

Glass-Technology International

THE LEADING MAGAZINE FOR THE INTERNATIONAL FLAT GLASS INDUSTRY

July/August Year 37 • No. 4/2026

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23-25 September, 2026

Booth: 4007

GLASSTEC 2026

20-23 October, 2026

Booth: 12A55

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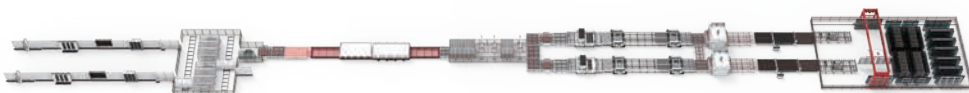


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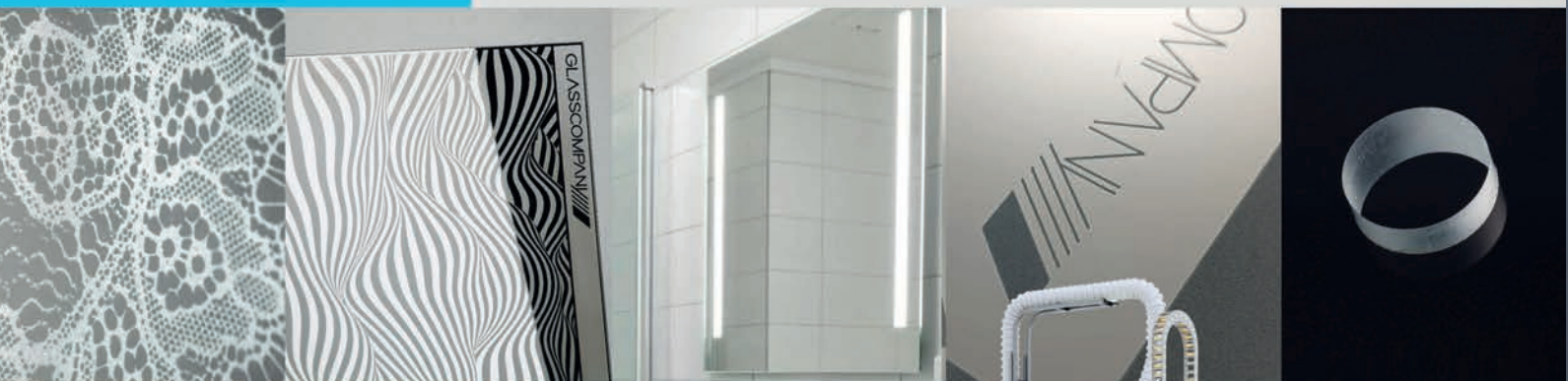
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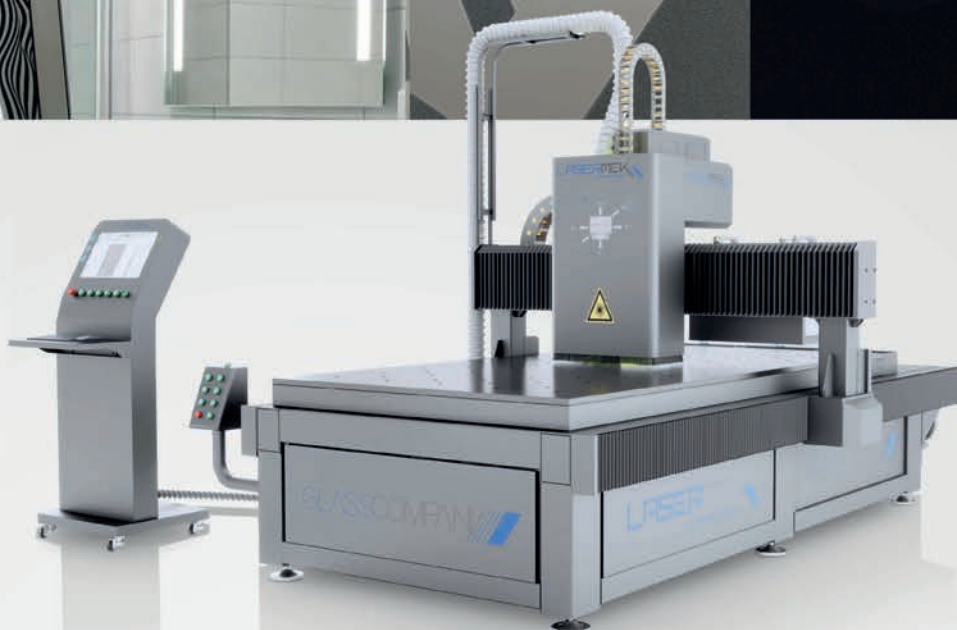
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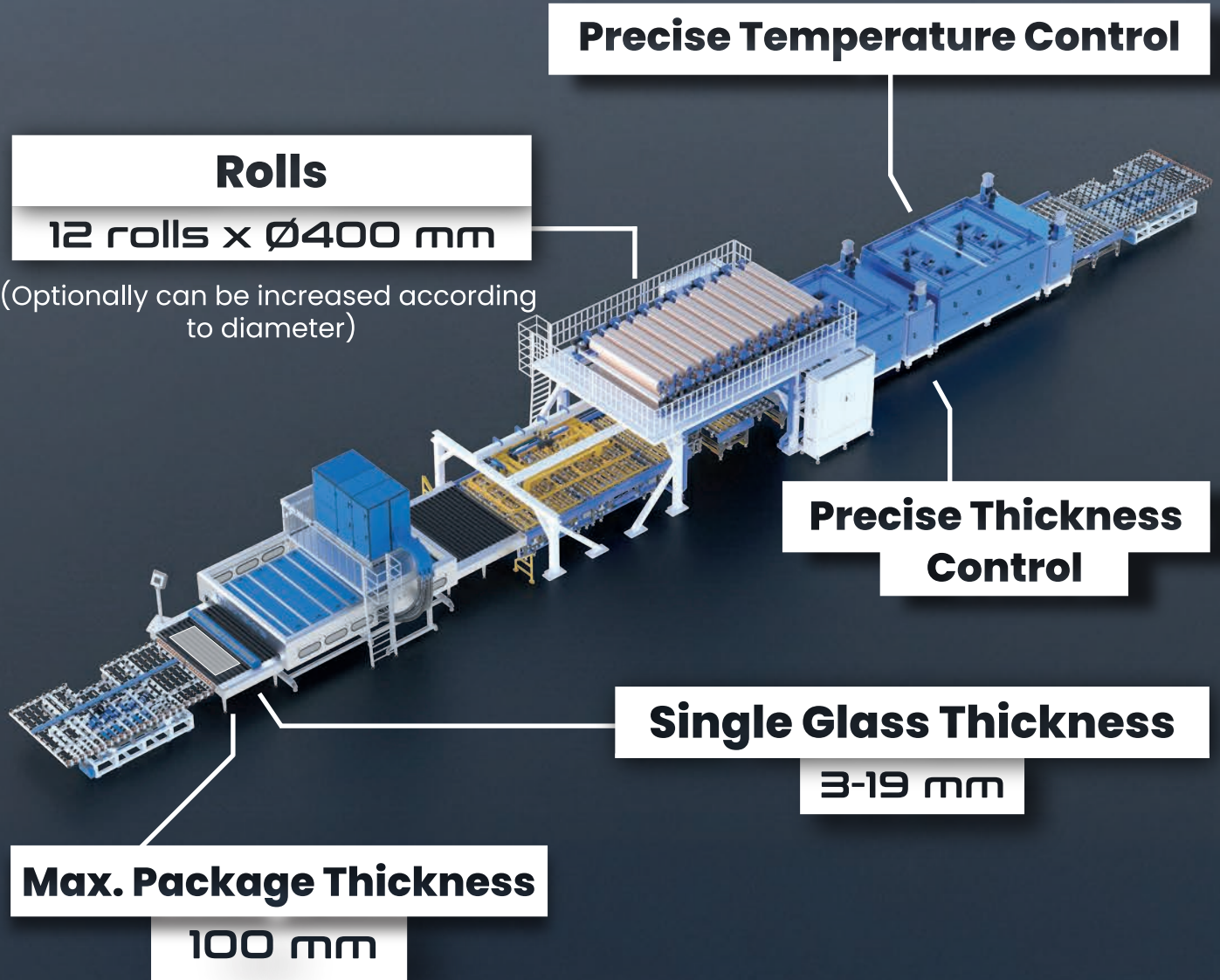


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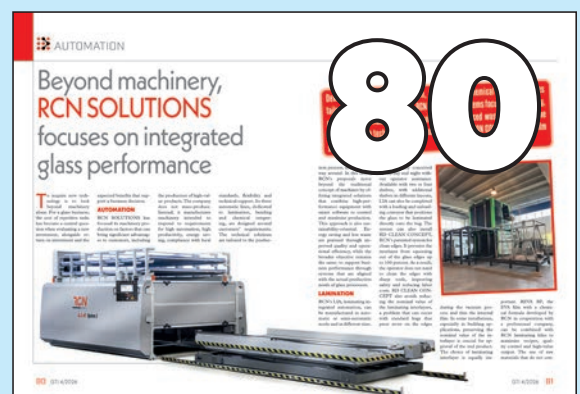
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DELTAMAX
we see it

A large industrial laser processing machine, the LiSEC LSP-A, is shown in a factory setting. The machine is composed of several large, modular units in white and red. A prominent red unit in the foreground has the 'LiSEC' logo on it. The background shows a large glass panel with a grid of small, square openings, likely for ventilation or as part of the machine's structure. The overall scene is industrial and modern.

LSP-A

LiSEC @ Glassbuild America
23rd - 25th September
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2026



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20-01-2026

2026

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FENSTERBAU FRONTALE | 24-27 MARCH | NUREMBERG - GERMANY

GLASS EXPO NORTHEAST | 25-26 MARCH | LONG ISLAND (NY) - USA

FEATURED CONTENT: FIRE-RESISTANT GLASS

Editorial files:

09-02-2026

Deadline Adv files:

13-02-2026

2026

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CHINA GLASS | 7-10 APRIL | SHANGHAI - CHINA

INTERNATIONAL GLASS MANUFACTURING SHOW | 21-23 APRIL | DUBAI - UAE

WINDOOREX | 7-9 MAY | CAIRO - EGYPT

Editorial files:

02-03-2026

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06-03-2026

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GLASS-TECH POLAND | 26-28 MAY | WARSAW - POLAND

BIG 5 CONSTRUCT SOUTH AFRICA | 9-11 JUNE | JOHANNESBURG - SOUTH AFRICA

GLASSTECH MEXICO | 15-17 JULY | MEXICO CITY - MEXICO

Editorial files:

24-04-2026

Deadline Adv files:

28-04-2026

2026

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ICCG CONFERENCE & EXHIBITION | 15-17 SEPTEMBER | BERLIN - GERMANY

GLASSBUILD AMERICA | 23-25 SEPTEMBER | LAS VEGAS (NV) - USA

Editorial files:

23-07-2026

Deadline Adv files:

27-07-2026

2026

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GLASSTEC | 20-23 OCTOBER | DÜSSELDORF - GERMANY

All GLASSTEC exhibitors advertising in this issue also receive a free GLASSTEC PREVIEW

GLASSTECH ASIA | 10-12 NOVEMBER | KUALA LAMPUR - MALAYSIA

VETECO | 10-13 NOVEMBER | MADRID - SPAIN

Editorial files:

24-09-2026

Deadline Adv files:

29-09-2026

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EURASIA GLASS | 21-24 NOVEMBER | ISTANBUL - TURKEY

ZAK GLASS TECHNOLOGY | 10-12 DECEMBER | DELHI - INDIA

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26-10-2026

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The equipment configurations can be stand-alone and/or in-line with an automatic loader (**series 600**) and

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BKM float cutting tables are **Industry 4.0** compliant and to support the green transition, Bottero S.p.A. recently achieved the **ISO 26000** certification which effectively assess and address our social responsibilities.

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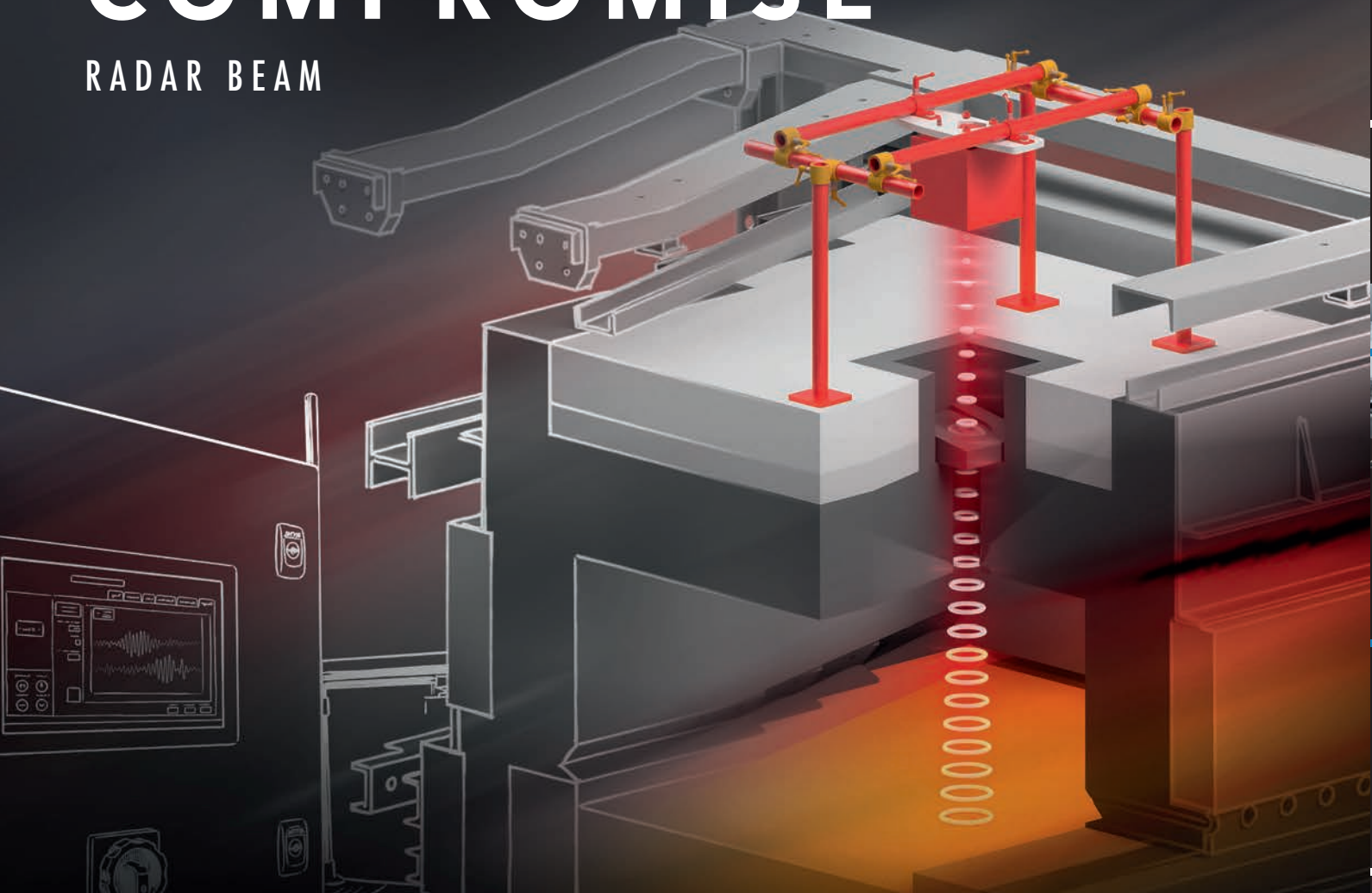
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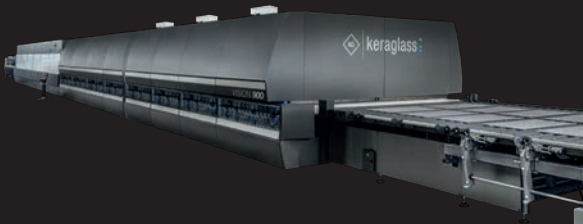


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LiSEC

Partnership with Manna Glass Company continues

Manna Glass Company continues its successful partnership with LiSEC through the upcoming installation of the new LiSEC Jumbo TPA Line.

This investment reflects Manna Glass Company's ongoing commitment to advanced automation, operational excellence and expanding its manufacturing capabilities to meet the growing demands of the glass industry.

LiSEC commented, "With the upcoming delivery of a new LiSEC Jumbo TPA line in June 2026, we are further expanding our long-standing cooperation with Manna Glass Company, supporting their continued growth and development in the glass industry."

This project highlights Manna Glass's clear commitment to investing in advanced technologies and modern automation solutions, enabling them to keep pace with the rapid evolution of the glass processing sector and to meet growing market demands.

Manna Glass greatly values the strong relationship and mutual trust between companies and looks forward to many more successful collaborations in the future. The company would like to thank Mr Ibraheem Manna and Mr Ahmed Mahmoud Nada for their trust.

WWW.LISEC.COM - WWW.MANNAGLASS.SA



GLASTON

Strengthened portfolio and acquisition of coating technology IP

Glaston has acquired selected intellectual property rights that were originally developed by the engineering start-up Volframi. The technology offers interesting opportunities for integrating intelligence into glass through advanced coating solutions.

As a result of the transaction, patented and patent-pending technologies related to this unique local area coating technology will transfer to Glaston. Initially introduced at the Glass Performance Days conference in 2021, the local area coating concept represents an advanced method for depositing multiple thin-film layers on precisely targeted areas of large glass substrates.

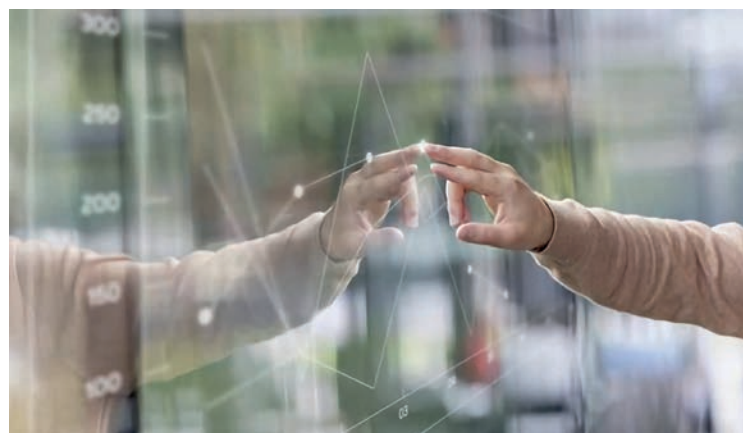
The coating technology supports more sustainable glass production by lowering resource consumption and environmental impact. It enables more efficient manufacturing of both

existing and new glass applications by reducing equipment needs, minimising factory space and decreasing labour intensity. In addition, it cuts material waste, contributing to better resource efficiency.

The acquired assets provide a proven scientific foundation that Glaston will leverage to develop high-performance glass solutions together with its customers. The technology enables various glass applications for the mobility, appliance, and architectural industries.

"Glaston actively supports the development of new technologies that integrate intelligence into glass, and this acquisition is a concrete example of that approach," said Miika Äppelqvist, Glaston CEO. "This local area coating concept lets our architectural, appliance and mobility customers add functionality precisely where it's needed, using less materials, less process steps and opening new design opportunities."

WWW.GLASTON.NET



FIVES

Powering Europe's largest flat glass line for Şişecam

Şişecam, a global leader in glass manufacturing, has successfully commissioned its greenfield TR9 float glass line in Tarsus, Turkey. The project was supported by Fives which supplied key process technologies focused on energy efficiency and performance.

With a production capacity of 1,200 metric tonnes per day, the TR9 line is now the largest flat glass production line in Europe and ranks among the highest-capacity facilities worldwide. The line will primarily serve the domestic market with clear flat glass while also supplying raw glass to the adjacent coating line in Tarsus.

This flagship investment marks a significant milestone for both Şişecam and the global glass industry, setting new standards in high-capacity and energy-efficient manufacturing.

As part of the project, Fives delivered the complete engineering design of the tin bath, along with a new generation of associated equipment. The company also supplied the annealing lehr, engineered to achieve cooling speeds of up to 28 metres per minute -significantly faster than previous installations- enhancing both productivity and product quality.



The TR9 line marks a new step in Şişecam's industrial development, combining scale, performance and sustainability. Delivered in partnership with Fives, the project sets a new reference point for the flat glass industry in Europe and beyond.

Gökhan Samsa, TR9 Line Plant Manager at Şişecam Tarsus, said, "The TR9 line is the largest flat glass

production facility we have ever built. It integrates advanced technologies such as AI-powered furnace automation, low-NOx combustion systems and state-of-the-art forming equipment. This significantly strengthens our industrial capabilities and reinforces our position in the global market. "The primary challenges were related to supply chain disruptions and workforce constraints driven by global economic fluctuations. However, leveraging Şişecam's presence in 14 countries and more than 90 years of experience, we successfully overcame these obstacles through a flexible, solution-oriented approach."

Talking about the cooperation with Fives, Gökhan Samsa added, "Fives demonstrated a highly responsive and solution-driven approach, providing skilled personnel on-site and adapting quickly to project requirements. The collaboration was excellent. Their expertise in energy-efficient, low-emission technologies and high-capacity equipment played a crucial role in achieving our performance and sustainability goals."

WWW.SISECAM.COM - WWW.FIVESGROUP.COM

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GIMAV

Nancy Mammaro elected President: Renewal of governance

The Members' Assembly of **GIMAV** -the Italian Association of suppliers of machinery, accessories, equipment and technologies for glass processing- recently elected the new governance that will lead the Association for the 2026–2030 four-year term.

Nancy Mammaro (Mappi International S.r.l.) has been elected President, taking over the leadership of the Association with the aim of strengthening its representative role, consolidating services in support of companies and accompanying the international development of the Italian glass technology supply chain.



The new governance takes office at a particularly significant time for the sector, which is facing industrial transformation, technological innovation, the energy transition and new competitive dynamics in global markets.

The new Presidential team Nancy Mammaro is President and CEO of Mappi International S.r.l., a company based in Cisterna di Latina specialising in the design and production of furnaces for glass tempering and laminating, which joined the Voilap Glass Group at the beginning of 2025.

Having led the company for over thirty years, Mammaro has contributed to the development and international consolidation of Mappi, strengthening its positioning in foreign markets and particularly in North America, also thanks to a direct presence in the United States.

Recognised for her entrepreneurial experience, leadership skills and strong focus on international relations, Nancy Mammaro is active in promoting Italian manufacturing excellence worldwide and in engaging with the main industry associations, including the National Glass Association. She is also Ambassador of Confindustria's Small Industry Committee, representing Unindustria Lazio, with the aim of promoting the values of the Confindustria system through a national network of entrepreneurs; in this role, she contributes to enhancing the value of Italian industry and promoting Made in Italy on international markets.

Supporting the President will be:

- Nicola Lattuada, Senior Vice President with responsibility for Association Services, Internationalisation and VITRUM;
- Francesca Antonini, Vice President with responsibility for Machinery and Technologies for Hollow Glass Processing;
- Matteo Padovan, Vice President with responsibility for Innovation and Glass Economy Supply Chains.

The new General Council is composed of:

- Monica Messori (Biesse S.p.A.) Beatrice Pianosi (Profilglass S.p.A.)
- Barbara Mazza (Cugher Glass S.r.l.) Gianluca Diener (Deltamax Automazione)
- Cinzia Schiatti (Schiatti Angelo S.r.l.) Massimo De Feo (LiSEC Solutions Italy S.r.l.)

Operational continuity within the Association will be ensured by Lucia Masutti, Director General of GIMAV.

A more authoritative, representative GIMAV, closer to companies The programme for the new mandate is based on a vision aimed at making GIMAV increasingly authoritative in institutional relations, more representative of the entire supply chain and more useful to member companies.

Among the priorities identified by the new Presidency are:

- strengthening the Association's representative role and expanding its membership base;
- consolidating services and help desks in support of companies; adopting a more proactive approach to internationalisation processes;
- strengthening dialogue with the Confindustria system and with institutions;
- developing VITRUM as an international hub for the glass economy and as a permanent platform for innovation, relations and business for the sector. Particular attention will also be devoted to developing relations among member companies, enhancing the value of the different glass supply chains and strengthening GIMAV's role as a point of reference for the entire industrial ecosystem of the sector.

Nancy Mammaro, incoming President of GIMAV, said: "I accept this appointment with pride and with a deep sense of responsibility towards all the companies represented by GIMAV. Our sector is experiencing a complex phase, marked by international tensions, regulatory transformations and increasingly competitive markets. In this scenario, it is essential to build concrete association action, capable of listening to the real needs of companies, protecting the supply chain and supporting businesses in their growth, innovation and internationalisation paths. We want GIMAV to be increasingly strong, authoritative and united, able to act as a recognised voice for the sector in Italy and around the world. We will work to strengthen the value of belonging to the Association, develop new opportunities for companies and consolidate the international positioning of Italian glass technology."

Looking to the future With the new governance structure, a new phase of development begins for GIMAV, based on listening, participation and concrete action. The objective is to strengthen the competitiveness of member companies and consolidate the role of Italian glass technology in international markets, while enhancing the industrial, innovative and manufacturing heritage expressed by the sector.

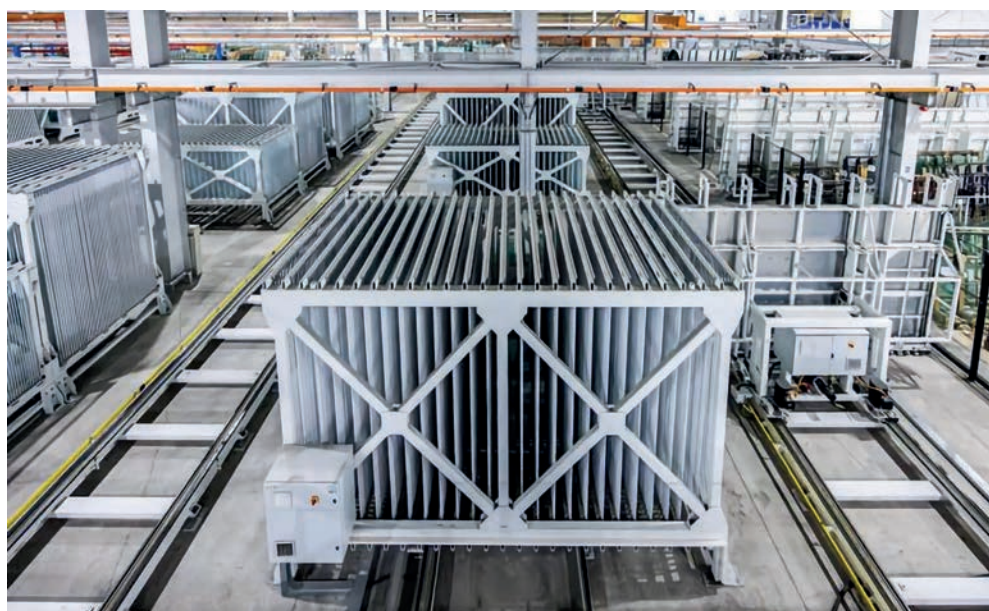
WWW.GIMAV.IT

FOREL

Sorting System automates handling, storage and management

In a modern glass factory, efficiency is not determined only by the performance of individual machines, but by the ability to connect and synchronise every production stage.

