Glass-Technology International

THE LEADING MAGAZINE FOR THE INTERNATIONAL FLAT GLASS INDUSTRY

November/December • Year 31 • No. 6/2020

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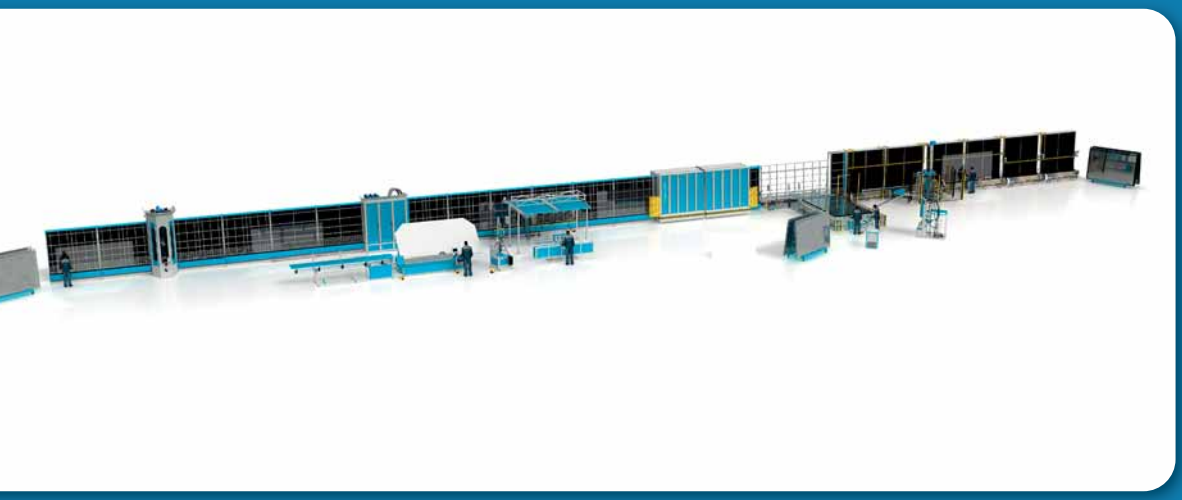

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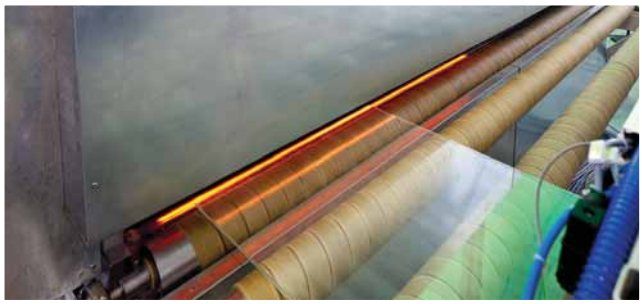
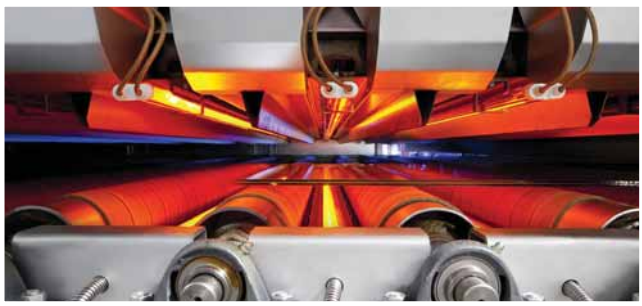
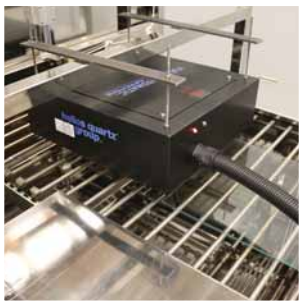
GLASS APPLICATIONS

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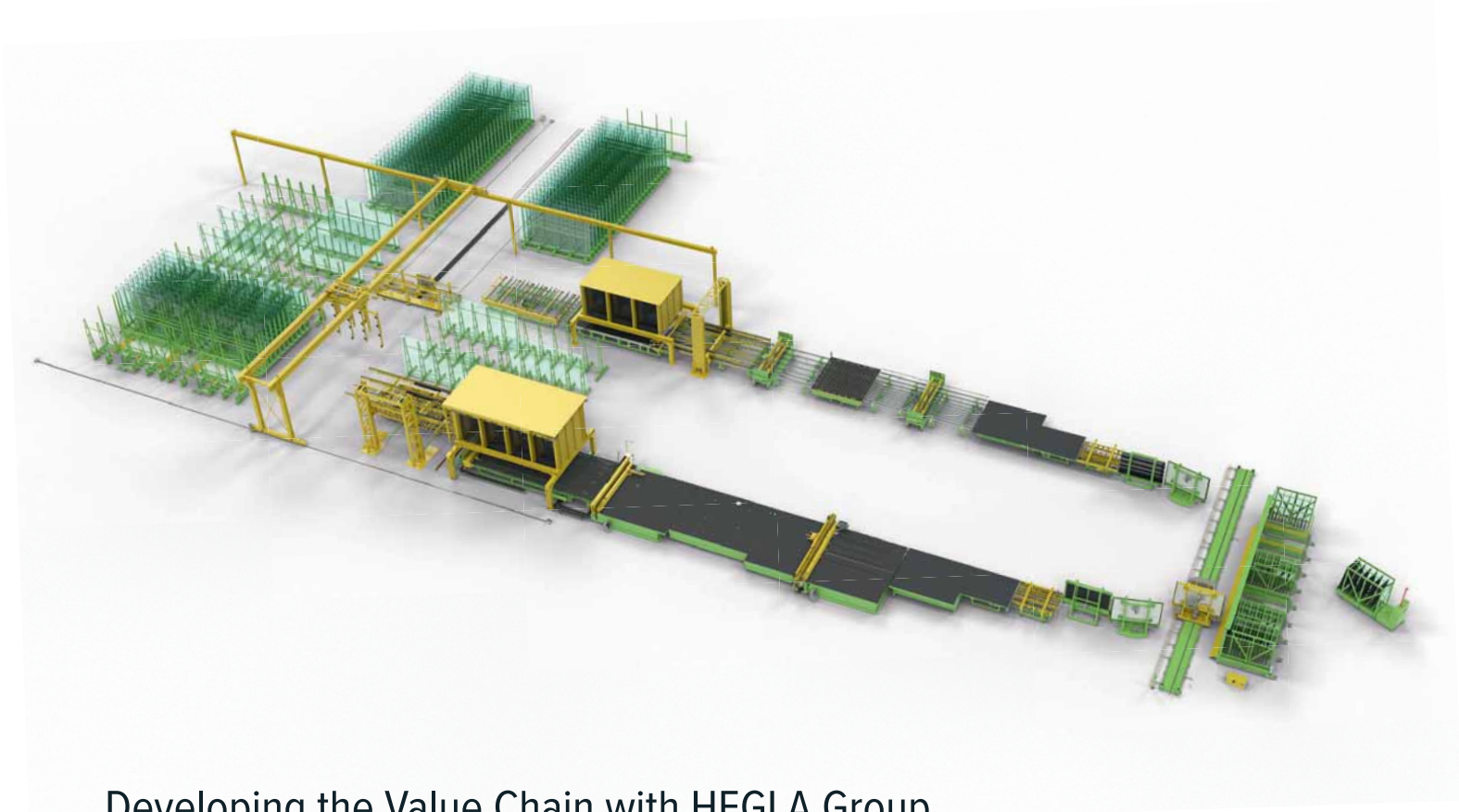

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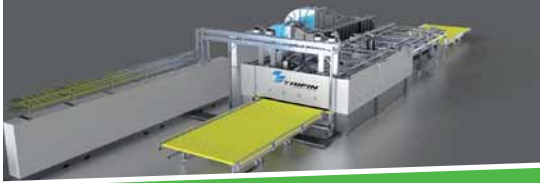

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The automatic sealing robot Art. SR "Hith Tech" is designed to maximize productivity and reduce waste and downtime, thanks to features such as the no-stop mode and the automatic dosing unit change.

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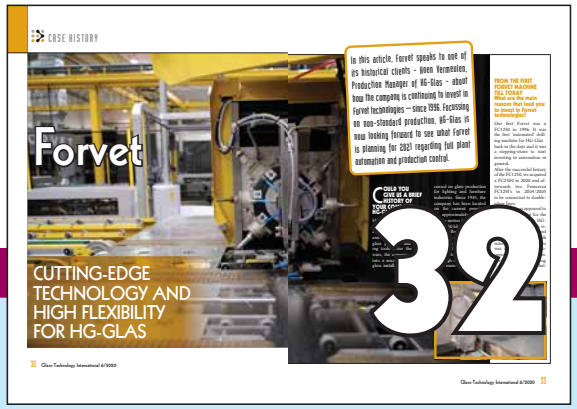

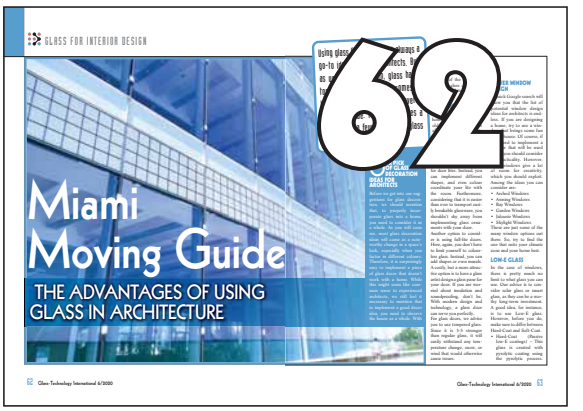

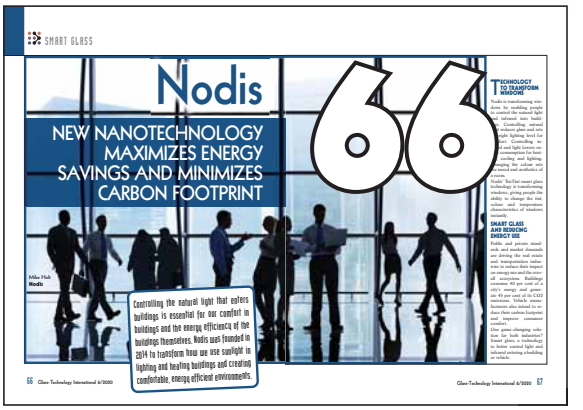

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Glass-Technology International

2021 FAIR CALENDAR

The magazine will be distributed at the following Trade Fairs

issue	exhibition/conference	date	venue	deadlines
2021 1	EURASIA GLASS	3-6 March	ISTANBUL Turkey	
	MIR STEKLA	22-25 March	MOSCOW - Russia	
	GLASS SOUTH AMERICA	24-27 March	SAO PAULO Brazil	Editorial files: 29-01-2021
	GLASSTECH MEXICO	14-16 April	GUADALAJARA Mexico	Deadline Adv files: 05-02-2021
2021	FLATGLASS 2021 world directory			Editorial files: 26-02-2021 Deadline Adv files: 08-03-2021
2021 2	VETECO	4-7 May	MADRID Spain	Editorial files: 26-03-2021
	CHINA GLASS	6-9 May	SHANGHAI China	Deadline Adv files: 02-04-2021
2021 3	GLASSTEC	15-18 June	DUSSELDORF Germany	
	ALL GLASSTEC EXHIBITORS ADVERTISING IN THIS ISSUE ALSO RECEIVE A FREE GLASSTEC PREVIEW			Editorial files: 26-04-2021
	GPD - GLASS PERFORMANCE DAYS	23-25 June	TAMPERE Finland	Deadline Adv files: 07-05-2021
2021 4	GULF GLASS	12-15 September	DUBAI UAE	Editorial files: 19-07-2021
	GLASSBUILD AMERICA	13-15 September	ATLANTA (GA) USA	Deadline Adv files: 30-07-2021
2021 5	VITRUM	5-8 October	MILAN Italy	Editorial files: 03-09-2021
	ALL VITRUM EXHIBITORS ADVERTISING IN THIS ISSUE ALSO RECEIVE A FREE SPECIAL FEATURE			Deadline Adv files: 10-09-2021
2021 6	GLASSTECH ASIA	16-18 November	BOGOTÀ Colombia	
	GLASSTECH COLOMBIA	18-19 November	BOGOTÀ Colombia	Editorial files: 11-10-2021
	ZAK GLASS TECHNOLOGY	December	DELHI India	Deadline Adv files: 18-10-2021

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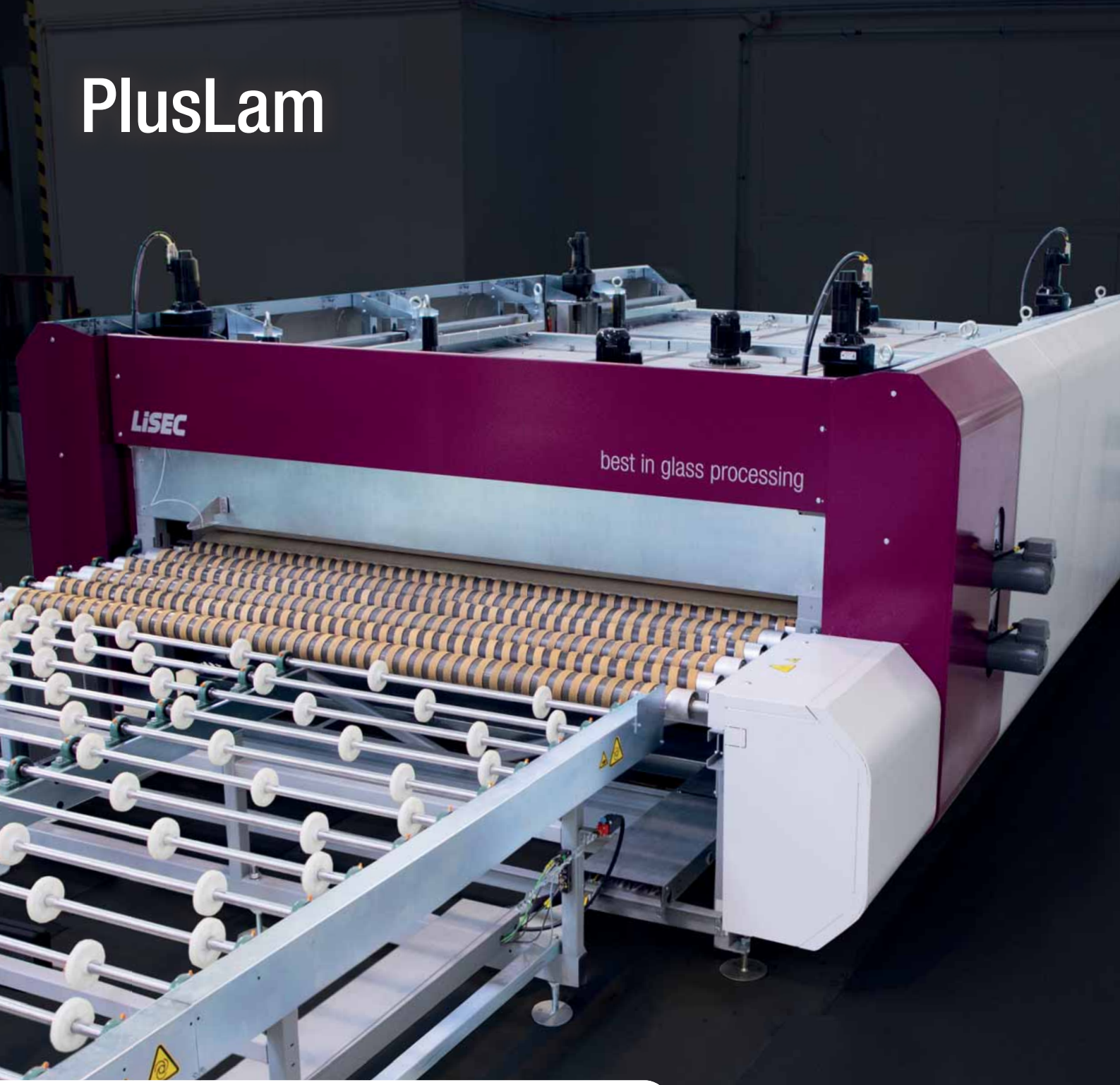
PlusLam



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FRATELLI PEZZA

Owner and founder passes away

Alessandro Pezza, the founder and owner of **Fratelli Pezza**, specialist in glass sandblasting machinery, passed away on Monday 5 October, due to a sudden illness.

The entire world of glass will remember this man, who dedicated every moment of his life to his company and to the world of glass.

WWW.FRATELLIPEZZA.COM/EN

GLASTON

Lasiliiri upgrades its product range with FC-zone

Lasiliiri is a third-generation, family-owned glass processing business in Riihimäki, just an hour north of Helsinki. Over the years, the company has continued to invest in new technology to grow the business and provide an ever-expanding range of high-quality windows, facades and interior glass.

"Although our goal is to be one of the leading smart and safety glass manufacturers in Finland, we didn't have the time needed to install a completely new furnace," said Raiko Mäkeläinen, Technical Manager at Lasiliiri. "Instead, we went with a significant **Glaston**'s FC-zone upgrade, which enabled us to leapfrog to the very latest heating technology in a quick, cost-effective and sustainable manner."

Raiko added, "After investing in 2016 in laminating machinery, the company has been able to explore exciting new types of smart glass, such as PLCDs, LED glass and design products and other types of smart glass to supply a thirsty domestic market.

Lasiliiri's existing *Tamglass* tempering machine were purchased second-hand and thoroughly refurbished with the latest technology in 2008. "After 10 years, the technology was still solid, but the market had moved towards high-performance coatings and larger glass sizes. Customers wanted multiple coatings and super-coatings to provide sun protection and selectivity. The existing furnace was just not able to do that."

"We first requested technical information from several suppliers to map out what all the new machinery could do for us. The problem was primarily the heating section," Raiko explained. Another huge concern was the time that would be lost if Lasiliiri installed a completely new furnace from scratch. That's when Glaston's FC-zone with some minor chiller modifications came into consideration.

By just upgrading the heating section of the tempering line and advancing to the latest machine control system Glaston iControL, Lasiliiri could take advantage of a smaller investment cost, less downtime and a shorter delivery time to reach the same capabilities as if they had purchased a new furnace. The entire upgrade took only 25 days. The completed furnace was shorter in length, reducing the line's footprint. Plus, the machine consumed much less energy, an added benefit.

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VIPROTRON

Viprotron quality scanners installed

As one of the largest window manufacturers in France and with its own insulating glass production, **Tryba Industrie S.A.S.** exclusively sells high quality windows in the premium segment.

After extensive tests and research Tryba has decided to use the reliable Quality Scanners from **Viprotron**, as they exceed the standards by far due to their unique 3D technology.

Within Tryba's insulating glass production, both insulating glass lines are equipped with one scanner each for checking the single glass panes after the washer. In addition, each production line will be equipped with a scanner to check the final insulating units after the press.

For the in-house tempering production another new and innovative product from Viprotron, the Haze Scanner, has been

ordered. The Haze Scanner, is installed directly at the exit of the tempering furnace, is designed to immediately detect the presence of White Haze – white streaks on the glass surface – that can occur when the glass is subject to heat treatment, in order to avoid this effect at an early stage.

The installation of the five inspection devices is scheduled for autumn 2020.

WWW.VIPROTRON.DE/EN

SAINT-GOBAIN HASSELT

SOFTSOLUTION's LineScanner

Saint-Gobain Hasselt, formerly Boermans in Kuringen, Belgium, produces and sells double and triple glazed units for purposes such as soundproofing, safety, and solar control. In addition, Saint-Gobain Hasselt offers innovative glass solutions for all living and working environments where comfort and safety are of the utmost importance.

In order to meet these high quality demands, the company decided to use a LineScanner from **SOFTSOLUTION**. The vertical LineScanner (2500 mm) was installed on an insulating glass line, after the press, where it inspects the finished insulating glass units by SOFTSOLUTION's technician, Samir Pasalic. The LineScanner checks not only for surface defects but it also verifies the coating of glass if it's on the correct surface by using a glass thickness and coating sensor.

"In order to be able to guarantee a complete archiving of each scanned lite, the Saint-Gobain Group decided to use the LineScanner archiving system. The software provides the customer with a PDF report for each individual insulating glass unit, which can be used to quickly and easily evaluate quality statistics during production," said Jonas Pfannenstill, Sales Manager at SOFTSOLUTION.

WWW.SOFTSOLUTION.AT

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RCN SOLUTIONS

New production concept installed at Vasiliou Glass

WWW.RCNSOLUTIONS.IT/EN/HOME-ENGLISH/

One of the most important Greek glaziers, **Vasiliou Glass Technologies**, has decided to enhance its business and has chosen **RCN Solutions** as reliable supplier, starting the project to install a part of the production sequence, giving priority to their bending oven and laminating line first.

RCN Solutions firmly believes in this project and knew its proposal for ISF – Integral Sequencing Framework – could meet the interest and the requirements of Vasiliou Glass Technology, committed to supply safety glass for special applications such as those in the automotive and the marine industry.

Willing to invest in the latest technologies, Mr. Vasiliou was convinced by the concept and decided to join the RCN philosophy by ordering one ECO SPECIAL bending kiln and one Lammy System 4+4, both of active size 5100x2800mm, which were installed with success at Vasiliou Glass' premises at the beginning of October.

Though the pandemic has delayed the time for the installation, RCN is satisfied to have enabled the customer to start production and serve customers accordingly.

RCN is confident that the customer will come back in the future to complete the framework by choosing one chemical tempering plant, Riva by RCN, completing their machinery and responding to the glass market requirements for safety, perfection and beauty.

AGC GLASS EUROPE

Glass Configurator introduced

The Glass Configurator – an online application developed by **AGC Glass Europe** – is a powerful tool that glass processors, façade and window manufacturers, architects and designers can use to calculate light, energy and safety properties. Single glazing, double and triple insulating glazing as well as laminated safety glass can all be configured. The latest version delivers even more functionality, such as acoustic calculations and photorealistic renderings.

Features:

- Configure products to comply with your specified properties: energy performance, aesthetics, acoustics, safety, etc.
- Work easily and quickly using drag-and-drop functionality.
- Create and download glass configurations (PDF reports).
- Find by performance: find the right product that meets your specifications in terms of optical, thermal, acoustic and safety performance.
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- Check out the Glass Visualiser: see how the product looks in different types of buildings and environments.
- Save glass configurations for projects, calculations etc. in your personal account.
- Share your content.

The AGC Glass Configurator is a free service available in nine languages on all devices. Registration is easy and free of charge.

WWW.AGC-GLASS.EU/EN

GUARDIAN GLASS

Guardian SunGuard® SNE 50/25 HT coated glass presented

Guardian Glass North America announces Guardian SunGuard® SuperNeutral® Essential 50/25 HT, a high performance, low-E coated glass that gives architects a subtle, blue-grey colour and mid-reflectivity aesthetic.

