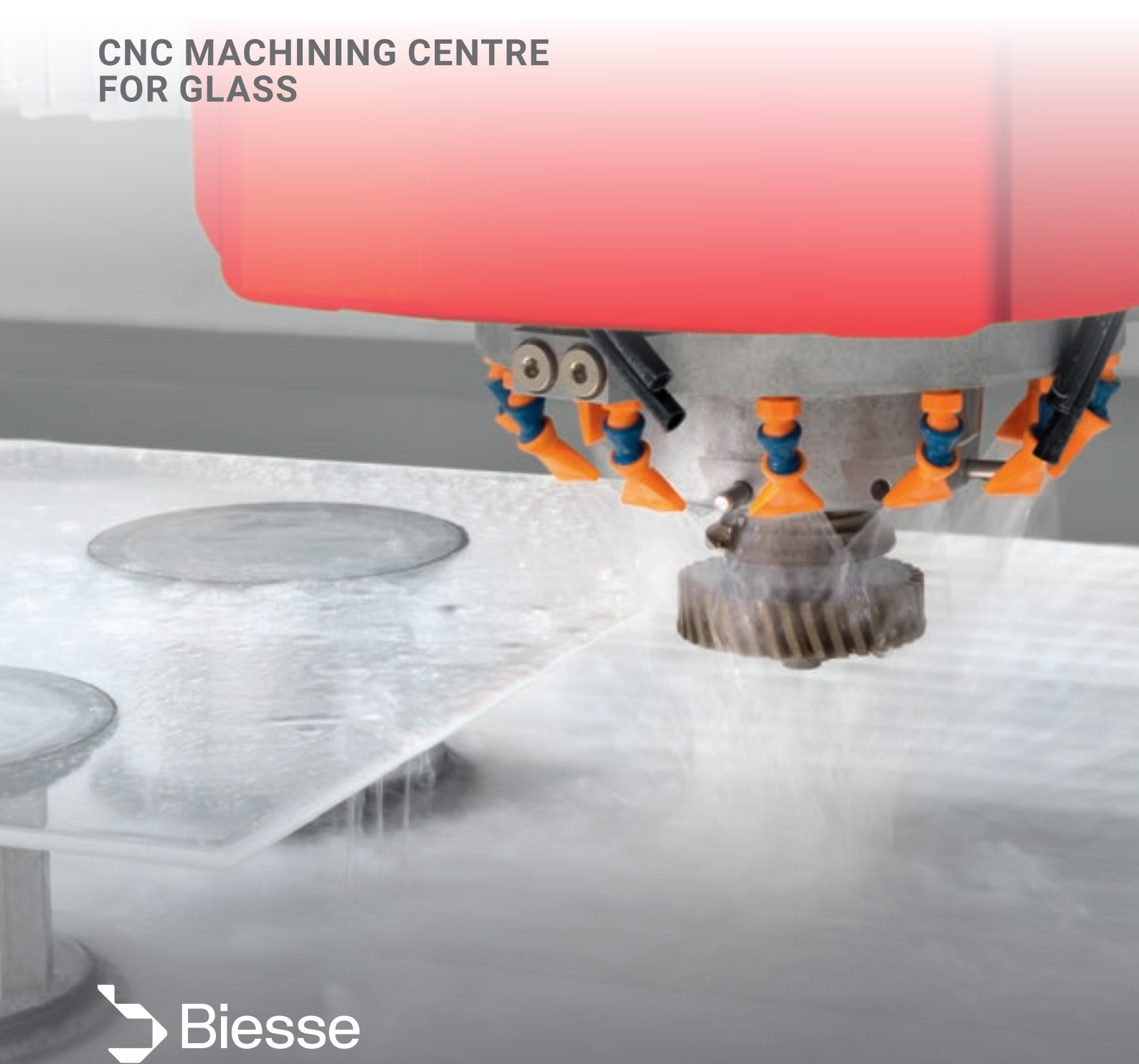


MA STER 23

CNC MACHINING CENTRE
FOR GLASS



THE COMPACT SOLUTION FOR THE NEEDS OF LARGE COMPANIES AND SMALL-SCALE ARTISANS



Master 23 is Biesse's most compact range of processing centres for machining glass. Designed to meet the needs of large companies producing big batches, but also small-scale artisans who decide to invest in the growth of their business and the evolution of the production process, obtaining high-quality results with limited outlay.



MASTER₂₃

- **COMPACT DIMENSIONS**
MAKING IT IDEAL FOR COMPANIES WITH LIMITED SPACE.
- **OPTIMUM VERSATILITY**
THANKS TO THE WIDE VARIETY OF POSSIBLE MACHINING OPERATIONS.
- **MAXIMUM QUALITY AND PRECISION.**
- **EXCELLENT PRODUCTION EFFICIENCY**
THANKS TO THE PERFECT INTEGRATION WITH ROBOTS
FOR THE PRODUCTION OF LARGE BATCHES

OPTIMUM VERSATILITY THANKSTOTHEWIDEVARIETY OF POSSIBLE MACHINING OPERATIONS

Master 23 can carry out a wide variety of complex machining operations, guaranteeing first class finish quality.



Milling.

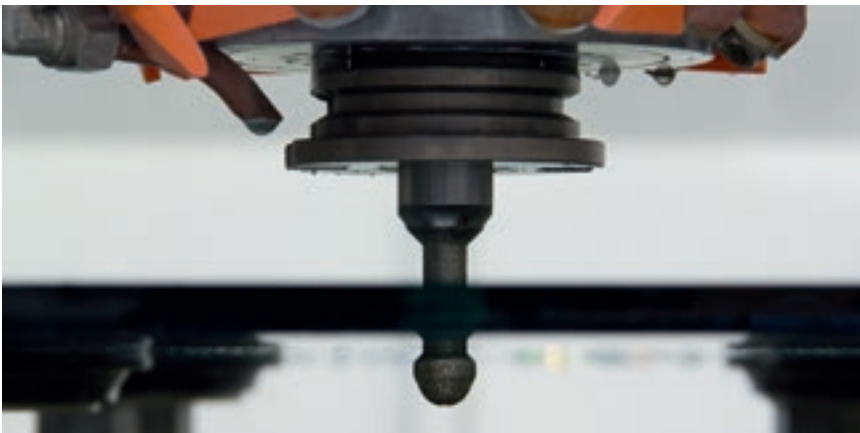


Grinding and peripheral finishing.

3-axis machining guarantees optimum reliability and precision when creating doors, bathroom unit tops, shower enclosures or glass for household appliances and the automotive and electronic sectors.



Boring integrated with the Helix system.



Boring from above.