Forel's Sorting System is designed to automate the handling, storage and management of work-in-progress products, creating a continuous and controlled flow between cutting and downstream processes.



- Intelligent buffer management
- Automated glass tracking and routing Optimised production sequencing
- Reduced manual handling
- Modular and scalable configuration

This solution has been developed to support high-mix production environments, multiple downstream processes and increasingly complex production requirements.

WWW.FORELSPA.COM

HORN

Stone-laying ceremony for Düzce Cam's 800 tpd float glass plant

With more than 30 years of experience, **Düzce Cam**, based in Düzce, Turkey, is one of the established manufacturers in the Turkish float glass industry. The company combines long-standing expertise with modern production technology, high quality standards and reliable glass manufacturing.

At the end of 2022, **HORN Glass Industries** was commissioned by Düzce Cam to supply essential plant components for the hot end of a new float glass plant with a production capacity of 800 tonnes per day to be established in Bilecik, Turkey. The scope of supply includes the glass melting furnace, the tin bath, the annealing lehr, a hot end automation system and the protective gas station.

Manufacturing of the individual components at HORN's site in Plößberg, Germany has been largely completed. Construction work on site began on 20 April 2026. This week, an important first milestone of the large-scale project was celebrated: during a ceremonial stone-laying ceremony on 15 June 2026, the first stones of the new glass melting furnace were laid.

The commissioning of the new float glass plant is scheduled for April 2027.

WWW.HORNGLOSS.COM - WWW.DUZCECAM.COM.TR

ACCURSIA CAPITAL

Portfolio company Eckelt Glas sold

Accursia Capital has completed the divestment of **Eckelt Glas**, a manufacturer and processor of architectural and safety glass solutions headquartered in Steyr, Austria. The company specialises in high-performance glazing solutions for complex façade and building applications.

Accursia Capital has divested Eckelt as part of its ongoing portfolio activity. During the ownership period, November 2025-June 2026, the company was supported within its industrial environment through a range of operational and functional initiatives embedded in the broader context of portfolio development.

The transaction is consistent with Accursia Capital's active approach to portfolio allocation and management, enabling a more focused deployment of capital and capabilities across its remaining industrial holdings within the current strategic and

operational framework.

Accursia Capital is a Munich-based private equity firm focused on the acquisition and development of industrial companies in special situations, including carve-outs and turnaround scenarios. The firm has extensive experience in operational value creation and manages a diversified portfolio across Europe with a focus on automotive, engineering and industrial materials.

WWW.ACCURSIA-CAPITAL.DE - WWW.ECKELT.AT





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ŞİŞECAM

Commissioning of new EUR 25 million coated glass line in Tarsus

Continuing its strategic investments, **Şişecam** has completed a new coated glass line at its Tarsus facility, Turkey, with an annual production capacity of 7 million square metres. This development follows the commissioning of a flat glass line with an annual gross capacity of 432,000 tonnes, as well as energy glass lines with an annual capacity of 47 million square metres at the same site within the past six months.

With a total investment of EUR 25 million, the new line stands out as a significant strategic step that will not only expand Şişecam's value-added product portfolio but also enhance its competitive power in global markets. The products manufactured on this new line will be exported to a wide geography, primarily including the Middle East-North Africa (MENA), Eastern Europe and South Asia, in addition to serving the domestic market.

With this strategically located production complex, Şişecam aims to increase the share of value-added products in its flat glass production, strengthen its supply chain flexibility, and further enhance its operational efficiency.

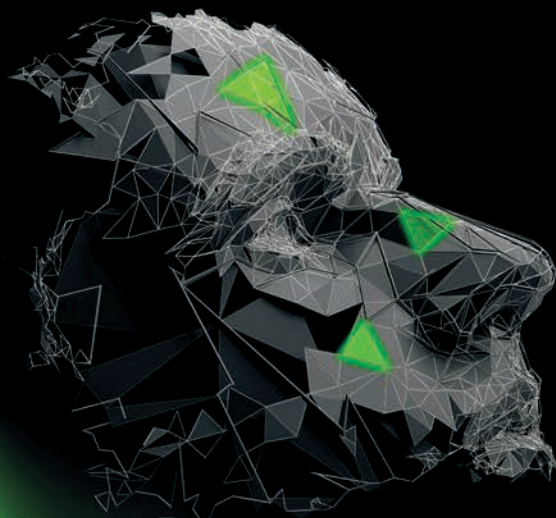
Highlighting the strategic importance of the new investment, Can Yücel, CEO of Şişecam, said, "We are maintaining a disciplined and continuous investment approach in the coated glass segment. Following our recent capacity additions in Bulgaria and Italy, we have now successfully commissioned our new line in Tarsus. These investments not only support our leadership position in Turkey but also strengthen our competitive positioning in international markets. By increasing the share of value-added products in our portfolio, these strategic initiatives contribute directly to our objectives of sustainable profitability, and operational efficiency."

Accelerating its coated glass investments on a global scale since the beginning of 2026, Şişecam completed its new line with an annual capacity of 6 million square metres at its flat glass facility in Bulgaria on January 30, 2026, and commissioned another new line at its San Giorgio di Nogaro facility in Italy in February.

With the Tarsus investment now fully operational, the number of Şişecam's active coated glass lines worldwide has reached seven, bringing its total annual coated glass production capacity to 48.1 million square metres.

WWW.SISECAM.COM





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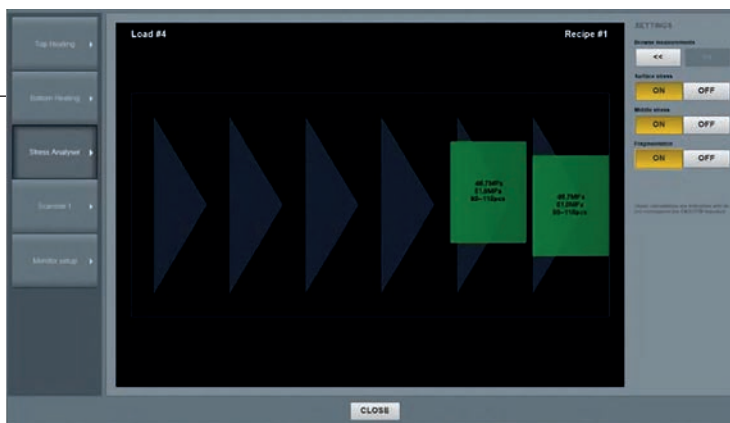
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GLASTON

Introduction of Online Stress Calculation (OSC™)



Safety is the most important characteristic of tempered glass. When broken, tempered glass breaks into small pieces that do not cause severe injuries as larger glass pieces would. Additionally, increased tempered glass strength enhances safety. But how do you know that all your glasses leaving the factory are properly tempered?

While accidents caused by improperly tempered glass are rare, even a single accident is too much.

“Keep performing those break tests. What if it was your child that ran through an improperly tempered glass and got injured or worse?”

“This quote is from a glass processor who said he uses this to remind operators to do the break test. It’s an excellent way to emphasise the importance of safety procedures,” says Riku Färm, Vice President at Glaston Product Management.

Glaston recently introduced the Online Stress Calculation (OSC™), a method developed to tackle the inherent issues of the standardised destructive break test and non-destructive surface stress and middle-pane tension measurements, namely:

The break test is not applicable to all processed glass. Surface stress and middle-pane tension measurements are too slow and expensive to be applied to all processed glass. OSC™ provides measurements of glass surface stress and middle-pane tension, as well as an estimated amount of fragmentation for all processed glass. OSC™ is directly integrated into the tempering line operating system, and all results are based on actual measurements of critical process variables during tempering.

The results include automatic alerts if any glass is outside the defined tolerances, providing a continuous readout of the same safety outcome as the fragmentation test without breaking the glass. Glass processors will be able to provide end customers with proof of the tempering level for each piece of processed glass.

“OSC™ lets you also define your own standard for stress levels,” Riku added. “And when you once define your limits, OSC™ enforces them automatically on every glass produced. Targeting the right stress level consistently also helps avoid over-tempering, supporting better process performance and lower energy use.”

WWW.GLASTON.NET

NORTHGLASS

23-metre tempered glass delivered for Guangshang Tower

When it comes to oversized architectural glass, size alone is never the real achievement. Recently, 23-metre-long tempered glass panels manufactured by **NorthGlass** were fully installed at Guangshang Tower, in Guangzhou, China, and will soon be unveiled as part of the building’s completed façade.

At approximately 23 metres in height -equivalent to a seven-story building- each panel extends continuously from the ground level to the upper floors, creating a

seamless glass façade with minimal visual interruption. Such dimensions offer architects greater design freedom, enhanced transparency and a stronger connection between interior and exterior spaces.

However, manufacturing oversized glass is about far



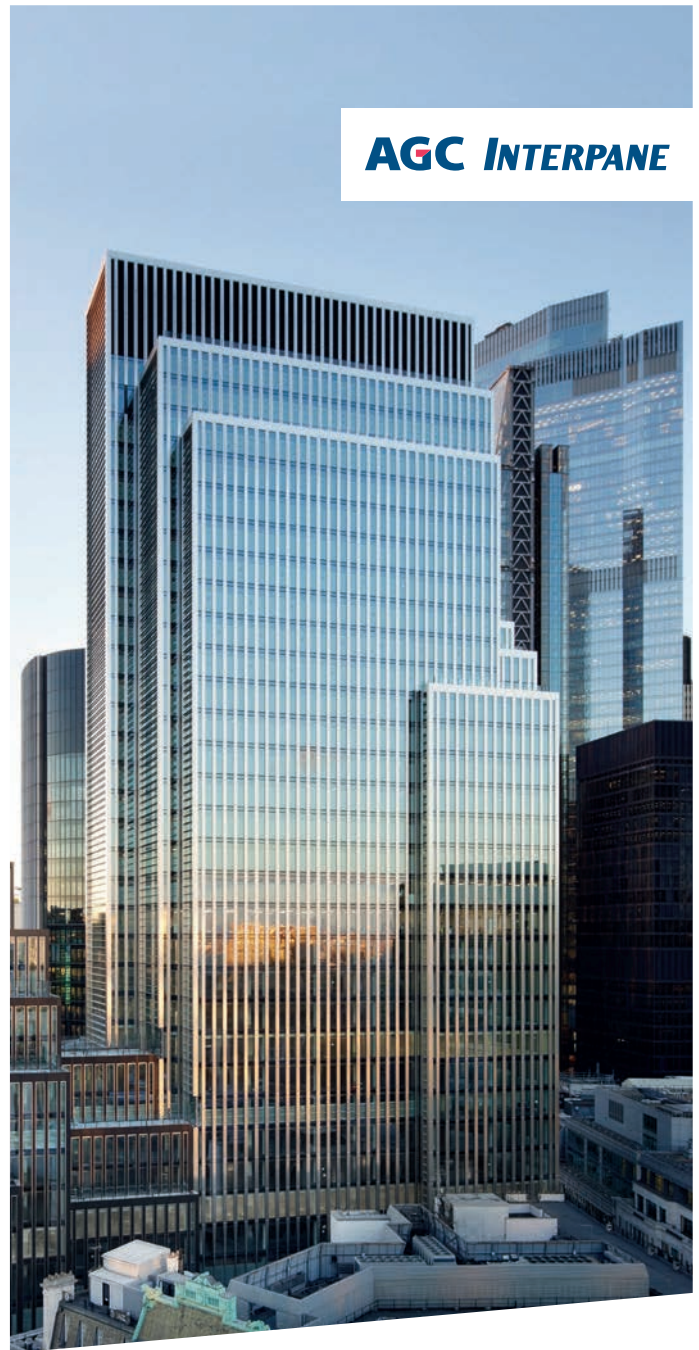
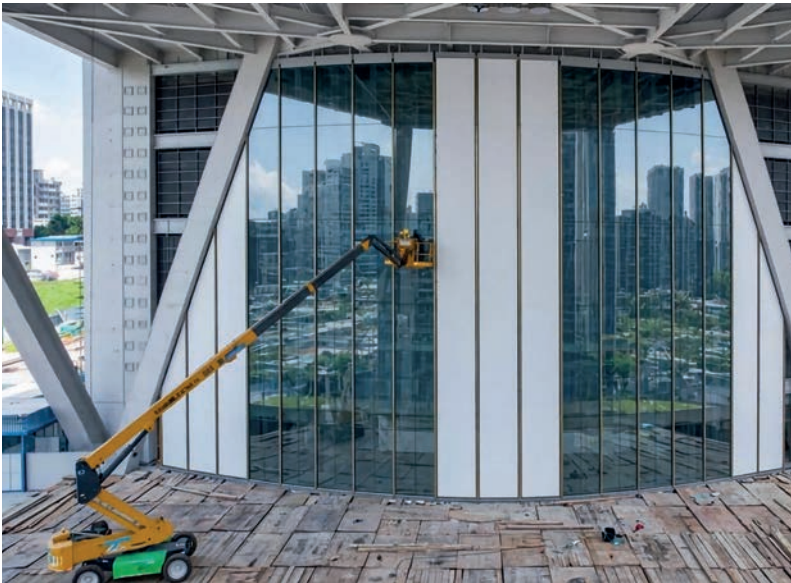
more than increasing dimensions. As glass size grows, technical challenges increase exponentially. Maintaining optical quality, surface flatness, tempering uniformity, structural integrity and installation precision becomes significantly more demanding. Even minor deviations can become highly visible when multiplied across a panel of this scale.

To ensure the performance and reliability of these oversized units, NorthGlass implemented strict quality control throughout the entire production process - from raw glass selection and precision edge processing to tempering optimisation, heat soak treatment and SGP laminated assembly. Every stage was carefully managed to meet the stringent requirements associated with ultra-large architectural glass.

For architects and façade engineers, the true value of oversized glass lies not simply in its dimensions, but in its ability to remain optically clear, structurally reliable and visually flawless at unprecedented scale.

The successful application of 23-metre tempered glass at Guangshang Tower demonstrates how advances in glass processing technology continue to expand the possibilities of contemporary architecture, enabling larger, more transparent and more ambitious building envelopes than ever before.

WWW.NORTHGLASS.GLOBAL



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iplus insulating glass units as well as ipasol and Stopray solar control glazing from AGC INTERPANE are state of the art in both technical and aesthetic terms. With their own EPD (Environmental Product Declaration), they meet all requirements for the highest level of environmental certification for your buildings. Our products are also „Cradle to Cradle“ certified and, thanks to CO₂-reduced production, available as „Low Carbon“ variants, including research, consultancy and technical advice.

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LANDGLASS

Tempering furnace powers evolution of appliance glass in Egypt

The transformation of appliance glass continues to advance, and **LandGlass** will always stand firmly behind glass processing innovators, empowering them to bring every ordinary family one step closer to an extraordinary, brighter future.

In the bustling markets of Cairo, families gather in lively clusters, carefully comparing air conditioners, refrigerators, stoves and washing machines. Children tip-toe to touch the sleek, smooth surfaces, while home-makers inspect the stove glass to ensure it is flawlessly pristine. For millions of Egyptian households, a durable, aesthetically pleasing appliance is far more than just a tool for chores. It is a tangible reflection of a life moving upward and forward.

As the most populous nation in the Middle East, Egypt's 106 million people are experiencing a quiet but profound lifestyle shift. With rising incomes and changing consumer habits, expectations for home appliances have evolved from simple functionality to refined utility and modern aesthetics.

- Ovens must bake to crispy perfection;
- washing machines must run quietly and dependably;
- refrigerator glass panels should be mirror-smooth, reflecting the joyful smiles of the family.

"Our new tempering equipment effortlessly handles high-volume production while flawlessly shaping complex bent or patterned designs," the team of a client shared confidently. "Even when clients inspect our products under a magnifying glass, we have absolute confidence in our quality."

Today, this client has not only consolidated their local market leadership but have also secured major international contracts, bringing Egyptian-crafted glass into homes across the globe.

WWW.LANDGLASS.NET

SAINT GOBAIN & AGC

Volta - hybrid melting at industrial scale

The VOLTA pilot furnace at the AGC Brevka plant in Teplice, Czech Republic, marks a decisive milestone in the demonstration of hybrid melting for flat glass, following one full year of continuous operation.

Since its start-up in early 2025, the pilot furnace has delivered stable and consistent production, providing strong technological validation of the robustness of the hybrid concept.

Operational performance fully met design expectations, confirming energy consumption, temperature control and glass quality at the level of float glass across a wide range of cullet ratios and pull rates. These results strengthen confidence in the scalability of the concept and support its suitability for future industrial-scale deployment.



What enables these results:

Higher energy efficiency through hybrid melting 50 percent share of electricity, with certified renewable sourcing Increased cullet use: 88 percent in standard operation (versus 40 percent previously)

What it delivers: 66 percent reduction in fossil fuel consumption 71 percent reduction in Scope 1+3 CO2 emissions vs. reference (emissions related to gas and raw materials only, according to Innovation Fund accounting) These achievements result from the constructive collaboration between **Saint-Gobain Glass** and **AGC Glass Europe**. After one successful year of operation, VOLTA stands as a validated technological platform supporting progress toward low-carbon flat glass production. The Volta R&D project is funded by the Innovation Fund of the European Union.

WWW.SAINT-GOBAIN-GLASS.COM - WWW.AGC-GLASS.EU



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- + Telemetry with dedicated mes

The image shows LIA in a 4+4 configuration. Other combinations available

rcnsolutions.it



NOVASKLO

Pilkington architectural glass distributor in Ukraine

NovaSklo Trade, a project of the Ukrainian investment and industrial holding EFI Group, recently signed an exclusive distribution agreement with **NSG Group**, one of the world's leading manufacturers of architectural glass. The agreement was signed on June 25, 2026, in Gdańsk during the Ukraine Recovery Conference 2026.

Under the agreement, NovaSklo Trade becomes the sole official distributor of Pilkington architectural glass products in Ukraine.

As part of the collaboration, the company has obtained exclusive rights to supply and promote the full range of Pilkington architectural glass products, including its flagship solutions: Pilkington Optiwhite™ extra-clear glass, Pilkington Suncool™ high-performance solar control glass and Pilkington Opti-float™ Clear float glass.

"Providing the Ukrainian market with access to world-leading technologies is of particular importance to us," said Igor Liski, Founder of EFI Group. "This next stage of cooperation with NSG Group, the technical partner of the NovaSklo project, represents another step toward developing a modern glass industry in Ukraine and strengthening the competitiveness of the construction sector. Collaborations like this create the foundation for the country's long-term industrial development."

NovaSklo Trade specialises in façade and panoramic glazing solutions, combining contemporary aesthetics with high energy-efficiency standards. The company will provide direct access to Pilkington architectural glass products and technological solutions for Ukrainian customers, working closely with architects, developers and glass processors.

The agreed model ensures direct access to the manufacturer without additional intermediaries, enabling competitive pricing, transparent logistics and predictable delivery timelines.

"Ukraine is a strategically important market for NSG Group, particularly in the context of the country's future reconstruction," said Alderlan Vitalino, European Marketing Director of NSG Group. "Selecting a local partner is an important step that allows us to better understand market needs and support long-term business development. We are confident that this agreement meets the highest standards of cooperation and will make a meaningful contribution to the development of the industry."

This joint initiative between NovaSklo Trade and NSG Group will contribute to the adoption of modern standards for high-quality architectural glass in Ukraine and strengthen the capabilities of the country's construction industry.

WWW.NOVASKLO.COM - WWW.NSG.COM





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neptunglass.com



AGC

Launch of project to recycle discarded wind-shields

Having recently announced the beginning from last month of a demonstration project to collect and recycle discarded wind-shields generated during vehicle repair and replacement, **AGC Group** is now carrying the project out through its consolidated subsidiary Autoglass. In this way AGC is establishing a scheme to recover and recycle automotive glass that has traditionally been treated as industrial waste and reuse it as raw material for architectural flat glass, drawing on knowledge gained through resource-circulation initiatives for architectural glass.

According to AGC, this is the first systematic initiative in Japan to circulate waste automotive glass as raw material for architectural flat glass (based on AGC research as of June 2026).

- Roles of participating companies Scheme Development and Operation: Autoglass.
- Glass Replacement and Separation of Glass and Components: AG Expert, Oda Safety Glass.
- Manufacture of Architectural Flat Glass Using Recovered Cullet as a Raw Material: AGC.



Project overview

The demonstration project will verify a new resource-circulation scheme that covers the entire process from collection to recycling of discarded wind-shields. It will make use of the wholesale, sales, and delivery functions of Autoglass for automotive replacement glass, together with its network of automotive glass installers across Japan.

Autoglass will build and operate the scheme, AG Expert and Oda Safety Glass will handle glass replacement and the separation of glass and components. AGC will use cullet recovered from collected wind-shields as a raw material in the manufacture of architectural flat glass.

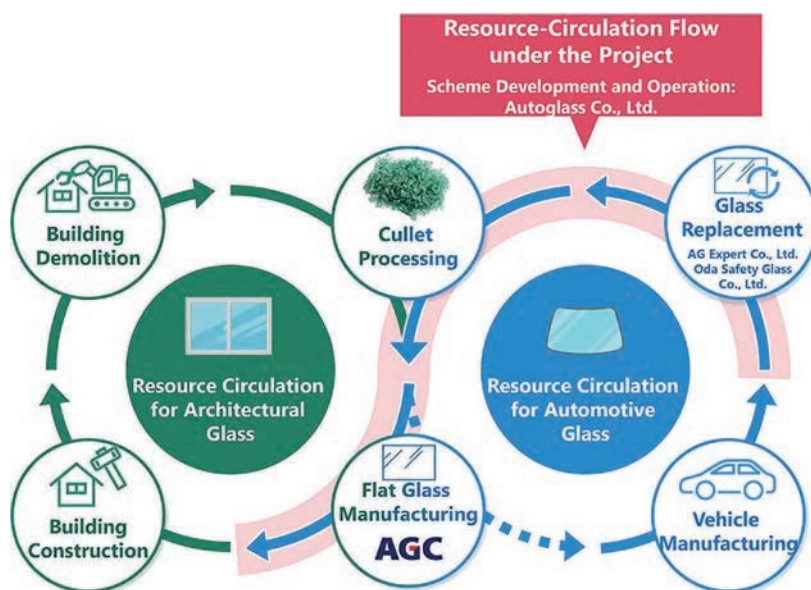
Evaluation and expected impact The project will assess whether cullet refined from collected discarded wind-

shields can be used as a raw material for AGC's architectural flat glass. It will be evaluated from the perspectives of quality, supply stability and practicality.

The use of recycled cullet is expected to help reduce CO₂ associated with glass raw materials, as well as energy-related CO₂ generated during raw material procurement and manufacturing. For each tonne of waste automotive glass recycled, GHG emissions are expected to be reduced by approximately 0.6 tonnes on a Scope 1, 2 and 3 basis.

AGC also aims to reduce the volume of discarded wind-shields sent to landfill and help build an effective model for advancing a circular economy.

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SUSTAINABILITY



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HORN

Contract signed for new 800 tpd float glass plant in Iraq



HORN Glass Industries recently signed a contract with **Al Rida Investment** for the construction of a new float glass plant in Najaf, Iraq. The plant will have a production capacity of 800 tonnes per day.

With this project, HORN Glass Industries underlines its international project expertise in the field of turn-key glass plant solutions. The plant will be equipped with state-of-the-art technologies and will make a significant contribution to expanding glass production capacities in the region.

Of particular importance for the realisation of the project is the financing, which is being structured in cooperation with Commerzbank AG and AKA Bank. The financing framework provides the foundation for the successful execution of the project and underlines the confidence of all parties in its long-term prospects.

The delivery of the equipment is scheduled for 2027. Commissioning of the new glass plant is planned for 2028.

"We are very pleased to be working together with Al Rida Investment, Commerzbank AG and AKA Bank and to jointly implement this significant project successfully," said Ekaterina Firsova, Executive Director Glass Plant Technology at HORN Glass Industries. "The new plant will make an important contribution to the development of the Iraqi glass industry."

With its many years of experience in the design and realisation of glass melting plants worldwide, HORN Glass Industries stands for innovative technologies, high efficiency, and tailor-made solutions for the international glass industry.

WWW.HORNGLOSS.COM - WWW.ALRIDAINVEST.COM

BENTELER MASCHINENBAU

Turning bottlenecks into productivity

At BENTELER Maschinenbau, Glass Processing Equipment, innovation is measured by the value it creates for its customers.

With the BENTELER Duplex Drilling Line, the company has already

set new standards by integrating two drilling processes into one highly efficient production line. Combined with the Duplex Buffer System, this solution unlocks even greater productivity.

The intelligent buffer continuously monitors the availability of each drilling station and automatically directs every glass pane to the next available machine in real time.

The result:

- Maximum machine utilisation
 - Continuous material flow Fewer idle times and waiting periods
 - Higher throughput Lower production costs
- Instead of allowing bottlenecks to slow down production, smart automation transforms them into opportunities for greater efficiency and performance.
- Smart buffering. Intelligent process control. Maximum productivity. BENTELER dedicated teams find the best solution that fits the production environment.

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PROFILGLASS & MANNA GLASS

Exclusive agreement for Saudi Arabia

Profilglass is an important player in the production of aluminium profile spacer bars. Founded in Fano, Italy, in 1982 by the brothers Giancarlo and Stefano Paci, the company has grown rapidly in a vertical structure to complete the aluminium cycle and diversify its business. The company grew from 7,000 to over 300,000 square metres; from 20 to 1,000 people; from profiles to flat rolled products; and from constructions to the automotive sector, electronics, household appliances, mechanics and more. Originally it produced spacing and decoration profiles for double glazing, a vocation reflected in its name, which has been significantly expanded through an ongoing investment policy.

Therefore, with over 250,000 tonnes of aluminium processed annually, Profilglass has now reached a leading position at international level, exporting to more than 85 countries.

For over 60 years, **Manna Glass Group** has led the glass industry in Saudi Arabia with innovation, quality and unmatched expertise. From advanced production of tempered, laminated, insulated glass and premium mirrors to a full range of processing services, they focus on delivering reliable solutions for every project.

With 56 branches and 1,800+ experts, they continue to shape the future of glass across the Kingdom and the GCC (Gulf Cooperation Council).

Manna Glass Accessories Division has now made an agreement with Profilglass to become the sole and exclusive authorised distributor of Profilglass products in the Kingdom of Saudi Arabia.

Karim Kathiri, Sales Director of Manna Glass's Accessories Division, said, "We have worked with Profilglass for several years and sales volumes have continued to increase as the market realises the benefits of our consistent quality, high performance and easy availability through our extensive branch network. This agreement confirms the strong relationship and our determination to grow our accessories business and its IGU materials product category."

Manna Company is authorised to market, distribute and supply genuine and original Profilglass products throughout the Saudi market.

Any Profilglass product supplied by Manna Company is an authentic product manufactured by Profilglass S.p.A. Please be aware of counterfeit products in the market which sadly exist.

