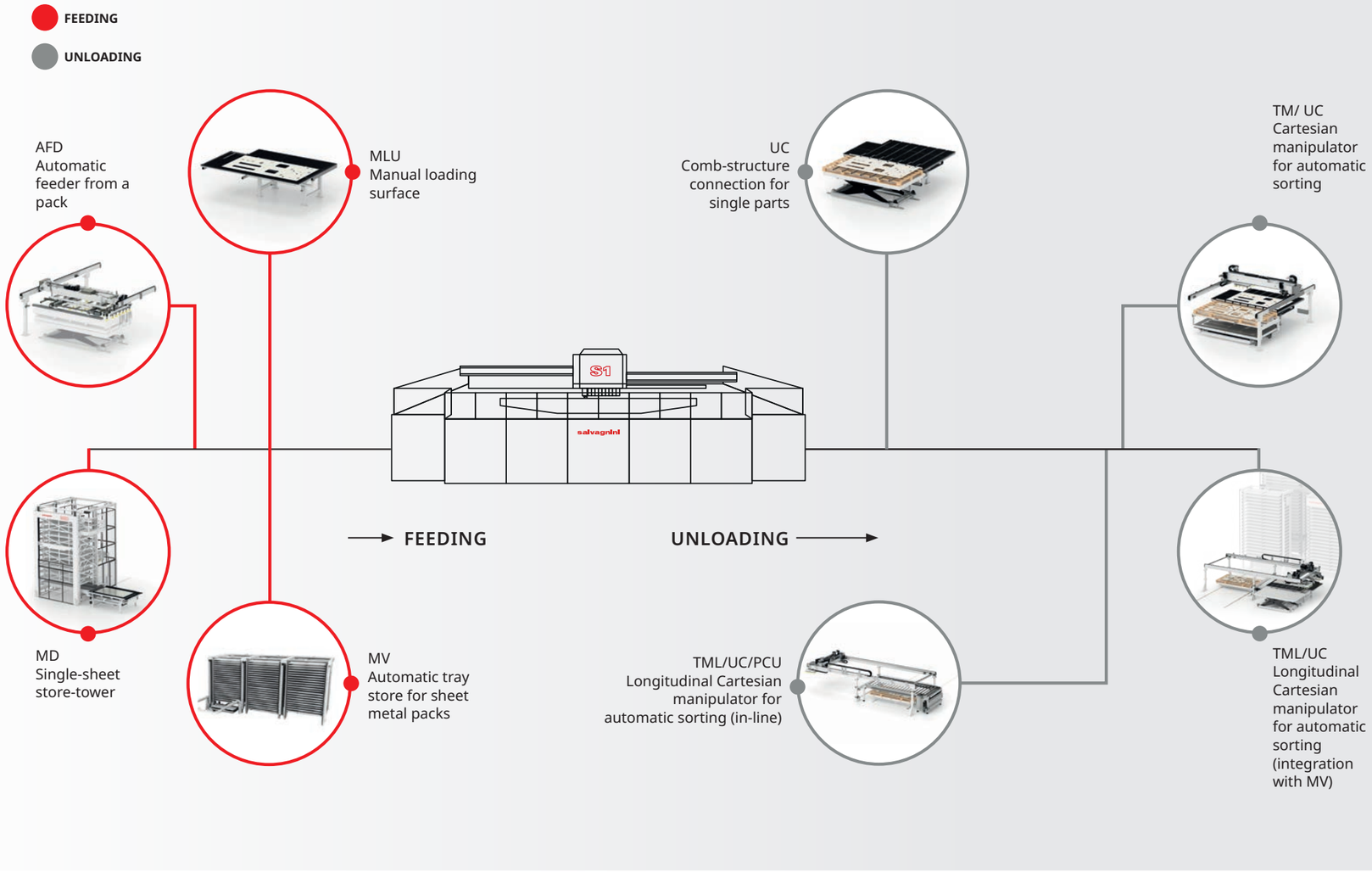
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Modular, scalable automation for regaining efficiency.

Automation plays an increasingly important role: it reduces the risk of loading and unloading becoming bottlenecks, and can help to reduce the impact of labor costs.

The loading/unloading connections meet all automation needs: from stand-alone operation, to automatic integration in flexible cells or automatic factories operating with lights out.





Feeding devices

The S1 can have different types of feeding connections:

- MLU for manual feeding;
- AFD for feeding from a pack in masked time;
- MD for the just-in-time production of kits or batch one. The single-sheet store-tower feeds and centers the sheet metal in masked time, and is available in configurations for 6 to 15 trays;
- MV for the just-in-time production of kits or batch one. The MV automatic multi-tower tray store can feed the S1 from a pack or with single sheets, if integrated with the SMD device.

