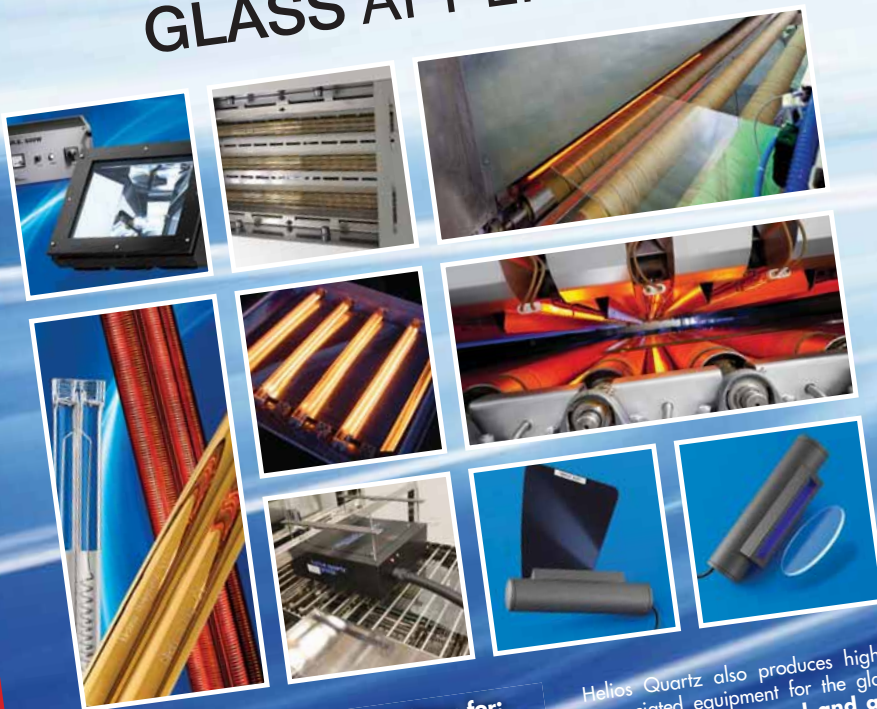


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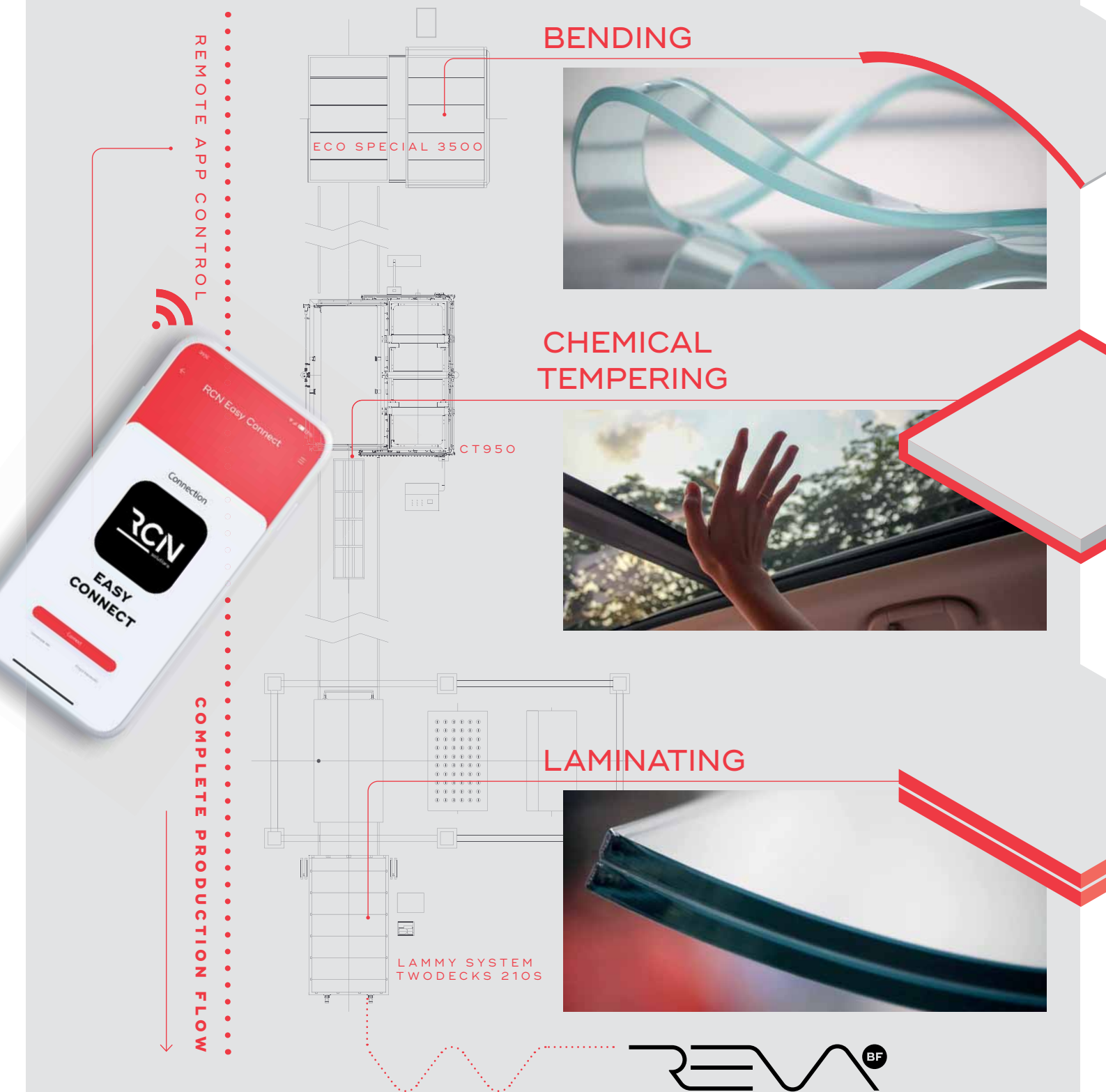
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PUBLISHING DIRECTOR: Arcangelo Altamura

EDITOR-IN-CHIEF: Marco Pinetti

ASSOCIATE EDITOR

Valerie Anne Scott | valerie.scott@glassonline.com

CONTRIBUTING EDITORS

Jennifer Pressman, Zoë Elaine Whitten, Lucy Pagano, Mauro Pagano

ADVERTISING

ITALY: Maurizio Lozza | maurizio.lozza@glassonline.com

WORLDWIDE: Luciano Molina | luciano.molina@glassonline.com

GRAPHIC DESIGN

Sonia Previeto | sonia.previeto@glassonline.com

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LiSEC PROVIDING SERVICE, MACHINES AND SOFTWARE FOR OLYMPIC GOLD

With over 25 years of experience in the processing and manufacturing of safety glass, Olympic Glass speaks to us about how it has become one of the UK's leaders in its field - especially thanks to equipment from LiSEC.

LiSEC, and now the dedicated LiSEC Olympic Glass team, have been instrumental in the production, processing and distribution of safety glass for the London 2012 Olympic Games. The company's expertise in the production of safety glass, combined with its advanced LiSEC equipment, has enabled it to meet the high standards required for the Olympic Games.

Olympic Glass has been a LiSEC customer since 1997. The company's expertise in the production of safety glass, combined with its advanced LiSEC equipment, has enabled it to meet the high standards required for the Olympic Games.

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Edgetech FLEXIBLE SPACER SYSTEMS FOR HOT DESERT CLIMATES

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, helping prevent condensation and also contribute to the lifespan of a window. This article gives us a perfect example of how these spacers are used with their application in the Qatar National Library by HKS.

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Guardian Glass

Guardian Glass, one of the world's largest manufacturers of float, coated and fabricated glass products, gives us an insight into one of the most recent applications of its products: the 'intelligent' cube built by the company's architectural design with the complex structural and energy performance required by today's building industry.

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sedak PRESENTS ITS NEW TECHNOLOGY: REGAL GLOSS IN DIGITAL PRINTING

With its new digital printing technology, sedak can now put precious metals onto glass. The technology allows glass, gold and silver creates glass panes with precision optical effects - as insulating and safety glass, even curved. Especially impressive: the printing process allows for extremely fine details and elegant design ideas can be realized with high precision.

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Trosifol SAFETY GLASS SOLUTIONS IN NATURAL, TINTED AND TINTED

Trosifol's PPG and Ingersoll Rand safety glass solutions are used globally in the architecture, providing safety and security applications. These companies and their products are featured in this article as a look at the industry's top suppliers.

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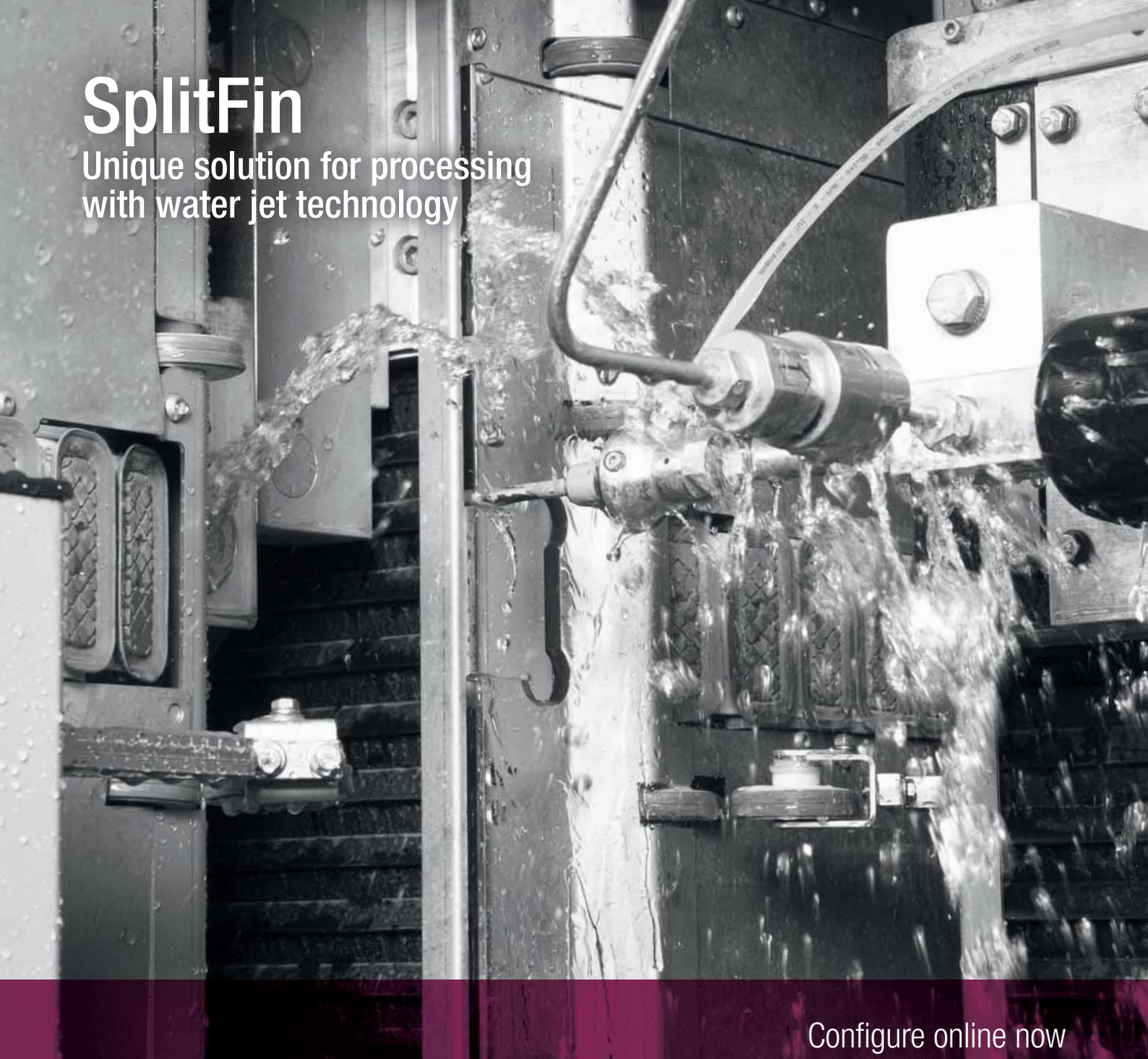
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	GLASSTECH MEXICO	14-16 April	GUADALAJARA Mexico	
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2021 3	MIR STEKLA	7-10 June	MOSCOW - Russia	Editorial files: 26-04-2021 Deadline Adv files: 07-05-2021
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Fratelli Pezza's new 301T Marker, was developed in response to the request of a large international manufacturer of safety glass of having an identification mark larger than that of 25mm, responds to the needs of those companies that are required to comply with the dimensional standards imposed by regulations or provisions laid down by their industrial groups.

The R&D department of the Clusone based company has developed a new version of the product that enables to imprint on the surface of glass and mirrors a mark with a diameter of up to 30 mm, ensuring the same quality and sharpness of the standard

version, M101T, which has been successfully selling for years.

The 301T Marker also response to the needs of companies that must convey a large amount of information while maintaining each word or number extremely precise.

With a view to continuous updating and improvement of its products, Fratelli Pezza has equipped the 301T Marker device with a new and more sensitive timer that allows the operator to set the duration of the sand jet with a range from 0 to 60 seconds, thus enabling to further optimize the life of the stainless steel masks in which the customer's logo is engraved. Fratelli Pezza product range also includes two automatic marking devices of the Easymarker series, designed to be combined with both vertical and horizontal glass working machines.

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NSG

Ramping up antiviral coating research

NSG Group's research into anti-microbial glass was already at an advanced stage prior to the COVID-19 pandemic. But the outbreak has made it a key priority for the group's UK research and development (R&D) team based in Lathom, Lancashire.

Its work has been supported by a grant from Innovate UK, as part of its GBP 40 million funding to help drive forward technological advances which address new challenges from COVID-19.

The team is studying how coatings can effectively reduce viral loads on a glass surface. According to the World Health Organization (WHO), coronaviruses can live on surfaces anywhere from two hours to nine days. The survival time depends on a number of factors, including the type of surface, temperature, relative humidity and specific strain of the virus.

Glass with antiviral properties is expected to help control viruses in areas such as shopping centres, hospitals, care homes, schools and public transport. It will also help to make touch screen devices safer. As part of the research, NSG Group is looking at how an antiviral layer can be combined with other functionality glass, such as solar control to further extend its applications.

Dr Neil McSporran, global portfolio manager at NSG Group, said, "Curbing the transmission of viruses will be a priority for those who design and manage buildings and transportation for years to come, not least until a vaccine for COVID-19 is found.

"Reducing infection via surfaces that the virus lives on will be an important part of any strategy organisations have to control the virus. This is where antiviral glass would play an important role in reducing the spread of a virus – limiting viral load on high-touch surfaces, like the inside of a bus window or a shopping centre door."

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BAU

Expansion of network in Asia

Messe München has acquired **Glasstech Asia/Fenestration Asia**, the leading trade fair for glass manufacturing, processing and machinery in the ASEAN region as of 2020, the result of strategic cooperation between **BAU China** and China National Building Waterproof Association (CWA).

The first edition directed by Messe München will take place in November 2020 in Bangkok. And the cooperation between BAU China and the China National Building Waterproof Association (CWA) is of equal strategic importance: the agreement

provides that CWA's China Roofing & Waterproofing Expo will be integrated into BAU China from 2020.

Reinhard Pfeiffer, Deputy Chairman of the Board of Messe München is convinced that BAU thus consistently pursues its efforts in Asia, "The acquisition of Glasstech and Fenestration Asia as well as the cooperation with CWA contribute to the expansion of our BAU network in the strategically important Asian market. Both strengthen BAU China as the leading industry platform in Asia as well as the world's leading trade fair BAU in Munich."

The annual Glasstech Asia/Fenestration Asia rotates between several countries in the Southeast Asian region (2018 in Malaysia, 2019 in Indonesia). As 'The Glass Hub of Southeast Asia', the three-day event incorporating a top-class supporting programme brings together the Southeast Asian glass and





← glazing sector. "This makes Glasstech Asia the ideal complement to BAU China with its Fenestration BAU China sub-brand," said Reinhard Pfeiffer.

Gan Geok Chua, Executive Director of the Singapore Glass Association hopes that Messe München's involvement will lead to greater participation by European companies in Glasstech Asia, he said, "This will allow opportunities for more European companies to gain access to the growing Southeast Asian market for glass and facades solutions and for Southeast Asian customers to be introduced to new solutions created by new technologies and capabilities of European companies." Edward Liu, Founder and Owner of CEMS, the previous organ-

izer of Glasstech Asia, explained, "The COVID-19 pandemic has obviously disrupted the Singapore and global economies. Like most organizers, we had to overcome these challenges and difficulties with alternative and practicable solutions. As we had worked with Messe München International in organizing the BAUCON series in Singapore in the 1990s, we are confident that MMI is a good partner in not only maintaining the growth of our Glasstech Asia series, but to bring the event to greater heights under the "new normal".

"With the concurrence of the Singapore Glass Association, we are happy to divest our interest to MMI which will bring fresh vigour, new and more exhibitors to the Glasstech Asia series. At the same time, CEMS would be delighted to act as consultant to MMI to ensure that the Glasstech Asia series will continue to flourish and develop as the signature event for the glass industry in Southeast Asia and beyond."

