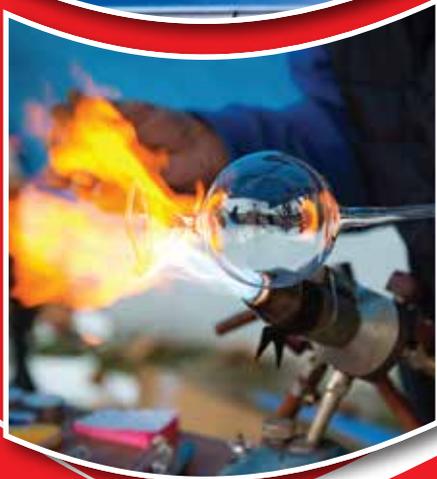


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Contents:

6  Glaston: New digital solutions enable better business

10  SORG: The Application of Modern Inventory Techniques in the Case of Plant Repairs when Reusing Existing Buildings and Structures

16  Edgetech: CRICURSA installs Super Spacer® TriSeal™ in the Qatar National Library

20  No chance for viruses - special glass makes disinfection superfluous

23  Digital Twin: Project by HEGLA & Lenze

24  Edgetech: 10 years of Super Spacer® production in Heinsberg, Germany

25  RCN Solutions: CT80S small-scale kiln, same performance as the big ones

26  Ecological and economic flagship project in Denmark

30  GIMAV AT CHINA GLASS 2021

32  Carey Glass buys 2.500 milestone 'EASY-LIFTER' from Glaston

34  A+W on the path to Industry 4.0

37  Rooftop terrace made for stargazing - Academy Museum of Motion Pictures

39  A 'Prince' of glass in Milán | Tvitec





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40g Solarban® 70, Acuity™ low-iron glasses shine at revitalized Pittsburgh Produce Terminal

41g Custom Laser Glass Finishing From HEGLABoraident

42g Cool as ice thanks to SentryGlas®

44g GLASWELT Interview with Dr. Klaus Mühlhans

48g FGIA releases 2020/2021 Industry Review and Forecast

49g Vanceva PVB Interlayers at Kaleidoscope Kindergarten in Tianshui

50g AGI Case Study: Hilton Garden Inn Camden Waterfront

52g LiSEC introduces new hub structure

56g Glaston sells two insulating glass lines to customers in the US

57g Vitro Architectural Glass celebrates commitment to sustainability in recognition of Earth Day

60g Glaston received a strategically significant order from PRESS GLASS UAB

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For an online presentation of the Tiama Xlab please contact us at marketing@tiama.com.



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Data – the deciding factor

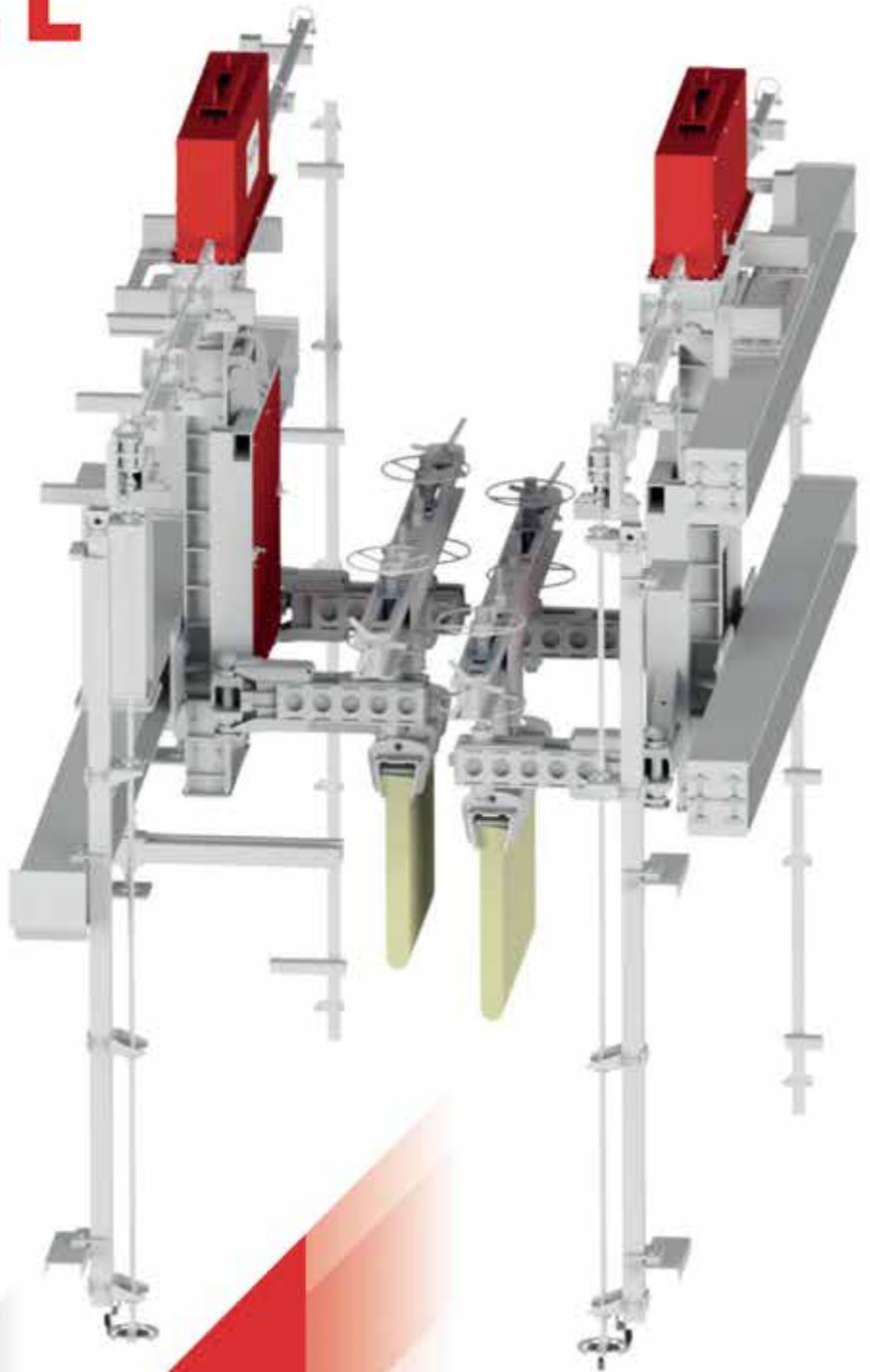
Xlab

TWEEL

SUSPENDED TWEEL

The tweel is one of the most important control instruments within a float glass production plant. It adjusts the flow of the glass melt from the furnace into the tin bath. The tweel can also be used to completely shut-off the glass flow.

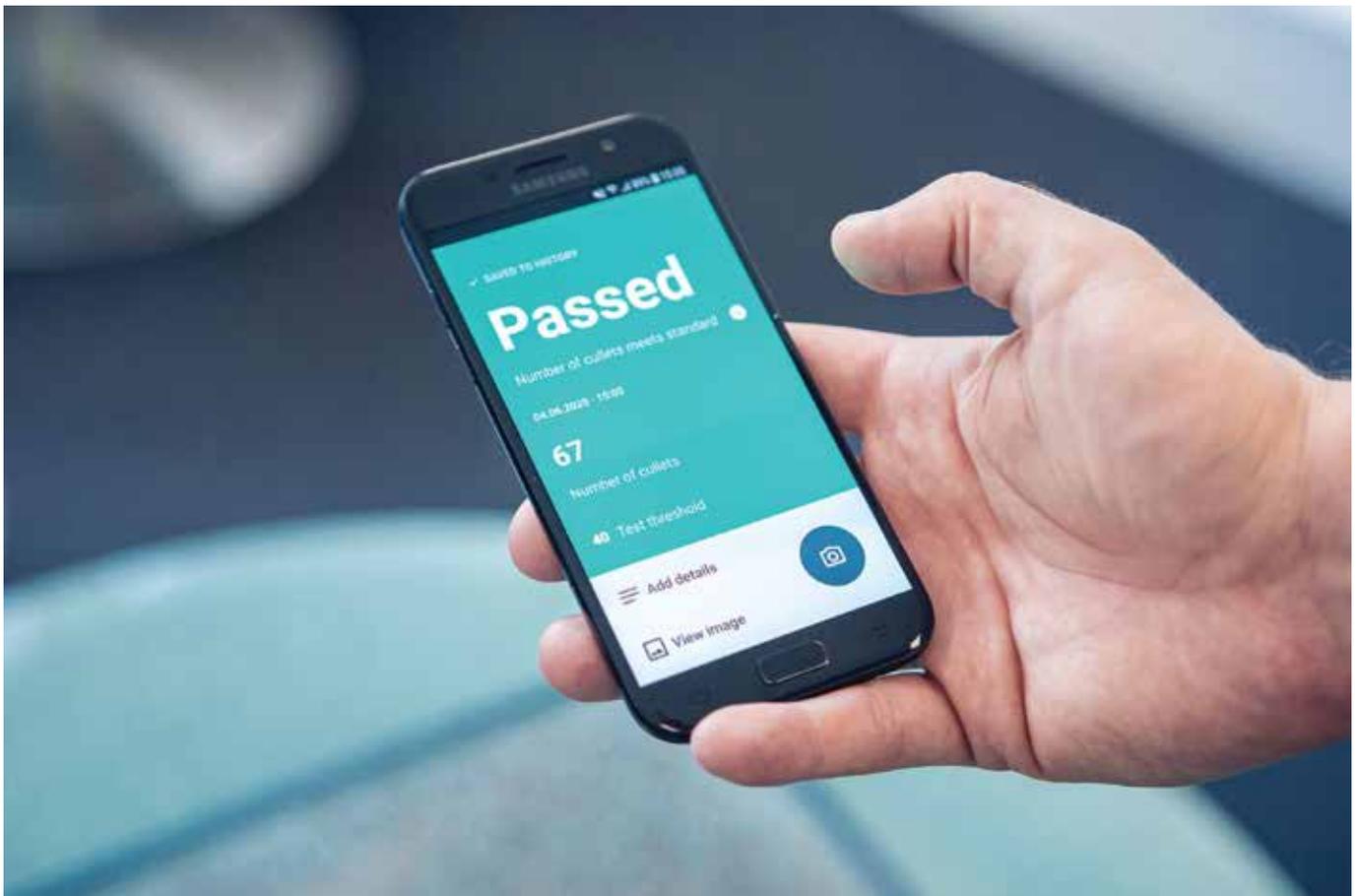
The suspended tweel is installed on the tin bath support steel structure. The robust and highly innovative design of the suspended tweel ensures a stable and smooth operation providing all the benefits of a freely accessible spout area. Additional air cooling protects the electrical and mechanical parts from the high temperatures.



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Digital solutions have always been – and continue to be – integral to the machinery and services we provide. They allow our customers to fully prepare for the future by generating significant business value. At Glaston, we keep investing in our digital capabilities to keep pace with the latest technological developments, such as the cloud, automation, remote connectivity and big data.

Bringing you built-in intelligence with our machinery has been our core focus for quite some time. This year, we will reach one of our main goals

– the launch of the first flat tempering line based on the big data of our global installed base.

Results are already being tested in real production conditions and look really promising!

By taking advantage of intelligence, our customers can gain higher bed utilization, leading to higher energy efficiency and capacity, better repeatability in quality and also greater operational safety which is thanks to online stress calculations, traditionally manual work for occasional glass inspections. Stress calculation is now available as an online solution for every piece of glass produced. Based on data, every machine will be also able to take care of its own predictive maintenance and suggest spare parts, when needed.

Glaston's ProL full convection laminating technology has been setting new standards for quality, yield and processing capability over the past few years. During 2021, we continue to



improve our laminating line performance. We're introducing new innovations to ensure a high level of yield and output for even the most challenging production scenarios – with minimized operator input.

Stay tuned for more news about the upcoming features and live demonstrations at GPD 2021!

With the new arissing machine MULTI'ARRISSER, Glaston launches a fast and user-friendly solution for the high-quality arissing of straight glass edges. Glaston still excels at the proven cup wheel technology, guaranteeing the best arissing quality at low operating costs. The cup wheels adapt individually to different edge geometries of rectangular and shaped formats.

Glaston's cup wheel technology has a 5 to 10 times longer lifetime than other systems, leading to higher productivity. One cup wheel can be used for multiple functions – arissing of the edge, basic edge planing and corner dubbing.

Additionally, the cup wheels allow a maximum arissing speed of 60 m/min, making MULTI'ARRISSER the fastest single-head machine worldwide.

Premium Low-E glass can be processed without any coated surface contact. Due to its compact design, MULTI'ARRISSER has a small footprint. It can be used as a standalone solution or integrated into an IG production line, enabling a wide range of applications in tempered, laminated or insulating glass manufacturing.



Glaston digital services

Glaston's digital services are designed to increase our customers' production performance and help them avoid unplanned downtime. Below are just a few of our recent digital solutions.

Glaston Siru application – the most advanced AI-based solution for heat-treated glass fragmentation analysis today.

Virtual Engineer – an augmented reality-based solution that allows our customers to carry out service work or spare parts installation independently – under the live guidance of experts. This solution ensures faster response times and reduces travel costs and risks related to travel restrictions.

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Projects references

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- Pinnacle Apartments – Brisbane
- Brisbane 1 Towers - Brisbane
- Sundale Appartments - Brisbane
- Qube – Gold Coast
- MTR Tai Wai Station Towers – Hong Kong
- Elan Apartments - Sydney



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The Application of Modern Inventory Techniques in the Case of Plant Repairs when Reusing Existing Buildings and Structures

Existing building structures and infrastructures and the demand for ever larger glass melting plants make the handling of so-called Brown Field projects increasingly complex.

Existing structures are to be reused to a larger and larger degree not only for cost reasons. The integration of new stages, entrances, plant components, etc., into the existing systems considering increasingly extensive safety regulations and the positioning of new and also reusable equipment requires a higher degree of coordination effort with the client than was necessary just a few years ago. Not only the communication with and the involvement of the customer in the solution finding process, but also the coordination of the individual technical departments over the different project phases make a detailed visualization of the existing plant complex necessary.

For the planning and integration of the new or to be modified plant parts or infrastructures, you need to rely on existing documentation. If these are still present, they are in paper format due to the age of buildings, etc. This makes the data transfer to the new plans difficult or impossible. Furthermore, very often additions and adjustments have been made over the years so that the existing documents are no longer up to date. In these cases, it was and is common for employees of the planning company, to be on site for a longer period of time and to record the situation with conventional means, paper drawing, folding rule and laser measuring device, depending on the size of the plant. Practice shows that these inventories contain inaccuracies and can also be incomplete. A more than reasonable alternative to the classical inventory is the method of laser scanning, which has already been used in other areas. SORG has now introduced laser scanning for the inventory of existing building structures and infrastructures in

the glass industry.

Laser scanning captures up to 1,000,000 points / second with the help of a laser beam rotating around two axes. Each detected point receives among other things two angles and a distance to the set up laser scanner. These polar coordinates are then converted into a Cartesian coordinate system. Thus, there is an x, y, and z coordinate for each point. Furthermore, the entire system can be aligned in 3-dimensional space as desired and thus positioned to newly planned system structures in CAD programs.

The SORG laser scanning team is able to capture the complete plant situation in a short time. Therefore, the system is scanned across 400 or more installation sites of the laser scanner across all floors. The following figure shows the measuring points (installation sites for the scanner).



Pic. 1: Measuring Points

Subsequently, the entire system with all its details is calculated as a 3D point cloud and made available to the user. In this point cloud, which of course can also be available in color, a simple measurement of the existing and required structures is possible. In addition, it is possible to extract further measurements from the 3D representation, which did not seem superficially necessary.

Industry demand for larger glass plants and the reuse of infrastructure has made projects more complicated. In most cases, when enlarging furnaces, modifying equipment or installing new technology there is little or no accurate documentation of the current structure available.

BETTER BY 3D DESIGN

This creates complications between the old and new, sometimes requiring complete structures to be refabricated – incurring additional costs and adding time to projects.

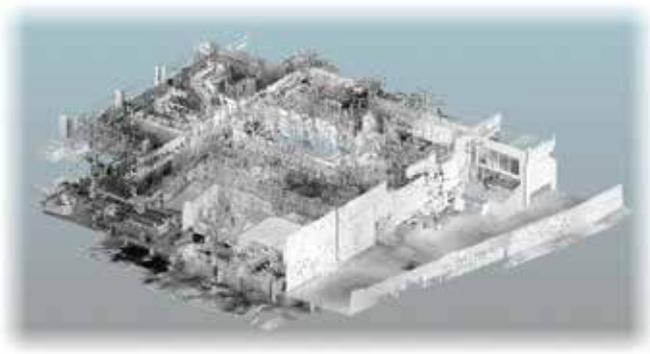
To help avoid the additional cost and installation time, SORG's in-house laser scanning equipment and highly experienced team can offer the precise solution you're looking for.

Surveying the existing installation provides the detailed information we need to form a basis for the new 3D designs, including steel work, furnaces and forehearths, pipe work, cable trays and equipment.

Laser scanning is an effective way of acquiring data without interrupting any on-site operations. It's contactless, accurate and sources highly detailed measurements even in problematic areas.

Get in touch with our experts today to find out how laser scanning can benefit your project.

Find us at sorg.de



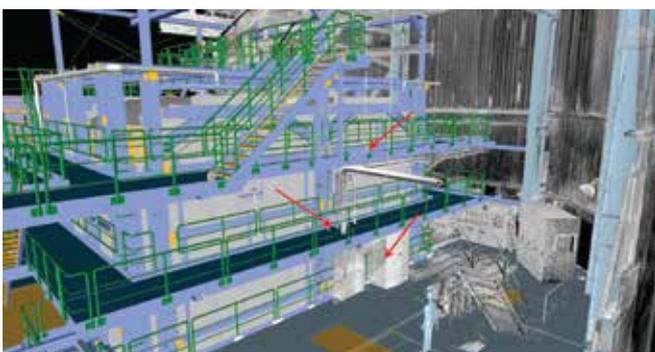
Pic. 2: Point cloud of complete glass furnace facility

The scanned system structure can be processed digitally, both with 2D CAD and 3D CAD programs.



