



MAPPPI

BEYOND GLASS PERFECTION



general catalogue

Mappi International

BEYOND GLASS PERFECTION

Since 1993 Mappi has designed and manufactured high quality tempering systems for the glass industry.

MAPPI ITALIAN HEADQUARTER

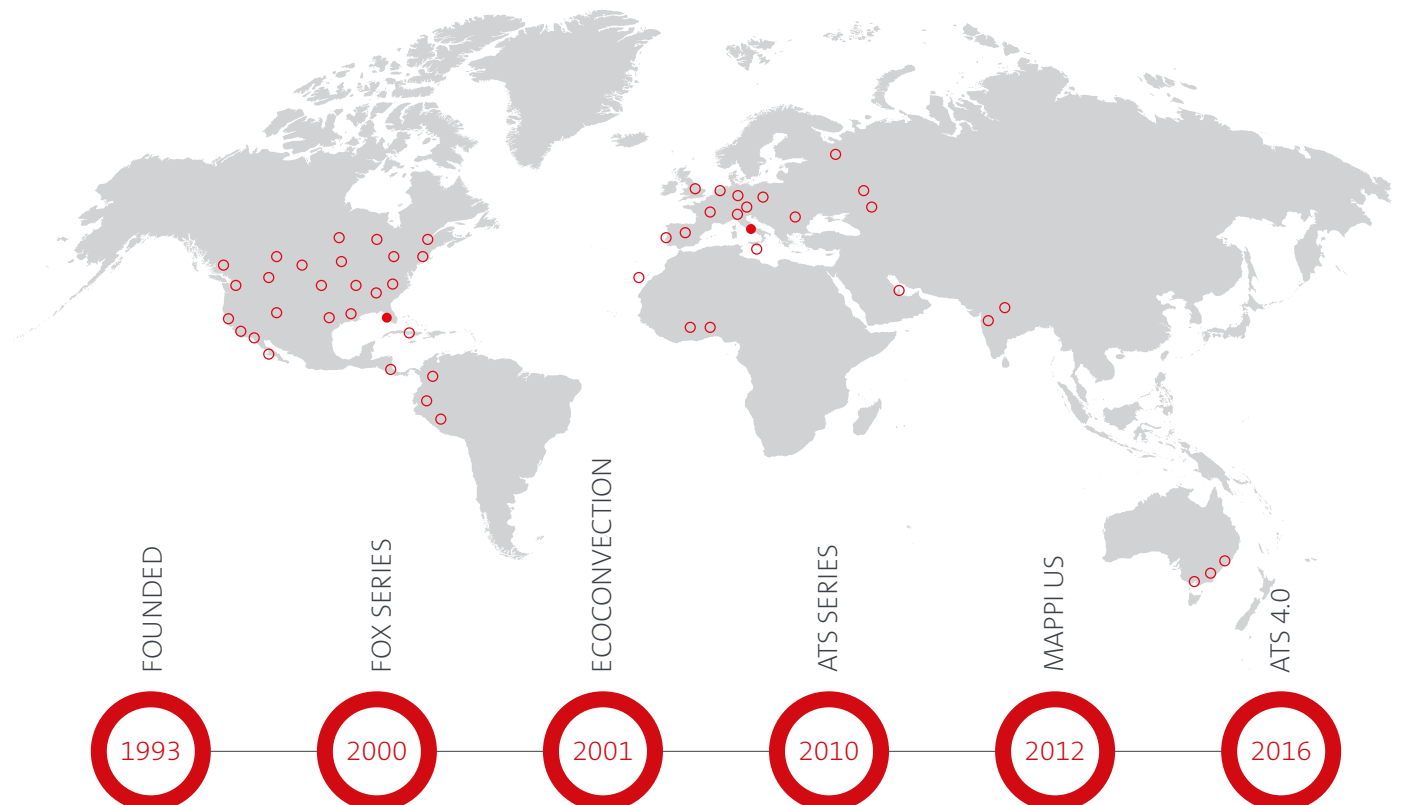


More than 400 plants installed all over the world represent the stages of a steady growth, made of investments in research and development, uncompromising quality and attention for specific needs of each customer.

• **CISTERNA (ITALY)**
Production facility

• **NAPLES (USA)**
Branch in United States

Mappi America comes up beside the Italian Plant, located in Florida; this allows the customer service department to reach within 24 hours of any plants located anywhere in the world.



MAPPI IS A GLOBAL LEADER IN THE PRODUCTION OF GLASS TEMPERING AND LAMINATING MACHINES. MORE THAN 400 MACHINES HAVE BEEN INSTALLED IN OVER 50 COUNTRIES GLOBALLY.

“Beyond Glass Perfection sums up our daily goal in just three words, shared at all levels in Mappi. From the beginning, going beyond the perfection of glass means taking a material with the unique qualities of glass and being able to enhance it, making it the best, and knowing that glass is a material that does not hide anything and shows its beauty as much as its defects” says **Nancy Mammaro, Mappi CEO.**

Mappi internally develops and builds the entire machine. That’s why **Mappi guarantees the perfection of the assembly and the consistent quality of each component**, for excellent performance which is reliable over time.

Mappi’s customer relationships is the core of our product, we provide round the clock support to all of our customers who acquire one of our state of the art machines.

“From design to assistance, every question we ask ourselves and every answer we provide must consider quality. **Every single piece, each component, and every person who works for Mappi is responsible for the quality of a distinctive brand**, because the solutions that it offers on the market are valid, in terms of both productivity and reliability. Our products and our people are the expression of our way of living and focused on going beyond the perfection of glass” concludes Nancy Mammaro.



MAPPI PRODUCTION

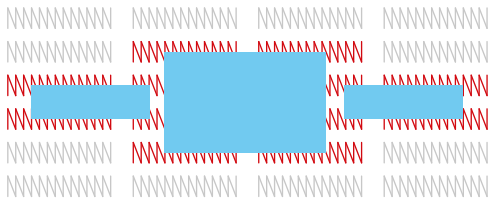
+ our mission

To become **the global leader in the manufacturing and production of tempering furnaces**, while raising the bar in quality, craftsmanship, and overall specific tailoring of our machines to meet the needs of each and every customer.

