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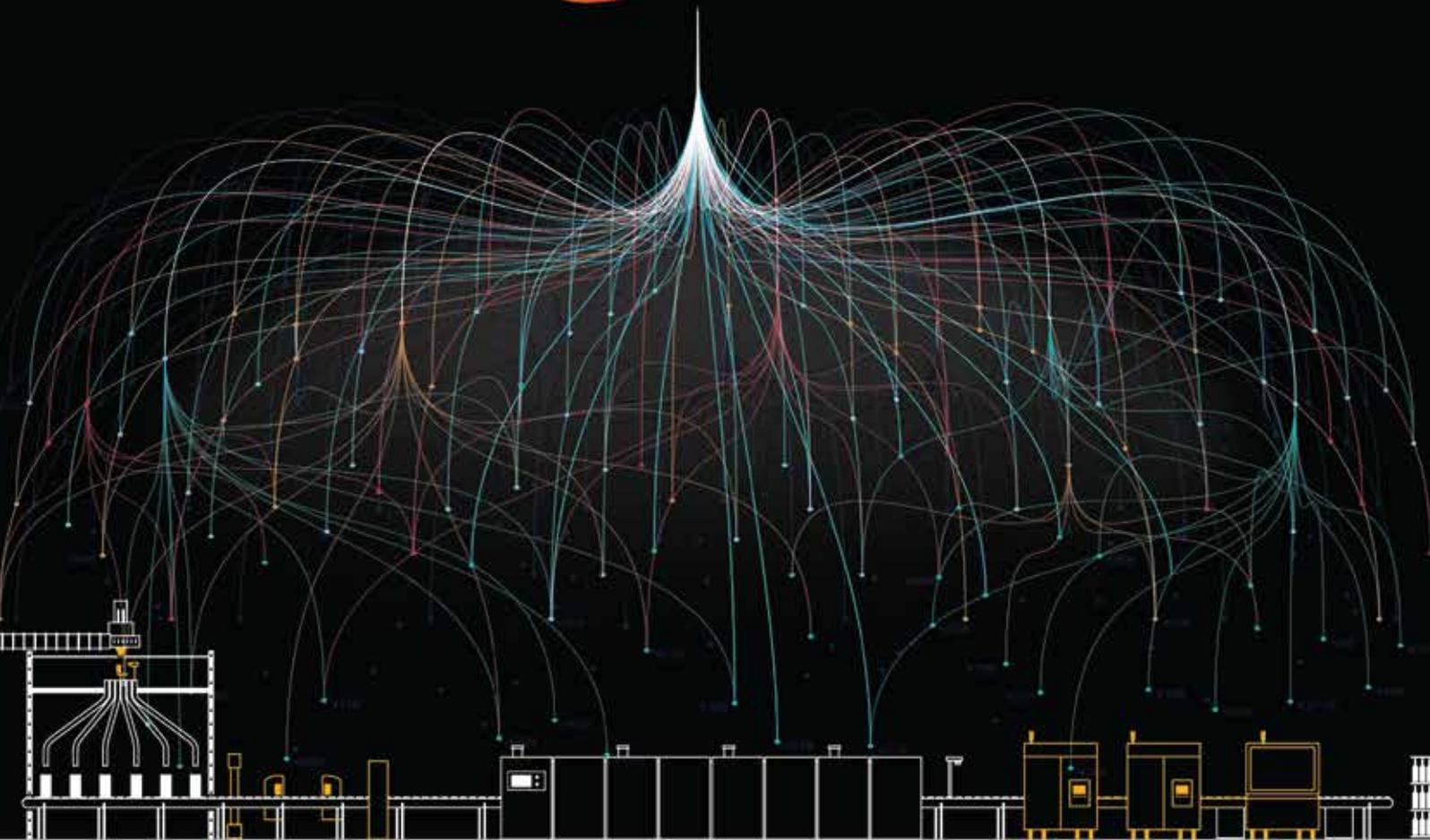
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Filtraglass and Daks-96: a successful partnership

Filtraglass, with more than 15 years of experience in the sector, specialises in the manufacture of water filtration systems for all types of glass industries, covering a wide sector of the automotive and optics industries, and the transformation of flat glass in general. Throughout its long history, the company has managed to become an international market leader, breaking new ground and exporting its systems to several different countries. Today, its water filtration systems can be found in the Americas, Europe and Asia. One of the most recent systems installed by Filtraglass was at Daks-96.

Why did you decide to buy a purification machine? For many reasons, actually. On the one hand, naturally, because having a water treatment system in place reduces water consumption considerably. In this way we are able, on the one hand, to improve our production rate (because we don't have to stop the machine to change the water) and, on the other hand, we pollute less. It was also very important to us that by using clean, good quality water in our handling machines, they would last longer and we would have to change their parts much less regularly. And we could reduce the consumption of coolant, because water is not changed.





Why did you choose Filtraglass systems? We chose Filtraglass because it's an internationally recognised brand with many years of experience. What's more, they were reliable and professional from the outset, which inspired a great deal of trust when it came to making our decision. When we met them, they understood our needs and were able to offer us customised advice on which system best suited the characteristics of our company. For us, their professionalism and attentiveness was key. In addition, of course, it was a plus for us that their systems allowed us to do our bit to combat pollution.

On a day-to-day basis, what are the most noticeable differences you have experienced after purchasing a Filtraglass system? In addition to the obvious reduction in water bills, I would highlight two changes. On the one hand, of course, an improvement in the quality of the final product. Since we installed the first Filtraglass system, our glass has had a transparent finish and is completely clean and free of dust marks and debris. This clean finish reflects positively on the quality of the product we offer and the image our customers have of us. What's more, and also very importantly, our productivity has improved because now we no longer have to stop the production line for maintenance work. Our machines are constantly working, so we're now able to offer more within the same time frame.

What are your reasons for repurchasing a system? Basically, the fact that our previous experience with Filtraglass had been positive in every way. We didn't want to take any risks and decided to stick with them, as they already know our company and our way of working, and we know theirs. We were very satisfied with the purchase of the first system. Since we installed the machine, our productivity has increased and our

costs have gone down. Naturally, as I said, the environmental factor is also important to us. In this day and age, commitment to the environment and sustainability is, or should be, key for all companies, and we're glad that our values and Filtraglass' are aligned in this regard.

What has your relationship with Filtraglass been like over time? Our business relationship with Filtraglass has been positive from the beginning. First before buying the machine, with their advice, then during installation, which also went very smoothly, and then with the technical and after-sales service. The Filtraglass team is always available to resolve any queries or problems and we also appreciate being able to contact them by various means, including WhatsApp, which is very practical. Since we started working with Filtraglass, Luis and his team have been monitoring the smooth running of the machine and have always offered to help when necessary. This excellent relationship and after-sales service is, of course, a plus to everything else the company offers.



Flexible spacer system supports maximum transparency

Super Spacer® TriSeal™ in spectacular glass wave facades



homogeneous, glass wave structure at Gothenburg's Våghuset

Even more transparency without visible support structures on the facade is one of the most important trends in modern glass architecture. Glasstec has regularly organized the "Engineered Transparency" conference since 2010 to discuss the latest developments. Christoph Rubel, technical manager at Edgetech Europe GmbH, was one of the speakers at the 2021 event. His input on the contribution of the flexible spacer Super Spacer® to the realization of facades with large, curved insulating glass elements can also be applied to Gothenburg's Våghuset and the Nordstrom flagship store in New York.

Facade recalls maritime heritage

Gothenburg and Hamburg have a lot in common:

important seaports, idyllic canals, and sensational, sustainable urban development projects in the former free port areas. Anyone who wants to rent into the fully glazed, BREEAM-certified Våghuset office and commercial building in Gothenburg's new Masthuggskajen district signs a voluntary commitment to the responsible use of employees, energy and materials." The elemental facade impressively demonstrates how glass can be used as a creative design tool while achieving its energy goals," enthuses Joachim Stoss, Vice President International Sales IG at Quanex.

Towards the city center, the building with its rounded edges has elegant, reflective glazing made of cylindrically curved elements, reminiscent of waves with two-tone stripes and the lively alternation between concave and convex; a tribute to the river Göta älv, on which Gothenburg's importance as a port city is based and which flows into the Kattegatt here.

The "Wave House" is a truly European project

According to facade specialist Staticus, who is by its own account one of the largest full-service facade contractors in Northern Europe, "Våghuset is a shining example of European collaboration". Indeed, the design was penned by the largest Scandinavian architectural firm White Arkitekter from Gothenburg, the facade was realized by Staticus in Lithuania, the curved profiles were manufactured in Denmark and the glazing in Germany and Poland. The Swedish company NCC AB was responsible for project development and construction.

"The fact that spacers from Heinsberg are also used in the curved insulating glass elements is mainly due to manufacturing reasons," explains Christoph Rubel, "Only flexible spacers such as Super Spacer can precisely follow the curvature of the cylindrically shaped glass. Since curved insulating glass is virtually always handmade, it must also be possible to apply the spacer manually."



Convex and concave curved structural glazing facade of Våghuset

Flintermann Glasveredelungs GmbH from Lower Saxony had delivered around 300 curved insulating glasses to Lithuania for installation. They are composed of 2 x 5 mm laminated float glass with SunGuard® SNX 60 solar control coating, TriSeal™ Super Spacer® Flex 20 mm and 10 mm float glass. As a standard double glazing, the highly selective Guardian glass lets in 60% of the natural daylight, but only 29% of the solar heat. Therefore, additional solar shading can be dispensed with in Våghuset.

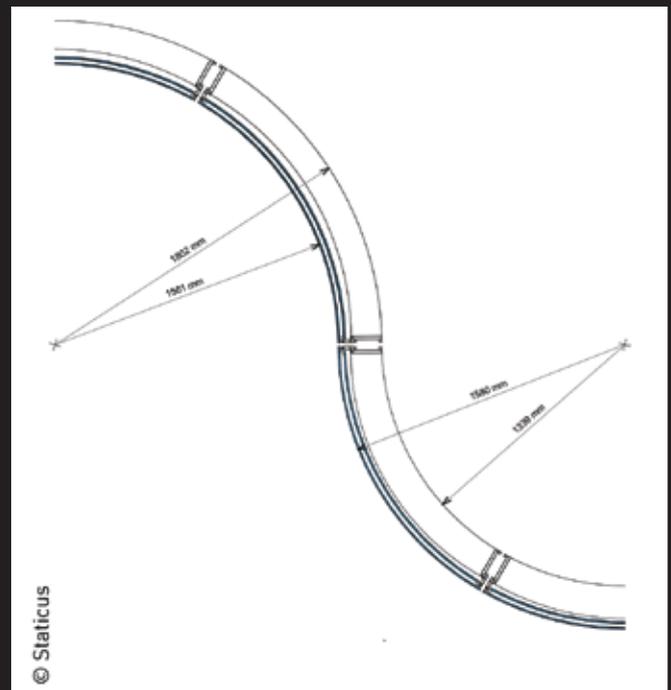
"The special feature of this project was the smooth change from concave to convex. A large part of the units had a step all around. The inner pane was always smaller so that it could be recessed into the unitized façade," explains Robin Dorn, curved glass sales manager at Flintermann.

Sustainability as a driving force for facade design

"Staticus is not only the Scandinavian market leader for large-scale facade projects, but also a driving force for smart and energy efficient facade solutions", project manager Saulius Visockas explains. "Våghuset fits right in with this philosophy. We are grateful that especially Northern European customers like NCC fully support our sustainable approach."

The combination of WICTEC EL evo for the element system and 50SG for the stick system enable the appearance of a homogeneous, glass-flush structural glazing facade. Perimeter lighting is integrated into the facade profiles on all 13 storey levels to make the building's form visible even in the evening and during the winter months.

In front of the thermal insulation, single spandrel glasses with opaque Blackpearl coating are



The curved insulating glasses in the facade of Våghuset have radii of 1580 mm for the convex and 1561 mm for the concave elements

installed up to 1 563 mm high and up to 2,688 mm wide. The transparent window strips consist of insulating glass units up to 4,307 mm high and up to 2,441 mm wide. A U_{cw} value of $\leq 0.5 \text{ W/m}^2$ was specified for the planar triple facade elements and a U_{cw} value of $\leq 0.65 \text{ W/m}^2$ for the curved double elements. At the same time, even under Nordic conditions of -15°C and 3.4 m/s wind load on the outside and $+20^\circ\text{C}/30\% \text{ RH}$ on the inside, condensation must not form on panes under any circumstances.

Curved insulating glass without vertical supports

The connection between Gothic cathedrals, whose structures create lightness, light effects and transparency in such an impressive way, and modern glass architecture has often been drawn. Using glazing, even as a structural element, to maximize daylight penetration is now a given. But the question of how to take this transparency to the extreme with ever-larger panes and without visible mullion-and-transom structures continues to preoccupy architects, facade engineers and the glass industry. Larger pane sizes naturally mean thicker glass and lower light transmittance. Curved shapes, which provide increased stiffness even with thinner glass due to the shell support effect, are often the solution.



Wave facade of the Nordstrom Flagship store in New York

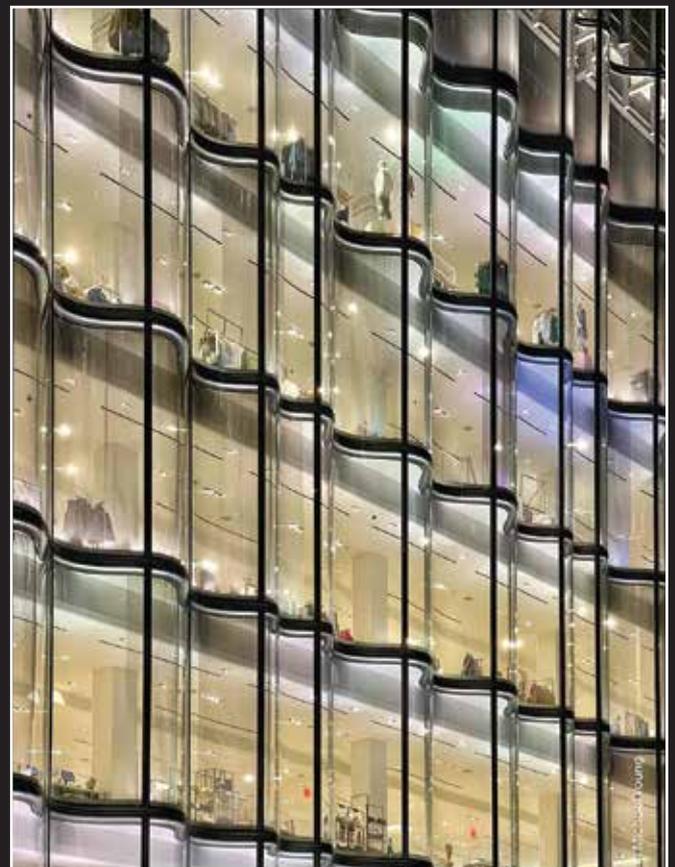
"Cylindrically curved insulating glass today is taking on more and more load-bearing functions to avoid mullions or vertical support beams in the facade structure," Christoph Rubel says. The space between the panes must be kept as small as possible in order to meet the high thermal insulation requirements and at the same time achieve a narrow, vertical glass edge seal. In addition, while curved insulating glass units are more rigid, they are also more sensitive to climatic loads such as wind and solar radiation.

In the facade of the Nordstrom Flagship store, which is located in the podium of New York's Central Park Tower, a total of 254 glass elements up to 6 m high form the individual storey levels without any visible vertical connection. The architectural firm James Carpenter Design Associates was responsible for the design of the 45 m wide and 38 m high facade at the corner of Broadway and 57th Street.

"Making glass of this scale is an art. One of the few glass benders in the world who has mastered it is

Cricursa," Christoph Rubel explains. In Nordstrom's case, 4-ply laminated glass with tight radii and a ceramic frit surface was produced using a gravity bending process. "Because the edge bond is elastic due to the flexible spacer, the spacer also does not absorb countable climate loads. This has the advantage that it also does not load the edge bond with stresses." To also play it safe when it comes to seismic risk, facade consultant Surface Design Group incorporated a lateral slip joint into the curved profiles to give the glass elements play when subjected to large loads.

The flexible Super Spacer® spacers can also be applied by robot in automatic lines. Joachim Stoss concludes: "Large-format and expensive insulating glass elements have to be manufactured with high quality and precision, often with three or even more panes, in order to meet the requirements for thermal insulation, safety or acoustics. The larger and heavier the insulating glass, the more difficult it is to handle during production. Super Spacer holds the edge seal in place virtually immediately after application and guarantees maximum precision and parallelism of the panes in both automated and manual processing."



Massive glass units span entire floors without vertical supports

A Part of Something BiggerSM

Glass bottle demand drives strong revenue growth at AGI Greenpac



The quarter saw robust demand for glass bottles from the beer and liquor industries.

Indian packager AGI Greenpac reported a strong growth in revenue in its latest financial note due to an increase in glass container packaging volumes.

For Q1FY23, revenue from Operations increased from ₹293 crore to ₹522 crore, registering a strong growth of 78% on a y-o-y basis.

