

Glass-Technology International

THE LEADING MAGAZINE FOR THE INTERNATIONAL FLAT GLASS INDUSTRY

September/October • Year 30 • No. 5/2019

ghbs⁺ extreme profile connection
ac⁺ advanced coating

mhs⁺ multi-zone heating system
its⁺ integrated touch system

ess⁺ energy saving system
ihs⁺ intelligent heating system

syncro⁺ transmission technology
ec⁺ chamber extraction

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A photograph of an industrial robot arm, likely a KUKA, in a factory environment. The arm is orange and black, with blue cables attached. It is positioned over a conveyor belt system. The background shows a complex industrial structure with metal frames and safety railings. The image is partially obscured by a large white triangle and a red triangle, which are part of the overall design.

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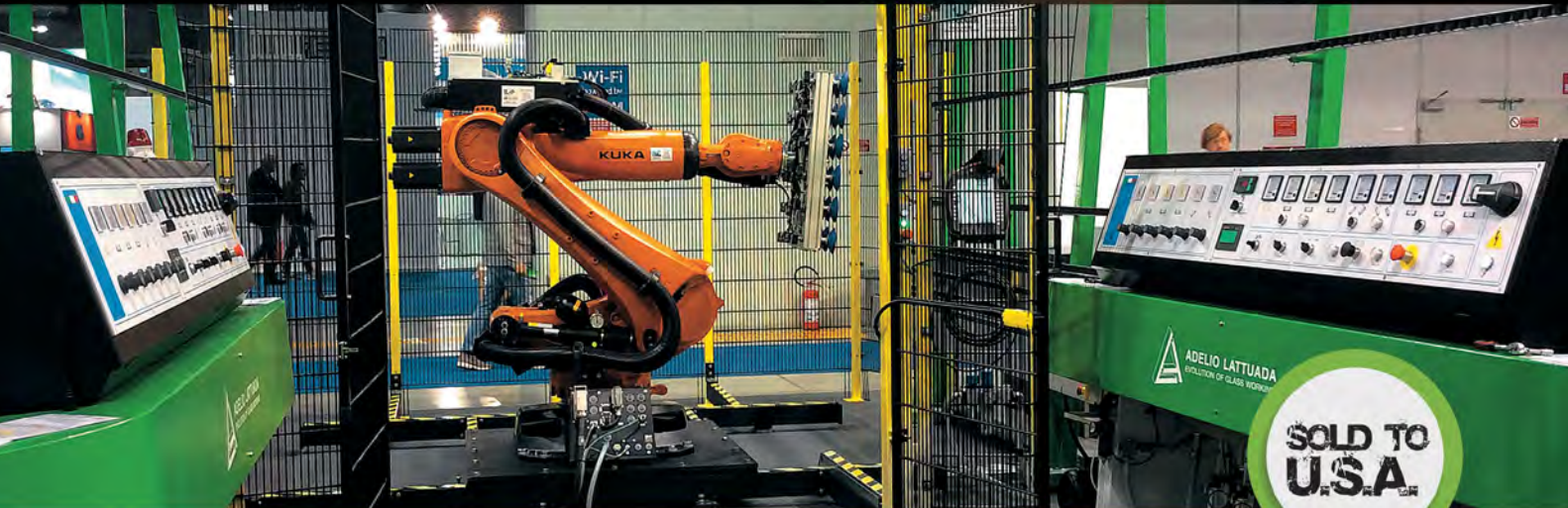
— Rob Carlson, Mechanical Engineer at the Tristar Tulsa, Oklahoma, U.S.A.

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At Wittmann 2019 Midea, one

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ment and modulation of the production level and content and enables control of HEGLA and HEGLA HANNE, emphasis on low temperature, the HANNE Division of HEGLA HANNE "E" grades, no solvent applications in all products, increase the flow of data and information systems to assist in perfectly balanced clay flow systems.

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Technology
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The system can also scan the glass surface as an alternative system pattern.

FINANCE INNOVATION

Glass Company 90



Tailor-made solutions on show at Vitrum 2019

In this year's Vitrum trade event, Glass Company will have on show a series of solutions for today's demanding glass processes and market. Visitors will have the chance to see innovative heating for all glass types - including heat-E - as well as finishing with PVE film.

AN ART CONNECTION

At Vitrum, Glass Company will be showcasing its new range of glass solutions, including heating, finishing, and PVE film. The company's new range of glass solutions is designed to meet the demands of the glass industry, providing a wide range of options for glass processing and finishing.

Glass Technology International 5/2019

CASE STUDY

Forel 98



Sorter SYSTEM REVOLUTIONIZES WORK AT ARTIGIANVETRO

Working relationships must be developed based on trust and reliability to be able to work. In this article, Forel gives us an idea of how these two fundamental aspects have led to a 20-year relationship with one of Italy's reference names in the flat glass sector.

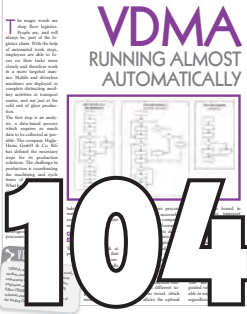
CONTRIBUTOR SOCIETY: ARTIGIANVETRO

Artigianvetro is a company that has been active in the glass industry for over 20 years. It is a company that has been able to develop a strong relationship with Forel, a company that has been able to provide a wide range of glass solutions for the glass industry.

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SHOP FLOOR LOGISTICS

VDMA 104



RUNNING ALMOST AUTOMATICALLY

Production processes are constantly being optimized. Both time and cost pressures require the constant evolution and integration of organizational structures in internal logistics, and this is no different in the glass industry. With constant increasing floor heights, the use of automated guided vehicles will also make it easier to implement these processes.

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Automation

TecnoFerrari 107




WORKING WITH AND FOR PRINTING AND LOGISTICS FOR INDUSTRY 4.0

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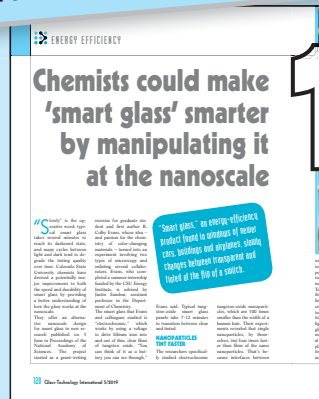
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Pilkington glass to protect the 'The School of Athens' cartoon

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123 Nippon Electric Glass

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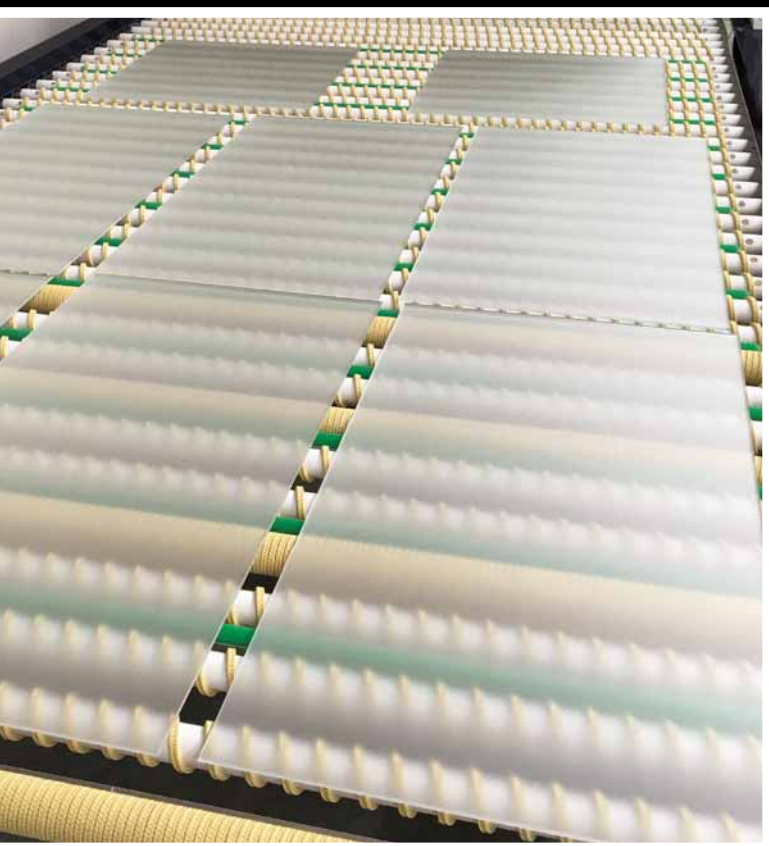
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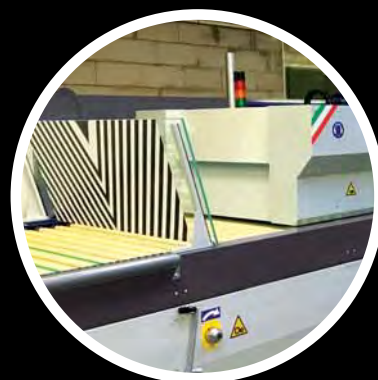


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issue	exhibition/conference	date	venue	deadlines
2019 1	EURASIA GLASS	6-9 March	ISTANBUL Turkey	Editorial files: 25-01-2019
	MIR STEKLA	2-5 April	MOSCOW Russia	Deadline Adv files: 01-02-2019
2019				Editorial files: 01-03-2019
				Deadline Adv files: 15-03-2019
2019 2	CONSTRUMAT	14-17 May	BARCELONA Spain	Editorial files: 05-04-2019
	CHINA GLASS	22-25 May	BEIJING China	Deadline Adv files: 16-04-2018
2019 3	GLASSTECH MEXICO	11-13 June	MEXICO CITY Mexico	Editorial files: 03-05-2019
	GPD - GLASS PERFORMANCE DAYS	26-28 June	TAMPERE Finland	Deadline Adv files: 10-05-2019
2019 4	GLASSBUILD AMERICA	17-19 September	ATLANTA (GA) USA	Editorial files: 19-07-2019
	GULF GLASS	24-26 September	DUBAI UAE	Deadline Adv files: 26-07-2019
2019 5	VITRUM	1-4 October	MILAN Italy	
	ALL VITRUM EXHIBITORS ADVERTISING IN THIS ISSUE ALSO RECEIVE A FREE VITRUM PREVIEW 			Editorial files: 26-08-2019
	GLASSPRO INDIA	10-12 October	MUMBAI India	Deadline Adv files: 06-09-2019
2019 6	GLASSTECH ASIA	12-14 November	JAKARTA Indonesia	
	COLOMBIA GLASS	20-21 November	BOGOTÀ Colombia	
	ZAK GLASS TECHNOLOGY	12-15 December	NEW DELHI India	
				Editorial files: 10-10-2019
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PUJOL

New Pujol 100 Continuous Oven

At Vitrum this year, Spanish company Hornos Industriales Pujol will be presenting the Pujol 100 Continuous Oven for high production rates, which stands out for a series of important characteristics.

Thanks to the continuous production line, production rates of 19 minutes with 4 + 4 glasses are now possible, enabling double the production capacity with homogeneous curing cycles, providing improved temperature uniformity of +/- 3.5°C. At the same time, there is also the Crosslink guarantee for products laminated with EVA, also of different shapes and sizes in parallel and using the most of the entire surface of the oven. Unlike other continuous Oven on the market, Pujol 100 Continuous Oven provides a plus of flexibility thanks to its independent chambers design, which allows working in independent chambers or in fast curing according to different demands and production needs. This allows to manufacture in continuous mode or by independent batch, therefore allowing special work formats and high production rates.

The Pujol 100 Continuous Oven consists of four chambers equipped with automatic movements.

Unlike other longitudinal systems in the market, the new development of Pujol has been projected with the idea of being able to reduce the space used. In addition, its open design provides easy access to interior of the oven, thus ensuring quick and easy maintenance.

The new Pujol 100 Continuous Oven incorporates the new and unique system developed by Pujol: Leakage Control System. This system

bases its technology on an automatic and variable adjustment of the vacuum pressure guaranteeing the different and demanding pressure states inside the bag.

The result obtained thanks to the Leakage Control System is clean glass without optical distortions and without excess of EVA on the edges, which usually dazzle the final finished product. This also implies a cost reduction of up to 25 per cent in human-, technical- and time resources in the long and tedious process of cleaning the glass or in the preparation of the laminated glass since it does not require taping.

More than 60 Pujol ovens have been installed worldwide thanks to the reliability provided by Hornos Industriales Pujol and its expertise and know how.

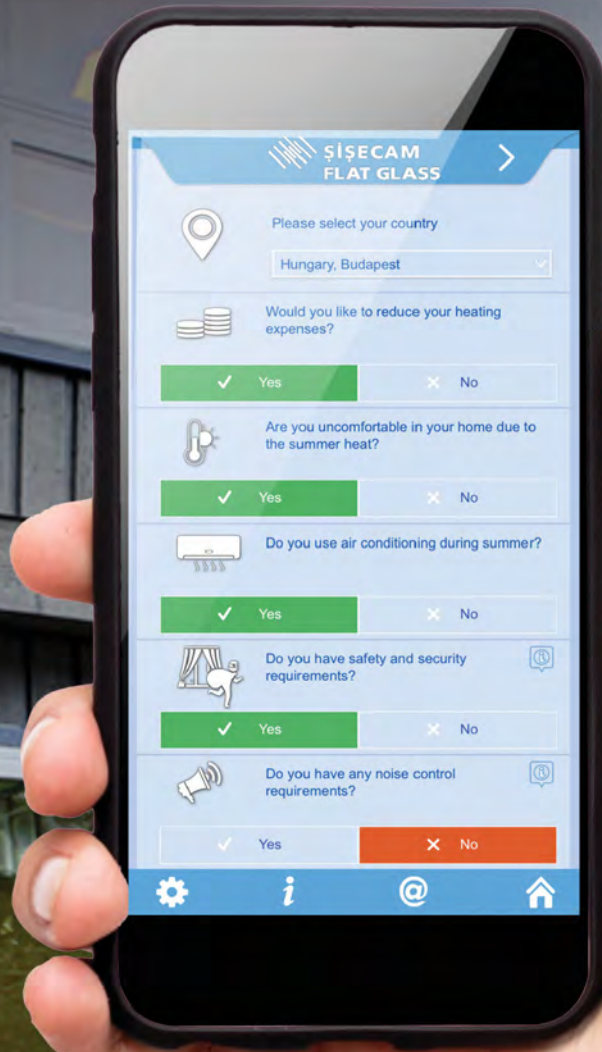
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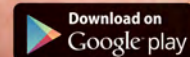


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KURARAY

Trosifol® Thin Film is rebranding as Mowital® Thin Film

Kuraray, one of the world's leading specialty chemicals manufacturers, is now offering its high-performance polyvinyl butyral (PVB) thin film under the name Mowital® Thin Film. Up until now, the film material has been available as Trosifol® Thin Film. With this rebranding, Kuraray is further expanding its Mowital series and consolidating its entire range of technical PVB materials under the trade name.

Mowital® Thin Film is used for laminating various materials and its binding power gives complex multilayer composites and preregs enormous stability over the long term. Production processes and all regulatory information remain valid even after the rebranding.

"By rebranding our PVB Thin Film, we are making our product portfolio even more transparent for our customers," said Jörg Bruss, Director of Global Business for Technical PVBs at Kuraray. "Mowital is a strong global brand when it comes to technical polyvinyl butyrals. Our PVB thin film now complements the brand core by adding further applications for composite materials and thermoplastic preregs." Under the trade name Trosifol, Kuraray will continue to sell high-quality film materials for laminated safety glass applications in the architecture, automotive and photovoltaic sectors. Extra strong for light-weight applications: With its excellent bonding strength, Mowital® thin-film is ideally suited for the production of compact composite materials that require a very high technical load-bearing capacity and lightness – for example in aerospace, motor sports and wind turbine rotors.

Extra strong for light-weight applications: With its excellent bonding strength, Mowital® thin-film is ideally suited for the production of compact composite materials that require a very high technical load-bearing capacity and lightness – for example in aerospace, motor sports and wind turbine rotors.

Mowital® Thin Film is a PVB-based film material. Thanks to its excellent bonding strength, the product is ideal for laminating a wide variety of materials – including glass, metal, ceramics, polymer fibers and polyurethane (PU) foam. As a thermoplastic intermediate layer, the material adds excellent stability to materials such as multilayer composites. In addition, Mowital® Thin Film is suitable for the production of thermoplastic preregs. These textile fiber matrix semi-finished products are cured under pressure at temperatures of up to 160°C. They can be used in the manufacture of compact composite materials that require a very high technical load-bearing capacity and lightness – for example in aerospace, motor sports and wind turbine rotors.

This rebranding makes Mowital® Thin Film the newest member of the Mowital brand. Under this trade name, Kuraray offers numerous PVB materials in the form of powders, granulates and now also on films. With their specific butyral, hydroxyl and acetal groups, these materials are ideally suited to their respective applications. Mowital® is compatible with many polymers and solvents and is ideal for a broad spectrum of applications, from paints and printing inks, to adhesives, ceramics, films, 3D printing filaments, and construction applications. "Of course, our production processes and high quality standards remain first-class, even with the new name. What's more, all the regulatory information remains valid," explains Jörg Bruss. "Until the name change is fully completed, the two names Trosifol® Thin Film and Mowital® Thin Film will accompany us together for a while, for example on product packaging. We plan to keep this transitional period as short as possible for our customers." "By rebranding our PVB film as Mowital® Thin Film, we are making our product portfolio even more transparent for our customers," says Jörg Bruss, Director of Global Business for Technical PVBs at Kuraray. "The unique properties of Mowital® Thin Film complement our strong technical PVB materials brand by adding applications for composites and technical preregs."



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Smart Companion entering pilot phase

The barcode scanner has established itself as an indispensable tool in flat glass industry and trade. From incoming goods receipts in the warehouse to status registration in production on through to delivery confirmation, data is recorded via barcode scanning and transmitted to ERP and production systems.

However, the industrial scanner as we know it is quickly becoming obsolete. Mobile end user devices, such as the smartphone and other smart devices equipped with the **A+W Smart Companion** app, are doing the industrial scanner in.

Smartphones and other smart devices come equipped with great computing power and outstanding algorithms for handling graphics. A+W Smart Companion assists users along the entire value-creation chain and contributes to its digitalization, saving time and money.



A+W Smart Companion being piloted at Saint Gobain Glassolutions in Kreuzlingen, Switzerland

Scanning via a smartphone app is easier than with tradi-

tional scanners as smartphones offers a multitude of possibilities as well as being cheaper, too. The current smart devices are also more technically sophisticated and stable since they are produced in much greater quantities than industrial scanners. Therefore, a lot more research and development potential flows into the final product.

With its A+W Smart Companion app, A+W is demonstrating where software development is heading. Peter Kühn, Product Manager at A+W, said, "The use of various scan functionalities with current smartphones and other smart devices is already a reality. The A+W Smart Companion can fulfill all of a flat glass companies' requirements without the disadvantages of traditional scanner hardware. The user replaces very specialized, expensive hardware with a familiar mobile device that we use all the time. Therefore, much less training is required."

Thomas Uhlemann, WCM Coordinator at Saint Gobain

Scanning of edge bond labels using the continuous mode of A+W Smart Companion



Glassolutions in Kreuzlingen, Switzerland, is piloting A+W Smart Companion in insulated glass production and is enthusiastic about the new solution: "In my opinion,"

said Uhlemann, "this is a quantum leap as compared to the old device – it's the simplicity of the device itself, and the user interface is kept very clean. You can select everything right away, the camera mode, the read mode, and it is precisely this ease of operation that is very important for our production workers."

As an alternative to the smartphone, Saint Gobain Glassolutions Kreuzlingen also operates the A+W Smart Companion on a Zebra smart device, which has an integrated 2D barcode scanner.

A+W Smart Companion can also be used as a mobile info terminal. Employees can use it to display the locations of order components and the content of racks since communication becomes bidirectional.

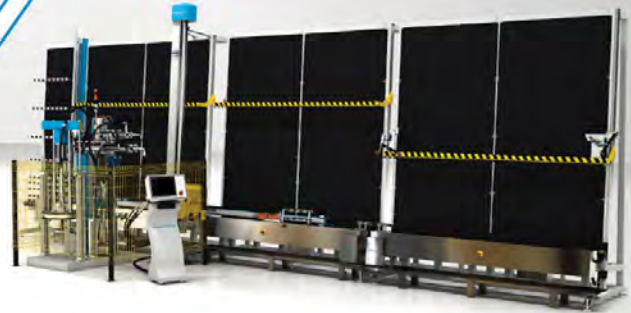
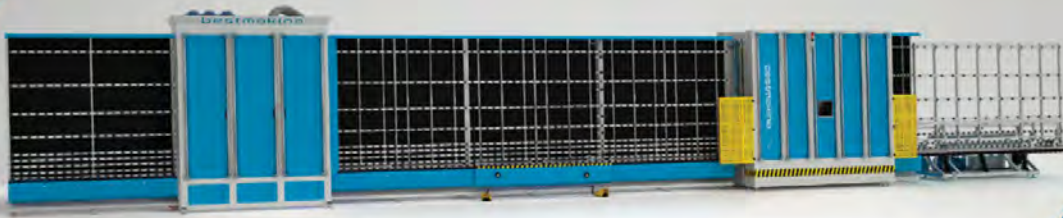
Invalid bookings due to incorrectly read sequence on the barcodes are now impossible since A+W Smart Companion guides the user. Additionally, the read quality is much higher. Another advantage, A+W Smart Companion can scan several barcodes at once, for example, edge compound labels on a rack. This saves a lot of time making work more productive and reducing errors.

This clever A+W app is an example of digitalization with the greatest practical value – a small piece of Industry 4.0. Intelligent apps like the A+W Smart Companion will make your processes faster, more secure, and cheaper – and in the end, that's what counts in a smart factory.



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HEGLA, GLASTON AND BYSTRONIC

New industry standards at Regency Glass

An investment in machinery and equipment from three of the UK's leading machinery suppliers, will take one the industry's foremost IG unit manufacturers to a next generational level. **HEGLA, Glaston and Bystronic glass** recently completed a state-



A HEGLA Optimax and EcoLam Plus laminated cutting line with Rapidstore has been installed to simplify the old glass warehouse system, which could take operatives hours to find the right glass type for a special project. Regency can now store 22 different glass types as well as standard bulk products that can be accessed easily, giving operatives in the cutting department an easier way to select lower volume specialist glass types when required. From a health and safety point of view this also ensures greater protec-

tion for people working on the production floor. of-the-art installation at **Regency Glass**, which firmly places the company as a main player in the sealed unit supply industry.

Based in the Northwest of England, the specialist glass manufacturer has made a firm commitment to customers through this investment. This has enabled Regency Glass to both future proof the business and reinforce the qualities associated with the Regency brand.

For an installation of such a high calibre the planning had been meticulous with CAD drawings and discussions with suppliers beginning back in early 2018. Subsequently, all new systems have now been successfully installed in the new 100,000 sq.ft. production facility that was originally bought in 2017 and is three times the size of the old manufacturing unit.

For Regency Glass customers it demonstrates strength and security in what can be a volatile market. The superior capabilities of the HEGLA, Glaston and Bystronic glass brands were well known to senior management with previous investments having been made which have shown their worth and resulted in the substantive investment.

Two high-speed Galactic glass cutting lines from HEGLA have been installed with automatic double-sided loading carriages as well as an integrated laser system and auto X breakout. This

will enable the company to simplify production by stamping standards and dimensions onto the glass, with the laser also used for toughened logo marking on high-performance glass coatings.



tion for people working on the production floor.

This investment has more than doubled the company's storage capacity and still leaves plenty of room for Regency Glass to grow. With more glasses, customers will be supported in their own business development and diversification strategies.

Darren Beazant, Managing Director, Regency Glass, said, "The cutting tables from HEGLA together with Bystronic IG lines and auto arassing are a big part of our future and will feed the factory's growing volumes for many years, providing an excellent capacity level moving forward."

The increased cutting capacity means that glass storage has also been increased, which at current values allows for a full stock complement of 6-8 weeks.

With uncertainty over Brexit and the changes that may ensue, this has future-proofed capacity and will override any supply issues that Brexit could cause.

In addition to the existing Bystronic glass IG line installed a number of years ago, Regency management commissioned the installation of two 2.7m high-volume production lines complete with tandem gas presses and automatic pad applicators. The twin press system is combined with a high speed sealing robot which has increased product volume by 40%.

A 2.7m high edge seaming line from Bystronic glass will now feed the new toughening plant. Together with the 6m x 2.8m new toughening furnace, this will allow the company to diversify its range significantly and will give Regency a 25,000+ unit production capacity per week.

Since machinery and equipment installation was completed, output has already increased and given customers a greater choice.



Steve Goble commented, "The challenge was to supply a system capable of holding a large range of glass types whilst automating the cutting process to achieve greater throughput and reduced cutting time."

Another essential component of this major Regency Glass investment included the Glaston FC Series tempering line. The toughening furnace is twice the size of the existing furnace at the old production site. What took 24 hours to manufacture previously can now be completed in one shift. The furnace has greatly simplified production and given Regency Glass the ability to speed up orders to meet customers' requirements.

The Glaston brand is not new to the company. Regency's first Glaston furnace was a Tamglass HTF installed in 1997. It gave the company nearly 17 years of good service. Then in 2014, the new Glaston FC500 tempering furnace was selected as a replacement. At that time, the new machine doubled the company's tempering capacity, whilst significantly boosting its glass quality.

"Based on our experience with *Tamglass*, we knew what we were getting. There's really nothing better. The FC500 furnace is the best on the market. It toughens faster and allows us to serve customers better by suiting their volume requirements as well as providing them with a wider range of glass products," Steve Massey, Director of Sales and Marketing for Regency Glass, commented at the time of the previous investment.



This time, the newest FC Series 2860 tempering line is set to bring the company's glass strengthening capabilities to an even higher level, supporting its overall growth strategy.

The HEGLA system provides the fastest, fully automated cutting capability of its kind on the market today, with the tables working together to cut a variety of coated and sized glasses faster than ever before.

The technical benefits and cost savings provided by HEGLA, Glaston and Bystronic glass were evident given the companies' combined history.

For Darren Beazant the payback advantages are already proving beneficial. He said, "There is complete synergy in respect of all new equipment, so we are now realising the potential of our investment in our machinery and system suppliers."

As a project, the HEGLA, Glaston and Bystronic glass solutions enable Regency Glass to achieve excellent results and lead the sector moving forward.

Darren Beazant continued, "With the new equipment we can further strengthen our market position. Training from the specialist engineers proved invaluable and has ensured a smooth transition from initial installation to the recent final handover. It is a very special project that is focused on being able to adapt to market demands for many decades to come."

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KEANAT AND LISEC

20-year jubilee

The history of **Keanat** stretches back to the year 1890.

It was during that year that the Indian company was founded by Farhat Kamil, and it plays a key role in the shape of the country's glass industry to this day. Building on the central pillars of the company: human endeavour, entrepreneurial initiative and a tireless commitment to quality, today the 6th generation is at the helm.

Keanat Glass Industries, located close to Delhi and employing around 250 members of staff in two factories, has a product range covering from tempered high-performance architectural glass, laminated glass and frameless glass façades, as well as glass sheets for interior and exterior living areas, right through to innovative products such as intelligent glass (light-impermeable at the touch of a button) and LED mirrors for the Indian market. Consultancy is a fundamental service of the company and is delivered by a separate branch office with a special showroom for customers.

1999 saw the company invest in a machine for the first time in its history – the first insulating glass line was purchased from **LiSEC**. And this was not the only première – this insulating glass line was also the first LiSEC machine to be imported into India from Austria.

The signs at that point were good. With this procurement, Keanat took the first steps in the direction of glass processing. This market was not yet mature and there were no limits to the possibilities in the field of insulating glass in particular. The demand was there, as was the desire for faster reaction times from suppliers. The customer base established by Keanat at that time still remains today.

Keanat could only profit from LiSEC's many years of experience in glass processing. The precision with which the newly created LiSEC insulating glass line processed products constituted a quality milestone for the customers of Keanat.

Keanat is now operating two insulating glass lines, two cutting lines and the software program `gps.opt` from the LiSEC brand and the company is highly satisfied. The jump from a pure trading enterprise to a processing operation could not have been bet-



ter supported in terms of both machinery and software.

Despite the hotly contested market, Keanat continues to work tirelessly towards the corporate vision: to become the industry leader in the Indian glass sector and to impress its customers with satisfaction and pleasure in its products. With the mission of offering a broad spectrum of modern, top quality products, it wishes to satisfy the varying requirements of its customers at a high quality level and create added value.

The most recent company acquisition in pursuit of its aims was a glass cutting line for jumbo formats from LiSEC. This investment has resulted in a huge rise in productivity. The increased output with enhanced quality and the highly automated processes on the machine itself deliver a significant competitive advantage. Through the automation of a greater number of work steps, it has been possible to reduce the personnel working on the machine by 20%.

As a complete supplier, LiSEC stands available as a reliable and trustworthy business partner for Keanat. An additional insulating glass line for the second factory is already under consideration.

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Whether it concerns model window panes with extreme radii, portholes that are several centimetres thick or quadruple insulating glass units, hardly any glazing units leave the *Porta Glas Design* factory without **Edgetech's** flexible Super Spacer® Warm Edge spacer system – some 600 kilometres a year – and it is an upward trend.

This is because the main clientele, i.e. the market for high quality tailor-made entrance doors, is growing at a stable rate. At *Porta Glas Design*, in fact, is in operation an insulating glass line unique throughout the whole of Germany is operating to facilitate the fulfillment of individual customer requirements even more rapidly and economically.

The front door market has, in the premium-price segment, always been a market which focuses on customisation as opposed to mass produced items. The customer has his customised door assembled by a component trader or a carpenter. Wooden, aluminium, steel or plastic, brushed, powder-coated, glazed or lacquered doors in various colours, with glass elements or stainless steel applications, doors that are particularly burglar-proof, thermally insulated or soundproofed – there are virtually no limits to customers' wishes. The receipt of the order by the front door panel manufacturers sets the downstream delivery chain in motion within the shortest space of time.



Virtually every single glazing unit is unique

The factory continues to make use of traditional glass making skills. Triangles, ellipses and any freeform designs are mounted here to form insulating glass units. In the case of front doors with

glass elements, the warm edge with all its advantages represents an additional selling point.

The range of finishing options is also something to behold: laser engraving, customised sandblast matting effects, application of stainless steel, integrated LED light, Swarovski crystals and glass applications, paintwork, facet grinding, Tiffany glass, domed glass or fusing effects and upon request the house numbers, the company logo and customised sample requests can be produced. Every trainee at *Porto Glas Design* does of course also learn how to manufacture genuine lead glazing.

Set against this you will find high-tech in the neighbouring hall, in the form of a LiSEC insulating glass production line that is unique throughout the whole of Germany. It is designed for the economical manufacture of double to quadruple standard glazing units that are up to 100mm thick.



The insulating glass production is designed to cope with the greatest possible variety of glass sizes

Depending on the order received and the customers' requests, extremely small formats ranging from sizes of 130 x 230mm to large formats of 1,500 x 3,000mm for fully glazed side sections are run through the machine. The manufacturing process is fully automated, ranging from the washing, drying and sorting to the application of the spacer, the filling of the panes with gas, the compression work and the sealing.

"We only provide the glazing that has been cut to size. All the variable parameters such as the size, thickness, pane structure, required spacers and the jointing compound applied are record-

ed in the production system, the automatic line subsequently processes each glass format and without any need for manual intervention."



© Porta Glas Design

The applicator accesses eight different Super Spacer® widths in parallel

Highly flexible solutions are required for this ingenious variant management system. In this way the application robot can access eight different widths of between 8mm and 24mm of Super Spacer® T-Spacer™ Premium Plus in parallel without having to change a reel from the stock magazine. The automation is also one of the things that guarantees such a high level of quality. Not even the smallest error in the glass will be tolerated, not even the smallest spot may be visible on the spacer.

Edgetech has only just celebrated its 30th anniversary. It has been supplying Porta Glas Design for 22 of those years. The glass finisher already opted in favour of Super Spacer® within a year of being founded. Joachim Stoss, managing director of Edgetech Europe GmbH in Heinsberg, is of course delighted about this. "Our Super Spacer proved itself to be extremely flexible in three respects," according to Joachim Stoss. "The foam-based material composition facilitates its precise application in parallel, and adapts to the pumping motions of the insulating units caused by the weather. Thirdly, it provides the necessary flexibility for the automated manufacture of series and variants."

All the well-known machine manufacturers offer solutions for the automated production of insulating glass elements using Super Spacer® systems, which also streamlines the entire manufacturing process. Steps such as the cutting to size, bending and filling of the spacers with desiccant are no longer required.



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HEGLA

First production site outside Germany

In a jovial, buoyant atmosphere, the representatives of the LEWAG Holding AG Executive Board, Jochen Hesselbach, Frank Schürmann, and Andreas Wiegman, **HEGLA** Group CEO Bernhard Hötger, and **HEGLA** Corp. CEO Elmar Zeidler laid the cornerstone of the new production site while Mayor Anthony Ford, the entire **HEGLA** Corp. team, and other officials and people involved in the project looked on.

Since the establishment of **HEGLA** in Germany in 1976, which was followed in 1995 by that of the **HEGLA** Corp. and a series of other sales and service branches, **HEGLA** has grown to become one of the world's leading providers of high-quality machines and systems for the flat glass industry. North America (USA, Canada, and Mexico) is **HEGLA**'s biggest export market, and **HEGLA** Corp. recorded more than 35 million USD in sales in 2018.

"**HEGLA** Corp. plays a huge role in our success, and they have proven their importance to the **HEGLA** Group as a whole. This has encouraged us to strengthen our presence in North America so that our customers here can enjoy more efficient access to our resources and the same reliability we provide throughout our Group," declared Jochen Hesselbach, Chair of the LEWAG Holding AG Executive Board, in his welcome speech. Hesselbach went on to explain that the new US headquarters in Stockbridge would further improve the subsidiary's existing service network and customer contact, saying that the local production facility would allow **HEGLA** Corp. to assemble and commission machine components shipped over from Germany on site.

"As the number of machines in the US market that are running every day increases, we are also seeing a boom in our service and spare parts business. Many of our customers expect **HEGLA** to be available 24/7, and we always strive to meet that expectation," said Hesselbach.



Animation of the future **HEGLA** Corp. production site in Stockbridge, Henry County, Georgia (USA). Animation: SteelCo Building Inc.

The representatives of LEWAG Holding AG and the **HEGLA** Group wanted to find a location close to the current **HEGLA** Corp. headquarters in Forest Park. The local authorities in Stockbridge were very helpful in this search, promising to make the planning permit process as quick and easy as possible – a promise they more than delivered on. The general building commission has been awarded to SteelCo Buildings Inc., a firm known for the reliability and thoroughness it applies to its projects. Everyone is looking forward to a fruitful partnership that will enable them to complete the construction project together with SteelCo Buildings Inc.

The building, which will have around 3,050 m² of office and warehouse space, is due to be completed by April 2020. The grand opening ceremony, which will include a live demonstration of the final assembly process for customers and interested visitors, will follow in May.

"Over the course of the next 12 to 18 months, we hope to create around 30 new jobs at the site, thus bringing the **HEGLA** Corp. workforce up to almost 50 employees," explained Bernhard Hötger, CEO of the **HEGLA** Group. The aim will be to keep expanding the production site; hopefully doubling its size in a few years' time.

"We would like to take this opportunity to thank everyone for their dedicated support – we wouldn't have been able to get this project off the ground so quickly without you," said Jochen Hesselbach at the conclusion of his speech. "We look forward to watching our new **HEGLA** site grow."



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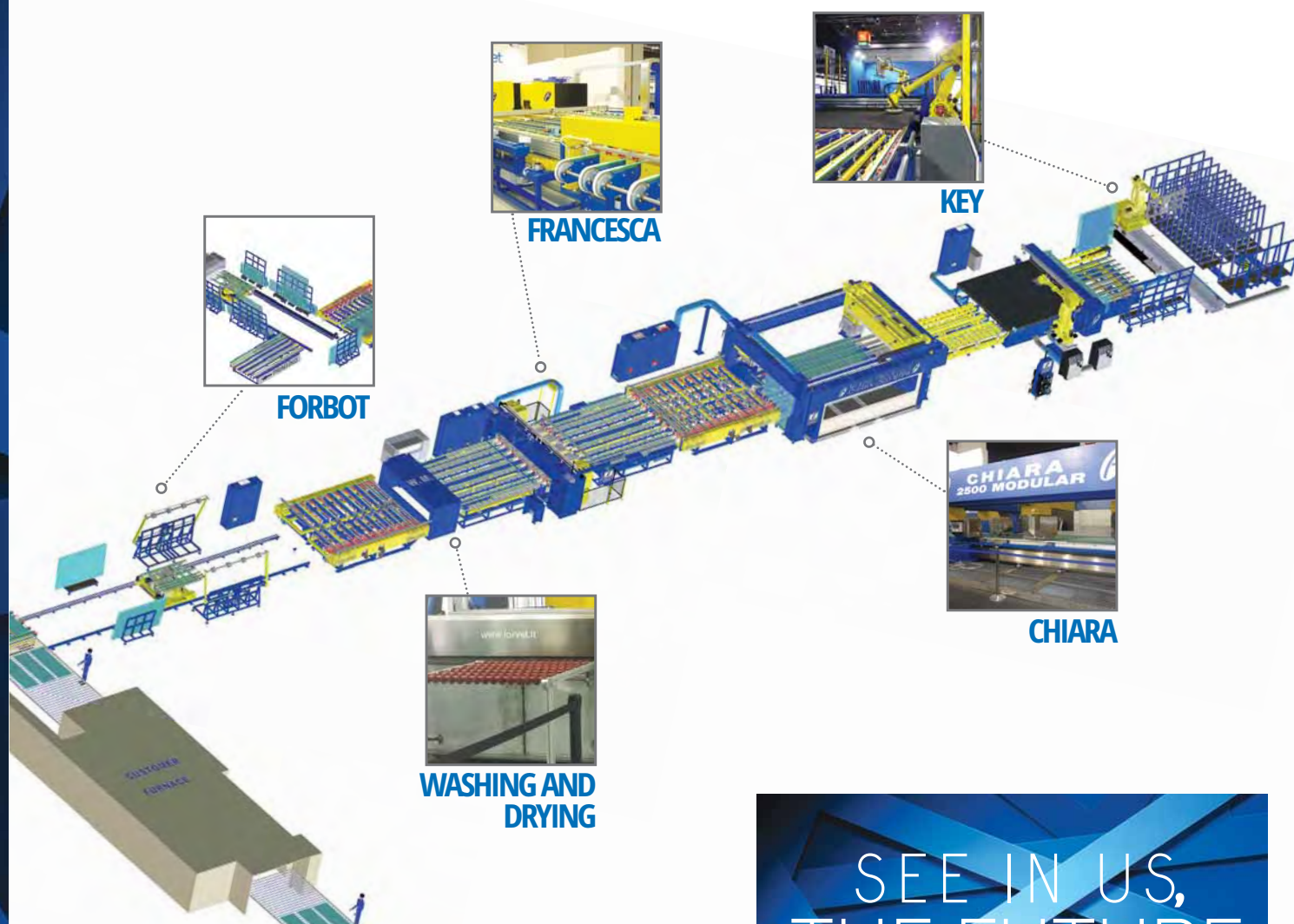
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IOCCO

Increased capabilities with new headquarters and production unit

IOCCO has announced that it is now operative at its new location, originally set up to increase the production area in Vasto, central Italy.