+ Innovation becomes better furnaces

USER FRIENDLY, ENERGY EFFICIENT, HIGHEST STANDARDS IN QUALITY

mhs⁺ multizone heating system



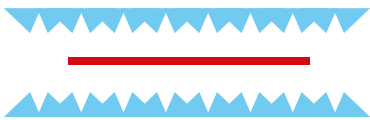
energy efficiency mhs operates through intelligent ihs system

MHS | MULTIZONE HEATING SYSTEM

Automatically manages the temperature of the furnace through a network of electronically controlled sensors. This allows the temperatures to remain constant and focused only in areas where there is the presence of glass.

- **Energy efficiency** mhs operates through **intelligent ihs system**
- **Finely controlled heating zones** insure thermal and energy efficiency
- Every heating element is equipped with an **independently managed thermocouple**
- **Wire heating resistance made with special alloy**, that is weldable
- **Heating zones 'movable'** (because they are interchangeable) in case of emergency

ac⁺ advanced cooling



AC | ADVANCED COOLING

An original design for the **blowing system** that allows an even more precise control while **tempering**. It substantially decreases the iridescence of the glass.

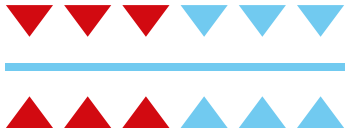
ihs⁺ intelligent heating system



IHS | INTELLIGENT HEATING SYSTEM

Power management of heating elements depends on the position of glass sheets. **The internal temperature of the furnace is controlled with an accuracy of +/- 1°C**: this prevents overheating of the ceramic rollers and avoids downtime for the adaptation of the furnace temperature.

ess⁺
energy
saving
system



optimized consumption
reducing the required power

syncro⁺
transmission
technology

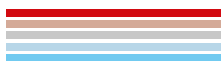


accuracy transmission technology
to maximize results

its⁺
integrated
touch
system



ati⁺
active
thermal
insulation



ec⁺
chamber
extraction



ESS | ENERGY SAVING SYSTEM

Heating and forced ventilation stages are coordinated and managed by a **computerized system optimizing the consumption and allows to significantly reduce the peak of installed power required** by the entire system and self balancing between heating and quench area to minimize overall peak.

- **Management Software** self developed.
- **Self-optimizing heating system** with the presence of the glass sheet.
- **Manage each thermal zone individually** through PLC supplied by a static relay.

SYNCRO | TRANSMISSION TECHNOLOGY

- **The ceramic rollers are driven accurately to within 1/1000 mm** by DC drive motor with a friction transmission between iron/rubber (avoids slack time gaps, gear lash, with resulting risks of marks on the glass). This eliminates the need for SO2. Roller drives are controlled by brushless motors to insure accurate roller position and speed.
- To avoid distortions and damages to the surface of the glass **the speed of oscillation of the ceramic rolls is managed automatically.**
- **Full ceramic rolls, easily replaced.**

ITS | INTEGRATED TOUCH SYSTEM

The system **monitors in real time the parameters of the tempering process**, it immediately prints the compliance report for CE and ANSI glass standards, and automatically stores this information for each production cycle.

ATI | ACTIVE THERMAL INSULATION

The ATI **fully reduces thermal dispersion**, a success due to continuous research in the best performing materials for thermal insulation, in collaboration with the most prestigious research centers in Europe and with Knauf and Morgan.

EC | CHAMBER EXTRACTION

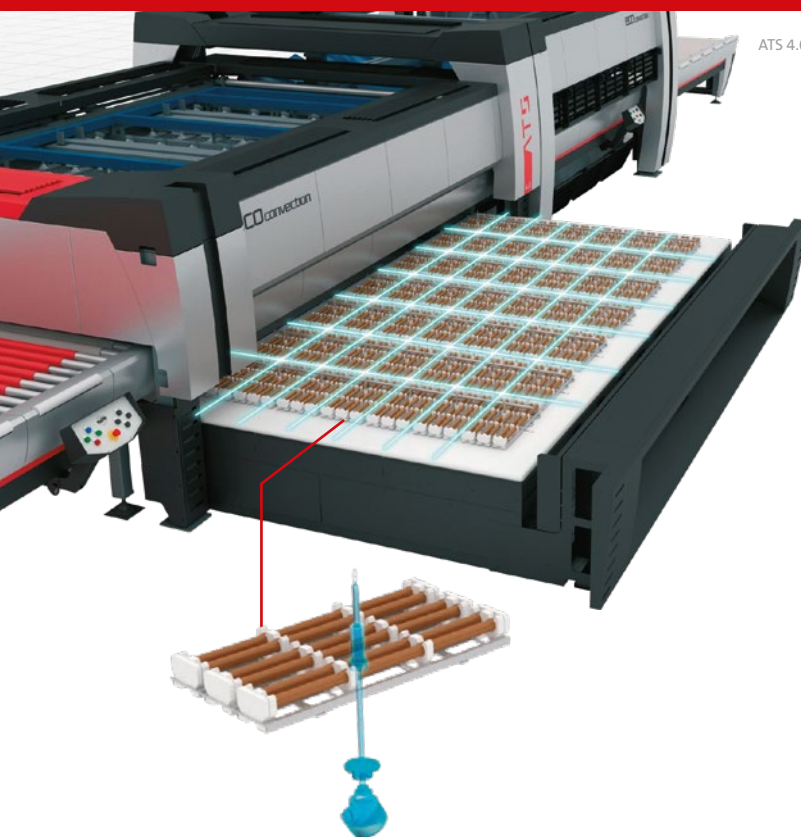
Extraction of the heating chamber represents a unique feature of Mappi technology. No need of roller removal to have access to the lower heating Elements.

+ mhs

MULTIZONE HEATING SYSTEM

Automatically manages the temperature of the furnace through a network of electronically controlled sensors. This allows the temperatures to remain constant and focused only in areas where there is the presence of glass.

Market standard is to have lengthwise or sideways heating elements that are much more economical for the machine builder but gives a lot less control on specific heating areas. This causes the rollers to overheat, leading to defects on tempered glass.




ATS 4.0 MULTIZONE SCHEMATIC

With Mappi MHS small heating elements (each of 300 x 600 mm) allow a pin point control of the temperature; each heating element is equipped with an independently managed thermocouple.

