

**P1**



*The productive, flexible bending solution.*

**salvagnini**

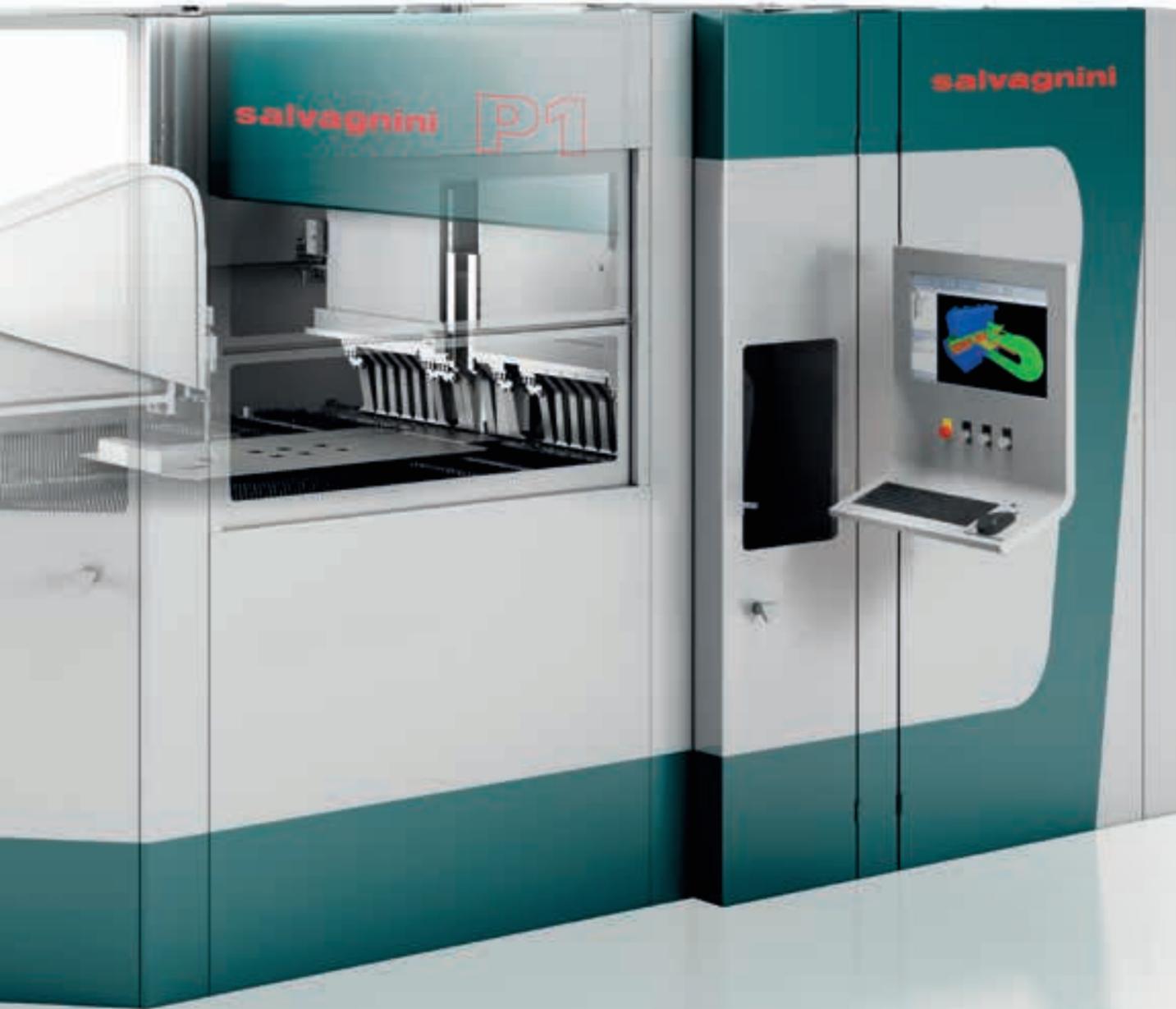
## The productive, flexible bending solution.

