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THE LEADING MAGAZINE FOR THE INTERNATIONAL FLAT GLASS INDUSTRY

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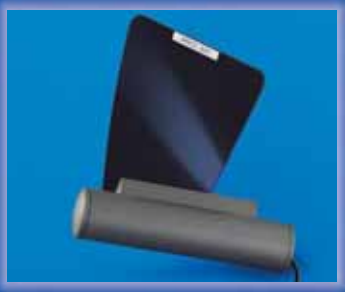


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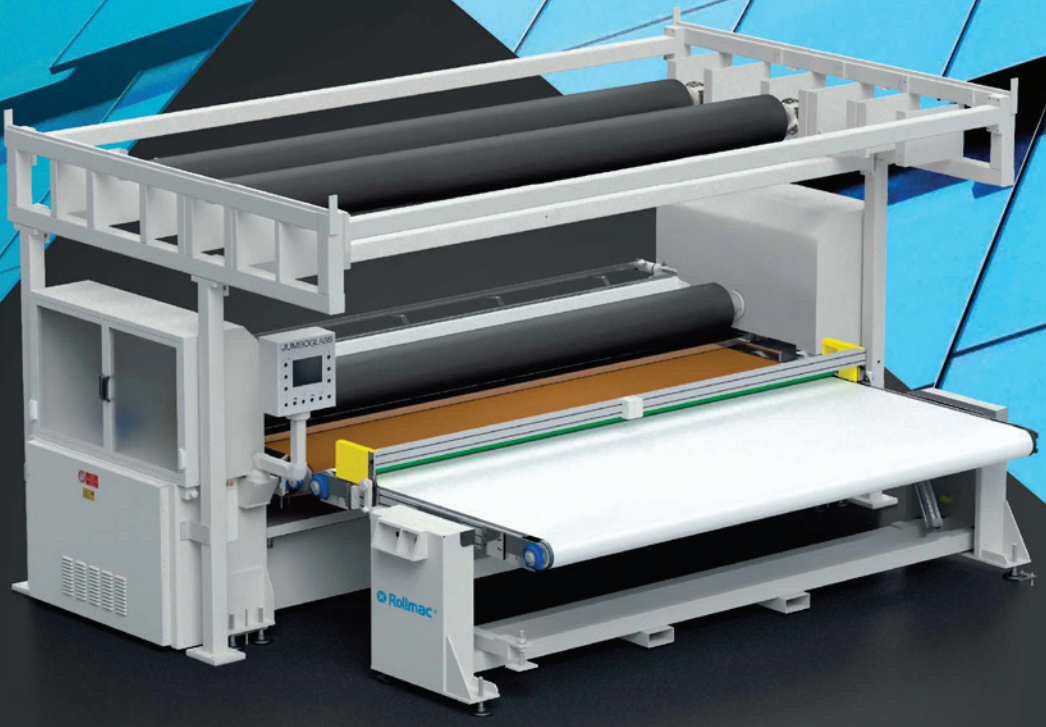

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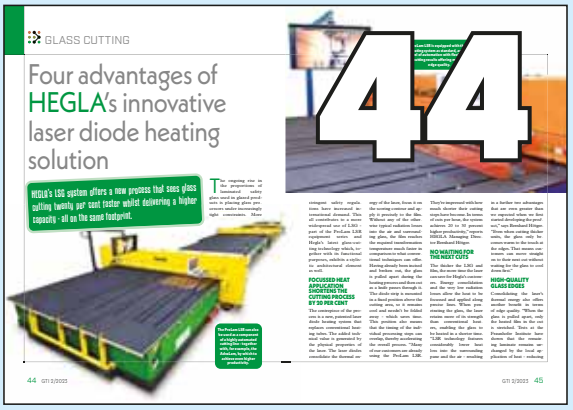


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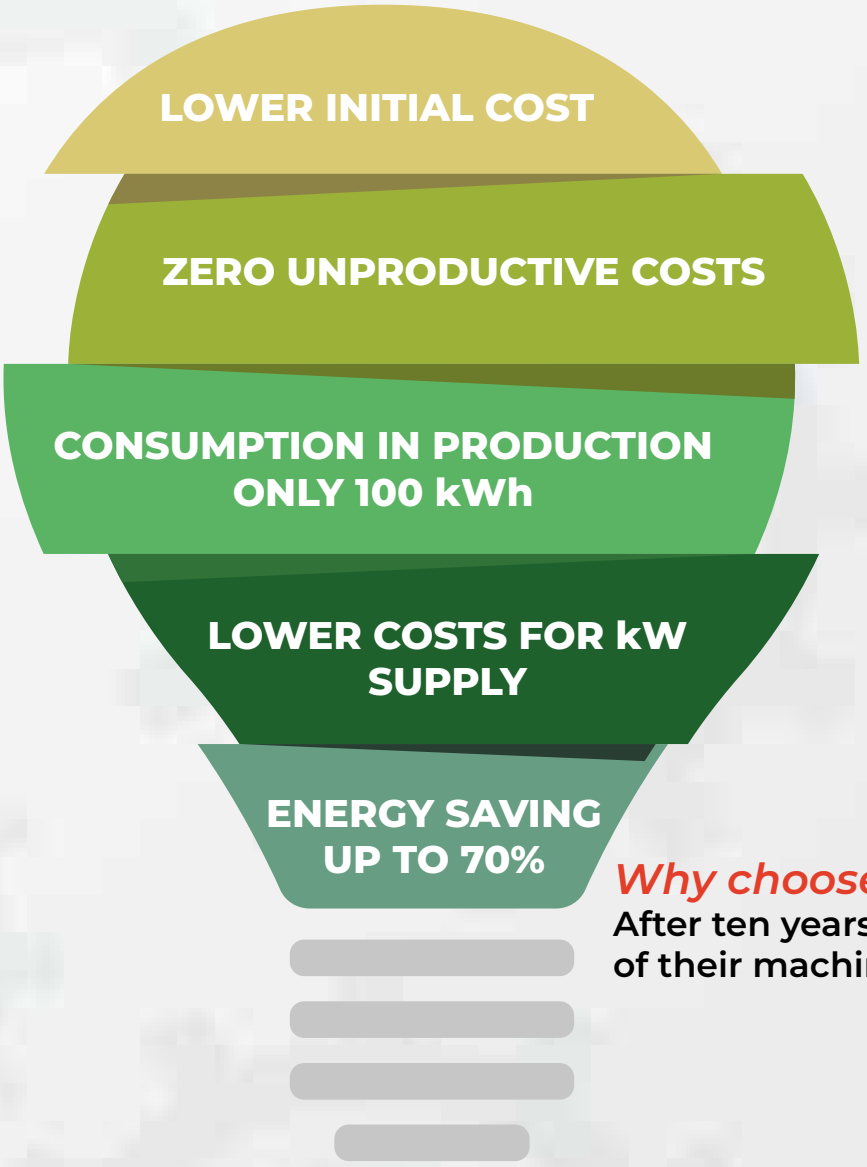

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Glass-Technology International

THE LEADING MAGAZINE FOR THE INTERNATIONAL FLAT GLASS INDUSTRY

2023 TRADE FAIRS CALENDAR

The magazine will be distributed at the following Events

issue	exhibition/conference	date	venu	deadlines
2023	FLAT GLASS 2023 world directory			Editorial files: 30-01-2023 Deadline Adv files: 10-02-2023
2023 1	BAU	17-22 April	MUNICH Germany	
	GLASSPRINT	25-26 April	DÜSSELDORF Germany	Editorial files: 03-03-2023
	CHINA GLASS	6-9 May	SHANGHAI China	Deadline Adv files: 13-03-2023
2023 2	GLASS TEXPO	11-12 May	SAN ANTONIO (TX) USA	
	FIT SHOW	23-25 May	BIRMINGHAM UK	Editorial files: 03-04-2023
	CONSTRUMAT	23-25 May	BARCELONA Spain	Deadline Adv files: 11-04-2023
2023 3	GPD - GLASS PERFORMANCE DAYS	14-16 June	TAMPERE Finland	
	GLASSTECH MEXICO	19-21 July	MEXICO CITY Mexico	Editorial files: 12-05-2023 Deadline Adv files: 19-05-2023
2023 4	VITRUM	5-8 September	MILAN Italy	
	ALL VITRUM EXHIBITORS ADVERTISING IN THIS ISSUE ALSO RECEIVE A FREE VITRUM PREVIEW			
	GLOBAL GLASS SHOW	6-7 September	ABU DHABI UAE	Editorial files: 14-07-2023
	GLASSPRO INDIA	14-16 September	MUMBAI India	Deadline Adv files: 24-07-2023
2023 5	GLASSBUILD AMERICA	31 October 2 November	ATLANTA (GA) USA	
	GLASSTECH CANADA	6-7 November	TORONTO Canada	
	REFRIGERA GLASS	7-9 November	BOLOGNA Italy	Editorial files: 15-09-2023
	EURASIA GLASS	11-14 November	ISTANBUL Turkey	Deadline Adv files: 22-09-2023
2023 6	ZAK GLASS TECHNOLOGY	23-26 November	MUMBAI India	
	GLASSTECH ASIA	29 November 1 December	BANGKOK Thailand	Editorial files: 13-10-2023
	GULF GLASS	4-7 December	DUBAI UAE	Deadline Adv files: 20-10-2023

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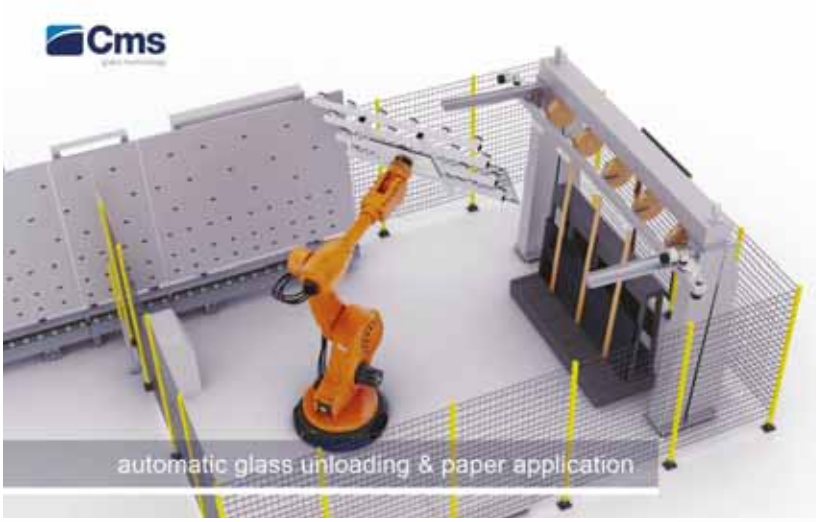
CMS

Customized automated lines solutions both reliable and convenient

The use of processed glass in such variegated sectors as architectural and interior design, often requires non-rectangular shapes and specific processing methods - including the creation of holes and notches in the glass itself, as well as grinding and polishing its edges.

CMS has been developing and producing special machines and customized automated lines for processing glass for over 50 years. Thanks to its experience and commitment to meeting client requirements, the company is an optimum partner for developing and creating customized solutions.



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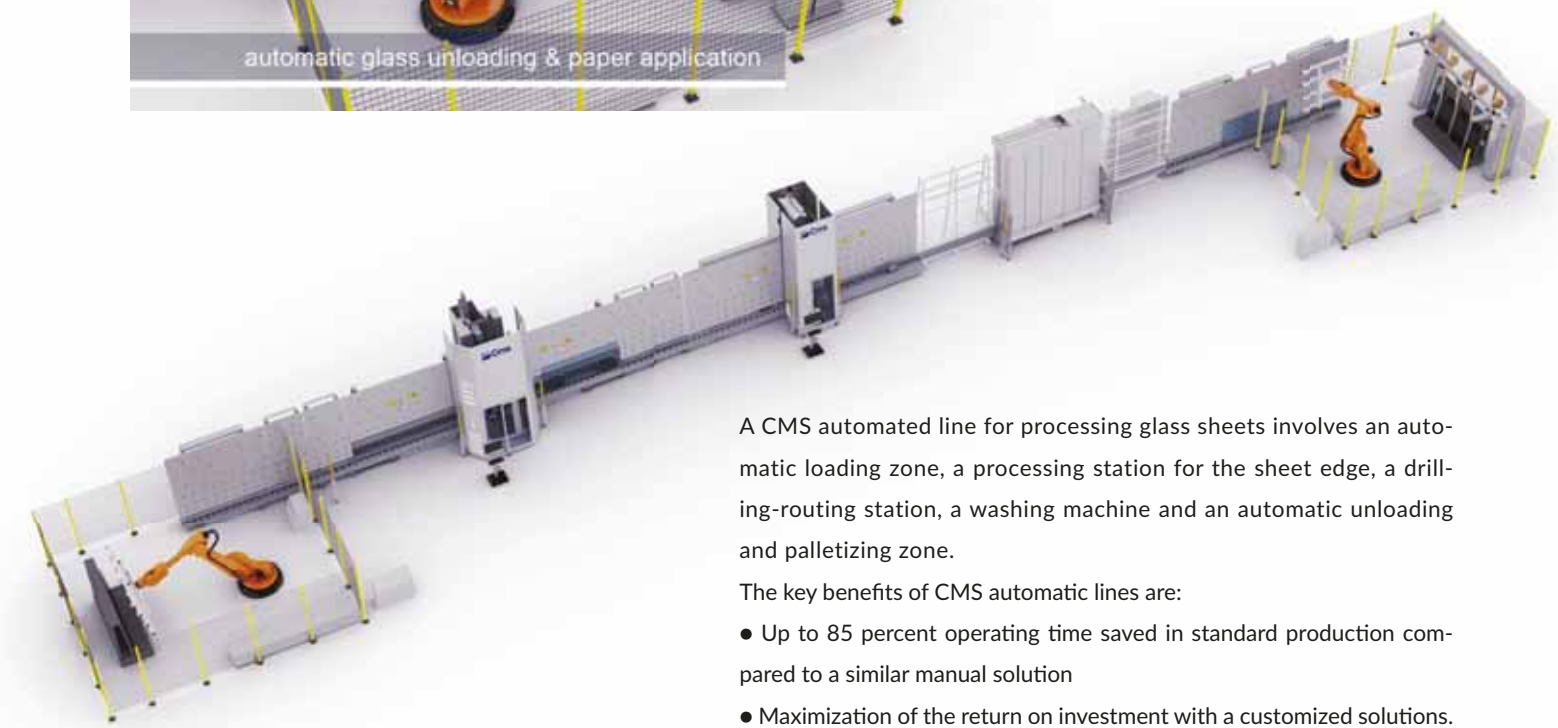

A CMS automated line for processing glass sheets involves an automatic loading zone, a processing station for the sheet edge, a drilling-routing station, a washing machine and an automatic unloading and palletizing zone.

The key benefits of CMS automatic lines are:

- Up to 85 percent operating time saved in standard production compared to a similar manual solution
- Maximization of the return on investment with a customized solutions.

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HELIOS QUARTZ

IR modules save the day

The age of crises we are living in – from the gas supply situation, to the rising energy costs, to the industrial sectors in general – has led us all to search for energy saving methods, trying at the same time to safeguard our productivity and the quality of our products.

To meet these challenges, **HELIOS QUARTZ** has been successfully proposing for some years now complete IR modules solutions. Infrared modules can be supplied complete of their relative control systems – with or without PLC -, to help companies optimize production processes and at the same time save on energy consumption.

HELIOS QUARTZ infrared modules are both easy and practical to install – even in case of their integration into existing lines. For small or large glassworks companies, HELIOS infrared modules are an excellent solution - being designed and produced based upon their real needs. This is possible because Helios Quartz has truly mastered IR technology, thanks to years of experience within the glass sector and thanks to the 100% internal production which allows Helios to design and develop the IR module with the greatest flexibility.

WWW.HELIOSQUARTZ.COM

SCHRAML

Top DRILL RX G8

New Schraml topDRILL RX of the G8 series is a further development of the well-known RX smart-5. **SCHRAML** is part of the LiSEC group.

The machine with the new eightfold turret is perfectly-suited for rapid drilling and countersinking of flat glass. Not only. It can produce surface and edge cut-outs extremely economically with its optional water-jet head.

As with all G8 systems, the RX can be used either as a stand-alone unit or as part of the combiFIN line.

WWW.SCHRAML.COM

GLASTON

Strategies to minimize costs in insulating glass production

The main driver in today's IG production is the need to reduce the total cost of ownership (TCO). To achieve this, all steps of the IG production process need to be optimized. Otherwise, wasted improvement opportunities will show up in monthly energy bills.