MHS uses 128 temperature controls (64 top + 64 bottom referred to a 2500 x 5000 machine), each temperature control correspond to an heating cell, consequently, 128 heating cells that allow us to have a very precise energy management, and the better thermal and energy efficiency.

HEATING CHAMBER



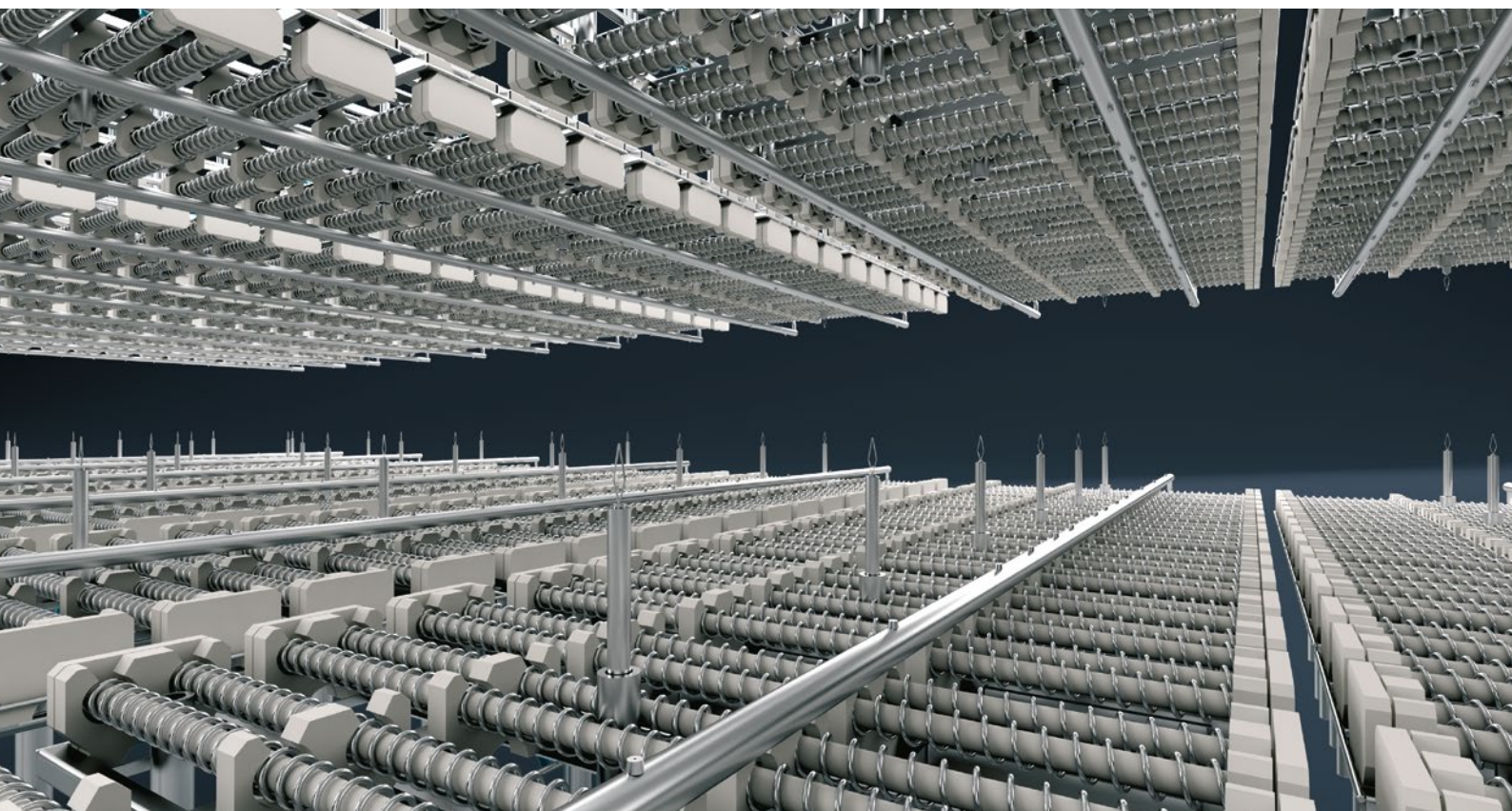


SMART HEATING

In partnership with Gefran and Kantal we developed a new and even more precise heating system maintaining the 300x600 mm heating cell matrix.

In every Mappi furnace you can find the increase of the electrical efficiency and an even smoother heating curve thanks to the new Gefran static relay and a special alloy from Kantal.

ATS 4.0 HEATING CHAMBER INTERNAL VIEW



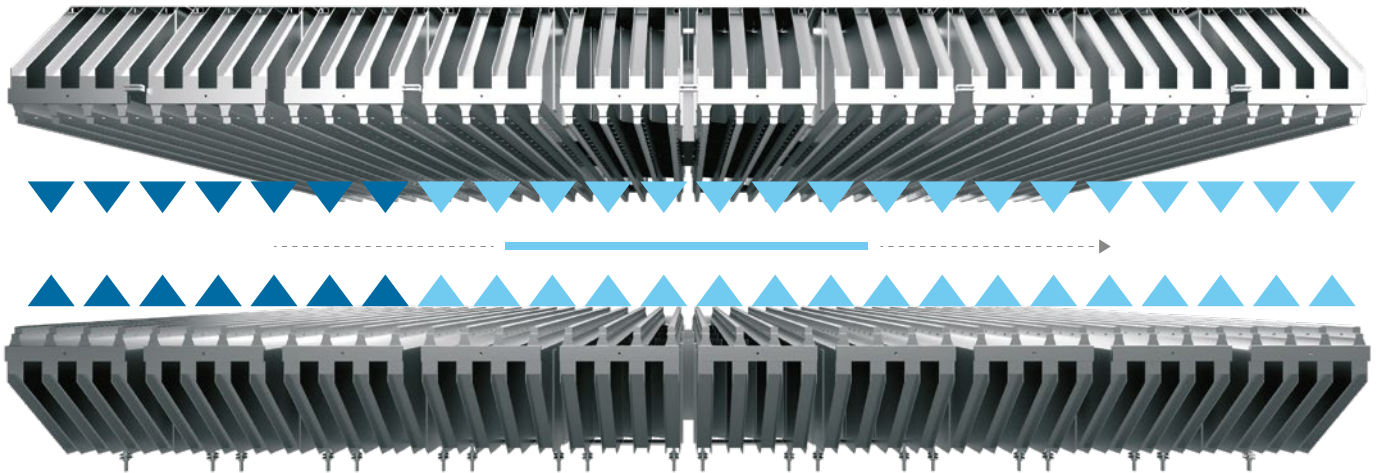
+ Advanced cooling

A NEW PERSPECTIVE ON TEMPERING

A new design of the quench/cooling nozzle and a new working angle emphasize the already very low glass anisotropy and iridescence. A redesigned air compression grid will optimize the quench effect.