Operating EBITDA stood at ₹92 crore, registering a growth of 57% on Y-o-Y basis with margins of 18%.

Profit after tax was at ₹66 crore, registering a growth of 258%.

Sales growth was primarily driven by an increase in glass container packaging volumes and better realisation.

The rise in out-of-home consumption and reduction of taxes by some state governments also contributed to the growth along with the passing of increased commodity prices to the consumers.

Mr Sandip Somany, Vice Chairman and Managing Director of AGI Greenpac, said: "The company had an outstanding start to the new fiscal year and delivered growth on both year-on-year and sequential basis driven by sustainable demand revival and favourable macro-economic factors. The quarter saw robust demand for glass bottles from the beer and liquor industries."

He further added: "The commercial production of specialty glass manufacturing unit at Bhongir, Telangana will commence in Q2 FY23, which will drive incremental growth in the coming quarters."

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Creating added value together

We've ordered over 32 lorries and the hotel rooms are booked: the HEGLA Group have always anticipated the best when the glasstec trade fair begins. Alongside many machines operating in real time, booth A55 in hall 14 has much to offer. "Creating added value together" is the motto under which the HEGLA Group is inviting accredited visitors to return to its exhibition. "We have focussed on the here and now, and want to show solutions that our customers can use to create sustainable added value," said Managing Director Bernhard Hötger.

Laser diode technology shortens heating time and increases value creation in LSG cutting

"In mechanical engineering, one project that was close to our hearts was to significantly improve cycle time in LSG cutting," Hötger explained. This resulted in the laser diode heating system. The new laser technology precisely focuses on the film in the scoring contour and reaches the transformation temperature much faster than conventional heating tubes can. "Thanks to bundled heat application, the productivity of the entire cutting process improves by 20 percent, and considerably higher pane throughput can be achieved," added Hötger. The surrounding pane surface remains cold, which makes subsequent cuts possible without waiting. The technology also benefits edge quality, as it systematically prevents subsequent delamination. For the first time, HEGLA are also showing a vertical remnant system for reducing glass waste.

Next-generation software

With Cut+, HEGLA-HANIC introduced completely reprogrammed software (HMI) for cutting table organisation last year. At glasstec, the company from Bochum will be giving visitors insight into the next generation of the ERP system that can integrate all processes: from digital order collection, storage and individual machines to delivery at the construction site. "Standard OPC UA, digitalization and an increasing level of automation all motivated us to make our ERP even more open with the Dynamics 365 development platform from Microsoft," said Managing Director Jan Schäpers from HEGLA-HANIC. The new software basis now makes it possible to enable many add-ons, such as for financial bookkeeping or controlling via the Microsoft platform. On the

other hand, a wide range of programs can be integrated with only minimal effort. As completely redeveloped software, it is perfectly adapted to all current systems.

The standard becomes added value

Be it bird protection glass, antibacterial panes, heatable glass or an RF-transparent IG unit: HEGLA boraident from Halle/Saale want to prove how easily a standard product can become a commodity with added value. "With a range of samples, we want to give the impression of how flexibly glass can be finished by removing or transforming the functional layer, or via non-destructive printing with our Laserbird," explained Dr Thomas Rainer, the Head of Development at HEGLA boraident. In addition to the option of creating functional glass without tooling time or an additional service provider, Thomas Rainer sees the "single piece" option as a major advantage: "Via the user-friendly GUI or connection to the ERP, each individual pane can be coated with various finishing treatments without any waiting time."

Greater efficiency and automation for tempering furnaces

"Tempered glass, as perfect as only glass can be" is what HEGLA TaiFin from Finland aspire to achieve. The company is known for convection technology and closely controllable heating zones with qualities much higher than the industry standard. "We have one of the best tempering furnaces on the market and at glasstec, we now want to show what is possible when strong partners work together," said Teemu Kolka, Manager of HEGLA TaiFin. The optimal bedload is determined with bed optimisation from HEGLA-HANIC. For maximum automation, the glass can be put together with automated batch creation from HEGLA – no operator required. Through "de-batching", the batch can be separated again. Optional quality scanners monitor quality and, in conjunction with the intelligent optimisation of HEGLA New Technology, they adjust the furnace recipes if necessary. Thanks to this holistic view, using such a system increases total throughput significantly and saves a great deal of energy.

Cross-manufacturer information and perfect

maintenance with an app

The Shop-Floor app from HEGLA New Technology meets the challenge of increasing demand for information and defined processes. Irrespective of the manufacturer, machines and systems can be integrated into the maintenance area of the app and documentation and spare parts lists, for example, can be stored there. An automatic ticket system alerts users when maintenance is required and saves the information when maintenance work is completed. Operations managers can also use the app to assign work to employees, putting work organisation on a platform as well. The Shop-Floor Assistant app can be used as a tool for initiating processes such as writing shipping documents or notifying breakages. It also has a function for location-independent product tracking. The QR code in the glass marking or production label can be scanned and read to access the default data. "The Shop-Floor Assistant app from HEGLA New Technology supplies flexible options and information anywhere, at any time," said Dr Markus Schoisswohl, the Managing Director of HEGLA New Technology.

"We look forward to glasstec and meeting up with the global glass industry," added Bernhardt Hötger. "We live in dynamic times, and we have not seen many of our customers for a long time. We hope to have ample opportunities for spontaneous technical and personal conversations."

You will find the HEGLA Group at glasstec in hall 14, booth A55.



Image 1: The ProLam LSR from HEGLA is equipped with the laser diode heating system as standard and increases productivity by 20 percent or more, measured by pane throughput.



Image 2: The standard becomes added value – thanks to processing with the Laserbird from HEGLA boraident, a standard pane can be transformed into bird protection glass or an RF-transparent pane.



Image 3: With various lasers and stored programs, the Laserbird can remove functional layers from glass, and add textures and functions to panes such that a standard pane becomes an RF-transparent unit or antibacterial glass – on a pane by pane basis and without any tooling time.

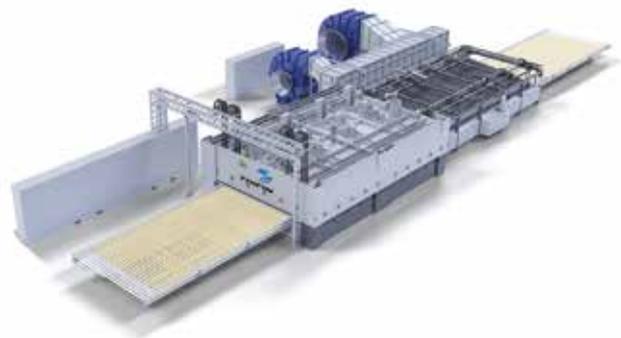


Image 4: The HEGLA TaiFin CTF tempering furnace with full convection promises tempered glass as perfect as only glass can be.



Image 5: At glasstec, HEGLA-HANIC will introduce a new ERP system whose design is based on the Microsoft Dynamics 365 development platform and enables numerous Microsoft add-ons. From digital order collection, storage and individual machines to delivery at the construction site, all process can now be integrated.

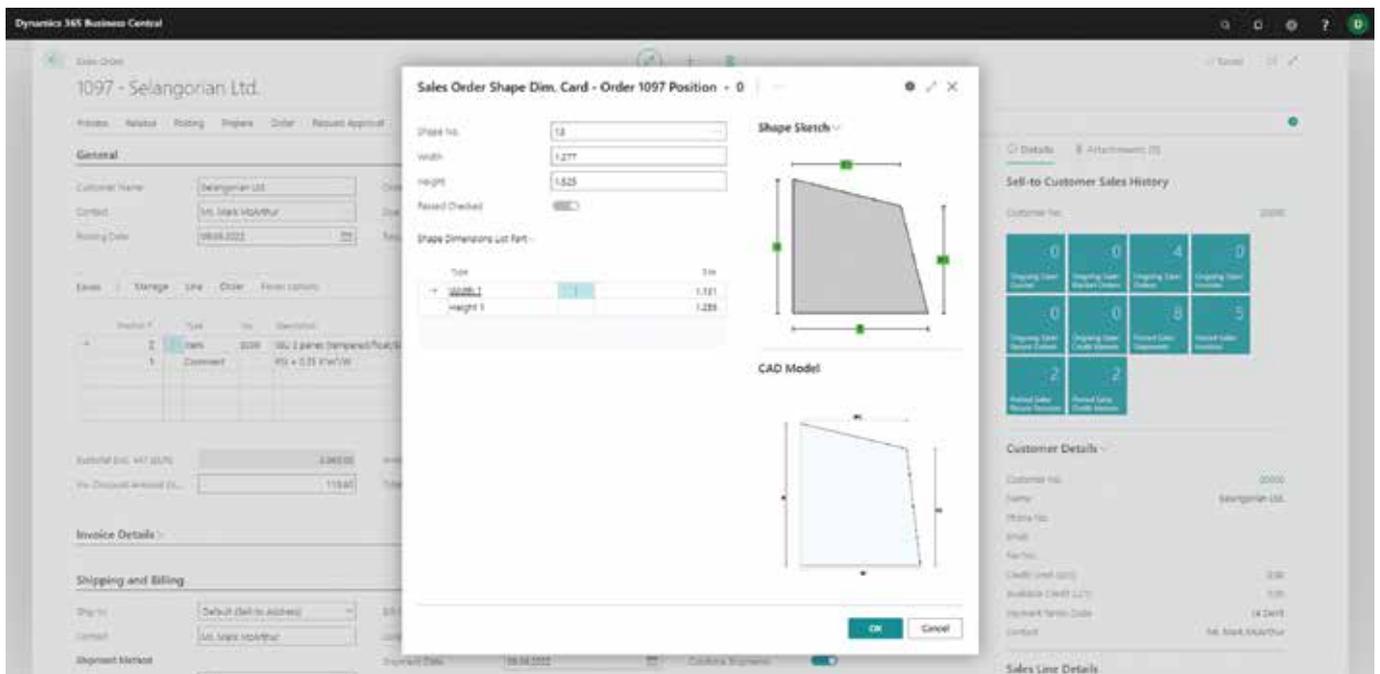


Image 6: The HEGLA New Technology Shop-Floor app enables product tracking and data access anywhere and at any time. The app's maintenance function has a ticket system and provides cross-manufacturer access to documentation and spare parts lists, for example: functions which simplify maintenance and service

Edgetech presents Super Spacer® T-Spacer™ SG at glasstec 2022



extruded onto the sides of the spacer and bonded to the inside of the glass pane bears the main load of keeping the edge seal gas-tight throughout and preventing vapour diffusion into the space between the panes. Super Spacer® T-Spacer™ SG, the new spacer for structural glazing and XXL glass panes, has larger surfaces for the application of the primary seal.

The outer dimensions remain unchanged compared to Super Spacer® T-Spacer™ Premium Plus, but the manufacturer increased the lateral areas in order to apply the polyisobutylene. The new spacer design also assists the application to be precise right down to the last millimetre of the spacer before the secondary seal is applied on the automated insulating glass line. This means that the parallelism and low tolerances of the spacers

Warm edge spacer system for structural glazing and XXL glass panes

Super Spacer® T-Spacer™ SG was developed for structural glazing and XXL glass panes in order to optimise the durability properties of the edge seal. Here the typical T-shape of the warm edge spacer has been specially adapted to the requirements of automated insulating glass lines for large formats.

Structural Glazing is more than a fashion trend. Thanks to its excellent performance in terms of thermal insulation and life cycle costs, the elegant, translucent facade designs are a growing trend where sustainable building is concerned.

The primary seal is of particular importance in structural glazing due to the fact the UV-resistant silicone secondary sealants are gas permeable. The primary sealant - usually polyisobutylene -



in large multi-pane insulating glass units are even more precise and the robustness of the system is further increased. This is particularly important where high pane dimensions and pane weights are involved, alongside the expected long service life of facade elements.

As with all products manufactured by Edgetech, Super Spacer® T-Spacer™ SG is a metal-free, silicone-based warm edge spacer made of structural foam with an integrated desiccant. It also offers excellent thermal insulation properties by

virtue of its low thermal conductivity of 0.19 W/mK. The spacer's composition offers enhanced shape memory which is very important for the long-term integrity of the edge compound. The elastic structural foam follows the climate-related movements of the glass, relieving a large proportion of the load from the butyl seal. This represents an invaluable advantage especially in climate zones with very low, very high or strongly fluctuating temperatures.

Edgetech at glasstec: Hall 17, Booth C 57

Glaston closes EUR 31 million deal for multiple insulating glass lines



Glaston has received a strategically significant order from a glass processor in Europe, valued at approximately EUR 31 million. The order will be booked in Glaston's received orders for Q3/2022. The first lines will be delivered in Q2/2023 and the final delivery is scheduled for Q3/2025.

The strategically important deal includes multiple insulating glass lines in addition to MULTI'ARRISSERS and machines for spacer frame production. The lines will be manufactured in Germany during 2023–2025.

“We are very honored to be a part of our customer's success story. For Glaston, this collaboration is an important strategic milestone, as it further strengthens the market's trust in our

broader product offering,” says Glaston Corporation's CEO Anders Dahlblom.

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Glaston in brief

Glaston is the glass processing industry's innovative technology leader supplying equipment, services and solutions to the architectural, automotive, solar and display industries. The company also supports the development of new technologies integrating intelligence to glass.

Glaston is committed to providing its clients with both the best know-how and the latest technologies in glass processing, with the purpose of building a better tomorrow through safer, smarter, and more energy efficient glass solutions. Glaston operates globally with manufacturing, services and sales offices in 10 countries and its shares (GLA1V) are listed on Nasdaq Helsinki Ltd. Distribution: Nasdaq Helsinki Ltd, key media, www.glaston.net.

Experience A+W live at glasstec 2022!

You are invited to visit us in Booth E37 in Hall 14. In 110 square meters, we will display the latest innovations and trends in the flat glass software sector. Our new, compact booth concept makes insight into the A+W world into an experience and invites people to linger and enjoy relaxed conversations. Let me tell you what else awaits you in our booth.



Do you work often with templates?

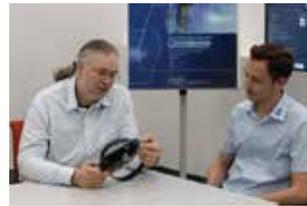


In cooperation with our partner Viprotron, A+W has developed a user-friendly, startlingly easy-to-use app to digitalize templates easily with a smartphone camera. Just fit the templates with L-shaped reference objects and then photograph them with a high-end smartphone camera. The reference objects, high-quality precision metal parts, are placed on the template or fastened to it. This corrects any distortions during photographing.

The templates also have a QR code, which enables automatic detection and eliminates the need for additional configuration. The special

feature: in contrast to older solutions, no calibration of the camera is required! A+W iShape works with any good smartphone camera and thus guarantees quick and reliable digitalization of templates.

Enter orders with the online configurator



The mobile, web-based quote and order entry app A+W iQuote is the ideal solution for building your online configurator. Your customers can use it to enter and manage quotations and orders 24/7 and view their status – even when they're on the road. This not only gives you an additional sales channel, it also provides competitive advantages. Furthermore, A+W iQuote reduces the work you have to do in order to recalculate quotations and orders and make changes – depending on the status, your customers can change and enter notes about quotations and orders themselves (for example, different delivery address or requested delivery date).

Individualized and complex products can be ordered via an easy-to-use and intuitive interface, which was developed with an eye to use on touch screens, tablets, and smartphones. Try it yourself on our touch screen in A+W's trade show booth and experience the process of real-time order entry at glasstec 2022.

Experience A+W virtually!



When it comes to the topic of digitalization, A+W is keeping pace with the times. To enhance quality in your production, we would like to introduce our new Hololens Project. By using smart glasses to scan barcodes, users can get more than just detailed information about the product. They can also interact with it via gesture control in production. The technical possibilities are almost endless. We will be glad to show you the application possibilities in a tech demo on our premises.

Digitalization in the A+W action area

Are you curious? We look forward to your visit to the A+W trade show booth! Let our product experts show you how you can digitalize your processes with A+W. There will be a live presentation in our action area once every hour on the hour. Use our planner to better plan your trade show visit:



20.09. – 23.09.