Unloading devices

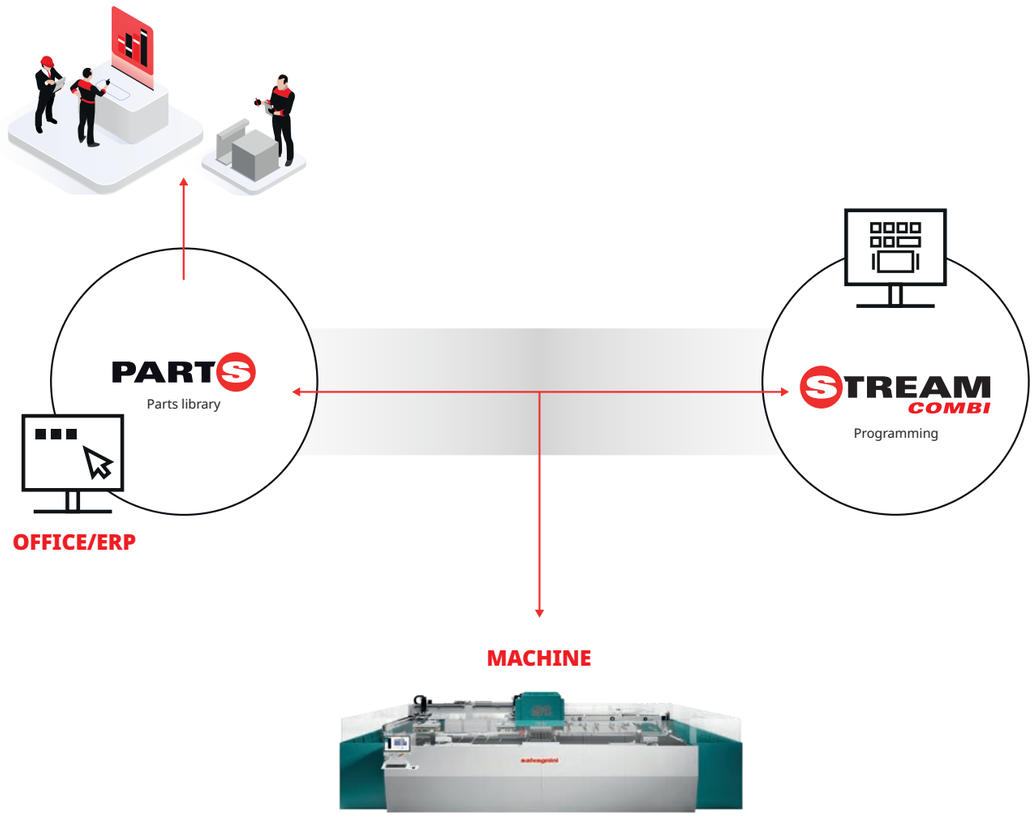
The unloading devices determine the production strategy of the system. The different solutions available also orient the programming strategy. The Salvagnini range includes:

- UC: **automatic comb-structure device** for unloading onto the table once processing is complete; it unloads single parts, entire micro-jointed sheets or skeletons with equal ease.
- TM: **a device with two telescopic Cartesian manipulators** for automatically picking up and stacking parts, without destroying the skeleton, once processing is complete.
- TML: **a longitudinal device with two telescopic Cartesian manipulators** for automatically picking up and stacking parts or transferring them in line, without destroying the skeleton, once processing is complete.
- PCU: integrated connection with the TML downstream of S1 used to **unload** notched parts on a scissor table or **transfer** the parts to the next system using a brush surface.