The new premises of 8,200 sq.m., now also houses its offices and production area, providing better management of areas but, above all, the possibility of construction, assembly and testing of entire production lines.

In fact, in the auto glass industry, the trend is that of connecting all production processes so as to obtain in-line production starting from the raw glass right up to the finished product, ready to be installed in vehicles, while the flat glass sector is also requesting production lines that are more and more autonomous and dynamic.

Therefore, the need to test particularly lines that are both complex and occupying considerable space, has led to the decision to move all company departments to the Vasto premises, which are located on the industrial area, near the A14 motorway (Vasto-Nord exit), and easy to reach the nearby Abruzzo International Airport (Pescara) just 60km away. Moreover, the commercial



port of Vasto (Punta Penna) and the railway station (Porto di Vasto) are very near to the company.

Last but not least, energy consumption has been optimized in the new plant, proceeding with an energy efficiency intervention in the offices and using renewable energy coming from photovoltaic panels placed on the roof of the building.

IOCCO's registered office remain in Cupello, where assembly also takes place together with the Montediorisio plant. These three locations now enable IOCCO to build and manage the most diverse projects, maintaining, at the same time, the privacy of each and every client and their projects – a fundamental aspect of IOCCO's way of working.

New headquarters: Viale Unione Europea, 36 Vasto 66054 Italy
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IOCCO
glass technologies

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Continuous training in new industrial technologies is a daily activity performed by IOCCO's engineers in fields of robotics, vision systems, mechanical/electrical design, software programming which is achieving a usability of systems supplied, never reached before; it means smarter and easier management of automation on equipment and lines, efficiency on production and improvement of results.

The R&D department has developed, starting from two years ago, a full automatic process to assembly the new generation of ultrathin windshields and big sunroofs for automotive in order make possible the production on a large scale industry. This goal has been possible thanks to the reengineering of its own automatic assembly system, vacuum deairing system and added value processes which usually are the bottle neck of OEM automotive glass processing.

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SALEM DISTRIBUTING COMPANY

Acquisition of HHH Tempering Resources

Salem Distributing Company, Inc., headquartered in Winston-Salem, NC, USA, has announced its acquisition of HHH Tempering Resources, Inc., a glass industry technical team and fabrication machinery provider.

HHH Tempering Resources is now a wholly owned subsidiary of Salem Distributing Company, Inc. (Salem). With this move, Salem substantially increases its foothold in the flat glass industry it serves as *Salem Flat Glass & Mirror* and it makes Salem the standout leader through its offerings of the largest equipment, supply and service line-up found in the glass industry.

The acquisition is a strategic move in Salem's greater vision of providing the glass industry with innovative solutions and unmatched service. CEO/Owner of Salem, Mike Willard, stated, "Our core focus is to grow and enrich the quality of our employee-owners' lives while delivering success to our customers. The acquisition of HHH will expand these efforts and help us achieve our goals of growing our company while staying customer focused, accountable and solution oriented. We believe the great reputation for quality products and technical service that HHH has built is a fit for the Salem family."



HHH will continue providing industry-leading glass tempering machinery and technical service. Mike Synon, HHH President/CEO as well as the rest of the HHH technical and leadership teams will stay intact. Mike Synon is quoted saying: "We're excited to join forces and become part of the Salem family. The entire HHH team looks forward to continue serving the needs of North American fabricators."

HHH headquarters will relocate to Winston-Salem, NC following the acquisition.

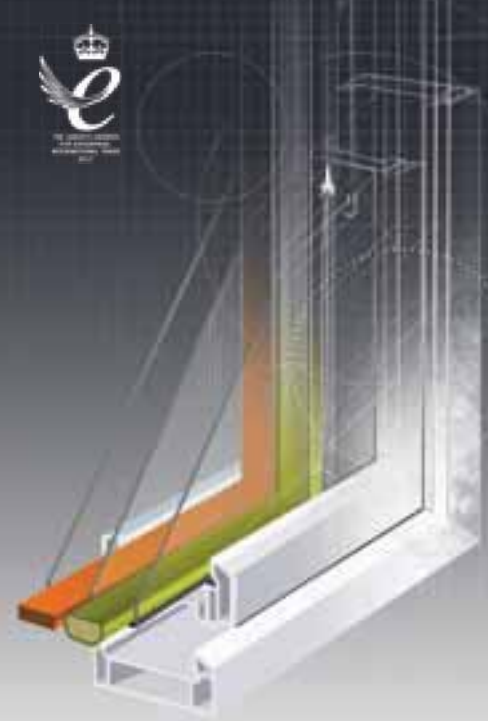
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ADELIO LATTUADA

New progressive lubrication system

Adelio Lattuada has announced the release of its new progressive lubrication system in which the lubricant is pumped into a single input of a 'progressive distributor' and is volumetrically divided into a number of points by the progressive movement of the pistons arranged in sequence. The valves of the distributor are in series with each other, that means that each piston can supply the lubricant only once the previous one has completed its dosing.

An obstructed dispensing point, or a faulty component, will cause the end of operation of all connected progressive dis-

tributors. A sensor will signal the alarm, and is necessary only to check a single element to detect the fault in the line block. One of the major advantages is that allow more control over the correct operation of the entire system and individual outlet points, not just the oil level and the correct operation of the pump.

The new system will then be managed with a new logic based on two different processing parameters of the conveyor, both empty and full.

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BOVONE NORTH AMERICA

New branch for North American markets

Bovone, an Italian manufacturer of solutions and technologies for the second processing of flat glass and natural and synthetic stones, announces for 2020 the opening of a new branch in the US intended to serve the North American markets.

The strategic decision to open the new headquarters is aimed to respond to market demand, in synergy with Bovone's technology distributor in the area, Salem Distributing Company. The new headquarters will consolidate the presence of the brand in a market that, year after year, continues to value "Made in Italy" technologies.

The location of the American headquarters is North Carolina, a state with a rich history in the furniture industry (it is the largest manufacturer of residential furniture in the US), a leading sector for glass. In addition, North Carolina has ranked as one of the top five pro-business states by the US economy and finance magazine, Forbes.

The company has finalized the purchase of the building, where areas will be divided and organized to accommodate commercial offices, a spare parts warehouse and a mechanical workshop for overhauls. The new headquarters, 100% operational by 2020 onwards, will be strategically located to best serve customers from a logistics perspective.

The networking initiated by the company during the due diligence phases of this intense site location process, has generated numerous relationships with main universities in the state, that are critical for the training and skills needed for the recruitment of motivated and competent employees. Staff will be guided by a precise and clear vision, based on the principles of providing excellent customer service to existing commercial clients along with actively developing new prospects. With this new location, Bovone will be able to guarantee faster response times and even more efficient sales support as the company will be investing in sales support activities in line with the demand for quick, accurate answers to questions from its customers. Investing in sales support activities will be the key to the success of a product already widely recognized and appreciated.

"We are excited about this new venture," said Federica Bovone. "Bovone has been successfully selling its machines in the US for 45 years and the time has come for us to expand into this market with a physical location so we can continue to effectively and efficiently meet the demands of our loyal customer base. Thanks to all who made this project possible and a special thank you to the local economic development organizations and the Economic Development Partnership of North Carolina who helped us navigate this complex process."

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Bottero

New logo and dual identity for products on show at Vitrum



With a company mission of innovation since 1957, Bottero has also continued to invest in R&D to maintain its technological leadership. And its new brand identity fully represents Bottero's core values and its ability to innovate.

Davide Cigna
Sales Director
Bottero

With more than 60 years of experience, Bottero is the ideal partner for the production of machines and glass transformation systems, always offering reliable and innovative products, and always attentive to the needs of its clients.

Thanks to its many available products and top technical performance, along with the quality of its customers service and 11 branches in 7 different countries: Italy, Germany, the UK, France, the US, Brazil and China, Bottero products have reached most countries in the world.

PRODUCT DEVELOPMENTS AT VITRUM

At Vitrum 2019 Milan, one of the most competitive

Italian and European exhibitions dedicated to one of the most extraordinary materials - glass - and its endless applications, Bottero will be presenting its latest achievements in terms of technology and know-how. At the event, the company will have on show a dual line for float and laminated glass cutting and a CNC machine, as well as its new flat edge double edger.

Dual line

The dual line is a combination of the machines 363 BCS and 548 LAM, to cut and break-off float and laminated glass. A combined line of the two products represents one of the sector's most innovative and most effective solutions. 363 BCS is a float glass cutting table available with accessories for low-E surface removal, automatic selection of the cutting pressure and shape

scanner. 548 LAM is the latest and most advanced cutting and breaking-off system for laminated glass; its many features, among which the automatic rotation device and PVB cutting with automatic blade, guarantee innovation and high performance.

CNC work centres

Regarding CNC working centers, the new PRATICA platform will complete Bottero's current range, which offers solutions for glass sheets up to 18 meters long. PRATICA Platform is the evolution of the well-known PRATICA PLUS which is equipped with many technological advancements, such as the new IoT system to manage selfdiagnostics, and the documentary training section supporting the operator. The machine is available in 3300 and 4000 sizes, and both 3 and 4 axes

versions are equipped with the new high-performance pressurized spindle.

Double edgers

Last but not least, the third product presented at Vitrum is the new Bottero double edger. This new machine includes the well-known features of Bottero's TITAN and TWO-B models, boosted up in a new all-in-one scalable and modular platform, creating the perfect synthesis of all market requests. With up to 17 spindles per side, the maximum available on the market, the new double edger allows to create every possible configuration and allocate multiple processing to the same machine. Additionally, every type of corner dubbing, including round corners and chamfers is available. Finally, the equipment is upgradable in opening size and number of spindle

wheels even after installation, permitting to have multiple different productions, still years after the installation of the machine. Thanks to the compliance of Bottero machines with Industry 4.0 most recent requirements, the double edger by Bottero can be easily combined with integrated lines, washing machines and other processing machines to create automatic production lines with almost no operator around, what Bottero calls Bottero 4.0 made easy.

OPEN CONNECTION SOFTWARE

Having an open connection software, all Bottero equipment can be interfaced with any other third-party equipment, from insulating glass lines, tempering furnaces, to vertical and horizontal machines. Moreover, since Bottero cutting products are the



most common in the market, most software companies have already developed dedicated customized protocols jointly with Bottero, for hassle-free integration of the optimizers and MES. In this fast-changing glass market, the new challenges for glass fabricators are to keep pace, raising productivity and staying competitive. This involves investing in new equipment, in parallel with rethinking the workshop organization towards a leaner model - where Bottero's products are the perfect solution to solve these issues.

REBRANDING

The changes in our world are deeper than ever, due to the scale and speed of digitalization and industrialization. At the same time, new technologies challenge us to redefine the way in which we conceive and live our lives.

Since 1957 Bottero has been making innovation its mission, investing in R&D to maintain its technological leadership. This is why today, with no whims and with the determination to excel that has always characterized it, Bottero decides to change, to have a brand identity that fully represents its core values and its ability to innovate.

Bottero is the only global leader in the world of glass technology to operate with both flat and hollow glass. However, not all its customers are aware of the potentiality and the scale of Bottero's products. With more than 50,000 installations over the world, in over 100 countries, Bottero is the unmissable partner to produce machines and glass transformation systems. With its unique organization model, divided into three distinct business units, flat glass, hollow glass and

engineering, can be present on the market in a curtailed way, serving small and medium glass factories but also big industrial implants with products capable of producing up to 8 million bottles per day.

Thanks to its extensive machinery catalogue it can cater for the needs and the latest tendencies of all segments of the market, covering for example 100 per cent of the European market for laminated glass and 90 per cent of the global market.

This constitutes both a huge responsibility but also a great privilege and a badge of honour for Bottero.

This unique feature is expressed in its new logo: the dual identity of Bottero is represented by the two overlapping shapes, evoking the dual soul of the firm. The two souls are fused together to give life to a unique technologi-

cal result, embodied by the pureness and transparency of white and the presence of the letter B. The logo is also an expression of everything that Bottero represents: innovation, dynamism, solidity and clarity.

Rebranding therefore symbolizes the will to show all our stakeholders, clients and employees that our actions are guided by Bottero's values, grounded in our history and leaning towards the future.

Bottero SpA



BOTTERO

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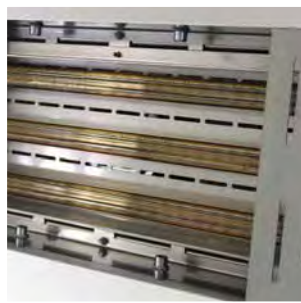
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	Crosslink (%)	>87	0
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	Open edge delamination	Perfect (20h)	Defects (8h)
Sound control	Sound Insulation (dB)	37	34
Production process	Investment in machinery	↓	↑
	Energy cost	↓	↑
	Raw material cost in Tempered Glass (mm)	0.76	1.52
	Storage – Manufacturing (°C/%)	T<35/HR<80	T<20/HR<30
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	Adhesion a 50°C	120N	



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LiSEC

A WIN-WIN
SITUATION - SPEAKING
TO HARBIN SAYYAS



Keren Bian, the deputy GM of SAYYAS, gives insights into his experiences and expectations of LiSEC

LiSEC not only ensures productivity but also reaches the production standards at a very high level

Harbin SAYYAS Windows Co., founded in 1998 in China, is known as the pioneer and market leader in development and production of wood-aluminium windows. The company is the first wood windows producer to be authenticated by the PHI (Passive House Institute). This article is a short interview carried out by LiSEC.

SAYYAS has three production plants with a total area of 40,000 m² and reaches an annual production capacity of 200,000 m² consisting of window series, door series and ecological window and door systems for passive construction.

In addition to the domestic market share of 25 per cent, SAYYAS wood-aluminium windows are exported to the US, the UK, Canada, Russia, Australia, Japan and several other countries and regions. Under its mission statement "better life, low-

er energy consumption," SAYYAS devotes all efforts to developing and producing the most energy-saving wood-aluminium windows, in the world's most energy-saving factories.

Keren Bian, deputy general manager of SAYYAS, sat down with us to talk about his experiences and his expectations of LiSEC.

COOPERATION WITH LiSEC

LiSEC: When and why did you start working together with LiSEC? How would you describe the partnership?

Keren Bian, deputy general manager of SAYYAS: Our cooperation with LiSEC started with the purchase of the first glass cutting machine in 2002. I was deeply impressed by the outstanding quality of the advanced LiSEC products and services. LiSEC not only ensures the desired productivity but also creates a very high level of production standards. Generally LiSEC's high-quality machines and innovative solutions have contributed greatly to the expansion of our markets as well as our brand awareness. For me personally, getting to know the LiSEC employees in charge of the projects was a definite bonus. Through those different perspectives, I gained a better understanding of the machine production process as well as the LiSEC brand concept.

During our cooperation with LiSEC we have improved our reputation in the industry and become a prominent brand in our segment.

The mutual trust, as well as LiSEC's firm position on quality and respect for their customers, are the foundations of this 16-year partnership, which has been confirmed as the right choice!

LiSEC: Which LiSEC products has SAYYAS purchased? What is your assessment of them?

Keren Bian: We have purchased numerous glass processing machines from LiSEC: besides the glass cutting table we have purchased the KSL connected to the table, as well as an insulating glass production line. Since the start of our partnership, all lines and machines have performed very well and they are still in excellent shape. The machinery allows us to keep up with the rising technical standard while ensuring high levels of quality and energy saving, which we consider crucial.

Our successful partnership will continue as SAYYAS just invested in a new IGU line as well as LiSEC's bending machine with zero-radius corner technology.

INCREASED PERFORMANCE, REDUCED WASTE

LiSEC: What issues did SAYYAS have to deal with,

and what kind of solution could LiSEC provide?

Keren Bian: The LiSEC solution with automatic breaking direction for trim cut removal and 3 point technology for X, Y, Z breaking helped us to reduce manual work and simplify processing. Our performance increased at least by 20 per cent and the wastage rate decreased by a remarkable 50 per cent. LiSEC also supported us with accompanying services that enabled our technicians to familiarize themselves with the machinery very quickly. Therefore, the equipment integrates perfectly and with high efficiency into the production process, which really helps us to improve the productivity of doors and windows. This combination of products and services was the perfect solution for us.

LiSEC: From your perspective: why is LiSEC the leader in the industry?

Keren Bian: The ability to reflect on themselves – beyond their development potential and limits – is decisive for staying competitive. The industry does not lack excellent brands, but a leading position requires a company to think outside of their own range and to broaden their horizons. In my opinion, LiSEC continuously pursues technical breakthroughs with their innovations and never loses focus of the relationship between product and user, as

well as between their products and the environment.

LiSEC: Which aspect of LiSEC do you appreciate the most?

Keren Bian: LiSEC's cus-

tomized products have earned my respect. To meet our high quality requirements for triple IG products, inspection is important and indispensable. Last year, when we considered

Cooperation between SAYYAS and LiSEC started from 2002





investing in a new IG line, the LiSEC sales team suggested installing two frame mounting stations, where the second frame mounting station can be used as an inspection station. This

increased our performance by 20 per cent. From my point of view, LiSEC's efforts are very valuable. The company considers the user experience in relation to increasing the quality in order

to create more and more customized products. I do believe that LiSEC will continue to amaze us.

FUTURE DIRECTION

LiSEC: Into which direction

will SAYYAS go? And what role will LiSEC play on that journey?

Keren Bian: We want to produce the most energy-saving wood-aluminium windows using the most



LiSEC

LiSEC, with headquarters in Hausmening/Amstetten, is a globally operating group, and has been offering individual and complete solutions in the field of flat glass processing and finishing for over 50 years. The service portfolio includes machines, automation solutions and services. In 2017, the group, with around 1,300 employees and over 25 locations, generated total revenues of around EUR 230 million, with an export rate of more than 95 per cent. LiSEC develops and fabricates glass cutting and sorting systems, single components and complete production lines for insulating glass and laminated glass fabrication as well as glass edge processing machines and tempering machinery. With reliable technology and intelligent automation solutions, LiSEC sets standards in quality and engineering and significantly contributes to the success of its customers.

 LiSEC Group

LiSEC

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efficient plant in the world. We hope to remain true to our key philosophies – modern functions and natural products, which satisfy people's growing psychological need to respect and embrace nature. As the pioneer and leader of Chinese wood-aluminum windows, SAYYAS dedicates themselves to developing energy-saving external windows. We definitely look forward to cooperating with LiSEC on the exploration of the fields of energy-saving production and eco-friendly products, and to achieve a win-win outcome through pursuing a balanced relationship between humans and nature. Regarding my investment plans, I am considering the sorting and buffer system.

Our new plant in Nanjing will open next year, so I expect challenges to improve the output very soon. I think the sorting and buffer system could streamline at least 30 per cent of the operation cycle.

LiSEC: Which LiSEC product or service do you personally like most and why?

Keren Bian: During this partnership I have come to know many flawless products in terms of quality, design and service. The product that impressed me most is the insulating glass line. LiSEC's product design considers both the technical ramifications as well as the production details, allowing precise control of the end products. This facilitated our packing and

logistic procedures and has greatly reduced production time.

INDUSTRY TRENDS









LiSEC: What are the trends of the industry today? In your opinion, how could they affect SAYYAS?

Keren Bian: In recent years, artificial intelligence has created many new opportunities for our industry, and this is also the focus of our development. SAYYAS' goal is to lead this trend in our field and to bolster our superiority regarding intelligent processing and production. LiSEC's "intelligent glass processing system" is leading the industry's innovation and represents a shining example of matured research in this field.

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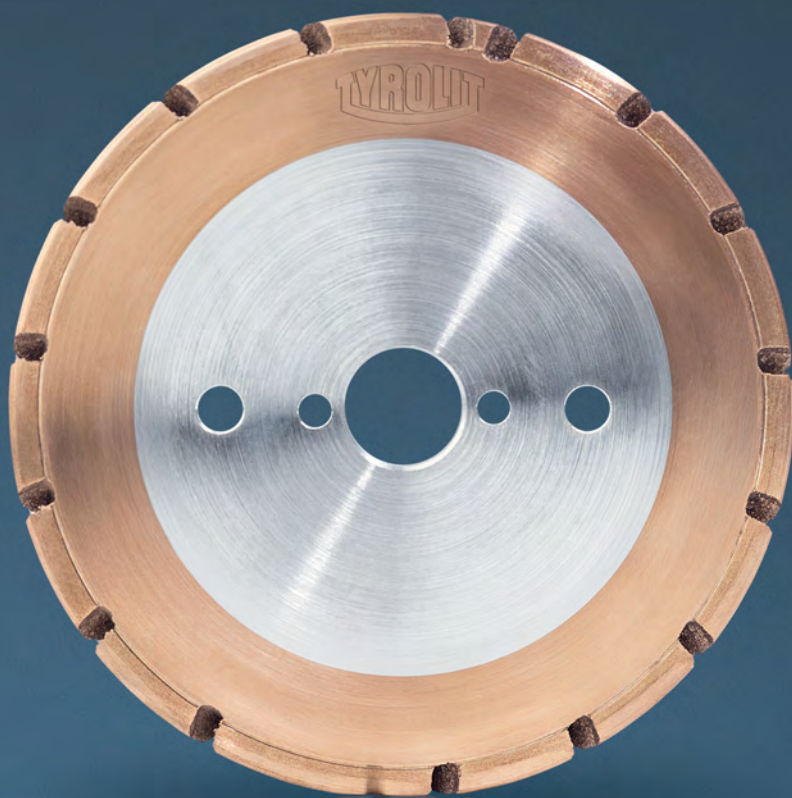


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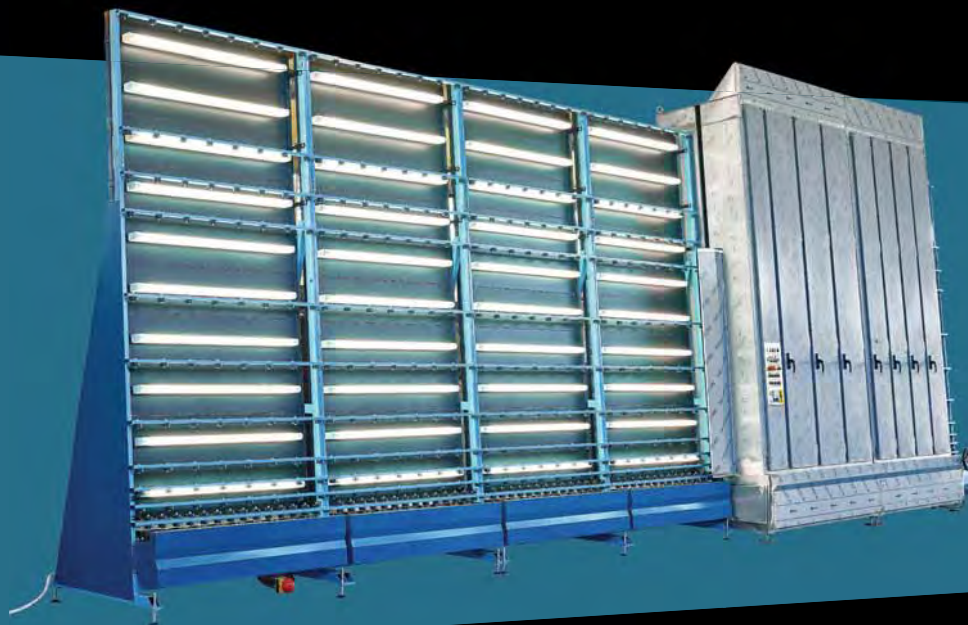
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Bernhard Hötger (HEGLA COO),
Dr Markus Schoisswohl (HEGLA New
Technology CEO), Dr Heinrich Ostendarp
(HEGLA CTIO), and Jochen
H. Hesselbach (CEO of the HEGLA Group)

The requirements of future markets, the opportunities of digitalisation, and new processes for the surface functionalisation and structuring of glass are the focus of the newly established “HEGLA New Technology” centre. The HEGLA Group headquartered in Beverungen, Germany, founded the innovation centre to expand its research and development capability and increase its innovation power.

INNOVATIVE SOLUTIONS

“Automation, interconnection, and digitalization are developing rapidly, and we are facing the ensuing challenges with our innovative solutions,” said HEGLA Managing Directors Bernhard Hötger and Dr Heinrich Ostendarp. “To work on new solutions for our customers in a more in-depth, concentrated manner, we have created a work forum that offers the necessary space for visions, experiments and innovation projects away from the daily routine: New Technology.” Strategic development will be located in the new company, while the teams in the relevant departments will be responsible for further

HEGLA

INNOVATION CENTRE FOR NEW TECHNOLOGY

By establishing HEGLA New Technology, the HEGLA Group intends to create a centre of innovation that researches and drives forward the technologies of the future, machining processes, and the opportunities of Industry 4.0 with utter focus and freedom from the company routine.

developing machines, processes and technologies.

INTENSIVE EXCHANGE AND JOINT PROJECTS

HEGLA New Technology was established as an innovation centre that takes up ideas and potential from HEGLA's individual companies and reflects on, evaluates and drives them forward. "Through intensive exchange and joint projects with HEGLA boraident and the HEGLA-HANIC software house, we have been able to clearly perceive the great, profound and supplementary potential available in open, creative collaboration," said Jochen H. Hesselbach, HEGLA Group CEO, to sum up the situation. "New Technology provides the ideal framework for innovation processes in order to try something out or include the expertise of other experts and unconventional thinkers," explained Dr Markus Schoisswohl, the Managing Director of HEGLA New Technology. The new development team is headquartered in Paderborn in close proximity to the university, and is tasked

with being the fast, flexible testing and implementation partner for the entire Group. The first concrete results are on the agenda for glasstec 2020, including new technologies for manufacturing smart glass applications with HEGLA boraident lasers.

MORE COMPLEX TASKS AND PROJECTS

Dr Thomas Rainer, the head of development there, is also pleased about the new research centre that will offer customers direct added value in future. Tasks and customer projects have become ever more complex; not only at HEGLA but also at the laser specialists from Halle/Saale and the software professionals from Bochum. "Sometimes we are asked to realise new ideas and requirements in the short term for specific projects but are unable to do so. It will be advantageous to transfer them to New Technology, where we are optimistic about our ability to develop them further

as a team and in partnership with our customers," said Dr Rainer.

"We have clearly defined our initial aims and have already started to work on them," added Dr Schoisswohl. "With our current projects, we strive to develop solutions that give customers greater transparency and more profound insight into their production processes." In particular, topics such as improving communications between humans and machines or the increasing capabilities of artificial intelligence have provided a good basis for the centre's work. In terms of content, it follows up on the ongoing further develop-

ment and modularisation of the production control systems and machine controls of HEGLA and HEGLA-HANIC, emphasised Dr Jan Schäpers, the Managing Director of HEGLA-HANIC. "Together, we define open interfaces to all providers, structure the flow of data, and interconnect systems to arrive at perfectly harmonised shop floor logistics."

➤ HEGLA GmbH & Co. KG

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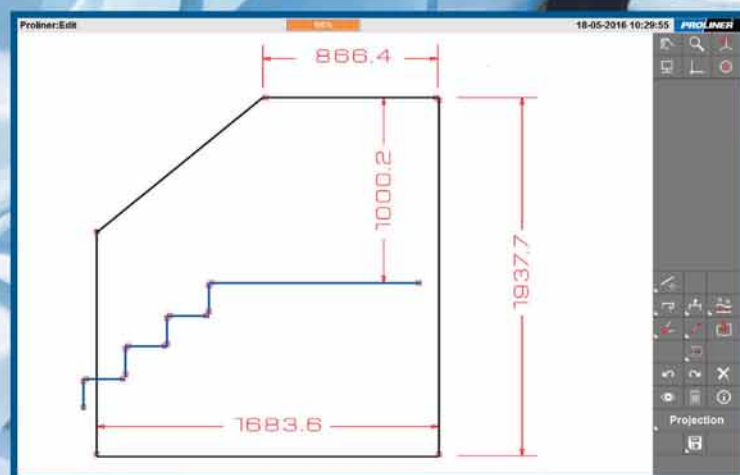


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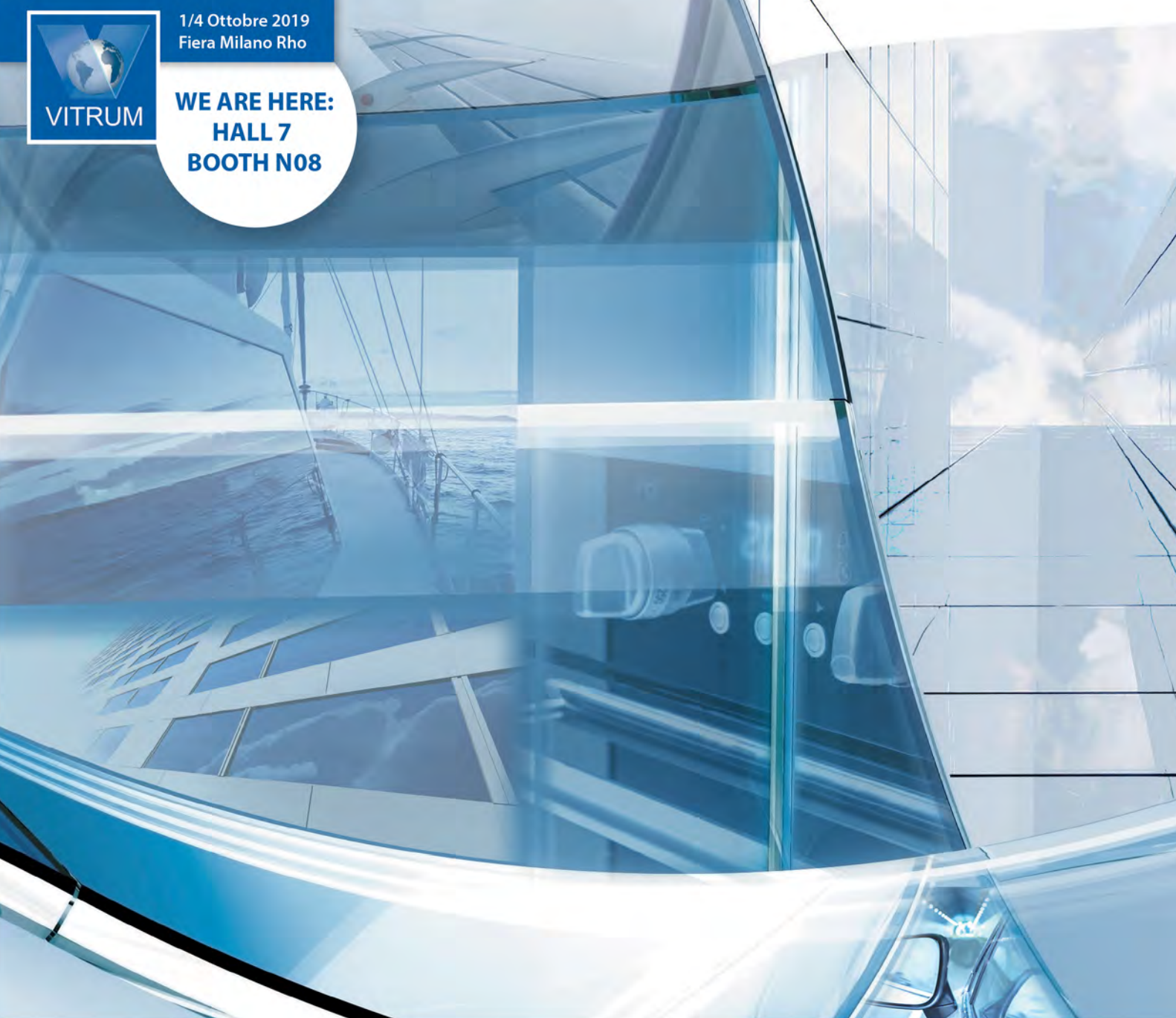
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Cugher Glass



INCREASED QUALITY
CONTROL AND PRODUCTION
MONITORING FOR INDUSTRY 4.0



With 50 years of company history and experience, Cugher is well known in the flat glass sector for its screen printing equipment. And with the continuous move towards Industry 4.0, having machinery that can not only communicate, but also automate and even anticipate production needs, is a real 'plus'!

The continuous reduction of cycle times and the improvements of finished product quality imposes the intensification of automation of both production monitoring systems and quality control. Automation and constant production monitoring are the main features of Industry 4.0, and, when applied to production cycles, artificial vision systems allow to monitor and automatically set some production parameters.

Cugher Glass, has, for over 50 years, been a reference in the market of flat glass for its cutting-edge solutions dedicated to screen printing. Thanks to the partnership with Acelabs, a company that designs and manufactures artificial automatic vision systems for quality control, Cugher Glass offers its customers the opportunity to control the glass in the best way possible and print quality in each and every detail – thanks to the very high resolution reached

by its devices – as well as to monitor and adjust the process using optical systems designed for automatic screen centring and automatic control of broken screens.

The high potential of customization and constant objectivity in evaluation make artificial vision systems the right solution to have 100 per cent automated production control.

AUTOMATIC GLASS QUALITY INSPECTION VISION SYSTEM

The quality inspection vision system, typically installed downstream from the washing machine, is able to scan the whole glass and detect any defects present, such as scratches, breakages, air bubbles, chips, contaminations, water drops, wet edges.

The system inspects raw glass or cut and ground glass through specifically designed optical technology that uses an alternate light source pattern which can detect any type of glass

VISION SYSTEMS USE CUSTOMIZED
ILLUMINATORS FOR A BETTER
DETECTION OF DEFECTS

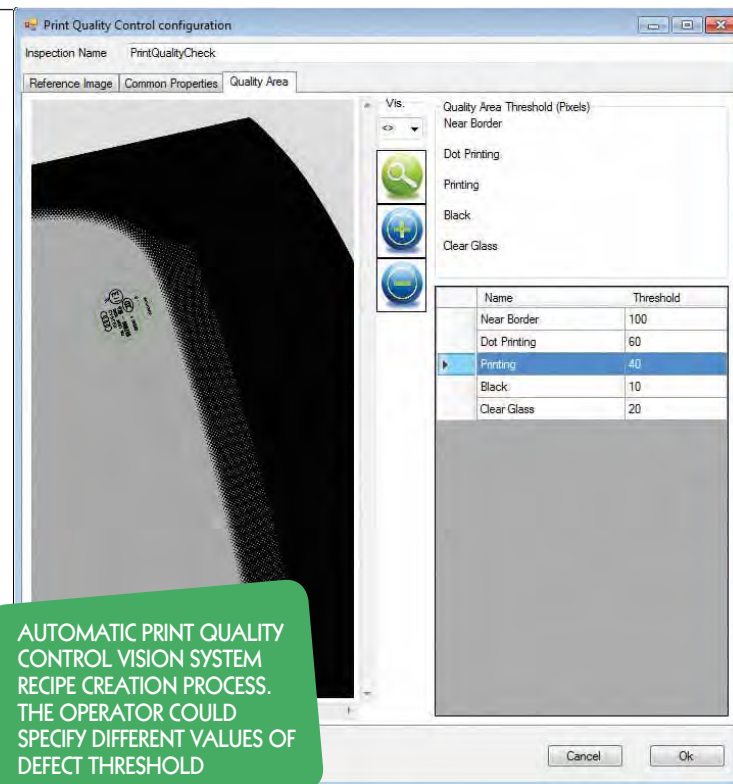
defect, even the smallest. During the setup phase, the quality manager defines the desired level of sensibility for defect types. Moreover, different sensibility areas can be defined on all the glass surface to set higher sensitivity in the centre instead of close to edges.

AUTOMATIC PRINT QUALITY VISION SYSTEM

The automatic print system, installed immediately after the printing machine, recognizes any 'slavering' or 'widening' of the design details due to an excess of ink coming from the screen. This type of inspection is able to detect fade out dots, pin holes, or if there are missing parts of the design, alerting the operator to verify the possible cause.

All the areas of the glass are checked and compared with the allowed tolerances specified in the glass inspection recipe, which is created as a 'one-off', using preloaded images obtained using 'good' glass or the digital image. Different sensibility areas can be defined on all the glass surface to allow higher control, for instance on logos and barcodes.

A specific software option provides controls on particular details, for example fiducial marks or special symbols or even ISO verification on barcode/datamatrix or OCV (optical char-



AUTOMATIC PRINT QUALITY CONTROL VISION SYSTEM RECIPE CREATION PROCESS. THE OPERATOR COULD SPECIFY DIFFERENT VALUES OF DEFECT THRESHOLD

acter verification) on text. The system is capable to perform retro actions, sending the adequate signals back to the printing machine to automatically modify the screen position in real time, with the aim of operating automatic limited screen adjustment starting from an optimal print. In general, the software can send defined signals to the printing machine's PLC to activate specific functions and automatically optimize the production.