Pic. 3: Thanks to laser scanning measurements, the designer can gain missing information

In addition to the almost complete recording of the existing system with all its pipes, cable trays, stairs, stages, fans and other equipment and the associated ability to measure all these structures and their position to the millimeter, also a much clearer communication with the customer is possible. A picture is worth a thousand words. For example, the customer can be told very quickly, if there would be collisions with existing components and the system being planned.



Pic. 4: Collisions of new facility structure with existing equipment can be easily identified and communicated

Of course, collision control is in the foreground of planning when using new components or components that are to be fitted to existing plant components. In the example, a newly planned reversing unit is delivered to the existing structure. In the past, it only became apparent at the building site, whether the unit really fits or needs to be adapted on site. As a basis for planning, it was well known that an oversize and possibly existing original planning documents were used. But it is not known whether these planning documents represent the real state.



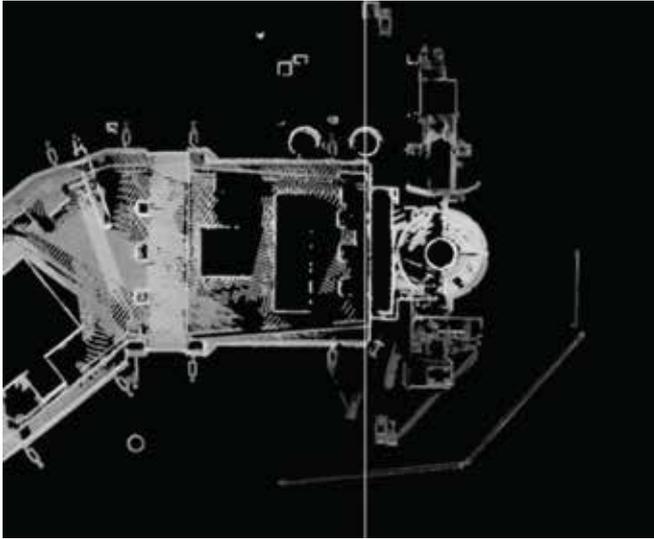
Pic. 5: New equipment can be integrated in existing structures

The planning quality at SORG has been further improved by the introduction of the laser scanning process.

With specially trained staff and own equipment, you know exactly what is important when scanning. This ensures that you can reasonably construct with the data later on.

A measurement of the entire system can be realized in a short time, without affecting the operation in any way.

Thus, for example, the forehearth situation of a system can be scanned in just one day and across all building floors. With the help of this data SORG is then able, for example, to record the real job point situation and to consider it in the planning:



Pic: 6 + 7: Determination of existing gob point location

All this saves adjustment work on the building site and enables a smooth project processes.

Summary:

3D laser scanning is a modern method which allows you to record existing structures quickly and accurately. The data can be used for further planning, so that the accuracy is increased and



possible collisions are already identifiable at the beginning of the planning phase.

SORG has successfully introduced 3D laser scanning in the glass industry. The company has the equipment and the team of experts to carry out the inventory in a timely manner, tailored to the customers' needs and the task.

Nicole Harris Offers Look at the Trends and Challenges Ahead in WGA Keynote



The Zoom meeting drew 68 member participants, a strong showing according to Maryanne Howell, WGA executive director.

During a keynote address at the Washington Glass Association's May 6 virtual conference, Nicole Harris, NGA president and CEO, offered a state of the glass and glazing industry with an in-depth look at current market conditions, glass product trends and top challenges for industry companies. The WGA proudly announced record contributions to its scholarship fund and strong interest in its first golf tournament since the pandemic, scheduled for September. The Zoom meeting drew 68 member participants, a strong showing according to Maryanne Howell, WGA executive director.

TOP KEYNOTE TAKEAWAYS

THE PANDEMIC HAS ALTERED THE COMMERCIAL BUILDING INDUSTRY.

Demand for commercial real estate and construction is down, with the AIA forecasting a 5.7 percent

decline in commercial construction in 2021. Office construction will be hit particularly hard—Moody's Analytics expects the average office vacancy rate for 2021 to reach 19.4 percent, which would represent a 30-year high, Harris said.

Those forecasts reflect the changing nature of tenant and building requirements. "Tenants want more flexible workspace to accommodate at-home, in-person and hybrid work models," Harris said. "And they want better building performance—a touch free environment, improved air circulation and energy efficiency."

AFTER A YEAR OF LOWS, SOME LEADING CONSTRUCTION INDICATORS HAVE MOVED INTO POSITIVE TERRITORY.

Despite projections for a slowdown in 2021, several leading construction indicators may be showing early signs of recovery as they move back into positive territory. In March, the AIA's Architectural Billings Index, which offers a 9-to-12 month forecast of construction spending, showed a strong score of 55.6 (any score over 50 indicates billings growth). Inquiries into new work and the value of new design contracts also continued to rise.

The Dodge Momentum Index was also up in March, reaching its highest level since 2018, thanks to a strong performance from the institutional sector. Overall, the Index for March 2021 was up 11 percent compared to March 2020.

PROTECTIVE APPLICATIONS TOP GLASS TRENDS.

The previous year showed the range of ways glass can protect buildings and its occupants. "With the need to protect employees and customers, but not build opaque walls, glass is easily the long-term product of choice," said Harris, noting that interiors are a key growth area for glass. "Building, stores and offices that used plexiglass or other plastics as temporary fixes are moving to glass—for instance, in retrofitting offices, where glass is used for partitions, barriers and walls."

Protective applications are also on the rise on building exteriors. "Likely because of protests over the last year, more protective glass is being used in storefronts. ... Glass that includes graffiti-retardant coatings for easy cleaning is also popular."

ENERGY PERFORMANCE REMAINS A TOP PRIORITY.

The industry continues to see high demand for new high-performance glass and glazing products in response to toughening energy codes and standards. "We're seeing more glass and glazing

products that are being developed specifically to disrupt the energy space and to allow glass to be a better player in buildings that call for Net Zero," Harris said. "This is an area to watch, especially in regions that have stricter energy codes." One product category to watch is energy-generating glass.

INDUSTRY'S LEADING CHALLENGES INCLUDE MATERIAL COSTS AND SHORTAGES, LABOR, AND ONGOING PANDEMIC CONCERNS.

The ongoing pandemic continues to create a range of issues for the glass industry. "I know we are all tired of this pandemic, but that doesn't mean we can stop paying attention—to new variants, vaccination resistance, worldwide vaccination, border and work visa restrictions," Harris said.

The pandemic has also exacerbated existing challenges, including the industry's labor shortage. "This challenge predates the pandemic and has gotten worse," she said. "More automation, integrated software and more and better training are the focus."

Additionally, supply chain issues and material cost increases are having widespread impacts on the construction industry, she said.

ASSOCIATIONS CAN HELP GLASS COMPANIES NAVIGATE THE CHALLENGES AHEAD.

Harris closed her address by noting the importance of trade associations such as the NGA and the WGA during challenging times. "The NGA's overnight staff transition to full-on remote work meant we could focus on helping our members respond to the pandemic and continue working on publishing new materials, launching new training and apprenticeship programs," she said.

WGA members can access numerous NGA resources, including members-only and member-discounted materials, including:

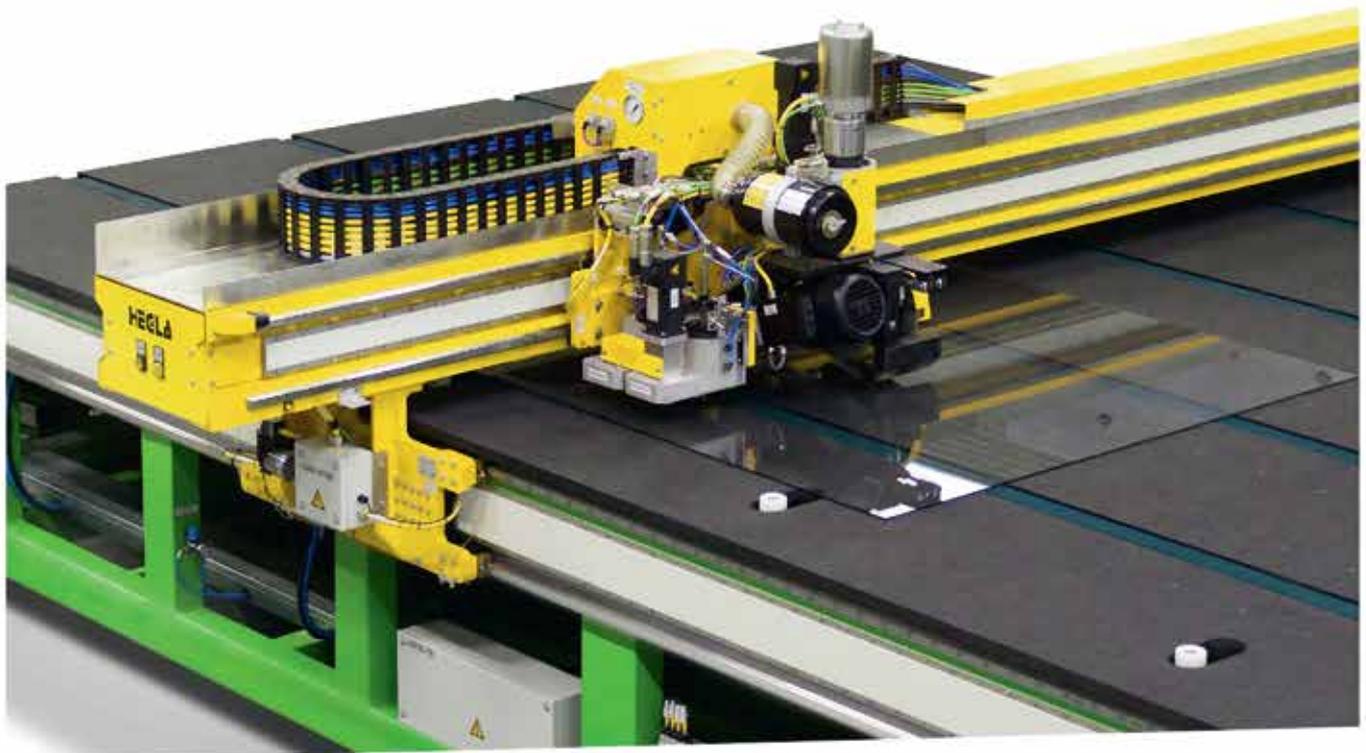
- Members-Only Codes & Standards Help Center
- AIA Continuing Education Seminars
- America Subcontractors Association Downloads
- Safety Bulletins
- Special Webinars
- Discounted MyGlassClass.com online learning (Spanish classes coming online soon)
- Discounted Glazing Executives Forum, BEC Conference, NGA Glass Conferences registration
- Discounted NGA Manuals and Glass Technical Papers, among 160 products in the NGA Store
- Free trade show pass for GlassBuild America
- Free subscriptions to Glass Magazine, Window + Door and WorldofGlassMap.com.

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Flexible spacer system for hot desert climate

CRICURSA installs Super Spacer® TriSeal™ in the Qatar National Library



(Picture caption) The wave-shaped glass facade of the Qatar National Library covers a total area of 5,500 square metres.

their own experience that there are only a handful of glass bending shops in the world capable of producing curved XXL glass panes in the required qualities, with the necessary tight radii and minimal tolerances.

The planning team also broke new ground with its solution involving the construction of the glass facade as a load-bearing, bracing element. In the case of Porto, Rem Koolhaas had the vision of glass facades without steel and where possible without disruptive pillars, beams, steel cables or frames. A considerable challenge, which was ultimately met by CRICURSA, one of the world's best renowned manufacturers of curved glass. Curved XXL glass panes arranged in close proximity to each other in a wave-like design, which stabilise each other and thus jointly bear the loads acting upon them, made it possible to dispense with vertical frames.

In the case of Doha the waveform is realised by employing tight radii

Rem Koolhaas also opted for a corrugated glass facade for the recently completed Qatar National Library building for the new Education City in Doha. This time the glass panes are designed in an omega shape, inspired by the notion of drying paper sheets. In a manner resembling the corners of a box being folded up, the glass

CRICURSA Cristales Curvados, SA and Super Spacer® have been a proven team in the production of curved XXL insulating glass units for iconic buildings with unique glass facades for some time now. Especially for energy-efficiency reasons, the warm edge spacer system was also used for the 5,500 square metre glass facade of the Qatar National Library in Doha, which was completed in 2018.

Wave-shape provides stability

Rob Nijse, Professor of Structural Analysis and former partner of the Dutch engineering company ABT Arnhem, and ABT structural consultant Ronald Wenting were both involved in a leading capacity in the structural design for the first congenial collaboration of Rem Koolhaas

and CRICURSA: the Casa da Música concert hall in Porto, the wave-shaped glass facades of which have become something of a trademark of star architect Rem Koolhaas and his Rotterdam office OMA architects over the last 15 years.

In their article "Designing and constructing corrugated glass facades" Rob Nijse and Roland Wenting write: "If the desired corrugated form can be folded from a sheet of paper, then the glass industry will also be able to produce it." Indeed, the static benefits of a facade designed as a wave are obvious. In the same way as a sheet of paper that has been folded to form an accordion, it possesses much more rigidity than flat paper. But one should not interpret this quote as nonchalantly as it first sounds. This is because the two structural engineers know from



(Picture caption) The braced corners of the building provide the facade with the exterior shape of a diamond.

facades form the shape of a diamond. They filter out the glaring sunlight and illuminate the library with as much diffuse, glare-free daylight as possible. The light is reflected down into the room via a white aluminium ceiling.



Glass facades provide the room with diffuse, glare-free daylight.

You do not enter the 138-metre long library from the side, but instead access the centre of a single triangular room under the supported corner of the building and you are immediately surrounded by three terraces with marble bookshelves. The Qatar National Library houses more than one million books and 500,000 digital editions across an area of some 42,000 square metres. A mezzanine floor with reading tables, media rooms, study rooms and a large auditorium is accommodated on a self-supporting bridge that spans almost the entire room. OMA architects Rotterdam has

come across a particularly spectacular solution for the accommodation of the Heritage Collection, which comprises particularly valuable scriptures and manuscripts on Arab-Islamic civilisation and is presented in the form of a permanent exhibition: a 6-metre deep room with a glass ceiling covered with beige travertine, reminiscent of an excavation labyrinth, was embedded into the ground. The message is clear: Books are treasures that are worth raising in the public's consciousness.

Facade is energy-optimised

In the Qatar National Library, the absence of metallic elements in the glass facade additionally has a decisive climatic benefit: there are no potential thermal bridges that conduct heat into the interior of the building and which could weaken the insulating effect of the gas layer and warm edge in the curved double glazing. "Qatar is one of the regions most markedly affected by the rise in average temperatures caused by climate change", explains CRICURSA's Marketing Director Joan Tarrus. "Outdoors, temperatures exceed 40 degrees centigrade in the summer, the temperature

inside the library should be a pleasant 20 degrees. The energy-related and thus production-related challenges placed upon the facade glazing were thus enormous, especially in view of the fact we did not want to plan for mechanical shading under any circumstances."

The arrangement of the curved glazing ensures the facade is self-supporting and exceptionally resistant to wind loads. "Antoni Gaudí made use of the same principle when he inserted the famous Catenarian arches," according to Joan Tarrus. Compared to a flat glass surface with an identical pane thickness, the corrugated shape enables much higher loads to be transferred both out of the plane of the glass – the load-bearing capacity increases by 1,000 % here according to Rob Nijse and Roland Weining – and also in-plane of the glass. In Doha the steel bases between the glass elements were connected with interior columns to provide the construction with even more stability.



The stacked glass elements are up to 5.50 metres in height.

Joan Tarrus continues: "When we started analysing OMA's architects new challenge, undulating DGU facade, the new there was only on way: slumping technique. Despite the technical challenges we knew we were going to face due to the extreme climate conditions in Doha, curved annealed glass was the only possible approach to provide an integral solution (geometry, coatings, ceramic frit, dimensions) corrugating the glass to 550 mm radius, providing us with greater freedom in the design process"



The curved glass panes in the Qatar National Library have a radius of 550 mm.

The glass panes that are up to 5.50 metres high, laminated and curved, are designed as double glazed insulating glass units. A low-e coating, and a solar control coating, filter and reflect sunlight. A grey grid of 3 mm metallic dots with a precise 6 mm spacing between them was burnt into them in order to

reduce radiation transmission even further; it represents a technological masterpiece due to these tight radii and the immense sizes involved.

Warm Edge indispensable in desert climes

CRICURSA chose the Super Spacer® TriSeal™ Flex product as its warm edge spacer. The product developed by Edgetech/Quanex especially for curved glazing is, based on the experiences of CRICURSA, ideally suited for the extreme climate loads in the desert.

"In this climate region, the use of a warm edge for double glazing is indispensable in order to optimise the energy efficiency of a building," explains Joachim Stoss, Managing Director of Edgetech Europe GmbH and Vice President International Sales at Quanex. The constant transition between hot sunlight, shade and cooler night temperatures leads to the permanent movement of the glass, and consequently, to considerable mechanical stress on the edge seal. "Flexible spacers such as Super Spacer hermetically seal the space

between the panes for many years. Due to the properties of the structural foam the spacer system absorbs the pumping motions of the panes and prevents wear of the primary seal", explains Joachim Stoss.

About Edgetech Europe GmbH

Edgetech's Super Spacer® flexible foam-based spacer systems act as energy-efficient warm edge spacers in insulating glass windows. They significantly reduce energy loss to the outside, largely prevent condensation and also contribute to the lifetime of a window. On average, worldwide, more than 300 million metres are sold annually in over 90 countries.

