

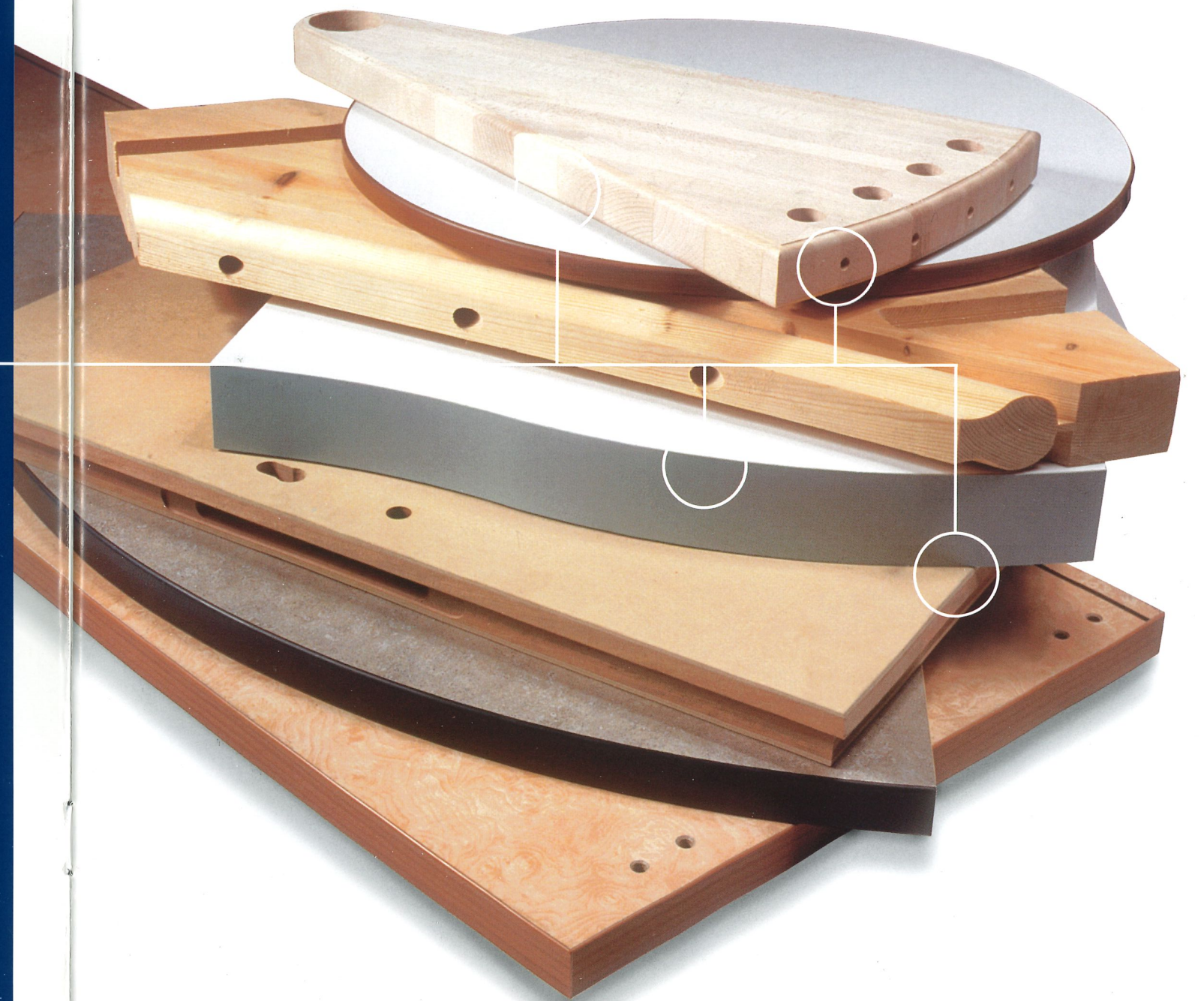
Multifunction work centre  
for drilling, routing and  
edge banding

## Planet MX



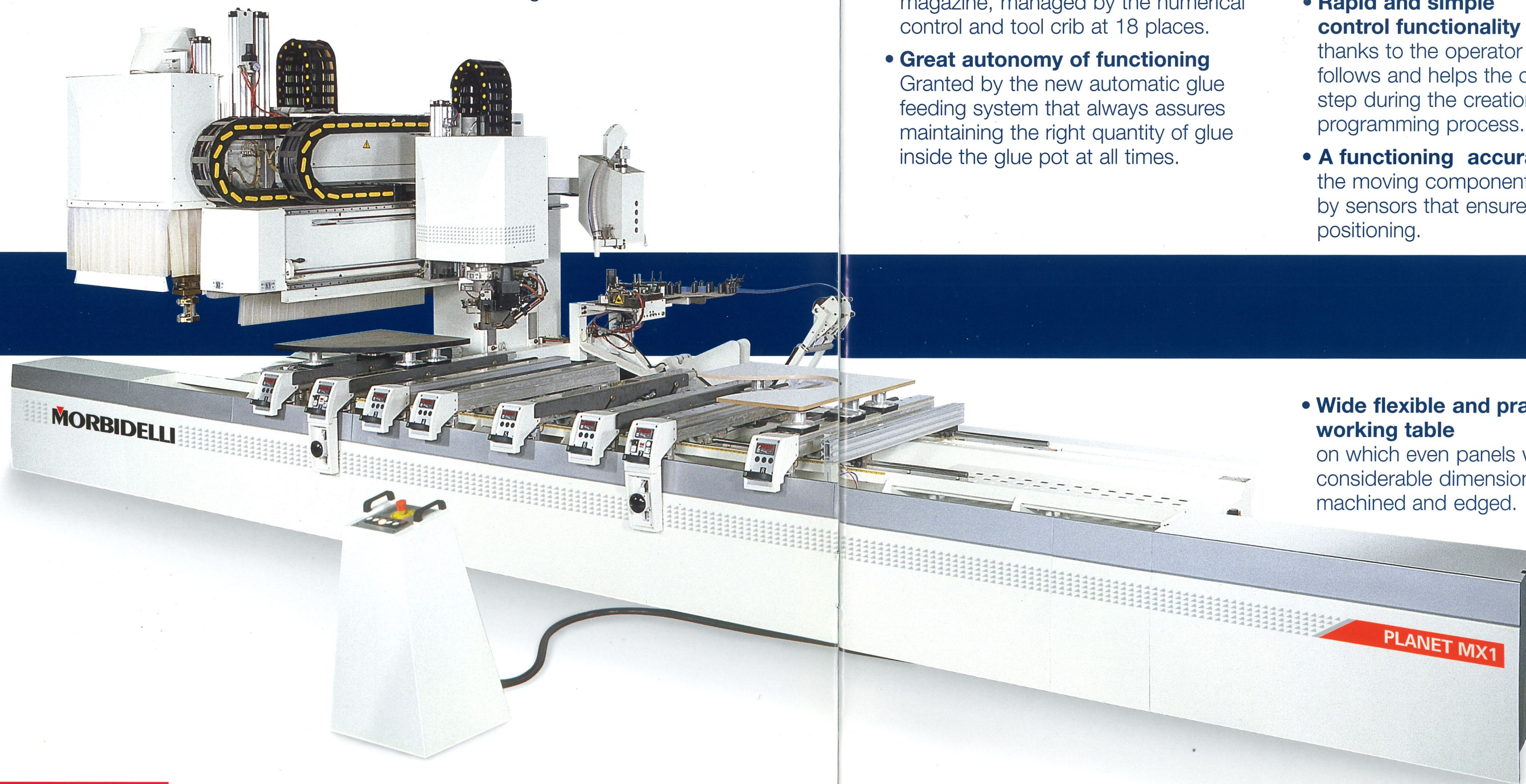
**MORBIDELLI**

if aiming at these results...



... this is the choice that will help  
your company grow

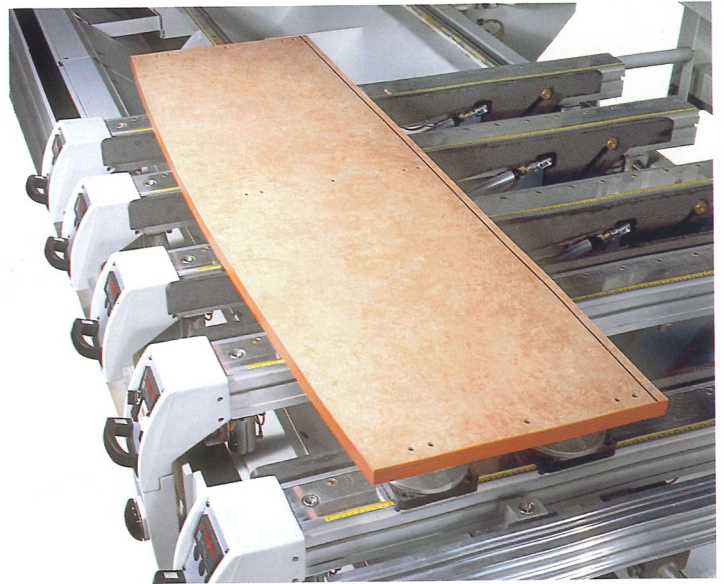
- **A great number of production capabilities** thanks to the high edging capacity and Morbidelli's expertise in the working centers.



# Planet MX

- **Incomparable edgebanding Quality** due to the application of glue directly onto the panel.
- **Higher flexibility** with the 6 position roll – carrying magazine, managed by the numerical control and tool crib at 18 places.
- **Great autonomy of functioning** Granted by the new automatic glue feeding system that always assures maintaining the right quantity of glue inside the glue pot at all times.
- **Maximum precision and efficient production** they are the result of the high rigidity and solid structure combined with the traverse speed of 107 m/min.
- **Rapid and simple control functionality** thanks to the operator interface that follows and helps the operator step by step during the creation of the whole programming process.
- **A functioning accuracy guarantee** the moving components are monitored by sensors that ensure the correct positioning.
- **Wide flexible and practical working table** on which even panels with considerable dimensions can be machined and edged.