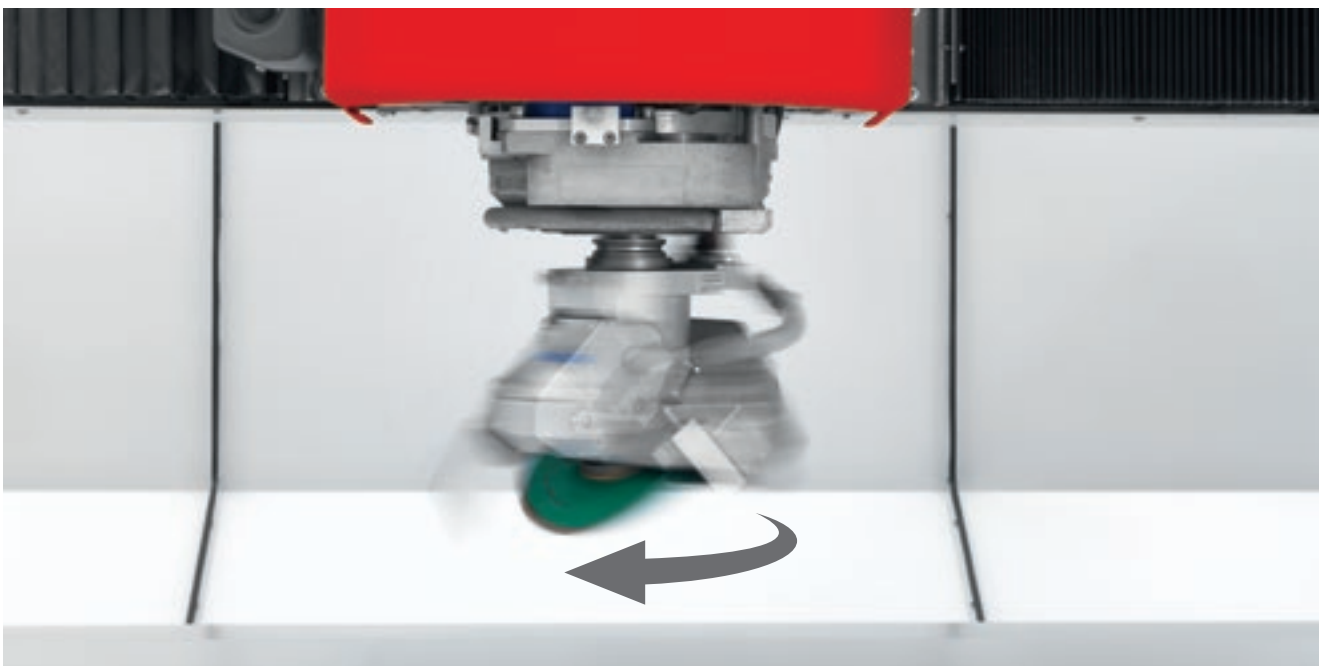


Surface writing.



INCREASING PERFORMANCE

The possibility to configure the machine with the endless rotation C axis ensures the perfect execution of even the most complex machining operations in a smooth, accurate manner and heightens the potential.



Aggregates guarantee top results with every machining operation.

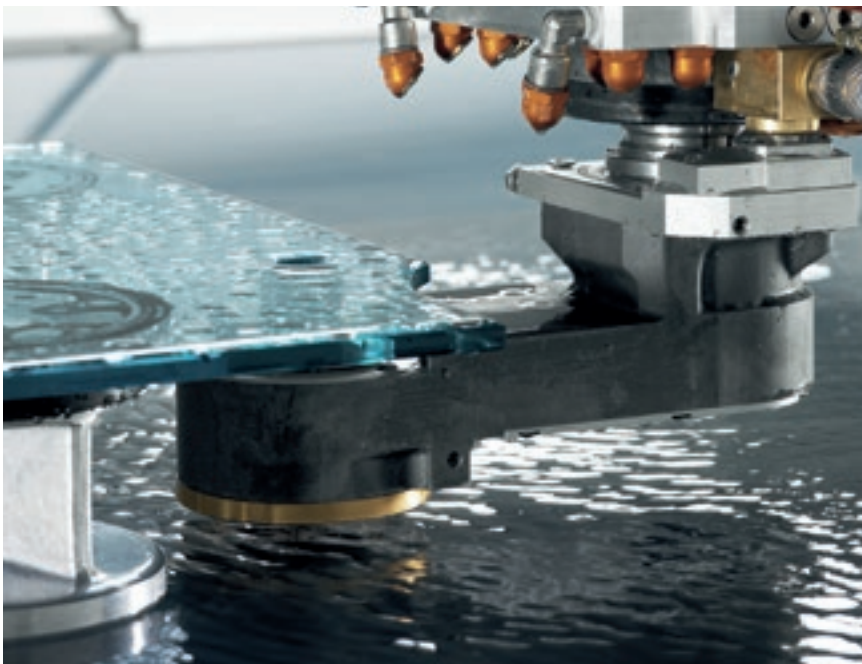


Engraving with an aggregate.

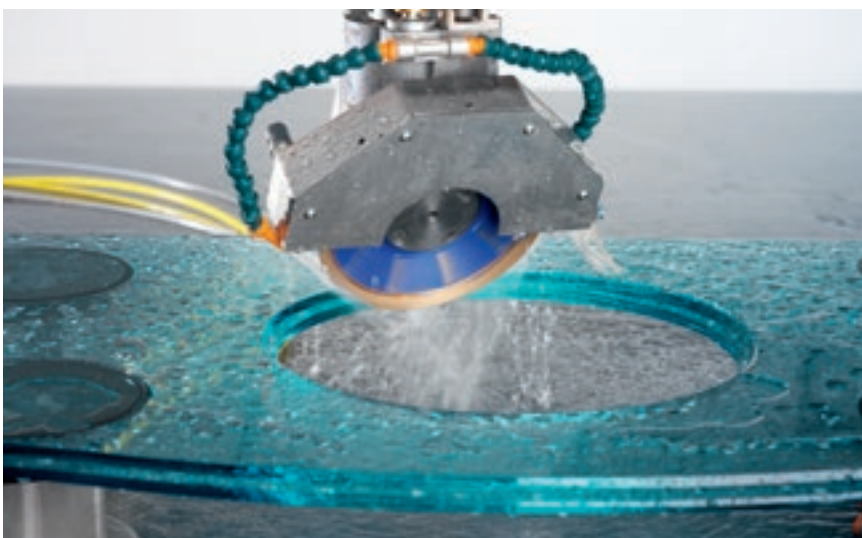


Cup grinding and finishing with an aggregate.

Master 23 can manage long, complex machining operations and also shorter ones for mass production, ensuring optimum results in both cases.



Drilling from below with an aggregate.



Saw disk.