Edgetech Europe GmbH, located in Heinsberg Germany, is a fully-owned subsidiary of Quanex Building Products Corporation, an industry-leading manufacturer of components sold to Original Equipment Manufacturers (OEMs) in the building products industry. Based in Houston, Texas, Quanex designs and manufactures energy-efficient fenestration products, in addition to kitchen and bath cabinet components. Regarding the turnover Edgetech/Quanex is the world's largest manufacturer of spacers. Edgetech Europe GmbH is a sales location for the markets in continental Europe and one of the three worldwide Edgetech production plants, with a total of 450 employees and 16 extruders. You can obtain additional information about the Super Spacer® systems and the Warm Edge Technology of Edgetech here : www.superspacer.com.



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www.superspacer.com

No chance for viruses - special glass makes disinfection superfluous

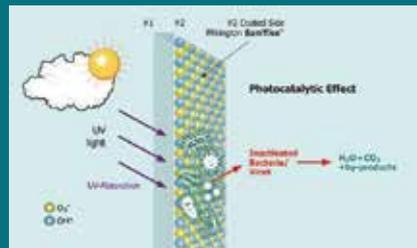
Glass surfaces can be pre-treated so that they do not offer bacteria and viruses a chance to survive and do not aggregate layers of dirt.

The last industry working group of the Glass Technology Forum dealt exclusively with glass surfaces and their specific properties. These are permanently under the influence of their environment and not only through weather and air pollution. Wherever people come into contact with glass surfaces, they leave traces and thus also viruses and bacteria. A special coating can prevent them from surviving on the surface.

Glasses like these from the NSG Group are used in the medical sector or are part of interior design. Furniture surfaces lend themselves to this, especially in places with much public traffic. The glass type SaniTise™ from Pilkington contains a coating based on titanium dioxide, TiO₂. This is applied in a CVD process at 600 °C during float glass production. The photocatalytic effect is triggered by UV light. Sunlight destroys 90 percent of the viruses on the surface after

about 15 minutes. An "accumulator effect" means that about 80 percent of the viruses are still devastated after 60 minutes. Additional UV light sources are necessary indoors. The layer is active for the glass's life and does not restrict further processing steps in the manufacturing process. Since it is very thin, the glass can be recycled.

With laminated glass, the film used must be UV-permeable. If the active surface gets a print afterward, the effect is reduced because the printed area can no longer reduce the virus load. Special cleaning agents are not necessary.



Source: NSG Group

Another possibility for creating an antibacterial function is offered by the process of HEGLA Boraident GmbH & Co KG. A laser does heat the glass surface and initiates the transfer of silver ions from a transfer medium on the glass surface into the glass surface. Silver ions are known to kill

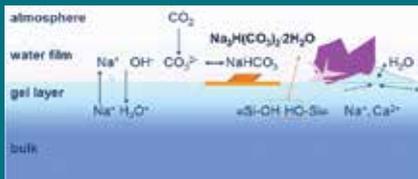
bacteria that get onto the glass surface through skin contact. The process can be used, for instance, to treat glass in the area of handles or other surfaces that are frequently touched.

Reactions of glass surfaces to the environment

In general, glasses react to external influences. 95 percent of the glasses that are used are silicate glasses. Due to the hybridization state, the SiO₂ ensures that a three-dimensionally linked silicate network with four bonding arms is created. This is hard to dissolve. Nevertheless, the surface reacts impressively - if new surfaces form, loose and thus reactive bonds are present. This is also reflected in the strength: the smallest defective spots in the surface cause brittle fractures when tensile stress occurs. Consequently, it is helpful to introduce compressive stresses into the surface. This is done, for example, via chemical or thermal pre-stressing.

The glass surfaces change over time. In particular, the reaction with moisture damages the surface ("deficient water attack"). A gel layer forms in which, on the

one hand, crystallization takes place, but which, on the other hand, can act as a protective layer depending on time. Why these gel layer bumps form has not yet been explained. The TU Ilmenau is also researching this. Sodium hydrogen carbonates are often found there. The weathered and dried gel layer can flake off over a large area and reveal a new glass surface. In the daily environment, we encounter glass surface reactions, especially in the dishwasher, but external environmental conditions such as dust or sand also show great effects.



Source: TU Ilmenau

Coatings require better adhesion properties

The gel layer that develops during the aging and corrosion process requires glass to be pretreated before printing or coating. This is a core competency of SURA Instruments GmbH.

One possibility is to silicise the surface using pyrosil technology. This involves burning a gas mixture with a precursor containing silicon. A silicate network with a high number of OH groups is formed. The result is a hydrophilic layer on which the water contact angle is reduced to values between 0 and 5 degrees. This is important for the application of lacquers or

adhesives, but it also affects the reflectance of the surface.

Digital printing, especially with organic, fast-curing inks, is becoming increasingly important. This process enables the smallest batch sizes and the highest degree of individualization. Unfortunately, organic inks are very sensitive and do not contain an adhesion promoter. A mechanical bond by clinging to the surface is usually not present in glasses. Physical bonds are always present (dipole forces, hydrogen bonding) but are not sufficient to ensure long-term adhesion. Chemical bonds, however, (covalent bonds) can arise when impurities and absorption layers are removed.

The best basis for coatings is the juvenile glass surface. Older glass must be pre-treated. Flaming is one possibility; it can clean the surface and, depending on the process, remove the cold end coating at the same time. The adhesion strength increases significantly with adhesion promoters, and the fracture pattern no longer shows adhesion failure.



Source: SURA Instruments GmbH

Better not to touch - mechanical stress on displays. Touch, swipe, and zoom not only generate abrasion but also leave skin grease, cosmetics, or disinfectants on displays. The Institute for Surface and Product Analysis (ISPA) investigates and tests the effects. Humans cannot see changes on the surface that are smaller than 40 μm. The fingertip, however, can feel changes up to 1 μm in size. The speed of the movement is decisive for the magnitude of the damage. Mechanical stress tests often do not reflect reality because they are performed too slowly.

An established standard test is the ABREX® Abrasion Test. It simulates the contact of a viscoelastic, rough, and inhomogeneous finger surface and can take into account various solids and liquids as well as temperature ranges. The contact angle of 45 degrees is particularly important. Depending on the requirements in the end application, different load levels and speeds are used. These and other test methods have been tested and further developed by the German Flat Panel Display Forum. An evaluation of the test result is carried out by measuring the contact angle.



PROPOSE CANDIDATES FOR JORMA VITKALA AWARD OF MERIT

Four years ago, at the Glass Performance Days (GPD) event in 2017, the Jorma Vitkala Award of Merit was created to recognize outstanding individual contributions to the glass industry. This award was presented to Jorma Vitkala himself as the first-ever recipient at GPD's 25th Anniversary event. Second award 2019 was given to the most known glass specialist and lecturer, Prof. James O'Callaghan. Every two years, this award will continue to be granted during each GPD opening ceremony to a new recipient who has been selected through an international nomination procedure.

“While the highlighting and personification of the award is a very concrete and effective publicity step, we wish to underline that it is for the common good and progress of the glass industry that the award is instituted,” Hautekeer says. “Continued innovative progress and bold new solutions will keep the applications of glass at the forefront for designers, industries and research institutions, and provide us with effective competitiveness in the choices of materials and solutions for building,

automotive and interior decorating. This award is our special tribute to leading contributors in the development of the glass industry.”

Nominations for contributors that made a significant impact on the development of the international glass industry are welcome from the public until end of June 2021 through a simple on-line submission process. A simple description of the nominee's relevant merits and contributions is required.

Nomination form for candidates:
<https://events.gpd.fi/event/mbpG0>

A nomination committee composed by the Glass Industry International Press will select the winner based on approved criteria at the end of summer 2021. The final decision on the winner of this year's award will be made by secret ballot among the nomination committee. Jean-Paul Hautekeer, chairman of the committee, will count the votes. The recipient of the JVAM 2021 will be announced at the GPD 2021 Opening Ceremony.

Digital Twin: Project by HEGLA & Lenze



HEGLA New Technology stands for innovation projects

HEGLA is a well-known supplier of machinery and software for flat glass processing. In order to meet the requirements of future markets, the possibilities of digitalization and, for example, new processes for functionalizing and structuring glass surfaces, the company founded an innovation center: "HEGLA New Technology". The focus here is working on new solutions and innovation projects, away from day-to-day business with appropriate freedom.

"As a machine manufacturer we are driven by our daily business. We have every machine in our catalog, but rarely the standard machine is sold. To be a powerful, sustainable partner to the European glass industry HEGLA needs to be able to produce batch size 1 very efficiently", says Dr. Markus Schoisswohl, CEO at HEGLA New Technology.



Asset Administration Shell for the Digital Twin
At the SPS 2019 he ran into Markus Kiele-Dunsche, who is Innovation Manager for Engineering and Automation at Lenze. Back then Lenze presented its approach to realize a Digital Twin with the Asset Administration Shell and Markus Schoisswohl, searching for applications of the shell was totally enthusiastic about the concept.

His thoughts were: What if I could get all relevant machine data fully automatically? That would be amazing, wouldn't it? Then I would reduce the effort I had before to virtually zero. Said, done.



Data integration without effort

"And that's exactly what we've done," he explains. "We have created an application called Shopfloor Assistant, which is intended to support production in the glass industry. Here we integrated Asset Administration Shell with Lenze's help. Markus Kiele-Dunsche recaps the approach: "It took about a month, with some online meetings. And then the whole thing was up and running. HEGLA had built a mechanism that allowed automatically to integrate information of the Asset Administration Shell. The implemented Digital Twin has proven its worth."

Complete structures including passive AAS parts could be integrated automatically. The benefit: Normally you would have to create the structure and content manually and if we imagine a complex machine structure, with 100 to 150 items, from different suppliers with different data structure, the effort for data integration which is normally tremendous reduces to nearly zero.





Edgetech Europe GmbH has a reason to celebrate **10 years of Super Spacer® production in Heinsberg, Germany**

When Edgetech I.G. Inc. introduced the silicone-based warm edge spacer system Super Spacer® to the American market in 1989, it was three years before the climate summit in Rio de Janeiro and long before energy-saving technologies and sustainable building became omnipresent topics. Double insulating glazing with low-E coating was the measure of all things in thermal optimization of windows for the mass market in those years.

"Edgetech recognized the importance of energy efficiency as a market driver for window technology at an early stage.



The metal-free, silicone-based Super Spacer spacer was a huge milestone and remains one of the leading products in terms of energy performance today," explains Joachim Stoss, Managing Director of Edgetech Europe GmbH and Vice President International Sales at Quanex. "Super Spacer is a major contributor to the Edgetech/ Quanex Group being the world's largest spacer manufacturer by combined sales," Joachim Stoss added.

At the beginning of the new millennium, energy-saving thermal insulation glazing, and premium windows developed into a relevant industry sector, especially in Northern and Central Europe, with corresponding growth potential for Warm Edge. So, it was only logical that Edgetech, now a subsidiary of the Texas-based Quanex Building Products Corporation, opened a sales and distribution office on the

European continent in 2004 to complement its production facility in the UK. Initially, a team of three, together with the sales force, looked after the European market from Neuss.



From a central location in North Rhine-Westphalia, the company maintained contact with leading insulating glass manufacturers and expanded its business. Then in 2011 came the next logical step: the establishment of a second production plant in Europe in Heinsberg near Düsseldorf. Today, several Super Spacer® lines run around the clock on the 12,000 m2 site. Due to the steadily growing

demand for flexible spacers, on-site capacities are constantly being expanded. Super Spacer® TriSeal™ Premium Plus, the spacer for manual processing, is produced exclusively in Germany for the entire global market.

"The potential for our flexible spacer is far from exhausted," explains Johannes von Wenserski, Prokurist of Edgetech Europe GmbH. "Insulating glass production is currently changing at a rapid pace. Automated processes are the new normal. Super Spacer supports the idea of lean manufacturing without sacrificing quality. And modern

glass architecture demands the greatest possible individuality as well as flexibility in glass structures, formats and shapes. A whole series of our prestigious projects worldwide would not

have been possible without Super Spacer - at least not within the given budget and time frames. We are very proud of this."



Joachim Stoss, Managing Director of Edgetech Europe GmbH and Vice President International Sales at Quanex.



Johannes von Wenserski, Prokurist of Edgetech Europe GmbH.

RCN Solutions: CT80S small-scale kiln, same performance as the big ones



The glass market is going bigger in size and the RCN machines also follow these requirements.

Chemical tempering of the glass has been recently reconsidered for those applications that seemed out of reach because not in line with the market trends.

The glass market is going bigger in size and the RCN machines also follow these requirements while keeping an eye on very small sizes too, as these are not less important or

negligible, indeed they are part of the countless possibilities the chemically tempered glass responds to.

The CT80S, max glass size 130x130mm or 250x130mm and tank capacity for 15Kg of potassium, is suitable for both laboratory tests and for the optical industry.

Although compact and for limited production, CT80S includes all the features to assure an excellent chemical tempering, a precious example of small but mighty that has charmed the R&D department of some international companies, as well as lens-manufacturing companies. Yet, one important element is not often fully pointed out when the subject of chemical tempering is on the table: the role of the potassium.

While it is clear the machines cannot work without potassium, its quality is a crucial matter for a good tempering result.

No matter how performing is the chemical tempering machine, if the potassium is poor quality, the specifications of the final product will be much lower than expected.

RCN SOLUTIONS supplies a hundred per cent pure Potassium Nitrate, as per RPE analysis that is provided with every lot of salt delivered. Potassium free from impurities, facilitates the ion exchange, the temper penetration, the bath temperature uniformity and tank longer life. Differently, potassium containing impurities, such as metals, compromises the quality of the final product.

Once again, RCN reveals to be a quality-driven company.

Ecological and economic flagship project in Denmark

Super Spacer® installed in the BaseCamp Lyngby

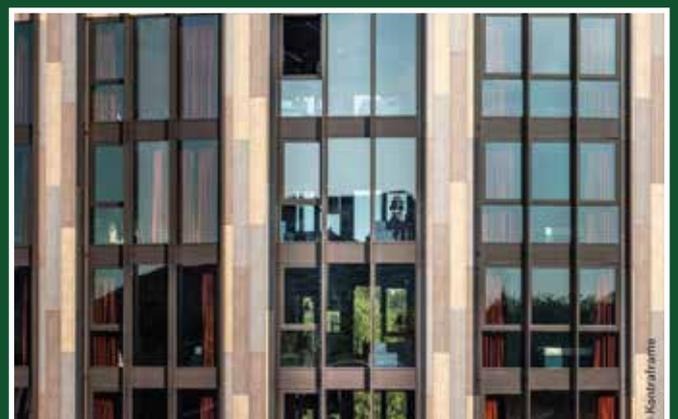
Affordable architecture is one of the most pressing concerns of our time. However, the issues of sustainability, energy efficiency, land sealing, recycling management, comfort and social integration are contrary to the economic demands. Lars Gitz Architects and BaseCamp Student pulled off the remarkable feat of combining these complex requirements within a spectacular, multi-award-winning student residence. Serial, modular construction, low-cost, recyclable facade materials, renewable energies and near-natural building greenery and seepage areas were the key to success here. One of Scandinavia's leading glass processors, Glaseksperten A/S, has contributed towards the realisation of the ambitious building concept of the BaseCamp Lyngby on several occasions: Automated production of the insulating glass units, varying direction-dependent glass construction and use of the warm edge spacer system Super Spacer® T-Spacer™ Premium Plus.

Record-breakingly fast, sustainable and economical

The running track on the roof of Google's new European headquarters in London will be used for the first time in 3 to 4 years at the earliest. The residents of BaseCamp Lyngby, built on a 41,000 square metre site, were able to don their running



shoes as early as August 2020: a park landscape was created on the green roof of the extensive student residence complex in northern Copenhagen using a system of biodiverse planting, urban gardening areas and an 800-metre-long path that can be used for walking or jogging as you please. From the flat terrain, it winds its way up six storeys above the organically shaped building back down to the starting point while enclosing cosy inner courtyards and a circular community centre in the process. The facades are reminiscent of tall trees and forests by virtue of the vertical arrangement of the panels in three different shades of oak wood as well as the line of windows, and in just the same way as the entire complex they blend harmoniously within the surrounding nature. The project developer, BaseCamp Student Nordics, a part of the Europe-wide BaseCamp Group, deliberately wanted to give something back to Lyngby Municipality and enter into dialogue on social and environmental aspects. The roof is therefore open



to the public to provide meeting areas.

The construction time for a project of this size is impressive. The 786 flats, including 639 student flats and 48 senior flats, were completed near Lyngby University of Technology within the space of two and a half years. The building was also intended to be no less spectacular, but one aspect distinguishes BaseCamp Lyngby from many other major projects: Ecology and economy determined the architectural concept equally.

Modules as the basis of architectural aesthetics

In order to meet the estimated construction costs of around € 75 million the Danish firm of Lars Gitz Architects designed a trapezoidal module that is repeatedly rotated by 180° and stacked at different heights to create the gently rounded structure. The outer skin also constitutes a model example of cost-efficient construction. The ventilated curtain wall is insulated with rock wool and clad with slabs made of pressed volcanic basalt rock from Rockpanel. With a weight of 8.4 kg per m², the extremely light material can be cut to size on site and simply attached to the substructure.

The facade panels with their natural wood look almost entirely consist of natural volcanic rock and recycled rock wool and can be repeatedly reused in line with the idea of a circular economy. This makes the facade one of the pillars of the sustainability concept, which has been awarded BREEAM Very Good certificate (equivalent to the DGNB certificate in silver). The energy-saving green roof with the photovoltaic modules serves as a form of thermal insulation, an energy provider and natural air conditioning. The rainwater that is captured is returned to the natural water cycle via evaporation, which consequently relieves the burden on the sewage system and lowers the ambient temperature.