The advantages of this innovative system are the possibility to verify print quality, tracking the defects on images and, in the case of errors, to automatically correct frame position without stopping the conveyor.

The hardware on these two technologies foresees

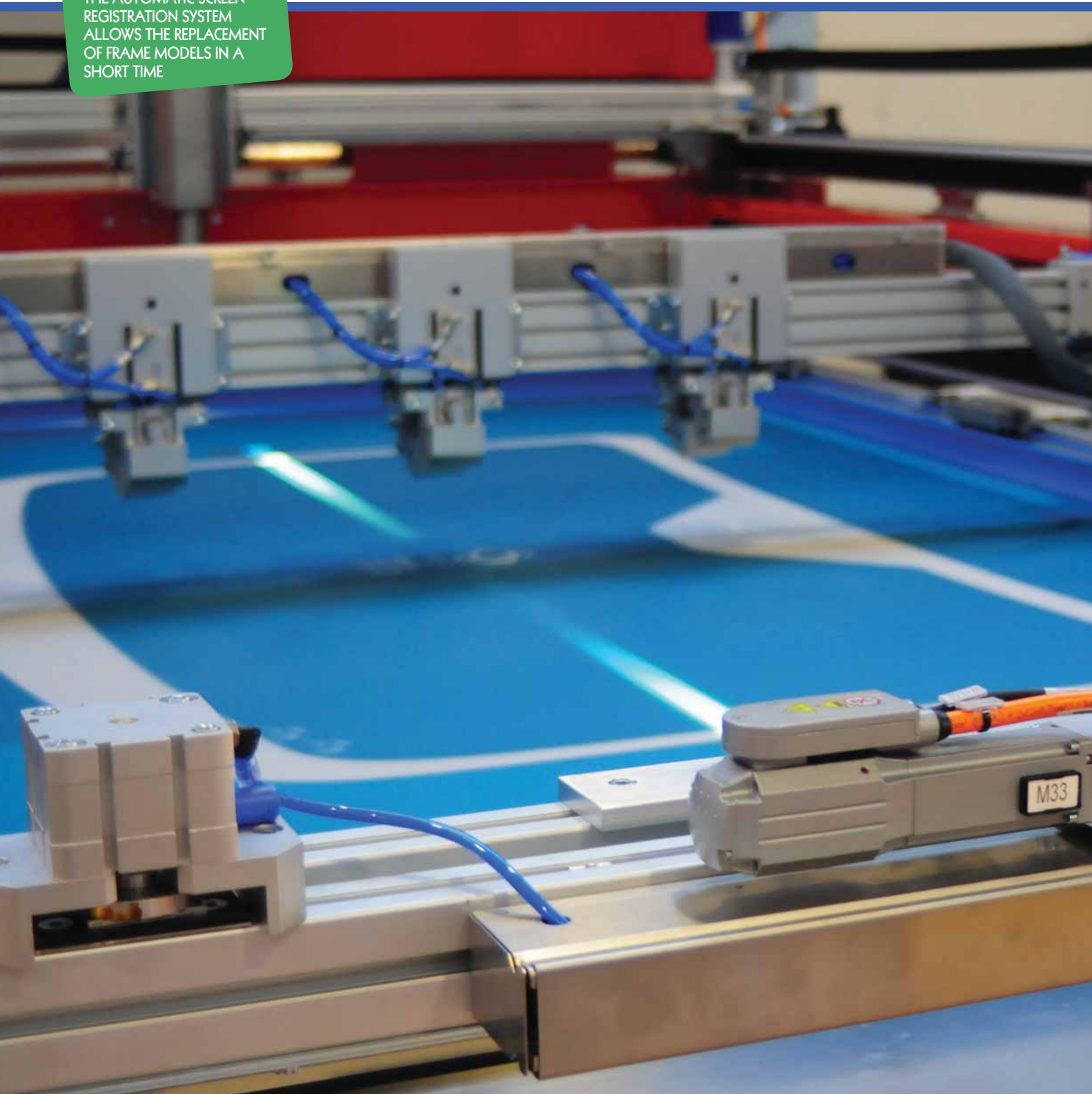
the use of a high resolution monochromatic linear camera with 16384 pixels, that guarantees resolution up to 60µm for 1,000mm glass and 122 µm for 2,000mm glasses (on leading long edges). It is able to verify design quality up to a circular dot of 0.09mm² (on 1,000mm glass) or 0.36mm² (on 2,000mm glass). The digital camera acquires one line at time, 'scanning' the glass during its movement on the conveyor. An innovative lighting system is adequately positioned to allow the camera to have optimal light conditions. The faulty areas and the acquired image are then showed on a wide screen (42") high resolution monitor and the good glass image used in the recipe creation phase can be displayed in overlay.



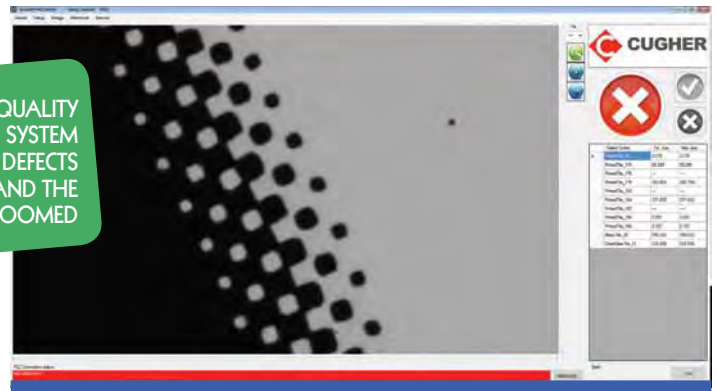
BROKEN SCREEN
DETECTION AND
QUALITY VISION SYSTEM
IN CUGHER'S LINE



THE AUTOMATIC SCREEN
REGISTRATION SYSTEM
ALLOWS THE REPLACEMENT
OF FRAME MODELS IN A
SHORT TIME



AUTOMATIC PRINT QUALITY CONTROL VISION SYSTEM APPLICATION. MULTIPLE DEFECTS HAVE BEEN IDENTIFIED AND THE SELECTED DEFECT ZOOMED



AUTOMATIC SCREEN PRINTING CONTROL VISION SYSTEM APPLICATION. THE GLASS HAS BEEN GRABBED AND SUCCESSFULLY INSPECTED



The operator can 'surf' the whole glass surface and, if necessary, zoom on selected areas to analyse image details. Moreover, the software shows the error detected and highlights the specified area on the monitor.

After inspection, the glass can then be diverted to a visual inspection station where the operator performs an extra inspection without halting the line.

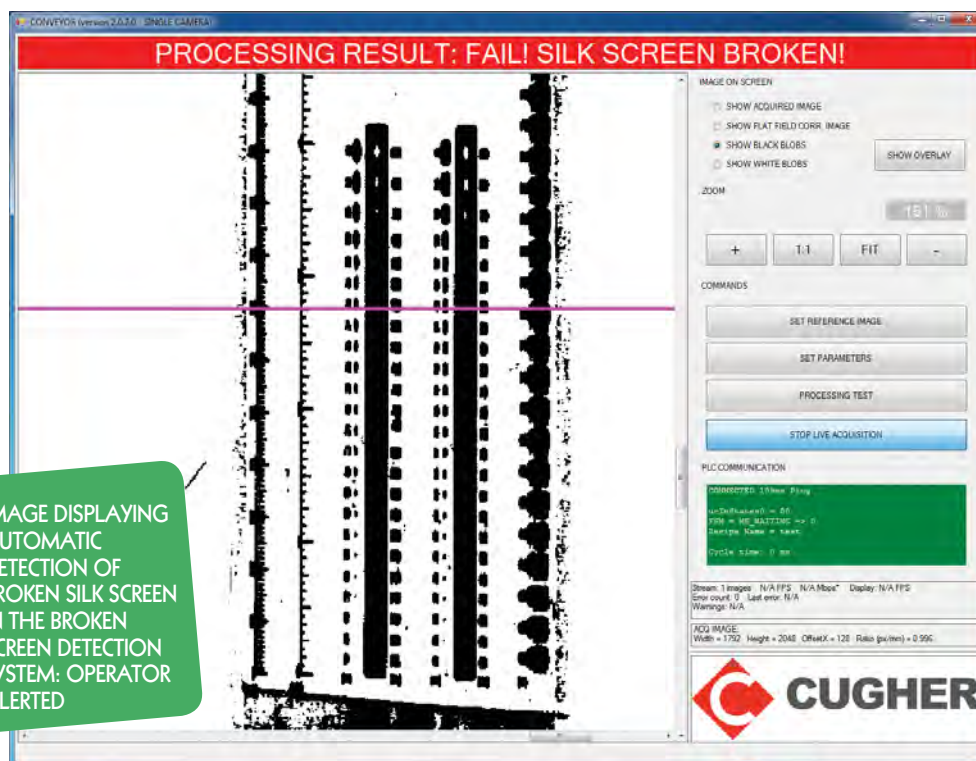
AUTOMATIC SCREEN REGISTRATION SYSTEM WITH CAMERAS

The automatic screen registration system is composed of two cameras installed under the printing table and driven by two servo-motors to store the data in the recipe. The system automates the adjustment of the screen with the glass to be printed.

The recipe is creating by placing a sample glass on the printing table and the cameras are driven in jog to visualize the referential targets. Once found, the targets are saved in the recipe and showed on the monitor. The sample glass is then unloaded, the screen provided with targets in adequate positions is inserted, and the cameras detect the screen position. The operator leads the screen approximately to the right position so that it is blocked and, using the motorized calibres, the accurate positioning operations are automatically performed by dedicated software, until the targets have been matched.

The images of the two cameras, showing the targets, are displayed on a monitor, while the operator has the commands to move the cameras and the

IMAGE DISPLAYING
AUTOMATIC
DETECTION OF
BROKEN SILK SCREEN
IN THE BROKEN
SCREEN DETECTION
SYSTEM: OPERATOR
ALERTED



motors for further screen movements on his touch panel. Using the automatic screen registration system, allows to obtain a complete model changeover in an extremely short time: thanks to the completely automatic machine setup, the operator's actions are reduced only to the inserting of the new screen into the printing machine.

BROKEN SCREEN DETECTION SYSTEM

This special unit has been studied to allow the control of the glass and to check, by means of a dedicated video camera and expressly developed software, the presence of ink spots on the lower surface of the glass. This unit is positioned just downstream from the printing machine, so that it can automatically

detect if there is a broken screen. The minimum detectable spot is a circle with the diameter of 1mm on a conveyor of 2,000mm width.

The advantage of this innovative system is that it doesn't matter where the screen has been broken or how 'small the hole is, if there is a leakage of ink, this unit will detect it.

 Cugher Glass Srl



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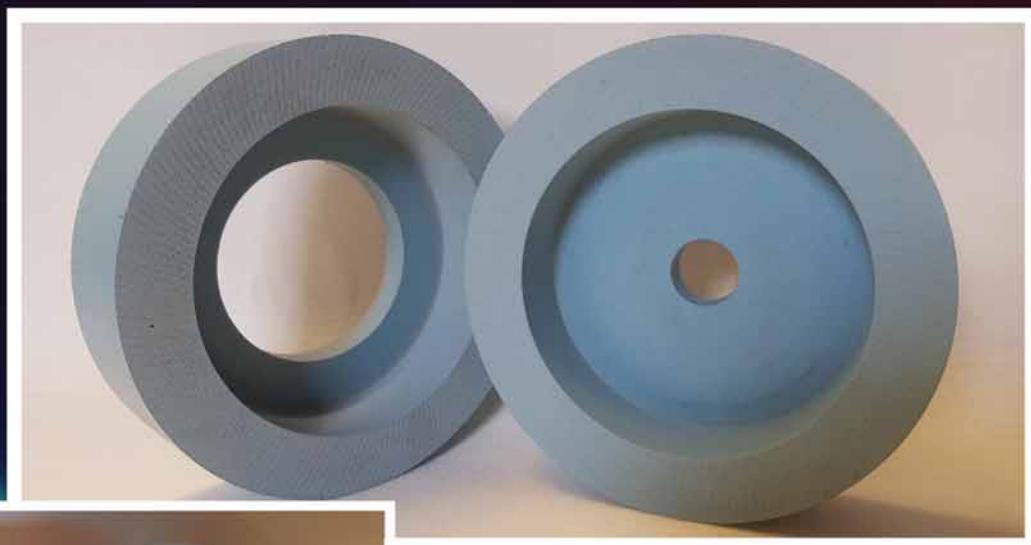
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The company has always considered important to provide technical support to clients, so as to advise them on the right choice of product to be used. Continuous collaboration and constant comparison with customers and machine builders has allowed to Italmole to undergo continuous growth, where needs become a stimulus for research and evolution.

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Tuomas

CONTINUOUS DEVELOPMENT AND EXPANSION ON ALL FRONTS

This year's International Networks! - the third edition of this special event held by Tuomas, also included the inauguration of the company's Centre for Innovation and Special Developments — the cornerstone of the expansion project.

INTERNATIONAL NETWORKS! - INAUGURATION OF CIDET AS THE PROTAGONIST

The opening of the CIDET was held alongside the celebration of International Networks!, a biannual event aimed at the commercial network and some of Tuomas' main customers. This year was the third edition of the event. The first, in fact, was held in 2015, coinciding with the 30th anniversary of Tuomas, while the second in 2017, coincided with the retirement of Miguel Tomás.

This year's event began with a guided tour of the company's facilities in the morning, followed by the official opening of the CIDET and a pleasant evening in the medieval castle of Mora de Rubielos with a few surprises for all attendees. Once more, taking advantage of the dinner time, the work of the best distributor for 2018 was publicly recognised, which went to the Romanian company Alumni. As well as this honour, the best agent of 2018 was also recognised for the first time, which went to the company Satecris, of Madrid.

INAUGURATION OF CIDET, THE "CORNERSTONE" OF THE TUOMAS EXPANSION PROJECT

Tuomas opened its Centre for Innovation and Special Developments (Centro de Innovación y Desarrollos Especiales, CIDET), the cornerstone of the expansion project on 27 July. The Centre is looking to lead efforts in investigation, design and the development of new machines, software and comprehensive solutions. Those who attended the opening ceremony were



the Deputy Mayor of Rubielos de Mora, José Vivó; the Mayor of Mora de Rubielos, Hugo Arquímedes Ríos; the Deputy Mayor of Mora de Rubielos, Luisa Vivas; the President of the Spanish Confederation of Freelancers of Teruel and the President of the Gúdar-Javalambre Association, Juan Carlos Escuder; The President of CEPYME

Teruel, Juan Círcoles and the President of the Chamber of Commerce of Teruel, Antonio Santa Isabel. The Mayor of Rubielos de Mora, Ángel Gracia, and the Provincial Deputy Antonio Amador, as well as Álvaro Tomás and Antonio Ortega, Vice-President and General Manager of Tuomas respectively, were also expected to take part. Gracia was, however, un-



able to attend due to personal reasons and the Deputy Mayor, José Vivó, came in his absence. Vivó underlined the importance of having a local business generating employment and revitalising the population in what is currently a depopulating area. He also publicly mentioned the effort that is being made by the Town Council to make fibre op-

tics a reality. The event began with words of welcome and gratitude to the attendees by the Vice-President of Tuomas. Álvaro Tomás emphasised that innovation is the cornerstone of future growth but, despite continuing to expand its activity and strengthen its image as an international business, they must not lose the essence and values of the family

business that began its activity in 1985.

Tomás expressed his pride in being in charge of a leading Spanish business from Teruel which competes with large German, Austrian and Italian corporations in the flat glass machinery industry.

Currently, as well as its factory in Spain, Tuomas has a delegation in Santiago in Chile and another in Sao

Paulo. The Latin American market is considered to be one of the most strategic regarding the expansion plan, which is why a third subsidiary will be opened in Bogotá at the end of November. This new subsidiary will be presented at the Colombia Glass 2019 Exhibition.

INNOVATIVE SPIRIT

Antonio Ortega structured his speech into two parts.





In the first part, he presented the CIDET as a support to the innovative spirit of the Teruel company. The Centre is set up like a new company within the Tur&Development, S.L Group, which will continue working on cutting-edge solutions with technology 4.0, as well as in the development of new product ranges that complement the Tuomas development portfolio.

In the second part, Ortega talked about the increase in production capacity which the expansion project will bring with it. Based on an architectural render, it was possible to visualise the current layout of the warehouses and how the space will be with the incorporation of the new ones. In total, five warehouses of 2,000 square metres each will be built.

In addition to the more efficient distribution of spaces with new connections that will shorten distances, investment in advanced machinery and equipment and the creation of interaction spaces for employees, an energy efficiency and saving and environmental sustainability plan will be implemented.

CREATING EMPLOYMENT

Another important point in this second part, was creating employment. In five years, from 2014 to this year, Tuomas has doubled its workforce. Today, the

Rubielos de Mora company has 100 workers and an organisation chart with new departments as a result of development and specialisation. The expansion plan estimates the generation of at least 50 more jobs.

Additionally, internship agreements with professional training centres and universities will continue to be signed. Students will benefit from an eminently

practical training that will complement their learning, easing their incorporation into the job market, and they will provide updated knowledge to the company. To finish, the General Manager did not want to leave out Tuomas' commitment to Teruel. Miguel Tomás, founder of the company, backed Rubielos de Mora from the beginning and, despite the obstacles, the

situation with the area is strengthening.

Álvaro Tomás closed the opening ceremony with a mention to Miguel Tomás. "Miguel is an example of perseverance. Resolve and tenacity are key to progressing and carrying projects forward, despite the challenges. These qualities have helped Tuomas to have a notable presence in the five continents."





Antonio Ortega, CEO of Tuomas, explained in detail the Tuomas expansion project: "The most important resource a company needs for any project is in the mind. Why do people who have good ideas get paid so much? Because they cannot be mass-produced. No matter how much money a person has, that money will never be able to generate the great ideas that a mind can create in an empty room."

SPEAKING TO TUROMAS

Glass-Technology International (G-TI): This third 'International Networks!' - always coinciding with an important event in the history of Tuomas - was another special part of the company and its workers. How are the workers distributed among the different departments of the company?

Tuomas: On the one hand, most of our workforce

is concentrated in the production department. After-sales is another key department for Tuomas, so we have increased our investment to improve the service we provide to our customers. The remaining departments such as financial, sales, purchasing, logistic... have less staff than the previous ones, but we talk about experienced people with a high knowledge of the product. On the other hand, we have or-

ganized the R&D department in a separate company: TuR&Development.

G-TI: This year saw the inauguration of CIDET - which you call the "corner-stone" of the TUROMAS expansion project. What will be the outcome of this centre as far as technology is concerned?

Tuomas: We say that CIDET will develop today the machinery of tomorrow. Tuomas has been developing glass cutting machines and smart storage for more than 30 years. Now, we are pretty sure that we can apply all our experience and knowledge in designing and creating not only new software solutions but more efficient, reliable, and competitive machinery. Maybe not only for cutting and storing systems. Only time will show what we are capable of achieving.

G-TI: How is the work towards Industry 4.0 proceeding? What can be the next steps to take?

Tuomas: We understand "4.0" as a real revolution for machinery and automation. In fact, we have been working in a new 4.0 software for our entire product range to provide our customers with strategic and valuable data for decision making. Information is, undoubtedly, a source of power. For this reason, we must analyze, filter and process all data to turn it into a useful tool.



G-TI: What can you tell us about the new machinery that you have developed this year?

Tuomas: Over the last years, we have been really focused in the smart storage systems. We talk about a complete redesign of our range of loaders. In addition, we have developed new solutions for all sort of glass processors in terms of storage and movement of glass. Moreover, we have applied very important innovations to our cutting machines to adapt them to the new types of glass.

G-TI: What will expansion involve and will there be any new branches opening in other countries or in Spain?

Tuomas: The expansion plan of Tuomas involves the construction of more than 15 thousand square meters for production buildings to meet all our sales orders. We are not only talking about growth but also about organization. Future facilities will be connected to avoid travel and achieve higher levels in terms of production and efficiency. There is going to be a clear evolution in all processes, which entails a considerable investment in advanced equipment and solutions for our workforce. Other branches of the company will be opened in strategic markets, but only regarding sales and after-sales



services (our production force will still be in Spain).

G-TI: What has changed since the previous International Networks! event?

Tuomas: Tuomas has increased its presence in several markets since its last International Networks!. As a result of that internationalization, we have managed to get more projects in new countries. However, the most interesting aspect is that some of these projects are very ambitious plans of new

customers who are betting hard on our brand. We are really happy to have the confidence of some of the most reputable and influential glass processors in the world.

G-TI: What will you be bringing to this year's Vitrum event? What kind of innovations can we expect to see?

Tuomas: If anything characterizes Tuomas, it is continuous innovation. At Vitrum, we will share with our customers new inter-

esting solutions that I prefer not to reveal yet, so we look forward to seeing you in October!

Author of the photographs:
Desirée Lamas

Tuomas

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Glass Company



**Tailor-made solutions
on show at Vitrum 2019**



At this year's Vitrum trade event, Glass Company will have on show a series of solutions for today's demanding glass processors and market. Visitors will have the chance to see innovative heating for all glass types - including low-E - as well as laminating with PVB film.

**Claudio Bernabucci - Ceo
Glass Company**

Glass Company will be at Vitrum this year with a series of tailor-made solutions for safety glass making. On its 170-square-metre stand, visitors and clients will have the chance to see for themselves the quality of the furnaces that Glass Company has been making for the European market for more than 10 years, in collaboration with Jinglass.

AIR-JET CONVECTION

At Vitrum, Glass Company will have on show an air-jet convection heating chamber, with the exclusive patented Matrix heating system. Visitors and clients will be shown the innovative heating chamber that enables to heat any type of glass: low-E $\geq 0,01$, reflective, transparent, coated, etc., thanks to real convection technology that does not differentiate between types of glass, thickness and dimensions. The real convection system with Matrix technology provides accurate and optimal heat transfer on the entire surface of the heating chamber, guaranteeing excellent quality of tempered glass, which cannot compare to that of traditional infrared heating.



Glass Company will also have on show large-sized curved tempered glass sheets created by its Italian clients using Glass Company machines, providing visitors the possibility of assessing production quality.

THE JUMBO FURNACE

Glass Company staff will be at the stand for those requiring more information and photos of recent machinery installations, such as the Jumbo furnace for flat tempered glass with real convection and Matrix technology, for glass sizes up to 3300x6000mm, also suitable for low-E, triple silver glass tempering with 4mm thicknesses, as well as the innovative double-chamber furnace with new heating technology that will

be installed at a European company by November this year. This furnace will have a heating chamber of about 1800x10000mm, and will be able to temper very thin glass, in oscillating and semi-continuous mode.

INNOVATIONS IN LASERS AND PLASMA TECHNOLOGY

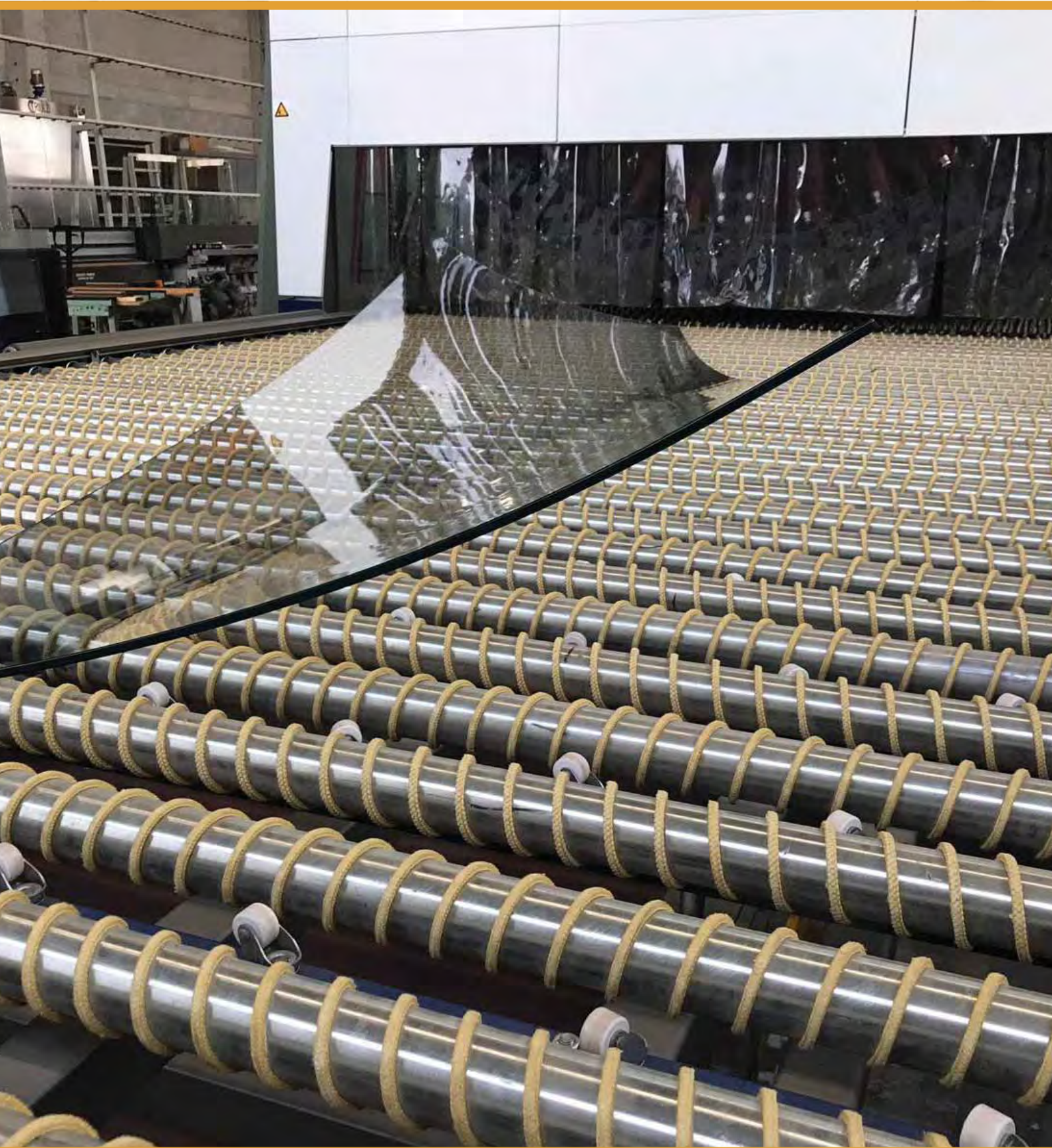
Information regarding the most recent Glass Company innovations, such as the laser drill for glass, the plasma system for the preparation of glass before digital printing, laser systems which remove paint, silver and coatings and low-E $\geq 0,01$, leaving the glass completely transparent, new high definition glass-marking lasers, painting systems, and much more.

Staff at the stand will provide visitors with information on Glass Company's exclusive production system for fire-resistant EI glass, along with examples.

LAMINATING WITH PVB FILM

Another successful sector where Glass Company is present, and which it will be presenting at Vitrum, is that of laminating using PVB film, thanks to the exclusive collaboration with an expert of this sector Cengiz Ergün. Glass Company's product range also includes PVB glass laminating furnaces as well as stand-alone laminating furnaces for each and every need of glass processors. An upcoming installation in Europe will be that of a laminating line for glass







sizes up to 6000x3300mm, with ease of use, the possibility of processing different glass sizes and thicknesses, a large PVB roll stock with quick film thickness change and, last but not least, an affordable price considering today's market.

All management and control systems of our machines and plants can be made to measure as per client needs and demands, including Smart industry and Industry 4.0

Glass Company will be at Vitrum at Stand F12-H16, in Hall 5.

 **Glass Company Srl**

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VITRUM 2019
HALL 5 - STAND F12 H16

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Structural defects detection (bubbles and inclusions) in both monolithic and laminated glass

Customizable with parameter for minimum defects dimension

✦ EFFICIENCY

Reduction of wasted glass and cycle time with increase in productivity

Defects detection in the first phase, before all processing

✦ INTEGRATION

Interfaced with the table/line software for a fully automatic management of the cutting

Easy installation in any cutting line/table

✦ CONVENIENCE

Reduction of machinery wear and waste management costs, saving energy

Works on unwashed glass

** In the picture: the OPT solution installed at the Finglas plant in Trento*



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Forel

SORTING SYSTEM REVOLUTIONIZES WORK AT ARTIGIANVETRO





Nicola, Graziano and Daniele Marcantonelli

Working relationships must be developed based on trust and reliability to be able to work. In this article, Forel gives us an idea of how these two fundamental aspects have led to a 20-year relationship with one of Italy's reference names in the flat glass sector.

Artigianvetro is a company based in San Severino Marche (Italy), founded by Graziano Marcantonelli in 1985. Two 20-year-old glaziers, a van and an area of 120 square meters, but with a great deal of enthusiasm and passion: these are the ingredients with which the company was established, and which is, today, a well-known reference name in the Italian glass sector, thanks to quality production that includes structural, residential, commercial and interior glass panes.

CONTINUOUS GROWTH AND DEVELOPMENT - ALSO IN TECHNOLOGY

Artigianvetro has undergone several site changes since the first location, up to the

current production plant. The latter is a real gem: a surface area of 4,000 square meters, completely independent from an energy point of view thanks to a system of last generation photovoltaic panels. Today, Artigianvetro employs approximately 20 people, coordinated by the Marcantonelli family: in fact, the founder Graziano and his brother Daniele were joined over time by his wife Patrizia, and their sons Nicola and Noemi.

"Artigianvetro has grown one step at a time, with passion and dedication," say Graziano and Daniele Marcantonelli. "The collaboration with Forel began in 1997, when we purchased the first flat plate coupling press. The quality demonstrated by the product, combined with the trust that was established with the supplier, took us a lit-

tle at a time to choose Forel also for the following investments. Today we use a edging line and an arrissing one, which feed our IG unit production line (all Forel): the last one allows the assembly of units with both rigid and flexible spacers, depending on the orders. However, we wanted to take a step forward through integrated logistics, a fundamental component for any modern glassworks. So, a year ago, we revolutionized our daily business

with the purchase of the Forel Sorting System. After considering other options available in the market, we choose the SS for performance and efficiency: we automated the management of glass sheets, simplifying the work of the operator and increasing productivity and safety.”

AUTOMATIC SYSTEMS

Today the workflow in Artigianvetro begins with cutting and continues towards the edging line or

towards the arrissing line, which runs parallel to the first one. However, up to a couple of years ago, the panes had to be loaded according to production order, to then be able to assemble the insulating glass units, while today this task is completely overcome. In fact, an automatic pane recognition system is installed on the line's infeed conveyor, which measures length, height, thickness and any low-emission coating. This reading allows the software





to recognize the job order to which that pane belongs and assigns it a unique ID. The pane, now 'registered' without any possibility of misunderstanding, is then arriasing, washed, checked by a quality control scanner and then arrives at the Sorting System. Composed of three shuttles and a series of vertical storage units, the Sorting System already knows the order of arrival of the pieces, picks them up and places them in the storage units. Then, following the production programme, the system feeds the insulating glass line.

THE MOST RECENT INVESTMENTS IN FOREL TECHNOLOGY

Artigianvetro 'second generation' Nicola Marcantonelli literally grew up in the glassworks. We ask him what the practical changes brought by this last investment were.

"The installation of the Sorting System, supported by an automatic glass sheet recognition system, changed everything," says Nicola. "Before, we had to cut and sort the pieces having already in mind the order with which the insulating glass unit would have been made. In practice, there had to be a cutting/unloading-loading/processing plan from the very beginning. Today, all we have to do is to cut the sheets and load them on one of the two lines: the system does the rest. A radical change. In addition to having increased production speed and safety both for operators and for the material, the current configuration allows better management of the unexpected. If for some reason one of the panes of a certain order is not ready, the Sorting system allows me to postpone that order,

place the other panes that are part of the order in the storage unit and proceed with another order. Management flexibility that is in no way comparable to the previous situation.”

“The fact that most of the systems we use today are Forel,” concludes Graziano, “is the result of a gradual process, starting with one press, then with a sealing robot and continued with one investment at a time. We put our trust in Forel, we verified that their systems were operating as promised and that their Service (undoubtedly a feather in their cap) was able to take action to solve the problems that arose during operations. Today we can safely say that our trust has been well founded.”



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www.forelspa.com

The magic words are shop floor logistics. People are, and will always be, part of the logistics chain. With the help of automated work steps, employees are able to focus on their tasks more closely and therefore work in a more targeted manner. Mobile and driverless machines are deployed to complete distracting ancillary activities or transport routes, and not just at the cold end of glass production.

The first step is an analysis, a data-based process which requires as much data to be collected as possible. The company Hegla-Hanic GmbH & Co. KG has defined the necessary steps for its production solutions. The challenge in production is coordinating the machining and cycle times of the equipment. What happens at individual steps, how good are the interfaces and how smooth are the transitions? How well is the supply of work materials coordinated? Machine parks are generally designed to be very heterogeneous, certain processes have "grown",

habits have crept in, information is scattered and, of course, there are always unplanned downtimes.

CONTRARY TO EXPECTATIONS

Taking a closer look at processes often shows that they are far more complex than initially thought, despite the fact that they should be simple and efficient. The goal is to determine the ideal

state, an analysis process which is more successful the more data the company has collected. Scenarios can be simulated to determine the steps where production needs adapting.

To do so, affected teams must describe the requirements and the ideal process and then compare both with the actual state. Simulating scenarios with the respective production software enables different solutions to be tested, which in turn allows the optimal

process to be honed in on. Driverless transport systems are flexible in this context, particularly when it comes adapting to future requirements, meaning production lines will no longer require redesigning.

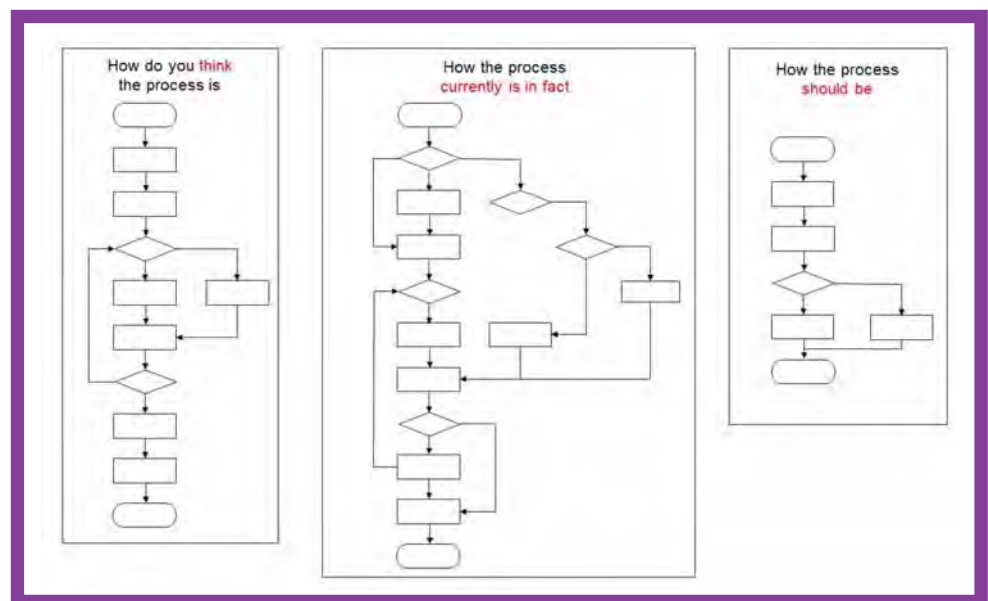
Source: Hegla-Hanic

GEOPOSITIONING IN PRODUCTION FACILITIES

The use of automated guided vehicles is conceivable in any industry sector, regardless of the prod-

VDMA

RUNNING ALMOST AUTOMATICALLY



 VDMA

VDMA represents more than 3,200 mostly medium-sized companies in the mechanical engineering industry. With over 1.3 million employees and sales of around EUR 232 billion (2018), the sector is the largest industrial employer in Germany and one of the leading German industrial sectors.