Glass washing and drying

The glass washing and drying process is one of the most energy-intensive steps in IG production. If one uses the latest and most advanced washing and drying machine, the drying zone will automatically be switched off as soon as the glass plate has been dried and leaves this section. If there is no glass to be washed or dried, the ventilation flaps of the blower will be closed. This results in up to a 25 percent reduction in washing machine energy consumption.

The next target is to reduce water consumption in the glass washing process. This is achieved by using a closed water circuit with a disc filter system, reducing water consumption by up to 15 times the current rate and leading to additional energy savings.

Conveyor systems

Roller-driven conveyor systems are indeed more energy efficient than air-cushion technology. However, if one includes the high risk of scratching the glass – especially with Low-E coated glass – during the process, the costs of roller-driven conveyors are higher due to frequent glass quality issues. With **GLASTON**'s modern air-cushion conveyor technology, glass quality is not compromised, allowing one to avoid remakes or reputational risks.

Components

In general, all component motors and drives should be efficient and state-of-the-art. Moreover, by using shared drives in modern IG lines, one can ensure that the only conveyor units running are those carrying glass at any specific moment. All others will be motionless. This reduces electrical power consumption significantly.

During drive deceleration, it is good practice to convert kinetic energy into electrical energy and feed it back into the network. This allows energy savings of up to 20 percent.

It is also preferable if the IG manufacturing equipment uses hydraulic and electric drives rather than pneumatic systems. These consume up to seven times less energy, meaning the facility can be operated at a significantly lower cost.

Top-level efficiency with TPS® technology

When improving energy efficiency at a facility, a more radical technology update might be required. The most advantageous solution is the Thermo Plastic Spacer (TPS®) system. Glaston is the inventor of this technology, launched it in 1995, and has very long-term experience with this system in the architectural glass industry.

With TPS® IG manufacturers need only a single machine instead of several components to produce the IG units. The solution eliminates the need for other production machines, including bending, ➜

sawing, connecting, filling and butyl coating. Together, these systems need more electrical power than just one TPS®APPLICATOR.

The TPS® system synchronizes several processes into one, making it possible to complete daily production earlier because of reduced cycle times. For example, if a considerable number of triple IG units can be produced in six hours instead of the previous eight, the savings is equal to two hours of energy consumption.

The new and patented TPS® drum pump system with a specially-designed follower plate provides better insulation with its larger heating surface and avoids permanent heating up and down. This further contributes to remarkable energy savings.

TPS® ensures energy savings for end users, too. With its thermally improved edge seal for each insulating glass unit, less thermal heat is transferred to the outside and vice versa. Compared to IG units with conventional aluminium spacers, TPS® units have a 12 percent lower U-value and a 60 percent smaller linear heat transfer coefficient at the edge zone.

Summary

The increase in government and private initiatives aimed at energy-efficient buildings creates considerable growth opportunities for the insulating glass market – especially for triple insulating glass units.

Although growing demand sounds positive for IG manufacturers, it implies an increase in production costs, too. Given today's energy and raw material prices, even small saving measures can make a significant difference.

With simple calculations, including cycle times, CO2 footprint, energy consumption figures and other parameters, it is easy to see how much more efficient state-of-the-art technology is. After all, this is a competitive business where profitability depends on forward-thinking long-term investments.

WWW.GLASTON.NET

HEAVYDRIVE

Spectacular demonstration of Heavydrive technology

Together with premium glass manufacturer sedak, **HEAVYDRIVE** recently organised a test run for the installation of a pane measuring 14 metres long and 3.2 metres high with a weight of 1.4 tonnes. The guest at this tricky demonstration was a customer from Salt Lake City, USA.

The demand for extremely large panes continues to increase - on the American market too. Yet contractors are often unsure how to handle the installation of extremely large glass elements. Planning to use mega panes for his approximately 80-metre high construction project, the customer from Salt Lake City had been on the lookout for an expert installation partner.

The test run in Gersthofen, Germany, including loading, assembly and dismantling, took a total of six hours. Here preparation of the system in an extremely confined space also tested the expertise of the employees.

The US customer was inspired by the professional demonstration, adjusting the specification to suit the project during his visit to the Heavydrive headquarters.

The Heavydrive staff also ensured the equipment was properly packaged and took care of the customs documents required for transportation overseas.

WWW.HEAVYDRIVE.COM

UNELKO

Makers of Invisible Shield® glass coatings exhibit at BAU 2023

Unelko recently exhibited at BAU 2023 in Munich, Germany, from April 17 to 22 - the world's leading trade fair for architecture, materials and building systems where the latest innovations in building and sustainability are showcased.

UNELKO's Invisible Shield® Coatings protects architectural glass and building projects world-wide for glass preservation, improved appearance and substantial labour savings.

The Invisible Shield PRO 15, Repel®, Glass Scrub® and other high-performance products clean and protect high rise glass for up to 15 years or longer. The Invisible Shield Glass Coatings make glass soil, stain and scratch-resistant and improve the overall appearance of glass.

Unelko manufactures innovative cleaners, treatments and protective coatings designed to clean/restore, enhance, preserve, and maintain glass and other surfaces.

WWW.UNELKO.COM

ŞIŞECAM

Award for organization in training and development

Şişecam, a global player in the glass and chemicals industries with 24,000 employees in 14 countries spanning four continents, won yet another prestigious international award. This year, **ŞIŞECAM** received the 'Best Organization in Training and Development' award at the BEST Awards. Organized by the Association for Talent Development (ATD), a globally renowned authority in its field, the BEST Awards recognized the activities of Şişecam Academy, where Şişecam conducts employee training and development activities.

To date, Şişecam Academy has delivered a total of 2,750,000 hours of training to over 52,000 persons. The Academy operates with the vision of being the leading development centre that trains value-adding employees. The Association for Talent Development recognizes Şişecam Academy as one of the largest corporate academies in the world today.

Established in 2016 to contribute to Şişecam's corporate gwoals, improve human resources competencies and foster employee engagement, Şişecam Academy carries out development activities that continuously support its employees and stakeholders in its ecosystem.

Şişecam employees can pursue their career development in line with their career goals by attending specialized schools for different functions. Şişecam Academy's strategies, practices, and standards are expanded in Şişecam's operating countries. As a result, employees from different territories meet in the same training environment and benefit from each other's knowledge and experience. At Şişecam Academy, development opportunities are not limited to employees. Development programmes are offered to all stakeholders with training content tailored to improve the entire Şişecam ecosystem. The Academy offers Şişecam employees in-class and e-learning programs under the hybrid learning model. Şişecam Academy also provides the opportunity for employees to benefit from the world's leading learning resource providers on the Unlimited Learning Platform.

Since 2003, the BEST Awards have recognized exceptional organizations that create added value by aligning their training and development efforts with their strategies in the best way and supporting their employees with pioneering development opportunities.

WWW.SISECAM.COM.TR

SCHOTT

PPA entry with CleanMax for Wind Solar Hybrid Project

SCHOTT has entered into an agreement with CleanMax Enviro Energy Solutions, Asia's leading C&I renewable energy company for purchasing green energy from a 5.5 MW renewable energy (Wind – Solar hybrid) project in Babra, Gujarat, India. The green energy will be utilized to run **SCHOTT**'s operations at its glass tubing factory in Jambusar, Bharuch, Gujarat. This agreement comes under the aegis of SCHOTT's commitment to becoming climate neutral across its production by 2030. To switch its electricity supply to 100 percent green energy, SCHOTT is also relying on power purchase agreements (PPAs). PPAs are contracts with operators of renewable energy plants, such as wind or solar farms.

CleanMax will be setting up and operating a hybrid power plant with a capacity of 3.6 MW Wind and 1.9 MW Solar - supplying power to SCHOTT's glass facility in Jambusar, Gujarat (India).

Kuldeep Jain, MD CleanMax, said, "CleanMax strives to be the sustainability partner of choice for corporations and companies. This PPA with Schott is another feather in our cap and we are proud to aid the sustainability efforts being undertaken at."

Welcoming this move, Pawan Shukla, Managing Director SCHOTT Glass India, said, "We are very proud to have signed this PPA with CleanMax as a part of our global commitment towards becoming climate neutral. Apart from the fact that this will reduce our energy cost by a significant percentage, it is our valuable contribution to India's aim to reduce carbon emissions by 45 percent by the end of 2030."

The 5.5 MW Wind – Solar hybrid project will lead to carbon abatement of approximately 16,000 tonnes CO2 equivalent annually. This is equivalent to planting 420 trees or taking 2,750 cars off the roads. This project capacity is part of a larger wind solar hybrid farm being developed by CleanMax in Babra, Gujarat. The overall capacity of the CleanMax wind solar hybrid farm will stand at 400 MW, leading to carbon abatement of more than 870,000 tons CO2 equivalent annually.

WWW.SCHOTT.COM

GLAS TRÖSCH

Specialized needs for both neuroscience and façade

For the new neuroscience research building of the California Institute of Technology, the architects at SmithGroup recently developed an integrative design that strongly promotes learning and interaction.

It includes generous windows that direct light from one side of the building to the other. When selecting building materials, the architects opted for classic Southern Californian elements such as travertine and copper. This made **GLAS TRÖSCH**'s OKATECH insulating glass with copper inlay an optimum choice. It also meets high solar and glare protection requirements, contributing to the building's LEED Gold status.

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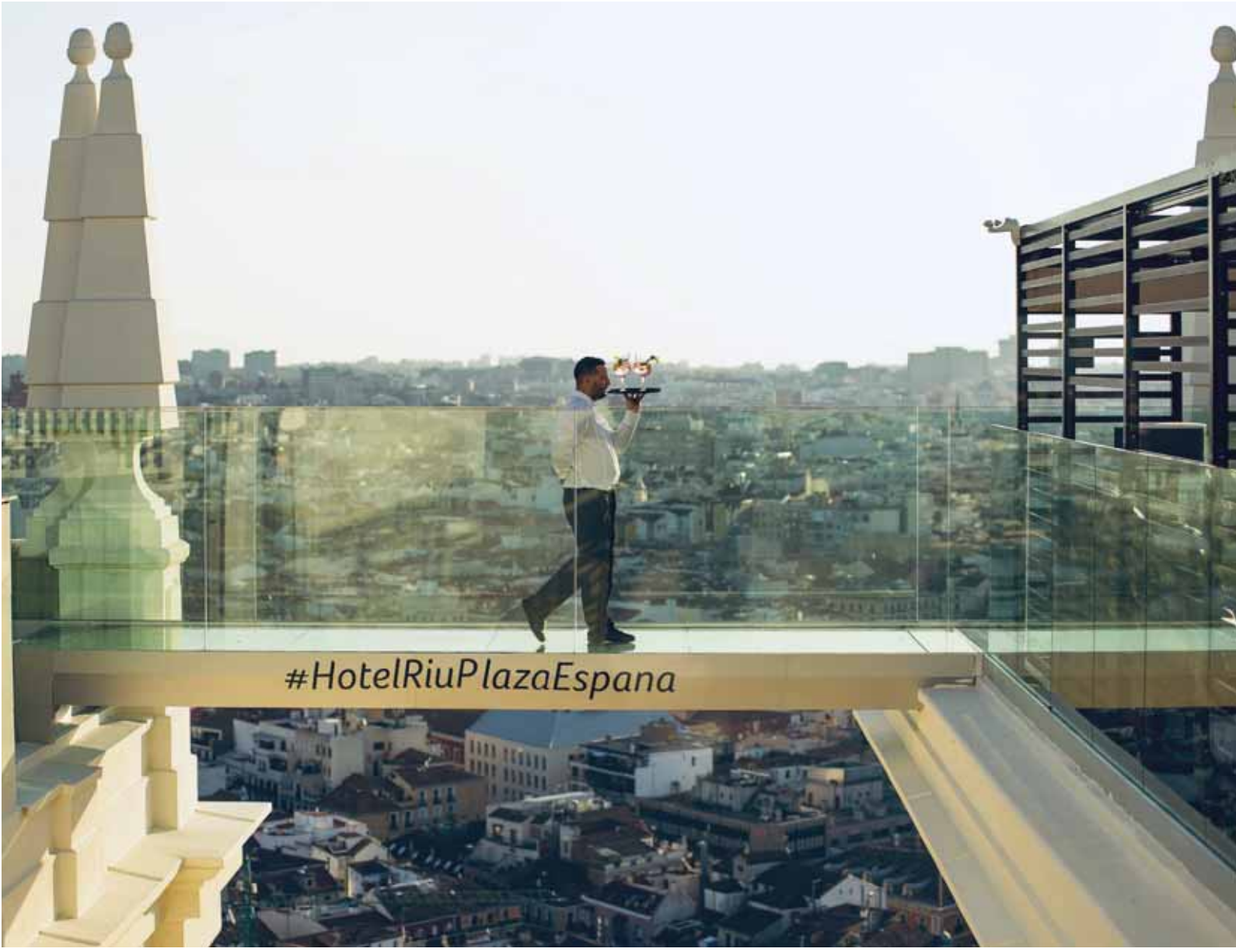

Evalam AB-AR

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AB-AR is a structural interlayer with high performance in mechanical resistance; especially in states of post-breakage stability above 50°C. It has been developed for use in applications that require extra security, such as public buildings/spaces or those with high additional security values.

It provides post-breakage passive security when tempered glass is used, making it the ideal option for use in glazed facades, structural windbreaks, walkable floors, stairs, ceilings, or railings, as well as an anti-vandalism security solution.

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GUARDIAN GLASS

Matmut Filature

The curvy Matmut Filature is a modern, energy-efficient office building facing the headquarters of the Matmut insurance headquarters in Rouen, France that's designed to prioritize sustainability.

The design choices were guided by the owner's desire for Passivhaus certification, which sets very low energy consumption targets. Another example of the building's sustainability priorities is that it boasts a 30-centimetre-thick vegetated roof.

The project's glass façades consist of triple glazing (some elements of which are curved) with solar control that also regulates lighting. The skylights, located at the heart of the complex, as well as the large central atrium, distill the natural light in all the floors - all to ensure the building gets cooled naturally.

Three **GUARDIAN GLASS** products were selected for the building:

- Guardian SunGuard® eXtra Selective SNX 60/28, a solar coated glass that provides an excellent balance between high light transmission and low solar factor, with outstanding thermal performance. Natural daylight is maximized whilst reflecting an optimal amount of solar heat away from the glass, thereby helping to keep occupants comfortable at all times.
- Guardian SunGuard SuperNeutral™ SN 70/37 was selected for its beautiful, neutral, transparent appearance with low reflection, consistent colour, high solar protection and elevated light transmission.
- Guardian ClimaGuard® Premium coated thermally insulating glass was also selected for its high thermal insulation, neutral appearance and high light transmission.

WWW.GUARDIANGLASS.COM

AGC GLASS EUROPE

Pyrobel Vision fire-resistant glazing

AGC GLASS EUROPE's Pyrobel Vision line glazing was recently exposed for more than 90 minutes to temperatures exceeding 1000 degrees Celsius.

The fire-resistant edge-to-edge glazing turned into a white wall, acting like a barrier to flames and hot gasses for building occupants and protecting them from the heat, so they have a secure route to evacuate safely in case of fire.

A picture taken after this EI-90 fire-test of Pyrobel Vision Line in a wooden frame with silicone, tested in DMT Lathen Germany, indicated that the glass and the frame will act at least during 90 minutes as a barrier to flames and hot gasses and block the heat transfer through it.

As for the market, this goes to show that Pyrobel is certainly a very well-tested, fire-rated glass.

WWW.AGC-GLASS.EU

VITRO ARCHITECTURAL GLASS

Launch of Vitro X Innovation Partnerships Programme

VITRO ARCHITECTURAL GLASS recently announced the launch of Vitro X™ Innovation Partnerships, a new strategic partnership program focused on identifying and developing inspired solutions to existing and future challenges in the glass industry. At the same time Vitro announced its first partnership through its programme with AERAS, an emerging technology company specializing in advanced drone applications.

As an incubator for innovation, the Vitro X™ Innovation Partnerships programme enables Vitro to collaborate with future-focused companies as an early investor to support its work and shepherd its ground breaking ideas, including new functionalities and services to building owners and home-owners - from the drawing board to the production line, installation, maintenance and beyond.

Through Vitro X™ Innovation Partnerships, Vitro is teaming up with a select group of growing businesses that are developing revolutionary technologies with the potential to impact the future of the glass industry. Together, Vitro and its partners will bring new products and services to market that will enhance and protect glass surfaces, reduce the need for exterior glass maintenance and even make outdoor venues healthier.

"Vitro X™ Innovation Partnerships allow Vitro to become a hands-on partner with progressive companies that have the power to influence glass in some way, with an innovative, non-traditional approach," said Martin Bracamonte, vice president, marketing & innovation, Vitro Architectural Glass.

