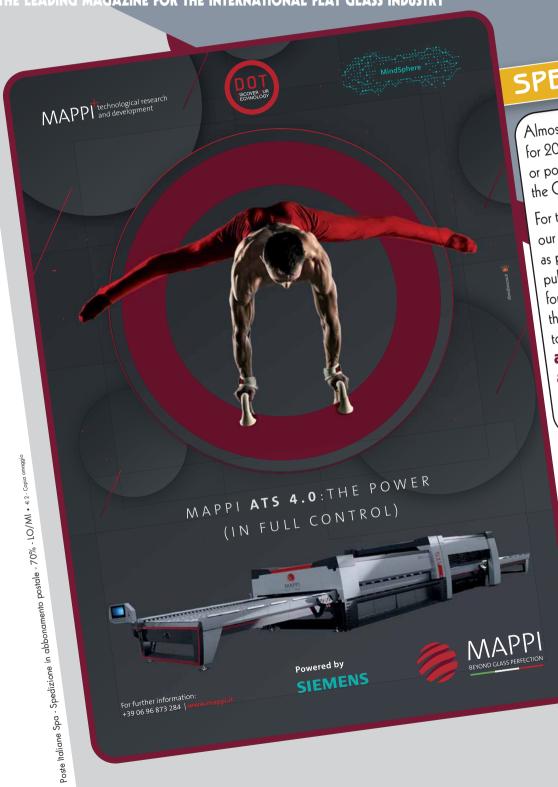
Gass-lechnology International September/October • Year 31 • No. 5/2020

THE LEADING MAGAZINE FOR THE INTERNATIONAL FLAT GLASS INDUSTRY



SPECIAL ISSUE

Almost all the trade fairs planned for 2020 have been cancelled or postponed to 2021 due to the COVID-19 pandemic.

For this reason and to maintain our responsibility to inform, as part of the press and as publishers of trade publications for the glass industry for more than 30 years, we have decided to support our customers and readers with a Special Issue filled with editorials, ranging from company presentations to technical articles.

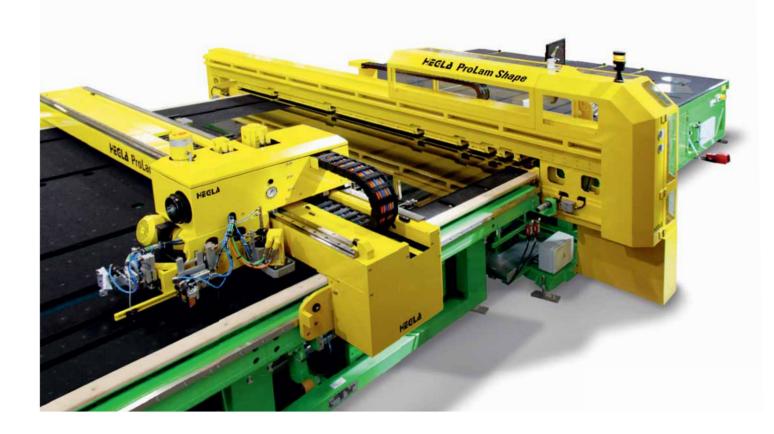
To further support companies and provide the glass industry with information, glassOnline now has special contents, including a series of company videos and video interviews.







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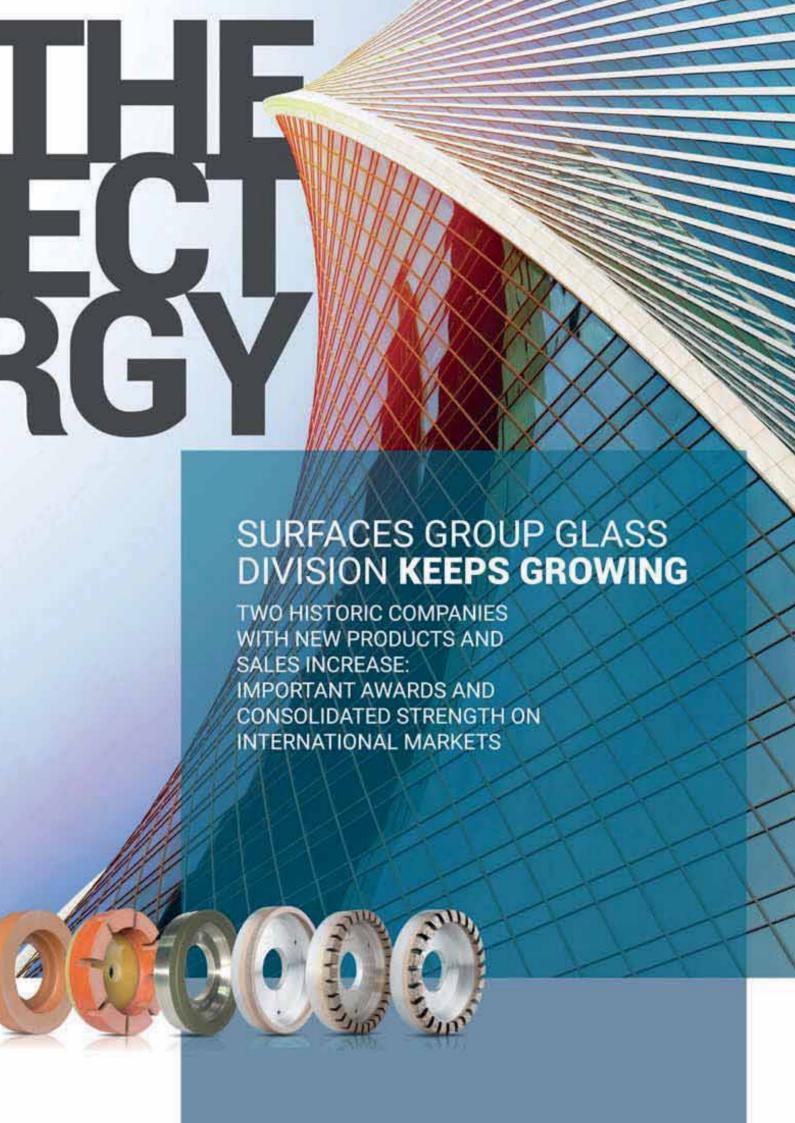
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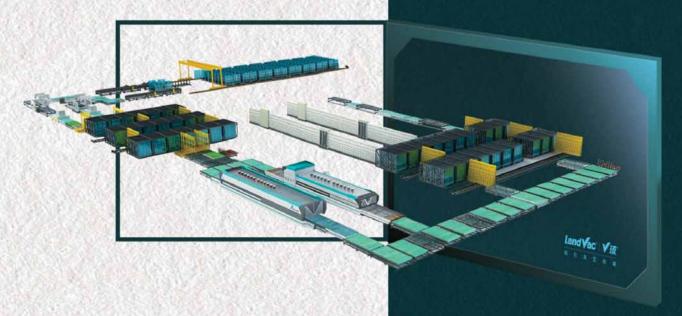
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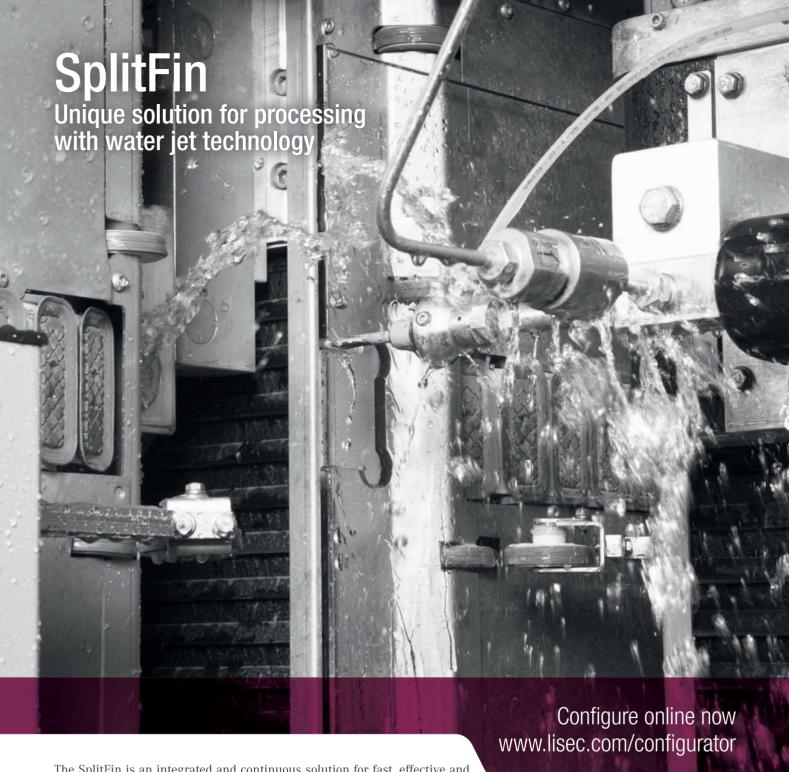
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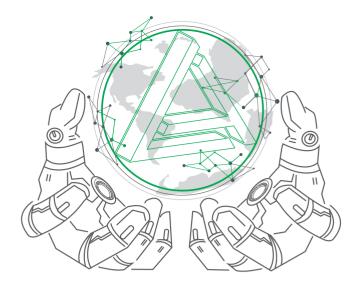








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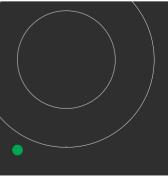






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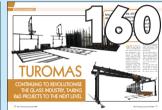
































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	issue	exhibition/conference	date	venue	deadlines
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		MIR STEKLA	22-25 March	MOSCOW - Russia	
		GLASS SOUTH AMERICA	24-27 March	SAO PAULO Brazil	Editorial files:
		GLASSTECH MEXICO	14-16 April	GUADALAJARA Mexico	Deadline Adv files: 05-02-2021
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		CHINA GLASS	6-9 May	SHANGHAI China	Deadline Adv files: 02-04-2021
_	3	GLASSTEC	15-18 June	DUSSELDORF Germany	
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N		GPD - GLASS PERFORMANCE DAYS	23-25 June	TAMPERE Finland	Deadline Adv files: 07-05-2021
00 00 1	4	GULF GLASS	12-15 September	DUBAI UAE	Editorial files:
		GLASSBUILD AMERICA	13-15 September	ATLANTA (GA) USA	Deadline Adv files: 30-07-2021
100	5	VITRUM	5-8 October	MILAN Italy	Editorial files: 03-09-2021
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		ZAK GLASS TECHNOLOGY	December	DELHI India	Deadline Adv files: 18-10-2021



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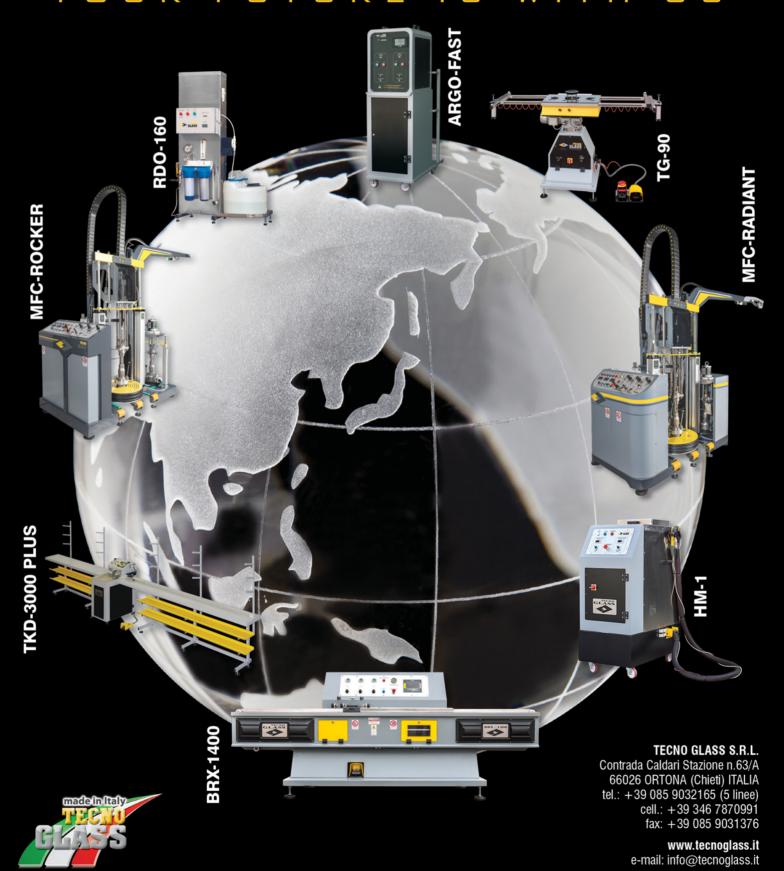
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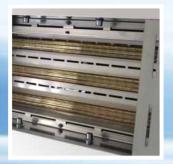
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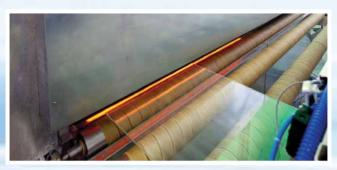
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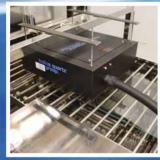


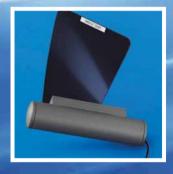


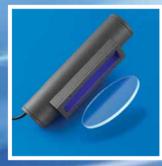












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SGM - Special Glass Machinery

A new player in the flat glass sector



SGM is the acronym of – **Special Glass Machinery** – and it is also the goal of the company itself, through research and care in studies to obtain the results that customers expect.

The company, founded thanks to the collaboration between historical companies in the flat glass sector, which have been producing different types of machinery for several years, deals with the marketing of plants, also including special ones, for flat glass processing. Determined to make a change in the design and construction of plants and machinery in the glass sector, thanks to the experience acquired over the years in the specific sector and innovation, a term that characterises today's society, a concrete future in the world of glass.

In particular, the machines of the company include: edge processing (grinding), drilling and milling, handling (loaders, unloaders, machines for positioning material for glass separation), washing, and the production of double-glazing.

SGM – this young company – also with regards to its shareholder structure is, at the same time technically and commercially prepared, and is boldly entering the market in this particularly difficult year.

A project will soon be completed, and will be promoted during an Open House, where customers will be able to preview the results of a homogeneous team both in terms of design, as well as hardware and software, chosen to simplify its use to the utmost.



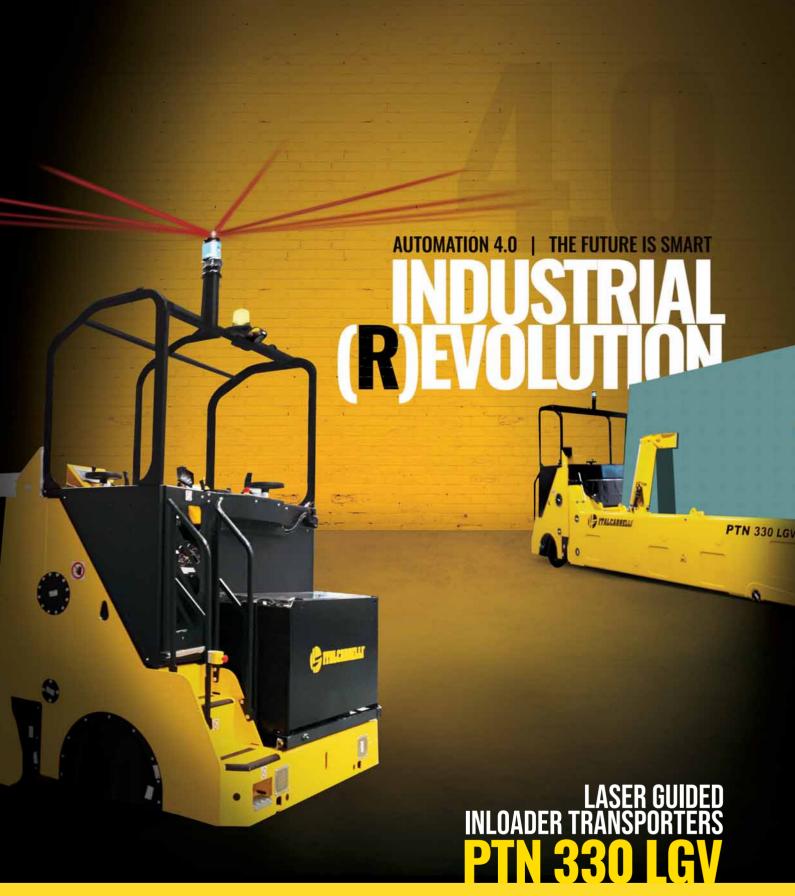
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iteSentry has been developing technologies to solve the difficult problems of inspection and measurement for glass fabricators since 1999. Their tools provide automated, accurate, 100% on-line inspection of flat glass and plastic sheets for manufacturers around the world. At the heart of LiteSentry's business is a passion for new technology that solves customers' most difficult challenges.

Vitrum Glass Group is always looking for ways to meet the increasing demand for architectural glass products, and the company has been an Osprey user since 2009. With their recent investment to measure both anisotropy and distortion, Vitrum Glass Group stands by their commitment to better serve their customers with competitive lead times and top quality products.

Pushing the limits with the most recent addition, a jumbo Firejet tempering furnace combined with the Osprey 9 Complete Anisotropy and Distortion, they can heat and treat superior quality glass up to 130 by 275 inches. The Osprey[™] 9 Complete measures maximum observable iridescence, strain marks, heat stain, white haze, average or residual stress, and ALL types of distortion, not just roller wave or edge kink.



WWW.VITRUM.CA

As a Canadian owned and operated glass fabricator, Vitrum Glass Group prides themselves in the quality products they manufacture to serve the needs of their Canadian and American clients, and Osprey technologies help them deliver their superior quality products.

SOFTSOLUTION

Anisotropy and edge stress detection at Tamcam Oto Cam

Sa.S., with its headquarters in Istanbul, has specialised in the production of flat glass, safety glass, windscreens and toughened safety glass. Today 274 employees work for the renowned glass producer, checking anisotropy and edge stress with a horizontal LineScanner from SOFTSOLUTION. Anisotropy appears in windows and glass facades when polarised light hits the glass during certain weather conditions. Modern tempering techniques make it possible to significantly increase the uniformity of the stresses within the glass which in turn reduces the appearance of anisotropy effects. The LineScanner on a Landglass tempering furnace inspects each glass for isotropic, as well as anisotropic, areas of a tempered lite in a single scan process with minimal space require-



ments and measures different parameters such as:

- Light delay in nanometers per pixel over the entire lite
- Measuring range up to 465nm or optionally up to 900nm
 For a professional and comprehensive definition of the quality, it is also important to measure the edge stress along all edges of a specific lite. By doing so, the LineScanner determines the edge stress levels and provides a precise result regarding the expected fragmentation pattern. This unique and telecentric approach, provided by the SOFTSOLUTION LineScanner, offers a solution that includes every combination of quality check within a single quality

inspection system.



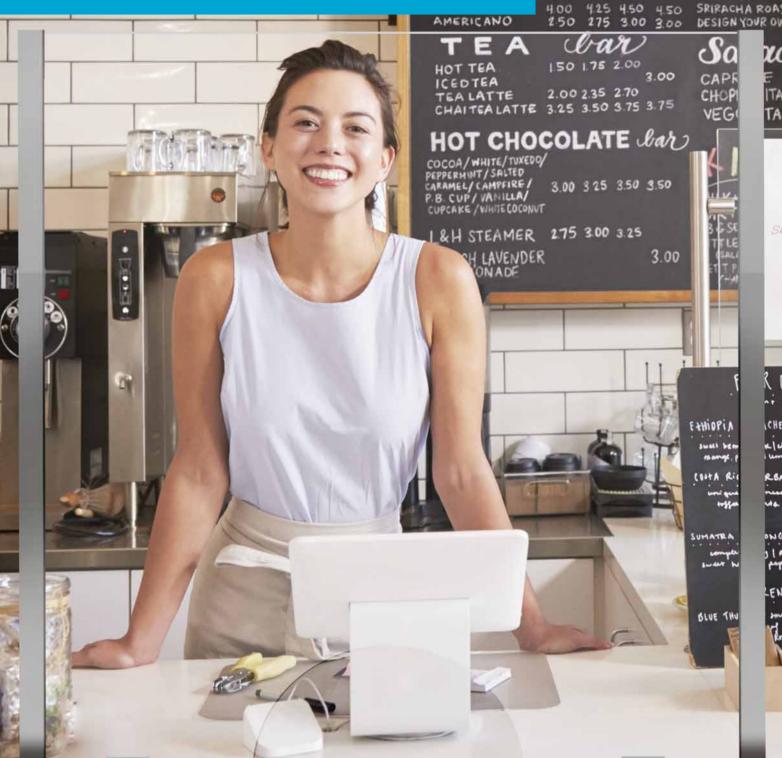
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VITRO GLASS

New sample kit for Solarban[®] low-e glass

Titro Architectural Glass has introduced a new Solarban[®] solar control, low-emissivity (low-E) glass kit featuring a more compact and environmentally friendly design. The streamlined, foam-free package contains 4-by-6-inch samples of Solarban® 60, Solarban[®] 70, Solarban[®] 90, Solarban[®] 67 and Solarban[®] R100 glasses on clear and Acuity[™] lowiron glass substrates. Solarban® 60 glass also is shown on tinted Optiblue® and Optigray® substrates and Solarban[®] 72 glass is coated on Starphire Ultra-Clear[®] and Acuity[™] low-iron

Nathan McKenna, marketing manager at, Vitro Architectural Glass, said that despite featuring a greater selection of products, the new kit is smaller and easier to handle than previous sample boxes.

"This kit is an important tool for architect libraries because it enables designers and specifiers to see the genuine difference in clarity and colour fidelity between conventional clear and low-iron glasses when specified with low-E coatings," he explained. "We also downsized the packaging and eliminated the use of foam, which makes it easier to ship, store and carry, and less impactful on the environment."





WWW.VITROGLAZINGS.COM



Green technology for glass industry



Reduced water usage, lower

High speed centrifuge removing solids down to 5 microns

Mechanical purification of water from 3,000 litres to 120,000 litres per hour











As **Şişecam Flat Glass**, with our glass expertise and wide range of products, we will continue to be on the same side of glass with you.





TVITEC

The world's most luxurious glass





The most advanced digital printing allows **Tvitec** to process perhaps the most premium and luxurious glass over the world through a line which crystallises gold, platinum and other precious metals onto hardened and laminated glass, ensuring the maximum beauty, safety and durability of the product.

This exclusive selection – Tvitec Gold – includes a huge selection of designs and representations upon the glass surface providing this splendid product with a reflection and precision absolutely magnificent. Moreover, it is possible to replicate all this workmanship in flat glass as well as in curved glass in a wide range of radius, always preserving the highest definition. High-purity gold or platinum nanoparticles are used to create the perfect formula which is the Jetver Luxury paint line, a mixture refined to the highest extend by *Tecglass* for the digital printing of this up-scale product. The cost of this painting is sky-high, which impacts the final price of the product in

such a way that the Gold line can be considered as a Rolex in the glass market.

By using Tecglass' digital production line, with a maximum size of 12 meters of length and 3.3 meters of width, Tvitec supplies this product always heat-treated and laminated – to ensure the maximum safety – for double- and triple glazing, guaranteeing the sustainability and the eco-efficiency that characterise the Isolar brand.

The gold, platinum and precious metals range from Tvitec is open to all kinds of applications, especially indoors, but outdoors too. Always attending to the most stringent criteria in every field -aesthetics, building and design, where a wide range of possibilities is available. Without a doubt, this is a new way of distinguishing oneself and making a difference in certain projects where high-performance glass takes centre stage.



TVITECGLASS.COM/EN







AGC GLASS EUROPE

Closure of a float glass furnace in Boussois planned

aced with the generalised, structural decline in demand for glass, the management of the AGC Glass Europe plant in Boussois, France, announced 24 September to the personnel representatives that in the near future it intends to shut down one of the two float glass furnaces on the site. This furnace has been put on hot hold since 1 April of this year; this measure forms part of an overall plan aimed at restoring competitiveness.

After operating on a market with overcapacity due to stagnant demand and the

start-up of new glass production plants, the Group is now feeling the full impact of the health emergency and associated economic crisis which is affecting the two main sectors of glass consumption, namely construction and automotive industries. This has led to acute overcapacity, falling prices and a marked deterioration in the Group's result overall. In the absence of prospects for recovery in the medium term, and despite the remarkable efforts towards productivity and diversification made by all the Boussois personnel, the Group sees itself forced to bring its manufacturing capacity into line with the current market situation.

This closure will lead to a loss of 90 jobs out of a total of 220. The Boussois management will act in concert with the personnel representatives to consider all the most socially acceptable solutions for putting this plan into practice.

WWW.AGC-GLASS.EU/EN





NORTHGLASS

Fully automatic coating production line



s of the middle of August, NorthGlass Coated Glass Company reported record high production and sales of coated glass. Production and sales in Luoyang were 1.8 million square meters, while those in Shanghai were 1.63 million square meters and 1.83 million square meters respectively. Due to the strong market demand, although the output has increased by about 50% compared with the same period last year, there are still a large number of orders that cannot be completed in time.

Based on the trend of the market, NorthGlass has decided to set up a new coating production line in the Shanghai factory, which is expected to be put into production in the first half of 2021. At that time, the Coated Glass Company will have three coating lines independently developed by NorthGlass, and its strength will be further enhanced.

The new production line is an intelligent production line independently developed by NorthGlass. The production line of nearly 200 meters can complete the production operation with only a few people. The production line uses Internet technology to realize remote monitoring and debugging.

No matter where the engineers are, they can monitor and debug the operation of the production line. Its production capacity covers almost all single-silver and double-silver low radiation coating products on the market at present, with the fastest single-silver 30 seconds/piece and double-silver 45 seconds/sheet. The processing specification is 3300 mm × 4880 mm. At the same time, it can produce 15-meter long ultra-large low-E glass, and the designed annual output is 10 million square meters.

At the beginning of 2019, NorthGlass integrated the resources of the coated glass industry and merged the production lines of Shanghai and Luoyang to establish the Coated Glass Company.

The annual sales volume in 2019 reached CNY 130 million, and the factories in Shanghai and Luoyang realized zero inventory for the whole year. In early 2020, a sudden outbreak of the epidemic disrupted the sales guidelines set out at the end of 2019. The company's sales team changed the sales strategy rapidly. On the one hand, it explored the market potential of Shanghai and Luoyang, on the other hand, it provided products and services to customers in other places through online sales and WeChat live broadcasts.

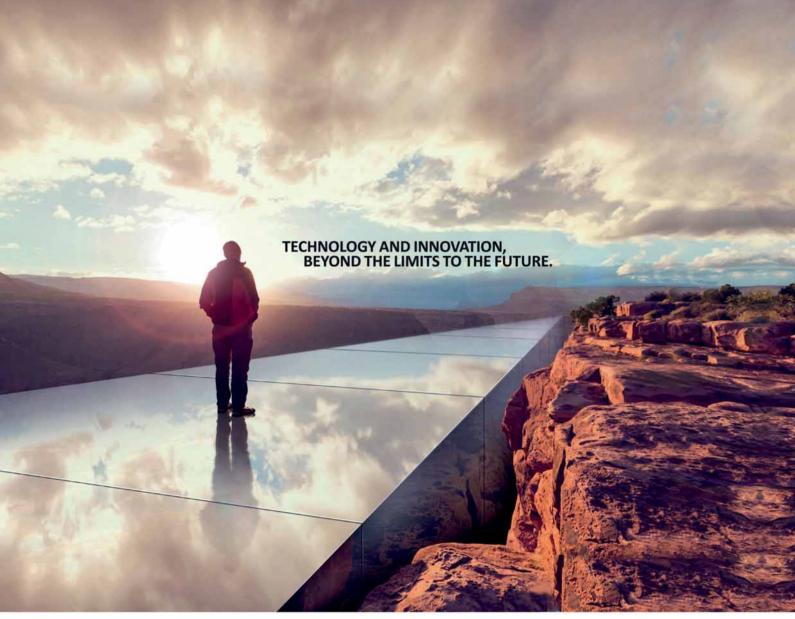
The company's production department optimises production organisation and management, improves the level of material and equipment support. All staff united to overcome difficulties, and organise production.



WWW.NORTHGLASS.GLOBAL/INDEX/INDEX.HTML









TECHNOLOGICAL MACHINES FOR WASHING, STOCKING AND CUTTING OF FLAT GLASS

SOLUTIONS FOR WASHING:

vertical and horizontal washing machines for low-e glass

SOLUTIONS FOR GLASS STORAGE:

manual, semiautomatic and automatic storage systems

SOLUTIONS FOR CUTTING:

manual, semiautomatic and automatic cutting tables for float and laminated glass

SOLUTION FOR GLASS HANDLING:

automatic loader and unloaders, clamps, vacuum lifters, manipulators

SOLUTION FOR PROCESSING:

CNC Milling machines, vertical drillers



WWW.SCHIAVOTECH.IT

GUARDIAN GLASS

New float line at Czestochowa plant launched



Guardian Glass completed its first ribbon pull at its second float glass facility in Częstochowa, Poland, to help meet the growing demand for high performance coated and fabricated glass products in Poland and throughout Eastern Europe.

The first pull of glass completes the plant's startup, which began with the ground-breaking in 2018 and led to the start of the plant's technologically advanced new glass coater on 6 July.

"The new float line is the largest in the Guardian family of float lines," said Guus Boekhoudt, Guardian Glass Executive Vice President. "We've implemented an innovative new furnace design with high efficiency combustion systems in order to provide products that meet the stringent quality requirements of our customers, while minimizing both the energy used for production and emissions from the process."

The plant, hosting two float lines, two coater lines and a lamination line, produces Guardian ExtraClear[®] float glass, Guardian ClimaGuard[®] low-emissivity (low-E) and Guardian SunGuard[®] solar control coated glass products as well as laminated glass for residential and commercial applications.

By engaging suppliers to provide both proven and innovative solutions to meet production and quality requirements, Guardian Glass took a progressive approach to the design for the new float line, underlining Guardian's long-term commitment to its customers to be the preferred supplier of glass solutions.

"The Guardian Glass Częstochowa plant represents our biggest greenfield capital investment in Guardian's history," Boekhoudt added. "This facility is the company's most efficient and operationally effective plant and houses our largest furnace and largest coater. The new float line has a nominal capacity of 1,000 metric tons of glass per day, while the new coater represents the latest in technology for Guardian and, we believe, for the industry."

"We are grateful for the strong support we have received in Poland from local and country officials," said Grzegorz Kuznik, Guardian Glass Czestochowa Plant Manager. "We are excited for the future and committed to the Czestochowa community."





WWW.GUARDIANGLASS.COM/EU/EN

SAINT-GOBAIN

L'Arboc staff protest furnace closure

Saint-Gobain has announced that it plans to close the furnace at L'Arboc plant in Spain. According to the company, the furnace has reached the end of its life.

The plant at L'Arboc supplies automotive glass to Sekurit, part of the Saint-Gobain Group, the company also foresee instability and a decrease in orders for automotive glass.

The cease of activity of the glass division would mean the dismissal of 122 people. Unions indicate that the closure would also call into question the continuity of Sekurit

division, where 260 people work.

WWW.SAINT-GOBAIN.COM/EN



New resource on vacuum insulating glazing released

has published the 'Introduction to Vacuum Insulating Glazing Glass Technical Paper (GTP)'.



This paper describes the makeup and purpose of vacuum insulating glass (VIG) and addresses its use in a variety of market applications, including new construction, restoration and refrigeration.

"This GTP was developed in response to the growing discussion about vacuum insulating glass," said Urmilla Sowell, NGA advocacy and technical services director. "It is an introductory resource that addresses the unknowns about VIG and provides examples of how it can be used for different purposes." Energy performance, acoustic improvements, size and shape options, as well as testing standards and a thorough list of terminology specific to VIG are also outlined in the GTP.

"We are excited to provide the industry with this GTP on VIG technology and what is currently available," says Kayla Natividad, NGA VIG task group chair and architectural technical services engineer at Pilkington North America. "As energy codes continue to develop, we'll see technologies being adopted that we may not all be familiar with. It's important our industry is equipped with as much information as possible."

Special thanks to the volunteer VIG task group members within the Fabricating Committee's Insulating segment who contributed to this GTP's development.

- Kayla Natividad, Chair, NSG|Pilkington North America
- Dr. Charlie Boyer, VIG Technologies, LLC
- Mark Cody, AGC Glass Company
- · Shelby Froehling, Viracon
- Steve Marino, Vitro Architectural Glass



WWW.GLASS.ORG/STORE



1989 - 2019 Performance



FUYAO GLASS AMERICA

USD 45 million plant expansion

uyao Glass America has announced it is hiring for 350 job openings in the midst of a USD 45 million plant expansion. The expansion plan at the company's plant in West Stroop Road, Moraine, OH, USA, includes investment for research and development, plus purchasing equipment to help produce more after-market



automotive glass for companies such as Safelite, headquartered in nearby Columbus. The company will also acquire an additional 161,000 square-feet at the Moraine facility.

At full capacity, the company will have 2,300 employees at the Montgomery County plant, according to Jeff Liu, Fuyao Glass America President and CEO.

The new jobs are the result of not only the expansion, but also the new programmes the company is tackling as a result of customer demand for its automotive glass products, Jeff Liu said. "We have to get people ready to support those new programmes," he continued. Fuyao Glass Industry Group, the largest automotive glass manufacturer in China and the second largest automotive glass manufacturer in the world, first invested in Moraine in 2014, initially committing to create 800 jobs for its Original Equipment Manufacturer customers in the shell of a former General Motors assembly plant.

In 2015, the company committed to create 750 additional jobs to manufacture after-market glass. It now is operating with about 1,900 employees, Jeff Liu added.

FUYAOUSA.COM



PRODIM

Accurate digital measuring for flat/curved glass

Glass fabricators using **Prodim**'s Proliner have improved their overall production process by significantly reducing the time required for measuring and creating digital templates for glass constructions.

Expensive waste products due to inaccurate measurements now belong to the past for them, thanks to the accuracy of the Proliner line of products.

There is a clear distinction in the requirements for creating digital templates for flat glass constructions and (double)



curved glass constructions. Prodim offers special solutions for both.

Operators can easily create, check and change digital measurements in their factories or on job sites and they can use

the rapidly created DXF files for further processing or as direct input for their machinery.



WWW.PRODIM-SYSTEMS.COM

FAST VIRTUAL ASSISTANCE?

The perfect solution is in your hands



BOVONE MACHINES GO ONLINE!

In compliance with Industry 4.0. requirements. The following packages enhance all remote assistance functions already present, in order to integrate the machine data in the clients' IT system.

More than ever, Bovone pays great attention to customer care, after-sales service and predictive maintenance.

NO DISTANCING ISSUES WITH

KIT INDUSTRY 4.0

BVA



More autonomy and faster maintenance at the right time!

BVA System for virtual and remote access to all data, manuals, certificates and technical videos related to the machine, works with an i-Pad and its camera

REMOTE ASSISTANCE



Allows Bovone to access some machine data in order to solve problems from remote. Customers can check a file, updated in a gateway, concerning machine status, worked meters, speed and thickness, consumption data.



HEGLA

StreamLam: fully-automated cutting system for laminated glass

he new **HEGLA** StreamLam is synonymous with a holistic high-performance cut for laminated safety glass, which was created by evaluating, rethinking and modifying any previous processes and interrelationships. The resulting double-deck concept and modular cutting units means up to three panes can be cut simultaneously.

Features include:

- Fully-automated cutting system for laminated safety glass (glass transport, positioning, scoring, heating, separating)
- Modular positioning system for simultaneous processing of up to three panes

- High-performance double-deck concept for consistent and efficient flow of glass
- Automatic residue disposal
- Space requirement adapted for the replacement of conventional cutting line combinations from two existing systems

Embracing a holistic concept, the StreamLam impresses as the central component of a newly installed high-performance line. In the case of existing lines, it makes an ideal replacement for combined cutting machines and boasts a significantly higher output.



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MOVING UP FROMSOLID TRADITION

Always one step forward

- A lighter wheel means a stress relieving of the motor
- Slats on the plate have been especially designed to allow water to be atomized sothat it can uniformly reach the point of contact between the wheel and the glass
- A higher rigidity of the material means a more direct pressure transmission set up by the machine operator
- A perfect balancing of the wheel is granted by the plate







SPARKLIKE

Battery operated, portable non-destructive insulating gas measurement



Sparklike Oy introduces the renewed and improved Sparklike Laser Portable™ 2.0 device that allows mobile and non-destructive measurement of insulating gas concentration for triple and double glazed insulating glass units.

The new and improved version of the device is mobile, more compact, provides easier measurement, and features a new $Ergogrip^{TM}$ with three handles.

Usability improvements and new features:

- Portable, more compact, and easier measurement
- Compact measuring head with New ErgoGrip[™] three handles and start-buttons, easy to handle in different measuring positions
- Smaller main unit case with 150mm pneumatic wheels easy manoeuvring
- Vacuum gripping to the IG unit light signal when reading and vacuum grip is released
- Barcode reader and Wi-Fi are available as options
- Technical support with remote connection

Jukka Manner, CEO of Sparklike Oy, said, "All Sparklike devices are designed in close collaboration with our customers. We listened to our customers and wanted to further develop our popular portable laser device to improve usability and make measurement even more easy and comfortable. We are very proud to have the first and only non-destructive insulating gas measuring technology for IG units."