WWW.EN.PROFILGLASS.IT - WWW.MANNAGLASS.SA



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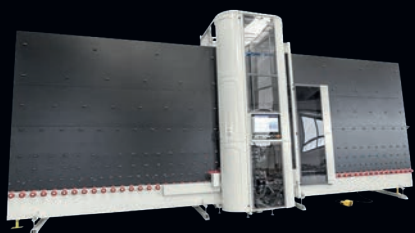
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WATERJET CUTTING SYSTEMS



FOREL

Thermoplastic spacer insulating glass lines

Forel's thermoplastic spacer insulating glass lines are the most advanced technological answer for those seeking efficiency, flexibility, and high energy performance in the production of insulating glass. Thanks to their dual nature, these systems can process both thermoplastic and rigid spacers, offering unique versatility and the ability to quickly respond to changing market needs.

The thermoplastic spacer is an innovative solution that significantly improves the insulating performance of insulating glass, reducing thermal bridges and ensuring greater durability over time. This makes it particularly suitable for the production of high energy efficiency windows and facades, both in residential and commercial contexts. The use of thermoplastic profiles is also ideal in environments subject to significant temperature fluctuations or high humidity, such as swimming pools, spas, laboratories, and industrial facilities.

Forel lines are designed for those who require

advanced automation and quality control: scanners, inspection systems, remote diagnostics, and supervision software allow real-time monitoring of every production phase, ensuring that panels comply with the highest standards. This approach not only drastically reduces errors and waste, but also enables predictive maintenance management and continuous process optimisation.

Thanks to the modularity of the lines, it is possible to produce insulating glass units of different sizes and thicknesses, including shaped panels or special formats, thus meeting the requests of architects and designers seeking tailor-made solutions for cutting-edge buildings. The lines also allow the production of double or triple chamber panels, with the possibility of inserting insulating gas between the panes to further enhance energy performance.

Digitalisation and innovation are at the core of these solutions: industrial management software makes it possible to automate and track the entire production cycle, from material management to quality control, maintenance, and technical support. The availability of remote assistance and dedicated training ensures continuous support for operators, facilitating the transition to more efficient and sustainable production processes.

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40 years
alongside
glass's experts

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HYDRO

Vertical washing machine



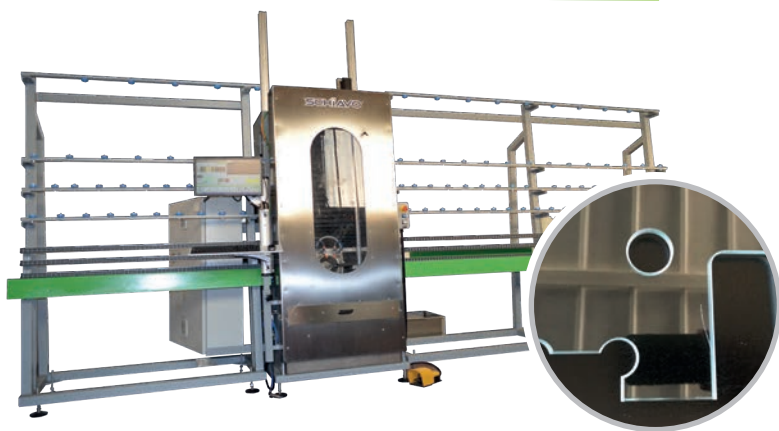
HTL

Horizontal flat glass washing machine



FV1000

Vertical milling and drilling machine



GEBI

Vacuum lifter



SCHIAVO

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TUOMAS

New technical service for clients in North & Central America

At **TUOMAS**, innovation and service excellence are fundamental pillars of commitment to customers and partners. With the aim of offering closer, faster and more specialised support, the company is launching the new technical service at its Mexico branch, aimed at North America and Central America. The launch of this service is intended to provide specialised technical support with direct assistance from within the region.

The after-sales service will be available to TUOMAS customers in North and Central America who require technical assistance in the following countries: Mexico, the United States, Canada, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica, Panama and the Dominican Republic.

The service will be provided by a team of three specialist technicians, factory-certified by TUOMAS and with more than ten years of experience in the sector. From the Mexico branch, technical assistance will be provided for the company's installations and equipment in these markets.

[HTTPS://TUOMAS.COM](https://tuomas.com)



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- Interchangeable dual head THT technology for super-fast processing
- Self-compensating support rollers to keep the glass perfectly supported and balanced at all times
- No mechanical parts directly exposed to water, dirt and falling of removed parts
- Tool racks with short, simple, precise and effective movement
- Self-washing system for parts exposed to dust
- 150 mm diameter tools with automatic size control and self-learning

The future is already here: reliability, precision and long life.



Monumental artwork restoration marks FOREL's half-century celebration

A Veneto-based company and global leader in machinery for glass processing, Forel is marking its 50th anniversary with the inauguration of a new production facility at its headquarters in Vallio di Roncade, in the province of Treviso. Presented

on May 12, 2026, in the presence of partners and authorities, this expansion connects the company's half-century milestone with a new phase of industrial growth. The development reflects Forel's stated focus on continuous innovation, technological de-

FOREL celebrates 50 years in business with a new 9,000-square-metre production wing in Vallio di Roncade, Treviso. Raising capacity by 40 percent, this milestone restores Le Ali di Venezia - linking glass-processing innovation, international growth and the company's ties to territory, culture and Murano craftsmanship.



velopment and the ability to anticipate market needs with cutting-edge solutions. Founded in 1976, the company has grown over five decades while strengthening its production structure and expand-

ing internationally. It now operates through four foreign subsidiaries and 20 agencies worldwide.

INDUSTRIAL GROWTH

The intervention at the industrial site was completed



ABOUT FOREL SPA

Since 1976, Forel has designed and manufactured solutions for the processing of flat glass and insulating glass units. Founded as a family business, over time it has established itself internationally as a reference point for the glass industry, while keeping the centre of its design, production and organisational activities in Italy. The company develops its solutions internally, from technical design to production and after-sales assistance, according to a model that allows it to directly oversee all the main phases of the process. Research and development are a structural component of Forel's identity, with an internal department where technicians and engineers work on the development of new solutions for processing flat glass and insulating glass, including latest-generation materials. Today Forel has 280 employees, four foreign subsidiaries -in the United Kingdom, Canada, the United States and Germany- and more than 20 agencies worldwide, enabling it to operate in 70 countries, with entirely Made in Italy production and 33 proprietary patents currently in force. The company operates in advanced industrial contexts and counts leading international groups and operators among its clients. In 2024, it recorded revenues of EUR 80M.

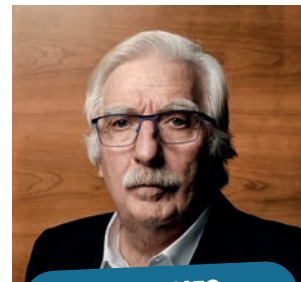


over a two-year period and added a new production wing as an extension of the existing area. The new facility covers 9,000 square metres and is designed to increase the company's capacity by 40 percent. According to Forel, the investment will allow orders to be processed more quickly and delivery times to be accelerated across its various product lines. The facility also includes a showroom conceived as a permanent exhibition space for the machinery produced by the company. "Fifty years is not only a symbolic milestone for us,

but a stage that reflects the way Forel has built its future and intends to continue doing so," said Fortunato Vianello, President and Founder of Forel. He said the company had lived through half a century of technological evolution "without ever ceasing to innovate," while preserving its family identity, its bond with the territory and the values that have guided it from the beginning.

SYMBOLIC RESTORATION

Riccardo Vianello, CEO and Vice President of Forel, described the facility



**FORTUNATO
VIANELLO**
PRESIDENT FOREL



RICCARDO VIANELLO
CEO and VICE-PRESIDENT
FOREL

expansion as “a very concrete investment in Forel’s future.” He said increasing production capacity, improving space organisation, accelerating delivery times and strengthening customer reception would help the company respond more effectively to a con-

stantly evolving market. The anniversary is also being marked by the recovery and enhancement of Le Ali di Venezia, a monumental artwork Forel has chosen to bring back to life for its fiftieth year. Created in 2003 as an artistic and cultural tribute to Venice and to the

heritage of Murano’s master glassmakers, the work brings together glass, art and technological innovation. Composed of two monumental wings made with 430 feathers in blown crystal glass, each hand-crafted individually, the sculpture was first exhibit-

ed in 2004 in the Bacino di San Marco at Punta della Dogana, and later at the entrance of Venice Marco Polo Airport. Subsequently acquired by Forel and kept for years at the company’s facility, it now stands in front of the main headquarters as a tangible sign of the connection between enterprise, culture, territory and design capability.



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Advanced photovoltaic projects see worldwide **EVALAM UC** performance

Supported by international projects and presented at Intersolar Europe 2026, EVALAM is expanding its photovoltaic portfolio with EVALAM UC and EVALAM UC+, two EVA encapsulants designed to improve module efficiency, lamination performance, durability and compatibility with conventional PV and BIPV applications.

The evolution of the photovoltaic market is increasingly shaping the glass industry. As Building Integrated Photovoltaics gain ground, higher-efficiency modules develop and manufacturing processes become more competitive, demand is growing for materials with increasingly specialised performance characteristics. In this context, EVALAM, a Pujol Group company and international

reference in the development of EVA encapsulants and interlayers for laminated glass, is expanding its portfolio with solutions designed specifically for the photovoltaic industry. With EVALAM UC and EVALAM UC+, the company is bringing its lamination expertise to a sector where materials must support solar module performance, manufacturing efficiency and long-term durability.

A COMMITMENT TO PHOTOVOLTAIC MODULE OPERATIONAL EFFECTIVENESS

Encapsulants are central to the protection and performance of solar panels. Beyond electrical insulation and structural support, they influence light transmission, module stability and resistance to environmental factors across decades of operation. With these requirements in view,

EVALAM has developed two new solutions for the evolving needs of photovoltaic module manufacturers and Building Integrated Photovoltaic applications. Both products address a market in which the glass element of the module must contribute not only to protection, but also to energy performance and process reliability.

EVALAM UC: STABILITY, ADHESION AND MANUFACTURING EFFICIENCY

EVALAM UC is a high-performance EVA encapsulant developed for photovoltaic applications. It combines high transparency, excellent adhesion and outstanding thermal stability, bringing together key properties required in solar module production. Its advanced formulation promotes efficient air evacuation, delivers high crosslinking and adhesion levels and minimises bubble formation. These



characteristics enable more efficient lamination cycles and significantly reduce production rejects, making the material relevant to manufacturers seeking both performance and process control. EVALAM UC also offers excellent compatibility with the various module components and a high gel content. These features provide long-term stability throughout the module's service life and help extend the lifespan of the finished module. For this reason, the solution is suited to both conventional photovoltaic modules and Building Integrated Photovoltaics.

EVALAM UC+: MAXIMISING LIGHT HARVESTING

EVALAM UC+ has been engineered to maximise ul-

traviolet light transmission to the active silicon layers, improving the module's energy harvesting capability. The encapsulant is designed for applications where the transmission of light to the active layers is a defining performance factor. The material also provides high transparency, low haze, excellent moisture resistance and strong post-lamination adhesion. These properties help maintain module performance throughout its operational lifetime, while supporting the long-term reliability expected in photovoltaic applications. Its formulation further supports manufacturing performance by optimising lamination cycles. Through efficient air

evacuation and reduced manufacturing defects, EVALAM UC+ contributes to increased manufacturing productivity.

SOLUTIONS DESIGNED FOR AN INCREASINGLY DEMANDING INDUSTRY

With EVALAM UC and EVALAM UC+, EVALAM addresses several of the main challenges facing photovoltaic manufacturers today. These include reducing manufacturing costs, improving lamination process efficiency, minimising defects and production rejects, increasing module durability and long-term reliability, and ensuring compatibility with both conventional

photovoltaic modules and BIPV systems. This combination of process and performance characteristics reflects the increasingly demanding context in which photovoltaic glass solutions are being developed. The requirements of solar module production now extend from manufacturing efficiency to aesthetic integration, structural performance and long-term durability in the built environment.

LANDMARK PROJECTS DEMONSTRATING EVALAM'S PHOTOVOLTAIC PERFORMANCE

EVALAM UC's performance has already been validated through interna-



tional projects carried out with leading companies in the architectural photovoltaic glass industry. These projects show its performance in solutions where energy generation must coexist with demanding aesthetic, structural and long-term durability requirements. Among the most significant examples is the expansion of Geelen Counterflow's headquarters in the Netherlands. There, a large-scale photovoltaic façade forms part of one of the world's most sustainable office buildings, awarded the highest BREEAM certification. Another project is the Lumen Shopping Center in Mexico City, where a 2,300 square metre photovoltaic skylight integrates nearly 800 photovoltaic glass units. The installation is capable of generating more than 347,000 kWh annually while com-

binning renewable energy production, daylighting and solar control. In Saudi Arabia, the NESR Oilfield Research Center incorporates curved photovoltaic skylights together with a solar carport. In this project, EVALAM UC is used to support stability, thermal insulation and reliable operation under extreme climatic conditions. In Spain, the Ribera de Triana Hotel in Seville has renovated its roof with a photovoltaic skylight combining contemporary architecture, renewable energy generation and improved thermal insulation. The technology is also present at the MOLEcoLAB laboratory of the Medical University of Lodz in Poland, recognised as the country's first passive laboratory building, where the integrated photovoltaic façade turns the building envelope into an active

source of renewable energy generation. Completing this project portfolio is the STEM Learning Center at Cuyahoga Community College in the United States. Its large photovoltaic skylight contributes to renewable energy generation while improving the building's thermal and acoustic comfort.

INTERSOLAR EUROPE 2026

As part of its growth strategy in the photovoltaic market, EVALAM participated in Intersolar Europe 2026, the world's leading exhibition for the solar industry and renewable energy, held in Munich from June 23 to 25. At its exhibition stand, the company officially introduced EVALAM UC and EVALAM UC+, presenting to the international market a new generation of EVA encapsulants de-

signed to improve photovoltaic module efficiency, optimise manufacturing processes and support the development of increasingly reliable and durable solar solutions.

PORTFOLIO

With this expansion, EVALAM strengthens its position as a specialist manufacturer of advanced lamination technologies. The new encapsulants extend the company's portfolio into a photovoltaic market in which glass, energy performance and long-term material reliability are increasingly connected.

ENVIRONMENT

The development of EVALAM UC and EVALAM UC+ also reflects the growing relationship between solar energy and the built environment. As glass and photovoltaic systems advance together, encapsulant technology becomes part of a broader movement toward more efficient and sustainable buildings.



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Glasstec to show **SCHIATTI ANGELO** converting engineering into savings

Bringing its long-term engineering philosophy to GlassBuild America and Glasstec 2026, SCHIATTI ANGELO presents robust, energy-efficient and maintainable machinery. Indeed the TFX1600 drilling and milling machine and SME10 variable-angle edger demonstrate reduced downtime, controlled consumption, predictable maintenance and configurable international production performance across demanding glass-processing applications.

Five decades in glass machinery have taught Schiatti Angelo one clear lesson: when glass processors walk the aisles of an industry exhibition, they are looking for answers about uptime, energy bills, spare-parts costs and how long a machine will remain productive after installation. This is the perspective Schiatti Angelo brings to its two upcoming international appointments: GlassBuild America in Las Vegas from 23 to 25 September, at

Booth 4345, and Glasstec 2026 in Düsseldorf from 20 to 23 October, in Hall 16 at Stand 16A14.

Three principles run through every machine on display:

1. MECHANICAL ROBUSTNESS, THE KIND THAT DOESN'T MAKE HEADLINES

Sophisticated electronics are now part of every modern machine, but electronics alone do not determine long-term performance.

The mechanical platform beneath them remains decisive. Robust frames, oversized components and engineering choices designed to maintain stability after five, ten or fifteen years of continuous production are details that ultimately become visible in maintenance budgets and residual values. For Schiatti Angelo, mechanical strength is therefore not an isolated specification. It is the foundation on which sustained productivity and long operational life depend.

2. ENERGY EFFICIENCY THAT TRANSLATES INTO ACTUAL SAVINGS

Glass edging and processing are energy-intensive operations. Kilowatt-hours represent a structural cost rather than a footnote on a technical data sheet. Schiatti Angelo machines are engineered to combine high productivity with controlled power consumption through closed water circuits, optimised drive systems and components sized for efficiency rather than

oversized for marketing purposes. The resulting savings are not expressed through one headline figure. They accumulate in the running costs recorded throughout the operational life of the line.

3. DESIGNED TO NEED LESS

Spare parts, downtime and service calls account for a significant share of total ownership costs over the life of a machine. Schiatti Angelo machines are assembled according to a clear design principle: minimise wear points, simplify maintenance access and introduce mechanical redundancy where it matters. The intended result is fewer interventions, lower spare-parts consumption and more predictable uptime over the long term. This is the area of total cost of ownership in

which much of the real expenditure is ultimately determined.

TWO NEW RELEASES ON THE STAND

These three principles are not simply a statement of intent. They shape the engineering of every Schiatti Angelo machine. At Glasstec 2026, they will be reflected across the line-up, with two recent releases demonstrating particularly clearly how the company's approach translates into measurable shop-floor advantages.

TFV1600

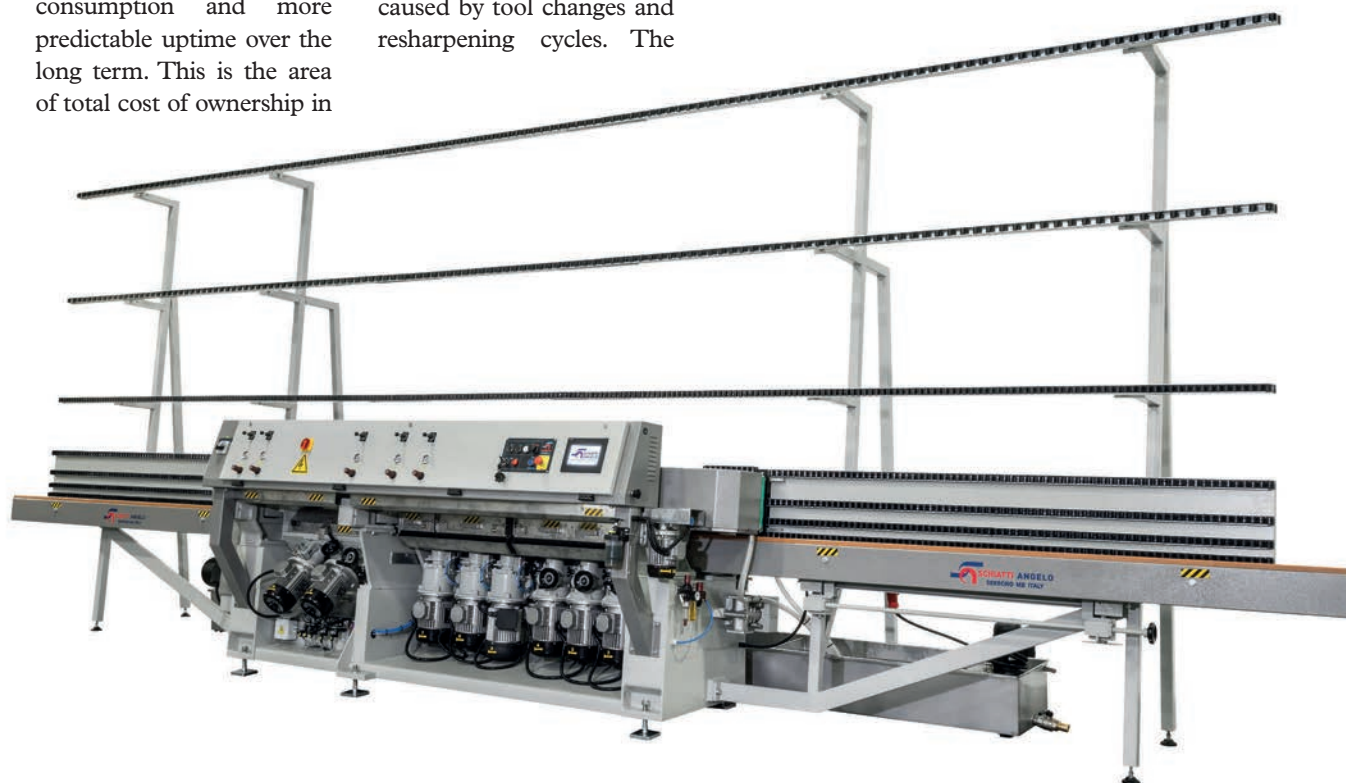
The first is the new TFFV1600 vertical drilling and milling machine. Drilling operations are particularly exposed to downtime caused by tool changes and resharpening cycles. The

TFV1600 was developed to remove that bottleneck by combining an automatic tool changer with an integrated sharpener, allowing the machine to continue operating without operator intervention. The result is a 50 percent reduction in tool-change time compared with the previous generation. That time is returned directly to productive shift hours rather than being absorbed by maintenance. The machine's closed-bridge structure provides the rigidity required for precision throughout the full thickness range of 3 to 19 millimetres, including laminated glass. It delivers consistent results when processing mirrors, shelves, table tops, kitchen components and

glass doors. Programming is managed through a touch-screen interface supporting project import and export, custom libraries and preset editing. Office-side programming is also available as an option. The TFFV1600 platform is modular, allowing future upgrades to extend the machine rather than replace it. This structural choice reflects the long operating horizon for which Schiatti Angelo machines are designed.

SME10

The second release is the SME10, a variable-angle straight edging machine developed to deliver measurable gains on the edging line. Its rubberised-pad transport system runs on





tempered-steel guides, reducing friction by 80 percent compared with traditional sliding systems and effectively eliminating vibration. The benefits are directly evident in finish quality on both the flat edge and arris, with cerium oxide polishing. Reduced friction also affects the wear profile of mechanical components, contributing to longer service intervals. The variable angle from zero to 45 degrees is controlled through a touch-screen PLC, with real-time management of glass thickness, processing speed and tilt. A predictive diagnostic system continuously monitors pressure and vibration patterns, reducing routine maintenance interventions by 50 percent. The complete processing cycle oper-

ates on 17.7 kilowatts with closed-circuit water cooling, combining high productivity with a contained power requirement in accordance with the company's energy-efficiency principle. Considered together, the TFEV1600 and SME10 present a coherent picture of how Schiatti Angelo applies the same engineering logic to different processing operations. In the drilling and milling machine, the design priority is uninterrupted operation. In the edging machine, it is finish quality and predictable maintenance. The problems differ, but the underlying approach remains the same. In both cases, the performance figures can be incorporated directly into a total-cost-of-ownership calculation rather than

confined to a marketing brochure.

TAILORED TECHNOLOGY IN PRACTICE: MEET THE TEAM IN LAS VEGAS AND DÜSSELDORF

At GlassBuild America and Glasstec 2026, these principles will take concrete form across the machines presented on the stands. Each machine is configurable. Rather than offering a fixed product, Schiatti Angelo provides a base architecture that can be adapted to the customer's actual production requirements, including volumes, formats, glass types and the required level of automation. This is what Tailored Technology means in practice: machines built to last, configured to save and

sized according to real production needs rather than a catalogue.

UPCOMING TRADE SHOWS

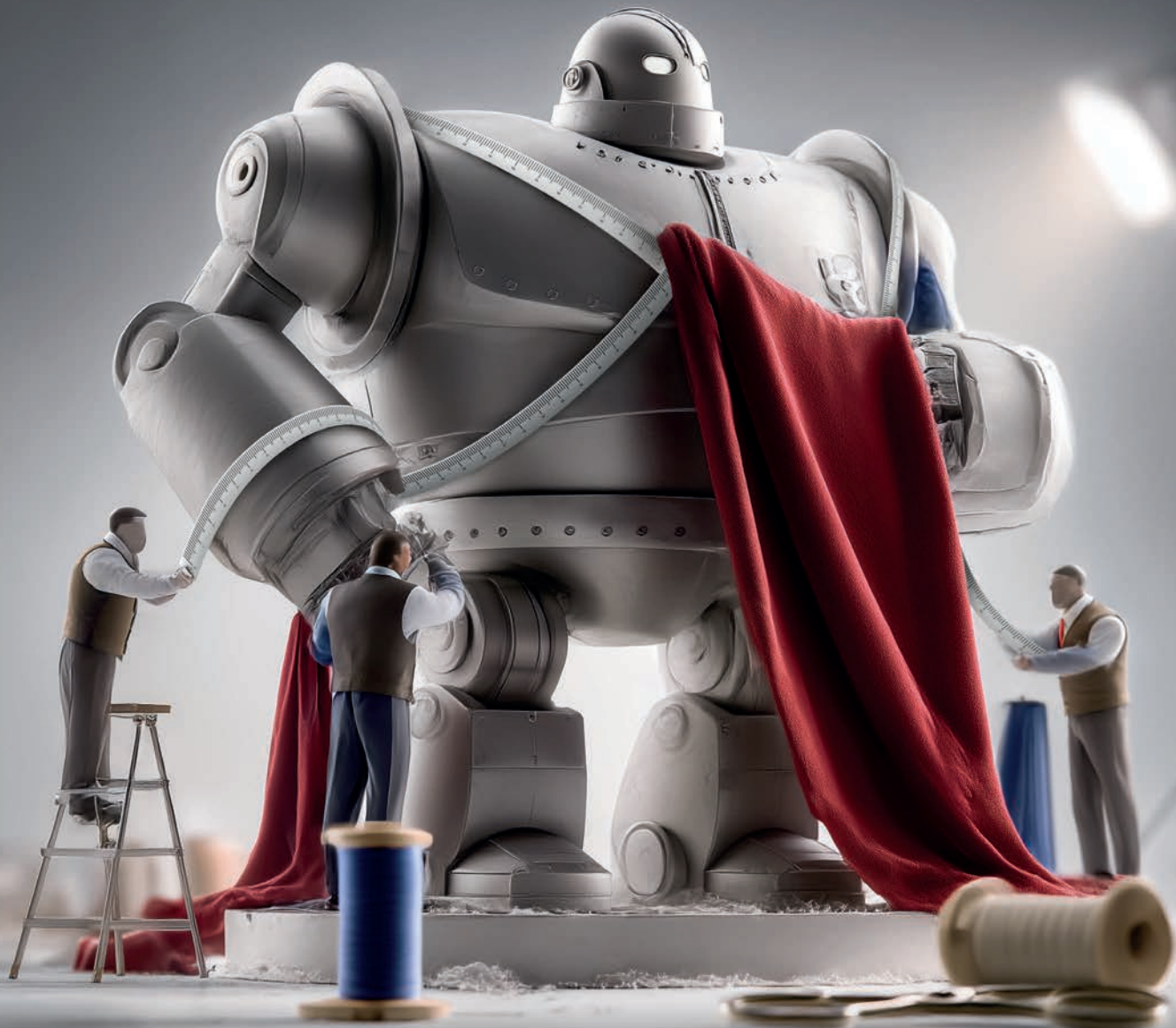
Schiatti Angelo will be exhibiting at GlassBuild America at Booth 4345 in Las Vegas from 23 to 25 September, and at Glasstec 2026 in Hall 16, Stand 16A14, in Düsseldorf from 20 to 23 October.