The first partnership to be announced through the Vitro X™ Innovation Partnerships programme is with AERAS, which operates advanced drones that have the capacity to serve as an alternative to traditional commercial window and glass façade washing to support both building owners/operators and facility managers.

Headquartered in Pittsburgh, PA, AERAS challenges the standards of drone technology with its revolutionizing research, such as developing the only drone in the world operating with a charged-electrostatic disbursement system. AERAS is also the first company in the United States certified by the Federal Aviation Administration (FAA) to use drones to provide decontamination services against viral contaminants such as COVID-19 at large gathering spaces like outdoor event venues, which has created a new standard in large-scale sanitization.

With additional development support and marketing services offered through its Vitro X™ Innovation Partnership, AERAS' products may also serve as alternatives to traditional commercial window washing and be used for servicing solar energy fields with aerial cleaning technology.

WWW.VITROGLAZINGS.COM

DOW

Dowsil™ 983 Silicone Structural Glazing Sealant

DOW's Dowsil™ 983 Silicone Structural Glazing Sealant is a two-part neutral cure RTV silicon sealant designed for specialized use where dual structure and weather seal applications are desired for factory glazing and curtain wall production.

WWW.DOW.COM

TECGLASS

Factory expansion to support continuous business growth

Expanding manufacturing capacity has become essential to meet growing customer demands. Not only. It also offers **TECGLASS** a great opportunity to take further steps towards improving overall business, greater flexibility and efficiency of the company's manufacturing processes, as well as optimized scalable production to meet and anticipate long-term growth and future demand for Tecglass' main global markets.

Despite the turbulent times experienced in recent years due to the unprecedented impact of the COVID 19 pandemic- with important repercussions in the glass industry- TECGLASS, as a leading firm in the supply of industrial digital printing solutions, has maintained its solid commitment to continued growth through a major investment by means of its business expansion with a new production facility.

A modern building next to the existing current factory, twhe facility has next generation equipment that can better provide global leaders in digital printing solutions with 5.000 additional square metres, which are subdivided into the following departments:

- New additional manufacturing line for digital printers.
- New live show-room with a complete digital line on display.
- Expansion and modernization of warehouse.
- New manufacturing plant for all range of ceramic Jetver inks.
- Expansion and modernization of laboratory and R&D departments.
- Expansion and modernization of administration and service support centre.

With this new expansion, now completed and fully operational, TECGLASS has increased its production floor to a total area of 13.000 square metres, all of which are located within the same industrial area where the Spanish company offers its activities - namely Lalin, Pontevedra.

WWW.TECGLASSDIGITAL.COM

PILKINGTON

Pilkington to invest over USD 86 million in Laurinburg plant

PILKINGTON NORTH AMERICA, part of the **NSG GROUP**, will invest USD 86.8 million in its operations in Laurinburg, North Carolina, USA. The project includes the rebuild of one of its two float glass lines, expansion of existing coating capabilities and other building and equipment improvements at the company's float glass facility that will create 20 jobs in Laurinburg.

The investment is part of our ongoing commitment to our customers and the Laurinburg community," said Chris Miller, Manufacturing Operations Director.

The Laurinburg plant manufactures float glass for the commercial architectural and export markets. It is located approximately 100 miles southwest of Raleigh and currently employs around 400 people.

WWW.PILKINGTON.COM

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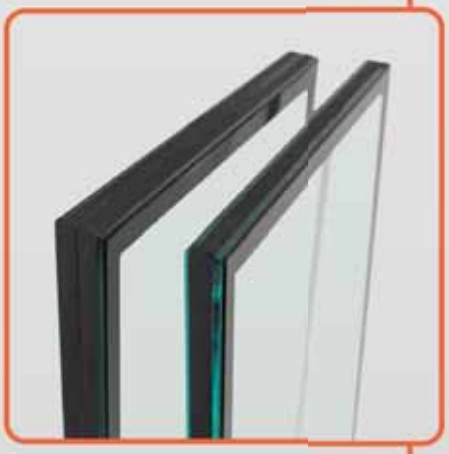

FOR **FLAT** AND **BENT** GLASS

SAINT-GOBAIN

First flat glass production to use more than 30 percent hydrogen

Saint-Gobain is the first manufacturer in the world to carry out a test production of flat glass using more than 30 percent hydrogen during Research & Development (R&D) trials at the Herzogenrath site in Germany.

With this world first, **SAINT-GOBAIN** has proven the technical feasibility of manufacturing flat glass with a significant proportion of hydrogen, which will complement other decarbonized energy sources and reduce the site's direct CO2 emissions (scope 1) by up to 70 percent.

A European R&D programme

This strengthens Saint-Gobain's position as a world leader in sustainable construction, confirming its lead role in helping to build a carbon neutral economy.

This technical feat is made possible by an R&D programme launched in 2022 which drew on the Group's extensive expertise in combustion, glass quality, ceramic refractories materials and industrial furnace design. The programme in question is carried out in collaboration with the independent German laboratory Gas and Heat Institute Essen e.V. (GWI), a specialist in industrial gas technologies, and financially supported by the Land of North Rhine-Westphalia to the amount of EUR 3.64 M.

The industrial tests in Herzogenrath have been preceded on a laboratory scale by trials carried out in two research centres in France, namely Saint-Gobain Research Paris in Aubervilliers and Saint-Gobain Research Provence in Cavaillon.

Analysis of the data from these tests will make it possible to deploy the use of hydrogen in the Group's floats in the decades to come, when low-carbon hydrogen is available in sufficient quantities.

This breakthrough innovation marks a new milestone in Saint-Gobain's roadmap towards carbon neutrality in 2050. It complements R&D initiatives on the electrification of glass melting and notable achievements, such as the world's first zero-carbon production of flat glass at Aniche in May of last year - thanks to 100 percent cullet and 100 percent decarbonized energy (biogas).

WWW.SAINT-GOBAIN.COM

SATINAL

STRATO® EVA interlayer for glass lamination

STRATO® EVA is a polymeric material used in glass lamination. It's a recent solution designed to create a performing product in terms of composition, durability, aesthetics and processing costs.

Composition and safety

STRATO® EVA film has a thermosetting chemical composition, with more than 94 percent curing rate (test performed on STRATO® Extra Chiaro), guaranteeing a very high level of protection for architectonic buildings - also those exposed to ➜

← exceptional weather conditions like high temperatures, humidity and extreme atmospheric conditions:

1. In case of breakage the fragments will be retained by STRATO®EVA film. The chemical composition retains glass fragments, thereby reducing any risk of accident;
2. UV rays: STRATO®EVA film filters up to 99 percent of UV rays at 380nm wavelength;
3. Great sound insulation.

Duration

STRATO®EVA is not an hygroscopic material, which means resistance to humidity and to water infiltration in the corners of laminated glass, as well as delamination risks.

Aesthetics

High transparency. STRATO® EVA film ensures brightness. STRATO® EVA COLOUR is the right way to personalize buildings or design interiors, with a touch of colour, without compromising the natural light of living rooms.

Processing costs

A laminated glass with STRATO® EVA film can be processed with a convection oven, like Lamijet Convection, or Lamijet 04-2c by TK srl. These ovens have small or medium dimensions, which are accessible to small and medium companies.

Satinal SpA has been the very first EVA production site in Italy, 100 percent made in Italy, and guarantees the high standards required by a very high-quality product.

Application of the EVA film is a delicate process that requires great precision for the temperatures and cycle times applied. Quality controls, which are carried out in the Satinal R&D laboratory, aim to guarantee perfect adhesion of the material to the glass surface. The experience acquired in the treatment of EVA-based materials is essential in mastering their potential while fully exploiting their characteristics.

WWW.SATINAL.IT

TURKISHGLASS

Expanding in the US market

TurkishGlass, the association representing the glass manufacturers, glass processors and glass exporters of Turkey, recently took part in the Façades Plus Conference in New York, where developers, architects, façade engineers, contractors, building specifiers and manufacturers from all over the world came together.

At the **TURKISHGLASS** booth on March 30 and 31, participants were informed about how the Turkish Glass sector is adding value to projects with advanced glass solutions, and contributing to the future of our planet with sustainable products and technologies. Also, the most sophisticated and demanding global projects completed by TurkishGlass were shared with visitors.

WWW.TURKISHGLASS.ORG

SYSTRON & INTERPANE

ProHD replaces three different glass processing machines

With around 120 employees and a production area of 10,000 square metres, **INTERPANE** Sicherheitsglas GmbH, based in Hildesheim (Germany), processes around 200,000 square metres of flat glass per year. The core competence lies in the production of safety glass. Last year, approximately 102,000 square metres was processed into laminated safety glass made of tempered safety glass and 98,000 square metres into monolithic tempered safety glass - generating sales of more than EUR 14.5 M. The special décor variants such as sandblasting, screen printing, digital printing, groove cutting as well as coloured foil combinations and laminated photos as well as glass with alarm transmitters and model variants in every shape result in an impressive product portfolio.

Expansion of capacities

To avoid bottlenecks in production, plant manager Frank Matz decided to invest in a new glass processing centre in consultation with the investment managers of the AGC Group. The specifications were extensive. Decision criteria such as short set-up times, high performance, space-saving operation, ease of maintenance, good spare parts availability, low operating costs, and top service were ultimately decisive in choosing the vertical glass processing centre systron proHD with integrated waterjet.

Minimizing set-up times even with batch size 1

Frank Matz sees the challenge in the further development of the company at the Hildesheim site, among other things, in the fact that it is a steadily growing factory. “We have to get along with limited space and we basically manufacture batch size 1. Consequently, we need very precisely coordinated, selective automation solutions. We don’t want to rebuild the entire production,” he explained. With the installation of the 5029proHD vertical centre including the systron WM washing & drying station in February 2022, an important step was taken towards more efficient and space-saving production.

“We previously had to use 3 different processing machines to produce slightly more complex glass, a horizontal processing, drilling station and the single side edging machine. Not to mention the handling effort and the washing stations in between, this was also very costly to map in the production planning system. Each step had to be scheduled one after the other and provided with transition grids. Now we clamp once and get the finished glass with free shapes, holes and a brilliant polish. This speed optimization was enormously important to us,” concluded Frank Matz.

WWW.SYSTRON.AT - WWW.INTERPANE.COM

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KURARAY

SentryGlas® ionoplast interlayer branding clarified

As a company that typically attaches great importance to the confidence its customers hold in its products, **KURARAY** recently sought to clarify some confusion in the industry relating to its SentryGlas® ionoplast interlayer branding - all with a view to acting against potential infringement and deception respecting the use of its registered trademarks and brands.

In recent years, other manufacturers have produced and sold interlayers that do not have the same properties as SentryGlas®. Some are using the name "SGP" to refer to those interlayers in an attempt to benefit from the long-standing quality and reputation associated with the SentryGlas® brand and to confuse the marketplace.

Kuraray recently identified the necessity to render the glass industry cognisant of the fact that authentic SentryGlas® products are not associated with SGP. Neither, the company underscores, should there be the expectation that SGP products will perform at the same level as SentryGlas® by Kuraray.

Kuraray has consolidated references for SentryGlas® products as "SG™" and has obtained a US trademark registration for SG™. While the acronym SGP was used when the product "SentryGlas® Plus" was first introduced by DuPont in 1998, the "Plus" was dropped from the name over 12 years ago. Unfortunately, the SGP moniker has persisted in the industry, and its use is now causing confusion with authentic SentryGlas® products.

To avoid confusion, Kuraray insists, the proper designation SG™ should be used when requesting or referencing authentic SentryGlas® interlayers. In addition to SentryGlas®, Kuraray also produces the next generation in the product line, namely SentryGlas® Xtra™ (SGX™).

WWW.KURURAY.EU - WWW.TROSIFOL.COM

SAINT-GOBAIN

Divestment of glass processing business in Switzerland

Saint-Gobain recently signed a binding agreement for the sale of its glass processing business Glassolutions in Switzerland to the privately-owned German group AEQUITA. Last year the business generated sales of around EUR 25M, employing approximately 70 people at its productiowwn site in Kreuzlingen.

This transaction, expected to close by the end of May 2023, is part of **SAINT-GOBAIN**'s continued business profile optimization strategy, in line with its "Grow & Impact" strategic plan.

WWW.SAINT-GOBAIN.COM

LISEC

LBH-60M semi-automatic butyl extruder

LISEC's LBH-60M semi-automatic butyl extruder applies butyl at a volume-regulated rate on both sides of fixed spacer frames, resulting in superior accuracy. With the LBH-60M, butyl can be applied at a controlled rate on both sides with fixed spacer frames and therefore with high precision. This butyl cord, which is placed precisely in the centre of the spacer side surface, serves as the primary waterproofing seal after pressing with the glass sheets to form an insulating glass unit. Frame widths from four to 60 millimetres can be processed, thanks to the infinitely variable nozzle adjustment: rectangles, frames with built-in Georgian bars and shapes - even the butylation of arches during processing is straightforward with the LBH-60M.

The butyl is heated in a heated butyl pressure system with a capacity of 14 litres and transported to the butylation nozzles on the filling head. The butyl transport system is identical in design and has a volumetric control system, so that the butyl application on the spacer frame is exactly the same on both sides of the frame. A belt transport unit and pressure roller system ensure the constant feed of the frame. A modern control panel with clear visualization guarantees convenient operation of the system.

The spacer frame is manually placed on the conveyor belt and guided through the laterally arranged butyl nozzles in the filling head. During this process, the set amount of butyl is precisely applied to both sides of the spacer profile.

The LBH-60M is an excellent complement to the semi-automatic desiccant filling systems for all small and medium-sized operations. However, large insulating glass manufacturers with fully automatic butyl extruders can additionally use the LBH-60M for the production of shapes.

The precise frame guidance guarantees that the spacer frame is accurately centered and guided through the butyl nozzles by means of parallel pressing hold-down rollers, thereby ensuring uniform butyl application on both sides. The intuitive operating concept offers the option of creating the most common spacer profiles as favourites. Following selection on the control terminal, the nozzles move to the correct profile width and all parameters stored in the 'recipe' are adopted. The 14-litre butyl cylinder means fewer refills are required. A swing-out butyl cylinder and the butyl fork provided allow a quick and easy refilling process. Butyl storage tank heating can also be automated via an integrated weekly timer for maximum efficiency.

WWW.LISEC.COM

SPARKLIKE

Inagas distributor launches Day Testing Initiative

Due to legislative changes on the horizon in the UK and Ireland coupled with continued scrutiny placed upon the methods and quality of Insulated Glass Unit (IGU) manufacturer production, **SPARKLIKE** distributor Inagas offers Day Testing Services with Sparklike devices. Being both industry leaders for manual gas filling and testing equipment and the official Sparklike distributor, Inagas has seen growing interest within the insulating glass industry towards accurate IGU gas measurement.

As Chris Kemp, Sales Director at Inagas explains: "We want to do everything we can to support our customers as times get increasingly difficult. Currently, the majority of manufacturers use an invasive method of gas testing which requires a sample of the gas/air mixture being extracted from the IGU. This method, although accurate, limits the number of IGUs tested and the size and type of units that are examined due to the cost of a destructive test. IGUs are often tested before the final seal is applied - which can also give a misleading result. Here verifying the gas fill by reliable measurement as evidence of consistent product quality can be a real challenge."

Service for Insulated Glass Unit (IGU) manufacturers

Says Kemp: "Using the very latest, non-destructive Sparklike gas testing equipment, we visit facility to carry out IGU testing - accurately measuring the gas concentration and produce a report on our findings. The Sparklike Laser Portable 2.1 allows the measurement of gas concentration from one to 95 percent for both double and triple IGUs -from surface one to surface three in a double-glazed unit and surface one to surface five in a triple- regardless of the number of coated glass surfaces, or laminate glass for IGUs of up to 51 millimetres thick. Whilst there, we can also provide training on the use of gas filling and testing equipment, offer support and advice on any improvements that can be made to the gas filling production method and service and calibrate any Inagas equipment. This latest initiative provides our customers with a way of proving that they do what they say they do. As market conditions continue to put a strain on manufacturers, we want to do all we can to support them - and we believe our Day Testing offering will do just that."

WWW.SPARKLIKE.COM

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Introducing DSC: LISEC's latest technology for precision glass cutting

Joining cutting wheel consultant Peter Pokoern at Arbonia Glassysteme GmbH Deggendorf in February this year, LISEC product development experts, cutting foremen and operators from Arbonia all met in a one-day workshop to fine-tune the company's latest DSC system for float cutting technology as it went into operation.