*The panel bender is a smart manufacturing tool, invented by Guido Salvagnini in 1977, designed for flexible and automatic production of panels starting from punched blanks without retooling or operator intervention.*



*Developed to fit in 8 m<sup>2</sup>, designed to produce with just 3 kW and featuring high bending dynamics, the P1 is the flexible solution for the production of parts and panels, offered as an alternative to traditional bending in terms of investment and manufacturing feasibility.*

# The P1 changes the shape of panel bending.



## **High dynamics and broader feasibility**

With the bending unit's patented kinematics, the P1 bends in less than 2 sec. an impressive variety of items, including parts that are not feasible with other panel bender models.

## **Automatic production cycle**

The machine does not require manual intervention during bending cycle and the operator's only task is to position the sheet on the worktable and remove the manufactured item once bending is complete.

## **Wide and diversified production**

Compared to traditional bending, for the same geometric characteristics, the P1 produces a greater number of parts of different materials and thicknesses with universal tools, including kit and batch-one production, without any machine downtime.

## **Sustainable consumption and small footprint**

The P1 fits in 8 m<sup>2</sup> and produces with just 3 kW thanks to direct drives technology and to the optimized design, which is the result of FEM analyses and in-depth market research.



MAC 2.0



Patented kinematics



Low consumption



Zero waste

# Flexible automation.

## Universal bending tools

The P1 uses universal bending tools that **do not require set-up times** and adapt automatically to panel geometry; this becomes a plus for operator safety and ensures productivity and flexibility. Bending on each side of the sheet is achieved thanks to the **controlled interpolated movements** of the two oscillating blades that make the bends, while the sheet is handled automatically.



### Down bend - NEGATIVE



### Up bend - POSITIVE



### Flattened bend - WITH BLADE

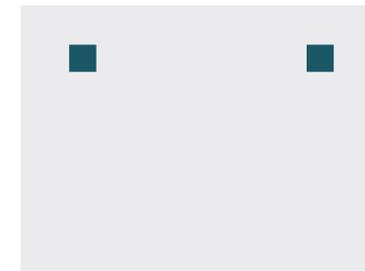


WATCH THE VIDEO

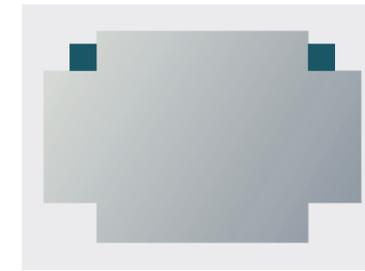
*Universal bending tool: zero set-up and wide versatility.*

## One single and controlled centering process

Finished panels are **always of the right size** thanks to the controlled reference stops. **The sheet is centered just once on the notches:** this reduces cycle time and possible errors in accuracy, which are all absorbed by the first bend.



Positioning



Referencing



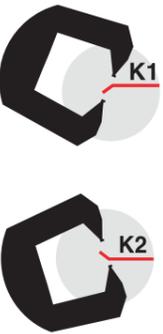
Centering

## Accurate controlled handling

The sheet is gripped, rotated and handled so as to ensure unbeatable **accuracy, repeatability and finished product quality**, thanks to the electric manipulator.

## Exclusive kinematics

The very small masses involved and the P1 optimized dimensions allow the bladeholder to reach a greater degree of freedom in its movements, and positions from where it can even make bends that would not be feasible with other panel benders.



### PRESS

*The press is the heart of the panel bender. Its sturdy frame holds:*

- the **bladeholder**, which holds upper and lower blades, the two tools featuring interpolated controlled movement and responsible for bending;
- the **counterblade**, which helps clamp the sheet during the cycle;
- the **blankholder**, one of the distinguishing features of the Salvagnini panel bender, which works simultaneously with the blades and counterblade to bend and hold the sheet.



### MANUAL BLANKHOLDER

*MLA is the blankholder that can be adjusted to suit the dimensions of the panel to be bent. Two symmetrical side segments enable quick automatic expansion or contraction. Blankholder length is adjusted in 5 mm steps.*

### AUTOMATIC BLANKHOLDER

*As an alternative to MLA, the P1 can be equipped with an ABA blankholder that automatically adjusts itself to the dimensions of the panel to be bent, eliminating the need for tool change. The profile of the tools allows inward bends up to 45 mm. Blankholder length is adjusted in 5 mm steps.*

### AUTOMATIC MANIPULATOR

*The sheet is handled, gripped and rotated by the manipulator, which handles all sheet movements throughout the processing cycle quickly and entirely automatically. The operator's only task is to position the sheet on the feeding device, where applicable, and remove the manufactured item once bending is complete.*

## CLA tools

CLA auxiliary blades are modular in length, come in both positive and negative versions (for making upward or downward tabs) and engage and disengage quickly and automatically between the blank and the bending blades. They are used to make bends that are shorter than the side to be bent.