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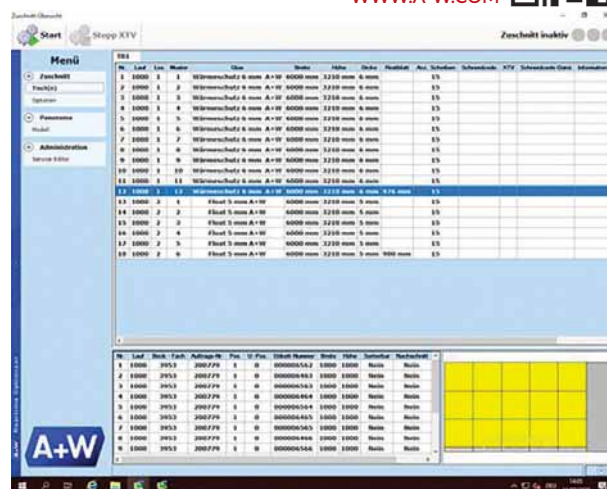
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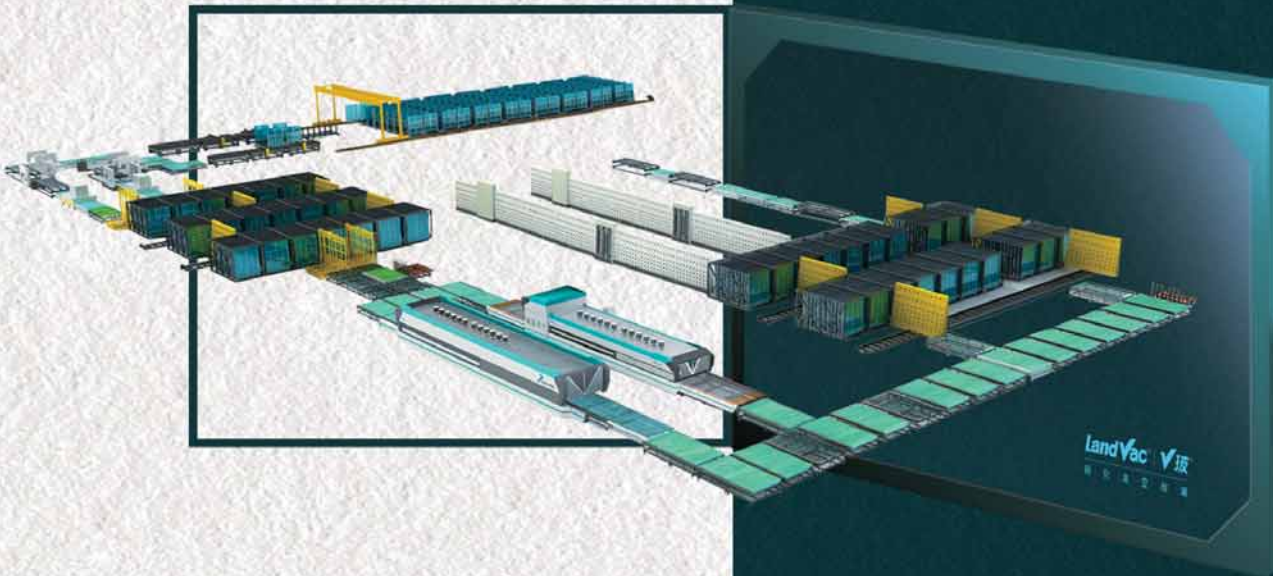
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Pro-active business partners; laminating layers for extreme glass applications



The international crisis has caused a lot of uncertainty and we all have experienced disadvantages, suffering the limitations in travelling, in business visits and in lacking face to face communication, making maintaining visibility difficult to maintain.

In short, we are having to reinvent our way of working; reorganising our business strategy to confirm our steady presence in the glass industry.

In this situation, the **RCN** team has compacted and is continuously showing its true value. In fact, the company's highly professional, international team, have consistently worked to serve the market, and have been very sensitive but not intimidated by the dramatic global events.

RCN has – and is – continuing to provide all its support, resulting in increased sales of *REVA BF*, RCN's laminating interlayer, which differs both in quality and performance: the unique product the laminating market is demanding.

Requests for *REVA BF* have undergone a sharp increase since March 2020, obliging the company to double production shifts and plan future investments, especially aimed at the manufacture of wider sizes.

RCN stock is always up-to-date, based on a warehouse first-in/first-out mode, thus always granting fresh lots available to be delivered to customers.

The choice of the raw materials is very important in production and the supply from a number of international chemical companies, together with accurate production and controls, are the characteristics behind one of the great peculiarities of *REVA BF*: quality constancy.

Quality, reliability, transparency are no more only abstract words, but can be experienced with *REVA BF*, the last generation of laminating interlayers, suitable for all the extreme glass applications.



WWW.RCNSOLUTIONS.IT



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The new SORTIFLEX Glass Storage System

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Responding to the Consultation on the Renovation Wave

GfE

Glass for Europe (GfE) has responded to the Consultation on the Renovation Wave initiative for public and private buildings. By way of the renovation wave, the European Commission aims at increasing the low decarbonisation and renovation rates for improving the energy efficiency of the EU building stock.

In its response, Glass for Europe stressed the key role of renovation to exit the economic crisis resulting from the COVID-19 pandemic. Building renovation has a well-documented and massive spillover effect on jobs and public finances, which is essential at the time of recovering from an economic shock.

Undoubtedly, the construction industry is one of the most hit sectors at all levels. Throughout the flat glass value chain, many companies are SMEs who have experienced severe cash flow challenges during this time of little or no activity. Innovative financial mechanisms commensurate with the EU Green Recovery Plan are urgently needed to restart. The creation of an adequately allocated Renovation Fund to finance public and private renovation projects could support the relaunch of the construction sector value chain, and allow the decarbonisation of the EU building stock by 2050.

Doubling window replacement rate with adequate glazing specifications could reduce energy consumption and related CO2 emissions by 14% in just ten years. Since windows stay on buildings for 40 to 50 years on average, it is urgent to ensure that high-performance glazing is installed as of now to ensure long-lasting savings. To Glass for Europe, setting an EU-wide financial scheme and a dedicated roadmap for replacing single glazed and early uncoated double-glazed windows with adequately specified windows,

is a wise and essential step to make our buildings more energy-efficient and comfortable. An EU renovation wave must pave the way for such plans, either developed at EU or national levels.



GLASSFOREUROPE.COM



CHINA GLASS

Rescheduled dates for 2021

After the 31st China International Glass Industrial Technical Exhibition (**China Glass**) was postponed due to COVID-19, the show organisers have informed that the event will take place at Shanghai New International Expo Centre 6-9 May 2021.

This was made possible thanks to the close monitoring of the development of the pandemic in China and at global level, maintaining communication both with the Shanghai government and the expo centre.

Dedicated to creating a top level trade and technology exchange platform for the global glass industry, China Glass will continue to play a key role in boosting industry growth after the pandemic.



WWW.CHINAGLASS-EXPO.COM

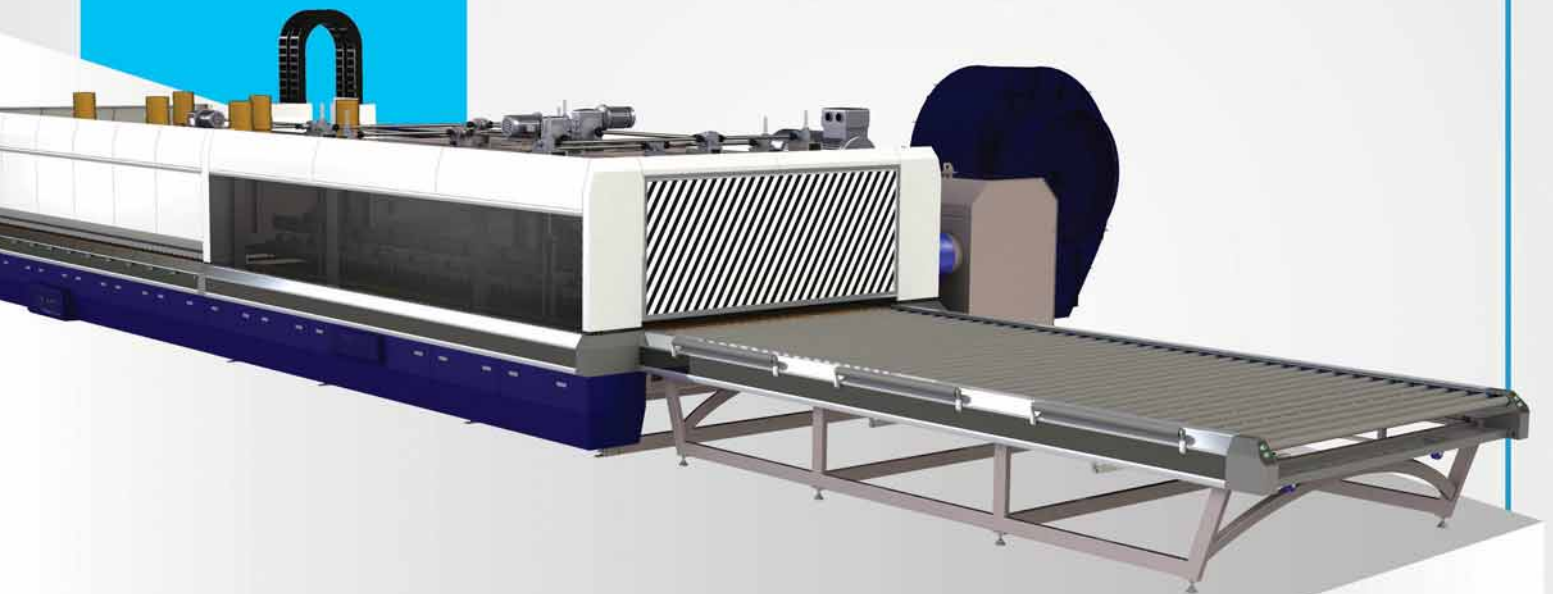
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GLASS TEMPERING FURNACE

FENZI GROUP

New logistics centre in Italy



Fenzi Group is investing in the future, upgrading its Tribiano (Milan) facility, strategic headquarters and hub of global operations for chemicals for secondary glass processing.

Engaged in the production and development of the most advanced solutions for all its business units – from sealants for high-performance insulating glass, to decorative paints for all kinds of applications, to protective paints and chemical solutions for mirror manufacturing – the Italian facility is expanding with a new integrated logistics centre to optimize efficiency in warehouse management and shipping.

With a surface area of more than 15,000 m², the new plant is highly automated and designed to make best use of the company's innovative logistics management techniques. It is equipped with the most cutting-edge structural technologies to optimally digitize the flow of raw materials and shipping, thereby improving traceability while having a decidedly positive impact on the overall quality of the Fenzi Group products.

This key investment in the new logistics centre will drive faster and more effective client services, with the utmost optimization of time and greater efficiency of processes. It also fits into a broader framework of upgrades to projects, services and sales initiatives with which the company aims to strengthen its leadership position in the world of glass. The project is also informed by future needs, aimed at managing greater volume and, above all, new products.

Matteo Padovan, General Manager of Fenzi Italia, said, "The COVID-19 crisis has not stopped our determination to continue to improve. Our enthusiasm is intact and we continue to invest in the development of new services to maximize our connection with our clients, becoming even more efficient and continuing the Group's growth process begun almost 80 years ago. At this juncture, it is naturally about making judicious, well thought-out choices to maintain balanced development and renewed optimism in the future. Special thanks go to all of our partners and Fenzi employees whose commitment and passion are clear, allowing us to obtain these results."



WWW.FENZIGROUP.COM/EN/HOME

AGC

WONDERLITE™ Dx makes debut in Toyota's new Harrier

AGC has announced its light control glass, WONDERLITE™ Dx, has been adopted for the panoramic sunroof of Toyota's new Harrier. When used as vehicle exterior glass, this product boasts the world's fastest-response*1 time, enabling instantaneous control of light transmission. This marks the world's first-ever adoption of this product in a mass production vehicle. AGC's light control glass WONDERLITE™ Dx is composed of a specialized film encapsulated between layers of interlayer in lam-



Dimmed mode (opaque state)



Transparent mode (clear state)

Photos do not represent the panoramic sunroof of the new Harrier model

inated automotive glass. By softening the sun's glare in dimmed mode (opaque state) and providing a wide sense of openness in transparent mode (clear state), this product realizes a vehicle interior that allows pleasant light to pour in from the panoramic sunroof whenever the user wishes.



WWW.AGC.COM/EN

IRIG

First step towards photochromic photovoltaic window panes

A CEA team, in collaboration with the Pablo de Olavide University (Seville, Spain) and the Swiss company Solaronix, has invented a new family of photochromic dyes for photovoltaics; the result of this work paves the way for photovoltaic glasses whose transparency adapts to the luminosity, an interesting application in particular in the buildings and automotive sectors

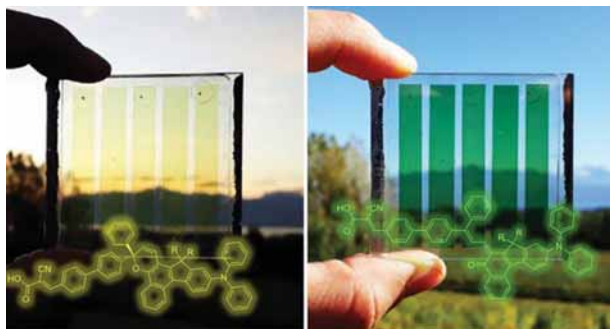
Photochromic dye-sensitized solar cell have many advantages to offer – low cost, high efficiency (14%) even under low light conditions – but above all they differ from their competitors by their colour and transparency, which are of interest to architects.

By proposing cells whose transparency adapts to sunlight, researchers at the Interdisciplinary Research Institute of Grenoble (IRIG), have succeeded in solving the dilemma between transparency and photovoltaic efficiency. Like photochromic glasses, these cells darken under strong light to produce electricity and lighten as soon as the sunlight declines.

Researchers have developed photochromic dyes of different colours to integrate these cells of the future. Their formulation and structure were then optimized to combine photochromism and the photovoltaic effect. The resulting photochromic solar cells change from pale yellow to orange, red or even dark green under high light conditions, thus increasing their photovoltaic efficiency. A cell with an active surface area of 14 Cm² produced 32.5 mW after colouring.

The first results in terms of stability are also very encouraging (at least 50 days without encapsulation, i.e. without any protection on the cell). It remains to optimize the stability of these cells and the transition speeds between high and low luminosity.

This work, carried out in the Molecular Systems and nanoMaterials for Energy and Health UMR (SyMMES, CEA-CNRS-UGA) is supported by the ANR (OH-risk programme) and by an ERC Advanced Grant which began in September 2019.

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MAPPI

New tempering furnace for Glassdebourg

Glassdebourg, located on the border between France and Germany, is a typical example of a company that has grown step by step, adding specialist expertise and passion for quality. Today the company is specialized in the production dedicated to hotels.

Glassdebourg stands out for its ability to work side by side with architects and designers, both in the design phase and in the actual production, always made to measure.



The two owners of the company, Slava Septelici and Jose Ochoa, share the same philosophy and the same love for quality and flexibility, and for this reason they agreed when Glassdebourg chose to grow further, and to buy a modern tempering furnace. Both chose a **Mappi Fox**, the ideal solution for those looking for maximum quality and maximum flexibility over time.

Slava Septelici said, "In a company there are costs and investments. The investments serve to grow the business. Well, today we have this new Fox at home and the first thing we said to ourselves is 'We waited too long, we should have bought it before!'"

Fox is, in fact, a tempering furnace with all Mappi innovations for perfect temperature control, and energy consumption reduced to a minimum. All this with great ease of use and maximum flexibility.

"It is an amazing machine for ease of use and quality and, above all, it is a machine that is already one step ahead in the future, thanks to the perfect integration with Siemens solutions for Industry 4.0. It is the symbol of what Glassdebourg is today and what we want to be tomorrow: we deserve it, but above all our customers deserve it!"

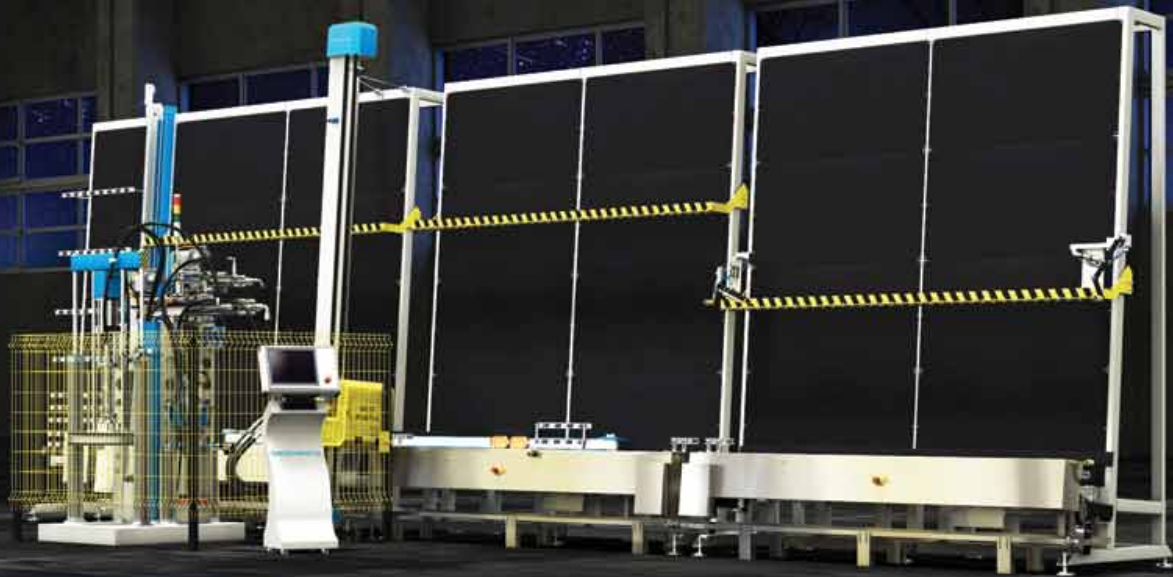


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BLS-S AUTOMATIC TWO COMPONENT EXTRUDER WITH SERVO MOTOR DRIVEN PUMP

BLS-S Automatic Two Component Extruder, can be installed after any brand of insulated glass production line for secondary sealing and corner rounding of double and triple glazing units.