Architect focus groups helped Guardian Glass deliver a product with a visible light transmission of 48% and low solar heat gain coefficient of 0.25 with a crisp, neutral, subtle blue reflected colour in the mid-exterior reflective range.

"We completed extensive architect testing on Guardian SunGuard® SNE 50/25 HT coated glass to be sure we were responding to the needs of the architectural community," said Brian Schulz, Commercial Segment Marketing Manager, Guardian Glass North America. "Our team is excited to be able to offer this new low-E coating that combines excellent performance and a pleasing aesthetic, which translates to greater design flexibility."

Drawing on the cumulative expertise of glassmakers and production teams throughout the world, Guardian Glass continually applies sciences and cutting-edge technology to the development of new SunGuard® coated glass products that expand the limits of performance.

Designed to be used on the #2 and #3 surface of a standard insulating glass unit, SunGuard® SNE 50/25 HT coating is available on multiple Guardian Glass substrates, including UltraClear® low-iron glass, in 6mm, 8mm and 10mm thicknesses and has similar durability and processing requirements as other SunGuard® low-E coated glass products. It is available through the Guardian Select® Fabricator network.

SunGuard® SNE 50/25 HT coated glass also offers architects oversized options and bendable applications.

"We are enthusiastic about this new offering from Guardian Glass," Schulz said. "We believe this unique aesthetic – which looks especially crisp on Guardian UltraClear low-iron glass – coupled with its outstanding performance characteristics will result in an excellent specification choice for architects. In fact, we already have a bit of momentum, having secured a variety of project specifications with SNE 50/25 HT coated glass, and have several more opportunities pending."

WWW.GUARDIANGLASS.COM/US/EN/NEWHOME

ADELIO LATTUADA

New partnership with GlassForce

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GIMAV

Most member companies will not take part in glasstec 2021

Given the challenges precipitated by the pandemic, over the last few months we have engaged in active debate with our member companies to understand the impact these challenges will have on participation in the leading international trade shows.

We believe it is our duty to apprise companies, visitors and all interested parties of the decision that came to light during these discussions: an overwhelming majority of the member companies expressed their intention to not participate in the 2020 edition of **glasstec**, which has been rescheduled for June of 2021. Many factors influenced this decision but the determining element was, above all, the desire to make *VITRUM* the only international event truly capable of promoting the excellence of Italy's glass industry, showcasing the machines as well as the products and technological applications produced through our technologies.

Contributing to that decision were also the unusual dates for the German show that do not encourage participation, its rejection by the major international players, alongside the constant difficulties in planning organized participation caused by the as-yet-unresolved control of the spread of COVID 19.

Nevertheless, should the organizers of glasstec decide not to cancel the 2021 edition, **GIMAV**, as an association, will still be there.

We have always supported the importance of the show and will continue to do so despite the fact that the choice to 'move' the 2020 edition to 2021 is not a sound choice.

We would be remiss in our primary duty toward our members and the entire sector if we withheld the undeniable evidence that came to light – a large majority of the actors in Italy's glass processing technologies industry – representing more than 10,600 net m2 (taking into consideration only the exhibitors in pavilions 13 and 16), will not be present at glasstec 2021.

We endorse this message out of a spirit of service to the Italian and international visitors who have every reason to expect a normal presence of Italian builders and suppliers of glass processing technologies at the glasstec edition to be held next June.

That will not happen. The glass processing technologies and products from around the world in 2021 will be on display at VITRUM in Milan 5-8 October in an edition that will include the opening of new pavilions dedicated to products and applications and a major increase in the exhibit space itself.

WWW.GIMAV.IT/EN

GUARDIAN GLASS and EASTMAN

Partnership on colour neutral laminated glass

Continuing demand for superior low-iron glass products in both the premium commercial and residential markets is being met with an innovative collaboration between **Eastman** and **Guardian Glass**. Eastman and Guardian are jointly announcing Eastman's new Saflex® Crystal Clear PVB interlayer, which is designed to produce one of the most colour neutral, brilliant laminated low-iron glass products available today: Guardian UltraClear® LamiGlass™ Neutral.

"Until now, laminating low-iron glass was challenging because traditional interlayers tend to reduce the neutral, transparent properties of low-iron glass," said Priya Kalsi, segment market manager with Eastman. "Our new Saflex Crystal Clear interlayer dramatically enhances the aesthetic appearance of Guardian UltraClear® low-iron glass when laminated, offering exceptional crisp neutrality and beauty, providing aesthetics that are very similar to monolithic Guardian UltraClear glass. All the traditional benefits of laminated glass remain unchanged, including safety, security and acoustic control. Saflex Crystal Clear PVB interlayer remains virtually undetectable at any visible angle in any light."

"This collaboration with Eastman answered a key concern for both companies' customers in search for an endless need for neutrality and transparency," said Eric Lassalle, product manager Laminated Glass at Guardian Glass. "Our joint cooperation enabled us to deliver a greatly improved aesthetic appearance when Guardian UltraClear glass is laminated with Saflex Crystal Clear PVB interlayer. Crystal Clear PVB can also be used with various combinations of coatings and surface treatments on Guardian UltraClear glass, making it ideal for a targeted range of high-performance solutions."

Guardian UltraClear LamiGlass Neutral can be used in a wide range of applications where brilliant neutrality, high transparency and safety are required. These include:

- Interior: Interior Doors/Partitions/Balustrades/Stairs and Railings/Furniture/Retail Shelving/Display Cases/Museum Glazing
- Exterior: Cladding/Curtain Walls/Facades/Windows/Skylights/Exterior Doors/Storefront and Shop Windows

Both Saflex Crystal Clear PVB interlayer and Guardian UltraClear LamiGlass Neutral expanded portfolio are commercially available as of October 15, 2020, as a first step, in Europe with a possible expansion into the other regions during 2021.

TROSIFOL

Fast and flexible support

Suddenly and unexpectedly, supply chains, business workflows and production processes around the world were interrupted by the coronavirus lockdown. Naturally, *Kuraray*'s customers were also affected. For one customer in the glass industry the lockdown threatened to interrupt production plans because the pandemic meant it was no longer possible to hold important on-site training sessions. To avoid that, the **Trosifol** team quickly switched to a flexible online training concept and remote support. The process was successful and is now being fine-tuned for future use.

Kuraray always helps customers with the installation and start-up of new production lines by providing on-site training and practical support. However, the COVID-19 pandemic abruptly interrupted this tried-and-tested process: overnight, on-site visits became impossible. That confronted one of Kuraray's customers with a fundamental problem.

The glass producer in Bologna, Italy, had recently invested in a new production line to broaden its range of architectural glass to include laminated safety glass with PVB and SentryGlas® ionoplast interlayers from Trosifol.

Alejandro de la Muela, Senior Consultant Technical Services at Kuraray, explained, "The production line was installed and ready to go. Normally, we would have gone along to help the customer with the initial lamination tests and train the production operatives. However, the lockdown changed all that." It looked as though the customer would not be able to start production on the new line.

Customer satisfaction has very high priority for Kuraray. Alejandro de la Muela and his team therefore considered how they could provide support despite social distancing and lockdown restrictions. Within a very short time, they produced an online training program. To enhance learning, the team at Technical Services spread the complex content over three online sessions. They also provided a list of glass samples and tools to guide the production workers step by step through the lamination tests.

In collaboration with the customer's engineers, the team came up with quick fixes for the hardware needed for the online training and for remote support during the test runs. "In our offices at Kuraray, we had computers with two screens so we could display both the presentation being shown to the customer and additional comments and information," said de la Muela. "We also used a sketchbook with a mobile phone fixed over it so we could share notes and information in real time." Thanks to this rudimentary set-up, ideas could be shared effectively.

All customized parameters on the production line were entered in a shared Excel spreadsheet. The file also contained an image of the pre-laminate so this completely new document for test runs can be used to deal with questions in the future. (To produce the pre-laminate, air is pressed out of the glass/interlayer composite before the final laminate is produced in the autoclave.)

Kuraray's customer in Italy used iPads for the training sessions so employees could move around freely and show the Trosifol technicians the various stages in the test runs. A laptop in the laminating room ensured smooth communication and transmission of the images. The set-up also included a temperature

sensor and a UV lamp for validation of the SentryGlas®.

"Nothing beats meeting up personally," said Alejandro de la Muela. Nevertheless, the flexible hands-on approach meant that his team could provide quick and uncomplicated support for this customer in Italy.

Thanks to the resourceful switch to online training, the whole process from the start of training to the first complete production run and the official production start took just two weeks. As a result, it has been decided to establish this remote concept for future use. Additional requirements such as special audio-visual hardware and other equipment have already been defined to drive forward and optimize the concept for online support in the future.

By combining online and on-site training and support, Trosifol can lift service for production to a new level both for this Italian glass manufacturer and for other customers around the world.

WWW.KURARAY.EU

GFE

The Renovation wave should trigger a ripple effect

"We hope this Renovation wave will have a butterfly effect and trigger a ripple effect for an unprecedented transformation of our buildings," said Bertrand Cazes in a video statement published in reaction to the release of the Renovation Wave by the European Commission.

By way of the Renovation Wave, the European Commission aims to at least double renovation rates in the next ten years and make sure renovations lead to higher energy efficiency. The goal is to renovate 35 million buildings by 2030 and unleash the creation of up to 160,000 jobs in the construction sector.

Glass for Europe believes that the initiative goes in the right direction even if the proposed actions remain somewhat limited. In the opinion of GfE, the European Commission misses the opportunity of creating a dedicated fund for renovation to boost the recovery in the construction sector and does not set a specific target for renovation which could have provided the required boost.

The call on Member States to dedicate more of the Recovery and Resilience Facility to building renovation and the invitation to massively renovate public buildings are very welcome by the European flat glass industry. A revision of the Energy Performance of Buildings Directive (EPBD) is also foreseen and needed. This is all going in the right direction and so Bertrand Cazes concluded, "today's communication is the beginning of something that needs to become much bigger and stronger."

The building glass sector is ready to play its role to decarbonise EU buildings and Glass for Europe will engage with EU policy makers to make a success of the announced revision of the EPBD.

GLASSFOREUROPE.COM

LOVATI FRATELLI

Angelo Lovati has passed away

Angelo Lovati particularly distinguished himself for his active role in *GIMAV* as a member of the Board of Directors and President, as a representative for various years in the FEDERMACCHINE General Council, and for his contribution to *VITRUM* as a member of the Board of Directors.

Mr. Lovati was the CEO of **Lovati Fratelli**, well-known the world over for the construction of shaped-glass processing-, grinders and CNC machinery, and was one of the pioneers of the Italian mechanical industry for glass processing. He was valued by all for his professionalism, honesty and fairness, and was dedicated to work but also strongly linked to his family.

The glass sector has lost an important protagonist who was part of the success of the Italian at international and global level. He was, in fact, one of the first to open a direct branch in the US, together with his close friend Annibale Besana, and was also one of the first to believe in CNC machines.

He worked within the Association with a united and compact spirit for the benefit of all protagonists of the Italian glass sector. He will be deeply missed, but his teachings will remain a treasure and a heritage for us all.

WWW.LOVATIF.COM/EN

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SALEM DISTRIBUTING COMPANY

Rebrand and restructure announced

Salem Distributing Company, Inc. will evolve into *Salem Fabrication Technologies Group, Inc.* This name change will better represent the company across all of the industries in which it offers machinery, tools, supplies, equipment and services.

Under Salem Fabrication Technologies Group, two distinct divisions will continue to focus on technology and fabrication solutions in the glass industry. With a diverse range of fabrication services, Salem offers an unmatched level of high-tech advancements and industry 4.0 expertise.

The first division, offering tooling, surfacing supplies and equipment solutions, will be known as Salem Fabrication Supplies. This division will be headed up by President Dan Reinhart, who previously held the position of VP of Sales & Marketing for Salem Distributing. Reinhart remarked, "Customers will continue to find top of the line, high quality diamond and polishing wheels, drills and router bits as well as polishing compounds, abrasives, coolants and material handling equipment. The knowledgeable and customer-service oriented sales staff servicing this division are our same employee-owners that customers have come to trust and rely on."

A second division will entirely focus on glass fabrication machinery and technical services. *HHH Tempering Resources*, acquired by Salem in July of 2019, will become *HHH Equipment Resources*. Salem and HHH machinery engineers and technical experts will come together under this division to focus on customers' machinery needs and will offer an even wider range of fabrication equipment, in addition to providing extended U.S.-based fabrication and glass tempering technical support and service. Mike Synon will continue as President of HHH and said, "HHH will diversify our offerings and incomparable technical service beyond tempering to include additional fabrication equipment from edgers, bevelers and CNCs to washers, sandblasting units, insulated glass equipment and more. We're excited to better meet the needs of our customers and the industry as a whole".

"Salem is thrilled to evolve with a cutting-edge approach to build on our fabrication industry experience. I look forward to combining this expertise with our technical knowledge, innovative equipment and superior customer service to bring a new standard to the industry," Salem CEO Mike Willard said.

WWW.SALEMFTG.COM

CMS

Speed 25 – the next generation

Speed 25 is a three or four axis numerically controlled machining centre designed and built specifically for fabrication of flat glass. This machine has a working envelope of 142" x 86" and can process glass up to 4" thick. The Speed 25 is available with an 18.5 HP (40 HP optional) electro-spindle completely engineered and built by **CMS**.

Speed 25 offers a compact and ergonomic design by housing the water recycling tank underneath the machine and offering a waist high worktable for convenient loading and unloading via automatic (optional) sliding doors. The vacuum pump recycling tank also tucks neatly underneath the back side of the machine for an ultra-compact design.

Speed 25 is very user friendly and versatile due to the large work area and easy to use control panel mounted to the front of the machine. The large touchscreen display adjusts up and down to accommodate operators of different heights. The water recycling tank is completely removable and fitted with

→ wheels, so maintenance and cleaning can be done away from the machine.

Speed 25 is much heavier built than the other machines in this class on the market. The accessories are neatly packaged in specific easy to access compartments making maintenance and service easy and worry free. The stiffness of the frame and accuracy of the dual direct drive servo motors combined with the high accuracy rack and pinion movement system and absolute encoders make this machine second to none.

WWW.SCMGROUP.COM/EN/CMSGLASS

VITRUM GLASS

First Guardian Select® Elite Fabrication certification earned

Guardian Glass North America has announced that **Vitrum Glass Group** as the first company to earn Guardian Select® Elite Fabrication certification for architectural glass fabricators in the United States and Canada.

Vitrum achieved Guardian Select® Elite Fabricator status because of its advanced capabilities and quality standards. State-of-the-art processing equipment, practices and measuring devices helps the company meet the Elite Optical Quality specification, a new specification from Guardian Glass that requires stringent specification targets and processing controls are in place to help achieve the highest level of optical qualities of glass on a project.

"We're proud to be the first Guardian Select® Elite Fabricator," said Vitrum President Thomas Martini. "As projects require more complex products and have increased quality requirements, it's important to collaborate on an improved standard. Synergy between the glass fabricator and glass manufacturer is key to give the end user the confidence of a successful project."

"We congratulate Vitrum for being the first fabricator to embrace Guardian's newly enhanced fabricator program and complete the Elite level of certification," said Brian Schulz, Segment Marketing Manager, Commercial for Guardian Glass North America. "Vitrum understands architects are demanding higher optical quality standards. We look forward to taking our partnership – which reaches back to the early 2000s – to new levels of architectural glazing performance."

Martini agrees. "The wide variety of Guardian SunGuard® coated glass products and resources paired with Vitrum's ability to offer all products and processes under one roof – as well as our plans to introduce a new level of automation – positions us well as a Guardian Select® Elite Fabricator," he said.

Vitrum, which tempers more than 10 million sf of glass and fabricates 600,000 sealed units annually, also recently added capacity to expand its project roster: A new 175,000 sq.ft. manufacturing building adjacent to the original 1996 facility in Langley comes on the heels of a 65,000 sq.ft. fabrication site just north of Calgary.

"Communication is essential in planning and managing successful projects," Martini says. "Staying on top of new products and industry trends with the help of manufacturers like Guardian Glass is crucial."

The Southport Office Complex is a great example of successful projects from Vitrum and Guardian Glass.

Designed by ZGF Architects, the three office buildings are the standouts in a mixed-use complex on Lake Washington in Renton, Washington. Vitrum, Guardian and independent Glazier Connection™ member Walters & Wolf worked together to secure the project, which boasts 105,000 sq.ft. of Guardian SunGuard® SNX 62/27 coating on clear glass and 89,000 sq.ft. of spandrel glass.

"The combination of the location, design and the glass created a beautiful project," says Tara Brummet, Business Development Manager, US Markets for Vitrum. "Guardian Glass is always a fantastic partner. The support, assistance and product quality are always appreciated and help Vitrum to be successful."

PILKINGTON

Antimicrobial glass ready for launch

The launch of the new glass product, Pilkington *SaniTise™*, follows the glass giant's Lancashire based research and development team fast tracking its research into antimicrobial coatings in the wake of the pandemic. The work was supported by testing at leading UK universities.

Pilkington SaniTise™ is a transparent coated glass that's activated through UV radiation. When the glass is exposed to UV light, its antimicrobial activity is significantly increased compared to using uncoated glass.

Pilkington SaniTise™ has a pyrolytic coating, which provides antimicrobial properties and acts against enveloped viruses on the glass surface.

The coated glass provides extra protection for any high-touch surfaces that are exposed to UV light. The company says it's suited for building façades in the commercial, healthcare, education, retail & hospitality sectors, as the insulating glass unit's (IGU) interior surface on any exterior wall system. It's also designed for use in all types of public transport such as buses, trains and passenger boats.

Pilkington SaniTise™ is available on multiple tints, and thicknesses. The durable pyrolytic on-line coating lasts the lifetime of the glass and can be toughened, laminated, bent or processed into insulating glass units using standard techniques. The product is also compatible with harsh commercial grade cleaning products and is highly resistant to corrosion, mechanical and chemical damage.

Neil McSporran, Global Portfolio Manager – Incubator Program, at the *NSG Group*, said, "Some viruses can live on glass surfaces for days if left untreated, creating a risk for people to become infected through contact transmission.

"Pilkington SaniTise™ ultimately helps to reduce the chances of this happening, which could make a big difference in high-touch applications such as Shopping Centre doorways or the passenger window of a bus, for example.

"Obtaining third party verification of the coatings effectiveness is a huge milestone, which represents a major push by our UK-based R&D team to respond to the very new challenges that the built environment and transport faces in the wake of the pandemic."

PILKINGTON.CO.UK/SANITISE

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

FENETECH and MIDWAY WINDOWS & DOORS

Collaboration

Located on Chicago's South Side, **Midway Windows and Doors** claims a rich legacy of unmatched quality and unparalleled customer service—a distinction that has earned this manufacturer of new construction, replacement windows and patio doors the unrivalled devotion from their customers throughout the Midwest.

Vice President Artie Strauss describes the family-owned business in humble terms. His grandfather Arthur started Midway in 1964, eventually passing the torch to his son Art who remains at the helm with his son Artie involved in the day-to-day business. Midway's family-like culture is apparent when listening to Artie describe his relationship with the company's 230 employees, who have undoubtedly contributed to the company's success.

When asked to name their number one competitive advantage, without hesitation, Artie replied, "Our people. We have the best people, and our customer service is top of the line. These people will bend over backward to help our customers."

Until 1998 Midway was a Certainteed® window fabricator. However, once they decided to do their own fabrication their way, the dynamic changed. Despite not knowing how their customers would take to this new idea or how their employees would handle the transition, Midway found that change was a good thing. "Being on our own and controlling our destiny turned out to be a lot easier than having a major company behind us. We found we could control all aspects of production."

In the ensuing years – and with the knowledge that they could manage a transition and come out ahead – Midway sought a better software system to manage their business. Their biggest fear, though, was the process of changing to something more modern and streamlined. Getting those valued employees on board with a new ERP system would not be an easy task, but past experience informed their decision to explore new possibilities.

Among the many elements they didn't have with their existing software system was customization. Midway knew they first needed to customize certain features and then find an effective tracking and shipping system. It didn't take long for Artie and the others at Midway to realize that *FeneVision* was the whole package.

When discussing the thought process while searching for an ERP, Artie said, "As we started to grow, we knew we needed a system that offered us a partnership – a company that had the best interests of our business in mind. We wanted to partner with a company that shared our philosophy about the value of our customers."

FeneVision's front-end capabilities were the tipping point for Midway. "We needed a better way for our customers to enter quotes. Once implemented, FeneVision WEB helped us enormously in improving our quoting process by providing a far better user experience. All our customers love it. With our old remote quoting system, some of our more seasoned customers wouldn't even use it. And, half my day was just spent managing it. Now, with FeneVision WEB, customers can jump in after an hour's training and enter quotes in real-time with much better feedback on order status. Our CSR's can handle more customers. It's made a huge difference."

During the decision-making process, **FeneTech** was up-front about proposed enhancements to the software – enhancements based on user feedback. "The things FeneTech said they were going to do, they actually did. That was a very big deal." And that implementation process? Through solid training, Midway found the things they needed out of the software – like customization – could be achieved.

"The fact that this system is so fully integrated from – order entry through shipping – gives all of us on the operations side of this business the ability to see not only what we have to do,

←

→ but what others on our team have to do."

Finally, Artie noted that the opportunity to network with others in the industry and to have the company's ideas heard and acted upon is unique among other providers. "Take the user conference: No one in the industry does it quite like this. No one deliberately brings in competing companies to an event like this to network among competitors, and few companies are as eager as FeneTech is to hear from their customers about their needs. We find great value in bringing as many of our people as we can so our employees can see what is available within the software." Now that they are well into their third year with the software, Midway is more than satisfied with their decision to implement FeneVision. "FeneVision is there when we need them. Whenever we need any kind of help, they're always there. We wanted a partner and got one. Our relationship with FeneTech and FeneVision is definitely a partnership we value."

FENETECH.COM

GLASTON

PLG acquires entry-level Glaston RC tempering line and then upgrades

"We've always been an important partner to the large window manufacturers in Finland. Listening to their needs and responding has helped us stay competitive in this market," Tommi Nousiainen, CEO of **PLG** in Finland, explained. "We were not specifically looking for a tempering furnace. But when our customers began to require high-quality tempered glass, we moved swiftly ahead with an entry-level **Glaston** RC model. Since then, we have already been able to upgrade the line twice in response to the rapidly evolving market."

Since 1980, PLG has built its long business success in insulated glass unit production on deep customer relationships. "What makes us unique is most likely our flexibility," Tommi said. "Our customers are king – and are able to tell us exactly what they need."

At the beginning of 2017, legislation for safety glass used in windows began to change. "Until then, we'd always said that a tempering furnace would be the last thing we'd ever get. We were mostly worried about the expense and having enough business to cover the costs," Tommi recalls. "We'd been doing fine for 35 years without one."