# A versatility choice with value for money investment

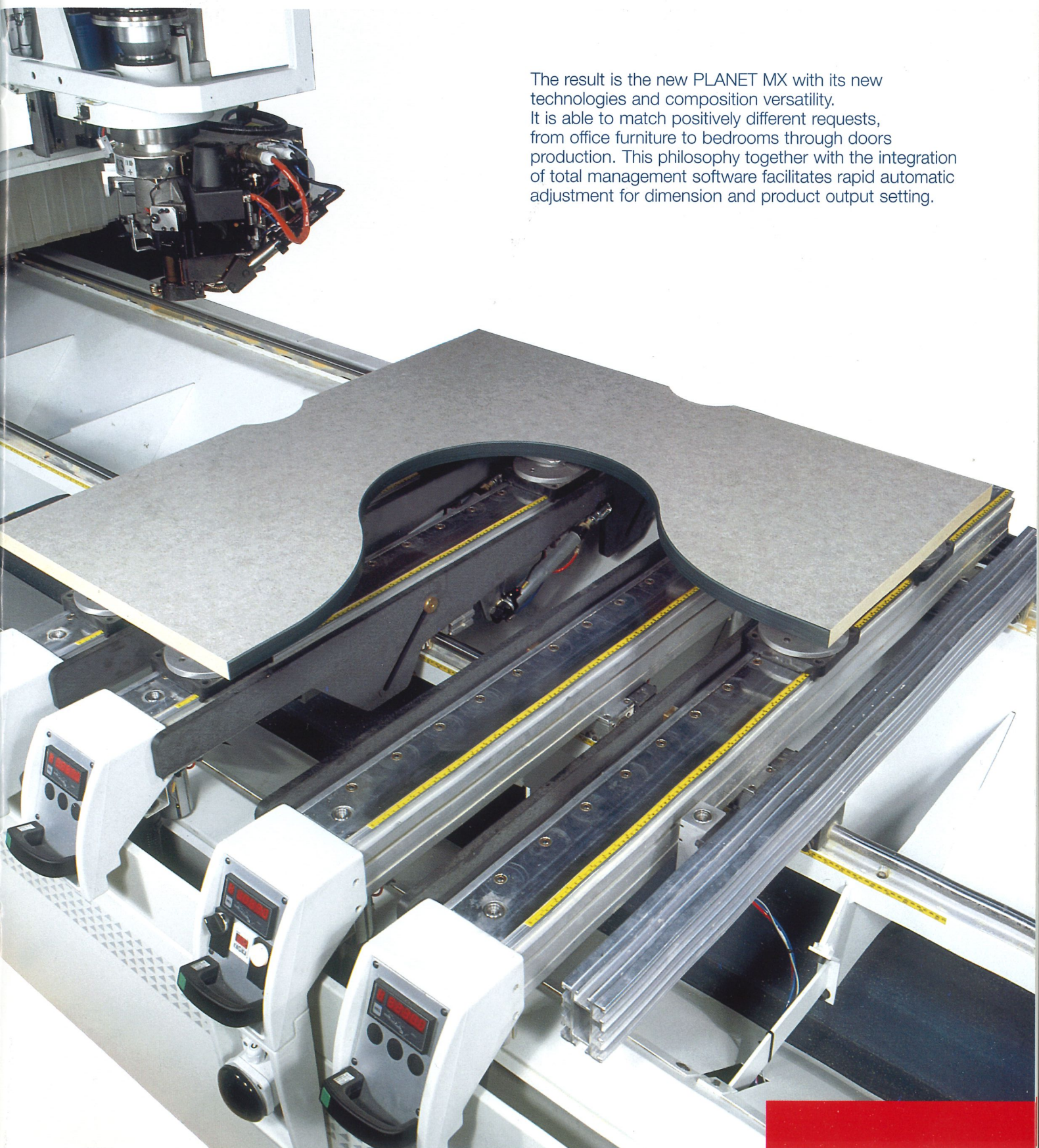


The increasing application of novelty from the market has determined in the last years the extension of the ranges and the consequent increasing specialization of the productive departments inside the firms. These ones have been forced to make investments more and more diversified and targeted, that often, they have not been amortized fully, since they were not available alternatives of machinery that offered the necessary versatility jointed to the inexpensiveness of the use. For this, Morbidelli always considerate of evolution within the world markets, has decided to invest in the development of a new product that can combines three basic elements:

1. The different production experiences that almost all enterprises have to face, on terms of wideness of standard range and on customisation preferences.
2. The swiftness during the mix of production, that till today has represented a weakness point for many enterprises, forcing them to limit as much as possible their production mix, with negative impact on finished stock and cash flow.
3. A reasonable investment and an immediate advantage into the analysis of costs/benefits with a positive impact on constantly changing production demands of a versatile high output machining unit.

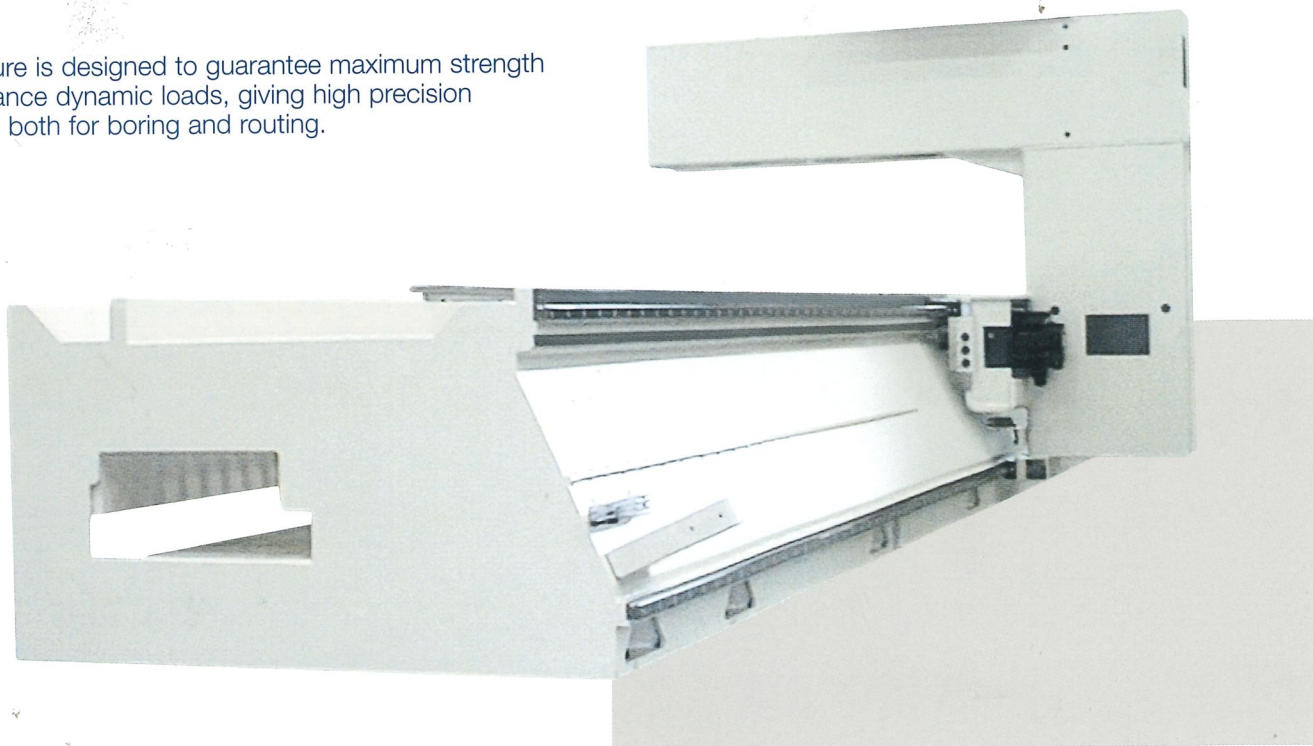
# Planet MX

The result is the new PLANET MX with its new technologies and composition versatility. It is able to match positively different requests, from office furniture to bedrooms through doors production. This philosophy together with the integration of total management software facilitates rapid automatic adjustment for dimension and product output setting.



# A balance and rigidity choice

The structure is designed to guarantee maximum strength and to balance dynamic loads, giving high precision machining, both for boring and routing.

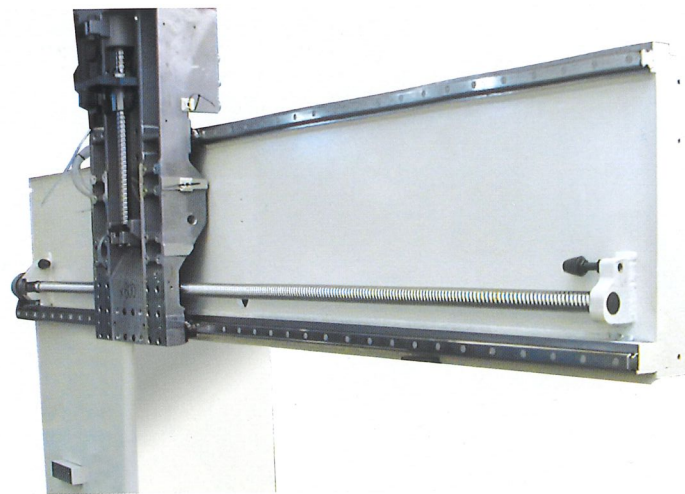


The self-supporting steel base with a triangular cross-section is a **solid and balanced support** for the machine's moving parts. The strengthening ribs and the large supporting base are designed and built to guarantee lasting machine stability and precision under the most severe working conditions.

The mobile machining unit consists of a **single-piece unit with one beam**. Its parts are **electric arc-welded**, for maximum **torsional rigidity year after year**.

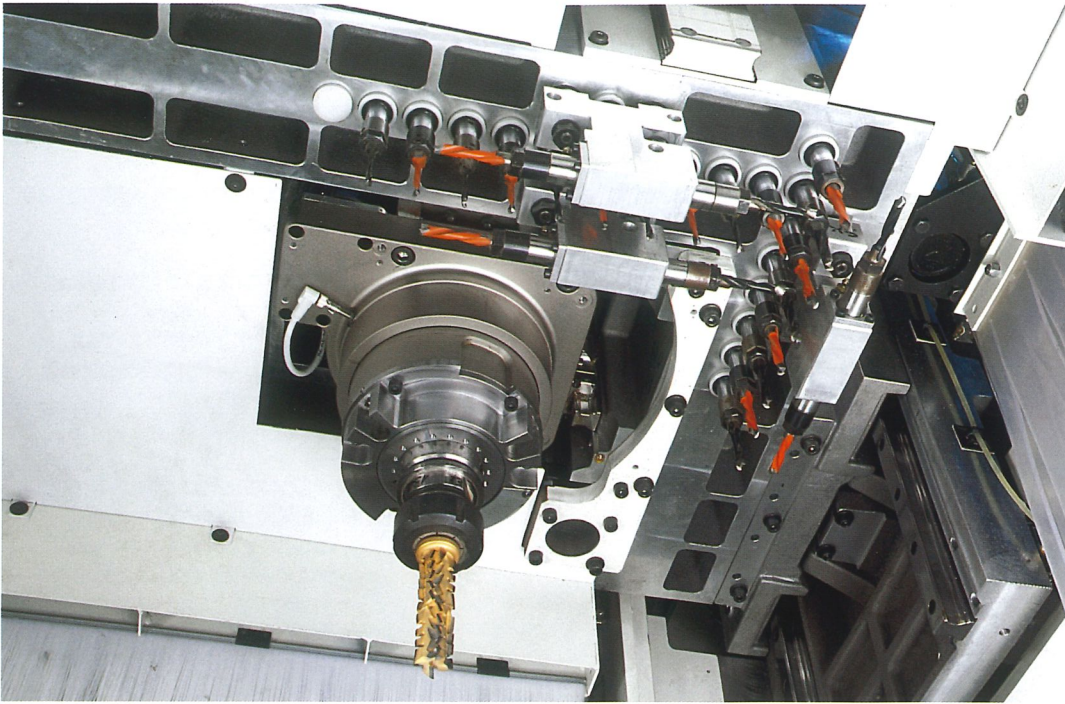


The axes movement is driven by Brushless motors on recirculating ball screws and racks with automatic error compensation. In this way it is possible to have **acceleration and deceleration up to 5 m/sec<sup>2</sup>** with an absolute precision of position. The axes movement does not require a particular maintenance, this because it can be lubricated automatically without any operator intervention.