+ PASS TROUGH TEMPER + COUNTER-ROLLERS + AUTOMATIC THICKNESS ADJUSTMENT

ATS 4.0 QUENCH/COOLING AREA SECTION



Quench/cooling areas partialisation is automatically managed from the Management software according to glass thickness.

Standard device is a motorized counter roller system in all the quench/cooling area to help thin glass, small measure, tempering.

A new specific design of the air nozzles is the result of long lasting testing period.

Air flow can be easily adjusted from the control panel in a very intuitive way.

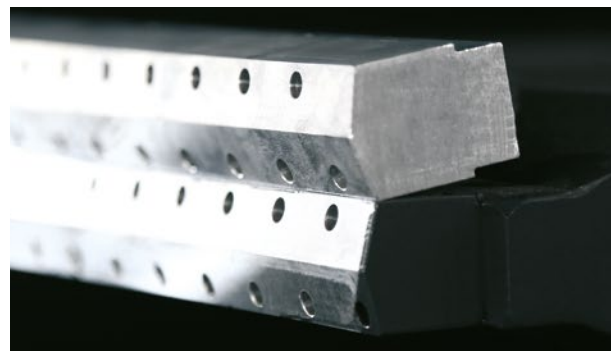


DC MOTOR BLOWER

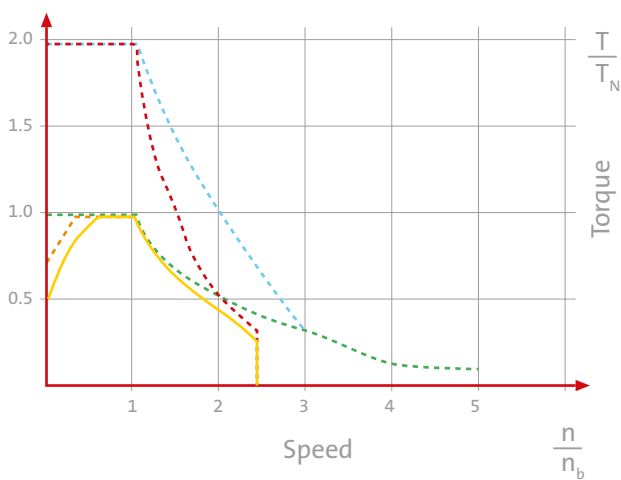
The well known efficiency of DC motor blower enhance it's reliability and long lasting characteristic in quench/cooling heavy duty application where top performance has to be reached in seconds.

Blower can be positioned according to building layout.

QUENCH/COOLING NOZZLE DETAIL

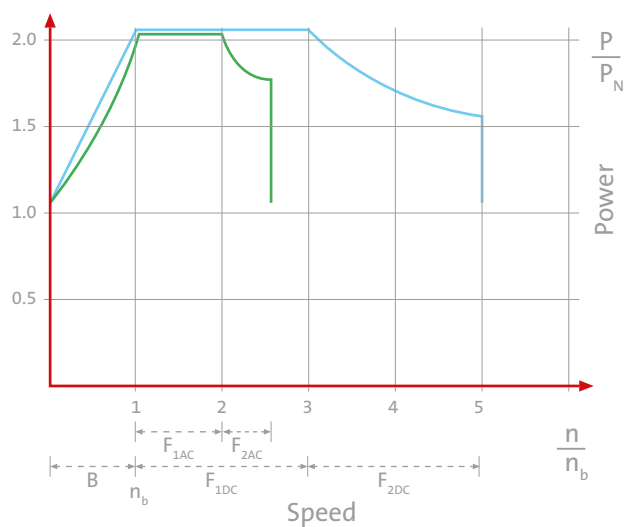


TORQUE COMPARISON OF DC AND AC MOTORS



- AC Motor maximum due to inverter limits
- DC Motor maximum due to converter limits
- DC Motor torque
- AC Motor torque forced ventilated
- AC Motor torque self-ventilated

POWER DEVELOPED BY A DC AND AC MOTOR



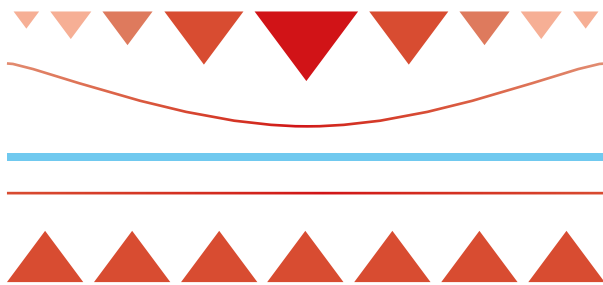
- DC Motor
- AC Motor

+ ghbs

XTREME PROFILE CONVECTION

A furnace for tempering produce heat, but this is nothing if it is not accompanied by the skill to manage in the best way both the heat and the air flows on the glass: this determines glass functional qualities, consumption and productivity of the system.