QUALITY UNDER A NEW NAME

Founded in Munich in 1977, Arbonia Glassysteme GmbH moved to Deggendorf in 1988 - changing in 2021 from Saint Gobain to the Arbonia Group: a focused building supplier for indoor climate and interior doors produced from wood and glass. In Deggendorf today, 160 employees produce mainly shower glazing and laminated safety glass from processed toughened glass. An expansion of the product range, doors included, is currently being planned. In its main operations in southern Germany, the company now wows customers with batch sizes, customised products, special sheets and rapid delivery times - all of which saw the site generating € 22.4 M over 2022.

USING LISEC CUTTING TECHNOLOGY FOR 30 YEARS

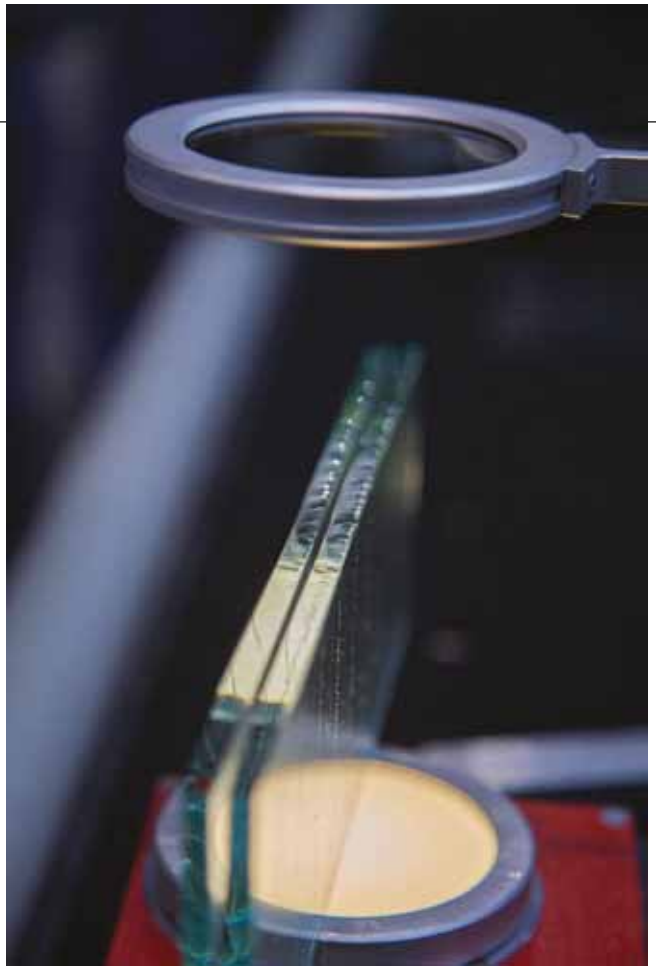
LiSEC machines have been used in production since 1990 - all initially in operation in glass cutting. Today, together with edge processing and an automatic feed solution, three LiSEC cutting tables remain in operation - one of which dates back to the 1990s. "The Deutsches Museum has already made enquiries hereto," jokes Matthias Baumgartner, Technical Operations Manager. "But the machine runs, and service remains spot on." Indeed another cutting table was replaced with the latest LiSEC cutting technology just this year.

FIRST DSC-GENERATION GLASS CUTTING TABLE IN GERMANY

Arbonia aims to achieve three goals with the new glass cutting table: fast cutting, top quality glass cutting results and high system availability. Precision cutting results require a lower grind addition, which reduces processing costs. High edge quality means less spontaneous breakage - and, with that, lower after-sales costs. The 'DSC - Dynamic Speed Cut' cutting system is the optimal solution for attaining these objectives. LiSEC 'Direct Cutting Technology' enables rapid cuts with high precision, thanks to direct contact of the cutting wheel with the glass combined with high positioning speed. Moreover, constant oil level control of the cutting oil as well as runtime monitoring of the cutting wheels both improve system availability.

PRECISION CUTTING - NOT JUST FROM A PHYSICS PERSPECTIVE

Scoring the glass surface with the cutting wheel creates concentrated tension that reaches deep into the glass. If pressure is exerted on the glass edges, the tension leads to a smooth break along the scribed line. Applying cutting oil prevents



tension concentration from decreasing too quickly. Cutting pressure, cutting speed, cutting wheel angle and cutting oil quantity have all been analysed in the workshop using a standardised test process. Here findings showed that polarised light made the tension distribution in the glass visible. A pressure gauge was also used to check the breakout force required to break the glass, which enabled optimisation of the cutting parameters for all glass thicknesses commonly used at Arbonia.

WHY ARBONIA DEGGENDORF IS KEEN ON LISEC

In the words of Matthias Baumgartner, Technical Operations Manager: "Arbonia Deggendorf is keen on LiSEC because the system works - having been tried and tested on the market with the added advantage of close regional proximity. Service response time is really good too. If we report a problem in the morning, we often have a technician out the same day to assist us. We also appreciate the reliability of the spare parts. LiSEC makes every effort to organise the parts -even for our oldest system- and, to date, they've always proved successful. There is a machine for every processing step in the LiSEC range, and the company's reputation remains stellar. Reliability, user-friendliness and general system availability are spot on in all areas where we use LiSEC. Not only. The company has even resolved the matter of standardisation. For anyone who's had a LiSEC machine before, the menu navigation remains pretty much identical, which makes things more straightforward for operators. An innovative approach was one of the most persuasive arguments when we opted for LiSEC's new feed. For example, no one else has the flyover crane in their programme. We feel we are in good hands with LiSEC."

FUTURE-PROOF, THANKS TO SPECIALISATION AND FLEXIBILITY

Baumgartner goes on to share his thoughts on the current situation, including Arbonia's strategy for the future: "New energy prices have resulted in major changes to the market, making the production site more complex. Customers and product requirements are becoming significantly more complex, which makes it all the more important to respond as efficiently and flexibly as possible to new market situations with the latest system technology. The topic of automation and energy efficiency will be the focus of our strategy in the future."

ABOUT LISEC

Headquartered in Seitenstetten/Amstetten, LiSEC is a globally-active group that has provided individual and comprehensive solutions in both flat glass processing and finishing for 60 years. Its service portfolio comprises machines, automation solutions and services. In 2021, the group, with circa 1.100 employees and over 20 sites, achieved an export ratio of more than 90 percent and generated sales of more than EUR 200 M. 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, it sets both quality and engineering standards and significantly contributes to the success of its customers.

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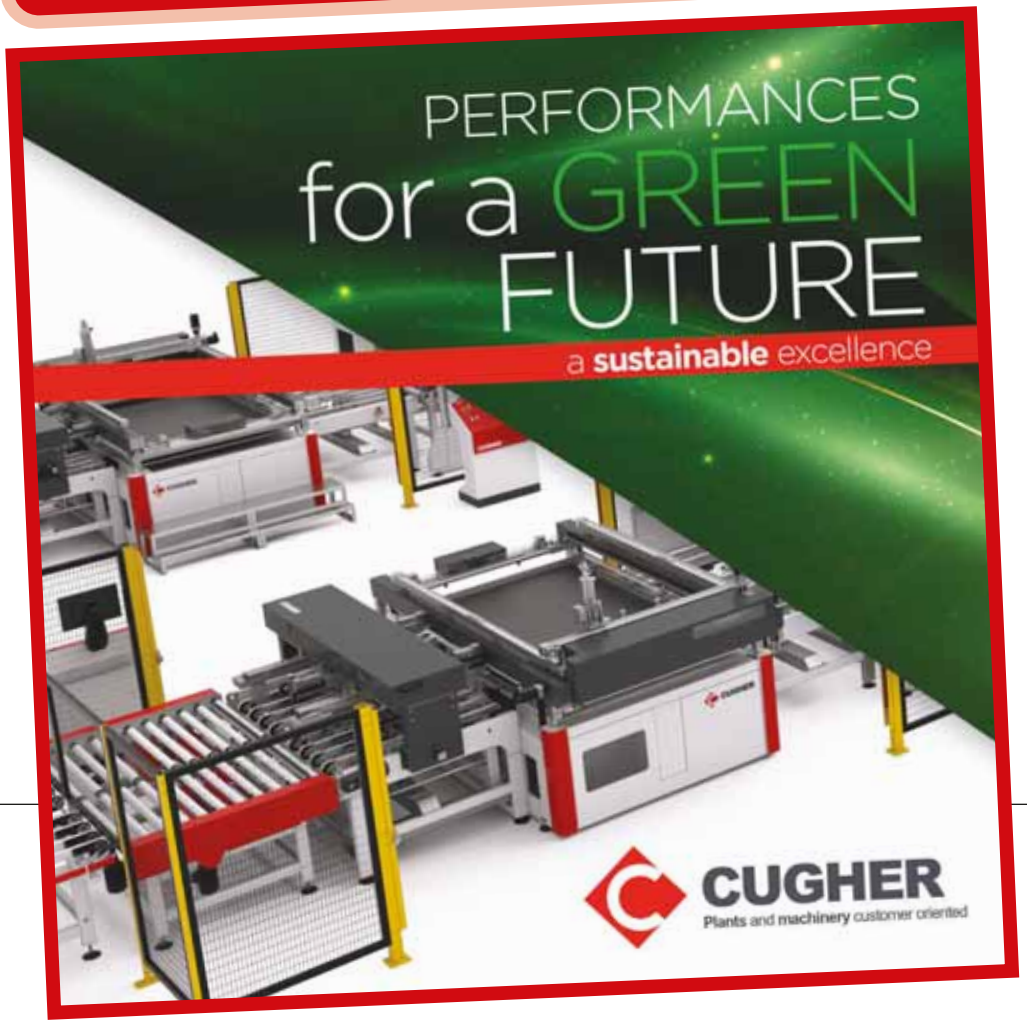
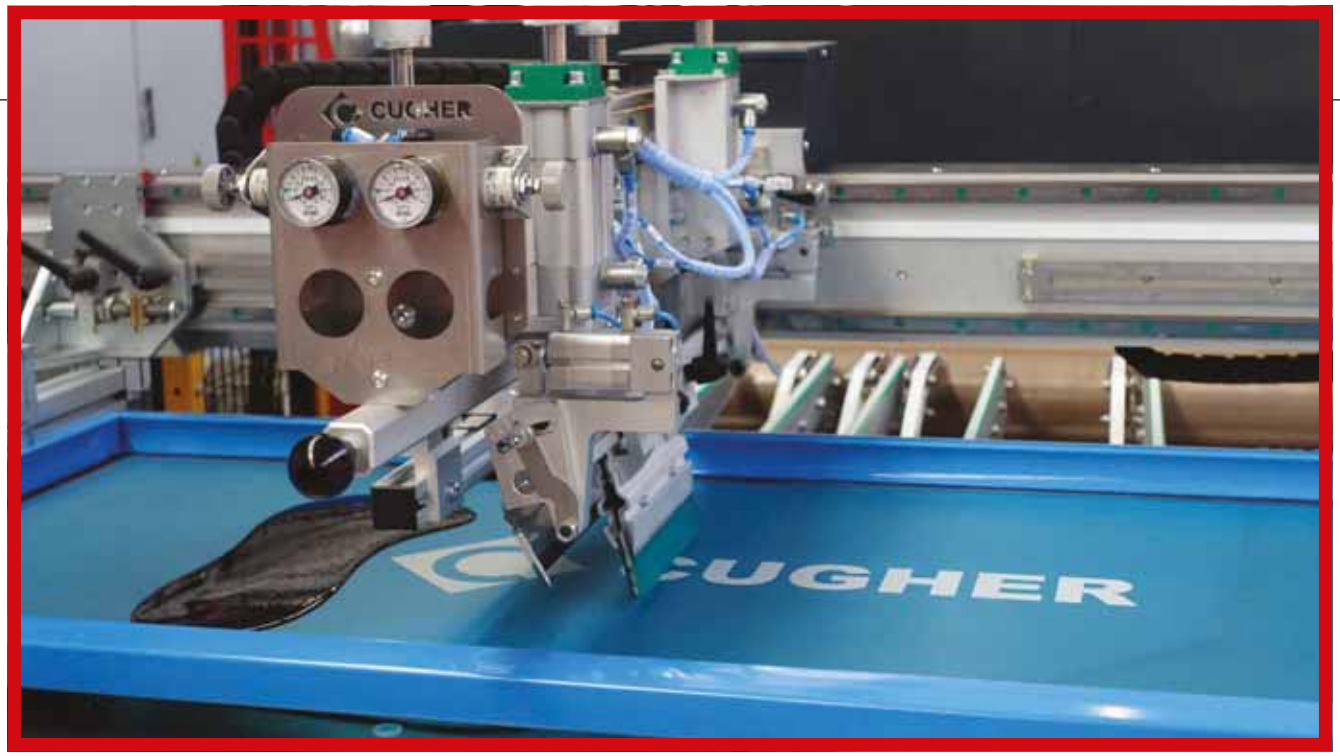
Still green as ever, CUGHER recommits to its core values

Fully embraced by CUGHER is the adoption of sustainable practices to preserve the Earth's ecosystem. Not only. The company continues to evolve its practices - always improving its contribution towards limiting every impact upon the environment, and all to better guarantee a greener future for all.

Cugher is starkly aware that producing such machinery as silkscreen printing machines, dryers and handling for flat glass all has its impact upon the environment. It knows, too, how these factors are interrelated and that they include materials, processes - even the level of energy consumption. For instance, the use of silk screen printing machines, especially those focused upon mass production, requires energy consumption at significantly elevated levels. Here Cugher sees yet more - mindful that, during the production process, the disposal of waste -which includes different materials used during production- can potentially contribute negatively to landfill waste and, by extension, to environmental pollution if negligently recycled. Moral of the story: the approach used during machinery production definitely contributes to either the increase or re-





duction of every related problem.

PUTTING THE ENVIRONMENT FIRST

To minimize the negative impact on the environment, Cugher Glass adopts a series of solutions - commencing from the singular aim of protecting the ecosystem during machine production. Here it's extremely important to use environmentally-sustainable materials, proper waste disposal practices and the adoption of energy-efficient production techniques. During the painting process, (and so for each machine too), the company attributes great importance to the use of ecological paints - always emphasizing the use of low-VOC paints based upon biodegradable natural materials, such as water - and all non-toxic. Such paints are free of chemicals that are potentially harmful either to the environment or to the health of workers. They also comply with current legislation as well as every regulation on health, safety and the environment in respect of substances and their mixture.

CHOOSING THE RIGHT ALLIES

No less important to Cugher is its consistent decision to privilege only those suppliers that prioritize environmental sustainability in their production processes. The company's purchasing department, among other divisions, also takes environmental certification into serious consideration during every selection.

SAVING ENERGY

Finally, for Cugher's machinery, a most important factor remains that of energy-saving - an option which favours energy-saving in the event of an arrest -even of seconds- during the printing process, for whatever reason. Here the machine will switch to energy-saving mode in automatic compliance with all the company's machinery which, by default, is designed to be energy efficient. Neither will they emit fumes or gasses into the environment to ensure that all natural resources remain preserved. It may seem a cliché, but proper waste disposal is a further key component. To prevent pollution, Cugher handles waste disposal techniques with great care - ensuring that waste materials are properly disposed of, and in full accordance with current regulations. Here companies like Cugher seek to protect our ecological system by way of a combination of approaches. Among these we might identify the use of ecological materials, energy saving options and recycling - as well as an acute attention to the correct waste disposal policy. Being scrupulous about all such features comprises an integral feature of Cugher's 'productive soul' - no less so than the company's singlar aim of being especially attentive to the most sustainable solutions out there that it can master.