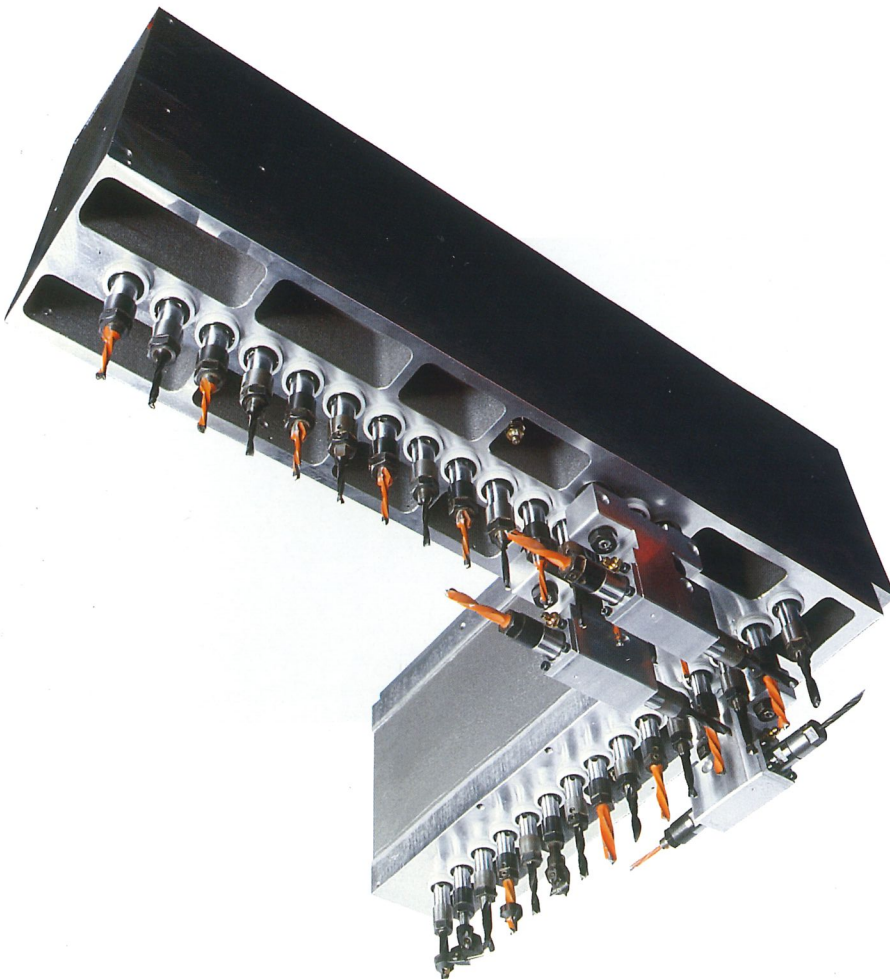


The mobile units move on **prismatic guides**, offset relative to their vertical axis to allow equal balancing of loads during machining.

## A drilling performance choice

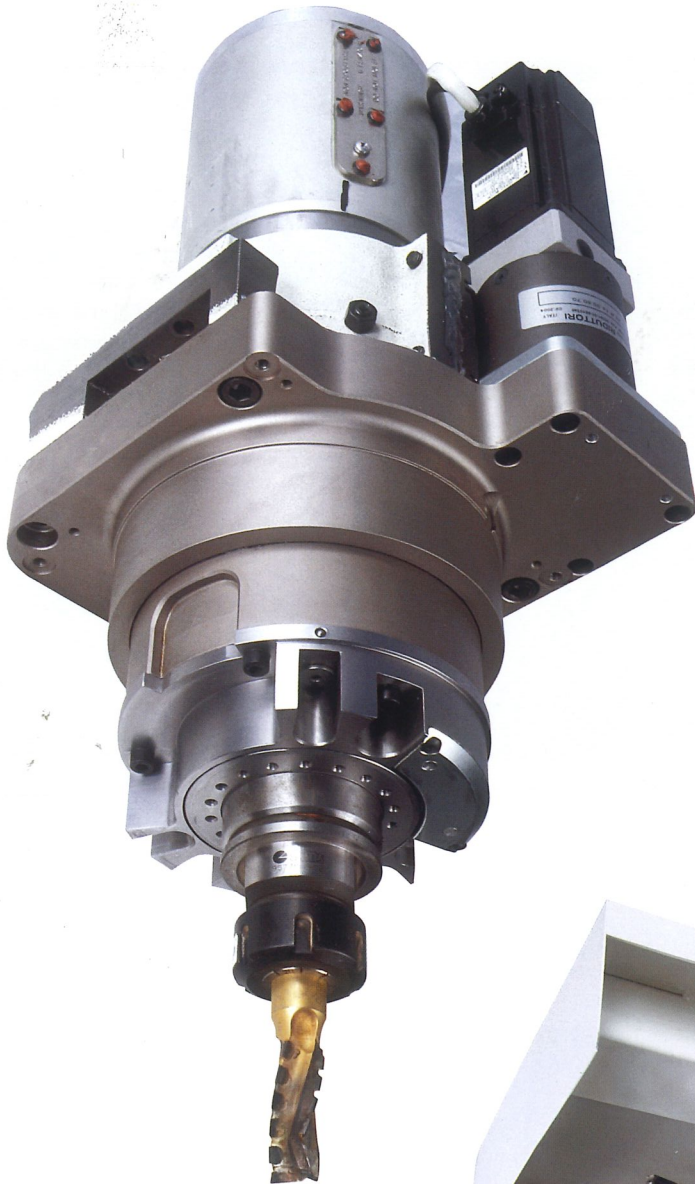


The experience and technology Morbidelli has developed over the years has allowed for the production of a multifunction unit with unmatched performance able to carry out with maximum precision and speed the functions of drilling, trimming, routing, end trimming of the edge and finishing of the edge. The standard machine is equipped with many features. There is a whole range of optional possibilities that enable the customer to specify a machine with multiple capabilities.



A unit with 18/30 independent vertical spindles and 6 horizontal, ensures high drilling capabilities. The bit rotation of up to **6000 rpm** allows for high speed drilling with the resulting **time saving** and with the highest quality.

## A routing power choice

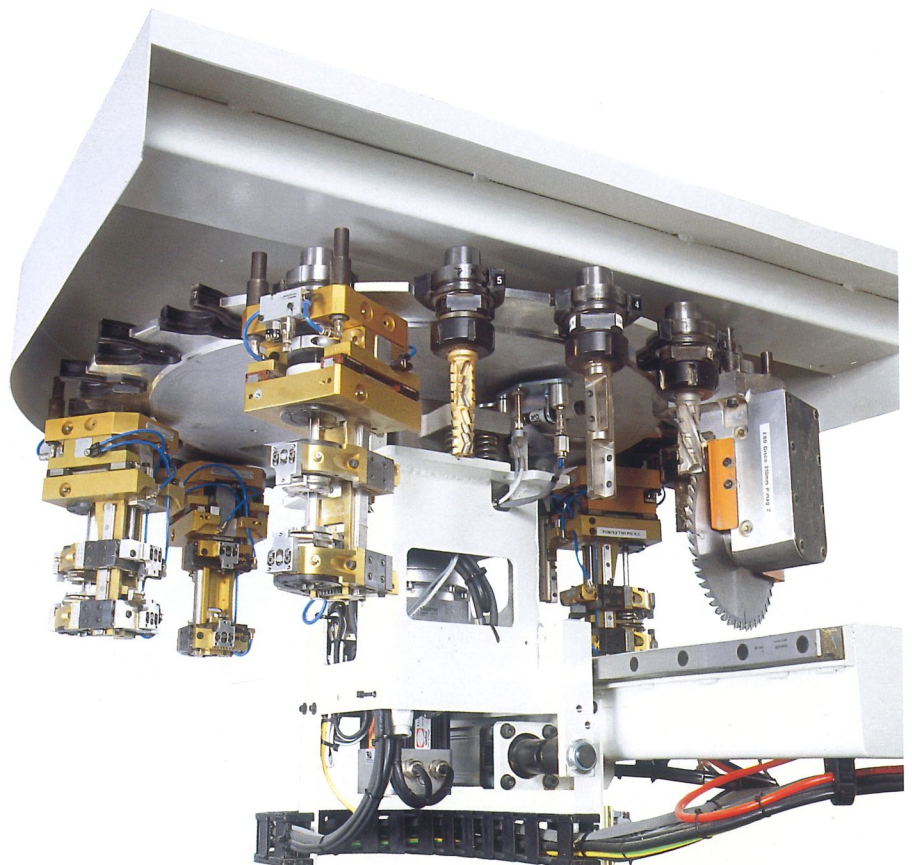


The 11 or 15 KW electrospindle (15 or 20 HP) with HSK63 attachment fitted on a slide independent of the drilling unit and equipped with a 400 mm vertical stroke, presents the following features:

- **motor** with constant power output from 9000 to 18000 rpm (24000 for 15KW).
- **Electronic control** of the rotation speed by program, with **inverter** starting from 1500 rpm.
- Selection of the left/right rotation from the program
- Liquid cooling system

The electrospindle is combined with **Vector 360°**, a numerically controlled rotating continuous axis to use aggregates for end trimming, trim and scrape the edge and glue, independently of the panel's trimming.