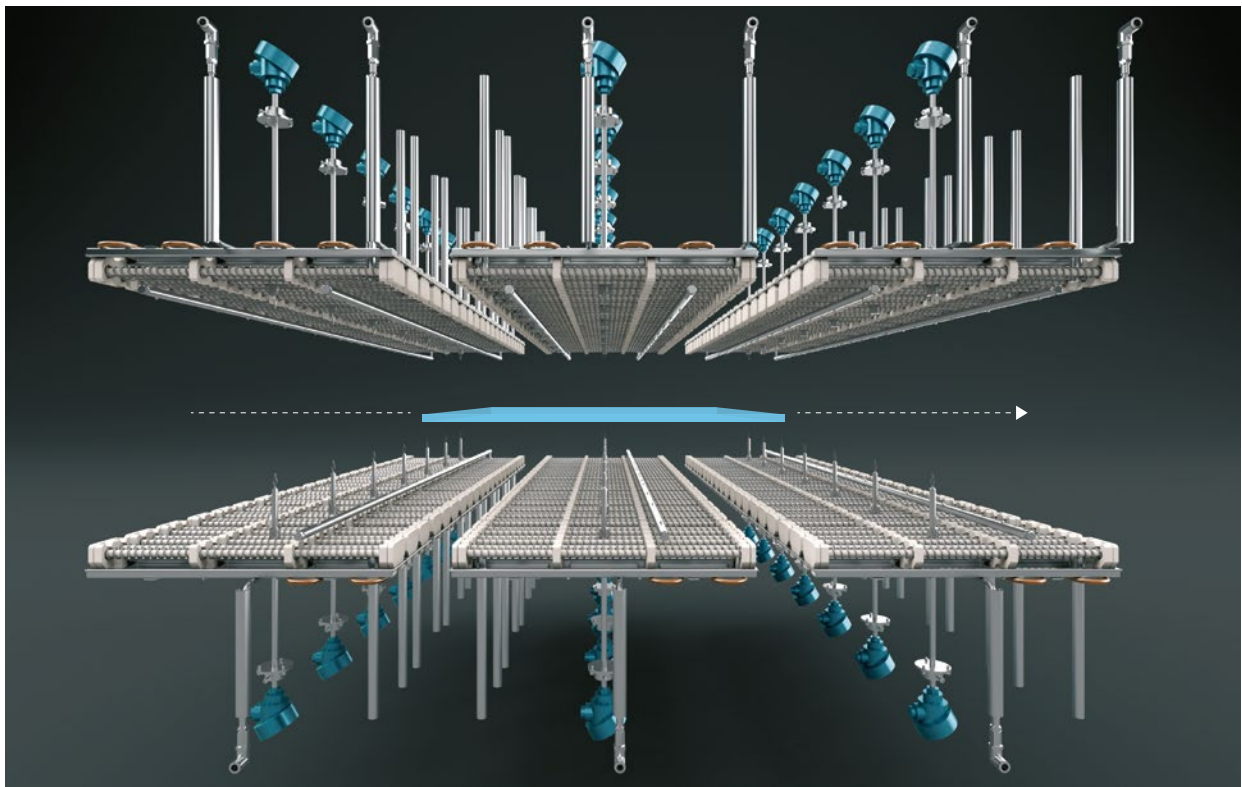
The **GHBS Xtreme Profile Convection System** is the result of the recent developments of the convection technology designed and patented by Mappi; it greatly enhances the performance of Mappi furnaces in terms of quality of the tempered product and increased production.



GHBS XTREME CONVECTION CURVE EXAMPLE

AIR CIRCUIT INSIDE THE ROOM

A set of high temperature steel pipe is situated in the superior and inferior heating chamber. This allows the heating of the compressed air and the following distribution on both the glass surfaces.



GHBS AIR HEATING AND DISTRIBUTION MODULE


 MAPPI INNOVATIONS

ghbs⁺ Xtreme
profile
convection

GHBS ALLOWS YOU TO:

Process all coated glass of the last generation including the LowE with 0,01 Emissivity.

Improve the quality of the glass in terms of:

- Optical Distortion
- Glass sheet flatness
- Surface defects

Increase the maximum dimensions of temperable sheet.

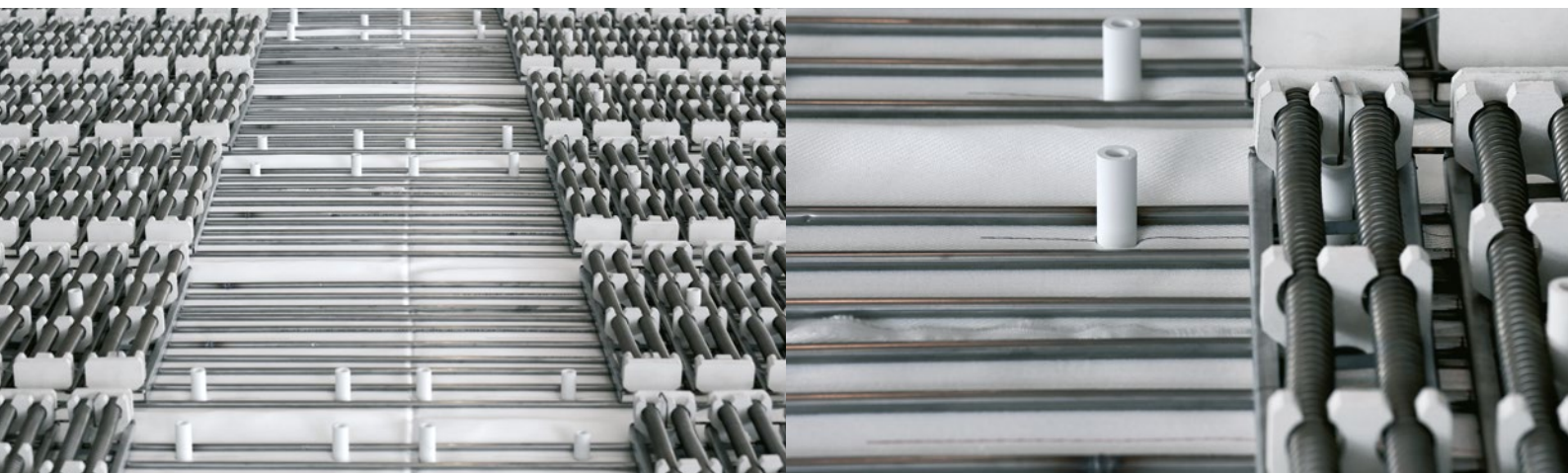
Reduce cycle time and increase the productivity.

Thanks to an elaborate management program of sensors and operations involved in the convection system it's possible to:

- Modulating the intensity of the pressured air in every single zone inside the chamber;
- Managing the distribution of the pressure along the extension of the loading present in the chamber.

This exclusive Xtreme Convection System allows temper all coated glass on the market, selective, solar control, including Low-E soft coating with an emissivity index of 0,01 and to increase the quality of the tempered glass and productivity plant.