BLS-S can detect air space, unit height and width along with instant sealant depth automatically, in order to calculate and change instant flowrate at a constant process speed.

BLS-S is equipped with servo motor driven injection system for a precise control of flowrate against viscosity and density changes without any extra calibration.

BLS-S has auto flushing system which is used for keeping flowline perfectly free from retains.



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High quality manufacturing, products and services



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Fast and wide area service system two years of warranty



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Continuous innovations and high technology

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PUJOL GROUP

New brand identity



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Pujol Group, the only international group fully specialized in the development of laminated glass with EVA, and owner of the companies *Hornos Industriales Pujol SA*, *Evalam* and *i-ON by Pujol*, has released its new corporate identity with a change of logos for their three firms.

New isotypes have been created following the same corporate pattern. The logos represent the values of excellence and technology that have defined the three companies of the group from their origins.

The new corporate identity projects the company into the future, enhancing its image of proximity. This is achieved thanks, among others, to the new typography that has been carried out following a simpler and closer line with the client, characterized by its clarity and readability. To remain recognizable, the main corporate colours of each of the group's companies have been maintained.

The renewed image, which will be implemented immediately, represents a new chapter in the more than 100-year history of the company, and is included in the important transformation process that the Group is undergoing, which, among others, led to announce the incorporation of a new production unit at the beginning of the year.

"As the fourth generation in charge of the company, we are proud to carry out this new change of image in our corporate identity. We are changing its appearance, but not philosophy. The new logos will continue to represent our values. We have great customers who have accompanied us in our growth for many years. They know that we will continue to be the same and that we will continue working hard to improve day by day," said Jorge Pujol, CEO of Pujol Group.



WWW.HORNOSPUJOL.COM/EN

GLASTON

Order for Chinese display glass supplier

Heyuan Orient Technology's main product is large-sized cover glass for displays used in meeting rooms and classrooms. The company is one of the biggest suppliers in China with key market leaders amongst their customers. Due to growing demand Heyuan Orient Technology is expanding their production and wanted a solution for better quality, good machinery performance and increased automation.

"Instead of an old CNC machine, the customer wanted to invest in better technology and well-known brands. **Glaston's B'BRIGHT** is the perfect choice when looking for flexibility in product sizes, fast processing times and highest edge quality. In addition, the customer really appreciates that we can support them at all times thanks to our professional service team in China," said Robert Prange, SVP, Glaston Automotive and Emerging Technologies. The B'BRIGHT is a line for highly efficient processing of large display glasses. Its high

precision cutting and breaking system enables a minimal grinding allowance and thus a fast grinding process. The vibration-absorbing structure of the grinding machine leads to a perfect edge quality. The line is scheduled for delivery in December 2020.

"We are excited to further strengthen our relationship with Glaston. The professional knowledge of the teams in China and Switzerland as well as the technology and good machine performance were key factors when making our decision," said Qiu Zhilin, Chairman at Heyuan Orient Technology Co., Ltd.



[HTTPS://GLASTON.NET](https://GLASTON.NET)

ABV GLASS HANDLING

MADE IN ITALY

Italcarelli® has developed a new glass handling device called an ABV. This new solution allows the handling of packed/unpacked glass by standard forklift trucks for virtually all aspects of glass handling including the loading of trucks.



PACKED GLASS



UNPACKED GLASS

EASY TO INSTALL

The ABV can be easily installed on a wide variety of standard forklift trucks enabling the operator to handle and transport glass packs quickly and safely.

EVERYTHING UNDER CONTROL

The ABV is made up of a frame where the glass is positioned, two overhead clamps with video camera and two forks. The operator can easily adjust to the thickness and the height of the packs of glass from his seat without needing assistance from other operators. To enhance productivity, the ABV is equipped with a system to enable $\pm 2.5^\circ$ horizontal positioning allowing for lifting the glass without needing to be perfectly aligned with the glass pack.

SAFETY CONTROL SYSTEMS

As per all Italcarelli® products, the ABV is produced to exceptional quality and safety standards.

AFFORDABLE, ADVANCED TECHNOLOGY SOLUTION

With the ABV, Italcarelli® provides an affordable solution to handle glass quickly and safely. The first step to improving productivity in glass handling operations.

CMS

Benchmark for machining large pieces of glass

Urban environments are undergoing drastic changes. The limited space available is being exploited vertically and there is a surge in the use of glass in order to streamline structures. Motivated by this new trend, architects are creating increasingly dynamic constructions with imposing glass windows.

CMS Glass Technology meets this demand with a series of specially designed machines for the processing of pieces of glass that are more than 6 metres long. In particular, the vertical profile solution can machine glass panels larger than 7500mm, guaranteeing 67% higher productivity compared to horizontal solutions. The lack of tooling of the board combined with loading simplicity make the machine an obligatory choice for small batch productions.

The loading surface of 540mm is a further advantage, facilitating the integration of the machine into any automated line, creating a continuous work flow.

The possibility of working 30mm thick glass, combined with the full compatibility of low emission glass, does not impose any limit in the choice of material to be used.



Top buyer benefits

- Endless tools are available: 60 tool cone positions and a change time that is 37% percent faster make Profile a market benchmark.
- Unparalleled shine. With a power of 30 kW in the most powerful spindle in the category, it is possible to polish glass of up to 30mm thick with an unrivalled quality.
- The glass can be perfectly squared thanks to the suction cups that support 1 ton with a tolerance of +/- 0.15mm, an unparalleled asset among vertical machines.

Specifications

- Maximum dimensions 7,500×3,300mm
- 30 kW Spindle, 12,000 rpm
- Automatic plate measurement
- Automatic tool polishing

The advantage of drilling without position restrictions, together with the possibility of working thicknesses from 3 to 30mm, makes Profile the ideal machine for numerous applications.

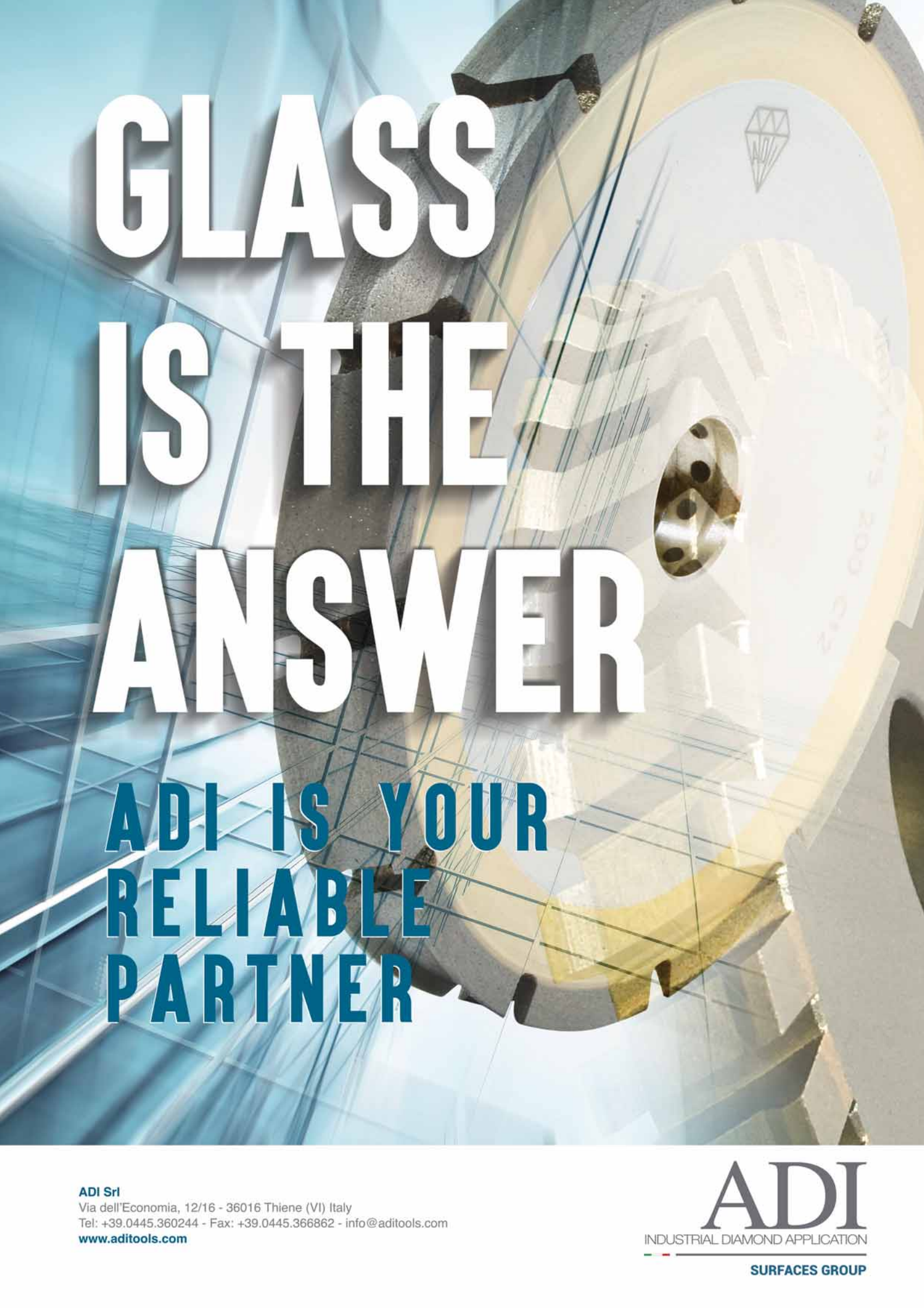
Profile is perfectly adapted to working low emission glass thanks to the numerous dimensions available, and is the ideal machine for the building and furnishings industry.

Its high execution speed combined with careful and repetitive precisions fully satisfies even the demands made by the glass industry linked to refrigeration.



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GUARDIAN GLASS

Strategic partnership with ML System

Guardian Glass has signed a strategic partnership agreement with ML System S.A., a technologically advanced company in the building-integrated photovoltaics (BIPV) market. Within the framework of this agreement, Guardian Glass will offer a complete range of BIPV product solutions – both semi-transparent and opaque – that help contribute to Nearly Zero Energy Building (NZEB) regulations. The cooperation will lead to the coordination of projects based on Guardian Glass' sales network and distribution channels with ML System's expertise in

BIPV and integrated structural solutions. New opportunities for Guardian Glass will be created in architectural projects across the world through their capability to offer innovative BIPV technologies in the field of energy generation on-site. Dawid Cycoń, CEO of ML System, said, "For ML System, this agreement opens up completely new opportunities, providing us with access to large architectural projects across the world, while Guardian Glass will benefit from supplementing its offering with innovative BIPV technologies in the advanced energy area."

Guus Boekhoudt, Vice President, General Manager of Guardian Glass in Europe, added, "Our experienced team can now take a more holistic approach to projects and can help architects, glass cladders and façade consultants find the best product solutions for energy-generating facades, in terms of their power requirements, integration, aesthetics and matched with the best performance coated solar control glass. The appearance of these reliable, high performance BIPV solutions can be tailored to best match the visual expectations of projects."

The drivers of cooperation between the two companies are, among other factors, the current regulatory environment and



increasingly popular trends in the application of innovative building solutions and the use of advanced energy savings and generation. In January 2019, an EU Directive came into force that aims to drive the large-scale deployment of Nearly Zero Energy Buildings (NZEB). The objective of this directive is to considerably lower the energy consumption of buildings while using to a significant extent renewable energy, including energy produced on-site or nearby.

"A key benefit of BIPV is its contribution towards transforming the building into a Nearly Zero Energy Building and helping to achieve the best green building certifications such as BREEAM and LEED. Modern glazing together with BIPV will not only help save energy, generate energy and therefore help reduce carbon emissions, but will also make the building itself more valuable, as higher ranking in green building certification is proven to result in higher rents. Current technology advancements also allow the photovoltaics to be integrated in a way that makes them unnoticeable," continued Guus Boekhoudt.



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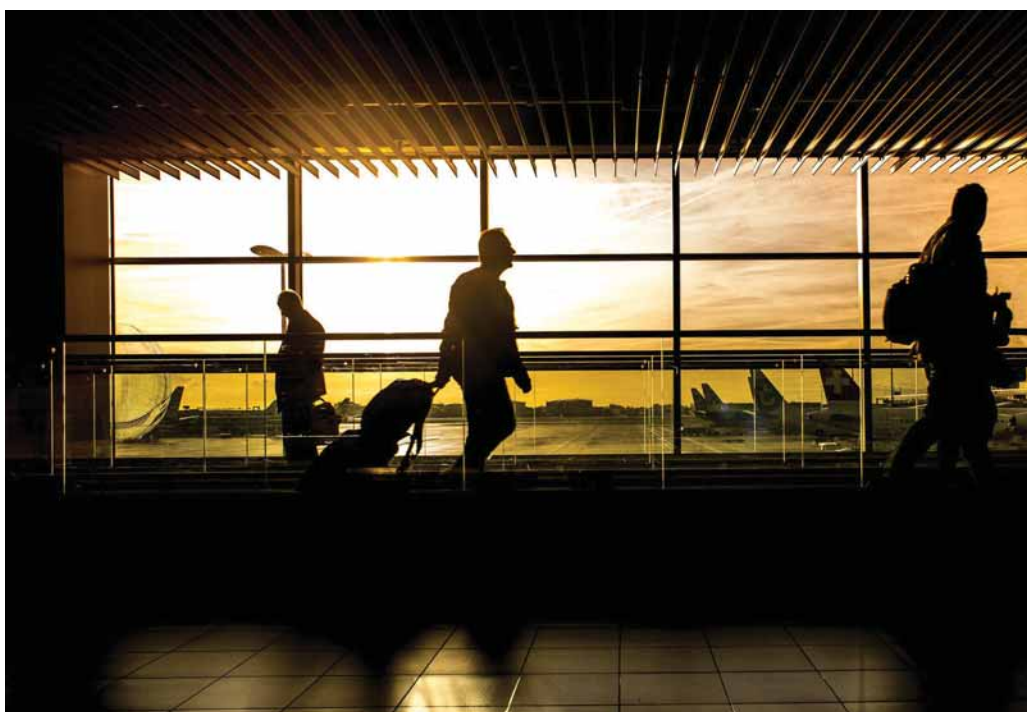
SATINAL

Strato® EVA interlayers for maximum acoustic performance and comfort

Satinal's complete range of Strato® EVA interlayers is characterised by its excellent sound insulation properties. This allows to produce laminated glass with higher performance compared to other interlayers on the market, minimising the weight of the glass structure and maximising the acoustic comfort of the environment.

Considerable attention in both residential and commercial environments are essential when designing glass elements as they play a key role.

Glass laminated with Strato® EVA film ensures acoustic insulation of both the internal environment from external noise (e.g. building windows) and the external environment from internal noise (e.g.



open-plan meeting rooms).

The study and implementation of the technological solutions adopted by Satinal for the production of the Strato® EVA interlayers have led to a significant improvement in the technical performance of the range. In fact, an important reduction in noise exposure in the private and professional environment can now be obtained, thus improving the level of personal comfort.

Noise reduction performance depends on the type →

← of interlayer/glass assembly used, which will have to be adapted according to requirements.

Noise is an acoustic sound that causes an unpleasant, annoying or intolerable sensation. It can become an important stress factor, causing difficulties in communication, reduced concentration, irritation, sleep disturbances, etc.

A logarithmic scale or level scale is used to measure sound and the measurement is expressed in decibels (dB). The range of sounds is between 0 and 130 dB and the various levels correspond indicatively to:

0 dB – absolute silence

18 to 20 dB – barely audible

40 to 50 dB – normal conversation

60 to 70 dB – road traffic

from 90 to 100 dB – jackhammer

Over 100 and up to 130 dB can be assimilated to aircraft noise; in this range the sound is unbearable and even painful.

Satinal commissioned specific tests on samples of laminated glass with Strato® EVA film in different thicknesses from an external laboratory. These tests were carried out according to European standards:

- EN ISO 10140-1:2016

Acoustics – Laboratory measurements of sound insulation of building elements – Part 1: application rules for specific products

- EN ISO 10140-2:2010

Acoustics – Laboratory measurements of sound insulation of building elements – Part 2: measurement of airborne insulation

- EN ISO 717-1:2013

Acoustics – Rating of sound insulation in buildings and buildings elements – Part 1: Airborne sound insulation

Satinal continues to invest in product certifications in order to further increase the quality value of Strato® and offer its customers additional reliability.

Reports on the results achieved can be requested from Satinal's Customer Service Department: customer@satinal.it.



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TUROMAS Loading System

A VERSATILE AND EFFICIENT SOLUTION



Figure 1. TUROMAS loading system

In the 80s, TUROMAS engineers realized that the loading phase slowed down the rest of the flat glass processing cycle. To cope with that bottleneck, they developed a

system composed of tilting arms with suction cups to load the sheet of glass and unload it on the cutting table.

Since the launch of this pioneering, reliable and secure

solution, more than 1,200 units have been manufactured and sold worldwide, with a significant expansion in Spanish, Brazilian and Portuguese markets.