Sparklike Laser technology was originally launched to market in 2014 and the first edition of the Sparklike Lasers™ device,

a non-destructive laser measurement device was launched in the autumn of the same year. Since launching, a total of almost 200 laser devices have been delivered to over 50 countries. The new and improved Sparklike Laser Portable™ 2.0 provides a fully integrated system that has a robust case with wheels and a battery for improved mobility. Due to this, the device enables measurement of the gas concentration on the Insulated Gas Units (IGU) both on the production line as well as on-site. The device measures the oxygen level and calculates results which are displayed as argon, krypton, or additional insulating gas levels.

Jukka Manner continued, "Non-destructive measurement and the mobile features are the main benefits of the Sparklike Laser PortableTM 2.0 device. When integration directly into the IG line and automatic measuring is needed, we are proud to offer the Sparklike Laser IntegratedTM measurement station







(formerly Online), which is based on the same patented and proprietary Sparklike laser technology."

The ever-growing popularity of the Sparklike devices™ is due to the fact that this agile and innovation-driven Nordic company – that holds various patents for their never-before-seen technology – is continuously able to develop their expanding offer of products to correspond to industry requirements. In other words, Sparklike devices™ enable IG manufacturers, window and door manufacturers, testing laboratories, building quality inspectors as well as construction consultants worldwide, to measure gas concentration of IG units in a fast, economic and non-destructive way.

Sparklike Laser Portable™ 2.0 deliveries will start in November 2020.



WWW.SPARKLIKE.COM/EN



glasstec

INTERNATIONAL TRADE FAIR FOR GLASS PRODUCTION • PROCESSING • PRODUCTS

NEW CHALLENGES NEW CHANCES

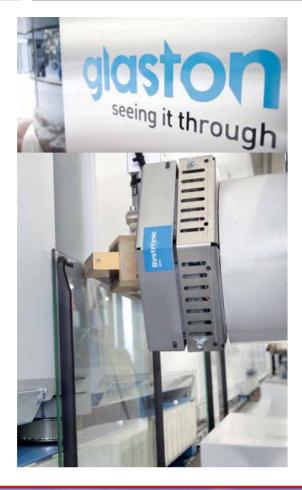


SAVE THE NEW DATE

For more information:

glasstec-online.com





BYSTRONIC

Company name changes but reliability remains

Pystronic Lenhardt GmbH has been part of Finnish Glaston Group since April 2019.

During the integration period, the next step has been taken: from 1 September 2020, Bystronic Lenhardt GmbH has become Glaston Germany GmbH.

The new company details are:

Glaston Germany GmbH - Karl-Lenhardt-Str. 1-9

75242 Neuhausen-Hamberg - Germany

Phone: +49 7234 / 601 0 - e-Mail: info.de@glaston.net

Nothing will change except the new company name in Neuhausen-Hamberg. Glaston Germany will continue to be a reliable contact for all questions regarding the production of insulating glass. Together, the company will always strive to provide the best knowledge and the latest

technologies in glass processing.



WWW.GLASTON.NET

WATER and GLASS

The most effective demineralized water for glass processing

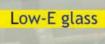
The manufacture of glass products requires highly refined technologies that depend on demineralized water with particular characteristics for each type of glass.











Laminated glass

Automotive glass

Specialist glass

Frosted glass













Why choose STRATO® Bird Friendly EVA interlayers for glass lamination:

- benefit 100% of the advantages given by laminated safety glass
- buy the quantity needed for a specific project (no minimum order quantity)
- any customed size available at no extra cost
- incredible cost savings production using standard float glass for lamination
- avoid expensive stocks of big quantities of non-standard float glass
- customize the EVA film with the pattern requested by designers
- combine the Bird Friendly line with other STRATO® products to create glasses with additional benefits (e.g. solar control)
- high visible light transmission
- high weather resistance due to the properties of STRATO® EVA film
- visual continuum (selected patterns do not disturb the view)
- full protection against UV rays



Contact us for more information



customer@satinal.it

+39 031 870573

EVA FILMS

Satinal STRATO® BIRD FRIENDLY – THE FIRST ANTI-COLLISION EVA FILM TO PROTECT BIRDS

Satinal produces in Italy the first anti-collision EVA film for bird-friendly applications thanks to the development of its own exclusive extrusion technology. STRATO® BIRD FRIENDLY is the first innovative and unique EVA interlayer on the market: it makes it possible to obtain a laminated safety glass characterized by lines, dots or patterns, recognizable by birds that, consequently, will avoid colliding against the glass.





Thanks to the development of an exclusive extrusion technology, Satinal has created the first anti-collision EVA film for birds in Italy. Strato[®] Bird Friendly is an innovative and unique line on the market: these special EVA interlayers allow to obtain a laminated safety glass characterized by lines, dots or patterns, recognizable by birds that, consequently, will avoid

colliding against the glass. Satinal has created the design of these effective patterns at its in-house R&D Lab, based on studies carried out by International Associations and Laboratories that have been analysing the flight and behaviour of birds for several years. Some tests have shown that most of them avoid flying through horizontal spaces less than 2 inches (5 centimetres) high or through vertical spaces 4 inches (10 centimetres) wide or less.

These guidelines are commonly known as the '2x4 rule', but there are actually exceptions resulting from research conducted on specific species.

This new range of EVA interlayers, has been designed by Satinal with the aim to raise awareness of designers, glaziers, architects etc. by encouraging them to use the right tools to reduce the problem.

Laminated glass with Strato® Bird Friendly EVA interlayers will not only limit bird collisions, but will also provide several advantages:

- 100 per cent of the advantages provided by laminated safety glass with EVA film;
- buying the quantity needed for a specific project (no minimum order quantity);
- customised sizing available at no extra cost;
- incredible produc-

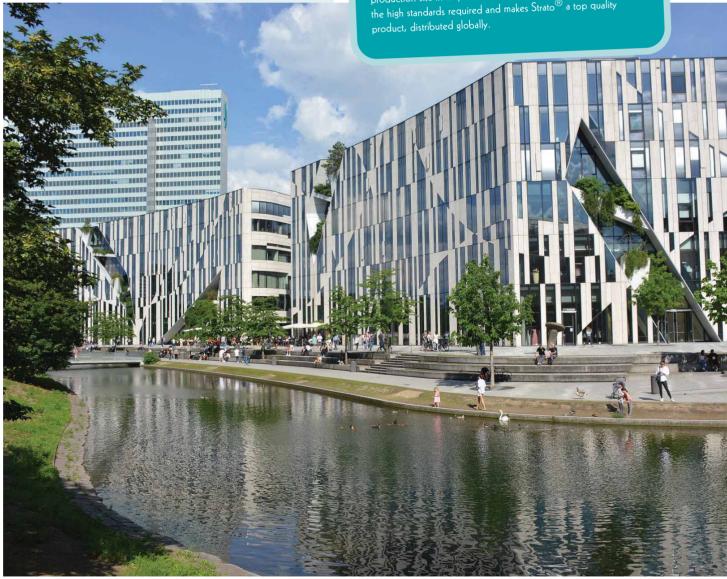
tion cost savings using standard float glass for lamination;

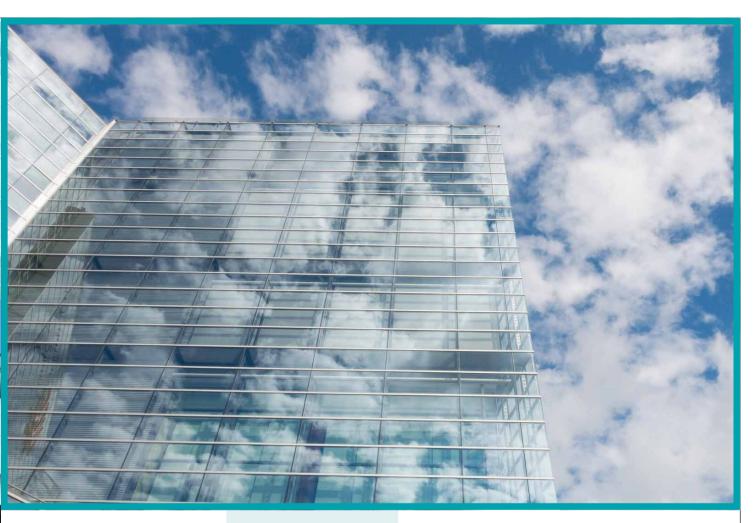
- avoiding expensive stocks of big quantities of nonstandard float glass;
- customisation of the EVA film with the pattern requested by the designer or architects;
- combining the Bird Friendly line with other Strato® products to cre-

STRATO® EVA Interlayers

Satinal includes three brands: Strato[®], Satinal and TK. From the creation of chemical products and equipment for glass manufacturing, machinery and kilns by TK, to EVA-based interlayer for glass, which can be used for various architectural elements or for interior design.

Strato[®] EVA interlayers are produced in Italy by Satinal, present in the glass market for more than 20 years, with the first ever production site in Italy for EVA. Italian production maintains the high standards required and makes Strato[®] a top quality product distributed globally.





ate glasses with additional benefits (e.g. solar control);

- high visible light transmission:
- high weather resistance due to the properties of Strato® EVA film;
- visual continuum (selected patterns do not disturb the view);
- full protection against UV rays.

SELECTING A 'BIRD-SAFE' PRODUCT

There are many factors that affect the selection of a product that makes it glass bird safe: by choosing an interlayer from the Strato[®] Bird Friendly collection to

laminate the glass, its transparency and reflection can be reduced.

Birds do not recognize glass as an obstacle because it is a transparent and reflective material.

Transparency, sometimes, can be a problem even for human beings, who sometimes do not notice the presence of a glass door or wall. We are, however, able to recognise details such as handles, uprights and fixtures, thus avoiding collision.

Unfortunately, birds do not have this kind of perception and they are also attracted by plants, food, water etc. placed inside

or outside the rooms that they see through glass.

they see through glass.
Another aspect, in addition to transparency, is the reflection of light: depending on how and where the glass element is positioned – for example in relation to the sun, the surrounding environment, internal light levels etc. – it can look like a dark passage that birds might mistakenly see as a usual space between

Moreover, glass can act as a mirror: reflecting the sky, clouds or vegetation around buildings, it attracts birds and this effect is the most fre-

branches and leaves.

quent trigger of the impact. Strato[®] Bird Friendly is created by humans but designed for nature, without sacrificing its aesthetic appeal.



Bovone Diamond

HIGH SPEED, HIGH PERFORMANCE PRODUCTS FOR TODAY'S

DEMANDING

MARKET

ounded in 2003 as a sister company of Bovone Elettromeccanica, Bovone Diamond Tools can therefore boast tradition and skills in its sector. The production of metalbonded and resin-bonded diamond wheels also includes wheels for bevelling, straight- and double-edger machines, as well as all brands of work centres.

The fundamental steps regarding the company's production are:

- 2005: I'UNI EN ISO 9001:2000 QS Certification:
- 2007: the company starts the production of diamond drill bits and accessories for manual and automatic drills, and work centres.
- 2010: the company



OOS

Glass processing is, and has always been, a complex sector. Glass processors request faster tools that do not compromise the quality of the final products and, therefore, quality, innovation and performance are fundamental. BDT gives us an idea of its continuous developments to satisfy these demands.



obtains the patent for Goldnet routers, now one of the most used tools of the Bovone Diamond Tools range.

BDT also supplies polishing and felt wheels, cerium oxide, cooling oil, pumice and carborundum cloths, as well as other complementary accessories for flat glass processing.

Bovone Diamond Tools is now continuing to pursue its path of affirmation in the flat glass processing sector, always focussing on the values and characteristics that have contributed to the success of the company's activities: quality, innovation and performance.

And in order to guarantee this, BDT is investing in production with the purchase of new machines, including a new work centre to carry out tests and trials in-house, achieving the quality standards guaranteed by BDT products.

A constantly growing Technical Sales team, a recently strengthened Research and Development area to experiment and identify new solutions that make BDT tools a concentrate of high quality and innovation.

In terms of human resources, the BDT team now includes high-profile technicians, bringing new life to Research & Development activities so that the company continues to be an injector of innovation in the reference markets.

This combination of en-

ergies has resulted in an important expansion and improvement of the company's product offer.

HIGH SPEED GRINDING WHEELS

AV – the new high-speed, high-performance grinding wheels for glass and Dekton processing – are BDT's most recent product development. Market demand continues to focus on product quality, along with tool performance and processing speed with advantages not only in terms of final results, but also time and ease to use. BDT's AV wheels have therefore been created to meet these multiple needs.

BDT's high-speed grinding wheels are flat edge, trapezoidal edge and, last but not least, routers, with performance as follows:

- Flat edge grinding wheels have newly designed sectors, which are smaller and closer together, allowing to reach speeds of 10 meters per minute at 7,500 RPM.
- Trapezoidal edge wheels have a different composition and different grain size compared to traditional wheels, reaching speeds of 8 meters per minute at 7,500 RPM.
- The same new design of sectors has been applied to the routers too, which now reach speeds that are 50 per cent higher than with traditional routers, with speeds estimated at 10 metres per

minute at about 12,000 RPM.

The excellent results obtained on glass were also seen with Dekton, demonstrating the very close relationship between the traditional hard and transparent material glass and the new and constantly evolving synthetic stone-type materials such as Dekton.

BDT has carried out numerous tests on the recently purchased work centre to perfect in-house testing of peripheral wheels and prepare a product line capable of responding to the demands of a market in constant demand for tools

that guarantee product quality but also great performance in terms of processing speed.

CLICK-FIT QUICK ATTACHMENT SYSTEM

Click-Fit, BDT's patented quick attachment system launched on the market in 2019, is an innovative quick attachment system for both metal and resin diamond cup wheels. Click-Fit can be used with all machines of the main national and international manufacturers.

With this system, the aluminium base remains attached to the motor while

the diamond parts of the wheel are changed, thus ensuring savings in storage and time, as well as – of course – costs. The environment also benefits from this system, as it is completely ecological, reducing the disposal of material to minimum, along with further savings in time and costs.

RESINOID BASES

Considering that resinoid wheels are BDT's core business, an upgrade of the resinoid base has already been developed so as to maximise optimisation of resources and time, result-

ing in significant advantages:

- the wheel is lighter, resulting in less stress on the spindle;
- the slats on the base have been specially designed so that the water is sprayed, and therefore reaches the point of contact between the grinding wheel and the glass uniformly and in the best way possible;
- the material ensures greater rigidity and therefore more direct transmission of pressure levels set by operators;
- the base guarantees





perfect balance of the grinding wheel.

CUP WHEELS, GOLDNET AND COMBI ROUTERS

Bovone Diamond Tools has always manufactured cup wheels for bevellers and grinders of the main national and international manufacturers, providing a wide range of products in terms of dimensions, hardness and height of the diamond band, as well as customisation as per needs and demands.

The company also continues to invest in technological and commercial development of peripheral wheels for NC machines for the main manufacturers. This part of BDT's product range is an important part of the company's production, and includes:

• routers with 3,4,5 and

- 6 sectors with different diameters and lengths;
- Goldnet routers, the flagship product for the processing of laminated glass with a high percentage of PVB or EVA. Thanks also to important investments. BDT is developing new technological solutions to improve performance in terms of speed and performance: by working on the design of the sectors, which are smaller and closer together, the cutters allow to reach speeds equal to 50 per cent more than traditional routers.

Goldnet routers, in particular, as per able to guarantee fewer splinters and breakage in output, homogeneous wear, silence, absence of vibrations, strong sharpness and considerable durability. Goldnet differs from the classic cutters because it has diamond sectors with much smaller ogival shape, welded to form a 'net' with crossed meshes.

This shape allows to increase the cutting speed of the laminated glass and avoid the recurring problem of breaking the edge of the glass during the output phase of the cutter. This is because the PVB is cut continuously and comes out of the many 'escape routes' of Goldnet routers avoiding the formation of the classic strips that are created using traditional cutters.

All BDT routers – including Goldnet – are available with standard and Forvet connections in trapezoidal or groove versions, obviously with different diameters

Last but not least, the Combi cutter, a 'two-inone' product, which associates a traditional segment cutter with a trapezoidal or groove cutter, allowing it to be used twice, is continuing to be in great demand, and is also available with different diameters.



MAZZAROPI

MACHINERY CREATED
WITH PASSION; ENRICHED
WITH TECHNOLOGY
AND INNOVATION





will close my company and do something else."

Antonio Mazzaroppi, the second generation of the family of innovative glass industry pioneers, has this philosophy, which is also the philosophy of his company.

Each Mazzaroppi machine is designed to meet the specific needs of customers and to provide concrete benefits in terms of energy saving, ease of use, space and investment optimization.

ENERGY SAVING – A FASTER RETURN ON INVESTMENT

Being close to customers also means optimising production costs; for this reason, all Mazzaroppi furnaces are designed to optimise energy consumption, by means of:

- Fast ignition system (about 60 minutes), which allows the tempering machine to be turned off in the evening and restarted in the morning, very easily, every day.
- Specific materials and an innovative production system that result in low thermal inertia; indeed, the heating section has excellent thermal insulation which avoids heavy heat loss to the outside.
- Automatic multi-zone control system which ensures that the machine automatically recognises the areas that

are truly occupied by the glass so that it only turns on the panels involved. In this way, in addition to an intelligent use of electricity, it also allows optimal and timely control of the temperature.

USER FRIENDLY – EASY INTERFACE AND AUTOMATIC CONTROL; SIMPLE AND INTUITIVE TECHNOLOGY

An intuitive and effective touchscreen operator interface provides timely and immediate control of the machine. Its work parameters can also be set or corrected from a service app on a smartphone.

Production recipes management is automatic, hence the operator only has to set the type of glass and its thickness on the monitor. In this way, the machines quickly adapt to the change of the thickness of the glass, thus eliminating waiting times, while and during the production process, different glasses ordered by type and thickness can be found in each section of the system.

SPACE OPTIMISATION – COMPACT AND EFFICIENT MACHINES FOR TAILOR-MADE SOLUTIONS

Compact furnaces are the flagship products of Mazzaroppi's product portfolio and the result of a careful engineering study that has led to the creation of a flexible solution, capable of maintaining technical and quality characteristics unchanged.

A LIFELONG PARTNERSHIP

Design

All Mazzaroppi machines, including standard ones, are adapted to the specific needs of each customer. The design phase therefore starts with an in-depth analysis of the customer's corporate situation (spaces, processes, operating times) and the creation of a pay-back plan of the initial investment.

Creation

Once defined the customer's needs, Mazzaroppi's team kicks off the production process of the machines. Each stage is supervised and executed very closely and the customer receives continuous updates on the production status. Thanks to this enormous attention to the process, Mazzaroppi has an on-time delivery rate of 100 per cent.

"Every machine for us is like a newborn baby and we know that for each customer it is an important investment that means the world for them. This is the reason why we decided to start this ritual as a sort of baptism. The machine belongs to him, it stands alone, there is no other like it, and I think

this should be celebrated, because when one of our machines enters a company it is as if a new life, and a new phase, begins."

Installation, ignition and testing

Installation of the machines, carried out by highly specialised staff, is enriched by on-site training.

After-sales

Machine downtime must be avoided and if this ever happens, it must be limited as much as possible. Thanks to this orientation to customers' production needs, all Mazzaroppi machines are included in a scheduled maintenance plan and followed by a specialised team of technicians operating all over the world in remote assistance or on-site.

"We are in love with our machines, we dream them, we design and we create them, we use them because what we offer to our clients is a solution that can take their companies to a new business level."

>Mazzaroppi Engineering



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B Solution



NEW PRODUCTS AND NEW TECHNOLOGY PARTNERSHIP

There are many important characteristics that machinery manufacturers need to have

and bear in mind when working in the flat glass sector. In this article we take a look at how one of these companies — B Solution — is doing this, also creating a new partnership to increase the quality, productivity and efficiency of glass processing.

ynamism, flexibility and innovation have become the three guidelines that characterise all aspects of the work of B Solution's work, thanks to 30 years of experience in the sector constantly committed to monitoring market trends and paying maxi-

mum attention to client requests.

B Solution, in fact, works side-by-side with its clients, setting up a direct relationship and close collaboration with the aim of developing performing solutions with high quality standards, made with carefully selected materials.

SPEED ARRIS FOR DOUBLE-GLAZING AND TEMPERED GLASS

Speed Arris is B Solution's high-productivity vertical arising machine specialized in rough-grinding or continuous cycle grinding processes by means of two follow-system spindles.

The machine can arris/grind two rectangular sheets of glass with different sizes and thicknesses by an automatic survey system, thus guaranteeing high-productivity for double-glazing lines.

Glass transport and handling is carried out with suction cups, especially for





Pre-washing system



logical partnership with Bonfiglioli, also resulting in a new machine with innovative features. The motors of this new machine are controlled by latest generation drives, by a motion control PLC and HMI Panel by Bonfiglioli technology.

- 1 HMI Panel
- 2 Motion Controller
- 3 Latest-generation Bonfiglioli drives



today's high-performance glass types.

System with oscillating spindles which ensures the regular arris.

The Speed Arris can be integrated with IG or tempering lines or as standalone machines.

Available in different sizes: 2.03. - 2.6.4 - 2.8.5 - 3.2.6.

NEW TECHNOLOGICAL PARTNERSHIP WITH BONFIGLIOLI

Mechanics and electronics combine to increase the quality, productivity and efficiency of production processes thanks to B Solution's new techno-







- 4 Rapid glass evacuation system
- 5 Shapes software
- 6 Z-axis control
- 7 Pre-washing system

SPEED EDGE -**UP TO 3200X9000** MM TOP SIZE

B Solution's Speed Edge is a vertical compact grinder with an innovative patented follow-glass system, which carries out rough and polished grinding, round and flat edging, arising and shaping. This compact machine also includes an integrated loading and unloading solution, thus reducing floorspace occupied.

An innovative suction cup system guarantees the locking of the entire glass sheet to be processed, allowing higher processing speeds, ensuring the complete elimination of vibrations during machining, and absolute squaring precision. Further important features include:

- loading of new glass sheets during the production cycle;
- can be applied to existing lines of glass processing;
- available in different sizes: 2.0.3 - 2.5.4 - 3.2.5-3.2.6 - 3.2.9.

S B Solution Scl



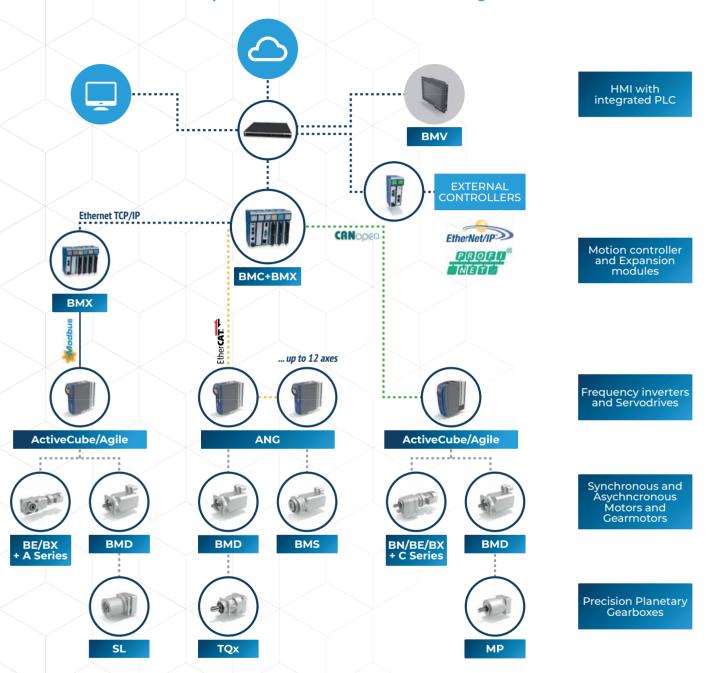
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Bonfiglioli mechatronic solutions for industrial automation: the highest level of precision, efficiency and energy optimization

Bonfiglioli is your one-stop shop for mechatronic applications in industrial automation, offering tailored and complete motion control solutions covering the entire motion drive trains.



Always at the customer's side

Our engineering specialists **work side by side with customers** to create the best possible solution, whether the request is to optimize an existing machine or to develop a new one.

Our relationship with customers, as the one developed with **Bsolution**, is based on an **active partnership** with fast decision-making processes to develop **individually-tailored offers**.

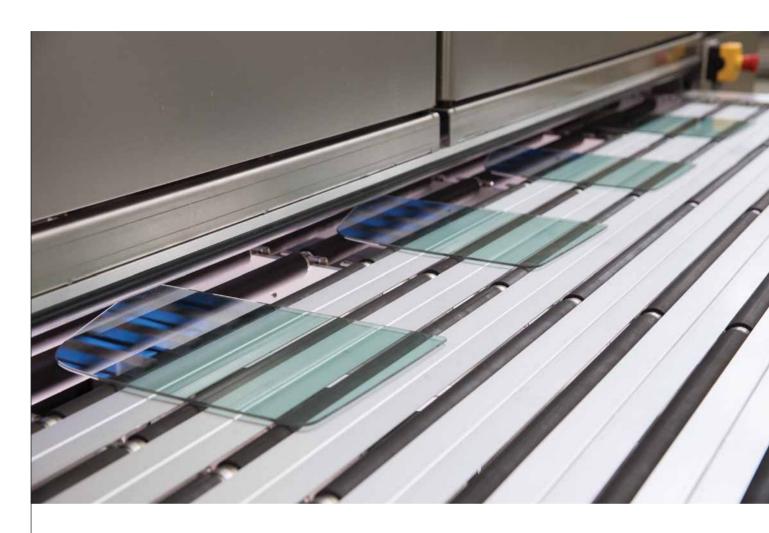












to eliminate possible printing defects, such as banding, uniformity of coating near a number of heads and the risk of missing nozzles.

With regards to the computing power, Creaglass is equipped with the CoreXpress platform, developed inside the System Electronics (the company department devoted to industrial electronics). CoreXpress is the processing unit that oversees all the operations to be performed in order to reproduce the image on the surface. It is a latestgeneration processor that can make use of a fast and immediately available memory.

CREAVISION

The internal development of the electronics has enabled the design of innovative functionalities which are unique on the market. Creaglass is also equipped with a powerful full-view vision system. Creavision. fitted with latest-generation video cameras which frame the entire printing area and analyse, control and process the exact position and inclination of the substrate, transmitting the data to the print module which, in real time, carries out a perfect centring of the graphics on the glass, ensuring perfect coverage of the edges.

This 'operating logic' solution has made it possible to overcome the complexities of mechanical centring systems, reducing line set-up times and achieving enhanced production performances thanks to the 'real-time' printing of the substrate. In addition, the full-view Creavision makes it possible to read the entire printing area upon input into the machine, so as to be able to print also different glass surfaces on a number of rows.

The maximum printing width of 2000mm allows to convey a number

of production lines into Creaglass system and print up to four rows of product simultaneously.

Last but not least, the process enables to read the real position of the glass on the rollerway, and the possibility of adjusting the ink drop to up to eight pl guaranteeing an absolute edge-to-edge print.

CREAGLASS: A COMPLETE PROCESS

From the point of view of its structure, Creaglass is made up of different frames corresponding to the different phases of the printing process. Every frame can be configured and imple-



mented at any time on the basis of particular production and space requirements, thereby ensuring a high level of customisation. System Digital guarantees the quality of the printing, offering all the phases necessary in the decoration process in a compact solution composed of independent two point five metre modules.

The Creaglass printing system is made up of:

- Loading the material is introduced into the printing process via a loading rollerway;
- Pre-heating the substrate is transported inside the heater where it reaches

the appropriate surface temperature for printing;

- Image scan having reached the necessary temperature, the substrate is scanned by the Creavision full-view vision system, which identifies the precise position of the material and passes the coordinates to the printer;
- Digital printing on the basis of the correct coordinates of the substrate, Creaglass's nozzles come into operation for the high definition printing;
- Drying after the printing phase the ink is fixed and dried on the glass substrate;

• Cooling and unloading — once the printing process has finished, the substrate is ready for tempering. The cooling module can be inserted in the event that the substrate has to be handled by technical personnel following the drying phase.

Through its System Digital business unit specialising in research and development of high-end digital printing processes, System Ceramics has sought to offer a printing system on glass of great potential, which makes it possible to use approved temperable glass inks and guarantee high definition

(777dpi) edge-to-edge printing, while enabling the printing of a number of glass surfaces simultaneously up to a speed of ten linear metres per minute.



The conversion of individual production systems into one integrated process will simplify and improve the transitions between machines and communication with humans, optimise cycle flow, and lead to a smooth glass flow.

HEGLA



DIGITALISATION AND THE SMART FACTORY AS AN INTEGRATED CONCEPT FOR GLASS-PROCESSING COMPANIES Glassmaking is continuing to move — not only in terms of the end products we all see in our world — but also with regards to the manufacture of these products. This ongoing development has been part of the glass industry for some time, with CNC machines and automatic loading, and is now using software in ensuring that the integrated transformation of production is successful.

PROCESSES, MACHINES, EMPLOYEES ...

Many companies in the glass-processing industry have enough machine and system capacity to process their customers' orders. But a lack of skilled workers, processes that are not optimally harmonised, the need for lots of in-house coordination, and rising delivery date and cost pressure can lead to bottlenecks - even at companies that otherwise have everything under control. For such critical aspects, the integrated consideration of processes, machines, employees, communication, and products is an approach that provides digital support for processes, uses existing means even more efficiently, and focuses on optimising the flow of materials. The 'smart factory' and 'digitalisation' are the current buzzwords used to describe this development process, but the glass industry has been aware of it since before these terms were even coined.

Early on, CNC machines were used to simplify and accelerate the glass-cutting process. Automated loading was adopted in order to supply the cutting lines with glass in precise synchronisation with the cycle and meet the operators' needs.

Next came residual sheet handling systems such as ReMaster, which saves resources, helps to preserve the quality of the glass, and rescues employees from a strenuous, time-consuming activity. Sorting systems were ultimately the logical consequence of these developments, and their overarching concept led to the glass flow being improved and homogenised across the entire cutting line.

THE NUMBER OF PANES AND PRESSURE CAUSED BY FAST CYCLES REQUIRES SMOOTH PROCESSES

Automation was the key concern in process opti-

The conversion of production into an integrated, overarching process will improve the transitions between machines.

misation for many years, but the continuous stream of new opportunities provided by digitalisation has increasingly expanded this focus to include other areas. "The conversion of production into an integrated, overarching process will improve the transitions between machines, the way they interact with operating personnel, cycle times, and the flow of materials," said Bernhard Hötger, Managing Director of the HEGLA Group. "More and more new areas will be included." In order to tap the entirety of the systems' potential, the rising level of automation requires more and more coordination among the tasks and dependencies of the internal glass logistics in the production hall. The term 'shop-floor logistics' aptly describes the change process affecting conventional production facilities. In many cases, up-todate equipment no longer automatically means that machines are responsible for production process efficiency. Instead, the key is how quickly and in precise synchronisation with the cycle the glass is available at each processing station. The number of panes and the pressure caused by fast

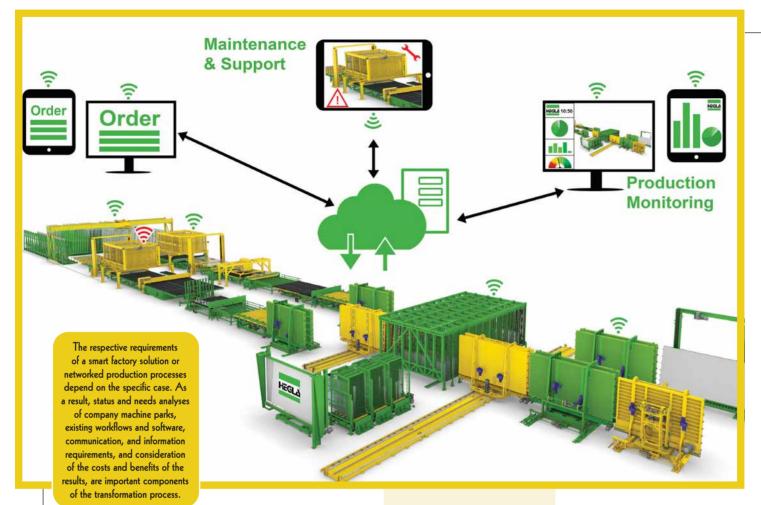
cycles require smooth, precise, and transparent material delivery in order to reduce or avoid downtime caused by manual handling or a lack of glass.

SOFTWARE AS A KEY FACTOR IN THE SUCCESS OF INTEGRATED PRODUCTION

Software is a key factor in ensuring that the integrated transformation of production is successful. Depending on the control concept and integration depth, it should digitally map not just the production process and its component parts, but also individual panes, along with their flow through the production facility. Of course, this requires the ability to

As digitalisation and connectivity increase, ever more opportunities for digital support and process steering will emerge.





select, acquire and compile the required data and key indicators and turn them into information. "These data enable us to simulate the processes in advance, define ideal processes, and derive potential areas of improvement," explained Dr Jan Schäpers, Managing Director of software specialists HEGLA-Hanic. Although more or less all of these data were available in the past, they primarily took the form of theoretical maps of reality that were based on planned values and probabilities. That is why one of the aims of the smart factory is to map processes accurately and in real time, using sensors to query systems or record and track laser-marked panes via scanners, for example. Once it has become possible to make target/ actual comparisons based on the data, processes can be optimised in even greater depth: capacity can be adjusted and any bottlenecks that could be resolved by further automation identified. Another objective of the analyses could be to find out where processes can be changed or optimised in order to deploy existing personnel at the places along the production line where they can contribute the most towards the company's value creation based on their manual or technical skills. At the same time, the machines can continue to assist the employees with their work – whether it's by providing help with workflows, data referring to orders, notes on controls, information on system states, or in general, by enabling even user-friendlier, more intuitive control.

As digitalisation and connectivity increase, ever more opportunities for digital support and process steering will emerge. In future, operators will no longer have to rely exclusively on local data access at the system or via control panels. Instead, they will be able to perform such tasks as triggering a new order for damaged glass, determining where a glass rack has been parked or which process comes next, retrieving maintenance information, reporting a malfunction, or re-ordering supplies – all using an app developed by HEGLA New Technology.

The level of transparency and precise knowledge of the process also give production management and work preparation a new degree of flexibility. Orders can be monitored from a desktop or the app and, depending on the data storage methods used, can be reconstructed years later. It will also be possible to adjust capacity and production planning in real time. Rush orders in

the expanding options for remote maintenance and the increasing number of sensors in machines will prove attractive areas of development.

particular will benefit from greater flexibility: it will be possible to prioritise or replan and track panes and finishing treatments in accordance with customer requirements.

DATA PROVISION VIA DEFINED, OPEN INTERFACES

These scenarios of networked, integrated production are gradually becoming a reality thanks to the ever-increasing volume of data available and insights into processes. In future, this will make it even more important to have joint, defined, and open interfaces for machines and software in order to make such in-depth networking between quality providers of machines and software both possible and reliable. A German Mechanical Engineering Industry Association (VDMA) steering group is working together with HEGLA-Hanic. Grenzebach, and A+W on a joint OPC UA platform (Open Platform Communications Unified Architecture) to create the foundation for these processes.

The form and extent to which production departments - or even entire companies - must adjust to or can benefit from the future demands of the smart factory varies from one case to the next. Depending on their product ranges or market niches, companies will have different needs. Dr Jan Schäpers advises companies to perform an exhaustive analysis of their machine parks, existing workflows and software. communication, and information requirements, and to weigh up the costs of the results against the benefits. For complex production processes with highpriced. time-consuming glass pieces, for example, it can make sense to use tracking via laser marking. Meanwhile, small companies may benefit from the use and integration of state-of-the-art, futureorientated ERP software with access to the machine level in conjunction with an app. In many other cases, alongside further automation in the form of driverless transport systems running between individual processing centres, for example, the expanding options for remote maintenance and the increasing number of sensors in machines will prove attractive areas of development. By means of continuous queries, systems with this capability will be able to monitor technical states and predict the need for pending maintenance or wear part replacement. The gradual process of determining which areas are relevant and offer the best benefits will make a profound level of integration and connectivity possible. This could encompass operations and companies in their entirety and offer them maximised, organically expanding potential for controlling, optimising, and completing all their processes, from the receipt of orders and all their commercial processes to production planning and control.







In future, operators will no longer have to rely on local data access at the control panel. Instead, they will be able to perform such tasks as triggering a new order for damaged glass, determining where a glass rack has been parked, retrieving maintenance information, reporting a malfunction, or re-ordering supplies — all using an app developed by HEGLA New Technology.



International



tefiglass International, located in Pieve San Giacomo, about 100 kilometres south of Milan, northern Italy, is a leading global manufacturer of a wide range of glass washing machines, complete IG

lines and complementary equipment. With over 40 years of experience in glass machinery manufacturing, the company is able to offer high quality, after-sales assistance and reliable service.

Stefiglass' operating phases regarding quality control and testing are followed by a team of technicians with expertise gained over the years. The company's machinery, manufactured entirely using mechanical, electrical and electronic components conform to EU norms, are characterized, moreover, for the particular attention to the environment and ecofriendliness.

Stefiglass is specialised in the creation of prototypes that respond to the most complex customer requests, with a wide production range of standard models: from small-sized washing machines of 1,300h right up to Jumbo sized glass of 3,300h. Other than standard models, Stefiglass also offers the possibility of customising plants as per specific needs of processing. Customisation - the creation of custom-built machinery – is the most important part of the company's activities.

Stefiglass has, for this purpose, an in-house Research & Development department dedicated to optimising the machines in



production, and designing innovative solutions.