Still when the market demands changed and customers reached out, PLG realized that they couldn't go on without a tempering furnace. "We wouldn't be able to offer products that met the new legislation – so it became a necessity to invest," he added.

The Glaston RC Series tempering furnace was delivered in the fall of 2018. Then, PLG began to learn more about the direction their customers were going, what they really wanted from the tempered glass and how to meet those expectations.

As PLG's customers began to request more low-E glass, the addition of a bottom scanner enabled the glass processor to produce higher quality glass with less waste. Again in early 2020, PLG responded to growing needs by installing a Vortex Pro convection system with Insight Assistant for more precise control of the convection air.

"We've come a long way in mastering the tempering process and further developing our capabilities along the way to be in sync with where the market is going. By adding step by step, rather than buying a line with all the bells and whistles, we have been able to expand on-the-go to match the evolving demands of our customers," Tommi explained.

GLASTON.NET

PUJOL

Furnaces adapted to industry 4.0 with the Pujol e-Connect system

WWW.HORNOSPUJOL.COM/EN

With the commitment to continue offering intelligent solutions that improve efficiency and simplify the work of professionals, **Pujol** has incorporated the Pujol e-Connect system as standard in all ranges of ovens, allowing full entry into Industry 4.0.

Pujol e-Connect is an advanced system chosen and developed by Pujol that allows interesting functionalities. Glass processors will be able to have greater control over what happens at all times with their furnaces, achieving greater peace of mind.

Pujol e-Connect allows access in real-time to the state of the oven. Operators can see what process each of the batches is in. Additionally, it is possible to program parameters and, for greater peace of mind, receive a notification of any incident that occurs in the laminating process. It includes, for example, the "CLICK SAVE" function for turning on and stopping the oven due to falling light. In order to access the Pujol e-Connect functionalities, it is necessary to identify yourself through a secure access control with a password.

With Pujol e-Connect, technical assistance is possible by remote and secure connection to the oven from any external device with internet access (mobile, tablet or computer). All the files generated can be downloaded to the device with which it is connected to the oven, avoiding unnecessary travel of technicians to check the status of the machine with the consequent saving in time and money.

The professional has extensive information available to be able to carry out a complete analysis of the oven. This allows, for example, to analyse the temperature curves performed, to view the list of alarms or to compare trend graphs.

In addition, Pujol e-Connect technology offers quick and clear traceability of the entire production process.

WRIGHTSTYLE

Jordan project completed

Wrightstyle, the advanced glazing system company, has completed a tourism project in the Kingdom of Jordan, the contract was for the supply of WSL 50 series FR doors and partitions, providing 120 minutes of fire protection. Wrightstyle's systems have been installed in a hotel in Ayla Marina Village, close to the Jordanian city of Aqaba, on the country's Red Sea coast.

The Jordan contract is just the latest project in the Middle East that Wrightstyle has been involved with, following other contract completions in the UAE, Saudi Arabia, Egypt and the Lebanon; it underlines the international nature of the specialist advanced glazing market, with Wrightstyle able to supply for the full range of indoor and external applications, including doors, screens and curtain walling.

The Ayla Marina Village is transforming a small stretch of coastline into a tourist hotspot, with retail outlets, residential apartments, restaurants and bars. It will also have an international golf course, man-made lagoons opening to the Gulf of Aqaba, and the largest marina in Jordan.

"Our focus on guaranteed quality, from design through to safe supply, has made us a trusted partner on projects large and small," said Jane Embury, director of Wrightstyle. "The trust our customers have in our complete and guaranteed systems underlines the specialist nature of the advanced glazing systems market," she added.

WWW.WRIGHTSTYLE.CO.UK

PILKINGTON UK and C-CAPTURE

Carbon capture capabilities demonstrated

C-Capture Limited have been awarded funding through Innovate UK's Sustainable Innovation Fund. The award will support experiments to quantify the compatibility of C-Capture's carbon capture technology with the requirements of the glass manufacturing industry. C-Capture were supported in their application by UK glass manufacturer, **Pilkington United Kingdom Limited** ('Pilkington'), part of the *NSG Group*. The experiments will assess the feasibility of deploying carbon capture technology on site at Pilkington and are an important step forward in decarbonising glass manufacture.

C-Capture, based in Leeds, is developing what will be the world's most energy efficient- processes for the capture of carbon dioxide. It has patented a unique, safe, low-cost carbon capture technology which uses up to 40% less energy than current commercially available technologies. The technology uses a new class of capture solvents that are amine and nitrogen free, are not classified as hazardous, are inexpensive, and could be manufactured on a large scale from biological sources.

Emissions from the glass manufacturing industry have traditionally posed technological challenges as they contain high levels of impurities that prevent the utilisation of existing technologies. During this project, CCapture will build upon existing data and expose the solvent to representative flue gases found during the glass manufacturing process, as the next step to prove the applicability of CCapture technology to capturing CO2 from heavy industrial waste gases.

By working alongside leading manufacturing companies like Pilkington who are striving to find technological solutions to decarbonise, C-Capture are optimising their technology to fulfil industryspecific requirements.

By investing in infrastructure and projects which provide jobs and reduce greenhouse gas emissions, companies can have a positive impact on climate change and environmental sustainability. This project is an example of how companies can work together, with government support, to enable the industrial sector to 'build back better' from the pandemic, create a more sustainable economy, and help deliver on the government's Clean Growth and Industrial Strategies and net zero ambition.

Dr Helen Atkinson, C-Capture's business development manager, said, "We are delighted to have been awarded this funding from Innovate UK, which will demonstrate the robust nature of C-Capture's solvent, and its suitability for processes which have traditionally been considered difficult to decarbonise. We are very excited to be working alongside Pilkington, their support for this project demonstrates their commitment to reducing their greenhouse gas emissions"

Matt Buckley, Managing Director Pilkington United Kingdom Limited said, "Our Manufacturing and R & D functions are extremely pleased to be collaborating with C-Capture in the development of carbon capture solutions for our glass manufacturing process. We look forward to making further progress in this important and exciting field."

Dr Ian Campbell, Innovate UK Executive Chair, said, "In these difficult times we have seen the best of British business innovation. The pandemic is not just a health emergency but one that impacts society and the economy.

"C-Capture's project to demonstrate carbon capture capabilities for glass manufacturing alongside Pilkington, along with every initiative Innovate UK has supported through this fund, is an important step forward in driving sustainable economic development. Each one is also helping to realise the ambitions of hard-working people."

WWW.C-CAPTURE.CO.UK

CUTTING-EDGE TECHNOLOGY AND HIGH FLEXIBILITY FOR HG-GLAS

In this article, Forvet speaks to one of its historical clients - Koen Vermeulen, Production Manager of HG-Glas - about how the company is continuing to invest in Forvet technologies – since 1996. Focussing on non-standard production, HG-Glas is now looking forward to see what Forvet is planning for 2021 regarding full plant automation and production control.

COULD YOU GIVE US A BRIEF HISTORY OF YOUR COMPANY, HG-GLAS?

HG-Glas was founded around 1900 by Mr. Heylen and his wife, Mrs. Geerts, and initially specialized in glass products and painting tools. After the world wars, the company evolved into a renowned insulating glass installer, and later focussed on glass production for lighting and furniture industries. Since 1981, the company has been located on the current premises of approximately 17.500 square metres in Herentals, a town 50 kilometres south-west of Brussels, Belgium. The focus then shifted from producing large quantities into made-to-order products for the interior market, with high-quality standards as the main target.

FROM THE FIRST FORVET MACHINE TILL TODAY

What are the main reasons that lead you to invest in Forvet technologies?

Our first Forvet was a FC1250 in 1996. It was the first 'automated' drilling machine for HG-Glas back in the days and it was a stepping-stone to start investing in automation in general.

After the successful history of the FC1250, we acquired a FC2500 in 2000 and afterwards two Francesca FC32M's in 2004/2005 to be connected to double-edger lines.

These two lines appeared to be the ultimate test for the relationship between HG-Glas and Forvet. Some issues occurred early on, and lead to frustration on both sides. But in the end, there was always room for co-operation and discussion. Forvet persisted in finding a solution for the chal-

lenges and in the end it all worked out. Both machines are still in a good condition and well producing.
One may say this was a challenging experience, but we see this as a proof of trust between both companies. It has made clear to both of us that in the end, we will both fight to make things work one way or the other and we got to know the values and policies of one another.
In 2013 we were actively working on the layouts of our new plant and were looking for a solution for our grinding/drilling division. The Chiara + Francesca in line were on the table as an option, but the Chiara technology was unknown to us. Being a double-edger customer for so long, made us wary of this new technology used by Forvet.
Forvet decided to pull out their trump card and gave us the opportunity to test a Chiara for three months to convince us that it was a suitable solution.
Which brings us to our new plant of which machinery construction was started in 2015 and completed in 2019, boasting a grinding/drilling division with three fully automated Chiara + Francesca lines for float glass production and a Multiflex line covering a large part of the laminated glass production.

Which are the advantages of the Forvet machines?

The Chiara Modular + Francesca in line offers us cutting-edge technology and high flexibility on a relatively small surface.
Our main production in float glass consists of high-end and custom made glass for interior usage.

Almost every glass is unique so 'standard' is not a key-word at HG-Glas. This implies that we needed a grinding/drilling combination which could deliver high polish quality (cup wheels, no peripheral), high flexibility in product size, shapes (25 per cent of production is shaped) and can work in a highly automated environment (manual labour has to be avoided as much as possible).

Due to our limited available space in our newest production facility, we also faced another hurdle when designing the lay-out.

The answer was delivered in 2015 with our first two Chiara + Francesca processing lines and eventually a third line as well.

With the positive experience of the Chiara Francesca lines, we decided to invest in the latest edging Forvet technology: the Chiara Multiflex which arrived in 2019 and was somewhat a 'leap into the unknown' for us. Grinding laminated glass poses extra problems that should be reckoned with and that could potentially plummet production numbers if you're not well prepared. The Multiflex has proven to easily beat the output of a double-edger (step by step production) on a daily basis and delivering the same or higher quality.

Please describe Forvet added values for your productivity and quality

We think it's safe to say that our grinding/drilling division has one of the highest efficiencies per square meters (taking into account the complexity of the products). This is due to the implementation of the Forvet lines. The high flexibility and automation of the Chiara's has reduced manual labour and transportation of glass to different machines. The Francesca's with water jet technology have not only made processing glass

faster, but also improved the quality a lot (compared to milling).

How would you rate the after sales service and ongoing technical support?

Working with Forvet for so many years has given us the advantage that we got to know some of their technicians and technical staff very well. They share the same philosophy as we do and won't stop until they see a happy customer. This is extremely important for us as no customer, big or small, should be treated as a number and this is what Forvet offers. They listen to your problems and try to find a solution as fast as possible. Knowing some people personally, we know their commitment not only to Forvet but also to delivering the Forvet quality everywhere at anytime.

Given your production results, do you confirm that the investment made with Forvet has met your business plan?

The demands of our project and the solutions offered by Forvet had a 90 per cent match. Looking back at it now, we wouldn't make any different choice whatsoever…

Can you express your view on Forvet's total plant automation approach

Forvet is known to us for successfully implementing cutting-edge technology. They go the other mile and take risks were others will stop or fail. What we have experienced from Forvet automation is promising. There's always a solution for any question you ask Forvet. Custom machinery and automation are daily business for Forvet. We're eager to see what Forvet has in store for us in 2021 regarding full plant automation and production control.

What are the future plans for HG-Glas?

We're planning a big makeover of our older plant. The current machinery will have to go and make space for new highly automated machinery. An increase of the grinding capacity is necessary and our automated packing division also needs an upgrade in capacity. New processes are also on the table. Recently we have acquired another 10,000 square metre facility neighbouring our current premises, so we're set for the next years regarding space.
Of course the COVID situation has put the world economy in a strange situation. But we will continue our planned investments as we believe in a positive future. To do this, we'll need reliable suppliers which we hope Forvet will be part of.

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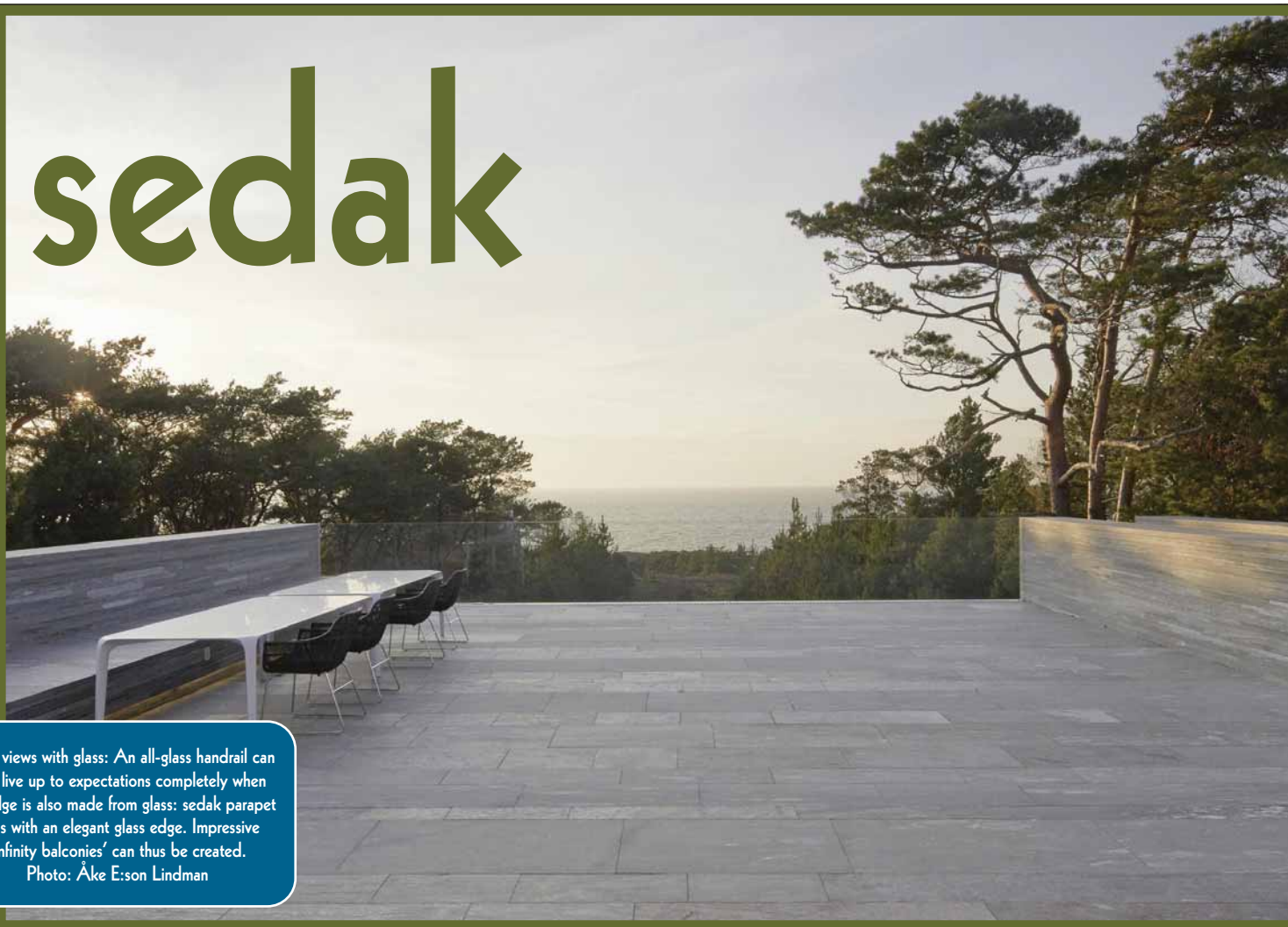


Wide views with glass: An all-glass handrail can only live up to expectations completely when the edge is also made from glass: sedak parapet glass with an elegant glass edge. Impressive 'Infinity balconies' can thus be created. Photo: Åke E:son Lindman

PARAPETS AND HANDRAILS WITH GLASS EDGES FOR CRYSTAL-CLEAR VIEWS

UNOBSTRUCTED VIEWS

With its glass edges for all-glass parapets and handrails, sedak combines attractive aesthetics with function. There is not even a narrow metal component to spoil the view. Curved or even bulletproof parapets are also available.

If balconies and roof terraces are to offer unobstructed sweeping views into the distance, then the vista should not be blocked by (opaque) handrails. Glass parapets can provide such clear views but the edging often spoils the transparent effect. This edging protects the glass from the effects of the weather and from impacts,

sedak is continuing to use its pioneering spirit in its position as a premium manufacturer of large-format insulating and safety glass. Iconic façades and buildings are created with an unprecedented degree of transparency thanks to superior quality of innovative products, with glass becoming a construction material for all-glass façades and roofs.

and is therefore necessary. In order to eliminate this optical interference, sedak has developed functional edge protection – made from glass! This provides seamless vistas; near and far merge together optically. These highly transparent aesthetics are now available in two variants.

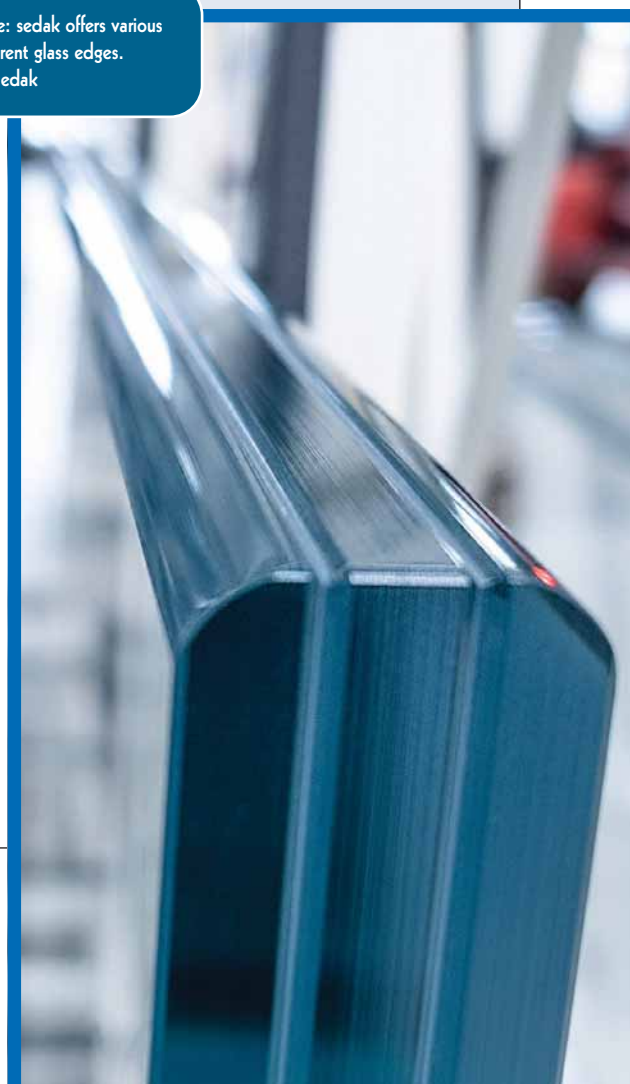
FUNCTIONALITY WITH PLEASANT HAPTICS

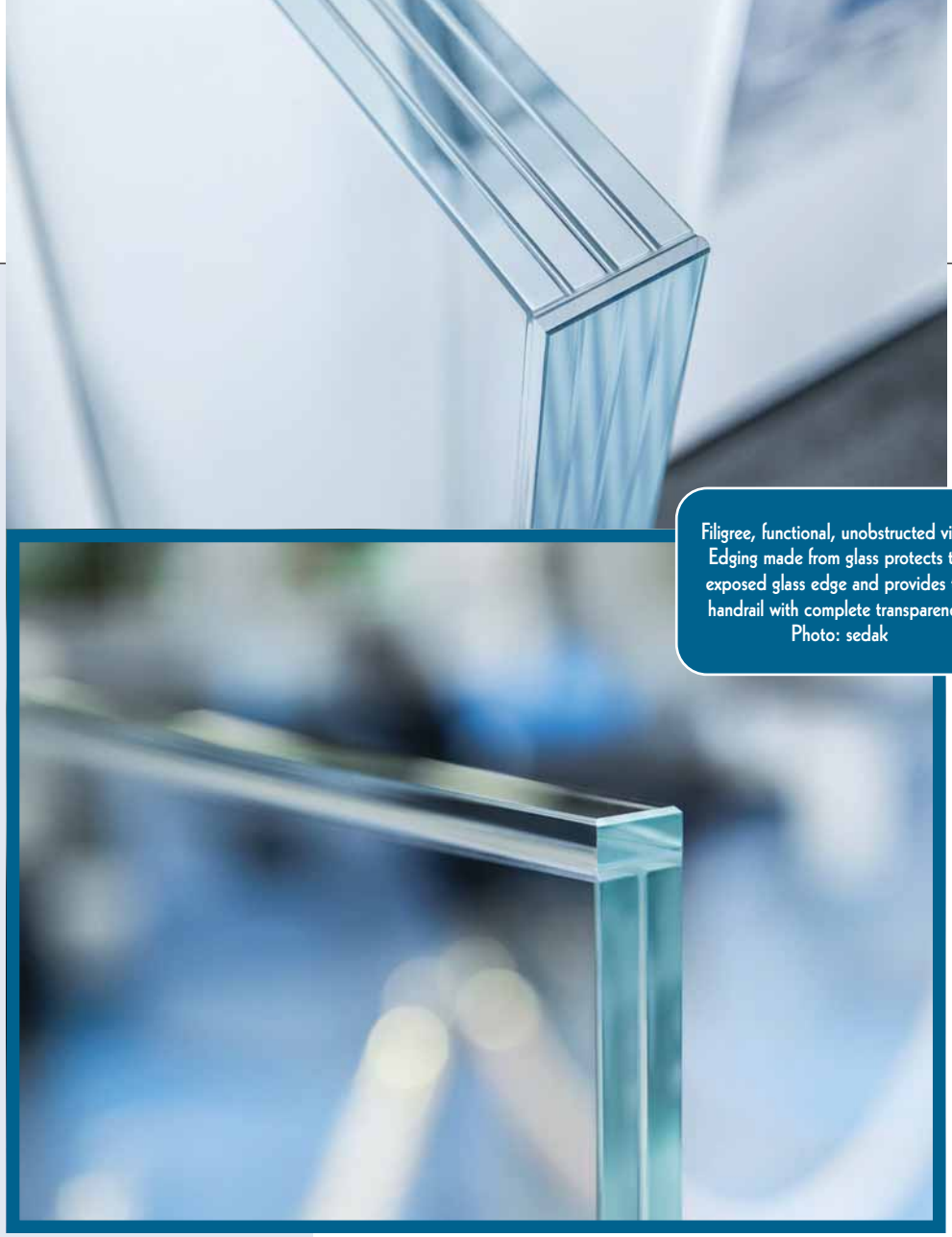
When topped with a defined glass C-edge, handrails are given an exceptional feel and completely transparent optics. Dirt cannot stick to the rounded edge and water flows off, so the edge stays clean for longer. Handrails with a C-edge are also available with astounding curves: in these curved variants they take up the sweeping geometry of the building and transpose it into highly transparent handrails and balustrades with the aesthetic properties of glass.