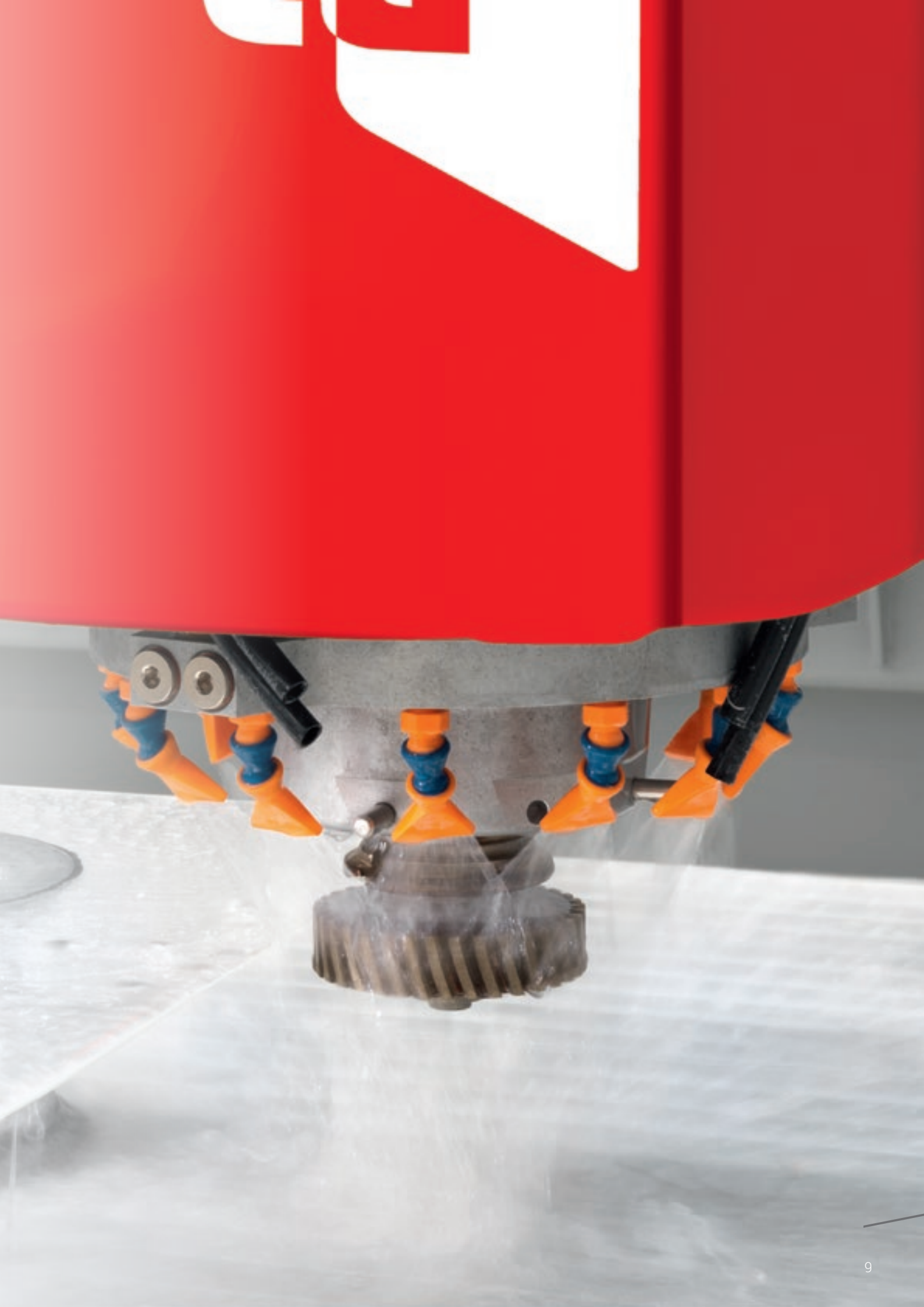
INNOVATION



BIESSE TECHNOLOGY

The high technological content of the world's most popular working centres satisfies the specific needs of the glass industry.

Configurations with 3 or 4 axes fitted with aggregates for managing a vast range of machining operations. For all the configurations, the components are the same as for the top-of-the-range solutions.

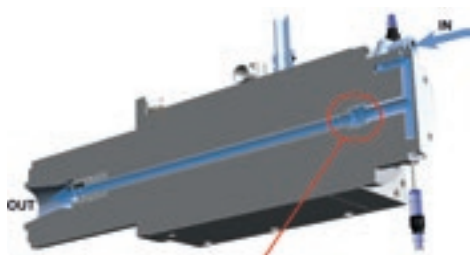


MAXIMUM MACHINING RELIABILITY AND PRECISION

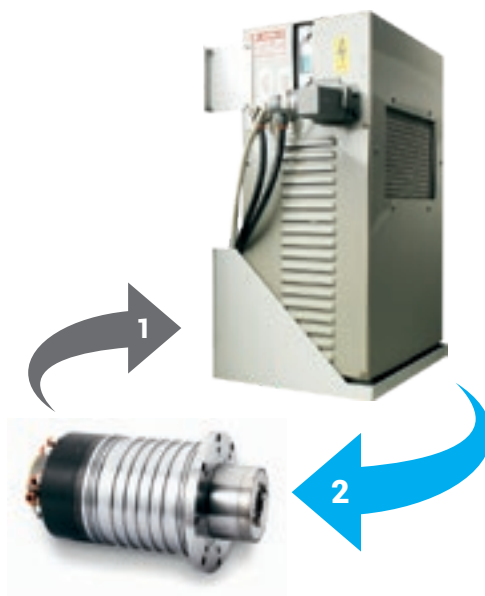


The Master range is fitted with spindles manufactured by HSD - a world leader in its sector. They guarantee optimum power, compact dimensions and extremely high finishing standards.

- ▀ **+60% spindle lifespan and noise reduction**
thanks to 4 ceramic bearings that offer greater resistance to mechanical stress.
- ▀ **Greater reliability**
thanks to the use of stainless steel and the 55mm spindle shaft.



DPC (patented) - Controlled loss distributor
A patented system that ensures excellent reliability and a long lifespan, thanks to the innovative seal system with no mechanical contact.



Optional **glycol-based cooling** systems with a closed circuit that guarantees constant results over time and resistance to the maximum machining stress levels.

1. **High-temperature fluid**
(cooling system with heat exchanger).
2. **Low-temperature fluid**



Master 23 is equipped with an integrated system for the automatic greasing of the movement axes, ensuring constant and precise maintenance every day.

The machine work table is an extremely rigid structure upon which is placed an aluminium worktable calibrated to grant maximum flatness of the work area, fundamental for first class machining results.

The machine is designed to work in twin-station mode too.

The beam is moved by means of twin-motor gantry technology to ensure greater accuracy and a longer lifespan.



FAST, PRECISE TOOLING



Rear tool change with casings for machining residue protection on the 18-position tool rack and cover, with automatic tool loading via the working unit.



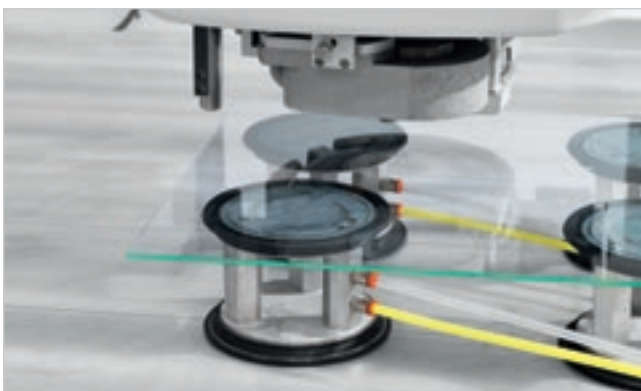
Tool change in 10 second

The fastest solution in the world of glass, thanks to the 8-position revolver magazine on the head.



Reading laser for the automatic recognition of the sheet orientation angle

Thanks to the laser scanner, the operator can position the sheet on any part of the work table (without having to make sure it's up against the stops). This reduces machining preparation times and the risk of errors. Speed and precision, for even more efficient production.