Production processes are constantly being optimized. Both time and cost pressure require the constant revision and reorganization of organizational structures in internal logistics, and this is no different in the glass industry. With companies increasing their digital networks, the use of automated guided vehicles will also make it easier to implement these processes.

uct. Transporting glass is a particular challenge. Grenzebach GmbH & Co. KG has devised solutions for these specific applications, in particular for transporting glass racks and L-frames. However, this is just a single part of the digital system. The company has developed its own application server as a modular platform on which all digital production processes can be mapped. All devices and machines on the shop floor are connect-

ed to the server via adapters, allowing adjustments to be integrated quickly and the results to be analyzed. The quantity and speed of production require the material flow to be reliable, a step during which automated guided vehicles are often deployed to cover a wide range of tasks. Grenzebach has installed a laser system in the entire driving area which is used to navigate the machines. The environment is mapped using a navigation

scanner which detects how light reflects off reflectors installed on the walls at certain distances. As soon as two or more reflectors are detected, the vehicle is able to accurately determine its current position. Using a triangulation algorithm in the control software, the necessary steering commands are sent to the vehicle. The company also uses a second navigation system, known as a dead reckoning navigation system. This system is equipped with an odometer and an angle encoder and is installed on the vehicle's drive wheels, resulting in even more accurate navigation, while a map of the environment is marked with the precise positions of the wall reflectors. An alternative method is to use contour navigation, which does not require an unrestricted view of reflectors, but is performed by the

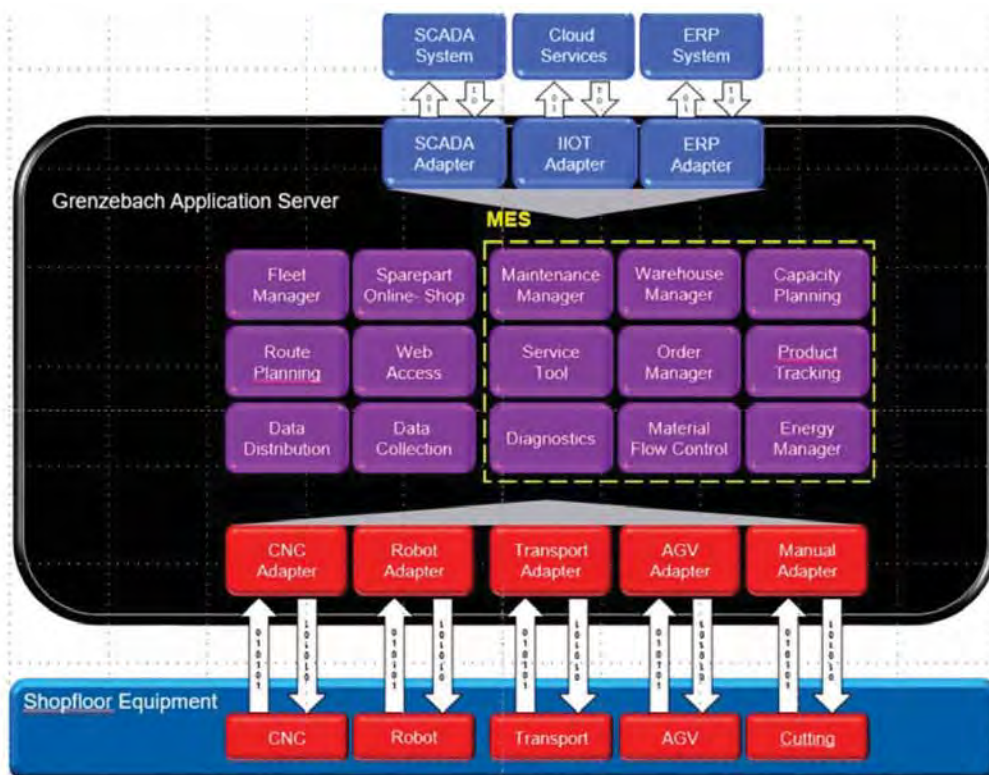
transport system itself using safety scanners.

Source: Grenzebach

STILL ROOM FOR IMPROVEMENT

According to Dipl.-Ing. Thomas Albrecht, an expert on automated guided vehicles at the Fraunhofer Institute for Material Flow and Logistics (IML), the topic has been trending across industries for three to four years. Compared to other automation solutions, these systems are the most flexible when it comes to linking production processes. Compared to manually operated forklifts, AGVs are gentler on the transported product and also do not cause accidents. However, as long as people remain in the driving area, the vehicles must be able to perform emergency stops, a process generally associated with abrupt braking.

The share of automated guided vehicles in the floor conveyors product group is currently still in the low single-digit percentage range, exact figures are not (yet) available.



VDMA - Forum Glastechnik



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Guardian Glass

CASTELLANA 77 - LEED PLATINUM CERTIFICATION; ENERGY EFFICIENCY AND ENVIRONMENTAL PROFILE

A recent project for Guardian Glass in Madrid, Spain, has given a building in the city's financial district a new lease of life thanks to the use of high performance glass products. This article takes us through the work and products involved in this important integral restoration.



ENERGY EFFICIENCY AND ENVIRONMENTAL PROFILE

In the heart of Madrid's financial centre, in the AZCA district, stands Castellana 77, a building which, after two decades out of service, has begun a new iconic life thanks to luis vidal + arquitectos. The original 1977 tower is now a 62-metre-high office building, defining the skyline of the city in its own special way. With completion of the restoration, the building is a leader in terms of energy efficiency and environmental profile and has received the prestigious LEED Platinum certification. Guardian Glass high performance glass products for the façade helped contribute to achieving this LEED certification.

UPDATING THE BUILDING

Clever use of natural light and the desire to create a strong identity for the building to stand out in its environment were two of the essential pillars for the architectural project. According to Luis Vidal: "The goal was to update the building, resulting in a new property that is both flexible and sustainable, while creating high quality commercial space with a new image incorporated into the skyline of Madrid, a city which respects its roots, but is still forward-looking."



A LIVING, EFFICIENT GLASS FAÇADE

Guardian Glass: High performance

solar control glass:	SunGuard® SN 70/41
Architect:	luis vidal + arquitectos
Client:	Grupo GMP
General Contractor:	ACCIONA, S.A.
Façade:	FERGA, S.A.
Glass Processors:	Tvitec System Glass, S.L.
Photography:	© luis vidal + arquitectos
Construction:	1977
Rehabilitation:	2016-2017
Height:	62 meters
Total surface:	21,000 m²
SBA Surface:	16,261 m²
Plants:	22

This has been achieved with an integral restoration, primarily focused on building a new façade with a sharp vertical modulation that utilises Guardian SunGuard® SN 70/41 coated glass in a high selectivity glazed curtain wall.

This modern, inspiring construction system also incorporates an added feature that provides extra solar protection by using fins with a 60cm overhang to provide shade (separated from the main façade by a 15cm gap for maintenance and cleaning). These

work in conjunction with Guardian glass to further improve the general performance of the building.

Over a total area of 21,000m², architecture and construction works also included the upgrade of all the facilities in Castellana 77, as well as the transformation of its 18 floors above ground (16,261m² in total), making the ground floor layout more flexible. The ground floor can hold both offices and commercial space. The original four storeys used for parking have been regenerated, as well as an additional floor for general building facilities. The five underground floors now hold over 200 parking spaces.

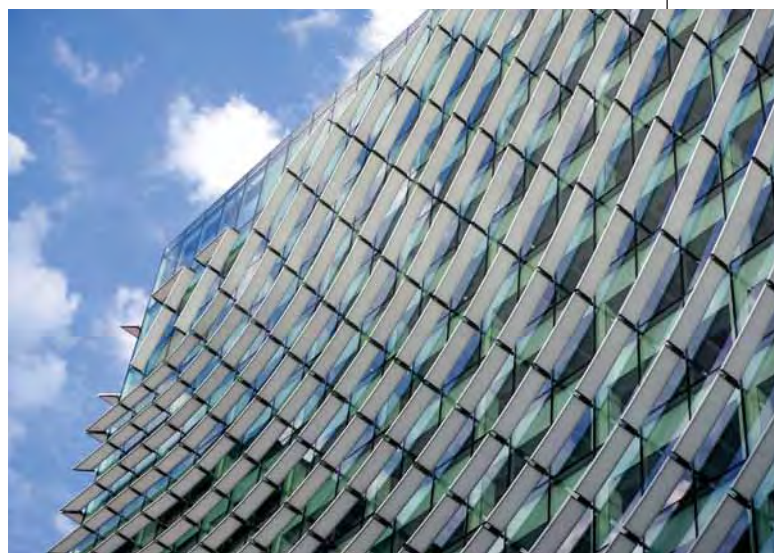
GUARDIAN GLASS

Guardian Glass, a major business unit of Guardian Industries, is one of the world's largest manufacturers of float, coated and fabricated glass products. At its 25 float plants around the globe, Guardian Glass produces high performance glass for use in exterior (both commercial and residential) and interior architectural applications, as well as transportation and technical products. Guardian glass can be found in homes, offices, cars and some of the world's most iconic architectural landmarks. The Guardian Glass Science & Technology Center continuously works to create new glass products and solutions using the most advanced technology to help customers *See what's possible®*. Guardian Glass is a member of the US Green Building Council.

DISMANTLING AND RECONSTRUCTION

Building the Castellana 77 façades comprised two stages. First, the dismantling of the original building, which was completely out of date and was suffering from a significant amount of wear and tear. Second, the installation of the new envelope. This resulted in the following types of façade based on area and orientation: a curtain wall façade, a curtain wall façade with slat protection, and a ventilated façade.

The curtain wall façade is made from an extruded aluminium profile system and infill panels made from laminated high se-





Guardian Industries, a global company headquartered in Auburn Hills, Michigan, operates facilities throughout North and South America, Europe, Africa, the Middle East and Asia. Guardian companies employ 18,000 people and manufacture high-performance float glass; coated and fabricated glass products for architectural, residential, interior, transportation and technical glass applications; and high-quality chrome-plated and painted plastic components for the automotive and commercial truck industries. Guardian's vision is to be a preferred partner to our customers, suppliers, employees and communities based on a foundation of mutual benefit. This drives our relentless focus on improving people's lives by providing products and services they value more highly than their alternatives and doing so responsibly while consuming fewer resources. Guardian is a wholly owned subsidiary of Koch Industries, Inc.

lectivity neutral coated glass with SunGuard SN 70/41 as the external pane. The SuperNeutral™ (SN) family is one of the coated glass options in the Guardian SunGuard high performance architectural glass range. With 70 per cent light transmission, this solution provides a neutral appearance with maximum solar control. The façade system enables free ventilation of glazing edges, which prevents unwanted condensation.

EFTE FINS FOR IMPROVED ENERGY EFFICIENCY

Another poignant feature of the architectural work at Castellana 77 are the EFTE (Ethylene Tetra-Fluoro-Ethylene) fins, which were specially designed for this project, with a specific orientation and curvature to allow them to flow through the skin of the building, giving it a unique, distinctive shape. Regardless of their aesthetic purpose, the

primary function of these fins is the continual pursuit of improved energy efficiency and sustainability, as they protect the structure from direct exposure to the sun. This advanced material, EFTE, allows light to pass through, but not heat, making backlighting a possibility. This allowed the architects to create a continuously evolving façade. During the day, the movement of the sun and shading (which depends on light intensity) generate a brightly changing image on the façade. At night, its identity emerges from inside the fins with different light configurations, achieved using several kilometres of installed LED lights. Ultimately, the façade of Castellana 77, with 70 per cent SunGuard SN 70/41 glazed units and EFTE fins, enables low-emissivity and high solar control capacity. A rigorous study of the building's exposition to the sun and shade on

the west, east and south façades at different critical times every day of the year, led to an efficient design that enables significant energy savings, as well as improved comfort and wellbeing for the building's occupants.

LEED SUSTAINABILITY AND CERTIFICATION

Castellana 77 is now a building with a high level of sustainability. For this reason, it received LEED certification (Leadership in Energy and Environmental Design) awarded by the US Green Building Council, a group of construction industry leaders promoting and fostering environmentally-sound structures. LEED is one of the most prestigious worldwide certifications that evaluates the sustainable behaviour of build-

ings, seeking to promote environmentally-friendly, as well as financially viable, comfortable properties. The category of the certification for Castellana 77 was "Platinum" in the Core & Shell system.

This distinction was awarded to the building, among other factors, on account of its:

- Energy efficiency: the glazed façade and solar protection fins, as well as energy management and control performance, result in maximum thermal and lighting comfort for occupants of the building. This helps to reduce energy consumption by up to 33 per cent per year, compared to a conventional building with the same usage and surface area. The air conditioning and lighting systems



LUIS VIDAL + ARQUITECTOS

luis vidal + arquitectos is an international architectural practice that provides high quality and innovative design-led solutions to challenging projects. Leading architects of the London Heathrow Terminal 2 project, this practice has offices across Spain, the United Kingdom, Japan, Dominican Republic, the United States and Chile, and an international workforce of over 150 architects co-existing with a strong background and solid experience in a wide range of disciplines including planning, building and industrial design. Founded in 2004, luis vidal + arquitectos has built up a consistent career path expressed in more than 200 projects and different scales. The practice is internationally renowned for its expertise in the design of aviation and healthcare buildings, having become one of the leading and most innovative practices committed to delivering functional, responsible and professional designs as an answer to the urban and social challenges of today.



are 46 and 34 per cent lower respectively.

- Its natural lighting and access for views: 95 per cent of workers and occupiers of Castellana 77 receive natural light and have direct views of the outside.
- The quality of the interior atmosphere: with an energy efficient air-46 and 34 per cent conditioning system based on 100 per cent exterior air intake.
- Its location and wide range of transport options to access the building.
- The efficient use of water by adding efficient bathroom facilities so that the building can achieve a 39 per cent reduction in water consumption, compared to other similar buildings.
- Its sustainability awareness: since its restoration, the building uses primarily recycled materials of certified local origin.
- Its low or zero emissions: the use of 100 per cent of the materials have no (or little) volatile organic emissions.

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Guardian Glass

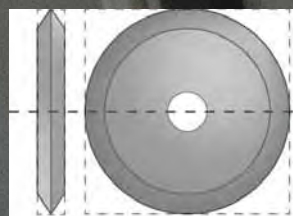


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TecnoFerrari

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AND FOR PRINTING AND
LOGISTICS FOR INDUSTRY 4.0**



Managing complex situations is part of the DNA of TecnoFerrari, thanks to its being involved in automation since 1972, following the growth and development of the ceramics industry right up to now. This means gaining experience and knowledge which has enabled the company to identify automation as the fundamental factor in this industry.

Sonia Serrau - *Marketing & Communication*
TecnoFerrari

Focusing continuously on R&D to improve and update products and the functionality of its machinery, starting from the know-how gained in the ceramics sector, has led TecnoFerrari to gain considerable skills and flexibility with regards to digital printing, as well as storage and logistics aspects.

This strong development has enabled the company to have an important position in other sectors such as glass, ceramic, cement, fiber cement, paper, wood, plastics and numerous other materials for digital printing, as well as textiles, beverages, automotive, pharmaceutical/medical, food and others with regards to logistics and storage.

At Vitrum 2019, (Pavillion 7, booth E27 - G26-30) TecnoFerrari will be introducing its innovative ideas for digital printing, as well as logistics solutions, in collaboration with Giardina Group, a leading brand in the finishing sector, and with which it is collaborating.

TECNOFERRARI VIVAJET® - STANDING OUT THANKS TO DETAILS

The continuous move towards innovation has led the VivaJet® digital printers range right up to complete technological maturity. And TecnoFerrari is using its skills to stand out from the crowd once more.

VivaJet® single pass digital printers enable to have

contactless printing in a single passage of glass with both regular and irregular shapes, thanks to the single- and multi-colour optical centring system.

These results are made possible thanks to more than 850 global installations and the extreme attention to improving each and every single detail: from printing heads and their optical alignment, to the mechanical aspects of the printing block, also covering the even further evolved ink distribution system with regards to materials and components, and the use of new low-environmental impact inks. Last but not least, last-generation GeCo® software, which adds further printing methods, specific screening that can improve quality, control the uniformity of colour spreading and to compensate for printing defects. All this enables to have high-quality products that really stand out: natural printing and decoration without defects, resulting in more high-resolution designs, high intensity coverage, uniform light tones and the possibility of high discharge.

Not only technical refinements but also continuous investments to offer an ever better service: advanced remote control tools, possibility of upgrades and presence in the field.

Thanks to the upgraded DigitalRemoteAssistance

service, TecnoFerrari's experienced and skilled technical staff can offer assistance to any sudden problems in the shortest time possible.

The use of these technologies enables the company to interact directly with operators to provide instructions and advice coming from our experience in the field, also allowing machines to be upgraded by installing

software updates containing the latest innovations developed by our R&D.

Based on the know-how and experience gained over the years as a leader in digital ceramic printing, TecnoFerrari has also developed specific models for decorating various materials. In fact, more and more merchandise sectors, where quality, productivity, reliability, flexibility and sim-



plicity are fundamental, are gaining great interest in the VivaJet® range.

TECNOFERRARI LOGISTICS – RELIABLE AND FLEXIBLE INNOVATION MADE IN ITALY

Leader in automation and logistics in different markets, and with more than 3,500 AGV vehicles installed in the world,

TecnoFerrari is continuing to invest in growth to continuously increase its market share.

Each and every year TecnoFerrari renews its commitment to new technological solutions to improve industrial automation systems that we design and export globally, with over 170 patents. The experience of the engineers who have been part of our team

for years constantly supports new resources, and are therefore able to face challenges and continue our story.

With regards to logistics applications in particular, technical staff is also able to manage processes and layouts of complex systems, providing customers with optimized solutions in terms of performance, reliability and flexibility.

TecnoFerrari's AGV vehicles are equipped with magnetic, laser and hybrid driving systems, as well as the latest safety and logic control systems, representing the largest portfolio of solutions available on today's market.

Industry 4.0 paradigms are implemented in all AGV systems, providing interconnection with all machinery and with company ERP systems.

The supervision software, developed entirely in-house by TecnoFerrari, with the possibility of customization according to customers' needs, is an added value in terms of flexibility.

TecnoFerrari AGV systems provide considerable economic savings when compared with the same activity performed by manual vehicles. TecnoFerrari AGV vehicles also reduce the loss of productivity due to the inefficiency of manual transport.

Damage caused by manu-

ally handled transported products is substantially reduced by AGV with regular and constant work flows.

TecnoFerrari offers a fast route to successful operations for every company, regardless of size, as automation means:

- Maximum level of safety for operators
- Fully automatic operations
- Process control and handling optimization
- Process timing and accuracy
- Perfect control over all stages of processes
- Cost reduction
- Ability to interface with other production technologies
- Data protection and data collection
- Product traceability.



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NSG



PILKINGTON GLASS TO PROTECT THE 'THE SCHOOL OF ATHENS' CARTOON

Pilkington OptiView™ OW, which already protects numerous priceless exhibits in global museums and galleries, now also enhances one of the world's most exceptional and unique works of art.

PROTECTING A MASTERPIECE

Raffaello Sanzio's masterpiece 'The School of Athens', features Plato and Aristotle and represents the study of philosophy. It was created in 1509 and over the years has passed through the hands of numerous notables including Napoleon Bonaparte.

It now rests back in Milan's Biblioteca Ambrosiana and, following four years of restoration, is open to public viewing. This fragile work of art, which was created using charcoal on laid sheets, now benefits from the all-round protective properties of Pilkington OptiView™ OW.

THE JOB

GLASS – THE OBVIOUS CHOICE

The glass was the obvious choice – when compared to traditional offerings. The artwork is displayed behind a vitrine featuring a single eight-metre long sheet of this special protective glass – the world's largest ever to be produced and installed in-situ. Laminated Pilkington OptiView™ OW, with its thin layer of metal oxides and anti-reflective properties, reduces light reflection to a minimum (2 per cent), protects against vandalism and offers the perfect all-round, true-colour, viewing experience.



NSG GROUP

The NSG Group is one of the world's leading manufacturers of glass and glazing systems in three major business areas: Automotive, Architectural and Technical Glass. Automotive serves the original equipment, aftermarket replacement, and specialized transport glazing markets. Architectural supplies glass for architectural applications, solar energy and digital signage and displays. Technical Glass products include very thin glass for displays, lenses and light guides for printers, and glass fiber, used in battery separators and engine timing belts. NSG have major market shares in most building and automotive product markets of the world, with a broad geographic reach, enabling us to respond to customers whose operations, particularly in the case of Automotive OE, are increasingly global.

Today, NSG Group has manufacturing operations in around 30 countries on four continents and sales in over 100 countries. In the fiscal year ending 31 March 2019, the Group reported revenue of JPY 612.8 billion (approximately EUR 4.75 billion). Of this, 40 per cent was generated in Europe, 33 per cent in Asia including Japan and 27 per cent in Americas.

Client: Veneranda Biblioteca Ambrosiana – Milan, Italy
Exhibition design Room IV and Room V of the Pinacoteca Ambrosiana: Stefano Boeri (Founding Partner), Marco Giorgio (Project Director), Francesca Motta (Project Leader), Esteban Marquez, Daniele Barillari, Elisa Versari – Milan, Italy
Executive Design and Production of the Case: Goppion SpA – Trezzano sul Naviglio (MI), Italy
Glass processor: Novavetro - San Severino Marche (MC), Italy
Transport and installation of special glass: Pinotti & Valentino Snc – Brugherio (MI), Italy

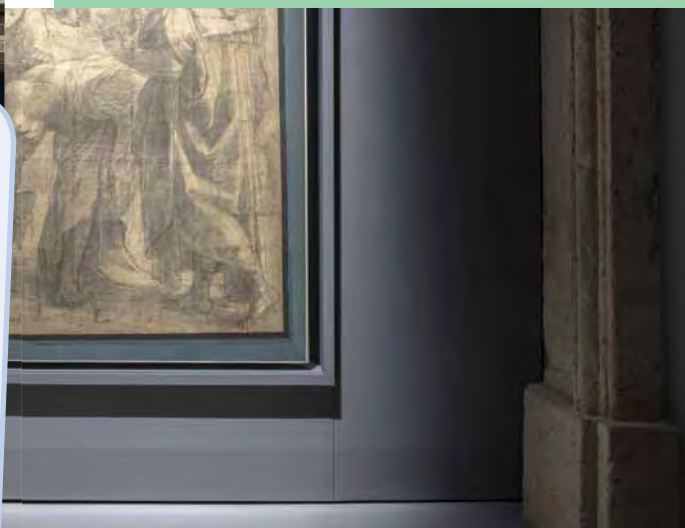
For those who want to deepen their knowledge, there is an informational display table set up in front of the Cartoon, which is designed to help viewers appreciate and share in this pivotal piece of artwork from the Italian Renaissance.

Pilkington Italia SpA
 NSG Group



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Chemists could make 'smart glass' smarter by manipulating it at the nanoscale

"Slowly" is the operative word; typical smart glass takes several minutes to reach its darkened state, and many cycles between light and dark tend to degrade the tinting quality over time. Colorado State University chemists have devised a potentially major improvement to both the speed and durability of smart glass by providing a better understanding of how the glass works at the nanoscale.

They offer an alternative nanoscale design for smart glass in new research published on 3 June in Proceedings of the National Academy of Sciences. The project started as a grant-writing

exercise for graduate student and first author R. Colby Evans, whose idea – and passion for the chemistry of color-changing materials – turned into an experiment involving two types of microscopy and enlisting several collaborators. Evans, who completed a summer internship funded by the CSU Energy Institute, is advised by Justin Sambur, assistant professor in the Department of Chemistry.

The smart glass that Evans and colleagues studied is "electrochromic," which works by using a voltage to drive lithium ions into and out of thin, clear films of tungsten oxide. "You can think of it as a battery you can see through,"

"Smart glass," an energy-efficiency product found in windows of newer cars, buildings and airplanes, slowly changes between transparent and tinted at the flip of a switch.

Evans said. Typical tungsten-oxide smart glass panels take 7-12 minutes to transition between clear and tinted.

NANOPARTICLES TINT FASTER

The researchers specifically studied electrochromic

tungsten-oxide nanoparticles, which are 100 times smaller than the width of a human hair. Their experiments revealed that single nanoparticles, by themselves, tint four times faster than films of the same nanoparticles. That's because interfaces between



nanoparticles trap lithium ions, slowing down the process. Over time, these ion traps also degrade the material's performance.

To support their claims, the researchers used bright field transmission microscopy to observe how tungsten-oxide nanoparticles absorb and scatter light. Making sample smart glass, they varied how much nanoparticle material they placed in their samples and watched how the tinting behaviours changed as more and more nano-

particles came into contact with each other. They then used scanning electron microscopy to obtain higher-resolution images of the length, width and spacing of the nanoparticles, so they could tell, for example, how many particles were clustered together, and how many were spread apart.

Based on their experimental findings, the authors proposed that the performance of smart glass could be improved by making a nanoparticle-based material with optimally spaced

particles, to avoid ion-trapping interfaces.

OTHER APPLICATIONS

Their imaging technique offers a new method for correlating nanoparticle structure and electrochromic properties; improvement of smart window performance is just one application that could result. Their approach could also guide applied research in batteries, fuel cells, capacitors and sensors.

"Thanks to Colby's work, we have developed a new way to study chemical reac-

tions in nanoparticles, and I expect that we will leverage this new tool to study underlying processes in a wide range of important energy technologies," Sambur said. The paper's co-authors include Austin Ellingworth, a former Research Experience for Undergraduates student from Winona State University; Christina Cashen, a CSU chemistry graduate student; and Christopher R. Weinberger, a professor in CSU's Department of Mechanical Engineering.



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Nippon Electric Glass

UNIQUE SOLUTIONS TO DELIVER INNOVATIVE GLASS PRODUCTS

Since its establishment in 1949, Nippon Electric Glass has consistently developed and supplied new products to meet the needs of the era, accumulating and refining glass manufacturing technologies. In this article we take a look at how this company is continuing to pursue its goals, providing world-class innovative glass manufacturing technologies and products.

Special glass can be formed into a variety of shapes and infused with different properties and functions. It can be made into unique materials and products for use in diverse fields such as IT equipment, automobiles, medical care, lighting, architecture, and the energy sector. Special glass increases the speed and capacity of data communication. It makes automobiles lighter and stronger and improves fuel efficiency. It doesn't break at high temperatures and protects against fire. It reinforces

concrete and provides a solution to aging infrastructure.

COMBINING TECHNICAL KNOW- HOW WITH UNIQUE SOLUTIONS

Nippon Electric Glass (NEG) combines its accumulated technical know-how with unique solutions to deliver innovative glass products for use in industry and daily life. The company has, in fact, been developing and providing glass suitable for the times since it was established in 1949. Beginning with

glass tubing for vacuum bulbs in radios, it went on to expand its product line to various areas that support society, including automotive and transportation, ICT and semiconductors, medical care, displays, lighting, energy, social infrastructure, and home appliances.

In recent years, the needs for glass have changed substantially to adapt to rapid transitions in society and the market environment. Thanks to state-of-the-art glass manufacturing technology, NEG manufactures glass products with various shapes and diverse functions to help address social needs such as reduction of environmental burden, innovation of ICT, and the advancement of medical care.

The special glass produced by NEG plays unnoticed roles in various areas, such as thin, smooth glass substrates in television displays, glass fiber in high-function plastic automobile parts, and glass for electronic devices such as smartphones. In addition, NEG glass-ceramics are used in top plates of cooking appliances and walls in train stations.

AUTOMOTIVE AND TRANSPORTATION

To accommodate stricter environmental regulations, improvement of fuel efficiency and environmental performance are urgent issues in the field of

transportation. Glass fiber with a diameter just over $10\mu\text{m}$ has great mechanical strength and improves the strength, hardness, and dimensional stability of plastic and is used worldwide to reduce the weight of automobile parts and components. NEG glass is also used for in-vehicle displays and sensor-related products, while Lamion™ is gaining popularity for use in train station platform doors.

E-Glass fiber

Plastic reinforced with NEG glass fiber is used in automobile parts such as engine components to contribute to weight reduction and better fuel efficiency. Since the use of resin allows for integrated moulding of complicated parts, it helps to conserve energy in the manufacturing process.

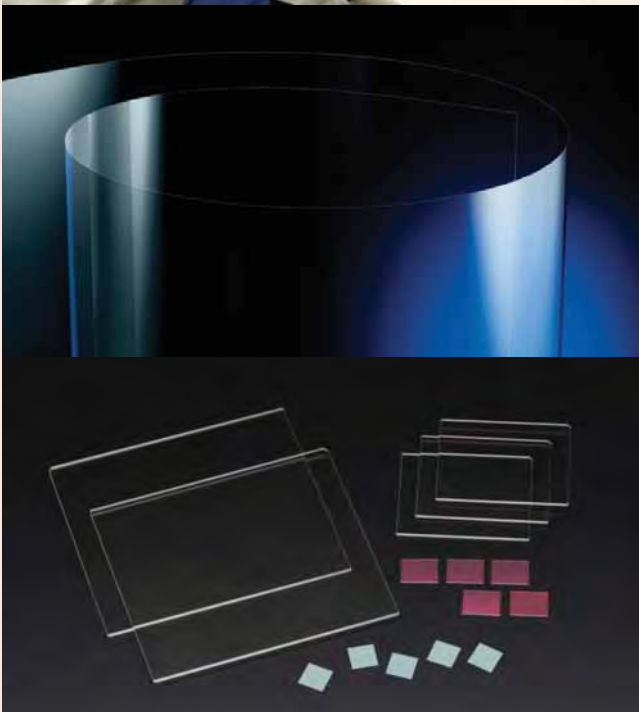
Display-related glass

Display glass is used in smart rear-view mirrors and information displays for vehicles. The half mirrors used in rear-view mirrors function as normal mirrors and can be switched to display images from a rear-view camera. Even during bad weather or at night, clear rear-view images can be displayed.

Sensor-related glass

In-vehicle sensors are an essential part of safe and comfortable driving. NEG cover glass for image sensors, infrared absorbing





filters, and band pass filters are important parts of in-vehicle sensors.

Lamion™, ultra-thin glass laminated on resin

G-Leaf™ is laminated onto one or both sides of a resin plate or film to make

Lamion™. This hybrid material has both the abrasion resistance and gas barrier properties of glass and the light weight and shock resistance of resin. It is being used in train station platform doors and covers for digital signage.



ICT AND SEMICONDUCTORS

The information communication field is constantly undergoing rapid market changes and technological innovation. Glass with excellent properties, such as transmittance, hermeticity, and electrical insulation, plays an important role in optical and electronic devices that support a highly information-oriented society.

Glass substrate/cover glass

NEG offers a variety of glass substrate products which have optical and/or electrical functions, mechanical strength, and chemical durability. Applications include cover glass for image sensors and infrared absorbing filters used in sophisticated cameras, and glass for supporting semiconductor wafers used in the semiconductor manufacturing process.

Functional powder glass/glass paste

These are widely used to form insulating films, coat electronic components, and hermetically seal elec-

tronic devices such as power semiconductors. Material design can be optimized for each application. Processed products also include green sheets, glass paste, and tablets.

Glass for optical communication

By utilizing material development, precision machining, and assembly technologies required for glass manufacturing, NEG provides various products that connect high-speed optical communication networks. Products include micro prisms, micro lens arrays, micro balls, aspherical lenses, and micro capillaries.

Glass frit for laser-sealing of ceramic package

NEG developed the world's first glass frits for laser-sealing of ceramic packages that are an optimal solution to sealing glass lids and ceramic cavities. NEG glass frit for laser-sealing of ceramic package enables local laser heating, which reduces thermal damage and contributes to increased reliability and extended lifetime of electronic devices.

MEDICAL CARE

NEG has been contributing to the development and improvement of safety in the medical field by supplying glass tubing for pharmaceutical and medical use as well as radiation shielding glass. Glass tubing is used for ampoules, vials, and injection syringes. Radiation shielding glass protects health care providers from radiation exposure.

Glass tubing for pharmaceutical and medical use

BS (Clear Borosilicate Glass Tubing) has excellent chemical durability and heat and shock resistance. It is an advanced glass with a low coefficient of thermal expansion and low alkaline elution. NEG also produces BS-A (Amber Borosilicate Glass Tubing) that has both a light-shielding effect and visibility features.

Radiation shielding glass

This high-performance glass protects health care providers from radiation exposure. Its high transparency contributes to accurate diagnosis. LX Premium can be wiped with a wet cloth and has excellent shock resistance. GR Premium is a gamma-ray shielding glass suitable for positron emission tomography (PET) facilities.

DISPLAYS

Displays are essential as an interface for communication devices such as

televisions, computers, digital cameras, and smartphones. With NEG highly-advanced technology, Nippon Electric Glass supports the continuing evolution of larger, higher-precision, and flexible displays.

Glass for flat panel displays (FPDs)

Alkali-free glass substrates (OA-10G and OA-11) are used for flat panel displays such as LCDs and OLED displays, since they do not affect semiconductors in the display manufacturing process. NEG glass substrate, with extremely smooth surface, is formed by the overflow process. OA-11 is easy to handle even though the glass substrate is very thin, with little deformation and gravity deflection.

G-Leaf™, ultra-thin glass

G-Leaf™ is an ultra-thin glass no more than 0.2 mm (200μm) thick that maintains the excellent functions and reliability of glass. Since it can be rolled up, it improves transport efficiency and enables roll-to-roll processing, and is regarded as a next-generation material. It contributes to energy conservation and reducing environmental burdens. G-Leaf™ is ideal for use in many areas, including displays.

Dinorex™, glass for chemical strengthening

Dinorex™ was developed as glass for chemi-

cal strengthening for use in cover glass to protect screens for smartphones and tablets. It is also being used as covers for CID (center information displays) and instrumental panels for automobiles.

LIGHTING

NEG glass is used in lighting with high luminance and high output, such as LED lighting, LD (laser diode) lighting, OLED lighting, and other lighting applications.

Lumiphous™, phosphor-glass composite

Lumiphous™ is a phosphor-glass composite that changes the wavelengths of a light source of LED and LD lighting. With less dispersion, it can express a variety of colours. Compared to resin materials, it has excellent heat, light, and water resistance, and high-power light emission.

Glass substrate with internal extraction layer (IEL) for OLED lighting

This glass can efficiently bring out light that occurs in OLED layers and substantially improves the luminance of OLED lighting.

ENERGY

NEG supplies glass fiber that reinforces wind turbine blades for wind power generation. NEG contributes to the expansion of natural energy use by providing solar mirrors used for solar thermal power



SPECIAL GLASS - FUNCTIONS

Optical	light absorption, wavelength conversion, optical thin film
Electromagnetic	insulation, dielectric, conducting film
Thermal	heat-resistance, fire-prevention, low-temperature sealing
Mechanical	high-strength realized through chemical strengthening or crystallization Chemical: acid-resistance, alkali-resistance, sustaining release of chemicals
Other	gas barrier, strengthening plastic and cement

PROCESSING METHODS

Precision cutting, precision polishing, pre-forming, firing (crystallization), fiber processing, powder processing, paste processing, green sheet processing, compounding, coating, patterning, precision redrawing, metallic joining, welding, sealing, accumulation process, perforation

generation facilities and focusses on developing ultra-thin light-weight mirrors for use in future solar power generation in space.

E-Glass Fiber

Wind power generation uses wind to generate electricity. Wind turbine blades made of glass fiber reinforced plastic (GFRP) using NEG E-Glass Fiber are light-weight and have weather resistance that can withstand strong wind, salt damage, UV light, and other factors.

Solar mirrors

Almost 100 per cent reflectance is realized by forming 100 dielectric layers on glass substrate with high light transmittance and heat resistance and a low coefficient of thermal expansion. The coatings are resistant to 300°C or more and the solar mirrors are used in photovoltaic power generation. We combined this with ultra-thin glass technology to develop mirrors for use in outer space for the Space Solar Power System (SSPS).

IMPROVING SAFETY AND COMFORT

FireLite™, fire-rated glass

With an extremely low coefficient of thermal expansion, FireLite™ can withstand rapid temperature changes and does not break during a fire even when hosed with water. FireLite™ meets US UL* standards. FireLite Plus™ is made of layers of FireLite™ laminated together and will not shatter even when it breaks. This is the only laminated glass approved for use in fire protective facilities in Japan.

*Underwriters Laboratories

Invisible Glass™, ultra-low reflection glass

Bare glass has a luminous reflectance of approximately 4 per cent per side, however, the reflectance of Invisible Glass™ is around 0.08 per cent to 0.5 per cent per side. It minimizes light reflectance, making it ideal for use in showcases and protective picture frame covers.

ARG Fiber

With its exceptional alkali and acid resistance, ARG

Fiber is widely used in construction and civil engineering areas as a reinforcing material in GRC (glass fiber reinforced concrete) and to prevent cracks in mortar and concrete. Its reinforcement effect provides the strength for complicated designs without the need to use reinforcing steel and improves installation efficiency through modularization of parts and increases the possibilities of architecture.

E-Glass Fiber

Rigid urethane resin is reinforced with E-Glass Fiber to produce plastic foam material which can be finished to create a wood texture. With excellent strength, lightness, corrosion resistance, and ease of forming, this material is used to simulate wood in railway ties and other applications.

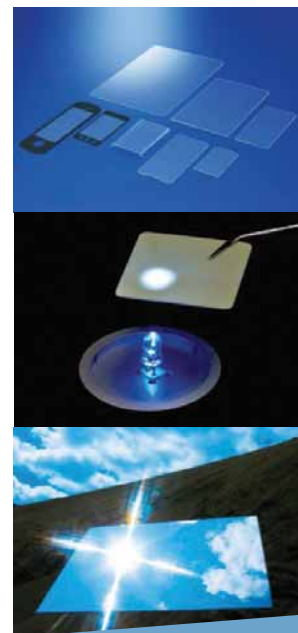
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Neoceram, super heat-resistant glass-ceramics

With excellent thermal shock resistance, mechanical strength, hardness, heat uniformity, and electrical properties, Neoceram is used all over the world. It is formed into plates, tubes, and pressed products, and used in cookware and wood-burning stove and fireplace windows. It can also be coated with thin heat reflective film.

StellaShine™, super heat-resistant glass-ceramics for cooking appliances

StellaShine™ has excellent thermal shock resistance and does not crack even when splashed with cold water after repeatedly being heated to 800°C. StellaShine™ is used for top plates of gas and IH cookers, and is known for its safety properties.



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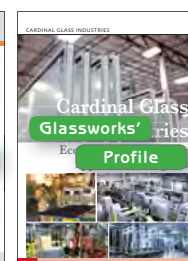
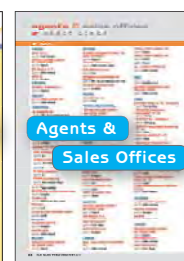
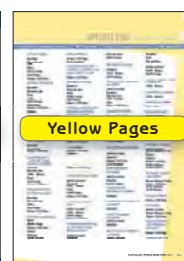
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NICOLA LATTUADA

OUR TECHNICAL AND COMMERCIAL STAFF

For glassmakers who no longer want to spend time on wheel pre-setting on vertical edging machines, **Lattuada** has the answer: **A-WR System**.