MODERN ELEGANCE, MAXIMUM TRANSPARENCY

Classical elegance is provided by 'sedak clear-edge', a transparent edging for handrails. The patented edge protector covers the upper edge of the laminate and provides a clean finish to glass parapets. With its highly polished sides and flat top, the glass strip thus protects the laminate from the effects of the weather and also functions as protection against impacts.
For increased security requirements sedak also manufactures individual

With an intriguing C-edge: sedak offers various solutions for transparent glass edges.
Photo: sedak





Filigree, functional, unobstructed view: Edging made from glass protects the exposed glass edge and provides the handrail with complete transparency. Photo: sedak

all-glass solutions for balustrades and handrails in bullet-resistance classes up to BR7 NS and STANAG level 3.

SEDAK – LEADING GLASS

Since its founding in 2007, Germany-based company sedak has used its pioneering spirit to establish itself as a premium manufacturer of large-format insulating and safety glass. sedak has evolved their glass as a construction material for all-glass façades and roofs. Iconic façades and buildings are created with an unprecedented degree of transparency thanks to superior quality of innovative products.

sedak manufactures single-pane glass units, multi-layer glazing and functional insulated glass units in formats up to 3.6 x 20 meters in an efficient, highly automated system. Raw glass is treated, strengthened, laminated, printed, lamination-curved and assembled into insulated glass with a unique set of machinery that spreads over a production area measuring 35,000 sq.m. Since integrating Italian-based Sunglass Industry srl, who are the specialist in curved glass, sedak's core expertise also now includes hot bending glass. The specialist also supplies exceptional solutions for luxury yachts with optimized glass for use on the high seas.

The glass fabricator particularly demonstrates its solution-oriented expertise in special designs. Thanks to its research and development spirit, new technologies and the expertise of its 190 employees, sedak is constantly advancing innovations in glass finishing and sees itself as a partner to architects, developers, façade builders and metalwork companies. As a specialist in oversized and extremely heavy glass, the company develops future-oriented solutions to implement customers visions with a flexible approach. The glass fabricator acts as a full-service supplier – from the initial order to final delivery. sedak thus helps advance tomorrow's visionary architecture today.

Exceptional reference projects provide proof of impressive expertise. These include: Lakhta Center, St. Petersburg / House of European History, Brussels / Faculty of Medicine, Montpellier / Torre Europa, Madrid / Iconsiam, Bangkok / Apple Park, Cupertino / Apple Cube, New York / Experimenta, Heilbronn / Numerous premium flagship stores.

Areas of use
- Glass façades
- Glass roofs
- Glass stairways
- Glass balustrades
- Yacht glazing
- Pool glazing
- Safety glazing
- All-glass structures
- Interior design
- Special designs

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Si.Ste

COMING SOON

2021 NEW CATALOGUE

Si.Ste Trading announces the release of the new 2021 general catalogue.
We have renewed the graphics and implemented the product range with many new features!

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E-mail: info@sisteitaly.it - www.sisteitaly.it

Si.Ste

in this article, Si.Ste Trading gives us a preview of its new product catalogue for 2021, which includes a much wider range of products and numerous new entries. In this difficult year for us all, the company has decided to focus on the development of new products and higher quality.

SI.STE TRADING

NEW PRODUCTS AND INVESTMENTS

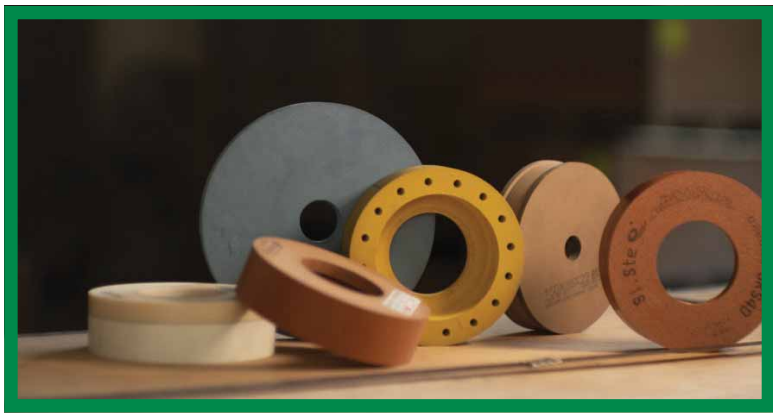
Si.Ste Trading srl was founded in 1997 by Luigi Sala after a long experience in the glass sector first in S.I.V (Italian Glass Society) and later as commercial director of Bavelloni.

Luigi Sala started his own business as a distributor of accessories and consumables for glass processing in his own living room. After 23 years, the company is now made up of a team of eight people and a warehouse of almost a thousand square meters.

SECOND GENERATION

Luigi Sala's sons, Simone and Stefano, then took over the business management with their father always at the forefront to guide and to contribute with his precious advice. Simone is in charge of sales in the Italian market and the administrative part of the company. Stefano follows international sales and is in charge of the technical aspects of product development.

The company has a very specific sales focus, with a product range that aims to meet the needs of both small glaziers up to important glass industries, making greater use of the collaboration of dozens



of distributors located all over the world at international scale.
Development and goals are those of increasing sales by searching for new areas and new markets and increase product ranges; which is why the company has invested so much in the new catalogue, in supporting documentation and company graphics.

QUALITY PRODUCTS AND SERVICES

The fixed points of Si.Ste Trading always remain two and these are the driving factors of the company since its birth: quality of products and services.
Working all over the world, Si.Ste Trading has decided to focus on the highest quality of products and in the timeliness of deliveries. The stock in the warehouse in recent years has been more than doubled to guarantee just in time delivery.
The products on which the company is focusing its efforts most are: polishing and diamond grinding tools, accessories for glass processing and lamination products.

EVASHINE

The latter is the sector with the greatest increase since the introduction of Evashine lamination eva to the market four years ago, of which Si.Ste Trading is the distributor for all Europe with its sister company GMT Bulgaria.
Evashine is very high quality product which is meeting the highest standards of glass lamination with EVA. Available in different sizes and formats, both extra clear transparent and white. The whole range is always available on stock for immediate shipments.

IMPORTANT COLLABORATION

To confirm and validate the search for the quality of the products it offers, Si.Ste Trading has signed important exclusive collaboration agreements with manufacturers of machines and consumables such as: Intermac-Biesse (machinery), Diamut-Biesse (diamond tools), Artifex dr Lohmann (polishing wheels), Neptun (machinery), RBB Brazzi (lifting machinery), Sulak (machinery), Dieffe (water treatment machinery) and Unelko corporation (surface treatment).
In addition to the above, the company has also established collaboration with companies such as: RBM Italia, Italmole Italia, Chemetall-Basf etc..

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Forel

Hitech Safety Glass Headquarters in Durban (South Africa)

Forel speaks to Mr. Vihaan Dasarath, about Hitech Safety Glass's future goals, market trends and obviously, glass processing machinery, a year after the company invested in a Forel vertical processing line made up of an Edging Machine Art. EM, a Drilling and Milling Machine Art. DM and a Washing Machine Art. VW.

HITECH SAFETY GLASS ENHANCES QUALITY

Hitech Safety Glass headquarters are located in Durban, on the east coast of South Africa. The glass company was initially called City Glass and it was established by Mr. Roopnarain Dasarath as a family business 43 years ago. The company sold glass that was cut to size and provided glass installation services, with patience, hard work and dedication, the family business grew successfully.

Mr. Roopnarain Dasarath's son, Ishan Dasarath, has been on his side since the beginning. Ishan introduced an architectural fenestration division in the late 1990s called 'City Glass & Aluminium'. With

Hitech Safety Glass Team

The Drilling And Milling Machine Art. DM

the success of the business, the Dasarath family saw a new opportunity in enlarging their activity to include glass processing and in 2004 Hitech Safety Glass Ltd. was established.

Hitech Safety Glass revolutionised the local industry by offering an overnight delivery service and continued this trend by being the first to manufacture double glazed units in its home state of KwaZulu-Natal. The company then expanded to Port Elizabeth, in the Eastern Cape, where it has a second fully operational plant.

The company is currently undergoing generational change, with the introduction of Vihaan, Ishan's son, to the family business four years ago. A year ago, Hitech Safety Glass invested in a Forel vertical processing line made up of an Edging Machine Art. EM, a Drilling and Milling Machine Art. DM and a Washing Machine Art. VW.

Forel spoke to Mr. Vihaan Dasarath, about Hitech Glass's future goals, market trends and obviously, the glass processing machinery.

Hitech Glass is a three-generation company and in a few years will celebrate its 50th anniversary. How is business today? How is the cooperation between the previous and the new generation?

The strength of the previous generations has helped the new generation to embrace the opportuni-

Vihaan, Roopnarain and Ishan Dasarath and their Forel vertical processing line

ties offered by the fourth Industrial Revolution in order to continue the family philosophy of customer service and quality, in these changing times. The average customer ranges from a retail consumer to architectural aluminium installers, interior decorators, showers and balustrade installers and the refrigeration industry.

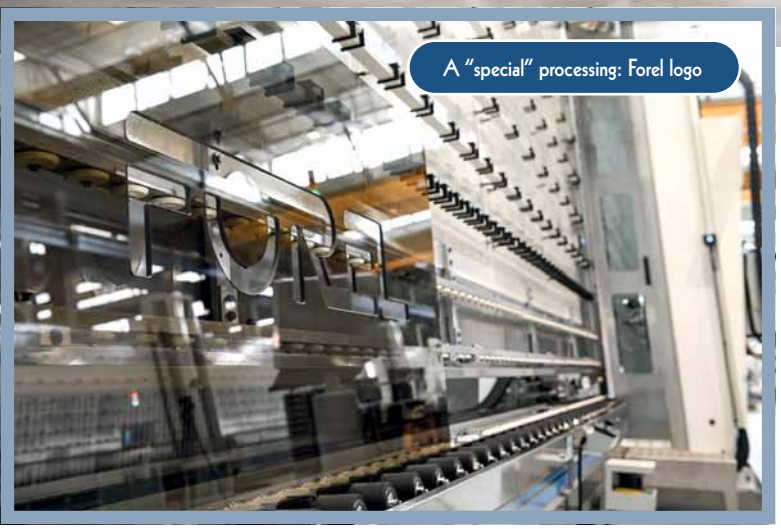
The strength of Hitech lies in its ability to service a range of customers across the spectrum, a customer that is asking for an always higher quality. Our mission is to be always a competitive supplier, so our efforts are focused in a continuous growth and improvement of our offer, also by investing in more advanced machinery.

Speaking about the investment, one year ago Hitech glass invested in a new vertical processing line by Forel. What is the target of this investment? Have you reached your goals?

This investment was in line with our strategy to enhance quality and drastically reduce lead times. This significant purchase for Hitech has exceeded expectations and the association with Forel has been

Tools of the Drilling and Milling Machine Art. E;

The Edging Machine Art. EM



A "special" processing: Forel logo

nothing short of fantastic. After extensive research, we were drawn to Forel as a manufacturer. While travelling through Canada, we have met the representatives of Forel North America, which provided the opportunity for me to see Forel processing lines in operation at various factories in Toronto. The quality of the machinery was something that attracted me to the brand, but it was the family ethos of the company that convinced me that Forel was the right partner for Hitech. We are two family companies established in almost the same year, grown with a similar passion and dedication to the customers' needs. It was easy to find a common language.

What do you appreciate about Forel vertical processing line?

The fully automated EM, DM and VW line has essentially combined three departments into one seamless production line. The ability for glass to pass through three different processes with no human contact has drastically reduced reject rates. Add to this the use of sophisticated software which ensures that all drilling and milling is done to exact dimensions.
The greatest facet to this line is the simplicity of the user interface, which allows easy connection to Forel's 24-hour service centre in case or fault.

What do you think about Forel as a supplier? (technology, service, assistance, ecc.)

We view Forel as a strategic partner rather than a supplier. Their support from pre- to post-sales has been excellent. We're very satisfied with choosing Forel for our machinery.

Covid-19 emergency is changing many aspects of our lives, and our business. In your opinion, how South African market will evolve in the future?

The South African market has followed the developed world and we believe that this trend will continue for the foreseeable future. The contraction of the world economy caused by the current pandemic will force the consumer to tighten their budgets. This will flow through the chain and developers and builders will have a greater focus on cost-effective products. As an industry, we will have to cut inefficiencies and create synergies to meet the nuanced demand.

Forel SpA

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VDMA

PRINTING GLASS IS NOW POSSIBLE!

Metals, concrete, and plastics are all materials which can be printed. But what about glass? Companies, institutes, and universities are researching the possibilities and have been able to gain experience from experimental procedures. The most common materials used here are silica glass or borosilicate glass, while applications using soda-lime glass are less common. Printed glass can be used in many applications, which is why it is certainly worth investing time and money into research.

Glass is becoming ever more popular in building architecture as it is deemed a modern and elegant material. The growing demand for large and custom glass façades which can take on additional functions is spurring on designers. Glass fronts must not only be aesthetically appealing, but also securely installed and durable, as well as being able to permanently withstand the enormous loads they are under. However, visible joints and load take-up points disrupt the image of a homogeneous, transparent façade. In general, attaching

the panes requires holes to be drilled in the individual elements, which harbours the risk of damaging the glass and thereby reducing its strength. Another option is to use adhesives to join components, but this has the disadvantage that the adhesive materials can age quicker than the joined parts due to UV radiation. A further aspect is that joined elements with different mechanical and thermal properties are used for both drilled and glued joints. Using glass from a 3D printer as a joint material, for example for point fixing, results in two identical materials with the same properties being joined together. This avoids different heat expansion factors between the materials, and the risks inherent with using drilled holes or adhesives are no longer a factor. The Glass Competence Center (ISM+D and MPA IfW) at the Technical University of Darmstadt is conducting research on how to create a substance-to-substance bond on float glass using additive manufacturing (3D printing), while simultaneously increasing its rigidity. The scientists here are testing fused deposition modelling, amongst other approaches. Their aim is to enable glass panels with an area of up to 3.25 x 20 metres in the future. Two important factors are the process temperature and the viscosity of the glass. In order to create a joint between a pane and a glass structure, the pane must be heated significantly beyond the transformation temperature of glass at the join. If insufficient heat is applied, the structures will not join together, while if the temperature is too high, unwanted deformation can occur. Internal tension in the joint reduces its strength and ability to support loads. Brittle material behaviour and a combination of individual process and material parameters can also have a significant impact on the result. It is, however, absolutely possible to manufacture a homogeneous joint in a desired geometry with an appealing and transparent appearance using 3D printing. The scientists at TU Darmstadt also hope to find an answer for the question of how to convert this procedure into an automated process.

Visitors to glass technology live at glasstec 2021 can also look forward to a further research project, as the scientists are planning to exhibit a 3D printed glass staircase with glass brackets.

JUST LIKE GLASS

When comparing the material properties, environmental impact and raw material properties of glass and plastic, glass comes out on top across the board. Unfortunately, melting glass is both complex and expensive, which is why the industry prefers plastic in part. The general methods used to process glass have hardly changed over the centuries, with the most common being grinding, polishing or etching. Glassomer GmbH develops materials and technologies which first enable the shaping of polymer nanocomposites at room temperature, before they are subsequently converted to glass at temperatures between 700°C and 1300°C. Glassomer® is a silicate nanocomposite, which enables highly pure quartz glass to be manufactured from a solid, paste or liquid state. Liquid Glassomer can be used to duplicate components at room temperature through casting or stereolithography. Solid Glassomer can be structured using traditional subtractive techniques such as drilling, milling and turning, or even with a knife. Thermal polymer transformation technologies such as nanoimprinting, thermoforming or roll-to-roll replication are also possible.

Glassomer components are chemically and physically identical to commercial quartz glass. They have comparably high optical transparency in the visible, UV and infrared spectra, as well as equal thermal and chemical stability and mechanical strength. Additional solids in the starting material help prevent the glass from shrinking during manufacturing. It is also

possible to manufacture components with threads. Simple technologies, such as casting, enable uncomplicated replication, and smaller components can be created using simple 3D printers. More complex tasks require high-resolution microstereolithography. Using this procedure, extremely fine structures with diameters of just tens of micrometres can be created without transitions. Glassomer is the first product to enable the structuring of high-quality quartz glass using polymer processing technologies. The replication is accurate right down to just a few micrometres and the resulting glass has a surface roughness of a few nanometres, which meets the demands of both optics and photonics applications. Users can create voids in bodies using sacrificial templates and extremely fine structures in bulk materials.

MELT FIRST, THEN PRINT

The Günter Köhler Institute for Joining Technology and Materials Testing (ifw Jena) in Jena collaborated with FH Aachen University of Applied Sciences to analyse laser powder bed fusion (L-PBF) of borosilicate and quartz glass powders within the process chain of 3D printing. This procedure has benefits including free geometric shaping, low production costs in small and medium-sized production runs and comparable component properties of the glass bodies. The scientists characterised the glass powder classes based on their geometric, thermal and mechanical-physical properties, and analysed how they can be processed at different laser wavelengths in the L-PBF process. To this end, the plant technology was adapted to the conditions of processing glass using CO2 laser radiation. The effort is worth it, as glass meets requirements in glass equipment or chemical plant construction that metal cannot. Glass has a high temperature resistance, thereby requiring a high energy input to melt, and is a poor conductor of heat. Scientists wish to investigate how they can

overcome this factor and the poor absorption at the wavelength of 1,064 μm. They were already able to prove that it is generally possible to process glass powders and define process parameters, such as laser power, scan strategy, powder coat thickness, chamber heating and much more. Researchers manufactured test specimens made of borosilicate and quartz glass and subsequently assessed their quality. The parameters were strongly dependent on the geometric shape of the specimen due to the heat agglomeration. Tempering can help improve the quality of the glass components. Further experiments aim to test the porosity, roughness and density in relation to the L-PBF parameters and clarify the possible application areas for the components.

The thermal and chemical resistance inherent to quartz and borosilicate glass have resulted in them becoming proven materials in glass equipment construction, microfluidics, microelectronics, optics and medical technology. A further research project at ifw Jena aims to develop an additive process based on laminated object manufacturing (LOM) with the goal of enabling additional industrial applications. In this project, complex glass components – for example with interior cavities – are constructed which could not be manufactured using conventional fabrication technologies. The procedure is intended to combine laser cutting and diffusion welding. Aside from quartz glass, CO2 laser cutting (= 10.6 μm) causes the glass composition in the area of the cut edge to change, the thermal expansion coefficient to shift and a bead to form. The research goal is to define process parameters for the respective glass in order to remove these effects.

VDMA

VDMA represents around 3300 German and European companies in the mechanical and plant engineering industry. This innovative industry is export-oriented and predominantly made up of SMEs, employing around four million people in Europe, including more than a million in Germany alone.


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SATINAL STRATO®

IS THE FIRST AND ONLY EVA INTERLAYER CERTIFIED BY MIAMI-DADE COUNTY

Satinal is continuing to invest in quality in order to offer the market a product that can be safely used in a variety of applications and in compliance with the different building codes – now also in Dade County, Florida, USA.

Satinal is proud to announce that STRATO® interlayer is now the first EVA film approved for use in Dade County, Florida, USA, and meets its toughest standards. STRATO®, in fact, has passed the weathering and flammability requirements that have been set and mandated by Dade County Florida to allow the sale of the product in the wind-borne debris zone.

NOTICE OF ACCEPTANCE (NOA) APPROVAL

STRATO® is the first and only EVA film that has received the Notice of Acceptance (NOA) approval. Before buying a product, glaziers and system designers should check that the interlayer has been truly certified. In this specific case, it is possible to search Miami Dade's database for products, certificates and listings that have been approved, complying with Florida Building Code, including the High Velocity Hurricane Zone.

The sample of laminated glass (33.1) with STRATO® EVA interlayer successfully passed the following tests:

- ASTM G155-13 | Xenon weathering
- ASTM D638-14 | Tensile strength
- ASTM D1929-10 | Self ignition temperature
- ASTM D2843-10 | Average Smoke density
- ASTM D635-10 | Average liner burning rate – Average extent of burning – Average smoke density

MINIMISING AND EVEN PREVENTING DAMAGE

Damage to glazing systems can be prevented, or at least minimised, by using glazing that has been designed to resist wind and wind-borne debris forces specified in the building code. Impact-resistant systems provide protection through the use of laminated glass with STRATO® EVA interlayer. As a result, architects now have the option of using an advanced high-quality glazing system in hurricane applications or other areas (interior or exterior).

CONTINUOUS INVESTMENTS IN QUALITY

Satinal continues to invest in quality in order to offer the market a product that can be safely used in a variety of applications and in compliance with the different building codes: the complete product range of STRATO® is now certified according to European (UNI EN ISO), American (SGCC - ANSI) and Miami Dade (ASTM) standards, counting more than 40 certifications.

For further information on the certifications achieved by STRATO® please send an email to customer@satinal.it or call +39 031 870573

Glass Company

FIREMEK - SOPHISTICATED TECHNOLOGY COMBINED WITH EXTREME EASE OF USE

Fire-resistant glazing is an essential part of buildings and, up to now, the production of this special type of glass has been carried out exclusively by a small number of manufacturers. With its new system, Glass Company now opens this sector to medium/small businesses, thanks to automatic weighing of components, perfection of heating and cooling of the vacuum mixer.

WHAT IS FIRE-RESISTANT GLASS?

Fire-resistance is the definition of an element that has the ability to maintain its mechanical characteristics and limit heat transmission and smoke resistance when directly exposed to the action of fire.

Fire-resistant glass is a special type of glazing made up of diverse sheets of glass separated from each other by an intumescent interlayer (a particular type of gel). If necessary, the heat causes the interlayer to expand, which turns into an insulating foam that reacts to the presence of fire and prevents the spread of flames and smoke.

The higher the number of layers, the greater the fire resistance class of the glass, which will therefore guarantee protection for a longer period.