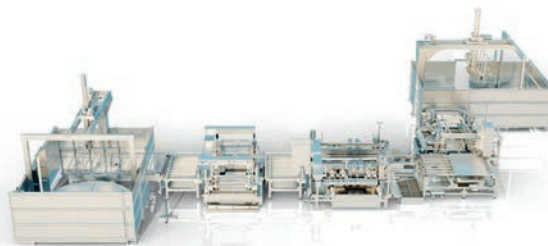
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TRADITION, EXPERIENCE, INNOVATION

Smarter argon measurement has **SPARKLIKE** ensuring glass performance

Invisible argon content can undermine insulating glass performance when left unmeasured. SPARKLIKE's non-destructive handheld and laser-based technologies verify gas concentration across varied glazing configurations, support standards-based quality control, reveal production deviations and reduce waste and returns - all to help manufacturers guarantee that units perform according to service specifications.



THE INVISIBLE COMPONENT OF THERMAL PERFORMANCE

Argon gas is a standard component of insulating glass units, yet systematic measurement as part of daily production quality control remains far from universal. The reason is simple and consequential: argon cannot be seen. Visual inspection cannot detect it, and an under-filled unit looks identical to a correctly filled one. That invisibility creates a performance risk. Research has shown that insufficient argon concentration can worsen a unit's U-value by up to 30 percent compared with its specified performance. For manufacturers, the gap is direct: units can leave the factory unable to perform as sold, with warranty exposure and customer trust consequences following close behind.

WHAT THE STANDARDS SAY

Sparklike's Handheld device uses spark emission spectroscopy which ASTM E2649 establishes as the test method for determining argon concentration in sealed insulating glass units. The company is a leading manufacturer of non-invasive gas measurement devices for the insulating glass industry, with more than 2,500 devices delivered and more than 1,000 customers in over 50 countries worldwide. On this basis, non-destructive gas meas-

urement has been used in production environments for more than two decades. The method is well proven for the glass configurations it covers. As production portfolios expand to include more complex glazing, laser-based measurement extends coverage to these configurations, operating through coatings and handling a broader range of unit types.

WHERE LASER MEASUREMENT CHANGES THE EQUATION

Laser-based TDLAS technology works by measuring oxygen and calculating the amount of argon, krypton, or other insulating gas con-

centration through coated and laminated glass without damaging the unit. Due to multiple laser-based device options, it fits from manufacturers running automated high-volume lines to smaller operators or building inspectors. The measurement takes seconds and generates data that can be logged, tracked, and integrated into existing quality management systems.

A DIAGNOSTIC TOOL, NOT JUST A VERIFICATION STEP

Consistent gas measurement does more than verify fill rate. Once implemented, it can become an operational diagnostic tool. Shifts or deviations in argon con-

centration across a production run frequently indicate equipment issues. A filling station may be drifting out of calibration, or a sealing process may have been subtly compromised.

Detecting these deviations early can mean less waste, fewer returns and tighter control over line performance. As one IGU manufacturer put it: 'You cannot manage what you do not measure.'



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KERAGLASS delivers consistent bubble-free laminated glass with Lamix

KERAGLASS introduces LAMIX, a compact, affordable multi-level kiln for flat and curved glass lamination. Designed for easy operation, efficient space use and consistent quality, it offers uniform heating, reliable extraction, two working trolleys, integrated storage and additional drying and rapid-cooling applications for growing glass processors.



A VERSATILE, AFFORDABLE SOLUTION DESIGNED TO GROW WITH YOUR BUSINESS

Lamination is a crucial process for producing safe, durable and aesthetically appealing glass. Responding to the requirements of an increasingly dynamic market, Keraglass has expanded its product range with LAMIX, a new multi-level kiln for flat and curved glass lamination. Complementing the company's established Combi and Air Stream solutions, LAMIX provides a more affordable, compact and flexible alternative. It is designed for companies seeking to enter the lamination market with a limited investment while achieving professional results. LAMIX combines ease of use, consistent qual-



ing area. Its lifting system is integrated beneath the kiln in a concealed position. This arrangement permits the passage of operators and forklifts while supporting safe kiln-opening operations. Following the same design approach, the electrical cabinet is positioned at the rear of the machine. An integrated three-level upper storage rack increases storage capacity without enlarging the machine's footprint.

INTEGRATED UPPER STORAGE RACK: MORE SPACE, BETTER ORGANISATION, HIGHER PRODUCTIVITY

One of LAMIX's most practical features is its integrated three-level upper storage rack. The robust, organised structure is designed to safely store lamination trolleys, optimise factory floor space, accelerate daily operations and maintain an orderly, efficient workflow.

AVAILABLE SIZES

LAMIX is available in four dimensions:

- 2100 × 4500 mm
- 2500 × 4500 mm
- 2100 × 3000 mm
- 2500 × 3000 mm

INTUITIVE AND HIGH-EFFICIENCY LAMINATION CHAMBER

The single chamber features a folding door and

ity and versatility. The kiln is suitable both for businesses beginning their lamination activities and for processors seeking to expand their product offering with a reliable and intuitive system. Operations are continuously monitored through the operator-side control panel.

SPACE OPTIMISATION

Special attention has been given to the efficient use of production space. LAMIX combines operational efficiency with a rational organisation of the work-





concealed lifting system, minimising the machine's overall dimensions and providing immediate access for the trolleys. Two working trolleys support continuous, smooth production. The kiln's simple and reliable vacuum cycle is designed to achieve clean, bubble-free and visually flawless results quickly.

UNIFORM HEATING FOR CONSISTENT QUALITY

LAMIX uses an optimised heating system to provide stable and homogeneous heat distribution, an essential factor in producing properly laminated glass. Every element of the system has been engineered to deliver repeatable results, including when the kiln is operated by less experienced personnel.

OPTIMISED EXTRACTION

SYSTEM: ZERO BUBBLES, ZERO COMPROMISES

The extraction system promotes effective adhesion between the interlayer film and the glass, increasing process reliability and simplifying daily production. A pocket silicone membrane enables fast sealing and clean results, helping processors consistently meet market quality requirements.

MUCH MORE THAN A LAMINATION KILN

LAMIX's versatile technology extends beyond glass lamination. The kiln can perform several additional processes that help processors complete and expand their production capabilities. These applications include the drying of special screen-printed glass, the drying of marble and similar materials, and rapid cooling

through forced ventilation. By combining lamination with additional applications in one machine, LAMIX is designed to help businesses enhance their competitiveness.

LAMIX: THE KERAGLASS SOLUTION FOR COMPANIES READY TO TAKE THE NEXT STEP

LAMIX is Keraglass's new entry-level solution for companies beginning their journey into glass lamination and seeking technology that is safe, affordable and backed by a leading industry brand. Alongside the established Combi and Air Stream solutions, LAMIX is the most cost-effective option in the Keraglass range, without

compromising the quality and manufacturing excellence associated with the company. The kiln provides a complete solution for expanding laminated-glass product ranges, integrating new materials into production, increasing production capacity and entering the lamination market with user-friendly, high-performance technology. LAMIX offers companies a practical route to growth founded on confidence, quality and cost-effectiveness.



keraglass

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OPPO headquarters showcases **EDGETECH** in hyperbolic glass engineering



Designed by Zaha Hadid Architects under Patrik Schumacher's direction, OPPO's new headquarters in Shenzhen Bay is emerging as one of the most ambitious high-rise façade projects of its time. Its softly flowing envelope is formed from around 14,000 individually curved insulating glass units, creating a hyperbolic glass façade of exceptional technical and aesthetic complexity.

Edgetech Europe/Quanex's flexible Super Spacer® system was used for all the glazing. According to the project information, it was the only system capable of implementing the complex glass geometries with the required technical and aesthetic perfection.

Around 40 years ago, Shenzhen was a small fishing village. Today, the city looks directly across the water towards Hong Kong and has become a megacity with hundreds of skyscrapers, as

EDGE TECH Europe/Quanex's Super Spacer® system supports the complex curved insulating glass façade of OPPO's new Shenzhen headquarters - designed by Zaha Hadid Architects. Around 14,000 individually curved glass units form the sculptural envelope - all demanding extensive testing, parametric design, specialist production and strict quality controls.

well as a centre of Chinese information technology in the Greater Bay Area of southern China.

The 117-hectare Shenzhen Bay Super Headquarters Base, located directly on the waterfront, is intended to become a highly visible symbol of the region's innovative strength. OPPO, described in the supplied material as the world's fourth-largest smartphone manufacturer, is building a new 199.75-metre-high headquarters there, with around 248,000 square metres of floor space. The space is divided among four interconnected amorphous towers that taper towards the bottom.

The façade engineering includes outstanding examples of cutting-edge technology: a 41-square-metre hyperbolic façade element weighing more than 10.8 tonnes; a 2,000-square-metre specially shaped, double-curved, self-supporting net shell structure of the highest degree of difficulty; and a 240-square-metre hyperbolic dome opening 200 metres above the planned Sky Bar. These elements placed extreme demands on structural mechanics, control systems and safety concepts.

Far East Façade is respon-

sible for designing and producing the curtain wall for Towers 1 and 2, as well as the base. CNYD was awarded the façade contract for Towers 3 and 4.

A STRUCTURAL SYSTEM WITHOUT MASSIVE BRACING OR AN ACCESS CORE

When asked why her buildings did not feature 90-degree angles, Zaha Hadid once replied that life is not structured in a grid. People find natural places relaxing, and this effect can also be achieved through architecture. The development of parametric design tools made it possible to transform organic landscapes into vertical structures.

In several publications, Hadid's long-time colleague Patrik Schumacher described the

demands placed on modern high-rise buildings by a networked society. The task is not merely densification, but the intensification of communication. To create spatial connections and visual openness across multiple levels, the massive core must be dissolved and replaced by navigational spaces that transform the tower into a 'vertical street'.

In the new OPPO headquarters, access to the two office towers via stairs and lifts is decoupled from the structural engineering and relocated to service towers T3 and T4. This creates open floor plans and unobstructed lines of sight within the building and out over Shenzhen Bay, promoting creativity and spontaneous interaction.

A 20-storey, light-filled atri-

um connects the two office towers, allowing visitors to explore the interior as if it were an urban street. At the same time, Zaha Hadid Architects have deliberately used curves to clearly structure the volumes and prevent the visual fragmentation of spatial units.

THE GLASS FAÇADE IS MADE ENTIRELY OF DOUBLE-LAMINATED, CURVED INSULATING GLASS

Tianjin North Glass Industrial Technology Co., Ltd. will produce the 70,000 square metres of insulating glass required for the four façades. Of the approximately 14,000 curved panes, 9,000 are highly sophisticated free-form, convex-concave or saddle-shaped insulating glass units. Single-curved panels reach arc lengths of up to 5.4 metres; double-curved panels are up to six metres long; and the narrowest bending radius is one metre. Most of the approximately 9,000 flat insulating glass units will also be cold bent on site.

Most of the glazing consists of double-laminated insulating glass units with four panes, incorporating 16 mm Super Spacer® TriSeal™ as the spacer system. The laminated lites are based on 10 mm



© FAR EAST FAÇADE

ABOUT EDGETECH EUROPE GMBH

Edgetech Europe GmbH, located in Heinsberg, Germany, is a fully owned subsidiary of Quanex Building Products Corporation, (NYSE: NX) a global, publicly traded manufacturing company primarily serving OEMs in the fenestration, cabinetry, solar, refrigeration and outdoor products markets.

Edgetech Europe GmbH services markets in continental Europe with a total of 490 employees and 17 extruders. The company prides itself in being 'A Part of Something Bigger' by improving the performance and aesthetics of end products through continuous innovation, helping customers achieve greater production efficiencies, and giving back to communities where it operates.

ultra-clear glass and include functional solar-control and low-E coatings. These contribute to considerable thickness and weight, placing high demands on the spacer's structural performance.

Anti-reflective glass is also used in special areas. There are deviations in the safety glazing and in individual special areas, where triple-glazed elements with three 12 mm-thick panes, or insulating glass with three 8 mm-thick panes, are used with laminated outer panes and monolithic inner panes.

North Glass worked closely with the client, Zaha Hadid

Architects, and façade specialists Far East Façade and CNYD on the project. Together, they conducted a comprehensive review of the visual appearance of the glass façade and implemented the strictest quality controls.

The decision to use Super Spacer® was made jointly by the client, architects, façade consultants and contractors. The project features a fully double-curved glass façade with varying glass shapes. Thanks to its flexible material, Super Spacer® ensures the tightness and thermal properties of the insulating glass, adapts to irregular or



curved pane shapes, and supports the glass curvature. The result is a façade designed to meet both functional performance requirements and the high aesthetic standards of the architecture.

Prior to the start of the project, the compliance of Super Spacer® with standards was verified by specialised Chinese testing institutes, in addition to existing global certifications. The cold-bent glass was tested on a special platform to evaluate deformation and tightness under bending forces.

To refine the technical strategies until all performance requirements were met, North Glass conducted several one-to-one visual mock-up tests between 2020 and 2024.

"The result is insulating glass units of outstanding optical quality and precise dimensional accuracy. The entire Edgetech/Quanex

family is immensely proud that Super Spacer is playing a part in the history of this unique façade project. World-renowned specialists who set standards in their fields are involved, including Zaha Hadid Architects, North Glass, Far East Façade and the Shenyang Yuanda Group," explains Paul Chen, Marketing & Sales Manager of Super Spacer®'s Chinese distribution partner, Linkeast International Trading.

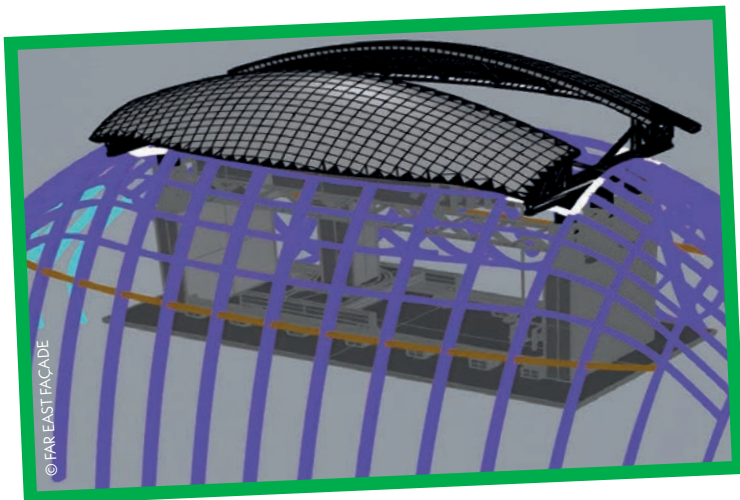
A PERIOD OF FOUR YEARS WAS DEDICATED TO DEVELOPMENT, TESTING AND OPTIMISATION

The project placed high demands on façade construction at every stage: procuring the curved materials; bending and processing aluminium and steel components;



ABOUT QUANEX

Quanex is a global manufacturer with core competences and a wide range of applications in various end markets. The company works with leading OEMs to provide innovative solutions in the areas of windows, doors, plastic fencing, solar panels, refrigerators and cabinets. Quanex has reported plans to leverage its material science and process engineering expertise to expand into adjacent markets.



and coordinating installation on site using 3D technology. In glass production, critical points included manufacturing oversized, tempered, curved and laminated panes; ensuring curvature tolerances; controlling optical distortions; and minimising rainbow effects. For aluminium bending, each individually shaped profile required custom-made bending tools with tolerances of ± 1.5 millimetres. T4-grade aluminium

underwent secondary ageing treatment prior to bending to ensure strength. First, all materials were designed parametrically and converted into LOD 400 precision models. These were then broken down into individual components and made available as STP files. Information was exchanged using AutoCAD, Rhino/Grasshopper and a bespoke design programme. Tolerance ranges were defined in the early stages of

planning, and 3D scans were used to verify the accuracy of manufactured materials. Prior to assembly, data analysis and reverse modelling were used to simulate real conditions and ensure accuracy. Due to the complex geometries involved, workshops were held with manufacturers, façade consultants, architects and building owners to reach consensus on formal decisions.

The feasibility, maximum dimensions and bending radii of curved glass production were tested in a two-year research process. Errors and deviations were systematically analysed, responsibilities were clarified, and solutions were evaluated from design and practical perspectives. North Glass developed customised equipment specifically for this project, enabling multi-curved glass to be tempered and improving its quality.

The biggest challenge was ensuring data interoperability, which could only be achieved through qualified personnel with the appropriate BIM skills and the right processing and testing technology.

“The project also established new standards and workflows, including specifications for double-curved façades, cold bending processes and numerous patented construction techniques that can be applied to future projects,” concludes Joachim Stoss, VP International Sales Quanex QES.

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Large-format glass transfer improves with CUGHER tilting solutions

Designed for formats up to 3000 x 2100 mm, the solution supports safer, more ergonomic loading and unloading while enabling smooth integration into automatic flat glass processing lines, CUGHER presents its Tilting Loading/Unloading system for assisted manual handling of large architectural glass sheets.

C ugher specialises in the design and manufacture of automated solutions for flat glass screen printing and handling. Drawing on consolidated experience across multiple sectors, the company develops customised plants and machinery for customers worldwide, with systems designed around specific production requirements rather than standard assumptions. In the architectural sector, those requirements are becoming more demanding. Glass sheets are increasingly large, heavy and delicate, while applications such as balustrades, internal partitions and shower enclosures continue to require large-format elements with



high aesthetic and quality standards. Within this production context, loading and unloading are not secondary operations. They are among the most sensitive stages of the process, both operationally and in terms of operator safety and ergonomics. To address these needs, Cugher has developed a new Tilting Loading/Unloading system dedicated specifically to the assisted manual handling of large-format architectural glass sheets. The solution builds on the company's long-standing experience in Tilting systems for flat glass handling, which over time have been adapted to different production needs, glass formats and line configurations. The new system is intended to make loading and unloading large-format sheets more efficient, controlled and ergonomic, while also supporting integration into automatic flat glass processing lines. In this sense, the machine responds to a practical challenge that is increasingly central to architectural glass production: how to handle larger sheets with greater stability, less physical effort and smoother transfer into the production flow.

ERGONOMICS AND SAFETY IN GLASS SHEET HANDLING

The system is designed to handle glass sheets measuring up to 3000 x 2100 mm, with a minimum format of 1000 x 500 mm. It can process glass thicknesses

from 3 to 12 mm and has a maximum indicative weight capacity of 204 kg. At the centre of the solution is a motorised tilting table that assists the operator during the positioning phase. The glass is manually placed on inclined support arms, a configuration that helps the operator maintain control of the sheet during the initial loading stage. This is especially important when working with large architectural formats, where stability and precision are essential from the first movement. To support correct positioning, the system includes adjustable manual supports installed at the base of the Tilting unit. These supports allow the contact point to be adapted according to the dimensions of the glass sheet, helping the operator centre the glass on the working surface and contributing to more precise and stable handling. Once the sheet has been positioned, the operator starts the cycle using a foot pedal control. The system then automatically moves the table from the inclined position to the horizontal position, allowing the controlled transfer of the glass sheet onto the rollers of the line conveyor. A further

ergonomic advantage comes from the possibility of lowering the unit down to 450 mm from floor level. This feature reduces the physical effort required from the operator and makes the handling of heavy, large-format sheets easier. The machine structure is manufactured from powder-coated steel profiles and is designed to ensure robustness, reliability and stability when handling heavy glass sheets. Operational safety is supported by the integration of photoelectric barriers and dedicated guards, which reduce the risk of accidental contact with moving parts and help ensure safe machine use in the production environment.

CUSTOMISATION AND INTEGRATION INTO PRODUCTION LINES

As with all Cugher solutions, the Tilting Loading/Unloading system can be configured according to the specific needs of the customer. Glass dimensions, thicknesses, weights, handling methods and integration requirements with existing or new lines can all be evaluated during the design phase, so that the final solution is con-

sistent with the real production process. The motorised conveyor of the Tilting system is inverter-controlled, enabling synchronisation with the production line and ensuring smooth, continuous glass transfer. This configuration makes the machine suitable for integration into automatic flat glass handling lines and supports greater continuity in the production process. For architectural glass processors, the value of the system lies in its combination of assisted manual handling, controlled movement, ergonomic support and line integration. Thanks to its experience in flat glass automation, Cugher is able to provide flexible, robust and customised systems that simplify the handling of large formats and integrate efficiently into production lines for the architectural sector.



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Inside SYSTRON proMD for laminated safety glass processing

By combining Helix drilling, oscillating milling, its very own patented Water Cushion and internal cooling, SYSTRON addresses drilling and milling challenges in laminated safety glass. Indeed the systron proMD improves process reliability, reduces tool wear, supports flexible hole diameters and stabilises machining for demanding glass, ceramics and coated applications.



In CNC glass processing, drilling remains one of the most common machining operations, yet laminated safety glass continues to test the limits of process stability, cooling efficiency and tool durability.

The demands are not only mechanical. Heat management, tool wear and machining time all become central concerns when conventional drilling methods require repeated drilling steps to cool the tool, while

special hole diameters can call for dedicated tooling, additional stock and higher inventory costs. Against this background, the systron proMD drilling and milling centre is presented as a different approach to glass

machining. By combining Helix drilling, oscillating milling, the patented systron Water Cushion and internal cooling as standard, the machine is designed to support a more stable machining process, extend tool

life and provide greater flexibility across a wide range of applications.

CHALLENGES WHEN DRILLING LAMINATED GLASS

Laminated safety glass places particularly high demands on CNC drilling. Conventional methods can require several drilling steps in order to cool the tool, increasing both machining time and tool wear. Where cooling is insufficient, the glass can be exposed to higher thermal and mechanical stresses. At the same time, the need for special diameters often means that processors must rely on dedicated tools, with the resulting cost and inventory burden. These challenges make process stability a central issue. In laminated glass processing, the machining zone must be managed carefully: heat and abrasive particles need to be removed effectively, while the glass

must remain sufficiently supported throughout the process. The systron proMD addresses these needs through the interaction of its drilling, milling, support and cooling technologies.

HELIX DRILLING FOR GREATER FLEXIBILITY

With Helix drilling, the glass is moved precisely along the X and Y axes while the tool performs an additional movement in the Z axis. This creates the characteristic hel-

ical motion and allows different hole diameters to be produced with a single tool. An 18 mm drill, for example, can produce a 19 mm hole, as well as special diameters such as 19.35 mm or 22 mm. The immediate effect is a reduction in tool changes and inventory requirements. At the same time, the larger gap between the tool and the glass improves coolant flow and helps remove heat and abrasive particles from the machining zone. For processors working with varied hole

diameters, this gives the process a flexibility that conventional drilling methods do not provide in the same way.

PATENTED WATER CUSHION IMPROVES PROCESS STABILITY

A key element of the systron process is the patented Water Cushion. The system supports the glass pane on a thin film of water, creating a floating clamping system. This keeps the glass sufficiently movable for the Helix motion while main-

Figure 2: The front and rear Water Cushions make the difference.

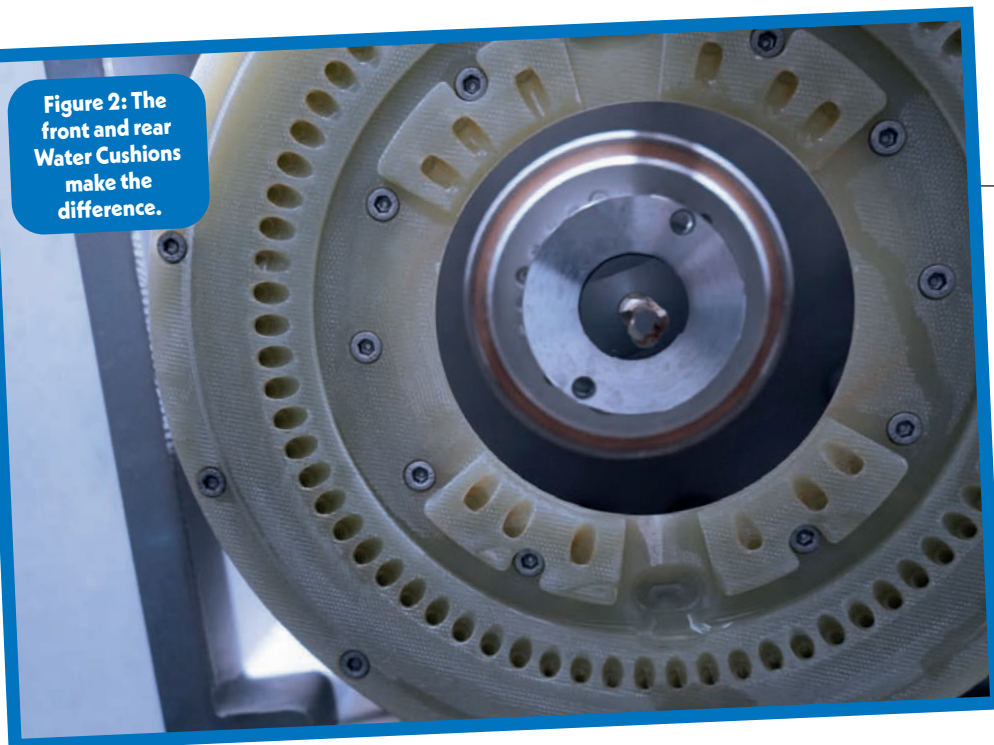


Figure 3: Helix drilling on the systron proMD enables flexible hole diameters using a single tool.

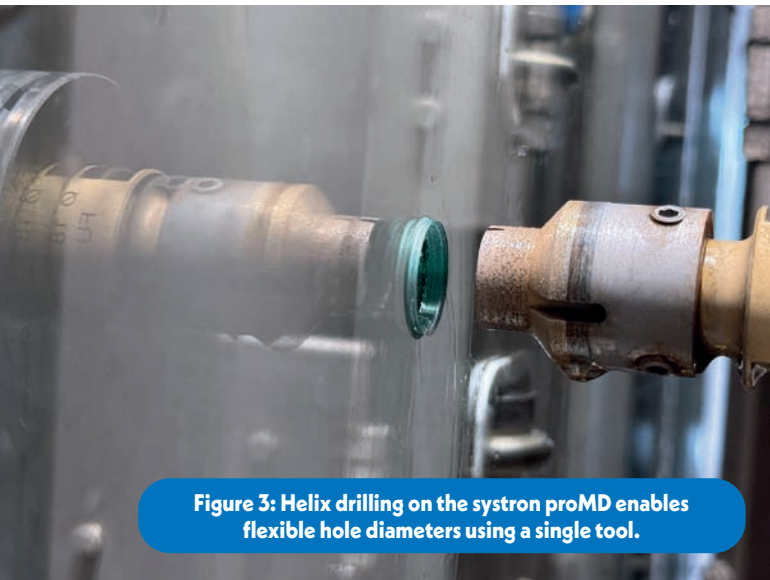


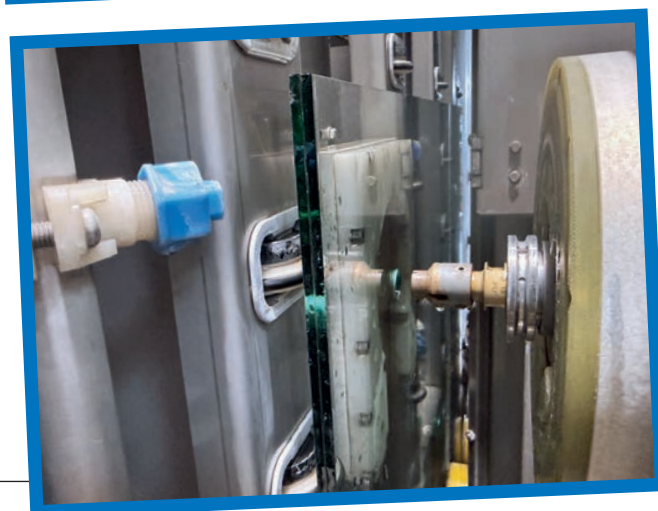
Figure 4: The systron proMD features front and rear machining spindles, allowing drilling and countersinking from both sides.



taining stable support during machining. The Water Cushion also provides contact-free support for sensitive glass surfaces, dampens vibrations, cools the tools and ensures permanently consistent edge parallelism without operator influence. These characteristics are particularly useful when processing laminated safety glass, coated glass, thick glass and ceramics, where stability and surface protection are essential to machining quality.