MACHINING QUALITY AND SPEED

Maximum results, thanks to the possibility to equip the machine with a series of optional elements using top quality components.



Master 23 can be fitted with the mechanical pre-setter which has a fully automatic system that quickly and simply ensures highly accurate and updated tool measurements during the machining processes, thereby avoiding any risk of error on the part of the operator.



Pressure intensifier for the external water

This is a circular wheel with small nozzles that increase the pressure of the external water. This optional device has a 3-position vertical movement to ensure that the water impact point is always the best one, regardless of the tool radius and height.

GLASS THICKNESS	STD SPEED	INCREASE
4 mm	18 m/min	+40% (up to 25 m/min)
10 mm	2.5 m/min	+60% (up to 4 m/min)
19 mm	1.8 m/min	+66% (up to 3 m/min)

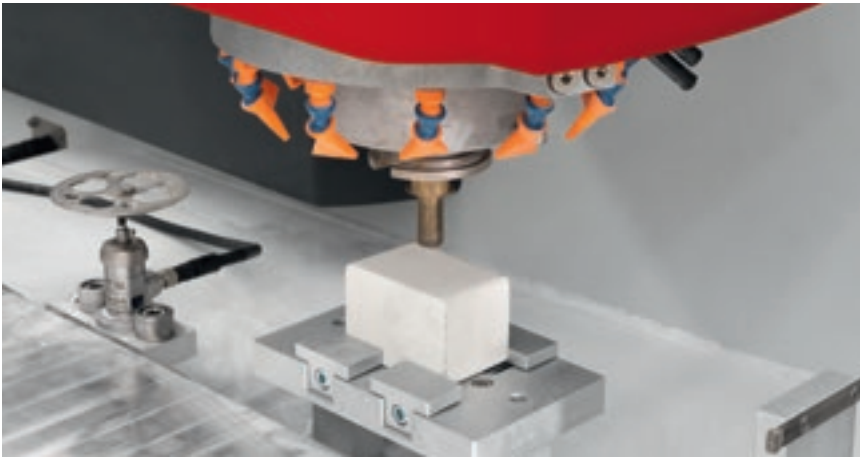


Quick piece locking system with vacuum, using the double pedal fitted on the machine as standard.

The optional dressing devices are positioned near the working area for fast, easy tool dressing operations that guarantee constant top quality and speedy execution. The dressers make Master 23 fully automatic, even for the longest machining operations, which means that manual operations are also simplified.



Drill dressing.



Finishing wheel dressing.

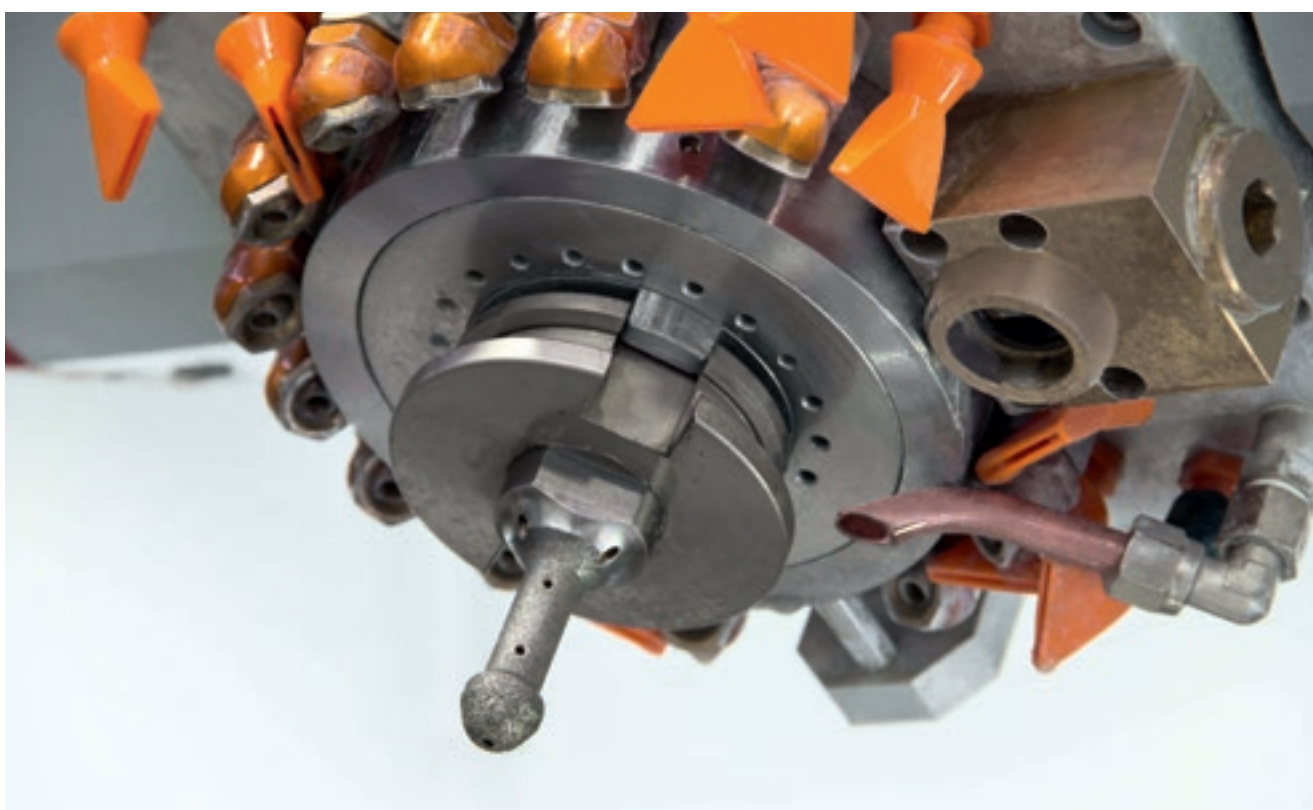


Diamond wheel dressing.



REVOLUTIONARY BORING

Helix is the Diamut tool that, when combined with Biesse software, exceeds all the limits of the traditional boring systems, using one single tool for all the boring, grinding and countersinking operations on glass sheets of up to 19 mm.