Cugher Glass Srl

CUGHER
Plants and machinery customer oriented

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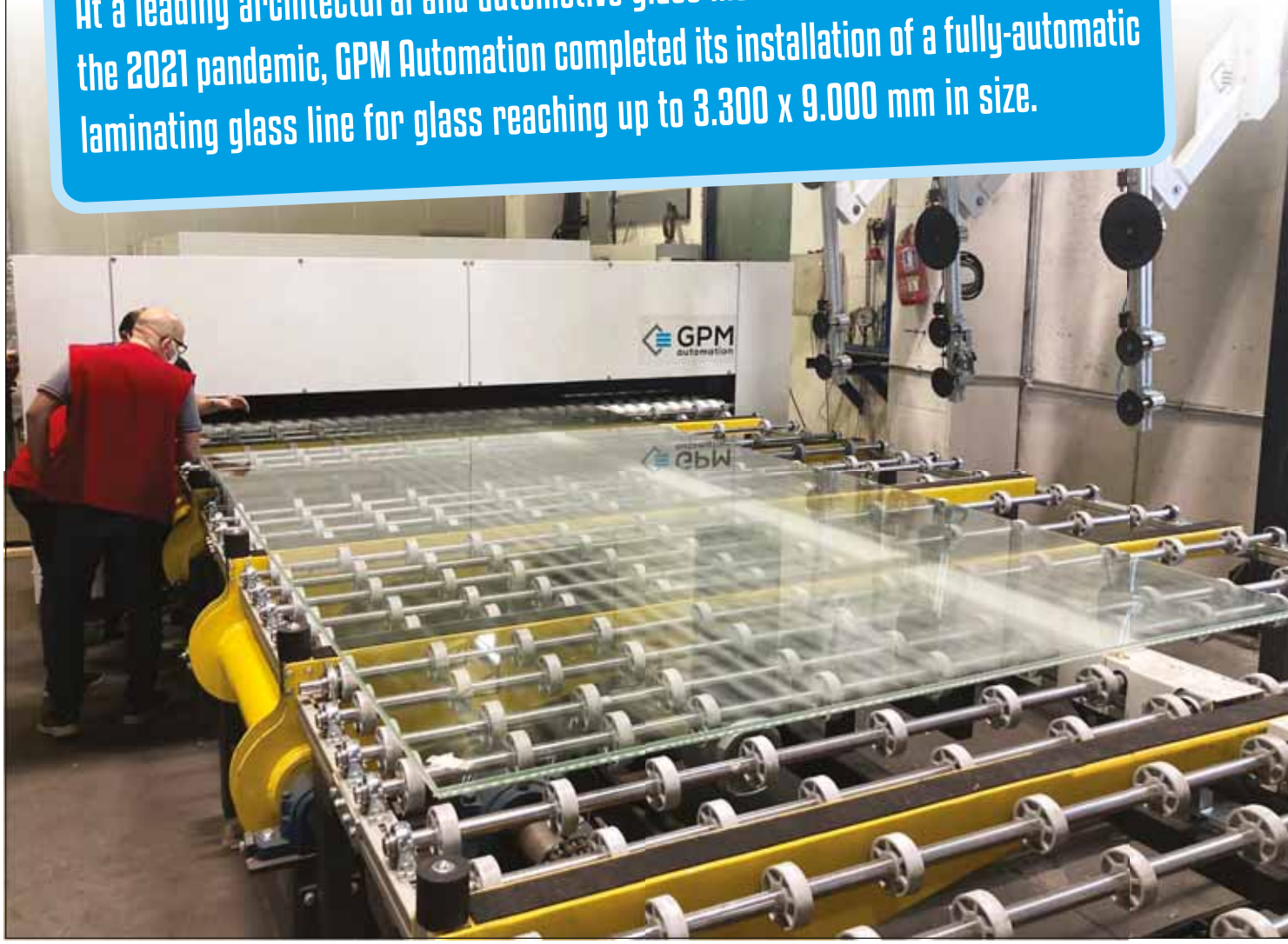
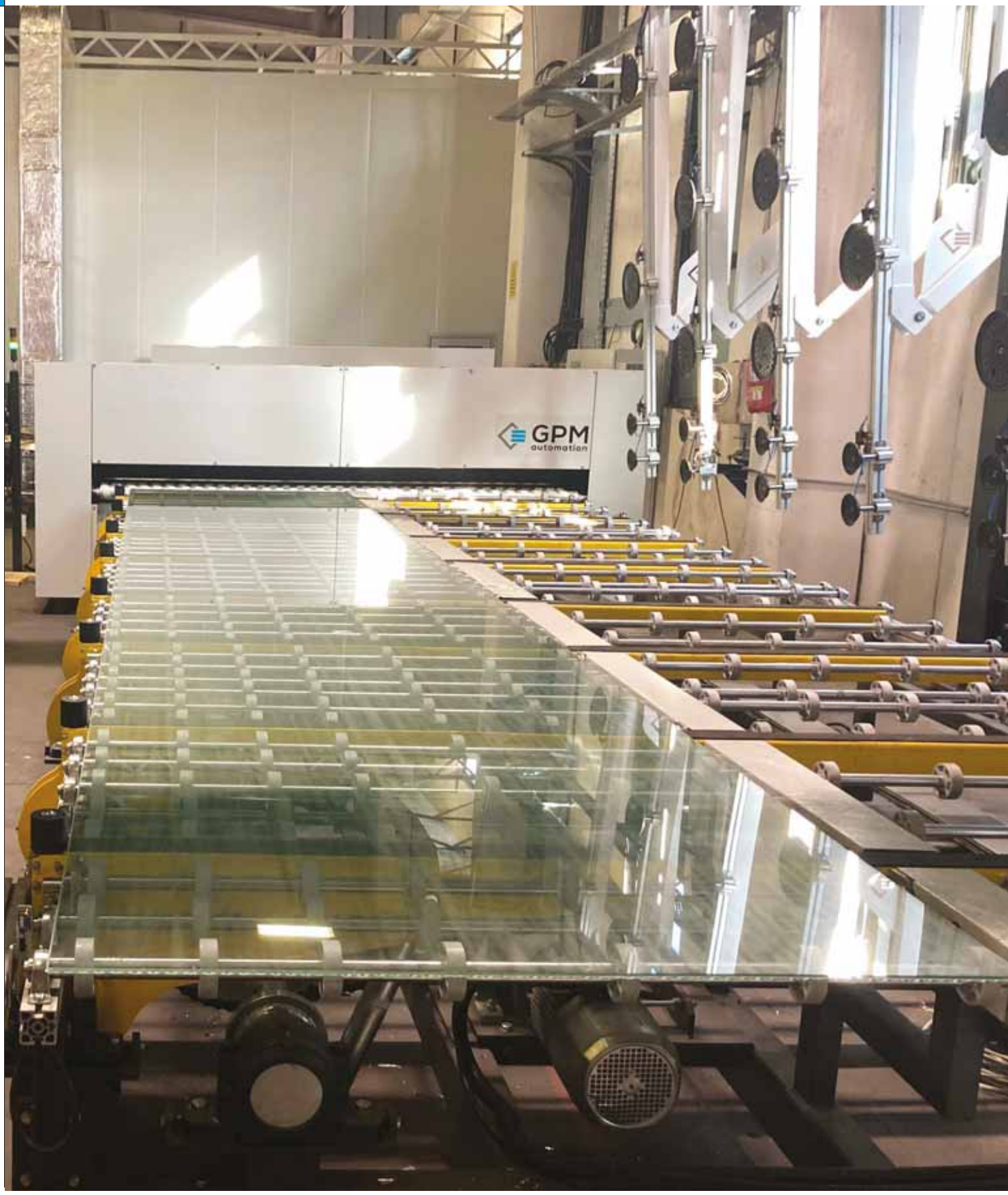
Turkey market benefits from superb GPM service delivery

At a leading architectural and automotive glass manufacturer in Istanbul during the 2021 pandemic, GPM Automation completed its installation of a fully-automatic laminating glass line for glass reaching up to 3.300 x 9.000 mm in size.



After a Turkish customer was scouting for an XXL line that could process cut-to-size glass that included smaller panes and a special lay-up, GPM presented its Lamiline, which has a gantry crane system for automatically-loading and unloading glass while also picking panes up from behind to avoid touching soft-coated glass at its top side.

An extremely complicated process for extra-large glass sizes, both automatic PVB application and PVB will cross-cut and trim in order to avoid any manual operation. The line is equipped with custom solutions for


GPM
automation

special production, such as automatic squaring for glass shaping as well as a system for multiple glass squaring and assembly that will enable simultaneous assembly of up to three different laminated glass panes - thereby significantly increasing the output of all small and medium glass sizes.
In this instance the customer is producing a huge quantity of soft-coated laminated glass and can exploit the great advantage afforded by GPM automation technology, which has developed state-of-the-art ovens with a forced air convection system. The size of the long heating tunnel allows for operation with a low temperature setup - also reducing energy consumption. Another key piece of equipment is the press, which works with servo motors on an electric axis as well as a dedicated power control software. Flatness positioning of the top roll is continuously checked by servo-drives - all to ensure correct, uniform pressing distribution whilst avoiding any different power force pressing on the working width size.

GPM AUTOMATION

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Four advantages of HEGLA's innovative laser diode heating solution

HEGLA's LSG system offers a new process that sees glass cutting twenty per cent faster whilst delivering a higher capacity - all on the same footprint.

The ongoing rise in the proportions of laminated safety glass used in glazed products is placing glass processors under increasingly tight constraints. More

The ProLam LSR can also be used as a component of a highly automated cutting line - together with, for example, the AdvaLam, by which to achieve even higher productivity.

The ProLam LSR is equipped with the laser diode heating system as standard, and features a high level of automation with flexibility as well as cutting results offering maximum edge quality.

stringent safety regulations have increased international demand. This all contributes to a more widespread use of LSG - part of the ProLam LSR equipment series and Hegla's latest glass-cutting technology which, together with its functional purposes, exhibits a stylistic architectural element as well.

FOCUSSED HEAT APPLICATION SHORTENS THE CUTTING PROCESS BY 20 PER CENT

The centrepiece of the process is a new, patented laser diode heating system that replaces conventional heating tubes. The added technical value is generated by the physical properties of the laser. The laser diodes consolidate the thermal energy of the laser, focus it on the scoring contour and apply it precisely to the film. Without any of the otherwise typical radiation losses into the air and surrounding glass, the film reaches the required transformation temperature much faster in comparison to what conventional techniques can offer. Having already been incised and broken out, the glass is pulled apart during the heating process and then cut as a knife passes through it. The diode strip is mounted in a fixed position above the cutting area, so it remains cool and needn't be folded away - which saves time. This position also means that the timing of the individual processing steps can overlap, thereby accelerating the overall process. "Many of our customers are already using the ProLam LSR. They're impressed with how much shorter their cutting steps have become. In terms of cuts per hour, the system achieves 20 to 30 percent higher productivity," reports HEGLA Managing Director Bernhard Hötger.

NO WAITING FOR THE NEXT CUTS

The thicker the LSG and film, the more time the laser can save for Hegla's customers. Energy consolidation and the very low radiation losses allow the heat to be focussed and applied along precise lines. When penetrating the glass, the laser retains more of its strength than conventional heaters, enabling the glass to be heated in a shorter time. "LSR technology features considerably lower heat loss into the surrounding pane and the air - resulting in a further two advantages that are even greater than we expected when we first started developing the product," says Bernhard Hötger. "Even when cutting thicker units, the glass only becomes warm to the touch at the edges. That means customers can move straight on to their next cut without waiting for the glass to cool down first."

HIGH-QUALITY GLASS EDGES

Consolidating the laser's thermal energy also offers another benefit in terms of edge quality. "When the glass is pulled apart, only the heated film in the cut is stretched. Tests at the Fraunhofer Institute have shown that the remaining laminate remains unchanged by the local application of heat - reducing

the previous causes of subsequent delamination to a minimum.

SHORTER BOOT-UP TIME SAVES ENERGY

The laser diode strip is divided in half and, to save energy, each side is activated completely, or partially - depending on the length of the cut. The much shorter boot-up time also improves the system's carbon footprint. When the system reaches 20,000 operating hours or more, the diode strip has proven it requires less maintenance and is more durable than the conventional technology.

ADJUSTABLE TO SUIT SPECIFIC NEEDS

ProLam LSR comes equipped with a laser diode heating system as standard, while some existing systems in the ProLam series can be retrofitted as well. Other features, such as the Kombi variant with automatic edge deletion, a float cutting head and built-in breakout bars all add to the range of functions on offer. Hegla boraident also continues to offer non-destructive laser printing to give glass a bespoke, machine-readable marking. If the marking is applied before cutting takes place, the glass production process can be fully digitalized by scanning the code. This technology can be used for such purposes as triggering process steps during production, tracking workflows across the entire product life cycle, and reading the glass data using a scanner - even many years down the line. If required, additional information such as fire protection certificates can also be saved in the marking.

The precise application of heat energy and zero-offset dual cutting heads yields high edge quality without delamination.

Hegla Gmbh & Co. Kg

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Equipped with the patented laser diode heating system, the ProLam LSR increases productivity by twenty percent in terms of pane throughput while also offering improved edge quality.

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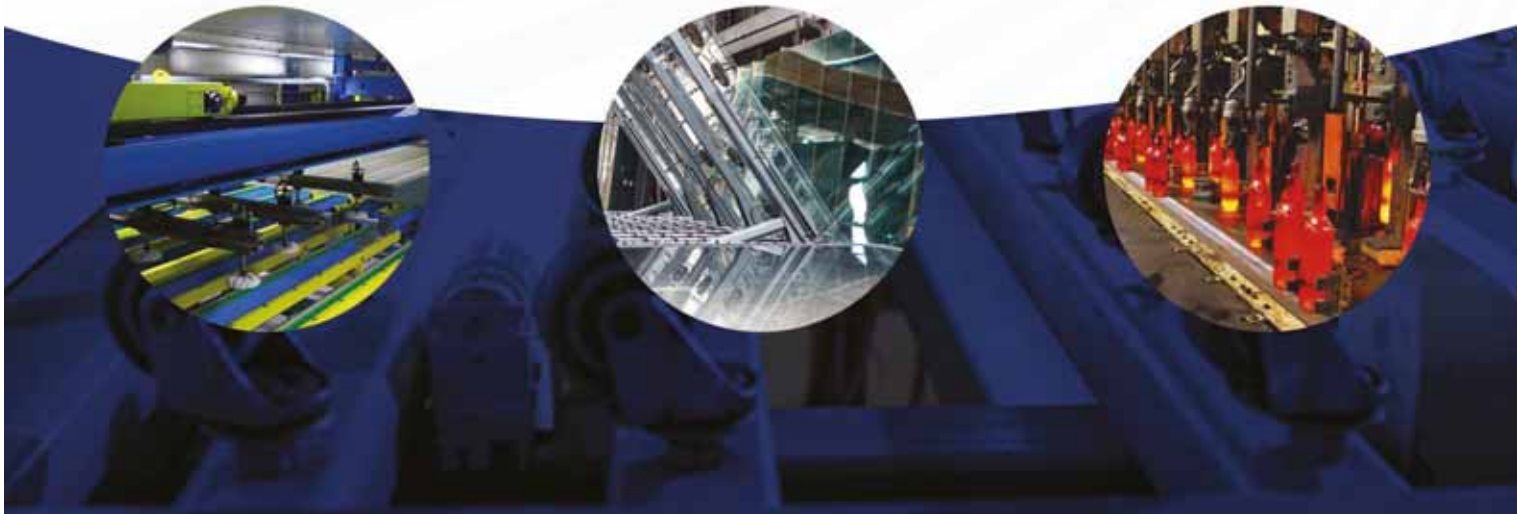

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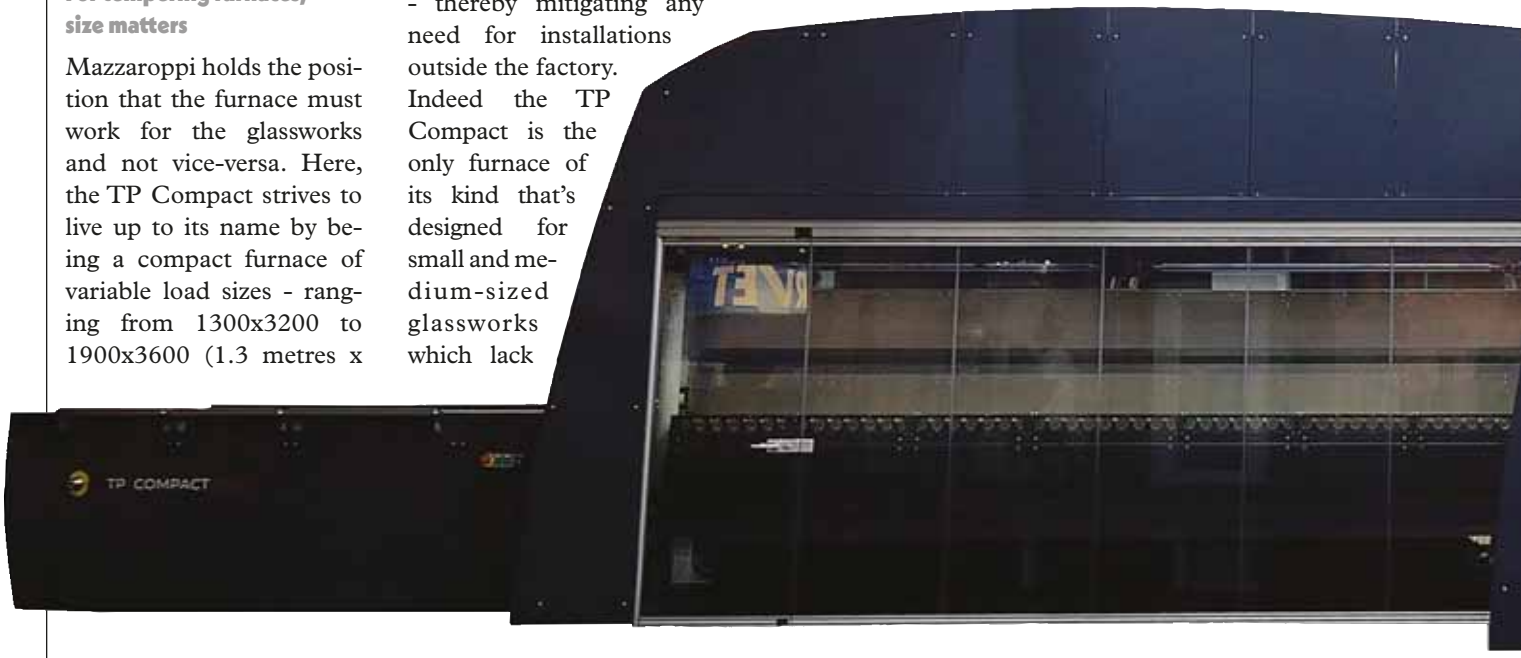
A glass tempering revolution: MAZZAROPPI's TP Compact