Morning Session

10:00	A+W iQuote
11:00	AR Hololense
12:00	A+W iShape

Afternoon Session

15:00	A+W iQuote
16:00	AR Hololense
17:00	A+W iShape

A Part of Something BiggerSM

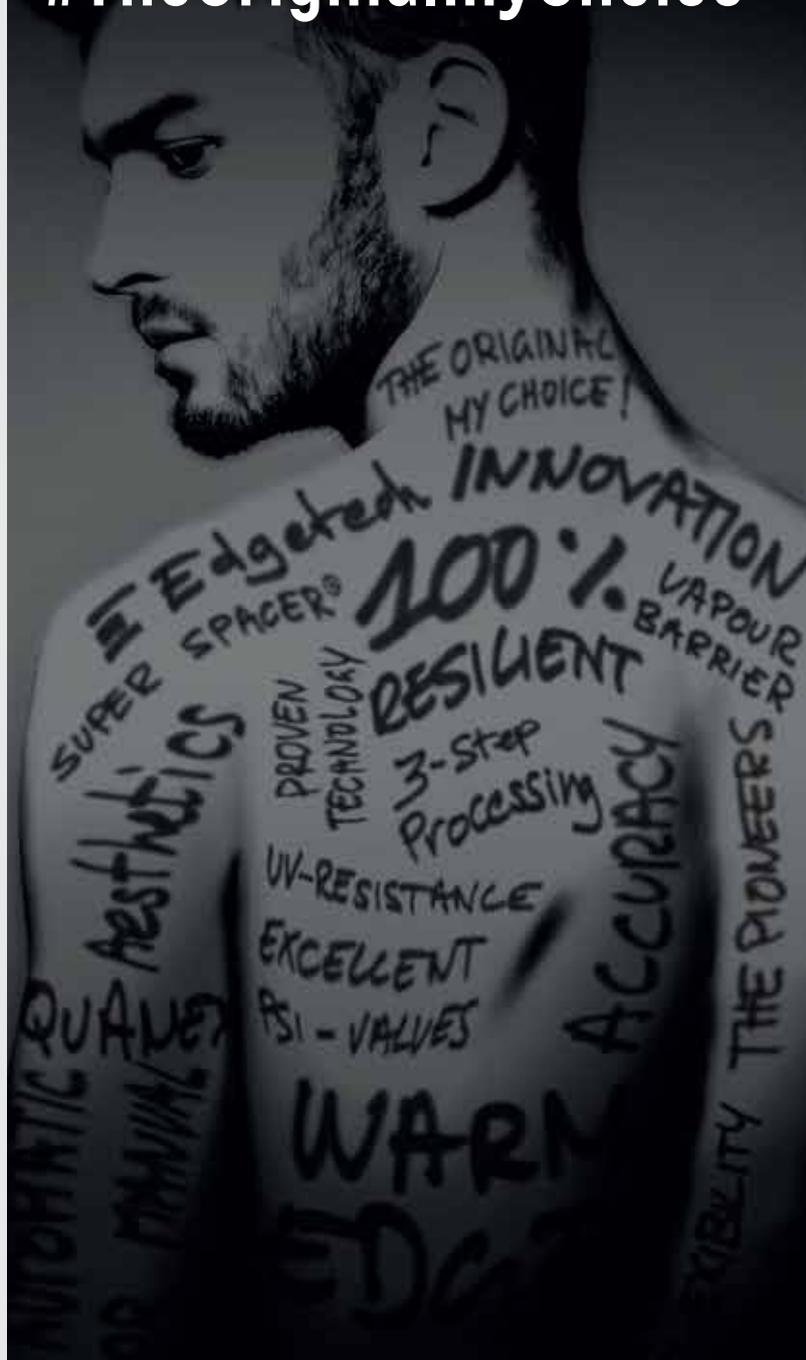
eyrise® will display the largest dynamic liquid crystal glass panels ever built, at international trade fair Glasstec.

Visitors to the exhibition in Dusseldorf, Germany, on 22 and 23 September, will be able to experience an interactive installation of two glass modules for facades and interiors. Live demonstrations of solar shading and privacy glass will be showcased, alongside innovative control technology.

The s350 solar glass for facades, measuring 3.5m by 1.6m, is the largest piece of its kind to date. eyrise® has developed a new type of facial expression control that visitors can use to interact with the glass and regulate light transmission. A camera mounted above will capture each facial expression, evaluate it using intelligent software and send the corresponding command to the electronics of the glass module.

eyrise®'s liquid crystal solar shading glass also offers a very short switching time compared with other technologies. Light transmission is regulated within a second, without compromising on natural daylight, designed to maintain a comfortable environment and positively impact occupants' wellbeing.

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Glasstec 2022 – with many reasons to celebrate!

Now with restrictions lifting and face-to-face events taking place once again, we are more than happy to meet our glass industry friends in person again at this year's glasstec 2022. And this year especially – we have many reasons to celebrate.

The General Assembly of the United Nations has designated 2022 as the International Year of Glass (IYOG 2022) to acknowledge the essential role of glass in our society. Glaston, a member of the International Commission on Glass (ICG), the organization behind the initiative, is actively participating in the celebrations. Glaston has been working to advance the technology needed to produce more energy-efficient glass. We have mastered new AI-based solutions to amplify human capabilities and deliver greater business value. And we are leading the discovery of innovations to better support sustainability and mitigate climate change.

Below are just some of our latest developments that will be showcased to the participants at this year's glasstec 2022.

Glaston is shaping the sustainable future of glass
In flat glass tempering – with AI and automation:
The latest Glaston flat glass tempering lines Glaston FC Series, RC Series and Jumbo Series incorporate modern convection technology for the highest yield and flexibility.

Glaston Chinook is the market's most efficient heating system, based on the highest number of measurements and automatic process adjustment. This minimizes operator input while maintaining constant high capacity. The Chinook convection system combines accurate temperature profiling with uniform heat transfer to increase production and reduce energy consumption with circulated air top convection.

Glaston Vortex Pro enables you to produce the highest quality glass products. Unlike any other available convection technology, it allows heat to be focused on any specific glass sheet location. Each convection nozzle is controlled independently, enabling thermal profiles to be adjusted as desired and run in an automated

sequence. Vortex Pro automatically adjusts the convectional heat transfer according to glass size.

One of our latest innovations to automate the flat tempering process are the online stress calculation solution using measured process data to calculate temperature and stress distribution in the quenching part of the tempering process. Another innovation is our unique white haze detection solution using artificial intelligence (AI). The tempering process autopilot reduces the need for operator input and offers process control without parameters.

The White Haze Scanner is the first AI-based solution to provide a high-quality visual indication of white haze on processed glass. The system instantly notifies users of an issue, allowing glass processors to react immediately when unacceptable haze is detected. This helps minimize waste and production reruns – and lowers costs over time.

By taking advantage of our latest innovations, customers gain higher bed utilization which leads to higher energy efficiency and capacity, better quality, repeatability and greater operational safety. Based on data, every machine is also able to manage its own predictive maintenance and suggest spare parts, when needed.

In flat glass laminating:

Glaston ProL flat glass lamination line provides unprecedented flexibility for mixed production. The ProL convection heating chamber makes switching between glass types and different glass sandwiches easier than ever. The whole line – from glass handling to the latest PVB cutting





technology – has been designed for flexible operations.

The most recent trend in flat lamination is a growing use of structural interlayers. To process this type of glass, Glaston has introduced new convection control technology that offers a significantly wider operating window, even with complex laminates.

A higher degree of automation is also on the agenda for the laminating process. With our lamination process autopilot, the furnace learns to achieve the most optimal way to run, instead of having operators make adjustments manually.

In insulating glass manufacturing:

Glaston MULTI'ARRISSER is a 3-in-1 solution for economical glass edge arripping, flat edge arripping and corner dubbing of the highest quality. All these benefits come with the proven Glaston cup wheel technology that uses only one wear part. With a maximum arripping speed of 60 m/min, Glaston MULTI'ARRISSER is the fastest single-head machine in the world.

TPS® is not just a machine. It is an ingenious system solution for highly efficient insulating glass manufacturing. Glaston is the inventor of this technology with more than 150 installations worldwide.

Production is significantly simplified as the Thermo Plastic Spacer material can be applied directly onto the glass plate. This eliminates any need to stock different spacer profiles and connectors. The spacer width can be changed as desired during operation without any time loss.

TPS® is the most flexible way of producing IG units, multilayer or solar panels.

Glaston ACTIVE'SEALER is the sealer family member that combines Glaston's proven dosing

technology with an outstanding economic advantage. Customers can rely on Glaston's long-term experience in automatic sealing technology for IG units.

ACTIVE'SEALER is especially designed for mid-range markets and completes Glaston's sealer product family. Together with COMFORT'SEALER, exclusively for the Chinese market, and SPEED'SEALER, the market leader for high-performance sealing, ACTIVE'SEALER is Glaston's newest member to individually serve customer requirements for automatic IG unit sealing robots around the globe.

Glaston CORNER'REFINER provides automatic corner treatment for the SPEED'SEALER. A growing number of customers are demanding that recently sealed insulating glass corners are treated automatically with an effective corner treatment tool to relieve unloading operators from this work.

The new CORNER'REFINER from Glaston has been designed as a quick and easy auxiliary tool for existing SPEED'SEALER automatic sealing robots. After the corner treatment with the spatula system, a humified roll follows the corner contour of each IG unit. The nozzle change is not affected. Even removing the CORNER'REFINER for stepped units works without tools.



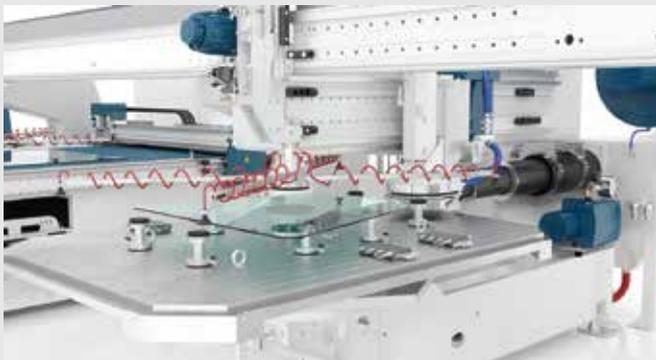
In automotive and display glass processing:

Glaston CHAMP Evo automotive glass preprocessing solutions enable enhanced efficiency in the daily production of windshields, sidelites, backlites or quarterlites. This means a yield greater than 98%, shorter cycle times, minimized downtime due to quick-response

software and an excellent cost-per-unit ratio. For even higher precision and more dynamic movements of the grinding machine, the new-generation CHAMP Evo includes two optimized features – a linear drive instead of the spindle and a honeycomb table.

The Glaston HYPERFEX grinding system represents a revolution in glass edge grinding. The new HYPERFEX grinding wheels take into account all aspects of glass preprocessing for different applications and demonstrate significantly improved performance parameters.

Glaston Matrix Evo, the automatic windshield



bending furnace for fast, efficient and high-performance production, features a new windshield press for bending deep sags and wrapping around corners to match the tightest tolerances. Matrix Evo is available in different sizes and capacity configurations to exactly meet specific business needs. Glaston's active convection technology improves automotive glass heat treatment processing of coated, printed and complex glass types and enables faster heating.

In services:

Glaston's latest development in services includes new upgrade possibilities for glass heat treatment, insulating glass manufacturing as well as automotive and display glass processing.

The new modular Glaston Care service agreement concept offers a wide range of service options to match your specific needs.

Come and join our live demos & meet with our industry experts at Stand A40/A41 in Hall 15 – we can show you more!



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HFT: Your Single-Source Solution

A global leader in EPC (engineering, procurement, and construction) contracting, HFT focuses on providing comprehensive, reliable project solutions for all sectors of the glass market. The company's expertise includes design-build of new greenfield facilities, redevelopment and modernization/upgrades of existing sites, and cold repairs, as well as other project solutions.

In the past 75 years, the company has forged partnerships and designed and built sustainable, efficient, state-of-the-art, and performance-focused glass manufacturing facilities around the world. Emphasizing solutions, it supports all stages of a project – from project feasibility reviews, initial concept-development, and securing of financing options, to preconstruction, equipment and materials procurement, and design-build general contracting, to project management and project execution.



Headquartered in Pittsburgh, PA – with regional offices in the UK, China, the Philippines, and Singapore – HFT employs engineering and construction professionals and craftsmen who provide the commitment, expertise, and passion that sparks the company's success and continued growth.

HFT's expert glass team offers a combined 500+ years of experience in designing and building glass manufacturing facilities and process lines. With more than \$13.5 billion in installed value across 47 countries, and in excess of 300 EPC projects completed worldwide, the company takes great pride in its reputation and will continue improving and innovating to align with evolving client expectations. For customers, HFT is committed to being worthy of the position it has earned in the glass industry, and to delivering reliable, transparent project solutions.

OUR VISION

A team of professionals delivering innovative solutions that build upon our core strengths and drive sustainability.

HFT is strongly committed to sustainability. Through its Power Solution Team, the company leverages

decades of experience in combined heat and power (CHP), alternative energies, and more to provide truly "green" designs that drive long term sustainability and promote a low carbon footprint.

Core Competencies and Services

Through the entire scope of a project, HFT provides a single source, concept-to-completion approach to deliver every component necessary for success, including project financing solutions.

Pre-Construction Services

- Preliminary design documents
- Project management and coordination
- Site surveys and exploration
- Designs and engineering
 - Site/civil
 - Buildings
 - Infrastructure and utility
 - Process line
- Planning and permitting
- Constructability reviews
- Sustainability reviews and planning
- Equipment, material, and construction bid packages
- Cost estimating and budget development
- Cash flow master planning
- Schedule development
- Execution plans

Execution

- Project, budget, and schedule management
- Procurement activities
- Logistics and expediting
- Material Inspections and FAT
- Construction, site, and safety management
- Construction
 - Site development
 - Civil and structural
 - Building and MEP
 - Process line installations
 - Process utilities
- Commissioning and startup
- Training
- Continuous operational support

Products

- Furnaces – up to 1,000+ TPD (end-fired / side-fired regenerative / oxy-fuel)
- Tin baths
- Top roll machines (ADS)
- Annealing lehrs
- Waste heat recovery systems

**Some solutions
are clearer
than others.**

For 75 years, HFT has developed a reputation as a leading EPC contractor to the global glass industry. What you might not know is in that time, HFT has completed over 300 EPC projects in 47 countries for Float Glass, Container Glass, Fiberglass, and more.

Whether it's a greenfield glass factory in a far corner of the globe or a major facility reconfiguration just up the road, HFT has consistently delivered quality, efficient, and innovative project solutions. This performance, plus our commitment to customer satisfaction makes us the clear single-source choice to take your next project from concept to completion.



Your vision. Our expertise. The perfect partnership.

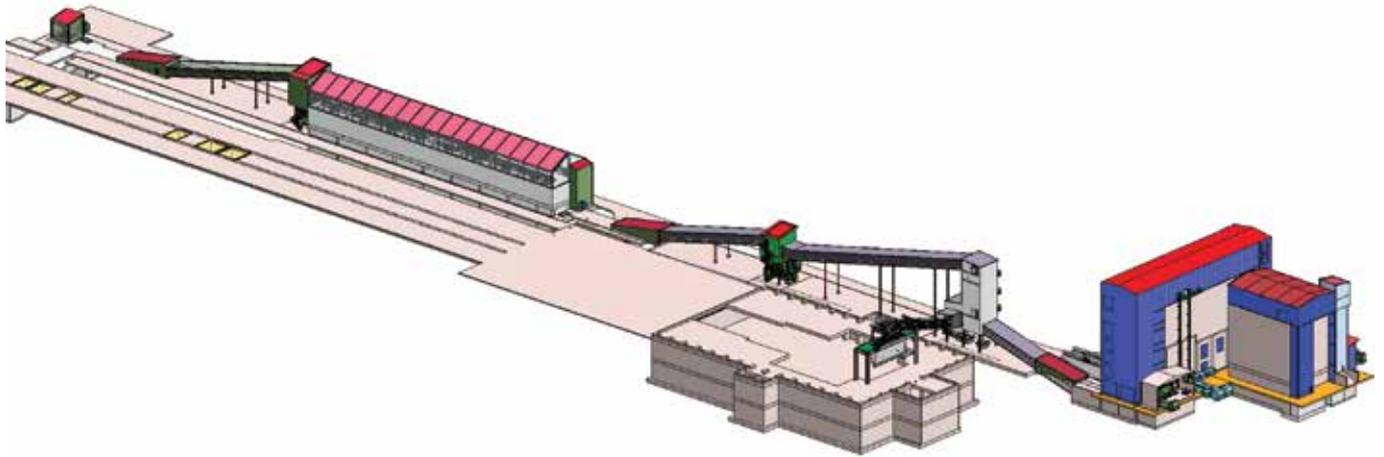
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Booth C48-1 / Hall 13



Triple Batch Plant Project with ZIPPE



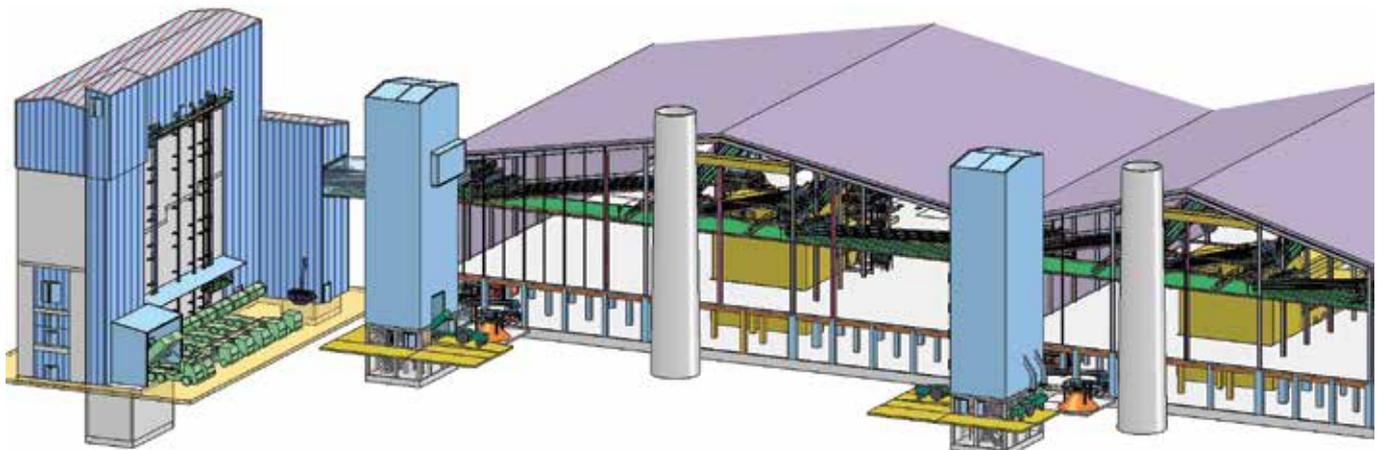
Sisecam is a Global Player in the glass industry, especially in key areas like flat glass, glass packaging, car glass and glass fibers.