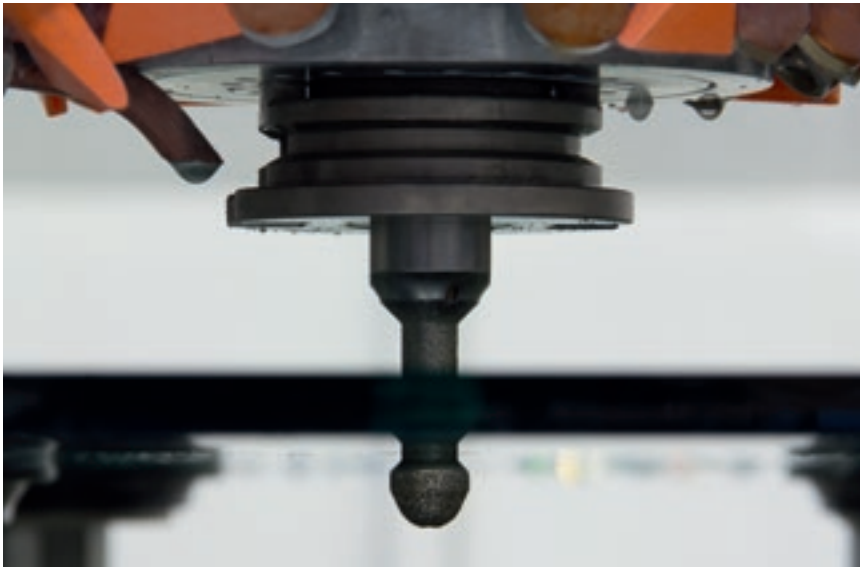
DEVELOPED, PATENTED QUALITY

Innovation created by a team of Diamut and Biesse experts, Helix Sistem is the perfect blend of hardware and software that emerges in the whole range of Master processing centres.

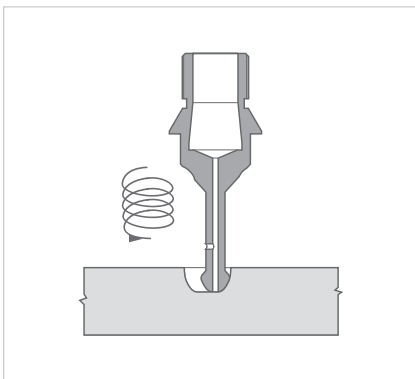
The new standard for boring operations.

Helix System was born of the desire to develop a revolutionary boring system unlike anything that has been seen on the market to date, capable of drilling holes with integrated upper and lower counter-sink on glass sheets up to 19mm thick, using a single tool on CNC machines.

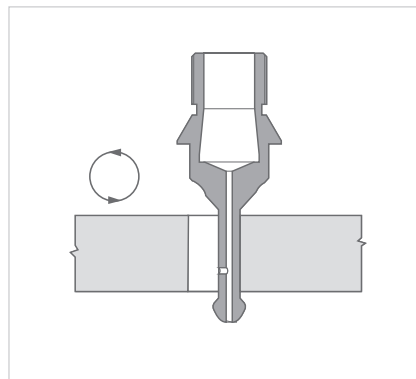
INTEGRATED BORING SYSTEM



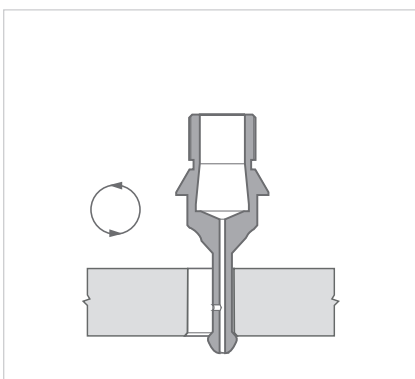
An innovative tool, managed by specific software.



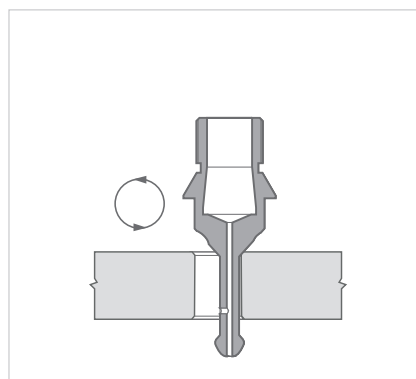
1_Boring with helical movement



2_Lateral grinding



3_Lower countersinking

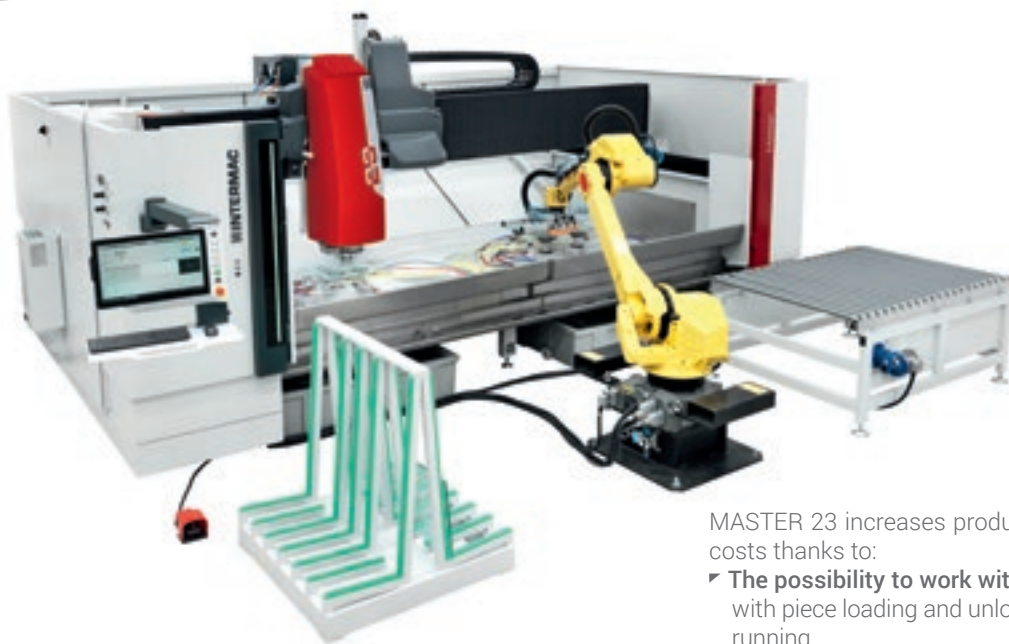


4_Upper countersinking

- ▣ Maximum finish quality.
- ▣ Machining tolerances are halved.
- ▣ Holes with different diameters, with just one tool.
- ▣ Can also be used on laminated glass.
- ▣ Integrated upper and lower countersinking.
- ▣ Machining operations on any part of the sheet.
- ▣ Tool cleaning blow after the machining operation.

EFFICIENT PRODUCTION, WITH NO LIMITS

Master 23 can be perfectly integrated in a line with robots and loading/unloading systems. It's the ideal solution for those who need automated solutions for producing large batches (the household appliance field and the automotive, electronic and furnishing sectors).

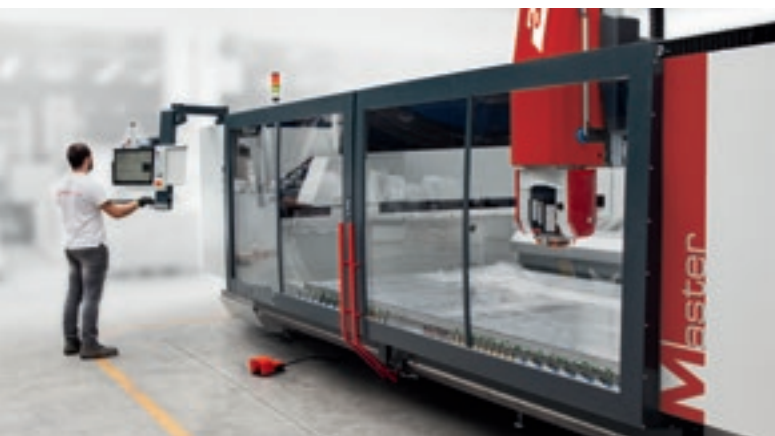


MASTER 23 increases productivity and reduces production costs thanks to:

- ▶ **The possibility to work with twin stations,** with piece loading and unloading while the machine is running.
- ▶ **Reduced work time for the operator**
- ▶ **Simplification of the work for the operator,** who only needs to manage the racks at the start and end of the machining batch.
- ▶ **Machining operations that require no supervision and have no time limits (24/7)**

INDUSTRY 4.0 READY

Industry 4.0 is the new industry frontier, based on digital technologies and on machines that speak to companies. The products driving this revolution can communicate and interact independently within production processes, which in turn are connected via intelligent networks.