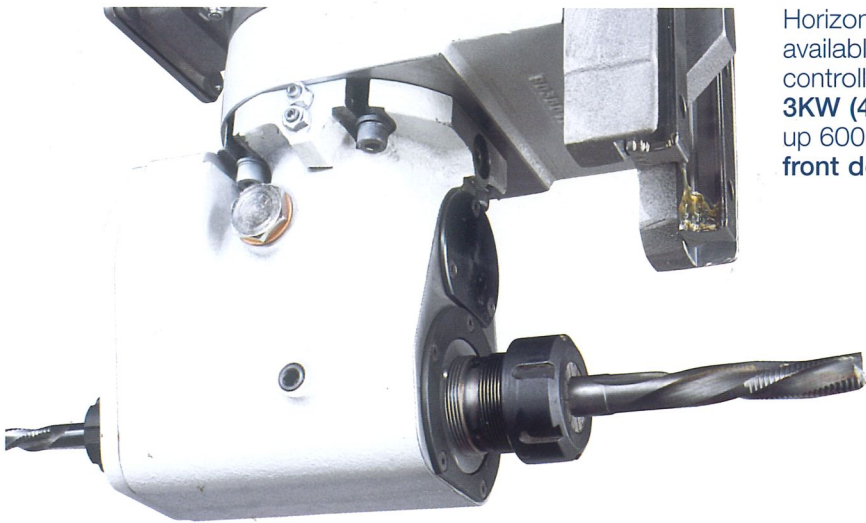
An 18 position tool magazine is fitted directly onto the mobile support, and allows rapid automatic tool changing **while the edgbanding unit is operating**. The tool magazine is designed with flexibility in mind. It can accept both large and small diameter tools therefore eliminating the need for unnecessary tool change operations. The whole device glides on prismatic guides assuring complete precision and reliability in tool changing operations.



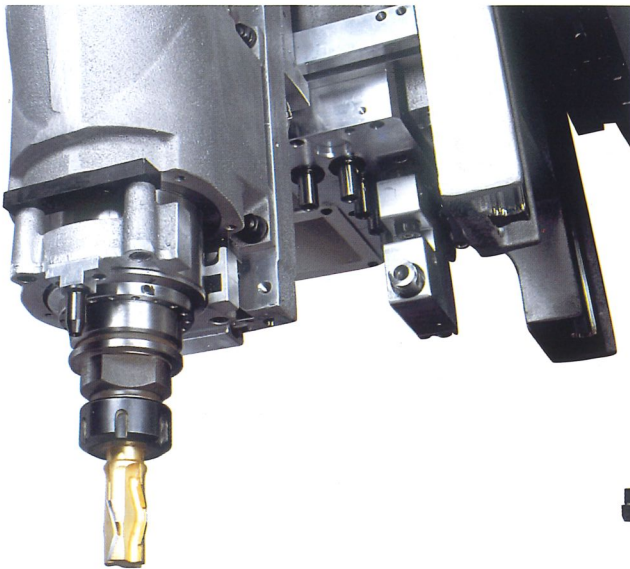


# A flexibility choice

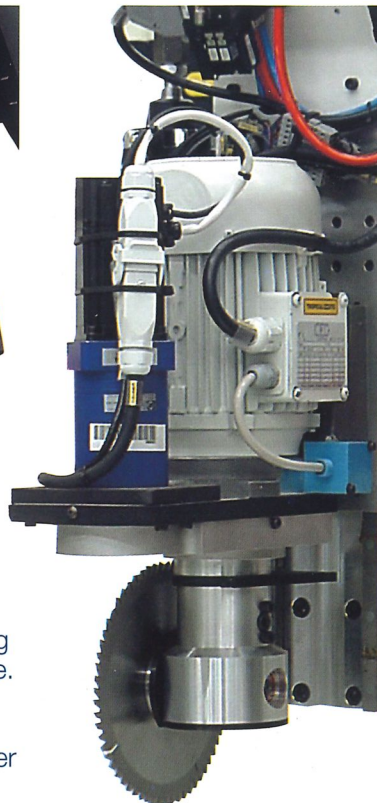
The machine's **highly flexible configuration** allows you to select dedicated independent units for different machining operations. These units are recommended for **heavy duty and continuous machining**, which subject machining units to high levels of stress. The solution using specific units for given work is the only one that offers units with **maximum power and reliability**.



Horizontal routing unit with one or two outlets; available both in a fixed position and with numerically controlled 360° automatic rotation. **3KW (4HP) independent motor** with speed rotation up 6000 to 18000 rpm. **Ideal for lock recesses for doors, front doors and retractable table supports.**



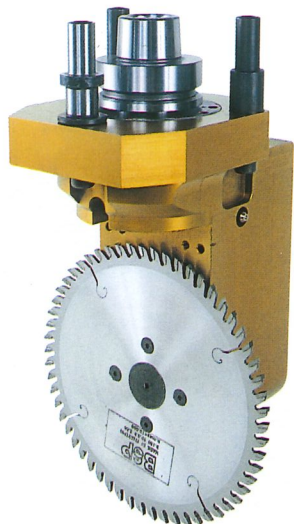
**6,6 KW (9HP) Vertical router unit, with HSK63 attachment**, installed on a unit independent from the boring unit. It has a strong rigid structure and a wide vertical stroke. This is a big advantage in all applications that require the use of the same tool in different steps during the execution of a program, removing in this way a large number of tool change cycles with considerable time savings and granting a quicker return of the investment.



Routing unit with fixed disc or numerically controlled 0-90° and 360° automatic rotation for blades with 160/200 mm diameter. **Recommended for end trimming and squaring pieces and profiles made of any material.**

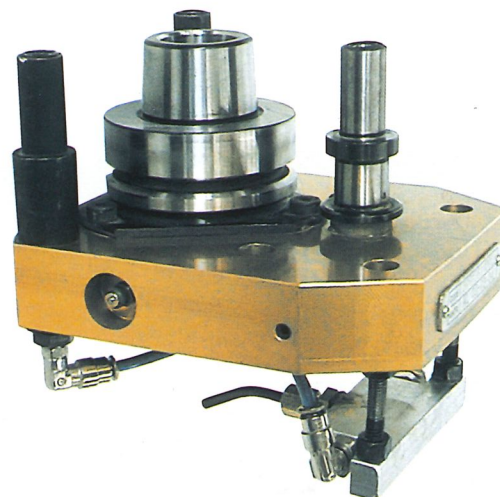
# A flexibility choice

The huge availability of aggregates allows for the most suitable solution to be found for the completion of the most complex manufacturing.



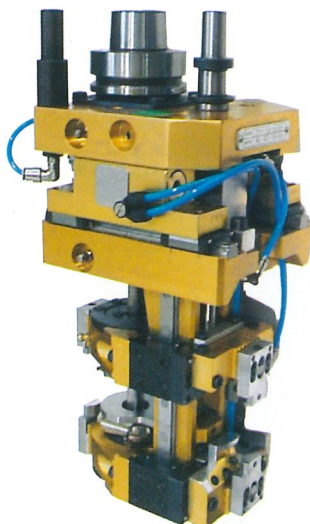
## End trimmer unit

End trimming aggregate equipped with a 210 mm diameter blade and 9000 rpm rotating speed.



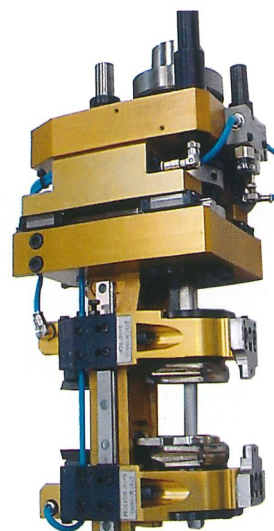
## Blower unit

Aggregate for cleaning the profile to be edged with a high pressure air jet to obtain a dust free surface to ensure perfect edging adherence.



## Multifunction combined head

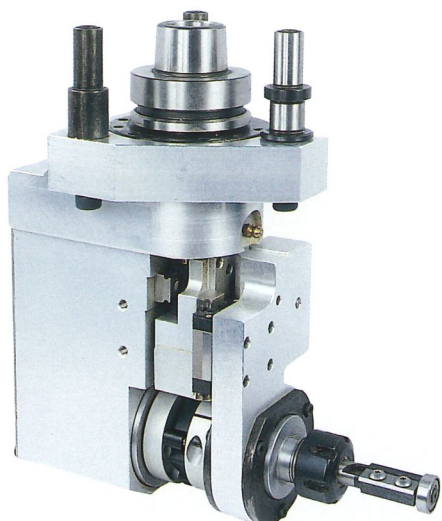
This aggregate has a double function, e.g. edge scraper on one side and edge trimming on the other side. This allows to save the time for tool change operation which would be necessary with two separate tools. The tools automatically adjust themselves according to the different thickness of the panels from **16 mm to 60 mm**.



## Multifunction combined head

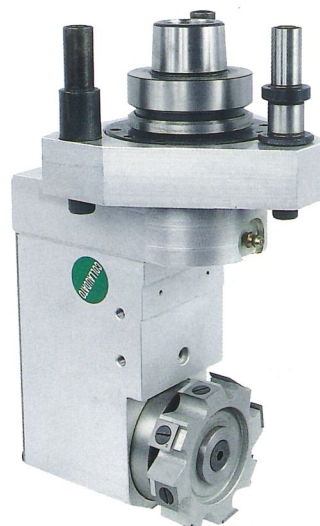
Aggregate with double function, to execute edge scraper and glue scraper functions in shorter time. Equipped with a part pneumatically mobile in Z through the numerical control to fit the different thickness of the panels from 16 mm to 60 mm.

# Planet MX



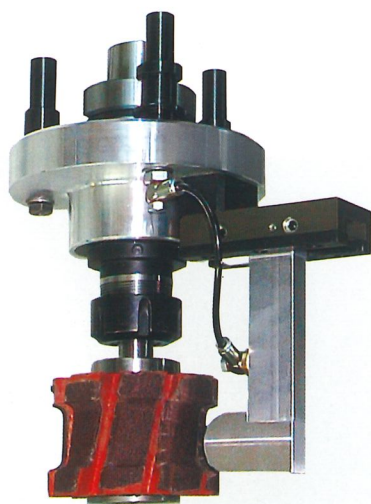
## Post-forming head

Aggregate for edge trimming of panels manufactured in post-forming. The end of the tool is fitted with a copier to perfectly recreate the profile of the panel and obtain an extremely precise trimming.



## Sharp corners milling head

Aggregate to execute sharp internal corners.



## Sanding wad head

A dedicated blowing unit allows to always maintain a clean wad and an unchanged operative ability in every situation.