The main quality features of Stefiglass' products:

- durable and strong construction in compliance with EU norms;
- only EU electrical and mechanical components of top quality brands;
- easy maintenance and easy replacement of spare parts;
- excellent value for money;
- customisation of machines and possibility to connection to CNC.

PRODUCT RANGE

- full range of vertical washing machines;
- horizontal washing machines;
- complete IG lines with different assembly models, press and optional tilting tables:
- exclusive IG lines, patented by Stefiglass;
- compact lines with press panel;
- full range of equipment for insulating glass production.



HTEFIGLASS

LV 3300 JUMBO



Stefiglass propose you a new cost effective washing machine LV 3300 JUMBO

- Two-part machine: washing and drying.
- Easy installation and transport thanks to its modular format.
- Equipped with 6 brushes for washing with high-performance hydraulic pumps.
 Pump impellers mounted only in stainless steel.
- Drying is provided by a 22 kW ventilation system.

- The brushes are driven by the inverter system with acceleration/deceleration to optimize the mechanical performance and reliability over time.
- The top is made of tubular AISI 304 scaffolding bearing and reinforced with stainless steel laser-cut sheets. This ensures high operating speed with greatly reduced vibration.
- Working speed from 1 to 5 mt/min

This is a vertical washing machine optimized for cleaning large glass sheets, especially suitable for heavy and continuous use. Thanks to its 6 brushes, it meets the standards for industrial cleaning, which are among the highest. Particularly suitable for on-line applications, it can also be combined with robotic systems. Made exclusively in closed top version, it allows to wash a glass minimum of $L = 450 \ H = 250$.



FILTRAGLASS

WATER TREATMENT FOR GRINDING TECHNOLOGY

NEW FILTRAGLASS APP





Take a look at the app's presentation video!

www.filtraglass.com

FILTRAGLASS NEW APP, NEW POSSIBILITIES

Filtraglass is continuing with its important developments in making the company's water filtration systems for the glass industry available for everyone — reducing costs and protecting the environment. This article shows us how, with a new app, clients have a series of important advantages regarding improvements in its systems, adapting them to new market needs.

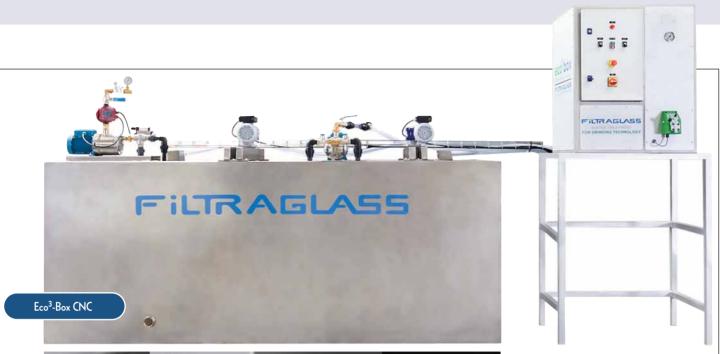
iltraglass, experts in water filtration systems for the glass industry, has investments in R&D and ceaseless technological development as part of its DNA ever since the company was founded. The company has continuously worked to improve its systems and adapt them to new market needs and now, more than ever, and it has done so once again.

Filtraglass will shortly launch its new mobile app, which is free to use and available on iOS and Android.



FILTRAGLASS







purchase spare parts, accessories, and other Filtraglass products such as coolant, additives, etc. On the back of the launch of the Eco³Box two years ago, this new app represents a further step in making Filtraglass water filtra-

app represents a further step in making Filtraglass water filtration systems for the glass industry available for everyone – reducing costs and protecting the environment.

FILTRAGLASS

> Filtraglass SL

ents will be able to assemble their machine with the online support of engineers via video call. In 24 hours the system will be up and running.

TECHNICAL AND AFTER-SALES SERVICE IMPROVEMENTS

The purpose of the app is also to improve Filtraglass' technical and after-sales service. Everyone in possession of a Filtraglass filtration system will have a customer account through which they can get in touch with the company by using the chat box or by video call, send photos and videos, ask questions related to their machine, and inform the Filtraglass technical team directly of any operation-related incidents, which they will resolve as soon as possible.

The new app also allows clients to



Halio International



BENEFITS IN TERMS OF THERMAL COMFORT, GLARE PROTECTION AND ENERGY CONSUMPTION



A study by the BCA Skylab Singapore has compared the electrochromic technology of Halio[®] glass with classic two-layer thermal insulation glazing plus mechanical sun protection. The results show that smart-

tinted glass improves user comfort and lowers energy costs while maintaining visual contact with the outside world. 100 per cent of the glare was blocked, between 17 and 25 per cent of the energy costs for the lighting was saved and over 95 per cent of the test period, a good room comfort was achieved.

Halio, a joint venture between AGC and Kinestral Technologies, develops and manufactures Halio smart-tinting technologies. The joint venture leverages the partners' respective strengths and knowledge: AGC's reputation in the building industry and 100 years of experience in glass technologies, and Kinestral's innovative, patented smart-tinting technologies.

Halio International has published the results of a full scale laboratory trial conducted by the Energy Research Institute of Nanyang University of Technology in Singapore. Halio's electrochromic glazing technology, known in the market as 'smart-tinting glass', was tested under real-world conditions at BCA Skylab, one of the world's most spectacular laboratories. "The study results prove that we can rightly call Halio technology an innovative, green solution for the buildings of the future," said Robert Jagger, Sales Manager Europe





and Middle East at Halio International.

ROTATABLE PLATFORM ALLOWS DIFFERENT LIGHTING SCENARIOS

Two identical test rooms of the BCA Skylab, each with 43 m² floor space, are mounted on a rotatable platform on the roof of a 7-storey building. This allows technology tests under tropical conditions as well as different solar irradiation. More than 200 sensors are available for measurements.

In the Halio study, a façade with Halio glass and a façade with conventional double glazing with low-E coating plus shutters were installed next to each other in the test rooms. Both rooms mimicked the iden-

REFERENCE ROOM Low-E coated glass with closed blinds		HALIO ROOM Halio glass with automatic control
3 hours of intolerable glare, 1.25 hours of disturbing glare	Visual comfort	No glare was observed
Baseline lighting consumption	Energy savings	Cuts lighting consumption by 17% (West orientation) and 25% (North orientation)
75 – 78% of the time	Thermal comfort (PMV2 in category B per DIN ISO 7730)	95% of the time

tical office situation. The results show that Halio technology outperforms traditional low-E glasses in three areas: anti-dazzle, thermal comfort and energy savings in lighting.

VISUAL COMFORT: GLARE PROTECTION

Shots with an HDR camera that covered the complete field of view of a building user show that Halio blocks even extreme glare by 100 per cent. The test period included three

consecutive afternoons with the test façades facing west. The values recorded by the camera were converted into the DGP glare code and, according to Wienold and Christoffersen (Wienold. 2006), were classed in the four categories: imperceptible, perceptible, disturbing and intolerable glare. A total of three hours of intolerable glare and 1.25 hours of disturbing glare in the reference room would have forced

the users to lower the blinds and, thereby, also interrupt the connection with the outside world. In the test room with Halio glazing, however, no glare caused to daylight was measured during the entire three days. Even when completely dark, Halio Glass remains transparent. Since the control adjusts the tint level automatically to changes in glare intensity, the building users always have the best daylight access.

LESS ARTIFICIAL LIGHTING NECESSARY

At the same time, the improvement of visual comfort was accompanied by a reduction in energy

© Halio International

costs for lighting. The test room equipped with Halio glass required 17 per cent less energy when facing west, and 25 per cent less energy when facing north, compared to

the closed-blind reference situation.

IMPROVED THERMAL COMFORT

Last but not least, the differences in thermal comfort according to DIN EN ISO 7730 and DIN EN 15251 were also measured. In the calculation of PMV index (personal well-being) and PPD index (dissatisfaction percentage) according

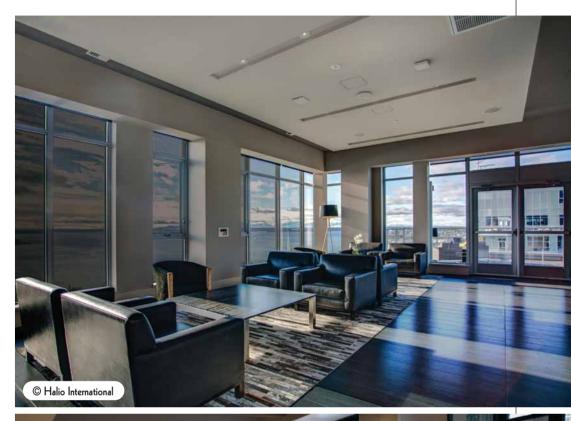
a reducti	on in energy	ing north, compared to ferences in	thermal comfort tion percentage) according
		CATEGORY A Recommended for spaces occupied by very sensitive and fragile persons with special requirements (very young children, the elderly, ill persons)	CATEGORY B Suitable for most new buildings and renovations
	Halio	61% of the time over the testing period	95% of the time over the testing period
Doul ret	ole glazing with racted blinds	33% of the time over the testing period	75% of the time over the testing period
Double glaz	ing with closed blinds	36% of the time over the testing period	78% of the time over the testing period
187			

to ISO 7730, the climate parameters included room temperature, mean radiant temperature, room air humidity and indoor air velocity.

Again, the results show clear advantages of electrochromic technology. Over 95 per cent of the time, the Halio glazing test room provided a comfortable category B climate, compared to 75 to 78 per cent in the room with double-glazing and open or closed blinds. This suggests that Smart-Tinting, in addition to preventing glare, can also sustainably improve the energy input from the outside and, thus, thermal comfort.

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Wienold, J. C. (2006). Evaluation methods and development of a new glare prediction model for daylight environments with the use of CCD cameras. Energy Build. 38, pp. 743-757.





Halio International

HALIO®

Avenue Jean Monnet 4 1348 Louvain-la-Neuve - Belgium halioglass.eu



Halio[®], the most advanced daylight management system

Natural daylight, comfort and well-being are the benefits most sought-after by architects and project managers when designing offices, collective housing, tertiary buildings, etc. Halio glass opens up new possibilities for the design of intelligent, aesthetic and bright spaces. Extremely responsive and precise, Halio goes from light to dark in under three minutes, giving users unrivaled control over their interior. With a Color Rendering Index of 97, Halio glass is particularly neutral and transparent when it is not tinted, like a conventional facade glass. Its performance impresses and reaches the highest levels of efficiency with Ug values up to 0.6 W / (m²K), which makes it possible to manage the heat gains and reduce the cooling needs. For architects and builders, it facilitates obtaining BREEAM, LEED and WELL certifications. Compatible with most technical building management systems (BMS) and devices connected to the cloud, the Halio glass can be controlled automatically using specific control algorithms, but also manually via an application.

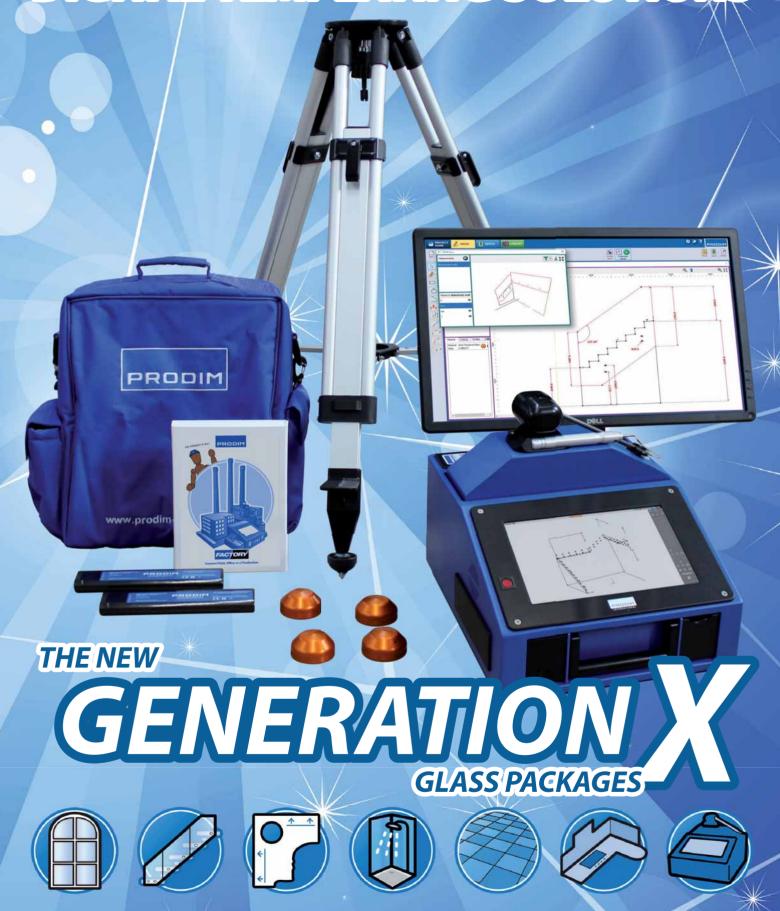
Halio fits perfectly into the Smart Cities trend and responsible architecture.

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www.halioglass.eu



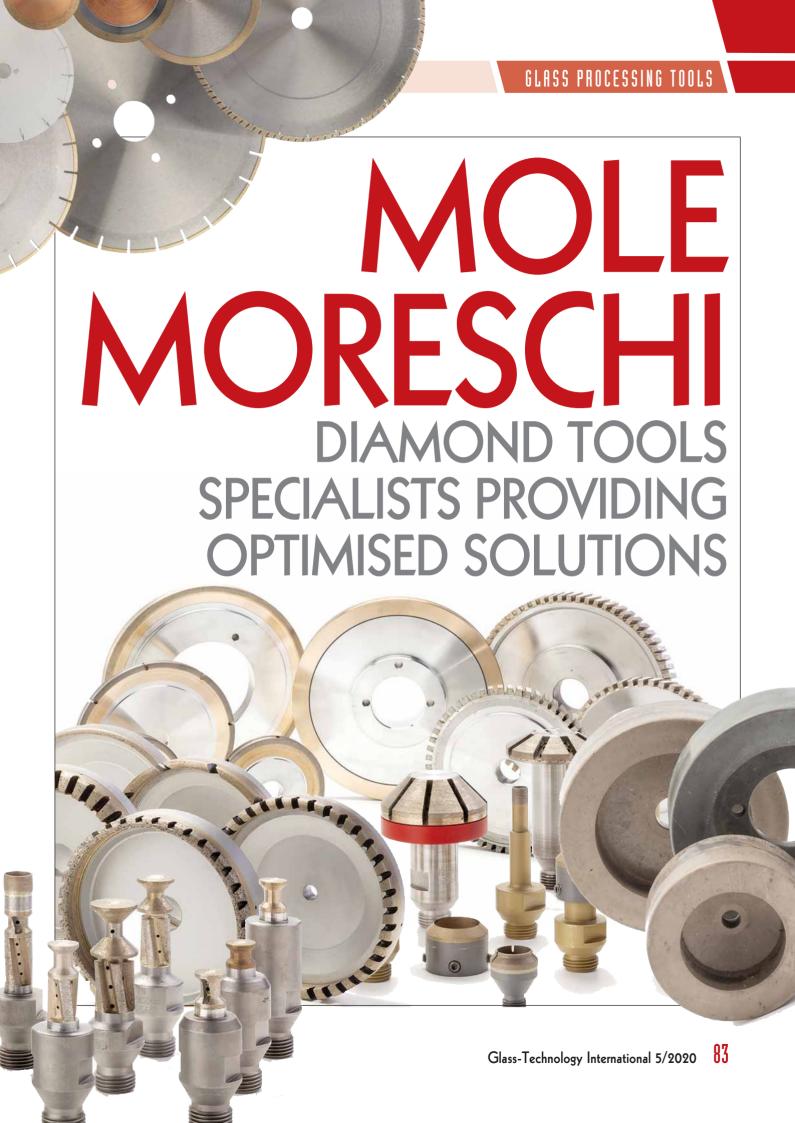
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The constant goal of Mole Moreschi is the search for solutions responding to the needs of its clients and the market. Designing new tools almost on a daily basis enables the company to provide the right solutions to each and every specific need.

ctive for almost 100 years in the marketing of the production and sale of diamond tools for the glass sector, Mole Moreschi is a highly specialised company with know-how that allows it to respond to the continuous needs of the market. Always synonymous with innovation, thanks to a widespread network of agents. Mole Moreschi is present in more than 90 countries around the world. The company's technical department is continuously working to obtain products that constantly improve work performance and efficiency.

COMPANY PRODUCTION

Polishing wheels

Polishing wheels were created to replace felt wheels with cerium, which are much more complex to manage. In fact, normal polishing wheels can only







be replaced when the ability to use the wheel ends. Moreover, the water used must not be too hard and must have saline concentration that does not exceed certain parameters.

Peripheral wheels

Mole Moreschi has invested a lot in the development

of a complete and performing range of peripheral wheels. In addition to the traditional, widely tested products, the company has added new ranges capable of effectively covering all areas of use.

Mole Moreschi solutions and services are able to support even the most demanding customers and, today, the company is able to offer highly performing products, satisfying each and every type of need.

Diamond and resin cup wheels

Mole Moreschi has a very wide range of cup wheels for all machines and specific types of processing, which have the highest quality, and are widely tested, known and appreciated all over the world. A wide variety of binders, grits and geometries are available, each of which can be completed with a specific fixing body for each individual machine



model. Alongside in-house production, the company also sells polishing wheels of the main international manufacturers.

Diamond discs, countersinks and drill bits

Mole Moreschi diamond discs are ideal for cutting both monolithic and laminated glass. Both continuous bond and segmented discs are available, with diameters ranging between 80 and 400 mm.

Mole Moreschi provides a series of tool able to make whatever type of countersink is needed.

Routers

Mole Moreschi offers a complete range of products able to effectively meet the most common needs, in terms of speed, finish and durability, as well as customised tools, optimised to the specific needs of customers.

Sintered tools and tools

with electroplated diamond, provided solutions to requests of geometries not achievable with more traditional technologies (diameter 4.5).

The constant goal of Mole Moreschi is the search for solutions to the problems of customers. The company's team offers continuous support in selecting the most suitable tools for each type of use, with new tools designed on a daily basis to provide optimised solu-

tions to the specific needs of its customers.

Mole Moreschi Srl



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Our experience, your projects

Mole Moreschi has a know-how and direct experience in the production of diamond wheels and tools for glass processing, that are the result of more then 90 years of production. They have been the first in the production and development of the resin wheels, today Mole Moreschi has a complete range of standard and special tools for the glass industry, with a very high quality.

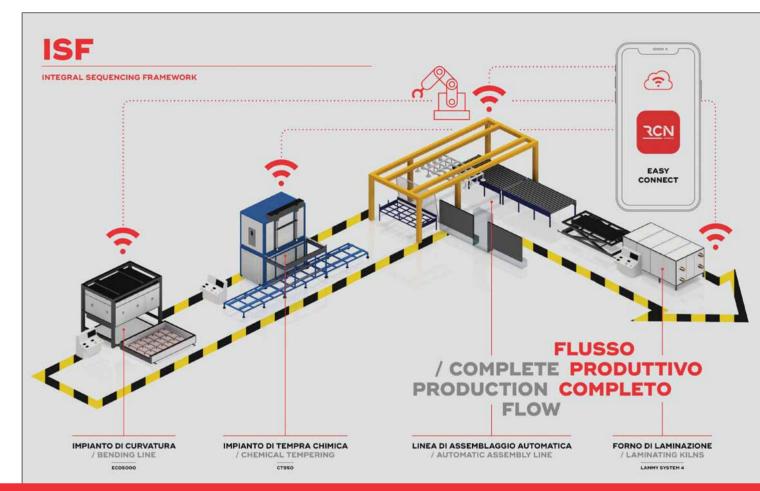
The sales and distribution network is winning not only for the quality and timing of the service, but also on the technical knowledge of his distributors that can assist and suggest the tools.



Mole Moreschi s.r.l

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R.C.N. SOLUTIONS

RESPONDING TO CHALLENGING COMMERCIAL AND TECHNICAL TIMES

In a period when trade events have been put on hold, companies of all industrial sectors are working to find ways to continue their activities. In this article R.C.N. Solutions shows us how it is doing this, responding to demands for customisation and complete production solutions.

e are approaching the end of the year and it is a real challenge to accept that glasstec 2020 will not take place in its usual format, leaving a business gap that we hope will be filled by next year's edition. In fact, the ongoing health emergency does not allow the regular operations of exhibitions and trade shows, and we are all responsible for virus containment measures, practising social distancing too.

R.C.N. Solutions is facing these global events in a world that seems to be moving in slow motion, and is responding to this dramatic time carrying out its job as usual, with customers and market as its priorities.

INVESTMENTS AND PROJECTS

The Covid pandemic has led to worries and perplexities regarding the future, and most investments and projects have been cancelled or postponed. In spite of this situation, R.C.N. has continued to receive enquiries for machines, especially concerning customisation and complete production solutions, which the company never neglects or underestimates because they are an important part of development. But what has R.C.N. done

But what has R.C.N. done this year, forced to work in closed premises?

First of all, it has enforced Internet technology to keep in contact with the global business world, especially to support the company's technical service, penalised by the travel ban. R.C.N.'s way of fighting these restrictions has been to provide remote assistance to customers.

Company staff has worked hard to implement the new communication programme started in 2019; the new company logo was launched this year; while the new catalogue and web-

site will be presented in a few weeks.

Furthermore, company growth also combines with the changed image of the advertising campaigns, focused more on concrete complete production proposals rather than around single products, and increasing the company's presence in the major in-

DATA SHEET

CT950 Chemical Tempering Line

Active size	3200xH2200x1000mm
Glass thickness	
to be processed	From 0.7mm to 19mm
Installed Power	Kw 40 - dome
	Kw 100 - base

ECO SPECIAL 5000 Bending kiln

Active size	2500x5000mm
Chamber	1 chamber, heaters
	divided in independent
	heating sections
Thermocouples	6
Base-Trolley	Electrical movement.
	Equipped with speed
	regulator
Opening	Hydraulic top lifting
Installed Power	Kw 190

LAMMY SYSTEM 4 Laminating kiln

Active size	2500x5000mm
Chamber and Shelves	2 independent
	chambers, 4 shelves
Aspiration pumps	4
Volcanized bags	4
Lifting platform	Capacity Kg. 2000
Installed Power	125 Kw



ternational trade magazines with articles and online news.

RESPONDING TO THE DEMAND FOR SAFETY GLASS PROCESSING MACHINES

One of the most important parts of R.C.N.'s business is the demand for safety glass, pushing the market for new products and equipment, increasingly responding to high quality standards.

Flexibility, is, in fact, the ability to be open to new, different requirements, that makes R.C.N. one of the most appreciated manufacturers of machines for the glass industry. The compa-

ny started putting this policy into practice some years ago, after understanding that it was significant and highly important to have other choices in addition to the different standard sizes, offering more possibility for customisation in order to cover needs and demand and satisfy clients.

NEW SYSTEM FOR SAFETY GLASS

R.C.N. has always followed developments regarding the new use of glass, responding with a production layout made up of three essential plants: bending, chemical tempering and lamination. This trio responds to the pro-

duction of safety glass, and curved glass in particular. The brand name of this system is ISF 'Integrated Sequencing Framework'.

This production setting is very important because each line, which can be installed independently from the others, has several options: from the different independent heating zones of the bending kiln, controlled by PLC, for complex curves; to chemical tempering serving the optical, aeronautics automotive industries, etc.; right up to lamination, concluding the cycle for the production of safety glass.

The present trend is to use thin glass – almost like paper – for further lightweighting and transparency in buildings. Chemically tempered thin glass can be bent cold and at environmental temperature. It is then used for façades, after being laminated, as it is flexible and safe. This technique has created a lot of curiosity and interest especially because it revealed to be low energy and costs saving process.

LAMINATED GLASS WITH FINISHED EDGES

R.C.N.'s most recent revolutionary development is the new system to produce laminated glass with finished edges, during which the laminated glass comes



out of the heating chamber without excess EVA on the edges, which is very difficult to remove and thus requires additional time and work.

The system is not based on complicated modifications of laminating recipes or the interruption of the intake at a certain stage, forcing clients to a daily revision of the production to adapt each type of glass thickness to the system, thus compromising the visual results with bubbles and quality adhesion result in the long terms.

R.C.N.'s system is, in fact, based on structured and integrated technology installed in the laminating kilns. This allows clients to have a real important option for both final products and costs, also saving time.

PRODUCTION STRONG POINTS RESPONDING TO CLIENT AND MARKET NEEDS

These results are a further example of R.C.N.'s skill in adapting its production to the needs and demands of its clients, and, of course, its constant efforts. The sequence of all these elements create the company's special DNA, which will continue to be an important part of the company in its future growth.

R.C.N.'s production has a

number of strong points that create added value, together with the possibility to check processes remotely, using the new R.C.N. 'Easy Connect' App. Quality control is an important, delicate job, and machine monitoring is part of this procedure. R.C.N.'s App allows remote control from PLC, tablet and/or mobile phone, also giving the chance to modify production parameters during processing. The same App can be used to start a late run or to check remotely together with the R.C.N. staff.

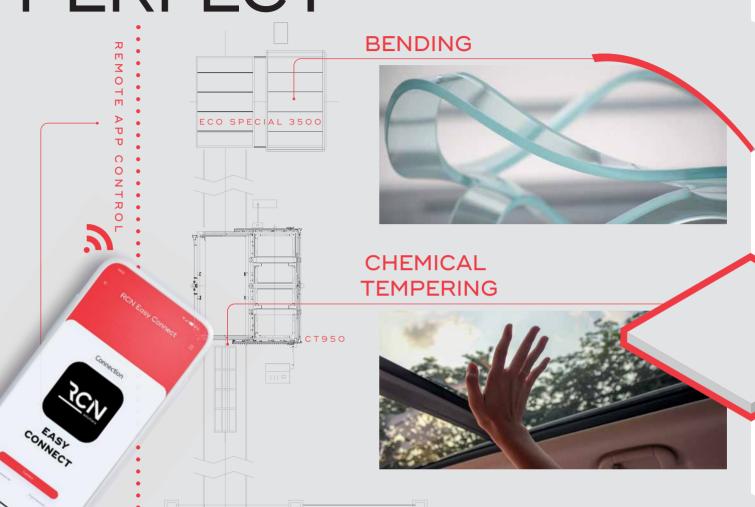
R.C.N. has, as we can see, used this difficult time as the motivation to consider

new perspectives cultivating remote contacts and work, while keeping an eye on market requirements and clients' demands, and — of course — being ready for new goals.



THE PERFECT









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and for processing JUMBO size glass.

Straight-line mitering machines with variable angle and spindle control system

VE 500 V - SCS Series

Conveyor with double drive system Spindle separated from the motor Patented conveyor without bearings Spindle control system





SCAN O DISCOVER MORE



Bayeloni RELIABILITY, QUALITY, EXPERIENCE: SINCE 1946

avelloni is a historical brand in flat glass grinding equipment, being on the market since 1946. The company is based in Lentate sul Seve-

so (Italy) and manufactures 100 per cent of its products in Italy. During over 70 years of activity, Bavelloni has delivered more than 25,000 glass

processing machines to more than 100 countries. Company products include glass processing technology and services for the architectural, furniture, domestic appliance and solar industries. The extensive company portfolio ranges from CNC machines to technologies for edging, bevelling, cutting,



drilling/milling, fully integrated solutions, and also includes a wide variety of diamond and polishing tooling.

Bavelloni SpA is also the majority shareholder of Yalos Bavelloni, a company specialized in highend horizontal and vertical washers for flat glass complementing Bavelloni offering.

COMPANY PRODUCTION Work centres

Bavelloni's NRG Series consists of three CNC work centres: the smallest one, NRG 250 is a 3-axis CNC machine very compact and fast, which now features an automatic front door like the bigger models, NRG 330 and NRG 420. The

latter are available in 3-

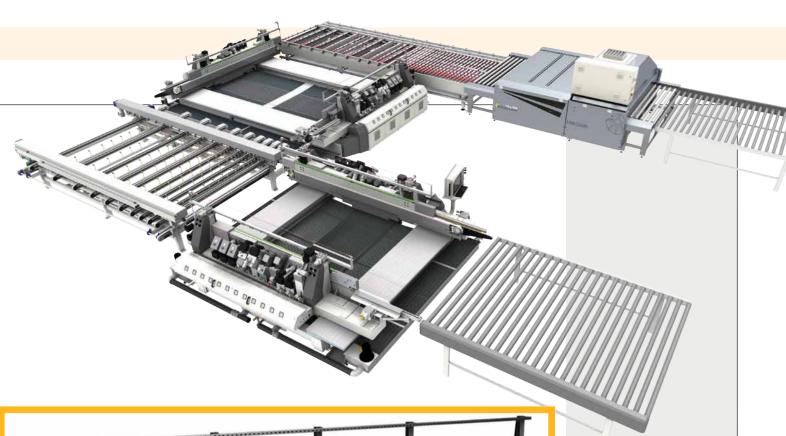
This article provides an overview of Bavelloni comprehensive machinery and tooling offering: a complete range of products resulting from the Company's extensive know-how and experience in the flat glass processing business.



Straight-line edging

The VE series includes a complete range of straightline edging machines called VE 350 and VE 500, featuring from 6 to 11 spindles for processing flat edges with arrises, and two mitering models, VE500 V10 and V14 for machining chamfers with angles from 0° to 45°. VE 500 11, VE 500 V10 and V14 are now also manufactured in the SCS version, provided with an innovative spindle control system for the automatic positioning of the diamond and polishing wheels. Bavelloni has also recently launched a special







edger, VE 350 6D, with six diamond wheels for high-speed grinding.

Double-edging

As regards double-edging, Bavelloni can offer an unlimited number of configurations according to the lavout, to the maximum workable sizes, to the glass profiles and to the automation level. The machinery can be equipped with a wide range of optional accessories (automatic loaders and unloaders, tilting tables, rollers and transfers) for tailor made solutions. The offering includes: the HE500 series with cup wheels and dimensions up to 3300x7200 mm to grind flat edges with arrises and the V-series with peripheral wheels to process small/medium thickness glass with pencil edge shape at high speed.

Bevelling

Bavelloni's bevelling portfolio includes VB 500 in configurations CNP and CNS and VB 350 in versions CN and CNS. The VB series bevellers assemble a patented conveyor (without ball bearings) that minimizes maintenance costs and grants, at the same time, performance and working accuracy. The belt transmission between motor and spindle eliminates any possible vibrations. Moreover, the maintenance-free spindles sealed and lubricated with permanent grease and the centralized lubrication system reduce operating costs.

Bevelling for the the automotive industry, and semi-automatic edging/bevelling

Bavelloni also offers complete lines to produce prismatic rear-view mirrors for the automotive industry: Prisma 75 is a bevelling line especially designed for the processing of large-sized bevels (up to 75 mm) with excellent optical quality. SB 10 deserves a specific mention being the most sold horizontal semi-automatic machine for grinding, polishing and bevelling the edges of shaped glass.

Cutting, vertical drilling&milling, washing

As to cutting, Bavelloni produces two lines of benches: the REV series for straight and shaped cutting of monolithic glass and the Lamy series for cutting, breaking and detaching laminated glass.

Bavelloni's vertical drilling-milling machine VDM 1636 CN provided with double drilling head and rotating tool store (8+8 positions) has become popular in just a few years thanks to its ease of use

and precision. Thanks to a new functionality, this machine can now also drill and notch off-square shapes and parallelograms. Regarding glass washing, in addition to the HW series horizontal washers by Yalos Bavelloni, available in six different sizes (1300 / 1600/ 2200/ 2600/ 3000/ 3300 mm), the company's portfolio now includes also four vertical washing machines belonging to the VW range. The smallest one, VW1600 OT features an open top structure while the other three models differ for the maximum workable height (2200, 2800 and 3300 mm).

Fully-integrated solutions

Bavelloni is also a pioneer in fully integrated solutions, being one of the first



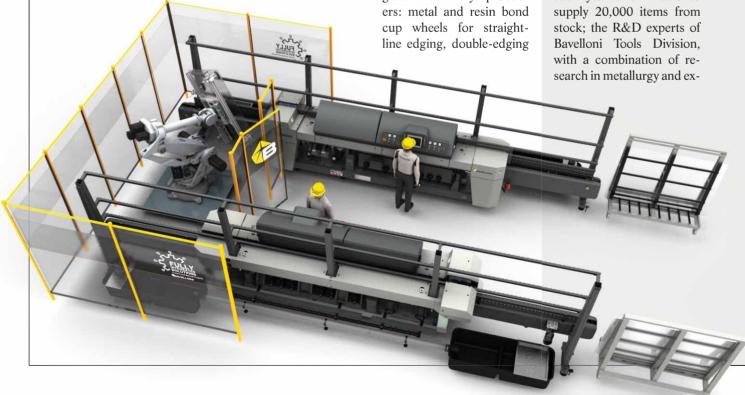
manufacturers supplying robotic islands featuring CNC machines and robots. In response to the increasing market demand for integration and automation, Bavelloni can develop a variety of custom and special projects in combination with Bavelloni machinery (straight-line edgers, double edgers, CNC, drilling/milling centers, wash-

ing machines) and other equipment.

Diamond and polishing tools

Last but not least, Bavelloni has extensive experience in the design, manufacturing and sale of the most complete range of diamond and polishing tooling for flat glass processing, suitable for Bavelloni machines and for the main glass machinery producers: metal and resin bond cup wheels for straightline edging, double-edging

and bevelling machines; peripheral wheels double-edging and horizontal NC machines, diamond and polishing wheels for vertical working centers, milling cutters, combitools, cut-out wheels, coredrills and countersinks. Bavelloni Tools Division – a specific production site of 5,000 sq.m. - manufactures around 100,000 tools each year and is able to supply 20,000 items from Bavelloni Tools Division, with a combination of re-





tensive application knowledge, are always looking for the perfect grinding wheel/machine synergy to find answers enhancing productivity, quality and safe operation.

PRODUCT RANGE

- Straight-line edging and bevelling machines
- Shaped grinding and bevelling machines
- Double edging machines and lines
- Drilling and milling machines
- CNC grinding machines
- Tables for straight and shaped cutting
- Fully integrated solutions
- Diamond and polishing tooling
- Yalos Bavelloni horizon-

tal and vertical washing machines

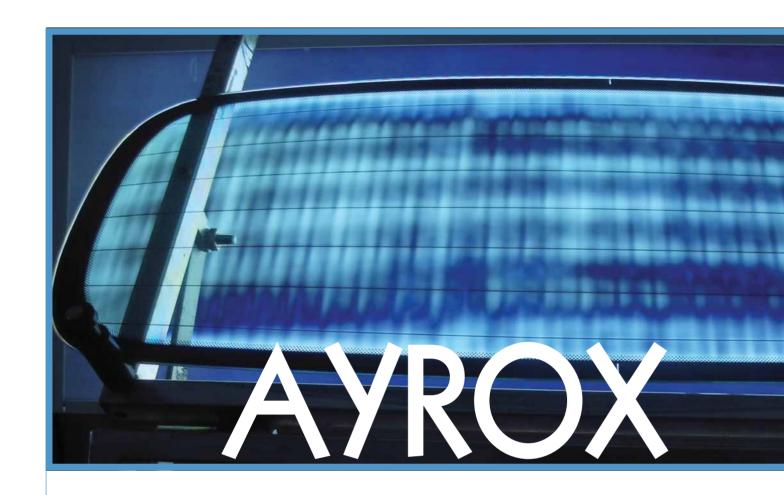
GLOBAL SALES NETWORK

Bayelloni has a widespread sales network all over the world thanks to long term collaborations with the best dealers and agents in the field who are able to advise customers on the most suitable solutions for their production requirements. Over the years Bavelloni has kept on working to strengthen its sales force aiming at bringing a valuable extra level of local support to customers. In 2017, Bavelloni consolidated its presence in North America through Bavelloni America Inc. in Greensboro loyal customers in one of its main market. The local business in Greensboro takes care of selling and servicing Bavelloni equipment in the USA and Canada and manages the commercial coordination of the South American markets in close cooperation with Bavelloni SpA.

With the same aim, Bavelloni SpA focused on another acquisition at the end of 2019 and can now count on a direct presence in Mexico with Z.Bavelloni México S.A. de C.V. The company, based in Guadalajara, has been operating for more than 25 years promoting the Bavelloni brand and installing over 1000 Bavelloni machines within

Mexico and the other Central American countries.
In 2020 Bavelloni has further expanded its sales network by appointing new agents and Sales Area Managers.





russels based worldwide supplier of glass industry quality measuring instruments and PVB shaping and stretching technologies Ayrox has carved out a world-leading position for itself in a very special niche. The company's focus is on automotive and architectural products and a product offering that includes all key instruments needed for the assurance of quality and compliance with standard regulations, in addition to specific PVB shaping and stretching technology. With this capability, Ayrox stands out as a full-range service provider for its customers.

WORLD LEADING NICHE TECHNOLOGY FOR **GLASS PROCESSORS**

INTERACTION WITH **CUSTOMERS AS ITS KEY SUCCESS FORMULA**

Ayrox has a record of 30 years in the glass industry. To stay ahead, however, requires more than a long

record: "It is mostly an issue of a solid industry background that enables you to see the directions of change," says Timo Suomi, Founder of the familyowned company Ayrox. "The development standards needs to be

monitored, new glass applications fully understood, contacts with customers and specialists are also absolutely vital as is the service mentality needed in making the business tick. Customers are often generally aware of what Uniform stress pattern visualised through a polariscope

Aurox specialises in products for the assurance of quality and compliance with standard regulations, along with PVB shaping and stretching technology. Thanks to 30 years of experience in the glass industry, it has reached the position of a full-range service provider for its customers.

ences replaced some of them. On-site demonstrations of instruments and machinery were not possible, but samples supplied by clients were tested in house and videos confirming compliance and test results were sent to them electronically.