Energy-efficient windows with warm edge spacers

The aluminium windows with triple glazing also form part of the overall concept. As is so often the case in Scandinavian architecture, the BaseCamp studios and communal areas are glazed down to floor level to allow as much daylight as possible into the room even during the winter. The Danish





insulating glass manufacturer Glaseksperten supplied 4,000 insulating glass units packaged in sizes of up to 4.011 x 1.127 metres to the construction site in accordance with a meticulous logistics plan. Due to the organic shape of the building, the glass structures change according to the direction. Depending on the heat input and amount of light, solar control glass, thermal insulation glass or clear glass with varying coatings and glass thicknesses were used. Glaseksperten opted for Super Spacer® T-Spacer™ Premium Plus in various widths as the warm edge spacer system. Sales Manager Jesper Hønning declared: "An ever increasing number of our customers wish to install energy-efficient windows. We consistently use low-emission thermal insulation glass and solar control glass combined with non-metal warm edge spacers in order to avoid thermal bridges and optimise the heat transfer coefficient." At the company's headquarters in Hjørring, an ultramodern, automated IG line is available for the production of insulating glazing for sizes of up to 3.2 x 6 metres. "Super Spacer is of key importance to Glaseksperten in supplying quality products which also ensure we are a leading company in economical and ecological terms", Hønning went on to say, "the fully automated continuous application of spacer from the reel saves time and money and guarantees top class product quality that is reproducible." Joachim Stoss, Managing Director of Edgetech Europe GmbH and Vice President International Sales at Quanex added: "Northern Europe is a global pioneer in the field of climate protection and therefore one of the growth markets for warm edge products. Of course, we are extremely proud that our Super Spacer system has been installed in another Scandinavian flagship project".



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FIERA MILANO

GIMAV AT CHINA GLASS 2021

Italy's foremost glass processing technologies center stage in Shanghai

May 6th to 9th 2021, the Shanghai New International Expo Centre (SNIEC) will be the setting for the latest edition of China Glass, the Asian glass industry trade show for the flat and hollow glass machines and accessories and processed products industry.

Now in its 31st edition, the show traditionally takes place in odd-numbered years in Beijing and is held in even-numbered years in Shanghai. However, because the 2020 edition was postponed due to the global pandemic, in 2021 Shanghai became the designated location for two years in a row.

"Each year, GIMAV, in partnership with ITA (Italian Trade Agency), offers participation to its member companies," remarked GIMAV Director, Fabrizio Cattaneo. "The participation of Italian companies, a high-quality presence, sends a powerful message to the international community, asserting the significance of the industry's Made in Italy products. Despite a lackluster year due to the Covid crisis, the Asian market remains one of the strategic business partners for Italy's glass industry, especially for hollow glass. In 2020, it was still the export destination for glass technologies to the tune of almost 60 million euro. Participating in an event like China Glass, one-on-one with existing and potential clients, is a valuable opportunity to strengthen existing relationships and build new ones with local businesses." GIMAV will be on hand with VITRUM and ITA with an institutional area (N1-159) that will offer, among other things, informative and promotional

materials on the latest innovations at the "Salone del Vetro" from October 5th to 8th in Milan.

Specifically, it will promote Glass Week, four days of events in Milan dedicated to glass and sustainability; VITRUM Life, the new portal that keeps the spotlight shining on the show year-round, with news from exhibitors and interesting facts about the world of glass; and the Glass Is... The Qualities of Glass project, that extolls and showcases the unique characteristics of glass attributable to the many special properties of the technologies that make its production possible.

GIMAV MEMBERS AT CHINA GLASS 2021

Ten member companies are participating in China Glass – between direct exhibitors and group participants – in a total area of about 360m². Following are brief preview presentations from the Italian companies exhibiting at China Glass.

BDF INDUSTRIES S.p.A. (stand N1-136)

BDF Industries is the perfect partner to guarantee reliable, professional support for all hollow-glass production technologies. For more than 50 years, the company has engineered ultra-high-level components to meet glass industry needs. And now, thanks to its vast experience and constant focus on the needs of its customers, BDF Industries designs and manufactures technologically state-of-the-art IS machines, melting furnaces and spare parts, and provides high-level technical support. In addition, the company's portfolio includes various solutions for exhaust gas energy recovery, pollution abatement and a cutting-edge industrial

automation department, recognized as one of the top-four largest suppliers of engineering solutions and equipment around the world. You will find BDF Industries at China Glass, in stand N1-136.

INTERMAC S.p.A. (stand N1-219)

Intermac's Industry 4.0 experience will be on display at China Glass with cutting-edge solutions that have consistently served as the standard for innovation in glass processing operations. In order to strengthen its business presence, flexibility and understanding of customer needs and support, Intermac will showcase its hallmark technological expertise at Shanghai. Located in – HALL 1, STAND 219 – it will focus on the two icons that best represent Intermac and Italian excellence: the Master 33.5 machining center and the GENIUS 37 CT-Red cutting table. The Master 33.5 is a machining center for processing glass typically used in the furniture, automotive, construction and household appliance manufacturing sectors. It is the ideal solution in terms of performance and productivity, suitable for high-speed processing of small and large production batches. Its legendary GENIUS 37 CT-Red glass cutting technology is a high-performance cutting table for float glass that is perfectly capable of working on cutting lines over two or three shifts.

ELETTROMECCANICA BOVONE S.r.l. (stand N1-139)

Bovone is the gold standard in the glass industry when it comes to quality and innovation. Its vast product line includes both stand-alone machines, such as straightline edgers, bevellers and washing

machines as well as complete systems, such as laminated glass lines, silvering lines and robotic integrated systems for loading and unloading edgers and bevellers. Bovone agents at China Glass are fully prepared to advise customers about the broad spectrum of solutions available for all their needs.

C.M.S. S.p.A. (stand N1-123)

CMS Glass Technology will take part in China Glass 2021 (Booth N1-123). A leader in the field of curved and flat glass processing, CMS manufactures technologically advanced solutions, such as CNC machining centers, cutting tables, and water-jet cutting systems. Thanks to its deep-rooted knowledge and expertise, today CMS Glass Technology is a highly respected player in this sector for the manufacture of innovative solutions dedicated to architecture and interior decoration.

HELIOS ITALQUARTZ S.r.l. (stand N1-129)

Even in this challenging year, Helios Quartz will be present at CHINA GLASS to showcase its quality solutions with infrared and UV technology for the glass industry. Among the highlights this year are its FULLY AUTOMATIC COMPACT VERSION TIN SIDE DETECTOR, that helps ensure – directly on the production line – that processing is done on the “air side” of glass sheets and the MEDIUM WAVE FAST RESPONSE and MEDIUM WAVE MEDIUM RESPONSE infrared lamps, complete solutions to improve screen-printing and digital printing on glass.

ITALCARRELLI S.p.A. (stand N1-131)

ITALCARRELLI® is a world leader in the design and manufacture of specialty

machines and solutions for merchandise storage and handling. Thanks to its many years of experience in the glass industry, the company has acquired remarkable knowledge in this field and, by investing in research into innovative solutions, it provides its products to the leading glass manufacturers and processors around the world. Visitors to the company stand at China Glass will receive information on the product range: platform transporters, inloader transporters, multidirectional side-loaders, special equipment for glass handling and trucks for glass handling inside closed top containers.

NEPTUN S.r.l. (stand N1-130)

NEPTUN S.r.l. produces 3 completely innovative product lines covered by numerous patents.

The straightline edging machines, vertical and horizontal washing machines and vertical NCs for drilling/grinding offer a wide range of solutions and can be fully integrated, thanks to the range of anthropomorphic 'Bravo' series glass handlers.

Neptun machines are at work in the top-rated glass factories in the world. The company will participate in China Glass to provide visitors with all the information they need.

OLIVOTTO GLASS TECHNOLOGIES S.p.A. (stand N1-122)

Olivotto Glass Technologies (OGT) has been a major player in the field of hollow glass since 1946.

Research, innovation and ongoing technological development have enabled the company to maintain market leadership in its primary sector, becoming the largest supplier of machines, systems and solutions for hollow glass, as well as achieving excellence in pharma packaging, thanks to its

tubing lines for neutral glass tube production.

Moreover, during the last decade OGT has developed, engineered and manufactured complete plants and equipment for the production of glass and rock wool and, more recently, equipment and assembly lines for PV-modules as well.

OGT will be present at China Glass 2021.

PNEUMOFOR S.p.A. (stand N1-138)

As a leading supplier of vacuum and compressed air systems for glass production, at China Glass 2021 Pneumofore will introduce its latest innovations for the glass industry with a focus on the air-cooled UV Series vacuum pumps, designed to fit the specific centralized vacuum needs of glass manufacturing, and its A Series air compressors, with up to 630 kW and pressures from 2.5 to 10 bar(g). The company develops and manufactures rotary vane machines that deliver high reliability and durability over decades, outstanding energy savings and the lowest life cycle cost in the market.

STAR S.r.l. (stand N1-137)

With more than 40 years of experience in developing technological and process innovations, STAR is recognized as a global leader in technologies and solutions for the automotive glass industry, and it will exhibit at China Glass 2021.

STAR designs and manufactures customized turnkey systems that cater to the specific needs of its customers. The company's highly skilled in-house staff provide processing solutions for the production of both laminated and tempered automotive glass, for the cold end of float glass production and for the ceramic glass industry.

Carey Glass buys 2.500 milestone 'EASY-LIFTER' from Glaston



Independent glass processor, Irish based Carey Glass, has recently made investments in Glaston technology with the purchase of an EASY-LIFTER handling device. The sale of the 2.500th EASY-LIFTER machine is a milestone for Glaston, with the foundation for this success originally laid by the former Armatec company and then continued under the former Bystronic glass brand and finally under Glaston now.

With an impressive 1,000,000 sq.ft production facility that boasts 12 insulating glass (I.G.) lines and 12 tempering ovens, Carey Glass has been pushing the boundaries of what's possible with glass for over 55 years. The company processes 14,000 sq ft of glass every day, so it is essential to be able to move the various glass types with ease.

The Glaston EASY-LIFTER enables an operator to carry flat glass quickly and easily, having rigid guidance and its own low dead weight. Movement is light as a feather which reaffirms why this is one of the most popular products in the UK glass processor's portfolio.

For this EASY-LIFTER investment, the rigid load guidance is already proving a great advantage on the production floor, as the glass can always be suctioned with its lower edge being completely horizontal when hanging in the

air. Handling glass safely and accurately is essential, particularly in such large premises as those at Carey Glass. Minimum operator intervention is required with adjustable lifting speed and all vacuum creation handled by the powerful Venturi nozzles, where each pad has a secure, self-holding system.

Time consuming readjustments to the insulating glass units have now been eliminated at Carey Glass, with fast, flexible and safe glass transportation incorporating ergonomic and economic aspects via this device.

As the EASY-LIFTER can easily rotate, tilt, incline and turn glass on the production floor, it guarantees safe and flexible handling for the operator. Furthermore, it can feed and remove glass units for I.G. sealing, tempering furnaces, pane turning or screen printing.

Carey Glass is focused on customer care, ensuring that only the best quality products are supplied, on time and with excellent technical support. The company is proud of the reputation it has established over the last 55 years, with a large number of national and international key companies who carry out large commercial projects. In addition, for those requiring products for smaller refurbishment projects the company will happily work with smaller fabricators and manufacturers to provide complete solutions across the sector.

The Company's commitment to providing the best processed glass available means they continually invest in the latest machinery, regularly and

thoroughly test their processes and maintain standards of quality that exceed all industry requirements.

For Glaston, the 2,500th EASY-LIFTER is a milestone. This is a perfect partnership, with Carey Glass and Glaston sharing the same corporate ethos - to provide the right solutions, time after time, that will exceed customer expectations.

For Glaston as one of the most technically advanced glass machinery suppliers in the world, this ensures that customers can meet the needs of a more demanding and ever-changing glass market.

Evelyn Carey, at Carey Glass comments, "As we have total in-house control of the quality and delivery requirements for each customer's project, we have to invest in reliable equipment and machines that meet our needs. Handling such high volumes of glass means that we must keep production methods as simple as possible where necessary without losing any of the guarantees. As we process all glass types in-house, with a highly qualified and experienced team, the EASY-LIFTER greatly simplifies handling for them.

We are also thrilled to be part of Glaston's production story, having purchased this 'special' EASY-LIFTER - it certainly is proving its worth."

For further information, please contact:

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Building Our Skills embark on a recruitment drive with a difference



Building Our Skills – make a difference, make a pledge and commit to inspiring the future

Building Our Skills – Making Fenestration A Career of Choice (BOS) has embarked on a recruitment drive with a difference ‘highlighting the need for the industry to come together and eliminate its ever-growing skills gap’.

Continuing to build on its key objective, heighten awareness of the Fenestration industry to new and young people, the organisation is encouraging individuals from the industry’s community to make a pledge by signing up and committing to its ‘Inspiring The Future’ campaign.

The campaign, which focuses on recruiting volunteers from within the Fenestration sector is supported by FENSA, and will highlight the work of many of its existing campaign supporters over several social media channels, whilst looking for new recruits.

Stephanie Tague, Head of BOS commented: ‘In order, to attract new talent, we need to promote our industry positively and encourage more youngsters to contemplate the Fenestration

industry when considering their career options.

‘Each one of us has a story to tell, whether you are an Apprentice or a Chief Executive, no one is exempt and the campaign helps set out how by committing to become a volunteer, a champion, an ambassador or an advocate of Building Our Skills you will be making a real difference, raising the industry’s profile amongst the younger generation.’ Stephanie adds.

Committing to being involved with the ‘Inspiring The Future’ initiative, means you will be asked to pledge your support – either as an individual or a business. There are many different activities in which supporters can get involved, including signing up as a volunteer and chatting to young people, sharing with them information about the industry, job roles and career choices.

‘Building Our Skills has created a variety of useful resources for those looking to help take those first steps on spreading the Fenestration word.’ Stephanie continues, ‘We have produced a series of videos and guidance documents all free to use when visiting schools or engaging with young people.’

For those passionate about making a difference in attracting new and young people to address the industry’s skills gap, or just needing a little extra encouragement for how they could get involved and commit, contact Stephanie directly on 07789 344479 email Stephanie@buildingourskills.co.uk and don’t forget to like, comment and share our posts on LinkedIn @buildingourskills, Facebook @buildingourskills, Twitter @BOSFenestration

A+W on the path to Industry 4.0



A+W SmartFactory controls high-tech glass production

When moving Vetrotech production from Aachen to Würselen, A+W implemented one of the most demanding software projects in its company history. Would it work? New hall, highly automated new machines, new software?

Guido Plum, Operational Director von Vetrotech: "The construction of automated production in Würselen was a challenge for all participants, for what we were planning had never been done in the 20-year partnership between Saint Gobain and A+W. For the software, we relied on A+W, even though we knew that a brand-new system would be used – fair and successful cooperation on a level playing field across 2 decades and A+W's sophisticated SmartFactory concept made the decision easy for us."



Guido Plum, Operational Director Vetrotech

Today A+W SmartFactory, a state-of-the-art production system, automatically controls the highly complex production of fire protection and safety glass in Würselen.

For the first time, multi-level production with backward planning is controlled by intelligent software throughout – without paper, lists, and long routes to travel – based on an A+W patent with an automatic sorter before and after the tempering furnace. Even now, the new system ensures faster throughput times, which is especially clear on the TPS insulated glass line, in LAMI production, and on the tempering furnace.



Dennis Tiegs, COO A+W Clarity: "The special thing about A+W Smart Factory is the scalable deployment, which helps the smaller operations to become large and the large operations to automate further! The advantage of the lean production approach is taken here right from the start."

A+W SmartFactory is the

top-level production system that coordinates the process flows for an optimized glass flow. The system is in a position to responsively control all coupled machines and software modules with the production data provided. Machines communicate constantly with the system via so-called A+W SmartFactory clients; this enables the control of machine status and machine capacity.

According to the principle of backward scheduling, the dispatch requirements and thus ultimately customers control the production sequence. Planning is done in real time and can be adjusted at any time in the future if this should be necessary for rush orders, capacity bottlenecks, machine failures, etc.

Dispatch generally doesn't even notice this, so it's almost always possible to make on-time deliveries. Vetrotech customers profit from improved performance and delivery reliability.

The intelligence required for this lies only in the software that controls the communication between machines, and also between machines and human beings: a new industry standard on the path to Industry 4.0, which is optimized constantly by the expertise that flows from our pilot customers.



Cutting control with A+W SmartFactory

The implementation phase went very well thanks not least to the engaged commitment of the Vetrotech project group. With enormous efficiency, they tackled the project together with the A+W planners, bringing it to a successful conclusion.

Guido Plum comments: "Despite the problems that are inevitable in such projects, the implementation phase created a win-win situation. We got to know the new software in great detail – our compliments to our colleagues at A+W, who helped with the project on-site! At the same time, we were able to shape and improve A+W SmartFactory with our specialized knowledge from the very beginning – to the benefit of both sides."



The performance of the LAMI production has increased significantly thanks to the use of software-controlled sorters: practical effects of clever automation.



Less-automated companies: the Osby Glas project

If there are no possibilities for direct machine communication, A+W SmartFactory clients function as imitation machines that can determine status and capacity per machine thanks to the integrated plant data collection. A control center provides the production manager and the general management with a wide variety of information from A+W SmartFactory, and if necessary, allows them to intervene directly in production, e.g. with the manual adjustment of production chains.

In less automated production, A+W SmartFactory controls the employees' activities first and foremost.

This way, even less-automated companies can profit from this development. First and foremost, in such production facilities, A+W SmartFactory regulates employees' activities and informs in real time about necessary production steps and

changes to the production process. Here too, precisely that is produced what is needed first in dispatch; rush orders are integrated without a problem, WIP (work in process) is reduced a great deal.

The Swedish insulated glass manufacturer Osby Glas pilots this variant of A+W SmartFactory, which eliminates paper in production and guarantees shorter delivery times. Joel Rosenqvist, CEO of Osby Glas: "We have been working with our software partner A+W for many years. In this time, we have worked together to implement many innovations that have made our processes better and better. That's why we're happy to pilot the new production software A+W SmartFactory and we believe that it can make Osby Glas still more successful. We're proud to be able to use our knowledge and experience to contribute to the enhancement and continuous improvement of this software."