OSCILLATING MILLING REDUCES TOOL WEAR

The same process logic extends to milling. In oscillating milling, systron uses an adaptive feed rather than a constant linear feed, while machining positions are stored intelligently by the system. This means the tool is not loaded continuously at the same contact point. Wear is instead distributed across a larger section of the tool, helping to extend tool life while maintaining consistently high machining quality, particularly on complex contours. Internal cooling completes the process strategy by delivering process water directly into the machining zone. Both the tool and the material are cooled exactly where heat is generated. The system operates only during active machining and requires approximately 1.2 litres of fresh water per minute. Around 100 litres of fresh water are



required for approximately 300 drilled holes.

CONCLUSION

By combining Helix drilling, oscillating milling, the patented Water Cushion and internal cooling, the systron proMD offers an efficient solution for machining glass, laminated safety glass and ceramics. The technology improves process reliability, extends tool life and supports stable machining conditions, while giving processors greater flexibility in demanding production environments.



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SATINAL: the global 360° partner for glass laminators

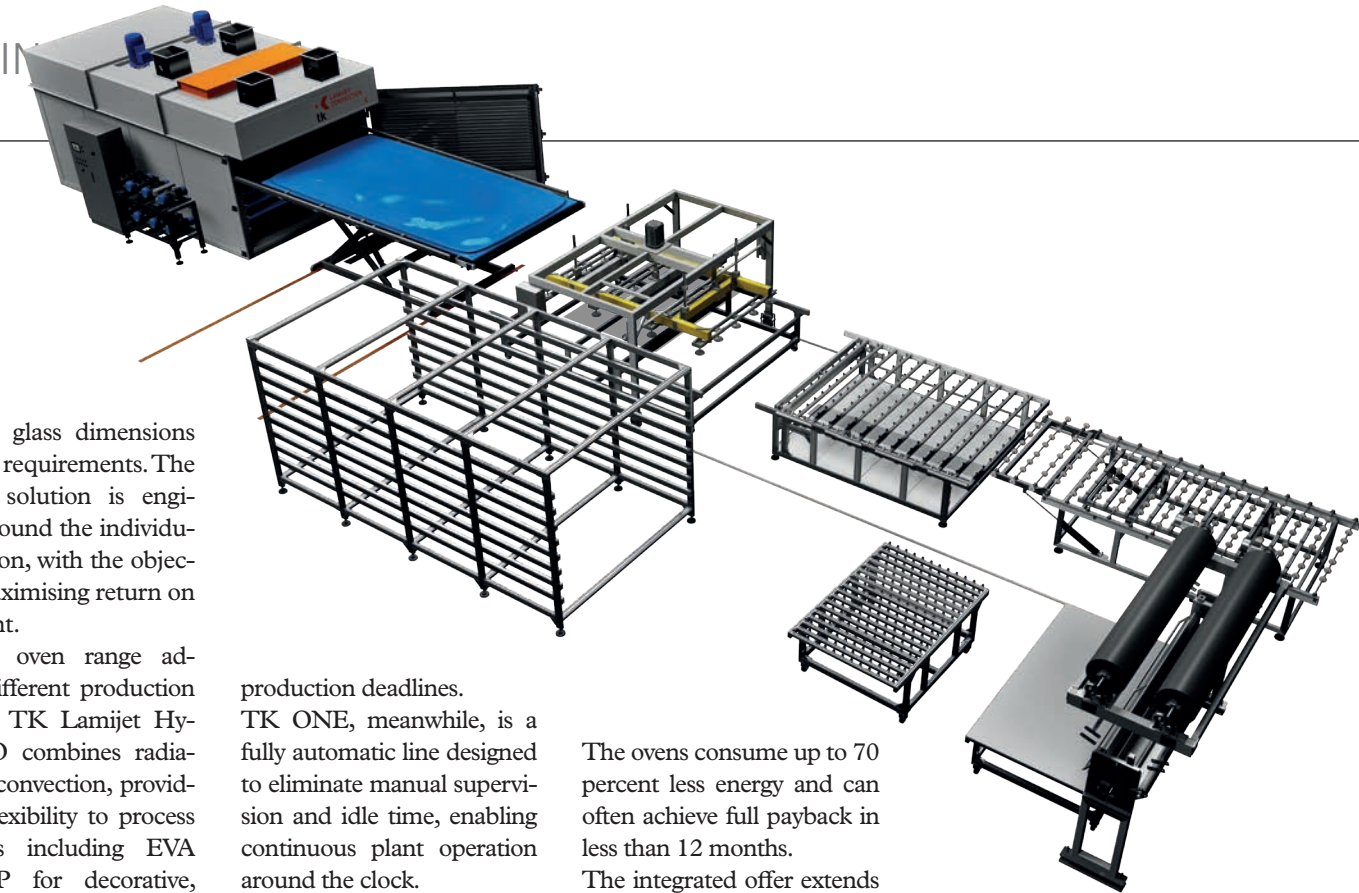
Combining STRATO® interlayers, TK ovens and technical support within one vertically-integrated global laminating ecosystem, SATINAL's tailored solutions unite energy-efficient processing, specialised safety, structural, decorative and photovoltaic products, remote diagnostics and regional assistance - giving glass processors one accountable partner across the complete production chain.

downtime and a fragmented chain of responsibility. Satinal was founded to remove that complexity. Based in Erba, Italy, the company provides complete, vertically integrated laminating solutions. By producing both STRATO® interlayers and TK ovens in-house, Satinal gives processors one accountable point of contact across the entire laminating chain, with integration established from the beginning. Rather than applying a standard configuration to every project, Satinal analyses each processor's produc-

BRINGING THE LAMINATING CHAIN TOGETHER

Excellence in laminated glass depends on the interaction of three essential elements: high-performance interlayers, stable and efficient ovens, and expert technical support. When these elements come from different suppliers, however, processors can face compatibility problems, production





tion mix, glass dimensions and cycle requirements. The resulting solution is engineered around the individual operation, with the objective of maximising return on investment.

The TK oven range addresses different production demands. TK Lamijet Hybrid PRO combines radiation and convection, providing the flexibility to process interlayers including EVA and SGP for decorative, structural and safety glass. The system is presented as the industry benchmark for versatility.

TK Convection uses intelligent convection for high-volume productivity. It is intended for large-scale architectural projects where processors must meet tight

production deadlines.

TK ONE, meanwhile, is a fully automatic line designed to eliminate manual supervision and idle time, enabling continuous plant operation around the clock.

PERFORMANCE SHAPED AROUND PRODUCTION

Throughout 2025 and 2026, processors worldwide have moved from traditional autoclaves to TK technology.

The ovens consume up to 70 percent less energy and can often achieve full payback in less than 12 months.

The integrated offer extends from processing equipment to the interlayers themselves. The STRATO® range is entirely made in Italy and certified according to ISO 9001, serving architectural, safety,

structural, decorative and photovoltaic applications.

- STRATO® SAFETY comprises PLUS, EXTRA CHIARO and 100. The range provides high-definition transparency and resistance for architectural glass and is intended for





projects in which absolute transparency is essential.

- For applications requiring post-breakage stability and structural performance, STRATO® STRUCTURAL includes RIGIDO and SENTINEL. These products address glass floors, railings, canopies and other structural or critical applications for which the end client requires certification.
- STRATO® COLOUR offers more than 20 colour finishes, extending lamination into interior architecture, furniture, retail and hospitality. For processors, the range creates an opportunity to supply differenti-

ated products with higher added value.

- The STRATO® FROST range, comprising LATTE, SATINATO and LEGGERO, provides translucent finishes for privacy. In many applications, these interlayers can replace screen-printed or acid-etched glass while offering greater stock flexibility and faster delivery times.

Environmental and energy-related applications form another part of the portfolio. STRATO® LOW CARBON, marketed as CarbonLight™, has a carbon footprint of 1.13 kilograms of CO₂ equivalent, compared with an industry aver-

age of 4.5 kilograms of CO₂ equivalent. The ISCC+ certified product is intended for projects with strict environmental requirements.

- STRATO® PHOTOVOLTAIC, or Solar PV, includes EVA, POE, TPO and EPE encapsulants for photovoltaic modules. The range serves a rapidly growing vertical sector within the wider interlayer market.

SUPPORT EXTENDING BEYOND INSTALLATION

Satinal's role continues through plant planning, installation and production optimisation. Its technical team works with processors from the initial plant layout through to post-installation optimisation, with the objective of maintaining high uptime. Remote assistance provides rapid responses, while TKconnect equips TK ovens with integrated remote monitoring and real-time diagnostics. A growing network of regional offices and showrooms also allows the company to provide assistance in processors' local languages and time zones.

Bringing ovens, interlayers and technical support under one organisation removes the friction associated with managing multiple vendors. Validated recipes and pre-documented parameters are designed to reduce waste and accelerate production cycles, placing the complete laminating process within one integrated system.

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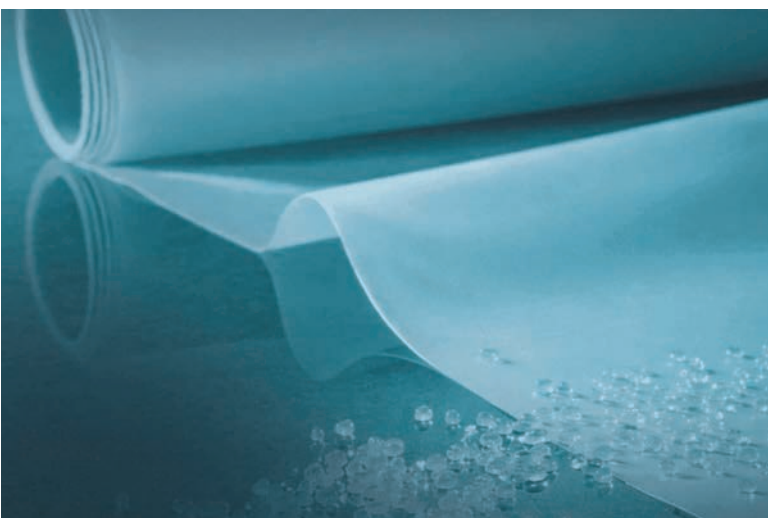
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Robotic glass handling evolves with STUDIO 1 AUTOMAZIONI

In developing custom automation solutions that improve efficiency, reduce costs and support scalable operations, STUDIO 1 AUTOMAZIONI's personalised line at Artigianvetro uses a robotic cell, two vertical grinding lines, adjustable suction cups, vision recognition, safety systems and a seventh FANUC interpolated axis.

CUSTOM AUTOMATION

With more than four decades of experience, Studio 1 Automazioni industriali has built its work around the design and execution of solutions developed for the specific requirements of its clients. Custom automation is presented as part of the company's DNA, with a focus on streamlining processes, cutting costs and improving operational efficiency. Since its inception, Studio 1 has worked by first seeking a comprehensive understanding of client needs. This approach allows the company to design systems that integrate with existing operations rather than imposing a standardised model. In this sense, custom



automation becomes not only a technical service, but a way of aligning machinery, process requirements and operational objectives.

THE BENEFITS

The benefits of custom automation begin with operational efficiency. By automating repetitive tasks, processes can

be accelerated while human errors are minimised. This allows companies to improve the consistency of operations and support a more efficient production environment.



Cost reduction is another central benefit. Automation can reduce the need for manpower on simple tasks, allowing employees to focus on strategic activities. Tailored solutions also bring flexibility and scalability, adapting to market changes and supporting business expansion.

STUDIO1 AUTOMAZIONI

The working method begins with needs analysis. Studio 1's technical team collaborates with clients to identify the areas that would benefit most from automation and to define clear objectives. Once

those objectives have been established, the development team designs the automation solution, taking into account the client's specific requirements and existing infrastructure. Implementation then brings the solution into the business system, followed by thorough testing to ensure that it operates correctly and fulfils the agreed objectives. After implementation, Studio 1 provides continuous support and maintenance so that the system remains efficient and can incorporate any improvements or updates required over time. Studio 1 Automazioni industriali positions itself

as a strategic ally for companies seeking to improve operational efficiency and remain competitive in the modern market. Its custom automation work is described through a combination of technology, reliability and durability, with bespoke solutions designed to help businesses revolutionise operations, streamline processes and prepare for sustainable growth. A recent example is the successful launch of a new personalised line at Artigianvetro, a company located in San Severino Marche and known for its focus on quality, automation and the handling of large dimensions. The installation includes a robotic cell designed to increase workflow efficiency by allowing a single robot to operate two vertical grinding lines simultaneously.

ADAPTIVE CONTROL ACROSS TWO GRINDING LINES

The robot manages materials from two A-frame stations through a specialised gripper with adjustable and retractable suction cups. Guided by

pre-set configurations, these features support precision and performance through customised handling. The system is divided into two separate operating areas, each dedicated to one grinding line, ensuring safe working conditions and allowing an exclusive operation mode when required. The cell configuration includes the ability to pick and rotate glass individually or through custom algorithms developed in collaboration with the client. The adaptable setup is supported by models such as the versatile UDC system. Technologically, the suite includes a six-axis anthropomorphic robot equipped with Dual Check Safety and Collision Guard for safety and precision. An integrated shuttle enables the robot to move along a seventh FANUC interpolated axis. The gripper operates autonomously and is supported by an integrated vision system capable of real-time recognition of part dimensions. The suction cups can also exclude themselves automatically according to the surface being handled, allowing the system to adapt to different sizes while maximising efficiency and maintaining accuracy.



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Made In Italy excellence expands through **ITECH** solutions

ITECH is strengthening its international growth through a South American partnership with Javier Oliva Gorriz of Glassamerica, GIMAV membership, and Made in Italy technologies - including the APUS Dry Seaming Machine and Automatic Desiccant Filling Machine for efficient, sustainable glass processing and insulating glass production.

A NEW PARTNERSHIP LOOKS TOWARD THE FUTURE

A company's growth depends not only on innovation, but also on the ability to build strong partnerships with professionals who share the same vision for development. For ITECH, the beginning of its collaboration with Javier Oliva Gorriz of Glassamerica represents a significant step in this direction, with Javier set to oversee the development and coordination of the company's activities across the

South American market. The partnership marks an important milestone in the company's growth journey and reflects its commitment to investing in new interna-

tional markets. South America is identified as a region with significant growth potential, and the collaboration is intended to strengthen the company's presence there. Javier's in-depth

knowledge of the local market, extensive industry experience and established network of relationships will make him a strategic point of reference for customers and for the development



of new business opportunities throughout South America. The collaboration is therefore presented as more than a business agreement: it is the beginning of a journey aimed at bringing the company closer to its international partners, with a service that is increasingly professional, responsive and customer-oriented. Through this new synergy, ITECH expects to reinforce its global pres-

ence and open new opportunities for growth. The direction is guided by the values of innovation, quality and trust that the company identifies as central to its identity.

BUILDING TOMORROW'S INDUSTRY TOGETHER WITH GIMAV

Innovation develops through dialogue, collaboration and the sharing of expertise. With this

conviction, ITECH has joined GIMAV, the association that has represented the excellence of the Italian glass processing technology industry for more than forty years, supporting companies in growth, innovation and internationalisation. For ITECH, membership of GIMAV is a strategic step toward the future. Joining a network that brings together leading players in the sector means creating new synergies, exchang-

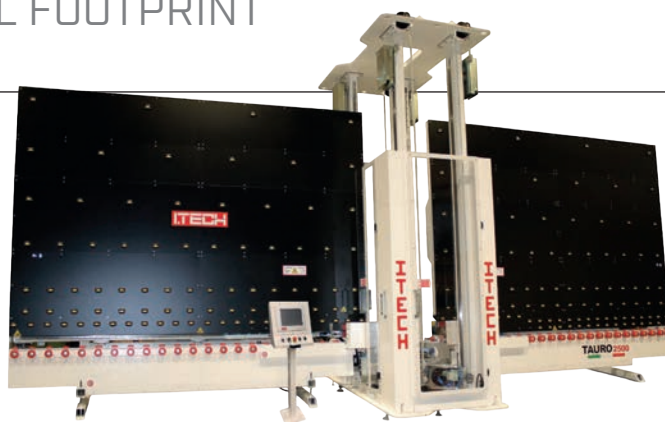
ing ideas with highly qualified companies and contributing to projects focused on market evolution, the digitalisation of manufacturing processes and the promotion of Made in Italy excellence. GIMAV's support will allow the company to approach international market challenges with greater determination, participate in leading international trade fairs, events and initiatives, and develop new collaborative



opportunities that can support the growth of both the company and its customers. The association also provides practical tools and valuable support for internationalisation, innovation, training and technological development. For ITECH, this collaboration is not simply a matter of joining an industry association. It is described as the beginning of a shared journey that will allow the company to continue investing in quality, innovation and the development of increasingly advanced solutions for the glass industry. Together with GIMAV and its member companies, ITECH aims to contribute to the continued growth of an industry internationally recognised as a symbol of excellence.

APUS DRY SEAMING MACHINE

The APUS Dry Seaming Machine is presented as a compact and innovative solution for glass edge processing, designed to provide high efficiency without using water. Its dry-processing technology eliminates process water completely, reducing water consumption, industrial wastewater and regeneration costs to zero. Compared with conventional water-based seaming machines, APUS saves thousands of litres of water every



year while eliminating sludge, maintenance of water tanks and pumps, machine downtime and wastewater disposal costs. The result is a production process designed to be more sustainable, efficient and cost-effective. APUS is also suitable for Low-E glass. With an installation footprint of just 7.7 metres, it optimises production space without compromising performance. Simultaneous processing of both glass edges ensures even wear across all four tools, while processing speeds of up to 30 m/min support productivity and precision. The processed glass is fully suitable for subsequent tempering. The machine's CNC control system, with an intuitive touchscreen interface, is designed for accuracy and ease of operation. Its integrated dust extraction system, equipped with automatic filter cleaning, helps keep the production area cleaner, safer and more efficient while reducing maintenance requirements and machine downtime. Fully automated and modular, APUS delivers consistently high-quality seamed edges, enhances operator safety

and minimises wear on downstream processing equipment. CE certified and Made in Italy, it is positioned as a solution for continuous production, greater sustainability and a rapid return on investment.

AUTOMATIC DESSICANT FILLER

The Automatic Desiccant Filling Machine is designed for operational versatility and is fully compatible with all types of spacer bars, including aluminium, steel and Warm Edge profiles, in both rectangular and shaped configurations. This flexibility makes it suitable for a wide range of insulating glass production requirements. The system includes a quick-change drill bit mechanism specifically designed to reduce maintenance time and improve operational efficiency, helping to limit machine downtime. Its sealing system uses 1 kg butyl blocks, enabling faster re-loading while ensuring continuous, air-bubble-free butyl application for improved process quality and reliability. The machine carries out drilling, desiccant filling and sealing fully automatically. Drilling is performed using special drill bits suitable for

both aluminium and steel spacer bars. Desiccant filling is accurately managed by an electronic dosing system to ensure precise and consistent filling. The filling holes are then sealed with butyl to provide a reliable and durable closure. Through its high level of automation, precision and reliability, the Automatic Desiccant Filling Machine optimises production efficiency, reduces operator intervention and supports consistently high-quality results in insulating glass manufacturing.



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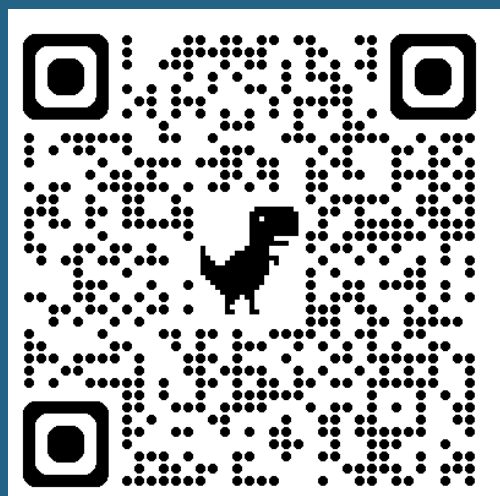
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Retrofit flexibility strengthens AGC FINEO solar-control applications worldwide

AGC's FINEO Solar Control vacuum glass combines high daylight transmission, solar protection and triple-glazing-level insulation in a slim, recyclable unit. Designed for new construction and refurbishment, the company reduces cooling demand, preserves architectural character and delivers certified, stable performance in service for at least 60 years.

Rising numbers of heat-waves across Europe have made summer heat protection a priority for architects, building owners and urban planners. With FINEO Solar Control, Belgian manufacturer FINEO by AGC is demonstrating that vacuum insulating glass can contribute to climate protection in several ways. Beyond controlling solar heat gain, the glazing reduces the energy required for mechanical cooling and consequently lowers CO₂ emissions. Its fully recyclable, lead-free composition and service life of at least six decades extend those environmental benefits well beyond the building envelope. Clément Lemoine, Head of Product & Marketing for FINEO by AGC, explains the strategic direction: "Solar Control answers one of the most pressing questions in modern construction: How

can maximum daylight utilization be combined with effective solar protection? Our highly selective solar control coating allows a high proportion of daylight to go through the glazing while it is effectively blocking heat gain from solar radiation. This opens entirely new design possibilities for architects, as large-scale glazing can be combined with south-facing facades."

SOLAR CONTROL COATING FOR THERMAL AND VISUAL COMFORT

As integral elements of the building envelope, windows play a central role in regulating light and heat, with a direct effect on energy efficiency and indoor comfort. Natural daylight is also an important factor in human health and well-being. Through light-sensitive receptors in the eye, daylight



influences hormone production in the body. Blue morning light promotes cortisol release and activation, while warm evening light stimulates melatonin release and prepares the body for rest. Daylight therefore helps stabilize the circadian rhythm, particularly in naturally illuminated interiors. Certification systems including WELL, DGNB, BREEAM and LEED recognize access to natural daylight as a central feature of building quality. FINEO Solar Control is designed particularly for larger south- and south-west-facing window areas, which receive the greatest number of sunshine hours. Its highly selective solar control layer combines light

transmission of 73 percent with a g-value of 0.41 in the FINEO 8 version. This combination is intended for spaces requiring abundant daylight without excessive summer heat gain. The performance results from the product's construction. Two thin glass panes enclose a hermetically sealed vacuum gap measuring 0.1 mm, complemented by a highly selective low-E coating. With a total thickness starting at 7.7 mm, FINEO Solar Control achieves thermal insulation values comparable with modern triple glazing. The Solar Control coating can be combined with the different annealed FINEO versions -Standard, Acoustic

and Safety- as well as with the Tempered version. The latter addresses large-format glazing measuring up to 2,980 × 1,605 mm. "With conventional insulating glass, gas diffusion can lead to measurable performance losses over the years. FINEO fundamentally avoids this: Without gas filling in the cavity and thanks to the sealing process technology, energy performance remains constant for decades and even more," Lemoine says. AGC has subjected the product to multiple durability test cycles, confirming a service life of at least 60 years.

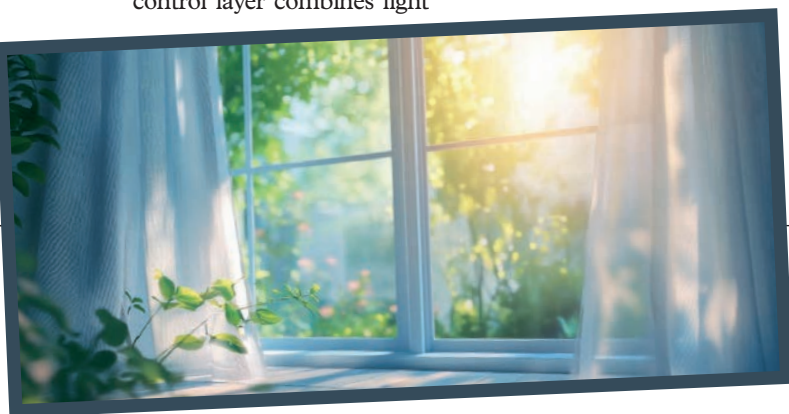
FINEO: PERFORMANCE AND SUSTAINABILITY IN ONE

"FINEO is far more than a high-performance energy glazing solution. As climate glass in the broadest sense of the term, it combines energy efficiency with a coher-

ent sustainability strategy - from material efficiency and recyclability to a service life far exceeding conventional insulating glass," Lemoine explains. That approach is reflected in the product's performance and sustainability characteristics.

PERFORMANCE

- A thermal insulation value of 0.7 W/m²K, matching modern triple glazing at a thickness comparable with conventional single glazing.
- A solar factor ranging from approximately 30 percent to 60 percent, depending on the FINEO version.
- Approximately 20 percent higher light transmission for standard FINEO glass than for conventional triple glazing, with FINEO Solar Control still providing around 10 percent more light transmission.



ABOUT AGC

AGC Glass Europe is a manufacturer, processor and distributor of flat glass for use in the construction industry (exterior glazing and interior decoration), the automotive industry (original equipment manufacturing and replacement glass) and other industries, including transportation, solar energy and high technology. It is part of AGC's European branch, which is the world's leading manufacturer of flat glass, with over 100 locations and around 13,000 employees across Europe.

SUSTAINABILITY

- No noble gases, organic sealants or evacuation opening, eliminating materials that degrade over time and supporting lasting thermal performance.
- A 100 percent recyclable, lead- and metal-free composition.
- Manufacturing in Belgium, minimizing transport emissions.
- A third-party-verified environmental product declaration registered in the IN-IES and NMD databases.
- A carbon footprint of 18.9 kg CO₂-equivalent per

square metre for the low-carbon variant.

For architects, investors and planners, these characteristics provide measurable added value. Virtually no commercial construction project is now completed without assessment against sustainability frameworks such as DGNB, LEED or BREEAM. These systems evaluate the environmental, social and economic performance of buildings. The Belnine office refurbishment in Brussels' European Quarter and the restoration of the Belle-Époque villa Domaine



© Koen Mouton Photography

de Myosotis in France demonstrate how FINEO Solar Control can meet architectural, energy-efficiency and sustainability requirements simultaneously, while contributing to long-term property value.