Fire resistant glass is designed to respond to three different requirements:

Irradiation resistance (W):

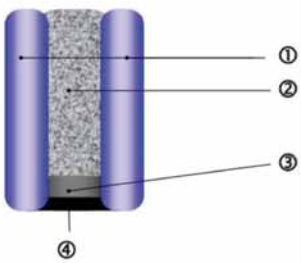
- the ability of a component to withstand fire on one side of the glazing by limiting the transmission of heat by irradiation within a specific threshold both to the surface not exposed to the fire and to other materials adjacent to it;
- air-tightness or seal (E): the ability of an element to resist the passage of flames and hot gases to the side not exposed to fire, preventing the combustion of elements close to that surface;
- insulation (I): the ability of an element to withstand exposure to fire on one side of the glazing only, preventing propagation by conduction to the protected side, avoiding the combustion of materials adjacent to it and protecting people in the vicinity.

There are therefore three different fire-resistance classes for glass as per the guaranteed performance of the glass sheets:

- E (resistance to the passage of flames and hot gases to the side not exposed to the fire, preventing the combustion of elements close to this surface);
- EI (maintenance of the average surface temperature of the side not exposed to fire below 140°C, with local maximum peaks below 180°C);
- EW (maintenance of heat radiation below 15W/m2 at a distance of 1 metre).

The resistance class of the

Composition of EI 30 fire-resistant glass made with two monolithic glass sheets



1. Tempered safety glass
2. 4-6mm (30') silica based dispersion
3. Spacer
4. Perimeter sealing

certified construction elements is expressed through the resistance time of the element itself to standard laboratory fire, i.e. 30, 60, 90, 120, 180 minutes.
We can summarize the above by saying that the degree of fire protection offered depends on the class of glass used (E, EW, EI) to prevent the spread of flames and smoke, and increase the degree of protection (insulation) against heat in the event of fire.
The use of fire resistant glass is therefore an important part of building safety, and is specified by building regulations.
There are products available that also ensure the fire performance class required for specific applications, such as curtain walls, walkable roofs, glass for the naval and railway sectors, large sheets, while providing additional performance, such as solar control.

FIREMEK

FIREMEK, is a system for the production of fire resistant glass developed by Glass Company Srl, already in use in leading multinational companies in their production of fire resistant glass. FIREMEK incorporates sophisticated technology combined with extreme ease of use, which has made the production of E, EW and EI glass no longer exclusive and the prerogative of a few manufacturers, but is now also available to medium/small businesses.

The continuous evolution of the system now allows to prepare the intumescent mixture without errors caused by human intervention, the automatic weighing of components, the perfection of heating and cooling of the vacuum mixer. The precision of the pump controlled as weight/ volume by the PC, allow to produce daily and replicate over time an intumescent mixture based on extremely transparent and bubble-free silica.
An important component of the production of FIREMEK is the cross-linking furnace, which has been designed to compensate for all the small defects that inappropriate heating and an unsuitable base can create in the final part of the production of fire-resistant glass.

Glass Company Srl

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CHINA GLASS 2021

31st China International Glass Industrial Technical Exhibition

Shanghai New International Expo Centre

May 6-9, 2021

Organizer: The Chinese Ceramic Society
Supporter: Shanghai Ceramic Society
Contractor: Beijing Zhonggui Exhibition Co., Ltd.

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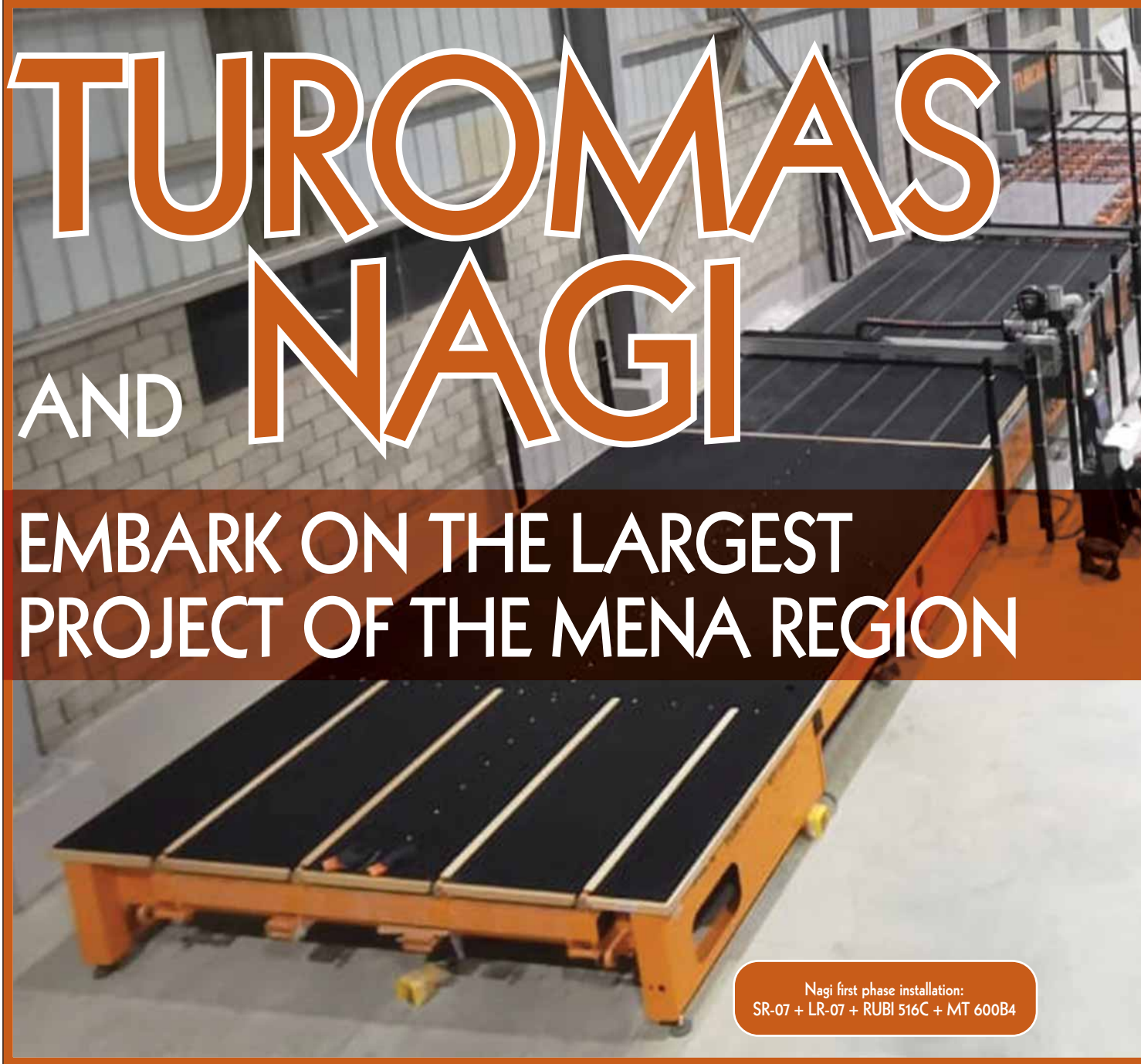
TUROMAS AND NAGI EMBARK ON THE LARGEST PROJECT OF THE MENA REGION



Nagi first phase installation:
SR-07 + LR-07 + RUBI 516C + MT 600B4

MAXIMUM AUTOMATION IN CAIRO

In 2018, Nagi Glass Industries, one of Egypt's leading glass processors, launched a public bid to select the best glass storage, loading and cutting equipment to meet the needs of its new plant in Cairo.

The selection process culminated last year with the election of Turomas against other recognized brands worldwide. The technology and quality of the Spanish brand equipment were the factors that determined the decision.

One of the customer's main requirements was the complete automation of flat glass storage, loading and cutting processes, as well as improving the plant productivity.

In order to achieve these objectives, complying with the expected quality requirements of one of the largest glass manufacturers in the MENA region, Turomas studied different alternatives until it found the final distribution: two

In this article, Turomas takes us through the various steps of one of its most recent projects involving the complete automation of flat glass storage, loading and cutting processes, as well as improving plant productivity of Nagi Glass Industries, one of Egypt's leading glass processors.

The acquisition of the Turomas intelligent machinery together with the additional equipment to be incorporated constitutes one of the largest projects in the Mena region. Once completed, Nagi will be positioned as one of the most automated plants in Egypt today.

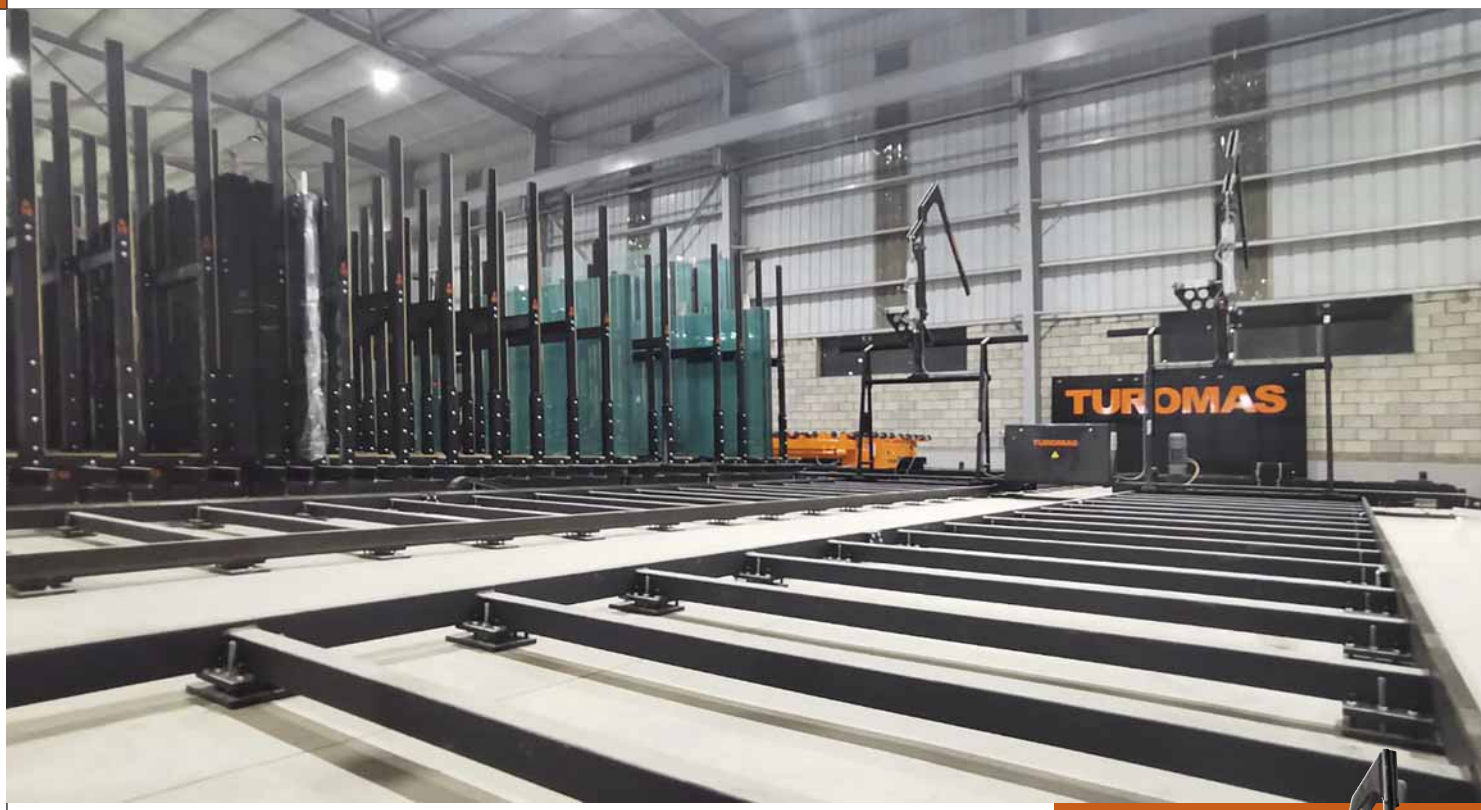
CIRCLES PLAYED A KEY ROLE

This success in Egypt has been made possible thanks to the great support and work carried out by Karim Badawy, founder of Circles for Float Glass Consultancy Co., LLC. who recommended Turomas brand and helped the sales team to better understand Egyptian market.

He established this company in 2016 to serve as a consultant for the glass community in Egypt and North Africa. Circles helps to close the distances between glass manufacturers and processors, and

RUBI 516C Linear driven float glass cutting machine

monolithic glass cutting lines model RUBI 516C integrated with an intelligent SR-type Rack Shuttle warehouse. The union of both machines comprise a fully automated line with the capacity to store more than 800 tons of glass.



has also facilitated the improvement and growth of the regional glass market by providing the best choices and alternatives from all over the world to serve its partners.

Thanks to the trust placed by Nagi, together with the work carried out by Karim Badawy Turomas has achieved the largest and most ambitious project in the Egyptian glass industry. With this installation the Spanish brand expects to strengthen its position and become the reference company in the Mena region.

RUBI 516C CUTTING TABLE

The RUBI 516C float glass cutting table incorporates linear motors. Turomas pioneered this technology in its monolithic glass cutting range, having now more than two decades of experience with this system. This solution allows to significantly increase the speed and acceleration on both axes bringing greater cutting accuracy while reducing noise and mechanical stress.

The RUBI 516C can also cut glass of any thickness — from 0.55 millimetres to 25 millimetres — thanks to its cutting head with four individual tools named 4-Tool. Each of the four tools in this system invented and patented by Turomas has its own cutting wheel and pressure cylinder calibrated for its cutting range and lubrication procedure. The cutting quality achieved with the 4-Tool reduces the time of the next glass process, saving costs and eliminating downtime.

In addition to the linear motors and the 4-Tool system, it also incorporates the TFS advanced planimetry system, which consists of a combination of aluminium and phenolic coating on the cutting table surface, ensuring stability and precision in scoring and breaking, essential for thin glass.

SR INTELLIGENT WAREHOUSE

The SR intelligent warehouse integrates the T-Racks continuous drive system, patented by Turomas. This innovative solution allows a rack full of glass sheets to be moved between two positions, reducing the cycle time significantly.

The T-Racks is also de-

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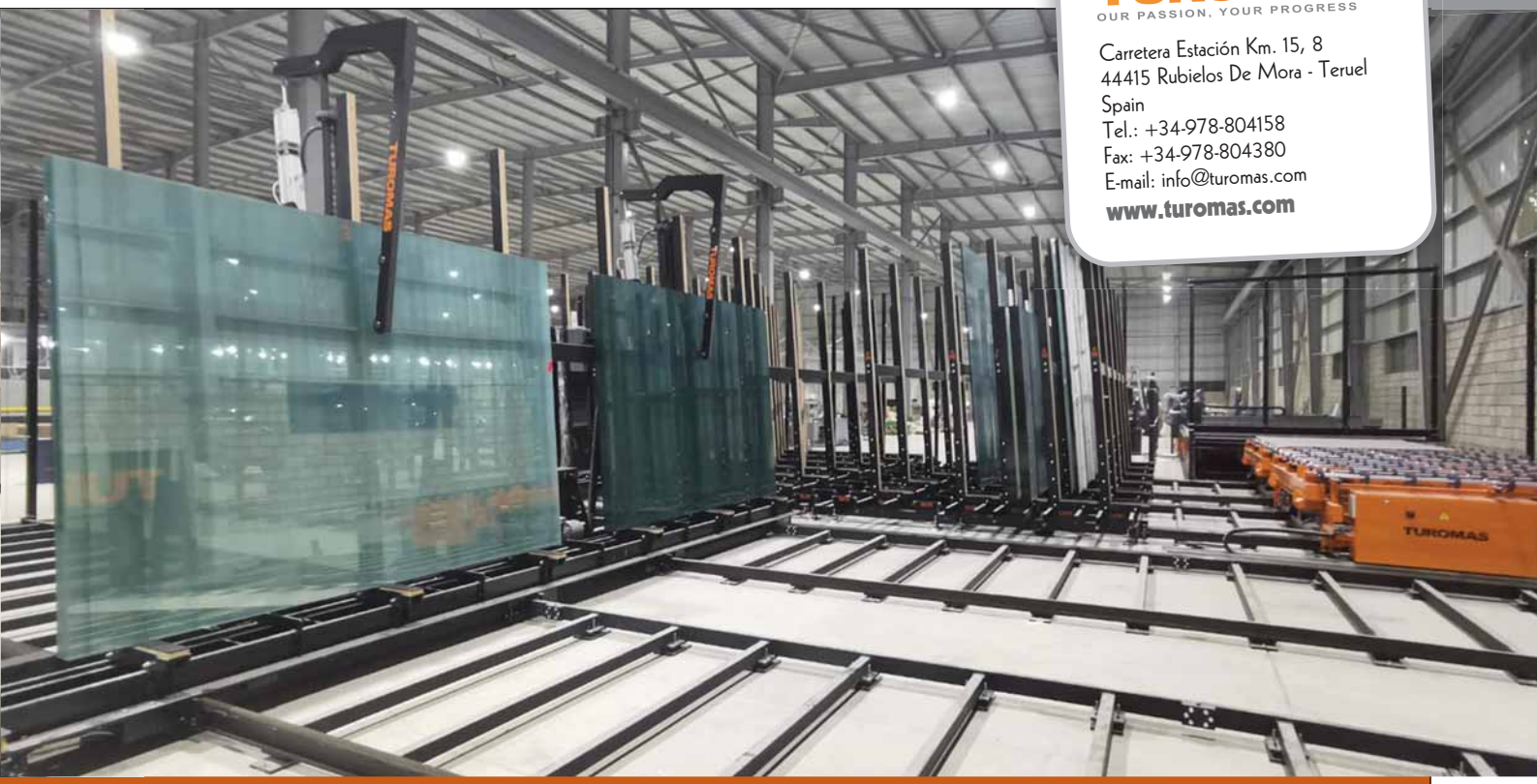
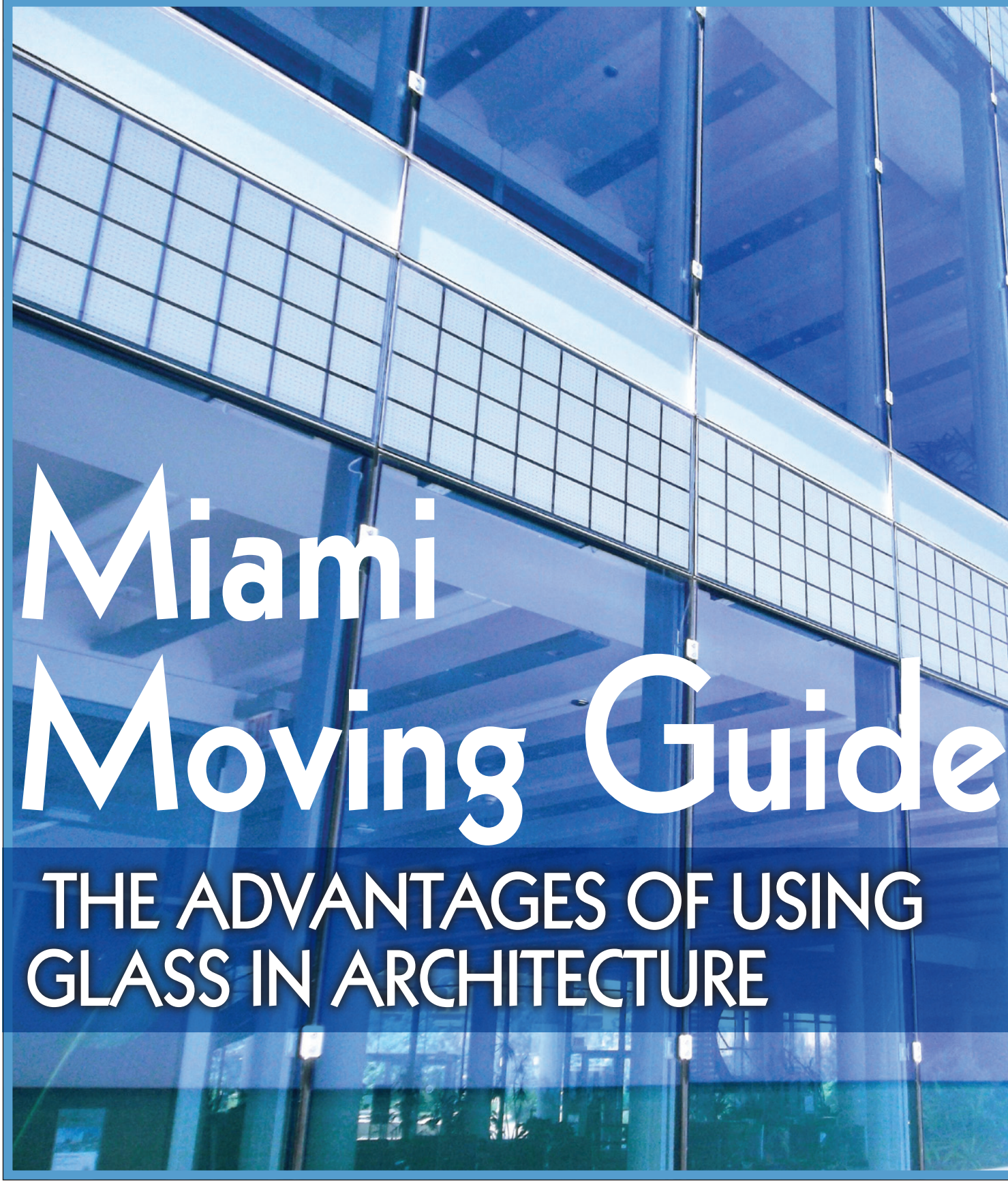


SR-07 Smart glass storage system for jumbo and jumbo+ sizes

signed to control the movement and position of the racks at all times, so that the probability of positioning errors is virtually zero increasing the safety, reliability and service life of the machine.

The storage system is equipped with the most updated software, prepared for the 4.0 Industry. It allows to know the warehouse glass stock in real time to manage in an optimal and fully automated way the glass loading in the cutting lines.



Miami Moving Guide

THE ADVANTAGES OF USING GLASS IN ARCHITECTURE

Using glass for decor is not always a go-to idea for most architects. But, as you will soon learn, glass has a ton of potential when it comes to both structural integrity and overall aesthetic value. This article takes a look at just a few of the best glass decoration ideas for architects.

OUR PICK OF GLASS DECORATION IDEAS FOR ARCHITECTS

Before we get into our suggestions for glass decoration, we should mention that, to properly incorporate glass into a home, you need to consider it as a whole. As you will soon see, most glass decoration ideas will come as a noteworthy change in a space's look, ***especially when you factor in different colours.*** Therefore, it is surprisingly easy to implement a piece of glass decor that doesn't work with a home. While this might seem like common sense to experienced architects, we still feel it necessary to mention that to implement a good decor idea, you need to observe the house as a whole. With that out of the way, here are some glass decoration ideas for architects to consider.