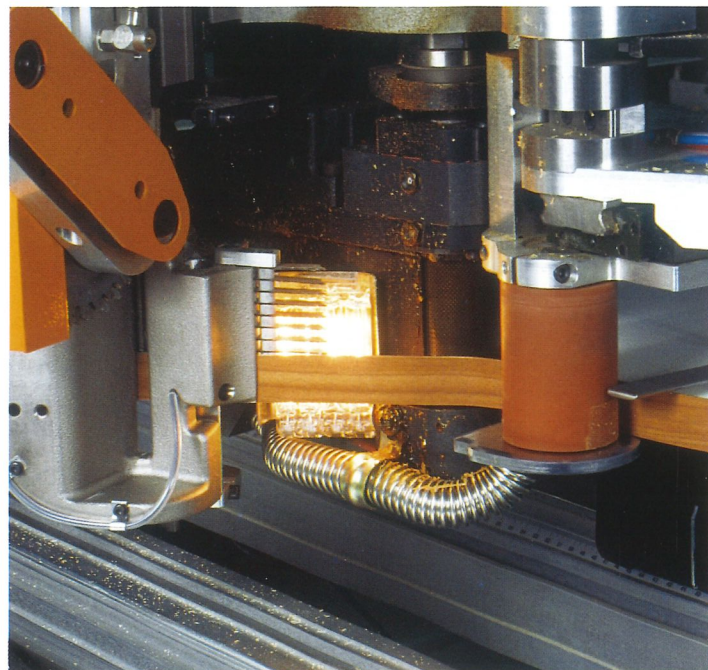
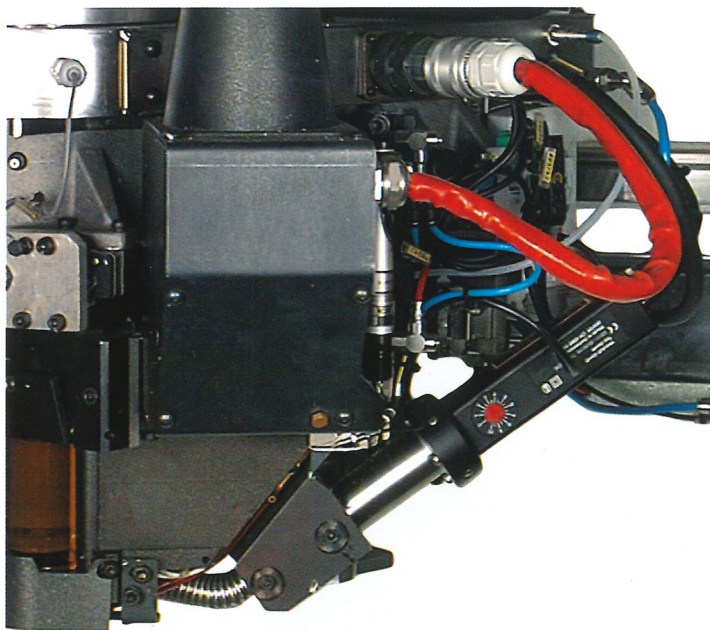
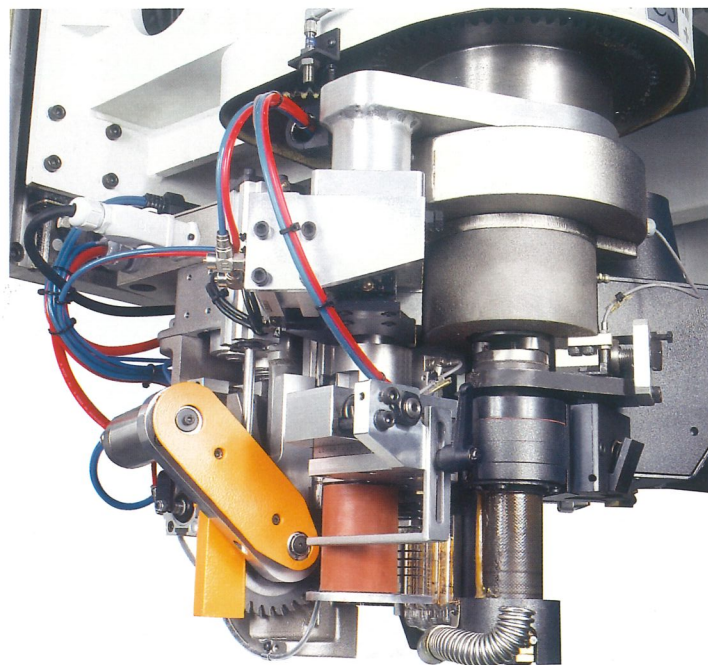
## Routing head on lower face

Routing head to work on the lower face of the panel, with Weldon blocking. The possibility to work on the lower face of the panel (max 105 mm from the edge), instead of to overturn the panel, reduces both production times and panel movement risk.

# An edge banding quality choice

The **edging unit** has been produced following the most innovative technological design and construction criteria. Morbidelli has patented a gluing unit with a device that allows the glue to be applied directly on the profile of the panel, obtaining:

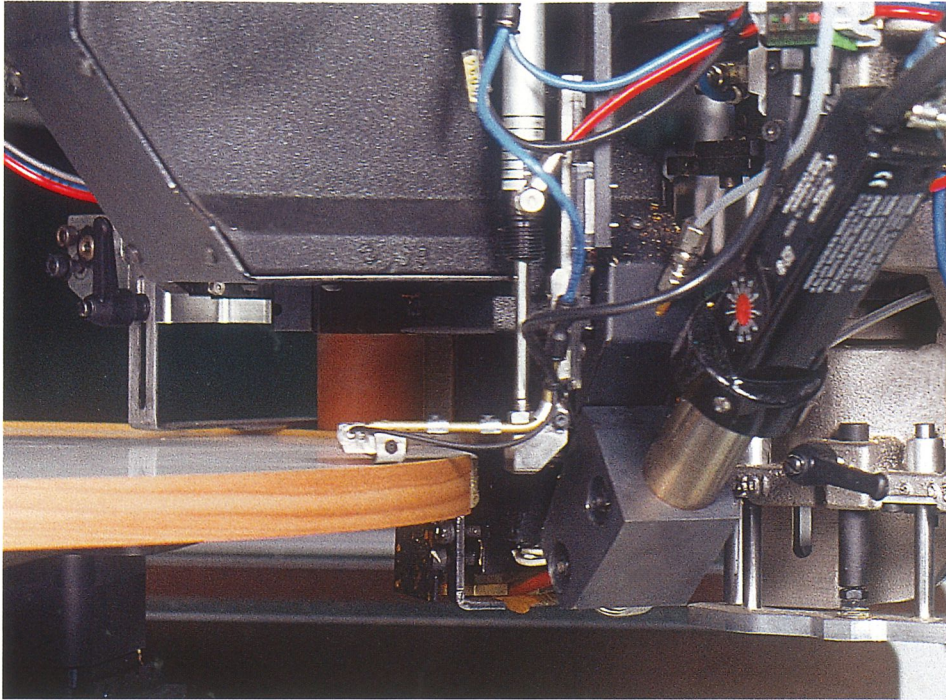
- **superior hold of the edging** glued on the panel as more glue is applied per cm<sup>2</sup> in this way
- **strong reduction of the effect of external environment factors**, such as temperature, in respect of the solutions that apply the glue on the edge as a greater quantity of material tends to always maintain its temperature for a longer amount of time.



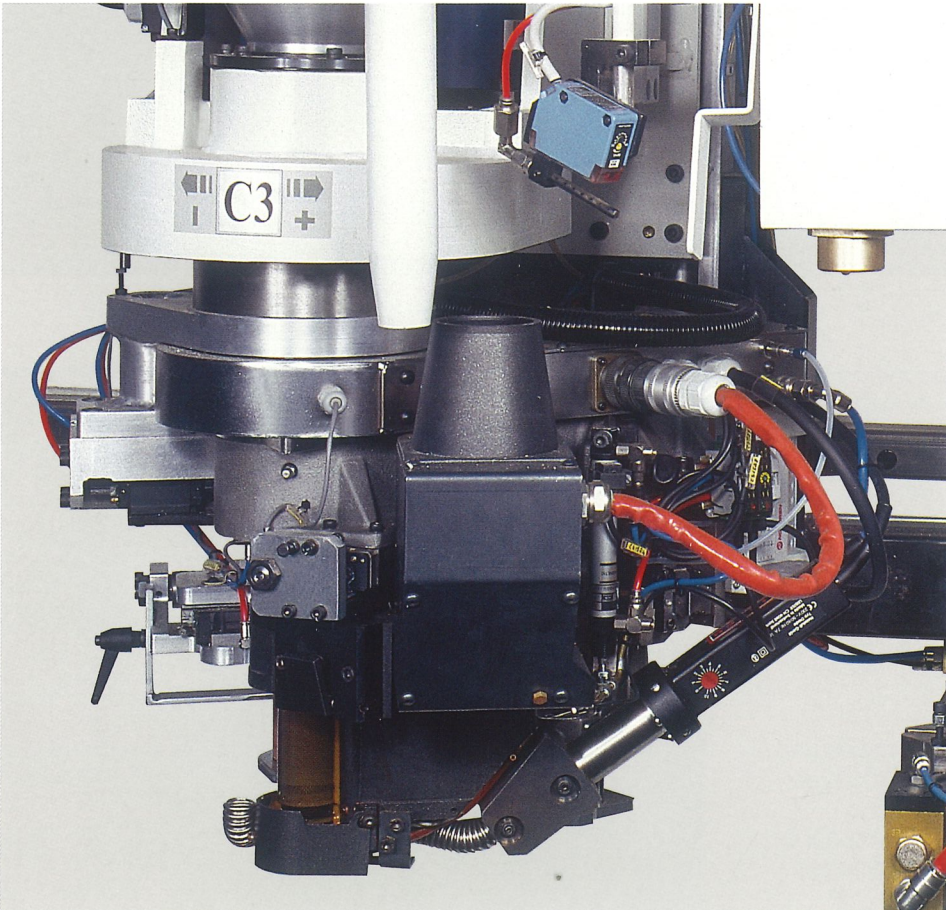
The pressure rollers **managed by the numerical control** ensure in the various edging phases, the correct pressure for perfect gluing of the edge even on complex angles and profiles. The presence of an **heating device allows to maintain the glue temperature applied** on the panel even during the execution of tight radiuses.

For so called "thickness" edging the adherence to the profile of the panel is ensured with the **softening** of the edge itself; a **thermal lamp** integrated in the gluing unit **heats the edge internally** without damaging the external part and therefore without requiring further operations to "revive" the edge itself.