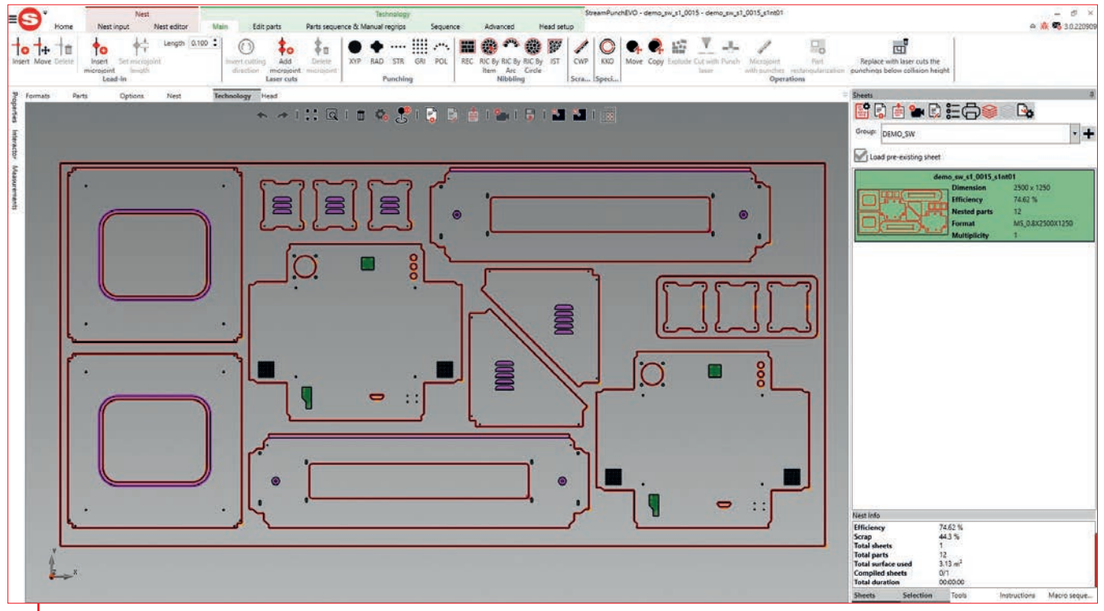
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The software ecosystem.

STREAM, Salvagnini's answer to the modern industrial context, is a programming suite that improves reactivity and reduces costs, operating errors and process inefficiencies.



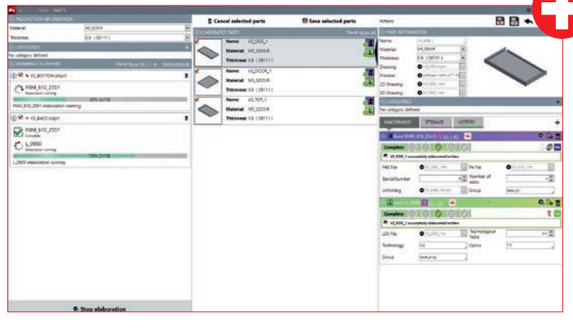
It is the integrated environment for **managing all activities in the office and on the shop floor;** it constitutes a single **point of access for all technologies,** from cutting to bending; it is capable of meeting all planning, programming, production, management, control and optimization needs throughout the production process.



STREAM.COMBI

STREAM.COMBI is the programming software for generating punching and cutting programs. It includes the following functions:

- **CAM**: creates or edits the 2D drawing of the part, and automatically defines the punches for creating the geometries, punching and laser cutting sequences and sheet metal handling operations.
- **Nesting**: automatically, semi-automatically or manually optimizes the sheets for production, starting from a production list.
- **OPTI**: optimizes the use of the metal sheet, increasing process efficiency and minimizing waste.



PARTS

PARTS is the software used to manage the whole database of products and parts:

- it classifies the elements according to common or customized categories;
- it defines the production flows for each part to be machined;
- it is integrated with the CAM software.

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Coordinate your factory with OPS in real time.



When adopted, advanced digital technologies can implement and manage complex, integrated, highly automated high-performance systems, and can help to develop simple solutions that require no structural changes to the production layout, making the world of smart manufacturing much more accessible.

In the production equation, OPS, the modular Salvagnini process software, acts as a central coordinator, managing and distributing information among all the environments to make the process truly efficient.

OPS receives the production list in real time from the factory ERP/MRP and supports programming activities, defines the rules and algorithms required to **automate the process, adding intelligence to the system.**

- **Can make independent decisions,** according to a production logic – or according to a mix of multiple production logics.
- **Used to exchange information** between different technologies, such as the components of an FSJ cell (Flexible Smart Job shop).
- **Organizes production,** defining priorities, managing any order changes or cancellations and checking the availability of the raw materials or semi-finished parts needed for production.
- **Automatically creates punching and cutting nests,** grouping parts by material, thickness, production and job orders.
- **Provides feedback to the factory ERP,** updating material availability and state of production in real time, part by part.
- **Reduces or eliminates any redundant activities** with low added value.
- **Integrates labeling, traceability** and stock management solutions up and downstream of the punching and laser cutting activities, minimizing error risk and waiting times.

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Transforming values into value.

A modular proposal developed across 3 service levels, designed respectively to:

Act

manage everyday needs

Plan

provide preventive maintenance and planning services

Grow

maximize the use and performance of the system

Proximity, reliability and **orientation to the future** are values that have always been found in the wide range of services available for responding to contemporary challenges.