1. Automatic pre-setting of 'ZERO' procedure on diamond and resin wheels, without glass and in less than one minute
2. Automatic recovery of the polishing wheels wear
3. Automatic positioning for wheel replacement
4. Jog increase/decrease of spindle position (accuracy 0.01 mm)
5. Automatic positioning on set-point
6. Automatic backlash recovery
7. Automatic spindle cleaning procedure
8. Wheel wear warning
9. Spindle problems warning
10. Manual unlocking for any situation



The **Lattuada Robotic Solution** will have a very special position at our booth at Vitrum: it will consist of two 11-wheels edging machines for the flat edge with arris, also equipped with a dubbing device (model TLR 11 DD PC), a fully automatic glass size

reading device and a Kuka robot to connect the two machines. Some strong points:

1. Customisable suction cups: Venturi vacuum system
2. High flexibility: joint processing of glasses of different sizes with minimum distance between them
3. Automatic glass measurement: pre-setting glass size is not required
4. Ease of use: straight grinding machines standard maintenance
5. Automatic speed adjustment: depending on the sizes of the glass
6. Lower costs: just one operator required
7. Higher productivity: thanks to the high speed of this system
8. Continuous quality checking: access to the area
9. Integrating option: with other machines
10. Continuity guaranteed: thanks to the low maintenance required by our machines

Range of products

- ELECTRONIC OR PC CONTROLLED STRAIGHT-LINE EDGING MACHINES FOR FLAT EDGES OR WITH VARIABLE ANGLE
- DOUBLE-EDGERS (SINGLE MACHINES AND COMPLETE LINES)
- ELECTRONIC OR PC CONTROLLED STRAIGHT-LINE BEVELLING MACHINES
- AUTOMATIC CORNER-GRINDING MACHINES
- VERTICAL WASHING MACHINES
- HORIZONTAL DRILLING MACHINES
- ROBOTIC SOLUTIONS

www.adeliolattuada.com • www.lattuada-na.com



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LATTUADA NORTH AMERICA

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VITRUM

hall 5 / stand C29-D30

ADI SRL

preview

People to contact at our stand

DINO ZANDONELLA NECCA GENERAL MANAGER AND CEO
LORENZA DAL MASO SALES MANAGER

ADI
INDUSTRIAL DIAMOND APPLICATION
SURFACES GROUP

ADI has recently inaugurated its new headquarters after a major expansion that involved both the production facilities and corporate offices. This allows ADI to respond to the ever increasing demand of its customers in a more punctual way. Both the space and the resources have been increased, also in the R&D departments, with the most updated instruments. This allows ADI to continue to increase the performance of its UHS® (Ultra High Speed) family of bonds. ADI produces both peripheral wheels for automotive glass, and for architectural glass, as well as a new generation of cup wheel which belong to this family of tools.

In addition, thanks to the consolidated worldwide exclusivity agreement, ADI will present the patented GLASS RENU scratch removal system at its booth at Vitrum. This system is the only one in the world that removes the scratches on the glass surface utilizing a dry system. As a consequence, it is much easier to use in both indoor and outdoor areas.

The applications of this system are endless: from the architectural industry, to automotive, marine, and maintenance of public transportation.



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VITRUM

hall 7 / stand P27-R30

AYROX SCRL

preview



People to contact at our stand

TIMO SUOMI

MIKKO SUOMI

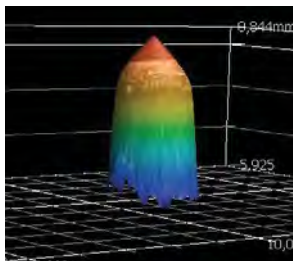
REIMA MÄKINEN

ANDRE SILNOV

MARK TIEBOUT

SALLA SUOMI

AYROX has over 25 years' experience in the glass industry. We provide quality control instruments complying with the international norms for architectural and automotive glass. We offer calibration, repair and maintenance service in our own laboratory for a wide range of optical quality control instruments. Additionally, to improving quality and optimising production, Ayrox commercialises production accessories for laminated and tempered glass such as silicone and silicone free vacuum rings and aramid fibre tapes.



Calibrated tool for fragmentation test

PVB Wiring machine for heatable laminates



AutoGASP II
for surface stress
measurement

Ayrox YouTube Channel



Range of products

- **PVB SHAPING LINES**
- **PVB WIRING TECHNOLOGIES**
- **HEATABLE BACKLITE SOLDERING AND TESTING SYSTEMS**
- **SILK PRINTING MACHINERY**
- **FLAT AND BENT GLASS TEMPERING MACHINERY**
- **SOURCING AND TRADING IN SAFETY GLASS FOR VARIOUS APPLICATIONS**
- **DISTRIBUTOR OF STRAINOPTICS PRODUCTS**



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E-mail: deals@ayrox.com

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VITRUM

hall 5 / stand P20

B SOLUTION Srl

preview

LBsolution
ON THE PLUS SIDE ●●●

People to contact at our stand

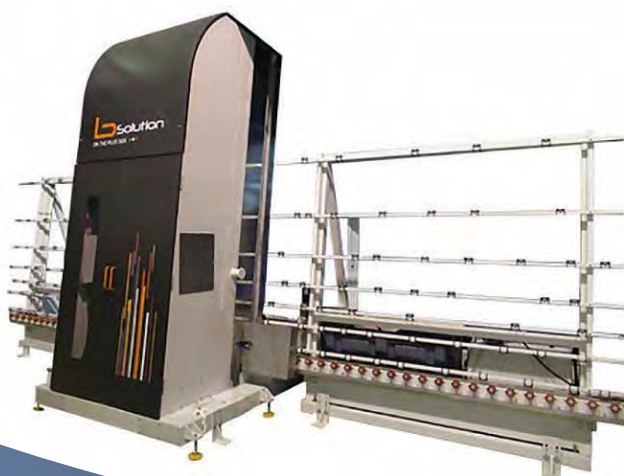
GIANLUCA BONFANTI
DANIELE NARDO

MANAGING DIRECTOR
SALES MANAGER

Speed||Arris

**HIGH-PRODUCTIVITY
ARRISING-GRINDING**

**FOR INSULATED AND TEMPERED GLASS
ARRISING-GRINDING OF GLASS
THICKNESS 4-21 MM.**



Speed||Edge

**HIGH-QUALITY
GRINDING**

**FOR TOP BIG SIZE 3200x9000 MM.
GLASS THICKNESS 4-21 MM.**



Produced in Italy in collaboration with partner of high technological value

Processing of arrising and grinding of rectangular and shaped glasses with two spindles that work simultaneously

Transport system with suction cups for high performance glasses

High-productivity guaranteed for double glazing lines

Oscillating spindle ensures the regular execution of threads

Possibility of stand-alone installation or integrated with existing lines

Machining rough or polish, flat or round edge, arrising and milling

The compact system integrate in a load and unload solution reducing bulky space

Suction cups system with the locking mechanism of the entire sheet of glass

Maximum level of precision of machining

Best efficiency of tools

New sheet's load during the cycle



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VITRUM

hall 7 / Stand L01-P04

BAVELLONI SpA

preview



People to contact at our stand

BAVELLONI SALES PERSONNEL WILL BE AVAILABLE ON THE BOOTH TO INTRODUCE ITS FULL RANGE OF PRODUCTS AND INNOVATIONS.

At Vitrum 2019, **Bavelloni** will showcase some of its most representing machinery, introduce Bavelloni Tools and will present, for the first time at an international event, Yalos Bavelloni, a new reality specialized in the design and production of high performance washing machines for flat glass.

The focus of **Yalos Bavelloni** is offering a **complete line of horizontal and vertical washing machines** featuring the highest performance in terms of washing and drying quality, durability and minimum maintenance. The machines have been designed in a standardized and modular way but, at the same time, a variety of options are available to configure them according to specific needs. Danilo Cigoli, Managing Director of Yalos Bavelloni, and the other shareholders of Yalos Bavelloni have a great experience and know-how in the field of flat glass processing and, in particular, in the washing and drying process. This also allows the company



to operate in the special machinery segment, developing customized solutions on demand. On display at Vitrum, a horizontal washing machine representing Yalos Bavelloni product portfolio.

Another innovation of this edition is the broad range of **diamond and polishing tooling** by **Bavelloni Tools** which result from a combination of research in metallurgy and extensive application knowledge. With a solid expertise in the field of grinding technology, Bavelloni Tools can provide an array of tools for Bavelloni machinery as well as for other producers'. On show, also the Bavelloni milling cutters recently launched on the market, featuring long life, stable performance and consistent finishing quality.

On display, the **Bavelloni VE500 V10** mitring machine for processing chamfers with variable angle from 0° to

45°. This machine can be customized with a wide range of options. The model on display, for instance, will be equipped with a presetting device for the automatic positioning of diamond and polishing wheels.

At the show, Bavelloni will also offer demonstrations of its **NRG 330 PJ** working centre with 4 axis. Its operating head fits Bavelloni electro-spindle, designed and assembled in-house; the machine also features the patented PowerJet device and an automatic up down sliding door. Moreover, thanks to its exclusive PAV system (patented), NRG330 will position suction cups and centering devices on the work table completely in an automatic way.

Visitors will also be presented with the vertical drilling/milling center **VDM 1636 CN**. It is fitted with one double drilling head with rotating tool storage (8 + 8 positions). The machine, extremely user-friendly, has been designed with the most advanced technical solutions to ensure very high working accuracy. Milling is performed while the glass is in a fixed position so to achieve better grinding quality and higher grinding speed.



Range of products

- **STRAIGHT-LINE EDGING AND BEVELLING MACHINES**
- **SHAPED GRINDING AND BEVELLING MACHINES**
- **DOUBLE EDGING MACHINES AND LINES**
- **DRILLING & MILLING MACHINES**
- **CNC GRINDING MACHINES**
- **TABLES FOR STRAIGHT AND SHAPED CUTTING**
- **FULLY INTEGRATED SOLUTIONS**
- **DIAMOND AND POLISHING TOOLING BY BAVELLONI TOOLS**
- **YALOS BAVELLONI HORIZONTAL AND VERTICAL WASHING MACHINES**



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www.bavelloni.com



VITRUM

hall 5 / stand G09-H10

BOVONE DIAMOND TOOLS Srl

preview



People to contact at our stand

VITTORIO BOVONE
PATRIZIA PASTORINO, MARTA PESCE
GIANNI MARENCO

OWNER
SALES DEPT.
TECHNICAL DEPT.



BDT was founded in 2003 to support and complete Elettromeccanica Bovone. Vittorio Bovone, together with his daughters Federica and Giulia, and all the BDT Staff, wanted to produce and manage wheels for straight-line edgers and bevellers in-house. This represented just the beginning, now BDT is a strong and consolidated company with well-prepared and experienced staff. Focus on market demand and technical improvement are the keywords of BDT's history and evolution.

Over the years, this small company has grown a lot: it now has 25 employees and large production capacity including metal bond and resin bond diamond cup and peripheral wheels for bevellers, edgers, double-edgers, CNC peripheral wheels, drill bits and glass tools to make holes. In 2015 two young employees were recruited, one in the Production Department and the second one for Sales&Marketing.

In 2010, the new revolutionary and

performing **GOLDNET** router was patented. Today it is one of the most highly appreciated tools of the range.

In the same year, Bovone Maquinas e Equipamentos Industriais was also founded. This is the Sister Company of BDT, based in São Paulo, which deals with Bovone machines and BDT tools all over Brazil.

Since 2010, the company has also been producing stone tools, investing on highly performing machines to provide high quality wheels to grind new materials such as Dekton.

The company has always experienced step-by-step development, recording a steady and progressive increase in sales volume year after year.

The only exception was in 2009 when sales decreased, but in 2010 the previous targets were completely restored. 2017 was a successful year since the company reported a 25% increase on total volume.

The formula never changes: investing in innovation, research, development, and performance in machines and human resources are the secrets to grow. At BDT, employees are people first and foremost - and they are very responsive people. They feel part of a very big family, and they are always ready to intensify rhythms when a customer urgently needs an order, since their efforts are always rewarded. They are, in fact, always granted the best working conditions

and they always receive what they ask for. BDT uses the same philosophy with customers, who need to have the best service. Our company aims at establishing positive business relationships with them, and sometimes thanks to this behaviour over the years, simple partnerships have evolved into something more. This also happens with agents, dealers, suppliers, both Italian and international, and even forwarding agents.

This virtuous circle keeps on producing great advantages, giving our brand name extra value which represents BDT's long-lasting seriousness and reliability.

Range of products

- **DIAMOND METAL BOND AND RESIN BOND WHEELS**
- **POLISHING WHEELS**
- **FELT WHEELS**
- **CERIUM OXIDE**
- **DIAMOND DRILLS**

NEW
AXION
GLASS POLISH

NEW

Click-Fit: the One-Click Revolution



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VITRUM

hall 5 / stand D01-F09

People to contact at our stand

ALBERTO MASOERO FLAT GLASS GENERAL MANAGER

BOTTERO S.P.A.

preview



Since 1957 **Bottero** has been making innovation its mission, investing in R&D to maintain its technological leadership. This is why today, with no whims and with the determination to excel that has always characterized it, Bottero is changing to a brand identity that fully represents its core values and its ability to innovate.

Bottero is the only global leader in the world of glass technology to operate with both flat and hollow glass, with more than

50,000 machines and glass transformation systems installed over the world, in over 100 countries.

Divided into three distinct business units, flat glass, hollow glass and engineering, Bottero can be present on the market, serving small and medium glass factories but also big industrial implants with products capable of producing up to 8 million bottles per day.

Its extensive machinery catalogue caters

for the needs and trends of all segments of the market, covering for example 100 per cent of the European market for laminated glass and 90 per cent of the global market.

The dual identity of Bottero is represented in its new logo by the two overlapping shapes, fused together to give life to a unique technological result. The logo is also an expression of all what Bottero represents: innovation, dynamism, solidity and clarity.

Rebranding therefore symbolizes the will to show that Bottero's actions are guided by its values, grounded in its history and leaning towards the future.

Bottero is no longer the same, but better.



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www.bottero.com



VITRUM

hall 5 / stand G09-H10

ELETTROMECCANICA

BOVONE Srl

preview

www.bovone.com
bovone
MADE IN EXCELLENCE

YOU CAN RELY ON

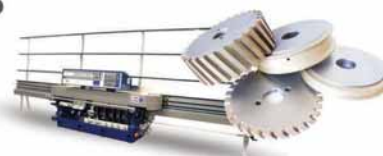
BOVONE GROUP

Bovone Group, operating with its own brands, is the prominent player for technological solutions in the field of glass processing.

Bovone manufactures stand alone machines (edging, bevelling and washing machines) as well as plants for laminated glass and mirror silvering; these two competence areas are combined in the BRS robotic edging systems.

Bdt manufactures and customizes metal and resin bond diamond wheels for bevelling, edging, polishing machines and CNC work centers.

**MACHINES
PLANTS
TOOLS**



Range of products

- MIRROR SILVERING LINES
- MIRROR SILVERING LINES FOR CSP
- LAMINATED GLASS LINES
- EDGING MACHINES
- BEVELLING MACHINES
- DOUBLE EDGERS FOR FLAT EDGES
- WASHING MACHINES



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VITRUM

hall 7 / stand H25-L26

BYSTRONIC GLASS

preview

Bystronic
glass

People to contact at our stand

OUR STAFF WILL BE AT YOUR SERVICE THROUGHOUT THE SHOW.

BYSTRONIC GLASS AND GLASTON AT VITRUM 2019

When the Vitrum trade fair opens its doors in Milan 1-4 October 2019, **Bystronic glass** will present innovations and trends in architectural, automotive and display glass manufacturing at the Glaston booth in Hall 7 at Stand H25/L26.

As part of the Glaston Group, Bystronic glass will present more than 50 years of experience in innovative glass processing solutions for the architectural, automotive and display glass industries.

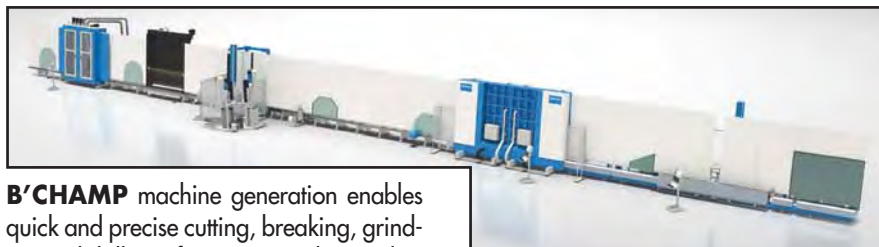
Insulating Glass Manufacturing

Irrespective of whether a fully-automatic line for I.G. production with warm-edge spacers or an entry-level solution: At Bystronic glass, every I.G. manufacturer will find the line or machine that meets their requirements.

Highlights of the IG product range are TPS® production solutions. TPS® stands for Thermo Plastic Spacer. Bystronic glass is the inventor of this «warm edge» technology and launched this system in 1994. This is the Original with much more than 100 installed TPS® I.G. lines worldwide.

Automotive Glass Pre-Processing

Bystronic glass is a world market leader in automotive glass pre-processing. The



B'CHAMP machine generation enables quick and precise cutting, breaking, grinding and drilling of automotive glass enduring system reliability for 24/7 operation. Due to the modular design, several cells can be combined together to individually adapt to customer specific requirements.

of glass thicknesses from 0.40 mm to 3.00 mm (other thicknesses optionally on request).

Display Glass Processing

With **B'BRIGHT** Bystronic glass launched a new machine generation for display glass processing. The thin glass options are suitable for a wide variety

Range of products

- **SYSTEM SOLUTIONS FOR THE MANUFACTURING OF ARCHITECTURAL, AUTOMOTIVE AND DISPLAY GLASS**
- **INSULATING GLASS MANUFACTURING**
- **HANDLING EQUIPMENT**
- **AUTOMOTIVE GLASS PRE-PROCESSING**
- **DISPLAY GLASS PROCESSING**
- **SERVICE & SUPPORT**



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VITRUM

hall 7 / stand G01-K10

CMS SpA preview



People to contact at our stand

DORIAN CAMPAGNOLA
GIULIO VITELLI
ELENA TURBA

DIVISION MANAGER
BUSINESS UNIT MANAGER
MARKETING MANAGER

VERTICAL PRODUCTION LINE BREMBANA PROFILE + VERTEC

Brembana Profile, the first vertical CNC modular processing centre designed for vertical grinding, milling and drilling of glass sheets up to 7,500x3,300mm (other maximum workable dimensions on request).

- Electrospindle 13.5 HP 0-15000 rpm (optional 30 kw)
- Automatic axes lubrication
- maximum flexibility in format and production batch change operations: no machine set-up operations are required
- **CMS** 'glass-guide' system which ensures perfect alignment between glass and Brembana Vertec the grinding wheel, CNC vertical drilling machine, for drilling countersinking, milling and notching operations on float, laminated and low-E glass.
- two opposed electrospindles and tool cooling system with internal and external water, which allows higher processing quality
- two 9+9 stations NC-controlled rotating tool racks moving together with electrospindle, ensuring shortest tool changes
- high-pressure water cushion (patented)

The **BREMBANA SPEED** 3- or 4-axis horizontal work centre for grinding, polishing, drilling, milling, disk cutting, engraving



Brembana
Easyline

ing and writing operations, as well as 5° bevelling operations.

The Twin version on display at the fair features:

- two grinding heads to allow the simultaneous machining of two workpieces, consequently doubling productivity.
- The heads are mounted on the same beam but are completely disengaged from each other along the stroke (it is possible to park a head to work in a single area with a single spindle).

BREMBANA EASYLINE is a 3- or 5-axis waterjet cutting system.

- The cantilever structure, with a separate tank, allows an easy access to the worktable for quickly loading and removing of sheets.
- The machine is equipped with a 5-axis cutting head with IKC technology (intelligent Kerf Compensation). Effective head motion to carry out bevel cutting and

Range of products

- **VERTICAL CNC MACHINES AND AUTOMATIC LINES**
- **3-7 AXES WORK CENTRES**
- **AUTOMATIC CUTTING LINES**
- **DOUBLE EDGERS**
- **TILTING CUTTING TABLES**
- **WATERJET CUTTING SYSTEMS**
- **HANDLING AND AUTOMATIC SYSTEMS**

control the cut conicity.

- The tank is set up for the installation of a dredge system for abrasive removal
- Available with single or double tank solution for pendular working (opt)

BREMBANA GREENJET EVO 4150 bar (6200 bar version also available) is the new electric pressure intensifier for highest efficiency with maximum energy saving (up to 60% compared with traditional intensifiers)

- Double-acting pressure multipliers, electrically driven, manufactured with materials highly resistant against mechanical stress and corrosion
- Reduced maintenance schedule because of 80% reduction of structural components



Brembana Speed Twin



Brembana Profile + Vertec



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VITRUM

hall 7 / stand C27

CO.M.S.S. Srl *preview*

comss
SILK SCREEN PRINTING MACHINE

People to contact at our stand

MARCELLO E ANDREA AIUDI TECHNICAL & SALES MANAGERS



1974 - 2019

COMSS s.r.l. has more than 45 years of activity and experience in artistic and industrial screen printing.

The two generations still present in the company combine their experience and dynamicity – the ideal combination for those who turn to COMSS looking not only for a supplier, but also a partner able to supply plants and follow-up with technical and post sales services.

Our technical services involve close contact with our clients, on-site where the plant is to be installed. In fact, knowledge of the company and its organization are essential to be able to install a new production line that is perfectly integrated with existing machinery.

The production of customized machinery and plants is what enables us to do this, and is – and has always been – COMSS' strong point. Customization can regard functional work dimensions,

automation and layout, as per the area available for the installation of the same plant. Our screen printers, transport systems and conveyors, as well as drying ovens, have all been designed with modularity in mind, enabling clients to update and increase their plant at a later date.

Post-sales involves, first and foremost, spare parts and assistance, fundamental to be able to guarantee continuous production of the plants.

Online assistance also plays an important part in reducing machine downtime needed, and for this reason all our

machines have Internet connection.

COMSS services also include training courses for screen printer operators for companies who are beginning to work in the sector.

Screen printing, in fact, is one of the sectors where human presence is important in reaching high quality levels of the finished printed products.

Training takes place on-site at the company's premises, where the operator will be working, and using the machine he will be working with.

COMSS can also supply screens ready to use for different sectors.

Range of products

- **SILK-SCREEN PRINTING MACHINES AND EQUIPMENT**
- **SILK-SCREEN PRINTING PLANTS**
- **DRYING SYSTEMS**



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VITRUM

hall 7 / stand E11-G20

CUGHER GLASS Srl

preview

**PLANTS
NOT ONLY**

People to contact at our stand

BARBARA MAZZA
MARINO BONETTI
ANDREA ZORZITTO
PAOLO BARDOTTI

GENERAL MANAGER
SALES MANAGER
AUTOMATION DEP. MANAGER
MECHANICAL DEP. MANAGER



CUGHER 50th
Plants for glass screen printing



Range of products

- CUSTOMIZED ENGINEERING AND SOLUTIONS
- TURNKEY PROJECTS
- AUTOMATIC SILK SCREEN PRINTING MACHINES
- SEMI-AUTOMATIC SILK SCREEN PRINTING MACHINES
- IR DRYERS
- UV DRYERS
- COMPLIMENTARY EQUIPMENT AND ACCESSORIES
- HANDLING
- CUSTOMIZED SOFTWARE

Cugher Technology for screen printing on flat glass: stand alone machine and complete lines

Cugher's 50 years of success regarding screen printing machines for glass is

the result of an efficient mix of productive resources and cutting-edge technologies, and derives from the work of a team of high profile professionals. Production focuses on **two macro areas of commercial offer** dedicated to **stand alone machines and complete lines**.

At Vitrum 2019 the company will be clearly and efficiently communicating this which integrates the two areas, each one made up of:

- **Machines for screen printing.**
 - **Dryers (IR, UV or combined)** that can also be integrated with systems for digital printing.
 - **Vision systems and quality control** system dedicated to handling, transport and storage.
- All production makes use of consolidated and strategic technological skills for which Cugher is well-known all over the world, enabling it to offer solutions:
- **Innovative:** thanks to constant R&D investments and in-depth knowledge of industrial processes that are in constant evolution.
 - **Highly customizable** as per spe-

cific customer needs: flexible engineering drives production right from the first project phases.

- **High performing** in terms of finished product quality, productivity and production flexibility.

The main application sectors in which the company performs are the architectural – building and interior design – the home appliance and the automotive.

Special Devices

- **EDGE TO EDGE PRINTING SYSTEM**
- **AUTOMATIC ASYMMETRICAL GLASS CENTERING**
- **QUALITY VISION SYSTEM FOR PRINT & GLASS**
- **CAMERA ASSISTED SCREEN ALIGNMENT**
- **DOUBLE GLASS PRINTING SYSTEM**
- **BROKEN SCREEN DETECTION UNIT**



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VITRUM

hall 5 / stand K09-L10

DELTAMAX AUTOMAZIONE Srl

preview

People to contact at our stand

GIANLUCA DIENER
CHIARA CORRIDORI
LEONARDO PLOTGHER



1989-2019: 30 years of innovation in glass quality control

2019 represent an important goal for **Deltamax Automazione**, not only because it is the 30th anniversary of the company, but also because it is the starting point of the new way of thinking and working, in the name of "green economy".

The latest solution developed by Deltamax Automazione, named OPT and officially presented at Vitrum, represent exactly the essence of the theories that aim at energy saving and environmental impact reduction: detecting structural defects in the first stage of the production process enable, in fact, to increase quality and productivity at the same time.

OPT: how it works

The most important innovation of the solution developed and patented by Deltamax Automazione consist in structural defects (bubbles and inclusions) detection on plate that come from the warehouse, thus with residue on the surface (lucite, dirt, etc.).

In this way it is no longer necessary to install a dedicated washing machine, thus saving money and space (required for its installation), two of the most demanding points in a new factory layout.

Installed between the loader and the cutting table, OPT acquires the images of the glass plate that move inside it, both monolithic or laminated, obtaining a map of the detected defects to provide to the cutting table management software.

The management of the detected defects can be carried out in different ways, which enable to obtain an increasing reduction of the whole surface of glass that has to be rejected:

- display of detected defects directly on the cutting plan, allowing the operator to find and reject plates with defects;
- display of detected defects directly on the cutting plan with manual optimization: in this case the operator can change the position of plates avoiding



the area with defects;

- automatic real time optimization of the plate on the table;
- automatic optimization of the whole cutting plan.

OPT: advantages

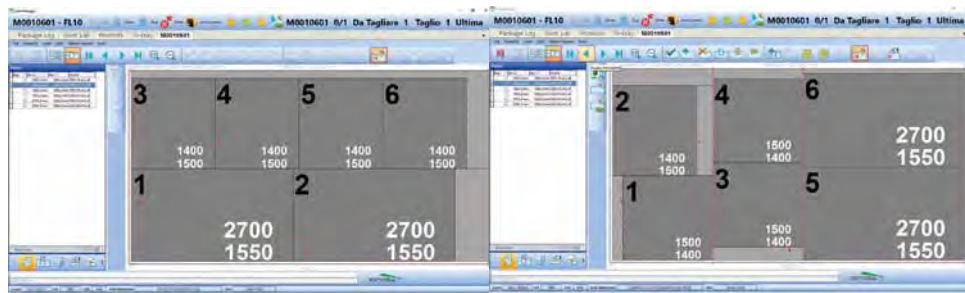
The innovative solution developed by Deltamax ensures various advantages, thanks to the early detection of defects. In particular:

- reduction of the glass area rejected, changing the cutting plan and positioning the waste around the defects;
- reduction of energy consumption and machinery wear, avoiding the processing of plates that will be rejected;
- reduction of the cycle time due to less rejection management.

Of course it is possible to customize the inspection process, setting the minimum dimension of the defects.

It is important to remember that all these advantages can be obtained without washing the glass.

OPT is not the only solution developed by Deltamax Automazione for the quality control of flat glass: we will be glad to show you our complete range of systems.



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www.deltamaxautomazione.it



VITRUM

hall 5 / stand L09-M10

DIAMUT - BIESSE GROUP

preview

People to contact at our stand

GIANLUCA GRIANTI TOOLING DIVISION DIRECTOR

 **DIAMUT**

Diamut, the Tooling division of Biesse Group, is ready for the 21st edition of Vitrum.

In the era of the digital industry, where the complete integration and automation of production processes with cutting-edge machines are driven by innovative software, tools take on an even more substantial role. In fact, it is the final instrument thanks to which all materials are shaped, giving form to finished objects of large-scale production up to real works of art. For this reason its full interaction with all technologies is crucial, in order to eliminate waste of time, and ensure full confidence with the operator, guaranteeing an efficient production process.

Interaction

And it is precisely with this concept of maximum technological interaction that Diamut, the tooling division of the Biesse Group, presents itself at the 21st edition of Vitrum, unveiling all its new solutions to the international stage of the event. In the spotlight there will be the Start-up tool kit; a case containing a special supply



of Diamut tools and accessories useful for the operator during the installation of the Intermac Master and Vertmax machines; the practical demonstration of the full synergy between the tool and the machine obtained thanks to the important collaboration with Intermac, the Biesse Group division that manufactures and markets machines and systems for flat glass machining. Moreover, Diamut has fielded the experience and know-how achieved over time, bringing to the highest state-of-the-art the range of cup wheels for all types of machines available on the market, with a new design, high speed of use, superior durability and excellent edge finishing. They are the ideal solution for all compa-

nies with a high production capacity.

On the Diamut stand, Hall 5, Stand L09 M10, other solutions made in Diamut, such as drills, routers, discs and all peripheral wheels will be on show. Diamut technicians, with all their experience will be available to propose solutions suitable for each and every production requirement.

Diamut, a first half-year to be framed

Important investments have been registered for Diamut, among the most important, Biesse Group has opened a new manufacturing facility on the Biesse Group Campus in Charlotte to assemble Italian-engineered Diamut diamond profiling wheels for glass, stone and ceramic processing. Biesse Group has opened a new manufacturing facility on the Biesse Group Campus in Charlotte to assemble Italian-engineered Diamut diamond profiling wheels for glass, stone and ceramic processing. An investment responding to growing market needs through a more timely and attentive customer service fully focused on the North America region.

Range of products

- CUP AND PERIPHERAL WHEELS
- DRILL BITS
- ROUTERS
- CUTTING DISCS
- WRITING BITS
- SPHERICAL TOOLS
- TOOLS FOR THIN GLASS SHEETS
- PRESETTER
- TOOLHOLDER FOR CNC



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www.diamut.com



VITRUM

hall 7 / stand P22

EDGETECH EUROPE GmbH

preview

Edgetech

A Quanex Building Products Company



Edgetech Europe GmbH is pleased to announce that it will, once again, be exhibiting its products at Vitrum in Pavilion 7 Stand P22, from 1-4 October. Attracting about 20,000 visitors across the four days of the bi-annual show, this exhibition for every sector of the glass industry is particularly relevant for Edgetech to demonstrate the production and thermal efficiency of its Warm Edge range of spacer products.

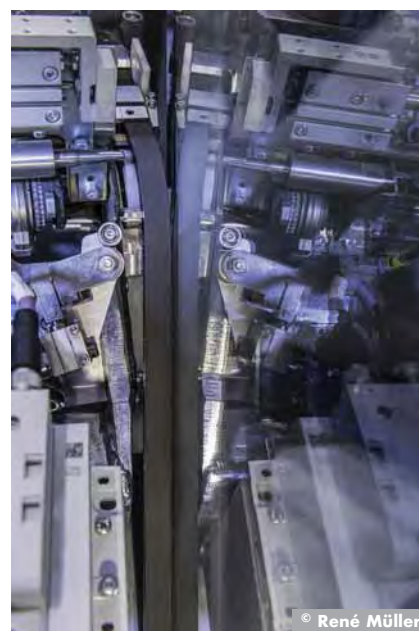
Joachim Stoss, managing director of Edgetech in Europe, explains: "Edgetech is a regular exhibitor at Vitrum because glass companies of all sizes, across all countries, attend the show to see what's new and which different machinery or components can help their business today and in the future. Our stand is always busy for exactly this reason. The Italian

market has great potential as experts have predicted that Italy as well as other European countries will soon be recovering from recession and negative market trends. Companies want to hear how such a small component can make such a big difference to the overall thermal performance of a window, as well as improve productivity in their factory – whether the spacer is applied with manual, semi-automated, or fully-automated machinery." A fully automated process represents a way to combat shortage of skilled workers but also an incredible time saving. The silicone-based spacers are set in parallel down to the last millimeter in a matter of seconds, thus guaranteeing a flawless and durable edge seal.

The 1st April 2019 saw Super Spacer® T-Spacer™ Premium, T-Spacer™ Premium Plus and TriSeal™ Premium Plus bear the RAL Quality Label for the first time. All three RAL quality-monitored Super Spacer® systems are also certified for Arctic climates and also every climatic zone with lower requirements by the Passive House Institute in Darmstadt, Germany. With an edge resistance of 6.11 m K/W, the warm edge Super Spacer® Premium was rated in the highest efficiency class phA+ and is thus one of the most energy-efficient spacers on the market.

Joachim Stoss explains "no Warm

Edge spacer offers more possibilities in applications than Super Spacer. It is not without reason that 30 years of experience have made us the innovation leader. Visitors to Vitrum will also be able to talk to Edgetech's Warm Edge Technology experts about existing and new products that really will be the future of building, so we look forward to greeting visitors throughout the show."



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VITRUM

hall 7 / stand P21

FILTRAGLASS SL

preview

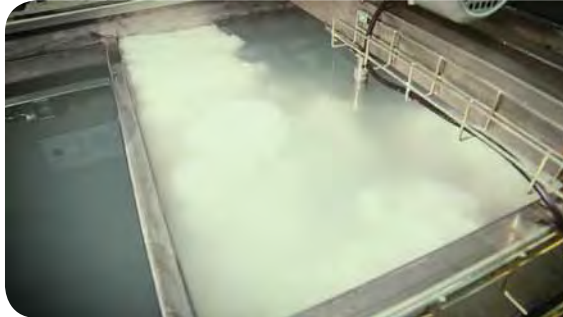
FILTRAGLASS
clear water, clean glass

Filtraglass was set up more than 15 years ago for the design and manufacture of water filtering systems for the glass industry.

Over the years, our team of engineers has developed several models to meet the various needs of large and small companies, while maintaining them at the cutting edge of technological advancements in the sector. Today, Filtraglass has machines in operation on several continents and is continuing to grow internationally.

This growth and development has been maintained thanks to three fundamental corporate values: firstly, our commitment to the environment and looking after the planet; secondly, our desire to remain on the cutting edge and invest in R&D+i; and, thirdly, our desire to offer our customers one of the best technical services in the market.

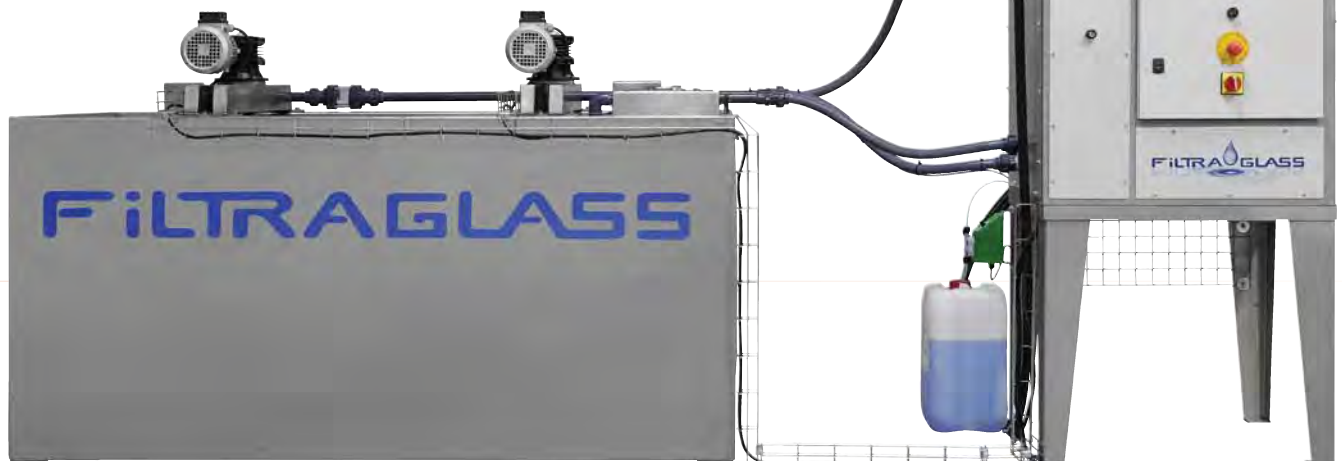
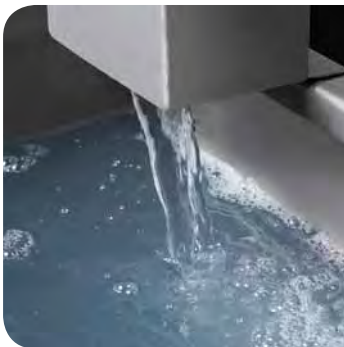
Filtraglass currently offers a range of models to its customers, each one of them suited to a specific customer profile based on company size, water volume to be filtered and the machines



used for glass treatment. The latest machine – the Eco3Box – was launched in 2018 and is a more efficient, environmentally-friendly and affordable version that can be installed on bevelling and edging machines quickly and easily.

All our systems share a series of characteristics: they all recycle 100% of the treated water, reducing water and cutting oil consumption, improving the performance and productivity of the main machine by reducing wear and extending the life cycle of the machine itself and its components, and, finally, help reduce environmental impacts by consuming less natural resources and enabling the waste generated by the whole process to be recycled.

We look forward to seeing you at Vitrum (Stand P21 , Hall 7), to respond to your questions, show you our machines and one of our models in operation.



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www.filtraglass.com



VITRUM

hall 7 / stand P01-R12-R01-V12

FOREL SpA

preview

FOREL

People to contact at our stand

CARLO ZUCCARELLO

EXPORT AREA MANAGER

Forel's trust in the Italian system is confirmed once again at Vitrum 2019. The company, one of the most significant in the 'Made in Italy' glass sector, will be present with a decidedly remarkable stand, both in terms of size and variety of solutions on show - facts and not just fiction.

The new Jumbo line for high-tech double-glazing, with a series of exclusive innovations, will be in the spotlight. This performing and flexible system, aimed at glass companies wanting to present themselves to the market with a varied and complete offer, both for the residential and commercial sector (standard panels, Jumbo format, staggered, shaped, of double-, triple- and quadruple-glass). On show at Forel's stand: vertical washing machine, quality control scanner, inspection bar and installation of profile, profile bending machine, desiccant loader, butyle machine, glass turning bar, gas press coupler and sealing machine.