This technology has been

in use for more than three decades under all conditions, however, its development has not remained inactive and has been evolved into new models, which incorporate belts to position



Figure 2. Monolithic glass cutting machine RUBI303VA + MT300B

and evacuate glass sheets in a completely automatic way.

Currently, the TUROMAS R&D department is developing a new version to work with jumbo-sized glass and a new immediate separation system, advances that without a doubt will revolutionise the glass industry.

BENEFITS OF THE TUROMAS LOADING SYSTEM

The TUROMAS loading system has multiple benefits for the customer who decides to purchase it. Benefits include increased productivity, plant distribution optimisation, economic savings and factory safety.

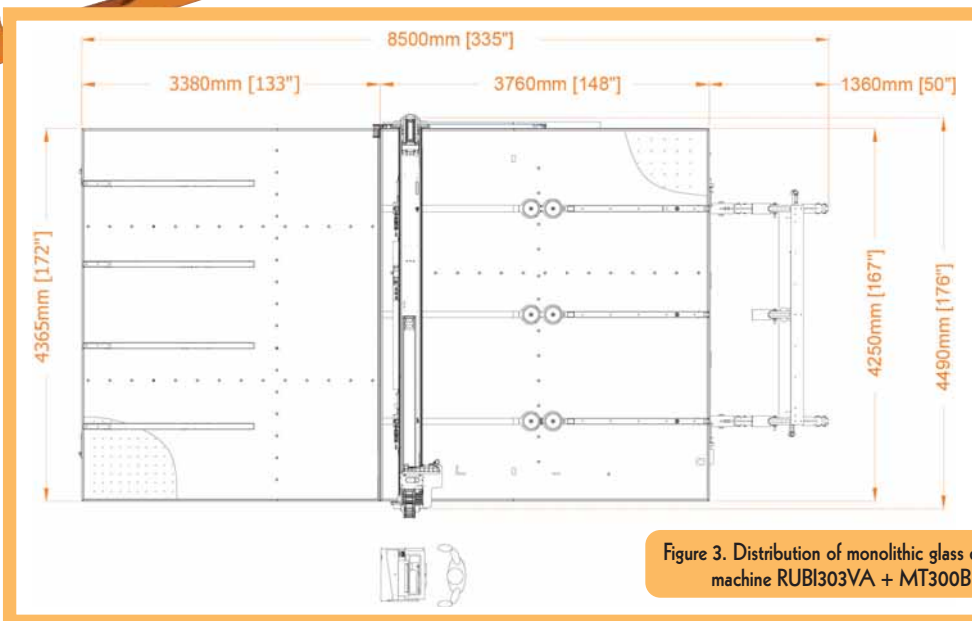


Figure 3. Distribution of monolithic glass cutting machine RUBI303VA + MT300B

1. Automation of glass loading and cutting for improved efficiency and productivity

To automate the glass loading and cutting process, TUROMAS offers different solutions depending on the customer's investment, or to the complexity of the plant installation.

The most standard solu-

tions would be to combine a RUBI 303VA table for cutting monolithic glass with a break out table or to add an MV-300 loading table to a compact laminated glass table. Both are equipped with tilting arms with suction cups that allow the glass sheets to be loaded regardless of the

thickness and type of glass. The arms with suction cups that perform the loading function are incorporated into the structure of the same table, thus eliminating the need for an external loader or a transfer table. Together with the suction cups, the arm structure is equipped with stops that

Figure 6. Loading arm stops for manual feeding



allow an operator to manually feed the cutting table as if it were a conventional loading arm. In this way, the loading system can be adapted for customers with highly variable production who are demanding a flexible loading system in accordance with their needs.

For companies with a significant range of glass, the alternative would be to combine a basic intelligent warehouse with a cutting table incorporating the TUROMAS loading system. The combination of both machines allows customers to optimize space

and allocate the non-used area of the loader to expand the storage capacity of the system.

This is the case of the VAC cutting models with TUROMAS loading system and positioning belts, an extremely compact and high performance automatic glass loading and cutting solution.

In particular, the RUBI

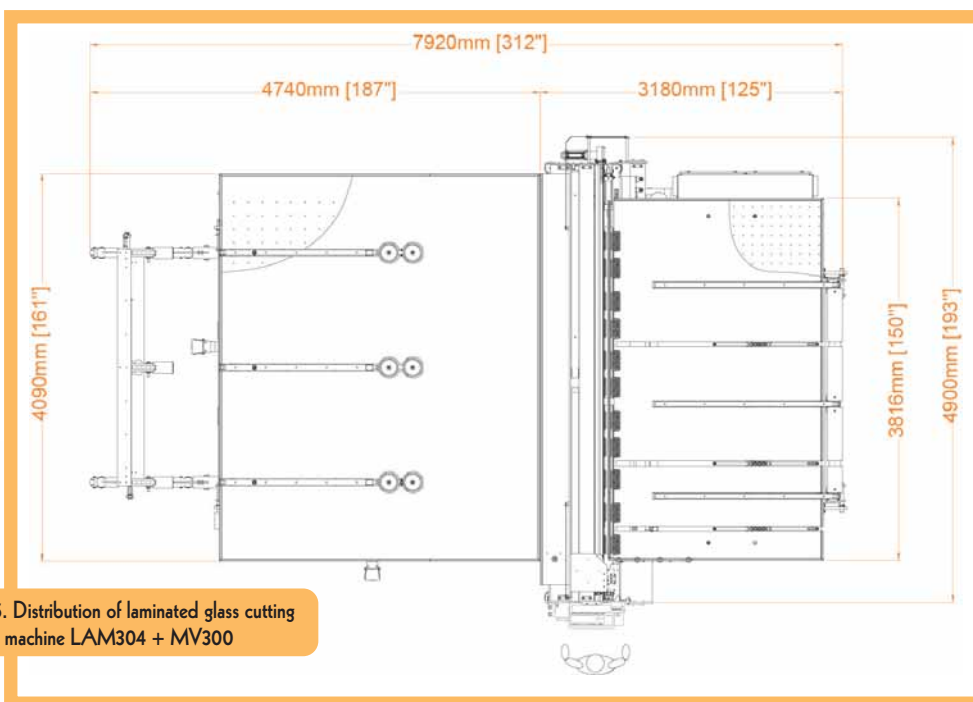


Figure 5. Distribution of laminated glass cutting machine LAM304 + MV300



Figure 4. Laminated glass cutting machine LAM304 + MV300



Figure 7. Monolithic glass cutting machine RUBI 403VAC-6

403VAC-6 model allows having 2 sheets of glass on the table at the same time, with synchronized movement, allowing the second sheet to enter the cutting area during the evacuation of the first sheet to the breaking system. In addition, the RUBI 403VAC-6 model offers the possibility of extending useful cuts to 6100 by 3300 millimetres. Finally, a fully automated solution could be integrated with an automatic warehouse: Rack-Shuttle SR and an automated cutting line, a simple and economical alternative that allows automatic storage, loading and cutting glass with 300 percent increased performance. Each plant is different and all of them have elements that hinder or block the installation of machines or their operation. They can

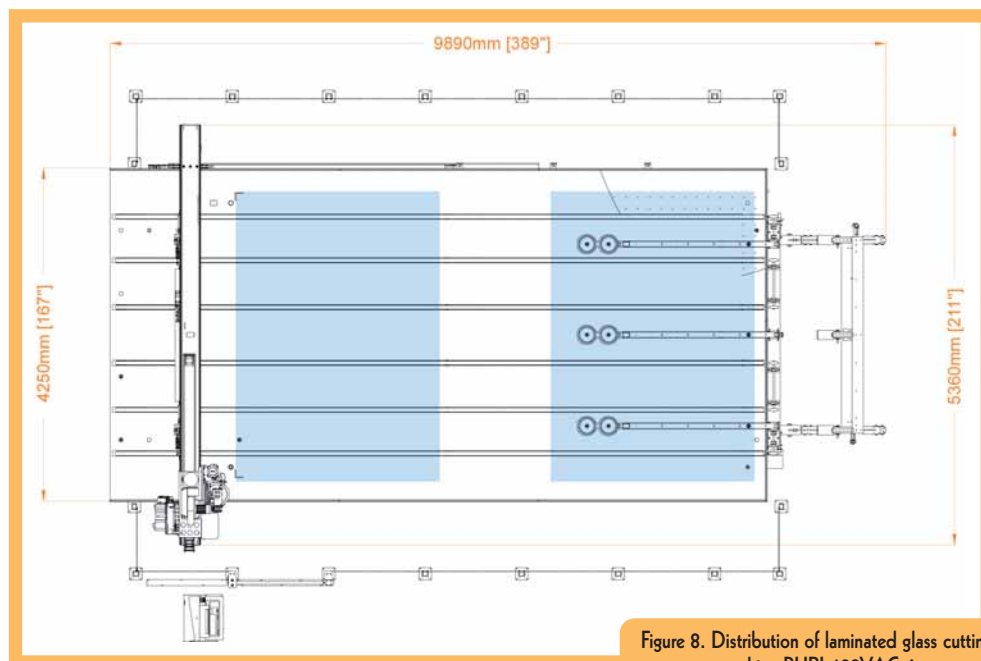


Figure 8. Distribution of laminated glass cutting machine RUBI 403VAC-6

limit the effective working area to the space between columns of the same hall and are always subordinated to the availability of a bridge crane over the entire storage area for glass reloading.

The SR system was born to break these limitations, since it can work between different halls by skipping columns and eliminates the need for a bridge crane covering the entire storage area. Glass is reloaded in

the storage area on a specific rack that will be moved within the warehouse by the machine itself. In addition, these storage systems have been designed modularly so that the machine can keep

Figure 10. Distribution of automatic warehouse SR-03 + cutting lines RUBI 303VA + MT300 and LAM 304 + MV300.

growing as the company's needs do, increasing the number of racks and the storage area gradually.

The cutting tables, thanks to the TUROMAS loading system, are able to load the glass sheets directly from the warehouse rack. In addition, the Rack-Shuttle SR allows simultaneous feed to two lines arranged in parallel, increasing the workflow and glass supply to the following processes. Combining greater flexibility and a higher production rate, the Rack-Shuttle - SR

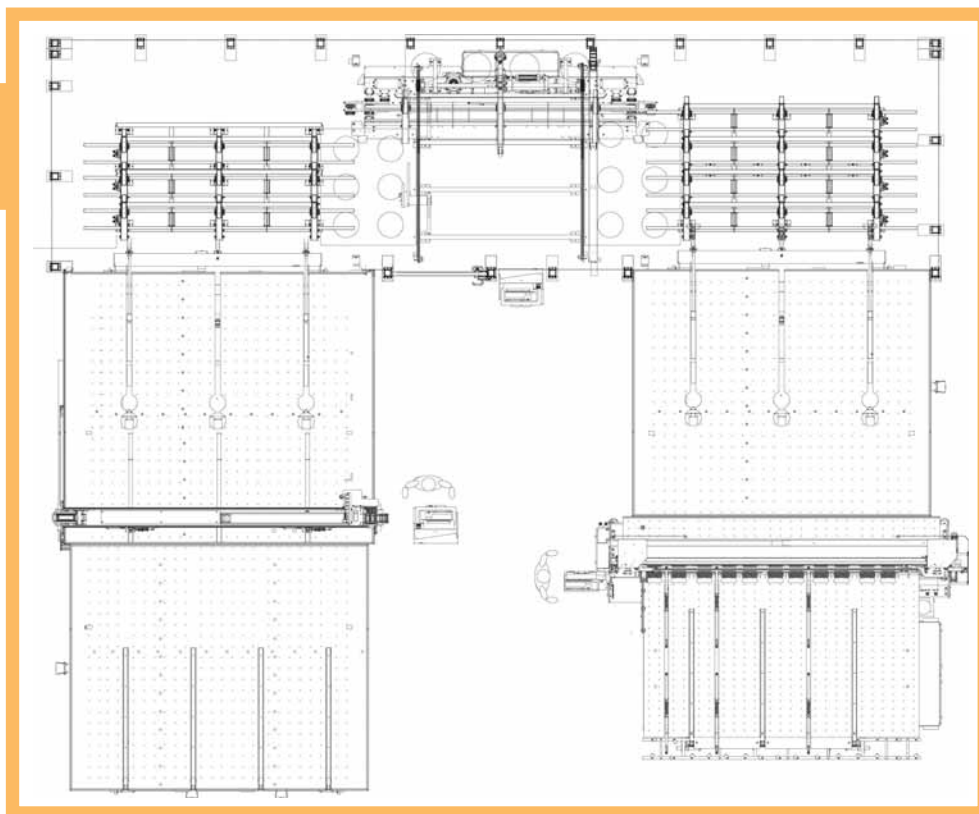


Figure 9. Automatic warehouse – Rack-Shuttle SR - 03





Figure 2. TUROMAS loading system in automatic storage SR-03.

warehouses with automatic loading machines with tilting arms and suction cups form a production system capable of meeting the needs of the most demanding processor and, at the same time, adapting to virtually any space and type of glass.

2. Save space and money without sacrificing absolute performance

Compared to other conventional systems, that do not integrate automatic

glass loading, the TUROMAS loading system saves customers between 10,000 EUR and 12,000 EUR per year as there is no need for an operator to feed the cutting table and the same can be assigned to other tasks. Additionally, instead of using the bridge crane to feed the cutting table, it can be reserved for other industrial processes such as loading/unloading of raw materials and finished products.

Another major benefit of this technology that integrates the loader into the

cutting table itself is the optimisation of the space and consequently the cost savings of the automatic loader. There are companies that do not have enough infrastructure and it is essential for them to make the most of the available space.

3. Safety, an important aspect that is not neglected

The TUROMAS loading system increases well-being at work, increasing employee safety by preventing accidents that could occur when feeding the cutting

table manually.

As well as prevention of labour risks, the systems offer a considerable reduction in breakages due to collisions, since the suction cups on the arms detect when the surface of the glass is close and only then activate the vacuum to prevent possible impacts.

To control the grip of the suction cups, a vacuum pressure switch indicates when the optimum vacuum level for each glass size is reached. In addition, the design of these suction cups is designed to only

pull one sheet of glass from the package in each cycle. All this data is monitored and displayed on the control desk of the table and the office monitor.

4. Loads all types of glass

Glass is a material which has a wide variety of typologies and applications depending on its composition. Therefore, the TUROMAS loading system has been specifically designed to work under any circumstances.

This system allows the au-

tomatic loading of standard sheets of monolithic glass with thicknesses from 2 millimetres. to 25 millimetres. as well as sheets of laminated glass up to 12+12 millimetres.

In particular, laminated glass is heavy and therefore difficult to move. In order to facilitate its handling, the Spanish manufacturer offers to the glass processor the most compact solution for loading and cutting laminated glass currently available on the market: an MV-300 loading table plus

a LAM 304 cutting table.

In addition, the loading system has been designed to avoid contact with the top layer of the glass at all times, transporting and loading the glass without touching it and therefore without affecting the quality of the low-emissive layer. Every warehouse is unique and every customer has different requirements, so TUROMAS handling equipment is versatile and tailor made. These state of the art technology solutions suit not only the entrepre-

neur who is taking the first steps towards automation, but also the client who needs maximum automation and productivity.



 **Turomas**

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Carretera Estación Km. 15, 8
44415 Rubielos De Mora -
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Fax: +34 - 978 - 804380
E-mail: info@tuomas.com
www.tuomas.com





Japan

AUTOMOTIVE GLASS DEMAND AND INDUSTRY

JAPANESE AUTOMOTIVE INDUSTRY

In 2018 motor vehicle production in Japan totalled 9.73 million units, up 0.4

per cent from 2017, increasing for the second consecutive year. Passenger car production rose 0.1 per cent to a total of 8.36 million units. Within that category, standard

cars climbed 2.1 per cent to 5.26 million units and minicars grew 0.9 per cent to 1.50 million units, but small cars fell 6.5 per cent to 1.61 million units. Meanwhile, truck produc-

tion increased 3.1 per cent from 2017 to 1.26 million units, whereas bus production decreased 8.0 per cent to 113,000 units. According to the data from Japan Automotive Manu-

Japan has been the most attractive automotive glass market in Asia for more than six decades. Even if China has overtaken Japan in last decade in terms of numbers, the country still remains one of the most interesting automotive production markets. Demand of automotive glass in Japan has registered steady growth as a result of steady automotive production.

Rajeev Jetley

facturers Association, automotive shipments (both domestic and export shipments, including motorcycles, auto parts, etc.) in

value terms reached JPY 60.7 trillion in 2017, up 5.1 per cent from the previous year, accounting for 19.0 per cent of the total value

of Japan's manufacturing shipments and 41.2 per cent of the value of the machinery industries' combined shipments.

Investments in equipment by the auto industry in 2017 totalled JPY 1.3 trillion and its research and development expenditures reached JPY 2.9 trillion, up 4.4 per cent from the previous year; those figures represent, respectively, more than 20 per cent of the value of overall investments of Japan's major manufacturing sectors.

With motor vehicle exports in value terms amounting to JPY 16 trillion in 2018 and auto-related employment in Japan totalling 5.46 million people, the automotive industry is one of the Japanese economy's core industrial sectors.

JAPANESE AUTOMOTIVE GLASS INDUSTRY OVERVIEW

Japanese glass producers Asahi Glass, Nippon Sheet Glass and Central Glass are counted among the leading global producers of flat and automotive glass for both domestic and international auto producers. These three producers are able to meet almost 95 per cent of the total demand of automotive glass in the country, while the remaining 5 per cent is imported from other countries in the region.

In addition to meeting domestic demand, Japanese automotive glass producers are significant exporters of automotive glass to a number of countries in the region. These producers



also have their automotive glass manufacturing facilities in a number of countries in Asia, Europe and the Americas.