The new TP Compact embodies all Mazzaroppi's core values, together with every advantage it believes customers will typically appreciate. By this machine the company seeks to challenge the following preconceptions:

For tempering furnaces, size matters

Mazzaroppi holds the position that the furnace must work for the glassworks and not vice-versa. Here, the TP Compact strives to live up to its name by being a compact furnace of variable load sizes - ranging from 1300x3200 to 1900x3600 (1.3 metres x 3.2 metres and 1.9 metres x 3.6 metres), with some sizes in between. The total length of the system runs to approximately 17/18 metres - depending upon various typologies and on the electrical system. Note, however, that the fan cabin flanks the machine itself - thereby mitigating any need for installations outside the factory. Indeed the TP Compact is the only furnace of its kind that's designed for small and medium-sized glassworks which lack the production volume to justify the purchase of a classic 2500x5000 tempering furnace. Here the current market trend is to offer larger machines - often with lower quality components and at reduced prices. That said, apparent savings are soon rendered superfluous by installation costs that require much factory adaptation - plus significant energy costs. That's especially true with classic hardening furnaces, which must be constantly on after being commissioned in order to avoid both the damage of large temperature fluctua-



Being a tempering furnace of which MAZZAROPPI is particularly proud, the TP Compact is presented by its creators as both an improvement on the performance and efficiency of its predecessor within the same series and a complete 'disruption' of today's popular notion that such products can only be purchased by large glassworks.

tions and prohibitive start-up times.

Furnaces cannot be powered off

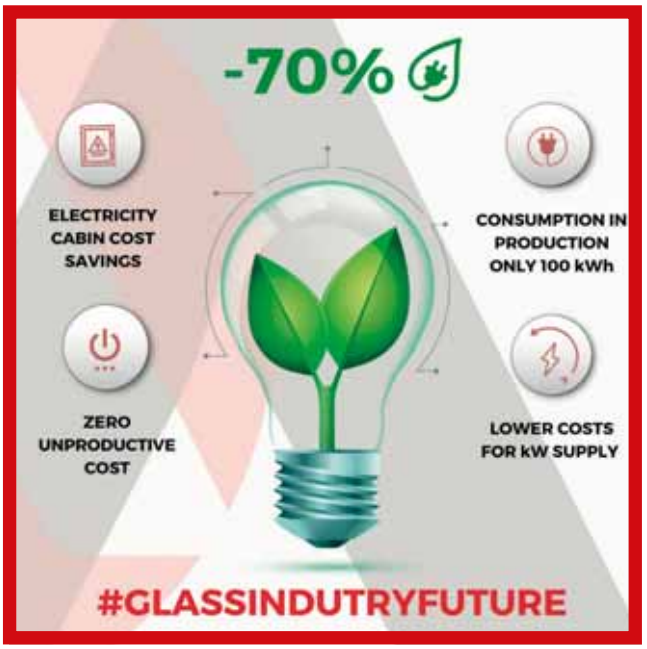
For small and medium-sized glassworks this constitutes one of the main hindrances to purchasing tempering furnaces. For a furnace that can't be turned off and must constantly consume, the only way to justify costs is to make it work in a continuous cycle - which, in certain cases, would mean compromising the glassmaker's work by simply transforming it into a 'tempering' job. With TP Compact, Mazzaroppi has sought to solve this problem. It can be switched off daily and will only take an hour to reach the necessary temperature of 680° (which drops to half an hour if the furnace has been operational the previous day). This makes it possible to optimise consumption - keeping the oven on only as required, i.e. when the machinery is producing and therefore generating value - a crucial consideration nowadays.

Furnaces must be high-powered and consume much energy

In terms of energy optimisation, the company considers this model to be arguably its greatest success to date. With the new TP Compact, thanks to an intelligent electronic management system, Mazzaroppi has succeeded in reducing consumption by a further 30 percent as compared to its predecessor. This means the furnace consumes less than half of what its European competitors consume and about a third of that of Mazzaroppi's Asian competitors. Proportionally, the electricity required to keep it running is also significantly less. Thus, for a company thinking in terms of investing in its future, a TP Compact oven translates into savings of several thousand Euros every month. In addition, no infrastructure adaptation work is required to allow installation, which also reduces start-up costs.

Furnaces change slowly from one thickness type to another

Many small glassworks don't benefit from the use of a conventional tempering furnace. That's because the time required for thickness changes forces them to organise production by dedicating an entire day to one thickness alone - which is impossible for small and medium-sized glassworks that must focus on the individual piece rather than on large quantities. The TP Compact, on the other hand, makes thickness change possible in no time at all, without interrupting workflow. This allows even small glass manufacturers to conquer a market which often demands that each company carry out many



different processes - often while requiring only a few pieces per process. Here the time taken for thickness changes is about half that of the machine's European competitors, one-third on compact sizes and one-quarter on large sizes when compared to Chinese competitors.

CATERING TO SMALLER GLASSWORKS

Ensuring production remains uncompromised

According to Mazzaroppi, the product is designed for a specific segment of entrepreneurs and was created with their daily needs in mind. Maintenance costs are also very low as compared to the market average. Here the company has opted to invest in the quality of materials and in design - only putting machines on the market that will practically never require maintenance and that last up to 30 years. This feature is particularly appreciated by Mazzaroppi's numerous German, Austrian and Swiss customers. Both the safety and reliability of the company's brand translate into continuous production - with no surprises for the customer, who can instead remain dedicated to quality care and production management. The TP Compact has been studied, designed and built with all such small and medium-sized companies in mind. Of these, none had dared before now to engage directly in glass tempering - either owing to the considerable costs of adapting and using a tempering furnace or simply to the sense that they lacked the production to justify such an investment. Here's why TP Compact can come as a sensible purchase for glassworks that are after sustainable growth and that wish to offer customers superior quality products over which there can be total control. For glassworks like these, the TP Contact can represent a choice of autonomy over third-party companies to which small entrepreneurs often have to entrust their tempering. As such, investing in the machine can mean viewing one's company with the right perspective and making plans for the next ten, twenty or thirty years - all with a view to finally becoming the master of one's own work and being free of any dependency upon large glassworks for delivery times and price management. For an entrepreneur, reclaiming one's own time as well as complete control of workflows is a fundamental choice. It means deciding to conquer one's own market and expand one's own clientele by working on the competitiveness of the offer. It means working for success. Such, indeed, is Mazzaroppi's express ambition: the success of its customers.

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The importance of glass in architectural design

As a magical material of many different properties and uses, glass often presents architects with a wide range of new design possibilities. In this month's issue, we turn to CONSTROFACILITATOR for some expert reflection on why architects typically favour glasses that are reinforced, toughened and laminated.

Attentive as s/he is to transparency and safety, your average architect will likely agree that glass is a must for any serious building project. Here the reasons are clear. All arise from the advantages of glass, which include the following characteristics:

- It can absorb, refract or transmit light. Glass adds beauty to a building when used in transparent or translucent applications. It also transmits up to 80 percent of available natural daylight;
- The use of natural light can lower electricity bills, brighten the rooms of a building and can boost the mood of the occupants;
- Resistant to weather, glass can withstand the effects of wind, rain or sun;
- Glass is rust-resistant and is resilient before any chemical and environmental effects;
- Glass is recyclable and it will not degrade during the recycling process. It can also be recycled time and again without losing its quality or purity;
- Unaffected by noise, air, water, sealed glass panes transmit very little sound. As such they can be a good sound insulator;
- Glass has a smooth, glossy surface so it is dust proof and can be easily cleaned.

GLASS IN CONTEMPORARY ARCHITECTURE

Glass is also a more resistant and dimensionally stable building material, odour-neutral, hygienic and easy to maintain. That is why it is used in windows, on façades and as roofs. In buildings, transparent sliding elements such as those found in kitchens and bathrooms -or transparent partitions in large office rooms- are all made of this material. Glass is also used in architecture for elevators or balcony railings. It has various uses that makes it a fascinating material that has special importance in architecture.

WINDOW PANES

A glass pane is built into the frames of your window to create a spotless view, eliminate air flow and insulate your home. Glass panes vary in shape and size from one window to the next. Some might have films on them to provide better insulation. These are known as Low-E glass. Other glass panes will vary in thickness, depending upon window quality. As windows age, panes become thinner and more vulnerable to the elements.

CURTAIN WALLS

A curtain wall is an outer covering of a building in which the outer walls are non-structural. As such, it's only used to keep the weather out and the occupants inside. Since the curtain wall is non-structural, it can be made of lightweight materials, including glass - thereby potentially reducing construction costs. An additional advantage of glass is that natural light can penetrate deeper within the building. Besides its own dead load weight the curtain wall façade carries no structural load from the building.

ROOFS

Glass roofs are highly effective at transforming the interior aesthetic of a property, presenting some of the most versatile and impactful glazing solutions. That said, it's somewhat misleading to simply refer to 'glass roofs' as though they were a single product or entity. There are many different types, styles, and designs and there are all sorts of things you'd need to consider when choosing one. Depending on your property and your require-

ments, different types of glass roof will be most appropriate.

PARTITIONS

Glass partition walls are ideal for creating comfortable, practical office working environments. When natural light is allowed to flow into a given space, it changes how shapes, colours, patterns, textures and people interact. Glass partition walls are also one of the simplest ways to update an office or commercial space. These glazing systems are gaining popularity over traditional drywall installations. Indeed both interior designers and architects appreciate these glass wall systems for their scalability and translucent properties.

DOORS

One of the most common types of home and business glass outside of traditional windows is that of glass doors. Safe for both interior and exterior use, modern-day glass doors are made of tempered glass, energy-efficient and come in a variety of styles. Glass doors can be customised to fit one's space and personal design aesthetic. From opaque shower or etched closet doors to clear French doors that lead into a dining room or living space, doors can be made with large panes set in a frame -like those used for sliding doors and storm doors- or they can be made of such materials as hardwood, metal or composite, with smaller windows inset within the door.

CONCLUSION

Glass acts as an unique architecture material that's mainly used for its special features and advantages. Here's why both architects and engineers can design a beautiful structure - with the proper planning.

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Super support to EVALAM customers by architectural department

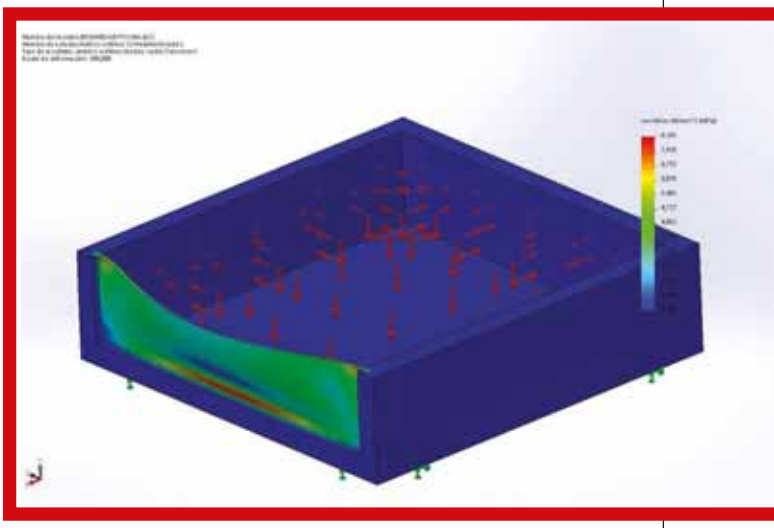
After over three years of EVALAM advising clients to optimize projects in structural calculations that may require their know-how, the company recently affirmed how guaranteeing success as a differential value is among its core values.

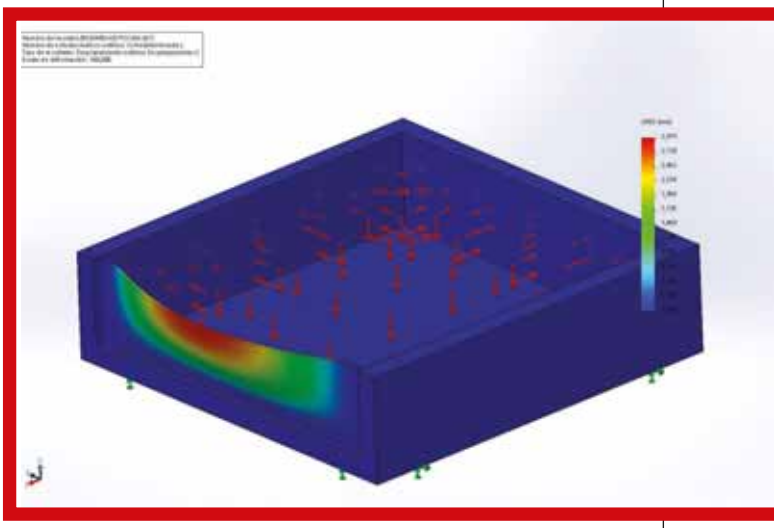
Given the current trend towards specialization within the glass market, industry professionals are pushed to get smart on ways to reliably answer the needs of architects and prescritors - both of whom set new challenges each day. Unlike former years, purchasing an interlayer and installing laminated glass will hardly suffice today. Instead it's become compulsory to be in the know concerning processes, the declaration of performances and certifications - and all staying perfectly abreast of building and construction regulations while, most essentially, being accompanied by a good adviser. Mindful of this reality and invested with the responsibility of being the international reference manufacturer of EVA for architectural use, Evalam is committed to both supporting and accompanying customers - from project beginning to project end.

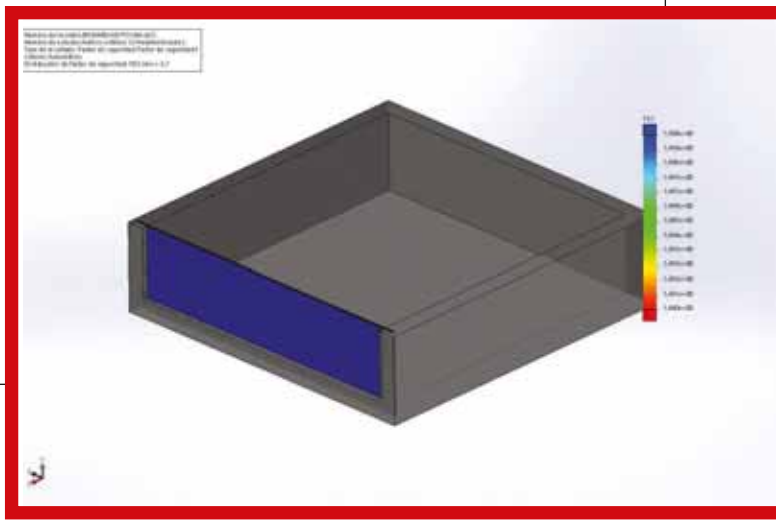
Indeed as a company that's passionate about challenges, Evalam's proud to help customers get the most from their projects thanks to its extensive knowledge of glass - put daily into practice over three years within the company's Technical Architectural Department, which was exclusively developed to provide customers with both service support and guidance.

WHATEVER THE SHAPE OR DESIGN ...