Joel Rosenqvist (right), CEO Osby Glas; Pontus Levin, A+W Director Sales North-East Europe – EMEA / APAC.

www.a-w.com

Rooftop terrace made for stargazing - Academy Museum of Motion Pictures



The glass rooftop dome of the project required the superior structural capacity found in Saflex® Structural (DG41) PVB interlayers instead of standard PVB interlayers.

Designed by Renzo Piano

Rooftop terrace made for stargazing

Academy Museum of Motion Pictures, Los Angeles, California

The Academy Museum of Motion Pictures in Los Angeles is as unique as the industry it represents. And because one part of the brand-new museum—the sphere—has a glass rooftop dome, it required the superior structural capacity found in Saflex® Structural (DG41) PVB interlayers instead of standard PVB interlayers

In a town where glamour and glitz are practically a requirement, the giant glass sphere sparkles appropriately. The museum gives visitors a behind-the-scenes look into how films are made while celebrating the power of the movies. Hollywood superstars Steven Spielberg and Tom Hanks helped spearhead the project. And its designer, “starchitect” Renzo Piano, is as well known as many of the actors celebrated inside the museum.

Designed by Renzo Piano Building Workshop in Genoa, Italy, the Academy Museum is housed in the historic May Company Building (now called the Saban Building) in Los Angeles. Glass bridges

lead to the glass dome, designed for viewing the stars—both the Hollywood and celestial varieties. Located in the lower half of the sphere is the 1,000-seat David Geffen Theater. The all-glass top half of the sphere resides over a rooftop terrace with jaw-dropping views of Los Angeles and the Hollywood Hills.

The dome design required careful attention to material selection and design detail and lasted several years. Knippers Helbig Advanced Engineering designed a unique “shingle” system to accommodate the complex geometry and high load requirements of the dome.

The glass rooftop dome consists of a single-layered, braced steel structure covered in shingled glass panels—two panes per grid. They were manufactured with Saflex Structural (DG41) PVB interlayers and installed by Permasteelisa North America. While the inner glass pane is supported by an invisible, custom dead-load pin connection, the outer glass pane is supported by the interlayer—making a stiff interlayer essential. Due to Saflex Structural’s strength and rigidity, the engineers found that it met both requirements.

Since the glass edges are exposed to varying weather conditions, Saflex Structural helps protect against delamination, preserving the dome’s beautiful appearance. It can also be combined with other Saflex PVB interlayers without any negative visual impact, which also contributes to the dome’s clarity. Low-iron glass without a coating created the final effect.

Because Los Angeles is earthquake prone, the dome’s superstructure is supported by base isolators, which allow the structure to move by up to one meter during the swaying and racking that occurs in a seismic event.

With the collaboration of some of the best architectural and engineering minds from both Europe and America, the motion picture industry will be celebrated for years to come.

CareyGlass Helps Create Luxury Accommodation For All Seasons In Halifax, Nova Scotia



Tall buildings clad almost entirely in glass have some significant advantages. They afford their occupants a spectacular view of the surroundings, and their interiors also tend to be filled with glorious natural light, dawn till dusk.

But, without careful engineering, these benefits can come at a significant cost – especially in locations with extreme or variable climates – and that is maintaining a steady interior temperature throughout the changing seasons.

This was exactly the challenge faced by the designers of The Jade, a new mixed-use development in downtown Nova Scotia, Canada.

On its first two floors, the building maintains its much-loved 1920s art deco façade, behind which commercial shopping units will be housed. Above this, however, is a fully glazed 11-storey tower that rises to take its place in the Halifax skyline.

While winters in Halifax drop well below freezing – the lowest temperature ever recorded was

-25°C and winter temperatures often reach -8°C – its summers often reach 30°C, so the glass on the building had its work cut out regulating the internal temperature.

The architect turned to the Pilkington product portfolio and chose to deploy Pilkington Suncool™ 50/25, a solar-control glass that helps prevent excessive heating during the warmer months.

It works thanks to a cutting-edge multi-layered coating that lets in just 25 per cent of the heat energy in the sunlight, while still permitting 50 per cent of the visible light to enter the building, with no change to its natural colour balance.

The result is an interior that is filled with daylight and unobscured views, but which won't cost the earth in air conditioning.

The other key part of the glazing's job is to keep residents warm during the cold winters, which it does well thanks to its excellent low-emissivity performance. This means that rather than allowing heat to radiate away from the interior, the glass reflects it back into the building, helping to save on heating bills and creating a comfortable living space all year round.

Being clad in 1,400 insulating glass units each 1.2m by 2m in size, The Jade stands out among the buildings of down-town Halifax, in which wholly glazed buildings are very unusual.

Michael Carew, north American sales director at CareyGlass said: "While the climate in Halifax is by no means extreme by Canadian standards, it certainly experiences cold winters and warm summers, and the technology in the glass will make a big difference in limiting the cost of keeping the building comfortable for residents throughout the year.

"The project is a real head-turner thanks to the glass. There is nothing like this building downtown and the glass really sets it apart from the existing architecture. Halifax is now starting to build a distinctive skyline, and The Jade has made a significant contribution, which will be admired by locals and visitors alike long into the future."

Jason Eggerton, specification sales manager Pilkington UK, said: "The architectural aesthetic of The Jade makes it truly stand out in its surroundings. However, to make sure it also functions successfully, the right choice of exterior materials was essential.

"Pilkington Suncool™ not only looks great, it also plays a vital role in helping control the internal temperature of the building, ensuring it's comfortable for residents and energy efficient year-round."

Project: The Jade, 1595 Barrington Street, Halifax, Nova Scotia, Canada
Client: 1595 Investments Ltd
Main contractor: Flynn Construction
Architect: DSRA
Glazing processor: CareyGlass

Jobs, Automation, and Software | A+W



How can automation help glass and fenestration fabricators meet growing demand?

Many flat glass and fenestration companies are struggling to find qualified employees or employees interested in working in the industry. People have suggested trade schools, bonuses, work-release programs, upskilling, and other ideas. Maybe we are missing an important selling point about our industry? Technology! Our industry is exciting requiring daily interaction with advanced machinery and software systems. If we cannot quickly recruit more/new tradespeople to our industry, what other options do we have?



Automation (a.k.a. Automotive Industry 4.0), at its core, is the reduction of human intervention during a given process, such as fabricating flat glass or a window. Automation allows

factories to operate with fewer skilled employees, while producing the same or more product than before. Robots are an obvious example of automation, especially for more repetitive jobs, as they can replicate certain human movements and functions automatically without taking breaks. By automating some jobs, we can redeploy skilled employees to other areas of the factory through options, such as upskilling.

Beyond robots, advanced machinery can help companies reduce their labor needs as modern, interfaced machines can accomplish higher output without human intervention. Advanced machinery, another part of automation, employs technology to improve products or processes. When you interface multiple machines allowing them to communicate with each other, you reduce the need for a paper trail as well as human interaction/interference. This interface is accomplished through software, which is the basis of multiple advancements in manufacturing over the last several decades.

To interface advanced machinery, you need automation software, which, according to Red Hat, “is the use of software to create repeatable instructions and processes to replace or reduce human interaction with IT systems. Automation software works within the confines of

those instructions, tools, and frameworks to carry out the tasks with little to no human intervention.” A smart factory is an example of automation software on a larger scale. Within a smart factory, machines interface with each other through different processes and instructions saving time and freeing up staff for more strategic work. One central software system allows all machines to speak to each other allowing for seamless interactions.

By employing automation, whether it is at the robot, machine, or software level, we as an industry can enhance worker performance, while, at the same time, freeing up managers and other workers to focus on tasks that are more important. By some estimates, automation software can reduce your need for unskilled employees by one third and skilled employees by one fourth. Taking this to heart, how can we excite Millennials and Zoomers to join our industry? That is one of the challenges facing our industry. We need to work as a team to recruit and train the next generation of glass and fenestration skilled laborers, managers, and executives. Without them, we risk falling further behind. Until we solve that problem, how can you as a business owner employ automation to enhance the work of your employees, increase yield, and raise customer satisfaction.

A 'Prince' of glass in Milán | Tvitec



Principe Amedeo 5, glazed for Gualini, candidate for the Mies Van der Rohe E.U. Prize for Contemporary Architecture Gualini (Costim group) has used Tvitec's most advanced glass solutions to transform a historic building in Milan with great delicacy and respect. Principe Amedeo 5 uses, amongst other materials, large-scale and digitally-printed glazing to complete the Vittorio Grassi & Partners architecture studio project. The redevelopment is a candidate for the 2022 'Mies Award' E.U Architecture Prize.



“Less is more”. This is the simple way in which Mies Van der Rohe defined his work, one of the masters of 20th-century architecture. Principe Amedeo 5, one of the latest projects Tvitec has developed with the façade designer Gualini (Costim group) in Milan, is a living embodiment of this axiom. Perhaps this is why it's been

included as one of the finalists for the prestigious prize of the same name, which has been considered the European Union's official prize for contemporary architecture for the last 20 years.

The refurbishment of Principe Amedeo, which in 1850 was the headquarters of the American Consulate and has now been transformed into a modern office complex of more than 9,000 metres across five floors, works as a showroom for Tvitec's technological glass processing capacity.

Among the 1,000 metres of glazing solutions developed by Tvitec for the systems installed by Gualini, it's possible to find large-scale pieces of glass, special digital printing, and, above all, triple glazing that contributes to the sustainability of this renovated historic complex.



Whether or not Principe Amedeo wins the Mies Van der Rohe Award, the building deserves recognition for its outstanding refurbishment design, in which Gualini and Tvitec played key roles. The

triple glazing chosen for the project lets in the greatest possible amount of natural light with the least possible loss of air conditioning inside. The argon chamber, meanwhile, offers extraordinary additional advantages in terms of energy savings and sustainability.

The international coordinator of this contract at Tvitec, Ricardo Santos, highlights the role played by Gualini's professionals, and is particularly satisfied with one of the solutions provided for the project: he speaks glowingly of the large-format units of up to 5 metres in height, which stand out not only for their dimensions but also for their eye-catching digital printing. On top, the monolithic units feature high-security laminates and a solar control coating identical to that of the triple glazing.

Principe Amedeo 5, designed by Vittorio Grassi architectural studio and selected as one of the best projects completed between October 2018 and October 2020, reaffirms Tvitec's ability to meet the strict demands of such outstanding projects, where every detail is carefully studied under the focus of quality, aesthetics and environment.



Solarban® 70, Acuity™ low-iron glasses shine at revitalized Pittsburgh Produce Terminal



The Pittsburgh Produce Terminal—rehabilitated with Acuity™ low-iron glass and Solarban® 70 glass with an Acuity™ glass interior lite—is a beacon of creativity and innovation in the Steel City.

Located in the heart of the city's popular Strip District neighborhood, the Pittsburgh Produce Terminal sat vacant and ignored for decades. But today, the historic five-block structure—now rehabilitated with Acuity™ low-iron glass and Solarban® 70 glass with an Acuity™ glass interior lite—is a beacon of creativity and innovation in the Steel City.

Manufactured by Pittsburgh-based Vitro Architectural Glass, Solarban® 70 and Acuity™ glasses combine to offer an exceptional mix of transparency, color-neutrality, solar control and visible light transmittance (VLT) that made it ideal for the revamped terminal's needs.

"Playing a key role in the revitalization of the Pittsburgh Produce Terminal was a tremendous honor," said Julia Giba, manager, Vitro Concierge Program™, who worked with United Plate Glass (UPG), a

glass fabricator in nearby Butler, Pennsylvania, to supply the project. "We were able to work as a team to reserve and deliver the raw glass as it needed to be coated, ensuring a smooth, successful collaboration."

The glazing contractor was Specified Systems in Canonsburg, Pennsylvania. Antunovich Associates, an architectural, planning and interior design firm, worked with Chicago-based McCaffery Interests starting in June 2019 to return the terminal's exterior to its original condition while repairing and restoring the interior structure. Industrial wood bi-fold doors were replaced with the new commercial glass storefronts, and passageways were cut through the building to connect the neighborhood with the Allegheny Riverfront Development.

Dan McCaffery, chief executive officer, McCaffery Interests, said the goal was to collaborate with Antunovich Associates to transform the terminal into a central hub again for the citizens of Pittsburgh. "We crafted a mixed-use vision for the historic building that will restore its energy and vitality to once again make it a commercial, people-centric destination," he explained.

Due to its clarity, consistency and solar control performance, Solarban® 70 glass has become the most specified triple-silver-coated glass in the industry, with more than 300

million square-feet shipped in the past 10 years. When coupled with Acuity™ low-iron glass in a one-inch insulating glass unit (IGU), Solarban® 70 glass offers VLT of 67% and a solar heat gain coefficient (SHGC) of 0.28.

Specially engineered for vision glazings, Acuity™ glass can function as a substrate for Solarban® low-e coatings or as a highly clear glass lite in insulating or laminated glass units.

In addition to office buildings, institutions, hotels and schools, Acuity™ glass can be specified for exterior applications from luxury condominiums and mixed-use buildings to entrances and storefronts. It also is ideal for distinctive exterior applications such as atriums, skylights and spandrel glass.

The Pittsburgh Produce Terminal offers a mix of retail, dining and office space, with an emphasis on local and contemporary art. Tenants include Fine Wine & Good Spirits, District Brew Yard, City Grows and OnPar Now. The 163,500-square-foot space includes pedestrian passageways that connect to a riverfront trail.

For more information about Solarban® 70 and Acuity™ glasses, as well as Vitro Glass's full line of architectural glasses, visit www.vitroglazings.com or call 1-855-VITRO-GLS (887-6457)

Custom Laser Glass Finishing From HEGLABoraident



Laser finishing can be used to produce custom, functional and decorative glass products.

The trend towards new applications has great deal to do with changes in customer demand and the feasible options for creating greater added value.

Laser processing of custom glass products
Until recently, laser-assisted finishing in glass processing was primarily considered an aesthetic tool for creating custom glass designs. The laser printing process is used to apply a wafer-thin, scratch-resistant pattern to the glass that matches a specific template.

Additionally, when working with coated glass, the physical properties of the coating can also be used to turn it into a sample or another motif via the laser.



The developed the patented Laserbird system that can be used for single-glazed panes, laminated glass and insulated glass units (IGUs).

Laser decoating for a crystal-clear surface with no scratches

As demands become increasingly strict for structural glazing and edge decoating the laser is fast becoming a popular tool. Decoating with laser technology is extremely precise and causes zero damage to the surface.

HEGLABoraident customers use laser decoating for example, on controls for machines or to create lighting effects behind mirrors. Crystal-clear results with no scratches are guaranteed.

High-functionality smart glass
Smart glass is another area with much potential for the future. Glass products can now be produced using laser techniques including glass needed for increased permeability such as mobile communication radio waves - this is perfect for use in areas such as conference rooms and offices.

The technology can also be used to finish bird protection glass, apply site-specific sun protection or increase radar dampening in areas close to airports. There is also the option of using laser prints or coating conversion to turn glass panes into conductors, which can then be used for technical applications.



Clear markings for traceable glass and product identification
Laser technology is becoming more important for use in the identification of glass processes. In order to simplify production management and product traceability, the panes are marked with a unique, machine-readable QR or data matrix code (and often a logo) before being cut to size.

Marking the glass using the UniColor laser printing process, for example, leaves the surface undamaged and permanently bonds the marking to the pane without scratching it. Individual marking allows the entire production process to be monitored in real time and optimised using special software. Should there be any queries, the HEGLABoraident laser system makes it possible to track down the production company that made the IGU, as well as the company that installed it for end users if required. In construction projects with multiple pane suppliers, production is greatly simplified.

For more information on the HEGLABoraident range please call Paul Gibbs on 07802 655 214 or visit the website www.hegla.de

Cool as ice thanks to SentryGlas®



New ribbon-wrapped Olympic speed skating arena is cool as ice thanks to SentryGlas® ionoplast interlayer from Trosifol

Ambitious concepts often require the development of new fabrication processes. The outstanding Ice Ribbon in Beijing demonstrates what can be achieved with new fabrication techniques and advanced structural interlayers.

The Olympics has always been a festival of human endeavour, endurance, skill and athleticism, but in recent years it has also evolved in its role as a shopwindow for the host city and country.

This national-level window dressing deploys a variety of means to showcase wealth, altruism, technology and society, including traditional pageantry and icons, loveable contemporary mascots, modern mass marketing, lots of meetings, dinners & handshaking, and of course, some truly staggering architecture.

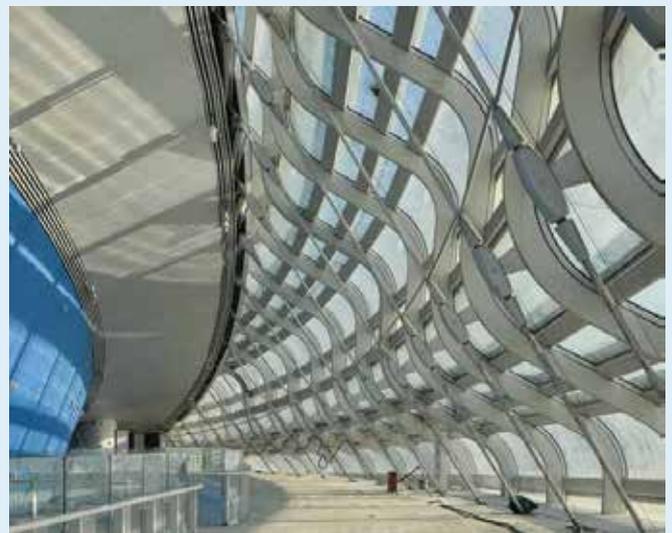
As each successive event unfolds – both winter and summer – we see designer's and architect's imaginations let loose, and structural engineers and glazing companies pushed in new and interesting directions.

The results vary from plain, almost utilitarian cubes up to some of the world's most visually dynamic architectural structures – some of which have redefined fabrication practices.