Steady automotive production since the 1950s has enabled all the major automotive glass producers to take advantage of domestic production. The Japanese automotive industry has made steady progress during its history. In fact, the Japanese automotive industry has created tough competition for luxury car makers in Europe and

America. The production of luxury automotive products has resulted in the demand of high value added automotive glass in Japan remaining very high.

Japan has one of the most sophisticated and demanding customer markets that motivate automotive glass producing companies to improve productivity and carry out innovation that could serve consumer needs. This means the automotive glass used in the country is highly value added. Moreover, since

Japan has stringent safety and environment standards, companies are motivated to always employ advanced technologies and manufacture value-added products.

REPLACEMENT MARKET FOR AUTOMOTIVE GLASS

In addition to OEM supplies, Japan offers a significant replacement market for automotive glass. At the end of December 2018, motor vehicles in use in Japan totalled 78.3 mil-

lion units, a 0.3 per cent increase over the previous year. Passenger cars in use increased 0.4 per cent to 62.0 million units, with standard and minicars growing 2.1 per cent and 1.3 per cent to 19.2 million and 22.4 million units respectively, but small cars dropping 2.2 per cent to 20.4 million units. Meanwhile, trucks in use slipped 0.2 per cent from 2017 to 14.3 million units, and buses in use dipped 0.1 per cent to 233,000 units. At the end of March 2018, the average service life of motor vehicles in Japan was 13.24 years for passenger cars, 14.72 years for trucks, and 17.69 years for buses.

THE IMPACT OF COVID 19 ON THE JAPANESE AUTOMOTIVE GLASS INDUSTRY

Covid 19 is having an adverse impact on the global industry in an unprecedented manner. The last few





months have been one of the worst times in the history of the automotive industry, with production and demand plummeting suddenly to almost nil levels. The lockdown in Japan was lifted in mid-May; and Japan has managed to keep the number of deaths due to Covid 19 below 1000. Nevertheless, the automotive industry and automotive supply chains in the country took a severe hit in the months of March and April. It will take some time for the country's automotive glass producers to attain the sales volume of

pre-Covid levels. However, as compared to most of the countries in the region and continent, the Japanese automotive glass industry is expected to register steady growth, which should be a big positive for the country's automotive glass producers in the short- and medium term.

AGC

Asahi Glass Company (AGC) is among the top global automotive glass producers. The company has more than 40 per cent share of the country's automotive glass market.

AGC entered into automotive glass production in 1956. Revenue from automotive glass in the first quarter of 2020 stood at JPY 889 million, a significant decrease from the sales revenue of JPY 1,001 million registered in the first quarter of 2019.

With around 5,500 employees, the company has principal automotive glass manufacturing facilities in 14 countries. In addition to Japan, the company also has automotive production facilities in Europe, Japan, North America, and South America.

The company has a strong global position in the Original Equipment (OE) and Specialized Transport markets. It is the largest global player in the aftermarket glazing distribution and wholesale market.

NIPPON SHEET GLASS

NSG or Nippon Sheet Glass, is one of the three prominent flat glass producers with a significant share of the automotive glass market in Japan. With around 27,000 employees, NSG Group has principal operations in approximately 30 countries around the

world, and sales in over 100 countries.

According to NSG management: “Our automotive business is one of the world’s largest suppliers of automotive glazing, serving the Original Equipment (OE), Aftermarket Glass Replacement (AGR) and Specialized Transport markets. The NSG Group supplies all of the world’s major automotive and specialized transport vehicle manufacturers. We provide a full range of glazing solutions to our global customers using our advanced technology.”

In May, the company announced that its operating income decreased 42.5 per cent year-on-year to JPY 21.1 billion and net income of JPY 18.9 billion for the fiscal year ended March 2020 (FY2019). The main cause is the worsened business environment showing a decrease in auto production volume in Europe and a decline in sales prices of architectural glass. In the

AUTOMOTIVE PRODUCTION IN JAPAN OVER THE YEARS

Year	Passenger Cars			Trucks	Buses	Total
	Standard	Small	Mini			
2013	4,618,014	1,888,759	1,682,550	1,308,177	132,681	9,630,181
2014	4,657,765	1,750,895	1,868,410	1,357,761	139,834	9,774,665
2015	4,744,471	1,555,548	1,530,703	1,309,749	137,850	9,278,321
2016	4,999,566	1,610,486	1,263,834	1,201,073	129,743	9,204,702
2017	5,147,256	1,715,970	1,484,610	1,219,741	123,097	9,690,674
2018	5,256,226	1,605,162	1,497,898	1,257,111	113,197	9,729,594

Source- Japan Automotive Manufacturers Association

fourth quarter, the company was also affected by Covid-19.

CENTRAL GLASS

Established as Ube Soda Industry Co., Ltd. in 1936 in Ube City in Yamaguchi, the company expanded into the fertilizer business, and later in 1958, launched its glass business. It changed its name to Central Glass Co., Ltd. in 1963.

Today, the company has expanded into a wide range of fields including automotive glass, architectural glass, glass for electronic

materials, chemicals, fertilizers, fine chemicals and glass fibers, responding to the diversifying needs of society.

Central Glass is currently the second largest automotive glass supplier in Japan. The company operates a JV with Saint Gobain – Central Saint-Gobain Co., Ltd., engaging in imports, exports and sales of automotive glass in Japan. Central Glass other subsidiaries include: Central Glass Module Co., Ltd (Shimotsuke City, Tochigi) and Japan Tempered & Laminated Glass Co., Ltd (Kaizu

City, Gifu) are engaged in the production of automotive glass in Japan.

Saint-Gobain and Central Glass have been working jointly in the automotive glass market in Japan since 2002. Both companies have replicated this model in China (in 2012) and Indonesia (in 2016).



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INDUSTRY 4.0



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2-4-60 Kanazawa, Tokushima 770-0871-Japan

E-mail: global@bandoj.com

www.bandoj.com



Forel

VERTICAL GLASS PROCESSING TECHNOLOGY FOR AKMA

A good reputation is one of the most important qualities of an entrepreneur. It is thanks to its good reputation that AKMA is the only

Russian company that, established immediately after the fall of the Berlin Wall, has grown and developed while maintaining the same structure and ownership.

FACING AND OVERCOMING DIFFICULTIES

Alexey Kinder sums up his entrepreneurial phi-

losophy, with the still but smiling gaze of those who have faced great difficulties, have overcome them and have treasured the experience. We are in St. Pe-

Akma - Forel Edging Machine



The founder and owner of AKMA talks about his entrepreneurial experience, the difficulties overcome, the success achieved, the plans for the future and his partnership with Forel.



Alexey Kinder (AKMA) and Eduard Kovacic (Forel Russia)

tersburg, and we have just visited the headquarters of AKMA, the company founded by Kinder, owner and manager, in 1991. 30,000 m² of production area employing a thousand workers and divided into 10 warehouses, where over 50,000 m² of double glazing and 50,000 m² of other types of glass panes (tempered, laminated, etc.) are processed every month. An





Akma - Forel Edging Machine

impressive structure which deals with all types of processing: grinding, drilling, milling, chamfering, coating removal, all types of screen and digital printing, flat and curved tempering, lamination and production of residential, commercial and facade double glazing.

FOUNDING THE COMPANY; BECOMING A STRATEGIC PARTNER FOR SAINT-GOBAIN

“At the end of the 1980s, I was a manager in a state-owned automation company. I dealt, in particular, with the glass and ceramic sectors,” recalls Kinder.

“Together with a partner, I decided to found a private company for glass processing. I wanted to establish a quality-oriented business, with profits reinvested in employees and in the growth of the company itself. Due to this strategy, I soon found myself the sole owner of AKMA, but it

also led us to become Saint Gobain’s strategic partner for the Russian market in 1995. A close and satisfactory collaboration until 1998, when the Russian state went bankrupt.” The consequences are well known: an unprecedented economic collapse, the devaluation of the Ruble and



Visit to AKMA plant by Forel Russia team



Vladimir Mukhin (Forel Russia) and Aleksandr Melnikov (tech director of AKMA)

a difficult recession period. At that juncture, unique in the history of Russia, companies could legally refuse to pay for pending supplies. A policy that caused huge losses to all international groups active in the Russian area. AKMA, although, paid off all its debts within a month.

“Back then, it required an immense effort, but this move proved successful in the long run, since it greatly strengthened the reputation of AKMA,” continues Kinder “Saint Gobain itself officially declared that we were a serious and reliable company to do business with, and they continued their collaboration with AKMA. From then onwards, all the other partners acknowledged our professionalism. Over the years we have entered into over 300 leasing contracts, which we always fulfilled. To the point that, when we urgently needed

a machine, we were able to order it in advance, even before receiving the financing. In hindsight, we can say that it was during the crisis when we most powerfully demonstrated our value. Today we are among the first glass processing companies in Russia: our distribution network mainly embraces the national market, but also Finland, Sweden, CIS countries (former USSR), Germany, the Netherlands, Canada and the United States ... with the future goal of bringing exports up to at least 30 per cent of our turnover.”

COMPANY PRODUCTION

AKMA's production covers a wide range of functions: double glazing for residential, commercial and facade use (a sector in which the company wants to specialize further in the future), for the transport sector (ships, trains - AKMA has just received an order from RJDE to supply the windows of 300 trains) and glass for interiors, safety and artistic installations. In

its portfolio there are also some special projects of the highest level, such as the Irina Viner Gymnastics centre, the Afimall shopping centre, the buildings of Huamin Park (Moscow), which show the indisputable talent of AKMA in the architectural glass sector.

“EXCELLENT TECHNOLOGY – FROM A SUPPLIER CAPABLE OF LISTENING”

“Today we have two Forel vertical glass processing lines, we have already ordered a third one and we assessing other machines,” concludes Kinder “After installing the first line, we immediately noticed a superior processing quality and an increase in productivity. Forel machines determined a clear upgrade for our business: they allow us a higher productivity and at the same time an excellent processing quality. In addition, in Forel, we found a different brand compared to all other manufacturers: in addition to offering cutting-edge technology, Forel is a supplier which is capable of listening. For a group like AKMA this is fundamental, not only to manage today's needs but, above all, to plan our future together. And looking to the future I foresee an increasingly demand-

Alexey Kinder



MIBC Moscow city Afimall city shopping center

Center rhythmic gymnastics Irina Viner in Moscow 2019



Eduard Kovacic and Alexey Kinder

ing market: we must be able to offer increasingly higher quality and to invest in qualifying personnel and in the technologies to be used. These are the challenges that AKMA will face in the future, with the firm intention of winning.”

(The photos of this article were taken before the Covid-19 emergency)

FOREL S.p.A.

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Via per Monastier, 4
Vallio di Roncade 31056
Treviso - Italy
Tel: +39 0422 840507
Fax: +39 0422 840900
Mail: info@forelspa.com
www.forelspa.com



AGC Glass Europe presents SunEwat

A NEW RANGE OF ENERGY- GENERATING FAÇADE SOLUTIONS

Stopray Active is an opaque spandrel and cladding glass solution that embeds photovoltaic cells concealed behind a Stopray Vision coating. It perfectly matches AGC's Stopray Vision coating of the windows, delivering an aesthetically superb project while ensuring optimal energy generation.



Today's fast moving glass sector, especially with regards to façade glass, is requiring smart, sustainable buildings that do not compromise on aesthetics or performance. SunEwat from AGC Glass Europe responds to these requirements when used in façade windows, spandrels, cladding and other applications.

DEVELOPED IN PARTNERSHIP WITH SOLAR SPECIALISTS

AGC's new product range – developed for use in façade windows, spandrels, cladding and other applications – is the result of intensive collaboration with specially selected partners, including PHYSEE Technologies, Sonnenstromfabrik, SolTech and Solar Visuals. “By combining their expertise in solar energy with our expertise in glass, we can now supply a wide range of cutting-edge photovoltaic-embedded glass solutions,” says Xavier Sahyoun, Manager of AGC Glass Europe's Active Glass business unit. He continues: “The Sun-

Ewat range is a revolution compared to conventional unattractive photovoltaic panels. Our modules comply with nearly zero-energy building requirements, while offering façade designers limitless architectural and aesthetic options as well as seamless integration into buildings. SunEwat solutions are also cost-efficient, featuring record low payback periods.”

THE SUNEWAT RANGE

SunEwat products for windows are available under the names Vision Square, Vision Stripe and SmartSkin. By enabling architects and designers to take an artistic approach to vision glass elements, SunEwat

The key factor in a building's image is typically its façade. In this fast-moving world, architects and designers have to adapt and evolve in an effort to comply with increasingly stringent environmental standards and cost-efficiency requirements. This is especially true for buildings, which account for about 40 per

cent of energy consumption in the EU. With this in mind, AGC Glass Europe's Active Glass business unit is shaping the future of façades by introducing its brand-new and innovative SunEwat product range, delivering affordable energy-saving façade solutions that do not compromise on design, aesthetics, performance or quality.



Vision delivers elegant solutions that showcase the use of green energy while maintaining the glazing's transparency and functionality. SmartSkin is a dynamic façade innovation by PHYSEE Technologies combining photovoltaics and learning sensors with a smart building management system.

SunEwat products for spandrels are marketed under the names Stopray Active, Artlite Active and Lacobel T Active. In these products, the photovoltaic cells are completely hidden behind a coating, creative designs or a coat of paint, resulting in the most aesthetically appealing rendering of a project while still

delivering optimal energy generation and shorter payback times. Artlite Active, developed in partnership with Solar Visuals, is an innovative solution enabling total customisation of the cladding area with infinite possibilities for images, colours and prints. Lacobel T Active is a totally uniform solution featuring photovoltaic cells concealed behind high-quality glossy paint. Stopray Vision coatings for windows can now be matched perfectly with Stopray Active, an active spandrel version delivering an aesthetically superb project with a uniform appearance while ensuring optimal energy generation.

THE FUTURE OF FAÇADES

With over a decade of experience in active glass technologies and numerous successful projects completed around the world, AGC Glass Europe confirms the accelerating transition towards smart, sustainable buildings that do not compromise on aesthetics or performance.

AGC GLASS EUROPE, A EUROPEAN LEADER IN FLAT GLASS

Based in Louvain-la-Neuve (Belgium), AGC Glass Europe produces, processes and markets flat glass for the construction industry

(external glazing and interior decoration), car manufacture and solar power applications. It is the European branch of AGC, the world's leading producer of flat glass. It has over 100 sites throughout Europe, from Spain to Russia, and employs around 16,500 employees.

AGC Glass Europe

AGC

Avenue Jean Monnet
41348 Louvain-la-Neuve - Belgium
Tel.: +32-2-4093000
Fax: +32-2-6724462
E-mail: comauto@eu.agc.com
www.agc-glass.eu

Halio Glass



DELIVERS ON ENERGY EFFICIENCY AND VISUAL COMFORT

Electrochromic glazing is used more and more in architecture thanks to its ability to improve offers the energy performance of the façades it is used in. There is, however, another important sustainability benefit to be had from the use of these important glass types, which is their contribution towards a simplification of the design of the façade itself.

CONTRIBUTING TOWARDS GREEN BUILDING CERTIFICATES

Green Building certificates are increasingly becoming a verified planning instrument. They sharpen the focus upon an integrated view of the life cycle as well as integral solution approaches for sustainable buildings. Intelligent technologies play a key role in releasing areas of sustain-

ability potential. Dimmable glazing such as Halio® Glass are also increasingly coming into focus where certification according to international standards such as BREEAM, LEED, WELL, DGNB/ÖGNI/SGNI or national standards such as ÖGNB or SNBS is sought.

The Fridays for Future movement has become a bit quieter. Many architects and companies have nevertheless declared their solidarity with the aims of

“

Sustainable building is no longer just merely an option, but a must.

”

the climate movement in recent months. The Federation of the German Construction Industry (Hauptverband der Deutschen Bauindustrie) also writes in a statement that all sectors of the economy must make a contribution in order to achieve the national and international climate protection targets.

The assessment criteria for sustainable building have been continuously extended since the introduction of BREEAM, the starting point of all Green Building certificates. Life cycle assessments and recycling management aspects took on increased importance, as did the health, comfort and well-being of building users. Robert Jagger, Halio Sales Manager for the Europe and Middle East regions, is certain that intelligently switchable glazing will be one of the successful products of the coming years: “Tinted glass contributes towards the topic of sustainable building on several levels. On the one hand, it does of course concern improvements in energy efficiency. On the other hand, it measurably increases the levels of



Daylight and energy input can be dynamically optimised using switchable glazing



visual and thermal comfort and thus also contribute towards improved health and performance.”

MINIMISATION OF ENERGY CONSUMPTION, OPTIMISATION OF ENERGETIC PERFORMANCE

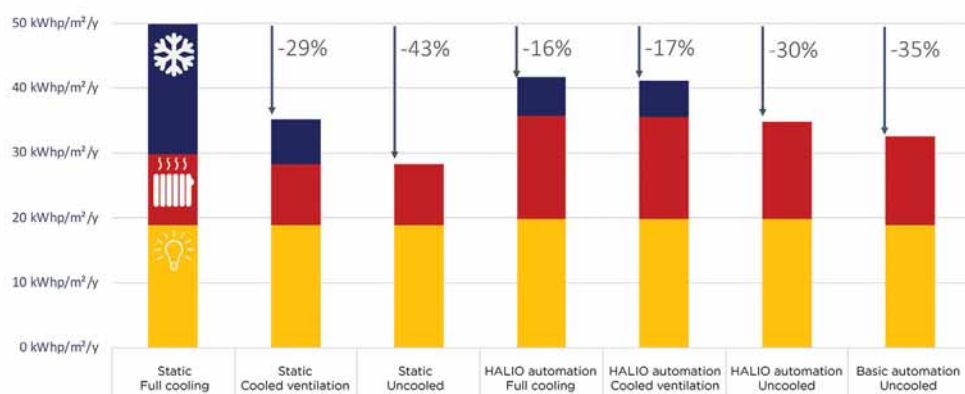
The highest possible level of energy efficiency is, of course, a great benefit for all current Green Building certifications. Electrochromic glazing influences the energy consumption of a building in two ways.