USING THE SLOWDOWN FOR STRATEGIC PROJECTS

The health crisis also pushed Ayrox towards a

they need for their quality monitoring but creating the readiness in practice takes a lot of effort. We like to think that we can meet the customer requirements from one source and deliver full service including equipment and training. Close monitoring of customer needs ensures that vital client input receives proper attention. The alternative for clients would be working individually with up to a dozen suppliers or so. The cost-effectiveness of our package has enabled us to state that product training is free for all our quality control products." During the COVID-19 pandemic, visits to customers had to be postponed but video confer-



more active internet presence, namely sponsoring the Challenging Glass 7 Conference webinar, working towards an upgrade of its website, and a more extensive Linkedin presence to name a few projects.

The calmer **COVID** months have also been used to finalise the project to become ISO 17025 certified calibration laboratory for polarimeters, and certified testing laboratory for surface stress measurements according to EN 12150. EN 1863 and ASTM C1279.

CUSTOM TAILORED SOLUTIONS FOR QUALITY CONTROL

For glass producers, processors, quality inspectors and designers the precision measurement offers the necessary quality assurance and helps prove better characteristics of the products.

Standards and regulations develop quickly and this development is driven by both industry and regulators. The overall aim is safety. Developing rules may leave some market players behind as new regulations may at times be hard to keep on top of. Ayrox full-range services include measuring calibration instruments, and installation, while the required training is a great help for glass producers setting up advanced and

expensive product lines.

The latest addition to Ayrox' product range is the PGP-10, Privacy Glass Polarimeter, used to make surface stress measurements for mechanical strength on dark privacy glass with a light transmission as low as 10 per cent. The primary use is for car sunroofs, rear sidelites and backlites.

PVB TREATMENT ALSO FOR WEDGED PVB

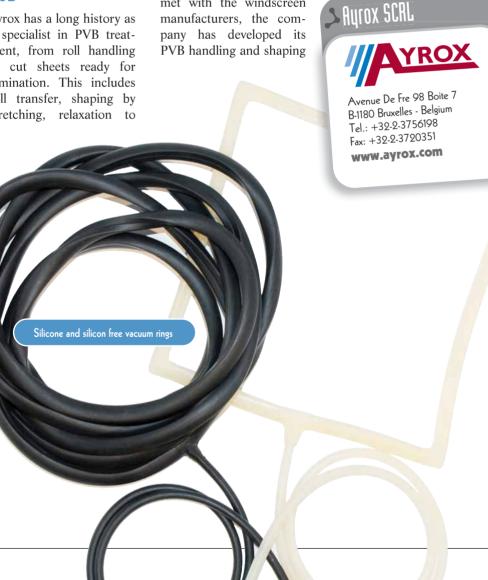
Ayrox has a long history as a specialist in PVB treatment, from roll handling to cut sheets ready for lamination. This includes roll transfer, shaping by stretching, relaxation to PRODUCT RANGE

- QC instruments and services for tempered and laminated glass and
- Large selection of non-destructive optical quality control equipment
- PGP-10 Privacy Glass polarimeter for dark heat treated glass
- Calibration, repair and preventive maintenance of optical QC

- Heatable backlite soldering and testing systems
- Vacuum rings with or without silicone

eliminate thermal tension and cutting. Ayrox PVB shaping and stretching technology generates considerable material savings. In the light of the success met with the windscreen manufacturers, the com-

technology further, and it is now also available for both flat and wedged PVB with linear gradient.





BEST MAKİNA, manufactures insulated glass which are production machines with aim of presenting high quality products and services with strong infrastructure and 100% Turkish engineering, becomes a solution partner in more than 80 countries. Insulated glasses which is manufactured by BEST MAKİNA products, already involved with most prestigious projects all around the world.



QUALITY

High quality manufacturing & products and services



PROFIT

High quality products high performance and reasonable prices



SERVICE

Fast and wide area service system two years of warranty









PRODUCTS

- Insulated Glass Production Lines
- Glass Washing Machines
- Glass Processing Machines
- Extruders
- Spacer Bar Process Machines
- Auxiliary Equipments











est Makina, global supplier of insulated glass production machines. is further strengthening its position in the IG machinery sector with a 3,300x6,000mm size complete insulated glass production line with automatic gass filling. With this new machine, the production of extra-height units is carried out by means of unique and flexible solutions which have been engineered in-house, facilitaing controls.

MODULAR SYSTEMS

This new IG line has modular systems which can work either stand-alone or coupled. Moreover, all systems have the possibility of on-line data exchange for final/semi-final product tracking, as well as production condition tracking through ERP softwares. The system can be customised as per end users' premises, resulting in considerable benefits thanks to the decreasing investment recovery time.

Main features of the IG line:

- glass washing and coupling from 3mm to 20/40/60mm;
- payload from 200 kg/m to 350 kg/m;
- unit thickness from 90mm to 170mm;

- double-, triple-, quadruple-, stepped-, triplestepped glass production:
- variable gas injection nozzle position allows usage of variable spacer thickness for multilayer insulated glass panes;
- active inert gas consumption control via analyser in filling chamber;
- multiply gas connection;
- modular mechanical system allow to produce 3,300x6,000mm/ 9,000mm/ 12,000mm even longer;
- previous (arriser, edge deletion etc.) or following (sealing robot, stacker etc.) machines

- can be mechanically connected and can exchange signals;
- transfer machines can be integrated for exchanging semi-products and line can be built on I, T or L shape layout;
- quality control scanners can be installed and datas can be exchanged on-line;
- multiple extrusion pumps can be installed for fast changing of work material or decreasing down times;
- unlimited dosing range via digital dosing chemicals allow usage of unlimited supply of sealants.





AFTER-SALES SERVICES

Best Makina supplies fast and solution-based after sales services with two years of complete warranty including electronics

and mechanics (independent from working hours). Additional features include free on-line service during machine lifetime, and spare part shipment the same date of order.

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FORVET AUTOMATION FIRST AND FOREMOST

he range of solutions Forvet offers includes numerically controlled installations for drilling, countersinking, milling and grinding operations, as well as all the management of the glass plate from cutting to shipping.

The company aims at innovation, product quality and service. Year after year, Forvet commits to applying new ideas and consolidating its role as technological innovator in order to serve the high-level market.

Since 1990, Forvet has been designing, developing and manufacturing special machines for processing flat glass, with the highest technological approach. The company addresses its offer to a very demanding and evolved market segment.

THE COMPANY'S APPROACH AND VALUES

Forvet's team prioritizes the real demands of the glass industry, to create proposals such as the optimization of the glass flow and the implementation of sorting systems with new concepts, ideas and solutions.

In an economic situation such as the one we are ex-

periencing today, having the ability to look ahead while continuing to invest in new solutions represents a courageous strategic choice; at the same time, it fits into the tradition of the





company that has always sought innovative solutions, investing tirelessly in strategic areas such as Research and Development. Forvet encapsulates those values that support and give new life to the global production system:

• the production of 'real' goods, capable of transmitting an important competitive value in order to compete on the various reference markets with appropriate and adequate means;



- the ability to constantly develop new solutions, to innovate and to constantly lay forward perspective;
- the positive attitude, which by triggering a virtuous circle, conveys the perception of the possibility of moving forward and succeeding.

CUSTOMER RELATIONS

At the base of each project, is the weaving of a close relationship with the customer to acquire data and information on their specific needs and to ensure trust and certainty in the completion of any project.

The benefits of automation include increased productivity, quality and safety

THE NEW ERA OF PROCESS AUTOMATION

Forvet builds machines for glass processing and provides unique solutions in terms of performance, innovation, technology: the entire production lies on solid bases of knowledge of the different productive processes.

Today, the technological push has declined on the side of process automation, entering the 4.0 industry panorama: automation accelerates production times by opening the way to a higher margin of revenues, also by virtue of a significant reduction in costs.

The handling and management of glass within the production process is increasingly important, complex and multifaceted, which is in line with the dynamic trends of target markets, such as architecture. Process integrations become protagonists: Forvet's automated and integrated machines are designed to perform multiple operations whilst simultaneously avoiding glass manipulation between processes.

The Forvet Automation department employs engineers and software experts with consolidated experience in the world of glass: due to this wealth of expertise, the company is able to guarantee the achievement of any project, regardless of size and complexity.

Automation unfolds through the digitalisation of processes, which generates a very important amount of data and information. Once these are implemented with the Company databases, they produce a significant optimisation of all the productive processes, allowing the industrial production unfold toward excellence.

THE FUTURE

Forvet has recently completed significant corporate restructuring with numerous acquisitions of management personnel, extension of the production spaces of the Volvera plants, implementing the expansion the Research & Development investments. Forvet's balanced mix of careful and bold commitment resulted in its latest

innovating solution. It will be presented to the market in February 2021, and will testify once again, that passion, enthusiasm and the detailed analysis of the customer's needs are key points for the success of a company.



> Forvet SpA



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Fratelli Pezza



ADAPTING TO THE NEEDS OF CUSTOMERS WITH EFFICIENCY AND OBSESSIVE ATTENTION TO DETAIL



Fratelli Pezza started its activity as a supplier to the petrochemical and textile industry for light and heavy carpentry work. It soon specialized in the design and manufacture of machinery dedicated to glass processing, and, in particular, sandblasting machines for flat glass, of which it has been the undisputed market leader for over 30 years.

N IMPORTANT RENOVATION IN RECENT

Fratelli Pezza has always stood out for its compulsive attention to detail and the general quality of its products, as well as for the unceasing technological development that has allowed it to implement new operational features, as well as improving existing ones.

Investments did not stop at products alone; in fact, in recent years, the company has carried out a total renovation of its headquarters, gaining in organization and production efficiency, as well as in terms of corporate representation.

AUTOMATIC SANDBLASTERS: THE ZEPHIR AND MINSTRAL EV SERIES

The range of Fratelli Pezza automatic sandblasters is vast and varied, and truly adapts to the needs of any customer. It consists of two series: the Zephir series, simple and cost-effective, and the Mistral

EV, equipped with top-of-the-range features.

The Zephir Series

The Zephir is available in two varieties, the Z120 (maximum working height 1200 mm) and the Z180 (1800 mm), which can be equipped with one or two automatic guns.

This line of sandblasters

carries out normal, light sandblasting and deep engraving, always maintaining high quality standards. Additionally, the software enables to programme a certain number of sandblasting passes in automatic mode, so that it excavates the glass without having to move it in and out of the cabin.

The Zephir is widely used for double-glazing, as it represents the ideal solution for those who want to recover glass with slight surface imperfections; nonetheless, it is also suitable for decorative designs. Thanks to the extremely competitive prices of the Zephir models, the glassworks can have excellent economic return with a little investment.



Mistral EV series enables to carry out shading blasting and to set up to 50 blasting areas on the glass plate. This feature propartition walls, and other architectural elements, and allows remarkably reducing process-time, especially in case of mass production of glass or mirrors that need to be sandblasted only in certain parts of their surface.



tomers involved in the production of shower cubicles, glass railings, balustrades and many other modern design solutions.

A NEW EFFICIENT INTERNAL SYSTEM

All Fratelli Pezza sandblasters are equipped with a built-in high efficiency filtration system, which does not require additional external units such as the cyclone separator. It has a unique system, which prevents the accumulation of static electricity within the cabin. The Mistral EV series is available in three models: M120EV (maximum working height 1200 mm), M180EV (1800 mm) and M260EV (2600 mm).

All cabins are equipped with:

- Colour display
- Newly enhanced software
- "Pause & check" feature - which allows to stop the working programme and then restarting it at any moment of the process, without jeopardizing the finish quality.
- Preventive maintenance warnings - which appear on the screen whenever an item needs to be checked and possibly replaced.

Sandblasters designed by Fratelli Pezza are characterized by the lowest power and compressed-air consumptions among the equipment available on the market and provide great



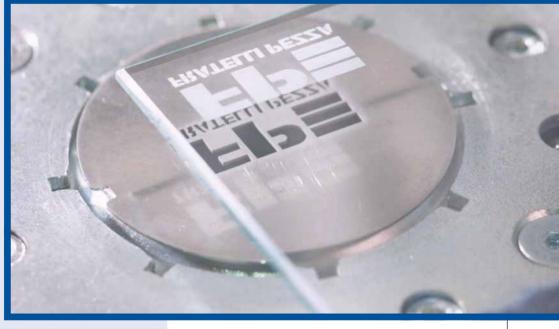
productivity and an excellent finish quality.

EASYMARKER SERIES - THE INNOVATIVE SAND-JET MARKING **EQUIPMENT**

Given the growing demand of marking on glass, the Italian company has devoted resources and energy to the development of a complete line of sand jet marking equipment. This is a result of the increasingly stringent regulations, with special regard to the glassitems used in the building sector.

The product range includes two manual and portable devices and two fully automatic equipment, the Easymarker series:

Easymarker UP is suitable to be combined with horizontal machines, while the Easymarker EV version has been designed to be



coupled with vertical machines.

Any Easymarker can be activated automatically by connecting it with any other glass-working machine. These are the ideal solution for companies with large numbers of production.

The portable versions are extremely flexible. The company's R&D department have developed a new version of the product, the new Marker 301T. This allows imprinting a mark with a diameter of up to 30 mm on the surface of glass and mirrors, ensuring the same quality and sharpness of marking of the standard M101T version.

The new Marker 301T responds to the needs of any company required to comply with dimensional standards imposed by the regulations or provisions of their industrial group, or simply those who, through the marking, must convey a large number of information while maintaining high sharpness of each word or number.

With the aim to continuously update and improve their products, Fratelli Pezza have equipped the machine with a new highly sensitive timer, which enables to further optimize the lifespan of the stainless steel masks where the customer's logo is engraved. Fratelli Pezza marking devices provide a clear, sharp and permanent mark, and can be used on any type of glass. Addition-

ally, the portable models and the Easymarker EV allow marking the edge of the glass, if the thickness makes it possible.

MIX 30 PRO, PROTECTIVE COATING FOR SANDBLASTED GLASS

Taking advantage of their wide experience in the field of sandblasting on glass, Fratelli Pezza have introduced the Mix 30 PRO, an enhanced version of Mix 30, the well-known protective coating for sandblasted glass that the company has been selling for many years.

The new formula maintains the best qualities of the older version, whilst additionally ensuring higher efficacy and reduced drying times. The product can be spread easily with a simple microfiber cloth and it does not leave stains or halos.



GHOSTGLAZE

Ghostglaze is a brand-new specific product for the protection of transparent glass, therefore non-sandblasted or treated.

Ghostglaze was created to protect the glass surface, by making it water-repellent and highly weather-resistant, without altering its mechanical and aesthetic characteristics.

Ease of application, quality of protection and a highly competitive price make Ghostglaze the ideal product for float glass, shower enclosures and any other type of untreated glass, to protect the surface and facilitate cleaning.



EXCELLENT CUSTOMER RELATIONS

Fratelli Pezza's e-shop offers its customers an optimal service through which it is possible to order accessories and spare parts quickly and easily; customers can register their machines in the portal so that the system only displays articles which are suitable for that model, thus avoiding the view of erroneous items.

Fratelli Pezza take advantage of an international distribution network, and offer customers top-level after-sales service, from both technical and commercial point of view.



SOMETIMES **TRANSPARENCY IS**NOT THE BEST OPTION







Innovation and Customisation,
Flexibility and Reliability,
Performance, Quality and Working
speed are the characteristics of
each Bovone product. In over 65
years of production at the highest
levels, Bovone Elettromeccanica
has established itself as an
international reference leader
for the supply of stand-alone
machines and full-line systems,
accessories and tools for the
second processing of glass and
natural and synthetic stone.

ovone Elettromeccanica's leading position in the flat glass machinery sector comes from the continuous analysis of the multifaceted and frenetic trends of these reference markets, constantly studying new solutions capable of equipping its customers with cutting-edge technologies in view of present and future challenges. Solutions with a very high technological content for applications aimed mainly at the construction, furniture and automotive sectors.

Production takes place entirely in the company's premises in Ovada, Alessandria, northern Italy, which is a par-excellence infrastructure both in the Italian and international industrial scene, able to manage every step in-house, from the supply of the best raw materials to the development and integration of management software, up to the proposal of the most suitable tools, thanks to synergy with sister company BDT. Boyone Diamond Tools

In addition to the Ovada headquarters, Boyone is also present on the market with two direct branches, one in the United States dedicated to the North American market, and the other in Brazil to cover South America. In addition, a widespread network of distributors present all over the world guarantees the presence of Boyone at global level.

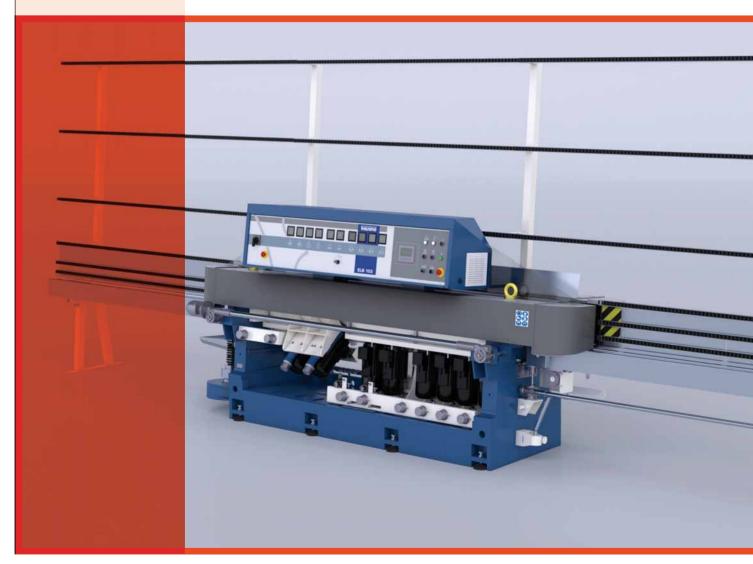
An articulated and highly qualified system of technicians, supported by the almost unlimited availability of stock, provides excellent after-sales service, responding promptly and competently in every geographical area.

Bovone machines and plants combine high quality with processing speed, and continuous innovation with the drastic reduction of machine downtime thanks to their extremely high reliability.

THREE REFERENCE PRODUCTION AREAS

Machinery

Stand-alone machines for the treatment of glass sheets: grinding, bevelling and washing machines for glass. The main aspect of this area is the high degree of customisation which, today, is a fundamental strategic plus: Bovone machines, in fact, are designed to solve each and every production need. They en-



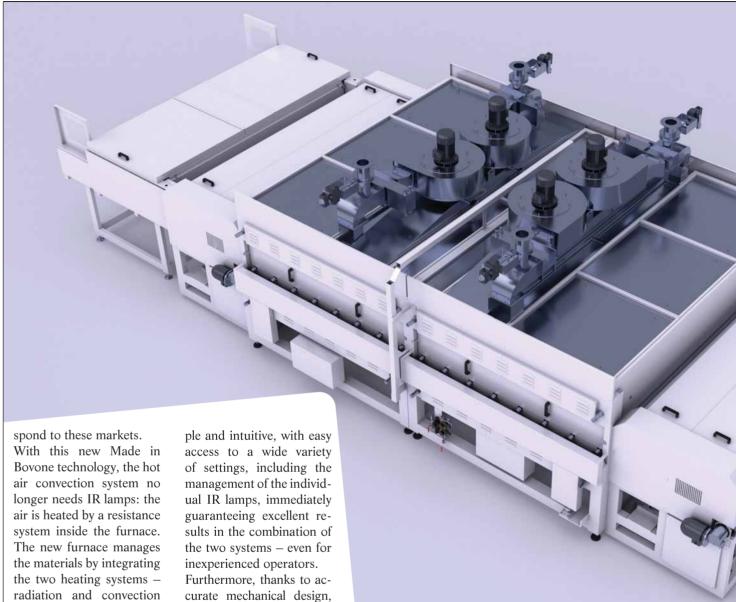


guaranteed over time. Entry level or more advanced machines from Bovone are able to guarantee excellent performance.

Systems

Silvering lines and laminating glass systems can be completely customised and integrated according to the specific needs of each customer. All construction details are customised and calibrated, compared to standard configuration, to meet specific needs. Bovone plants ensure the Production also includes the BRS area, fully automated robotic Bovone systems for glass grinding. BRS systems integrate straight-line edging machines and articulated, multi-axis robots, with different load and application characteristics. With regards to applied industrial robotics, Bovone is Kuka's Official System Partner. BRS adheres perfectly to Industry 4.0 protocols: the islands work without the presence of personnel and are fully connectable **Convection Radiation**

HCR hybrid laminating furnace, a combined technology to achieve maximum production versatility. The lamination market is closely linked to the construction, architecture, automotive and transport sectors, where laminated glass, by virtue of its qualities in terms of safety and comfort, is widely used, and where new materials with excellent performance are constantly sought. Bovone's new hybrid furnace was created to re-



- completely independent from each other. These can be combined according to the needs imposed by the type of glass sheet being processed.

In addition to its high versatility, the furnace also guarantees heat distribution optimisation, monitored by a sophisticated control system, providing greater uniformity of the glass temperature with tolerances of \pm 2°C. The control panel is very simmaintenance operations are extremely easy, while excellent construction quality guarantees reduced consumption, with energy savings of over 40 per cent compared to other technologies on the market.

In terms of service, and in line with its role as a market leader for technological innovation, Bovone has developed a number of Industry 4.0 solutions to increase its automation and remote working services.

BVA - BOVONE VIRTUAL ASSISTANT

Bovone Virtual Assistant is a system to provide remote access to all data, manuals. certificates and technical videos relating the machine, using a simple IPad device that is supplied with the machine.

This product becomes an ambassador of cuttingedge technology and the

degree of innovation that Boyone is able to introduce in its reference sector. BVA is part of the panorama of solutions designed to facilitate both automation levels and remote interventions as much as possible.

In this particular moment of distancing, remote assistance acquires even more meaning and value. In fact, in the glass processing sector, where production





set-ups must be constantly calibrated and reviewed, Boyone is at the forefront in countering the critical issues generated by distance. This is combined with the skills of a highly qualified service team ready to be in direct contact with the machines installed around the world to diagnose, solve and optimise.

This technology allows to save considerably in terms of time, human and economic resources. Speed of intervention and efficiency are guaranteed.

INDUSTRY KIT FOR REMOTE ASSISTANCE

The Bovone product range is equipped with the Industry Kit For Remote Assistance, which allows to be connected online via an Ethernet cable. The remote connection guarantees that wherever the machine is located in the world, an internet connection will be sufficient to allow Boyone technicians to intervene directly, solving most of the support requests remotely. Thanks to remote connection, technicians can intervene immediately to assist and support customers in the case of incorrect settings or inadequate recipe parameterisation operations, or any other unsuitable operation that leads

to the generation of an alarm, guaranteeing immediate problem solving and a drastic reduction of line downtime, thus protecting productivity. Production data collection for predictive maintenance and use and performance of the same is another interesting aspect of this service.

A further effort made by the company to assist its customers in after sales.



> Bovone Elettromeccanica Srl

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Nel's Alkaline Water Electrolysers (Hydrogen Generators) have been in use for decades at float glass manufacturing facilities



Nel is a global, dedicated hydrogen company, delivering optimal solutions to produce, store and distribute hydrogen from renewable energy. Since its foundation in 1927, Nel has a history of development and continual improvement of hydrogen plants covering the entire value chain. from hydrogen production technologies to the manufacturing of hydrogen fuelling stations, providing all fuel cell electric vehicles with the same fast fuelling and long range as conventional vehicles today.

Raymond Schmid - VP Sales and Marketing EMEA-Oceania Nel Hydrogen

ON-SITE TIN BATH ATMOSPHERE GENERATION IMPROVES FLOAT GLASS **PRODUCTION**

irst developed by Sir Alistair Pilkington in 1952, the float glass process creates a specialised type of flat glass with an extremely smooth, uniform structure and superior optical qualities. Over the past 60 years, this method has not lost its relevance. Today float glass is everywhere. It is used to construct windows and doors, the glass 'skins' of modern skyscrapers, tables, shelving and display cases, solar panels, plasma, LCD and LED screens, au-

tomotive windshields and more. If you see a clear or tinted flat piece of glass, it was most likely manufactured using the float glass process.

THE PRODUCTION OF FLOAT GLASS

Float glass is produced on a continuous production line. First, raw materials such as sand, dolomite, limestone, carbonate and sodium sulfate, as well as scrap glass are heated to extreme temperatures (1,500°C/2,800°F) to form



molten glass. This glassy liquid then moves into the tin bath chamber, which has a controlled atmosphere, where it is poured onto the surface of molten tin. As the molten glass floats on top of this tin bath, the tin acts as a level template for the glass to distribute over and then harden into high-quality flat glass.

Tin is a metal that does not react with glass, but is the forming basis for a flat surface of glass without optical defects. One of

the most important tasks at this stage is to prevent the interaction of oxygen with the tin.

The oxidation of tin introduces flaws in the tin's structure, which in turn will create flaws in the surface of the glass. In order

to stop this oxidation from occurring and to avoid a negative impact on the glass, a protective atmosphere is used in the tin bath chamber. This atmosphere usually consists of 90 per cent nitrogen (N₂) and 10 per cent hydrogen (H₂). While the nitrogen remains non-reactive in the process, the hydrogen will react with any oxygen present, preventing any oxidation of the tin.

DETERMINING WHICH TECHNOLOGY IS BEST – USING THE RIGHT GAS

In order to determine which technology is the best to produce protective atmospheres, there are several factors to considered:

- High purity requirements for process gases
- Large volume of gas demand (average: 800 Nm³/h nitrogen and 90 Nm³/h hydrogen)
- Sourcing gas supply
- Environmental impact of generating the gasses Traditionally, industries that require high volumes of these gasses for produc-

tion purposes have used compressed gas or liquid forms of nitrogen and hydrogen, which are supplied by pipeline from a nearby producer, or by trucks in tanks or tube trailers. However, this is not without its problems.

Nitrogen

Nitrogen is typically produced with air separation units using pressure swing absorption technologies. This method provides the highest purity of nitrogen available, and can be cooled and compressed into liquid form and stored cryogenic containers. However, whether as a compressed gas or liquid, nitrogen is a dangerous element to store. If it escapes into an enclosed space, there is a high risk of asphyxiation, or if pressure builds up there is a high risk of explosion. Given the high volume of nitrogen required in the float glass process, the logistics of transporting the nitrogen to the glass plant can also present a problem. Any disruption to the supply chain, whether from a strike, natural disaster or global pandemic can cut off the flow of nitrogen to the plant causing a shutdown of production. To help keep glass production operating at peak efficiency and safety, plant managers should consider installing air separation units on-site to replace, or at least supplement delivered nitrogen.

Hydrogen

Most hydrogen is produced via coal gasification (CG) or steam methane reforming (SMR), which uses fossil fuels as the feed stock and creates carbon dioxide (CO₂) emissions, a very damaging greenhouse gas. Depending on the method used, for every ton of H2 produced, 11 to 19 tons of CO₂ is released.

The main driver for CG and SMR applications is the low specific cost of hydrogen produced. However, the disadvantages are the high cost of equipment, costly and lengthy maintenance, and the presence of impurities in the hydrogen, which requires additional purification equipment. Add to that the changing attitudes and legislation around the world on greenhouse gas emissions, decarbonization of industries and the expense of carbon capture equipment now being required, CG and SMR are starting to fall out of favour. In addition, liquid



hydrogen is highly explosive which means it must be handled very carefully, and requires a large storage area and special permitting.

Hydrogen production through traditional alkaline water electrolysis is a well-known technology to the glass market. In this process, the electrolyser uses a liquid alkaline electrolyte (NaOH or KOH) to facilitate the electrolysis. While installation of an alkaline system may require RTN and other permits as well as additional inspections and special insurance due to the caustic nature of the alkali, the system is extremely reliable and efficient. Many float glass plants have been using this technology for decades to produce the hydrogen they require for their tin bath atmospheres. Because the hydrogen produced by water electrolysis is generated by cracking water molecules (H2O) into hydrogen (H_2) and $oxygen(O_2)$ using only electricity and an electrolyte, no greenhouse gasses are produced. The only by-product is oxygen. When hooked up to a source of renewable energy for the electricity, true green (zero carbon) hydrogen is produced. Utilizing the water electrolysis process to generate the required hydrogen will lower a plant's carbon footprint and help the company comply with the ever-tightening carbon reduction legislation. By producing the hydrogen on-site as needed, the plants can also eliminate the safety and storage problems of delivered hydrogen.

WATER ELECTROLYSIS - THE OPTIMAL CHOICE

Given the importance of hydrogen purity for the float glass process, all the features of CG and SMR operations, and the same logistic problems for delivered hydrogen as for delivered nitrogen, the process of water electrolysis is the optimal choice for the float glass process. Today the safest, most advanced technology to produce the purest hydrogen is through Proton Exchange Membrane (PEM) water electrolysis. This process uses a caustic free solid polymer electrolyte as the catalyst to crack the water molecule (H₂O) into hydrogen (H₂) and oxygen (O_2) .

In a Nel Proton® PEM electrolyser, deionized water and electricity are fed into the cell stack. Here, water splits at the anode into electrons, protons and gaseous oxygen (O_2) at a pressure of 1.5 barg. Protons then pass through the proton exchange membrane while the electrons follow an electric circuit to the cathode. At the cathode, protons and electrons combine to form hydrogen (H₂) at a pressure of 30 barg. The membrane material is gas impermeable,

and the differential pressure between the hydrogen and oxygen streams ensures that there is no mixing of the gasses. This mechanism of the Proton PEM system has brought water electrolysis to a new level of safety. The high purity of hydrogen is due to using pure DI water as the only raw material. Hydrogen purification consists of drying the hydrogen through two internally installed pressure swing absorption tubes. There is no need to have additional purification and treatment equipment. The standard purity of hydrogen is guaranteed at a level of not less than 99.9995 per cent with a dew point of 72°C.

With the absence of a liquid alkaline tank and mechanical high-pressure compression on the hydrogen line. PEM systems are more compact than their Alkaline counterparts. A more important benefit that comes with the absence of alkali in the PEM systems in the lack of need for 'hazardous production facility' signs, RTN and other special permitting, additional inspections and special insurance.

Nel electrolysers operate automatically and do not require the constant presence of customer personnel. They can be set to follow the on-demand requirements of the production process, eliminating any hydrogen storage requirements. The systems constantly monitor the operation process adhering to several dozens of safety parameters.

As float glass facility managers contemplate changes or additions to their tin bath atmosphere supplies. it should be noted that each project requires a detailed technical and economic analysis, taking into account specific plant requirements. Nel Hydrogen produces hydrogen generators, both alkaline and Proton PEM technologies, and can match the needs of any float glass operation. Nel provides turnkey solutions... the implementation of all stages including production, delivery, commissioning, warranty and post-warranty service throughout the life of the equipment.





SCHIAIII



50 YEARS OF SPECIAL MACHINERY; WORKING SIDE-BY-SIDE WITH CUSTOMERS

or more than 50 years Schiatti Angelo has been a partner for small-, medium- and large companies in the furniture, construction and photovoltaic sectors, offering its customers a wide range of glass processing machines, and when required, customising them so as to reach the shared goal of business growth.

CORE BUSINESS

The core business of the company is represented by straight- and doublegrinding machines pencil- and flat-edge pro-

duction. In the last years, these machines have been updated and have become more user friendly and high-performance. Thanks to the new PLC, with a greater and more modern look from a graphical point of view, data transmission, storage of polishing wheel

positions and more precision in the calculation of polishing wheel rising according to thickness, speed and inclination for the mitring models are granted. In addition, the glass removal step can be performed in automatic by means of the same new PLC.

ANGELO



Glass processing machinery, with the possibility of being customised as per client needs and demands, is what Schiatti has been providing glass processors for the past 50 years and more. In this article we get an overview of the company's production, and how today's Industry 4.0 applications are increasing efficiency and competitiveness — both regarding its machines, and that of its clients' productivity.

Schiatti Angelo's product range also includes straight bevelling machines, drilling machines with opposing heads, multi-heads drilling machines, vertical drilling/milling machines and corner machine.

AUTOMATION – INDUSTRY 4.0 AND

In this age of 'digital manufacturing', Schiatti Angelo is also focusing on Industry 4.0 solutions: the latest technologies based on the Internet of Things



(IoT). Automation and the way that smart data are managed by IoT are two of the main factors that help to define an enterprise's efficiency and competitiveness.

The advantages of this interconnection are numerous, these include remote access to machine data, remote and instant support, and suggestions of appropriate response actions, automatic learning (for increasing productivity and quality) and reduction of unnecessary machine down time.

Schiatti's automated solutions can be both vertical and horizontal. Fully automatic complete lines for loading, processing on all four sides of the glass, and unloading can be supplied.

FAST AND CONVENIENT AFTER-SALES SERVICE

The company is also proud of its fast and convenient

after-sales service. Customers expect companies to meet their needs and respond to their problems effectively, and that is why Schiatti is always present, supporting its customers by optimising and implementing vices such as a dedicated WA line, remote assistance, the use of video tutorials, webinars, etc.





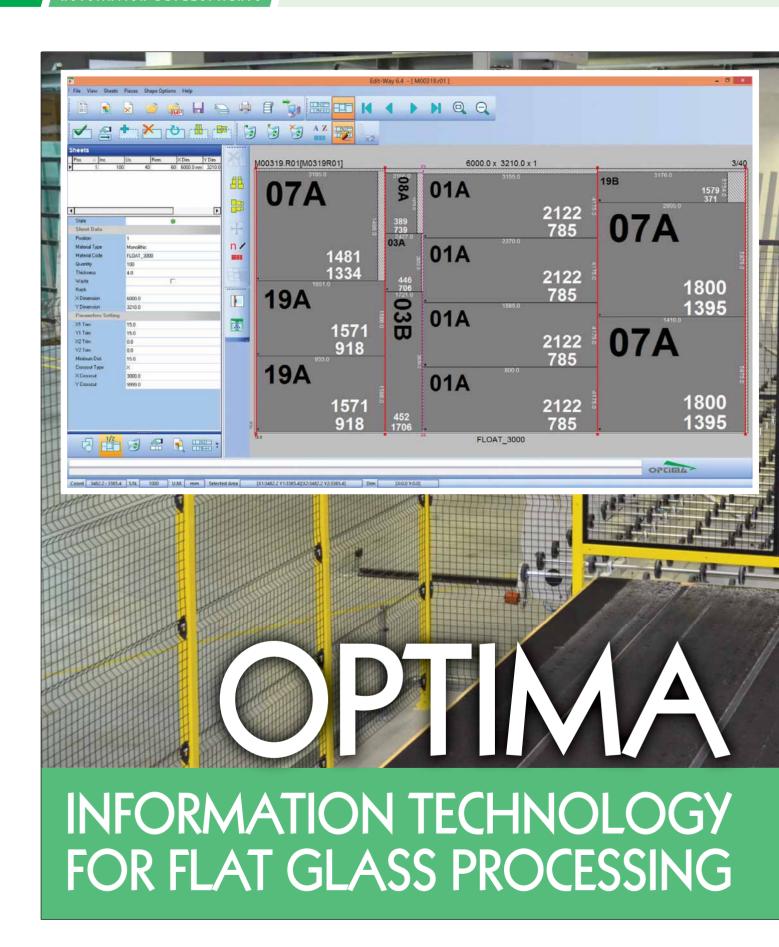
SAME EXPERIENCE

SAME RELIABILITY

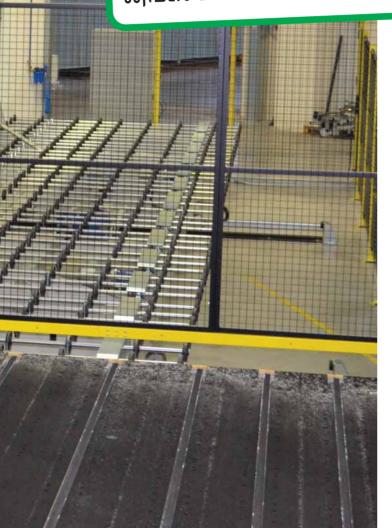
schiattiangelosrl.com info@schiattiangelosrl.com







Thanks to more than 25 years of experience, dynamism, competence and motivation, Optima has continued to develop software for companies of the flat glass sector, with more than 20,000 global installations. In the present Industry 4.0 era, the company is now active in Information Technology, with software aimed at the complete control of production.



n the era of Industry 4.0, companies increasingly need to automate and monitor production processes in real time and from this point of view, software certainly plays a crucial role in the integration and communication between the different types of systems present in glassworks: cutting lines, processing machines, CNC, furnaces and so on.

EXPERIENCE AND PROFESSIONALISM: DYNAMISM. COMPETENCE AND

Founded in 1994 thanks to the experience and professionalism of the founding members, Optima is the result of the synthesis of dynamism, competence and motivation: the company is now active in the Information Technology sector applied to the processing of flat glass in particular and, in general, to all machine tool machining on flat surfaces.