Imparting a sense of speed, the ribbons are manufactured from highly transparent low-iron glass in insulated glass units, all of which are laminated using the SentryGlas® ionoplast

interlayer from Trosifol. Image © Erqing Li

One such structure is China's National Speed Skating Oval, in Beijing, which will host the 2021 World Single Distance Speed Skating Championships and the speed skating competitions at the 2022 Winter Olympics. As one of the 26 venues being used for the Winter Olympics and built on the location of the former site used for field hockey at the 2008 Summer Olympics, the structure has been bestowed with the same significance as the 2008 event's Bird's Nest and Water Cube.



Incorporating a 400 m (1312 ft) racing track and accommodating up to 12,000 spectators, the 240 x 180 m (787 x 590 ft) Oval is cocooned or wrapped in 22 glass ribbons, which swoops around its external envelope from ground level up to its 34 m (111 ft) high roof. Designed to look like ice and to impart a sense of speed, the ribbons are manufactured from highly transparent low-iron glass in insulating glass units (IGU), all of which are laminated using the SentryGlas® ionoplast interlayer from Trosifol. The wrap effect is particularly striking at night, where the optically clear ribbons become almost dynamic thanks to an array of lighting effects.

The façade totals some 30,000 m² (322,917 ft²) and is formed of 3,484 different glass panels. The panels vary in their composition depending on their form. The flat IGUs comprise an outside lite made from 8 mm (0.3 in) glass + 1.52 mm (60 mil) SentryGlas® + 8 mm glass with a low-E coating on surface 4, a 12 mm (0.5 in) Argonfilled air gap

separates this from the inside lite, which comprises 8 mm glass + 1.52 mm SentryGlas® + 8 mm glass. All glass is low iron. The curved IGUs have the same layered format but differ by their use of 2.28 mm (90 mil) SentryGlas®. The maximum panel length is around 4,100 mm (161 in), the maximum arc length is 2,400 mm (94.5 in) and the minimum bend radius is 1,500 mm (59 in).

According to Mr. Li Chun Chao, Sales Director at Tianjin North Glass Industrial Technical Co., Ltd: “There were several difficulties in the processing of the glass in accordance with the drawings. In the early stages, we considered creating a transparent curved surface with structural glass, but this was complicated by the small radii and potential glass distortion. The aim then became how to minimize glass distortion and maximize the safety of the 4 m-long (13 ft) curved arc glass panels. Considering the installation distortion and the lower safety of hot-curved glass, it was difficult for us to improve the safety by tempering the glass; so, to solve this, we developed, tested and trial-produced curved tempering equipment, which could produce a small radius. After continuous debugging and testing we completed the equipment transformation and upgrade before the official order was placed and, as a result, we are now able to apply the heat strengthening process on small-radius glass forms, exceeding the imagination of the building’s designers and owners.”

“SentryGlas® enables us to achieve ultimate clarity and vision using low-iron safety glass,” explains Dr. Zhen Fang, Deputy Chief Architect, at Beijing Institute of Architectural Design (Group) Co., Ltd. “It eliminates the undesirable yellow or greenish tint that affects safety glass produced with other conventional interlayers. It was recommended by the façade engineer after multiple calculations. As architects, we have to pay attention to the strength and visual effects of films, and the use of high-strength film such as SentryGlas® as an inevitable choice for large-scale glass units of this type. In addition to its excellent high-clarity partnership with low-iron glass, SentryGlas® was also selected for its high strength and longevity, coupled to its outstanding post-breakage performance.”

Kuraray and North Glass have worked together on some astounding large-glass structures, including various Apple Stores and Shanghai’s new library to

name but a few. This combination of class-leading structural interlayer performance coupled to larger and larger glass-processing capabilities is steadily opening up the potential for structural and aesthetic glazing in a wider array of projects.

Events such as the Olympics tend to push the envelope in terms of building designs and concepts, often acting as a proving ground for new ideas. Following these successful implementations, somewhat overly cautious architects start to become more receptive to what can be achieved with glazing and interlayers and we are starting to see the new concepts drip-feed into other projects around the globe.



Incorporating a 400 m racing track and accommodating up to 12,000 spectators, the Oval is wrapped in 22 glass ribbons. Image © Tianjin North Glass

Architect: Beijing Institute of Architectural Design (Group) Co., Ltd Populous

Laminator: Tianjin North Glass Industrial Technical Co.,LTD

Building Owner: Beijing National Speed Skating Pavilion Management Co. LT

Trosifol is the global leader in PVB and ionoplast interlayers for laminated safety glass in the architectural segment. With the broadest product portfolio Trosifol offers outstanding solutions:

- Structural: Trosifol® Extra Stiff PVB and SentryGlas® ionoplast interlayer
- Acoustic: Trosifol® SC Monolayer and Multilayer for sound insulation
- UV Control: from full UV protection to natural UV transmission
- UltraClear: lowest Yellowness Index in industry
- Decorative & Design: black & white & colored interlayers

GLASWELT Interview with Dr. Klaus Mühlhans



Can umati lead us out of the "interface jungle"?

Under the umati (universal machine technology interface) brand, a working group of the glass technology forum of the VDMA is advancing the development, dissemination, and use of open, inter-company machine interface standards. GLASWELT asked Dr. Klaus Mühlhans of A+W Software exactly what this involves and what the significance of umati is for the OPC UA standard and its dispersion. Dr. Mühlhans leads the VDMA working group together with Dr. Markus Schoisswohl (Hegla).



GLASWELT – Why is the umati standard so important for the flat glass industry? What are the specific benefits for processors and insulated glass manufacturers?

Dr. Klaus Mühlhans – First of all: umati is not essentially an interface standard, but rather the brand for the dissemination and adaptation of the interface standard for mechanical and plant engineering. The umati community is working to make

the standards based on the OPC UA (Open Platform Communication Unified Architecture) more visible at trade shows, events, and through demonstrations. Since so many people are working together, this will mean that standards can be established much more quickly. With the underlying standards that are not developed within umati, we want to make machine communication between heterogeneous systems and superior systems fit for the future.

This way, complex production environments will be faster, more digital, and more secure. The standardization of machine interfaces according to the OPC-UA standard for which the VDMA is striving will reduce the set-up work required for these interfaces dramatically.

GLASWELT – What exactly does this mean?

Dr. Klaus Mühlhans – In networked production environments, machines and systems exchange data all the time; with controlling software, with visualization systems, etc. Today, many individual interfaces have to be written for this since most machine parks feature machines from many different manufacturers. This makes a lot of work for all participants and is a true bottleneck for Industry 4.0. What we need is a kind of USB connection that fits everyone on the network. Ideally, in the future, we will be able to network Industry 4.0 production facilities with a kind of plug-and-play system, just as

you connect a printer or card reader to your PC. In the OPC UA world, this will be achieved through the "companion specification" interface standards, which we are currently formulating especially for the flat glass industry.

"With umati, we would like to make machine communication between different manufacturers' systems and machines and superior systems fit for the future."

GLASWELT – Is the companion specification for the flat glass industry compatible with companion specifications for other industries?

Dr. Klaus Mühlhans – Wide-ranging cooperation is essential, especially when it comes to interfaces. A majority of the data to be defined or exchanged is universal and should therefore also be uniform.

GLASWELT – What does the umati community mean to A+W?

Dr. Klaus Mühlhans – umati is an interest group that is expressly open to manufacturers and customers in research and industry, for organizations and networks around the world, regardless of their industry. We would like to make our work with the VDMA and especially on the glass-specific companion specification public on a broader level in order to attract market partners who have not previously participated. umati promotes cooperation and makes it visible. That's why we are anticipating broader, longer-lasting acceptance for

the specifications we formulate. GLASWELT – What's the relationship between OPC-UA and umati?

Dr. Klaus Mühlhans – umati was established in order to promote the dissemination of standards based on OPC UA in cooperation with all participants and in particular, to make these known to end users. The OPC

Foundation disseminates and maintains OPC UA and offers a basic OPC UA certification. Today, OPC UA is the globally accepted communication technology for industrial data exchange. That's why, in the VDMA working group, we formulated the companion specifications based on OPC UA from the very beginning.

With umati, we will achieve better recognition of the specification, as well as of the companies and groups that are working on this common goal.

This interview was first published in German language in the trade journal GLASWELT www.glaswelt.com

KellGlass chooses Glaston to help add value



KellGlass has just installed its first Glaston RC Series furnace last month.

The company, located just north of Dublin, plans to use the furnace to add value for its customers in both the double-glazed glass and processing market.

Patrick Kelly, owner and founder of KellGlass Limited, began thinking about purchasing a new tempering furnace about four years ago. He had run his existing plant for the last 16 years, technology had moved on, age was catching up – and a new furnace was needed.

“We first looked at various makes of furnaces. I have

known Glaston, earlier Tamglass, over the years. The company has a really good name,” Kelly says. “They are certainly at the upper end of the market. But when making an investment on that scale, we knew we wanted the best.”

Through discussions with Steve Brammer, Glaston’s UK Managing Director, it became clear that the RC Series furnace would best suit the needs of Kellglass. The company’s business is split 50-50 between glass for the double-glass glazing business and glass for the processing market. The RC Series furnace does both.

Although Kelly had intended to purchase the new furnace earlier, the COVID-19 pandemic got in the way. He placed his order for the Glaston RC Series furnace in June 2020, and the furnace was successfully commissioned in March 2021.

The installation process went very smoothly. “The team was

very professional, very self-contained. They just got on with it,” Kelly remarks. A team of two main operators was initially trained to run the furnace with the idea that they will train another two operators as backups. Today, the furnace is already running glass for commercial sales.

Kelly’s goal is to continue developing his process over the next few years to add more value for his customers. Ireland is still a growing market with substantial potential. With the influx of people moving to Ireland and the shortage of houses, Kelly sees this trend continuing. “We’ll see good growth to fill the gaps for the next 10 years,” he says.

Kellglass began operations in Meath County, Ireland in 2005. Today, the company is one of Ireland’s leading glass processors and tougheners. References include the Dublin Airport and the Dublin Zoo.

Glass Group grows: new acquisitions and partnerships



New entries, at the end of the first quarter of 2021, are the Cappelletti and Roleri glassworks in Piacenza; Glastebo of Bologna; Quidam of Cairo Montenotte (SV).

The number of Glass Group affiliates rises to 18: the first completely independent Italian group that brings together leading glass companies with decades of experience in the transformation of high quality insulating glass units around its brand. New entries, at the end of the first quarter of 2021, are the Cappelletti and Roleri glassworks in Piacenza; Glastebo of Bologna; Quidam of Cairo Montenotte (SV).

“Glass Group’s goal is to” create a system “, through synergies and strategic partnerships, effectively designing a large supply chain hub” – comments Daniele Predari, President of Glass Group – “We are pleased to welcome 3 new leading affiliates to the group such as Cappelletti & Roleri, Glastebo and Quidam. We believe their addition also constitutes an opportunity for growth for the whole group that will benefit from their expertise and their driving force and, at the same time, will guarantee them to grow, in terms of size, know-how and as a reference point for the flat glass supply chain “.

The supply chain, in particular,

is today represented by the glass factories, with which the group has a fruitful collaboration that has lasted for years, from the main partners, the companies producing complementary products to glass for the production of double glazing (Fenzi, Industrie Pellini, Technoform) and the flat glass processing industries that are the driving force of our group, which managed to bring together actors who were linked by purely commercial purposes and who today instead share a common growth project. Glass Group is a “laboratory” that looks at the economic and production challenges that await all companies in the supply chain, from the largest to the smallest.

News also on the business partner front: with Sapiens spa, an employment agency, which joins the Glass Group business partners, the aim is to promote the employment of young people in the industries of the sector. With Sapiens Spa, Glass Group will collaborate in the creation of a training center for specialized personnel to be included in the glass processing industries with the aim of allowing young people to be able to enter companies with adequate knowledge of the material and production processes. This is a project that has a double objective: on the one hand to train specialized personnel by accompanying young people in the world of glass and on the other hand to respond to the needs of companies that increasingly need specialized personnel.

We recall that the group was formed thanks to the aggregation of 5 founders (Mornagotglass Srl, Predari Vetri

Spa, Vetraria Pescini Srl, Vetreria Romagna Srl, Vetreria Valfon Srl) and today boasts 13 affiliates (Alu vetro, Vetreria Lucana di Vetromat Srl, Vetreria Deserto Srl, Vetreria Biava, Podda Vetri Srl, Termovetro Sud Srl, Vitrum & Glass Srl, Vetreria Tacca Srl, Vetropadana Srl, Guidi Glass Srl and – precisely – Cappelletti & Roleri, Glastebo and Quidam).

Glastebo International is a young, dynamic company that looks to the future with great determination whose target sectors are construction, furniture, interior design, boating, defense, aeronautics, automotive and biomedical industry. “Glastebo International is pleased and honored to join the Glass Group and share its important ambitions and mission. – declares Tarik El Ouariti, president of the Glastebo Board of Directors – The enhancement of technologies, know-how and investments fully embraces our work philosophy and we are confident that the synergies created by this large group can effectively promote the Italian Glass Industry and the excellence of which the group is composed. << The things you really believe in always come true, believing something makes it possible >> said Sir Frank Lloyd Wright and we believe it too ”.

QUIDAM has thirty years of experience in glass processing and is established in the production of special glass for building, architecture and design. “We are extremely pleased to be joining the Glass Group. – says Matteo Ferraiuolo, Director of Quidam Srl – Our goal is to grow and to accredit our role in a constantly

evolving and increasingly competitive global market. This is why it is essential to create a system through synergies, partnerships and sharing of know-how. The strength of Glass Group lies precisely in the possibility of making its voice heard not in favor of a single company, but of an entire production sector that is increasingly strategic also in terms of sustainability and environmental impact “.

Cappelletti & Roleri is a Piacenza company active in the market segment destined for the

construction sector. “Vetzeria Cappelletti & Roleri s.r.l. is pleased and honored to be part of the new Glass Group family. We hope and look forward to continuing our growth every day to achieve new goals – explains Claudio Roleri, director of Cappelletti & Roleri – We trust in the new opportunity presented, to be able to give voice to our production capabilities and our desire to always advance. more with more news. Our motto is: “It doesn’t matter if you move slowly, the important thing is that you don’t stop” and it is thanks to the meaning of these words,

having never stopped, that today we have become part of a large group, which is believing in our work skills. Precisely for this reason our commitment will always be to be a valid support within the new team “.

In the current economic context, the companies belonging to the GLASS GROUP have joined together in order to restart with their 100 million turnovers, 22 factories and about 600 employees, which constitute a significant share of the Italian flat glass market, estimated at 880 million euros.

FGIA Releases New Document Setting Requirements for Synthetic Laminates for All Substrates



FGIA has released a new specification establishing minimum requirements for in-process quality control requirements for applicators of synthetic laminates to substrates used in windows, doors and skylights.

The Fenestration and Glazing Industry Alliance (FGIA) has released a new specification establishing minimum requirements for in-process quality control requirements for applicators of synthetic laminates to substrates used in windows, doors and skylights. AAMA 664-21, Voluntary Specification for In-Process Quality Control Requirements for Applicators of Synthetic Interior and Exterior Laminates to Substrates of: Cellulosic

Composite, Cellular Polyvinyl Chloride (PVC), Fiber Reinforced Thermoset, Finished Aluminum, Rigid and Reinforced Thermoplastic, and Wood, is now available for purchase.

“After having extracted, condensed and updated quality control requirements out of the individual substrate specifications, there is finally one universal guideline for the minimum requirements for in-process quality control requirements for in-house as well as third party applicators of synthetic laminates across all substrates used in windows, doors and skylights,” said Marco Patermann (Continental), Co-Chair of the FGIA Third Party Lamination Certification Task Group.

Previously, according to Patermann, there was no specification which addressed third party applicators, nor was there consistency in wording and requirements across the individual substrate specifications. This new document reduces duplicate

content and applies uniformly to all substrates and all applicators.

“Color demand from consumers has continued to expand rapidly in the window and door market. As a result, lamination has grown dramatically as a strong color solution,” said David Harris (American Renolit Corporation), Co-Chair of the FGIA Third Party Lamination Certification Task Group. “With that growth, the industry was ready for a revised set of in process quality control guidelines to which to adhere. Now, regardless of if you are an extruder, fabricator or third-party applicator, everyone has a single source for up-to-date processing standards that apply to all substrates.”

AAMA 664-21, as well as other AAMA documents available from FGIA, may be purchased from the online store at the discounted member rate of \$20 or the non-member price of \$60. For more information, visit FGIAonline.org.

FGIA releases 2020/2021 Industry Review and Forecast



This report delivers timely information on window, door and skylight market trends and product relationships

The Fenestration and Glazing Industry Alliance (FGIA) has released the FGIA 2020/2021 U.S. Industry Statistical Review and Forecast. This report delivers timely information on window, door and skylight market trends and product relationships. Historic data for 2012 through 2020 and forecast data for 2021 through 2023 are also included in the report. Forecasts are based on projections of construction activity as of March 2021.

Housing Starts

Total housing starts rebounded strongly after an initial COVID-19 slowdown and ended with strong gains for the year. Growth of 11.5 percent in single family starts was offset by declines of 3.5 percent in multi-family starts and 0.5 percent in manufactured housing, for an overall increase of 6.5 percent. Going forward, the overall new housing market is expected to continue to experience strong growth in 2021 driven by single family construction with an overall increase of 11 percent currently forecasted.

Residential Windows

Residential prime window volumes grew by 1.5 percent in

2020 versus 2019. The increase was seen primarily in new construction with window demand increasing by 3.2 percent while remodeling and replacement demand was almost flat with a 0.2 percent increase. The outlook for residential window demand is a significant increase in 2021 due to the continued strength of the new housing market in particular, with expectations for a 6.8 percent increase in 2021, to be followed by a 1.8 percent increase in 2022.

Residential Doors

In the residential market, 2020 new construction demand for entry doors grew by 3.2 percent. Meanwhile, entry door remodeling and replacement demand, which continues to represent a significantly larger share of total demand, grew at 1.0 percent. The total market grew by 1.8 percent versus 2019 and is expected to grow significantly in 2021 due to strong single family construction activity. 2022 and 2023 are expected to provide additional growth.