Due to the fact they regulate the energy input depending on the weather, position of the sun and user needs, they consequently reduce the costs of heating, summer air conditioning and artificial lighting. Depending on the glass design, Halio glass

panes achieve Ug values of up to 0.5 W/(m²K). The total energy transmittance can be gradually regulated downwards from 45 per cent in the untinted state to only two per cent in the tinted state. “Obviously, the direct energy-saving potential of Halio glazing varies depending on the climate region and the orientation of the façade, but our experiences demonstrate that, thanks to our innovative control algorithms and tinting speed, the optimum result can exceed 20 per cent,” adds Jagger.

Energy consumption and thermal comfort

Impact on primary energy consumption



© Halio

“Daylight therefore has a mood lifting, energising effect ...”

HEALTH AND USER COMFORT

Light, especially daylight, has always been one of the most important design elements in architecture. However, the question of how important natural daylight really is for peo-

ple’s health, was only finally brought to the attention of building planners due to a relatively novel scientific discipline.

Chronobiology recognised that the eye is not only an organ of sight, but that hormone production in the body is also influenced by its retinal photo-receptors. The blue light in the morning stimulates the formation of cortisol and revives us, the reddish light in the evening sends us into a state of rest due to an increased release of melatonin. Daylight therefore has a mood lifting, energising effect, which, due to a lack of time spent in the open air, we can only achieve through sufficiently large windows and skylights in our living and working environments. The WELL Building Standard, which above all measures and standardises structural measures for the health and well-being of building users, was the first system to establish guidelines to ensure the integrity of the circadian rhythm.

VISUAL AND THERMAL COMFORT

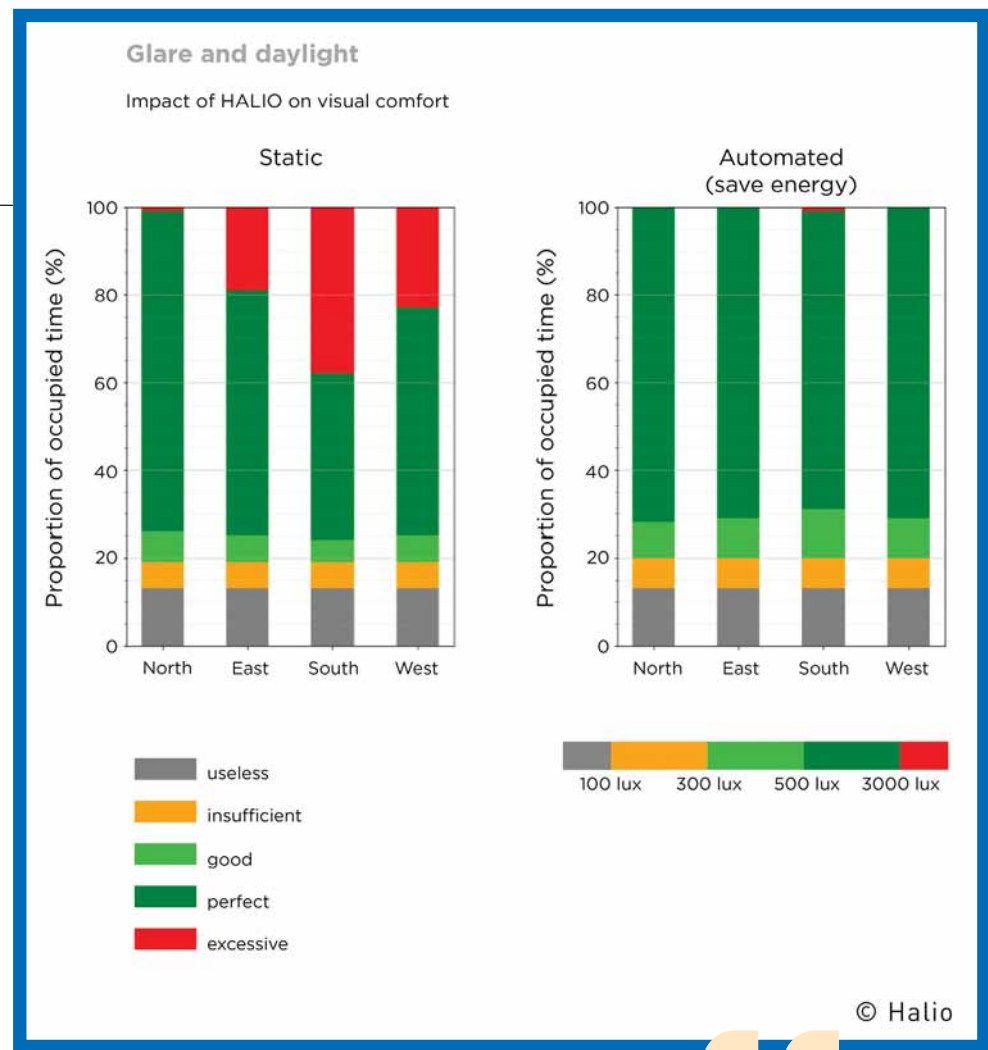
All sustainability certificates stress the importance



© Halio

of daylight. However, they do certainly make a difference in terms of the weighting of related aspects such as solar protection and glare protection, the outside view, colour rendering, availability of daylight or room temperature.

Even if standards are specified for the measurement and calculation of the evaluation criteria, they remain characteristics that we perceive subjectively. "By combining automation and individualisation, Halio glass makes a major contribution both towards the energy goals of building operators and to people's feeling of well-being," explains Jagger. The advantages of as much daylight as possible are counterbalanced, especially in summer, by the adverse effects of glare or overheating. Users have the option of changing the tint of each individual glass pane themselves via apps, local control panels or voice assistants. The central control and regulation unit for the automatic optimisation of daylight incidence

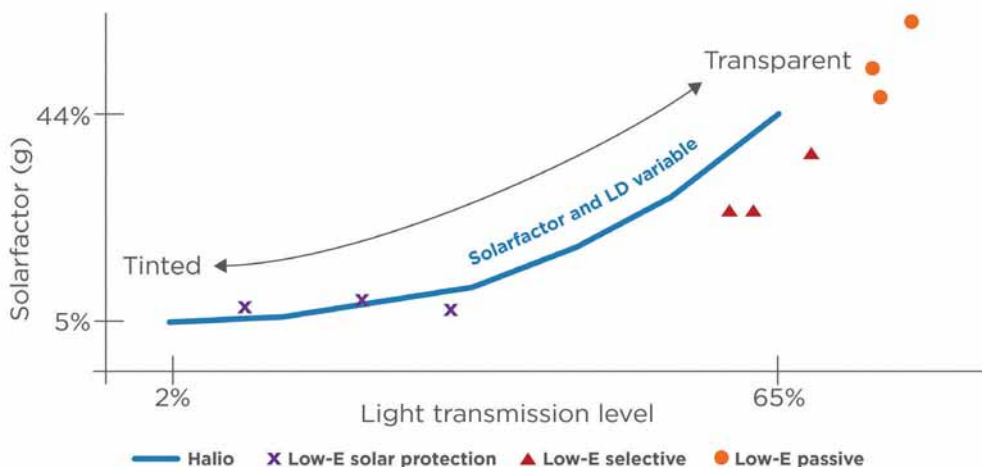


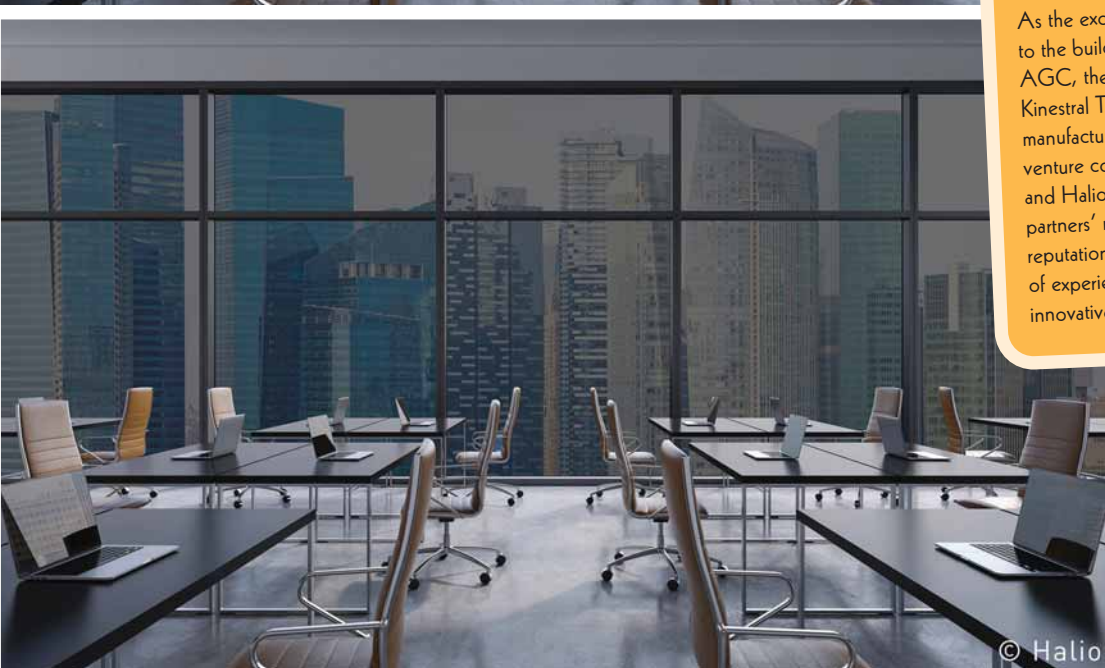
and thermal comfort is the Halio cloud. Here all the parameters such as the users' individual preferences, building use, location, the alignment of the façades and the weather conditions are tracked and recorded. With a colour rendering index of 97, Halio glass cannot be distinguished from conventional glazing in its untinted state.

The view outside remains unobstructed and due to the fact that mechanical solar protection can be dispensed with when using dimmable glazing, the connection with the outside world is not lost even when the glazing is gently tinted. With a maximum light transmission of 65 per cent in the double glazing version, Halio is positioned

Halio glass makes a major contribution both towards the energy goals of building operators ...

in the range of normal solar control glazing. In a completely darkened state, the light transmission level decreases to 2 per cent and 95 per cent of the radiation input is kept out. Halio glazing switches to an even shade of grey in under three minutes without any blue cast or volatile gradients. "This may not win any sustainability points, but it does win a lot of rec-





ognition from architects and users,” laughs Robert Jagger.

Conservation of resources
The use of electrochromic glazing offers yet another sustainability benefit: in a lot of cases they contribute towards a simplification of the façade design.

The adaptive double façade that was originally planned is replaced by space and raw material saving element façades or mullion and transom constructions. Smart insulating glazing improves the energy performance of the façade, reduces complexity and makes a positive contribution towards the overall balance of the raw material cycle.

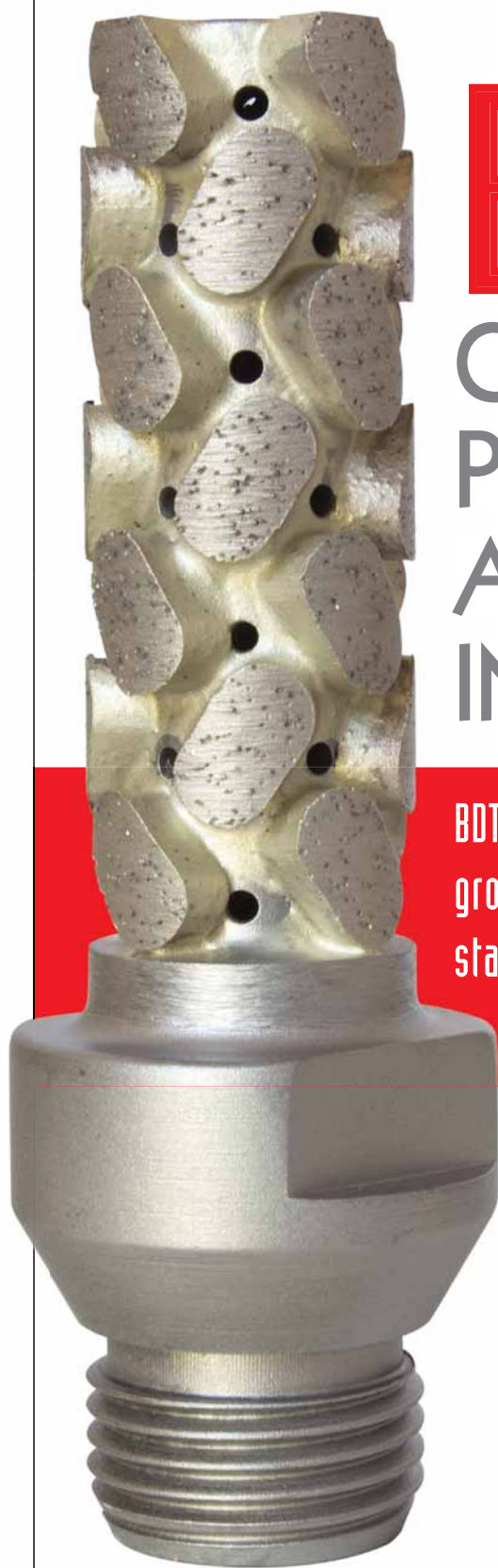


HALIO INTERNATIONAL

As the exclusive supplier of Halio products and services to the building industry, Halio is a joint venture between AGC, the world's largest flat glass manufacturer, and Kinestral Technologies, Inc., which develops and manufactures Halio smart-tinting technologies. The joint venture comprises two entities: Halio North America and Halio International. The partnership leverages the partners' respective strengths and knowledge: AGC's reputation in the building industry and 100+ years of experience in glass technologies and Kinestral's innovative, patented smart-tinting technologies.

 Halio Glass

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BDT

CONTINUOUS PRESENCE WITH A SOLID 'MADE IN ITALY' TRADITION

BDT is a fast-moving company, undergoing continuous growth and development in all areas: from company staff, to the development of new and increasingly performing tools for flat glass processing.

Bovone Diamond Tools was founded in 2003 to work alongside its sister company Elettromeccanica Bovone, supplying the wheels for flat glass processing machinery. The production of diamond wheels includes those for bevellers, straight-line edgers, and work centres of all major machinery manufacturers.

In 2007, BDT started with the production of diamond routers, accessories for manual and automatic drills, as well as work centres, fol-

lowed by – in 2010 – the patented revolutionary router Goldnet. BDT also supplies polishing and felt wheels, cerium oxide, cooling oil, pumice and carborundum cloths, as well as other complementary accessories for flat glass processing.

FACING THE CONTINUOUSLY EVOLVING FUTURE

Bovone Diamond Tools is now continuing to pursue its path of affirmation in the sector of diamond tools for glass and stone renewing its

productive forces: a transversal renewal process that is based on the continuous input of energy, instilling new life to the values and characteristics that have contributed to the successful position that the company now has in its reference sectors.

The solid all-Italian tradition of BDT has, in fact, recently been enriched with new personnel to work alongside the specialists already present in the company: looking to the future with renewed enthusiasm and strong dynamism. An

active functional approach to address the new challenges of the market.

A COMBINATION OF TECHNOLOGICAL, HUMAN AND COGNITIVE RESOURCES

A constantly growing Technical Sales team, a recently strengthened Research and Development area to experiment and identify new solutions that make BDT tools a concentrate of high quality and innovation.