GLASS DOORS

Having glass doors in a home may seem like an old-fashioned idea. After all, most homes have a lite (a glass or a windowpane) on their front door. Now, the vital thing to consider is that you don't have to limit yourself to square-shaped, colourless glass for door lites. Instead, you can implement different shapes, and even colour coordinate your lite with the room. Furthermore, considering that it is easier than ever to transport ***easily breakable glassware***, you shouldn't shy away from implementing glass ornaments with your door. Another option to consider is using full-lite doors. Here, again, you don't have to limit yourself to colourless glass. Instead, you can add shapes or even murals. A costly, but a more attractive option is to have a glass artist design a glass pane for your door. If you are worried about insulation and soundproofing, don't be. ***With modern design and technology***, a glass door can serve you perfectly.

For glass doors, we advise you to use tempered glass. Since it is 3-5 stronger than regular glass, it will easily withstand any temperature change, snow, or wind that would otherwise cause issues.

CLEVER WINDOW DESIGN

A quick Google search will show you that the list of potential window design ideas for architects is endless. If you are designing a home, try to use a window that brings some fun to the house. Of course, if you need to implement a window that will be used often, you should consider its practicality. However, most windows give a lot of room for creativity, which you should exploit. Among the ideas you can consider are:

- Arched Windows
- Awning Windows
- Bay Windows
- Garden Windows
- Jalousie Windows
- Skylight Windows

These are just some of the many window options out there. So, try to ***find the one that suits your climate zone and your home best***.

LOW-E GLASS

In the case of windows, there is pretty much no limit to what glass you can use. Our advice is to consider solar glass or smart glass, as they can be a worthy long-term investment. A good idea, for instance, is to use Low-E glass. However, before you do, make sure to differ between Hard-Coat and Soft-Coat.

- Hard-Coat (Passive low-E coatings) – This glass is created with pyrolytic coating using the pyrolytic process.

Through manufacture, the coat fuses with the glass surface, which creates a strong bond (or a hard-coat) which is quite durable. Due to its design, hard-coat glass is best suited for cold climates as it reflects the long-wave heat from the interior back inside, thus keeping your home warm.

- Soft-Coat (Solar Control low-E coatings) – Here manufacturers use the MSVD (Magnetron Sputtering Vapor Deposition) process to apply the coating to pre-cut glass. The coating itself needs to be sealed in a laminated unit or insulated glass. But, once sealed, it gives the highest performing solar control out of all the other types. Due to this, it is best suited for warmer climates as it gives the best protection from UV rays. The coating also helps reflect cool air back into the room, therefore keeping your home cold.

PHOTOVOLTAIC GLASS

Another option is to go for photovoltaic glass and ***use your windows to create energy***. Not only does this type of glass reduce the transmission of infrared radiation by 95 per cent and UV radiation by 99 per cent, but it will also produce 80 Watts of power per square meter meter in ideal conditions (although you should count on 30-40 Watts). The potential downside is that you might need to rely more on internal light sources, as the glass can absorb quite a bit of light.

GLASS WALLS

While glass walls are usually reserved for offices, you can use one for your home. The critical thing to keep in mind is what you achieve by implementing a glass wall. The beauty of using such a wall is that it separates two rooms from sound, smell, and noise, but it doesn't separate them from sight. So, if you want to have two connected rooms that still provide a sense of privacy, glass walls are the way to go. People usually use them for a nice view of their backyard or an outside terrace.
The best type of glass to use for walls is insulating glass, as it will give similar performance to that of a regular wall regarding insulation and heat retention. Another option is electrochromic glass, as more a more cost-intensive but comfortable option.

ELECTROCHROMIC GLASS

By installing a simple smart home system that goes with electrochromic glass, it, you'll be able to control:

- Light.
- Glare.
- Energy use.
- Colour rendering.

The best way to think of it is am an improved version of low-E glass. It is covered with a sophisticated metal-oxide coating, which gives it specific capabilities seen only with integrated circuits. If you don't want to change windows, you can always go for stick-on electrochromic films as a substitute. With proper use, electrochromic glass can reflect about 98 per cent of the light back. This will reduce the overall energy load by 20 per cent and make the house much more eco-friendly.
Potential drawbacks to consider are that electrochromic glass can be somewhat expensive, at USD 50-100 per square foot (USD 500-1000 per square meter). With certain manufacturers, glass can take a while to change colours, which can present a problem for some people. Furthermore, with the current technology, glass performance can degrade over time. Depending on how you use it, you will need to change your glass 10-20 years after installation.

GLASS TABLES

One of the common misconceptions people have when thinking about glass tables is that there are only those with simple, metal, or wooden frames. While these staples are quite popular, there are other options you can explore for some exciting interior decor. Here, again, you can use the full decorative potential of glass and design something truly

MIAMI MOVING GUIDE

Miami Moving Guide is a website with the sole mission of providing the best tips, tricks, pieces of advice, checklists and former experiences in order to help make moving to the city less stressful and more organized. The website posts on a weekly basis about a wide range of topics.

beautiful. A handmade table made out of glass and wood can be just the piece of decor you need to tie a kitchen together. The only potential downside is that handmade tables can be on the expensive side. But a glass table can easily be a show stealer and the most beautiful piece of furniture in the home.

Depending on the table's design, you might want to consider the different thicknesses of the glass used. Whatever the case, there isn't much reason to deviate from standard glass here, so we will recommend using it as well. The usual glass thickness for a table is:

- 3/16"
- 1/4"
- 3/8"
- 1/2"

GLASS SHOWER ROOMS

The last of our glass decoration ideas for architects are glass shower rooms. Having a glass shower room is a fairly common idea, but still an underutilized one. Such a room will provide more space to shower and make the bathroom look much larger. With enough space, you can even implement sitting elements and some basic sauna mechanisms to make it that much more comfortable.

For shower rooms, we suggest that you use tempered glass. Due to its design, it will easily withstand the sudden temperature changes that occur in bathrooms.

THE ADVANTAGES OF USING GLASS AS AN ARCHITECT

To finish things off, we will mention some of the benefits of using glass as an architect. As one of the staples of modern design, you should know that glass has various uses. With the innovations in smart home technologies, using this material is becoming easier and more affordable. So, here is why to use glass in your next project:

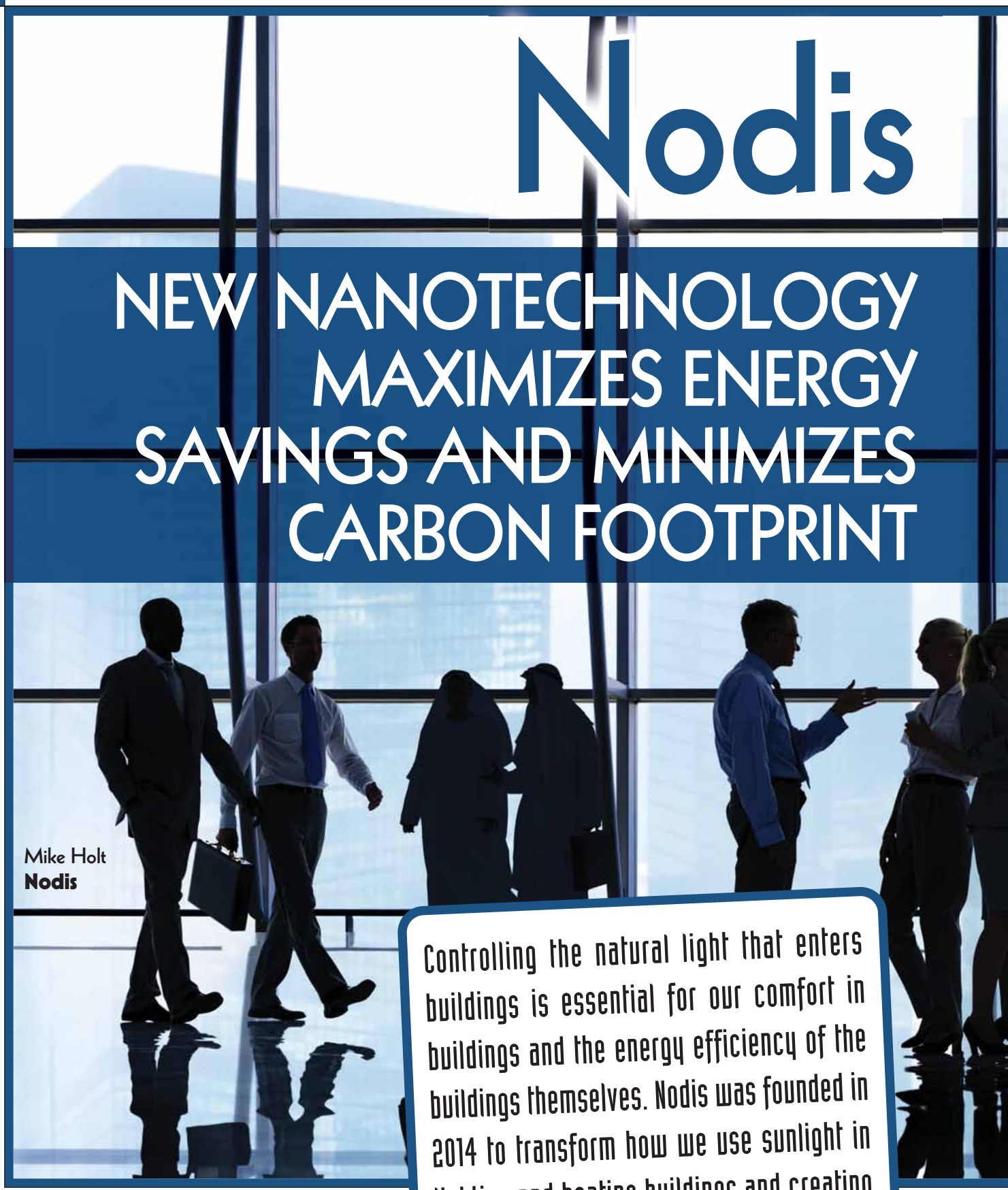
- Bringing in natural light.
- A more open, natural feel to the entire home.
- Eco-friendliness (both due to excellent insulation and electricity-generating windows).
- Easy maintenance (with proper care, glass is one of the most resilient materials).

As we mentioned, you should only employ these glass decoration ideas if they make sense with the rest of the house. But, if there is room for glass decor, we strongly suggest that you implement it.

Photo used https://pixabay.com/photos/window-house-door-inside-indoors-3065340/

Nodis

NEW NANOTECHNOLOGY MAXIMIZES ENERGY SAVINGS AND MINIMIZES CARBON FOOTPRINT



Mike Holt
Nodis

Controlling the natural light that enters buildings is essential for our comfort in buildings and the energy efficiency of the buildings themselves. Nodis was founded in 2014 to transform how we use sunlight in lighting and heating buildings and creating comfortable, energy efficient environments.

TECHNOLOGY TO TRANSFORM WINDOWS

Nodis is transforming windows by enabling people to control the natural light and infrared into buildings. Controlling natural light reduces glare and sets the right lighting level for comfort. Controlling infrared and light lowers energy consumption for heating, cooling and lighting. Changing the colour sets the mood and aesthetics of a room.

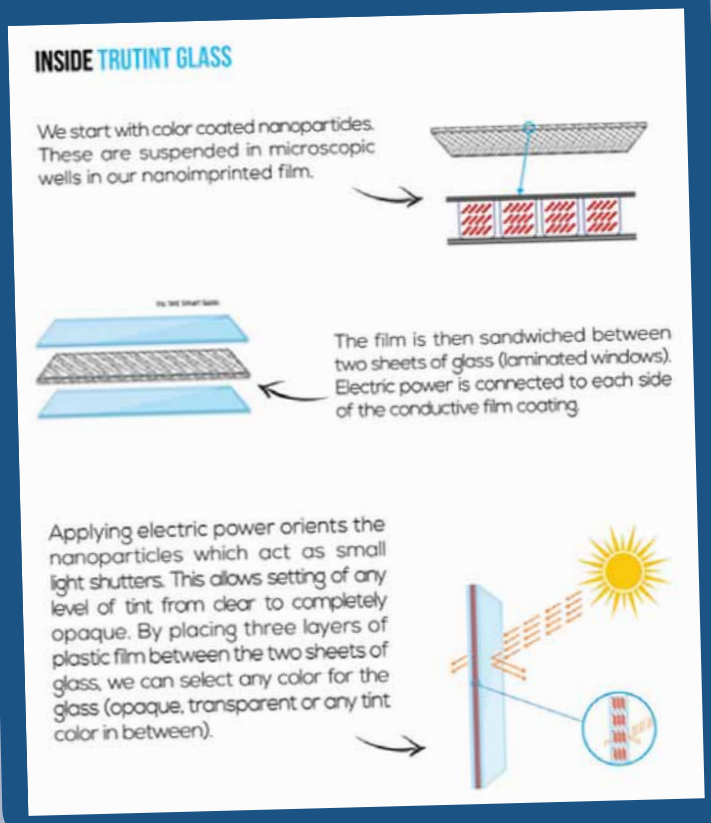
Nodis' TruTint smart glass technology is transforming windows, giving people the ability to change the tint, colour and temperature characteristics of windows instantly.

SMART GLASS AND REDUCING ENERGY USE

Public and private standards and market demands are driving the real estate and transportation industries to reduce their impact on energy use and the overall ecosystem. Buildings consume 40 per cent of a city's energy and generate 45 per cent of its CO2 emissions. Vehicle manufacturers also intend to reduce their carbon footprint and improve consumer comfort.

One game-changing solution for both industries? Smart glass, a technology to better control light and infrared entering a building or vehicle.

HOW TRUTINT WORKS



However, the full potential of smart glass has not yet been realized. Existing smart glass technologies do not fully address energy efficiency, comfort, aesthetics and architectural requirements. They lack the capacity to control infrared, the real cause of heat within a building, and they take as long as 20 minutes to shift.

In addition, existing approaches can't offer colour options or electrically change colour. Finally, the cost of implementation is high, making the limited benefits even more unattractive or too expensive for the market.

NODIS' RESPONSE TO ENERGY EFFICIENCY, COMFORT, AESTHETICS AND ARCHITECTURAL REQUIREMENTS

Smart glass technology company Nodis has pioneered a smart glass film called TruTint to respond to all of these issues. Nodis came to life in 2014 to commercialize a nanoparticle-based smart glass and display technology developed by Dr. Sergey Shokhor and his team. The company has since attracted investment from the Singapore National Research Foun-

dation and Get2Volume and won three separate international competitions with its innovative technology, including the Innovate 4Climate World Bank Summit, Korea Startup Grant Challenge and Shell Idea Refinery.

Nodis technology suspends colour rod-like nanoscale particles in an organic liquid and then sandwiches them between two pieces of glass. In a natural state, the suspended particles randomly organize and then block light. When voltage is applied to the suspended particles, they align and light passes through. Thus, the amount of light allowed into the build can be regulated by the degree of voltage applied.

Nodis TruTint reduces energy consumption and CO2 emissions by 50 per cent. The system automatically controls illumination, and infrared for heating and cooling, reducing building energy cost and CO2 emissions. It switches in under once second. It can display an infinite number of tints. Last but not least, TruTint sells at much lower cost as a result of its high-volume manufacturing approach.

Buildings are the largest users of energy and greenhouse gas producers. Vehicles must better adjust to glare, heat and reduce their environmental impacts. Smart glass technology now exists that can contribute significantly to these goals.

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NODIS

Founded in Singapore in 2014, NODIS' TruTint smart glass technology is transforming windows, giving people the ability to change the tint, colour, and temperature characteristics of windows instantly. NODIS provides glass companies with the technology to transform their glass into a smart glass with the only colour, tint, and infrared switchable smart glass technology.

GMINSIGHTS

AUTOMOTIVE GLASS MANUFACTURERS TO COUNT ON INNOVATIONS AND STATE-OF-THE-ART ADVANCEMENTS

A portfolio often shunned in the mainstream – automotive glass – is yet to receive the due attention. Automotive glass has become the current linchpin and what beholds in the year 2020 and beyond may just be what the entrepreneurs and other stakeholders have been craving for.

In common parlance, the presence of car glass provides strength to the car frame and protects the occupants from any untoward impact during collision. Unprecedented demand for an auto glass which is stronger, tougher and can withstand any type of collision is witnessing an uptick. Not to mention auto glass enables the airbags to be deployed in an apt position to cushion passengers. It does not come as a surprise that automotive glass has become second to none on the safety envelope in vehicles.

FROM TEMPERED- TO LAMINATED GLASS

Laminated glass, also popular as safety glass, has ushered innovation and growth in the automotive landscape. Produced

by sandwiching a layer of polyvinyl butyrl (PVB) adhesives in between two sheets of tempered glass, safety glass does not shatter on impact and acts as a protective barrier by bending and cracking. Given that it has high resistance to penetration, laminated glass bolsters safety of the passengers.

The auto industry is arguably doing away with tempered glass that shatters into pebble-like particles, posing injury concern. With safety glass being highly recommended for installation on the heels of its noise reduction attribute, it may perhaps seem as though tempered glass is losing its sheen.

However, it is not the end the world for tempered glass as big companies make headway towards manufacturing chemically tempered glass that is more durable, flexible, light, thin, and that too with less distortion.

> Looking at today's auto glass market not only shows how glass plays a fundamental role in the safety of vehicles, due to the fact that it is continuously stronger, tougher and can withstand any type of collision, but also how the foreseen entry of damage-resistant Gorilla glass, will lead to weight reduction that will further transpire into achieving fuel efficiency.

GORILLA GLASS ON THE HORIZON

Original Equipment Manufacturers (OEMs) envisage Gorilla glass as the next big thing with behemoths such as Ford and BMW installing the tough glass. Counting on the legacy created by Gorilla glass on smartphone market to boost durability, auto glass manufacturers expect substantial revenue from the portfolio.

Claimed to have an edge pertaining to weight, strength, Gorilla glass technology has come to the fore and will hold key to automotive exterior applications. Expanding the consumer

base, Gorilla glass is touted to be damage-resistant vis-à-vis its predecessors. Use of advanced glass will lead to weight reduction that will further transpire into achieving fuel efficiency.

Industry experts predict the innovative glass to be the fist step towards a revolution in automotive landscape that will help integrate navigation technology and sophisticated head-up displays (HUSs).

With weight reduction being akin to saving money and conserving environment, glass manufacturers have upped their focus on hollow glass. Production of hollow glass is going from strength to strength as it is touted to be a lighter and cheaper automotive component.

As weight reduction and composites grab headlines, lightweight materials based on hollow glass are witnessing remarkable growth. Investment in hollow glass will be in line with the innovations in automotive glass such as damage-resistant and lightweight windows. One of the most compelling facets is that advanced glass is not far from mass production.

WHAT MAKES FLAT GLASS SO COMPELLING?

Flat glass, a potential top-of-the-line product, has become a top-notch solution used to manufacture windows, windscreens, backlights and sunroofs for cars. With glass manufacturers pushing to the limits to streamline supply chain and offer a viable technological solution, flat glass may be the right portfolio to provide maximum visibility for exceptional driving experience and protect the occupants in case of any accident.

Flat glass has also gained prominence in buses and lorries to provide high level of durability and optimum visibility, while reducing noise at the same time. Over the years, flat glass is prevalently being used for windscreens, backlights and sidelights.

Given that flat glass helps in saving energy and is recyclable, automotive glass manufacturers are overwhelmingly producing the glass to contribute towards 'green cars'. Now that the auto sector has been warranting more rigorous tolerances and coming up with more complex shapes and forms, glass manufacturers have upped their game in the production process of automotive flat glass.

Glass manufacturers tend to be in line with OEMs to provide an innate solution that will be in line with the vision of green solution. Automotive glass manufacturers are infusing funds in R&D applications to reduce weight of the glass and to streamline new functionalities. And with EVs setting the trend, photovoltaic cells are likely to be integrated into glass components of vehicles, enabling energy generation in the vehicle.

CURVED GLASS GEARS FOR POSITIVE OUTLOOK

Curved glass has been associated with panorama windshields and moon roofs that boost occupants' satisfaction. Glass manufacturers are striving to manufacture windshields to keep up with the robust advancing design demands.

Automotive glass manufacturers are injecting funds to develop advanced glass shaping technologies that leverage bending to provide auto makers the leeway to attain their style and design concepts. Gravity bending, for instance, has made bending process in auto sector highly desirable as it is perceived as a cost-effective process to create deeper sags and create any shape.

MIRRORLESS CARS—FAD OR FUTURE?

Automakers are eyeing to replace sideview and rear view mirrors with camera monitoring systems in the next half-a-decade. Going a step further, this next-gen technology assesses images and responds aptly to impending dangers.

Japan became one of the first countries to jump on the bandwagon and adopt the cutting-edge technology. The U.S. National Highway Traffic Safety Administration is contemplating testing mirrorless with

traditional rear view mirrors making way for cameras. Toyota started selling mirrorless cars in Japan in 2018, while Volkswagen soon followed the suit in Europe. (Source: https://in.reuters.com)

Mirrorless systems could well be the next big thing and it may be here to stay as the technology received ap-

proval from governments in Europe and Japan.

SMART AUTOMOTIVE GLASS: THE NEXT DISRUPTION ON THE CARDS

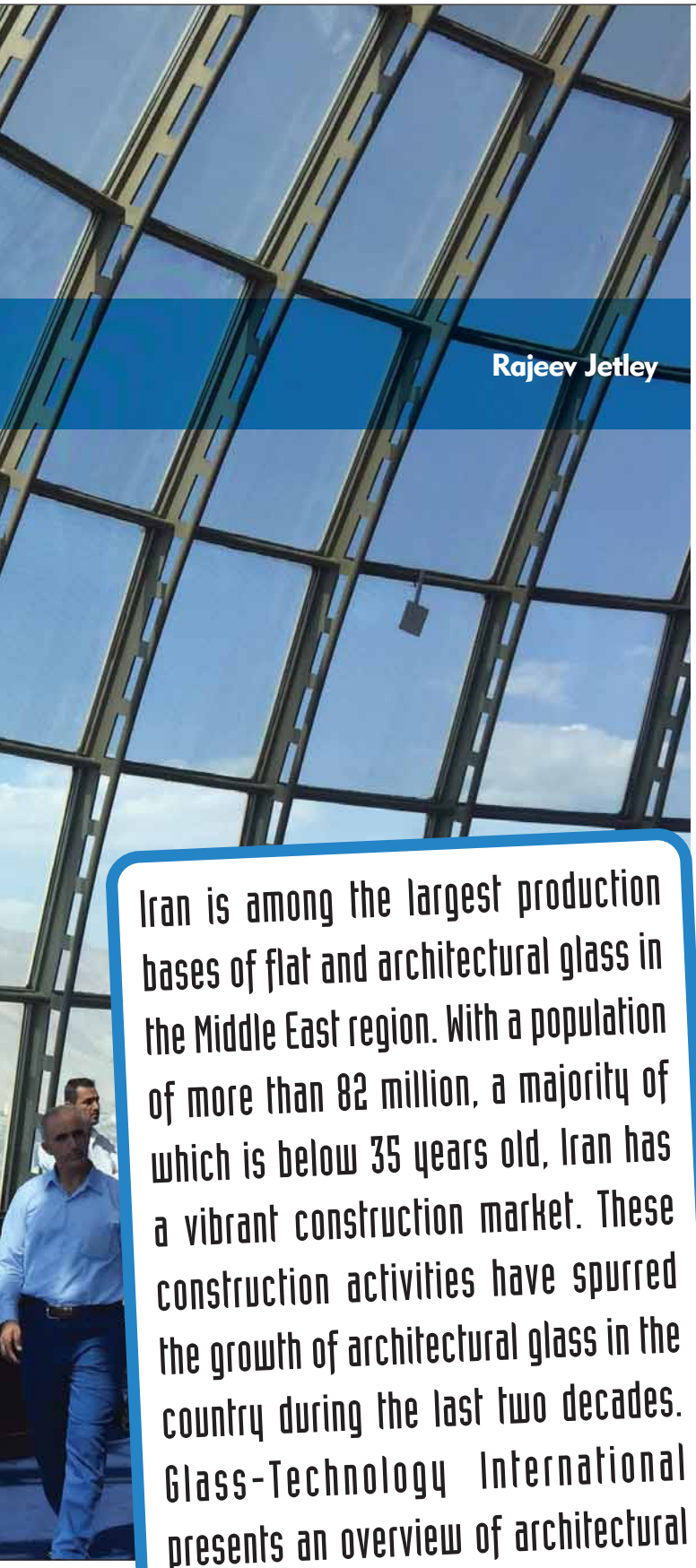
Taking a massive stride in innovation, glass manufacturers are using advanced glazing techniques as luxury sports car manufacturers are installing electrochromic glass on the upper part of the door windows and on the roof.