Biesse commitment is to transform our customers' factories with real-time technology, ready to guarantee digital manufacturing opportunities, with smart machines and software packages becoming vital tools that facilitate the daily tasks of people all over the world processing glass, stone, metal and more. Our philosophy is a practical one: to supply entrepreneurs with solid data that can help them to lower their costs, optimise their processes and improve their results.

And that means being 4.0 ready.

PROTECTION AND SAFETY FOR ALL MACHINING OPERATIONS

Biesse has always paid the utmost attention to the health and safety of its customers. The protection of every operator during the use of the machine is of vital importance, preventing any possible distraction or error that could lead to inconvenience or even accidents.

One indispensable condition for obtaining any sort of financing is the respect of the machinery directives and workplace health and safety regulations

With Master processing centres, the operator is protected by:

- ▣ Ergonomic front guards of a suitable height that are also explosion-proof (certified by external bodies with "detonation" tests) .
- ▣ Side and rear guards made of a metallic material subjected to special anti-corrosion painting cycles.
- ▣ Electric and pneumatic systems fully integrated in the machine and protected by closed doors .
- ▣ Inaccessibility of moving machine parts.
- ▣ A clean working environment (water and machining residues are not dispersed).
- ▣ Reduced noise levels, fully complying with the machinery directive



Optimum convenience in the operations thanks to a hand-held terminal with:

- ▣ Quick, simplified positioning of the stops and suction cups thanks also to the possibility to tool the work table with the doors open.
- ▣ Simplified tool preparation, thanks to the optimum control of the working head directly on the piece to be machined, and no limits between operator and Master.
- ▣ Machining speed control.
- ▣ Emergency button always near the operator's hand.
- ▣ Start buttons for the two machining stations.
- ▣ A machining pause and restart button.

Extremely easy to use, thanks to the ergonomic console and user-friendly operator interface. The use of a PC with the Windows operating system, makes it easy and intuitive for the operator.



IC: THE TOTAL GLASS EXPERIENCE IN A SINGLE SOFTWARE



IC WAS CREATED FROM THE EXPERIENCE AND RELIABILITY OF ICAM WHICH, WITH OVER 7500 PACKAGES INSTALLED IN 180 COUNTRIES, IS THE MOST WIDELY USED CAD/CAM SOFTWARE IN THE WORLD WHEN IT COMES TO GLASS APPLICATIONS.

- **RENEWED GRAPHIC INTERFACE THAT'S USER-FRIENDLY AND EASY TO PICK UP THANKS TO SELF-LEARNING CONCEPTS, BUT WITHOUT COMPROMISES IN TERMS OF FUNCTIONS AND PROGRAMMING FLEXIBILITY**
- **ROBUST, RELIABLE PLATFORM**
- **ENHANCED CALCULATION POWER THANKS TO THE USE OF THE LATEST DEVELOPMENT TECHNOLOGIES**

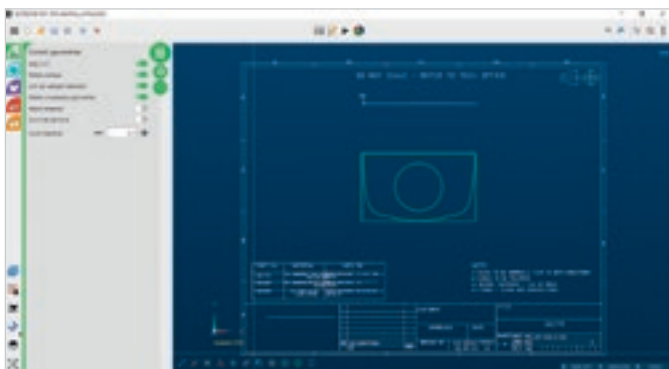
- **MODERN INTERFACE:** similar to the most modern apps, it can be used with a touch screen.
- **EXTREMELY USER-FRIENDLY:** assisted design in 5 steps.
From the drawing to the machine in just a few seconds.
- **TOTAL CONTROL OF THE DESIGN PROCESS, FROM THE DRAWING TO THE FINISHED PIECE.**
- **SOLUTIONS FOR LARGE-SCALE OR ONE-BATCH PRODUCTION:**
the possibility to manage libraries of models (even parametric).
- **SUPPORT SERVICE ALONGSIDE THE CUSTOMER:**
IC is equipped with "AIC Log" technology: in the event of problems and/or a need for support, Biesse Service can see the operations that have been carried out, and can quickly intervene.



IC: SEE, DESIGN, CREATE

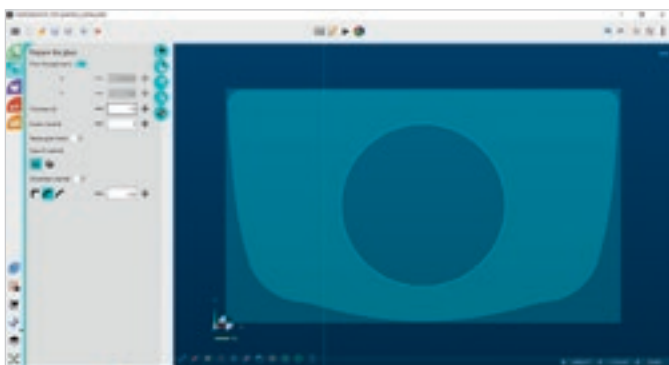
The software suggests the correct sequence of the 5 steps for the design phases.

1. SIMPLIFY
2. IDENTIFY
3. APPLY
4. PROCESS
5. EXECUTE



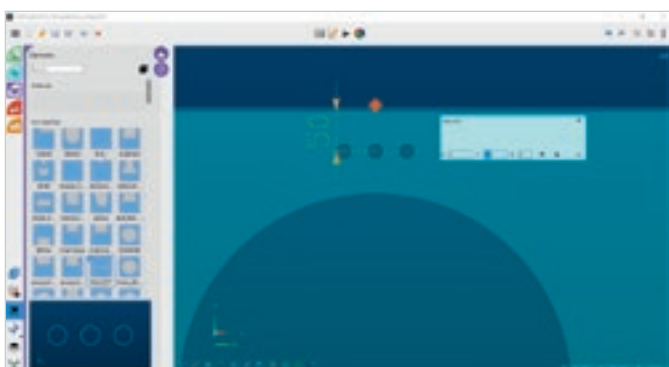
SIMPLIFY

In this step, an imported drawing can be simplified, the geometries needed for the machining operation can be identified, and any possible imperfections can be corrected.