The same importance is given to the constant develop-

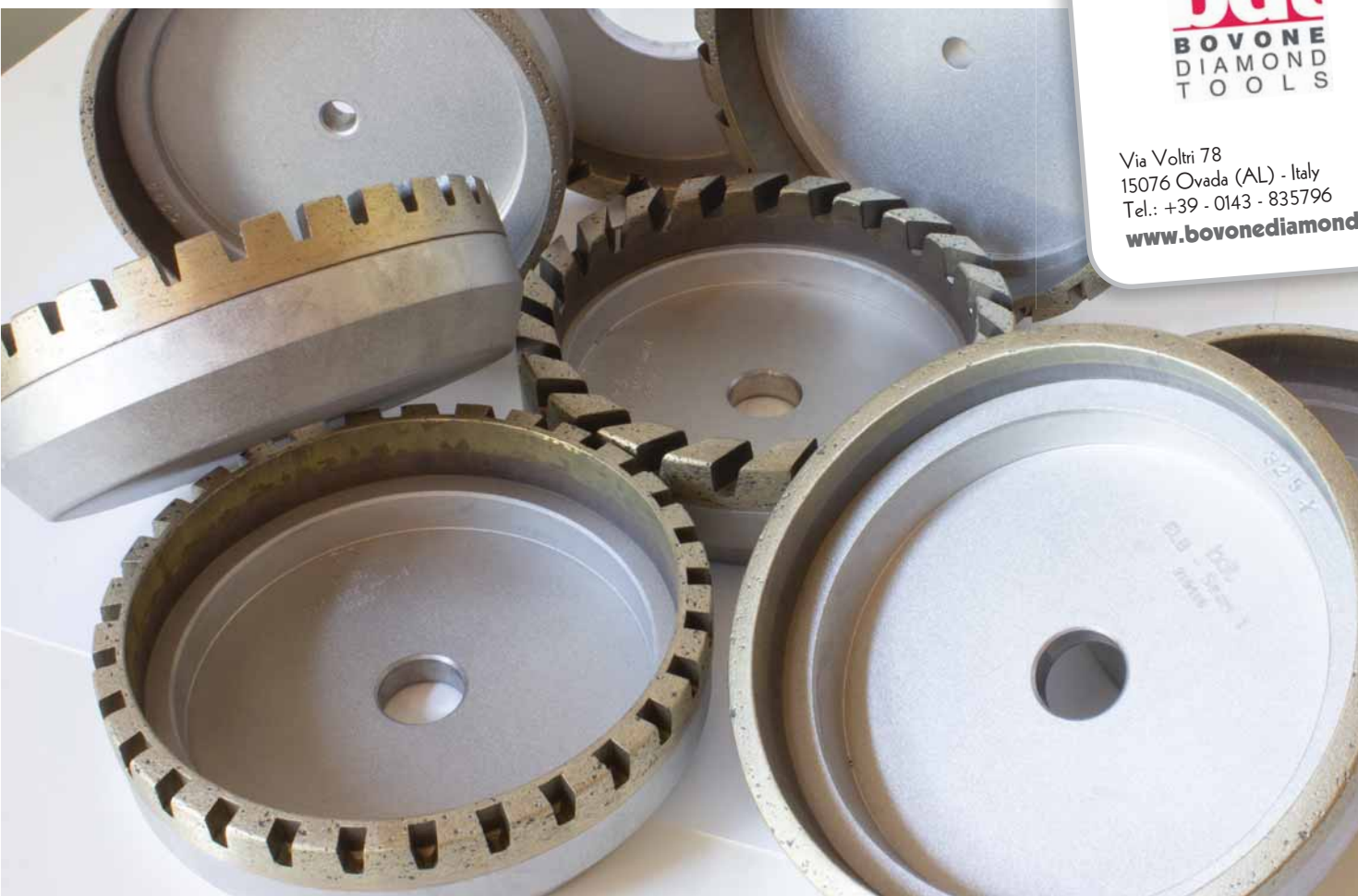
ment of new, increasingly performing solutions, collaborating side by side with customers, leading to the most suitable products that respond to specific needs.

VISIBLE RENEWAL – ALSO IN COMMUNICATION

This framework of renewal is communicated and transmitted by means of a new visual brand that the company launched earlier this year: a clear and unique message supported by a new graphic layout that speak about the com-

pany that is moving forward thanks to solid traditions.

The colours create continuity and confirm the distinctive values of BDT's mission: quality, productivity and reliability. A solid and traditional company that constantly pushes forward.



BDT



Via Voltri 78
15076 Ovada (AL) - Italy
Tel.: +39 - 0143 - 835796
www.bovonediamond.com



LiSEC

PROVIDING SERVICE, MACHINES AND SOFTWARE FOR OLYMPIC GOLD

With over 25 years of experience in the processing and manufacturing of safety glass, Olympic Glass speaks to us about how it has become one of the UK's leaders in its field — especially thanks to equipment from LiSEC.



Olympic Glass is one of the UK's leading manufacturers and processors of safety glass and sealed units. On an area of around 8,500 m², high-quality products are manufactured at the headquarters in Sheerness, Kent, on the south-east coast of the

UK, and can be delivered anywhere in the UK. To ensure the high quality of its products, the company has been cooperating with LiSEC for many years.

QUALITY, RELIABILITY AND TOP SERVICE

Olympic Glass has been manufacturing and processing quality glass products for the private and commercial glass industry since 1992. The company produces toughened safety glass and a variety of special glass products, such as energy-saving insulating glass units, coated tempered glass and fire protection glass.

Olympic Glass is known for its commitment and focus on the double-glazing market and is distinguished by its wide range of products with all types of glass, many spacer widths and optional gas fillings. Olympic Glass is one of the market leaders in supplying insulating glass products of the highest standard not only thanks to its broad product portfolio, but also because of its high-quality manufacturing processes, high reliability and top service.

COOPERATION BETWEEN LISEC AND OLYMPIC GLASS

The partnership between

Olympic Glass and LiSEC also began in 1992: "When we started to operate at Olympic Glass, we were looking for the best and highest quality machines in the industry — LiSEC met our criteria perfectly," said Gary Jenkins, Managing Director of Olympic Glass, who has always appreciated working with LiSEC. "LiSEC has always worked closely with us in the development of our machines and software and has always supported our needs," he continued.

Ged Smith, Managing Director of LiSEC Software UK Limited, also speaks only positively about the



cooperation, “Olympic Glass and LiSEC have been business partners for over 20 years and it is no coincidence that Olympic Glass have grown continuously during this time. Gary Jenkins understands the value of technology in his constant push for improvement and excellence. He knows from experience that LiSEC is a business partner you can trust – when it comes to service, machines and software. With LiSEC he achieves the high standards he sets. He has a concrete vision for the future of his company – we can provide the pathway to that future. Nonetheless, we must not forget the importance of personal relationships – Gary knows that there is a high level of trust and honesty in communication between our companies at all levels. We both value this connection and it will bring positive benefits to both of us in the future.”

With regards to the long-standing cooperation between the two companies, Roger Hafenscherer, LiSEC Head of Business-Unit Ser-

vice, said, “Over the years, a great business relationship has developed between Olympic Glass and LiSEC. A good customer-supplier relationship plays a significant role or rather is the basis for the success of a company.”

The fact that Olympic Glass is convinced of LiSEC is easy to see, right there in the company. Olympic Glass owns LiSEC cutting tables, LiSEC bending machines, LiSEC machines for grinding and washing, two production lines and the LiSEC perfectscan. Furthermore, Olympic Glass is equipped with LiSEC software for capacity planning, delivery management, stock management and purchasing, shelf management, as well as LiSEC Scancam, LiSEC EDI order and LiSEC software for automatic batch planning.

According to Gary Jenkins, what sets LiSEC apart from other companies is their unique progress in the development of new machines and software in the industry, but also the close mutual working relationship. LiSEC’s software products

and services help Olympic Glass to develop new technologies, increase productivity and give the company a competitive advantage.

EMPLOYEES, CUSTOMERS AND SUPPLIERS DURING COVID-19

Due to restrictions and guidelines of the British government, Olympic Glass stopped production and closed its factory on 24 March 2020. “We have contacted all customers and suppliers to ensure that relationships are maintained while retaining cash flow. Through constant communication with our customers, we have always kept up to date with the latest market information. As a result, a gradual return to work began on 4 May 2020,” said Gary Jenkins.

This return to work was carefully planned to ensure compliance with government guidelines. Safety distances were also strictly observed, hand disinfectant dispensers were placed, and masks were provided for the employees. Gary Jen-

kins looks to the future with hope, “These are unprecedented times and it is impossible to predict the coming months, but the initial signals from our customers are positive.”

But during this exceptional situation, it is important not only preservation or the vision of customers. In these times, suppliers must also show that they can still offer top service and rapid assistance in the event of problems, despite the difficult general conditions. Cooperation with LiSEC has, once again, proven its worth in this instance. Thanks to the usual fast reaction and response times, cooperation at eye level has been excellent, and the reliability of LiSEC service has once again been proven.

“At LiSEC Service the customer’s word is heard. This is important! During COVID-19 we also maintained a 24-hour hotline and various standby services for spare and wear parts sales to support our customers as much as possible during this special time,” said Roger Hafenscherer.



LiSEC

LiSEC

Peter-Lisec-Straße 1
3353 Seitenstetten - Austria
Tel.: +43-7477-4050
Fax: +43-7477-40580
E-mail: sales@lisc.com
www.lisc.com

The wave-shaped glass façade of the Qatar National Library covers a total area of 5,500 square metres



© Iwan Baan

Edgetech

FLEXIBLE SPACER SYSTEMS FOR HOT DESERT CLIMATES

CRICURSA Cris-
tales Curvados,
SA and the warm
edge Super Spacer® have
been a proven team in
the production of curved
XXL insulating glass units
for iconic buildings with
unique glass façades for

some time now. Especial-
ly for energy-efficiency
reasons, the warm edge
spacer system was also
used for the 5,500 square
metre glass façade of the
Qatar National Library
in Doha, which was com-
pleted in 2018.

WAVE-SHAPE PROVIDES STABILITY

Rob Nijse, Professor of
Structural Analysis and
former partner of the
Dutch engineering compa-
ny ABT Arnhem, and ABT
structural consultant Ron-
ald Wenting were both in-

involved in a leading capacity
in the structural design for
the first congenial collabo-
ration of Rem Koolhaas
and CRICURSA: the Casa
da Música concert hall in
Porto, the wave-shaped
glass façades of which have
become something of a

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. This article gives us a perfect example of how these spacers are used with their application in the Qatar National Library by CRICURSA.

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 façades," Rob Njisse 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 façade 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 their own experience that there are only a handful of glass bending shops in the world capable of producing

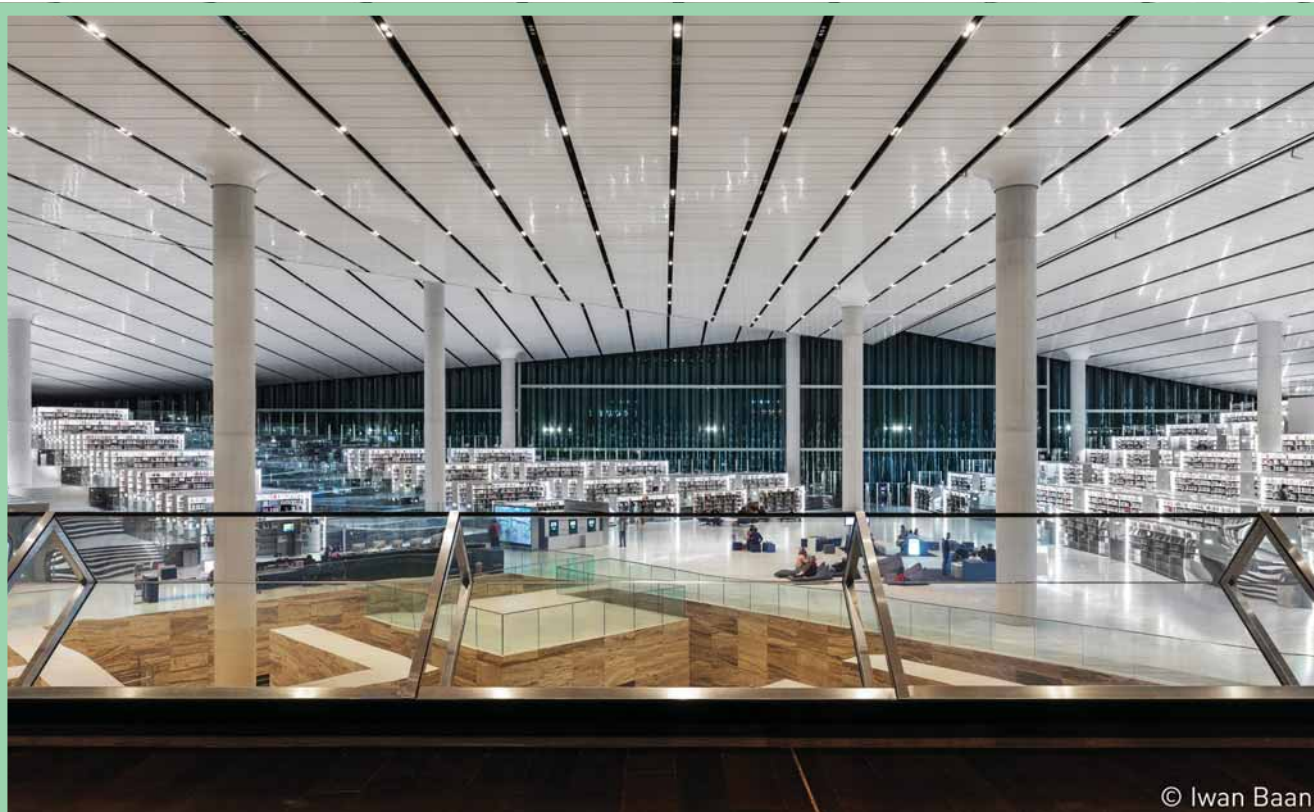
curved XXL glass panes in the required qualities, with the necessary tight radii and minimal tolerances.

The planning team also broke new ground with its solution involving the construction of the glass façade as a load-bearing, bracing element. In the case of Porto, Rem Koolhaas had the vision of glass façades 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.

The braced corners of the building provide the façade with the exterior shape of a diamond



© Iwan Baan



SUPER SPACER® TRISEAL™ IN THE QATAR NATIONAL LIBRARY

Rem Koolhaas also opted for a corrugated glass façade 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 façades 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.

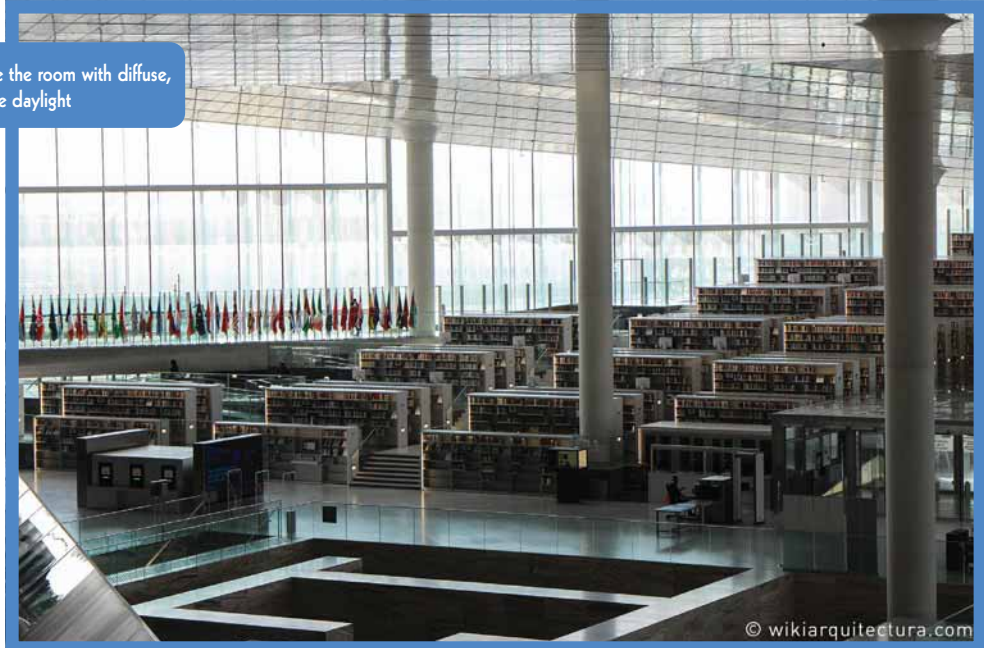


On average, more than
300 million metres Super
Spacer® are sold annually
in over 90 countries
worldwide.



Glass façades 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



EDGE TECH 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.

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.

ENERGY-OPTIMISED FAÇADE

In the Qatar National Library, the absence of metallic elements in the glass façade also has a decisive climatic benefit: there are



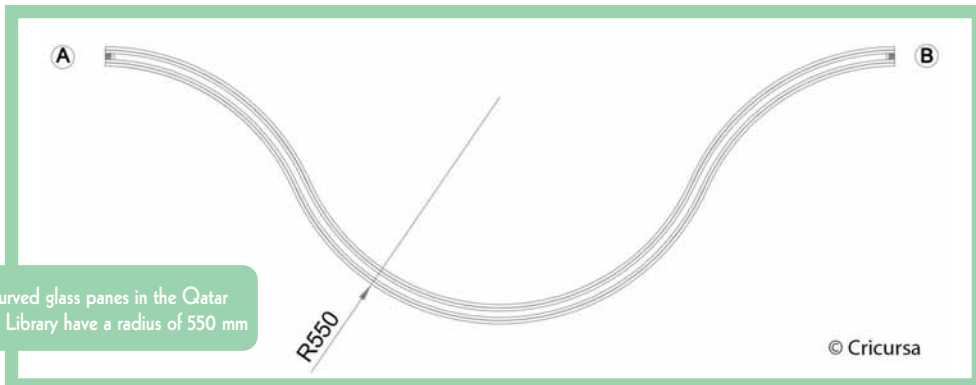


no potential thermal bridges that conduct heat into the interior of the building and which could weaken the insulating effect of the gas layer and warm edge in the curved double glazing. "Qatar is one of the regions most markedly affected by the rise in average temperatures caused by climate change," explains CRICURSA's Marketing Director Joan Tarrus. "Outdoors, temperatures exceed 40° centigrade in the summer, the temperature inside the library should be a pleasant 20°. The energy-related and thus production-related challenges placed upon the façade 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 façade 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 per cent here according to Rob Nijssen and Roland Weining – and also in-plane of the glass. In Doha the steel



The glass structure is characterised by the filtering and reflection of light and the lowest possible levels of heat input



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

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 Stoss.

Edgetech Europe GmbH

Edgetech
A Quanex Building Products Company

Gladbacher Strasse 23
52525 Heinsberg - Germany
Tel.: +49 - 2452.96491.0
Fax: +49 - 2452.96491.11
E-mail: info@edgetech-europe.com
www.superspacer.com

bases between the glass elements were connected with interior columns to provide the construction with even more stability.