The company has a production capacity of 2,6 million tons of glass per year in its production facilities for glass packaging.

The three new projects ZIPPE Industrieanlagen GmbH is executing are one container glass plant and two flat glass production facilities, among others for the car industry. The plants shall be established in Turkey and Hungary.

ZIPPE supplies the entire technology for these plants in the field of "batch and cullet".

Completion shall be in mid-March 2023.





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Batch Plants | Cullet Plants | Automation | Modernization | Engineering | Factory Cullet Recycling
Glass Recycling | Batch Charging | Glass Level Controlling | Preheating | Maintenance & Service

Glaston to establish production for automotive glass pre-processing equipment in China

Glaston's Board of Directors has approved a plan to establish the production of Automotive pre-processing equipment for standard products at Glaston's factory in Tianjin, China. The aim is to serve customers in the globally largest automotive market with local machine production. The plan is in line with Glaston's strategic focus to grow its business in China and improve operational efficiency.

Glaston's addressable global automotive glass equipment market was estimated at over EUR 50 million in 2021, with expected continuous growth. Asia and China, in particular, are major growth regions in the automotive industry. In the previous years, China's share of the automotive glass new machinery market has been 50–70% (1 of which the majority are standard products). Based on its long experience of operating in the Chinese market and technological know-how, Glaston is well-positioned to tap into the automotive growth in the region.

For more than 50 years, Glaston has served automotive glass processing customers globally from its production site in Switzerland. Ramping up the production at Glaston's factory in Tianjin, currently manufacturing heat treatment and insulating glass equipment, starts with enhancing local automotive technology know-how and product-specific production skills as well as setting up a local automotive supply chain network to meet required quality criteria. The first products produced in China for the Chinese market are expected to be delivered during the first half of 2023.

Introducing the Automotive offering's local production in the Chinese market contributes to

Glaston's strategy of profitable growth by improved product offering for the Chinese market as well as productivity improvements. The estimated investment for the implementation of the plan is approximately EUR 1.4 million. Most of the costs and capital expenditure are expected to take place in 2022. The plan enables gradually improving production cost efficiencies of 10–15% starting in 2024. The plan is based on an assumption that COVID-19 related restrictions will gradually ease in China in the second half of 2022. If this will not happen, the timing of the financial impacts will move forward.

"In China for China. Expanding the role of our Tianjin facility will enable us to reach a new automotive glass processing customer segment in China as well as strengthen our position with existing customers. Proximity to the customer is important when addressing our growth ambition in the Chinese market. Glaston has been present in China for more than 20 years. We have a long experience and high readiness and flexibility to serve customers with local production, delivery and services. With this plan we will get a more flexible footprint and cost efficiencies within our automotive business," says Anders Dahlblom, President and CEO of Glaston Corporation.

Production of Automotive machines in Bützberg, Switzerland will continue to serve Glaston customers outside of China. The Swiss factory will also deliver customized machines to China. According to current estimates, the planned production ramp-up in China has no direct personnel impacts in Switzerland.

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When will we finally put an end to aluminium in glass edge seals?



Christoph-Rubel HD

Warm edge contributes to energy cost reduction

Many will remember: In 1973, a global energy crisis directed focus to the energy efficiency of buildings for the first time. With the Thermal Insulation Ordinance of 1977, single-pane glass was banned, coated insulating glass quickly became the standard and the U_w value dropped

from an average of $4.7 \text{ W}/(\text{m}^2\text{K})$ to $2.7 \text{ W}/(\text{m}^2\text{K})$ [1].

Today, the exorbitant energy price increases triggered by the war in Ukraine, the coronavirus-related supply bottlenecks and the tense supply situation have catapulted the energy optimisation of buildings back to the top of the agenda in legislation and the construction industry. What can warm edge spacer contribute to this? Christoph Rubel is European Technical Manager at Edgetech Europe GmbH based in Heinsberg, which produces the flexible warm edge spacer Super Spacer® made of silicone foam for many European countries and he has summarised the most important facts. His bottom line: the warm edge is a must, because even small energy guzzlers add up to a massive loss over the lifetime of a window.

There is still a lot of room for improvement in the U_w value

Modern thermal insulating glass achieves up to $0.5 \text{ W}/(\text{m}^2\text{K})$ as triple glazing with thermally optimised

glass edge. A study by the VFF shows [1]: At 1.1, the average U_w value for the most recently reported period between 2017 and 2020 is still far from the passive house standard, which requires triple glazing with a thermal transmittance $U_w < 0.8$ $W/(m^2K)$. There is therefore considerable potential in the thermal optimisation of insulating glass. Here, the warm edge is the solution that is easiest to implement and requires neither complex coatings nor changes in the profile construction.

Why are aluminium spacers still being installed?

It has long been known that conventional aluminium spacers form thermal bridges in the edge seal, through which valuable thermal energy is lost. Furthermore, in winter, when there are large temperature differences between inside and outside, the glass surface in the edge area of a window with a warm edge is significantly warmer; with the consequence that condensation hardly forms and the comfort in the room noticeably increases. So why do many window manufacturers still rely on aluminium? On the one hand, the reason lies in the price competition, but in part it is also due to some in the market not yet fully realising the extent that the conductivity of an insulating glass spacer in the edge seal also determines the thermal insulation values of a window. The heat loss is quantified by the Ψ value Ψ , a linear heat transfer coefficient in the unit W/mK . It describes the heat loss per metre of thermal bridge per degree of temperature difference. With the different warm edge spacers, the values are close together; in comparison to an aluminium spacer however, the impact is clear.

With a thermal conductivity of only 0.15 W/mK , silicone foam, for example, has a thermal conductivity 1000 times lower than aluminium. The

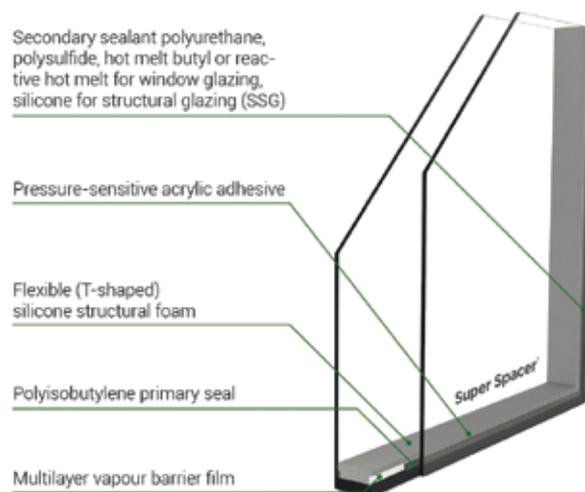


Fig. 1: Flexible spacer Super Spacer® with integrated desiccant, vapour barrier and lateral acrylic adhesive.

additional price for Super Spacer® is in the low cent range per linear metre. The price argument is therefore easy to refute.

Furthermore, automated insulating glass production with robot-assisted spacer application offers additional savings potential on the processing side. Flexible spacers from the roll are already prefabricated in the desired width and colour. While a roll is running on the applicator, the software signals six metres before the end of the run which material is needed next and this can be loaded onto the second applicator head. There is no waiting time for the material and the roll change in the applicator is also done quickly: The two ends are connected with the help of an adhesive foil and production can continue. Since flexible spacers are already equipped with desiccant, vapour barrier and acrylic adhesive, there is no need for time-consuming, labour-intensive and machine-intensive preparatory work.

Only windows with a warm edge will be eligible for subsidies in the future

When making investment decisions, one should not forget the legal framework conditions. With the "Energy Efficiency Work Plan" published in May 2022, the Federal Ministry of Economics and Climate Protection (BAFA) made it clear that the replacement of old windows and doors in particular will be at the centre of building promotion. This is a signal that should have a positive impact on order books, because according to calculations by the VFF in the above-mentioned study, around 235 million window units in existing buildings are in

Reference window	Metal with thermal separation		Plastic		Wood		Wood/Metal	
	Super Spacer® Premium	Aluminium	Super Spacer® Premium	Aluminium	Super Spacer® Premium	Aluminium	Super Spacer® Premium	Aluminium
U-values two-pane insulating glass 4 16 4								
U _f -value	1		0.8		0.8		0.8	
U _g -value	1.1		1.1		1.1		1.1	
Ψ-value	0.035	0.111	0.031	0.077	0.03	0.081	0.031	0.092
U _w -value (rounded)	1.1	1.3	1	1.2	1	1.2	1	1.2
U-values three-pane insulating glass 4 12 4 12 4								
U _f -value	1		0.8		0.8		0.8	
U _g -value	0.7		0.7		0.7		0.7	
Ψ-value	0.030	0.111	0.029	0.075	0.028	0.086	0.029	0.097
U _w -Wert (rounded)	0.87	1.07	0.80	0.91	0.80	0.94	0.80	0.96

Psi values from BF data sheets
 Calculation of savings is based on the energy balance of a passive house building model and a low-energy house building model (NEH)

Fig. 2: U-value tables with comparison of aluminium spacers and Super Spacer® Premium.

Possible energy savings TriSeal™ / T-Spacer™ Premium compared to aluminium spacer	NEH, Double glazing	NEH, Triple glazing	Passive house
Heating / Cooling [KWh/(m²a)]	3.1	4.2	3.4
Heating / Cooling	5.8%	8.2%	22.3%
CO ₂ [kgCO ₂ eq(a)]	118	157	122

Figures calculated for Frankfurt
 Calculation of savings is based on the energy balance of a passive house building model and a low-energy house building model (NEH)

Fig. 3: Savings potential through Super Spacer Warm Edge compared to aluminium spacers

need of renovation. Triple thermal insulating glass now has a market share of more than 60%. The share of windows with a "warm edge" (Psi value of 0.06) marketed in 2020 is estimated at 74%.

The GEG (Building Energy Law) stipulates a U_w value of 1.3 W/(m²K) as a minimum requirement for new windows. However, if a builder wants to secure subsidies and BAFA grants, the situation is different. If triple glazing is installed, the U_w value must be 0.95 W/(m²K) or better. Double glazing is currently (as of September 2022) not subsidised at all. As you can see in Fig. 2 the aluminium spacer is no longer a viable option in most framing types, and is certain not a long-term option. As a window manufacturer, you are smart to position yourself for the future with automated production and the warm edge as standard. Because one thing is certain: the requirements of the legislator will never be relaxed again.

What are the benefits of the warm

edge in terms of thermal insulation and heating costs?

As a rule of thumb, a difference of 0.04 W/mK in the Psi value means an improvement of 0.1 W/mK in the U_w value. Fig. 2 shows the changes that are possible simply by changing from conventional spacer to warm edge, in this case from aluminium spacer to silicone foam spacer.

A study conducted by the Passive House Institute Darmstadt (PHI) for Edgetech Europe GmbH in December 2019 proves the sustainability and cost-effectiveness with concrete savings in annual heating demand and CO₂ footprint (see summary in Fig. 3). Since energy prices have changed exponentially since then and are hardly predictable, the projection of monetary savings over the lifetime of the window is omitted here.

According to EnEV 2016, in a low-energy house with double glazing, the annual heating requirement is reduced by 5.8%. Due to the



improved insulation provided by triple glazing, the savings can increase to 8.2%.

If one uses the average CO₂ footprint in Germany of 11 tonnes of CO₂ equivalents per capita and year (data from the Federal Environment Agency, 2021) as a basis for comparison, the warm edge spacer in the triple glazing of a low-energy house alone reduces this value by 1.43%. As the energy mix in Germany shifts towards renewable energies, these savings opportunities become smaller, as the CO₂eq emission factor also decreases. A value of less than one tonne of CO₂ equivalents is generally considered to be a climate-friendly CO₂ footprint per capita worldwide. So we all still have a long way to go, where every kilo saved counts.

Since the annual heating demand of a house depends on countless factors such as age, insulation values, location, orientation of the windows, outside temperatures and personal user behaviour, the savings potential through the warm edge cannot be calculated as a simple average value.

What remains as a conclusion: the energy-efficient refurbishment of buildings is the sum of many



small parts. More than 8% possible energy savings through the warm edge even in a low-energy house is a potential that should not be ignored. In addition, the minimisation of condensation and mould formation as well as the noticeable increase in comfort are irrefutable arguments in favour of the thermally optimised glass edge. Last, but not least, 235 million window units in need of renovation add up to a huge potential.

Sources:

[1] Save more energy with new windows; update May 2021 of the study "In the new light: energy modernisation of old windows", Verband Fenster + Fassade, Frankfurt am Main, and Bundesverband Flachglas e. V., Troisdorf.

[2] Energy, CO₂ and cost savings by using Edgetech Super Spacer® TriSeal™ | T-Spacer™ Premium in comparison to aluminium and stainless steel spacer bars in different climates, Passivhaus Institut Darmstadt on behalf of Edgetech Europe GmbH, 2019



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"Best glass treatment anywhere."
Michael Jazdyk RRC RRO - Senior Consultant

Project Manager

Curtainwall Design & Consulting, Inc.

The permanent* coating is tested and certified by TÜV Rheinland, Germany, and Intertek. Providing protection for shower, façade, railing, solar and automotive glass, EnduroShield continues to be specified for major glass projects around the world.

With the increasing growth in automation, EnduroShield has now extended its popular range of X-Line automated spray machines to include a NEW horizontal version.

"X-Lines are installed in glass factories all over the world and continue to deliver a super-fast and efficient application for our customers," says Craig Howard International Managing Director. "The addition of our latest horizontal version provides even greater choice for any factory layout."

Choose the model that matches your needs. The vertical and horizontal machines utilize in-line flow for effortless assembly line integration, with in-built smart sensors that measure the height, and width of glass panels ensuring the correct amount of coating is used every time. As well as efficiency, EnduroShield is an economical investment for any sized operation offering cost reductions, increased margins, and reduced downtime.

Reduce costs and generate profit with a globally trusted brand. EnduroShield - on display at Glasstec Hall 10, Stand number A52. Visit us to view the exciting EnduroShield range first-hand and get the specifics on all the features and benefits.

*Based on 10 years of simulated normal use and certified by TÜV Rheinland, Germany.

Pujol Group, solutions designed for cost savings



The technology marks the context. Technology savings solutions

In the international context we are currently facing several crisis with important consequences that, among others, directly affect energy prices whose ceiling seems to have no limit. Faced with this situation, only those companies that know how to adapt to changes and that decide to invest and bet on reliable, flexible solutions that helps them reduce their production costs, but also increase their profit margin, will be strengthened.

Efficient decisions in raw materials.

The physical characteristics of EVA, such as its non-hygroscopicity (the ability of some substances or materials to absorb moisture from the surrounding environment) make it a material with high competitive advantages, its quality-price ratio compared to other materials such as PVB and ionomers that require both significant investments in process machinery and at the same time support important fixed costs derived from the need for the use of climatic chambers for the correct maintenance of humidity and temperature of the interlayers.

As a consequence, a high energy cost must be sustained, which directly affects the profit margin of the final product. In the current context of stressed energy prices, margins are even more affected, the trend, according to the forecasts, is going to be upward in the medium/long term. Therefore, the optimization and drastic reduction

of energy costs will be key in the production cost equation.

The flexibility required in the lamination processes, together with the development of new and reliable EVA-based materials led by EVALAM, are causing a change in the trend in the laminated glass market, which is consistently moving towards tempered/laminated with EVA.

The technology marks the context. Technology savings solutions.