One of Forel's 'best sellers' will also be up and running at the stand: the vertical processing line, consisting of a grinding machine (for filleting, rough-edge grinding and polished edges), a drill and a vertical washing machine.



As regards the handling and automated management, a Sorting System will also be in operation at the Forel stand. This solution is not just limited to moving the glass sheets inside the glassworks (for example, by connecting a cutting or vertical processing line with a double-glazing line) but also organizes the glass sheets stored according to the production schedule, even if not loaded in a specific order, also enabling it to be collected and leave the warehouse as per the order to which it belongs.



Range of products

- AUTOMATIC INSULATING GLASS LINES INCLUDING:
 - EDGE-DELETION MACHINES
 - ARRISING MACHINES
 - WASHING MACHINES
 - IN-LINE SCANNERS FOR SHAPE RECOGNITION AND QUALITY CONTROL
 - AUTOMATIC FLEXIBLE SPACER APPLICATORS
 - AUTOMATIC CORNER TAPE APPLICATORS
 - FLAT COUPLING PRESSES W/ OR W/O GAS FILLING
 - AUTOMATIC CORK PAD APPLICATORS
 - SEALING ROBOTS
- HIGH SPEED INSULATING GLASS LINES
- SEMI-AUTOMATIC INSULATING GLASS LINES, INCLUDING:
 - WASHING MACHINES
 - FLAT COUPLING PRESSES W/ OR W/O GAS FILLING
 - TILTING TABLES
 - MONO AND BI COMPONENT SEALING EXTRUDERS
 - TURNTABLES FOR SEALING
- AUTOMATIC PROFILE BENDING MACHINES
- AUTOMATIC DESICCANT LOADERS
- AUTOMATIC AND MANUAL BUTYL EXTRUDERS
- MANUAL GAS FILLING MACHINES
- ANGLE ROTATING AND TURNING CONVEYORS
- LAMINATING LINES
- VERTICAL EDGING MACHINES
- VERTICAL DRILLING AND MILLING MACHINES
- VERTICAL DOUBLE-BRIDGED AUTOMATIC CUTTING LINES FOR LAMINATED GLASS W/ AUTOMATIC LOADER AND STOCKING SYSTEM
- AUTOMATED PLANTS FOR STOCKING GLASS SHEETS
- PROFILE SAWING MACHINES
- MANAGEMENT SOFTWARE PACKAGE
- SORTING SYSTEM • ACCESSORIES



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www.forelspa.com



VITRUM

hall 5 / stand H11-M20

FORVET SpA

preview



People to contact at our stand

OUR MANAGEMENT STAFF

6 machines in ONE

COMBIFLEX

Connected with **FORBOT SYSTEM**

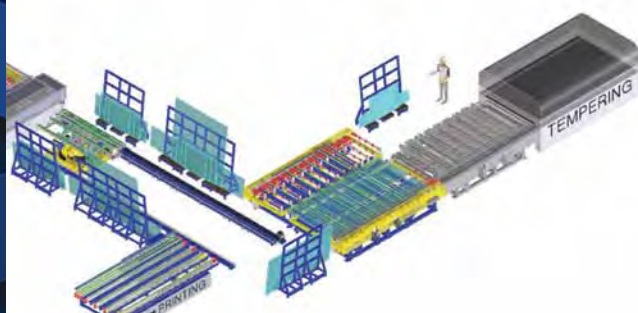
- ✓ Automatic loading
- ✓ CHIARA grinding - polishing
- ✓ FRANCESCA drilling - notching Water Jet
- ✓ CNC round corners
- ✓ Engraving Mitering
- ✓ Washing & drying
- ✓ Automatic unloading

**FOOTPRINT
32 sqm ONLY**



FORBOT

Automatic glass stocking,
sorting and furnace loading
optimization system



Range of products

- | | | |
|-------------------------------------------|--------------------------------------|------------------------------------|
| • COMPLETE HANDLING
AND MOVEMENT LINES | • AUTOMATIC DRILLING
LINES | • DRILLING AND MILLING
MACHINES |
| • COMPLETE EDGING LINES | • MULTI-SPINDLE DRILLING
MACHINES | • DOUBLE EDGE GRINDING
MACHINES |



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VITRUM

hall 5 / stand M29-M30

FRATELLI PEZZA

preview

FP
FRATELLI PEZZA

People to contact at our stand

MICHELA PEZZA

MANAGING DIRECTOR

PAOLO DE BORZATTI

SALES MANAGER

Italian company **Fratelli Pezza**, leader in the production of sandblasting systems for flat glass, with its well known automatic cabins of the Mistral EV and Zephyr (basic line) series, has invested energy and resources in the development of a new line of glass marking equipment. These efforts have resulted in the series of a fully automatic marking device called Easymarker, available in two models: Easymarker EV and Easymarker UP.

Easymarker EV is suitable to be used in line with vertical machines, while Easymarker UP for use with horizontal machines. Settings are quick and intuitive and the marking operation can be activated via a touch screen, button or pedal. The most important innovation is the fact that Easymarker can be connected to other glass processing machinery (tempering lines, double glazing, washing machines,

etc.), receiving an impulse that activates the marking operation in a totally automatic way. With Easymarker EV, the glass edge can also be marked.

At Vitrum, Fratelli Pezza will also have on show the portable marking unit Marker 101T and the sandblasting machine Mistral 180EV. The cabins of the Mistral EV series allow to programme up to 50 blasting areas on the glass plate, even of different type (normal, light, engraved, shading), as well as to create and store up to 200 customized working programmes. Preventive maintenance messages appear on the screen each time an item needs to be checked or replaced.

Fratelli Pezza automatic sandblasters are also equipped with a revolutionary system to prevent the accumulation of static electricity within the cabin, a very common problem while blasting mirrors.



Range of products

- SANDBLASTING AND MARKING MACHINES

www.fratellipezza.com

shop.fratellipezza.com



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VITRUM

hall 5 / stand F12-H16

GLASS COMPANY Srl

preview

GLASSCOMPANY

People to contact at our stand

CLAUDIO BERNABUCCI MANAGING DIRECTOR
CRISTINA SANTINI ADMINISTRATIVE DEPARTMENT

Glass Company Srl, one of today's leaders for special glass processing machinery, will be at Vitrum 2019 with Matrix, the exclusive, patented heating system with convection heating.

At the company's stand, there will be a 2500x4200mm heating chamber to allow visitors to find out about the quality and technology of Glass Company's tempering furnaces, which allows to heat each and every type of glass on the market, such as low-E $\geq 0,01$, reflective, transparent, enamelled, etc., real convection technology that does not differentiate between the types of glass, thicknesses and sizes. This real convection system with Matrix technology provides accurate and optimal heat over the entire surface of the heating chamber, guaranteeing excellent optical quality of the tempered glass, which cannot be compared to that of the traditional infrared heating.

Glass Company will also have on show large-sized curved tempered glass sheets created by its Italian clients using Glass Company machines, providing visitors the possibility of assessing production quality.

Glass Company staff will be at the stand to speak about the company's most recent installations of flat and curved glass tempering furnaces, such as the 3300x6000mm flat glass tempering furnace installed recently at Glasskon (Poland) and the curved glass tempering furnace with double longitudinal and transverse curving section, for curved glass sizes up to 2500(arc)x4500mm, installed at VE.UR (Italy).

Those interested in tempering extremely thin glass can take a look at some glass tempered in our plant for glass of 2.5mm, while a double-chamber furnace with new heating technology that will be installed this year, will also be presented. This furnace will have a heating chamber of about 1800x10000mm, and will be able to temper very thin glass, in oscillating and semi-continuous mode.

Visitors at the stand will have the chance to find out about the most recent Glass Company innovations, such as the laser drill for glass, the plasma system for the preparation of glass before digital printing, laser systems which remove paint, silver and coatings and low-E ≥ 0.01 , leaving the glass completely transparent, new high definition glass-marking lasers, painting systems, as well as the exclusive production system for fire-resistant EI glass, and much more.

The spotlight will also be on laminating using PVB film, thanks to the exclusive collaboration with an expert of this sector Cengiz Ergün. Glass Company's product range also includes PVB glass laminating lines as well as stand-alone laminating furnaces for each and every need of glass processors. In fact, we will soon be installing a lamination line for maximum glass size 3300x6000mm at a European glass processor.



Range of products

- **FLAT GLASS TEMPERING FURNACES OF ANY SIZE: FROM THE SMALLEST RIGHT UP TO LARGE FURNACES FOR ARCHITECTURAL GLASS SIZES**
- **FURNACES WITHOUT MOULDS FOR CURVED GLASS, SUITABLE FOR SHOWER ENCLOSURES, HOME APPLIANCES, AND LARGE ARCHITECTURAL GLASS SIZES, ETC.**
- **LARGE-SIZED CHEMICAL TEMPERING FURNACES FOR ULTRA-THIN AND COMPLEX-SHAPED GLASS**
- **GLASS CURVING FURNACES FOR ALL APPLICATIONS**
- **HST FURNACES**
- **TURNKEY SYSTEMS FOR FIRE-RESISTANT GLASS PRODUCTION (EI30, EI60, EI90, EI120, ETC.)**
- **FIXED-POSITION AND CNC-BASED LASERS SPECIFICALLY DESIGNED FOR GLASS PROCESSING**
- **WATER JET CUTTING MACHINES WITH 3 AND 5 AXES**
- **GLASS LAMINATING SYSTEMS WITHOUT AUTOCLAVE, FROM THE SIMPLEST TO THOSE WITH THE HIGHEST PERFORMANCE**
- **QUALITY CONTROL INSTRUMENTATION FOR TEMPERED, LASER ENGRAVED, SMART INDUSTRY, ETC.**

www.glasscompany.com



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VITRUM

hall 7 / stand E27-G26

GIARDINAGROUP

preview

giardinagroup FINISHING SOLUTIONS 1972

People to contact at our stand

STEFANO TIBÉ
LUIGI VILLA

SALES MANAGER - FINISHING
SALES MANAGER - SCREEN PRINTING

Giardinagroup works in the field of glass coating and printing, covering almost all areas, such as architectural, automotive and home appliances, using the very latest techniques and environmental friendly finishing solutions available, including cost effective UV and Selected Microwaves (MOS®) dryers for water based products. The highest standards in finishing and screen-printing are part of the ongoing targets that Giardina, supported by many years of experience, successfully employs with many customers throughout the world.

Numerous jumbo size finishing lines have already been realized with great success.



Range of products

- ENAMELLING EQUIPMENT AND PLANTS
- HOT AND COLD COATING SYSTEMS AND MATERIALS (ROLLERS, CURTAIN COATERS, DRYERS)
- POWDER OR LIQUID APPLICATION SYSTEMS FOR PROTECTING FLOAT GLASS



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www.giardinagroup.com



VITRUM

hall 7 / stand H25-L26

GLASTON GROUP

preview

glaston

People to contact at our stand

AT VITRUM, OUR EXPERTS WILL BE AVAILABLE TO PROVIDE YOU WITH RECOMMENDATIONS AND SOLUTIONS FOR ANY OF YOUR GLASS PROCESSING CHALLENGES. COME ASK US MORE!

Glaston & Bystronic glass at Vitrum 2019:

SHOWCASING SOLUTIONS FOR BETTER UPTIME, PRODUCT QUALITY AND CUSTOMER SERVICE



Digitalization is now more than just a passing trend. Glass processors who have connected to the power behind the data are showing concrete results. These are the pathfinders who want to get more information – easily and automatically – from their equipment and machinery. They've discovered this data holds the key to unlocking more effective ways to reach higher uptime, produce better product quality – and even serve customers better than ever before.

At Vitrum 2019, **Glaston** and **Bystronic** glass will be showing you more about the possibilities of these latest technologies. What easy steps can you take to tap into data from your equipment? Why does this translate into more uptime? How is it possible to produce better quality products? This data also enables you to stay on top of excellent customer service.

Putting digitalization into practice

The new version of **Glaston FC Series** incorporates high levels of automation and intelligent process control. Insight Assistant Pro gives the intelligent online process assistance, while Insight Reporting Pro allows to track all trends online and improve overall performance for long-term strategic planning. Another new feature is active edge control technology, enabled by intelligent cooling profiling that automatically adapts to your glass size, eliminating issues with edge lift.

Glaston Jumbo Series offers the best heating control available for high-quality results. It also gives the extra capability to

process low-E glass in mixed sizes. The main highlight of the machine is its Fusion option, providing the capacity of a double-chamber furnace to match growing architectural glass demands.

Glaston ProL lamination line now comes equipped with the latest PVB cutting technology and a convection heating

chamber offering glass processors extremely high flexibility. It is suitable for all types of glass, even printed and low-E, and can also laminate all glass sizes. Glaston Insight Reporting is now available for ProL to monitor furnace production data, energy consumption and maintenance needs online.

Satisfying the toughest warm edge demands

The advanced architectural glass **TPS® (Thermo Plastic Spacer)** technology of Bystronic glass 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.

The entire production mix can be manufactured on one line on the various Bystronic glass TPS® insulating glass production lines. The insulating glass manufacturer can choose from the following system solutions for this purpose: B'VARIO TPS® – the individually configurable IG manufacturing line B'SPEED TPS® – the fast system solution with shortest cycle times B'JUMBO TPS® – the IG line for glass sizes up to 9 m in length.

Digital solutions for real life

With extensive investments and R&D, Glaston is heading towards automated processes and real-time customer support. At Vitrum 2019, we will be showing you how we're using artificial intelligence and augmented reality in glass processing and services.

See the power of Glaston Siru

Glaston's latest mobile application, Glaston Siru, allows anyone to perform the tempered glass fragmentation test quickly and easily with a mobile phone. No longer do you need to spend time counting cullets manually or risk making mistakes. Come see Glaston Siru in action – or download it now from the app stores.



Range of products

- FLAT TEMPERING FURNACES
- BENDING AND TEMPERING SYSTEMS
- FLAT LAMINATING LINES
- WINDSHIELD BENDING FURNACES
- PRE-PROCESSING LINES FOR AUTOMOTIVE GLASS MANUFACTURING
- INSULATING GLASS MANUFACTURING LINES
- SYSTEM SOLUTIONS FOR AUTOMATIC PROCESSING OF DIFFERENT TYPES OF THIN GLASS AND DISPLAY GLASS
- HANDLING EQUIPMENT
- GLOBAL SERVICING & SPARE PARTS
- UPGRADING, REFURBISHMENT, REMOVALS AND RETROFITTING OF EXISTING EQUIPMENT

www.glaston.net

www.bystronic-glass.com



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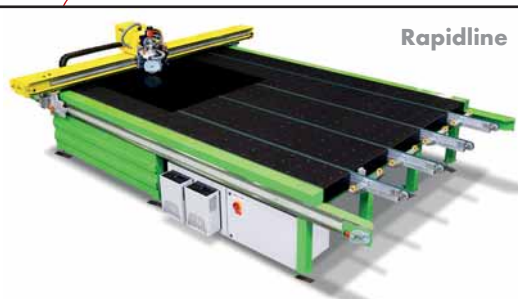


VITRUM

hall 5P / stand N27-P30

HEGLA GMBH & CO. KG

preview



Rapidline

For more than 40 years **HEGLA** has been playing an important role in flat glass cutting and processing. All this time HEGLA has been known for outstanding quality as well as continuous development and product innovation.

On display at the Vitrum show will be the universal cutting machine for float glass **Rapidline**. Equipped with electromagnetic linear drive technology, high acceleration rates and precise cutting results are achieved. Designed as a three-part cutting line the Rapidline can be complemented with an automatic loading solution (e.g. the Rapidloader) and a manual breakout table. Over the last two years it has turned out as an effective start into automated cutting processes. On the other hand the cutting table is frequently used for production peaks or short-term orders. The shuttle storage system called **Rapidstore** is an optional part of the

cutting system together with the Rapidline. It was created to increase the amount and variety of glass which is accessible for the floor loading system. The panes are kept on space-saving storage racks. Depending on the cutting plan the shuttle of the store picks up a rack with the required glass type and transports it to the pick-up location of the loading system.

As a solution to cut costs in glass cutting, HEGLA recommends the dynamic intermediate storage system **ReMaster**. It is placed directly over the cutting machine and stores remnants until they are requested by the optimization system, no operator intervention is needed. Therefore glass damage is minimized and it guarantees the optimal use of a large variety of glass remnants. With multiple sheets per slot, the ReMaster utilizes the space above the cutting line even more efficiently.

HEGLA also supplies efficient and highly automated cutting tables for laminated glass. The **ProLam** with optional Shape equipment can not only process straight cuts but shapes and free forms of laminated glass. HEGLA is proud to offer an automatic system that can be fitted with electro-magnetic linear drives for the bridge and the carriage. This solution achieves even higher acceleration for the shortening of cutting cycles and double position-

ing precision. Various types of automated loaders and warehouse equipment, cutting machines and automated breakout systems for float as well as sorting systems (SortJet), complete the product range.

As a leading manufacturer; HEGLA has three production facilities in Germany and also International Sales and Service companies in the US, France, UK, Russia and India. A highly competent worldwide network guarantees HEGLA's global presence and responsiveness in sales and services.

HEGLA is looking forward to meeting you in Hall 14, stand A56-A72.

Range of products

- GLASS STORAGE AND PREPARATION SYSTEMS
- CONVEYOR SYSTEMS
- FLOAT GLASS CUTTING TECHNOLOGY
- LAMINATED GLASS SEPARATION TECHNOLOGY
- COMBINED FLOAT AND LAMINATED GLASS CUTTING MACHINES
- DYNAMIC STORAGE SYSTEM FOR RESIDUAL SHEETS
- AUTOMATIC BREAKING SYSTEMS
- SORTJET - AUTOMATIC SORTING SYSTEMS AFTER BREAKOUT
- DE-STACKING AND TRANSPORT TECHNOLOGY FOR COATING PLANTS/ MIRROR COATING LINES
- PLANT AND PRODUCTION LOGISTICS FOR PHOTOVOLTAIC PANEL PRODUCTION
- SOLUTIONS FOR INTERNAL AND EXTERNAL GLASS LOGISTICS

Cuts Down Costs:
Dynamic Intermediate
Storage ReMaster
with Galactic Cutting
Machine



ProLam Shape can score
not only straight cuts but
shapes and free forms



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VITRUM

hall 7 / stand C11

HELIOS QUARTZ

preview

helios quartz®



People to contact at our stand

LUIGI GASTALDO

C.E.O.

ARMANDO GIRO

CHAIRMAN

Founded in 1940, **Helios Quartz** is a family-owned company with production plants in Italy (Helios Italquartz S.r.l.) and Switzerland (Helios Quartz Group SA). The company has distribution channels in the USA, South America and Asia, and is a **major international supplier for Quartz Glass processing and the manufacturing of Infrared Emitters and Ultraviolet Lamps**. Helios Quartz also produces **Specialized Equipment for Industrial, Scientific, and Medical applications**.

TÜV certified, Helios Quartz is a very flexible and dynamic group which is deeply oriented towards internationalization and which is living strong and stable growth with great momentum: the opening of commercial branches in USA (Helios Quartz America), in China (Shenyang Helios Tech) and Hong Kong (Helios Quartz Asia).

Thanks to its long track record and to its **cutting-edge testing laboratory** located at the historical Helios Italquartz S.r.l. plant in Cambiago (Italy), **Helios Quartz can advise customers and provide them with the best solution for each and every specific application**.

Helios Quartz product range, specific for the glass industry, includes:

- **Quartz Infrared Heaters in short-, medium- and fast wavelength**, in single and twin tube, with or without gold-coated reflectors for:

- **Laminating lines (plastic film coupling);**
- **Dry screen printing lines;**
- **Bending furnaces;**
- **Fusion furnaces;**
- **Laminated glass cutting machines.**

- **UV Polymerization equipment:** UV high and medium pressure lamps for drying screen printing of reactive inks, paints, coatings and adhesives for the decorating and furnishing sector;

- **Manwood 25-N:** UV black light apparatus, able to identify the tin coated side of float glass even under high brightness conditions. Such identification is very important prior to laminat-

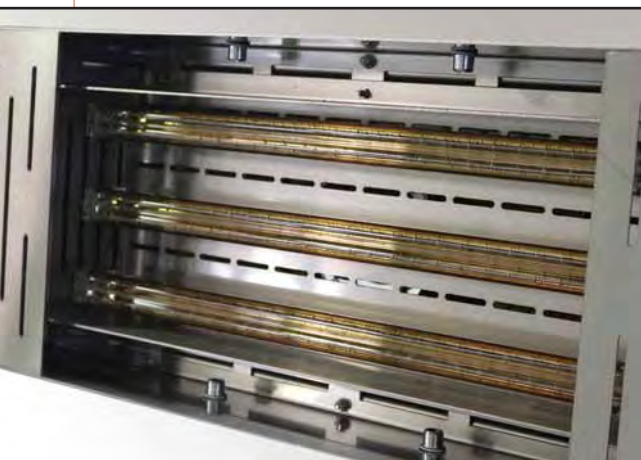
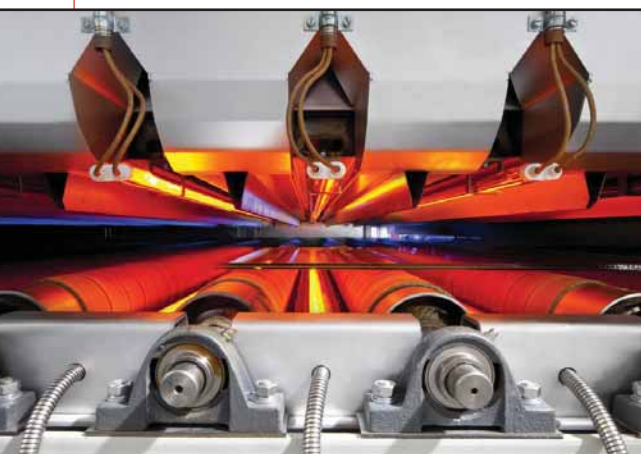


ing, mirroring, printing and decorating processes;

- **Fully Automatic Tin Detector:** the technological development of the Manwood 25-N. It can be mounted directly on the glass transportation line, in order to check each and every piece of glass. Thanks to its simplicity of installation and great flexibility, it is suitable for mass manufacturing where methodological control is essential to support the rate of production.

Range of products

- **INFRARED HEATERS**
- **HIGH AND LOW PRESSURE UV LAMPS**
- **FULLY AUTOMATIC TIN DETECTOR**
- **TIN DETECTOR ANALYZER**
- **UV PHOTOPOLYMERIZATION EQUIPMENT**
- **UV BLACK LIGHT EQUIPMENT**
- **PHOTOCHEMISTRY**
- **QUARTZ GLASSWARE**



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VITRUM

hall 7 / stand L21

IDROTECNICA Srl

preview

People to contact at our stand

FEDERICO MARCENARO

SALES TECHNICIAN



The new IR225St-VP and IR300St-VP which will be on show at **Idrotecnica's** stand at Vitrum, are the company's response to today's market needs, with the medium-capacity production of demineralized water (in the range of 200 - 300 l/h) but with components and technical solutions of the larger models that allow intensive use.

These new versions are part of the already well-known and widespread range used in the glass industry, thus making the range even wider and complete.

Analyzing the technical aspects, we would like to highlight the use of a specific internal pressurization system which provides reduced maintenance and makes the demineralizer even more silent.

ECC Controller

At Idrotecnica's stand, visitors will be able to see the ECC-control system to manage the changeover of water in glass washing machines. The ECC system can be integrated only

with the new water demineralizers and it guarantees the correct water quality to allow the best washing, with optimized and intelligent water consumption.

Different solutions are envisaged depending on the circuit of the washing machine to meet individual needs but maintaining the plug-and-play approach.

Range of products

- **REVERSE OSMOSIS DEMINERALIZERS**
- **ION EXCHANGE DEMINERALIZERS**
- **CLOSED-CIRCUIT SYSTEMS**
- **FILTERS, SOFTENERS, ELECTRODEIONIZERS, ETC.**



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VITRUM

hall 5 / stand M01-P10

INTERMAC

preview

INTERMAC

People to contact at our stand

FRANCO ANGELOTTI	SALES DIRECTOR
MICHELE TAPPA	TRADE SALES DIRECTOR
MIRANDA TOMATIS	SUBSIDIARIES SALES DIRECTOR



INTERMAC technology, software, and services to help spread digital culture in the 4.0 Factory.

Integrated handling systems, collaborative robotics, and new technology for work centres: at the 2019 edition of Vitrum, scheduled for 1-4 October, Intermac's sophisticated technology places particular emphasis on automation and integration that support our clients in the challenge to Industry 4.0.

In a 1,000 sq.m. showroom, the Vitrum audience will be able to find out first hand, through machinery, product lines, and perfectly functioning integrated technological tools, how Intermac is capable of creating digital, automated, and interconnected factories.

Intelligent automation

The solutions that Intermac provides for its clients are the Movetro handling and storage systems; the Master Loader, a flexible robotic cell, designed and created to

optimise loading and unloading times for work centres and water-jet machines; the V-Loader, an automatic loader for the collection and positioning of sheets of glass from pallets to the roller beds of vertical work centres; and new technological tools for work centres which, through an investment that any company can afford, make revolutionising industrial manufacturing possible, guaranteeing competitiveness and a reduction in time-to-market production.

Flexible integration

Thanks to SOPHIA, an IOT service platform, the process of digital transformation (the process of factory digitalisation) has become even more a reality. This new platform, implemented in the wood sector and, as of September, also available for Intermac, provides real time information and data from machines distributed around the world through an intuitive dashboard.

intermac.com/glasstec

BIESSE S.p.A.

Biesse Group is a global leader in technologies for processing wood, glass, stone, plastic and metal. The Group designs, manufactures and distributes machines, integrated systems and software for manufacturers of furniture, door/window frames and components for the construction, ship-building and aerospace industries. Biesse invests on average EUR 14 million per year in R&D, boasting over 200 registered patents. It operates through 9 industrial sites, 37 branches and 300 agents and selected dealers, exporting 90% of its production. Its customers include some of the most prestigious names in Italian and international design.

biessegroup.com



Range of products

- **MACHINES AND SYSTEMS FOR MONOLITHIC AND LAMINATED GLASS CUTTING**
- **WATERJET SYSTEMS**
- **DOUBLE EDGING MACHINES AND SYSTEMS**
- **LOADING AND UNLOADING SYSTEMS**
- **VERTICAL WASHING MACHINES**
- **CNC WORK CENTRES**
- **STORAGE & HANDLING SYSTEMS**



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www.intermac.com



VITRUM

hall 5 / stand C07-D08

ITALCARRELLI Srl *preview*



People to contact at our stand

DAVIDE SCHIAVON SALES MANAGER



PLATFORM TRANSPORTERS



INLOADER TRANSPORTERS



LAMINATED GLASS HANDLING

ITALCARRELLI - TOP HANDLING SOLUTIONS

Smart working, from one generation to the next.

Italcarelli designs and manufactures special machines, technology and accessories for the transport and storage of glass. After many years of hard work, the third generation of the Negrin family – the owners of Italcarelli – have put into practice their idea of smart work. Smart with clients to create personalized machines responding to the precise needs and demands of clients. Smart with suppliers to have the constant availability of top class material and components. Smart solutions both with regards to technology and energy savings. Last but not least, smart for safety each and every day. The company is one of the very few that is able to provide both machines and automatic driving systems and, thanks to the perfect synergy between design department and software development, Italcarelli's machines have the highest levels of performance and ease of use, with low energy consumption levels.

CONTAINER
LOAD/UNLOAD



Range of products

- PLATFORM TRANSPORTERS
- INLOADER TRANSPORTERS
- SIDE-LOADERS
- TAILOR-MADE SOLUTIONS
- CONTAINER LOADING/
UNLOADING
- LAMINATED GLASS HANDLING



SIDE-LOADERS



TAILOR-MADE SOLUTIONS



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VITRUM

hall 5 / stand M22

ITALMOLE SRL

preview



People to contact at our stand

STAFF

Alongside the big names, 'Made in Italy' is also made up of small- and medium-sized companies with a strong family footprint that know how to move forward, despite everything, even at small steps and without the help of anyone - just like a family - just like Italmole.

By maintaining its artisan spirit, and dedicating a significant part of investments to innovation, **Italmole** exports almost all of its products.

Over the past 10 years, important changes have taken place that have obliged companies to be organized differently. Digitization has cancelled and cooled personal relationships by forever changing the way people work.

The relationship with change, however, can be paradoxical, change is scary and it is not always easy to face but, at the

same time, it is also fascinating and leaves room for creativity - those who overcome this fear are the ones who succeed in changing.

Company personnel are decisive in facing this process, success comes above all from collaboration between people who believe in the possibility of a combination of tradition and innovation, teamwork and it is this working together that allows to obtain the best results.

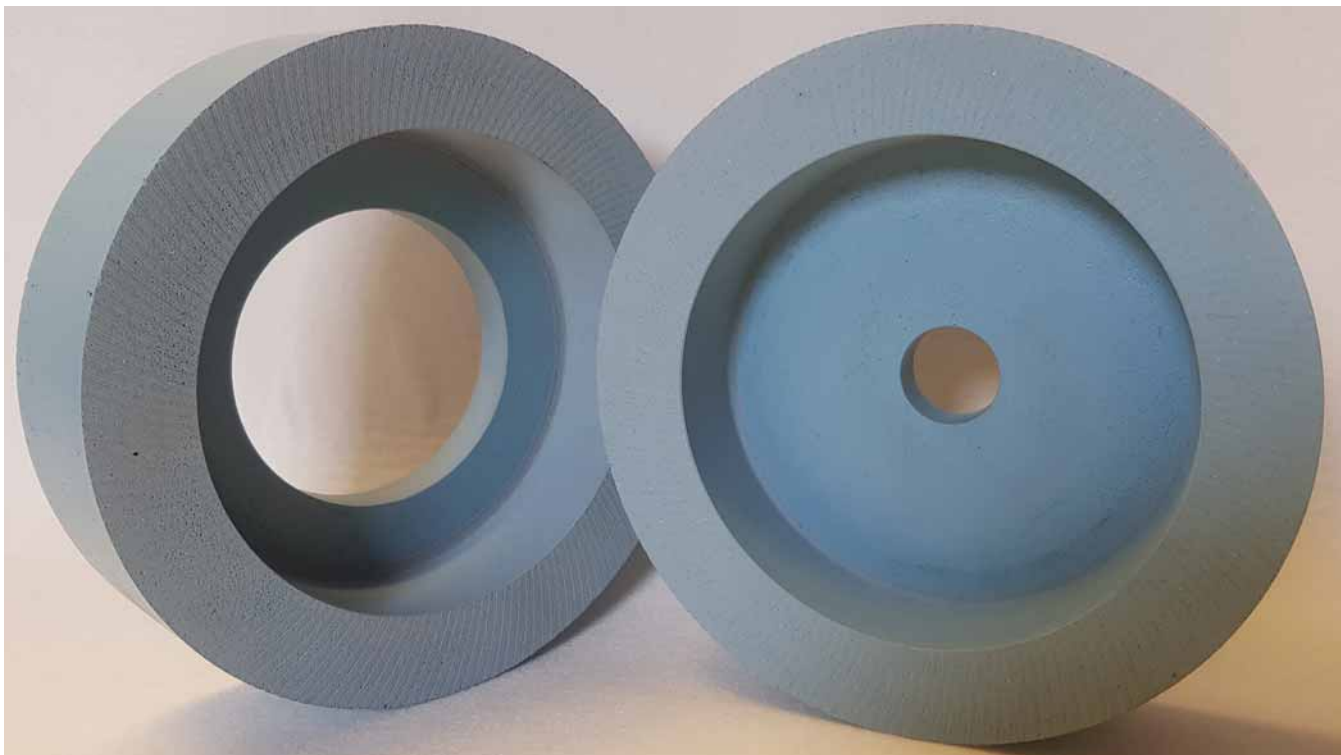
The basketball champion Michael Jordan said: with individual talent you can win games, with intelligence and teamwork you can win the championship.

This is the story of Italmole, that after 41 years on the market continues to represent 'Made in Italy' around the world, following the values of transparency, correctness and seriousness as in the past,

while researching new technologies and innovations, guaranteeing better quality of continuously evolving products, and always keeping up with market needs and demands.

At Vitrum, this year, Italmole will be presenting its range of products known at global level, starting from the most 'copied' BD peripheral wheels, BD2 engraving wheels, up to the complete range of BLACK-RED-AR1 thread grinding wheels -AR2 and AB4. last but not least, cup wheels for flat wire type X and L that are seeing more and more interest all over the world.

Moreover, this year, Italmole will also have on show an important innovation - the BLUE CE cerium grinding wheel for polishing of shaped bevels on Intermac or CMS type CN machines.



Via Carducci, 11/12/14

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www.italmole.com



VITRUM

hall 5 / stand D11-F19

KERAGLASS INDUSTRIES Srl

preview



keraglass

People to contact at our stand

CORRADO FANTI
STEFANO SPEZZANI
MAICOL SPEZZANI
PAOLO RIGHI

SIMONE CECI
FRANCO CAPECCHI
SIMONE SPEZZANI, PATRIZIA DURIAVIG
ORIENTA GUALTIERI
GIULIA FERRARI, GIMMI BORGHESI

CEO
FOUNDER, VICE PRESIDENT
DIRECTOR, SALES COORDINATOR
PRODUCT MANAGER
EUROPE & AFRICA SALES AREA MANAGER
NORTH AMERICA SALES AREA MANAGER
SALES SUPPORT
MARKETING DEPARTMENT
SERVICE DEPARTMENT



Range of products

- **OSCILLATING AND CONTINUOUS FURNACES FOR THE TEMPERING OF ARCHITECTURAL GLASS, HOUSEHOLD APPLIANCES, SHOWER DOORS AND FURNITURE GLASS**
- **BENDING AND TEMPERING FURNACES**
- **HEAT SOAK TEST FURNACES**
- **SILK-SCREEN PRINTING MACHINES**
- **ROLLER-COATING MACHINES**
- **DRYERS • STACKERS**
- **AUTOMATIC LOADING-UNLOADING MACHINES**
- **90° DEVIATORS**
- **CONVEYING LINES**
- **PACKING MACHINES**
- **LAMINATING LINES WITH PVB**
- **MULTI-LEVEL LAMINATING KILN WITH EVA**
- **DIGITAL PRINTING MACHINE**
- **ROLLER CLEANING MACHINE**

At the 2019 edition of Vitrum, **Keraglass** will be receiving visitors at a 500 m2 stand packed with exciting new products.

One of the key systems installed at the stand will be the tempering furnace that has been pushing the functional and qualitative envelope of systems of this type - the *Vision* line - which has achieved excellent performance and aesthetic results, achieving 0.01 in terms of emissivity of the latest generation of low-E glass, workable glass sizes up to 3,350x9,000 mm and perfect flatness of the glass. All this thanks to an innovative heating system based on the blowing of 700°C preheated air through a network of stainless steel pipes. The possibility of graduating air intensity according to each recipe and each area of the single glass sheet optimizes results. The cutting edge of this technological jewel is then the monitoring system that it is equipped with. *Supervision Intelligent* offers constant process insight allowing the

operator to follow and manage the whole process step by step and in real time.

But the 'attractions' of the stand are not just limited to tempering. Sharing the exhibition space with *Vision* line there will also be solutions dedicated to laminating, and a whole range dedicated to printing. Keraglass will also present the *Combi* plant that has versatility as its distinctive feature. This laminating plant can, in fact, process flat and curved glasses of different sizes, shapes and thicknesses, also in combination with marble and ceramic thanks to the additional chamber with increased height.

The finishing touch with which Keraglass plans to enrich its presence at the event will be an exclusive space dedicated to the latest products in the digital lines.

iPlotter, the digital inkjet plotter with DOD (drop on demand) technology, specifically designed for printing on glass sheets. It uses specific inks to reproduce drawings, images and photographs on structures for use in the architectural, automotive and furniture sectors.

All this and much more you will find at the Keraglass booth at Vitrum 2019 in Milan.



iPlotter

www.keraglass.com



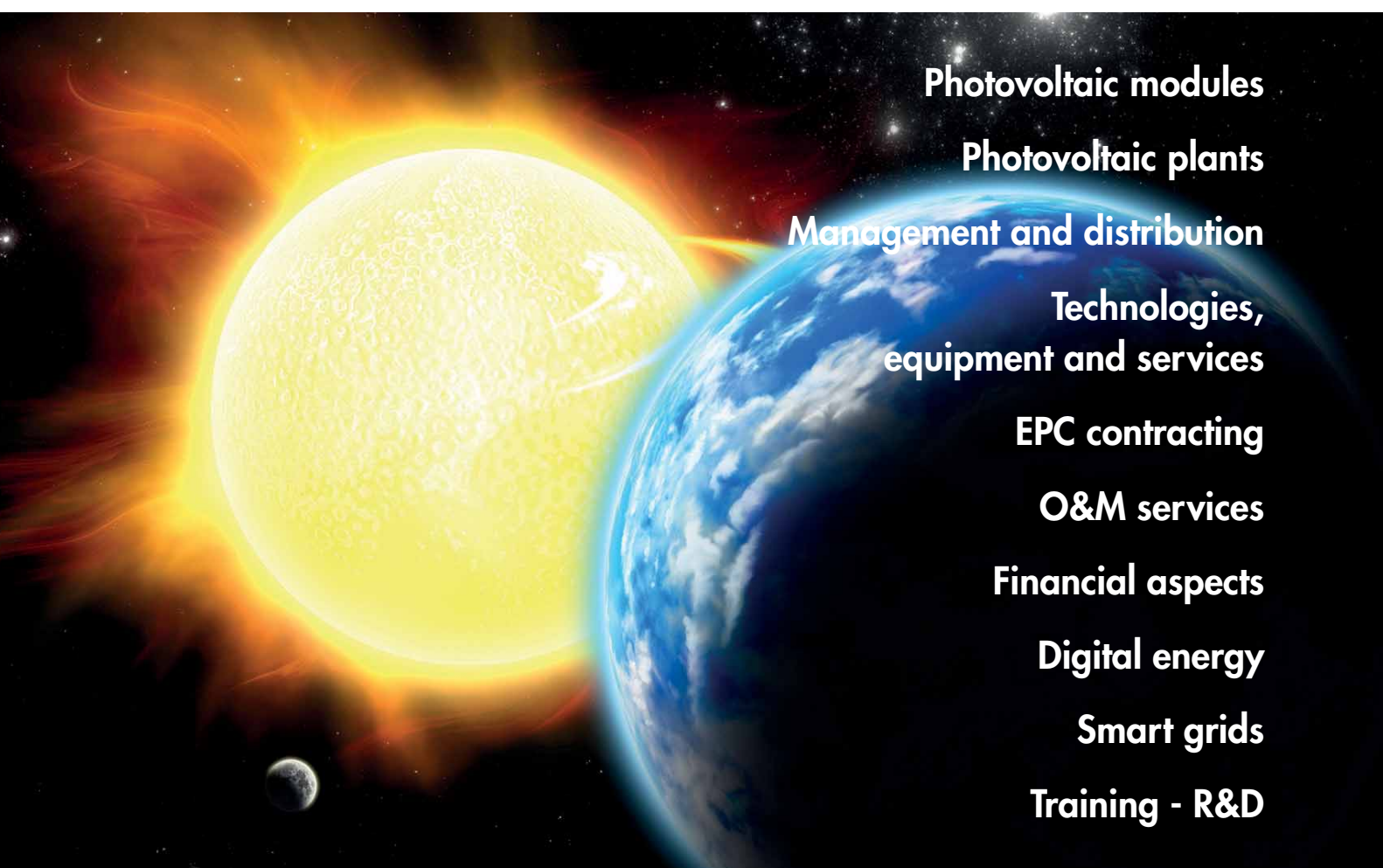
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VITRUM

hall 7 / stand R25-S30

LANDGLASS TECHNOLOGY CO., Ltd.

preview

People to contact at our stand

OUR STAFF WILL BE AT YOUR SERVICE THROUGHOUT THE SHOW.