Smart glass is believed to allow driver to derail the amount of sunlight coming into the cars and will boost visibility, thereby streamlining driving experience. State-of-the-art glass will automatically darken with outside light getting brighter.

Automotive glass has become second to none and has become a lucrative industry value chain. Glass manufacturers face the challenge of adopting to a highly competitive environment to boost brand value. An efficient consumer base would warrant investing both time and money in safety glass, laminated glass, and flat glass. Automotive glass manufacturers will potentially remain at the forefront of innovation. Green and safe automotive solutions will encourage automotive manufacturers to use advanced glazing solutions that are likely to go mainstream soon enough.

Iran

ARCHITECTURAL GLASS MARKET



Rajeev Jetley

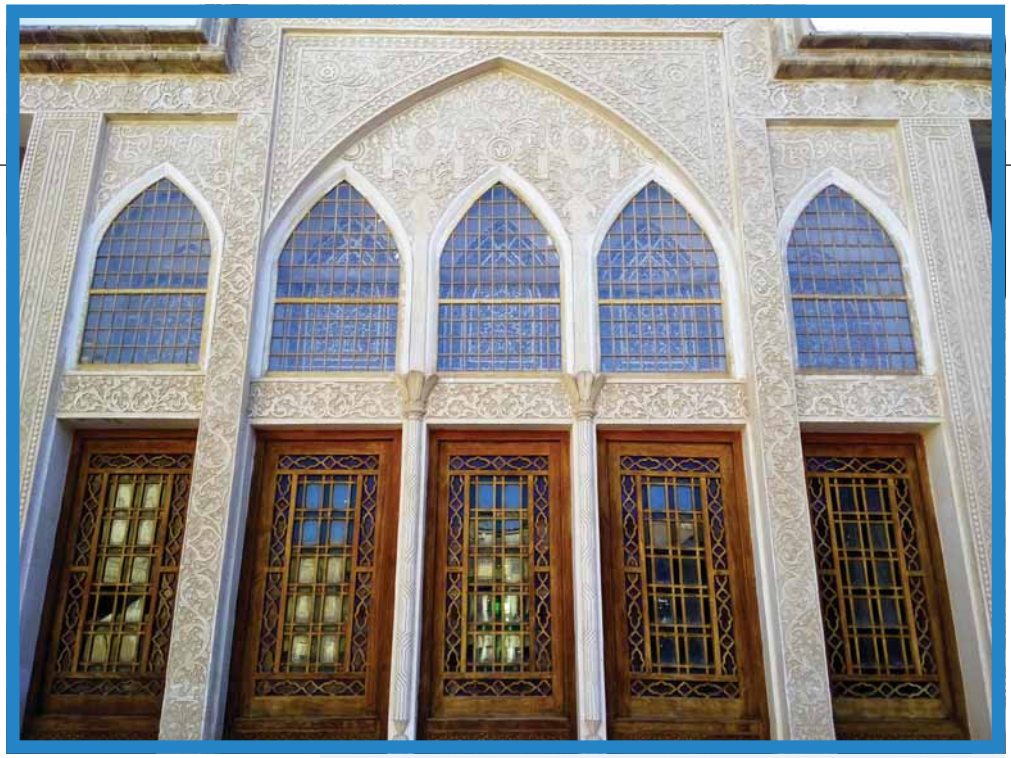
Iran is among the largest production bases of flat and architectural glass in the Middle East region. With a population of more than 82 million, a majority of which is below 35 years old, Iran has a vibrant construction market. These construction activities have spurred the growth of architectural glass in the country during the last two decades. Glass-Technology International presents an overview of architectural glass industry of Iran in this feature.

THE COUNTRY AND ITS GLASS INDUSTRY

In recent years, the Iranian architectural glass industry has had mixed performance. The architectural glass industry, which is highly correlated with construction activities, has had its ups and downs due to the political and economic situation in the country. The country's the construction industry has been thriving due to an increase in national and international investment to the extent that it is now the largest in the Middle East region. According to the Central Bank of Iran, nearly 70 per cent of Iranians own their own homes. The country's high urbanization levels of 74.90 per cent has also benefited architectural glass consumption.

The year 2019 and the current year have not been the best of times for Iranian architectural industry due to slowing economy. The recession in Iran accelerated in 2019 as US sanctions progressively tightened. Iran's GDP contracted by 7.6 per cent during the April-December period of 2019 largely due to a 37 per cent decline in the oil sector. Since the reintroduction of US sanctions in 2018, oil production has dwindled reaching a record low in December 2019. Non-oil GDP growth in April-December 2019 was close to zero, a marginal improvement compared to the sector's 2.1 per cent contraction in the previous year. In the same period, non-oil industries grew by 2 per cent driven by construction and the utilities sectors. Hossein Zojjaji, Secretary of Iran's glass union says. "Iran produces a total 2.2 million tons of glass products per year, and is a leading producer of the product in the world. Iran's major glass production plants are producing 550,000 square meters of architectural glass per day, of which 60 per cent is supplied to the domestic market and the rest is exported. The required raw materials are all domestically supplied and the good production and export conditions have laid a proper ground for the Iranian companies and plants active in this sector. Iraq, Armenia, Tajikistan, Azerbaijan, Persian Gulf littoral states, and some European countries as the main importers of Iranian glass."

Even if architectural glass consumption has seen some dips in last two years, long term prospects of the Iranian architectural glass industry look very positive. Statistics from March 2019 to March 2020 put the number of total Iranian households at 18.1 million and the total number of dwelling units at 15.1 million, signifying a demand for at least 5.8 million dwelling units. Every year there is a need for 750,000 additional units as young



couples embark on married life. At present, 2000 units are being built every day although this needs to increase to 2740 units. Iran's construction market will expand to USD 174.4 billion in 2021 from USD 149.2 billion in 2018.

PRODUCTION OF ARCHITECTURAL GLASS IN IRAN

Iran has three major float glass producers: Kaveh Glass Group, Sahand Industrial Group and Ardakan Float Glass Corporation. Together these producers operate a total of eight float and figured glass production lines. All the three float glass producers also own major glass processing operations to supply architectural glass to domestic market.

Along with these three producers, Iran has about 30 downstream architectural glass processors. Most of these downstream glass processors are spread in and around the capital city, Tehran.

KAVEH GLASS GROUP

Iran's largest producer of float glass, Kaveh Glass Group, is the largest architectural glass producer and supplier in domestic market. Kaveh Group operates several laminating lines with an installed capacity to produce 2,000,000 square meters per annum of laminated glass at its premises. The Group also operates a mirror production plant with an annual capacity of four million square metres. In 2004 the company installed an online coating machine at one of the production facilities facility to produce reflective, solar control and low-E glass. Another coating line of the company operates at Asa Float Glass line, which commenced operations in 2009. The 700 TPD line of Asa Float also produces mirrors in different colours. The coating facility at this line was installed to cater to the increasing demand of coated glass in the country.

SAHAND INDUSTRIAL GROUP

Float glass manufacturer Sahand Industrial Group is a major producer of architectural glass. The company's float glass line is equipped with a coater to enable the company to produce low-E glass. Other subsidiaries are engaged in the production of mirrors (Sahand Mirror Tabriz Co) and value added glass (Imeni Ark Tabriz Co). The company supplies tempered glass, insulating glass and printed glass to domestic architectural industry.

Another subsidiary of Sahand Indutrial Group, Sahand Jame Tabriz, is a producer of coloured decorative, patterned and stained glasses with a production capacity of 200 tons per day.

ARDAKAN ARCHITECT GLASS INDUSTRY FACTORY

Ardakan Architect Glass Industry Factory, a subsidiary of Ardakan Float Glass is one of the largest producers of processed glass in Iran. The parent company, Ardakan Float Glass, which commenced operations in 2013 is one of the largest float glass producers in the country.

Ardakan Architect Glass Industry Factory produces architectural glasses in different grades. The company supplies acid etched glass, sand blasted glass, reflective glass, insulating glass, tempered glass, and solar control glasses for architectural segment. Located at the junction of Iran's four main railways (Tehran, Isfahan, Mashhad and Bandar Abbas), Ardakan holds a strategic position in Iran. Location of the plant at this strategic junction provides Ardakan Architectural Glass a unique advantage in terms of reaching its customers in different cities at one of the lowest costs.

VENUS GLASS

Venus Glass is the leading player in the Iranian market for the production of high-performance insulating glass units and various types of bullet proof, anti-seismic and sound control safety glass.

Venus Glass entered into architectural glass industry in 2004 thanks to investing in state of the art tech-

nology from Lisec. A year later, the company installed tempering line from Tamglass Ltd., which enabled Venus Glass to introduce high-performance double-glazed glass products to Iran's market for the first time.

With a number of expansions over the following years, Venus Glass has become one of the leading glass processors in the country. Spread over an area of 30,000 square meters at Shamsabad Industrial Zone, company's manufacturing facilities are located 35 km south of the capital Tehran.

Venus Glass produces tempered, insulating, laminating silk printed, solar control and reflective glasses. It is one of the few Iranian producers, who offer bullet-proof and sound proof glasses. In order to meet the demands of the architects and developers for modern decorative glass solutions, Venus Glass has also developed a wide range of decorative and coloured glass products. The company was awarded as one of the Most Outstanding Manufacturing Companies in Iran by Iranian industry ministry.

The company owns two state-of-the-art convection tempering furnaces from Tamglass, which can fully temper and heat strengthen high performance, low-E and other categories of coated glass, as well as a fully automated CNC cutting machine from Lisec, Austria. Additional machinery includes a semi-automated double-glazing line from Lisec, with the capability of producing both polysulphide and silicone insulated glass, and a fully automated flat laminating line from Bystronic-Armatec, Switzerland.

Venus Glass also collaborates with Spanish company, Dream Glass to supply privacy glass products in the Iranian market. Dream Glass Group (DGG) is based in Madrid, Spain.

Venus Glass has supplied façade glass for Saderat Bank Iran, Saari Branch, and double skin façade glass for the NOOR Eye Hospital, Milad Tower, Atlas Mall, Janbanzan Sports Complex, Ibis & Novotel Hotel and Mellat Pardis Cineplex among others.

ARCHITECTURAL GLASS PROCESSORS IN IRAN

Company	Location	Segment/s
Kaveh Glass Group	Multi	Architectural Glass
Sahand Industrial Group	Tabriz-Khosroshahr Road –Tabriz	Architectural Glass
Ardakan Architect Glass Industry Factory	Ardakan	Architectural Glass
Arman Jam Safety Glass Industries Factory	Tehran	Architectural Glass
Azarjaam Nashkan Safety Glass Industries	Tehran	Architectural Glass
Behnoor Safety Glass Company	Tehran	Automotive and Architectural Glass
Eshfan Zarin Mirror	Eshfan	Architectural Glass
Gilan Glass Company	Tehran	Architectural Glass
Iran Glass Technology	Mashhad	Architectural Glass
Jam Curved Glass Decoration	Tehran	Architectural Glass
Jam Imen Safety Glass Company	Tehran	Architectural Glass
Khorsan safety Glass	Mashhad	Architectural Glass
Miral Glass Company	Tehran Saveh Highway	Architectural Glass
Sahand Jame Tabriz	Tabriz-Khosroshahr Road –Tabriz	Decorative Glass
Secco Iran	Tehran	Architectural Glass
Shargh Safety Glass	Mashhad	Architectural Glass
Shayan Glass	Fatah	Architectural Glass
Shishe Nashkan Industrial Company	Karaj	Architectural Glass
Venus Glass	Shamsabad Industrial Zone	Architectural glass
Zarineh Naghsh Mahshad	Tehran	Architectural Glass

BEHNOOR SAFETY GLASS COMPANY

Behnoor is a leading Iranian company in the safety glasses industry. This company was established in 1997 and has been able to design and produce a wide range of safety glasses. With the ability to manufacture various kinds of flat and curved glasses in tempered and laminated form and different thickness degrees, Behnoor is capable of designing and producing glass consumer products with the highest quality for Iranian architectural industry.

SUPPLIERS GUIDE Yellow Pages

COMPANY	website
A+W SOFTWARE	www.a-w.com
BANDO KIKO	www.bandoj.com
BEST MAKINA	www.bestmakina.com
FILTRAGLASS	www.filtraglass.com
FOREL	www.forelspa.com
GLASS COMPANY	www.glasscompany.com
GLASTON	www.glaston.net
HEGLA	www.hegla.com

COMPANY	website
KERAGLASS	www.keraglass.com
LISEC GROUP	www.lisec.com
NEL HYDROGEN	www.nelhydrogen.com
NORTH GLASS TECHNOLOGY & JUISUN TECHNOLOGY INDUSTRIAL	www.northglass.global
SI.STE	www.sisteitaly.it
TRAKYA CAM - ŞIŞECAM GROUP	www.sisecamflatglass.com
TUROMAS	www.turomas.com

Glass manufacturing and Processing

FLOAT GLASS
Bavelloni
Sisecam

PROCESSED SHEET GLASS
CMS

North Glass Technology
Satinal Spa

LAMINATED SAFETY GLASS

Kuraray - Trosifol
Satinal Spa

MIRRORS

CMS

Stocking, handling and movement

COMPLETE STOCKING LINES / ENGINEERING

Cugher Glass
ECOL
Glaston Group
Hegla
IOCCO Group
Keraglass
Lisec Group
North Glass Technology
MOVETRO
Schiavo
Torgauer Maschinenbau
Turomas

COMPLETE HANDLING AND MOVEMENT LINES

Bando Kiko
Bottero
Cugher Glass
CMS
ECOL
Forvet
Giardina Finishing + HS Glassprinting
Glaston Group
Hegla
IOCCO Group
Keraglass
Lisec Group
North Glass Technology
Schiavo
Torgauer Maschinenbau
Turomas

MACHINES FOR HANDLING GLASS SHEETS

Ashton Industrial Sales
Bando Kiko
Bavelloni
Bottero
CMS
ECOL
Forel
Glaston Group
Goldglass Technologies
Guangdong Northglass & Juisun Technology Industrial
Hegla
IOCCO Group
Italcarrelli
Keraglass
Lisec Group
Schiavo
Torgauer Maschinenbau
Turomas

HANDLING ROBOTS

Ashton Industrial Sales
Bavelloni
Bottero
CMS
ECOL
Hegla
IOCCO Group
Lisec Group
Schiavo
Torgauer Maschinenbau
Turomas

HANDLING EQUIPMENT FOR FLOAT GLASS

Bovone Elett.
Bottero
ECOL
Glaston Group
Goldglass Technologies
Hegla
IOCCO Group
Italcarrelli
Lisec Group
Schiavo
Torgauer Maschinenbau
Turomas

TROLLEYS AND CLASSIFIERS

CMS
Forel
Hegla
Lisec Group
MOVETRO
Schiavo
Si.Ste
Tecno Glass
Torgauer Maschinenbau
Turomas

TRANSPORTATION SYSTEMS/ TRUCKS

Giardina Finishing + HS Glassprinting
Hegla
Italcarrelli
Lisec Group
Schiavo

VACUUM LIFTING EQUIPMENT

Bottero
CMS
ECOL
Fenzi
Forel
Glaston Group
Hegla
Lisec Group
Schiavo
Si.Ste
Torgauer Maschinenbau
Turomas

CRANE SUCTION CUPS FOR LARGE SHEETS

Bottero
Fenzi
Glaston Group
Hegla
Lisec Group
Schiavo
Turomas

TRANSPORTATION TONGS

Bottero
Fenzi
IOCCO Group
Schiavo
Turomas

SUCTION CUPS

ADI
Bottero
CMS
Fenzi
Glaston Group
Hegla
Schiavo
Si.Ste
Turomas

CONVEYOR BELTS

Ashton Industrial Sales
Cugher Glass
ECOL
Glaston Group
Schiavo
Turomas

PACKAGING MATERIALS AND SYSTEMS

ECOL
Hegla
Schiavo

ACCESSORIES

Bottero
CMS
Fenzi
Hegla
Helios Quartz
Mole Moreschi
Schiavo
Turomas

Straight-edge and shape cutting

COMPLETE STRAIGHT-EDGE LINES

Bando Kiko
Bavelloni
Bottero
CMS
Euromec
Forvet
Glaston Group
Hegla
Lisec Group
Schiavo
Schiatti Angelo
Shanghai North Glass Technology

COMPLETE SHAPE CUTTING LINES

Bando Kiko
Bavelloni
Bottero
CMS
Glaston Group
Guangdong Northglass & Juisun Technology Industrial
Hegla
Lisec Group
Schiavo
Shanghai North Glass Technology
Turomas

AUTOMATIC CUTTING MACHINES FOR AUTOMOTIVE GLASS

Bando Kiko
Bottero
CMS
Glaston Group
IOCCO Group
Lisec Group
Schiavo

LOADING AND TILTING MACHINES

Bando Kiko
Bavelloni
Bottero
CMS

ECOL
Euromec
Forel
Glass Company
Glaston Group
Hegla
Intermac - Biesse
IOCCO Group
Lisec Group
Schiavo
Tenon (Beijing) Equipment
Turomas

CUTTING TABLES

Bando Kiko
Bavelloni
Bottero
CMS
Euromec
Fenzi
Forel
Glaston Group
Hegla
IOCCO Group
Lisec Group
Macotec
Schiavo
Tekno Kilns
Tenon (Beijing) Equipment
Triulzi
Turomas

CUTTING OPTIMIZERS

Bando Kiko
Bavelloni
Bottero
CMS
Deltamax Automazione
Euromec
Forel
Glaston Group
Hegla
IOCCO Group
Lisec Group
Optima
Schiavo
Turomas

CUTTING PATH OPTIMIZERS

Bando Kiko
Bottero
CMS
Euromec
Glaston Group
IOCCO Group
Lisec Group
Optima
Schiavo

CAD SYSTEMS

Bavelloni
CMS
Lisec Group
Prodim
Schiavo

ARMOURED AND LAMINATED GLASS CUTTING MACHINES

Bando Kiko
Bavelloni
Bottero
CMS
Glaston Group
Hegla
Lisec Group
Schiavo
Turomas

ROUND OR SHAPE CUTTING MACHINES

Bando Kiko
Bavelloni
Bottero
CMS
Fenzi
Glaston Group
Hegla
Lisec Group
Schiavo
Turomas

CUTTING ACCESSORIES

ADI
Ayrox
Bando Kiko
Bottero
Fenzi
IOCCO Group
Schiavo
Softeco
Talamoni
Turomas
Tyrolit Vincent

SAW MACHINES

Schiavo
Tecno Glass

AUTOMATIC SAWS FOR CUTTING LAMINATED AND BULLET-PROOF GLASS

CMS
Schiavo

BREAKING SYSTEMS

Bando Kiko
Bavelloni
Bottero
CMS
Euromec
Glaston Group
Hegla
IOCCO Group
Lisec Group
Schiavo
Turomas

CUTTING MACHINES WITH BREAKING AND EDGE DELETING DEVICES

Bando Kiko
Bottero
CMS
Euromec
Glaston Group
Guangdong Northglass & Juisun Technology Industrial
Hegla
IOCCO Group
Lisec Group
Schiavo
Turomas

GLASS CUTTING FLUIDS

Diamant - AR Nunziata
Schiavo
Turomas

ACCESSORIES

Schiavo
Schiatti Angelo
Talamoni
Turomas

Edging and bevelling

COMPLETE EDGING LINES

Adelio Lattuada
Ashton Industrial Sales
B Solution Licensee of BF Project
Bando Kiko
Bavelloni
Bottero
CMS
Forel
Forvet
Hiseng Glass Machinery
IOCCO Group
Schiavo
Schiatti Angelo
SKG - Skill Glass

COMPLETE BEVELLING LINES

Adelio Lattuada
Bando Kiko
Bottero
CMS
Hiseng Glass Machinery
IOCCO Group
Schiavo

COMPLETE AUTOMOTIVE GLASS EDGING AND BEVELLING LINES

Adelio Lattuada
Bando Kiko
Bavelloni
Bottero
Glaston Group
Hiseng Glass Machinery
Intermac - Biesse
IOCCO Group
SKG - Skill Glass

DOUBLE-EDGE GRINDING MACHINES

Ashton Industrial Sales
B Solution Licensee of BF Project
Bando Kiko
Bavelloni
Bottero
CMS
Forvet
Hiseng Glass Machinery
Intermac - Biesse
IOCCO Group
Schiatti Angelo

VERTICAL-EDGE GRINDING MACHINES

Adelio Lattuada
B Solution Licensee of BF Project
Bando Kiko
Bavelloni
Bottero
Forel
Glass Company
Glaston Group
Hiseng Glass Machinery
Schiavo
Schiatti Angelo
Shanghai North Glass Technology
SKG - Skill Glass
Vismara

GRINDING SPINDLES

Schiavo
Tecno Glass

BEVELLING MACHINES FOR ROUND AND SHAPED GLASS

Adelio Lattuada
Bando Kiko
Bavelloni
CMS
Hiseng Glass Machinery
Intermac - Biesse
Schiavo

STRAIGHT-EDGE BEVELLING MACHINES

Adelio Lattuada
Bando Kiko
Bavelloni
Bovone Elett.
CMS
Glass Company
Hiseng Glass Machinery
Schiavo
Schiatti Angelo