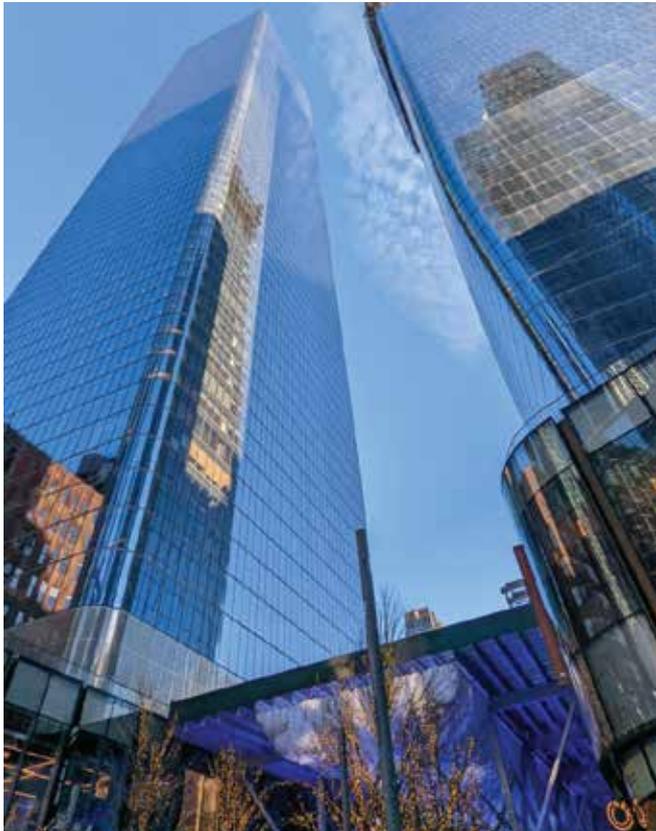
Aware of the importance of offering the best solutions to professionals, Pujol has its Pujol 100 PVB+ technology in its range of laminating ovens, a system that has already had more than 50 units installed throughout the world and that allows, indistinctly and at a highly cost efficient laminating of PVB, EVA and Ionoplastics with high productivity in most transformations of tempered/laminated glass.



This system is the only one in the world that has three lamination phases in independent chambers, which gives the professional great flexibility. It has been designed to extract moisture from the interlayer without the need to use traditional autoclave systems, for which energy efficiency costs are drastically reduced. Pujol 100 PVB+ is considered to be an ideal solution for glass transformers with productions of between 5,000 and 15,000 m² per month.

According to the calculations carried out by EVALAM, the choice of a suitable material and technology for glass laminating can more than quadruple costs depending on monthly production, as shown in the attached graph.

TVITEC CRICURSA UNVEILS THE MOST COMPLETE OFFER OF FLAT AND CURVED GLASS SOLUTIONS



Tvitec, the largest glass manufacturer in Spain and one of the largest in Europe, is launching with Cricursa the most complete and comprehensive offer of high-performance flat and curved construction glass solutions on the market.

This alliance will unite, perhaps like before, two of the largest high-performance flat and curved glass manufacturing capacities in existence. The new venture will work not only on a national level, but with an even greater international focus than the companies already had before Tvitec acquired Cricursa.

The perfect combination

Tvitec and Cricursa are joining forces both commercially and industrially, with Tvitec bringing its



strong financial standing and technological capacity to maximise Cricursa's curved glass manufacturing know-how and experience for the most iconic projects on the planet.

Two of the most emblematic architectural glass manufacturing companies in the world will now work in collaboration to create new synergies and elevate the levels of quality, precision, innovation, prices and service that have already made Tvitec a sector leader in all markets.



Tvitec is looking firmly to the future with this unique new model for marketing large-format high-performance curved glass, enabling the production of solutions as beautiful as they are innovative and designed to contribute to more sustainable construction, energy saving and environmental preservation.

Tvitec and Cricursa's flat and curved glass have already featured together on landmark projects such as One Manhattan West in New York and Brookfield Place Calgary. Tvitec has just supplied all eco-efficient glass for the new Google campus in Bay View (BIG-Heatherwick Studio), while Cricursa recently curved the spectacular façade of La Samaritaine (SANAA) in Paris.



futronic bids farewell to two long-time companions



Managing Director Michael Preuss (left) and Head of Development Frank Ebersbach (right) present Bernd Kubik and Johannes Dimmler (centre, from left) with a basket filled with delicious goodies. (Photo: futronic)

Two long-serving colleagues at glass production technology company futronic, Johannes Dimmler and Bernhard Kubik, have retired.

Bernhard Kubik was with futronic for almost 37 years and Johannes Dimmler for 38. Both of them had become part of the furniture, as it were, and they're already sorely missed.

Dimmler and Kubik played a crucial role in the development of the CIMOG machine control system. Without them there would also have been no EPRO, no FMT24S and no EPRO Upgrade Kit.

They're both people who know a tremendous amount about the complex processes involved in container glass production.

It's fair to say that without Johannes Dimmler and without Bernd Kubik, futronic would be a different company.

Reliable problem solver

Kubik was a service technician who was employed in quality assurance. As such, he was responsible and accountable for testing and repairing control systems.

He also travelled a lot over the years, putting systems of all sizes into operation for customers throughout the world.

And if there was a problem to be solved somewhere, he was particularly good at finding and fixing the error fast, so that colleagues and customers alike knew they could rely on him absolutely.

Software development

Johannes Dimmler worked for many years as a programmer in software development and was mainly responsible for designing embedded software, programming microcontrollers and control systems and controlling software quality.

As project manager, his job at the dividing line between hardware and software development was to assist his colleagues in Technical Support.

For almost four decades, Johannes made sure customers' control systems and machines interacted and functioned perfectly, or as near perfectly as possible.

Right up until their last day at work, Bernd Kubik and Johannes Dimmler felt very much at home at futronic in the company of their colleagues: "The atmosphere there and the team spirit couldn't be better", said Johannes at his farewell.

He also enjoyed the new and exciting challenges he was regularly asked to tackle as well as the varied and diverse nature of his work.

"I never had time to get bored," he explained. And as a confirmed technophile, he added, "I think it's great that I've not just been an onlooker but an architect of futronic's technological advances".

At a small ceremony attended by the entire staff, Managing Director Michael Preuss thanked his two long-time companions for their outstanding service to futronic.

Preuss could not resist sharing a few anecdotes, which he punctuated with warm words and his inimitable sense of humour.

He described it as "a good way to end" and wished Johannes Dimmler and Bernd Kubik all the best and plenty of time to relax as they embarked on this new phase in their lives.

Şişecam reported investments of TRY 2,8 Billion in the first half of 2022



Şişecam increased its net sales to TRY 40,2 Billion in the first half of the year

Şişecam's 2022 half-year consolidated net sales totaled TRY 40,2 Billion and international sales of the Company – comprising the total of exports made from Turkey and sales from out of Turkey production – accounted for %62 during this six-month period. In the first half of the year, Şişecam produced 2,9 Million tons of glass, 2,4 Million tons of soda ash, and almost 2,1 Million tons of industrial raw materials. Thanks to its flexible applications developed through transformation and its deep-rooted governance experience, Şişecam continued its growth journey uninterrupted with strong performance. The Company achieved its financial targets in an atmosphere full of ongoing economic and geopolitical uncertainties on a global scale.

Şişecam CEO Görkem Elverici commented on the Company's results: "The world's economic and geopolitical risks, high inflation and supply chain problems continued to shape the policies and business practices in the first half of 2022. As a strong global player in the glass and chemicals sectors, we have successfully continued our growth journey with our advanced risk management muscles, sound investment decisions and practices implemented by shared wisdom. We are reaping the rewards of our strategic decisions and best practices. While we continue on our way with the goal of being one of the top three players in the world in our main fields of activities, we sustained our investments

to support the growth of the locomotive sectors that we provide inputs. We made investments of TRY 2,8 Billion and increased our consolidated net sales to TRY 40,2 Billion in the first half of the year. Our exports from Turkey reached to 478 Million Dollars in the same period. We aim to produce and create sustainable value for all our stakeholders continuously in the long term."

Elverici: We sustained growth with a holistic development approach

Görkem Elverici stated that Şişecam sustained its growth by evaluating the risks and opportunities with the aim of a holistic development of its entire ecosystem. "The world is going through such a radical transformation where the need for change arises, and the ability of adaptation becomes increasingly important. Although the negative effects of the Covid 19 pandemic due to the closures have weakened, it remains as a global risk. On the other hand, while the world is facing big challenges such as Russia-Ukraine conflict, hyperinflation, risk of recession, energy shortages, logistic disruptions and even sudden lack of supply, Şişecam achieved a strong, solid and healthy performance. As evidenced by the solid results we obtained in the first half of the year, Şişecam is on a solid path towards its year-end targets."

Görkem Elverici, indicated: "The lean and agile structure of "One Şişecam" enables us to manage risks effectively with a proactive and data-driven approach. Our cost optimization practices, effective production planning, healthy and optimized supply chain management and successful crisis management skills help us achieve our ambitious targets. Şişecam's functional-based organizational structure is almost complete now. Our more agile and simple organization structure provides us the necessary infrastructure to adapt to the changing conditions of the new world. We continue to operate full capacity in our production facilities in 14 countries on 4 continents. With the contributions of our investments, we are committed to almost doubling our growth in the next 5 years." Elverici said.

The new patterned glass furnace and processing line investment in Mersin

Görkem Elverici, stated that Şişecam, the founder of the Turkish glass industry, remains committed to making investments contributing to the growth, exports, and further development of the industry. He added: “We decided to invest in a new patterned glass furnace and processing lines on the same site in Mersin where we are constructing a new flat glass line. This greenfield investment which amounts to TRY 3.4 Billion (EUR 185 Million), will allow us to capitalize on opportunities that arise in the rapidly growing global solar energy

market and support us for a leading position to become one of the main suppliers of renewable energy investments globally. This is also perfectly in line with our sustainability targets.”

Pointing out that Şişecam continues all its activities with the goal of creating sustainable value, “We focus on constantly improving the harmony of our strategic goals with the Planet, Society and Life in every step we take while confidently walking through our targets. Our 2030 Sustainability Strategy, CareForNext, is a roadmap that guides us on this path.” Görkem Elverici said.

Lee Lagazon Joins A+W Software



Lee Lagazon joins A+W Software as an Application Support Specialist for A+W Clarity Customers

A+W Software announces the hiring of Mr. Lee Lagazon as we continually strive to build our customer-centric approach. Mr. Lagazon joins the team as an Application Support Specialist for our A+W Clarity (glass) customers.

“We believe Lee is the ideal hire for A+W Software as we expand our presence in North America. With multiple years of experience implementing software solutions in the glass industry, Lee can step in and make an immediate impact for our growing customer base. Lee’s industry and software knowledge (including Microsoft SQL server) together with proven customer-support skills will help our customers prepare and grow into their future success,” according to John Staiano, COO of A+W Software North America.

Mr. Lagazon’s brings extensive, hands-on IT support knowledge of glass fabrication systems as demonstrated by his ability to manage the complete re-write of a glass-fabrication software system. His customer-service skills, ability to work with different teams to achieve a common goal, knowledge of technical issues within the glass fabrication process, and IT capabilities will allow our glass customers to translate software into success.

As an Application Support Specialist, Mr. Lagazon is responsible for troubleshooting customer support tickets, prioritizing tasks, implementing solutions in a timely manner to meet customer demands, and ensuring high customer satisfaction throughout the support process all with a goal to help A+W’s customers prepare, thrive, and grow. Mr. Lagazon states, “I’m excited to join A+W Software, where I can further my knowledge of glass fabrication software, develop solutions to unique questions, and train our customers to maximize their software. With 7+ years of experience in the glass industry and driven by a passion to train and teach others, I look forward to helping A+W’s customers grow and thrive. I think the stability of A+W will allow me to develop skills to benefit the organization and our loyal customers.”

For more information, please contact Chris Kammer at marketing.us@a-w.com for information on joining the A+W team. Then see why your peers choose to work for A+W Software time and again!

Dow introduces carbon-neutral silicones service



Dow representatives Jean-Paul Hautekeer (middle left) and Enrico Cutri (middle right) with Jaguar TCS Racing drivers Mitch Evans (left) and Sam Bird (right).

Dow will release the world's first commercially available, project-specific, carbon-neutral silicones service for building façade and automotive applications.

With more than 50 years' experience in structural silicone glazing, the materials science company is the first to offer high-performance bonding silicones with externally verified carbon neutrality and a global service offered on a project-by-project basis.

Following procedures required by the internationally recognized PAS 2060 verified carbon neutrality standard, Dow's carbon-neutral service for DOWSIL™ Brand Silicone Sealants offer key sustainability advantages for structural glazing, insulating glass and weathersealing systems. This includes an audited commitment to continuously reduce the level of embodied carbon.

Carbon-neutral silicones service for bonding and structural glazing can help reduce the environmental impact of buildings, achieve better green-building certification ratings and help limit the creation of greenhouse gases that contribute to earth's climate changes.

Benefits can include reduced aluminium usage and a potential embodied carbon reduction of up to 600 tons of CO₂ on a 30,000m² façade.

The journey toward carbon-neutral silicones starts with Dow's investment in decarbonising its back-integrated production process for silicone feedstocks.

Low-carbon silicon metal is produced with clean,

renewable energy and responsibly sourced, audited raw materials. The remaining embodied carbon is realised as insets (sequestered) to achieve carbon neutrality. (See graph below.)

Architects and building designers can request the Dow carbon neutrality service on specific projects globally that involve DOWSIL™ Brand Silicone Sealants for façades.

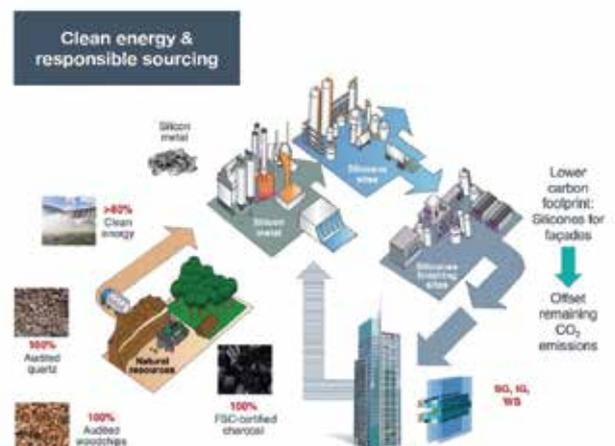
Dow sealants have also been selected for the Jaguar TCS Racing cars for the current 2022 ABB FIA Formula E World Championship.

Over the past year, Dow's MobilityScience™ engineers have collaborated closely with the Jaguar TCS Racing team to identify challenges that its materials science may solve. For example, adhesion performance issues.

Key components in the powertrain required protection from the race car's chemically hostile environment. Dow's MobilityScience™ engineers were able to help the team leverage a spray-on adhesion promoter and primer to ensure more effective assembly and component durability.

Jaguar TCS Racing Team Principal James Barclay said the company's partnership with Dow was crucial for improvement and innovation, commenting that every small "ingredient" was vital to the overall performance of the car and its impact on the environment.

Dow believed that the collaborative nature of the partnership had led to its success, and said it was "extremely proud" of the speed at which the company had been able to implement solutions for Jaguar TCS Racing.



Change in the management of Corporate Human Resources of the ZEISS Group

•Georg von Erffa will be the new Head of Corporate Human Resources (CHR). He will succeed Susan-Stefanie Breitkopf, who was appointed Chief Transformation Officer (CTO) on the Executive Board of Carl Zeiss AG from 1 July 2022.

•Arlett Hesse will take on the newly created role of Head of CHR Germany.

Oberkochen, Germany | 1 August 2022 | ZEISS Group

Effective 1 August 2022, Georg von Erffa will take over the management of Corporate Human Resources of the ZEISS Group. He will succeed Susan-Stefanie Breitkopf, who was appointed Chief Transformation Officer (CTO) on the Executive Board of Carl Zeiss AG from 1 July 2022. As Head of CHR, Georg von Erffa will report to Susan-Stefanie Breitkopf.

Georg von Erffa has been Head of HR of the ZEISS Consumer Markets segment since May 2020. In this role, he has implemented various strategic projects, notably setting up the Sourcing Center in the UK, introduction of collective wage agreements at VIS, restructuring of Photo/COP and stepped up the international HR collaboration at COM. Until a successor for the Head of Human Resources at COM has been appointed, Georg von Erffa will retain this position on a temporary basis.

Georg von Erffa started his professional career at Haniel, initially in M&A in 2003, after which he pursued an international career at HeidelbergCement in 2006. He worked in various management and HR roles in Russia, Australia and Europe and acquired sound strategic and operational expertise which

continues to characterize his work in HR. Georg von Erffa studied international business in the UK and in the US.

Newly created role of Head of CHR Germany
Effective 1 September 2022, Arlett Hesse will take on the newly created role of Head of CHR Germany. In this position, Arlett Hesse will report to Georg von Erffa, the new Head of Corporate Human Resources of the ZEISS Group, who will also be responsible for international CHR.

Since 2020, Arlett Hesse has been Head of the Corporate Centers (CC), Service Centers (SC) and the Shared Production Unit (SPU) as Head of HR at the Oberkochen, Jena and Munich sites. In the future, responsibility for these areas will also lie with the newly created role of Head of CHR Germany. Arlett Hesse has already successfully headed up multiple cross-site projects in Germany including Digital Participation as part of ZEISS@work, and the introduction of the 35-hour week and the supplementary collective wage agreement for all business units in Jena.

Arlett Hesse joined ZEISS in 2013 as Head of Human Resources HR for Medical Technology in Jena. In 2017, she assumed global responsibility as Head of People Development, likewise for ZEISS Medical Technology. In this role, she was part of the People Development and the Cultural Journey team. Before joining ZEISS, she worked in various roles in HR at amazon.de and Bertelsmann AG. Arlett Hesse studied social work at the University of Applied Sciences Erfurt and received a master's degree in business law from Saarland University.