A highly qualified team

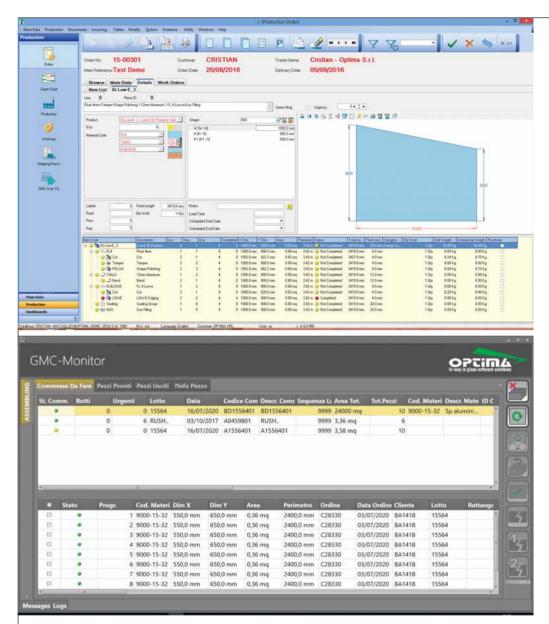
of professionals provides prompt and decisive answers to meet the needs of international customers.

The company boasts more than 20,000 installations all over the world thanks to a widespread sales network (three international offices: Spain, Canada and China, and more than 20 international collaborators, including agents and dealers).

ERP AND MES SOFTWARE SOLUTIONS

For over 25 years, Optima has been developing ERP





(Enterprise Resource Planning) and MES (Manufacturing Execution System) solutions capable of managing the entire business cycle and glass production: from the purchase of raw materials, accessories and consumables, to the realization of estimates, orders; from the production scheduling for the optimal management of the plants in relation to the production batches, to the unloading

and handling on trestles, automated or manual up to the delivery to the customer with the issue of bills and invoices, up to the energy certifications and the issue of DOP (thanks to integration with the glassAdvisor system).

NATIONAL AND INTERNATIONAL COLLABORATION

Another strong point of Optima is, and has always

its collaboration with national and international manufacturers that generates a fruitful environment for the development of software solutions capable of guaranteeing improvements in production efficiency, integrating and automatically sending information on what must be done in the various lines and receiving automatic feedback on the execution and timing of the specific phase. Management, therefore, aimed at the complete control of production, including scheduling and initial planning.

PRODUCTION EFFICIENCY

Again in terms of production efficiency, Optima software is integrated GLASSInspector with by DeltaMax Automazione, an Italian company leader in the production of scanners for the detection of defects, allowing interfacing with production, as well as data processing for the creation of statistics, and production reports for ad hoc quality control. Benefits:

- increased productivity and efficiency;
- reduction or elimination of insertion times and the use of paper;
- lead-time reduction;
- organisational improvement of processes.





The house of best competence in glass worldwide.

Opty-Way Enterprise ERP/MES for a smart and integrated glass production









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ADIANDRBM

SURFACES GROUP CONTINUES

TO GROW



SURFACES GROUP

The two historic glass sector companies gain important recognition and consolidate their strength in international markets, even during these challenging times, with new products and increased sales. In recent years, the Surfaces Group has established itself as the benchmark for the production of tools, machining and surface finishing treatments.





and present in 70 countries

various sectors, has been

has allowed it to become



fundamental in the development of new solutions to increase penetration and consolidate the positioning of its brands in major international markets.

ADI AND RBM

In the sector of glass processing, Surfaces is present through two well-known and highly-esteemed players, ADI and RBM. The resulting interaction has allowed to define and finetune innovative, effective and technologically advanced solutions, in terms of increasing quality and greater speed of execution, thus increasing the production performance of its customers.

ADI

Over its 40 years in business, ADI has become the brand of choice for the production of grinding wheels, metal-bonded and resin-bonded diamond wheels for CNC machines, straight edging lines, double-edgers and bevelling machines. It also produces routers, cutting discs and tools for the glass, marble, ceramic and optics industries. The Thiene-based company has always stood out for its ability to offer original and innovative technological solutions. It is able to assist companies looking for highly targeted and efficient application solutions which ensure high-quality standards and the optimization of production processes.

RBM

RBM, founded in Baldichieri d'Asti in 1963, is unquestionably the leader in the supply of glass polishing wheels. 'Experience,

technology, innovation, high quality and technical support' is the mantra that characterizes its actions and helps to explain its international success. RBM has become renowned over its 50 years of entrepreneurial history, and the widespread use of its polishing tools consolidates it as one of the main world players in the sector. It offers over 20 formulations for different shapes and grains: grinding wheels in rubber, resin, cerium, foamed polymers and non-woven fabrics.

An RBM polishing wheel is chosen for the absence of defects, its excellent precision, perfect profile retention, high execution speed and longer life - all pluses that reduce waste and processing times, increasing the yields of production plants.

REWARDING INNOVATION

Surfaces brands are characterised by the quality of their products, including grinding wheels with unique bonds, which have an extremely high concentration of diamonds, designed to perfectly meet the needs of the solar and automotive glass industries that require high production speeds.

Aware of the competitive advantage gained by using its tools, ADI is committed to promoting its products as a key to production efficiency. An ADI tool is always the best choice for reducing the TCO (Total Cost of Ownership or Total Cost of Management). The adoption of these parameters as the driver for purchasing the best tool means a winning strategy to ensure increased performance. This is an added value choice, and an advantage to the entire production cycle.

"On the other hand, choosing a wheel based solely on the price parameter can easily lead to additional costs that eliminate the initial advantage," says Lorenza Dal Maso, ADI Glass Division Sales Manager. "The cost of the tool, in fact, has a minimal influence on the total costs. but choosing a poor quality product can lead to higher costs in terms of scraps and repairs, meaning an increase in the relative lahour costs. downtime. with the associated costs of non-production," she says. "We are noticing that our customers, who are increasingly sensitive to the importance of optimising production costs, are paying more attention to this, and in this context ADI wheels and routers have become the reference products."

"The fact that ADI tools are being chosen, even as we faced the difficult start to 2020, has been an important confirmation for the company."

"In accordance with the provisions of the D.P.C.M. (Decree of the President of the Council of Ministers) for the Covid emergency, we were closed for about a month and then we restarted with all the necessary precautions in place to comply with the stringent regulations. In addition to underlining the great awareness and understanding on the part of all the staff, I must admit that we have not registered significant imbalances: our customers have rewarded us and despite the sharp downturn in important markets such as the Chinese, our sales have been very satisfactory," continues Ms Dal Maso.

ONE-SHOT

ADI's One-Shot wheels and GlassRenu system are among the notable products which confirm its position as world-leader in wheels for glass processing.

Paying particular attention to customer needs, ADI developed the One-Shot range to reduce the collateral costs due to reprofiling. Aimed at the automotive sector which requires a perfect profile retention, "To guarantee the precision of the profile, each wheel can be reprofiled five-six times. It is a necessary process, but it involves time and management costs that impact heavily on production. Furthermore, there are places where it is not easy to find reliable re-profiling centers," explains Ms Dal Maso. "ADI's world-first One-Shot wheel is a 'disposable' tool which has a lower diamond thickness, and can work until the end of its life before being thrown away, and can still be re-profiled once. This technology allows to cuts down on all operating costs, and guarantees the same result as a standard wheel, so the operator saves all the time of profiling management. Derived from the automotive sector, UHS® technology is complete with edge grinding wheels and Blue UHS® Cutting Mills, which are 1 appreciated for their duration and a machining speed 30 per cent higher than a standard wheel, as well as reduction of vibration and possible chippings."

Green UHS® routers which provide uniform wear, with a softer bond and greater versatility, are also part of this range.

GLASSRENU

Another undeniable success is the partnership with GlassRenu for the development and exclusive distribution of the Scratch Removal System. Marketed in the US by the IGP brand, it is distributed by ADI throughout the rest of the world. It is an absolutely exclusive patented system that responds to an important market need. The GlassRenu system, designed for the naval, automotive and furniture sectors, allows the removal of scratches without the need to remove the affected glass. It works completely dry, and restores the glass surface in significantly lower times and with lower cost than any other system, since it eliminates the need for disassembly, refurbishing and reassembly of the damaged sheet.

FULL R&D AND SERVICE

ADI has skillfully built its pre-eminence in the market in recent years not only through its strong global distribution, but above all thanks to the constant involvement in research alongside its industrial customers to develop new opportuni-



ties for the development of their businesses.

Technological innovations, solutions to optimise production costs and reduce waste, the strong and specific after-sales service all emerge from this collaboration. On CNC machines for example, ADI service guarantees the installation of the tool without holding up the production cycle with long start-up times. The perfect understanding of customer needs, the constant monitoring of processes and the use of certified raw materials

and highly specialised personnel means that these are pluses are available to every client.

GROUP SYNERGIES

These distinctive and rewarding characteristics have been strengthened through the interactions between the brands in the Surfaces group, making it possible to share experiences and analysis equipment for new R&D projects.

ADI and RBM have created important synergies working together on doubleedgers and straight edgers machines for edge processing, where diamond and polishing tools operate in sequence. Wheels with different bonds and structures have been designed according to the type of processing. These are all tools that ensure high working speeds by adapting to different sheet thicknesses.

RBM

For RBM Italia, the opportunities which have come from joining Surfaces have allowed the company to significantly enhance all research, testing and quality control activities both internally and for customer service. An in-depth business strategy has introduced further improvements to traditional references thanks to increasing process control, in-depth quality control on incoming raw materials and outgoing finished products.

LOW-E WHEELS

The new direction has also seen highly significant progress in the development of new wheels for low-E for High Speed Machines: nonwoven, foamed polymer and rubber. "For low-E glass, our main target markets are the United States, where the use of this product is more widespread, and China, which is the largest producer and supplier of insulating glass," explains Tomaso Zago, RBM Italia Operations Director. "The low-E market is characterised by a complexity that is due to a strong diversification of types of glass and tools. The strength of RBM lies precisely in the completeness of the range, capable of satisfying every need. We have also developed new high-performance wheels for these markets. The tests carried out both in our internal testing departments and at companies confirmed the

high efficiency of the UHS wheels in particular for high-speed systems."

AR/AA WHEELS

RBM has always been involved alongside customers for the improvement of their production efficiency, and is recognized by international markets for the quality/price ratio of its products.

According to Zago: "Now, thanks to growing investments in research, we are expanding the qualitative offer of our wheels and we are developing an increasingly precise service, able to cover all the most diversified niches of our market."

At the beginning of 2020 RBM launched two new product families, the AR/





AA grinding wheels for edge processing for low-E glass. They are available in two hardness versions, and in six different grains nonwoven fabric, and are effective at very low pressure. "The lockdown phase both in Italy and in other countries has hindered us from sustaining the penetration of these wheels. Despite this, in the first months of 2020 we recorded a 100 per cent increase in sales compared to the same period of 2019," says Zago, "which is a brilliant result that testifies to the interest in the distinctive quality of Italian technological solutions."

GREEN SOLUTIONS

"I want to confirm that all our products are strictly Made in Italy, allowing us to closely monitor the production processes of all our companies and guarantee the customer the constant quality of the product we supply, significantly rewarding compared to the competition," concludes Lorenza Dal Maso.

The 'eco-friendly' policy adopted by the Surfaces Group sees ADI and RBM playing a leading role in a new operational deal, oriented towards the eco-compatbility of its most recent applications, a program of constant monitoring of processes and research of more sustainable raw materials, while also paying greater attention to the health and well-being of the workplace. Indeed, Zago confirms "We are also taking on an important 'green' renewal process, flagged to be completed in 2022, across the entire range, aiming at using more sustainable materials."

Effective and exclusive developments that make ADI and RBM able to meet all the needs of the production process related to glass grinding and polishing operations.





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N-FLUENT

EVA TO ACHIEVE
PERFECT FINISHES AND
TO SAVE COSTS IN EDGE
CLEANING

@EvalamOficial





FIVE REASONS TO CHOOSE EVALAM N-FLUENT

- Less cleaning of edges
- UV filtering
- 85% crosslink
- Stability to contraction
- European quality

PUJOL GROUP



he laminated glass sector is undergoing continuous changes and sustained growth. Due to the severe crisis in which we are subjected, companies with great adaptability to change, that decide to invest in reliable and flexible solutions, will be strengthened. These are companies that enable to adapt production to the demand curve that is generated in the market without the need to increase the cost per unit produced, while maintaining a stable

profit margin regardless of the point of demand where we are. Bearing this in mind, Hornos Pujol, belonging to the Pujol Group, developed the Pujol 100 PVB + system, which is the option chosen by professionals with a greater knowledge of lamination. More than 50 of these units have already been sold around the world.

FLEXIBILITY IN LAMINATING

The flexibility required in the laminating processes, to-

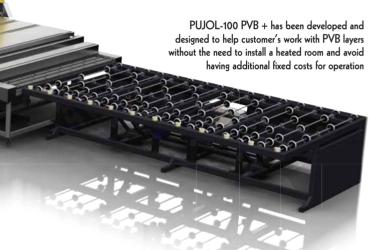
gether with the development of new and reliable EVAbased materials, is led by the company Evalam, also integrated within the Pujol Group, located in Galicia (northwestern Spain) with a new and modern production unit of 3,500 square meters for the development, formulation and extrusion of EVA. The group is making significant investments in this factory, including two new production lines, one of them of 2.65-meter line that will allow it to respond to the increasingly frequent demand for large-format widths. These investments will make the Galicia plant the most modern EVA factory in the world. In addition, production capacity and quality of customer service will be significantly increased in a growing demand year after year.

THE BEST 'SHOPPING' EXPERIENCE BASED ON SEVEN BASIC PILLARS

Aware of the responsibility that leadership represents,



Today Pujol Group faces the future with the commitment to continue promoting quality products and excellence in service to its customers.



mission is to specialise and consolidate as a world leader in the architectural laminate market.

A wide range to cover all architectural solutions on the market

Evalam offers a wide range of EVA products, of which Evalam Visual should be highlighted. developed for laminating experts looking for a high added value solution. Its excellent and incomparable transparency, high adhesion, great acoustic insulation and a crosslink index not comparable in the market, represent perfection and make it the ideal lamination solution to be placed in all those places where optics and durability are a must. Evalam also has Evalam N-Fluent, the latest innovation developed by the company is designed with the aim of minimizing the

global costs of the postlamination process thanks to its innovative formula it avoids the fluidity of the product and saves time and costs in edge cleaning. The time to clean the glass is clearly reduced, obtaining greater benefits for the business, without sacrificing transparency which, despite being somewhat lower than with Evalam Visual, continues to be better than any other EVA on the market. on the other hand, it has an excellent crosslink level of 85 per

Completing the range of transparent EVA Evalam offers the product 80/120. It has been designed thinking of all those laminations in which it is necessary to work with temperatures that do not exceed 100°C, such as decorative insertions with organic prod-Evalam 80/120 ucts.

Evalam constantly works on seven pillars that are the basis to ensure the best 'shopping experience' for its customers.

Part of the Pujol Group

Being part of a well-known group with an average growth in turnover of more than 18 per cent in the last five years, a history of more than one hundred years and a workforce of more than 70 workers distributed in three production plants, Pujol Group's



guarantees to maintain the decorative effects of the insertions without deterioration of colours and textures due to the effect of high temperatures, maintaining the adhesion and safety performances at lower processing temperatures.

Evalam also offers a range of coloured EVA films developed to work in the temperature range of 120°C without loss of tone at the ends and providing greater colour durability over time. They are created in contrast to those EVA films of process colour at only 80°C that prioritize the uniformity of tone over the durability of the material. Thanks to Evalam colour and the technology used with Pujol's laminating furnaces, both objectives are achieved: durability and colour uniformity. In addition, the range has four shades of white and one



black that comply with the strict European certification for outdoor use.

The quality of the final products

Evalam controls and ensures the quality of its final products through four strict phases from beginning to end of the production process, which has

allowed it to obtain ISO 9001 and ISO 14001 certifications.

Know-how of engineers and two in-house laboratories

The company's team of eight engineers is trained to offer laboratory services for testing or product development. In addition, and as per client request, tests such as: pendulum resistance, humidity, temperature, radiation, UV filtering, peeling adhesion, resistance to the ball drop, as well as silicone compatibility can also be carried out. Evalam provides customer service and has an Architectural Technical Department that currently offers, at structural calculation level, appropriate glass dimensioning (thicknesses and layers) based on values provided by the customer.

Product certification

Evalam currently has more

than 50 certificates issued by external and independent laboratories. These demonstrate the reliability of the products to different laminated compositions such as resistance to impact, humidity, radiation, acoustic insulation.

Regarding the new Building Regulations launched by the European Union and mandatory since January 2020 (EN ISO 16612: 2019-03 and EN ISO 16613: 2019-03) which refer to the resistance to the lateral load of glass and the viscoelastic properties between layers of laminated glass and laminated safety glass respectively, Evalam has achieved the highest possible classification -Class-2 for the products: Visual; N-Fluent and AB-AR (EVA based copolymer) while most Thermoplastics (PVB) are only classified as Class-1.



Appearance of finished glass laminated with the new Evalam N-Fluent

Reference works and unique projects

Day by day Evalam products have been worthy of the trust of the prescribers, that is why we can find Evalam solutions installed in proiects for different uses, such as residential, public, or even transport. As a result of this notoriety. Evalam is already one of the options to choose from in the most important software of structural glass design and the calculation of the glass thickness on the market, such as the SJ Mepla & ProgrammaVetro.

Diversification of new products

Evalam constantly develops solutions other than EVA. In fact, Evalam has a wide range of references

View of the 7 basic pillars of Evalam to guarantee an excellent customer shopping experience

with regards to interlayers using different materials, such as AB-AR, thinking of applications that require additional security in public spaces or with high linear load, but above all in passive post-break safety when tempered glass is used. AB-AR is an EVA-based CO-Polymer that reinforces the standard qualities of EVA, and places AB-AR film as the Interlayer with the highest mechanical resistance performances on the market ahead of ionomers. Above all, in states of post-fracture stability above

Other Group products AB-AR HIGH TECH belonging to Group References and Product success stories Wide variety of Present in reference projects worldwide 🕲 Evalam Certificates Quality More than 50 certificates granted by ISO certifica and quality Know how & service Own engineering, technical and development

45°C, normal situations in glazed roofs of large commercial spaces, airports or glazed public spaces in large geographic areas where it is very common to reach these temperatures during much of the year.

I-ON BY PUJOL

Other products included in Evalam's offer are those developed by i-On By Pujol, (a company also belonging to the Puiol Group) based on an offer of laminated glass

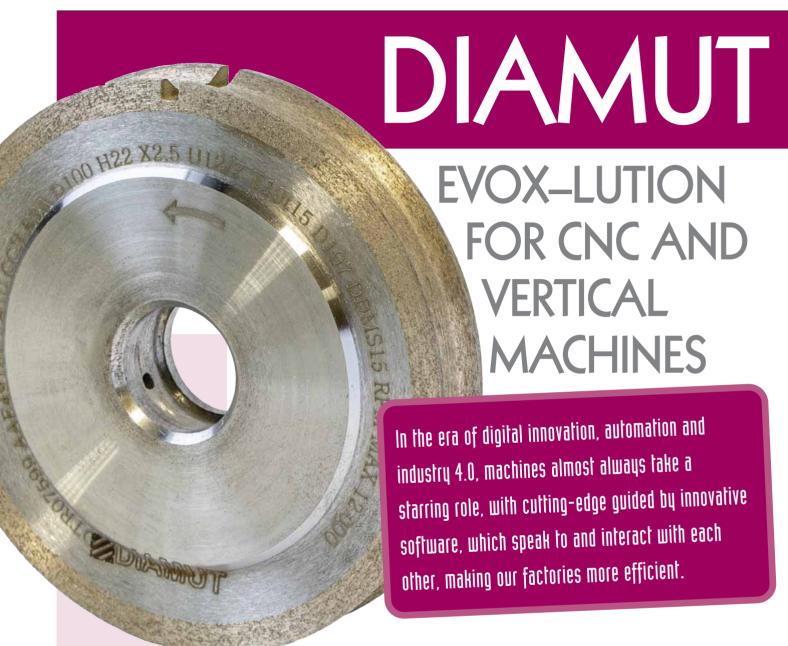
with PDLC. i-ON by Pujol has developed PDLC (Polymer Dispersed Liquid Crystal) laminated solutions for multiple architectural applications and also to be used as a room divider that can offer transparency or privacy. A new concept of dynamic showcase is currently being developed together with the Japanese multinational Panasonic, where laminated glass with PDLC + EVA will add value to the retail and leisure sector.



The analysis and verification of the products is a key process in the quality of Evalam







There are two very important kept in very high consideration in each and every glassworks: their own machine park, and obviously the glass itself. And it's quite funny that these two important elements are never in direct contact. But, as everyone of us knows, it's the tool that is

the point of contact of these two elements, and it's the tool itself that transforms the glass sheet into a glass product that all the world knows: from a window to a glass shelf, from a cabinet to a shower door. And this is why we can resume this concept with a simple sentence: a performing tool makes a performing machine; a top quality tool makes top quality products.

RENEWED DESIGN FOR GUARANTEED PERFORMANCE

With this concept in mind, Diamut, the division of Biesse Group dedicated to the design and manufacture of tools for processing glass, stone and synthetic materials, has developed a new range of tools able to increase both machine productivity and quality of all glass processed: the EVOX line.

TWO EVOX FAMILIES

The EVOX line has been developed in two main families: EVOX10, with a diameter of 100mm for all CNC machines, and EVOX15, with a diameter of 150mm for all vertical CNC machines.



EVOX10

The EVOX10 line especially developed for standard, horizontal CNC machines, such as the globally known and appreciated Intermac Master, but this same line can also improve performance in every CNC model and brand.

QUALITY WITHOUT COMPROMISE

The first aspect to highlight is the fact that has been made with a new revolutionary bond: DDSM15. Beside the fact that it is environmental friendly, thanks to being cobalt and nickel free, it also guarantees cost savings as, once the tools are consumed, they do not need to be disposed of as special waste.

Another important feature is reduced total height, thus allowing the assembly of packed wheels onto the tool holder, which means that fewer tool holders are needed. Savings in time are guaranteed thanks to the automatic tool changeover. With regards to design, an important development is that of the passing through cut, which obviously helps the water coolant to enter. also facilitating material removal, thus improving performance and quality.

The results of this evolution are clear to see in performance: +50 per cent.

Three values are always measured when testing tools at Diamut: speed, working life and quality. End users who decide to increase one of these values will create a disadvantage in the other two. In fact, if the speed is increased too much it will result in a shorter working life and lower quality, in the same way with the other two aspects.

So when we say +50 per cent in speed it means without affecting the other two aspects: quality and life. A simple example of this can be seen in figures: door processing in 10mm 2 meters x 1 meter glass, with three notches, the total working time with previous wheels was 18 minutes compared to 15 minutes for the same iob carried out with EVOX wheels. This means five more doors produced per working day, increassing machine productivity by over 20 per cent.

EVOX10 is Diamut's new

advanced tool to obtain maximised performance.

FVOX15

EVOX15 has all the advantages of EVOX10, with with a number of additional features: the aluminium body enables to reduce weight as much as possible, an important factor considering the dimensions of the wheel. Cuts also pass through and, in this version, the number of cuts are increased: passing from six cuts of the previous version to the 12 cuts of the EVOX line. EVOX15 also achieves another very important result, being able to work at maximum efficiency with reduced rotational speed. This, in turn, results in energy savings and an important reduction on electro spindle wear.

This version also has impressive performance, with +43per cent working speed.

So we can say that with new rotational speed and new increased working speed, EVOX15 is, therefore, the perfect change to carry out uncompromising glass grinding.

Diamut – Biesse Group

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TECHNOLOGY, PRODUCTIVITY, INTERNATIONALIZATION AND ASSISTANCE

NNOVATION

"In the coming months, four important projects will be launched, to which we have dedicated considerable efforts and resources, to establish ourselves even more in the global industry of glass manufacturing automation," comment Fortunato and Riccardo Vianello, owners of Forel. "The projects we are announcing today can be summarized in four words: technology, productivity, internationalization assistance."

As for technological innovation, the Thermoplastic Spacer Applicator Art. TA is in presentation, enlarging the Forel range of solutions for spacer application.

"With the Thermoplastic Spacer Applicator, Forel developed innovative solutions for this kind of processing, optimizing not just the spacer application but all the process of assembly of the insulating glass unit," says Fortunato and Riccardo Vianello. "Our thermoplastic spacer

IG line is indeed a solution with unique features, which already drawn the attention of many customers."

EXPANSION

Forel's business volume has been growing steadily for over ten years: to cope with the large number of orders, it was necessary to invest Forel has responded to 2020 with new investments and projects: the main production site is expanding, a new commercial branch will soon be inaugurated in South Africa, the range of solutions for double glazing has been completed with a specific line for the assembly of the panels with thermoplastic profiles, and important new investments have been made in the Service department.

in new resources involving the whole company and all business aspects... and also in the production space.

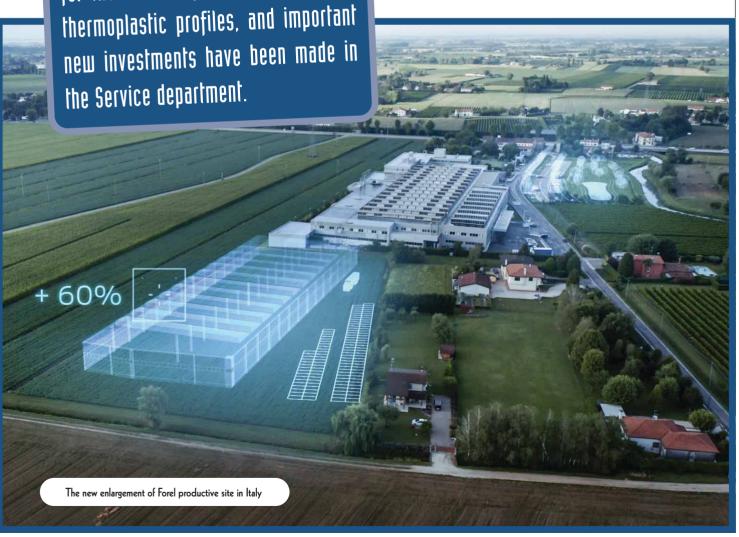
"In its history, Forel has always enlarged its presence in the market, year by year. As a consequence, we need to constantly increase our production area. The next investment, indeed, will be remarkable: Forel's production site in Treviso will be enlarged by more than 60 per cent."

Thanks to this operation, it will be possible to process a

greater number of orders at the same time, thus avoiding moving a part of the production to other sites: this will result in greater efficiency and faster production times, while ensuring the same quality of the finished product, strictly 'Made in Italy'.

BUSINESS GROWTH

Quality is the value which has allowed Forel to compete on international markets. With a commercial network of 31 agencies





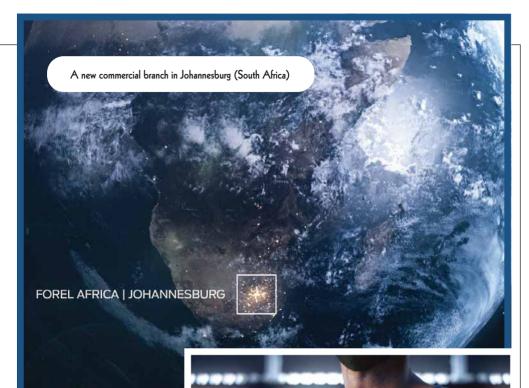
worldwide, the company currently exports to 72 countries, but never stops expanding its horizons, in search for new opportunities. In 2020, collaboration was formalized with the South African manager Afam Ike, a professional with over 20 years of experience in the glass manufacturing automation sector. From this partnership, Forel Africa will soon be born: a new branch based in Johannesburg to further



develop the brand in the African continent, both in terms of commercial presence and after-sales management. Afam Ike will take on the role of CEO.

"I am honoured to join the Forel team, a company whose commitment, business philosophy and innovative technology I could immediately appreciate," commented Afam Ike. "In Africa, the glass market is showing a sharp growth, but African glassmakers





need reliable partners that bring added value to their business, especially in aftersales: many companies today suffer from the lack of empathy from current suppliers, the poor preparation of assistance staff, the exorbitant cost of spare parts and software updates. Today Forel offers the best technical assistance service on the market, which aims to amortize customer expenses, optimizing the cost/benefit ratio. Forel is a partner who cares about technology sustainability and, most importantly, who listens, understands and responds to the different needs of the African market."

ASSISTANCE

Customer assistance, which has always been one of the company's priorities, is at the centre of new investments. Forel Service team, includes on-site which

staff, travelling technicians and spare parts shippers, is being upgraded. From a technical point of view, remote assistance has been enhanced with a series of new additional augmented reality technologies, offering the customer the best support in troubleshooting and maintenance. Technical training, both for Forel staff and for the maintenance technicians of agencies and customers, have always been at the centre of a vast programme of lessons and demonstrations, and has also be enriched with new multimedia and interactive tools. This ensures the best preparation

and a continuous updating of all the technical intervention staff of the Forel network.

Forel 2020







31st China International Glass Industrial Technical Exhibition

Shanghai New International Expo Centre May 6-9, 2021

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Supporter: Shanghai Ceramic Society

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HOW DO YOU GAUGE A GLASS MANUFACTURER? BY WHETHER THEY'RE STILL USING GAUGES.

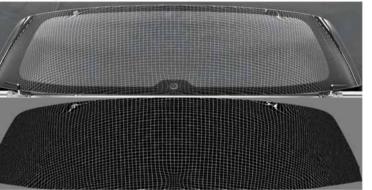
When it comes to glass inspection, Glasstech offers the industry's first online solution for accurately measuring optics and glass shape without the need for expensive gauges. This high-tech method not only increases accuracy, it reduces costs as well. The most powerful software in the industry comes from the most powerful name in glass – Glasstech.



www.glasstech.com

GLASSTECH

ADDRESSING THE AUTOMOTIVE INDUSTRY'S CHALLENGES FOR HIGHER **QUALITY GLASS**



Reflective Output Report comparing a simulated grid board and an actual photograph

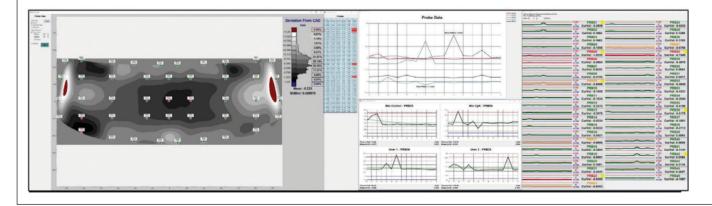
EN YEARS OF DEVELOPMENT

For nearly a decade, Glasstech's engineers and scientists have been developing a technology that can accurately measure the surface of complex glass shapes without touching the part, other than datums. Extensive testing has shown that the technology can measure the entire surface of complex shaped glass with sufficient accuracy and repeatability to gauge glass to industry standards[1].

This development addresses the challenges posed by the automotive

industry's higher quality requirements for glass. Glass shape measurement has evolved from perimeter glass support fixtures with 10 to 20 interior measurement points to glass measurement fixtures with hundreds of measurement points. Glass optical meas-

Example Display of AGI-GTM



Glasstech announces that it has completed the development of a revolutionary technology that can dimensionally gauge and quantitatively measure the reflective optics of complex shaped automotive glass, all on the same system. This article gives us an idea of just what this new technology can do.

urements have evolved from a subjective evaluation or projection of patterns through or reflected off the glass in an optics lab to objective evaluation by various technologies.

The increased quality expectation has led to increasingly complex and costly gauging systems that can exceed USD 200,000 per fixture. In comparison. the Glasstech System only requires a part dedicated glass support structure that incorporates the A, B and C datum along with a simple glass positioner. The glass support structure eliminates all of the costly electronic probe gauges, so it is a fraction of the cost of traditional gauging systems. Yet, the technology can provide dimensional measurements at specific points as well as provide an accurate surface map of the entire glass part. The elimination of the costly probe gauges plus the measurement of the entire glass surface offers a significant cost savings while giving much greater information to the automotive OEM that can be used to evaluate vehicle HUD, camera and wiper performance.

AGI-G/R™ FOR THE **MEASUREMENT OF** TYPICAL BACKLITES, **WINDSHIELDS OR SUNROOFS**

technology, new AGI-G/R™, is capable of measuring typical backlites, windshields or sunroofs. It can be integrated with AGI-T™ to provide a complete quality report for a part, including glass shape to design, and both transmission and reflective optical distortion levels. The AGI-G/R technology has gone through extensive AGI-G/RTM will operate either in a laboratory or in the production facility. Glass parts are loaded onto AGI-G/R™ either manually or by robot. The glass parts are placed on the glass support structure and then the AGI-G/R™ system will measure the part in a sealed enclosure that controls the measurement environment allowing for very accurate results. The AGI-G/R system can measure glass either horizontally or at installation angle.

AGI-G/R's output has the basic measurement probe data and Statistical Process Control (SPC) analysis of traditional contact gauges. In addition, a full surface topographical off-form map can be superimposed to provide more part information. This additional information can assist in understanding wiper performance, HUD or other quality attributes to assist the glass fabricator by further enhancing their forming tool or process.

The output is displayed on two large monitors situated side by side. As an example of the display is shown below, where the most recent part measured including each probe measurement and the topographical map are shown on the left monitor, while trend graphs for each probe measurement data are displayed on the right monitor.

AGI-G/R measures the glass surface to a level that allows reflective optics to be determined. As an example, AGI-G/R can simulate any grid board reflected off the glass surface. Below is an example of that capability. AGI-G/R can report the local curvature

of the glass surface to be compliant with published standards.

AGI-G/R revolutionises glass inspection by:

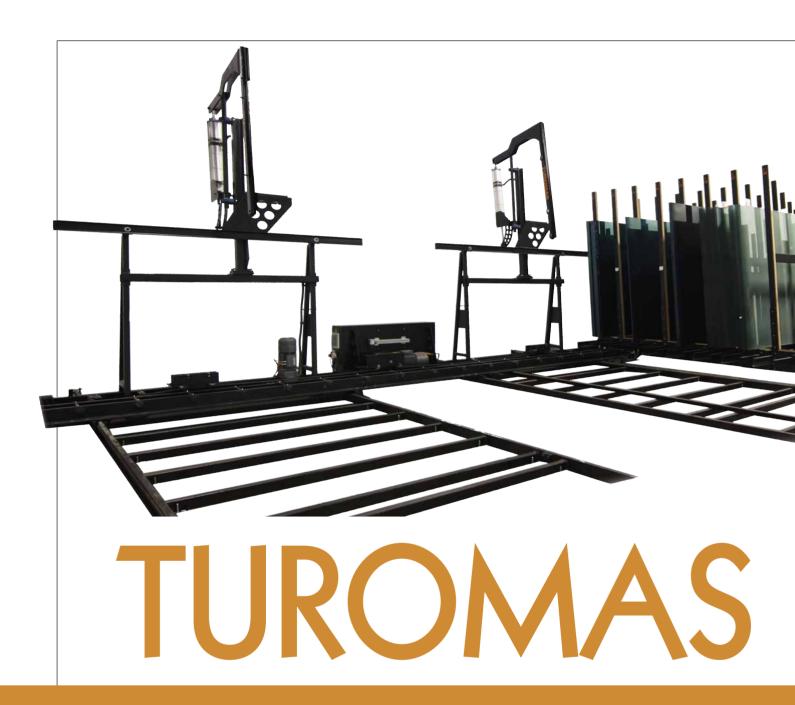
- lowering the cost to gauge parts by replacing multiple probe checking systems with a much lower cost glass support structure and eliminating the multiple probe's ongoing maintenance cost;
- providing more meaningful shape information that can be used to improve operations;
- this single system can be used for the measurement of shape and reflective optics;
- it can be integrated into a production line or used in a laboratory setting.

Footnote:

[1] Automotive Industry Action Group, Measurement System Analysis, 4th edition



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CONTINUING TO REVOLUTIONISE THE GLASS INDUSTRY, TAKING R&D PROJECTS TO THE NEXT LEVEL











tivity of machines with any ERP Optimizer available on the market. They provide an optimum use of resources to manage production from a single control interface, monitoring and controlling the

glass stock in real time, and managing non-automated glass warehouses. Their control interface has been carefully designed to meet the requirements of the final user: adaptability, intui-

tive and user-friendly. Information is power, and this is the aim that the Turomas brand has pursued: provide the right information in a standardized and open language to make customers' day-today lives easier.

NEW MACHINERY **DEVELOPMENTS**

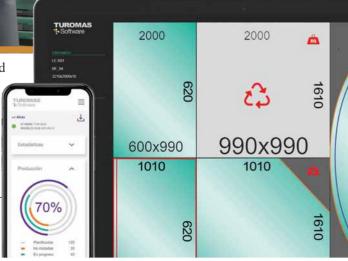
High-performance decorating system

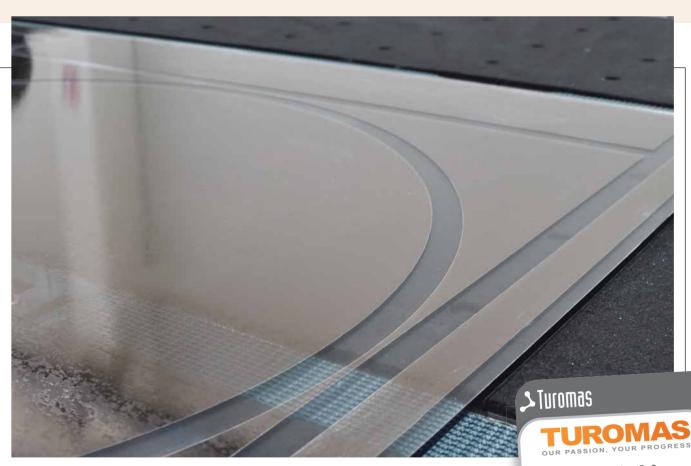
The new self-calibrating high-performance decorating system for low-E glass and low-E with plastic protective coating (TPF), is now also capable of decorating low-E with EASYPRO® protection.