GHBS XTREME CONVECTION HEATING PIPES





AT YOUR SERVICE, EVERYDAY

+ati

ACTIVE THERMAL INSULATION

In a Mappi furnace you can find the better thermal insulation, to minimize thermal dispersion, because of our efforts pursuing a clear objective: if heating is a cost, dispersion is a loss to avoid.

The ATI fully reduces thermal dispersion, thanks to hi-tech 350mm state of the art insulation. A success due to continuous research in the best performing materials, in collaboration with the most prestigious research centers in Europe and with Knauf and Morgan.



INSULATION MATERIAL DETAIL

+sbhc

SINGLE BLOCK HEATING CHAMBER

Mappi excellent insulation is due also to our Single Block Heating Chamber, another example of our “out of the box” thinking.

Market standard is to build heating chamber in various modules and assembled together on site. These modules have a metallic structure that has deep effect in thermal loss as well there is no continuity in the insulating material.

Mappi delivers the heating chamber in one single block in order to avoid all the just described problems. Mappi construction is precise and heavy duty.



COMPLETE HEATING CHAMBER

+ syncro

TRANSMISSION TECHNOLOGY

The ceramic rollers are driven accurately to within 1/1000 mm by DC drive motor with a friction transmission between iron/rubber (avoids slack time gaps, gear lash, with resulting risks of marks on the glass). Roller drives are controlled by brushless motors to insure accurate roller position and speed. To avoid distortions and damages to the surface of the glass the speed of oscillation of the ceramic rolls is managed automatically.

SYNCRO TRANSMISSION BELT DETAIL



Full ceramic rolls, easily replaced. We use the latest Vesuvius – Zyarock ceramic roller, eco friendly and with an even more durable end cup grip. No need of SO2 systems thanks to the high precision construction, but equipped with the piping if requested.

EASY TO START, EASY TO SWITCH OFF



Mappi is the only tempering producer that has this features for a much easier maintenance and better finish product quality.

Roller removal is always a risky operation, especially in reference of replacing the rollers in the exact micrometric position.

No more need to remove the roller to have access to the lower heating chamber which can have a deep impact on the quality.



HEATING CHAMBER EXTRACTION

Extraction of the heating chamber represents an unique feature of Mappi technology.

No need to remove rollers to have access to the lower heating elements. This design provides a clear advantage of an always perfect roller positioning and no risk of rollers damages during the roller removal.



OUR TECHNOLOGY FOR YOUR IDEAS

+ furnaces ATS 4.0 series

ALL THE POWER YOU NEED, WHEN YOU NEED IT

ATS 4.0 raises the bar in limiting consumptions through the use of coordinated MHS, ESS and ATI systems, a Mappi exclusive. **ATS 4.0 raises the bar in productivity** because it minimizes the time between tempering cycles, until you approach a virtually continuous cycle without down time for the adjustment of the operating temperatures.



mhs⁺ multizone heating system

MULTIZONE HEATING SYSTEM

Small heating modules, for precision heating and great flexibility, through a network of sensors.

ess⁺ energy saving system

ENERGY SAVING SYSTEM

A computerized system optimizes consumption and reduces the peak of installed power.

ac⁺ advanced cooling

ADVANCED COOLING

An original design for the blowing system that allows a precise control while tempering.

syncro⁺ transmission technology

SYNCRO

Allows a perfectly synchronized movement of the ceramic rolls over the whole heating chamber.

ATS

ATS 4.0 REDUCES TO THE MINIMUM VALUES NOW POSSIBLE ALL GLASS DEFECTS DUE TO THE COMPUTER MANAGEMENT OF THE MOVEMENT, THE HEATING AND AIR TEMPERATURES FOR TEMPERING, SUPPORTED BY THE USE OF ENGINES AND MATERIALS OF ABSOLUTE EXCELLENCE.



- + PROCESS ALL THE TYPE OF LOW E GLASSES
- + REDUCE CYCLE TIME AND INCREASE PRODUCTIVITY
- + MANAGE DISTRIBUTION OF AIR SEPARATELY IN LOWER AND UPPER HEATING CHAMBER
- + MODULATE THE PRESSURE OF THE AIR IN SINGLE AREAS
- + TAB SYSTEM, WHICH ALLOWS MAPPI TO CHECK QUICKLY THE CONDITIONS OF THE FURNACE



ATS 4.0 SERIES:
Size range from
1500x3800 mm
to 3300x6000 mm.

LOADING AREA

ATS SERIES

	1500x3800	1800x3000	1800x3800	1800x4200	2200x3800	2200x4200	2500x4200	2500x5000
mm	1500x3800	1800x3000	1800x3800	1800x4200	2200x3800	2200x4200	2500x4200	2500x5000
inches	60x150	70x120	70x150	70x165	86x150	86x165	98x165	98x196

PRODUCTIVITY | LOADS / HOUR

CLEAR GLASS	3 mm	26	26	26	26	26	26	26	26
	4 mm	25	25	25	25	25	25	25	25
	6 mm	17	17	17	17	17	17	17	17
	10 mm	10	10	10	10	10	10	10	10
	19 mm	5	5	5	5	5	5	5	5
LOW-E	3 mm	24	24	24	24	24	24	24	24
	4 mm	20	20	20	20	20	20	20	20
	6 mm	13	13	13	13	13	13	13	13
	8 mm	10	10	10	10	10	10	10	10
	10 mm	8	8	8	8	8	8	8	8