# A precision choice



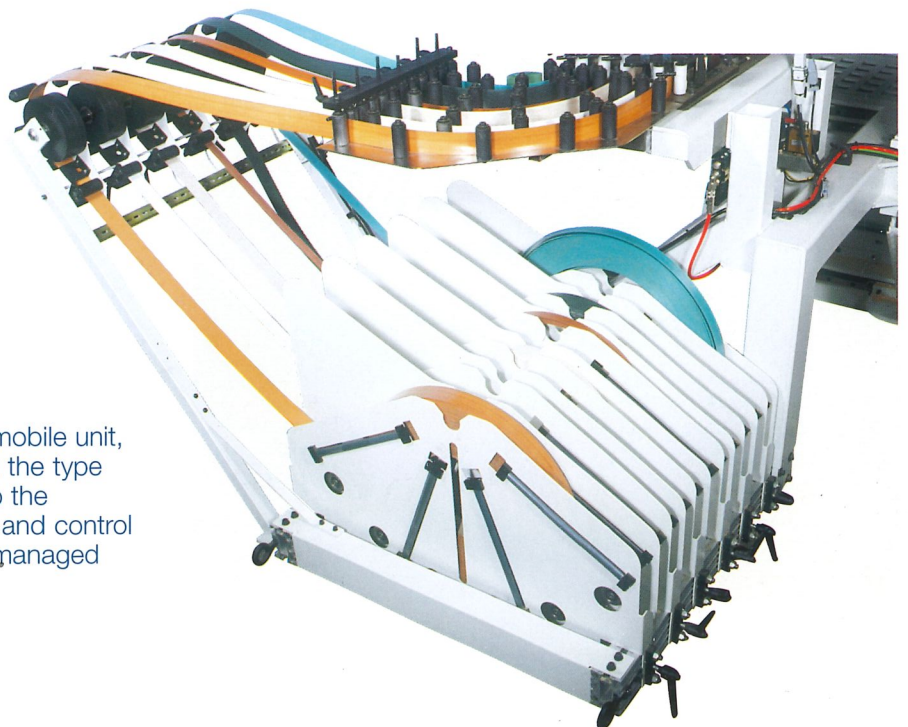
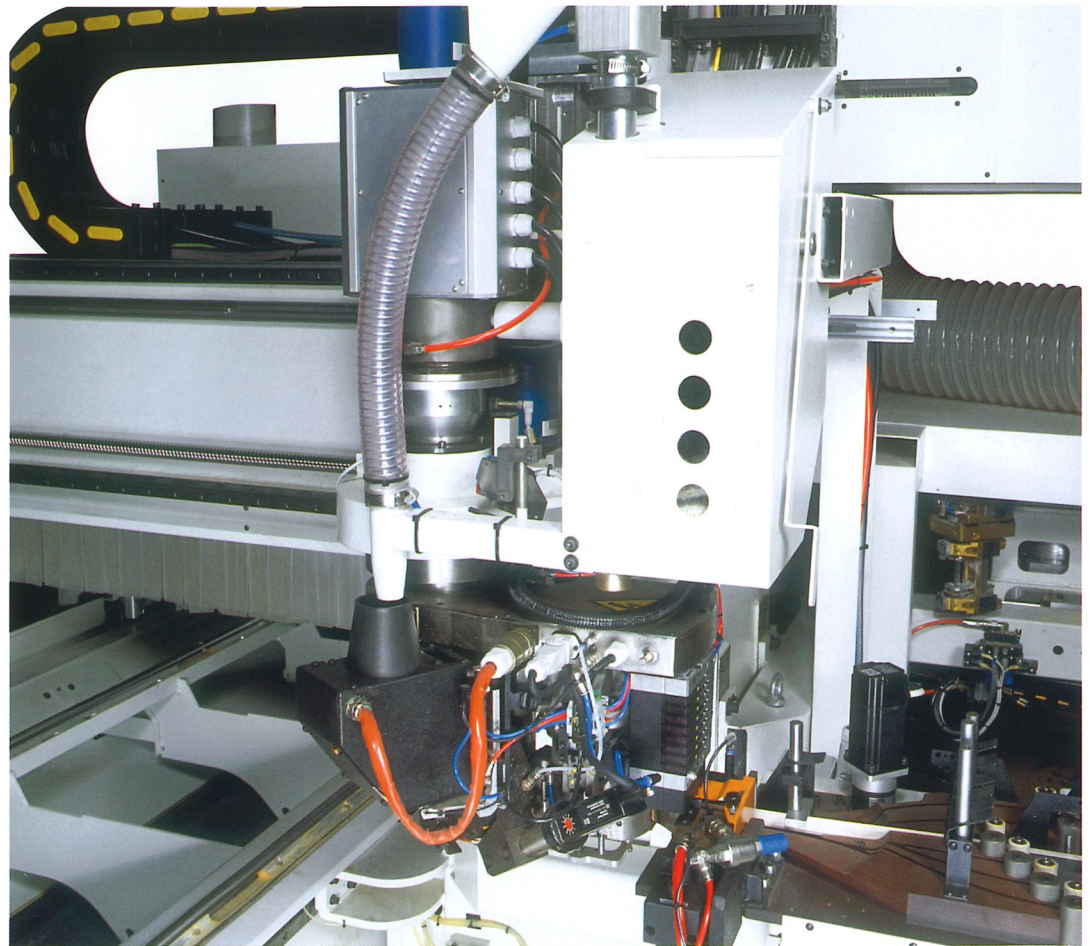
The 360° closure precision is obtained very effectively with a photoelectric cell incorporated in the edging unit; 3 cm before reaching the closure point the photoelectric cell reads the amount of edging already glued and gives the pre-cutting unit the measurement to trim the edge. This **system is very precise** as it calculates the exact length for the closure of the final section; the error introduced is very minor compared to a reading of the whole length of the edging that could change along the perimeter of the piece being manufactured. The reading is made **on the upper surface of the panel** in order to avoid any possible collision with vacuum cups or interference with wasted glue.



A **quick release glue tank** able to hold up to 1000 g of glue with a 3-minute turnaround has been fitted to speed up the machine setting operations. A very useful solution when having to use different types of glue (in colour and features) as additional tanks can be prepared and very quickly installed.

# A gluing technology evolution

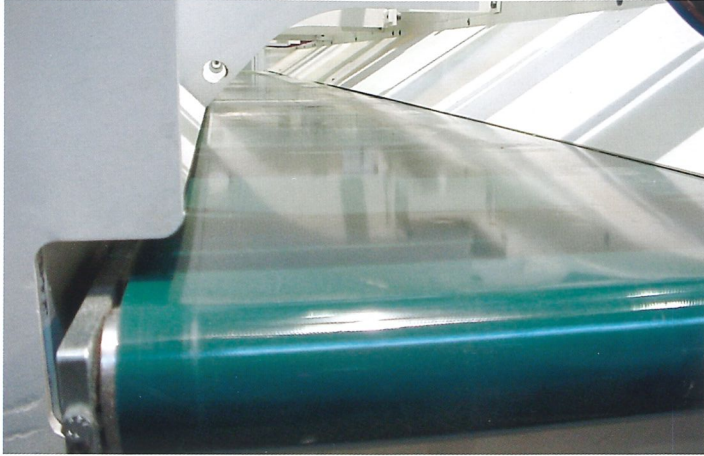
The new glue feeding system has been designed to **optimise consumption** and **improve quality**. The tank is ergonomically positioned to improve filling procedures, contains 5 kg of glue in granules and allows for **a high autonomy of the operation**. It is equipped with a sensor that measures the quantity of glue inside the tank, and that sends the refilling instruction to the numerical control. This solution allows firstly for **a saving in the amount of glue** used as only the amount required is melted. Secondly the tank always contains "fresh glue" which retains its adhesive qualities. Glue that has been melted inside the tank or in the pre-melter for a long time is less effective. Product quality is therefore maintained at all times.



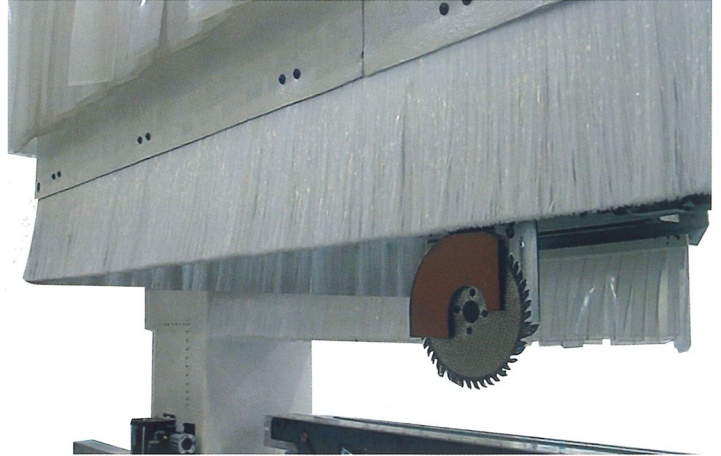
The edging magazine, which is integral to the mobile unit, is able to hold up to 6 different edgings so that the type of edging can be quickly changed according to the manufacturing demand. The selection, feeding and control of the residual edging quantity are completely managed by the numerical control.

# A cleanliness and environment quality choice

Planet MX has been designed bearing in mind the cleaning procedure of the work plane and the quality of the environment.



The boring and routing units are enclosed within the extraction hood. Soft anti-scratching brushes lower onto the panel during the machining process to facilitate optimum removal of waste material.



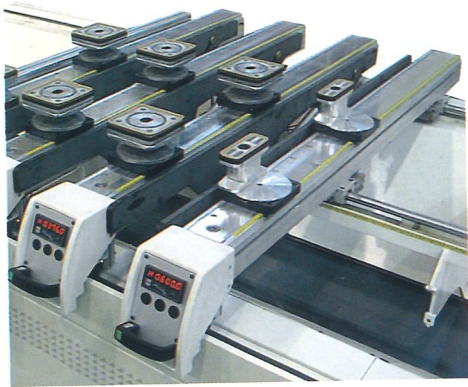
Frame design together with an integral waste conveyor facilitates continuous removal of chips and off-cuts, ensuring maximum cleanliness, allowing instant production changes at all times with maximum output.

# A safety choice



The machine is protected on three sides by 2 mm fences, while on the front side is situated a sensible mat. This system prevents access to it during machining and safeguards the operator, stopping the cycle when somebody walks on the mat. The operating functions of the machine are managed by control remote devices positioned in order to be easy approachable in any occasion.

# A convenience choice for worktable management

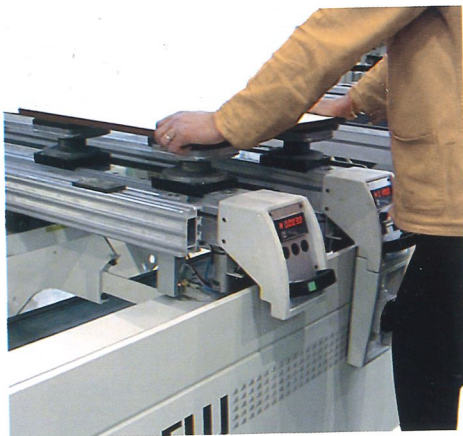


The **Quick Set Up** work plane is made up of aluminium supports mobile in X within which the vacuum system is piped. In this way the whole surface of the plane is completely free and there are no risks that scrap can damage parts of the plane.