We must prepare ourselves for the future

Efforts are ramping up around the world to achieve climate neutrality as quickly as possible. France has adopted a pioneering role and is tightening up regulations for new buildings. “It is only a matter of time until window manufacturers and window makers will have to engage more with life cycle assessments, including in the DACH region,” says Mario Kindler, product manager at SWISSPACER, with confidence. This will require the right database. The Swiss company recently published Environmental Product Declarations (EPDs) for its spacer bars and the Georgian bar. These supply reliable data on the environmental properties of a product over its entire life cycle.

France is making changes right now: The thermal protection regulation RE2020 for new buildings, which came into force at the beginning of 2022, presents the construction industry with demanding challenges: By 2030 it envisages a reduction in total CO2 emissions of 40 percent compared to 1990 levels – and climate neutrality for new buildings should be achieved by 2050. It is no longer only about thermal performance, but about the analysis of the entire building life cycle. Building cladding, flooring, windows – all installed parts of a building have a considerable impact on the environment. Be it in terms of energy during manufacturing, the CO2 emissions or the waste produced.

The regulation is based on the national label for sustainable building E+C-. Apart from achieving a positive energy balance for the building, it also aims at low CO2 emissions over the entire life cycle. The regulations define maximum limits for CO2 emissions and energy needs, as well as minimum requirements for living comfort. Construction materials with a low CO2 balance and better

insulating properties should consequently have far better market opportunities.

“We have to prepare ourselves for these challenges so that our customers have the data they need quickly to hand,” says Mario Kindler. An important basis for an ecological building assessment are the Environmental Product Declarations (EPDs). They are independently verified and provide transparent information on the environmental impact of products over their entire life cycle.

“We know that the topic of life cycle assessments in the window making industry only plays a very small role at present,” says Kindler. “But that can very quickly change: If other countries follow up with tighter regulations or if public procurement exercises with EU-wide tenders are subject to stricter requirements, that will quickly have an impact on the domestic and export market.”

Sustainability in focus

The Swiss manufacturer of premium spacer bars has launched a comprehensive sustainability strategy with which it wants to explain its own processes in detail and improve its products. It also wants to support its customers in the challenges to come: “We started by publishing our own EPDs. We are currently in contact with various manufacturers of insulating glass units in order to develop joint environmental product declarations and to move the industry forward as a whole. In doing so, we will certainly be able to benefit from the experience of our French parent company Saint-Gobain,” says the convinced product manager. The results should benefit the entire industry because in the long term the carbon footprint will become just as important as the U value.

Grenzebach and Sorg form glass technology alliance



Glass technology suppliers Sorg and Grenzebach have formed a partnership to work closely together on future glass production projects.

The family-owned companies Grenzebach Maschinenbau and Nikolaus Sorg will cooperate more closely in the future.

This cooperation is reflected in the foundation of the joint company GS Engineering (GSE).

Grenzebach and Sorg ideally complement their own scope of supply and services as suppliers in their respective market segments and technology pioneers.

GSE will support the activities of Grenzebach and Sorg as leading suppliers for the glass industry.

They will focus in particular in the development of overall projects with complementary services for works planning, architectural and construction planning, planning of the complete media and power supply, as well as services for project management, construction supervision, commissioning up to technical assistance and production support.

In doing so, they will ensure customers have full access to the latest technological developments for sustainable and state-of-the-art glass production.

At glasstec in Dusseldorf from 20 to 23 September 2022, GS Engineering will introduce themselves in more detail at the booths of Grenzebach and Sorg booths in hall 15.

Pictured above (from left to right): Markus Gruber, Senior Vice President Business Unit Glass at Grenzebach, Egbert Wenninger, CCO at Grenzebach, Dennis Schattauer, Managing Director at GS Engineering and Ralf Czeschka, Managing Director at GS Engineering, Alexander Sorg, Managing Partner at Nikolaus Sorg and Michael Sorg, Director Sorg Holding, Sales - Source: GS Engineering

Glass leak at Vitro's Wichita Falls facility

Several people were transported to hospital following a glass leak at Vitro Architectural Glass's Wichita Falls, Texas, facility on Sunday (August 7). According to Vitro officials, six employees were treated for heat stress, and five were released the same day, with one employee held overnight for observation.

Vitro officials released this statement regarding the leak:

"A glass leak occurred at the Wichita Falls plant of Vitro Flat Glass LLC. The furnace of line number two developed a leak allowing hot, molten glass to

escape from the vessel.

"Wichita Falls Fire and EMS was called to the plant to help seal the leak. Six glass plant employees were taken to United Regional Hospital for treatment of heat stress.

"Glass production slowed on line two but was not stopped during the leak or repair. Glass supply is not expected to be impacted by the incident. Plant and engineering specialists will be working to determine the root cause of the glass leak and identify any required long-term repairs."

Clearlight Glass & Mirror: Experiencing Rapid ROI with FeneTech



Clearlight Glass and Mirror is an "artsy yet gritty" glass fabricator, according to its president William Calhoun. After careful research, Clearlight chose FeneVision as their ERP solution.

Though not your typical glass fabrication company, Clearlight Glass and Mirror president William Calhoun knew that to remain a formidable player in the glass fabrication arena, he needed help to significantly grow this smaller-than-average operation—a shop that primarily fabricates monolithic glass in addition to creating a variety of products including custom glass for high-end exhibits, specialty products, shower doors, and etched glass. Calhoun describes Clearlight as an “artsy yet gritty fabricator.” As early as 2018, he began looking for an ERP software provider willing to support and help scale such a unique operation.

“We had just made a significant investment in our facility by doubling the size through new construction and purchasing new equipment. What was missing was the ability to track our inventory and a means to help us with order entry, production, and shipping.”

Due Dilligence

As a former practicing attorney, it is part of Calhoun’s nature to be judicious. He knew the software a specialized company like Clearlight required would need to be tough enough to manage its complex order entry process. Undaunted, Calhoun spent between four and six months researching the global glass fabrication marketplace and proceeded to query these companies’ stakeholders to discover how their providers were helping them succeed. He was especially interested in determining if these solutions would support Clearlight’s growth because ‘up’ was the direction he sought for the company. Calhoun was especially interested in hearing from fellow fabricators using FeneTech’s FeneVision solution. Not surprisingly, the satisfaction these companies experienced with FeneVision, combined with all the functionality FeneVision provides, helped reinforce Calhoun’s decision to join the ranks of hundreds of other successful companies that placed their trust in FeneTech.

Conquering Complexity During Implementation

In June 2020, Clearlight joined forces with FeneTech. Once properly partnered, the implementation team and a cautiously optimistic, if not enthusiastic Calhoun, began the process of implementing FeneVision into Clearlight’s production. “The most enjoyable aspect of the implementation was dealing with the implementation team. They were ultra professional, they were there for us whenever we reached out, and their onsite visits were just terrific. They each went above and beyond what we expected, often helping us with aspects of the process that were outside the scope of what they were supposed to be doing. That really made a big

difference for us.”

Initially, Calhoun was surprised that a company as small as Clearlight would require such a meticulous and thorough analysis of its operation. “I thought because we were on the smaller side that implementation would be a piece of cake. I didn’t fully appreciate all the detail and data entry required. That’s when I learned how customizable FeneVision is.” And because Clearlight is such a small operation with literally no additional personnel to spare, Calhoun became the de-facto system administrator during the implementation. “It’s a testament to FeneTech that a neophyte like me—a person without any computer background at all—was able to make it through this. I really couldn’t have done it without the implementation team’s hands-on and patient approach.”

ROI

Once up and running with FeneVision, it didn’t take long for Calhoun to see a significant return on the company’s investment. “Twenty-twenty was our best year ever, but we’re on track to be up 50 to 60 percent in 2021—this, without any pain from the front office. They’re happy they no longer have to enter the shop floor to see what’s going on. There is complete visibility right in front of them. Order entry has improved immensely, and the front end of our business can keep our customers updated on their orders, which makes them happy.”

That’s not all. “The way FeneVision works relieves the guys on the shop floor of the burden of having to program the machines. We’ve become more efficient and have reduced the types of errors we experienced before. Having FeneVision interact with the cutting table and the CNC machines has been tremendous. It’s helped us with efficiency, reduction of errors, and we’re much faster than I thought we ever could be. I didn’t fully appreciate how the software could help us in those areas.”

“On the back end, shipping is so much better. There are fewer missed pieces, and we’re more efficient in getting trucks loaded and on their way. FeneVision’s interfacing with (accounting software) SAGE has helped Clearlight improve as well—with invoicing, packing slips, and a reduction of errors. It’s made such a difference efficiency-wise from beginning to end.”

The FeneVision Experience

As a man who has a way with words, Calhoun offered this analogy. “We were traveling in a covered wagon before FeneVision, and now we’re traveling in a Mercedes. In a few years, we’ll be off the ground flying in a 737. There’s no way we could have come this far and continue to achieve our vision for the future without FeneVision.”

“Now we can monitor every aspect of the business; we can automate. We have a system in place where the user interface is easy enough to teach to a new hire but sophisticated enough to run the reports we need and monitor the activity out in the shop. It’s been a ton of work, but we already see the benefits after six months. FeneVision touches every aspect of our business.”

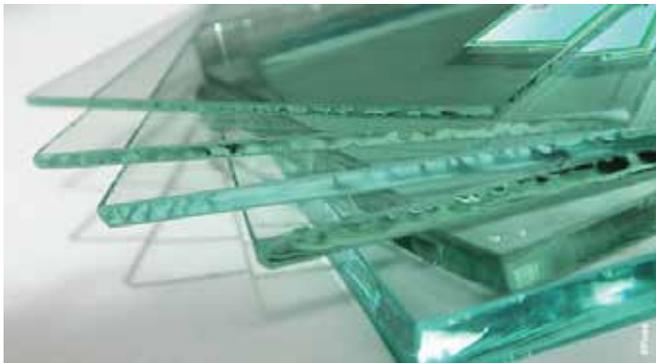
When asked what set FeneVision apart from the competition, Calhoun didn’t hesitate. “It’s the people over technology—and that’s saying quite a bit because the technology is incredible. From the beginning, when we met with the business development team, they understood we were a small shop primed to grow and helped us envision that growth. With this shared goal, it’s been a partnership from day one. With FeneTech and FeneVision, I feel like we’ve got a friend for life.”

We appreciate your dedication and investment in the process, William. And yes, the feeling is mutual.

Flat Glass Market Sees Growth Rate Of 4.5% Through 2032

The global flat glass market is anticipated to reach US\$ 445 Bn by the end of the 2022-2032 forecast period, inclining at a CAGR of 4.5%, projects a recently concluded study. Growth of the market is inextricably linked with developments in the global construction and power generation industries respectively. Flat glass is especially deployed in solar power generation.

During the historical period 2015 to 2021, demand for flat glass products surged at a CAGR of roughly 4%, concluding at US\$ 274 Bn. Prospects declined considerably during the height of the COVID-19 pandemic, attributed to the downsizing of the global construction industry. Postponement or cessation of key infrastructure development activities negatively impacted flat glass demand. However, since 2021, prospects have begun to rebound, as restrictions on commercial activities ease.



The market is expected to grow over the forecast period with the growing number of solar energy installations across the globe and the increasing penetration of glass technology in both residential and non-residential constructions. Building and infrastructure development are directly related to the demand for flat glass. Recent changes in building architecture have increased the use of flat glass on roofs and facades to maximize natural daylight.

Key Takeaways from the Market Study

The global market is expected to reach US\$ 286.33 Bn by the end of 2022.

The global flat glass market for new construction application systems was worth US\$ 40 Bn in 2021. In 2022, Asia Pacific is expected to account for more than 62% of global revenue.

More than 45% of volume share will be held by the insulated product segment in 2022.

The architectural application segment is projected to hold the largest revenue share of more than 73% in 2022.

“Residential and commercial construction companies are replacing brick, cement, and granite with stylish and colourful glass facades and other counter parts. The trend could help develop the flat glass market. Increasing construction and refurbishment spending in India and China, combined with increased investment in the construction industry, could drive industry growth and increase the demand for products,” opines a Senior Research Analyst

Which market will yield the highest revenue share during 2022- 2032?

By 2022, the architectural application segment will hold the largest revenue share of more than 73%. This segment will continue to grow steadily from 2022 to 2032, driven by increased construction activities and infrastructural developments in response to rapid urbanization and population growth worldwide.

The product has a wide range of applications in the automotive industry, including windows, doors, automotive windshields, side panels, and sunroofs. As a result of a decline in global vehicle production, the automotive application segment has seen slow growth over the past couple of years.

Competitive Landscape

The market is fragmented and highly competitive due to the presence of several major players. Various strategies are being employed by the companies to recover losses from the pandemic and to strengthen their market positions. In addition to extensive R&D, the companies are striving to make high-quality and cost-effective products in various applications through

increased efforts to develop innovative products.

In September 2020, Guardian Glass opened its second float glass facility in Poland. The newly constructed facility will make high-performance products easier to access for the architect and construction markets.

AGC Inc. integrated its Architectural Glass Business in Japan with Central Glass Co. by the fourth quarter of its fiscal year ending December 31, 2021.

These insights are based on a report on Flat Glass Market by Fact.MR.

Sorg manager Werner Frankenberger retires



Werner Frankenberger (left) with Alexander Sorg (right).

After 41 years with Sorg Keramik Service (SKS) Werner Frankenberger is retiring.

For 150 years Sorg has served the glassmaking industry, and since 1949 has settled in Lohr am Main. Like many other boys within Rechtenbach, Germany, Werner Frankenberger aspired to work there.

“As a young man, I was fascinated by the stories and experiences of people that worked at Sorg. It soon became clear that I would also like to enter the glass industry,” he said.

It didn't take long for him to join the company in 1981. Now, 41 years later, Mr Frankenberger is retiring from the business: “What I will certainly miss most is the exchange with customers and colleagues.”

Mr Frankenberger started as a bricklayer, and his first task was reconstructing a glass melting furnace in Steinbach am Wald. Eight years later, he moved to the service department, where he enhanced his knowledge and skills with the help of Adolf Knauer. The technical manager turned

himself into a mentor for Mr Frankenberger. Sadly, Mr Knauer died in 1996 and it was up to his pupil to assume the manager role.

As a technical manager, Mr Frankenberger was responsible for the technical execution of projects and services. One of his biggest challenges was a glass leakage in South Africa a few years ago: “The customer rang me out of bed in the middle of the night. The next morning, I was on a plane on my way to South Africa to support the customer on-site.”

Asked about his greatest accomplishment, Mr Frankenberger brings up his first replacement of a complete throat in hot conditions: “It took a lot of preparation and consideration. I was jubilant when it all worked out.”

Since he joined the company, a lot has changed: “Today, we have lots of tools and equipment for our work. Back then, everything was done by hand! I also noticed that, due to digitalisation, many things are discussed via video conferencing and email. Personal contact on-site is becoming less and less frequent.”

The manager predicts that more changes are coming: “It is becoming increasingly difficult to find skilled experts and personnel for the glass industry. SKS is facing increased competition, especially in maintenance and hot repairs. The preservation and transfer of knowledge will be challenging, but I am confident that we will handle it.”

Mr Frankenberger's retirement plans are simple yet fun – to cycle more: “I'll miss my colleagues and customers, but I look forward to investing more time in riding a bike.”

Dow: Safe, efficient installation of frameless glass balustrades



Introducing DOWSIL™ 375 Construction & Glass, a high-performing polyurethane for use in glass balustrade embedding applications.

Offering many aesthetic benefits and design options, glass has become more widely used to produce contemporary designs for external building elements, particularly in applications such as balconies. This conveys individuality, elegance and luxury, allowing artificial light to flow freely and permit unobstructed views from both inside and outside buildings. Maximizing the glazed area of a balcony to take full advantage of these benefits can be achieved through the installation of frameless glass balustrades. These pure glass walls can be securely and invisibly mounted in current system designs using a fast-curing polyurethane technology, which offers the necessary high strength, stiffness and durability.

Glass panels in balustrade designs are typically secured by bolting each pane through holes in the glass, clamping the panes to upright metal posts or embedding the panes in a cement-based grout within a U-profile at the base of the balustrade design. These options can require either drilling holes in the glass itself or result in potentially

inducing high stress levels locally in the panes which could lead to breakage. By embedding the lower part of the glass panel using polymeric material, for instance a polyurethane, which is not excessively stiff, the stress remains distributed and low.



DOWSIL™ 375 Construction & Glass Embedding is a two-part material which requires mixing directly before application. It has a relatively low viscosity, around 5000 mPa s, which enables it to flow well and self-level. With a relatively long open time, DOWSIL™ 375 Construction & Embedding is also pourable and has a fast cure for speedy application and higher productivity during installation. With aesthetics always a top priority, in some designs the assembly can look even better if the color of the embedding material is matched to that of other components. The DOWSIL™ Solution allows the addition of a color paste during the mixing process to achieve an improved appearance.