LINKS

LINKS (ACT) is the IoT solution that improves the overall effectiveness of Salvagnini systems, using the latest business intelligence technologies. LINKS is used to monitor the machine performance and access the production data, logbooks, performance KPIs, telemetry and parameter monitoring, through the Condition Monitoring process.

SupportYou

SupportYou (ACT) is a subscription-based service that manages updates and provides support for using and programming STREAM and all the applications in the office station.

Close2You

Close2You report (PLAN) uses LINKS data to offer an overview of the state of health of a system, suggesting the required maintenance interventions according to their criticality and proposing agreed interventions to minimize the risk of malfunctions.

Rethinks

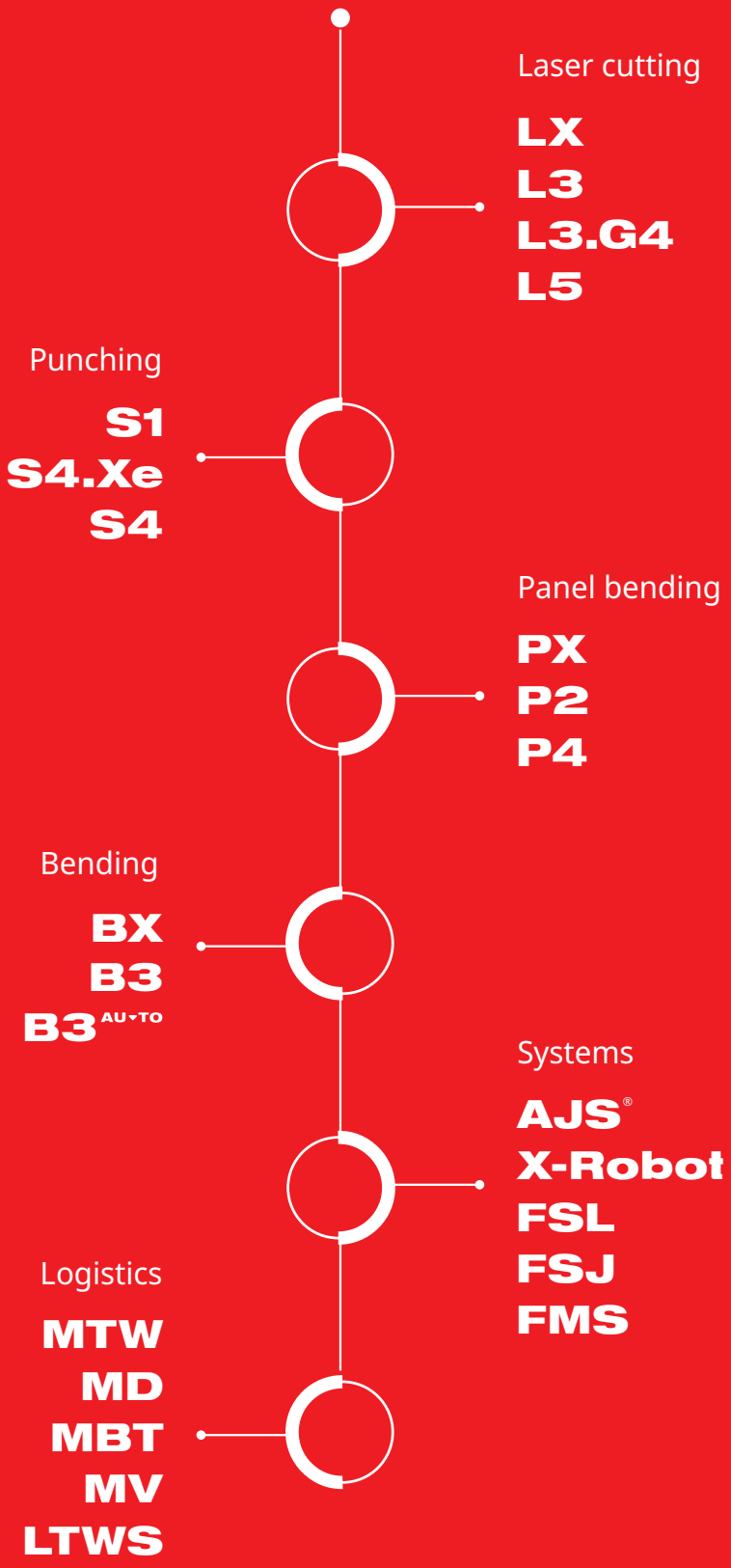
Rethinks (GROW) is the ideal solution for anyone wishing to optimize their production process and improve quality and efficiency, reducing the number of work steps, material usage and costs.

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