AVERAGE CONSUMPTION¹

kW/h	241	241	286	310	333	367	410	469
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POWER PEAK

kW	320	320	400	410	420	480	520	580
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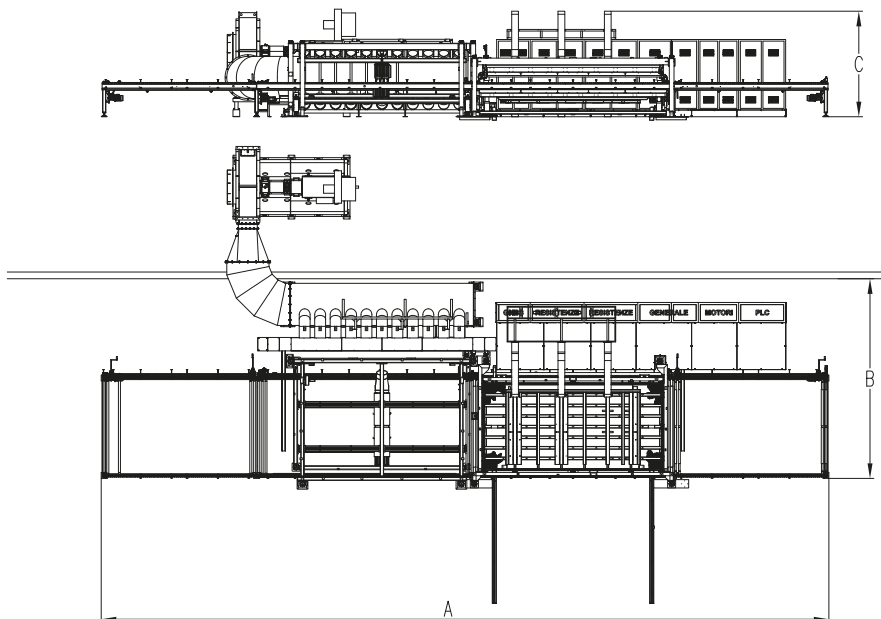
PLANT DIMENSION

Lenght M/feet	20 65	17 55	20 65	22 72	20 65	22 72	22 72	25 82
Width M/feet	4,7 15	5 16	5 16	5 16	6 20	6 20	6 20	6 20
Height M/feet	3 10	3 10	3 10	3 10	3 10	3 10	4 13	4 13

(1) The consumption is based on the glass thickness of 4 mm at 65% of the load.

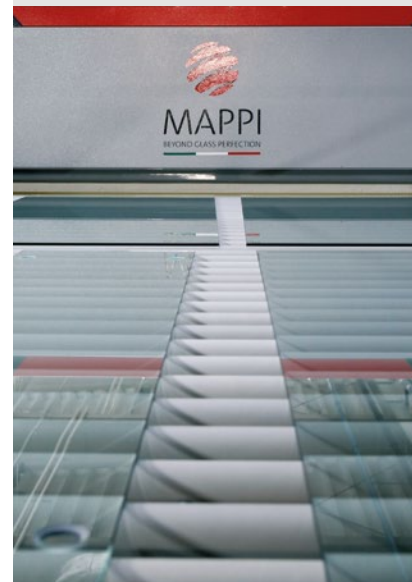
ATS 4.0 SYSTEM FEATURING

ghbs⁺ mhs⁺ ess⁺ ac⁺ its⁺ ihs⁺ syncro⁺ ec⁺



AVAILABLE OPTIONS

- SC:** Quality control scanner
- UPS:** Uninterruptible power supply
- CV:** Sound reduction for ventilator
- CS:** Sound reduction for quench section
- FI:** Sound reduction filter for in take air section



+ ATS 4.0

XTREME PROFILE CONVECTION

LOADING AREA

ATS J SERIES
2500x6000 J | 2700x6000 J | 3300x6000 J

mm	2500x6000	2700x6000	3300x6000
inches	98x236	106x236	130x236

PRODUCTIVITY | LOADS / HOUR

	3 mm	4 mm	6 mm	10 mm	19 mm
CLEAR GLASS	3 mm	-	-	-	-
	4 mm	25	25	23	
	6 mm	17	17	16	
	10 mm	10	10	9	
	19 mm	5	5	5	
LOW-E	3 mm	-	-	-	-
	4 mm	20	20	19	
	6 mm	13	13	12	
	8 mm	10	10	9	
	10 mm	8	8	7	

AVERAGE CONSUMPTION¹

kW/h	595	624	764
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POWER PEAK

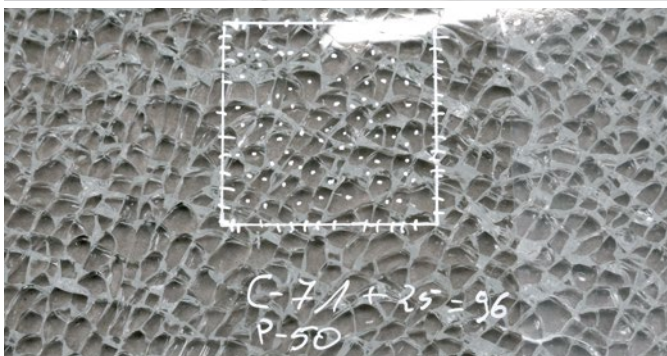
kW	850	950	1500
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PLANT DIMENSION

Lenght M/feet	28 91	28 91	28 91
Width M/feet	6,5 21	6,5 21	7 23
Height M/feet	4 13	4 13	4 13

(1) The consumption is based on the glass thickness of 4 mm at 65% of the load.

MAPPI ATS 4.0



CRASH TEST



TEMPERED GLASS

+ furnaces FOX series

SMALL IN SIZE, GREAT IN RESULTS

Fox is a series of compact furnaces designed for the needs of medium-small glassware. Despite its small size, every Fox Series machine ensures high quality and cost-effectiveness even in small series machining.



mhs⁺ multizone heating system

MULTIZONE HEATING SYSTEM

Small heating modules, for precision heating and great flexibility, through a network of sensors.

ess⁺ energy saving system

ENERGY SAVING SYSTEM

A computerized system optimize consumption and reduces the peak of installed power.

ac⁺ advanced cooling

ADVANCED COOLING

An original design for the blowing system that allows a precise control while tempering.

syncro⁺ transmission technology

SYNCRO

Allows a perfectly synchronized movement of the ceramic rolls over the whole heating chamber.



THE NEW FOX ECOCONVECTION FURNACE IS A MACHINE FEATURING THE MOST ADVANCED FEATURES THAT TECHNOLOGY OFFERS IN THE INDUSTRY.



FOX SERIES:
Size range from
1050x2300 mm
to 1500x3200 mm.