Smooth sliding movement by 4 preloaded recirculating ball bushes on 2 ground and hardened round guides which are positioned centrally as regard to the supports to ensure stability in any use.

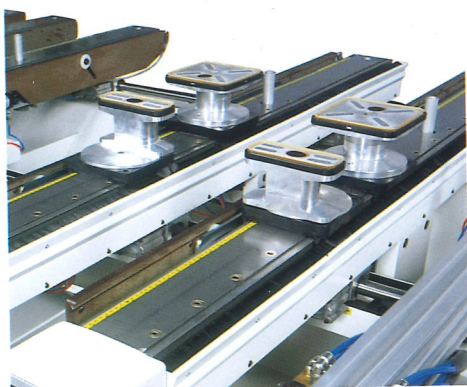


The system of automatic clamping and release of the supports works on sliding guides by pneumatic cylinders, which are controlled by a push-button ergonomically positioned to enable the handling of panels with great easiness.



Thanks to knee operated mechanism, that controls the vacuum and load aiding bars, it is now much easier to load and unload the panel leaving the operator with both hands free to handle the material.

This type of plane represents the **most rapid and simple solution** for blocking and referencing the panels. The suction cups can be removed from the supports **in a few moments** allowing the operator greater freedom to obtain a better positioning according to the profile of the piece to be worked, thanks also to the sphere valves that activate the vacuum cups in any point of the working table in which they're positioned. During all the loading and unloading phases of the panels, the vacuum cups are locked to the table by an innovative system at high pressure that avoids their accidental movement.



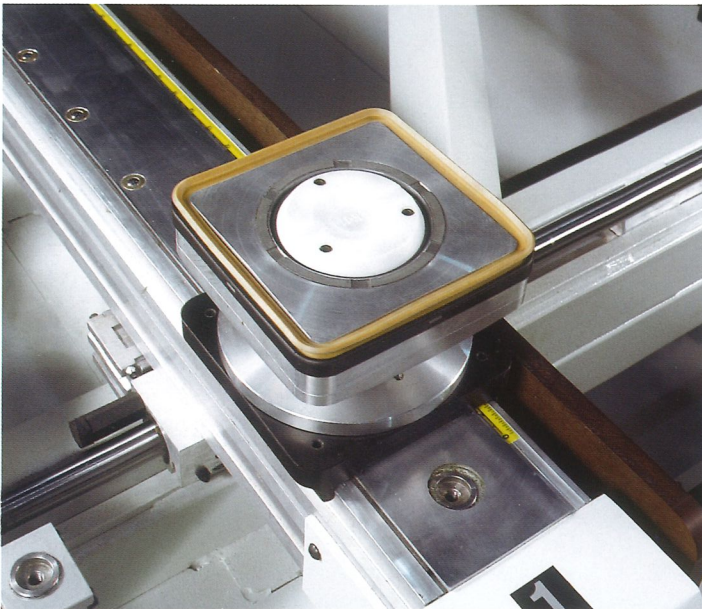
The possibility to automate the whole positioning operations of the table, makes this solution ideal also for the producer of small or even single piece production. Now thanks to the operator interface it is possible to programme the positioning and movement of the vacuum cups and bars which are positioned by Brushless motors directly connected to the numeric control. Therefore, the time for this operation is masked by the machining cycle, which is never interrupted.



# Planet MX



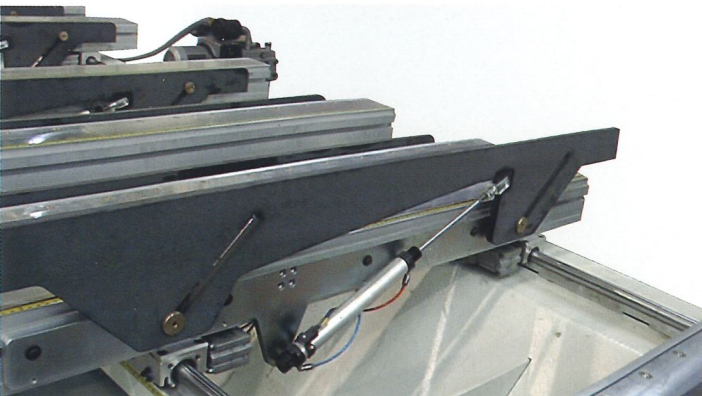
The range of vacuum cups assures in each situation the best solution to guarantee the perfect holding of panels.



Integrated easy loading device into the vacuum cup with wide sliding surface made of antiscratching material to avoid damages of the panels. Compared to different system, this solution allows to keep the maximum flexibility on the table set up and to position the tables close the one to the other. This is a great benefit with irregular components clamping.



Front and side aluminium cylindrical reference stops automatically managed by the program according to the type of work. The stops are equipped with sensors that control their exclusion position.



Load aiding devices equipped with sensors pneumatically raised to help the positioning of heavy panels. If a piece of scrap wedges itself between the load aiding device and the support bars the sensors cut in by informing the operator



# A choice of operating simplicity

The management of all production systems is **easy and intuitive**. Hardware constituted by a personal computer directly communicates with the numerical control and to an interface software in a **simple Windows® environment for immediate understanding**.

This solution guarantees the operator an **incomparable level of user-friendliness** and comfort, **making work much easier**.

The hardware is made up of a **Personal Computer with the following features:**

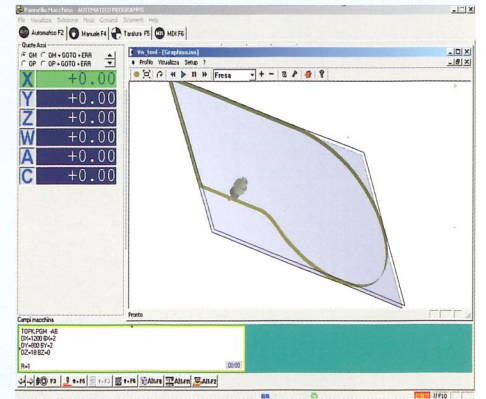
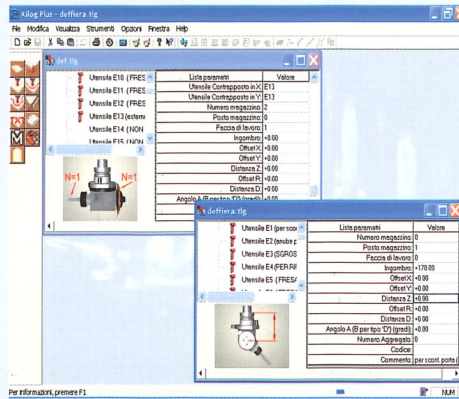
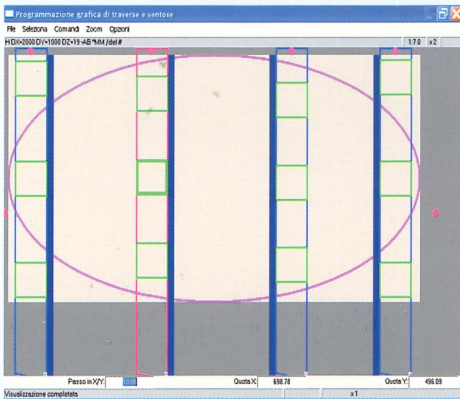
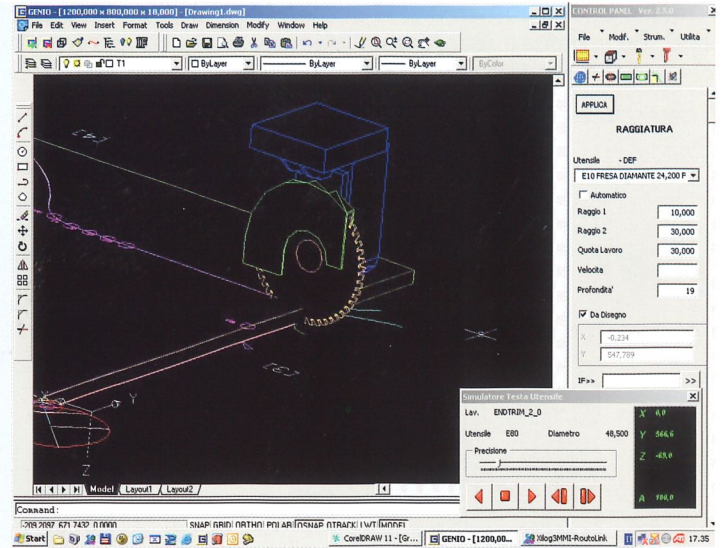
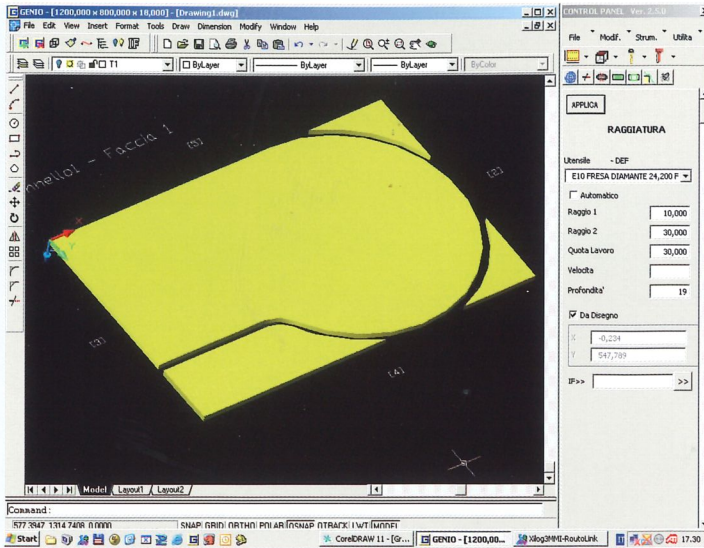
- 2,4 GHz Intel Celeron processor or above
- 15" colour monitor
- Keyboard and mouse
- 512 Mb Ram (DDR 266 MHz)
- 80 Gb hard disk
- CD ROM
- Floppy disk
- Sound card
- integrated Intranet card 10/100
- 2 serial ports, 1 parallel port, 4 USB port
- Modem



The software design takes into account programmer requirements, to cater for both expert operators and machining centre first time users. The **graphical aids** allow intuitive programming, without extensive computer skills. Yet even those with more confidence will find something familiar in it, not requiring extra effort to take in new systems and will immediately be able to appreciate its great potential.