Following improvements implemented on the system, Turomas has achieved the elimination of this material in a single run, improving cycle time and grinding wheel wear. In addition, the advanced vacuum system eliminates any waste resulting from the process.

Revolutionising glass loading

In addition to the innovative decorating system,





a new machine has also been developed, which will revolutionise glass loading concepts, and has been designed to change the perspective of any glass processor. It has never been possible to automate the loading and cutting of jumbo glass in such an optimised space as this new model does, reducing the area required to a minimum.

The new RUBI, in addition to automating the loading of jumbo glass, also incorporates a new instantaneous separation system which increases safety and makes the glass loading process more delicate, considerably reducing breakages due to collisions and the possibility of accidents. Following cancellations or postponements of the industry's most important trade fairs in 2020, this new

range of products will be presented in the upcoming year and in particular - at glasstec 2021.

Turomas and its new de-

velopments will be there to help glass processors make the most of their flat glass processing operations now more than ever.

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www.turomas.com



Glass Company

INNOVATION, TECHNOLOGY AND AFFORDABI

Being able to face the challenges this really tough period is bringing, is the main focus of industries worldwide. Glass Company shows us how it is not only fighting this 'battle', but is also continuing to develop its products to meet the demands of the ever more technological flat glass sectot.

020 has been - and still is – a year to remember, caused by the global negative effects of the COVID-19 pandemic. Glass Company is facing up to the challenges this period is creating, thanks to its consolidated activities over the past decades, combined with the company's most recent innovations, presenting products with cutting-edge technology, ease-of-use and affordable prices. A harmonious combination of simplicity and excellent performance, with ample possibilities of customisation, so that the proposed machines are tailored to the needs of customers.

GLASSMEK AND LASERMEK

The well-consolidated Glassmek range, created to show what innovation means for Glass Company, also includes Lasermek, for engraving and surface treatment of glass using laser technology.

Lasermek is a highly versatile modular machine that enables to obtain an extensive range of applications, with the engraving of any type of glass and

the removal of any type of pyrolytic or silver coating. Available in a wide range of sizes, powers and types of laser sources, depending on the specific application required.

- In the refrigeration sector, it is used in the manufacture of frozen food display cabinet doors, etching the transparent resistive coating of the glass, creating circuits that allow the heating of the glass at a controlled temperature, to obtain anti-condensation effect.
- It enriches the radiator sector, by means of the





engraving of the elements for the creation of electric heaters, with a sophisticated design effect combined with the comfort of heating for residential homes and offices.

· Lasermek can also be used in the bathroom furniture sector, where it is used to remove silver plating from mirrors, leaving the surface completely transparent, and creating patterns and functional effects with a high visual impact and added value.

• In the railway transport sector, engravings with textured designs can be made to allow the passage of wi-fi used by smart phones, tablets and notebooks for the rail transport sector.



Engraving is also Flymek, which, thanks to the use of a high-tech laser module with a very high processing speed allows the engraving of clear float glass, coloured with paste, laminated, silkscreened, or painted with both organic and ceramic paints. etching the glass slightly superficially, as well as internally as per its thickness.

Flymek allows to engrave

small-dimensioned (8x8mm) Bar codes or QR codes on the glass for easy traceability, by means of a Galvo Scanner head, mounted both on a column and positioned so as to mark the glasses that are loaded onto the table of the tempering furnace, and on a mobile bridge.

Flymek can be configured according to specific production needs, as well as for different applications, such as cutting plastic in laminated glass, marking glass on the cutting table, etc.

FIREMEK

Glassmek is not just engraving, it is also Firemek, a system for the production of fire resistant glass, already appreciated for its ease of use, which makes the production of EI glass no longer exclusive, also thanks to its affordable price, which makes it suitable for medium/small businesses, combined with its use of innovative technology.

The transition from a semi-automatic system to an automated system was the natural result of Glass Company's continuous desire to research and develop its products. An intumescent and extremely transparent mixture based on Silica is prepared using a vacuum mixer, following a process controlled by PLC, and, thanks to a special dispensing pump, is poured between two or more glass sheets, accord-



ing to the fire resistance to be obtained (EI30, EI60, EI90, etc.). The process is completed in the furnace, where cross-linking takes place by means of specially designed technology.

PLASMEK

The company's most recent innovations also include Plasmek, an innovative technology, created thanks to the experience of Glass Company, uses atmospheric pressure plasma for the surface treatment of flat glass. It is a cleaning and treatment cell that allows an alteration of the surface tension of the glass in a single step, increasing the adhesion of the products applied in the immediate subsequent stages of processing.

Among its many applications, the cleaning and preparation of glass - fundamental prior to digital printing or spray painting, as well as coating of any kind (for example antibacterial, antiviral, etc.), with the use of technical gases if necessary, in addition to compressed air, are the most impressive characteristics of this technology.

This processing is also essential for certain gluing and adhesion processes with other materials, or in flat glass lamination processes, to obtain highly performing finished products compared to standard products.



NOT ONLY MACHINERY ...

Glass Company is not only a manufacturer of special machinery and, for more than 20 years, has been providing exclusive equipment for the flat glass sector, such as painting systems, glass tempering furnaces, glass lamination lines with PVB, EVA, TPU, Water Jet, etc.

The company provides automatic painting systems for glass, sprayers made entirely in Italy with the

collaboration of a company with 20 years of experience in the construction of these types of machines.

Extremely versatile in use, they can paint glass consuming a very small amount of paint (less than 500gr) or in continuous cycle, maintaining the same quality of painting. Colour changeover takes place in a few minutes and is managed by PLC.

The machine is made up of a pressurised dustproof booth, a very thin (a few microns) conveyor belt coated with a protective plastic film, long lasting and easy to dispose of. It can use organic or temperable paints, and, thanks to

special sensors that detect the shape of the glass, applies the paint only where the glass is present.

The sprayer is also suitable for use with nano-coatings such as anti-limescale, antibacterial products, etc.

Glass Company also continues to offer its customers high-tech furnaces for tempering flat and curved glass, with very low energy consumption and suitable for tempering all types of glass on the market.

SGlass Company Srl

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Glass Company S.r.l. www.glasscompany.com info@glasscompany.com

GL/SSCOMP/N/////

LASERMEK

LIGHT FOR YOUR WORKS

"SurFace" Laser machine to remove the Functional and Decorative Coating with several industrial application fields:

Refrigeration: electro-resistive tracks processing on coating for the various types of anti-fog heating glass
Furniture: silver removing for the production of mirrored glass with transparencies in decorative sectors
Building: matt surface graphic engraving even on big size glass for doors, windows and walls
Transport: processing of wifi waves passage grids for personal passenger devices
Heating: heating coils engraving on heating glass for radiators

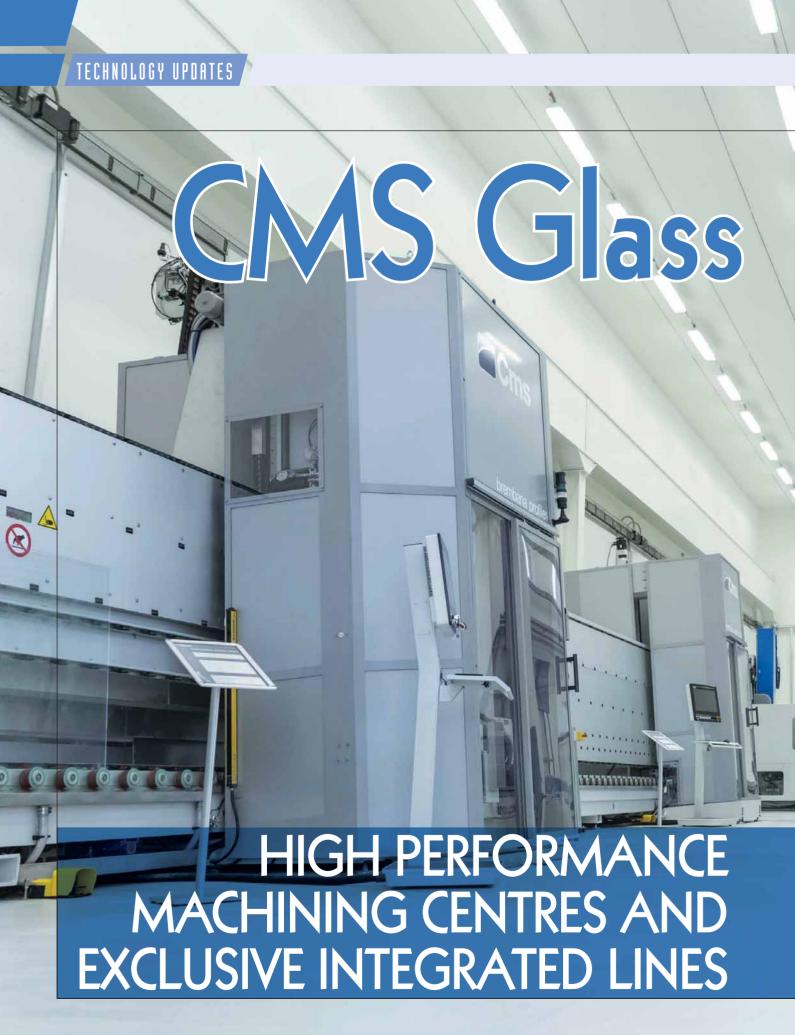


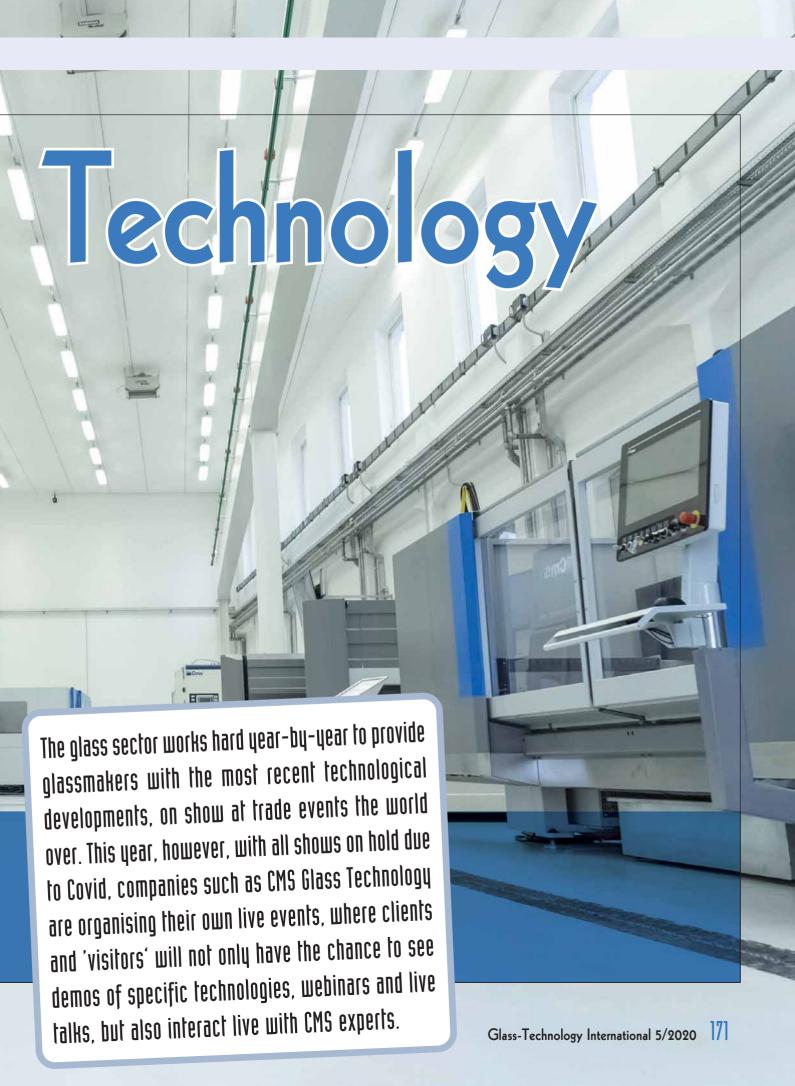




Flatbed Laser Scanner

LASERMEK







MS Glass Technology is a leader in the curved and flat glass machining sector with technologically advanced solutions such as the numerically controlled machining centres, cutting benches and waterjet cutting systems. Thanks to tradition and experience, CMS Glass Technology is, today, an absolute leader in this sector for the creation of innovative solutions aimed at the architectural and interior design world.

CMS LIVE SHOW -**GLASS MACHINING LIVE ON 12 NOVEMBER**

Even if 2020 has been and is a difficult year, there has been no lack of innovations or new ideas at CMS. Unfortunately, the main trade fair, glasstec 2020, which would have been the ideal occasion to present the latest technologies to the world, has been postponed until 2021, so CMS will launch

these technologies on 12 November at the first edition of the CMS Live Show, entirely dedicated to the world of glass machining.

A unique event that will be entirely streamed live in eight languages and accessible from all over the world thanks to the super-technological platforms that will ensure all those participating can be present in CMS, while remaining comfortably in their own office or home. and take part in an event in which they will have an opportunity to watch demos of specific technologies, webinars and live talks, all dedicated to the world of glass with the possibility of interacting live with CMS experts.

"The event will be a unique experience," points out CMS Business Unit Manager, Giulio Vitelli, "and one which I firmly believe in. We are working towards creating a format that will



grams running in real time and the functioning of the machine and its components (electrospindle, vacuum pump, etc...). Even in the event of faults, the system can instantly signal active alarms, reducing intervention times by staff entrusted with production supervision. All the data gathered becomes significantly important for the decision-making process and for planning any corrective or improvement measures, permitting a significant increase in production and a reduction in machine downtimes. CMS Connect supervises production providing statistics on the production line; all the recorded data can be processed from the specific web interface using filters, to highlight any production gaps and rapidly intervene to resolve these faults.

Remote assistance

The digital possibilities offered by CMS do not extend solely to production. All the machinery is fitted with a free remote assistance programme that allows to communicate directly with CMS technicians in order to be guided remotely when solving any problems. CMS Smart Glasses were recently introduced that allow for demonstrations and machine acceptances to be carried out remotely: a CMS technician wears them and the connected user sees exactly what is happening from the comfort of their home or office.

NEW TECHNOLOGY CENTER

The new CMS Technology Center was inaugurated in January 2020, a thousand



square metre exhibition space where all the machinery from the five CMS departments are on display. A space with a specific team entirely dedicated to it. where companies can take part in demos, training or simply discover the range that interests them.

All that remains now is to wait for 12 November and take part in the CMS Glass Technology Live Show to discover the new, revolutionary technologies!







HIGH PERFORMANCE CNC
MACHINES AND UNIQUE INTEGRATED LINES
FOR GLASS PROCESSING



appi's philosophy is - and has always been, since 1993 - focused on the desire to make the work of their customers ever simpler and more

effective, with user-friendly machines and the ability to control and manage production in a timely and predictive manner, with ever greater quality and efficiency. Mappi



All this translates into ease of use for the customer and consistent quality of tempered glass. The new generation of Mappi furnaces have made a significant new leap into the future. Now they are, first in the entire glass industry, recognized as 'Powered by Siemens'. This means that they are ready to implement all MindSphere applications.

MINDSPHERE

MindSphere is the interface that connects the Mappi tempering furnace to the entire management system of the company that uses it, and which, through dedicated software, allows to perform typical Industry 4.0 functions, such as the control and coordinated management of production, maintenance needs, order planning, etc.

This is a substantial enhancement for machines already rich in innovations and capable of offering performance far above standards. Furnaces ATS 4.0 and Fox are different in size but share as many innovations and functionalities as possible, to guarantee same levels of quality.

In the words of Robert Miklus of Formator, a Mappi customer from Croazia: "tempered glass in the Mappi furnace comes close to perfection. We have tested it with different shapes. complex glass and abnormal situations, then passing the result to tolerance quality tests as well almost zero." Semco, from Germany says "We are very pleased with these toughening machines. We achieve results that enable us to lift the performance of our toughening plants up to a higher level."

ATS 4.0 PROFESSIONAL FURNACES

ATS 4.0 is the series of professional furnaces that contains all the Mappi International technology; their use guarantees great production and qualitative results through innovative solutions that respond to the most demanding requests of the market.

ATS 4.0 has dimensions

Powered by

SIEMENS



1500x3800mm 3300x6000mm. and also available in customisable sizes. The ATS 4.0 series hardens glass with the highest optical and flatness standards, thanks to





cutting-edge technologies that manage the tempering processes. ATS 4.0 increases productivity in a virtually continuous cycle with no downtime for the regulation of operating temperatures and most of the operating parameters.

Fox compact furnaces

Fox is a series of compact furnaces, with loading dimensions starting from 1050x2300 mm, designed for the needs of mediumsmall glassworks. Despite its small size, each Fox series machine has the most advanced features offered by technology in the sector, and guarantees high quality and cost-effectiveness even in small series processing.

Exclusive solutions – increased efficiency

Each Mappi furnace offers a series of exclusive solutions allowing customers

MHS, Multizone Heating System

Automatically manages the temperature of the furnace through a network of electronically controlled sensors that allow temperatures to remain constant and focus only in areas where there is glass.

HIS, Intelligent Heating System

The internal temperature of the furnace is controlled with an accuracy of +/-1°C, preventing overheating of the ceramic rollers and avoiding downtime for the adaptation of the furnace temperature.

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 installed power required by the entire system.

Syncro Transmission Technology

Automatic speed management of the ceramic rollers oscillation avoid distortions and damage of glass surface. Full ceramic rolls, can be easily replaced. This eliminates the need of SO2.

AC, Advanced Cooling

A peculiar design of the blowing system that allows even more specific control while tempering and substantially decreases the iridescence of the glass.

GHBS, Xtreme Profile Convection

This solution allows to process all the latest genera-

tion coated glass, including low-E with 0.01 Emissivity.

Heating Chamber Extraction

Mappi is the only tempering equipment manufacturer that has the feature for an easier maintenance and a better finish product quality. This is an exclusive feature for ATS 4.0.





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Horn, manufacturer of glass

melting furnaces, is now one

HORN

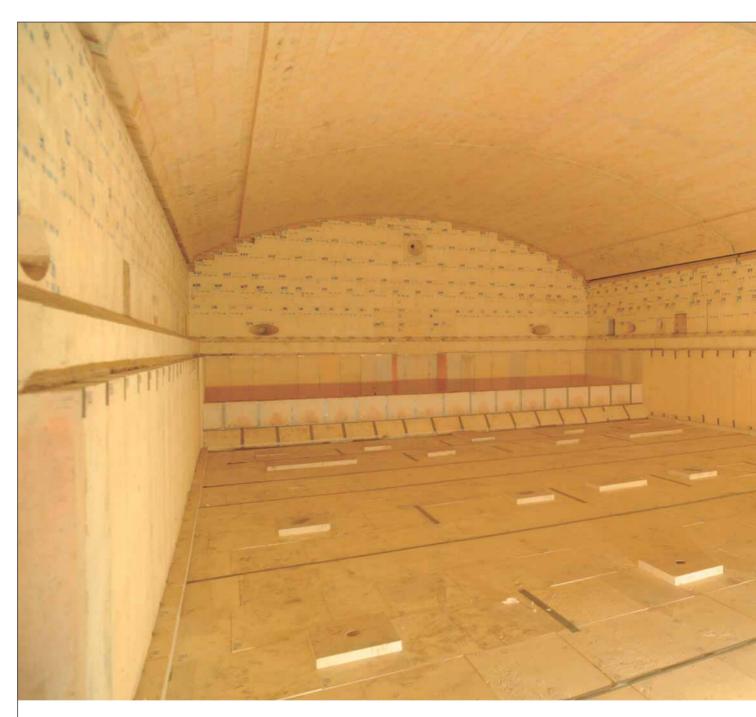
HIGH-PERFORMANCE

FURNACES AND TURNKEY PROJECTS



t its location in Plößberg, Germany, HORN Glass Industries AG plans and makes glass melting technology and turnkey projects for the float and container glass industry. The company's high-performance glass melting furnaces and turnkey projects are installed at glass manu-

facturers all over the world and serve the production of beverage bottles, food containers, drinking



glasses, glass panes, glass tubes, glass fibres and special glass.

LONG-TERM EXPERIENCE

With more than 135 years of experience, HORN has been the specialist and expert in the field of the construction of glass melting furnaces for many years, and is now one of the industry leaders in the implementation of turnkey projects.

WORLD-WIDE EXPORTS

Subsidiary companies in China, Malaysia, India,

Croatia, Ukraine, Brazil and the Czech Republic add value to global customers, offering proximity and prompt response in the global market. Almost 90 per cent of HORN's products are exported from Plößberg in Upper Palatinate to more than 75

countries worldwide.

TAILOR-MADE **SOLUTIONS**

HORN offers its customers complete support and a helping hand at all times. HORN offers tailor-made solutions because of a very high level of vertical inte-



PRODUCT RANGE

Melting furnaces Turnkey technological plants Project engineering

- Financing and authorisations Project management on site
- [®] Training [®] Operational support [®] Tin baths [®] Heating equipment
- © Control equipment © Electric boosting systems © Batch chargers
 © Media supply equipment © Service works © Forehearths

gration for all its products. HORN has ventured into unknown areas, e.g. in the construction of its own tin baths and associated equipment. HORN manufactures a large number of products in its workshops in Plößberg:

- Gas, oxyfuel and heavy oil heating for melting furnaces
- Electric boosting systems
- Batch chargers
- Burners
- Stirrers
- Tin baths and tin bath equipment
- Tweels
- Dross boxes
- Waste gas reversing units

• Control cabinets and SCADA systems.







Quick 2 T8

INTEGRATED NC DRILLING AND MILLING PROCESSING











QUALITY AND SPEED LESS TOOL WEAR

Milling process when glass is stationary



HIGHEST PRECISION

Linear encoders grant 0,15 mm accuracy all the time



TOP DRILLING PERFORMANCE

DCS technology self adapts the drilling parameters intelligently



LOWER MAINTENANCE COST

Optimised milling/drilling functions make the machine simple and reliable





Neptun 2020

THE STRENGTH TO KEEP GROWING

Beyond is a concept that characterises Neptun as a company, in its products, in its approach to glass processing and continuous evolution towards ever-increasing quality by maintaining cost- effective solutions.



ounded in the difficult economic context of the year 2008, in an already saturated market, Neptun finds its strength in the ability to identify and implement innovations that push machinery beyond traditional limits, to perform new functions as well as old ones, in a more effective manner.

INNOVATIVE PRODUCT LINES

Neptun is a unique reality among the manufacturers of flat glass machines. In less than 12 years it has created three completely innovative product lines covered by numerous patents, which contribute equally to turnover.

The company's straightedging machines, washing machines and vertical NCs for drilling and milling have a full range of width and depth and, although very different from each other, they can be fully integrated thanks to the anthropomorphic Bravo manipulators.

This work has involved an enormous technological and financial effort, considering that competing companies with the same turnover range, which have been operating for decades, are concentrated on a single product line and have a secondary one at the most.

ORGANISATION AS A **KEY STRENGTH**

important key to Neptun's success is organisation, both internal and external. Since its launch, in fact, the company has been structured in an industrial manner. From the development of a project to manuals, order entry to warehouse and production management, accounting to after-sale service – all processes are carried out according to clear protocols, guaranteeing the maximum reliability of services and machinery for customers. Neptun has also made important investments in the creation of a sales and service network, in a scenario where competition has

PRODUCTS

time.

Horizontal and vertical washing machines

been organised for a long

The company is mainly known for its horizontal and vertical washing machines, sold in over 80 countries and





consolidated as par excellence machines for industrial contexts, where nothing can be left to chance.

Straight-line edging and mitring

Neptun is the reference point for straight-line edging or mitring, with virtually one machine installed per week since 2012: tens of millions of kilometres processed with the most robust conveyor that can be found on the market.

Quickline - Vertical NC processing

In the field of vertical NC

processing, on the other hand, the concept of Quickline has been widely known, for having brought milling and drilling to a level of speed and accuracy at least equal to the horizontal NCs, but with unprecedented flexibility and costs accessible to all.

The new vertical NC Quick2-T8

Due to a strong outlook to respond to market needs and focus on R&D, Neptun launches new products or updates of existing ones each and every year.

Even in this difficult 2020, they did not hold back and are proud to introduce the new vertical NC Ouick2-T8. Quick2 combines the drilling and milling phases in a single structure, without sacrificing the main benefits of the Quick series. The extreme precision achieved through double positioning control (drilling with a tolerance of +/- 0.15mm), impeccable working quality of the milling process with glass in a fixed position, fast automatic tool exchange (less than 8 seconds), ease of programming and mechanical simplicity are all standard proven features. Thanks to the Ouick2





module, these benefits are now within the reach of those who, due to lack of space, cannot opt for a solution with two separate drilling and milling units. On the one hand, this al-

lows the processing of two glass sheets simultaneously, thus essentially providing double-production; but on the other hand, it has a footprint of only several meters more.



The Awa system

The Rock edger also comes with a new look: the Awa system for the fully automatic management of diamond and polishing wheels, which combines simplicity, precision and consistent reliability over time. With automatic presetting of the diamond wheels, recipes for managing different combinations of removal according to the processing type or set of wheels used, and an automatic compensation system for the polishing wheels, the operator obtains fast and safe machine set-up.

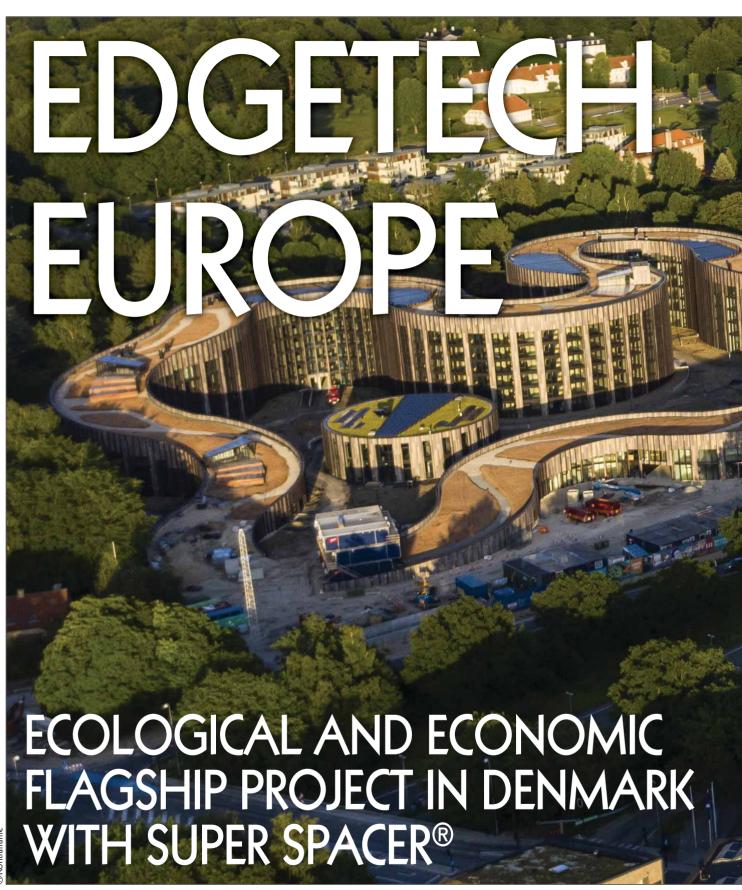
NEPTUN HUB NEW OPENING

To offer customers the opportunity to try our products directly, Neptun have created a real booth of 170 square meters at their premises in Rovello Porro, near Como, northern Italy, where they have the best of their technology on show, including Quick2-T8 and Quickmill, washing machines and the Rock 11 straight line edger with the unique patented AWA system.

In a safe COVID-free environment, customers can come and check machines themselves. The display can also be seen in a video online. This means that everyone has the chance to experience Quick2-T8 NC or any other machine physically or virtually until the end of December.

This goes to show what the company means when they say they go 'beyond'.



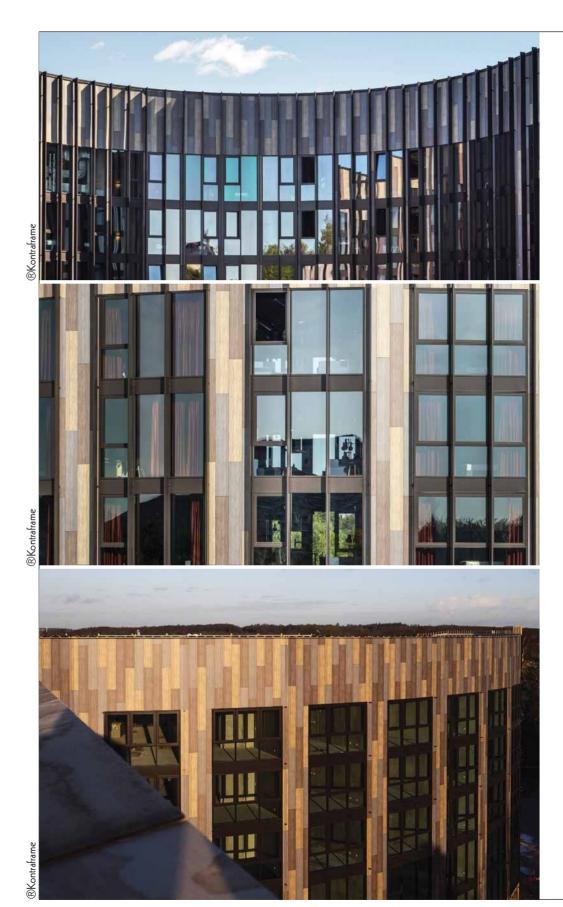




RECORD-BREAKINGLY FAST, SUSTAINABLE AND ECONOMICAL

The running track on the roof of Google's new European headquarters in London will be used for the first time in three to four years at the earliest. The residents of BaseCamp Lyngby, built on a 41,000 square metre site, were able to don their running shoes as early as August 2020: a park landscape was created on the green roof of the extensive student residence complex in northern Copenhagen using a system of biodiverse planting, urban gardening areas and an 800-metrelong path that can be used for walking or jogging as you please. From the flat terrain, it winds its way up six storeys above the organically shaped building back down to the starting point while enclosing cosy inner courtyards and a circular community centre in the process. The facades are reminiscent of tall trees and forests by virtue of the vertical arrangement of the panels in three different shades of oak wood as well as the line of windows, and in just the same way as the entire complex they blend harmoniously within the surrounding nature. The project developer, Base-Camp Student Nordics, a part of the Europe-wide BaseCamp Group, deliberately wanted to give something back to Lyngby Municipality and enter into dialogue on social and

Affordable architecture is one of the most pressing concerns of our time. However, the issues of sustainability, energy efficiency, land sealing, recycling management, comfort and social integration are contrary to the economic demands. Lars Gitz Architects and BaseCamp Student pulled off the remarkable feat of combining these complex requirements within a spectacular, multi-award-winning student residence. Serial, modular construction, low-cost, recyclable façade materials, renewable energies and near-natural building greenery and seepage areas were the key to success here. One of Scandinavia's leading glass processors, Glaseksperten A/S, has contributed towards the realisation of the ambitious building concept of the BaseCamp Lyngby on several occasions: automated production of the insulating glass units, varying direction-dependent glass construction and use of the warm edge spacer system Super Spacer® T-Spacer™ Premium Plus.



environmental aspects. The roof is therefore open to the public to provide meeting areas.

The construction time for a project of this size is impressive. The 786 flats, including 639 student flats and 48 senior flats, were completed near Lyngby University of Technology within the space of two and a half years. The building was also intended to be no less spectacular, but one aspect distinguishes BaseCamp Lyngby from many other major projects: Ecology and economy determined the architectural concept equally.

MODULES AS THE BASIS OF ARCHITECTURAL **AESTHETICS**

In order to meet the estimated construction costs of around EUR 75 million the Danish firm of Lars Gitz Architects designed a trapezoidal module that is repeatedly rotated by 180° and stacked at different heights to create the gently rounded structure. The outer skin also constitutes a model example of cost-efficient construction. The ventilated curtain wall is insulated with rock wool and clad with slabs made of pressed volcanic basalt rock from Rockpanel. With a weight of 8.4 kg per m², the extremely light material can be cut to size on site and simply attached to the substructure.

The façade panels with their natural wood look almost entirely consist of natural volcanic rock and recycled rock wool and can be repeatedly reused in line with the idea of a circular economy. This makes the façade one of the pillars of the sustainability concept, which has been awarded BREEAM Very Good certificate (equivalent to the DGNB certificate in silver). The energy-saving green roof with the photovoltaic modules serves as a form of thermal insulation, an energy provider and natural air conditioning. The rainwater that is captured is returned to the natural water cycle via evaporation, which consequently relieves the burden on the sewage system and lowers the ambient temperature.

ENERGY-EFFICIENT WINDOWS WITH WARM EDGE SPACERS

The aluminium windows with triple glazing also form part of the overall concept. As is so often the case in Scandinavian architecture, the BaseCamp studios and communal areas are glazed down to floor level to allow as much daylight as possible into the room even during the winter. The Danish insulating glass manufacturer Glaseksperten supplied 4,000 insulating glass units packaged in sizes of up 4.011 x 1.127 m to the construction site in accordance with a meticulous logistics plan. Due to the or-







3/V____/___/





ganic shape of the building, the glass structures change according to the direction. Depending on the heat input and amount of light, solar control glass, thermal insulation glass or clear glass with varying coatings and glass thicknesses were used. Glaseksperten opted for Super Spacer® T-Spacer[™] Premium Plus in various widths as the warm edge spacer system. Sales Manager Jesper Hønning declared: "An ever increasing number of our customers wish to install energy-efficient windows. We consistently use low-emission thermal

Edgetech Europe GmbH

Edgetech's Super Spacer® flexible foam-based spacer systems acts as energy-efficient warm edge spacers in insulating glass windows. They significantly reduce energy loss to the outside, largely prevent condensation and also contribute to the lifetime of a window. On average, worldwide, more than 300 million metres are sold annually in over 100 countries.

Edgetech Europe GmbH, located in Heinsberg Germany, is a fully-owned subsidiary of Quanex Building Products Corporation, an industry-leading manufacturer of components sold to Original Equipment Manufacturers (OEMs) in the building products industry. Quanex designs and produces energy-efficient fenestration products in addition to kitchen and bath cabinet components, with its head offices in Houston, Texas. Based on turnover Edgetech/Quanex is the world's largest manufacturer of spacers. Edgetech Europe GmbH is a sales location for the markets in continental Europe and one of the three worldwide Edgetech production plants, with a total of 450 employees and 16 extruders.





insulation glass and solar control glass combined with non-metal warm edge spacers in order to avoid thermal bridges and optimise the heat transfer coefficient." At the company's headquarters in Hjørring,

an ultramodern, automated IG line is available for the production of insulating glazing for sizes of up to 3.2 x 6 metres. "Super Spacer is of key importance to Glaseksperten in supplying quality products which also ensure we are a leading company in economical and ecological terms," Hønning went on to say, "The fully automated continuous application of spacer from the reel saves time and money and guarantees top class product quality that is reproducible." Joachim Stoss, Managing Director of Edgetech Europe GmbH and Vice President International Sales at Quanex added: "Northern Europe is a global pioneer in the field of climate protection and therefore one of the growth markets for warm edge products. Of course, we are extremely proud that our Super Spacer system has been installed in another Scandinavian flagship project."

>Edgetech Europe GmbH

Edgetech

A Quanex Building Products Company

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drotecnica

HE COMPANY

Idrotecnica realizes systems and equipment to produce demineralised water, in addition to providing support and consultancy in washing sections of washing machines. Idrotecnica, in fact, represents the reference point to identify and install the most suitable demineralising systems for glass washing machines.

The company has been present in the glass industry from more than 30 years, constantly updating its devices and machinery, while studying new technologies according to the needs and the ever-higher parameters requested in this sector.

OVERVIEW OF RECENT NEWS

The ECC-control system, a system to manage water changeover in washing machine tanks, integrated only with newly-built water demineralisers, allows to ensure the correct water quality for the best washing, while, at the same time, ensuring optimised and intelligent water consumption.

Different solutions are provided according to the

SIMPLICITY OF USE, INNOVATION AND SPECIALISATION



washing machine circuit to meet individual needs, maintaining the plug-andplay approach. The recent models: IR225St-VP and IR300St-VP. are the response to the current needs for washing machines with important operating condiIdrotecnica has the fresh and open approach typical of a start-up, with constant improvement solutions and new targets, but with the feature of a solid and already structured company. This is the approach of the company, present in the glass industry from more than 30 years, which allows it to look back at the past with satisfaction, continuing with new projects which confirm a more than positive vision of future years.







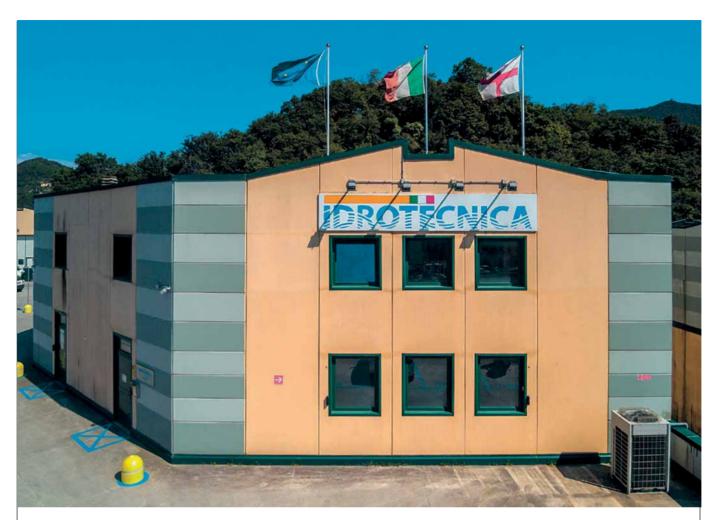
tions. They have an average flow rate of medium flow water (in the range of 200-300 l/h) but with components and technical solutions of larger models, allowing intensive use.