BEVEL POLISHING MACHINES

Adelio Lattuada
Bando Kiko
Bavelloni
Bovone Elett.
CMS
Hiseng Glass Machinery
Intermac - Biesse

STRAIGHT-EDGE ENGRAVING MACHINES

Bavelloni
Bottero
CMS
Intermac - Biesse
SKG - Skill Glass

SHAPED GLASS ENGRAVING MACHINES

Bavelloni
Bottero
CMS
Intermac - Biesse

CORNER GRINDING MACHINES

Adelio Lattuada
Ashton Industrial Sales
B Solution Licensee of BF Project
Bavelloni
CMS
Intermac - Biesse
SKG - Skill Glass

SHAPED GLASS GRINDING MACHINES

Adelio Lattuada
Ashton Industrial Sales
Bando Kiko
Bavelloni
Bottero
CMS
Forel
Glass Company
Guangdong Northglass & Juisun Technology Industrial
Hiseng Glass Machinery
Intermac - Biesse

BELT GRINDING MACHINES

Adelio Lattuada
Ashton Industrial Sales
Fenzi
Hiseng Glass Machinery
IOCCO Group
Si.Ste
Tenon (Beijing) Equipment

LATHES - VERTICAL AND HORIZONTAL

CMS
Fenzi

EMBOSSING MACHINES

CMS
Fenzi

PORTABLE MACHINES

Fenzi
Helios Quartz
Si.Ste
Tecno Glass

DIAMOND TOOLS

Adelio Lattuada
ADI
Ashton Industrial Sales
Bando Kiko
Bovone Diamond Tools
Bottero
Diamant - AR Nunziata
Diamut - Biesse
Fenzi
Glaston Group
Mole Moreschi
Schiavo
Talamoni
Tyrolit Vincent

DIAMOND BELTS

Mole Moreschi

SEAMING LINES

Ashton Industrial Sales

MANUAL LINES

Ashton Industrial Sales

POLISHING WHEELS

Adelio Lattuada
ADI
Bando Kiko
Bovone Diamond Tools
Diamant - AR Nunziata
Diamut - Biesse
Fenzi
Glaston Group
Italmole
Mole Moreschi
RBM Italia
Schiavo
Si.Ste
Tyrolit Vincent

POLISHING AGENTS AND OXIDES

ADI
Bovone Diamond Tools
Diamant - AR Nunziata
Fenzi
Schiavo
Tyrolit Vincent

POLISHING BELTS

Diamant - AR Nunziata
Fenzi
Schiavo
Si.Ste

COOLANTS

Adelio Lattuada
Bovone Diamond Tools
Fenzi
Schiavo

GLASS GRINDING AND BEVELLING COOLANTS

Schiavo

SEPARATORS FOR GLASS-SOLIDS

Ashton Industrial Sales
Dieffe Macchine
Filtraglass
Schiavo
Vitrosep

ACCESSORIES

ADI
CMS
Dieffe Macchine
Fenzi
Helios Quartz
IOCCO Group
Mole Moreschi
Schiavo
Schiatti Angelo
Tyrolit Vincent

Washing

HORIZONTAL WASHING MACHINES

Ashton Industrial Sales
Bando Kiko
Bavelloni
Bovone Elett.
ECOL
Forel
Glass Company
Glaston Group
Hiseng Glass Machinery
IOCCO Group
Lisec Group
Neptun
Schiavo
Si.Ste
Triulzi

VERTICAL WASHING MACHINES

Adelio Lattuada
Ashton Industrial Sales
Bavelloni
Best Makina
ECOL
Forel
Glass Company
Glaston Group
Hiseng Glass Machinery
IOCCO Group
Lisec Group
Neptun
Schiavo
Shanghai North Glass Technology
Si.Ste
S.T. Group
Stefiglass
Tenon (Beijing) Equipment
Triulzi

WASHING MACHINES FOR AUTOMOTIVE GLASS

Bando Kiko
ECOL
Glaston Group
IOCCO Group
Triulzi

WASHING PURIFICATION SYSTEMS

Dieffe Macchine
Forel
Glass Company
Glaston Group
IOCCO Group
Schiavo
Tenon (Beijing) Equipment

LIQUID WASHING CONCENTRATES

Diamant - AR Nunziata
Schiavo

ACCESSORIES

Helios Quartz

Idrotecnica
Schiavo
S.T. Group

Mirror production

COMPLETE PLANTS & CONVEYORS FOR MIRROR PRODUCTION

Bovone Elett.
IOCCO Group
Triulzi

PAINTING EQUIPMENT

Fenzi
Giardina Finishing + HS Glassprinting
Goldglass Technologies
IOCCO Group
Triulzi

DRYING OVENS

Bovone Elett.
CMS
Giardina Finishing + HS Glassprinting
Goldglass Technologies

AUTOMOTIVE MIRROR BENDING FURNACES

Bovone Elett.

MANUAL SILVER- SPRAYING EQUIPMENT

Fenzi
Glass Company

PAINTS AND CHEMICAL PRODUCTS

Fenzi

ACCESSORIES

Fenzi
Helios Quartz

Insulating glass

COMPLETE INSULATING GLASS LINES

Ashton Industrial Sales
Bavelloni
Best Makina
Forel
Glass Company
Glaston Group
Neptun
Schiavo
S.T. Group
Tenon (Beijing) Equipment
Thermoseal Group
Triulzi

AUTOMATIC SEALING LINES

Bavelloni
Forel
Glaston Group
Lisec Group
S.T. Group

AUTOMATIC SPACER BENDING MACHINES

Bavelloni
Best Makina
Fenzi
Forel
Glaston Group
IOCCO Group
Lisec Group
Lombarda Macchine
Schiavo
S.T. Group
Tenon (Beijing) Equipment
Thermoseal Group

DESICCANT SALT FILLING MACHINES

Ashton Industrial Sales
Bavelloni
Best Makina
Di Gregorio
Fenzi
Forel
Glaston Group
Lisec Group
Lombarda Macchine
Neptun
Schiavo
S.T. Group
Tecno Glass
Tenon (Beijing) Equipment
Thermoseal Group
Triulzi

SPACER CUTTING SAWS

Ashton Industrial Sales
Bavelloni
Best Makina
Fenzi
Forel
Lisec Group
Neptun
Schiavo
S.T. Group
Tecno Glass
Tenon (Beijing) Equipment
Thermoseal Group

BUTYL EXTRUDERS

Bavelloni
Best Makina
Forel
Glaston Group
Lisec Group
Neptun
Schiavo
Si.Ste
S.T. Group
Tecno Glass
Tenon (Beijing) Equipment
Thermoseal Group
Triulzi

HOT-MELT EXTRUDERS

Bavelloni
Best Makina
Fenzi
Forel
Lisec Group
Neptun
Schiavo
Si.Ste
S.T. Group
Tecno Glass
Tenon (Beijing) Equipment
Thermoseal Group
Triulzi

POLYURETHANE EXTRUDERS

Bavelloni
Best Makina
Fenzi
Forel
Glaston Group
Lisec Group
Schiavo
S.T. Group
Tecno Glass

POLYURETHANE ENCAPSULATION

Glaston Group
Lisec Group
Schiavo

SILICONE EXTRUDERS

Best Makina
Fenzi
Forel
Glaston Group
Lisec Group
Schiavo
S.T. Group
Tecno Glass
Tenon (Beijing) Equipment
Triulzi

POLYSULPHIDE SEALANT EXTRUDERS

Best Makina
Fenzi
Forel
Glaston Group
Lisec Group
Schiavo
Tecno Glass
Tenon (Beijing) Equipment
Triulzi

GAS FILLING EQUIPMENT

Fenzi
Forel
Glaston Group
Lisec Group
Neptun
Schiavo
Si.Ste
Sparklike
S.T. Group
Tecno Glass
Tenon (Beijing) Equipment
Thermoseal Group

DESICCANT SALTS

Ashton Industrial Sales
Fenzi
Neptun
Schiavo
S.T. Group
Tecno Glass
Thermoseal Group

SPACERS/PROFILES

Ashton Industrial Sales
Edgetech Europe
Fenzi
Schiavo
S.T. Group
Tecno Glass
Thermoseal Group

GEORGIAN BARS

Ashton Industrial Sales
Hegla
Tecno Glass
Thermoseal Group

BUTYL

Ashton Industrial Sales
Fenzi
Thermoseal Group

POLYSULPHIDE SEALANTS

Fenzi

HOT MELT

Ashton Industrial Sales
Fenzi
Thermoseal Group

OTHER SEALANTS

Fenzi

PANTOGRAPHS

Fratelli Pezza

ACCESSORIES

Ashton Industrial Sales
Deltamax Automazione
Diamant - AR Nunziata
Dieffe Macchine
Forel
Forza G / G. Tech
Helios Quartz
Schiavo
Sparklike
S.T. Group
Tenon (Beijing) Equipment
Triulzi

Tempering

TEMPERING FURNACES (ARCHITECTURAL GLASS)

CNUD-EFCO
Glass Company
Glasstech Inc.
Glaston Group
Hornos Industriales Pujol
Keraglass
Landglass Technology
Lema
Lisec Group
Mappi International
Schiavo
Shanghai North Glass Technology
Tekno Kilns
Tempering furnaces (automotive glass)
Glass Company
Glasstech Inc.
Glaston Group
Keraglass
Landglass Technology
Mappi International
Mazzaroppi Engineering
Satinal Spa
SGLASS
Shanghai North Glass Technology

CHEMICALS TEMPERING EQUIPMENT

Glass Company
R.C.N. Solutions

ACCESSORIES

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

Bending

BENDING FURNACES (ARCHITECTURAL GLASS)

Hornos Industriales Pujol
Keraglass
Mappi International
Mazzaroppi Engineering
R.C.N. Solutions
SGLASS
Tekno Kilns
Bending furnaces (automotive glass)
CNUD-EFCO
Glass Company
Glasstech Inc.
Glaston Group
Keraglass
Mappi International
Mazzaroppi Engineering
R.C.N. Solutions
Satinal Spa
Si.Ste

ACCESSORIES

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

Laminated glass production

COMPLETE PLANTS

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

LAMINATED WINDSCREEN BENDING FURNACES

ECOL
Glass Company
Glasstech Inc.
Glaston Group
Keraglass
Mappi International

AUTOCLAVES

Glass Company
Glaston Group
Hornos Industriales Pujol
Lisec Group
Triulzi

CLIMATIC CABINS

Forel
Glaston Group
IOCCO Group
Lisec Group
Triulzi

INFRARED OVENS

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

PRESSES/BENDING MACHINES

Forel
IOCCO Group
Lisec Group
Triulzi

RESIN LAMINATING MATERIALS AND EQUIPMENT

IOCCO Group
Satinal Spa
Torgauer Maschinenbau

EVA (ETHYLENE VINYL ACETATE)

Satinal Spa

PVB

Everlam
Kuraray - Trosifol

PVB - SHAPING AND CUTTING EQUIPMENT

Ayrox
ECOL
Forel
Glaston Group
IOCCO Group
Lisec Group
Softeco

PVB - WIRING TECHNOLOGY FOR HEATABLE LAMINATES

Ayrox
ECOL
Softeco

ACCESSORIES

Ayrox
Bottero
Deltamax Automazione
Glaston Group
Helios Quartz
Hornos Industriales Pujol
IOCCO Group
Lisec Group
Satinal Spa
Softeco
Triulzi

Drilling

AUTOMATIC DRILLING LINES

B Solution Licensee of BF Project
Bando Kiko
Bavelloni
Forvet
Glaston Group
Guangdong Northglass & Juisun Technology Industrial
Intermac - Biesse
IOCCO Group
Schiatti Angelo
SKG - Skill Glass
Vismara

MULTI-SPINDLE DRILLING MACHINES

B Solution Licensee of BF Project
Bando Kiko
Bavelloni
CMS
Forvet
Glass Company
Glaston Group
Intermac - Biesse
IOCCO Group
Schiavo
Schiatti Angelo
SKG - Skill Glass
Vismara

DRILLING MACHINES WITH OPPOSITE DRILLING HEADS

B Solution Licensee of BF Project
Bando Kiko
Bavelloni
Bottero
CMS
Fenzi
Forvet
Glaston Group
Hiseng Glass Machinery
Intermac - Biesse
IOCCO Group
Schiavo
Schiatti Angelo
SKG - Skill Glass
Vismara

COLUMN DRILLING MACHINES

B Solution Licensee of BF Project
Bottero
Fenzi
Schiavo
Si.Ste
Vismara

PORTABLE DRILLING MACHINES

CMS
Fenzi
Schiavo
Si.Ste

DRILLING AND MILLING MACHINES

Bavelloni
Bottero
CMS
Forvet
IOCCO Group
Schiavo
SGLASS

DIAMOND DRILLS

ADI
Bovone Diamond Tools
Diamant - AR Nunziata
Diamut - Biesse
Fenzi
Glaston Group
Mole Moreschi
Schiavo
Si.Ste
Tyrolit Vincent

ACCESSORIES

CMS
Fenzi
Schiavo
Si.Ste

Other equipment and plants

TURNKEY PLANTS / ENGINEERING - FOR BUILDING GLASS

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

TURNKEY PLANTS / ENGINEERING - FOR AUTOMOTIVE GLASS

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

KEY PLANTS / ENGINEERING - FOR DISPLAY GLASS

Bando Kiko
Cugher Glass
Torgauer Maschinenbau

WORKING CENTRES - CNC CONTROLLED

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

FLOAT PLANTS/LINES (EQUIPMENT & ACCESSORIES)

Bovone Elett.
Horn
IOCCO Group

CULLET HANDLING SYSTEMS

ECOL

COMPLETE BATCH PLANTS

Zippe

VACUUM COATING EQUIPMENT AND PLANTS

Glass Company
Shanghai North Glass Technology

ENAMELLING EQUIPMENT AND PLANTS

Giardina Finishing + HS Glassprinting
Glass Company
Rollmac division of GeMaTa

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

Giardina Finishing + HS Glassprinting
Goldglass Technologies

SANDBLASTING SYSTEMS, EQUIPMENT AND PLANTS - OPTIMIZERS

Fenzi
Fratelli Pezza
Glass Company
Schiavo
SKG - Skill Glass

DIGITAL INKJET PRINTERS

Glass Company
System Ceramics

SCREEN PRINTING EQUIPMENT AND PLANTS

Ayrox
COMSS
Cugher Glass
Deltamax Automazione
ECOL
Giardina Finishing + HS Glassprinting
Glass Company
Guangdong Northglass & Juisun Technology Industrial
Keraglass
Rollmac division of GeMaTa
Shanghai North Glass Technology
Softeco

SCREEN PRINTING FRAMES

COMSS

SCREEN PRINTING DRYING SYSTEMS

COMSS
Cugher Glass
Glass Company
Guangdong Northglass & Juisun Technology Industrial
Rollmac division of GeMaTa

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

Glass Company
Keraglass
Tekno Kilns

CUTTERS

Accessories
Deltamax Automazione
Helios Quartz

CUTTING WHEELS

Si.Ste

UV ADHESIVES

Si.Ste

Miscellaneous

ADHESIVES FOR GLASS BONDING
Si.Ste

AUTOMATION
Ashton Industrial Sales
Goldglass Technologies
Horn
IOCCO Group
Torgauer Maschinenbau
Zippe

AUTOMOTIVE GLASS APPROVAL SERVICES
Ayrox
Softeco

AUTOMOTIVE GLASS QUALITY CONTROL
Ayrox
Bando Kiko
Cugher Glass
Deltamax Automazione
Easy Automation
Glaston Group
IOCCO Group
Softeco

CE MARKING - QUALITY CONTROL EQUIPMENT FOR GLASS IN BUILDING
Ayrox
Softeco

COATING OF GLASS SHEETS - SYSTEMS & MATERIALS - HOT / COLD END
Goldglass Technologies

COLOURS & ENAMELS - OTHER APPLICATIONS
Ayro
Goldglass Technologies

DEIONIZING AND WATER SOFTENING EQUIPMENT
Fenzi
Forel
Glass Company
Idrotecnica
Lisec Group
Triulzi

FLAT GLASS QUALITY CONTROL DEVICES
Ayrox
Deltamax Automazione
Forel
IOCCO Group
Softeco

FURNACES
Glass Company
Horn

FURNACES / HYDROGEN GENERATORS (WATER ELECTROLYSERS)
Nel Hydrogen

GLASS COATING AND TINTING
Giardina Finishing + HS Glassprinting
Glass Company
Goldglass Technologies
Rollmac division of GeMaTa

GLASS TREATMENT FILMS
Glass Company

HEATING EQUIPMENT - STANDARD (GAS FIRING, BURNERS, AIR GAS MIXERS, SAFETY DEVICES, ELECTRICAL RESISTORS)
Horn
Keraglass

HINGES FOR GLASS DOORS
Si.Ste

METAL ACCESSORIES
Si.Ste

INFRARED TUBES
Helios Quartz
Deltamax Automazione

KILNS
Glass Company
Keraglass
Lisec Group
Tekno Kilns
Metal accessories
Fenzi

METALLIC SECTIONS
Fenzi

NUMERICAL CONTROL SYSTEM (CNC) FOR ALL GLASS PROCESSING MACHINES
Glass Company
IOCCO Group
Prodim

OPTICAL DISTORTION ANALYSERS FOR AUTOMOTIVE GLASS
IOCCO Group
Keraglass

OPTICAL INFRARED THERMOMETERS
Optris

POWDER OR LIQUID APPLICATION SYSTEMS FOR PROTECTING FLOAT GLASS
Cugher Glass
Giardina Finishing + HS Glassprinting
Glass Company

PUMPING AND APPLICATION SYSTEMS (AUTOMOTIVE GLASS)
IOCCO Group

PURIFIERS FOR REFLUENT WATER
Dieffe Macchine
Forza G / G. Tech

PUTTIES AND SEALANTS
Fenzi

QUARTZ EQUIPMENT
Helios Quartz

SHAPE CHECKING DEVICES
Easy Automation
IOCCO Group

SIC HEATERS
Helios Quartz

SOFTWARE DATABASE, PROPERTY PREDICTOR
Synerglass Soft

SOFTWARE SYSTEMS FOR PRODUCTION CONTROL
A+W Software
CMS
Cugher Glass
Deltamax Automazione
Edgetech Europe
Forel
Lisec Group
Optima
Prodim
Synerglass Soft

SOLDERING EQUIPMENT FOR ELECTRICAL CONNECTORS FOR WINDSCREENS AND BACKLITES
Ayrox
Easy Automation
Softeco

SORTING SYSTEMS
Glaston Group
Lisec Group

SURFACE STRESS MEASUREMENT INSTRUMENT
Ayrox
Glass Company
Jeffoptics

TESTING FOR SOLDERINGS
Ayrox
Easy Automation
Softeco

TESTING DEVICES OF BACKLITES ELECTRICAL HEATING
Ayrox
Softeco

THERMAL IMAGING SYSTEMS
Easy Automation
Glass Company
Optris

TIN FLOAT BATH FURNACES
Horn
IOCCO Group

UV LAMPS
Helios Quartz

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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

Glass Industry Directory 2020

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2013

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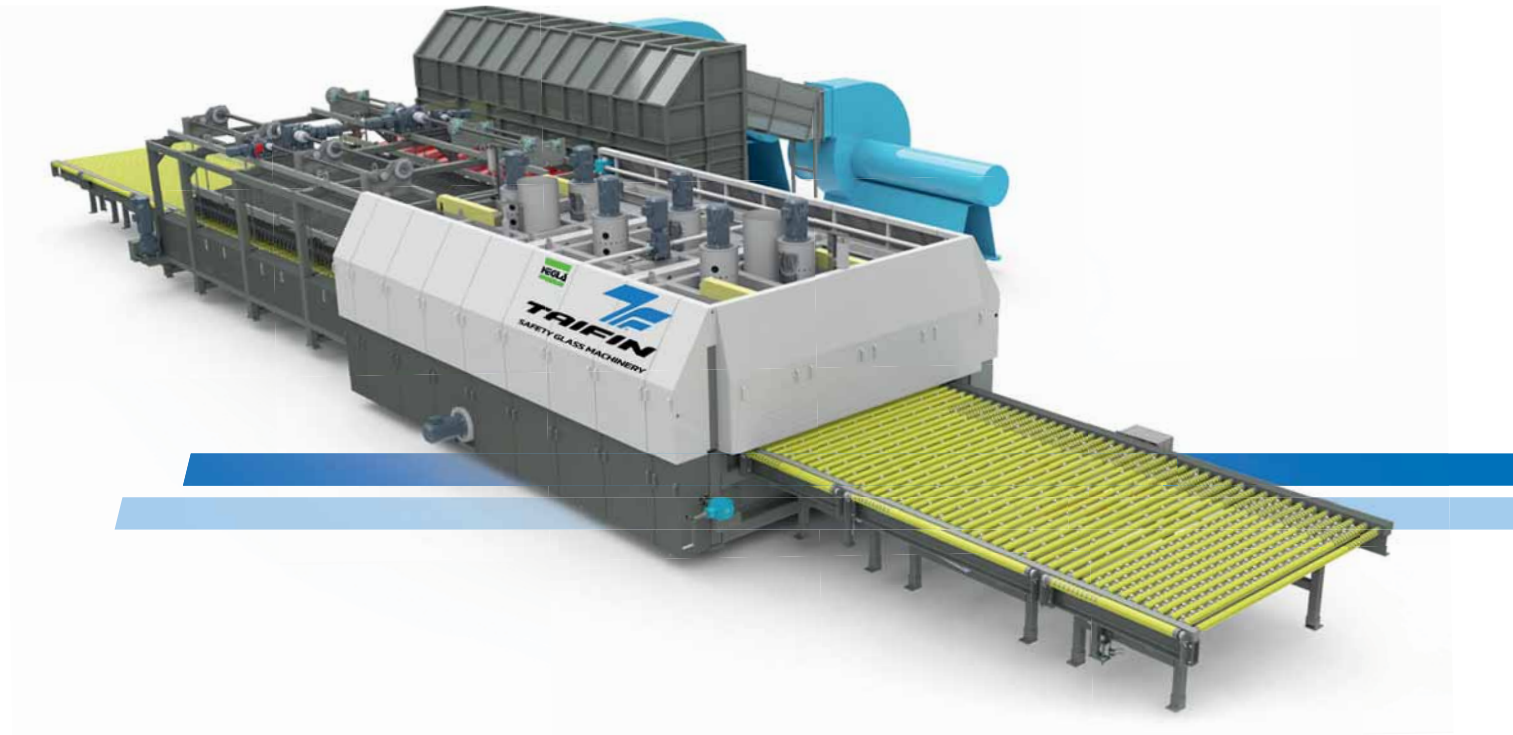

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