Faithful to Evalam's motto 'no limits in glass creation', the Technical Architectural Department considers each project independently - regardless of shape, design or measurements. As a differential service it works to find the most appropriate solution, offering the calculation to justify glass compositions while guaranteeing their service suitability. Based upon tests performed to determine the mechanical properties offered by the company's products (Evalam Visual, Evalam N-Fluent & ABAR), it's possible to simulate stresses to which the glass is subjected in each of the applications defined by the customer - thus being equipped to advise on the best glass composition to manufacture. The client receives a detailed and personalized report with the results of the static analysis, carried out using finite element analysis software (FEA), where stresses, deformations and safety factors resulting from the study generated by the efforts contemplated in it are all observed. Follow-







ing analysis of each layer comprising the final glass, thicknesses that meet the requirements established by the client are verified - providing an optimum solution for their application. In short, it is about guaranteeing project safety with a correct dimensioning of the glass thicknesses that will allow an optimal cost-safety ratio.

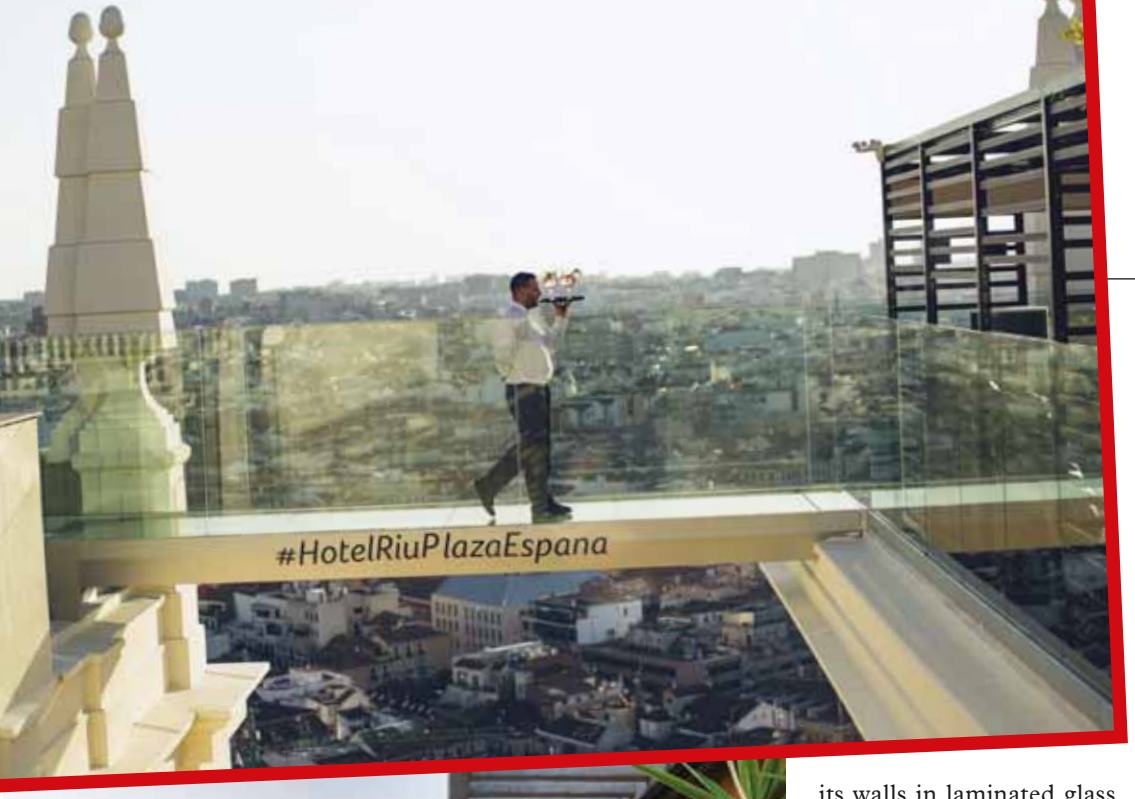
Here calculations include a wide range of applications - from glass placed upon walkable floors, walkways and stairs to glass installed in swimming pools.

ACCOMMODATING THE FINAL APPLICATION

Multiple projects exist for different applications, all for which the Evalam Technical Architectural Department has collaborated to define the glass to be applied with the most peculiar applications being those designed for installation as pool walls. Here the important role played by EVA is important to note where laminated glass is used as a pool wall, given that it's a non-hygroscopic material that will not absorb moisture from the surrounding environment as other products do. Indeed Evalam Visual and Evalam N-Fluent have been specifically developed to offer great humidity resistance - avoiding delaminations generated when the glass is installed open-edged either in extreme weather conditions or unfavourable environments.

Interesting success stories include collaboration and advice carried out in 2020 with Panamanian company Temperbraz, which was responsible for the transformation of a glass composition using five ultra-clear 10 mm glasses. Four of the internal glasses were tempered and the last was raw in order to brace the others in case of spontaneous breakage. The glasses were laminated with Evalam Visual with a thickness of 1.52 mm between each one. The joints were sealed with transparent structural silicone. During installation, the panels were buried 25 cm deep and supported on a urethane base - anchored with quick-drying mortar.

Two installations carried out in South Africa also stand out. In both cases, 63 mm thick multi-layered glass was used with panels measuring between 1,200 and 3,200 mm wide, laminated with Evalam Visual. The configuration achieved a beautiful aesthetic quality from all angles, also accentuating the clarity of the pool water. The glasses were laminated in 2021 by the company Phoenix Fenestration and Glass and installed by MacQuatix.



Another was carried out in Brazil in 2022 by Lajeadense, which was responsible for transforming a glass of various layers of 12 mm glass laminated with Evalam Visual at a thickness of 1.52 mm between each one and dimensions of 3,120 x 555 mm. The architect designed the pool on the terrace with one of its walls in laminated glass that had to perform the containment functions simultaneously while offering a great superb panoramic vista.

Besides the glass use of laminated applications for swimming pools, the advisory work for applications on walkable floors is worth mentioning - like for the laminated glass walkway made by Luxglass Technology that was installed in 2019 at Hotel RIU Plaza (also known as Edificio España). This completely transparent and safe glass walkway spans a length of 7 metres x 1.8 meters wide and is suspended 117 metres from the ground. It was laminated with AB-AR, a technical solution that offers compositions that are 50 percent lighter than glass-only compositions - obtaining the same resistance, only with added safety. AB-AR is an ideal interlayer for structures of all kinds, whether for use on walkable floors, like in this case, or for glazed facades, stairs, ceilings, railings, and anti-vandalism security situations.

WORKS AVAILABLE IN A REFERENCE BOOK

A part of the work carried out by Evalam's Architectural Technical Department is included in the Evalam reference book, which demonstrates how Evalam helps its customers to develop glass that exhibits optimal features - all while helping to comply with the requirements of comfort, protection and resilience. An example that reflects how Evalam, being more than an EVA manufacturer, is also a highly-prepared adviser that can be counted on to successfully tackle any project.

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Automation at SCHIATTI: defining the present, piloting the future

As a company that typically views technological progress and automation as twin differentiators that add value for its customers, SCHIATTI has invested heavily in R&D over the years. For industrial automation that makes perfect sense, given that recent strides in this field have rendered it a must for today's designers and builders of machinery for manufacturing.

Alongside SCHIATTI's traditional production range, which includes the company's standard models, almost all its machines are being continually upgraded with options and variants that 'transform' the original versions into customized creations - each optimally-equipped to meet specific needs.

SME10: IS ALSO AUTOMATIC

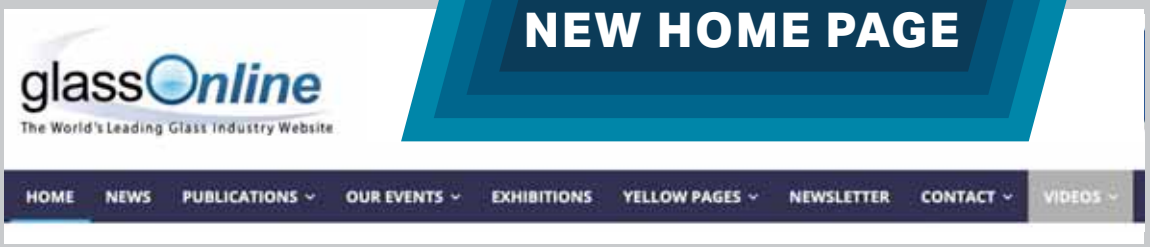
The SME10 grinder is also a fully-automatic model. It performs grinding and polishing of flat edge and arrisses while processing also variable angles that ranges from between 0° and 45° and thicknesses from 3 to 30mm.

The machine also self-adjusts according to the sheet being processed. Sensors will first detect

the presence of glass, then measure its thickness. They stops the glass sheet so that to give time to set the conveyor and release it. Here, in the interests of compliance, sheets will typically continue to be processed. However, should the sensors detect some discrepancy, the machine will independently ensure that the conveyor becomes conformant with the thickness detected - thereby adjusting the processing speed based upon previously set parameters. Not only. The spindles, diamond and polishing are automatic - all self-regulating, as required, in sync with the glass removal. Here settings are set by the machine itself every time it's powered on. Like almost all Schiatti straight edgers, the SME model is equipped with a system that will allow for an increase in the glass removal amount -up to 4mm- without adjusting the diamond wheels. The automatic version, too, is controlled and managed by the PLC.

SO, WHY AN AUTOMATIC GLASS PROCESSING MACHINE?

- It reduces human error;
- It increases working speed and precision
- It optimizes machine times (reduction of set-up times)
- It offers better detection, storage, analysis and control of the working data
- It reduces downtime thanks to predictive maintenance



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Raising the bar: KERAGLASS gets more 'vivid'

Of the many glass industry production processes, digital printing stands out in terms of promise and appeal, not least because of the endless possibilities that emerge when technology meets human genius - the same that's had KERAGLASS reaching greater summits in terms of resolution, colour, and versatility.

Ever insistent upon its 'all round' approach, Keraglass is now attaining to new heights of excellence in digital printing with VIVIDA, an inkjet plotter for glass that combines high definition with specifications, as well as features that fit perfectly with the needs of several sectors - including Architecture, Design, Furniture, the Automotive and high-end Home Appliances.

INTRODUCING VIVIDA

VIVIDA is a high definition ceramic ink digital printer that's capable of faithfully reproducing any type of image on glass. A mechanical and electronic system installed on the infeed roller conveyor allows automatic registration of different glass types without requiring any form of operator intervention. So whether it's rectangular glass or bent glass, the best registration for each job is guaranteed - with printing accuracy and full compliance with both measurements and standards. Glass is transported on calibrated belts driven by a brushless motor that's controlled with absolute precision. Here XAAR printheads are the secret to the vivid colours and high speed execution - all achieved thanks to a native resolution of 360/720 dpi, more elevated firing frequencies, stainless steel nozzle plates and very high lay-down rates. The ceramic inks in the range for digi-

tal decoration of glass have been developed in line with the main quality standards - rigorously tested for both their durability and their potential to withstand the most adverse conditions.

THE COLOUR OF SUCCESS

The chromatic range is composed of cadmium- and lead-free pure inks that are made using frits and pigments specially-selected to ensure optimal adhesion on glass - glass that's coloured, defined and also clean thanks to a 'No Dust System' that removes any contaminants deposited before printing, thus increasing final quality.
The operator simply interacts with the touch screen monitor from where machine and graphics can be managed safely and with total control - freely adjusting operating parameters as well as those required to optimise the print file, if necessary.
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Quality, Reliability, Savings: MAPPI's magic trio for glassmakers

Albeit in constant evolution, the glass industry never changes respecting certain characteristics - which also makes it difficult to standardize. This calls for both flexibility and made-to-measure solutions - and it's why MAPPI has always sought to be not only supplier but glassware partner as well.

With Mappi's ongoing commitment to heed the needs of both customers and glassworks -while offering solutions too- three examples stand out on what 'being a partner' means to the company.

THE MTH SERIES CONVECTION 2600 5000

Size matters. That's not just a cliché. It's often a necessity that can hardly be avoided in today's glass industry. In most cases, furnaces with very large loading surfaces will give problems when working at incomplete capacity - especially when it comes to energy consumption and management flexibility. To respond to these needs, Mappi created MTH.

Having been among the first to install it, Josef Bleier of Impra can now offer his impressions: "Ever since the earliest tests, MTH has proven to be just the tempering furnace we were after. The machine combines large production volumes with maximum flexibility." Based in the Czech Republic, the company provides a 360° service to large construction companies. For this reason, MTH must be capable of large volumes - all the while ensuring maximum functional and aesthetic quality. It must also be able to respond to the requests and needs of both architects and builders.

Impra has a MTH Series Convection 2600 5000 SUPER LOW E SYSTEM GHBS Xtreme Profile Convection tempering furnace. Says Bleier: "We chose this furnace for the typical characteristics of every Mappi furnace that it brings - namely reliability, innovation, impeccable after-sales service and technical support. Sometimes anyone purchasing a furnace will think they're buying a machine. Instead we're convinced that what you buy is a relationship of trust with a partner - one that must endure over years, just as the working life of a furnace lasts for years."

THE ATS 4.0 2200X3800

Moving to the other side of the ocean, to Canada, we find Adriatic Glass & Mirror - lead player over a long growth period that's always been conducted with care and with particular attention being paid to innovation. Its motto is 'Service & Commitment As We Grow', which sums up the company's focus on its customers as it seeks continually to guarantee both premium service and quality products. As such, the purchase of a high quality tempering furnace was obligatory. Here the choice fell on the ATS 4.0 2200x3800 GHBS Xtreme Profile Convection - a machine that combines quality and flexibility. But that's not all. Like all Mappi furnaces, it stands out for being extremely sparing in terms of energy consumption - with savings of at least 30 percent when compared to more conventional machines.

Joseph Imbrogno said this about the purchase: "Since the first tests with our new furnace, only one thought came to my mind: 'I should have bought it sooner'. I'd heard from colleagues and friends about the great performance of the ATS 4.0. However, seeing it at work in your company is something else. You can literally touch its ease of use, the constant quality, the flexibility. Here I must

add another thing. I was also struck by an aspect I couldn't know beforehand, which is the competence and friendliness of the people who work at Mappi - both those who carried out the assembly and those who took care of the technical training, who taught us to make the most of the super qualities of this exceptional machine."

THE FOX 1500X3200

Another thing about Canada is that it's got Mappi discovering a new need: that of a furnace that can be updated while remain-

ing always at the cutting edge. Being a long-lasting investment, a tempering furnace is a machine that must run constantly for at least ten years. As to that, Frank Paglieri of Metropolitan said recently: "Among the reasons motivating our decision to buy a Mappi tempering furnace some years ago is its longevity. These furnaces were created to be avant-garde and to remain by your side for many years. Not only. I knew they included the possibility to update them - to add features and functionality."

The Canadian company established itself in the market of flat glass supplies for architecture and construction in recent years. It has since been the protagonist of projects of great value - in terms of both aesthetic and functional characteristics. That success is also owed to the company's possibility of having a Mappi Fox furnace - a real joy that's capable of tempering high quality glass in a flexible, reliable way. The furnace was recently upgraded, i.e. with the added Convection System for Low-E glasses. "That upgrade has allowed us to supply customers with even higher quality glass - also making us able to respond to requests from the most demanding designers. We're fond of our Fox 1500x3200, which is one of the strengths of our company. And with the new upgrade we now appreciate it even more!"

Commenting on the upgrade, Mappi's chief designer Giulio dalla Costa says: "A tempering furnace has a lifespan of about fifteen years. Our furnaces are always designed state-of-the-art. It's why we anticipated the possibility of upgrades - and here's one of the cases where that's happened."

Says Nancy Mammaro, CEO of Mappi: "We're delighted to be collaborating with market leaders - companies that have a modern vision and are projected towards the future. Our new MTH was created after listening to the specific needs of such glassworks as ATS 4.0 and Fox. We found ourselves faced with the challenge of having to vary the dimensions without compromising on quality, flexibility and energy efficiency. Indeed the feedback from Impra, Metropolitan, Adriatic, and other companies where Mappi machines have been installed over recent months - all tells us that the challenge has been met."