**Remote control device to manage the main functions of the machine.**

# Planet MX



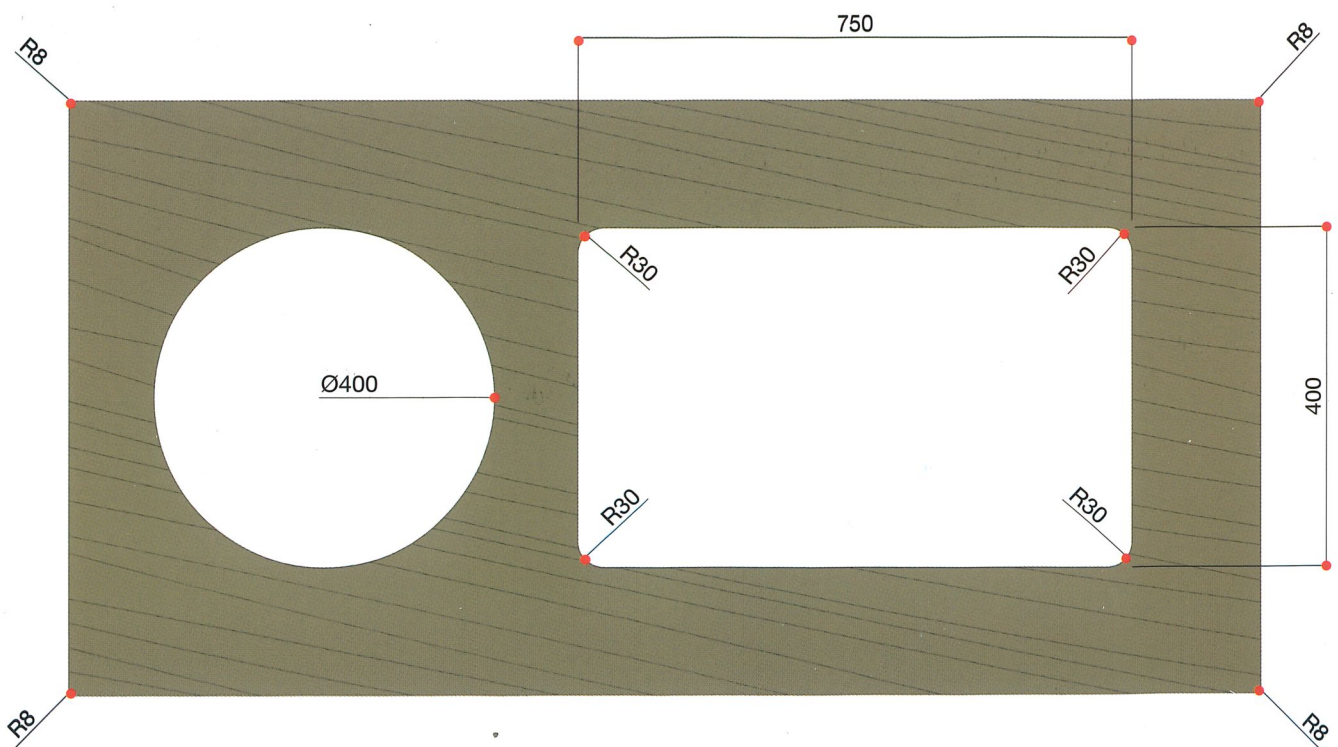
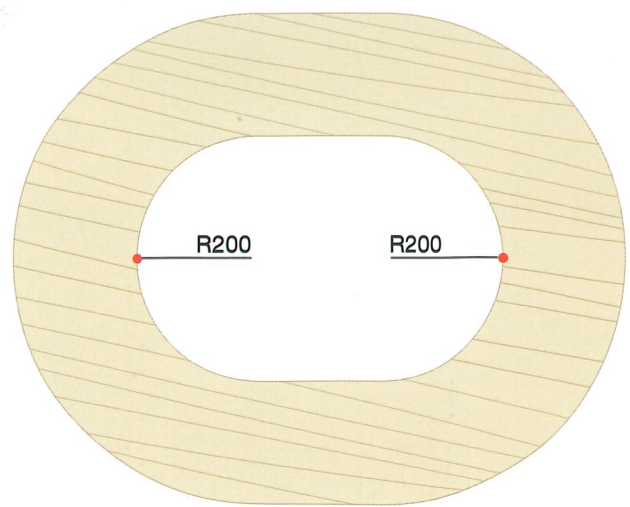
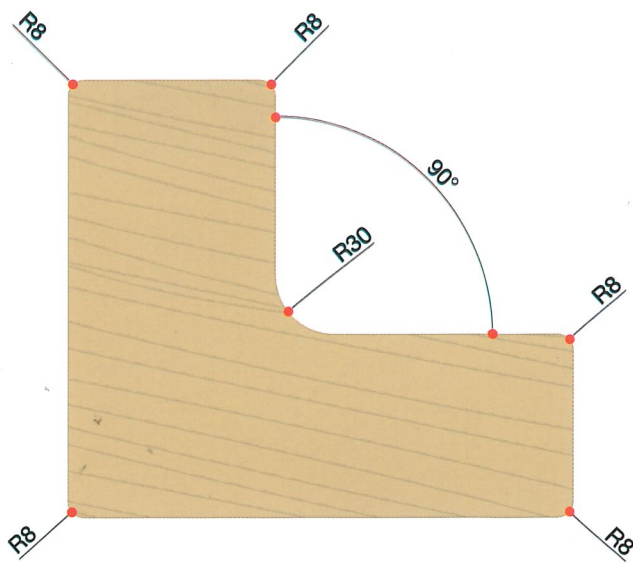
## Software features:

- The basic instructions of the operation environment are the same as the Windows system: copy, paste, edit, clear, properties, curtain menu, right click on the mouse for quick menu, multiple opening of windows etc.
- AutoCad® 2002 framework and functions
- Automatic check of the **programs rightness**
- **3D solid vision** of the tool route
- Integrated **parametric programming** with the possibility to make parametric macros by the uses of environment and wide variables
- Automatic working options setting on geometrical graphic modifications;
- **Direct uploading and downloading of DXF** format files;
- **Teleservice via telephone lines to connect the machine's numerical control with the Morbidelli support centre;**
- **Graphic aids for the positioning of work supports** to avoid collisions with the tools in cases of passing drilling and/or milling to eliminate the empirical trials directly on the machine;
- Execution of programs through bar codes.

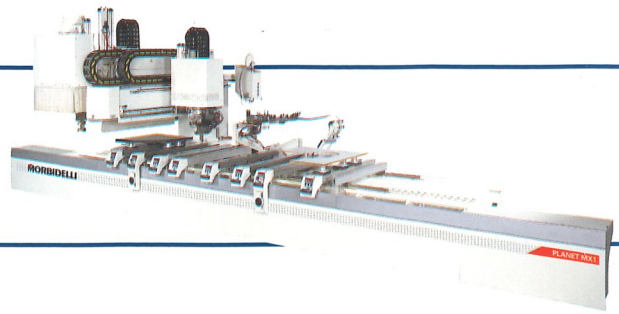
# A powerful choice

Thanks to the software and edging unit innovative technology, it is possible to find always the most **suitable trajectories** and the **pressure rollers best balance**. Planet MX is enabling to router and edge either at the internal or at the external of shapes **not feasible throughout any other system**.

These are some examples of the internal and external edge banding, for which the Planet machine is unique.



# Technical data

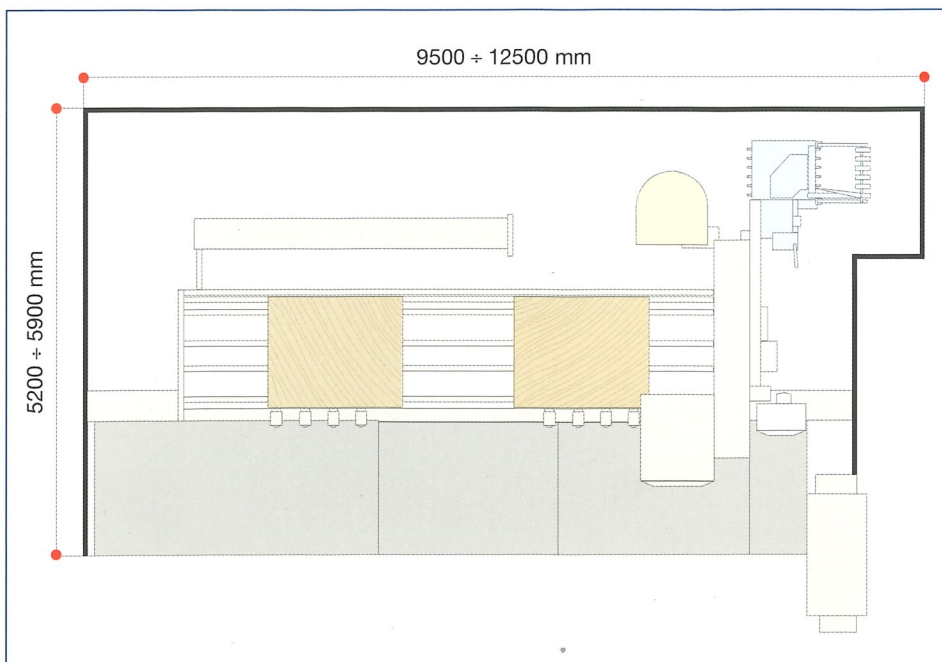


Work area in X	mm	3250
	mm	3850 (2 x 1300)
	mm	4450 (2 x 1600)
	mm	5050 (2 x 1900)
	mm	5650 (2 x 2200)
Work area in Y	mm	1230 - 1530
Panel passage*	mm	220
Z axis stroke	mm	400
Edges Highness	mm	12 ÷ 64
Edges thickness	mm	0,4 ÷ 3
Minimum internal radius on 90° angle**	mm	30
Minimum external radius on 90° angle**	mm	8
Edges magazine capacity		2 / 4 / 6
Main electrospindle power	kW	11 / 15
Secondary electrospindle power	kW	6,6
Drilling bits motor power	kW	3
Tool magazine capacity		18
Drilling bits speed	rpm	4500 / 6000
Compressed air pressure	atm	6 / 7
Centralised extractor outlet diameter	mm	300
Intake air consumption	m³/h	7500
Intake air speed	m/sec	30
Total weight	Kg	6000 ÷ 8000
Installed power	kW	35 ÷ 50

\* The maximum thickness that can be manufactured is conditioned by the thickness of the piece, the length of the tool and the type of edge.

\*\* The internal and external radiuses depend on the thickness and type of edge.

## Overall dimensions



In this catalogue, machines are shown with options. The firm reserves the right to modify technical specifications without prior notice, provided that such modifications do not affect safety as per E.C. certification.

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