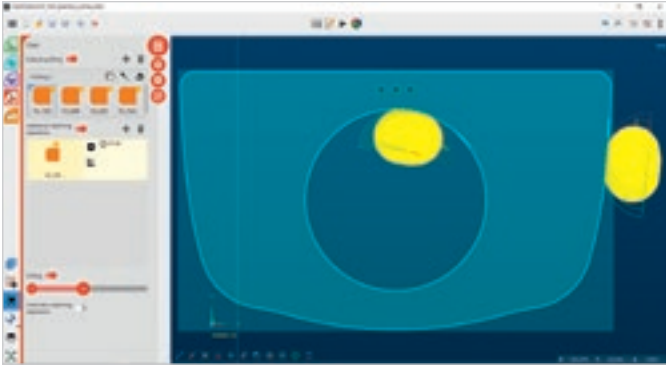
IDENTIFY

The glass to be worked in the machine is easily identified, starting from the drawing previously processed or specifying its dimensions.



APPLY

With a simple drag&drop, additional elements such as notches or hardware items can be parametrically applied to the piece. These elements can be easily added and personalised by the customer.



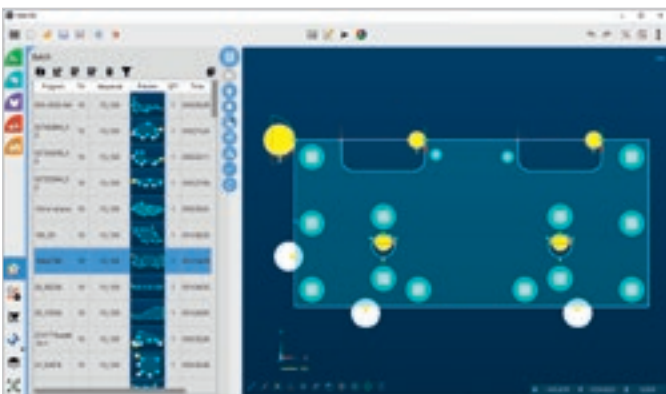
PROCESS

The geometries are automatically processed with a click: circles become bored holes, profiles become milling operations, glass is ground; layers can be associated with specific machining operations.



EXECUTE

The piece is prepared so it's ready to be executed in the machine. The carriage positions are calculated and the necessary suction cups are enabled. Possibility to intervene manually for collision control.



IC BATCH

Option of importing and automatically programming a list of designs (in standard DXF, DWG or IC formats) and sending them directly to the machine. Option of modifying the pieces after the automatic calculation.

IC AUTOMATICALLY SIMPLIFIES COMPLEX DRAWINGS, IDENTIFYING THE GLASS TO BE MACHINED AND ALL THE OPERATIONS REQUIRED TO PRODUCE IT.

CUSTOMER CARE IS WHO WE ARE

SERVICES is a new experience for our customers, to offer not just excellent technology but the added value of an increasingly direct connection with the company, the professionals who work there and the experience they embody.



ADVANCED DIAGNOSTICS

Digital channels for remote interaction online 24/7. Always ready to intervene on-site seven days a week.



A WORLDWIDE NETWORK

39 branch offices, over 300 certified agents, retailers in 120 countries, and spare parts warehouses in America, Europe and the Far East.



SPARE PARTS AVAILABLE IMMEDIATELY

Identification, shipping and delivery of spare parts for every need.



EVOLVED TRAINING OPPORTUNITIES

Lots of on-site, online and classroom training modules for personalised growth.



VALUABLE SERVICES

A wide range of services and software packages to help our customers achieve continuous improvements in performance.

AN EXCELLENT LEVEL OF SERVICE

+550

HIGHLY SPECIALISED
TECHNICIANS AROUND
THE WORLD, READY TO HELP
CUSTOMERS WITH EVERY
NEED

90%

OF MACHINE DOWN CASES
WITH RESPONSE TIME
UNDER 1 HOUR

+100

EXPERTS IN DIRECT
CONTACT THROUGH
REMOTE CONNECTIONS
AND TELESERVICE

92%

OF SPARE PARTS ORDERS
FOR MACHINE DOWNTIME
PROCESSED WITHIN 24
HOURS

+50.000

ITEMS IN STOCK IN THE
SPARE PARTS WAREHOUSES

+5.000

PREVENTIVE MAINTENANCE
VISITS

80%

OF SUPPORT REQUESTS
SOLVED ONLINE

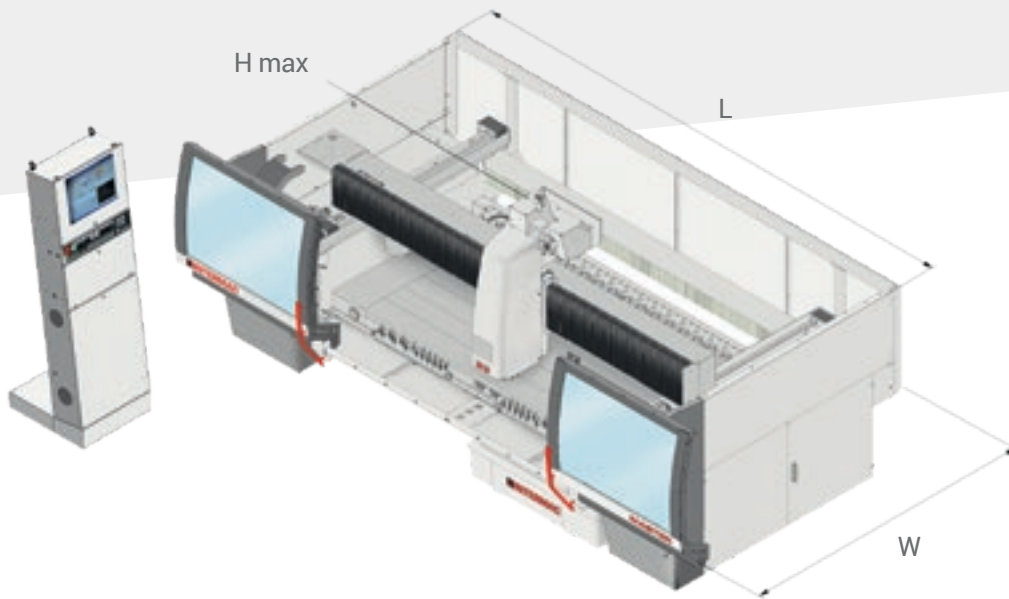
96%

OF SPARE PARTS ORDERS
DELIVERED IN FULL ON TIME

88%

OF CASES SOLVED WITH
THE FIRST ON-SITE VISIT

TECHNICAL DATA



MASTER 23

Maximum piece size for machining with a 100 mm grinding wheel (peripheral grinding)	mm	2500x1200 *
Z axis stroke	mm	275
Overall machine dimensions	mm	L: 5380 (doors open) L: 4700 (doors closed) W: 2680 H MAX: 2620
C axis stroke (optional)	mm	∞
Max axis speed (X - Y - Z)	m/min	60 - 30 -15
Work table height	mm	730
Electrospindle power	kW	9,2
Max electrospindle rotation	rpm	12000
Tool coupling		ISO 40
Rear tool magazine (optional)	positions	18
Tool magazine on head (optional)	positions	8 (6 if the C axis is fitted)
Working air pressure	bar	7
Max air consumption	l/min	160
Internal water consumption	l/min	10.5

* Some optional elements may reduce the dimensions of the maximum machinable piece.