LandGlass



LandGlass Technology Co., Ltd. is a high tech company specialized in the development and manufacturing of glass tempering furnaces (for architecture, household appliance, automotive and solar power industries) and tempered vacuum insulated glass products. In the field of high-end intelligent equipment manufacturing, LandGlass is able to offer integrated solutions for glass tempering machinery, smart factory upgrade, assisting users to realize elaborate and efficient intelligent manufacturing and management.

Huge R&D investment

Since its establishment, LandGlass has considered innovation as the driving force for the development of the company, which has led to its achievements in R&D and technical progress today.



At present, LandGlass has established a company technology centre equipped with 20,000 square meters of factory floor space for new glass tempering product development and experiments - the largest facility in the industry - in addition, the world-class vacuum insulated glass laboratory established by LandGlass is equipped with more than 100 sets of various R&D equipment and testing instruments worth more than USD 6 million.

Worldwide after-sales support

LandGlass has established a service network with worldwide coverage through technical service centres located in Europe, America, Southeast Asia, India, and Russia, allowing more timely and thoughtful services to its customers around the world. In the meantime, these existing

international service network and service centres will have an important role in the future, providing comprehensive and timely after-sales service to LandGlass' customers.

LandGlass' customer service team is responsible for the installation of LandGlass equipment and providing after-sales service. All our service personnel have received formal, systematic training in mechanical and electrical fields. We are available to help customers solve problems anywhere, anytime.

We now invite you to experience the improved safety and quality of life that our latest innovation brings to the market. We will be at Vitrum in Hall 7P, R25-S30.

Range of products

- LANDGLASS CYCLONE™ SERIES GLASS TEMPERING FURNACES
- ALL-NEW ULTRAJET™ SERIES GLASS TEMPERING FURNACES
- VARIABLE CURVATURE GLASS TEMPERING FURNACES • GAS HEATING GLASS TEMPERING FURNACES • JETCONVECTION FLAT GLASS TEMPERING FURNACES • JETCONVECTION COMBINED GLASS TEMPERING FURNACES
- JETCONVECTION CONTINUOUS GLASS TEMPERING FURNACES
- FLAT AND BENT BI-DIRECTIONAL GLASS TEMPERING FURNACES
- BENT AND BENT BI-DIRECTIONAL GLASS TEMPERING FURNACES
- LANDVAC® TEMPERED VACUUM INSULATED GLASS



www.landglass.net



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VITRUM

hall 7 / stand E01-G10

MAPPI INTERNATIONAL Srl

preview



MAPPI

BEYOND GLASS PERFECTION

People to contact at our stand

NANCY MAMMARO

ERMANNO PETITTI, SERGIO COSANO

ANTENORE TOSELLI, MANUEL DI LIBERO

GIULIO DALLA COSTA

VALENTINA D'AGOSTINO

MANAGING DIRECTOR

SALES MANAGERS

TECHNICAL MANAGERS

SOFTWARE & ELECTRICAL MNG.

ASSISTANT

At Vitrum, **Mappi** will show how strong collaboration with Siemens has resulted in a series of functions based on MindSphere, 'the 4.0 operating system dedicated to companies', able to implement solutions capable of changing the world of glass tempering. In the new generation of its machines, Mappi implements new possibilities for analysis, management and forecasting offered by modern machines connected to the network, which help businesses organize production, plan and achieve results, optimize energy consumption. A powerful improvement of all the distinctive features of Mappi furnaces.

MHS | MULTIZONE HEATING SYSTEM Automatically manages the temperature of the furnace by means of a network of electronically controlled sensors that maintain temperatures constant and focus heat only in areas where there is glass.

IHS | INTELLIGENT HEATING SYSTEM The internal temperature of the furnace is controlled with an accuracy of $\pm 1^\circ\text{C}$, 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 consumption and significantly reducing the installed power required by the entire system.

SYNCR0 | TRASMISSION TECHNOLOGY The ceramic rollers are driven accurately within 1/1000mm by DC drive motor with a friction transmission between iron/rubber (avoids slack



time gaps, gear lash, with resulting risks of marks on the glass). This eliminates the need of SO_2 . Brushless motors control roller drives to guarantee accurate roller position and speed. Automatic speed management of the ceramic roller oscillation avoids distortions and damage to the glass surface. Full ceramic rolls, which can be easily replaced.

ITS | INTEGRATED TOUCH SYSTEM The system monitors the parameters of the tempering process and immediately prints the compliance report for CE and ANSI glass standards at the same time, automatically storing this information for each production cycle.

AC | ADVANCED COOLING A particular design of the blowing system that allows even more specific control while tempering, and substantially decreases the iridescence of the glass.

ATI | ACTIVE THERMAL INSULATION The ATI completely reduces thermal dispersion thanks to continuous research in the best performing materials for thermal insulation, in association with the most prestigious research

centres in Europe, as well as with Knauf and Morgan.

GHBS | XTREME PROFILE CONVECTION GHBS allows to process all last-generation coated glass, including low-E with 0.01 Emissivity.

HEATING CHAMBER EXTRACTION Mappi is the only tempering equipment manufacturer that has this feature for easier maintenance and better finished product quality. ATS 4.0 is available from 1500 x 3800 to 3300 x 6000 mm and also in customizable sizes.

Range of products

- **HORIZONTAL TEMPERING FURNACES FOR ALL TYPES OF GLASS**
- **BENDING AND TEMPERING FURNACES FOR ARCHITECTURAL AND AUTOMOTIVE FLAT GLASS**
- **LAMINATING PLANTS**
- **HEAT SOAK TEST PLANTS**



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VITRUM

hall 7 / stand N08

MOLE MORESCHI Srl

preview

People to contact at our stand

**MARCO MORESCHI, BARBARA DODA,
ROBERTO BACCHINI, YURI CATTABRIGA**



MoleMoreschi
Diamond Wheels since 1921

Moreschi is, and has been, one of the leading companies in the production of diamond wheels for glass processing machines for 90 years. The company can offer a complete range of diamond and polishing wheels for all types of glass processing, ranging from 25mm. to 200mm. diameter with different bond and grit to be used for float glass and laminated glass. The wheels are made for high production and long life, the best partners for processing of all types of glass.

Moreschi can offer sets of wheels for all types of grinding and polishing: polished edge, ground edge, industrial edge and polishing with cerium oxide. Depending on the quality of the edges, the wheels can be combined with or without polishing.

The routers are available in different types with diameters from 6 to 20 mm., and each type is available with different bonds for the best quality.

Moreschi give its customers the possibility to have the best technology and the best tools.

At Vitrum, Moreschi will be in Hall 7 Stand N08, with the following products on show:

- CBMPM new bond for high speed CNC vertical machines
- CBMPSC New bond for Automotive wheels
- DZ1 New bond for Automotive wheels with automatic redressing of the shape of the wheels during working.
- New wheels for laminated glass
- New wheels for Bovone straight line edgers
- New countersinks without vibrations



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www.molemoreschi.com



VITRUM

hall 7 / stand L27-P30

MAZZAROPPI ENGINEERING Srl

preview

People to contact at our stand

ANTONIO MAZZAROPPI
ORSOLA ABBATE
MARIAELENA PICCOLO
MICHELE SPANO
ILARIA D'ANTONIO
PIETRO MAZZAROPPI

GENERAL MANAGER
ADMINISTRATION MANAGER
SALES SUPPORT
CUSTOMER SERVICE
PURCHASE ENGINEER
TECHNICAL MANAGER



MAZZAROPPI
HIGH PERFORMANCE. ALWAYS

TEMPERING: TP NEW EXTREME 1600x2200 (2800)mm

Mazzaroppi's new glass tempering machine TP NEW EXTREME has been designed to meet the needs in terms of clearance and power of most demanding customers, in fact the TP NEW EXTREME needs just **12 meters** of installation space and **100kW** of power and is the first extensible machine.

The peculiarity of this system is the possibility to switch automatically from load-lengths of 2200mm to 2800mm, thus adapting to a flexible production.

For instance, if you produce mainly 800x2100mm doors but also need to produce glass sizes that do not fit your standard production, thanks to this new function you can easily extend the capacity of the furnace, and go back to standard production when needed. This means that you can diversify and increase your production type.

Thanks to the continuous research of new materials and in-house technological development, we have reduced energy consumption of our machines, taking them to a new development phase.

The special quick start feature allows the machine to reach working temperatures of 680° in just 60 minutes the first day you switch on the furnace, requiring just 30 minutes in the following days. The furnace can be switched off each and every day without problems, cutting energy costs and then overall business costs.

Moreover, thanks to its extreme flexibility, the TP NEW EXTREME can be used as if it were a tool machine. It means you can switch on the machine just when you really need it according to 'just in time' logic.

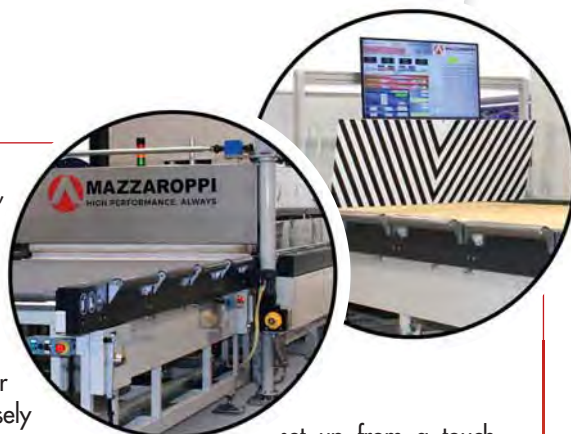
The machine's heating system is divided into zones which are controlled and managed by software. This system has been

developed to optimize production and, at the same time, reduce power consumption to the minimum; in order to use electricity to heat the glass and not the furnace.

The entire mechanical transmission has been further improved, in order to move the rollers even more precisely and regularly, with the aim of obtaining an extremely high quality of final product. The advantages of the new transmission system facilitate even more maintenance operations, minimizing downtime and related costs.

The ventilation system has a particular optional miscellany device which has the purpose of standardising production over time, and has been specifically designed in order to be installed on a mezzanine level. The ventilation system further improves the quality of glass both in terms of flatness and fragmentation (according to the EN 12150) and above all reduces energy consumption. All these special features require just 100 kW of electricity.

The TP NEW EXTREME, our last generation machine, has an extremely ergonomic electronic interface that enables the operator to use the machinery easily, focussing attention on production and not on how to use the machine. All parameters are



set up from a touch screen monitor, as well as via Smartphone, PC, Tablet, etc. Recipe management is automated.

Once the working parameters have been identified, they can be saved in a recipe, and the operator only needs to select the recipe in a file manager, therefore guaranteeing the repeatability of processes.

The TP NEW EXTREME is extremely adaptive in terms of thickness changes, thus further reducing waiting time, as different glass thicknesses can be in each section of the machine.

All our machines are equipped with a remote connection with our technical assistance office, which monitors the situations and, if necessary, intervenes.

Range of products

- GLASS TEMPERING MACHINES
- TEMPERING AND BENDING MACHINES
- AIR CONVECTION SYSTEM FOR LOW-E GLASS
- BENDING MACHINES
- LAMINATING MACHINES
- HEAT SOAK TEST MACHINES



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www.mazzaroppi.com



VITRUM

hall 5 / stand M01-P10

MOVETRO Srl *preview*



People to contact at our stand

GIORGIO MISTRELLO OWNER
DAVIDE MISTRELLO SALES MANAGER

Movetro srl is a leading company for the manufacture and installation of automatic plants for the storage and handling of glass sheets. Well-established know-how and considerable experience are the basis of the company history, which started up with the construction of simple sheet storage systems, and today can offer the most up-to-date technological systems on the market.

Movetro's main strengths are its flexibility and great ability to adapt its product range according to the times and to technology evolutions. Company organization is ideal to be able to offer highly customized products with professionalism and competence that have always been Movetro's trademark worldwide.

Movetro is a real industrial company, able to accept new technological challenges, counting on technical and human resources, listening to and understanding customers' needs, which are always satisfied with highly customized designs and which have, as their main considerations, reliability, safety and efficiency of the plants.

Movetro guarantees a very high quality level which positions the company among the leaders of similar glass industries as all machines are fully manufactured and tested in-house at the company's metal workshop, while welding, painting and assembling lines are positioned in order to reach the very ambitious target of 'total product quality'.

Movetro does not only manufacture and install automatic systems, but goes beyond this point thanks to the fact that all plants can be fully connected and integrated to already existing processing lines manufactured by any other company.

From the smallest to the largest glass processing company: all can find in

Range of products

- **AUTOMATIC STORAGE AND HANDLING SYSTEMS**



Drawer

Movetro the right partner who can, thanks to a wide product range and well qualified technical staff, provide the correct solution when space, storage or handling needs cannot be satisfied by the standard market offer.



Loader



Crane loader



Shuttle storage system



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www.movetro.it



VITRUM

hall 5 / stand T15-U18

LUOYANG NORTH GLASS TECHNOLOGY CO., LTD.

preview

People to contact at our stand

NORTHGLASS LOOKS FORWARD TO MEETING YOU AT ITS STAND;
FOR MORE INFORMATION VISIT OUR WEBSITE.



NorthGlass was established by Mr. Gao Xueming, Chairman of the board, in Luoyang National High & New Technology Development Zone on 18 May 1995. In 2011, NorthGlass created a precedent in the glass deep processing machine industry, going public at Shenzhen Stock Exchange (stock code: 002613).

Today, NorthGlass has developed into a high-tech industry group integrating in R&D, manufacturing, sales and service with continuous innovation capability, made up of five locations respectively in Luoyang, Shanghai, Tianjin, Beijing and Guangdong.

NorthGlass is one of the strongest leading manufacturers and technology R&D enterprises in the field of glass deep-processing machinery. The annual sales of its major product, flat/bent glass tempering furnaces, is ranking stable at the forefront of the worldwide industry over the last 17 years - since 2002 - when sale of furnaces exceeded 100 sets. More than 4,600 NorthGlass glass tempering furnaces are now up and running around the world.

The coating line developed and produced by NorthGlass is becoming one of the global leading suppliers in glass coating industry and has led to a rapid development of the coated glass business in China.

GLASS TEMPERING FURNACES

T-Series: Standardly furnished with "Finer Heating Control Partition" and "Intelligent Heating Control System based on glass exit-chamber temperature", suitable to produce the highest quality tempered glass with large production quantities, guaranteeing high efficiency



and stability. It is the ideal choice of domestic and international large-scale glass processors for industrial upgrading.

A-Series: Standardly furnished with "Intelligent Heating Control Module" and "Super Flat & Spotless technology", optionally with "5G Gapless Forced Convection technology", A-series tempering furnaces can efficiently and stably temper almost all kinds of glass with minor optical distortion and slight iridescence. It is the most popular choice of glass tempering furnaces for all different scale glass processors.



B-Series: Completely upgraded and reborn from NorthGlass' classic B-series furnace, furnished with recently developed "2G Temperature Control System" and "Basic Gapless Forced Convection System", significantly improve production efficiency and glass quality, while reducing energy consumption. It is an affordable choice for small and medium scale glass processors.

GLASS AUTOMATION

The Glass Automation System can not only provide turnkey projects, but also provide personalized optimization to existing glass production. In the whole automation system, NorthGlass can provide you with raw glass storage systems with space-saving, cutting machines with automatic loading, cutting and break-out, control systems and other accessories, such as MES (manufacturing execution system), NorthGlass box, AGV, buffer systems, automatic loading/unloading systems, etc..



COATING

Equipped with vacuum sputtering cathodes, NorthGlass' coating line can be widely applied



in the glass industry, consumer electronics industry and PV industry, etc. from designing to manufacturing.

PROCESSED GLASS

NorthGlass is also one of the biggest manufacturers of high-quality oversized architectural glass, with dimensions up to 3,600mmx18,000mm, 8,000mmx4,000mm, which are the largest sizes in the world. Various types of glass are produced and sold, including jumbo-size insulated glass, curved tempered glass, laminated glass, super flat and spotless glass, screen printing glass, digital printing glass, jumbo-size curved tempered glass, structural glass, low-E coated glass, etc..

A number of glass deep-processing technologies independently developed by NorthGlass have been applied in many famous landmark construction projects, such as China National Grand Theatre, Beijing Olympic "Bird Nest", Shanghai Center, UAE Abu Dhabi Airport, One Blackfriars, London Three Quays, US Oracle Headquarters etc..

Range of products

- TEMPERING FURNACES
- AUTOMATION SYSTEMS
- STORAGE SYSTEMS
- CUTTING MACHINES
- COATING MACHINES
- PROCESSED GLASS
- GENERAL FANS
- HVLS FANS



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VITRUM

hall 5 / stand N21

OPTIMA Srl *preview*

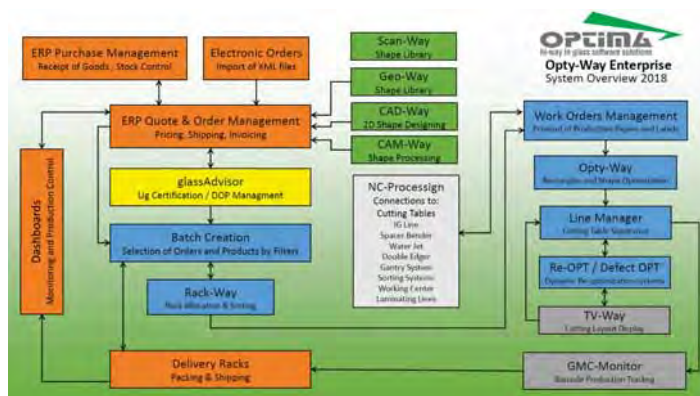
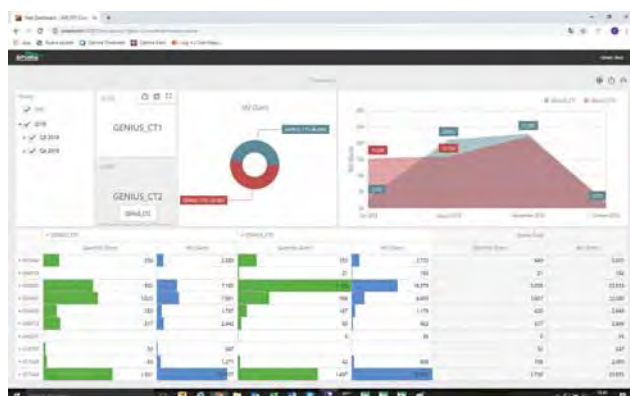
25 years
1994-2019

OPTIMA
hi-way in glass software solutions

People to contact at our stand

CRISTIAN ZANCA
MARCO MENZOLINI
MARCO ALONZO
MANUELA MOLINARI

SALES MANAGER
DEVELOPERS MANAGER
TECHNICAL SUPPORT & IT
MARKETING & SALES DEPT.



At VITRUM 2019, **Optima** will celebrate its 25th anniversary: Established in 1994, drawing on the experience and professional knowledge of its founding partners, Optima pools dynamism, competence and motivation. Today, the company has operations in the Information Technology field applied to flat glass processing in particular, and flat glass processing with machine tools in general.

The company's objectives are therefore to develop 'turnkey' **ERP solutions**, capable of managing the entire production cycle in an integrated and interconnected way: from the purchase of raw materials, to accessories and consumables, providing quotations and filling orders; scheduling production for machine management in relation to production batches, unloading and handling on racks, automated or

manual delivery to customers with issuing of packing slips and invoices, through to energy certification and DOP (thanks to the exclusive integration with glassAdvisor).

Optima's ERP systems become **MES solutions**, planning materials needs, scheduling production and showing the production start date for every order. Starting with defining the processing times, each machine is assigned a calendar showing the respective work loads. The collection and transmission of the production status data in real time enables scheduling and verification whether the expected dates will be met or not, and therefore facilitates synergy with the final customer.

Another innovation is the supervision system for **Stock Manager** glass loading, integrated with ERP Opty-Way

Enterprise that manages up-to-date stock quantity and booked material data to correctly plan purchase orders.

Last but not least, the **WEB Dashboards** module, optional for the management software package, creates dashboards in the web browser of PCs, tablets or mobile phones, providing customized statistic reports drawing from the database: sales statistics, production, calculation of processing times, warehouse data.

Range of products

- **OPTIMIZATION SYSTEMS FOR FLAT GLASS CUTTING**
- **CAD SYSTEMS FOR THE TREATMENT AND ACQUISITION OF IMAGES AND SHAPES**
- **AUTOMATIC AND INTEGRATED MANAGEMENT OF NC MACHINES**
- **SOFTWARE FOR GLASSWORKS ACTIVITIES MANAGEMENT AND PRODUCTION CONTROL**



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www.optima.it



VITRUM

hall 5 / stand M19

PRODIM

preview

People to contact at our stand

PRODIM'S SALES AND SUPPORT TEAM WILL BE AVAILABLE
TO PROVIDE LIVE PROLINER AND PRODIM SOFTWARE DEMONSTRATIONS

PRODIM

Proliner Glass packages – the best digital templating package got even better

Prodlim has been supplying complete digital templating package solutions to glass templators and fabricators for over two decades now. The Proliner measuring device has always been at the centre of each package, completed by dedicated digital templating software for the glass industry. As a leading specialist, Prodlim invests heavily in the continuous development of the Proliner Glass packages, making the best even better.



Proliner hardware: Motion detection, easier handling and upgraded capacity

Prodlim is proud to introduce the new Proliner "X" models with several upgrades, including motion detection. The Proliner can be set to sound an alarm when it is accidentally moved, preventing incorrect measurements. Other Proliner hardware upgrades are the improved grip on the measuring pen for easier handling, the improved visibility of the measuring wire, the overall battery management improvement and the quadrupled storage capacity.

Two new smartphone apps: Proliner Remote and Proliner Update

Prodlim has developed two new smartphone applications (Android) connecting



with the Proliner. The Proliner Remote app enables operators to use their smartphone as the Proliner remote controller. The second app, Proliner Update, uses the internet connection of the smartphone to update the Proliner software anywhere, anytime.

Prodlim Factory update 3.X

The latest Prodlim Factory 3.X update has improved the data flow from the Proliner for easier use in all Factory modules. Proliner project data and project pictures can be sent directly to the office using the Proliner File Transfer smartphone app, saving valuable time.



Proliner measurement files can now also be directly imported in the Factory Draw module for editing. Factory Draw is a fast and easy-to-use CAD drawing software that further extends the functionalities of the Proliner Edit software. Factory Draw is easy to master and contributes to the easier processing and finalization of digital templates for production.

Prodlim Bent Glass: Measure – Model – Flatten – Frame – Compare

Bent Glass introduces new functionalities to measure and process digital templates of double curved glass constructions. Prodlim Bent Glass enables glass manufacturers to:

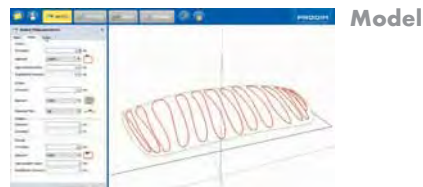
- Create 3D Glass surfaces based on

Proliner measurements

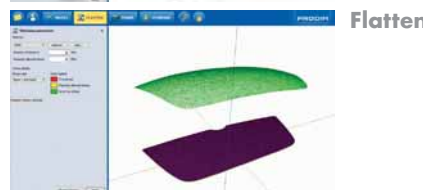
- Transform 3D surfaces to 2D unfolded production shapes
- Create digital support frames to construct molds
- 3D Match surface models for IST and SOLL quality control



Prodlim
Proliner Bent
Glass package



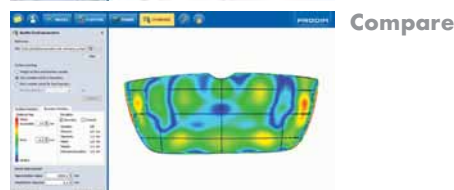
Model



Flatten



Frame



Compare



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www.prodlim-systems.com



VITRUM

hall 7 / stand L19-N20

HORNOS INDUSTRIALES PUJOL, S.A

preview

People to contact at our stand

OUR STAFF WILL BE AT YOUR SERVICE THROUGHOUT THE SHOW.

Pujol

Range of products

- **TRANSPARENT EVA FILMS**
- **COLOUR EVA FILMS**
- **DYNAMIC GLASSES**
- **LAMINATION FURNACES**
- **HEAT SOAK FURNACES**
- **FUSING, BENDING & CHEMICAL**

Hornos Pujol is a fourth-generation company founded in 1911, consolidated worldwide in more than 90 countries as a company specialized in the sector of laminated glass, offering a complete 360° service based on furnaces and complete rolling solutions, consumables, training, and Technical Assistance Service, covering all needs of our customers.

We have our own machinery and complete laminating equipment factories (Barcelona) and EVA film extrusion (A Coruña), as well as commercial offices in Russia and Uruguay. The staff at Hornos Pujol is made up of more than 70 highly qualified professionals who are dedicated to serving the client's needs.

Our best guarantee and our greatest pride are the more than 3,000 satisfied customers who, over the last 15 years, have experienced our quality solutions and accompanied us in our growth and international expansion to achieve our motto: **"Since 1911 no limits in glass creation"**

PUJOL LAMINATION SYSTEMS

Pujol lamination furnaces now have a new leakage control system to obtain clean glass, without excess EVA at the edges, reducing labour costs for glass cleaning by about 25%. Other features include improved convection system for higher temperature homogeneity, and software to manage the download of process data via mobile, I-pad or PC. These lamination furnaces adapt to glassmakers needs and production capacity; processing glass sheet from 3,000x2,200m up to Jumbo sizes of 6,000x3,210m.

PUJOL 100 SERIES

The Pujol100 system is designed to win:

- **Flexibility:** producing without limits any material EVA; PVB; SGP or TPU. From small format to jumbo glass sheets.
- **Productivity:** Efficient and profitable.
- **Profitability:** Fast Pay Back with less investment.
- **Cost Saving:** Decrease your energy and production costs thanks to its advanced system that laminates without air conditioning or dehumidifiers.

EVALAM

The first EVA with better properties than PVB; Made in Europe & Certifies in CEE / USA / RUSSIA / JAPAN.

ADVANTAGES:

1. Transparency.
2. Cross-link.
3. Open Edge Resistance.
4. UV Filtering.
5. Adhesion at high temperature.
6. Sound isolation.
7. Security in people and goods.

ABAR

It is a unique product for reinforced EVA performances, created for specialized markets such as high security handrails and STAIRS, obtaining low deflection and strong-er glass. Achieving structural glass with higher static load and safety after breakage.

I-ON

This product is designed for the separation of spaces, ensuring privacy or transparency through a single click, being the only film, which, together with Evalam, fulfills international certifications according to European regulations.

DYNAMIC SHOWCASE

The I-ON window display, which enables the retro-projection of photos and videos making the environment dynamic, will enable to attract more customers with its 24/7/365 showcase.



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VITRUM

hall 5 / stand C21-D22

R.B.M.ITALIA

preview



People to contact at our stand

OUR STAFF

R.B.M. ITALIA is an Italian company that produces synthetic rubber polishing wheels for flat glass used on the most common edgers and double-edger machines. The company is located in Baldichieri, Asti, in North West Italy, still maintaining its roots as a manufacturing company with a long history and experience.

Technology, skills, research of new challenges, have always been the key words for R.B.M.

R.B.M. ITALIA has undergone a year full of research to develop new products and strengthen its existing range and improve the availability of products to match customers' needs, also improving after



sale services. A new technical department has been developed, with a new member of staff who will be the contact person for customers to make trials and focusing on problems that may occur. The idea is to follow more and more on individual requests, therefore customizing solutions.

The company has been working to complete its range of wheels for low-E (edge deletion wheels). A new product was presented last year: a non-woven convolute wheel that gives great performance in removing coating. It is a complete different bonding resulting in a good and homogeneous surface without leaving any remaining material.

At Vitrum 2019, R.B.M. will have on show a new wheel for low-E, made of a different, polyurethane-based material, with a series of possible solutions for this application.

The R&D department has also worked considerably to find new materials and compounds to expand the cerium wheels range.

Visitors at Vitrum will therefore have the chance to see a lots of innovation with the same level of quality reached throughout the years.



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www.rbmitalia.com



VITRUM

hall 5 / stand U28

R.C.N. SOLUTIONS Srl

preview

People to contact at our stand

ELENA CALVI	CEO & OWNER
DAVIDE RICCHI	SALES & TECHNICAL MANAGER
EZIO CALVI	PRODUCTION MANAGER
SIMONE VECCHI	SALES & TECHNICAL MANAGER
GIANFRANCO RIVAROLI	CHEMICAL TEMPERING CONSULTANT
ROBERTA COMETTI	INTERNATIONAL DEPARTMENT & PUBLIC RELATIONS MANAGER



At this year's Vitrum trade show, **R.C.N. Solutions** will be relaunching its company image by improving communication regarding production and control of quality concerning REVA BF, R.C.N.'s new product.

This communication programme will have a strong impact during Vitrum, where the company will make use of images and pictures to present R.C.N. Solutions as the only true and reliable manufacturer of REVA BF, resulting from research, investments, tests and strict technical criteria to guarantee specificity and quality over time.

The EVA film market sector is, at present, full of completely different information that can have a negative effect on the choices and consideration of glassmakers.



R.C.N. therefore wants to highlight the quality, solidity and transparency of REVA BF. At the company's stand at Vitrum, visitors will be able to see a video of the production of REVA BF, as well as the quality control systems used to test the nature of the product and understand the peculiarities and advantages that REVA BF high-range film can offer end users.

R.C.N. is a young and dynamic company with an omni-directional professional vision, and therefore its products can not be limited to a single offer, but include a wide range of possibilities.

In fact, all R.C.N. products and machines are part of a complex production that enables clients to purchase production lines that include bending, chemical tempering and lamination, or just a single stand-alone machine. These machines range from laminating furnaces of various sizes, right up to Jumbo, as well as different optional equipment to increase production; glass bending furnaces designed to carry out complex and special curve. Last but not least, chemical tempering, all associated with the flexibility of personalized machinery. Special focus must be on chemical tempering systems where R.C.N.

goes beyond the traditional use and point of view, leading to a more advanced vision and concept of chemical tempering able to generate interesting and modern perspectives that are in line with the most recent needs and demands of the glass industry, and not just limited to the thickness of the glass or its end use.

R.C.N. is proud to supply important international companies and groups such as AGC and Schott, and is ready to meet with companies looking for a reliable partner for their projects and investments.



www.rcnsolutions.it



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VITRUM

hall 5 / stand D21-E30

ROLLMAC

preview

People to contact at our stand

GIANNI MAITAN	GENERAL MANAGER
MAURO PELLIZZARI	
MICHELE FASSINA	
MATTEO SOMMAGGIO	> SALES MANAGEMENT
MARCO PRETTO	
RICCARDO BOOZ	LABORATORY DPT.



Rollmac, the commercial branch division of Gemata Spa, world leader in the design and production of roller finishing and coating machines, is now introducing itself to the enamelling market as a reliable and expert partner in the supply of finishing machinery, from single machines up to complete lines. The experience acquired over the years in the global market has brought the branch to offer final users complete know-how service and support to project completion.

The **new GLASSPRINT ONE** digital flat glass printer provided with advanced technology that uses ceramic-type inks to print, images, photos, drawings and texts received through a digital support on flat glass plates will be on show at Glasstec.

GLASSPRINT ONE uses a high definition print and allows up to 12 colours to be used simultaneously in a single application, thereby allowing for many applications of colour and shades. Thanks to software, these images are then processed and converted into work instructions. The software uses an application entirely developed by GEMATA for Windows operating system, which interface is composed of simple icons to allow the synoptic panel to be intuitive.

Also on display at the show:

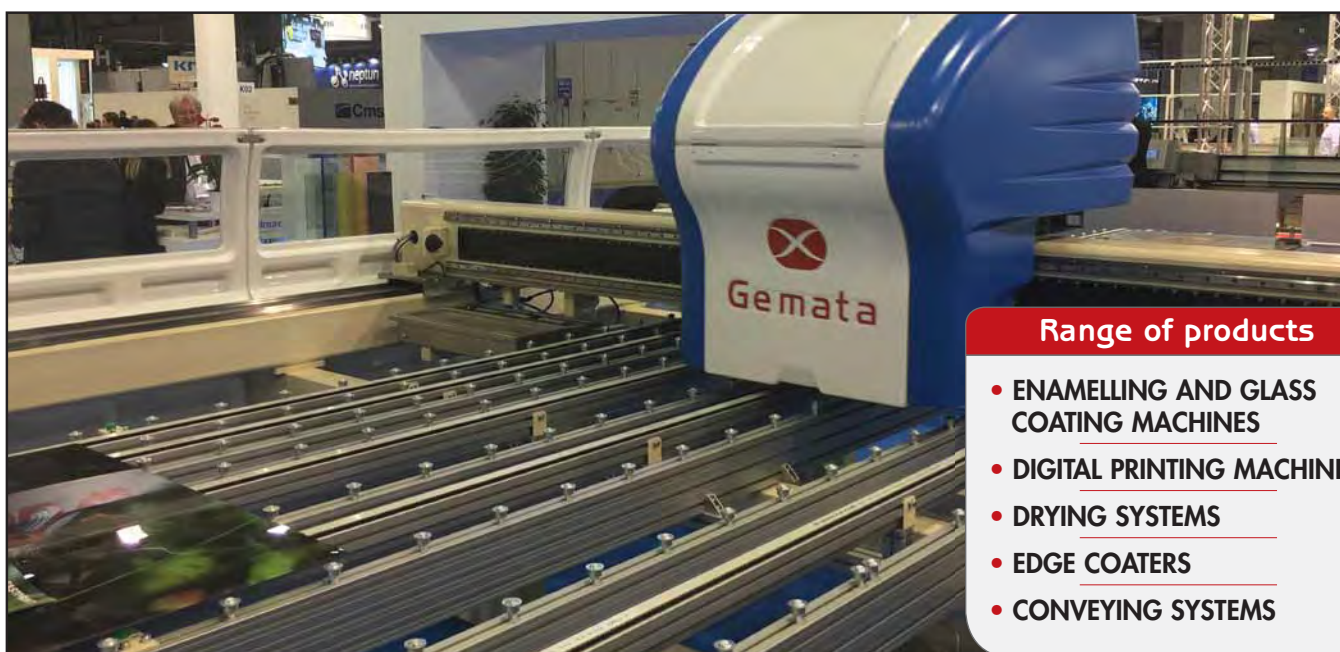
MULTIGLASS 1800 is the rollercoater for enamelling, coating and design printing on flat glass sheets by means of an engraved roller. The technology of the Multiglass machine is quite flexible and, without any particular changes or setting changes, spe-

cial paints and products can be used to give the plate particular properties. Special care has been taken in the uniformity and homogeneity of painting, that must not have overcoating, unpainted areas, drops or excess paint on the entry/exit edges.

GLASSLINE edge coater system designed for the complete automation of the Automatic Sheet Rotation (ASR) process. The ASR process is particularly useful for coating glass sheets which are too large, too heavy, or which cannot be handled manually.

Rollmac - Gemata is certified ISO 9001, ISO 14000, and Italian "Safe Work" standards

Live printing demonstrations and tests will be carried out during the show.