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Hornos Industriales Pujol
Jinglass
Keraglass
Landglass Technology
Lema
Lisec Group
Mappi International
Mazzaroppi Engineering
Schiavo
North Glass Technology
Tecnosens
Tekno Kilns
Texpack

TEMPERING FURNACES (AUTOMOTIVE GLASS)

Glass Company
Glasstech Inc.
Glaston Group
Jinglass
Keraglass
Landglass Technology
Mappi International
Mazzaroppi Engineering
Satinal
SGLASS
North Glass Technology
Taifin
Tecnosens
Texpack

CHEMICAL TEMPERING EQUIPMENT

Glass Company
R.C.N. Solutions

ROBOT FOR CLEANING SILICA ROLLERS

Eurotech Way

ACCESSORIES

Deltamax Automazione
Fenzi
Glass Company
Glaston Group
Helios Quartz
Hornos Industriales Pujol
Keraglass
Landglass Technology
Mappi International
Mazzaroppi Engineering
R.C.N. Solutions
Satinal
SGLASS
Taifin
Tekno Kilns
Torgauer Maschinenbau

Bending

BENDING FURNACES (ARCHITECTURAL GLASS)

Hornos Industriales Pujol
Jinglass
Keraglass
Mappi International
Mazzaroppi Engineering
R.C.N. Solutions
SGLASS
Tecnosens
Tekno Kilns
Texpack

BENDING FURNACES (AUTOMOTIVE GLASS)

Glass Company
Glasstech Inc.
Glaston Group
Jinglass
Keraglass
Mappi International
Mazzaroppi Engineering
R.C.N. Solutions
Satinal
Si.Ste
Taifin
Tecnosens
Texpack

ACCESSORIES

Ayrox
Deltamax Automazione
Glass Company
Glasstech Inc.
Glaston Group
Hornos Industriales Pujol
Keraglass
Mappi International
Satinal
Softeco
Tekno Kilns

Laminated glass production

COMPLETE PLANTS FOR LAMINATED GLASS

Bovone Elett.
Bottero
Forel
Glass Company
Glaston Group
GPM Automation
Hornos Industriales Pujol
IOCCO Group
Italmatic
Lisec Group
Mazzaroppi Engineering
R.C.N. Solutions
Satinal
Si.Ste
Texpack
Triulzi

LAMINATED WINDSCREEN BENDING FURNACES

ECOL
Glass Company
Glasstech Inc.
Glaston Group
Keraglass
Mappi International
Taifin
Texpack

AUTOCLAVES

Bürkle
Glass Company
Glaston Group
GPM Automation
Hornos Industriales Pujol
Italmatic
Lisec Group
Triulzi

AUTOCLAVE-FREE LAMINATED GLASS PRODUCTION

Bürkle

CLIMATIC CABINS

Forel
Glaston Group
GPM Automation
IOCCO Group
Lisec Group
Triulzi

INFRARED OVENS

ECOL
Forel
Glass Company
Glaston Group
GPM Automation
Hornos Industriales Pujol
IOCCO Group
Lisec Group
Satinal
SGLASS
Triulzi

MANGLES

GPM Automation

PRESSES/BENDING MACHINES

Forel
IOCCO Group
Lisec Group
Triulzi

RESIN LAMINATING MATERIALS AND EQUIPMENT

IOCCO Group
Satinal
Teknik Elmas
Torgauer Maschinenbau

EVA (ETHYLENE VINYL ACETATE)

Satinal

PVB

Everlam
Kuraray - Trosifol

Tecnosens

PVB - SHAPING AND CUTTING EQUIPMENT

Ayrox
ECOL
Forel
Glaston Group
GPM Automation
IOCCO Group
Lisec Group
Softeco

PVB - WIRING TECHNOLOGY FOR HEATABLE LAMINATES

Ayrox
Easy Automation
ECOL
Softeco

EVA (ETHYLENE VINYL ACETATE)

Tecnosens

ACCESSORIES

Ayrox
Bottero
Deltamax Automazione
Eurotech Way
Glaston Group
Helios Quartz
Hornos Industriales Pujol
IOCCO Group
Lisec Group
Satinal
Simtech
Softeco
Taifin
Triulzi

Drilling

AUTOMATIC DRILLING LINES

B Solution
Bando Kiko
Bavelloni
Biesse Group
Glaston Group
IOCCO Group
Neptun
Schiatti Angelo
SKG - Skill Glass
Teknik Elmas
Tesir Makine
Vismara

MULTI-SPINDLE DRILLING MACHINES

B Solution
Bando Kiko
Bavelloni
Biesse Group
CMS
Glass Company
Glaston Group
IOCCO Group
Neptun
Schiavo
Schiatti Angelo
SKG - Skill Glass
Teknik Elmas
Tesir Makine
Vismara

DRILLING MACHINES WITH OPPOSITE DRILLING HEADS

B Solution
Bando Kiko
Bavelloni
Biesse Group
Bottero
CMS
Di Gregorio
Fenzi
Glaston Group
Hiseng Glass Machinery
IOCCO Group
Lovati
Neptun
Schiavo
Schiatti Angelo
SKG - Skill Glass
Teknik Elmas
Tesir Makine
Vismara

COLUMN DRILLING MACHINES

B Solution
Bottero
Di Gregorio
Fenzi
Neptun
Schiavo
Si.Ste
Tesir Makine
Vismara

PORTABLE DRILLING MACHINES

CMS
Fenzi
Schiavo
Si.Ste
Teknik Elmas
Tesir Makine

DRILLING AND MILLING MACHINES

Bavelloni
Bottero
CMS
Biesse Group
IOCCO Group
Lovati
Neptun
Schiavo
SGLASS
Teknik Elmas
Tesir Makine
Vismara

DIAMOND DRILLS

ADI - Surface Group
Bovone Diamond Tools
Diamut - Biesse
Fenzi
Glaston Group
Lanzetta
Mole Moreschi
Neptun
Schiavo
Si.Ste
Teknik Elmas
Tesir Makine
Vincent - Surface Group

ACCESSORIES

CMS
Fenzi
Neptun
Schiavo
Si.Ste
Teknik Elmas

Other equipment and plants

TURNKEY PLANTS / ENGINEERING - FOR BUILDING GLASS

Bando Kiko
Bottero
Cugher Glass
Glaston Group
Horn
Biesse Group
IOCCO Group
Keraglass
Lisec Group
Torgauer Maschinenbau

TURNKEY PLANTS / ENGINEERING - FOR AUTOMOTIVE GLASS

Bando Kiko
Bottero
Cugher Glass
Easy Automation
Horn
Glaston Group
Biesse Group
IOCCO Group

TURNKEY KEY PLANTS / ENGINEERING - FOR DISPLAY GLASS

Bando Kiko
Cugher Glass
Torgauer Maschinenbau

EDGES ROLLER COATING MACHINE

Eurotech Way

WORK CENTRES - CNC CONTROLLED

Bando Kiko
Bavelloni
Bottero
Glass Company
Glasstech Inc.
Glaston Group
Hegla
Biesse Group
Neptun
SKG - Skill Glass

FLOAT PLANTS/ LINES (EQUIPMENT & ACCESSORIES)

Bovone Elett.
Horn
IOCCO Group

CULLET HANDLING SYSTEMS

ECOL

COMPLETE BATCH PLANTS

Zippe

VACUUM COATING EQUIPMENT AND PLANTS

Giardina Group Glass Division
Glass Company
North Glass Te chnology

ENAMELLING EQUIPMENT AND PLANTS

Giardina Group Glass Division
Glass Company
Rollmac division of GeMaTa

DRYERS AND ENAMELLING FURNACES

Bürkle
Giardina Group Glass Division

SPRAYING TECHNOLOGY

Bürkle
Giardina Group Glass Division

HOT- AND COLD-END COATING SYSTEMS AND MATERIALS (CVD, ROLLERS, CURTAIN COATERS)

Bürkle

Giardina Group Glass Division

SANDBLASTING SYSTEMS, EQUIPMENT AND PLANTS - OPTIMIZERS

Di Gregorio
Fenzi
Fratelli Pezza
Glass Company
Schiavo
SKG - Skill Glass

DIGITAL INKJET PRINTERS

Glass Company
System Ceramics
TecnoFerrari

SCREEN PRINTING EQUIPMENT AND PLANTS

Ayrox
COMSS
Cugher Glass
Deltamax Automazione
ECOL
Eurotech Way
Glass Company
Keraglass
Rollmac division of GeMaTa
North Glass Technology
Softeco
TecnoFerrari

SCREEN PRINTING FRAMES

COMSS

SCREEN PRINTING DRYING SYSTEMS

COMSS
Cugher Glass
Glass Company
Rollmac division of GeMaTa

EDGES ROLLER COATING MACHINE

Giardina Group Glass Division

ACIDING GLASS EQUIPMENT AND PLANTS

Lisec Group
Rollmac division of GeMaTa

LASER DECORATING MACHINES

Ashton Industrial Sales
Glass Company

LASER MARKING

Ashton Industrial Sales

Artistic glass production

CERMAMIC INKS

Glass Company

CHAMBER ELECTRIC KILNS

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Keraglass
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ACCESSORIES

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Helios Quartz

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CUTTING WHEELS

Si.Ste

MANUAL GRINDING MACHINES

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AUTOMATION

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Easy Automation
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Tecnosens
Torgauer Maschinenbau
Zippe

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Cugher Glass
Deltamax Automazione
Glaston Group
IOCCO Group
Softeco
Tecnosens

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CUTTING WHEELS

Talamoni
Teknik Elmas
Tesir Makine

DEIONIZING AND WATER SOFTENING EQUIPMENT

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Idrotecnica
Immmes
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Triulzi

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Keraglass
Texpack

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Deltamax Automazione

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Lisec Group
Tekno Kilns
Fenzi

METAL ACCESSORIES

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Teknik Elmas
Tesir Makine

METALLIC SECTIONS

Fenzi
Tesir Makine

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IOCCO Group
Prodim

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Glass Company

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Dieffe Macchine
Immmes

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RAW MATERIALS

BOST

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CMS
Cugher Glass
Deltamax Automazione
Edgetech Europe
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Lisec Group
Optima
Prodim

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Easy Automation
Softeco

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GPM Automation
Lisec Group

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Tecnosens

WINDSCREEN STRESS MEASUREMENT INSTRUMENT

Tecnosens

WINDSCREEN AND BACKLITES

Tecnosens

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Softeco

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Softeco

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Easy Automation
Optris

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IOCCO Group

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Tecnosens

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Prof. JAMES O'CALLAGHAN on the future of architectural glass

The use of glass in architecture has never been more popular, but the global drive to increase the energy efficiency and sustainability of buildings is posing a challenge to architects, engineers and manufactures alike. PROFESSOR JAMES O'CALLAGHAN is pushing the boundaries to ensure the future of architectural glass.

As founding director of award-winning engineering design practice Eckersley O'Callaghan, James O'Callaghan is well-known in the world of architecture and structural engineering. Even those outside it will be familiar with his work, since he's also the engineer behind Apple's iconic glass stores. Says O'Callaghan: "Working with the architects and team at Apple, I was the instigator in making glass a fundamental material in the pallet of their design. I was already working with structural glass at the time. Not a lot of people were back then, so I knew what the potential could be." Architecturally, that's all about transparency. "Making something out of transparent material dematerializes the object and creates a feeling of space."

GLASS STAIRCASES

O'Callaghan's first project for Apple was a glass staircase for the company's store in SoHo, New York. "It enhanced the customers' ability to visually navigate the merchandise in a small retail space," O'Callaghan

explains. “From there we moved to glass bridges to building envelopes and even entire buildings. It evolved from being about transparency alone to being about what we could do with the material: how it could be integrated with architecture, to support or even create it. Though at the time I started developing Apple stores, I had no idea it would end up being such an ambitious campaign, spanning more than 400 locations.” These include the famous glass cube at Apple’s Fifth Avenue retail space in New York and the column-free Steve Jobs Theater on the Apple campus in Cupertino, California. Though glass has never been O’Callaghan’s sole area of work, Apple’s interest was instrumental in creating opportunities to develop a knowledge base in the material. “It has stimulated more ambitious design and fabrication technology, as well as a more ambitious use of materials that are complementary to glass, such as interlayers and the technology around them. In short, it has enabled the technology of structural glass to accelerate at a pace it would not have been able to otherwise,” he says.

BRIDGE TO ARCHITECTS

Working closely with architects has been vital to achieving this. “Here I am the bridge between the aspirations and ambitions of architects and reality. My job is to inspire them to use a material like glass creatively,” O’Callaghan says. “However, an architect’s ideas are often fragile, and fragile ideas are easily squashed if you don’t find ways to make them happen. So I feel I have a responsibility to be as supportive as I can - to not say ‘it can’t be done’ but rather find ways to make things happen. Not enough engineers do that.” He believes this ‘can-do’ attitude has been behind the success of his company, which has grown from a few people in 2004 to 120 people and seven offices around the world. “It is part of the culture of our practice. A keen interest in architecture is key for everyone who works with us. Besides that, it’s all about innovation. In order to keep providing creative solutions in engineering, you need to invest in R&D. We have to provide the best solutions possible with existing technology. At the same time, we have to look forward and develop technology that can address new challenges down the line. So everyone at Eckersley O’Callaghan undertakes research as a regular part of their job.”

COMING TO DELFT

It was this research that first brought him into contact with TU Delft, where he has been a visiting professor since 2015. In 2019 he was appointed full professor in architectural glass. “The university provides a network of people and knowledge that allows me to experiment further and deeper with the development of glass in architecture than I would have been otherwise able to do in my practice”, O’Callaghan says. “It also gives me the freedom to focus on a particular area of research without the limitations that running a business brings, so in many ways it is complementary to what I do in the commercial world. At the same time, my commercial experience can help guide the research we do here, so that the outcomes of that research have an industrial and commercial relevance in the world of architectural glass.”

WIDER REMIT

O’Callaghan stresses that as a professor of architectural glass, his remit goes beyond glass structures. “My chair is about the future of glass in the built environment in every form. That includes glass structures, glass as part of the building envelope, but also, for example, the use of smart glass.” The overarching research questions are all about sustainability. “How can we improve the circularity of glass, so we don’t have to keep making it anew. How can we use less glass by making it thinner with the same strength? And how can we make glass contribute more to the sustainable performance of buildings?” he sums up. For the latter challenge, the technology is already out there: “There is glass that can change dynamically with its environment, to modulate light and to harvest energy through solar cells inside it. Ultimately, it will also become our screens, making separate televisions superfluous.”

REUSE, REDUCE, RECYCLE

Glass in its basic form is eminently recyclable. It’s what happens during post-

processing that makes it less so. "We laminate glass panels, make glass into double glazing units and so on. All that has an effect on the embodied carbon, and on the sustainable nature of the glass. This is something we have to address. We need to look at the way in which we design windows and frames and building envelopes so we can reuse glass in the future. If buildings last for fifty years, glass can last for hundreds of years." says O'Callaghan. "An interesting research direction here is the use of digitally fabricated connecting elements."

O'Callaghan is also setting up a dedicated glass research lab, partly funded by alumni donations. The lab will include a 4K digital microscope. "That will allow us to look at surface flaws with the resolution we need to increase our understanding of how glass quality affects its strength. Traditionally, the design of glass relies on fairly conservative safety factors. If we have more knowledge about the inherent flaws in glass and how these influence performance, then we may be able to reduce the safety factors and hence reduce the material we use. Ultimately, sustainability is about using less."

Currently, only five percent of glass from buildings is recycled, compared to 90 percent of our bottles. "Even that small percentage is down-cycled. It gets used as aggregate for road building, for example." Two researchers, Telesilla Bristogianni and Faidra Oikonomopoulou, are working on cast glass. A well-known example is The Crystal Houses in Amsterdam, built from glass bricks in 2016. "These glass bricks are made by casting molten glass, rather than processing it. This has led to the idea that you could take any form of polluted glass, from microwave doors to car windscreens, and distil it into building blocks. They are now investigating what effect that has on transparency, colour and usability. I think that is a great story of sustainability."

TEACHING

In between his busy research and business schedule, O'Callaghan also finds time to teach and mentor students, something he is passionate about. "I love the contact with students. Their minds are not filled with 30 years' experience, so they can think in any direction they wish, and through that freedom comes creativity. Though it makes me a tad jealous that I am not that creative anymore, it also inspires me to new ideas. I hope that is a two-way street, where they in turn learn from my experience," he says. "Ultimately, we are teaching them to become less creative along the way. We have to, because as young professionals they will need some wisdom, knowledge and experience too. But working with students is a wonderful reminder of what you found fascinating in your profession in the first place, and that reminder is an important catalyst for doing creative work."

LOOKING BACK

His work has won him many accolades: O'Callaghan is a Fellow of the UK's Royal Academy of Engineering, and in 2019 he was awarded the Gold Medal from the Institution of Structural Engineers, to name but a few. Looking back, his work for Apple is the body of work he is most proud of. "I look at it as a story of the evolution of structural glass over the past fifteen to twenty years. There are buildings in it I particularly like, such as the Steve Jobs theatre, which is probably the most ambitious glass structure ever built,and the culmination of many years of experimentation through other buildings."

It is not something he would have believed possible 25 years ago. "When my boss at that time said that we were going to build with glass, I thought it was crazy. Then I got into the science of it and I started questioning things, and as a result I found all sorts of interesting aspects. That curiosity is a fundamental part of being an engineer. I was curious about glass and it has proven to be an incredibly interesting material to build with."

Prof. James O'Callaghan

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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

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2013

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