Glass balustrades are often incorporated in designs such as elevators, walkways and public viewing areas, which provide fantastic views over cities and landscapes. In each case, safety of glass balustrade systems is paramount. DOWSIL™ 375 Construction & Glass Embedding can help realise such challenging designs and can be used in systems requiring flat and curved monolithic or laminated glass panels and large glass sizes.

Build tomorrow with carbon-neutral silicones for facades | Dow



Dow's Carbon-Neutrality Program offers silicones for structural glazing, insulating glazing and weatherproofing

Environmental responsibility

The construction industry is moving toward an environment of ECOLlaboration, meaning that designers and constructors are together embracing the urgent need to reduce embodied carbon and greenhouse gas emissions, by addressing this aspect of sustainability in a more holistic way. In line with this need, Dow has introduced carbon-neutral silicones for specific high performance building applications, to support the push from designers, architects and property developers to create lower carbon buildings and help facilitate industry incentives such as green building standardization. Dow's Silicone Solutions help enable the façade design intent of the architect in a sustainable way, with enhanced energy and material efficiency whilst offering a possibility of end-of-life disassembly.

Energy efficiency

Sustainable design requires a combination of engineering and assessment of system performance. For example, the energy efficiency of a building envelope will greatly influence operational carbon output during the lifetime of a building. It is here that the performance features of Dow's Silicone Solutions demonstrate a proven value and can help to enhance systems within a facade and extend a building's service life.

Material efficiency

Another area for consideration in sustainable

design is material efficiency, which is gaining a lot of credence during the design process. The obvious step is to try to build clever by avoiding using materials or reducing material usage in systems, such as aluminium in a façade, and also to select materials that offer a low embodied carbon, such as carbon-neutral silicone sealing and bonding solutions.

Reuse and recycle

For a truly sustainable design, material end of life consideration is likewise needed. Can the selected building materials be disassembled and reused – all before reuse or recycling? The use of silicone structural glazing facilitates disassembly of bonded systems when compared to harder thin adhesives. The silicone bead is not detrimental to a reuse of the substrate - metal or frame - as it can remain in place and be used as a basis for a new bonded assembly.

Trusted assessment

The accountability of a company's practices to reduce carbon emissions of products and processes can be confusing. Dow have appointed an independent third party who will assess and measure their efforts within an organized framework, according to the PAS 2060 verified carbon neutrality standard. The life cycle analysis documentation (LCA) for Dow's carbonneutral silicones created will be evaluated as well as the way Dow manages their own internal supply chain offsets (also referred to as insets). The major benefit of PAS 2060 verification is that it continuously requires a reduction in carbon emissions, which are independently validated.

For further information about the Dow Carbon-Neutrality Program and how to apply, please visit [dow.com/carbonneutralsilicones](https://www.dow.com/carbonneutralsilicones).



A revised End-of-life Vehicles Directive that supports greater recycling of automotive glazing



Glass recycling can offer many environmental and economic benefits, provided a proper framework enables the collection and sorting of high-quality materials.

Flat glass used in windscreens, side windows, backlights, panoramic sunroof and mirrors is an essential part of a vehicle. It is meant to guarantee unaltered visibility to drivers and safety to vehicle occupants in case of accident while being an essential part of a vehicle design and a substrate for the integration of sensors, cameras and lidar, enabling assisted and automated driving.

As pointed out by the European Commission, at the end of vehicles' life, automotive glass pieces are rarely removed from vehicles before the latter are shredded. Consequently, most automotive glass is not entering a recycling route. When automotive glass pieces are removed, they require additional sorting and cleaning before they can be recycled as secondary raw material in glass melting furnaces. This reality impairs the effective recycling of automotive glass products. Jointly with the industry's high-quality requirements, it renders the flat glass industry's aspiration for closed loop recycling, i.e. flat glass waste going to flat glass manufacturing, even

more challenging today.

Glass recycling can offer many environmental and economic benefits, provided a proper framework enables the collection and sorting of high-quality materials. The European flat glass industry is eager to collect and use more flat glass waste, aka 'cullet', in its manufacturing process to decrease the use of virgin raw materials and reduce CO2 emissions[1]. Glass for Europe members look for ways to continuously increase their use of cullet[2]. End-of-life automotive glass pieces could be a new source of cullet if collection, sorting and quality can be improved.

In this context of the upcoming revision of the End-of-life Vehicles Directive, Glass for Europe would like to provide background information to policy-makers and offer some reflections on the topic.

Flat glass in vehicles

Glass accounts for approximately 3% of a vehicle by mass[3]. Different types of flat glass are used in the production of vehicles.

Windshields are usually made of laminated safety glass, which consists of two or more curved sheets of glass sealed together with a plastic interlayer (polyvinyl butyral, PVB) inserted between them, which keeps the windshield intact in the event of a collision. Laminated safety glass is more complex to get recycle-ready, since the plastic sheet needs to be removed prior to recycling.

Side and rear windows are generally made of tempered glass, which is stronger than ordinary glass. Tempered glass provides enhanced safety as it fractures into small, relatively harmless pieces when it breaks. This type of glass is 'purer' as there is no plastic laminate to remove, however its collection is more difficult as it can shatter in small fragments during its dismantling from the

car.

In modern vehicles, glazing is bonded to the body of the vehicle for safety reasons. In practice, it is generally glued, which makes it harder to remove.

Design of vehicles

The conception of vehicles lies in the hands of vehicle manufacturers (Original Equipment Manufacturers, OEMs). Flat glass manufacturers deliver products according to their clients' requests and specifications with no room for deviation or adjustment.

Automotive glazing parts increasingly integrate other materials than glass to fulfil extra functions. Glass pieces may include plastic interlayers for laminated safety and acoustics, ceramic inks for design, silver printing electrical connectors and sensors, encapsulation materials, fixing clips, etc., according to the vehicle manufacturer's demands. In electric or hybrid cars, glass sunroofs can also integrate solar PV modules. This complexity of automotive glass pieces requested by OEMs implies that, once the automotive glass piece is dismantled from the vehicle, a thorough sorting of materials is necessary.

Increasing automotive glass recycling therefore requires that OEMs improve the design of vehicles to make automobile glass 'dismantle-ready' and that they adopt a 'designed for recycling' approach at the vehicle conception stage, well before the procurement of glass pieces.

Recovery and recycling of flat glass

The removal of the glass pieces from the vehicle is the first essential step. It requires preserving vehicle's integrity. A paper by the German Association for Secondary Raw Materials and Waste Management (bvse)[4] has shown that half of the end-of-life vehicles reach dismantlers without windows or with destroyed windows, making for a very low recycling potential. When removal is undertaken, it requires several minutes of manual work because fixed glazing is bonded to the vehicle body.

Once removed from the vehicle, glass needs to be sorted by type, i.e. laminated, tempered, silver printed rear windows, etc. This separation must be with an adequate size, purity and colour

sorting system, to avoid contamination. The average time for this operation is of the order of 30-40 minutes per vehicle and involves a cost of approximately €1,000 per tonne[5]. The decision regarding the treatment of end-of-life vehicles lies in the hands of dismantlers (Authorised Treatment Facilities, ATFs) which balance time, costs and benefits. Currently, most of the glass in end-of-life vehicles is not recovered[6].

Finally, collected glass pieces require treatment to ensure the removal of all potential contaminants, such as plastic interlayers from laminated glass. Automotive glass products necessitate the highest quality and purity to ensure unaltered visibility and safety. Contaminants in raw materials and cullet generate production defects but can also jeopardise the glazing structure and make serious damage to the industrial equipment[7]. For these reasons, the flat glass industry has the most stringent quality specifications for sourcing cullet.

Because quality specifications for recycled glass are not as strict in other glass sectors as in the flat glass sector, for instance in container glass or glass fibre, for which visibility and transparency are not essential selling points, some flat glass cullet of automotive origin may be used by these glass sectors at a lower quality level and cost than what could be possible in flat glass manufacturing.

Policy recommendations for the ELV Directive revision

1. Definition of recycling

The 2021 European Commission's evaluation of the End-of-life Vehicles (ELV) Directive suggests an alignment of the definition of 'recycling' with the Waste Framework Directive.

In principle, Glass for Europe is in favour of such an alignment, insofar it would allow for glass to be segregated for recycling, in support of the circular economy objectives. In that sense, backfilling should not be excluded from the definition.

To make this description more precise, Glass for Europe supports the proposal formulated in the Joint Research Centre's report on the quality of recycling[8]. This proposal states that the definition of the quality of recycling should be based on the preservation or recovery of the distinct characteristics of the material with the

view of maximising their potential to be re-used.

•Article 3, Waste Framework Directive and Article 2, End-of-Life Vehicles Directive: Glass for Europe supports an alignment of the 'recycling' definition with the Waste Framework Directive, insofar a precision regarding the quality of recycling is included, adding the criterion of preservation or recovery of the distinct characteristics of the material with the view of maximising their potential to be re-used.

2. Recycled content target for glass

Glass for Europe is supportive of a regulatory framework conducive to glass recycling. Given the difficulty to access high quality and high purity flat glass cullet, in particular that originating from automotive glass pieces, Glass for Europe opposes a recycled content target specific to glass.

A recycled content target would not help solve the issue of availability and quality of automotive glass cullet. The latter can only be improved if OEMs work on the design of vehicles to make automobile glass 'dismantle-ready' and if they adopt a 'designed for recycling' approach at the vehicle conception stage, well before the procurement of glass pieces. In the end, a recycling content target would not support effective dismantling and sorting of automotive glazing but only exacerbate competition between glass manufacturers to source an already scarce resource.

•Article 2, End-of-Life Vehicles Directive: The definition of 'recycling' should maintain the inclusion of the reprocessing of the waste materials for other purposes.

3. Material-specific recycling target for glass

Glass for Europe advocates for a policy framework that supports its members' initiatives to increase the availability and quality of flat glass cullet ready for recycling. For this purpose, dismantling of glass needs to be facilitated. Currently, dismantling represents a hurdle to flat glass recycling, both technically and economically. If dismantling is facilitated and end-of-life vehicle-derived cullet meets rigorous quality requirements, it can be a secondary material for the fibre glass, container glass and flat glass industries. The closed-loop recycling from flat glass into flat glass is desirable but most

difficult to attain due to the required quality requirements.

•Article 7 § 2, End-of-Life Vehicles Directive: Should a material-specific recycling target be proposed, it should follow an open-loop model (glass to glass, without sub-sector granularity).

4. Extended Producer Responsibility Scheme

One of the solutions envisaged by policy-makers to foster recycling in end-of-life vehicles is to put in place Extended Producer Responsibility (EPR) schemes with the objective to ensure that producers of products bear financial and/or organisational responsibility for the management of waste. Such schemes have already been put in place in some Member States, however on products or automotive parts which are easier to identify and isolate, e.g. tyres.

In order to enhance materials valorisation and in line with EU's decarbonisation policy, including with regard to consumer behaviour, should an EPR scheme be put in place, it should contain a fee on the final product, i.e. the vehicle. In any case, the economic and technical feasibility, as well as the expected impact of a potential EPR on end-of-life vehicles would first need to be thoroughly evaluated.

Glass for Europe members are investigating the potential impacts of such an EPR route for the glass components of vehicles. However, given the recycling and treatment needs for post-consumer automotive glass waste, it seems that an open loop model would still have to be favoured, for both economic and environmental reasons.

•New article, End-of-Life Vehicles Directive: An EPR could be envisaged only after an in-depth evaluation of its feasibility and of its expected impact.

5. Hazardous substances

To keep a coherent ensemble of EU policy, restrictions regarding hazardous substances should be dealt with under REACH (Annex 17). Specific exemptions cases should remain under ELV Directive.

To enhance this coherence, Glass for Europe supports a link of the ELV Directive to the SCIP database.

CMS Glass Technology & BCE Glass Industry



Thanks to the new CMS maxima machining center and the advanced system developed by CMS, BCE Glass Industry is the ideal partner to its demanding clients.

We had the privilege of gaining access to the BCE Glass Industry, a global leader since 1970 in the supply of glass to the marine, automotive, aerospace and architectural industries. The glass on luxury yachts that cruise the seas all over the world, those on aircrafts or in exclusive super cars are designed and produced in Istanbul, Turkey where BCE Glass Industry has its headquarters.



We use the term privilege because highly sophisticated processes take place inside the plant, like the processing of large-size curved glass, that means the company can offer the market top quality services. They showed us the incredible work behind this huge success.



Everything inside is spotlessly clean, perfectly organized and with attention paid to the tiniest detail. The over 2,500 unique projects achieved are for clients who leave no margin for error. Everything has to be perfect. Expectations are always extremely high and satisfying them is what pleases the people at BCE the most, even when they have to assume that bit more responsibility.



The company is continually expanding, both in terms of figures and technology. They aim to raise the bar time and again without fear of failing, and go where others fear to tread. Thanks to the new CMS maxima machining center and the advanced system developed by CMS created from a combination of three elements (specific 3d software, laser detection system of the models and new locking system for the glass with suction cups in different positions) BCE Glass Industry is the ideal partner to its demanding clients in the marine, automotive, aerospace and architectural world.



Portland Courthouse Delivers Crisp Views and Unrivaled Transparency with Solarban® 72 Starphire® Glass



Strips of Spanish limestone and curtainwall alternate to create a visually interesting façade for Portland’s new 17-story Multnomah Courthouse.

Designed with Solarban 72® Starphire® glass by Vitro Architectural Glass (formerly PPG Glass), the floor-to-ceiling windows welcome in daylighting and deliver beautiful vistas of Mt. Hood and the Willamette River.

As Bjorn Clouten, AIA, LEED® AP, Assoc. DBIA, a principal with the project’s architect SRG Partnership told KPTV FOX 12 Oregon, the envelope design is meant to convey a sense of safety, openness and transparency.

Building occupants enter inside a spacious, light-filled and decorative lobby, reminiscent of an upscale hotel. “On each of the court floors, as you come up the elevator, you’re drawn to the view of the river,” said Clouten.

To deliver these crisp views, Solarban® 72 Starphire® glass was selected for its high visible

light transmittance, exceptional clarity and superior solar control performance. In a standard one-inch insulating glass unit, Solarban® 72 Starphire® glass delivers visible light transmittance of 68% and a solar heat gain coefficient (SHGC) of 0.28.



The glazing played a key role in the architect’s four-layered symbolic presentation of a courthouse. The building’s interior displays the activity and energy taking place in the public spaces next to the courtrooms and the second layer of façade glass reinforces the transparent nature of justice. The third level is the structural, seismic design that represents stability and order, and the final layer showcases the irregularly-spaced glass and limestone panels symbolizing

the people of the county.

An integrated project delivery model helped the team fine-tune the design and capture project efficiencies by onboarding key subcontractors early on. Working in partnership with Hoffman Construction Company, façade consultant RDH, glazing contractor Washington Window & Door and fabricator Oldcastle BuildingEnvelope – Schofield, the building team was able to produce BIM designs and build full-scale mock-ups for early owner and stakeholder review.

The LEED® Gold-certified 460,000 sq.-ft. building achieved Architecture 2030 carbon reduction targets with a carefully calculated window-to-wall ratio, high-performance building envelope, radiant heating and cooling, displacement ventilation and rooftop solar panels.

The design team engineered the façade together with a structural thermal mass. This enables the structure to capture the solar heat gain through the floor-to-ceiling windows on the building’s east side. A radiant hydronic loop embedded in the concrete floor then absorbs the energy in the slab and redistributes it to the public spaces, thereby reducing heating loads on a clear winter morning by up to 20%.

SATINAL launches the first third-party production of chemically tempered glass for the nautical sector



Boat windshield made in Italy

SATINAL, the innovation-driven Italian company operating worldwide to deliver advanced solutions for safety glass manufacture, launches the first third-party production of chemically tempered glass for the nautical sector.

The Chemical tempering of glass is obtained by immersing the glasses to be treated in a bath of molten salts of potassium nitrate at temperatures higher than 400°C. The potassium ions (K+), contained in the salt, replace the sodium ions (Na+) inside the glass, resulting in the establishment of compression tensions over the entire surface and over the edges.

The properties of mechanical resistance to bending of a chemically tempered glass are up to 6 times higher than those of a thermally

tempered glass, subjected to the same force. This particular production process, as consequence of the surface compression, increases the impact and scratch resistance.

The TK Chemical Tempering oven is installed at Satinal headquarters and the first third-party production already started: glass with a thickness of 2 mm each, chemically tempered to be then used as a windshield in the nautical field.

After this process, the glasses were laminated using STRATO® Fresco, the EVA interlayer with solar heat control properties: it absorbs UV and NIR energy allowing the highest visible light transmission and efficient solar control. It is specifically formulated to provide thermal

insulation and exceptional durability when exposed to natural weathering; it also provides excellent acoustic insulation performance.

However, nautical is not the only sector in which chemical temper is applied: it can also be found in aeronautics, architecture, automotive, electronics and the military.