- + CONTROL OF INDIVIDUAL HEATING ZONES INTERFACED WITH THERMOCOUPLES DATA
- + AUTOMATIC HEATING ZONE MANAGEMENT IN ORDER TO AVOID OVERHEATING
- + INDEPENDENT CONTROL OF THE CONVEYOR'S MOTORS FOR THE HEATING SECTION AND QUENCH SECTION
- + VENTILATOR IN POWERED BY DC MOTORS, WITH AN ELECTRONIC SPEED CONTROL, THAT PROVIDES CONSIDERABLE ENERGY SAVINGS
- + SOFTWARE COMPLETELY MANAGED BY SIEMENS PLC
- + TAB SYSTEM, WHICH ALLOWS MAPPI TO CHECK QUICKLY THE CONDITIONS OF THE FURNACE



FOX HEATING ELEMENT



ELECTRICAL MULTIMETER



QUENCH/COOLING AREA



SYNCRON TRANSMISSION

LOADING AREA		1050x2300	1250x3200	1500x3200
mm		1050x2300	1250x3200	1500x3200
inches		41x90	49x126	60x126

PRODUCTIVITY LOADS / HOUR				
CLEAR GLASS	3 mm	26	26	26
	4 mm	25	25	25
	6 mm	17	17	17
	10 mm	10	10	10
	19 mm	5	5	5
LOW-E	3 mm	24	24	24
	4 mm	20	20	20
	6 mm	13	13	13
	8 mm	10	10	10
	10 mm	8	8	8

AVERAGE CONSUMPTION¹			
kW/h	115	170	233

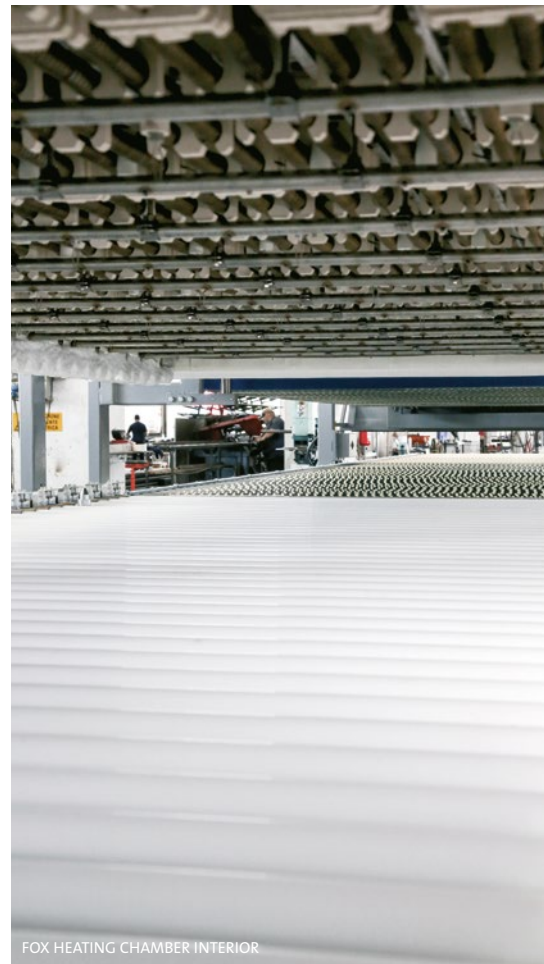
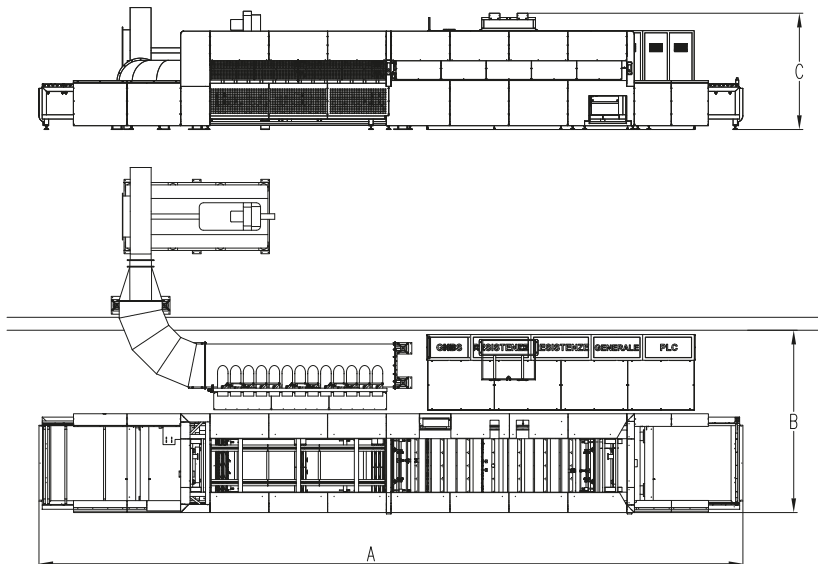
POWER PEAK			
kW	160	210	280

PLANT DIMENSION						
Lenght M/feet	12	39	16	52	16	52
Width M/feet	2,3	7,5	3,5	11,5	4	13
Height M/feet	2,3	7,5	2,3	7,5	2,3	7,5

(1) The consumption is based on the glass thickness of 4 mm at 65% of the load.

ATS SYSTEM FEATURING

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FOX HEATING CHAMBER INTERIOR

AVAILABLE OPTIONS

- SC:** Quality control scanner
- UPS:** Uninterruptible power supply
- CV:** Sound reduction for ventilator
- CS:** Sound reduction for quench section
- FI:** Sound reduction filter for in take air section



+ tab service

THE NEXT LEVEL FOR CUSTOMER SERVICE

It is essential for Mappi to always be close to the customer from the first contact, to the choice of the most suitable model, up to the after-sales service.

Today Mappi can be even closer with Tab Service: the instant support service that allows them to be at customer side. Video conferencing allowing the technician to understand the actual nature of any concerns.

- + LOGS ALL MECHANICAL ASSISTANCE SINCE INSTALLATION
- + PROVIDES SPECIFIC DOCUMENTATION TO ASSIST IN DIAGNOSIS
- + FULLY CUSTOMIZABLE



+ our customers certifications



ECE 43R

AS/NZS 2208



ANSI Z97.1

EN 12150-1

EN 1863-1



MAPPI INTERNATIONAL S.r.l.

Via Fieramonti, 1
04012 Cisterna di Latina (LT) Italy
Phone +39 06 96.873.284
Fax +39 06 96.873.211
P.iva: IT02218070593

MAPPI AMERICA

3888 Mannix Drive #314
34114 Naples (Florida)
United States
Phone: +1 239 234.5028
+1 336 257.9651

info@mappi.it
www.mappi.it
www.mappi.us