These new models complement those already known and widespread in the glass sector, expanding and enhancing the range even further.

The use of a specific internal pressurisation system is highlighted by analysing the technical aspects: allowing reduced maintenance and making the demineraliser even more silent.

PRODUCTION - ESSENTIAL CHARACTERISTICS

Simplicity of use, innovation, specialisation in the application sectors, and at the basis of everything, responsibility; these are the essential characteristics of Idrotecnica's plants and devices for demineralised and pure water production. Idrotecnica is, as always, aware that each installed device produces pure water for an important and sophisticated production process. Therefore, every day for the past 30 years, the company's attention has been based on designing and creating extremely simple, strong and reliable devices and machines.





Idrotecnica equipment is a utility for systems, and not the main system to which operators pay their primary attention and, therefore, their installation and operation must be simple and intuitive.

Innovation, because new technologies make everyday life increasingly simple, with new horizons and possibilities. Idrotecnica's devices, apply and develop new techniques to better meet and anticipate market needs, according to the company's technical philosophy.

Specialisation in the application sectors. Idrotecnica is always present in the application sectors, not only for system supply. In this way, thanks to its knowledge of water treatment and that of the application sectors, Idrotecnica represents the ideal supplier and partner to identify and install the most suitable systems.

Really and truly 'born in the basement at home'. Idrotecnica has grown gradually and solidly thanks to the previously described characteristics, always appropriate to the period, to the growing and importance of the company itself and to that of its customers. From the approach of the early times, followed by the

spontaneous creation of a structured company, maintaining attention to the care of its equipment and to services provided; the growth and organisation of the company allow to satisfy the increasingly high and particular needs of its customers with excellence.



FLATGLASS

2020 world directory



FLAT GLASS WORLD DIRECTORY is on line in digital version



Intermac is the Biesse Group division that manufactures and markets machines and systems for glass second machining intended for furniture, construction and automotive sectors. Founded in Pesaro by Giancarlo Selci in 1987, it quickly reached a position of world leadership. They are famous for the reliability of their machines and the high quality finish that they are able to guarantee.

propelling their customers towards the era of digital manufacturing.

The glass division of the Group is now characterized by an extra high-value consulting approach and have completed the previous range offered, with classifiers, shuttle magazines, automatic loaders, loaders and tilters.



the sector dedicated to machining flat glass. Intermac and Movetro glass machining technologies incorporate the key concepts of Industry 4.0,









operations and maximise productivity.

- Maximum machining flexibility, thanks to the wide choice of optional features.
- Interface built into the CAD-CAM parametric, so that all the operations can be carried out from within a single work environment.
- High degree of integration with the water jet cutting systems -Intermac Primus.

AQUA SERIES – **VERTICAL WASHERS** FOR FLAT GLASS

The Aqua series is the Intermac range of washing machines, which can be fully integrated with vertical machining centres, enabling processed glass to be washed and dried to the highest standards. Aqua guarantees extreme cleaning, eliminating all impurities accumulated during machine operations carried out on glass sheets. It prepares these perfectly for subsequent processing operations.

Robust and reliable

Down to the very last detail, Aqua is designed to last. The technical characteristics and finishing of the

machine are synonymous with quality and pioneering technology.

The machine structure is entirely made of stainless steel and the brushes orm a single assembly to ensure optimum glass cleaning results.

Sustainable technology

Technology that reduces the need for maintenance for manufacturing firms.

This is achieved thanks to the high quality standards of the materials used, as well as the 'Eco Save' system, which limits energy consumption by switching off the main motors when the machine is in standby.

High productivity

An automatic adjustment system. which enables Aqua to handle glass sheets with thicknesses of up to



in the same line, allowing the processing speed and the machine opening to be managed in accordance with the thickness of the sheet of glass in question. High-capacity independent water tanks for each washing section reduce the need to change water frequently. Aqua washers can work on three shifts, with glass feed speeds up to 7 metres. It is also possible to arrange the processing direction, from right to left and from left to right.

Easy, safe setting

When designing the Aqua Series range, Intermac also considered optimising setting times and safe procedures for the operator.

The glass thickness is automatically, measured thanks to the 'infeed' sensors, and a handy touch screen, which allows to alter the washing temperature or adjust the working speed and washable thickness to a millimetre degree of precision.

The Aqua range stands out for long-lasting robustness,



reliability and excellent results - key strengths and features that confirm its technological quality. Last, but not least, the Aqua range is fully integrable with Vertmax vertical machining centres.

VERTMAX ONE, VERTICAL MACHINING

Vertical technology that is compact and flexible.

With its new vertical technology, Intermac confirms its leadership in the development of glass machining technology. The One range offers unique, compact solutions that are high performing, accessible and user-friendly.

Vertmax One is designed and developed to meet the needs of companies of any size. From small glasswork companies that want to see their production evolve technologically with limited investment, to large-scale factories producing articles in a quicker and more flexible way, with lower costs.

High performance with a modest investment

Doors, shower enclosures. balustrades. interior/exterior furnishings, large windows with oversized glass sheets: Vertmax One adapts perfectly to any production need, and can machine sheets measuring up to 3000x1500mm.

Vertmax One technology stands out for its excellent productivity and its machining speed. This machine allows every machining operation, from glossy and rough grinding to quick dull. The machine

obtains the best results because of the use of twin power, with HSD electro spindles, and the milling and grinding of both notches and openings in the inner part of the glass.

Perfect quality, thanks to the pilot system

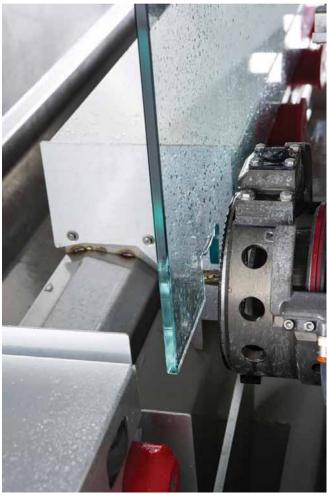
Top machining quality is guaranteed by the Pilot System, designed to ensure flawless polishing during vertical machining and minimising vibrations and maintaining perfect centring during operations on the edges, even when far away from the suction cup hold area.

This system can even work sharp internal radii, thanks to the compact new design of the front head.

With its 'zero set-up' time technology, Vertmax One guarantees quick automatic



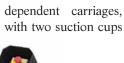




needed to create a product without the operator having to worry about the preparation of the work table.

Key word: productivity

Vertmax One has two independent carriages,



for each one. This fully automatic technology optimises the grip on the glass regardless of its size, geometries and machining. Additionally, it makes the machine unique in terms of both productivity and flexibility and it can process every type of glass in batch one.

Thanks to the automatic repositioning of the carriages, even the most complex machining operations can be carried out without having to ever unload the glass from the machine and then reload it.

The process is entirely managed via the intelligence of the IC software, giving Vertmax ONE an exceptional advantage when it comes to simplicity.

IC is the new Intermac software based on the iCam experience and characterised by a modern interface, extremely easy to use and with optimised calculation power, offering unbeatable programming functions and flexibility.

Last but not least, Vertmax One can be fully integrated with Intermac's Aqua vertical washers: the two technologies are complementary and together ensure line certification in keeping with the EC regulations.

≯Intermac – Biesse Spa

INTERMAC

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THE MOST UP-TO-DATE TECHNOLOGICAL SYSTEMS ON THE MARKET

ovetro became part of the Glass Division of Intermac in 2017, a move that has further enhanced, strengthened and expanded the Group's product range, which now includes classifiers and shuttle machines from Movetro.

Movetro's product range is made up of:

• Overhead loading devices

- Overhead loading devices with tilters
- Advanced dynamic storage for flexible production

OVERHEAD LOADING DEVICES

The CAM single-beam and CAB twin-beam overhead loading devices are automatic solutions for the handling and overhead loading of single sheets. These are designed





Movetro specialises in automatic plants for the handling and storage of glass sheets. Well-established expertise and considerable experience are at the basis of the company history, which started with the construction of simple sheets storage, and today can offer the most up-to-date technological systems on the market.



for those looking not only for space saving, safety and automation, but also top production flexibility, given that they can load several cutting lines simultaneously.

ADVANCED DYNAMIC STORAGE FOR DYNAMIC **PRODUCTION**

Telescopic loading devices

Movetro offers a wide choice of single-direction or twin-direction telescopic loading devices for loading regular, jumbo or

extra-jumbo sheets. The supervisor software shows the magazine situation in real time and receives the instructions for loading, moving and returning sheets in an entirely automatic manner thanks to its integration with the cutting line optimiser.

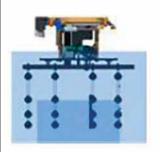
The same information can be shared with the material provisioning office.

STATIC STORAGE

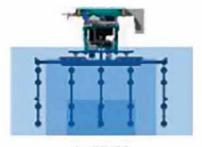
Automatic classifiers

Movetro automatic classifiers are storage areas that

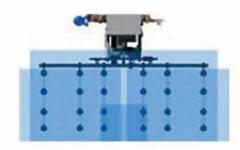




R-REGULAR



J-JUMBO



XJ - EXTRA-JUMBO

R - REGULAR

Maximum sheet size	mm	3660x2750
Minimum sheet size	mm	1500x1500

J - JUMBO

Maximum sheet size	mm	6100x3355
Minimum sheet size	mm	1500x1500

XJ - EXTRA-JUMBO

Maximum sheet size	mm	6100x3355 2x3210x2750
Minimum sheet size	mm	1500x1500

are the perfect solution for those wanting to gain more space on their business premises, ensuring safe and highly automated handling operations.

Ready for automatic loading - opening with a single movement

Automatic and technological storage entirely managed and moved from a single command console with a touchscreen panel where the operator only needs to key in the number of the required element in order to have it available

for loading or unloading

ADVANCED DYNAMIC STORAGE FOR MASS **PRODUCTION**

Swift Shuttle

The automatic Movetro Swift Shuttle is the most compact solution for the integration of automatic



tems, introducing the new '3-piece line' concept.

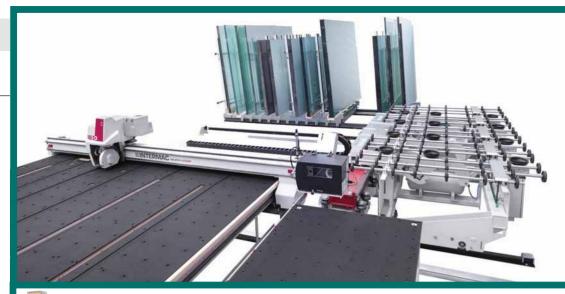
Swift Shuttle is the latest addition to the range of integrated magazine solutions for cutting lines. This is the ideal technology for storing and handling jumbo and regular glass sheets, purposely designed to provide a higher number of cutting references in a very compact space.

Production context

Inserting the Swift Shuttle in a production context, the advantages can be seen straight away:

- Footprint reduction
- Increased productivity
- Greater safety

The design and construction modularity of Movetro shuttle systems ensures that customers can arrange their own storage to suit their production and logistics needs,

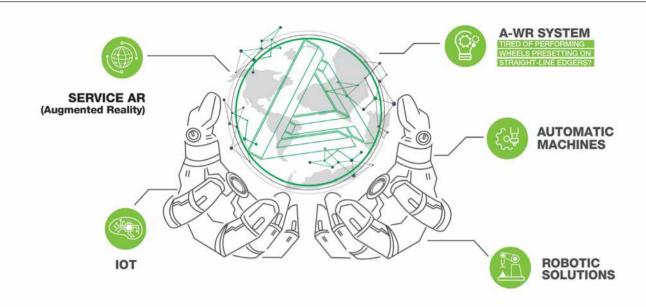






MOVETRO

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attuada INCREASED AUTOMATION LEVELS, HIGHER FLEXIBILITY AND PRODUCTI PRODUCTION OPTIMISATION AND COST REDUCTION

he strong points of all Lattuada products mainly concern their simple use, long life, high processing quality and limited maintenance required. The ability of being able to customise all machines to the utmost, ensures that they can be adapted to customers' different needs.

Lattuada's current machines range includes:

- more than 30 models of electronic or PCequipped straight-line edging machines for flat
- edges with arris, and with variable angle from 5 to 16 wheels;
- · peripheral edging machines from 4 to 8 wheels;
- complete line of double-

Automation is, nowadays, a keypoint for companies. Lattuada has developed several solutions, within its CYBERAL project, to automate activities and increase production flexibility.

edgers from 8 to 11 wheels on each side, for flat edges with arris;

- more than 10 models of electronic or PCequipped straight-line bevelling machines from 7 to 14 wheels;
- 4 models of automatic corners grinding machines:
- complete range of vertical washing machines;

• complete line of horizontal drilling machines.

AUTOMATIC MACHINES – THE A-WR SYSTEM

Robotics and automation require automatic machines. It is possible to ask for a special package of options (i-AL) for automating machine adjustments and increasing the production



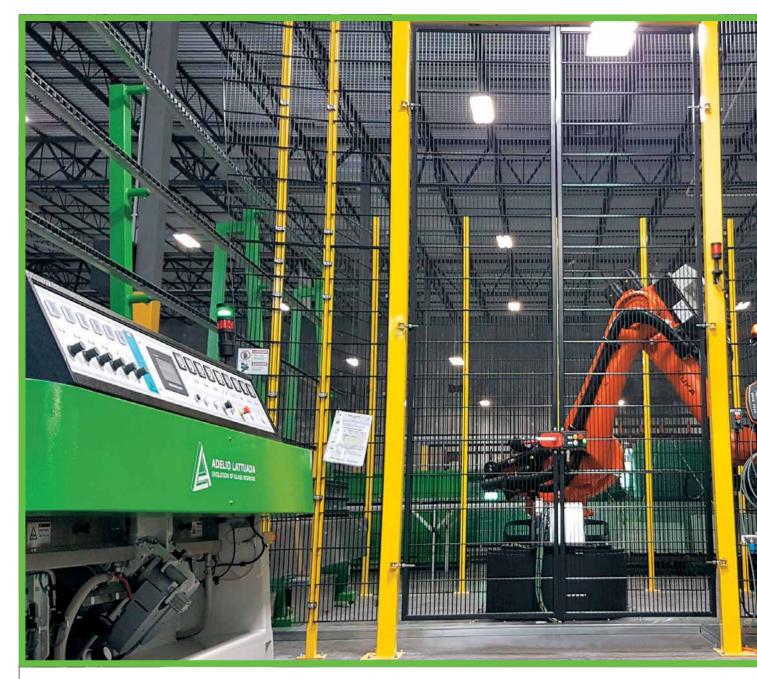




flexibility on all Lattuada edgers:

1. A-WR System:

- Automatic pre-setting ZERO procedure of diamond and resin wheels, without glass, and in less than one minute
- Automatic recover of polishing wheel wear
- Automatic positioning for wheel replacement
- Jog increase/ decrease of spindle position (accuracy 0.01mm)
- Automatic positioning on set-point
- Automatic backlash recovery



- Automatic spindle cleaning procedure
- Wheel wear warning
- Spindle problems warning
- Manual unlocking for any situation
- 2. Digital ammeters and automatic alert system for polishing wheel wear
- 3. Brakes on all polishing spindles for wheel wear recovery
- 4. Automatic management of thickness, pressure, removal and speed
- 5. Management of working phases by means of a touch-screen panel
- 6. Assistance service with AR (Augmented Reality)
- 7. Proportional valves for pressure regulation of the polishing spindles
- 8. Motorised glass removal with portable push-button panel
- 9. Glass length measurement
- 10. New progressive lubrication system
- 11. Remote-assistance and support

12. Data-logging and IOT

ROBOTIC SOLUTIONS

Thanks to a strategic partnership with the German company Knittel Glass, Lattuada can offer robotic solutions for any variety of needs and goals: increasing of automation levels, higher flexibility and pro-



ductivity, production optimisation and consequent costs reduction.

Lattuada-Knittel solutions require only one operator (which means reduced labour costs plus higher safety), also offering higher energy savings (compared to other solutions) with a very competitive price. These solutions grant continuous production thanks to ease of use, standard maintenance, reduced downtime and high speed (up to 5 mt/min).

Their advantages include:

- The quickest solution available on the market
- The most sold and installed (our partner has installed over 150 simi-

lar solutions on glass edgers alone)

- The widest experience in this field (Knittel Glass has been supplying robotic applications in the glass business since 2000)
- Ease of use and maintenance

AR (AUGMENTED REALITY)

Thanks to an augmented reality program dedicated to service, with a tablet or a smartphone it is now possible to provide technical assistance to customers in a simpler and more direct way using a tablet or smartphone.

Through the camera of a smartphone/tablet, the company can observe problems, errors, faults or alarms on the machine. and solve them more intuitively thanks to 3D icons and indications applied to the real environment. This ensures a clearer, faster and more cost-effective service, which can therefore reduce downtime and potential costs caused by machine stops.

101

Lattuada IOT i-Like Machines software, which connects machines to each other to monitor them, clear data is also provided through an interface that is intuitive and easy to use. This allows to:

- monitor production cycles in real time;
- receive alerts in the

event of malfunctions:

- optimise plant availability and production;
- plan maintenance work:
- reduce failures and downtime;

view machine use data and report records.

The system includes:

- Siemens IOT hardware to collect data from the PLC and to send them to cloud servers using MQTT protocol
- License to access to a dedicated dashboard to visualize, analyze and download all the production data
- Possibility to exchange data with an external system (ERP, MES, etc.)

INTEGRAL: LATTUADA INTEGRATED SOLUTIONS, FOR ALL NEEDS

Grinding solutions

The company provides a wide range of machines: more than 40 models, which can be configured specifically to ensure maximum productivity.

Washing solutions

For more than 20 years, Lattuada has been studying and providing solutions for glass washing. They offer a full range of high-tech, vertical washing machines that are easy to use and maintain.

Automation and robotics solutions (CyberAL)

The company is constantly formulating solutions to

operate at the highest levels of automation, making the most of integration with robotics to increase productivity and reduce costs.

Special machines solutions

Lattuada can find the most suitable solutions for specific needs, such as out-ofstandard processes, customising machines to ensure any flexibility needed.

Complementary glass processing solutions

Lattuada can provide a complete range of horizontal drilling machines and automatic radius and straight corners grinding machines.



Stone processing solutions

The company designs ideal machines to process marble, stone, synthetic, and composite materials.

Industry 4.0 solutions

Lattuada can support its customers in the streamlining of production processes by offering hightech solutions to digitise, connect, monitor, manage and optimise data in real time.



Adelio Lattuada Srl



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EXPERIENCE AT THE SERVICE

F GLASS

Products that have - and are continuing to — characterise the history of the glass sector. This is how Italmole describes its work, which started at the end of the 1970s. This difficult year has created difficulties for everyone and for all industries, but has also pushed us to find new ways of communicating and — in the case of the company in this article — to provide its customers with the products they need to face these challenges.



ounded at the end of the 1970s, Italmole entered the market with its products that have characterised the history of the glass sector over the years until today.

The glass sector has made important steps forward creating new challenges for

the company, which, thanks to its ability to adapt to this changing market, has always provided high quality solutions with the robustness and experience it has always put into its work.

"The secret behind this long-lasting success comes from the attention and customised technical assistance that we have always given our clients, carrying on the philosophy of technological research and great expertise in the sector," says the owners of Italmole, who add, "Our participation in trade fairs and cooperation with machine manufacturers has introduced us to new realities by diversifying production to guarantee new quality standards."



This is why new types of polishing wheels have been introduced, meeting the most demanding needs of clients.

NEW POLISHING WHEELS

ASTRA wheels, which have become very famous in recent times, are more silent and super-polishing, and are available only in the peripheral form. These wheels are suitable for CNC vertical machines such as Vertmax. CMS. Skillglass, as well as horizontal machines such as Master. CMS. Bottero-Bimatech.

LOW-E is Italmole's lowedge-deletion emission wheel, suitable for all types and brands of cutting tables, manual and automatic edger machines, and is available in all sizes.

WELL-KNOWN AND APPRECIATED PERIPHERAL WHEELS

Alongside the range of peripheral wheels, such as the highly-adaptable BD wheel with ease of use, constant quality and excellent durability, Italmole also manufacturers the BD2 engraving wheels specific for polishing engravings, available with V-shaped-, round- and off-centre profile for all types of machines.

ARRISING WHEELS

Italmole arrising wheels include AB4, AR1/AR2, BLACK/RED and BDCUP. AB4 is recommended for polishing arris on bilateral and straight machines,

used after the diamond wheel, guaranteeing a brilliant and perfect polish.

The AR1 wheel is highly appreciated for Zafferani, Lattuada and Baudin machines, and is recommended for the creation of arrising without using a diamond wheel, while AR2 is recommended for use always after the diamond wheel.

BLACK is the top-of-therange of Italmole's arrising wheels, and is recommended for polishing of the arrising after the diamond wheel. RED, on the other hand, is used to create arrising without the diamond wheel.

Both these wheels can be equipped with any type of support, for all types of machines.

The important success of the BD peripheral wheel has led to the development of the BDCUP wheel. which has the same quality and performance also in cup shape, polishing the arris after the diamond wheel.





As with arrising wheels, where various types have been studied and manufactured for each type of use, meeting all customers' needs, the company has also established itself worldwide in the production of cup wheels, with the X-. L- and SUPER ranges with different grits and for all types of machines. These products are available with rigid plastic support, aluminium support and special J40 support. These wheels can also be manufactured with sectors for laminated glass on request.

The importance given to customers has resulted in a great deal of stimuli and inventiveness, enabling Italmole to expand its range, offering softer or harder grinding wheels, with low noise output, suitable for prestigious, standard or for the most diverse processes.

2020 - A YEAR WHERE INDUSTRY IS BEING SERIOUSLY **PUT TO THE TEST**

Il 2020 is a difficult and challenging year for the whole world because of the COVID-19 emergency. Italian companies have experienced worrying moments for their work and for their employees. Like many other companies, Italmole has also tried to lessen the dramatic effects of this emergency: following government directives, the company has set up a new protocol regarding the entire working environment. Instructions have been given to all staff concerning new health and safety behaviour, providing guidance to all external visitors and couriers. A waiting area has been set up for external visitors, where temperature measurement is carried out, along with another area used for the collection and receipt of documentation and goods.

A NEW START

The beginning of September and the return to work from the traditional Italian summer holiday month, means a new start with new stimuli, hopes and expectations. The desire for collaboration and support for customers for their needs and advice is felt even more this year.

This period characterized by social distancing has alienated people, but has also brought them closer, new ways or working have been introduced to allow the continuity of activities. Italmole will continue to work with the same philosophy and the same spirit of always adapting to changes and ensuring the continuity of the company over time.





STON

Celebrating 150 years in business this year, Glaston optimises their production process. With leading edge technology, they keep customers one step ahead of the competition, especially in these challenging times.

BETTER PRODUCTION SOLUTIONS WITH A COMPETITIVE EDGE

laston's most recent technologies are ready to respond to client needs and demands, helping them to achieve their goals, while answering any questions they may have. What easy steps can you take to tap into data

from your equipment? How does this translate into more uptime? What's the easiest way to produce better quality products? In this article we get a small idea of how this is carried out.

DIGITALIZATION BENEFITS

Glaston's latest flat glass tempering furnaces Glaston Series FC, RC and Jumbo incorporate high levels of automation and intelligent process control. Vortex Pro utilises glass-size-sensitive convection profiling that precisely follows the glass in the furnace, enabling higher loading efficiency with top quality. Glaston's 50 years of know-how in glass heat treatment technology has been used to create special glass types such as super-tempered, fire-resistant glasses (FRG) without compro-



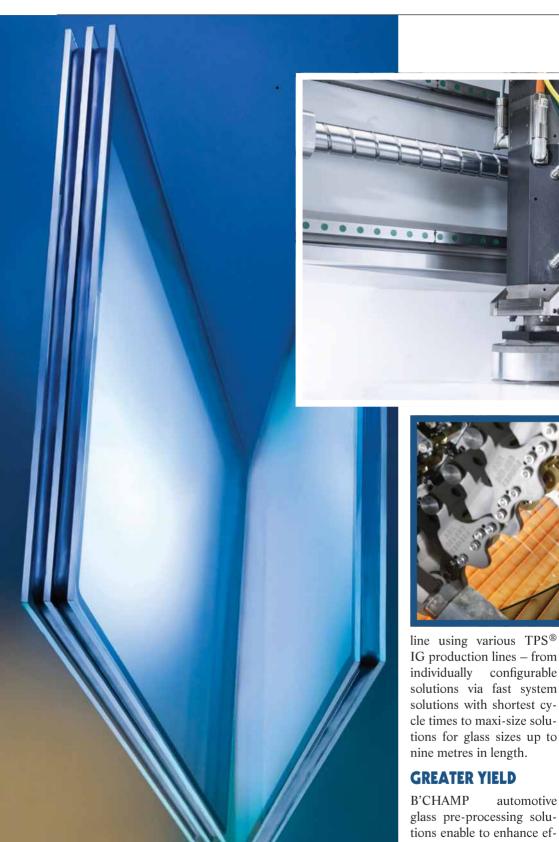


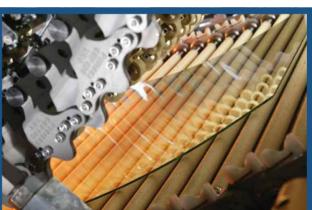
mising on yield.

Glaston ProL flat glass lamination line provides flexibility unprecedented for mixed production. Now it's easier than ever to use ProL convection heating chamber to switch between glass types and different sandwiches. The whole line, from glass handling to the latest PVB cutting technology, has been designed for flexible operation. Glaston ProL can be connected to the Glaston Insight ecosystem to monitor furnace production data online and take advantage of the ecosystem benefits. Updating existing laminating lines has been made easy with the ProL-zone heating chamber replacement that can be installed on any laminating line in the market.

SATISFYING WARM **EDGE DEMANDS**

Glaston's advanced architectural glass TPS® (Thermo Plastic Spacer) technology provides processors with end products to satisfy the toughest warm edge demands. Insulating glass units made with TPS® improve energy efficiency in buildings, increase durability and reduce energy costs. A major advantage of TPS® is its production flexibility. By directly applying the Thermo Plastic Spacer onto the glass lite significantly simplifies the processes for IG manufacturers. The entire production mix can be manufactured on one





IG production lines – from individually configurable solutions via fast system solutions with shortest cycle times to maxi-size solutions for glass sizes up to

automotive glass pre-processing solutions enable to enhance efficiency in daily production of windscreens, sidelights, backlights or quarterlights. This means a yield greater than 98 per cent, shorter times, cycle reactionfast software to minimise downtime and an excellent cost-per-unit ratio.

B'BRIGHT display glass solutions are individualised production systems for automatic cutting, breaking, grinding and drilling of thin glass down to 0.4mm in thickness. These thin glasses are used for moni-



tors, TV screens, mobile devices as well as automotive glass displays. The machine configuration offers not only a process-optimized line layout, but also various expansion options using upgrade kits.

Glaston Matrix, the automatic windscreen bending furnace for fast, efficient and high-performance windscreen production. features a new windscreen press for bending deep sags and wraps around corners to match the tightest tolerances. The new active convection heating enhances the production of windscreens with conductive or heat-reflective coatings.

Glaston HTBS bending and tempering system covers a wide range of application areas in the automotive, appliance and furniture glass industries. With its flexibility and high end-product quality, the HTBS furnace allows to meet evolving market requirements and process multiple glass sheets in one production load.

LIFETIME UPGRADES **EXTENSION**

insulating glass, Glaston now offers the opportunity to upgrade individual machines or complete insulating glass lines to achieve state-of-the-art performance by replacing components. Glaston's recently launched IG Service Upgrade team at its Technology Centre in Germany is ready to help extend the lifetime of lines with tailored solutions. For tempering furnaces too, Glaston heating chamber upgrade gives furnaces another life. Outdated or damaged furnace chambers and control systems can also be updated to match the market's latest tempered glass needs without investing in a totally new line.

AUGMENTED REALITY AND AI

With extensive investments and R&D. Glaston is heading towards automated processes and real-time customer support.

Glaston's latest mobile application, Glaston Siru, based on artificial intelligence, allows anyone to perform tempered glass fragmentation test quickly and easily with a mobile phone. Spending time counting cullets manually or risk making mistakes is no longer necessary.

cessing industry's innovative technology leader supplying equipment, services and solutions to the architectural, automotive, solar and appliance industries. The company also supports the development of emerging technologies by integrating intelligence in glass, with safer, smarter, and more energy-efficient glass solutions. Glaston Operates globally with manufacturing. services and sales offices in 12 countries. and its shares (GLA1V) are listed on NASDAO Helsinki Ltd.

S Glaston Corporation



Italcarrelli REVOLUTIONISING FLOAT **GLASS LOGISTICS**



or accurate, flexible, and efficient logistics results, today's glassmanufacturing plants rely on high-performance handling machinery, thus increasingly moving towards smarter, connected, and autonomous systems.

With its tailor-made handling solutions, ITALCAR-RELLI® supplies the most

important float glass producers and processors all over the world. International customers who are constantly growing and changing and therefore always attentive to the most modern technological and cuttingedge equipment.

In recent years, the company's Glass Division and R&D department have

constantly focused product innovation, studying increasingly performing handling solutions and making important investments in automation, development of autonomous guided vehicles (AGV), and correlated services.

LGV TECHNOLOGY

In the glass industry,

Italcarrelli mainly supplies machines based on LGV technology (Laser Guided Vehicles). The LGV consists of the triangulation of the position through a laser scanner monitoring its position compared to fixed reflectors installed in the warehouse. This guidance system provides excellent accuracy, it does

not require any particular installation on the facilities, and the routes can be easily modified. Continuing to revolutionise float glass factories logistics, Italcarrelli engineers have developed the BES. RDS and RIS for LGV PTN inloaders, which operate without operators on board.

BES (BATTERY EXCHANGE STATION)

The BES (Battery Exchange Station) is a patented system that allows automatic recharging and

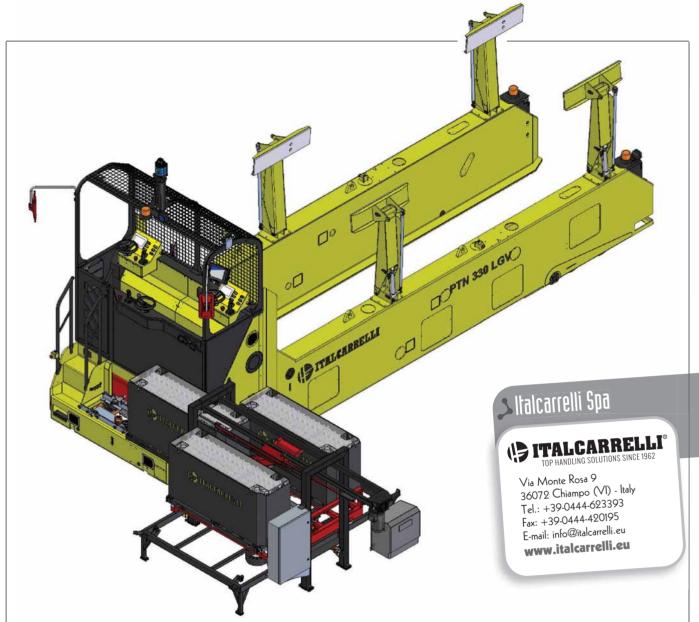
ITALCARRELLI® is continuing to improve logistics in float glass factories with its most recent systems for LGV inloaders: BES, RDS & RIS. This article gives us an idea of how the company supplies the most important global float glass producers and processors with its tailor-made handling solutions.

replacement of the battery onboard the LGV. Thanks to this system, the battery once discharged can be replaced automatically

without the intervention of any operator. The low battery LGV will automatically move to the BES to swap the battery with a charged

one and the whole operation will take about 4 minutes. Thanks to BES. Italcarrelli has considerably increased the opera-





tion of its LGV machines, as it is no longer necessary long stops for battery recharging. The BES station is also available for standard onboard operator machines.

RDS - RACK **DETECTING SYSTEM**

The RDS, an acronym for Rack Detecting System, is an innovative localization system that allows tracking all information about the load - i.e. presence of the load, an estimate of the

glass width, pack numbers, and position on the rack, rack type - for safer handling. It can be installed on both AGV and manually guided machines, to help the operator in his manoeuvring operations. The inloader is equipped with various electronic sensors to provide all the data: encoder, photocells, and ultrasonic sensors. Thanks to RDS, the system not only detects if the rack is present but also starts an automatic slowdown of the machine and stops it to prevent from hitting the rack during loading.

RIS – RACK **IDENTIFICATION** SYSTEM

Moreover, the machine can also be equipped with RIS (Rack Identification System) which allows scanning a barcode or reading an RFID tag with the information about the racks and communicating it automatically to the warehouse management software or

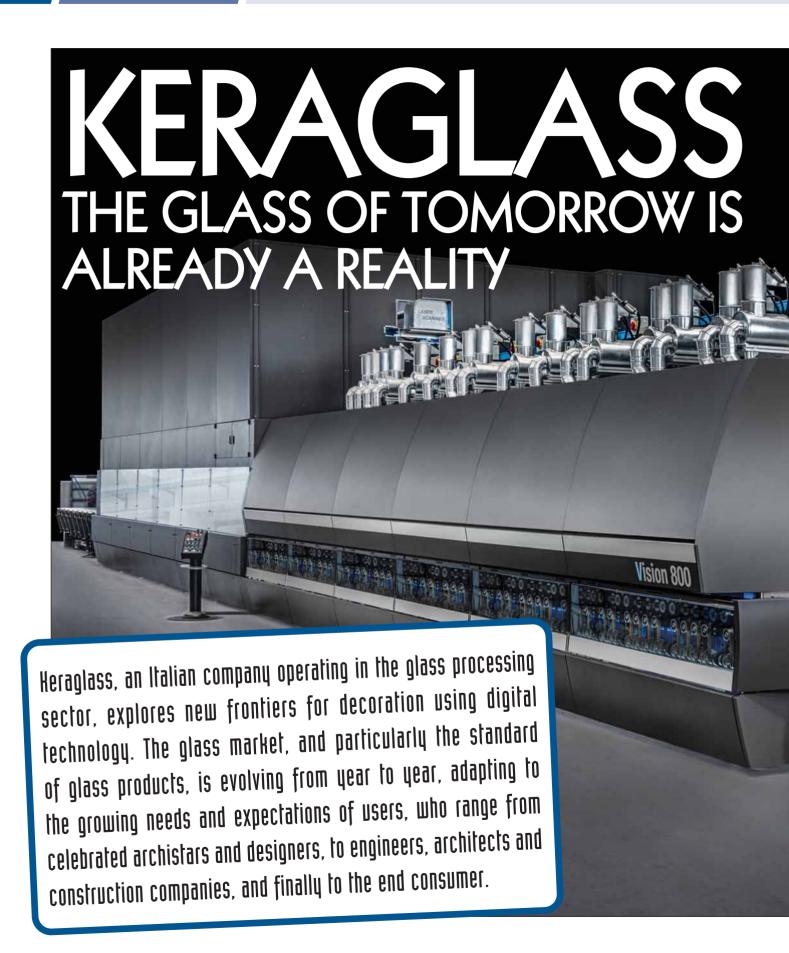
ERP, so it is possible to know at any time the exact location of glass and racks. Italcarrelli paves the way for a new generation and increasingly technologically advanced machinery and accessory technologies for handling float glass. With the highest standards of safety, quality and continuous developments in robotics, software and services in mind, it aims to provide ever-greater customization of the machine and its features.















Dinamica combines the flexibility of digital printing with the high-speed performance typically associated with traditional screen printing. Flexibility and speed, a combination that meets and satisfies the requirements of the most exclusive design projects, particularly in the home appliances, interior design and automotive sectors.

The revolutionary Dinamica digital printing system allows faster reproduction of any image on glass surfaces.

'MULTI-PASS' AND **'SINGLE PASS'**

The operator can choose between two printing types: 'multi-pass' or 'single pass'. With multi-pass printing, after an automatic alignment phase the glass sheet is immobilised and scan printed, with the option of setting a different colour printing sequence. With the single pass process, the printing unit is

fixed, and it is the glass

that moves under the print

heads, allowing the application of a single 'coat' in multiple colours. The constantly recirculated ceramic ink allows rapid repeat print jobs, thus guaranteeing constant availability and exceptional flexibility of use.

IPLOTTER

No less impressive is iPlotter, the digital ink iet plotter using drop-on-demand technology, which was conceived and designed specifically for printing on glass sheets using dedicated inks, and which is especially suitable for reproducing drawings, images and photographs for the architecture, automotive and furnishing sectors. This ceramic ink printer is capable of reproducing any type of image on glass sheets, obtaining a resolution of up to 2880 dpi in the HD model. All with top performance in terms of production flexibility, fast design and execution, as well as easy management and maintenance. Available in a new version incorporating up to 24 print heads that can operate with different inks and effects; iPlotter offers space - in both the physical and figurative sense – for any idea or application need in the present or future.

iPlotter can be integrated into a production line that starts with the glass sheet loading phase and ends in unloading with the print already dried and the glass ready for lamination or tempering. All in a fully automated system that includes print head cleaning.