SYSTEMATIC GLASS REPLACEMENT: VACUUM GLASS FOR WINDOW REFURBISHMENT

A large proportion of Europe's building stock no longer meets modern energy standards. Complete window replacement, however, is frequently labour-intensive, costly and aesthetically undesirable, particularly for listed buildings and

premium existing façades. FINEO offers an alternative based on retrofit glass replacement, without compromising thermal protection, light quality or appearance. Depending on the product variant, FINEO is approximately 7 to 20 mm thick and can fit into many existing frame structures, including frames that previously held single or double glazing. This can save resources and installation costs while retaining slender frame profiles, historic views and architectural details. "We are opening new market opportunities for window manufacturers and refurbishment firms with our innovative technol-



ogy,” says Stefan Lips, Sales Director. “FINEO enables economically viable glass replacement, is ideal for limited rebate depths, and delivers high performance despite its slim build. Each FINEO is designed after carefully reviewing the requirements of the project:

dimensions of the different glazings, usage constraints, building type, location of the building, etc.” According to Lips, the breadth of the FINEO product catalogue and the ability to create dedicated compositions for specific projects provide additional value. The com-

pany can also produce free shapes alongside standard formats. “This solves a problem which previously could not find an answer, especially in the world of restoration: provide comfort and energy efficiency in old-listed buildings while preserving the frame’s original form and thickness,” he says. AGC is the first manufacturer to obtain both CE marking and general building type approval from the DIBt for the product. Its certification portfolio is supported by an externally verified environmental product declaration confirming a carbon footprint of 18.9 kg CO₂-equivalent per square metre for the low-carbon variant. Long-term durability

testing has also confirmed stable thermal and acoustic performance for a minimum of 60 years. For architects and planners specifying solar control glazing, FINEO combines summer heat protection, energy efficiency and sustainability credentials within a single slim unit.

ABOUT FINEO

FINEO by AGC is the latest generation of insulating glass, combining an ultra-slim design with exceptional thermal and acoustic insulation properties. Manufactured in Belgium using a revolutionary process, FINEO guarantees maximum energy efficiency and sustainability, in line with current building regulations. It does not compromise on aesthetics or performance. FINEO is a reliable and proven solution for professionals seeking the highest standards of technical excellence and environmental responsibility, whether for restoration, renovation, or new construction projects.

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by AGC

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Beyond machinery, **RCN SOLUTIONS** focuses on integrated glass performance

To acquire new technology is to look beyond machinery alone. For a glass business, the cost of repetitive tasks has become a central question when evaluating a new investment, alongside return on investment and the

expected benefits that support a business decision.

AUTOMATION

RCN SOLUTIONS has focused its machinery production on factors that can bring significant advantages to customers, including

the production of high-value products. The company does not mass-produce. Instead, it manufactures machinery intended to respond to requirements for high automation, high productivity, energy saving, compliance with local

standards, flexibility and technical support. Its three automatic lines, dedicated to lamination, bending and chemical tempering, are designed around customers' requirements. The technical solutions are tailored to the produc-



Developing automated lamination, bending and chemical tempering lines tailored to customer processes, RCN SOLUTIONS' systems focus on productivity, energy saving, flexibility, technical support, reduced waste and high-value output - all with technologies that include LIA, RD CLEAN CONCEPT, REVA BF film and chemical tempering.

tion process, not the other way around. In this sense, RCN's proposals move beyond the traditional concept of machines by offering integrated solutions that combine high-performance equipment with smart software to control and maximise production. This approach is also sustainability-oriented. Energy saving and less waste are pursued through improved quality and operational efficiency, while the broader objective remains the same: to support business performance through systems that are aligned with the actual production needs of glass processors.

LAMINATION

RCN's LIA, laminating integrated automation, can be manufactured in automatic or semi-automatic mode and in different sizes.

It is especially conceived to run day and night without operator assistance. Available with two or four shelves, with additional shelves in different layouts, LIA can also be completed with a loading and unloading conveyor that positions the glass to be laminated directly onto the bag. The system can also install RD CLEAN CONCEPT, RCN's patented system for clean edges. It prevents the interlayer from squeezing out of the glass edges up to 100 percent. As a result, the operator does not need to clean the edges with sharp tools, improving safety and reducing labor costs. RD CLEAN CONCEPT also avoids reducing the nominal value of the laminating interlayers, a problem that can occur with standard bags that press more on the edges



during the vacuum process and thin the internal film. In some installations, especially in building applications, preserving the nominal value of the interlayer is crucial for approval of the end product. The choice of laminating interlayer is equally im-

portant. REVA BF, the EVA film with a chemical formula developed by RCN in cooperation with a professional company, can be combined with RCN laminating kilns to maximise recipes, quality control and high-value output. The use of raw materials that do not con-



tain production waste, or POE, reduces the risk of imperfections and rejections. Curved glass requires suitable equipment to produce perfect and clear curves. RCN's three bending lines respond to all types of curves because they are based on different independent heating zones and different production capacities. The Rotary system is a self-excluding twin-axled machine with four positions: loading and

unloading, heating, bending and cooling, with controlled movement. Floating, meanwhile, is based on a multi-bending trolley with moving dome or trolleys, with the possibility of upgrading by installing additional trolleys and two hours of active bending time.

TEMPERING

Chemical tempering is currently under the spotlight, with some com-

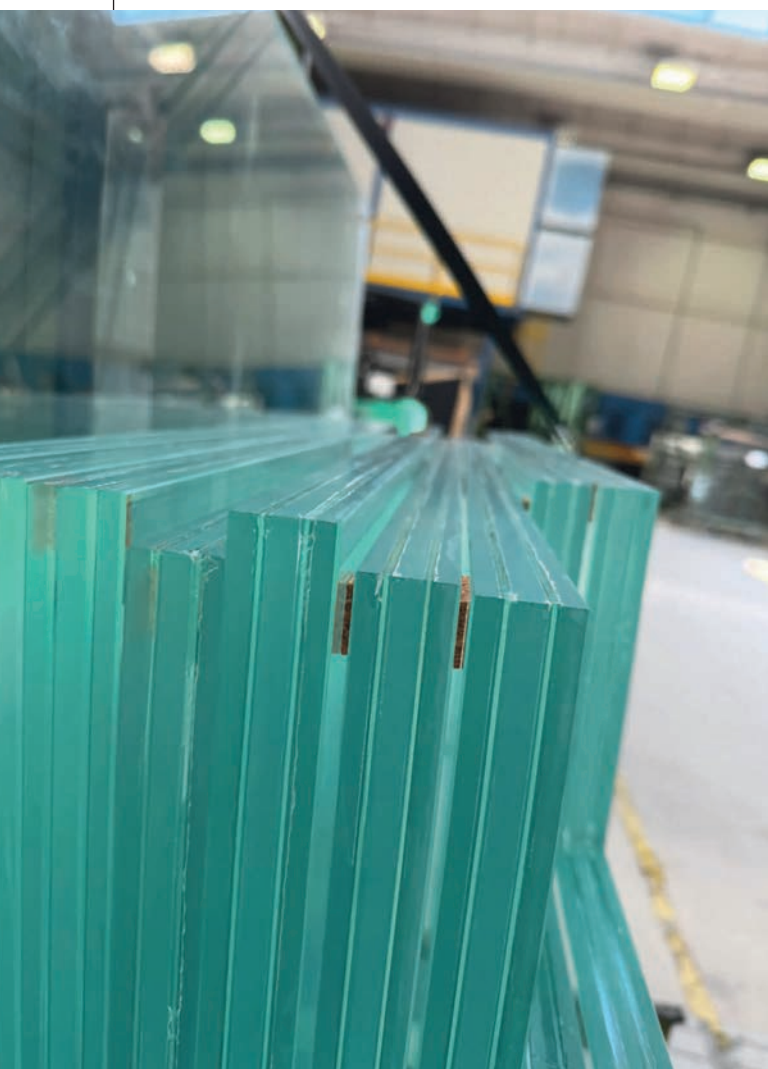


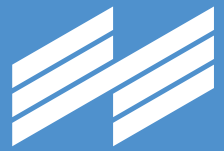
panies considering it for unique projects. Based on ion exchange between glass and melted potassium salts, the machines do not require specialised operators or HST testing. They also do not require frequent complete changes of the salts, but only partial additions to maintain the level. Energy consumption is very low. Pre-heating takes place at 300°C and the process at 450°C. Once the temperatures have been reached, consumption is about 15 percent of the installed power. The role of potassium salts is fundamental, and the use of a pure product free from impurities determines the quality of the temper. Potassium salts supplied by RCN are 99 percent pure and granted by certificate of analysis. Chemical tempering makes it possible to obtain more robust glass while maintaining excellent flatness. This makes it particularly suitable for later lamination, without the need

to increase the number of film layers to compensate for distortions, as happens with glass tempered by other systems. It also offers another important advantage: the tempering of very thin glass suitable for lightening several installations while combining superb transparency, superior resistance to breakage and reduced weight. In double glazing, for example, an internal thin glass can help potential thermal isolation and reduce stress on frames and hinges. For RCN SOLUTIONS, indeed, performance does not depend on machines only. It is also based on the entire system supporting them.

RCN
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Fire-retardant positioning benefits From **TEXPACK** PBI tape materials

A leading manufacturer of thermal insulation and sealing products, as well as packings, tapes, ropes, cloths, sleeves and industrial gaskets, TEXPACK has a product range that includes Aramtex sleeves for glass tempering rollers, silica cloth, Thermaltex cloth with stainless steel reinforcement and PBI tapes for high-temperature applications and positioning.

Founded in 1993 from the business experience of Giorgio Lanza and Simonetta Ghisi, Texpack® has developed around the manufacture of textile products for thermal insulation and sealing applications. Its production includes packings, tapes, twisted ropes, cloths and sleeves for static thermal insulation use, as well as special packings and braided packings for dynamic use in pumps and valves. The company also produces and markets industrial gaskets in different types and sizes, offering a complete range of sealing systems and products for high temperatures. Alongside its industrial range, Texpack® also supplies products for the maintenance of fireplaces and stoves dedicated to the consumer market.

A WINNING HISTORICAL TRAJECTORY

Since its foundation, Texpack® has specialised in textile products made from



glass, silica, Texil®, Bio-tex®, Thermaltex, Pyrotex, Tenack and Aramtex® for thermal insulation at temperatures from 200°C up to 1,200°C. This focus has been supported by constant and continuous investment, technological research, cutting-edge production methods and specialised technical staff for each individual process. Over time, that strategy has taken the company from a small initial space to its current production and commercial headquarters of more than 10,000 square metres. From there, Tex-

pack® sells its products in Italy and worldwide, while remaining rooted in the local area where it has maintained its corporate headquarters since its foundation. The company has continued to change with the market in order to meet customer needs, becoming an established reality.

AN EXTENSIVE PORTFOLIO

Texpack®'s warehouse is able to handle countless items, supporting fast and effective deliveries through a modern management system for in-

coming and outgoing goods. This system is constantly monitored by the shipping area, while orders can be traced at any time to keep customers informed about delivery progress.

LEADER PRODUCTS

Among the company's leader products is the Cod. 1210C Aramtex® continuous filament sleeve. Aramtex® sleeves are textile products made with heat-resistant yarns on special braiding machines with several spindles. The sleeve is produced using 100 percent pure aramid yarns

with continuous filaments, giving it better mechanical properties than discontinuous filament sleeves. Its main use is in the glass tempering sector, where it is applied to cover the rollers of tempering furnaces.

COD. 1040VS SILICA CLOTH

The Cod. 1040VS silica cloth is made with silica yarns produced from continuous glass fibres with a diameter of 6 µm and over. An additional treatment increases the overall proportion of SiO₂ to more than 94 percent. The



product is used as reinforcement for composite materials and as acoustic, thermal, hydraulic and electrical cable protection insulation. Under normal conditions, it has

good chemical stability. The substances or compounds protect the glass fibre surface from damage that may occur during transfer and improve the technical properties re-

quested by the user.

COD. 8240VX100 THERMALTEX CLOTH

The Cod. 8240VX100 Thermaltex cloth with stain-

less steel is made using special 'HT' glass threads, textured through a chemical purification treatment applied to type 'E' glass thread. This increases resistance to high temperatures of up to 700°C while maintaining good mechanical resistance. Thermaltex cloth can be reinforced with stainless steel wire in both warp and weft to provide high mechanical resistance and is available in various colours, including pink, grey and blue. It can also be aluminium-foiled to reduce fraying when cut and provide additional protection from radiating heat, or silicone-coated to offer maximum protection against various liquids and welding splatter.

COD. 1203N PBI TAPES

The Cod. 1203N PBI tapes are fire-retardant textile products made of PBI yarns and are particularly suitable for high temperatures. To improve their use, a double-sided adhesive has been added to help ensure correct positioning.



TEXPACK®



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Flexible glass decoration scale-up, courtesy of **ROLLMAC** JumboGlass

With its JumboGlass, Rollmac proudly offers a single-roller machine that's specifically designed and engineered for the enamelling and design printing of jumbo-size float glass sheets. Having a maximum working width of 3,300 millimetres, or 130 inches, the machine extends roller-based decoration to large-format glass while accommodating a

broad range of sheet thicknesses and coating requirements. Enamelling is performed by an engraved roller operating in reverse mode. Its direction of rotation is therefore opposite to the direction in which the glass sheet travels through the machine. By selecting from a wide range of engraved sleeves, processors can print sheets between 3 and 19 millimetres thick in a single pass.

APPLICATION

The available engraved sleeves allow wet quantities ranging from 50 to 350 grams per square metre, corresponding to coating thicknesses from 30 to 220 microns. These working parameters enable JumboGlass to address both enamelling and design-printing applications without requiring multiple passes through the machine. Uniformity

is supported by the special antidripping device used across ROLLMAC machines. On JumboGlass, this system provides precise and even surface coverage while preventing paint from accumulating along the leading and trailing edges of the glass sheets. Automatic positioning of the coating roller further supports this function. The edge-antidripping device is positioned to prevent excessive paint delivery at the entry edge of each sheet, helping the machine maintain controlled application from the begin-



Bringing single-roller enamelling and design printing to jumbo float glass sheets up to 3,300 millimetres wide, ROLLMAC JumboGlass combines reverse-roller application, broad coating ranges, antidripping control, shared-drier integration, quick-change components, automated cleaning, ergonomic handling and safer roller storage for streamlined production - all across changing production requirements.

ning of the coating process. JumboGlass can operate with a reverse engraved cylinder for enamelling and printing. It can also use a synchro engraved cylinder when design effects are required, extending its working possibilities beyond standard surface coverage.

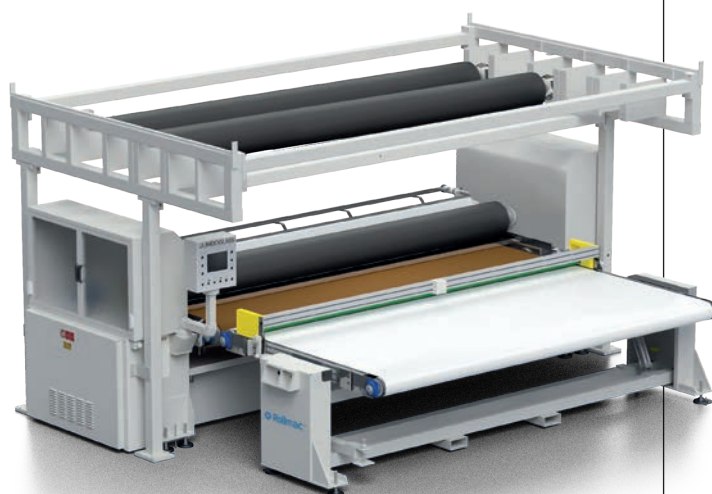
INTEGRATION

Production-floor efficiency can be increased by installing JumboGlass in line with the GLASSLINE 3400 perimeter-edge printer. In this configuration, the two machines can use the same infrared drier, reducing the space required for a combined enamelling and perimeter-printing installation. Several optional systems have also been developed to simplify production changes and routine machine operations. A tilting, ergonomically designed feeding belt can be positioned at the front of the machine, providing easier access when the rubberised sleeve must be replaced. Automatic washing

of the engraved sleeve and an integrated colour-change device accelerate cleaning when preparing a new production batch or completing a production cycle. These functions reduce the manual operations associated with changing colours and preparing the printing components for subsequent work. The machine also incorporates a roller-storage system positioned above it but structurally independent of the main body. This arrangement addresses the logistical requirements associated with storing spare air mandrels and sleeves.

HANDLING

Placing the roller-storage system above the machine also improves operator handling when a replacement sleeve is moved into its working position. The system is intended to make this operation easier while enhancing operator safety. The main conveyor uses a special rubber belt offering high resistance to oils and solvents. When replacement is necessary, the belt can be



removed quickly and easily from the front, or feeding side, of the machine. A quick-change roller holder similarly facilitates replacement of the engraved printing roller. Working thickness can be adjusted centesimally through digital indicators, with the left- and right-hand sides controlled independently or operated in tandem. Thickness adjustment is achieved by changing the vertical position of the engraved roller. Two jacks, driven by a gearmotor, control this positioning. Together with

the quick-change printing components, automatic cleaning functions and controlled antidripping system, these features equip JumboGlass for large-format float glass enamelling and design printing across its specified range of sheet thicknesses and coating quantities.

 **Rollmac®**

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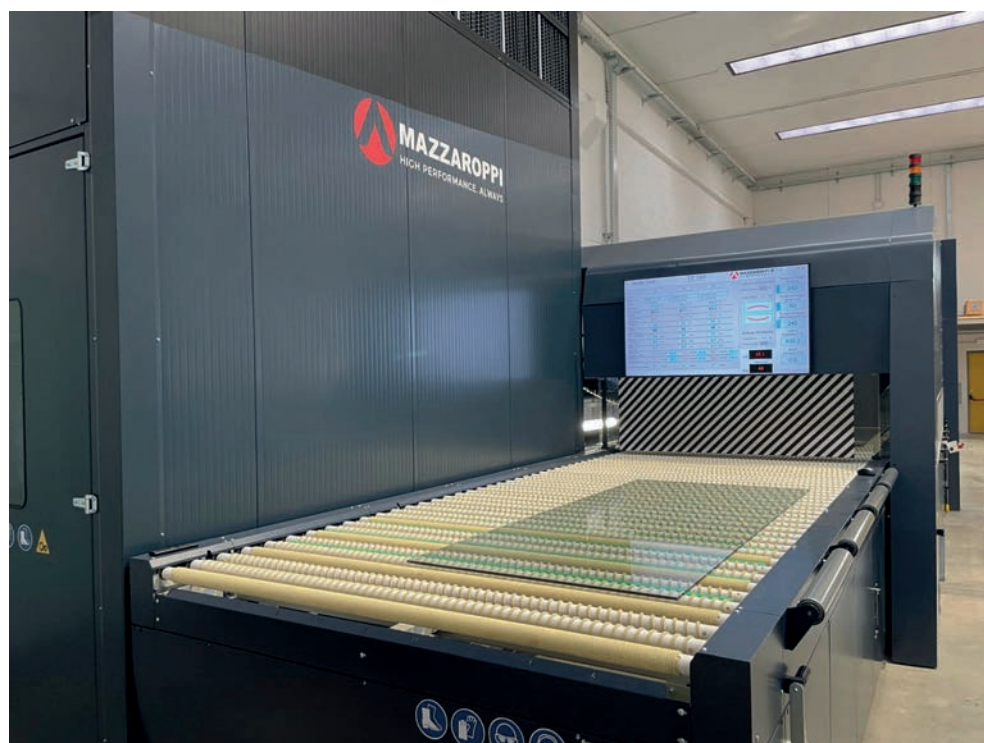


Energy uncertainty sharpens demand for MAZZAROPPI furnace efficiency

Glass tempering remains an energy-intensive process, and recent years of energy uncertainty have made investment decisions in tempering furnaces more complex for companies and glassworks. With energy bills rising sharply, the question facing the sector is how to obtain the required tempering results without accepting excessive operating costs over the life of the machinery.

COSTS

An Italian company based on the outskirts of Rome in Aprilia, Mazzaroppi has been working for years to reduce energy consumption in glass tempering. According to CEO Antonio Mazzaroppi, the company's patents and technologies allow it to guarantee energy consumption up to 70 percent lower than that of competi-



tors. For furnace buyers, the issue is not limited to the initial investment in machinery. Federico Mazzaroppi, the company's marketing manager, identifies

energy as the largest long-term cost in purchasing a glass tempering furnace. In one example he offers, five years after the purchase of a medium-sized tempering

plant operating on a single shift, energy costs can account for 55 percent of the total investment. After 15 years, that figure can rise to 77 percent. The proportion

Based in Aprilia near Rome, MAZZAROPPI focuses upon reducing energy consumption in glass tempering furnaces. Thanks to its patented technologies, the company has systems that can cut consumption by up to 70 percent - helping glassworks control long-term energy costs and maintain competitiveness.

becomes even higher when a machine operates on two shifts and energy prices continue to increase. This long-term cost profile has made energy performance a central factor in furnace selection, particularly in a market where many glass

companies have seen their energy bills double during the most critical periods.

EFFICIENCY

Higher energy bills increase product costs and can lead to a loss of competitiveness. Federico Mazzaroppi



describes this as a dangerous spiral for companies and glassworks, adding that it cannot be avoided simply by choosing a cheap furnace. In his view, the better choice is an efficient furnace that saves money month after month.

Mazzaroppi furnaces are described as highly energy-efficient because they apply solutions designed to eliminate non-productive energy consumption and optimise productive energy use. This approach is applied across the company's systems by its R&D department. The company is also preparing a new range of furnaces intended to cover different production requirements, from medium-sized models to jumbo models. Here's

why the new range is set to offer even lower energy consumption and higher performance. The broader point is that achieving the desired tempering results does not require higher energy consumption. For Mazzaroppi, the key lies in improving the efficiency of the tempering process itself, combining lower energy use with the required performance in glass hardening.



MAZZAROPPI
HIGH PERFORMANCE. ALWAYS

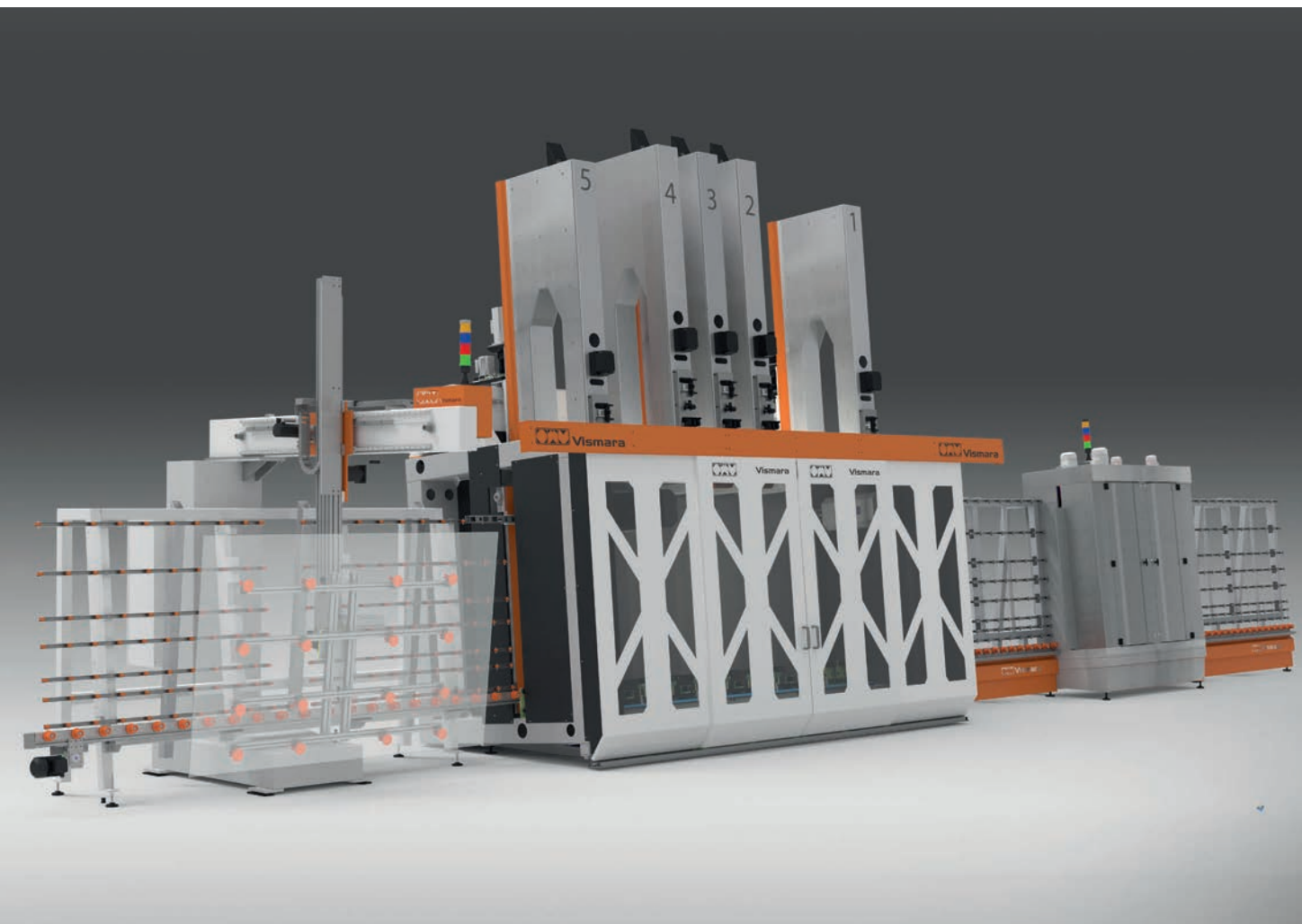
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Drilling and milling expertise shapes **OMV VISMARA** machines

Flat glass processing technologies from OMV VISMARA reflect a Made in Italy, tailor-made approach built on drilling and milling machines, customised production lines, in-house design, service, spare parts and international expansion, supported by technical partnerships, customer relationships and decades of experience in flat glass markets.





Founded in 1981, OMV Vismara specialises in technologies for flat glass processing. From its origins as a small business, the company grew rapidly while maintaining its identity and progressively expanding into international markets.

TAILOR-MADE

At the centre of this development is tailor-made production. The company's stated strength lies in its ability to meet individual customer re-

quirements, supported by a strictly Made in Italy brand that has developed continuously since its establishment.

VISMARA

OMV Vismara specialises in drilling and milling, offering a wide range of single-head and multi-head machines in both horizontal and vertical configurations. These systems are used for processing flat glass applied in furniture, construction, earthmoving machinery and household applian-

es, including cooking and refrigeration equipment. The company remains a wholly Italian brand and continues to evolve. It has recently doubled the size of its production facility and operates an in-house design department, enabling it to respond closely to market requirements and innovation demands. Its showroom, inaugurated in 2010, gives customers the opportunity to test different machine models and processing methods. A central factor in the company's development

has been its tailor-made approach. OMV Vismara designs and manufactures customised machines according to the requirements of each individual customer, a capability described as increasingly rare among producers of machinery with such a high technological standard. The company's history is presented as long and solid, shaped by passion across generations and by a management philosophy focused on growth and the future. This places OMV Vis-



mara between experience and innovation, with machinery distinguished by technological flexibility and ease of use at both mechanical and software level.