Any customer interested in seeing Satinal solutions is welcome to visit Satinal factory in Italy: a company where you can see under one roof STRATO® EVA film production, an operating TK Chemical Tempering plant, TK Glass Machinery manufacture and the S-Lab R&D laboratory with a wide range of testing equipment for your laminated safety glass.



Reform and Integration of Automotive Glass Business in China

NSG Group is proud to announce that we plan to integrate our Automotive glass business in China with SYP Kangqiao Autoglass Co., Ltd. ("SYP Automotive"), a major Chinese automotive glass manufacturer. This integration into SYP Automotive will strengthen our ability to meet the growing needs of vehicle manufacturers in China.

It is planned that automotive processing operations fully owned by NSG in Guilin and Tianjin will be transferred to SYP Automotive. NSG Group will undertake to re-invest the sale proceeds back into SYP Automotive. The sale will take the form of the sale of two wholly owned legal entities owned by NSG in China, being Tianjin NSG Safety Glass Co., Ltd. ("NSG Tianjin") and Guilin Pilkington Safety Glass Co., Ltd. ("NSG Guilin").

NSG Group currently holds a 20% stake in SYP Automotive. As a consequence of the sale, this stake will increase to approximately 29%.

The largest shareholder in SYP Automotive is Shanghai Yaohua Pilkington Glass Co, Ltd ("SYP"). The shares in SYP are listed on the Shanghai Stock Exchange. NSG Group has had a long standing partnership with SYP for over 30 years and has a 13% equity stake in it. In addition to its investment in SYP Automotive, SYP is recognized a high-quality manufacturer of advanced coated float and processed products for the Chinese architectural glass market.

The proposed deal terms are due to be presented to the shareholders of SYP in June and it is expected that, should shareholder

approval be obtained, binding definitive agreements will then be signed.

Completion of the transaction is expected to take place later this year once Chinese regulatory approvals have been obtained.

Through this integration, NSG Group and SYP Automotive will work in partnership to develop and grow SYP Automotive's automotive processing business in China. As an active participant in the partnership, NSG will help SYP Automotive to enhance its ability to satisfy increasingly complex demands for glazing solutions, including meeting expectations from established global automakers looking to develop advanced glazing supply inside China.

The decision by NSG Group to pursue this transaction is part of the structural reform measures set forth in the medium-term management plan "Revival Plan 24 (RP24)" for the three years from April 1, 2021 to the fiscal year ending March 2024. This is an important step in transforming our business portfolio, as a part of our Shape to Shine transformation program.

There will be no material one-off exceptional impact on the NSG Group's results as a consequence of the above. After completion of the integration, the business performance of NSG Tianjin and NSG Guilin will be included in the results of SYP Automotive which in turn will be included in "the share of post-tax profit of joint ventures and associates accounted for using the equity method" line in the consolidated NSG Group income statement.

Wiegand-Glas in Schleusingen puts furnace 2 into operation



The new end fired furnace, which produces container glass in the colours amber and green, was finally successfully commissioned at the end of the first quarter of 2022

Wiegand-Glas, a family-run business group, is committed to innovative packaging concepts made of glass and PET. With a history that goes back some 450

years and plenty of experience in development and production, Wiegand-Glas has become one of the most successful container glass manufacturers in Europe.

In October 2020, HORN was commissioned with the construction of furnace 2 in the new glass plant in Schleusingen (Thuringia). The new end fired furnace, which produces container glass in the colours amber and green, was finally successfully commissioned at the end of the first quarter of 2022 despite the postponement of the production start at the end of 2021. Exploding prices for energy and raw materials were the main drivers for this.

The project included the complete



refractory and steel planning as well as its delivery, the combustion system, the tank and throat cooling, the measuring and control equipment, the boosting system, the reversing system, the stirring system, the HORN drainage system VARI-DRAIN® as well as the installation of the batch charging machine HVR® 700 S-2P.

In March 2022, the time had come: The furnace was heated up by HORN and successfully put into operation. On 21 March we celebrated first glass. To good glass all the time!

Forglass performs hot overcoating at flat glass manufacturer



Forglass performed a hot overcoating of a flat glass furnace based in Europe.

Forglass has partnered with one of the world's largest producers of automotive and architectural glass to perform a hot overcoating of its float furnace in Europe.

Hot overcoating of a large float furnace is one of the most demanding types of furnace

repair, requiring organisation and teamwork.

It involves a large number of skilled workers and supervisors, who have to work in extremely harsh conditions.

During a hot overcoating, the furnace is kept around its operating temperature, so people working around the furnace must wear special protective clothing, gloves, face and head shields and other garments that protect the human body from exposure to extreme heat.

Scheduling this type of work has to account for another factor,

which is human endurance while working in extreme conditions.

Teams must work in short intervals giving them time to rest and cool off.

Hot overcoating of a large float furnace is planned to minimise glass-to-glass time and there is no room for delay.

Detailed planning is key, allowing exactly the right amount of time to complete each task.

The efficiency and quality of work has to be 100%, as there is no time to redo a mistake. It has to be done correctly the first time.

Konatic app translates datamatrix codes



The Konatic app is available on any smartphone or tablet device. See below for full-sized image.

Konatic has released an app which allows mobile phones and tablets to read datamatrix codes on glass bottles.

For many years, Konatic has been working on an app to read the datamatrix code on glass bottles, which are engraved at the hot end by a CO2 laser.

The app uses artificial intelligence (AI) to 'scan' a bottle, which can then display the following information on any smartphone (see left):

- Date, hour, minute and second of production
- Section and cavity number (new)
- Plant number and line

Until recently, localising the code with the smartphone was time consuming. But the new

algorithm with AI can detect the code automatically and read it faster.

For example, an operator can now pick a bottle on the line and scan it to know exactly when it was produced and on which section and cavity. In case of a bottle with a critical defect, they will know exactly when it was produced.

It is also useful in the filling lines, as the user will also know when the bottle was produced or filled if the line is equipped with an inline datamatrix reader.

On returnable bottles, it could be way to count the loops for the final consumer or allow them to get credit when returning bottles to the supermarket.

This app, called Konatic Reader, is available on Android or Apple store free of charge with a limitation of two readings per day. There is also an option to purchase a yearly license with unlimited readings (send request to Konatic).

Konatic, located in France, develops hot end sensors like gob control or temperature control with closed loop regulation, laboratory devices to measure the hot-end coating treatment and a full range of datamatrix reading solutions. Meet us at glasstec Hall13D16.

Soda ash company bids to acquire Indian glass manufacturer

India's largest container glass producer by capacity, Hindustan National Glass Limited (HNG) may see a new owner and management soon.

Soda ash producer, Nirma has submitted an INR 16,500 million (USD206 million) plan to acquire the bankrupt company.

Africa-based bottle maker Madhvani Group and container glass producer AGI Greenpac have also submitted separate resolution plans for the company.

Danish beer maker Carlsberg, private equity funds Oaktree Capital and SNJ Distilleries are among a dozen entities that have shown interest in acquiring the company.

At a committee of creditors meeting recently, HNG lenders rejected an INR 12,500-13,000 million (USD 156- USD 162 million) one-time settlement (OTS) offered by the promoter. A company can exit insolvency only if 90% of creditors by value agree.

The resolution professional Girish Juneja, backed

by EY, has admitted INR 33,280 million (USD 416 million) claims from financial creditors.

HNG's creditors include State Bank of India, Canara Bank, Bank of Baroda, Rathi Brothers, Standard Chartered Bank, Life Insurance Corporation, Export-Import Bank of India and Edelweiss ARC, Goldman Sachs International Bank.

HNGL has made several attempts since 2018 to settle the loans, but the negotiations did not progress due to the promoter's inability to tie up funds.

In its latest attempt a year ago, HNG offered an INR 14,000 million (USD 175 million) settlement

over ten years and a conversion of the INR 5,000 million (USD 62.5 million) loan into equity.

However, the settlement offer was not unanimously approved - a precondition to the deal. Edelweiss ARC, which holds 21% of the debt, rejected the proposal claiming it to be below expectation.

In 2019, an OTS backed by Carlsberg could not be concluded after it failed to get approval from the Competition Commission of India.

HNG was admitted for insolvency proceedings in October 2021 based on an application filed by DBS Bank.

Decarbonisation technologies aided by new study



Cold batch on top of melt in full electric furnace.

Two articles on thermal radiation conductivity of glass melts have been published to aid in the design of low carbon glass melting technologies.

Designing low carbon glass melting technologies requires reliable glass melt properties input data.

Accurate data is available on the viscosity behaviour of practically all industrial glasses.

However, the existing data on the thermal radiation conductivity of glass melts is scarce and often unreliable - especially the effects of temperature and redox on the radiation conductivity are unknown in many cases.

But from now, the guessing of this essential glass

melt property is no longer necessary.

Two peer-reviewed articles with accurate models for quantifying the thermal radiation conductivity $kR(T)$ of industrial silicate glass melts were recently published, see: Faber AJ et. al. in Int J Appl Glass Sci (2020*) & 2022**), a journal of the American Ceramic Society.

For designing any industrial glass melting process, including low carbon melting technologies, by CFD modelling, the thermal transparency of the glass melt is a key property, next to viscosity.

For example, in electric glass furnaces, the transfer of the heat generated around the electrodes to the cold batch on top of the melt is strongly limited by the radiation conductivity of the melt.

A low radiation conductivity of the melt will result in a poor melting rate of the batch and thus in a low furnace pull rate.

The method for determining $kR(T)$ has a sound scientific basis and can be applied to any silicate glass without or with (a combination of) the colouring ions Fe, Cr, Cu, Co, Mn and Ni.

NSG to invest in Malaysian solar glass production line



The NSG Group is to invest in production capacity in Malaysia to support the solar glass industry..

NSG Group is to invest in production capacity of TCO (transparent conductive oxide) coated glass in Malaysia to support the growing solar market.

A float line at the Johor Bahru factory of NSG's Malaysian Sheet Glass will install online coating capacity soon and start shipping TCO glass for solar panel manufacture after the facility is in

operation.

It is anticipated that the supply from the converted line will commence in March 2024.

The investment is to support the expansion strategy of NSG partner, First Solar a global manufacturer of thin-film solar panels.

In addition to its existing facilities in Vietnam and Malaysia, First Solar is constructing a new manufacturing plant in India, which is expected to be commissioned in the second half of 2023.

NSG Group started operation of the second dedicated float line for solar glass in Vietnam in January 2020, and a new plant in Luckey, Ohio, USA has been operating since November 2020.

The glass produced in these plants is exclusively supplied to First Solar.

Gerresheimer focuses on sustainable glass production



As part of its global sustainability strategy, the Gerresheimer Group has set itself the goal of reducing its CO2 emissions by 50% until 2030 compared with 2019. An important component of this endeavor is the use of state-of-the-art furnace

technology in container glass production. The company produces high-quality glass packaging for the pharma, food and cosmetics industries at locations in Europe, America and Asia. Gerresheimer is currently replacing one of its two furnaces at the German plant in Tettau, Bavaria.

"Against the backdrop of the current economic and geopolitical situation, Gerresheimer sending a strong signal for a successful future with this investment in more sustainable technology. We believe in glass as a future-oriented packaging solution and are committed to the expansion of the Tettau plant," explains Kay Rohn, Managing Director of Gerresheimer Tettau.

At the Tettau plant Gerresheimer employs around 600 people and produces over 700 million glass containers a year. With the new multi-fuel oxygen

furnace, Gerresheimer is laying the foundation for more sustainability in glass production. In particular, the use of green electricity, which in future will account for up to 50% of the energy input, will make a significant contribution to reducing the CO2 footprint in container glass production after completion at the end of July.

To start the new furnace construction, the existing furnace was first drained and dismantled in mid-June so that the new furnace with new technology can be built afterwards. This furnace technology will help Gerresheimer to continue to

support its international customers as a reliable partner on their way to more sustainable products. Glass can be recycled an infinite number of times and is therefore an attractive material in the context of a sustainable packaging economy. In addition, the Gerresheimer Group has already been working for over a decade in various projects on the more energy-efficient production of glass containers for the pharma, cosmetics and food industries. In addition to innovative furnace technology, this also includes the increased use of post-consumer recycled (PCR) glass and eco-design concepts.

Glass for Europe's recommendations on the revision of the Construction Products Regulation (CPR)



Today, the European flat glass association releases its recommendations on the revision of the Construction Products Regulation (CPR).

“Glass for Europe welcomes the European Commission’s proposal for a new Construction Products Regulation” says Justin Loup, Technical Regulations and Project Advisor. “This proposal could reinforce the single market principles for construction products and stimulates the move towards greater sustainability in the industry” he continues.

Glass for Europe calls on the European Parliament

and the Council to focus on three important items of the European Commission proposal which demand adaptations. “To make it really workable, the CPR should be adapted to the realities of the construction sector”, concluded J. Loup:

- First, some procedures should be simplified to allow the thousands of SMEs across the flat glass sector to operate efficiently. The simplified procedure currently allowing the recognition of test results obtained by another manufacturer should be reintroduced in the new CPR, as should the possibility of replacing type calculation by technical documentation when specified in the harmonised technical specifications.

- Second, some more practical provisions on the sustainability of construction products are needed. The sustainability performance of building glass products depends on too many environmental parameters as well as on the building where the glass product will be installed. Thus, tagging such products with a traffic-light label would not effectively inform users.

- Finally, Glass for Europe believes that the industry’s digitalisation efforts should be better supported. The planned EU database or system must avoid over-prescriptive and outdated requirements. It should be smart and allow data to be shared smoothly and without extensive human and financial resources.



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Vancouver House, Canada

Google offices, New York

A large, white, three-dimensional "Google" logo is mounted on the facade of a brick building. The building is part of the Google offices in New York. The logo is positioned above a window and below a balcony. The building's facade is made of red brick and has several windows with white frames. The Google logo is the central focus of the image, with the word "Google" written in its characteristic font. The background shows a cityscape with other buildings and a body of water in the distance.



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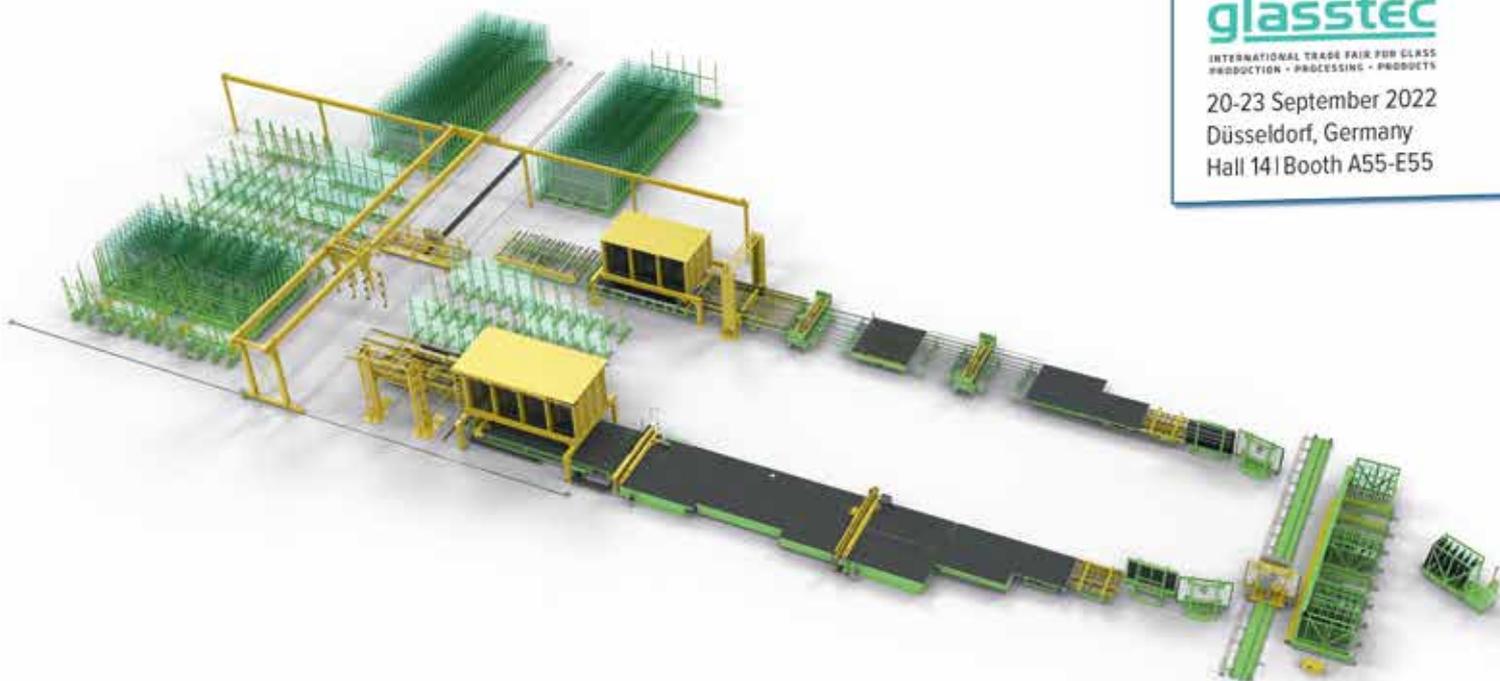
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