Commercial Windows

The non-residential glazing market decreased by 11 percent in 2020, with decreases across all applications. New construction shrank by 11 percent, while renovation demand decreased by 12 percent. A decline is forecast for 2021, with a rebound in 2022 and 2023.

Commercial Doors

In 2020, non-residential construction demand for entry doors shrank by 10.5 percent. Looking forward, a continued decline in 2021 is likely followed by a recovery in 2022 by 2.6 percent. After 2022, an

additional slight recovery of 0.3 percent is expected.

Residential Skylights

Residential skylights closed the year at 1,120 thousand units, or just over 1.1 million, a growth rate of 4 percent over 2019 volume. New construction skylight activity was up 3 percent, while remodeling and replacement skylight activity was up 4 percent versus 2019.

Additional Reports

Additional and more detailed information on the residential and commercial fenestration markets is contained in the FGIA 2019/2020 Study of the U.S. Market for Windows, Doors and Skylights (published in May 2020), which includes all items listed below, now including this new, latest statistical review and forecast.

- FGIA U.S. Industry Channel Distribution Report profiles the residential and non-residential market for windows and doors as it flows through the identified distribution channels.
- FGIA U.S. Industry Market Size Report quantifies residential and non-residential market volumes, both historic and projected.
- FGIA U.S. Industry Regional Statistical Review and Forecasts detail information on trends and product relationships.

The updated FGIA 2020/2021 U.S. Industry Statistical Review and Forecast, as well as the other reports listed above, are available for purchase from the FGIA Online Store.

For more information about FGIA and its activities, visit <https://fgiaonline.org>.

Vanceva PVB Interlayers at Kaleidoscope Kindergarten in Tianshui



SAKO Architects used colorful glass and the sun's movement to create a life-size kaleidoscope inside this newly built kindergarten in Tianshui City, China.

SAKO Architects recreated a magical child's toy when they designed Kaleidoscope, a newly built kindergarten in Tianshui, Gansu Province, China. Its squat shape and all white exterior create the perfect backdrop for rows of colorful glass.

Ten vibrant Vanceva PVB interlayers were fabricated into laminated glass by Shanxi Jingfeng Glass Co., Ltd for repetitive use in arches above doors and windows as well as inside on the handrails of corridors and stairs.

Recognizing the architects' intent to create a joyful learning environment, WOCA juror Ammar Al Assam says of Kaleidoscope's design, "Beautiful and playful application of colored glass makes the kindergarten look inviting, cheerful, and inspiring to the children. The proportions of the color splashes against the white envelope feel just right—and the choice of soft gradient colors too."

When sunlight shines into the school's atrium onto the central stairway, it forms colorful shadows of varying shapes. These free-flowing rainbows overlap to create a beautiful kaleidoscope effect that rotates with the sun's movement throughout the day. At night, interior lighting turns the building into a breathtaking piece of art.



AGI Case Study: Hilton Garden Inn Camden Waterfront



Glaziers cooperate on Camden's first new hotel in 50 years.

INTRODUCTION

The Hilton Garden Inn Camden Waterfront opened its doors December 4, 2020, becoming Camden's first new hotel in 50 years. Part of a mixed-use development renaissance in the city, the hotel sits adjacent to the Delaware River and a short walk to new office, retail, and entertainment venues.

Camden Mayor Frank Moran said at the opening, "Camden's revitalization is tangible, and Hilton Garden Inn Camden Waterfront will be one of the leading catalysts for our city's economic resurgence."

DESIGN-BUILD INTECH

Construction led design-build project delivery of the steel framed structure. NELSON Worldwide designed the 180-room, 122,750-square foot hotel, which features over 4,000 square feet of event space and 20 extended-stay units. NELSON customized Hilton Garden Inn standards to

achieve the dramatic facade.

COOPERATIVE GLAZING

The hotel's facade of punched windows and panels was executed through cooperation between two AGI member glazing contractors. GMI Contractors, Inc. managed the project and subcontracted the glazing installation to D&D Family Construction, LLC. D&D's owners, Dennis Bozeman and Dedarryl Washington, AGMT, previously worked for GMI and the company trusted their expertise and experience. D&D holds Minority Business Enterprise (MBE) and Disadvantaged Business Enterprise (DBE) credentials, and their minority participation supported overall project objectives.

SCOPE

GMI President Stephen Gilchrist served as project manager, while Bozeman and Washington led glazing crews. The comprehensive glazing package included 5,000 square feet of YKK storefront and curtain wall, 250 Crystal Windows aluminum windows, fixed bathroom windows with levers, two sets of automatic sliding doors, SAFTI FIRST fire-rated doors with Stanley operators and Omaha hardware, CR Laurence glass railings, Trulite glass canopies, and 10 interior lobby mirrors. Glass was supplied by Glass

Enterprises, Inc.

To accommodate outdoor gathering even in cooler months, D&D also installed a series of permanent glass partitions to shield outdoor patios from Delaware River breezes.

CHALLENGES

GMI and D&D mobilized in late 2019. "Our biggest challenge was Covid-19," said Gilchrist, explaining that the project was shut down for about a month during the earliest phase of the pandemic. When the site reopened, temperature checks and masks were required and crews maintained safe distancing when possible. To ensure the project progressed smoothly, Gilchrist was on site two-to-three times per week and Bozeman and Washington remained on site throughout the project duration.

Another challenge involved storefront glass. Additional steel was required to reinforce the system and enable the storefront placement as the architect designed it. The corner windows also posed a challenge for positioning and installation. But through proactive drawing reviews and glazing expertise, GMI and D&D overcame any potential obstacles for a smooth and relatively uneventful installation.

SOLID PARTNERSHIP

Both AGI members agreed the project relationship was successful. "It was our first experience with D&D," said Gilchrist. "They did a good job." He added that GMI subsequently hired D&D for several additional projects. Bozeman agreed the collaboration worked well. "We're experienced glaziers as well as owners. Between the two of us, Dedarryl and I have

done almost everything." Since they founded D&D in 2019, the company has welcomed opportunities to subcontract with other AGI members.

COMMUNITY IMPACT

Mayor Moran called the hotel's opening a "momentous occasion" for Camden residents, business owners, and visitors. Over \$1 billion of improvements are underway in the city. As the 900th Hilton

Garden Inn to open since the brand originated in 1996, the property will be sure to wow guests once widespread travel resumes.



Glaston receives an order for two Jumbo Series lines from Kazakhstan



Glaston Group has signed an over EUR 2 million contract for a Jumbo Series flat tempering line and a ProL flat laminating line with StekloMir LLP.

The order was received at the end of March and is booked in Glaston's received orders for Q1/2021. The lines will be delivered within the next six months.

Larger glass panels in facades are a growing trend today. At the same time, safety and energy efficiency play an important role driving demand for tempered and laminated glass. StekloMir LLP is one of the largest enterprises in the Republic of

Kazakhstan and they provide services related to glass cutting, processing, tempering, and painting.

StekloMir has a large fleet of equipment for the production of a wide range of glass products, including automated lines with sealing robots for the production of insulating glass units (IGU) from former Bystronic glass which currently is part of Glaston. Yet they needed to increase their capacity for safety glass production in bigger sizes. With these two new Glaston glass processing lines, the customer can process glass up to the size of 3300x6000 mm with high performance.

The benefits that StekloMir was looking for are manifold. The heating control in Glaston Jumbo Series flat tempering line ensures the energy-efficient production of high-performance end products. The ProL flat laminating line on the other hand utilizes Glaston's convection heating technology that provides flexibility for

laminated glass production.

"We are looking forward to a long and prosperous co-operation together with StekloMir. This agreement also strengthens Glaston's position in the Kazakhstan market. Building a production line with these two major safety glass processes together indicates the trend in the market where tempering and laminating are closely linked with each other," says Pekka Nieminen, VP Sales & Service, EMEA region.

"Quality, speed of production and innovation are our key priorities. We're proud of the wide range of projects where we have been directly involved with our glass solutions. With Glaston technology and a strong services presence we can rely on high-end tempering capabilities and focus on developing and delivering high standard glass solutions to our customers," says Vladimir Visotsky, Managing Director at StekloMir.

LiSEC introduces new hub structure



Competent. Innovative. Reliable: And very important: close to the customer.

With the new hub structure, LiSEC is breaking new ground with its international subsidiaries and literally opening up “limitless” possibilities in sales and service matters.

MORE PROXIMITY TO THE CUSTOMER THROUGH LISEC HUBS

Faster. More efficient. More effective.

“With its worldwide network of offices, LiSEC has always been close to the customer. In accordance with the market size and the installed machine stock, there are naturally also smaller branches in this network. In the smaller branches, however, it is only possible to maintain the service resources and the know-how required for the large number of products and solutions in order to be able to meet the support needs of the customers directly from the branch to a limited extent. Therefore, for more difficult

issues, the support of the service centre in Austria must always be requested. Due to what is often a time difference of several hours between the customer's home country and Austria, due to travel times for technicians that may be necessary, but also due to language barriers and the longer distances through the organisation, support for customers in these cases is sometimes not as quick and as flexible as customers expect and as we want to guarantee in any case,” Gottfried Brunbauer, CEO of the LiSEC Group, describes the considerations that led to the optimisation of the branch office structure.

In order to focus even more on customers and their needs in the future, LiSEC is revising its branch structure in line with the cornerstones of its corporate strategy and optimising the structure for customers. The major change is that LiSEC is expanding individual branches worldwide into so-called focal branches or hubs, each of which is responsible for a specific market region. These hub regions cover the entire global market. Accordingly, more resources and more know-how can be pooled in the focal branches or hubs, and the coordination of after-sales activities in particular for a flexible and rapid response will be increasingly carried out by

these focal branches in the future.

The remaining branches are coordinated by the respective hub in whose region they are located; administrative tasks and management activities are pooled in the focal branches as far as possible.

The central organisation in Austria is of course still available as a backup for demanding solutions at any time, but due to fewer time differences, shorter travel distances for technicians as well as fewer language barriers and shorter distances through the regional organisation, many more issues can be solved flexibly and quickly through the regional organisation than before.



C O N C E N T R A T E D K N O W - H O W A N D R E S O U R C E S

From the new focal branches, the entire region will be supported in sales and service issues.

However, this structural change not only improves the proximity to the customer, it also makes communication

channels shorter and more efficient - response times are shortened and faster and the speed of solutions for customers is increased.

“Through the new structure, the knowledge required for professional, even more technically sound customer advice for the sales process will be made available increasingly in the regions. On the one hand, this is done by our own employees as well as a close cooperation network with agents to support the different national languages and to look after markets with less continuous demand,” says Christian Krenn, Director International Sales at LiSEC and also responsible for the sales activities in all branches worldwide.

Dr Roger Hafenscherer, Director International After Sales Service at LiSEC and responsible for the installation, start-up and service activities worldwide and in all subsidiaries, regarding the changes: “Fast, uncomplicated, high-quality help and ideally in the respective national language - that is what our customers expect and also get.

Implementing customer projects professionally or meeting their needs as best and as quickly as possible was what originally prompted me at LiSEC to first develop a hub strategy for after-sales service. In a second, logical step, we then fully integrated sales into this concept in order to serve our customers and any

interested parties in the same, efficient manner on the sales side as well, thus ensuring the advantages of the hub concept for our customers worldwide in all aspects. It is only possible to offer customers an “All-round stress-free package” if the entire organisation works together. I am very pleased with the implementation of the first hubs and the improvements achieved, but I also believe that the full increase in performance towards our customers will only come to fruition gradually over the next few months. This is not least because we will be going through a certain learning curve with the improvements in internal business processes that this will bring about. However, the goal of focusing even more clearly on our customers reinforces our motivation - in line with the motto ‘Rock our customers!’”

In total, LiSEC's branch structure will comprise six regions in the future; due to the geographical expansion of the China, South-East Asia, Oceania, Australia and New Zealand region, there will be two and thus a total of seven focal branches or hubs in this region:

NWE: North Western Europe (Hub: Germany)

S A L : S o u t h e r n Europe/Africa/Latin America (Hub: Italy)

CIS: CEE/CIS (Hub: Poland)

NAM: North America (Hub: USA)

COS: China/SEA/Oceania (Hubs: China and Australia)

MEI: Middle East/India (Hub: UAE).

Austria, Hungary, Israel and Japan will continue to be serviced directly by the head office in Austria.

With this change, LiSEC will continue to work in the usual way to remain your reliable, competent and innovative partner for flat glass processing.

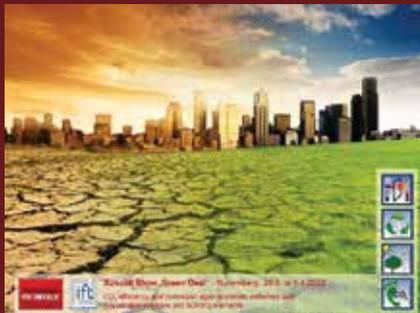


TOPIC OF THE HUB STRUCTURE ON THE VIRTUAL LISEC CAMPUS

From 15 to 17 June 2021, LiSEC will host a virtual trade fair for the second time. Automation solutions of the future, industry news from the LiSEC machinery and software sector and three exciting theme days: All this and more can be experienced on the virtual LiSEC Campus in the anniversary edition for the company's 60th year. On the second day of the fair, visitors can expect, among other things, the expert talk “Strong partnership: Hubs”, which will exhibit the new, worldwide branch structure at LiSEC, provide insights into the processes and explain the advantages for our customers. Register here: campus.lisec.com.

If you have any questions on this topic, please feel free to contact us at any time.

Special show „Green Deal“ on Fensterbau Frontale 2022



Special show "Green Deal" – CO2 efficiency and protection against climate extremes with sustainable windows and building elements (Source: ift Rosenheim, Fotolia/Kwest)

CO2 efficiency and protection against climate consequences with sustainable windows and building elements

Climate change is here. It is no longer a matter of limiting climate change through energy-efficient and sustainable building products and technology, but also of protecting ourselves from future climate extremes. The building sector is bringing up the rear when it comes to achieving Germany's climate targets. Politicians know this, too, so that building components and materials will have to meet higher energy efficiency and sustainability requirements in the future. Otherwise, there is a threat of penalty payments to the EU amounting to billions.

At the same time, the CO2 footprint of building products is coming more into focus, because the "grey energy" for new buildings and building elements can no longer be neglected. Interested companies are invited to present their innovative products and services as

co-exhibitors at the special show "Green Deal - CO2 efficiency and protection against climate extremes with sustainable windows and building elements".

Nuremberg, 29 March - 1 April 2022, World's Leading Trade Fair FENSTERBAU FRONTALE in Hall 1 (1-515)

Information for Application of co-exhibitors at ift-Website

The damage caused by climate change and the resulting costs are constantly increasing, and the targets of European climate policy can only be achieved through radical savings. The necessary measures must focus much more strongly than before on the building sector, because this is where about 40 % of CO2 emissions originate, and achieving the sectoral reduction of emissions is still a long way off.

The great potential in the fight against climate change could be found in the energy refurbishment of existing buildings. According to analyses by the associations VFF and BF, over 250 million old window units with glass without a low-E coating are waiting to be replaced. This could save more than 14 million tonnes of CO2 annually. That would be 50 % of the 28 million tonnes that would be necessary, according to dena (Deutsche Energie-Agentur GmbH), to achieve the Climate



Protection Plan 2030 for the building sector.

Information on the evaluation of sustainable criteria of different certification systems (Source: ift Rosenheim)

For this, politicians must develop instruments such as a replacement obligation, stricter energy requirements and attractive subsidy programmes. In this context, however, the CO2 footprint of building products is coming more into focus, because the "grey energy" for the construction of new buildings has a large share and cannot not be neglected.

Politicians are also aware of this, so that building elements and building materials must become more CO2-efficient and should have higher proportions of renewable raw materials and recycled materials. In addition, protection against climate extremes must also be considered. Building elements must therefore protect against heat waves, floods, hurricanes, but also against unexpected cold spells with large amounts of snow.



Building elements must provide better protection against climate extremes in the future (Source: Pixabay)

In consequence there are great opportunities for windows,

doors, façades, sun protection, decentralised ventilation systems and other building elements and materials. The following topics will therefore be presented at the "Green Deal" special show:

- 1.reduction of CO2 emissions and improvement of the energy efficiency of building materials, building elements and buildings,
- 2.products made from renewable raw materials and a high proportion of recycled materials,
- 3.technologies to simplify energy-related renovation (serial

refurbishment/energy-sprong principle),

- 4.products and constructions that improve sustainability in accordance with the "cradle to cradle" principle and with good maintenance, care and disposal concepts,
- 5.green facades to improve air quality and microclimate,
- 6.adaptive solar shading systems that protect against heat waves and reduce the energy consumption of air-conditioning units,
- 7.protection and resilience against climate extremes such as floods, tornadoes and

hailstorms,

- 8.decentralised ventilation systems for night cooling and natural fresh air supply with minimal energy consumption,
 - 9.digital control systems to minimise CO2 emissions and improve living comfort,
 - 10.surfaces that do not heat up so much when exposed to solar radiation and thus protect the building elements from damage.
- Companies can apply with innovative products and services for a presentation as co-exhibitor at the special show "Green Deal" by ift Rosenheim and NürnbergMesse.

Safely experience the difference of the glass floors in decoration



Yorglass' anti-slip floor glass series carry the quality and aesthetic appearance of the glass to the spaces.

Glass floor applications are becoming increasingly common in decoration. They can be used in all areas where floor coverings are applied and attract attention with their stylish appearance as well as being functional. Turkey's first satin and decorative glass Yorglass' Yorfloor anti-slip floor glass series are certified by the German IFA Institute. It can be used safely in areas such as shopping malls, hotels, restaurants, gardens, shower cabins, as well as homes and workplaces.