INTEGRATED SUPPLY

Through cooperation and partnerships with other companies in the sector, OMV Vismara can also supply machinery that complements its drilling and milling systems. These include washing lines, vertical grinding lines and equipment for

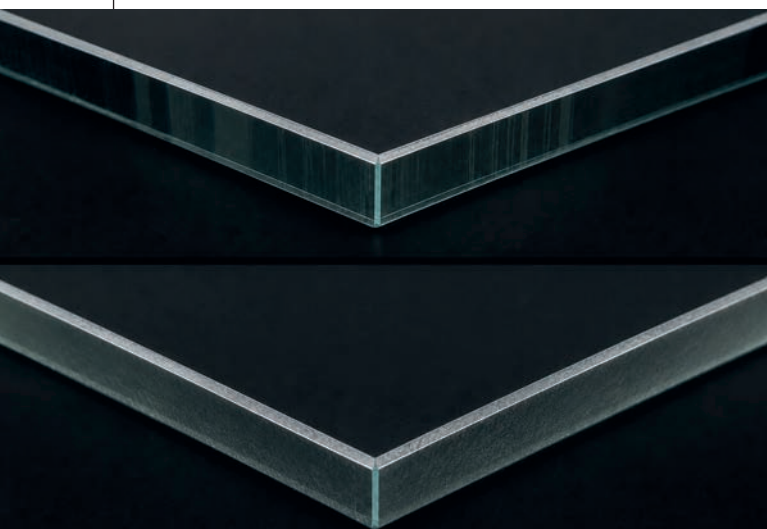
loading, unloading and handling within automatic production lines, in both vertical and horizontal configurations. Such systems may also incorporate barcode-reading technology. In particular, the group company SGM Srl supplies washing, edge-seaming and vertical grinding lines, allowing customers to work with a single supplier. OMV Vismara can therefore provide individual machines as well as complete production lines, including systems developed for a specific

customer requirement or processing application. This ability is supported by cooperation and synergies among the technical departments of its partner companies. In a market where specialised and customised requirements may struggle to receive sufficient attention and a high-level technical response, this technical network strengthens the company's capacity to address individual applications. A direct and constructive relationship with customers is another part of the company's operating model. OMV Vismara promotes this relationship in order to understand customer requirements and improve both products and after-sales services, supported by two dedicated divisions. OMV Service manages the installation and start-up of machinery and complete plants, as well as training for customer technicians. It

also provides machine overhauls, upgrades, maintenance and remote diagnostics. OMV Parts enables customers to obtain original OMV Vismara spare parts, which are then shipped by courier throughout the world. The lasting quality of its machinery and the work of its specialised technicians have helped OMV Vismara establish strong brand credibility. This credibility has supported its international expansion and given the company a worldwide market presence for many years.



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High-tech glazing applications broaden through LiSEC laser integration

Combining CO₂ and near-infrared laser sources, the LiSEC LSP-A enables glass engraving, surface structuring and functional coating removal without additives or consumables. Applications include bird protection, anti-slip, signal and heated glass, mirror coating removal, decoration, integrated line operation, standalone processing and safety class 1 design.

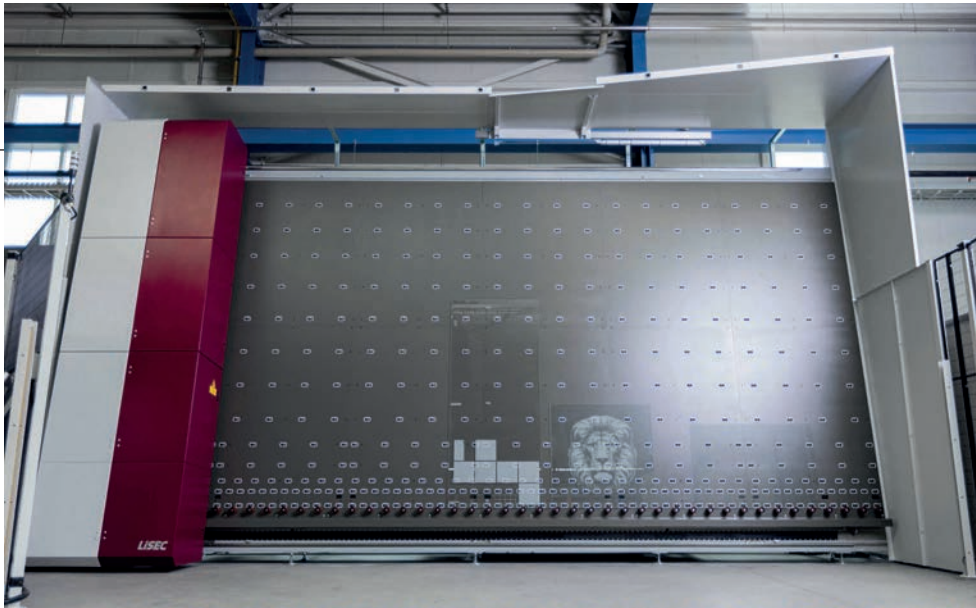
With the LSP-A, LiSEC brings together two laser technologies in a single system for applications ranging from bird protection glass to functional high-tech glazing. The system combines surface structuring and targeted coating removal, while operating without additives or consumables. Visitors can learn more about the technology at LiSEC's booth 1345 during GlassBuild America 2026, and the system will also be showcased

at glasstec 2026, in Hall 17, Booth A64.

DUAL PROCESSING

The central idea behind the LSP-A is the integration of two different laser beam sources in one machine. According to Elias Leichtfried, the system's distinctive feature is that both laser processes are combined in a single platform and can be used flexibly. The aim is to enable glass processors to structure glass surfaces and remove functional coatings in applications that conventional





processes can realise only to a limited extent, or not at all. The first beam source is a CO₂ laser that acts directly on the glass. Depending on the settings, it produces very low material removal, matting or engraving the surface and creating a clear visual contrast. This makes the process suitable for several applications, including bird protection glass, where dot-shaped structures are applied in a defined pattern to make glass visible to birds and help prevent collisions. The same CO₂ laser process can also be used for decorative designs such as lettering, logos and images. Another application is anti-slip glass, where dense dot structures are created to enable tested and certified slip resistance in classes R9 and R10. The second beam source is a near-infrared laser, or NIR, used for coating removal. In this process, the glass itself remains completely unaffected while only the coating is removed. This is relevant where conventional mechanical processes reach their limits, including signal glass and heated glass. In these ap-

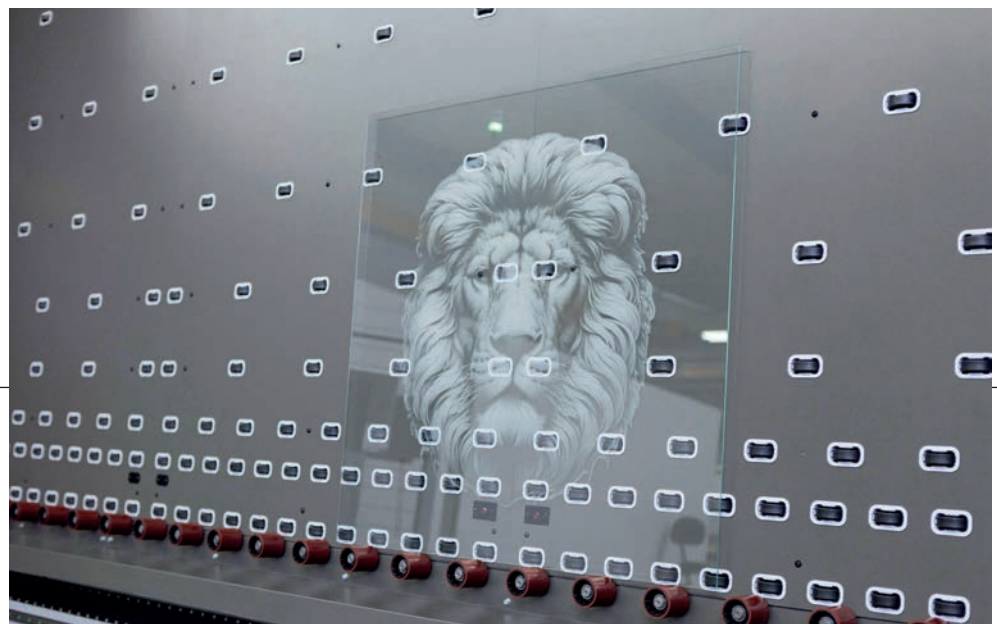
plications, extremely fine grid structures only a few 20 µm thick can be introduced into the coating. Since usually only a few percentage points of the coating are removed, its function remains fully intact. This allows glass to be made permeable to mobile communications signals or prepared for use as heated glass. The NIR laser is also used for mirror coating removal. Here, the system enables targeted and complete removal of the mirror layer without matting the underlying glass, an important advantage compared with conventional processes. For LiSEC, the market distinction of the LSP-A lies in combining both processes, engraving and coating removal, in one machine without additives

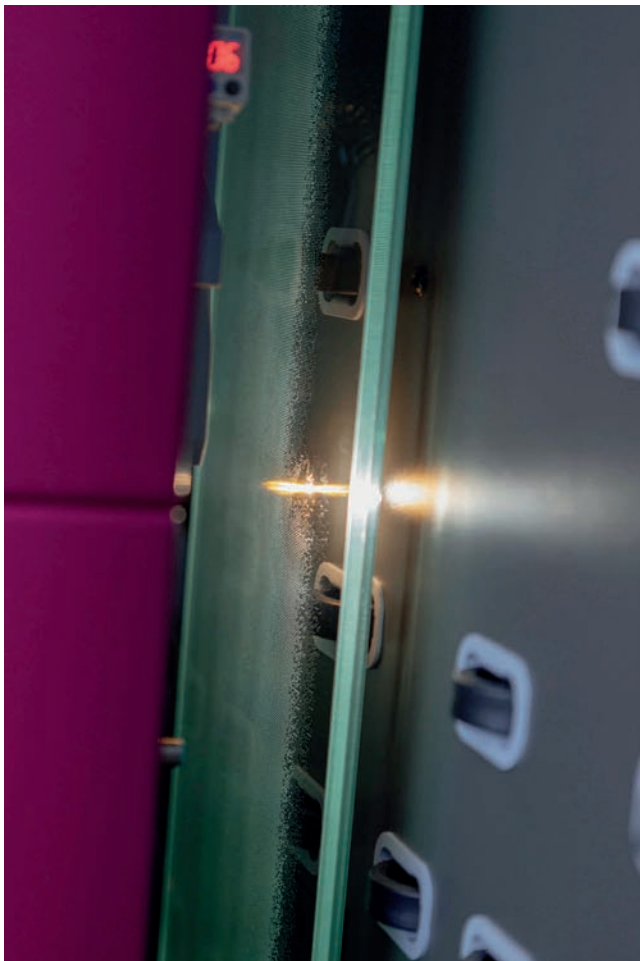
or consumables. Productivity is another defining point. In bird protection glass, the system achieves an output of approximately 55 to 60 square metres per hour using two simultaneously operating CO₂ laser beam sources. The lasers process the glass pane in parallel using a meander pattern, enabling these throughput rates.

INTEGRATION AND SAFETY

The LSP-A is designed for flexible integration into production environments. Processing can take place before or after tempering without affecting glass strength, a point verified through corresponding tests. The system can be fully automated and integrated into existing lines, often as a bypass solution, or

operated as a standalone machine. Multiple glass panes can be processed in batches while the operator simultaneously performs other tasks. Laser technology also brings safety requirements, and LiSEC supplies the system as laser safety class 1. This means the operator does not require additional laser protection. Neither laser safety curtains nor special protective enclosures are necessary, as the safety features are integrated into the system. Energy efficiency is also addressed in the system design. The lasers operate at only a few hundred watts, while the axes are highly energy efficient. The main energy consumption comes from extraction and cooling, but it is significantly lower than that of upstream or downstream processes. The application range is broad and covers several market segments. Typical areas include façade construction, especially bird protection glass and signal glass. The system is also suited to interior applications such as design or partition elements. Combined applications, including mirror coating removal and engraving



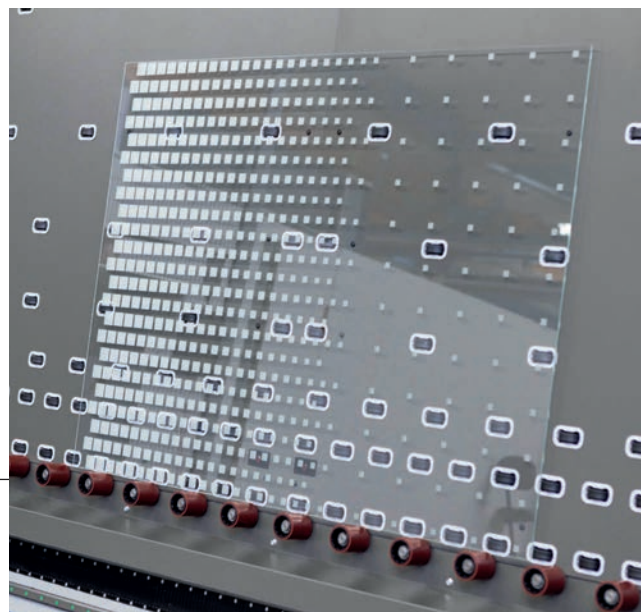


ing, allow the realisation of backlit mirrors or integrated touch functions.

KEY TAKEAWAYS

The LSP-A combines two laser beam sources for engraving and coating removal in one system. Alternatively, the machine can use two CO₂ sources for higher productivity. The system requires no additives or consumables and is designed for high productivity, especially in bird protection glass. It can be integrated flexibly into production lines or operated

as a standalone machine, while offering laser safety class 1 and an energy-efficient design. The LiSEC



ABOUT LISEC

With headquarters in Seitenstetten/Amstetten, Austria, LiSEC is a worldwide group of companies that has provided individual and extensive solutions in flat glass processing and refining for more than 60 years. In 2025, the group had around 1,300 employees and 25 locations, generated total revenues of around EUR 300 million, and had an export rate of more than approximately 95 percent. LiSEC stands for high quality machines and systems, as well as integrated complete solutions including software along the entire process chain in flat glass processing. Its product range includes standalone machines and complete production lines for glass cutting, glass edge and glass surface processing, insulating and laminated glass production, and the underlying intra- and extra-logistics. Customers benefit from working with a complete service provider with comprehensive experience in implementing large projects and a global service network.

LSP-A combines two different laser beam sources in one system and operates entirely without additives or consumables. It enables structuring of glass surfaces and targeted removal of functional coatings. One of its laser beam sources is a CO₂ laser that acts directly on the glass, matting or engraving the surface depending on the settings.

Decorative designs such as lettering, logos or images can also be realised. Bird protection glass is a key application of the LSP-A, with surface structuring making the glass visible to birds. Typical applications for laser-processed glass can be found in façade construction, including bird protection and signal glass. The near-infrared laser removes coatings while the glass itself remains completely unaffected.

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Mixed production highlights **MAPPI** innovations with energy



Energy is no longer simply another operating expense. In today's market, it can determine whether a tempering furnace delivers a return on in-

vestment or steadily erodes profitability throughout its working life. Every glass processor must contend with a physical minimum. Heating one square metre

of 4 mm glass from room temperature to 630°C, the temperature at which tempering takes place, requires at least 1.9 kWh. This is not a performance claim or an

approximate benchmark, but a limit imposed by thermodynamics. The energy needed to raise a given mass of glass to the required temperature is fixed, regardless

While rigorously examining how energy consumption, idle periods and production changes influence the long-term profitability of glass tempering lines, MAPPI combines full convection, multizone heating control and continuous loading. Its furnaces are designed to remain close to physical efficiency limits throughout demanding mixed production over extended operating lifetimes.

of furnace design or production claims. Under real manufacturing conditions, however, the requirement is higher. Once heat losses, convection and the cooling phase are included, even a fully optimised tempering line requires approximately 2.5 to 3.0 kWh per square metre for the same 4 mm glass sheet. The meaningful difference between furnaces therefore lies not in over-

coming the physical limit, but in how closely and consistently a line can operate near it across changing loads, production schedules and years of service.

ENERGY COSTS AND INDUSTRIAL COMPETITIVENESS

For much of the previous decade, energy represented a visible but manageable operating cost.

That position has changed significantly. In 2025, average wholesale electricity prices in the European Union were approximately twice those recorded in the United States and nearly 50 per cent higher than those in China. The International Energy Agency has noted that energy can account for more than two-thirds of total production costs in ener-

gy-intensive industries. A 2025 Make UK study also found that 65 per cent of manufacturers considered high energy costs to be directly reducing their competitiveness. For glass processors, these wider economic figures translate directly into monthly electricity expenditure. At the operating scale of a tempering furnace, even a relatively small change in the cost of each kilowatt-hour can have a substantial cumulative effect. A fluctuation of only a few cents, multiplied across the thousands of kilowatt-hours consumed during a year, becomes visible in annual financial results. Energy-price volatility that may appear marginal in general economic reporting is magnified by the volumes processed by an industrial tempering line. Energy efficiency in tempering can therefore no longer be treated merely as an environmental consideration. It directly affects competitiveness, operating margins and, in a stagnant market, the continued viability of production.





SOURCES OF CONSUMPTION AND PRODUCTION LOSSES

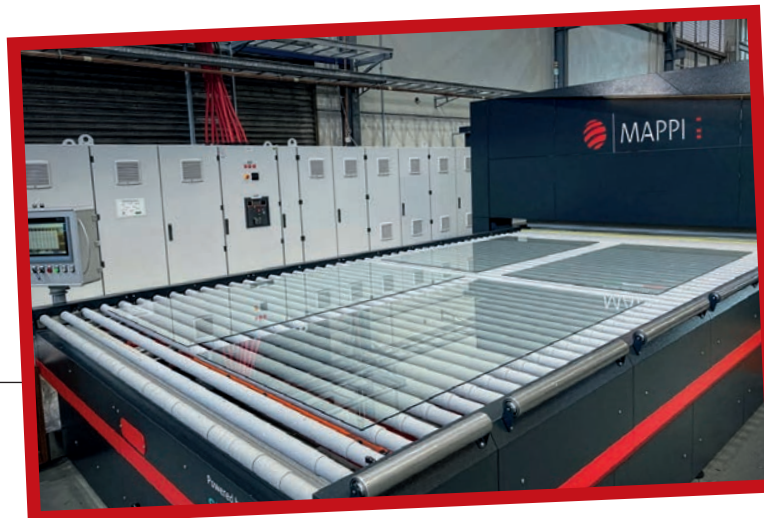
The tempering process contains two principal energy-intensive stages: heating and cooling. The basic heating requirement is largely fixed by physics. Furnace insulation and convection can be optimised to reduce losses, but the minimum requirement of 1.9 kWh cannot be eliminated. The main opportunities for improvement are consequently found in heat losses, cooling and periods during which the

furnace continues consuming energy without processing glass. In a conventional tempering line, a change from one glass batch to another with different characteristics may require the furnace to pause while its temperature stabilises. During this interval, energy consumption continues. Heating systems remain active, blowers continue operating and electricity is used without producing tempered glass. This idle consumption represents energy expenditure without corresponding output. Its impact becomes particu-

larly significant in mixed production environments, where orders frequently alternate between different glass thicknesses, coatings and dimensions. Repeated pauses between batches can consequently account for a meaningful

proportion of annual energy costs.

This is precisely where MAPPI's engineering philosophy makes a measurable difference, an approach that the company shares with the Voilap Group, to which it belongs.



CONTINUOUS PRODUCTION ACROSS CHANGING LOADS

MAPPI addresses these production interruptions by considering the lifetime operating cost of a furnace rather than focusing exclusively on its initial purchase price. The company's furnaces are designed to permit continuous loading across glass batches with different characteristics. When production moves from one thickness to another, the line does not need to stop, recalibrate and consume energy while waiting. Instead, successive loads can be introduced continuously. This capability is based on full convection throughout the MAPPI furnace range, including both larger systems and more compact lines, together with precise multizone heating control. Each section of the heating chamber is managed independently, enabling the furnace to adapt to the glass being processed without requiring the entire system to be reset whenever production conditions change. The objective is to keep the furnace close to the physical efficiency limit not only under controlled testing conditions, but also during normal mixed production. A greater proportion of the energy consumed is therefore directed into processing glass rather than main-

taining an idle machine between loads.

CONVECTION PERFORMANCE FOR LOW-E GLASS

The same engineering approach is applied to Low-E glass, one of the more demanding materials processed by the sector. Low-E coatings reflect infrared radiation, making the glass more difficult to heat evenly and generally increasing both heating time and energy consumption. MAPPI's full-convection system, available across all furnace sizes, is designed to provide efficient and uniform heating for Low-E products, including thin Low-E glass below 4 mm. This enables reflective coated glass to be processed without the additional energy burden normally associated with its heating characteristics.

LIFETIME OPERATING COSTS

A tempering furnace should be assessed as a long-term industrial investment rather than as a single equipment purchase. Such a line is expected to remain in operation for at least fifteen years. Across that period, total energy consumption will exceed the original purchase price many times over. A furnace operating even a few percentage points closer to the physical efficiency limit, while avoiding unnecessary idle consumption between loads, can accumulate savings across every shift, production cycle and year of service. The financial difference does not necessarily become apparent when the equipment is ordered. It emerges gradually through monthly electricity bills and compounds throughout a decade and a half of operation, and potentially beyond. Processors that remain strongest during

periods of high and volatile energy prices are therefore likely to be those that evaluate equipment beyond its initial price. The decisive consideration is how much a furnace will cost to operate during every hour of its expected working life. For MAPPI, this long-term operating question forms the basis of furnace design: how closely a tempering line can remain to the physical efficiency limit while continuing to process changing glass loads without unnecessary energy-consuming interruptions.

Find out more with us at MAPPI, a brand of the Voilap Group's glass division.



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Elegant I.G. partnership has **FILTRAGLASS** entering Oceania markets

Today an Australian installation by FILTRAGLASS at National Glass connects its DM.665.F water treatment system to a vertical edging and drilling IG line - highlighting sustainability, water reuse, trust, local partnership with Elegant I.G. as well as international expansion into Oceania through shared technical goals.

A collaboration between Filtraglass, Elegant I.G. and National Glass has made Filtraglass' debut installation in Australia possible in a project that underscores the value of trust and local partnerships in international expansion. Behind every installation, especially when it takes place in distant and culturally different markets, there's a network of partners that's sharing knowledge, experience and a common vision. Indeed the installation of Filtraglass' DM.665.F water treatment system at National Glass in Australia shows just how much technology



can be a meeting point between companies and professionals working toward sustainability in the glass industry - notwithstanding geographical distance. The project is particularly significant because it is Filtraglass' very first installation in Australia and on the continent of Oceania. National Glass sought to prioritise water efficiency and sustainability in its production processes, and the project came to fruition through the work of Elegant I.G., a sales representative in the Australian market. The installed DM.665.F model is connected to a vertical edging and drilling line, or IG line. Beyond the technical aspects, the installation also highlights the importance of trusted partners in supporting international growth.

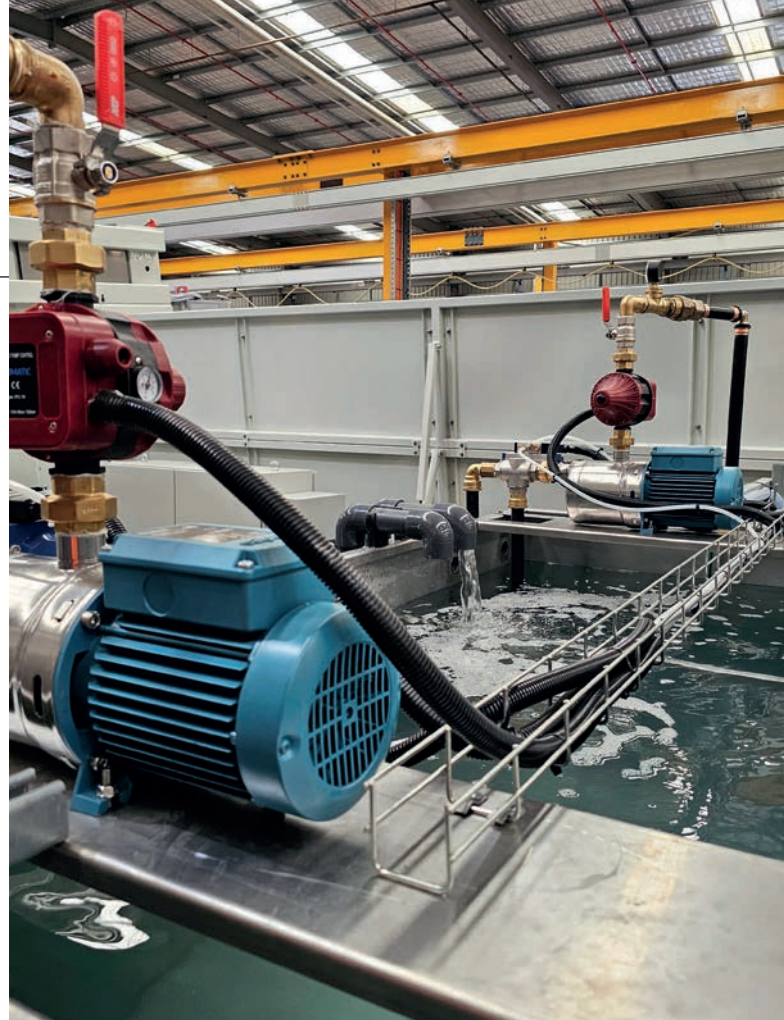
THE BEGINNING OF A STRATEGIC PARTNERSHIP

The relationship between Filtraglass and Elegant I.G. began in 2023 during Glasstech Asia in Thailand. What started as a conversation between industry professionals soon revealed shared values and objectives. Both companies recognised the need to offer solutions combining production efficiency, sustainability and customer-focused service. That first meeting made it possible to identify oppor-

tunities for collaboration in the Australian market, a demanding environment where proximity to the customer and local knowledge are essential to project success. For Filtraglass, it represented an opportunity to enter a region where it did not yet have a foothold. For Elegant I.G., it offered the possibility of adding a distinctive technology with a solid international track record to its portfolio. Almost a year later, the partnership was further strengthened at Glasstech 2024 in Germany. The two companies gained a deeper understanding of each other's capabilities and established a way of working based on trust and complementary expertise. Filtraglass contributed its expertise in manufacturing water recycling systems, while Elegant I.G. acted as a natural bridge between the technology and the specific needs of the Australian market. This combination made it possible to offer specialised solutions to potential clients, including the project developed at National Glass, which became the first Filtraglass installation on the Australian continent.

BEYOND A MERELY COMMERCIAL RELATIONSHIP

In business, some relationships are strengthened by the human element. The



partnership between Filtraglass and Elegant I.G. shows how trust and shared values can support a lasting alliance. Elegant I.G., founded in 1996 by Sandro Ianni, began as a family business and has grown to become a leading national supplier of double-glazing consumables. Throughout that development, it has upheld a philosophy based on honesty, loyalty and integrity. These values were important in strengthening the relationship with Filtraglass, which went beyond a purely commercial exchange and developed over time. This rapport was visible at China Glass 2025, where the Filtraglass team met the Elegant I.G. family. Beyond the professional aspect, the meeting reinforced a bond based on trust and a shared vision for growth.