Latest generation manufacturing

iPlotter and Dinamica thus enhance the Keraglass range of glass decoration products, which is intended to provide an integrated process for latest-generation manufacturing.

Although the sector's transition to Industry 4.0 is not yet complete, Keraglass is ready to seize the opportunities and advantages of the digital technology transformation, once again placing itself at the forefront of the global market.

AUTOMATIC SCREEN PRINTING AND ENAMELLING MACHINE

Alongside this new digital frontier in glass printing, Keraglass uses the Decoglass automatic



screen-printing machine, which is particularly indicated for large-sized glass (processes sheets up to 3210x6200 mm) and the Rainbow enamelling machine, capable of grading the thickness of the glaze based on the desired effect.

TEMPERING OF THE FUTURE

But glass is not solely about aesthetics. Insulation power and efficiency are still priority characteristics.

Vision 800 from Keraglass is a tempering furnace that has pushed the boundaries of what is possible, adopting innovative solutions that are destined to become the standard of the future. Solutions that have led to a result never achieved before in terms of the emissivity of large sheets of low-E glass: e = 0.01. A reduction in transmittance, with a consequent

increase in thermal insulation power, makes the glass panes processed by Vision 800 ideal for modern buildings, which are increasingly energy-efficient and environmentally sustainable.

Convection system

At the base of these extremely high-performance results is a convection system with a highly innovative concept that involves blowing air preheated to 700° through a network of stainless steel blowing tubes arranged above and below the rollers, with adjustable convection mapping and intensity according to the composition of each individual glass pane.

Single-step process control

The optical distortion effects of the heating and cooling processes are thus minimised. An equally innovative live monitoring system,

Supervision Intelligent, oversees the entire Vision 800 machining process. Through Supervision's 'hands and eyes', the operator can control every single step of the process and intervene if necessary. It provides a safe and linear path that leaves no room for nasty surprises.

FLEXIBLE LAMINATION -COMBI AND DELUXE

Completing the broad range of Keraglass products are lamination machines such as the Combilaminating kiln, a multilevel system divided into independent chambers capable of handling flat and curved glass of various dimensions, shapes and thicknesses. It incorporates high chambers dedicated to special treatments such as screen-printed glass or lamination of glass

with marble or ceramics. And, last but not least, Deluxe, the complete, fully automatic PVB laminating line, equipped with a pre-furnace, furnace, two roller presses and bufferconveyors that enable high productivity. The line is available in different sizes, enabling it to process large sheets up to jumbo size and cover the full gamut of architectural glass products.

> Keraglass Industries Srl



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Tecno Glass

Solid experience in glass thanks to over 40 years of activities, is what the Canzano family — the owners and management of Tecno Glass — are proud to have. And it is thanks to this experience and dedication, combined with the continuous search for innovative solutions, that has enabled the family and company to become a leader in the production and sale of glassworks' equipment.

wide range high-quality products able to meet the needs and demands of both Italian and international customers, with precision, punctuality and in the shortest time possible also thanks to a completely automated warehouse. This is the Tecno Glass way of working, thanks to the 40 years of experience and activities of the owners and managers of the company the Canzano family.

Intense work and passion Company headquarters are located in Ortona, Abruzzo, southern Italy, employing about 30 specialised technicians, warehouse managers and office workers. Thanks to the intense work and passion of the entire team, Tecno Glass reported a turnover of more than EUR 12,000,000 in 2019, further confirming the company's constant growth in these recent years, char-

PROUD TO BE MADE IN EUROPE; PROUD TO BE MADE IN ITALY

Sandro Canzano:

"We are very satisfied with our work and the objectives achieved. Proud to be Made in Europe. Proud to be Made in Italy."

acterised by the continuous search for innovative solutions and expansion.

In particular, with the second generation of the Canzano family in the company in 2000, Tecno Glass established itself on the international market, also thanks to Manuela Can-

zano, graduated in International Languages and Literature, who manages and coordinates the administrative and commercial sector. Sandro Canzano, on the other hand has, for over 15 years, been designing and manufacturing machinery for glass processing

capable of combining excellent functionality, maximum safety for operators and ease of use, without neglecting those functional and aesthetic details that make Tecno Glass machinerv absolutely unique and irreplaceable, according to the best tradition of Made in Italy.

CONTINUOUS RESEARCH AND STUDY **OF INNOVATIVE SOLUTIONS**

The continuous research and study of innovative solutions have allowed Tecno Glass to expand their offer of machinery entirely designed and built in-house. with the addition of the BRX-1400 butyl machine and the MFC-ROCKER extruder.

BRX-1400 BUTYL MACHINE

BRX-1400 is the top-ofthe-range butyl machine of the BRX series: completely automated, and ideal for glassworks with high production rates, which meet

the strict quality standards required to obtain EC certifications, such as Cekal certification.

The BRX-1400 features the elevation of the automatic worktop managed by PLC, increase in the workable profile up to 34.5mm and the installation of an optical reader for measuring the width of the profile. The butyl refilling system is quick and easy, and the hydraulic cylinder tank contains two 7 kg panes.

An on and off timer, together with the programming of standby time, eliminate unnecessary waiting times for the machine to warm up, thus guaranteeing energy savings. Equipped with an extremely intuitive PLC, available in several languages, the BRX-1400 has four operating speeds and a proportional valve capable of automatically adjusting the different operating pressures, allowing the delivery of the optimal amount of butvl.

Last but not least, the BRX-1400 meets the requirements of Industry 4.0 and allows to monitor all processing activities (energy consumption, alarms, warnings, etc.).

MFC-ROCKER

The MFC-ROCKER is a two-component extruder capable of ensuring the perfect dosage of structural silicones. Thanks to the use of rotor pumping units, instead of traditional volumetric pumps, it has a vari-

able flow rate, directly proportional to the speed of the brushless motors used for their drive, and much higher than traditional pumping elements. The pumps are entirely produced in Italy by a partner company, in collaboration with Tecno Glass technicians.

The fully-automated MFC-ROCKER provides the operator with all the useful information during the work cycle (number of

drums changed, quantity of material dispensed, alarm reports, etc.) and is equipped with a manual dispensing valve, i.e. a dispensing gun, equipped with a disposable mixer allows to obtain the perfect mixing of the base resin with the catalyst, eliminating any waste material to be disposed of.

The MFC-ROCKER also meets the requirements of Industry 4.0, being totally remote.







EXPERTISE IN ALL NORMATIVE AND INFORMATIVE TESTS

ofteco was founded in 1984, and since 1988 it has been active in the safety glass industry. Thanks to more than 30 years' experience, the company provides machinery and instruments for safety glass production and quality control.

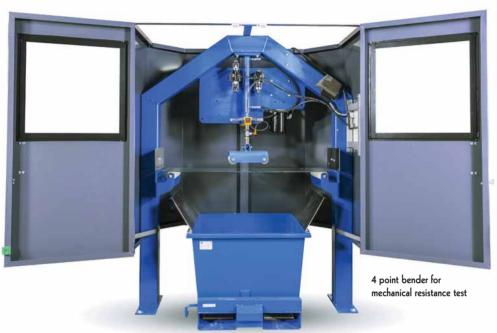
AUTOMOTIVE GLASS

Softeco provides expertise in all normative and informative tests according to ECE R43. The company supplies all necessary QC equipment, such as:

- dropping towers and supports for test pieces;
- impact objects;
- projectors and slides;
- resistance to radiation test equipment;
- light transmission measurement;

Softeco can also coordinate ECE R, DOT and CCC certification processes.





ARCHITECTURAL

Softeco provides knowledge and consultation services for CE marking and tests, supplying a full solution in addition to equipment and machinery to perform obligatory and non-obligatory tests, such as:

Softeco is a leading supplier of Quality Control Equipment for the flat glass industry worldwide, both architectural and automotive. The company closely follows changes in EU regulations and international norms, updating its supply and services accordingly.

- spring loaded punch;
- roller wave gauges and edge lift gauge;
- optical surface and edge stress measurement equipment;
- · resistance to high temperature test furnaces:
- automatic pummel testers for laminated glass
- insulated glass units gas concentration measurement.
- low-E emissivity testers, and much more.

GAINS THROUGH QUALITY

Some of the quality control equipment provided by Softeco can also be used to optimise production parameters: avoiding waste and increase yield.

OTHER CONTROL TOOLS

In addition to all mandatory QC instruments, the company also provides instruments for daily or random testing, such as:

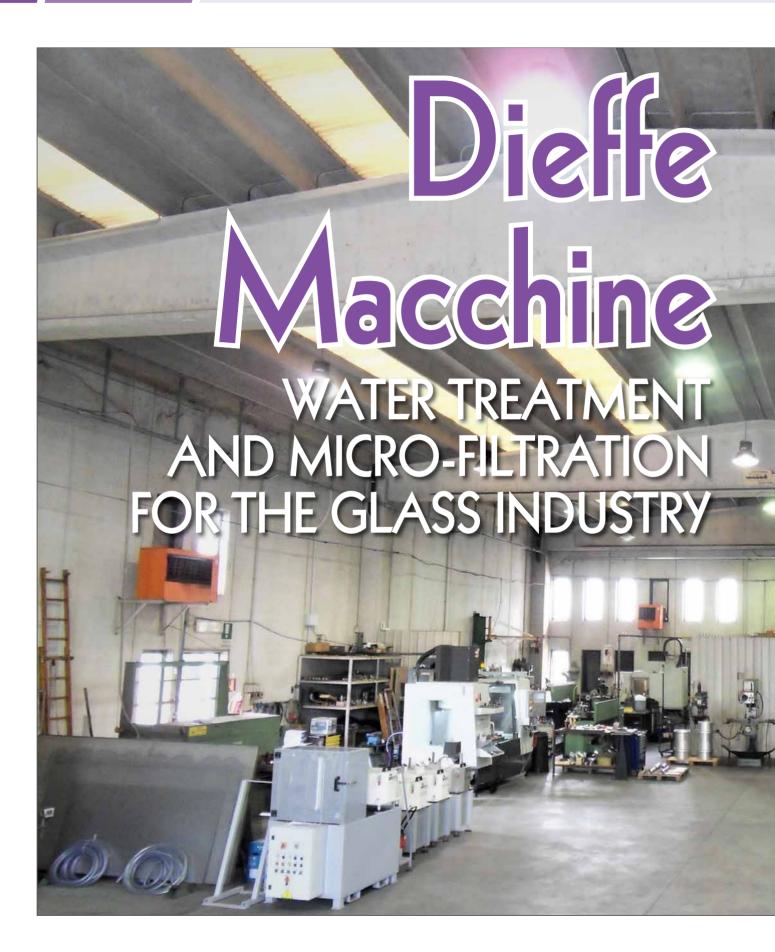
- coating detection for IGU glass;
- tin-side detectors;
- PVB humidity meters;
- and much more.



Ayrox YouTube Channel









ing to plant operation and on-site personnel training. The company's top quality technical assistance is highly appreciated by clients and represents a differentiation element of Dieffe Macchine's product range.

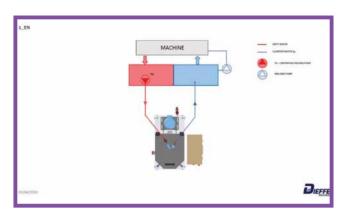
RELIABILITY; USER-FRIENDLY; REDUCED COSTS

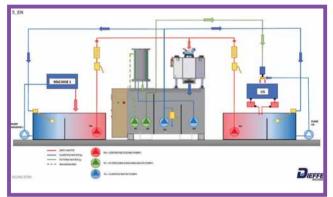
Dieffe Macchine offers a wide range of reliable, easy to operate, solid/liquid separation equipment:

- manual centrifuges;
- automatic centrifuges;
- fine filtration:
- micro-filtration;
- reverse osmosis;
- complete plants.

glass fabricators Many are still cleaning out their coolant tanks by hand, or

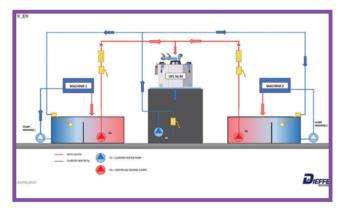










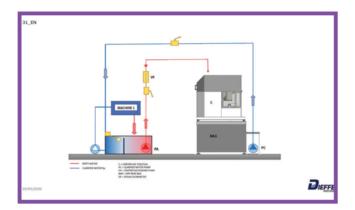






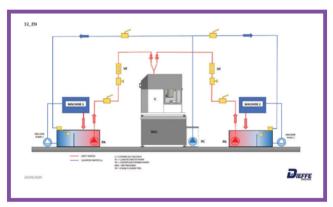


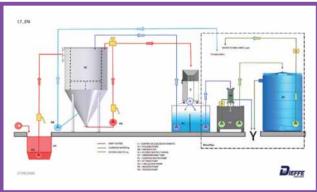
















are using ineffective underground settling tanks. These traditional methods simply don't solve the problems, and continue to result in lost production time (and profits) during clean-outs, increased labour, disposal and coolant costs, and the typical problems caused by dirty coolant (slower operating speeds, decreased cutting/bevelling quality, decreased life of diamond wheels, conveyor bearings and other components, and increased maintenance costs).

DECREASED PRODUCTION COSTS

- greater life for diamond wheels, conveyor bearings and other components;
- extended coolant life;
- reduced settling tank clean-out;
- reduced maintenance costs:
- reduced disposal costs;
- reduced labour costs.

INCREASED PRODUCTIVITY AND QUALITY

- less machine/line downtime:
- cleaner coolant increases running speeds;
- fewer scratches caused by dirty coolant, so less waste material.



vitec **CONTRIBUTES TO LEED** CERTIFIED GREEN BUILDING WITH ITS PREMIUM INSULATED GLASS: ISOLAR

lass can contribute decisively to building sustainability and bearing this is mind, Tvitec has just edited the first guide to provide building and promoting companies, architects and construction professionals with information as to which types of this 'ever-modern' material could favour the achievement of maximum LEED or BREEAM certifications in their projects. Tvitec's premium double-glazing Isolar is, in fact, an ecoefficient factor that really makes the difference.

A SIMPLE GUIDE

The simple guide edited by Tvitec reviews succinct steps on how more technologically advanced glazing solutions can score towards obtaining different LEED





seals that internationally guarantee the energetic efficiency of constructions, which become friendlier towards the environment while caring for the planet. Tvitec, one of the larger European architectonic glass transformers, is engaged with all the guidelines regarding climate change challenges. Each and every Isolar product that appears in the guide, whether flat or curved, not only adjust to this environmentally friendly spirit, but also contributes to the comfort and well-being of people in the residential, commercial, offices or services framework.

LEED GOLD AND PLATINUM CERTIFICATIONS

The maximum LEED Gold or Platinum certifications that are possible to achieve with the prescription of adequate glass for each project also subscribes to the guarantees that any business seeks when trying to achieve maximum energetic saving, which therefore also achieves economic saving.

ONLINE TECHNICAL INFORMATION

Tvitec, aside from this informative publication, also

Being able to ensure sustainability protecting our planet is an important goal for all of us, even more so for industrial sectors such as building and construction. Glazing — an important part of residential and commercial buildings — is moving more and more towards ecoefficiency, awarding glassmakers important certifications. Tvitec provides information on which types of glass can contribute in achieving these certifications.

has an active technical online channel, Glask (glask@ tvitec.com), through which its experts can respond to questions regarding this field in particular, and any other that architectural studios, façade consultants or construction firms may have.





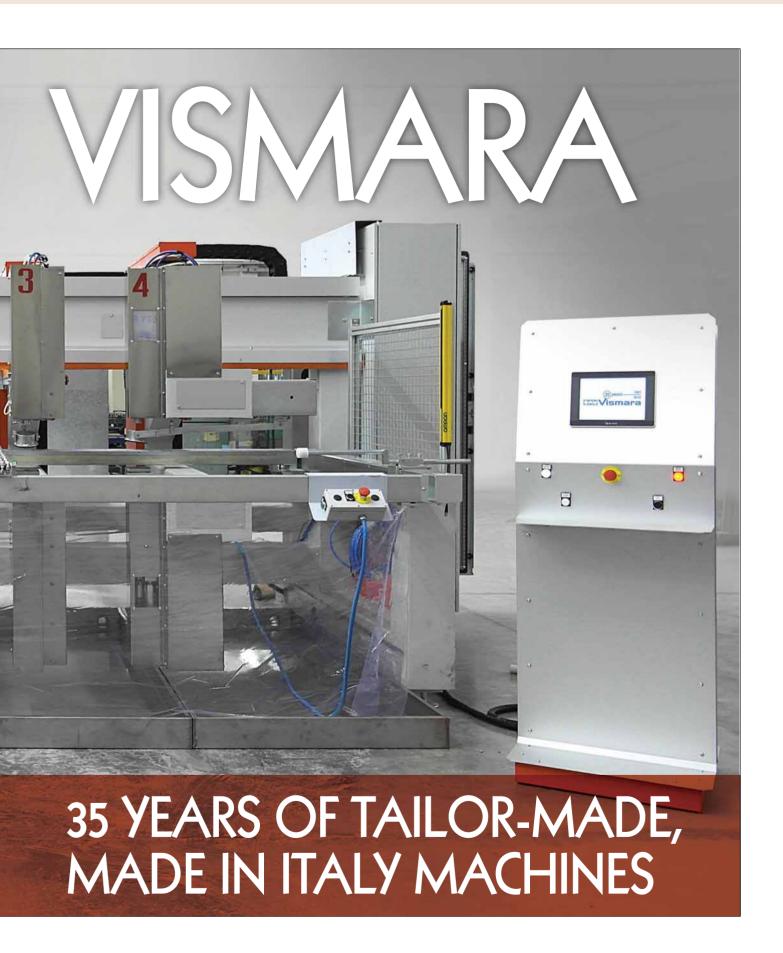
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MV Vismara has been manufacturing special machines for drilling and milling for the flat glass sector for over 35 years. This focus on specialisation, a specific choice of the company's owners, has enabled OMV to become an important reference name in a sector where large companies are its competitors, providing 'tailor-made' alternatives to potential customers who often look for machines de-

signed for their needs.

HORIZONTAL AND VERTICAL MACHINES

OMV Vismara's production range includes both horizontal and vertical machines, which can all be included in production lines of other machinery manufacturers, as robotic islands, or as stand-alone machines connected to a series of production lines. Continuous R&D is fundamental in today's market to be able to have the right products for glassmakers which, in turn provide the feedback needed, comparing logics and themes and, above all, the experience, knowledge and techniques of glass, coming from their customers.

The market often requires user-friendly machines and OMV is, in these cases, often not taken into consideration, as it is considered as a manufacturer of large complex and expensive

machinery alone. In reality, company production has, over the years, expanded and now ranges from the solution for small- and medium-sized glassworks, up to large producers or production on an industrial scale.

This product specialisation gives OMV Vismara the possibility of designing individual orders according to customer requests, both in terms of space and specificity of processing.



glass, for the production of doors and shower cubicles. OMV's product range for these demands includes lines made up of single machines, or single machines that carry out both types of processing (drilling and milling), as well as user-friendly machines and more performing machinery with tool storage (from 8+8 to 20+20 positions) and automatic tool changeover.

These more performing machines can take the place of the work centres used up to now, thus facilitating processes (for example eliminating the laborious task of equipping

and positioning the suction cups).

A further important advantage is that of internal milling of mirrors, during which the position of the where the position of the vertical processing allows to avoid breakages during the movement that must be performed, when moving from horizontal to vertical position.

RESPONDING TO MARKET DEMANDS: COLLABORATION: NEW GENERATION

The demands of the market are increasingly technological and the watchword is automation as well as processing flexibility, for more frequent and continuous change of batches which requires flexible and easyto-equip machines, also to allow to reduce costs of final products.

In addition to collaborating with other companies in the sector, OMV also has

DRILLING AND MILLING AS **SPECIALISATION**

OMV designs and manufactures drilling and milling machines for flat glass sectors: construction, doors, shower cubicles, furniture, earth moving machines, household appliances.

In recent years, the greatest demand comes from machines that make it possible to carry out drilling and milling (or cut-outs) in the





the possibility of supplying other types of machinery for grinding, handling, grinding and washing of flat glass thanks to a commercial partner company. The new generation, which has been active in the company for some years now, has brought more energy and research into new and performing increasingly technical choices, which improve the tried and tested technology, simplifying processing methods and reducing timing.





POST-SALES AND

OMV has an immediate and efficient assistance service, guaranteed by qualified technicians who can intervene immediately 'remotely', thus eliminating on-site costs.

The company's accurate, quick and effective after sales service is highly appreciated by customers, and thanks to prompt response to questions, eliminates production stops and, in turn, financial losses for customers.





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Hiseng Glass Machinery **IOCCO Group**

Tenon (Beijing) Equipment

LATHES - VERTICAL AND HORIZONTAL

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Fenzi

EMBOSSING MACHINES

CMS Fenzi

PORTABLE MACHINES

Fenzi

Helios Quartz Tecno Glass

DIAMOND TOOLS

Adelio Lattuada ΔDI

Ashton Industrial Sales

Bando Kiko

Boyone Diamond Tools Bottero

Diamant - AR Nunziata

Diamut - Biesse

Fenzi

Glaston Group Mole Moreschi

Schiavo Talamoni

Tvrolit Vincent

DIAMOND BELTS

Mole Moreschi

SEAMING LINES

Ashton Industrial Sales

MANUAL LINES

Ashton Industrial Sales

POLISHING WHEELS

Adelio Lattuada ΔΠΙ

Bando Kiko

Boyone Diamond Tools Diamant - AR Nunziata

Diamut - Biesse

Fenzi

Glaston Group

Italmole

Mole Moreschi

RBM Italia Schiavo

Tyrolit Vincent

POLISHING AGENTS AND OXIDES

ADI

Bovone Diamond Tools

Diamant - AR Nunziata Fenzi

Schiavo

Tyrolit Vincent

POLISHING BELTS

Diamant - AR Nunziata

Fenzi Schiavo

COOLANTS

Adelio Lattuada **Boyone Diamond Tools**

Fenzi Schiavo

GLASS GRINDING AND BEVELLING COOLANTS

Schiavo

SEPARATORS FOR **GLASS-SOLIDS**

Ashton Industrial Sales

Dieffe Macchine **Filtraglass** Schiavo Vitrosep

ACCESSORIES

ADI CMS

Dieffe Macchine

Fenzi

Helios Quartz

IOCCO Group

Mole Moreschi

Schiavo

Schiatti Angelo

Tyrolit Vincent

Washino

HORIZONTAL WASHING MACHINES

Ashton Industrial Sales

Bando Kiko Bavelloni Boyone Flett. **ECOL**

Forel Glass Company

Glaston Group Hiseng Glass Machinery

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Neptun Schiavo Triulzi

VERTICAL WASHING MACHINES

Adelio Lattuada Ashton Industrial Sales Bavelloni

Best Makina ECOL

Forel

Glass Company Glaston Group

Hiseng Glass Machinery

IOCCO Group

Lisec Group

Neptun Schiavo

Shanghai North Glass

Technology

S.T. Group

Stefiglass

Tenon (Beijing) Equipment Triulzi

WASHING MACHINES FOR AUTOMOTIVE

GLASS

Bando Kiko FCOL

Glaston Group

IOCCO Group

Triulzi

WASHING PURIFICATION SYSTEMS

Dieffe Macchine

Forel

Glass Company

Glaston Group

IOCCO Group

Schiavo

Tenon (Beijing) Equipment

LIQUID WASHING CONCENTRATES

Diamant - AR Nunziata Schiavo

ACCESSORIES

Helios Quartz Idrotecnica **S**chiavo

S.T. Group



Mirror production

COMPLETE PLANTS & CONVEYORS FOR MIRROR PRODUCTION

Bovone Elett. IOCCO Group

Triulzi

PAINTING EQUIPMENT

Giardina Finishing + HS

Glassprinting Goldglass Technologies

IOCCO Group Triulzi

DRYING OVENS

Bovone Elett.

CMS

Giardina Finishing + HS Glassprinting

Goldglass Technologies

AUTOMOTIVE MIRROR BENDING FURNACES

Boyone Elett.

MANUAL SILVER- SPRAYING EQUIPMENT

Fenzi

Glass Company

PAINTS AND CHEMICAL **PRODUCTS**

Fenzi

ACCESSORIES

Fenzi

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Insulating glass

COMPLETE INSULATING **GLASS LINES**

Ashton Industrial Sales

Bavelloni

Best Makina

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Glass Company

Glaston Group

Neptun

Schiavo

S.T. Group

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Thermoseal Group

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Bavelloni

Forel

Glaston Group

Lisec Group

S.T. Group

AUTOMATIC SPACER

BENDING MACHINES Ravelloni

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Forel

Glaston Group

IOCCO Group

Lisec Group

Lombarda Macchine

Schiavo

S.T. Group

Tenon (Beijing) Equipment

Thermoseal Group

DESICCANT SALT FILLING MACHINES

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Bavelloni

Best Makina Di Gregorio

Fenzi

Forel

Glaston Group

Lisec Group

Lombarda Macchine

Neptun

Schiavo

S.T. Group

Tecno Glass

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Bavelloni Best Makina

Fenzi

Forel

Lisec Group

Neptun

Schiavo S.T. Group

Tecno Glass

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Thermoseal Group

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Lisec Group

Neptun

Schiavo S.T. Group

Tecno Glass Tenon (Beijing) Equipment

Thermoseal Group

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ENCAPSULATION Glaston Group Lisec Group

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Sparklike

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Thermoseal Group

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S.T. Group

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Fenzi

HOT MELT

Ashton Industrial Sales

Fenzi

Thermoseal Group

OTHER SEALANTS

Fenzi

PANTOGRAPHS

Fratelli Pezza

ACCESSORIES

Ashton Industrial Sales **Deltamax Automazione** Diamant - AR Nunziata

Dieffe Macchine

Forel

Forza G / G. Tech

Helios Quartz

Schiavo

Sparklike

S.T. Group

Tenon (Beijing) Equipment

Temperino

TEMPERING FURNACES (ARCHITECTURAL GLASS)

CNUD-EFCO

Glass Company

Glasstech Inc.

Glaston Group

Hornos Industriales Pujol

Keraglass

Landglass Technology

Lema

Lisec Group

Mappi International

Schiavo

Shanghai North Glass

Technology Tekno Kilns

Tempering furnaces

(automotive glass)

Glass Company

Glasstech Inc.

Glaston Group

Keraglass

Landglass Technology

Mappi International

Mazzaroppi Engineering

Satinal Spa

SGLASS

Shanghai North Glass

Technology

CHEMICALS TEMPERING EQUIPMENT

Glass Company R.C.N. Solutions

ACCESSORIES

CNUD-EFCO

Deltamax Automazione

Fenzi

Glass Company

Glaston Group

Helios Quartz

Hornos Industriales Pujol

Keraglass

Landglass Technology Mappi International

Mazzaroppi Engineering

R.C.N. Solutions

Satinal Spa

SGLASS

Tekno Kilns

Torgauer Maschinenbau

Bendino

BENDING FURNACES (ARCHITECTURAL GLASS)

Hornos Industriales Pujol

Keraglass

Mappi International

Mazzaroppi Engineering

R.C.N. Solutions

SGL ASS

Tekno Kilns

Bending furnaces (automotive

glass) CNUD-EFCO

Glass Company

Glasstech Inc.

Glaston Group

Keraglass

Mappi International

Mazzaroppi Engineering

R.C.N. Solutions

Satinal Spa **ACCESSORIES**

Avrox

Deltamax Automazione

Glass Company

Glasstech Inc.

Glaston Group Hornos Industriales Puiol

Keraglass Mappi International

Satinal Spa

Softeco

Tekno Kilns

Laminated glass production

COMPLETE PLANTS

Boyone Flett.

Bottero

Forel

Glass Company

Glaston Group Hornos Industriales Pujol

IOCCO Group

Lisec Group

Mazzaroppi Engineering

R.C.N. Solutions

Satinal Spa

Triulzi

LAMINATED WINDSCREEN **BENDING FURNACES**

ECOL

Glass Company

Glasstech Inc.

Glaston Group

Keraglass

Mappi International

AUTOCLAVES

Glass Company

Glaston Group

Hornos Industriales Pujol

Lisec Group

Triulzi

CLIMATIC CABINS

Forel

Glaston Group

IOCCO Group Lisec Group

Triulzi

INFRARED OVENS

ECOL

Forel

Glass Company

Glaston Group

Hornos Industriales Pujol **IOCCO** Group

Lisec Group

Satinal Spa SGLASS Triulzi

PRESSES/BENDING

MACHINES

Triulzi

Forel IOCCO Group Lisec Group

RESIN LAMINATING

MATERIALS AND EQUIPMENT

IOCCO Group

Satinal Spa . Torgauer Maschinen<mark>bau</mark>

EVA (ETHYLENE VINYL

ACETATE) Satinal Spa

PVB Everlam

Kuraray - Trosifol

PVB - SHAPING AND CUTTING EQUIPMENT

Ayrox

FCOL

Forel Glaston Group

IOCCO Group

Lisec Group Softeco

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PVB - WIRING TECHNOLOGY FOR HEATABLE LAMINATES

Ayrox ECOL Softeco

ACCESSORIES

Ayrox Bottero

Deltamax Automazione

Glaston Group Helios Quartz

Hornos Industriales Pujol

IOCCO Group **Lisec Group** Satinal Spa Softeco Triulzi

Drilling

AUTOMATIC DRILLING LINES

B Solution Licensee of BF Project

Bando Kiko Bavelloni

Forvet

Glaston Group

Guangdong Northglass & Juisun Technology Industrial

Intermac - Biesse IOCCO Group Schiatti Angelo

SKG - Skill Glass

Vismara

MULTI-SPINDLE DRILLING MACHINES

B Solution Licensee of BF

Project Bando Kiko Bavelloni

CMS Forvet

Glass Company

Glaston Group

Intermac - Biesse

IOCCO Group Schiavo

Schiatti Angelo

SKG - Skill Glass

Vismara

DRILLING MACHINES WITH OPPOSITE DRILLING HEADS

B Solution Licensee of BF

Project Bando Kiko Ravelloni Bottero **CMS**

Fenzi Forvet.

Glaston Group

Hiseng Glass Machinery

Intermac - Biesse

IOCCO Group Schiavo

Vismara

Schiatti Angelo SKG - Skill Glass

COLUMN DRILLING **MACHINES**

B Solution Licensee of BF

Project Bottero

Fenzi

Schiavo

Vismara

PORTABLE DRILLING MACHINES

CMS

Fenzi Schiavo

DRILLING AND MILLING MACHINES

Bavelloni Bottero CMS Forvet

IOCCO Group

Schiavo **SGLASS**

DIAMOND DRILLS

ADI

Boyone Diamond Tools Diamant - AR Nunziata

Diamut - Biesse

Fenzi

Glaston Group Mole Moreschi

Schiavo

Tyrolit Vincent

ACCESSORIES

CMS Fenzi

Schiavo

Other equipment and plants

TURNKEY PLANTS / ENGINEERING - FOR BUILDING GLASS

Bando Kiko Rottero Cugher Glass **Glaston Group** Horn

Intermac - Biesse IOCCO Group

Keraglass

Lisec Group

Torgauer Maschinenbau

TURNKEY PLANTS / **ENGINEERING - FOR AUTOMOTIVE GLASS**

Bando Kiko Bottero

Cugher Glass

Easy Automation

Horn

Glaston Group

Intermac - Biesse IOCCO Group

KEY PLANTS / ENGINEERING -FOR DISPLAY GLASS

Bando Kiko

Cugher Glass Torgauer Maschinenbau

WORKING CENTRES -CNC CONTROLLED

Bando Kiko Bavelloni Bottero

Glass Company

Glasstech Inc.

Glaston Group

Hegla

Intermac - Biesse SKG - Skill Glass

Vismara

FLOAT PLANTS/LINES (EQUIPMENT & ACCESSORIES)

Bovone Elett.

Horn

IOCCO Group

CULLET HANDLING SYSTEMS

COMPLETE BATCH PLANTS

Zippe

VACUUM COATING EQUIPMENT AND PLANTS

Glass Company Shanghai North Glass Technology

ENAMELLING EQUIPMENT AND PLANTS

Giardina Finishing + HS Glassprinting

Glass Company

Rollmac division of GeMaTa

HOT- AND COLD-END COATING SYSTEMS AND MATERIALS (CVD, ROLLER, **CURTAIN COATERS, DRYERS)**

Giardina Finishing + HS Glassprinting Goldglass Technologies

SANDBLASTING SYSTEMS, **EQUIPMENT AND PLANTS -OPTIMIZERS**

Fenzi

Fratelli Pezza **Glass Company** Schiavo

SKG - Skill Glass

DIGITAL INKJET PRINTERS

Glass Company System Ceramics

SCREEN PRINTING **EQUIPMENT AND PLANTS**

Avrox

COMSS

Cugher Glass Deltamax Automazione

FCOL

Giardina Finishing + HS

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Shanghai North Glass

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SCREEN PRINTING FRAMES

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SCREEN PRINTING DRYING **SYSTEMS**

COMSS

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Glass Company

Guangdong Northglass & Juisun Technology Industrial Rollmac division of GeMaTa

ACIDING GLASS **EQUIPMENT AND PLANTS**

Lisec Group

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LASER DECORATING MACHINES

Ashton Industrial Sales Glass Company

LASER MARKING

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Artistic class production

CERMAMIC INKS

Glass Company

CHAMBER ELECTRIC KILNS

Glass Company

Keraglass

Tekno Kilns

Accessories

Deltamax Automazione

Helios Quartz

Miscellaneous

AUTOMATION

Ashton Industrial Sales Goldglass Technologies

Horn

IOCCO Group

Torgauer Maschinenbau Zippe

AUTOMOTIVE GLASS APPROVAL SERVICES

Ayrox

Softeco

AUTOMOTIVE GLASS QUALITY CONTROL

Avrox

Bando Kiko

Cuaher Glass

Deltamax Automazione

Easy Automation

Glaston Group

IOCCO Group

Softeco

CE MARKING - QUALITY CONTROL EQUIPMENT FOR GLASS IN BUILDING

Ayrox Softeco

COATING OF GLASS SHEETS -SYSTEMS & MATERIALS - HOT / COLD END

Goldglass Technologies

COLOURS & ENAMELS -OTHER APPLICATIONS

Goldglass Technologies

DEIONIZING AND WATER SOFTENING EQUIPMENT

Fenzi

Forel

Glass Company

Idrotecnica

Lisec Group

Triulzi

FLAT GLASS QUALITY CONTROL DEVICES

Avrox

Deltamax Automazione

Forel

IOCCO Group

Softeco

FURNACES

Glass Company Horn

FURNACES / HYDROGEN GENERATORS (WATER ELECTROLYSERS)

Nel Hydrogen

GLASS COATING AND TINTING

Giardina Finishing + HS Glassprinting

Glass Company

Goldglass Technologies Rollmac division of GeMaTa

GLASS TREATMENT FILMS

Glass Company

HEATING EQUIPMENT -STANDARD (GAS FIRING, **BURNERS, AIR GAS MIXERS,** SAFETY DEVICES, **ELECTRICAL RESISTORS**)

Horn

Keraglass

INFRARED TUBES

Helios Quartz

Deltamax Automazione

KILNS



Glass Company

Keraglass

Lisec Group

Tekno Kilns

Metal accessories

Fenzi

METALLIC SECTIONS

Fenzi

NUMERICAL CONTROL SYSTEM (CNC) FOR ALL GLASS PROCESSING MACHINES

Glass Company

IOCCO Group

Prodim

OPTICAL DISTORTION ANALYSERS FOR AUTOMOTIVE GLASS

IOCCO Group Keraglass

OPTICAL INFRARED THERMOMETERS

Optris

POWDER OR LIQUID APPLICATION SYSTEMS FOR **PROTECTING FLOAT GLASS**

Cugher Glass Giardina Finishing + HS Glassprinting

Glass Company

PUMPING AND APPLICATION SYSTEMS (AUTOMOTIVE GLASS) IOCCO Group

PURIFIERS FOR REFLUENT WATER

Dieffe Macchine

Forza G / G. Tech

PUTTIES AND SEALANTS

Fenzi

QUARTZ EQUIPMENT

Helios Quartz

SHAPE CHECKING DEVICES

Easy Automation IOCCO Group

SIC HEATERS

Helios Quartz

SOFTWARE DATABASE, PROPERTY PREDICTOR

Synerglass Soft

SOFTWARE SYSTEMS FOR PRODUCTION CONTROL

∆+W Software

CMS

Cugher Glass

Deltamax Automazione

Edgetech Europe

Lisec Group

Optima

Drodim

Synerglass Soft

SOLDERING EQUIPMENT FOR ELECTRICAL CONNECTORS FOR WINDSCREENS AND **BACKLITES**

Ayrox

Easy Automation

Softeco

SORTING SYSTEMS

Glaston Group Lisec Group

SURFACE STRESS MEASUREMENT INSTRUMENT

Glass Company

Jeffoptics

TESTING FOR SOLDERINGS

Ayrox

Easy Automation

Softeco

TESTING DEVICES OF BACKLITES **ELECTRICAL HEATING**

Ayrox Softeco

THERMAL IMAGING SYSTEMS

Easy Automation

Glass Company

Optris

TIN FLOAT BATH FURNACES

IOCCO Group

UV LAMPS Helios Quartz

UV PORTABLE MACHINES

Helios Quartz







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