Yorglass' anti-slip floor glass series, carry the quality and aesthetic appearance of the glass to the spaces and offers a boutique collection of 6 different patterns to the customers alongside a transparent glass. Yorfloor has the German Occupational Safety Agency IFA Approved Anti-Slip Certificate. It offers a stylish complement for those who want to add a pleasant mood to decoration, benefit more from daylight and experience the naturalness of glass.



Experience the elegance of the glass floor with a silky touch.

Yorfloor series designed with

inspiration from nature; It carries Yorglass signature in terms of flexibility, quality, and reliability. It does not deteriorate, wear and change color over time and allows you to put your feet on the ground with a silky and soft touch. Being an indispensable part of architectural projects as a decorative and functional floor covering material, Yorfloor series inspires those who want to create a different ambiance in interior and exterior spaces all around the world.

Also, Yorglass promises its customers to make the pattern they request. It can be tempered and laminated. Besides standard sizes, there is also a choice of finished products for the Yorfloor series. There is no minimum order quantity, the requested quantity can be produced. Customers are also offered a partial loading option. You can contact us at marketing@yorglass.com for size, thickness, and more detailed product information.

Glaston sells two insulating glass lines to customers in the US



Glaston Group has received orders for two Glaston VARIO TPS® insulating glass lines in the United States.

The orders from Central Valley Glass & Screen and Sierra Glass Fabrication are booked in Glaston's received orders for Q1/2021. The lines will be delivered during the third quarter of the year.

Increased automation and ensuring high quality in the insulating glass production were the driving factors for the customers when choosing Glaston technology. The VARIO TPS® insulating glass lines for the glass sizes of 2700x3500 mm are equipped with a line scanner that digitally reads and defines the different shapes of the glasses passing the information directly to the Thermo Plastic Spacer (TPS®) applicator and the automatic sealing robot, thus saving time and ensuring more accurate end results.

In addition to the increased production capacity with limited failures, local service availability and spare parts support were important for the customers.

Central Valley Glass & Screen in Sacramento has been the Californian contractors' premier source for wholesale quality manufactured screens and insulated glass units as well as being a leading source for glazing products and screen supplies since 1997.

"We manufacture our own glass products, including insulated glass units. In order to keep the status of being known for the fast, dependable turnaround times and providing the best service possible we require high standards also from our suppliers.," says Scott Davis, President of Central Valley Glass & Screen.

Founded in 1976, Sierra Glass Fabrication has become one of the leading wholesale suppliers for insulated glass units, tempered and fabricated glass in Reno Nevada, Mammoth Lakes, Bishop and Truckee/Tahoe California.

"Working systematically for the long term success and continued growth in our glass business led us to look for a proven machine and services supplier to support us in reaching these goals. Glaston's technical knowledge and expertise as an inventor of the TPS spacer system convinced us in making the decision," says Mike Fedyk, Vice President Operations at Sierra Glass Fabrication.

"We are happy for the trust that these customers place on us and our technology in producing high quality insulating glass. Central Valley Glass & Screen had already experience from our FC Series flat tempering technology, and their decision to expand with Glaston's insulating glass technology is highly appreciated while Sierra Glass is a new Glaston customer. We are looking forward to working together in successfully installing the lines and ensuring the smooth production moving forward," says Kimmo Kuusela, SVP Sales and Service for Americas at Glaston.



Vitro Architectural Glass celebrates commitment to sustainability in recognition of Earth Day



In observance of Earth Day, Vitro is recognizing its growth as a sustainable and environmentally-focused business.

In observance of Earth Day, Vitro Architectural Glass (formerly PPG Glass) is recognizing its growth as an environmentally-focused business and ongoing commitment to meeting the standards of sustainability certification programs through its introduction of new, sustainable products.

Vitro Glass's commitment to sustainability prioritizes responsible manufacturing processes and large-scale energy reduction using energy-efficient low emissivity (low-e) glasses. Vitro's family of Solarban® solar control low-e glass products and other glasses by Vitro have been installed on hundreds of LEED®-certified buildings, including at least three of the world's certified net-zero "living" buildings.

According to the U.S. Department of Energy, low-e coatings reduce the energy lost through typical windows by 35%, resulting in about 1.5 quads in U.S. annual energy savings. Market share estimates suggest that about 0.5 quads—approximately 0.5 x 10¹⁵ BTUs—of that reduction is

attributable to Vitro Glass products.

Vitro Glass produces over 100 million square feet of high-performing low-e glass annually. Energy modeling estimates suggest its annual production of solar control low-e glass has the potential to reduce annual energy consumption in a U.S. building by 729,000 kilowatt hours and 55,000 natural gas therms—preventing more than 1.9 million pounds of carbon dioxide from entering Earth's atmosphere every year for the life of a building.

To maximize the energy efficiency and sustainability of existing glass products, Vitro introduced Solarvolt™ building-integrated photovoltaic (BIPV) glass modules earlier this year. Seamlessly integrated into the building structure, Solarvolt™ modules combine aesthetics, CO₂-free power generation and protection from the elements for commercial buildings, all while reducing air conditioning costs and replacing cladding materials.

"Solarvolt™ BIPV modules are the next step in enhancing the sustainability and energy efficiency of Vitro's range of architectural glass products," said Nathan McKenna, director of marketing and innovation, Vitro Architectural Glass. "We're proud to offer yet another way to utilize our products to support increasingly stringent environmental and performance codes in commercial construction projects without compromising design or aesthetics."

Vitro also announced earlier this year that its entire range of coated and uncoated

architectural glasses has been renewed as Cradle to Cradle Certified™, which is a recognized measure of safer, more sustainable products made for the circular economy across the globe. In order to receive this certification, eligible products are evaluated for environmental and social performance across five major sustainability categories: material health, material reuse, renewable energy and carbon management, water stewardship and social fairness.

In addition to maintaining its Cradle to Cradle Certification™, Vitro Glass was awarded a Material Health Certificate at the Gold level. This document certifies that in producing its glass products, Vitro Glass refrains from using chemicals of concern and is transparent about all chemicals used in products across its supply chains.

"Architects, fabricators and building products professionals of all kinds rely on the Cradle to Cradle Certified™ Product Standard as a guide for purchasing and designing with products that have a positive impact on both people and planet," said McKenna. "Since Vitro Glass became the first U.S.-based glass company to have its entire range of products Cradle to Cradle Certified™ in 2008, we have continued to offer one of the industry's most extensive selections of clear, ultra-clear, tinted, solar control and passive low-e (low emissivity) glasses qualified to this rigorous, globally-recognized lifecycle standard."

Edil Vetro (Italy) triples its plant with Forel machinery



“I started working with glass because...I liked it. And this is where I am today”

Tommaso Sabatino, owner of the Company Edil Vetro, reveals this with unassuming sincerity and a smile, summing up his entire business philosophy: “work with passion and dare”. We're in the new production plant of Edil Vetro, a Company established in 1984 in Benevento (Italy) by Tommaso and his wife Antonella, partners not only in life but also in work, who are now facing the challenge of a significant expanding of their business.

“In the beginning it was just the two of us. Today, we have a company with a workforce of 30 employees and we are about to move up from a 2000 square meters factory to a 6000 square meters plant: this is an important step, which fills us with pride, especially in consideration of the fact that we did it for the next generation”

The Sabatinos are in fact a family of glaziers. Following the example of their parents, also Michele and Piero decided to join the company.

“I have three children” explains Tommaso Sabatino “The eldest

two are already in the glazing business, and they may also be joined one day by their younger sister. When they told me that they wanted to work with me, I realised that it was time to invest, and that we had to step up to the next level in automation and technology. Our partner in this ambitious project was Forel. From the very beginning of our dealings with them, they have impressed us with their technology, creativity and ability to listen to our needs, while their after-sales service has always responded quickly and met our needs completely. Given the feeling of mutual trust that had built up between our companies, they were our natural choice for our machinery investment”.



Forel Automated Glass Sheets Storage and the Vertical Cutting Line (Edil Vetro-Italy)

The cooperation between Forel and Edil Vetro is a long-standing one. After the first insulating glass line, installed over fifteen years ago, a succession of other successful projects has followed. The latest of these are a complete vertical cutting line for laminated glass and the recently installed “High Tech” insulating glass line. Both of these solutions are already installed and fully operational at the new production site, along with all the other machines

purchased by Edil Vetro for tempering, laminating, horizontal cutting and edge processing.



Forel “High Tech” IG Line in Edil Vetro plant

“In our plant” explains Sabatino “the entire insulating glass units production cycle is carried out with Forel machinery: laminated glass sheets (Jumbo size: 6,000 x H=3,300 mm) are loaded into the automated storage, which feeds the vertical cutting line, which is equipped with two cutting bridges and a central rotation section, Using two separate IG production lines has significantly increased our flexibility and allow us to process different orders simultaneously. The first of these two insulating glass lines is dedicated to the residential applications. This line is producing mainly single chamber units up to 2000 mm in height, and can also process shaped units. It is very precise and is capable of ensuring high production outputs, within a specific range of sizes. We wanted to improve our capabilities, so that we could also be competitive with more challenging sizes and characteristics: that's why we installed a new Forel “High Tech” Jumbo IG line. This new line has substantially increased our competitiveness”.



Forel Sealing Robot in Edil Vetro plant (Italy)

The “High Tech” IG line represents Forel's last evolution in terms of IG units production, designed to offer the most effective choice of options for the production of IG units for residential and commercial applications, like glass facades. Boasting a host of exclusive, innovative solutions, this line is capable of producing double, triple or quadruple insulating

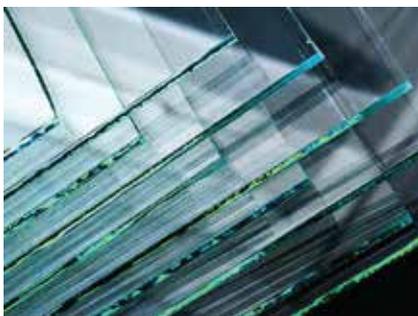
units up to 6000 x H=3300 mm, including stepped units and shapes, as well as offering many other possibilities. The impressive production capacity of this IG line and the superior quality of the finished products make it a strategic choice.

“Edil Vetro today supplies many different customers operating in all applications for flat glass, from interior furnishings, residential and commercial IG units to very complex projects” explains Piero Sabatino. “With this new plant and our new investments in different machinery, our goal is not only to consolidate our existing position but, more important, to expand further. The new

production site has just been completed, but we already have another further expansion project in the pipeline”.

“We inherited our passion for this job from our father”, concludes Michele Sabatino. “We saw our parents build Edil Vetro with their time, patience, hard work and enthusiasm, and it is because of their example that we decided to join the company and become part of its future. What you can see today was not made only by investment in machinery and buildings, but also by a solid human factor, because we believe that passion makes the difference.”

New Standard Will Help to Evaluate Durability of Laminated Glass



A new ASTM International standard presents a set of criteria that can be used to evaluate laminated glass products for durability against radiation and weathering.

ASTM's glass and glass products committee (C14) developed the standard, which will soon be published as C1900.

“The new standard outlines both natural exposure and accelerated environments to achieve performance results,” says ASTM International member Julia Schimmelpenningh. “This standard is needed to allow

reference and unification in the testing and evaluation of laminated glass to ensure that equitable comparisons can be made that affect durability, performance, and, in some cases, life safety.”

The standard will provide manufacturers throughout the glass industry value chain with the opportunity to select components that best fit their needs and desired levels of performance. Regulatory bodies will be able to specify the standard to set a minimum performance level for durability based on the results of weathering tests

In addition, the new standard will provide consumers with attributes they can quantify and use to make intelligent selections. Finally, laboratories will have proper guidance from the standard that will ensure that tests will be run according to

parameters set forth by experts instead of having to run tests that vary by product or manufacturers' desires.

“The practice found in this document stems from weathering requirements that were set forth in ANSi Z97.1,” says Schimmelpenningh, global applications manager, Eastman Chemical Company. “As these requirements get more complex, the committee decided to bring this section of the safety glazing standard to the ASTM community where many experts in weathering congregated and developed standards. Although the current requirements have been partially referenced for over 40 years, this is the first time they are put into an easily referenceable document.”

To purchase standards, contact ASTM International customer relations (tel +1.877.909.ASTM; sales@astm.org).

Glaston received a strategically significant order from PRESS GLASS UAB



The order, valued at approximately EUR 9 million, includes in addition to one tempering line, several insulating glass lines, a grinding line as well as other equipment.

Glaston has received a strategically significant order from PRESS GLASS UAB, part of PRESS GLASS Group, the leading European producer of processed flat glass for the construction industry. The order, valued at approximately EUR 9 million, includes in addition to one tempering line, several insulating glass lines, a grinding line as well as other equipment. The order is booked in Glaston's received orders for Q2/2021. The lines will be delivered during the first half of 2022.

Glaston's customer relationship with PRESS GLASS goes back to 2003 and is based on a common understanding for technology leadership and proven equipment quality. PRESS GLASS is constantly increasing their production capacity and currently runs a total of fourteen production plants in several countries in Europe as well as in the United States.

For PRESS GLASS' newest investment, Glaston offered a solution that met the customer's requirements for both flat tempering and insulating glass technologies thereby expanding the earlier tempering cooperation into the insulating glass technology business.

The strategically important deal includes one tempering line, several insulating glass lines, a grinding line as well as other equipment, and demonstrates the strength of Glaston's versatile product offering. The total value of the deal is approximately EUR 9 million. The lines will be manufactured in Finland and Germany and their delivery is scheduled for the first half of 2022.

"With our current broad and technologically advanced product portfolio we were able to offer a solution including both glass heat treatment and the manufacture of insulating glass units that met PRESS GLASS's needs. The product offering adds value to the customer, who can benefit from more consolidated technology solutions, increased reliability of operations and a high level of automation", says CEO Anders Dahlblom.

Chief Sales Officer (CSO) Sasu Koivumäki continues: "At Glaston, the cooperation with PRESS GLASS is highly valued and it's a great honor for us to be part of their successful journey. The expansion into insulating glass equipment is of great significance and opens up future sales opportunities".

PRESS GLASS has systematically invested in the state-of-the-art technology and Glaston's tempering furnaces are used in a number of their locations. The lines are typically big sized and always fully equipped with latest technology for highest quality.

Tomasz John, CEO of PRESS GLASS UAB states: "At PRESS GLASS we focus on building a technology advantage in the glass processing industry. In order to guarantee the highest quality of our products we cooperate with the most reputable partners, such as Glaston. Our advanced processes become more and more automated, which allow us to constantly improve our efficiency and customer service".

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Projects references

- Star Casino – Gold Coast
- Pinnacle Apartments – Brisbane
- Brisbane 1 Towers - Brisbane
- Sundale Appartments - Brisbane
- Qube – Gold Coast
- MTR Tai Wai Station Towers – Hong Kong
- Elan Apartments - Sydney



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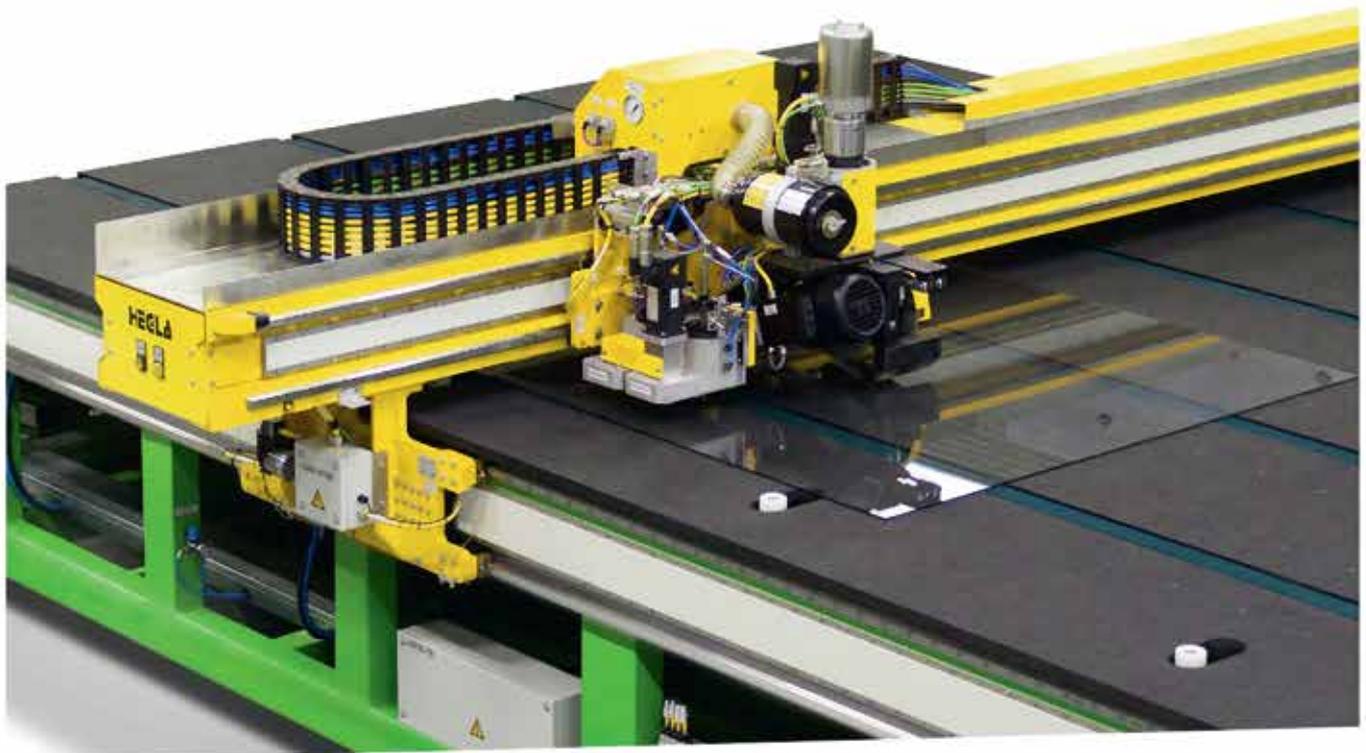
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