The technical specifications and drawings are non-binding. Some photos may show machines equipped with optional features. Biesse Spa reserves the right to carry out modifications without prior notice.

Sound pressure level on operator workstation (LpA) Milling 77 dB (A). Sound pressure level on operator workstation (LpA) Milling with circular blade 80 dB (A). Master 23 - Master 30 Uncertainty of measurement K = 4dB (A).

The measurement was carried out in compliance with UNI EN ISO 3746, UNI EN ISO 11202 and subsequent amendments. The noise levels shown are emission levels and do not necessarily correspond to safe operation levels. Even though there is a relation between emission levels and exposure levels, this cannot be used reliably to establish whether or not further precautions are necessary. The factors determining the actual noise levels to which the operating personnel are exposed include the length of exposure, the characteristics of the work environment, other emission sources (e.g. the number of machines and machining operations nearby). At any rate, the above information allows the operator to better evaluate dangers and risks.

Founded in Italy,
international native.

We are an international company that manufactures integrated lines and machines to process wood, glass, stone, plastic and composite materials and what will come next.

Thanks to our rooted competence nurtured by an ever-growing worldwide network, we support your business evolution – empowering your imagination.

Master of materials, since 1969.

We simplify your
manufacturing
process to
make the
potential of any
material shine.



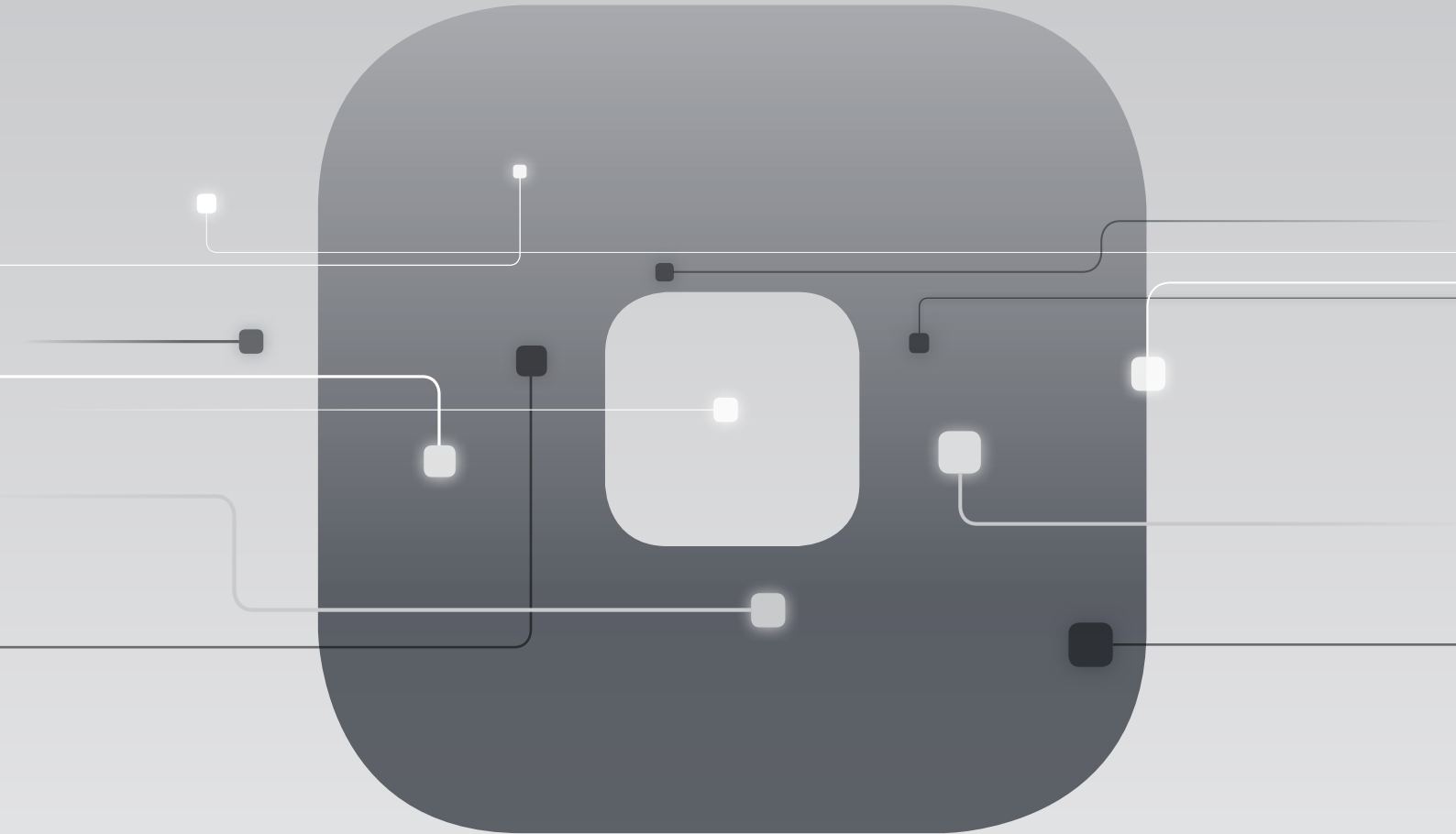
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Biesse world.

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SOPHIA

GREATER VALUE FROM MACHINES



The Biesse IoT platform which enables customers to access an extensive range of services to streamline and rationalise their work management processes.

SERVICES

PROACTIVITY

ANALYSIS



MADE WITH BIESSÉ

GLASS ART AND CUTTING-EDGE TECHNOLOGY

"In Fiam's workshops, we have always tried to respond to designer ideas, even when they were apparently impossible to implement. Designers, like artists, have a creativity that stimulates cutting-edge innovation. So, over time, we have been able to develop new technologies that have allowed us to create unique objects on an industrial scale".

"Everything started with a stool. A glass stool, of course. A photographer friend came to see me in my glass workshop, saw me standing on the stool and took a picture that was published in some

newspapers. That's when I thought: why not try to make furniture with this material?"

From the first, self-built oven to bend glass sheets through to the first collaborations with artists and designers, it's been an ongoing learning curve.

Along with design innovation, Fiam has always invested in technological innovation too. In this respect, the partnership with Intermac for the development of solutions such as bilateral grinding machines and the Master processing centres range is a strategic one.

Our company has always worked in partnership with internationally-renowned Italian and foreign designers.

People like Massimo Morozzi, Rodolfo Dordoni, Giorgetto Giugiaro, Enzo Mari, Cini Boeri through to Vico Magistretti, Ron Arad, Makio Hasuike. Not forgetting Philippe Starck, Daniel Libeskind and Massimiliano Fuksas".

*Vittorio Livi,
founder and sole administrator
of Fiam Italia, Italy*