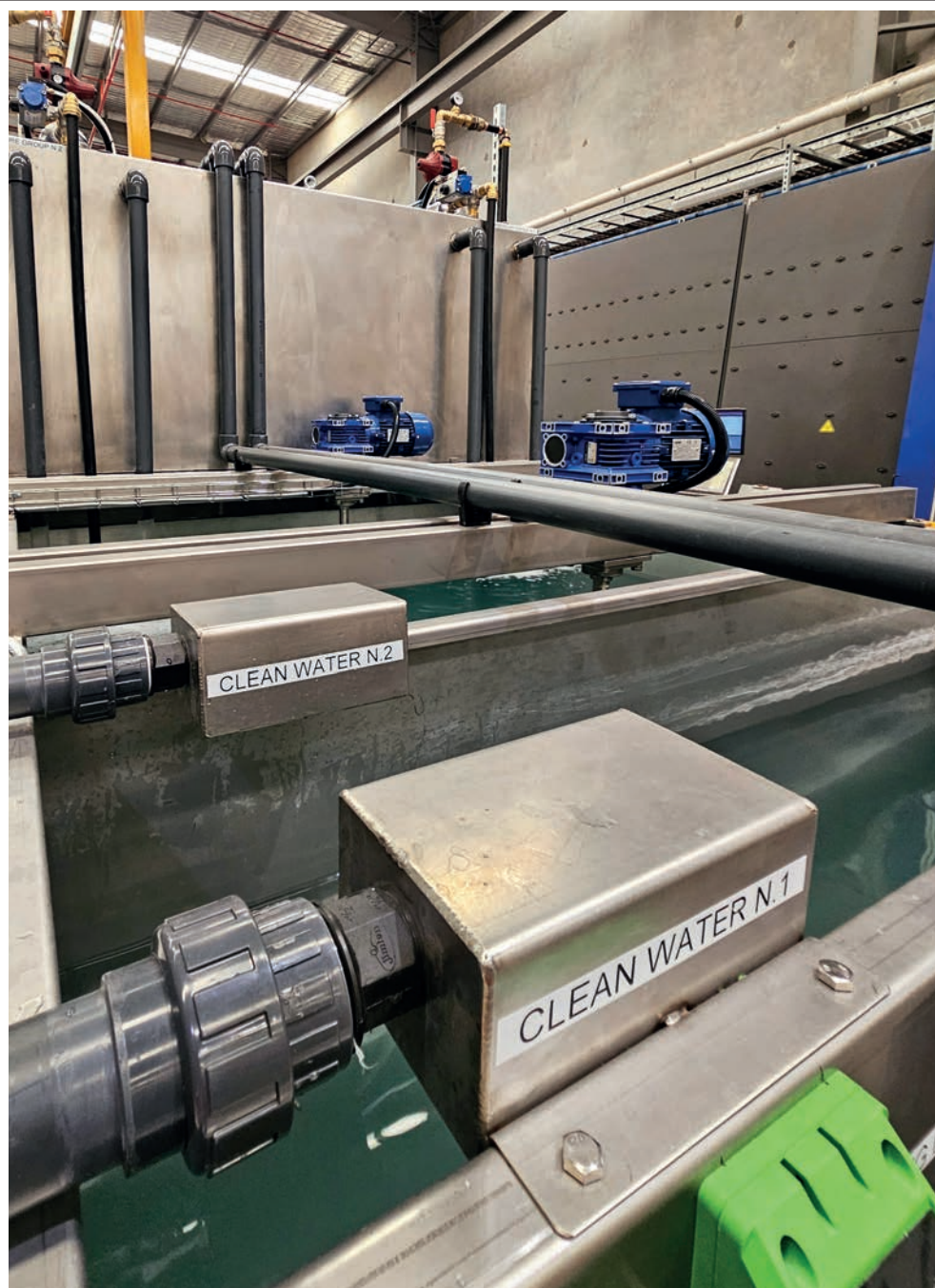
A SHARED PROJECT

National Glass has been in business since 1989 and has established itself as one of Australia's leading wholesale suppliers of flat glass products for the construction industry. With facilities in Brisbane and Townsville, the company supplies markets in Queensland, the Northern Territory, northern New South Wales and the Sydney metropolitan area. Through its specialisation in processes including tempering, bespoke lamination and the manufacture of insulating glass units, National Glass has built a solid reputation based on quality, innovation and the ability to offer solutions focused on energy efficiency, safety and decorative applications. In this context, the introduction of Filtrag-

lass' DM.665.F system represents more than a new installation. As well as being the first machine of its kind installed on the Australian continent, the system supports the management and reuse of water during production through its integration into a vertical edging and drilling line. The value of the project lies in the collaborative effort that made it possible. Filtraglass contributed its technological expertise and its ability to develop systems tailored to the client's specific needs. Elegant I.G. acted as the local point of contact, facilitating communication, interpreting the needs of the Australian market and building the trust needed to establish a strong relationship with National Glass.

INTERNATIONAL GROWTH STRATEGY

The collaboration between Filtraglass and Elegant I.G. is part of a broader international expansion strategy. In recent years, Filtraglass, based in Vilamallà, Girona, has strengthened its presence in new markets and formed alliances with partners able to understand the specific needs of each region. This vision enables the company to build an international network of partners sharing the same standards of quality, service and in-



novation. Its entry into Australia and Oceania is a tangible example of this strategy and confirms the importance of establishing strong relationships before entering new markets. In a sector where technological innovation is essential, this experience shows that peo-

ple continue to make the difference. When manufacturers, distributors and customers work together in genuine partnership, projects move beyond commercial transactions and become opportunities for growth and long-term value creation.



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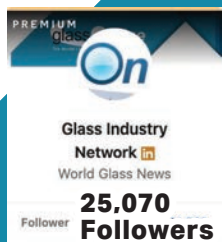
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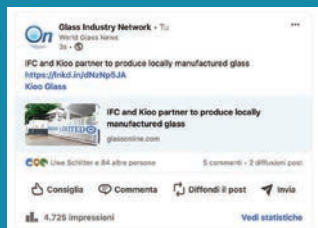
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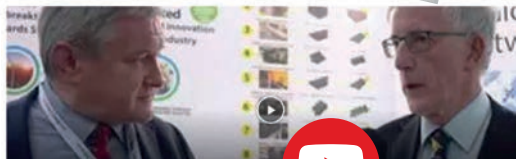


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Customers involve IOCCO in feasibility studies for whole car glass sets

Among IOCCO's contribution in the manufacture of systems for the air extraction during the lamination of windscreens, laminated sidelights and sunroofs is the notable improvement for both concept and fabrication of vacuum bag furnaces....



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Teknik Elmas
Tesir Makine

STRAIGHT-EDGE BEVELLING MACHINES

Adelio Lattuada
Bando Kiko
Bavelloni
Bovone
CMS
Glass Company
Schiavo
Schiatti Angelo
Teknik Elmas
Tesir Makine

BEVEL POLISHING MACHINES

Adelio Lattuada
Bando Kiko
Bavelloni
Biesse Group
Bovone
CMS
Lovati
Teknik Elmas
Tesir Makine

STRAIGHT-EDGE ENGRAVING MACHINES

Bavelloni
Biesse Group
Bottero
CMS
Litros
SKG - Skill Glass
Teknik Elmas

SHAPED GLASS ENGRAVING MACHINES

Bavelloni
Biesse Group
Bottero
CMS
Lovati
Teknik Elmas
Tesir Makine

CORNER GRINDING MACHINES

Adelio Lattuada
B Solution
Bavelloni
Biesse Group
CMS
Litros
Lovati
SGM - Special Glass
Machinery
SKG - Skill Glass
Teknik Elmas
Tesir Makine

SHAPED GLASS GRINDING MACHINES

Adelio Lattuada
Bando Kiko
Bavelloni
Biesse Group
Bottero
CMS
Forel
Glass Company
Litros
Lovati
Systron
Teknik Elmas
Tesir Makine

BELT GRINDING MACHINES

Adelio Lattuada
Best Makina
Fenzi
IOCCO Group
Litros

LATHES - VERTICAL AND HORIZONTAL

CMS
Fenzi
Teknik Elmas
Tesir Makine

EMBOSSING MACHINES

CMS
Fenzi

PORTABLE MACHINES

Fenzi
Helios Quartz

DIAMOND TOOLS

Adelio Lattuada
ADI - Surface Group
Bando Kiko
Bovone
Bottero
Diamut - Biesse
Fenzi
Glaston Group
Litros
Marrose Abrasives
Mole Moreschi
Neptun
Schiavo
Si.Ste Trading
Talamoni
Teknik Elmas
Vetrolux

DIAMOND BELTS

Mole Moreschi

SEAMING LINES

Best Makina

POLISHING WHEELS

Adelio Lattuada
ADI - Surface Group
Bando Kiko

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Bovone
Diamut - Biesse
Dogo
Fenzi
Glaston Group
Italmole
Litros
Marrose Abrasives
Mole Moreschi
RBM Italia - Surface Group

Schiavo
Si.Ste Trading
Teknik Elmas

POLISHING AGENTS AND OXIDES

ADI - Surface Group
Bovone
Fenzi
Litros
Schiavo
Si.Ste Trading
Teknik Elmas

POLISHING BELTS

Fenzi
Litros
Schiavo
Si.Ste Trading

COOLANTS

Adelio Lattuada
Bovone
Fenzi
Litros
Schiavo
Si.Ste Trading

GLASS GRINDING AND BEVELLING COOLANTS

Litros
Schiavo
Si.Ste Trading
Teknik Elmas

SEPARATORS FOR GLASS-SOLIDS

Dieffe Macchine
Filtraglass
Immes
Schiavo
Vitrosep

ACCESSORIES

ADI - Surface Group
CMS
Fenzi
Helios Quartz
IOCCO Group
Mole Moreschi
Schiavo
Schiatti Angelo
Si.Ste Trading
Teknik Elmas

Washing

HORIZONTAL WASHING MACHINES

Bando Kiko
Bavelloni
Best Makina
Bovone
ECOL
Emar
Forel
Glass Company
Glaston Group
GPM Automation
IOCCO Group
Itech
Lisec Group
Litros
Neptun
Schiavo
SGM - Special Glass
Machinery
Tecglass
Triulzi

VERTICAL WASHING MACHINES

Adelio Lattuada
Bavelloni
Best Makina
Emar
ECOL
Forel
Glass Company
Glaston Group
GPM Automation
IOCCO Group
Itech
Lisec Group
Neptun
Schiavo
SGM - Special Glass
Machinery
Stefiglass
Systron
North Glass Technology
Tecglass
Teknik Elmas
Tesir Makine
Triulzi

WASHING MACHINES FOR AUTOMOTIVE GLASS

Bando Kiko
ECOL
Glaston Group
IOCCO Group
Tecglass
Tesir Makine
Triulzi

WASHING PURIFICATION SYSTEMS

Best Makina
Dieffe Macchine
Emar
Forel
Glass Company
Glaston Group
Immes
IOCCO Group
Itech
Litros
Schiavo

LIQUID WASHING CONCENTRATES

Schiavo
Si.Ste Trading

ACCESSORIES

Helios Quartz
Emar
Idrotecnica
Litros
Neptun
Schiavo

Mirror production

COMPLETE PLANTS & CONVEYORS FOR MIRROR PRODUCTION

Bovone
IOCCO Group
Triulzi

PAINTING EQUIPMENT

Fenzi
IOCCO Group
Triulzi

DRYING OVENS

Bovone
CMS

AUTOMOTIVE MIRROR BENDING FURNACES

Bovone
Marposs
Tecnosens

MANUAL SILVER- SPRAYING EQUIPMENT

Fenzi
Glass Company
**PAINTS
AND CHEMICAL
PRODUCTS**
Fenzi

ACCESSORIES

Fenzi
Helios Quartz

Insulating glass

COMPLETE INSULATING GLASS LINES

Bavelloni
Best Makina
Emar
Forel
Glass Company
Glaston Group
Itech
Litros
Marval
Neptun
Schiavo
SGM - Special Glass
Machinery
Thermoseal Group
Triulzi

AUTOMATIC SEALING LINES

Bavelloni
Best Makina
Easy Automation
Emar
Forel
Glaston Group
Itech
Lisec Group
Litros
Marval
Teknik Elmas
Tesir Makine

AUTOMATIC SPACER BENDING MACHINES

Bavelloni
Best Makina
Emar
Fenzi
Forel
Glaston Group
IOCCO Group
Lisec Group
Marval
Schiavo
Thermoseal Group

DESICCANT SALT FILLING MACHINES

Bavelloni
Best Makina
Emar
Fenzi
Forel
Glaston Group
Itech

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Lisec Group

Marval
Neptun
Schiavo
Thermoseal Group
Triulzi

SPACER CUTTING SAWS

Bavelloni
Best Makina
Emar
Fenzi
Forel
Itech
Lisec Group
Marval
Neptun
Schiavo
Tesir Makine
Thermoseal Group

BUTYL EXTRUDERS

Bavelloni
Best Makina
Emar
Forel
Glaston Group
Itech
Lisec Group
Marval
Neptun
Schiavo
Thermoseal Group
Triulzi

HOT-MELT EXTRUDERS

Bavelloni
Best Makina
Easy Automation
Emar
Fenzi
Forel
Itech
Lisec Group
Marval
Neptun
Schiavo
Thermoseal Group
Triulzi

POLYURETHANE EXTRUDERS

Bavelloni
Best Makina
Easy Automation
Emar
Fenzi
Forel
Glaston Group
Itech
Lisec Group
Marval
Schiavo

POLYURETHANE ENCAPSULATION

Emar
Glaston Group
Lisec Group
Marval
Schiavo

SILICONE EXTRUDERS

Best Makina
Emar
Fenzi
Forel
Glaston Group
Itech
Lisec Group
Marval
Schiavo
Triulzi

POLYSULPHIDE SEALANT EXTRUDERS

Best Makina
Emar
Fenzi
Forel
Glaston Group
Itech
Lisec Group
Marval
Schiavo
Triulzi

GAS FILLING EQUIPMENT

Emar
Fenzi
Forel
Glaston Group
Itech
Lisec Group
Litros
Marval
Neptun
Schiavo
Sparklike
Thermoseal Group

DESICCANT SALTS

Emar
Fenzi
Litros
Neptun
Schiavo
Thermoseal Group

SPACERS/PROFILES

Edgetech Europe
Fenzi
Litros
Schiavo
Thermoseal Group

GEORGIAN BARS

Hegla
Thermoseal Group

BUTYL

Fenzi
Litros
Thermoseal Group

POLYSULPHIDE SEALANTS

Fenzi
Litros

HOT MELT

Fenzi
Litros
Thermoseal Group

OTHER SEALANTS

Fenzi

PANTOGRAPHS

Fratelli Pezza

ACCESSORIES

Deltamax Automazione
Forel
Helios Quartz
Litros
Schiavo
Si.Ste Trading
Sparklike
Tesir Makine
Triulzi

Tempering

TEMPERING FURNACES (ARCHITECTURAL GLASS)

Glass Company
Glasstech Inc.
Glaston Group
Pujol Group
Jinglass
Keraglass
Landglass Technology
Lisec Group
Luoyang Fuchong Machinery
Mappi International
Marposs
North Glass Technology
Schiavo
Tecnosens
TK
Tekno Kilns/Pujol
Texpack

TEMPERING FURNACES (AUTOMOTIVE GLASS)

Glass Company
Glasstech Inc.
Glaston Group
Jinglass
Keraglass
Landglass Technology
Luoyang Fuchong Machinery
Mappi International
Marposs

Mazzaroppi Engineering
North Glass Technology
Satinal
Taifin
Tecnosens
Texpack

CHEMICAL TEMPERING EQUIPMENT

Glass Company
R.C.N. Solutions
TK

ROBOT FOR CLEANING SILICA ROLLERS

Eurotech Way

ACCESSORIES

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

Bending

BENDING FURNACES (ARCHITECTURAL GLASS)

Pujol Group
Jinglass
Keraglass
Luoyang Fuchong Machinery
Mappi International
Marposs
Mazzaroppi Engineering
R.C.N. Solutions
Tecnosens
Tekno Kilns/Pujol
TK
Texpack

BENDING FURNACES (AUTOMOTIVE GLASS)

Glass Company
Glasstech Inc.
Glaston Group
Jinglass
Keraglass
Luoyang Fuchong Machinery
Mappi International
Marposs
Mazzaroppi Engineering
R.C.N. Solutions

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Ayrox
Deltamax Automazione
Glass Company
Glasstech Inc.
Glaston Group
Pujol Group
Itech
Keraglass
Mappi International
Satinal
Softeco
Tekno Kilns/Pujol
TK

Laminated glass production

COMPLETE PLANTS

Best Makina
Bovone
Bottero
Forel
Glass Company
Glaston Group
GPM Automation
Pujol Group
IOCCO Group
Italmatic
Lisec Group
Mazzaroppi Engineering
R.C.N. Solutions
Texpack
TK
Triulzi

LAMINATED WINDSCREEN BENDING FURNACES

ECOL
Glass Company
Glasstech Inc.
Glaston Group
Keraglass
Mappi International
Marposs
Taifin
Texpack
AUTOCLAVES
Glass Company
Glaston Group
GPM Automation
Pujol Group
Italmatic
Lisec Group
Triulzi

CLIMATIC CABINS

Forel
Glaston Group
GPM Automation
IOCCO Group
Lisec Group
Triulzi

INFRARED OVENS

ECOL
Forel
Glass Company
Glaston Group
GPM Automation
Pujol Group
IOCCO Group
Lisec Group
TK
Triulzi

MANGLES

GPM Automation

PRESSES/BENDING MACHINES

Forel
IOCCO Group
Lisec Group
Triulzi

RESIN LAMINATING MATERIALS AND EQUIPMENT

IOCCO Group
Satinal
Teknik Elmas
Torgauer Maschinenbau

EVA (ETHYLENE VINYL ACETATE)

Satinal
Si.Ste Trading
Tecnosens

PVB

Everlam
Kuraray - Trosifol
Marposs
Si.Ste Trading
Tecnosens

PVB - SHAPING AND CUTTING EQUIPMENT

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

PVB - WIRING TECHNOLOGY FOR HEATABLE LAMINATES

Ayrox
Easy Automation
ECOL

Softeco

ACCESSORIES

Ayrox
Bottero
Deltamax Automazione
Eurotech Way
Glaston Group
Helios Quartz
Pujol Group
IOCCO Group
Lisec Group
Satinal
Si.Ste Trading
Softeco
Taifin
Triulzi

Drilling

AUTOMATIC DRILLING LINES

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

MULTI-SPINDLE DRILLING MACHINES

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

DRILLING MACHINES WITH OPPOSITE DRILLING HEADS

B Solution
Bando Kiko
Bavelloni
Bottero
CMS

Fenzi
Glaston Group
IOCCO Group
Litros
Lovati
Neptun
Schiavo
Schiatti Angelo
SKG - Skill Glass
Systron
Teknik Elmas
Tesir Makine
Vismara

COLUMN DRILLING MACHINES

B Solution
Bottero
Fenzi
Neptun
Schiavo
Tesir Makine
Vismara

PORTABLE DRILLING MACHINES

CMS
Fenzi
Schiavo
Si.Ste Trading
Teknik Elmas
Tesir Makine

DRILLING AND MILLING MACHINES

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

DIAMOND DRILLS

ADI - Surface Group
Bovone
Diamut - Biesse
Fenzi
Glaston Group
Litros
Mole Moreschi
Neptun
Schiavo
Si.Ste Trading
Teknik Elmas
Tesir Makine
Vetrolux

ACCESSORIES CMS

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Fenzi
Litros
Neptun
Schiavo
Si.Ste Trading
Teknik Elmas

Other equipment and plants

TURNKEY PLANTS / ENGINEERING - FOR BUILDING GLASS

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

TURNKEY PLANTS / ENGINEERING - FOR AUTOMOTIVE GLASS

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

KEY PLANTS / ENGINEERING - FOR DISPLAY GLASS

Bando Kiko
Cugher Glass
Marposs
Torgauer Maschinenbau

EDGES ROLLER COATING MACHINE

Eurotech Way

WORK CENTRES - CNC CONTROLLED

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

Systron

FLOAT PLANTS / LINES (EQUIPMENT & ACCESSORIES)

Bovone
Horn
IOCCO Group

CULLET HANDLING SYSTEMS

ECOL

COMPLETE BATCH PLANTS

Zippe

VACUUM COATING EQUIPMENT AND PLANTS

Giardina Group Glass Division
Glass Company
North Glass Technology
Unelko

ENAMELLING EQUIPMENT AND PLANTS

Giardina Group Glass Division
Glass Company
Rollmac division of GeMaTa

DRYERS AND ENAMELING FURNACES

Giardina Group Glass Division
Tecglass

SPRAYING TECHNOLOGY

Giardina Group Glass Division

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

Giardina Group Glass Division

SANDBLASTING SYSTEMS, EQUIPMENT AND PLANTS - OPTIMIZERS

Fenzi
Fratelli Pezza
Glass Company
Litros
Schiavo
SKG - Skill Glass

DIGITAL INKJET PRINTERS

Glass Company
System Ceramics
Tecglass
TecnoFerrari

SCREEN PRINTING EQUIPMENT AND PLANTS

Ayrox
COMSS
Cugher Glass
Deltamax Automazione
ECOL
Eurotech Way
Glass Company
Keraglass

North Glass Technology

Rollmac division of GeMaTa
Softeco
Studio 1 Automazioni
TecnoFerrari

SCREEN PRINTING FRAMES

COMSS

SCREEN PRINTING DRYING SYSTEMS

COMSS
Cugher Glass
Glass Company
Rollmac division of GeMaTa
Studio 1 Automazioni

EDGES ROLLER COATING MACHINE

Giardina Group Glass Division

ACIDING GLASS EQUIPMENT AND PLANTS

Lisec Group
Rollmac division of GeMaTa

LASER DECORATING MACHINES

Glass Company

Artistic glass production

CERMAMIC INKS

Glass Company
Tecglass

CHAMBER ELECTRIC KILNS

Glass Company
Keraglass
Tekno Kilns/Pujol

ACCESSORIES

Deltamax Automazione
Helios Quartz
TK

Miscellaneous

ADHESIVES FOR GLASS BONDING

Si.Ste Trading

AUTOMATION

Easy Automation
Horn
IOCCO Group
Marposs
Studio 1 Automazioni
Tecnosens
Torgauer Maschinenbau

Zippe

AUTOMOTIVE GLASS APPROVAL SERVICES

Ayrox
Marposs
Softeco
Tecnosens
Teknik Elmas

AUTOMOTIVE GLASS QUALITY CONTROL

Ayrox
Bando Kiko
Cugher Glass
Deltamax Automazione

Glaston Group
IOCCO Group
Marposs
Softeco
Tecnosens
CE MARKING - QUALITY CONTROL EQUIPMENT FOR GLASS IN BUILDING

Ayrox
Softeco
COLOURS & ENAMELS - OTHER APPLICATIONS

Ayrox

CUTTERS

Si.Ste Trading
CUTTERS WHEELS

Si.Ste Trading
DEIONIZING AND WATER SOFTENING EQUIPMENT

Fenzi
Forel
Glass Company
Idrotecnica
Itech
Lisec Group
Triulzi

DEIONIZING AND WATER SOFTENING EQUIPMENT

Immies

DIAMOND ROUTER EQUIPMENT - PORTABLE

Teknik Elmas
Tesir Makine

DISTRIBUTORS

Si.Ste Trading

FLAT GLASS QUALITY CONTROL DEVICES

Ayrox
Deltamax Automazione
Forel
IOCCO Group
Marposs
Softeco
Tecnosens

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FURNACES

Glass Company

Horn Texpack

FURNACES / HYDROGEN GENERATORS (WATER ELECTROLYSERS)

Nel Hydrogen

GLASS COATING AND TINTING

Glass Company

Rollmac division of GeMaTa
Unelko

GLASS TREATMENT FILMS

Glass Company

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

Horn

Keraglass Texpack

INSPECTION INSTRUMENTS & INTENSIMETERS

Marposs
Tecnosens

INFRARED TUBES

Helios Quartz

Deltamax Automazione KILNS

Glass Company

Keraglass

Lisec Group

Tekno Kilns/Pujol
TK
Fenzi

METAL ACCESSORIES

Si.Ste Trading
Teknik Elmas
Tesir Makine

METALLIC SECTIONS

Fenzi
Tesir Makine

NUMERICAL CONTROL SYSTEM (CNC) FOR ALL GLASS PROCESSING MACHINES

Glass Company

IOCCO Group
Prodim

OPTICAL DISTORTION ANALYSERS FOR AUTOMOTIVE GLASS

IOCCO Group

Keraglass

Tecnosens

OPTICAL INFRARED

THERMOMETERS

Optris GMBH

POWDER OR LIQUID APPLICATION SYSTEMS FOR PROTECTING FLOAT GLASS

Cugher Glass

Glass Company

PUMPING AND APPLICATION SYSTEMS (AUTOMOTIVE GLASS)

IOCCO Group

PURIFIERS FOR REFLUENT WATER

Dieffe Macchine
Immes

PUTTIES AND SEALANTS

Fenzi

QUARTZ EQUIPMENT

Helios Quartz

REFRACTORIES

Rath

SHAPE CHECKING DEVICES

Easy Automation
IOCCO Group

SHOWER ENCLOSURES

Si.Ste Trading
Vismara

SIC HEATERS

Helios Quartz

SOFTWARE DATABASE, PROPERTY PREDICTOR

Litros

SOFTWARE SYSTEMS FOR PRODUCTION CONTROL

A+W Software

CMS

Cugher Glass

Deltamax Automazione

Edgetech Europe

Forel

Lisec Group

Litros

Optima

Prodim

SOLDERING EQUIPMENT FOR ELECTRICAL CONNECTORS FOR WINDSCREENS AND BACKLITES

Ayrox

Easy Automation
Softeco

SORTING SYSTEMS

Glaston Group

GPM Automation

Lisec Group

Studio 1 Automazioni

SURFACE STRESS MEASUREMENT INSTRUMENT

Ayrox

Glass Company

Tecnosens

WINDSCREEN

STRESS

MEASUREMENT INSTRUMENT

Tecnosens

WINDSCREEN AND BACKLITES

Marposs

Tecnosens

TESTING

FOR SOLDERINGS

Ayrox

Easy Automation

Softeco

TESTING DEVICES OF BACKLITES ELECTRICAL HEATING

Ayrox

Easy Automation

Softeco

THERMAL IMAGING MSYSTEMS

Glass Company

Easy Automation

Optris GMBH

TIN FLOAT BATH FURNACES

Horn

IOCCO Group

TIN FLOAT BATH SIDE DETECTION DEVICES

Tecnosens

UV ADHESIVES

Si.Ste Trading

UV LAMPS

Helios Quartz

UV PORTA BLE MACHINES

Helios Quartz

WATER REPELLENT

SPRAY COATING

MACHINES

Best Makina



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FLATGLASS

2026

world directory

LAMINATED GLASS PRODUCTION LINE **BLM**

Rolls

12 rolls x Ø400 mm

(Optionally can be increased according to diameter)

Precise Temperature Control

Precise Thickness Control

Single Glass Thickness

3-19 mm

Max. Package Thickness

100 mm

bestmakina
Common Language Of Glass World

*Image of the machine may vary according to selected options.

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☎ +90 262 754 0232

🌐 www.bestmakina.com

📍 Makine İhtisas Organize Sanayi Bölgesi, 15. Sokak, No:5, 41455 Dilovası/Kocaeli/TÜRKİYE



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PERFECTED FOR RESIDENTIAL GLAZING ENGINEERED FOR QUALITY & PERFORMANCE

From washing to final corner closure — fully automatic with zero compromise

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Digital corner closing unit: for precision material stitching and hermetic unit sealing

Double or Triple IGUs of up to 2,500 x 2,000 mm — residential scale, industrial performance

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