Range of products

- ENAMELLING AND GLASS COATING MACHINES
- DIGITAL PRINTING MACHINES
- DRYING SYSTEMS
- EDGE COATERS
- CONVEYING SYSTEMS



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VITRUM

SCHIATTI ANGELO Srl

preview

hall 5 / stand H21-K30

People to contact at our stand

ALESSANDRO SCHIATTI

PRODUCTION MANAGER

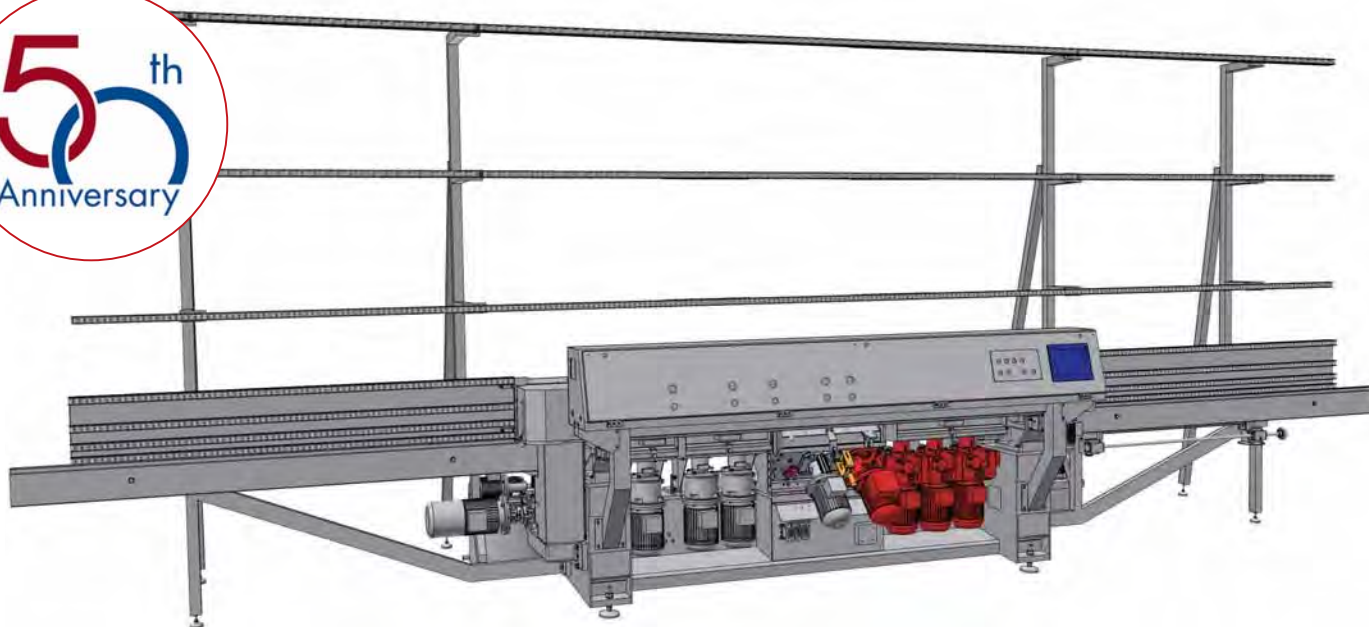
CINZIA SCHIATTI

SALES MANAGER

COMMERCIAL AND TECHNICAL STAFF



5th
Anniversary



In the year of the 50th anniversary of the company run by Angelo Schiatti, the **Schiatti** company continues in its technological innovation and development of new solutions for the glass industry. Schiatti machines are well-known on the international market for their reliability and also for their ability to keep up with the needs of the times providing the most suitable innovations and improvements to operators.

From now on, Schiatti straight edgers have a new plus: the automatic adjustment of diamond wheels. The company's machines were already able to automatically manage the adjustment of the polishing wheels through their PLC and now, the glass removal step can also be performed automatically by means of the same new Mitsubishi PLC.

The automation of the grinding process considerably reduces the time of machine set up, tests and human error, facilitating the work of the operator who only needs to set the required working parameters. During Vitrum, Schiatti will have on show the fully automatic model FPS20RS together with other straight edgers such as mod. SME10 and FPS50R and automatic driller mod. FPD60 which represent the company's core business. Schiatti's technical staff will give live demonstrations of all the equipment displayed.

At Vitrum, Schiatti will be pleased to welcome old and new clients at its stand with gifts and surprises.

Range of products

- **STRAIGHT GRINDING MACHINES FOR PENCIL, FLAT EDGE AND ARRIS AND 45° MITERS (SINGLE OR COMPLETE LINES)**
- **DOUBLE EDGING MACHINES FOR PENCIL AND FLAT EDGE AND ARRIS (SINGLE OR COMPLETE LINES)**
- **BEVELLING MACHINES**
- **VERTICAL AND HORIZONTAL DRILLERS**
- **DRILLING CENTRES**
- **GLASS LOADER/UNLOADER**
- **CORNER MACHINES**
- **CUSTOMIZED SOLUTIONS**



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VITRUM

hall 5 / stand K25

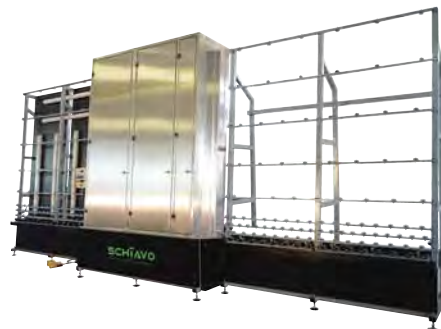
SCHIAVO Srl *preview*

SCHIAVO
italian technology

People to contact at our stand

MICHELE SCHIAVO
ANTONIO LURAGHI

GENERAL MANAGER
PRODUCT MANAGER



Products

Schiavo machines are well-known for their quality, reliability and advanced technology. As of today, more than 5,000 machines have been installed in over 50 countries. Schiavo machines are produced 100% at its facilities in Robecchetto con Induno, Italy, with 100% Italian and European components.

Washing

Schiavo horizontal and vertical washers have been developed to offer high quality and high performing machines for clients needing affordable and quality machinery. The washing machine range goes from simple and reliable washers for small glassworks to comprehensive washing systems for high-production rate facilities. Schiavo washers are made entirely of stainless steel, with the highest quality and the best technology available.

Milling

With the FV-Series, Schiavo makes high-technology CNC milling affordable

for all medium and small glassworks looking to become independent and self-reliable. Thanks to Schiavo vertical milling machines, now every glasswork can perform notches for locks, hinges and handles on glass doors, balustrades and furniture, as well as every kind of inner cuts and corner cuts, importing shapes directly from the office computer in .dxf, .dwg and many other formats, modifying the rich built-in shapes library or simply creating their own new shapes.

Cutting

With a large number of CNC automatic cutting tables installed on four con-



tinents, Schiavo PUMA-S and PUMA-SL are among the best choices for its reliability, simplicity, technology and long-lasting components.

Storage systems and handling

Glass storage systems and glass handling are essential for glassworks to organize production efficiently and optimize available space. In this sector, Schiavo is a leader, with highly reliable solutions for the needs of its customers.

Patented-technology storage systems in manual, semi-automatic and fully-automatic versions, combined with a complete range of manual and motorized vacuum lifters, package unloaders and clamps, makes Schiavo the best choice to better organize production areas in glass facilities and perform on-site installations safely and comfortably.

Assistance

Schiavo performs first-person service assistance on its machines and spare parts are available immediately. Customers contacting Schiavo for assistance receive fast and precise response directly from the engineers and technicians who designed and produced its machines, deciding together the type and timing of the intervention. Direct, simple, fast, effective.

Range of products

- VERTICAL WASHING MACHINES
- HORIZONTAL WASHING MACHINES • VERTICAL MILLING MACHINES
- STORAGE SYSTEMS • AUTOMATIC CUTTING TABLES
- AUTOMATIC LOADERS/UNLOADERS • VACUUM LIFTERS
- MANIPULATORS • DRILLING MACHINES



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www.schiavotech.it



VITRUM

hall 7 / stand B11-C20-B21-C24

SKILL GLASS

preview



VERTICAL CNC CENTERS

People to contact at our stand

OUR STAFF WILL BE AT YOUR SERVICE THROUGHOUT THE SHOW.

SKILL GLASS is an Italian company specialized in the manufacture and design of high technology numerical control machines for the processing of flat sheet glass, which, combined with special software with dedicated functions and modern and functional design, are simple and quick to use.

SKILL E-D is a vertical CNC centre for grinding, milling, drilling and polishing rectangular and shaped flat sheet glass. The machine can process both rectilinear and shaped flat sheet glass and combines all the technology for vertical drilling and milling with the features of a vertical grinding machine. Its main feature is its versatility, which allows for different types of processes at high speeds and optimal precision.

Oppositely placed heads ensure drilling is at maximum speed with top quality and precision, and countersinking can be performed with individual diamond tipped tools or with accessories of the drill bits.



The power and precision of the machine guarantee rapid and simple milling and multiple tools produce milled and ground inserts.

DRILL 1600FF is a 5-axis CNC drilling machine designed for producing holes, inserts and countersinks on rectangular flat sheet glass with a thickness of 3-20 mm.

The machine is composed of five axes, X Y V Z W, and two electro-spindles which, as opposite drilling heads, create a double-sided drilling system that drills perfect holes.

This vertical drilling CNC is able to operate with extreme speed and precision thanks to the management of all the processes by numerical control and also thanks to the support of the double tool change.

DRILL 101FF is a 6-axis CNC drilling machine for the programmed drilling of holes and cutting of incisions, bevels and polished or rough openings of any shape on flat glass sheets from 4 to 20 mm in thickness. The machine is composed of six interpolated axes, X XG Y V Z W, and two electro-spindles which, as opposite drilling heads, create a double-sided drilling system that drills perfect holes.

The milling on this machine is a simple and quick operation and by using multiple tools can mill and grind an insert in just a few seconds.



www.skillglass.it



Via Egidio Gregori, 2 - 36015 Schio (VI) - Italy

Tel.: + 39-0445-500-202 - Fax: + 39-0445-500-203



VITRUM

hall 7 / stand P27-R30

SOFTECO OY

preview

softeco

People to contact at our stand

TIMO SUOMI
MIKKO SUOMI

REIMA MÄKINEN
ANDRE SILNOV

SALLA SUOMI



RWG-EL edge lift gauge, mandatory for tempered and heat-strengthened glass in Europe

Softeco was founded in 1984, and, since 1988, it has been active in the safety glass industry. Strong with over 30 years' experience, Softeco offers consultancy in safety glass production and quality control. We arrange complete testing services and official test reports as well as applications to the granting authority and delivery of approvals for European ECE R43, Chinese CCC and American DOT.

In addition, Softeco also specializes in PVB treatment equipment and more particularly in PVB shaping and stretching technology. We also have PVB roll handling systems for different needs.



New automatic pummel tester also for thick glass



Range of products

- QC EQUIPMENT FOR TEMPERED AND LAMINATED GLASS
- COMPLETE RANGE OF QUALITY CONTROL EQUIPMENT FOR AUTOMOTIVE SAFETY GLASS
- CHECKING FIXTURES AND TRAINING
- QC PLANS AND INFORMATION FOR ARCHITECTURAL AND LAMINATED BUILDING GLASS
- QC PLANS AND INFORMATION FOR AUTOMOTIVE SAFETY GLASS PRODUCTION
- ECE R 43 AND DOT ANSI Z 26.1 APPROVAL SERVICES
- TESTING SERVICES FOR SAFETY GLASS ACCORDING TO DIFFERENT NORMS, INCLUDING EN
- PVB SHAPING MACHINERY
- WEDGED PVB-UNWINDING AND CUTTING SYSTEM, AS WELL AS OTHER PVB TREATMENT EQUIPMENT



PVB shaping and cutting line

www.softeco.com



Itämerenkatu 5 - 00180 Helsinki - Finland
Tel.: +358-336-00424 - Fax: +358-336-00434
E-mail: Reima.Makinen@softeco.com



VITRUM

hall 5 / stand K25-M26

STEFIGLASS INTERNATIONAL Srl

preview

STEFIGLASS
MACCHINE ED IMPIANTI PER LA LAVORAZIONE DEL VETRO

People to contact at our stand

GIOVANNI VISINI
ELISABETTA ANELLI VISINI

GENERAL MANAGER
ADMINISTRATOR



Range of products

- **FULL RANGE OF VERTICAL WASHING MACHINES**
- **HORIZONTAL WASHING MACHINES**
- **COMPLETE IG LINES WITH DIFFERENT ASSEMBLY MODELS, PRESS AND OPTIONAL TILTING TABLE**
- **EXCLUSIVE IG LINE, PATENTED BY STEFIGLASS, COMPACT LINE WITH PANEL PRESS**
- **FULL RANGE OF EQUIPMENT FOR INSULATING GLASS PRODUCTION**

With over 30 years of experience in glass machinery manufacturing, **Stefiglass International** is a leading manufacturer in Europe for a wide range of glass washing machines, complete IG lines and complementary machinery, offering good quality, post-sale assistance and reliable service.

Stefiglass' production, which responds to all the needs and demands concerning washing, ranges from small-sized washing machines of 1300h, right up to Jumbo sized glass of 3300h. Along with a wide range of standard models, Stefiglass also offers the possibility of customizing plants as per specific needs of processing. Customization, which is the realization of custom-built machinery, is the prevalence in the company's production activities.

On show at Vitrum 2019: SPRINT, the most sold model in our vertical washing machine range.

Main quality features:

- 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;
- Customization of machines and possibility of connection to CNC.

www.stefiglass-international.com



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E-mail: info@stefiglass-international.com



VITRUM

hall 5 / stand H09

TALAMONI SRL

preview



People to contact at our stand

TOMASINO TALAMONI
ROSELLA MITIDIERI

OWNER
EXPORT MANAGER

Talamoni will be present once again at Vitrum, this year for the 12th time, and, since the first edition back in 1997 where we introduced ourselves to the market, many things have changed. We changed, in fact, from a sole ownership into a partnership in 2008, and in May this year Talamoni became a limited company, now known as Talamoni srl.

The company's core business is the production of carbide heads and wheels for automatic glass cutting, a line of oil cutters produced entirely in Italy with six different versions; wheels for engraving and processing hollow glass, as well as a range of diamond tools for processing glass edges, and a line of manual suction cups also strictly Made in Italy. Experience in cutting has enabled us to develop our range of cutting oils for glass and ceramics, which optimizes and improves the final quality of engraving.

Alongside its successful range of glass processing tools, Talamoni srl also manufactures ceramic cutting tools.

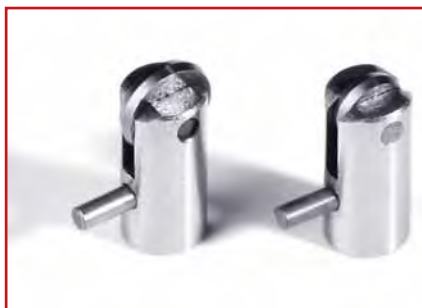
We have changed the company name, a few years have passed but the enthusiasm and dedication with which we follow the production of glass cutting wheels each and every day has remained the same.

This year we will be at Vitrum with a different look - a new style stand to display our products.

We look forward to meeting clients and visitors to speak about and show the improvements made to our products in terms of duration and cutting quality.

Lubrificants & Cutting oils

Lubrificanti e Oli da taglio



Via Menconi 3,28877 Ornavasso (VB) - Italia

Tel.: +39-0323-836198 - Fax: +39-0323-836900 - E-mail: info@talamoni.com

www.talamoni.com



VITRUM

hall 5 / stand P27-P29

TECNO-GLASS Srl

preview



People to contact at our stand

FRANCO CANZANO CEO
MANUELA CANZANO SALES MANAGER
SANDRO CANZANO TECHNICAL DIRECTOR

Tecno-Glass, a leading company in the production and sales of equipment for glassworks, decided, over 15 years ago, to expand its professional horizons, dedicating resources and know-how to the construction of machinery for glass processing. This is how the Tecno-Glass design and construction department was set up, with the mission of creating machines characterized by high professionalism, maximum attention to operator safety, as well as ease of use and maintenance, without neglecting those functional and aesthetic details that make Tecno-Glass machinery absolutely unique and irreplaceable.

All our machinery will be on show at Vitrum 2019, in Hall 5 - Stand P27-P29.

Tecno-Glass will be presenting the most recent development coming from its workshop: the MFC-RADIANT and the MFC-ROCKER. These machines are for two-component hydraulic extruders for polysulfuric and polyurethane sealants – MFC-RADIANT – and for silicone sealants – MFC-ROCKER – built with carefully selected components, coming from the best companies operating in the field of Italian and American mechanics. The company's long tradition of the sector merges with the most modern technologies: highly technological and,

at the same time, easy and intuitive to use, thanks to the dashboard in Italian and English equipped with all the commands necessary for the control of work operations. Tecno-Glass extruders are equipped with numerous accessories to facilitate operators, such as the centring guide roller and the mixing unit with AISI 316 stainless steel propellers or the innovative MD2 gun that does not require daily washing.

At the stand, visitors will also be able to see the HM-1 hot extruder, compact and reliable, which uses latest generation components to minimize consumption and reduce noise to a minimum, with fully stainless steel casing for easier cleaning; the TKD-3000 Plus saw, with double disc and double motor, which ensures clean cuts, able to work perfectly with all types of profiles on the market; the TG-90 revolving table, characterized by speed and high resistance, equipped with remote control.

Also on show the BRX-250, 700 and 1400 cutting edge butyl extruders of different sizes to meet the needs of all companies, small or large, featuring precision, high reliability and low consumption.

The ARGO-FAST will be on show, equipped with a fast and intuitive interface, this machine is confirmed among the best gas filling machines available on the market. With an accuracy of 99%, it is able to detect various types of gas and, with fully automatic filling cycles, offers the possibility to fill simultaneously two panels of different sizes, thanks to the two autonomous lines each equipped with its own sensor and dedicated card. The ARGO-FAST is equipped with a PLC touch screen that constantly displays the progress of the filling level, setting various functions, such as purging, filling, closing of the valves and the automatic printing of filling percentage. Thanks to an industrial thermal printer, housed in the upper casing, it is possible to print the main processing data: company data, lot number, operator, percentage of filling, date and time and a series of others custom parameters chosen by the user, can be printed on a removable plastic label.



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www.tecnoglass.it



VITRUM

hall 5 / stand P21

TEKNO KILNS Srl *preview*

Teknokilns

People to contact at our stand

PIERFELICE CAVENAGHI
RENATO ANDREOTTI
NICOLÒ MAESTRONI

> BOARD OF DIRECTORS
EXPORT MANAGER



Multilevel kiln with removable carriage. Convection heating. Excellent temperature uniformity. Forced cooling. High productivity.



Oscillating kiln with convection heating. Maximum temperature uniformity. Tempering of selective low-emissivity glass.



CERTIFIED ACCORDING TO EN 14179-1



Automatic kiln for chemical tempering of glass.

At its factory in Lecco, Italy, **Teknokilns** designs and manufactures all of its complete kilns for the fusing, bending, tempering and lamination of glass.

Meticulous control of the production and quality process, from selecting components to the running of the plant, have made Teknokilns one of the market's global leaders in terms of technological innovation and reliability.

Founded in 1996 as a result of the technical knowledge held by its founders, the company is still today managed and driven by Renato Andreotti and Pierfelice Cavenaghi. The partners have established a consistent growth strategy based on the durability and reliability of kilns, constant technical innovation and customer satisfaction throughout the product's life cycle.

Teknokilns always proposes new solutions in the furnaces field. During 2017 Teknokilns has launched a new plant with totally convection technology for low-E glass tempering. This kiln, which is part of the Teknokilns Full Convection line, guarantees more uniform heating of the glass surfaces and higher production capacity for glass machining.

Another kiln of the above mentioned line is "Foehn", a hot air laminating plant for the production of special glasses, which can reach very high thermal and mechanical resistance. This new kiln can produce glass windows and doors which can resist to hurricanes and which meet the strict American requirements, as well as windows, doors and walls able to resist to bomb attacks, create high resistance walls and covers and structural glass floors and stairs.

The new products are in addition to the entry-level units of the line Teknokilns Infrared Temper which use infrared rays, and to the medium level category of the Teknokilns Temper Pro line which uses a combination of technology: convection solution and infrared rays.

Range of products

- **LAMINATING FURNACES**
- **FLAT TEMPERING FURNACES**
- **COMPLETE LINES FOR THE PRODUCTION OF PV PANELS**
- **PVB LAMINATING LINES**
- **FUSING AND BENDING FURNACES**
- **CHEMICAL TEMPERING**



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E-mail: info@teknokilns.it

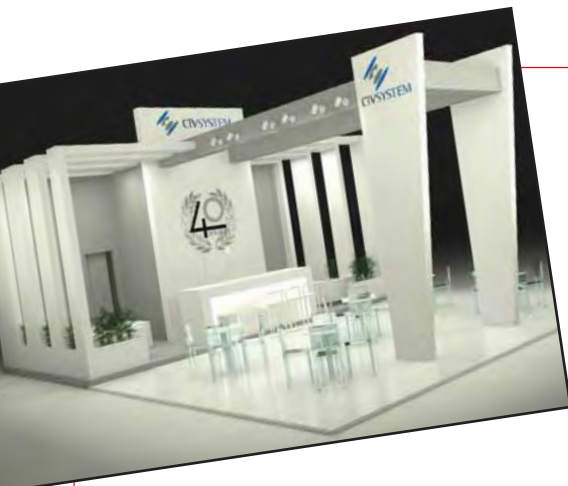
www.teknokilns.it



VITRUM

hall 7 / stand N15

CIV Systems SRL



Thermoseal Group products are represented at Vitrum by its Italian distributor, **CIV Systems** with representatives from Thermoseal Group available at the stand.



Thermobar
Warm Edge Spacer Tube
Available in black, grey or white

THERMOSEAL GROUP Ltd.

preview



Thermoflex
Warm Edge Spacer

THERMOSEAL GROUP
Dedicated to Insulated Glass

Thermoseal Group, UK manufacturer and supplier of two of the highest performance warm edge spacer bars available in the world – Thermobar and Thermoflex Warm Edge Spacers – is also a UK industry leading supplier of over 2,500 insulated glass (IG) components and a wide range of machinery for manufacturing double glazing, triple glazing and also quadruple glazing units. It is a one-stop shop for IG manufacturers, with an offering that includes everything except glass.

Thermobar and Thermoflex can achieve psi value as low as 0.029. In addition, Thermobar has a Passive House rating of pH_A (pH_A+ with Hot Melt Secondary Sealant) certifying it for use in Arctic climates. Both spacers have been made to Thermoseal Group's own exacting standards to meet and exceed all required European certifications for EN1279 and E2190-10.

Thermoseal Group has been supplying components to the IG industry for 40 years and has invested heavily in its manufacturing facilities so that it now produces over 55% of the products it supplies and 99% of all warm edge spacers are manufactured in-house. In conjunction with its production

facilities, the Group has also set up its own Technical Centre and EN1279 test laboratory to ensure that its products are always of the highest quality and that its scientists understand how all of the components perform within the lifetime of a glass unit.

Thermobar Warm Edge Spacer is a tubular spacer system made with engineering plastic and laminated with a multi-layered non-metal gas barrier tape. This spacer is the result of many years of research and development to ensure that it is highest performance, preferred by manufacturers and bendable on current plastic spacer bending equipment.

Thermobar is now available from stock in black, grey and white in various sizes from 7.5mm up to 23.5mm. Additional colours are available on request.

Thermoflex Warm Edge Spacer is a pre-desiccated silicone rubber spacer system which is also laminated with a multi-layered non-metal gas barrier tape.

Thermoflex is currently available from stock in black and grey in a range of sizes from 6mm up to 20mm.

The Group also produces glass machinery, injection moulds components and manufactures its own PermaLed and DecraLed adhesive lead and Decra Films.

Manufacturing is now a passion to Thermoseal Group so look out for the production of further insulated glass components.



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www.thermosealgroup.com



VITRUM

hall 7 / stand K01-L10

TK - STRATO™

preview



tk Pura Tecnologia Italiana

For over 20 years TK has been designing and manufacturing tempering, laminating, Heat Soaking and chemical tempering ovens.



CONTACT US

Ovens Division

TK Srl

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Email: service@tkitaly.com
www.tkitaly.com

EVA interlayers Division

Strato™ by Satinal Spa

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Email: customer@satinal.it
www.stratointerlayers.com

Other locations:

Satinal USA Ltd.

1717 N Bayshore drive
Miami, Florida - USA

Satinal do Brasil Ltda.

Rua Paes Leme, 215 - 17º andar sl 1704
Pinheiros, São Paulo - Brasil

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STRATO™ is the first and only EVA film produced in Italy.

It is used for laminating safety glass for both architectural and interior design applications without running the risk of de-lamination.

STRATO™ is a thermosetting material and it is not sensitive to moisture and water.

It is certified according to European (UNI EN ISO) and American (SGCC - ANSI) standards. Moreover it has also carried out several tests in accordance with the ASTM standards.

STRATO™ is available in different colours and finishings.

TK and STRATO™ are brands of the

SATINAL
Group 



Via del Lavoro, 1 - 22036 Erba (CO) - Italy
Tel.: +39-031-3574873 - Fax: +39-031-5472199
E-mail: service@tkitaly.com

tkitaly.com



VITRUM

hall 7 / stand G11-L20

TRIULZI CESARE SPECIAL

EQUIPMENTS Srl

preview

People to contact at our stand

TRIULZI QUALIFIED STAFF

TRIULZI
You name it, We'll do it.



**HORIZONTAL SCRUBBING -
ENERGY EFFICIENCY WASHER -
WATER SAVINGS**

- Made entirely of stainless steel
- Working width 2,600mm
- Top scrubber section with disc brushes
- 3 shifts daily performance capability
- 4 cylindrical brushes/2 water tanks heated water

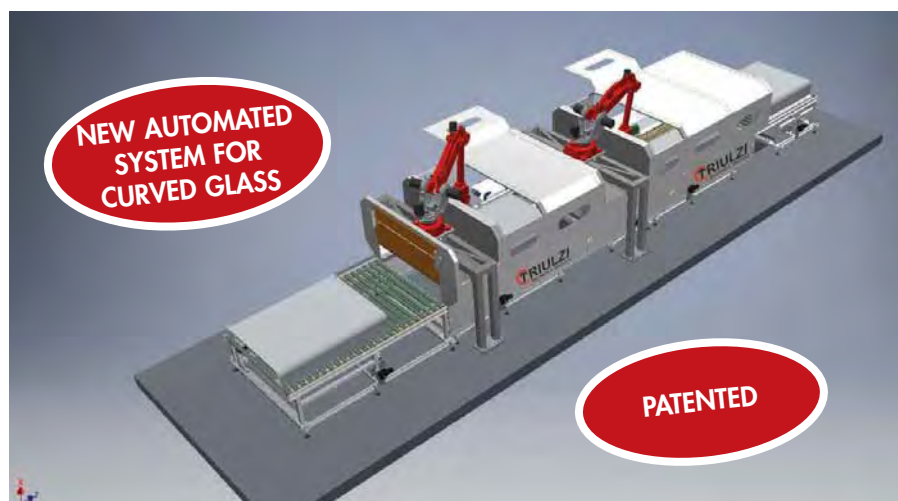
- Conductivity water sensor for water control, cascaded water flow
- Controlled by PLC and touch screen operator panel
- Antistatic bar fitted to exit of upper drying section
- Remote control
- Very silent operations
- Bevel gear transmission

**NEW-FIREPROOF
GEL REMOVAL LINE:
ENERGY EFFICIENCY -
WATER SAVINGS**

- Made entirely of stainless steel
- Working height 1,600mm
- Max. thickness range 65mm
- Automatic Gel Removal around four sides of "fire stop" glass panes
- Controlled by PLC and touch screen operator panel
- Very silent operations

**JUMBO VERTICAL CLOSED
TOP - ENERGY EFFICIENCY
WATER SAVING WASHER**

- Made entirely of stainless steel
- Working height 3,300 mm jumbo sizes - to be integrated in line
- Automatic thickness adjustment
- Low Emissivity glass detection with frequency control
- Complete with high pressure prewash section with tank
- 6 cylindrical brushes/3 water tanks, heated water
- Controlled by PLC and touch screen operator panel
- Very silent operation



Range of products

- OPEN AND CLOSED TOP VERTICAL WASHERS
- HORIZONTAL WASHERS FROM MINI TO JUMBO SIZE
- LAMINATING GLASS LINES
- INSULATING GLASS LINES
- AUTOMATED SYSTEM FOR CURVED GLASS
- WET POWDER APPLICATION SYSTEM FOR AUTOMOTIVE
- ULTRASONIC BATH GLASS WASHING EQUIPMENT
- FIREPROOF GLASS WASHING EQUIPMENT
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www.triulzi.com



VITRUM

hall 7 / stand L13

TUROMAS preview

TUROMAS
OUR PASSION, YOUR PROGRESS

Tuomas will be at Vitrum once again

The industry is approaching a new era with the Fourth Revolution and Spanish **Tuomas** is channeling efforts in the research, design and development of new machines, software and solutions 4.0.

The Spanish brand will make the most of this opportunity to present its complete range of machinery standardised for monolithic glass, laminated glass or smart storage to visitors who come over to its stand L13 in hall 7 at Vitrum, as well as offer them personalised solutions.

Since its beginnings in 1985, Tuomas has in mind that it is not only about selling a machine to load, cut or store glass, it is about accompanying the user throughout the whole process until they find the comprehensive solution that they truly need.

100% of the design, manufacturing, programming and assembly of the machines is carried out in the company's premises in Rubielos de Mora (Teruel, Spain) using only high-quality European components to ensure reliability, security, performance and precision which is expected from a leading brand.

Expansion Project

Tuomas has become a global benchmark in smart machinery for storage, loading and cutting glass in very demanding markets such as the automotive industry, architecture or decoration.

Apart from its headquarters in Spain, it has offices in Santiago, Chile and another in Sao Paulo. The Latin American market is one of the most strategic in the face of the expansion, which is why, from November 2019, we will have a third branch in Bogotá.

In July 2019, the Centre of Innovation and Special Developments (CIDET) was unveiled, the cornerstone of the Group's expansion project. The Centre channels efforts in the research, design and development of new machines, software and solutions 4.0.

This expansion project will increase the production capacity with the construction of five 2,000 square metre warehouses, in



Rubielos de Mora. In addition to more effective spatial distribution with new connections that shorten distances, investment in machinery and advanced equipment and the creation of interactive spaces for employees, an energy savings and efficiency and environmental sustainability plan will be implemented.

Industry 4.0

The industry is approaching a new era with the Fourth Revolution. The large corporations are driving and strengthening digital transformation processes. The digital infrastructures, interconnections and automatic production systems, motors for competitiveness, will also have special emphasis at Vitrum 2019.

Currently, the R+D department at Tuomas is working on refining a new software solution which is perfectly integrated with its storage system and cutting process.

The apps are developed with web technology and provide information about the production process in real time. Simplification, speed and effectiveness, among other advantages, are the results of this research.

2020 will be the year of the official launch of this solution, as well as other developments that industry 4.0 requires.

See you at Vitrum 2019.

Range of products

- SMART GLASS STORAGE AND LOADING SYSTEMS
- FLOAT GLASS CUTTING SYSTEMS
- LAMINATED GLASS CUTTING SYSTEMS
- CUSTOMIZED PROJECTS



Carretera Estación Km. 15,8
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www.tuomas.com



VITRUM

TYROLIT VINCENT Srl

preview

hall 7 / stand L07

People to contact at our stand

**CRISTIAN PIVATO, CARLO CRESCINI, MORENO MOLON
FRANCO DI NARDO, MATTEO MOLON**

TYROLIT



Two steps forward in laminated glass grinding

TYROLIT has developed the ultimate solution to process laminated glass in an effective way, by equally reducing stress to the tool and the workpiece.

In laminated glass processing, a push to simplify grinding operations, improve yields and increase processing quality, has led customers to try many different things. The need to regularly stop grinding machines to remove the built up plastic waste during the processing of laminated glass can often present a problem as well. The TYROLIT R&D department has recognised these issues and has developed innovative new grinding wheels offering the ultimate solution.

The slots on these new wheels – angled in opposite directions – are designed to fragment plastic waste into small shards that can easily drain away from the grinding area. This new geometry of the tool has given it the name REVERSE.

The regular and effective removal of plastic shards has significant positive effects also on the diamond band of the grinding wheel. Once free of processing waste they can work with no overheating. This is an essential condition to obtain an enhanced finishing quality of the edge and prevent deformation. It also reduces wear of diamond wheels, thus improving diamond tool

life up to 30%. Moreover, the new REVERSE wheels allow a 20% faster working speed compared to standard ones.

Laminated glass is a widespread application in architectural and structural facades. Those dealing every day with laminated glass will benefit not only from faster working speeds, but also from the lack of machine stoppages and tedious resetting processes.

TYROLIT will be presenting the new REVERSE wheel at Vitrum, Milan, 1-4 October 2019, Hall 7 Booth L07.

The new REVERSE diamond wheels are produced in Thiene (VI), Italy where the global headquarter of TYROLIT's Quartz Industries division is located. Quartz Industries provides tools and solutions for the stone, glass and ceramic industries.

The TYROLIT Group

TYROLIT is one of the world's leading manufacturers of grinding and dressing tools as well as a system provider for the construction industry. Headquartered in Schwaz (Austria), the family-owned business combines the strengths of being a part of the dynamic Swarovski Group with over a century's worth of individual corporate and technological experience.



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BI-MONTHLY INTERNATIONAL MAGAZINE FOR GLASS MANUFACTURING

GLASS MACHINERY PLANTS & ACCESSORIES is the leading international magazine for glass manufacturing, and is targeted at glassworks involved in the production and processing of hollowware and special glass (bottles, containers, household, lighting, technical, scientific, industrial and medical glassware).

GLASS MACHINERY PLANTS & ACCESSORIES is a bi-monthly periodical with about 100 pages of product news, current world news, focus on..., technical articles and dossiers, worldwide exhibitions, glassworks in the world, Yellow Pages, etc.



1989

Glass-Technology International

GLASS-TECHNOLOGY INTERNATIONAL is the leading international magazine for professionals involved in the flat and bent glass industry, from building to automotive, and from furniture to household appliances. **G-TI** is useful for those working in float glass plants as well as glass processors/fabricators, glazing contractors, automotive glass installers, window and door manufacturers, glass merchants, wholesalers, etc. With about 100 pages per issue, it is the bi-monthly tool for keeping abreast of new technology, new products, company life and all innovations in the world of flat and bent glass.

Annual Guides



1990

Glass Industry
Directory 2019

The **GLASS INDUSTRY DIRECTORY** is a unique international annual guide which gives a complete overview of international glassworks and suppliers involved in hollowware and special glass manufacturing. About 300 pages of complete company profiles: addresses, management, sister companies, plants, number of employees, turnover, banks, year of company foundation, capital, trademarks, areas of activity, innovations, product-by-product and country-by-country breakdowns. The **GLASS INDUSTRY DIRECTORY** is the annual reference point for the international glass manufacturing industry comprising bottles and containers, domestic glassware, tubing, vials and ampoules, lighting glassware, technical and industrial glassware, scientific, laboratory and medical glassware and much more.



2013

FLATGLASS
2019 world directory

The **FLAT GLASS WORLD DIRECTORY** is a unique international annual guide providing a complete overview of glassworks and suppliers for the flat glass sector. More than 150 pages of company profiles and information about worldwide glassmakers, glass processors and suppliers, including addresses, management, sister companies, plants, number of employees, turnover, banks, year of company foundation, capital, trademarks, areas of activity, innovations, sales network, exhibitions, and, of course, interactivity in digital format, make the **FLAT GLASS WORLD DIRECTORY** the annual reference point for the international flat glass industry.

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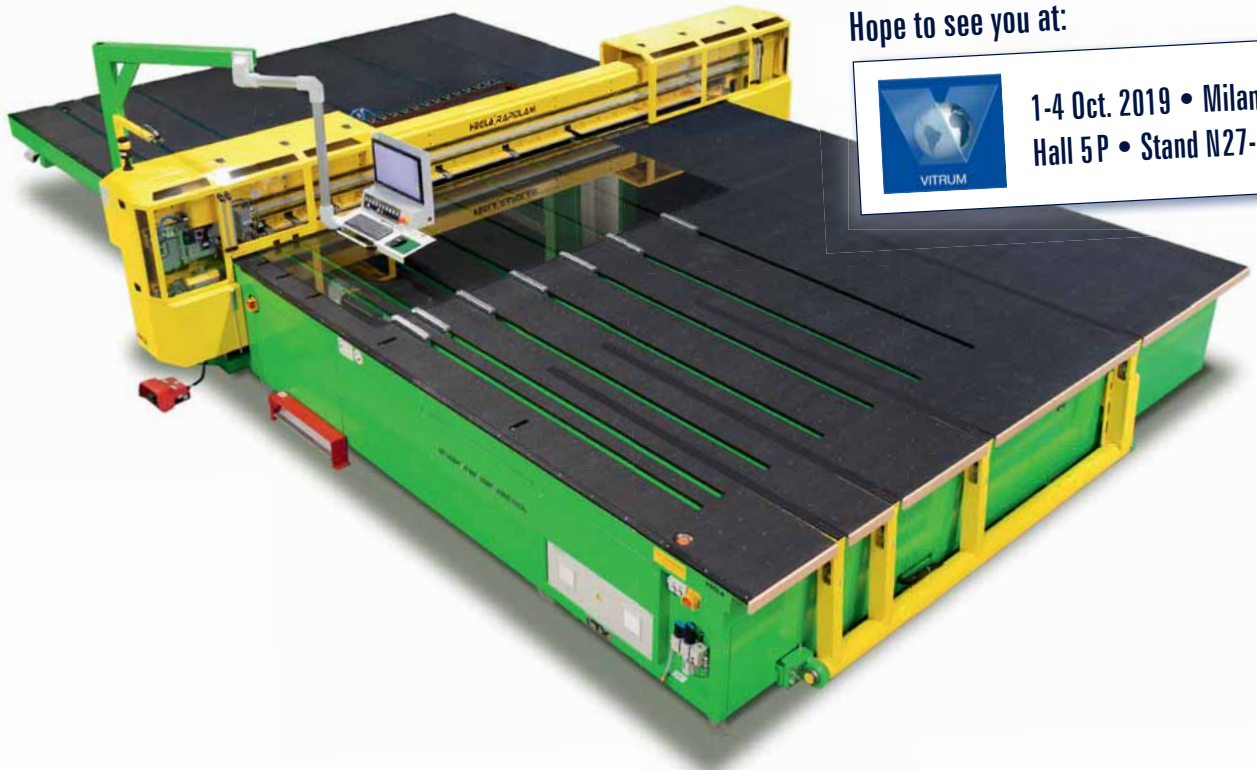


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