# Sustainable adaptive technology.

## MAC 2.0: guaranteed quality, each and every time.

Bending technology, machine type and material are the three factors that determine the result of the bending process.

The proprietary bending formula that controls movements, FEM deflection analysis and the numerous innovative solutions built into the machine eliminate any effects linked to the machine factor.

Then there is the MAC 2.0 adaptive technology which enables the machine to compensate in-cycle for any variations in material quality.

An innovative control procedure means that even the slightest variations in the material's mechanical properties are detected and, where necessary, compensated for in-cycle by the movements of the bending unit.

**As a result, part quality remains consistent, even with variations in material, resulting in zero waste and optimized production times, for maximum productivity.**

MAC 2.0 also reduces costs per part as the Salvagnini panel bender delivers an accurate bending result regardless of material quality.

-  **Zero waste**
-  **Quality**
-  **High productivity**



## Fully electric solution

The use of the most innovative technologies available on the market has allowed the P1 to be optimized down to the finest detail, including structure weight, machining precision, installation and consumption, also making it fully electric.

-  **100% electric**
-  **3kW consumption**

## Panel bender 4.0, ideal for flexible manufacturing cells.

The P1 makes a successful addition to FMC flexible manufacturing cells and is an ideal solution for companies looking for efficient and flexible solutions to meet their variable and diversified production needs. The intelligent integration of the P1 panel bender with a Salvagnini press brake results in a flexible manufacturing cell, FlexCell: the proprietary OPS-FlexCell software running the cell can actually optimize the production flow as it exploits the advantages of each technology, maximizing the cell's efficiency based on the current production process.

-  **4.0 Connectivity**
-  **Ideal for FlexCell**
-  **OPS-FlexCell manages and optimizes the production flow**



TECHNICAL SPECIFICATIONS	P1
Maximum length of incoming sheet (mm)	1575
Maximum width of incoming sheet (mm)	1000
Maximum diagonal that can be rotated (mm)	1600
Maximum bending length (mm)	1250
Maximum bending height (mm)	127
Minimum thickness (mm)	0.4
Maximum thickness and bending angle steel, UTS 410 N/mm <sup>2</sup> (mm)	1.60 (±90°) / 1.30 (±130°)
Maximum thickness and bending angle stainless steel, UTS 660 N/mm <sup>2</sup> (mm)	1.30 (±90°) / 1.10 (±120°)
Maximum thickness and bending angle aluminium, UTS 265 N/mm <sup>2</sup> (mm)	1.60 (±90°) / 1.30 (±130°)
Average consumption (kW)	3.0
Noise level (dB)	64
Weight (kg)	7800

Values refer to a standard machine. Salvagnini reserves the right to modify this data without prior notice.

# CHECKLIST

## Catering to all requirements - both today's and tomorrow's.

### Flexibility

*Wide and diversified production.*

*Bending tool with interpolated movement for producing a great variety of items that were not possible on a panel bender before.*

### Productivity

*Bending in less than 2 seconds.*

*Minimum cycle times thanks to the patented kinematics and controlled movements of the tools.*

### Sustainable

*AAA machine.*

*Use of electric drives resulting in average consumption not exceeding 3 kW.*

### Optimized

*Cutting-edge architecture.*

*Shape and content fine-tuned with powerful FEM analyses and simulations to pack universally affordable exceptional capabilities into less than 8m<sup>2</sup>.*

### Quality

*Adaptive technology.*

*MAC 2.0 adapts bending to the material in real time.*

### Safety

*Risk-free results.*

*The operator's only job is to load and unload, thanks to the automatic manipulator, eliminating the need for in-process handling.*

## New bending horizons.

### Lighting



### Steel furniture



### Catering and restaurant industries



### Electrical enclosures





*Simply our trademark*

P1

P2**lean**

P4**lean**

P4