Joan Tarrus continues: “When we started analysing OMA’s architects new challenge, undulating DGU façade, 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 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 ra-

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

WARM EDGE INDISPENSABLE IN DESERT CLIMATES

CRICURSA chose the flexible 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

The stacked glass elements are up to 5.50 metres in height



Guardian Glass



DOUBLE SKIN FAÇADE THAT
MEETS COMPLEX AESTHETIC
AND TECHNICAL
PERFORMANCE REQUIREMENTS

Guardian Glass, one of the world's largest manufacturers of float, coated and fabricated glass products, gives us an insight into one of the most recent applications of its products. The 'intelligent' cube berlin combines innovative architectural design with the complex structural and energy performance required by today's building industry.

CUBE BERLIN

Cube berlin is an eye-catching, 11-storey office building located at Washington Platz in the Europacity urban district of Berlin. This 19,000 square-metre structure, developed by CA Immo, is an excellent example of how innovative architectural design can be successfully combined with the complex technical (structural and energy performance) requirements of an 'intelligent' commercial building.

Designed by 3XN Architects of Copenhagen, cube berlin stands out due to its fully glazed, double skin ventilated façade that integrates the building into the surrounding environment. The unique, custom-designed façade not

only meets the aesthetics required by the architect, but also meets the high structural and energy performance requirements.

Due to the combination of glass used in the fully glazed façade, the aesthetics are visually appealing, reflecting the building's surroundings on all sides and dynamically changing its appearance depending on the viewing angle, the weather and time of day. The dynamic façade uses a stepped thermal façade beneath an outer glass skin, which wraps the building in a triangular pattern. Access points are introduced through a set of articulated openings in the outer skin on all four sides and on multiple floors.

Torben Østergaard, partner at 3XN and architect



on the project comments: "Our initial idea was to sculpt the building so that it would enter a dialogue with the urban space, the surrounding buildings and

life at Washington Platz. In order to make the building work as a sculpture on the square we were looking for reflective glass that emphasises the surface while also

visually reflecting the surroundings...

Another important design element was to maximise natural daylight for the building's occupants. As Torben Østergaard states: "As the floor plates are rather deep, we were aiming at a fully glazed façade, not only to produce the best possible daylight con-

ditions but also to allow for the particular feel of floor-to-ceiling windows that offer great outside views."

ENERGY EFFICIENCY

As well as its stunning architecture, the project also stands out due to its high level of commitment to environmental sustainability, with reduced energy

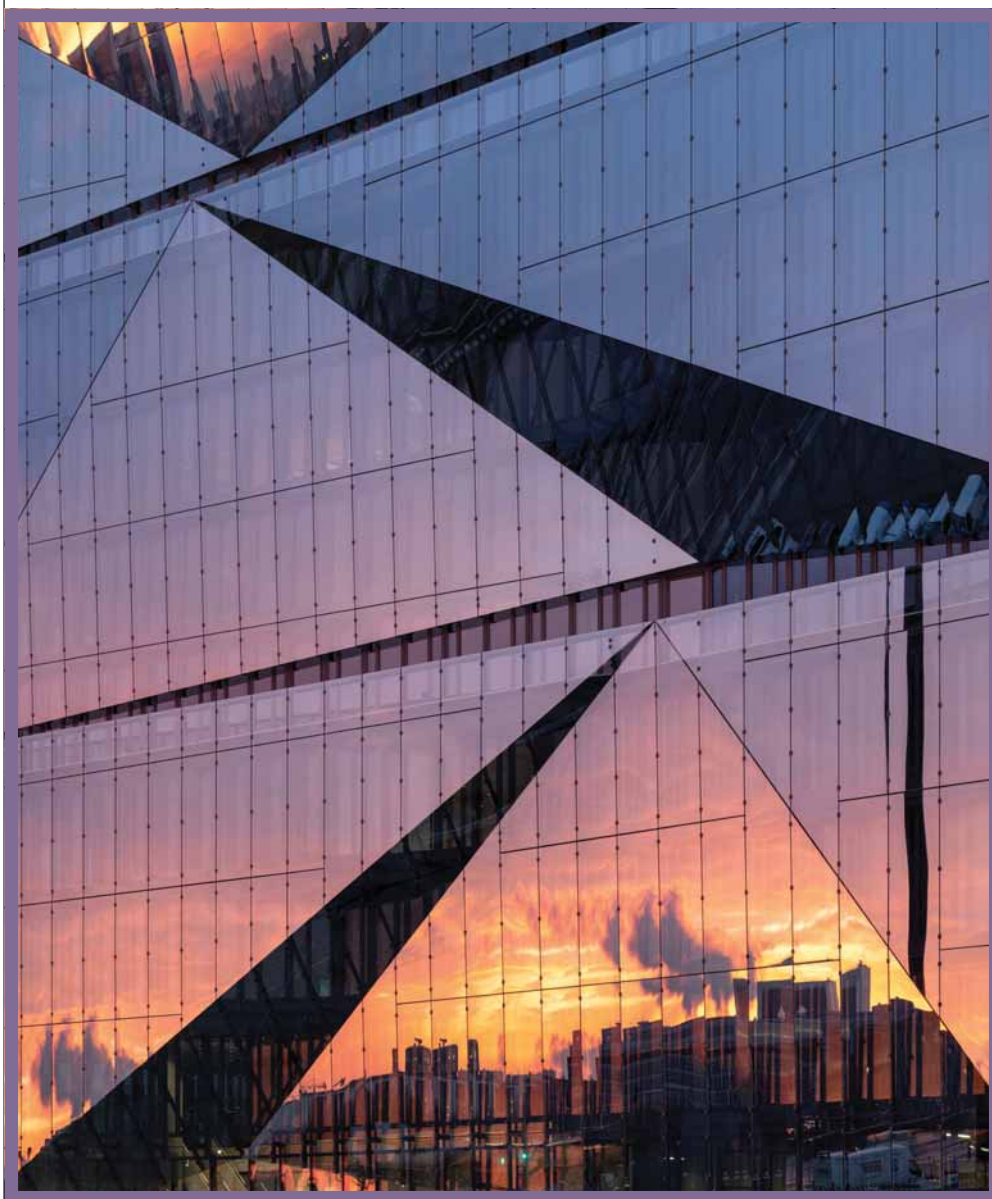
consumption compared to traditional office buildings. The ventilated double skin façade was a crucial factor here. As well as being a natural daylight provider, the façade also offers effective protection against (solar) heat gain, while allowing the occupants to benefit from natural ventilation. As Joachim Fauth of

Drees & Sommer, façade consultant on the project states: "To prevent overheating of the cavity, we put solar control coatings and solar absorbing PVB layers in the outer skin."

Matthias Schmidt, Head of Development at Investor CA Immo states: "We are aiming for DGNB Gold certification on this project. The design of the façade is actually very energy efficient and together with a clever technical concept that, among other things, includes regaining energy from heat, adds up in total to an effective energy solution that will negate the common idea that glass buildings are severe energy spenders."

Another challenge was the structural make-up of the glass. This meant adding another structural interlayer, which had to be compatible with the solar absorbing PVB interlayer. This solution was developed from scratch and national approval had to be sought during the design and construction phase. By adding this extra structural interlayer, edge stability was increased, and the risk of delamination lowered, while reducing the yellowness index.

Joachim Fauth says: "To design such a complex product, you need real teamwork, which is exactly what happened during the design phase, with the glass supplier, the PVB supplier, the architect and



the façade consultant all working closely together.”

EXPERT ADVICE AND TECHNICAL SUPPORT

In addition to supplying coated glass products, the Guardian Glass team involved in the project also provided technical expertise. As Olivier Beier Costa, Guardian Glass Sales Manager who worked on the project states: “The biggest challenge was to

GUARDIAN GLASS

Guardian Glass, a major business unit of Guardian Industries, is one of the world's largest manufacturers of float, coated and fabricated glass products. At its 25 float plants around the globe, Guardian Glass produces high performance glass for use in exterior (both commercial and residential) and interior architectural applications, as well as transportation and technical products. Guardian glass can be found in homes, offices, cars and some of the world's most iconic architectural landmarks. The Guardian Glass Science & Technology Center continuously works to create new glass products and solutions using the most advanced technology to help customers see what's possible®.

Guardian Industries Guardian Industries, a global company headquartered in Auburn Hills, Michigan, operates facilities throughout North and South America, Europe, Africa, the Middle East and Asia. Guardian companies employ more than 16,000 people and manufacture high-performance float glass; coated and fabricated glass products for architectural, residential, interior, transportation and technical glass applications; and high-quality chrome-plated and painted plastic components for the automotive and commercial truck industries.

Guardian is a wholly owned subsidiary of Koch Industries, Inc.

combine two things: first of all, the design and aesthetic concept of the architect and secondly, the technical requirements of the building, so we had to identify the right products that could be used for

such an application. That involved the performance of various tests and calculations, as well as the production of many samples.”

Guardian Glass

- Guardian SunGuard®

HD Diamond 66 Ultra and SuperNeutral SN 62/34 solar control glass;

- Guardian ClimaGuard® Premium2 thermal insulating glass;
- Guardian UltraClear® low-iron float glass.

Investor/Project Developer

- CA Immo Deutschland GmbH.

Architect

- 3XN.

Consultant in façade engineering, energy design and green building certification:

- DREES & SOMMER Cladder.

GIG Photo Credits

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Glass Processor

- outer skin glazing: BGT Bischoff Glastechnik AG.

Glass processor

- inner skin: Reflex.

 Guardian Glass

 **GUARDIAN GLASS**

See what's possible™

www.guardianglass.com



With a digital printing process, sedak prints panes of up to 3.30 x 18 meters with real gold and silver.
Photo: sedak

sedak PRESENTS ITS NEW TECHNOLOGY: REGAL GLOSS IN DIGITAL PRINTING

Two materials that have fascinated mankind for centuries are gold and glass. The elegant radiance of the precious metal and the high value associated with it combined with the bright transparency of

the fragile material glass results in a unique and very unusual effect. sedak (Gersthofen) has made this splendid symbiosis a reality and now prints glass panes of up to 3.30 x 18 meters with genuine gold and silver

– with the highest precision and a resolution of up to 1024 dpi.

The printing takes place on float glass. During the printing process the gold or silver particles are bound in a special solution

With its new digital printing technology, sedak can now put precious metals onto glass. The interplay between glass, gold and silver creates glass panes with fascinating optical effects — as insulating and safety glass, even curved. Especially impressive: the printing process allows for extremely fine details and filigree structures. Complex design ideas can be realized with high precision.

and applied to the glass extremely finely in a digital procedure. In the tempering process that follows the valuable metal bonds permanently to the glass.

In order to protect the printed design from environmental influences and mechanical damage such as scratches, the printed side is placed on the inside of the laminate towards the film interlayer and is thus protected by the glass. "After three years of research and development we have now extended

the spectrum of our digital printing to include the possibility to design glass panes with the majestic shine of real gold and silver – even in oversized formats," Ulrich Theisen, Sales Manager at sedak, is pleased to report. "There is a fascinating interaction between the transparency of the glass and the brilliance of the precious metals, which captivates the observer." sedak uses the glass panes printed with genuine precious metals to produce insulating and

sedak

Since its founding in 2007, Germany-based company sedak has used its pioneering spirit to establish itself as a premium manufacturer of large-format insulated and safety glass. sedak has evolved their glass as a construction material for all-glass façades and roofs. Iconic façades and buildings are created with an unprecedented degree of transparency thanks to superior quality of innovative products. sedak manufactures single-pane glass units, multi-layer glazing and functional insulated glass units in formats up to 3.6 x 20 meters in an efficient, highly automated system.

Raw glass is treated, strengthened, laminated, printed, lamination-curved and assembled into insulated glass with a unique set of machinery that spreads over a production area measuring 35,000 sq.m. Since integrating Italian-based Sunglass Industry srl, who are the specialist in curved glass, sedak's core expertise now also includes hot bending glass. The specialist also supplies exceptional solutions for luxury yachts with optimized glass for use on the high seas. The glass fabricator particularly demonstrates its solution-oriented expertise in special designs. Thanks to its research and development spirit, new technologies and the expertise of its 190 employees, sedak is constantly advancing innovations in glass finishing and sees itself as a partner to architects, developers, façade builders and metalwork companies. As a specialist in oversized and extremely heavy glass, the company develops future oriented solutions to implement customers visions with a flexible approach. The glass fabricator acts as a full-service supplier – from the initial order to final delivery.

Shining results: precious metal printing allows even complex designs and filigree details to be realized – with a resolution of up to 1024 dpi.

Photo: sedak





safety glass, including curved glass.

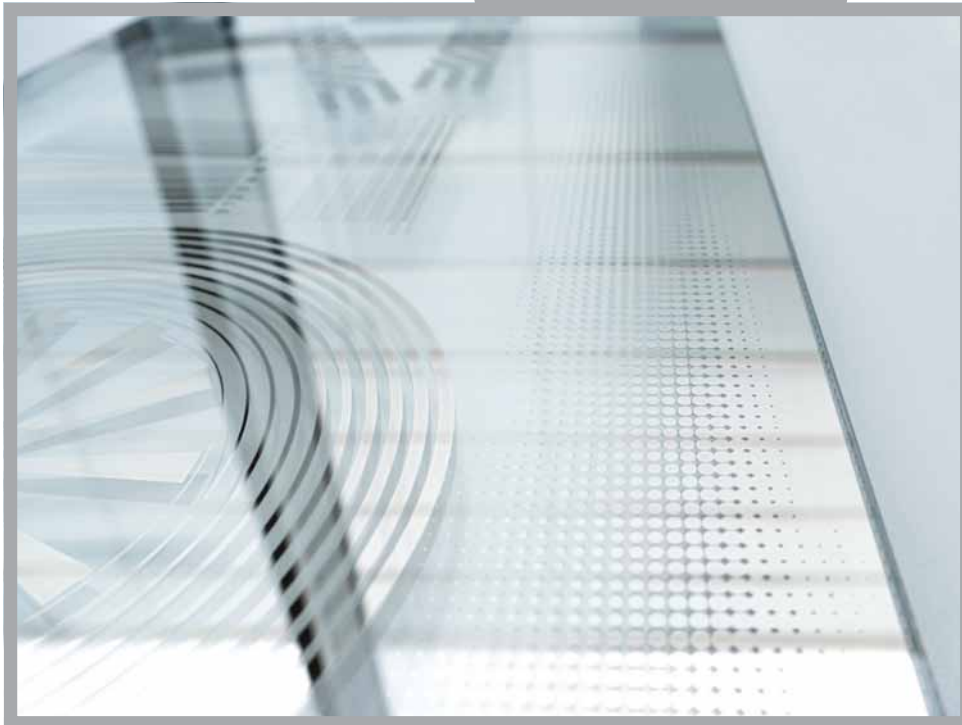
DIGITAL PRINTING: FAST, FLEXIBLE, CREATIVE

Digital printing of precious metals offers numerous advantages compared with other procedures. Whereas with coating only full-surface application of the metal layer is possible, with digital printing even the most intricate designs can be printed: fine dots, complex patterns and even colour gradients can be achieved. There are hardly any limits to creativity: "The digital gold and silver printing can also be combined with ceramic colour printing," explained Theisen. A further advantage of digital printing is the

Unlimited creativity: the printed glass can be processed further into insulating and safety glass, and can even be curved.
Photo: sedak



Richly adorned: the precious metal print in gold and silver is processed into a laminate and is thus protected from mechanical influences, keeping its characteristic shine.
Photo: sedak



economical application of the material – a cost advantage, especially with precious metals.

Gold and silver are timeless classics and exude luxurious radiance as optical highlights. Extravagant concepts for interiors and façades can be realized with the high-quality materials. sedak's new printing technique will be used for the first time in a large project in Asia.

sedak GmbH & Co. KG

sedak

Einsteinring 1 - 86368 Gersthofen
Germany
Tel.: +49-821-2494222
Fax: +49-821-2494777
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GLASS
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GLANCE INTO A WORLD OF INNOVATION

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WINDOWS** EXPO2020



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For enquiries contact: Sulaiman Khan | +91 98999 52189 | skhan@zakgroup.com | www.zakglasstech.com

Trosifol's PVB and ionoplast interlayers for laminated safety glass applications are used globally in the architectural segment, providing safety and security applications, sound insulation and UV protection. In this article we take a look at the company's new SentryGlas® Xtra™ (SGX™) ionoplast interlayer, which is now available in roll form from its plant in Holesov in the Czech Republic.



Trosifol

SAFETY GLASS APPLICATIONS IN THE ARCHITECTURAL, AUTOMOTIVE AND PHOTOVOLTAIC INDUSTRIES

Trosifol™ – part of the Kuraray Group – is a leading global producer of PVB and ionoplast interlayers. Trosifol™ offers the world's broadest portfolio of innovative glass-laminating solutions, including structural and functional interlayers for safety and security applications, sound insulation and UV protection. For decorative applications, Trosifol supplies coloured interlayers, digitally printable films

and other innovative products for interior design projects. Trosifol UltraClear films exhibit the lowest Yellowness Index (YID) in the industry.

HOLESOV PLANT ON A ROLL WITH NEW-FORMAT SENTRYGLAS® XTRA™

Trosifol's new SentryGlas® Xtra™ (SGX™) ionoplast interlayer is now available in roll form from its plant in Holesov in the Czech Republic.

Available in widths up to 2.7 meters, the roll format gives processors and laminators far greater flexibility. Rolls are not only easier and more efficient to store, but they also promise less wastage compared to the sheet-supplied variant.

The Holesov plant, which started production of SentryGlas® earlier last year, can produce rolls with calipers of 0.76 and 0.89mm. What is more, the exceptional roll flatness on offer from

the new plant results in improved lamination efficiency and throughput.

SGX™ – in both roll and sheet form – improves lamination processing efficiency and streamlines processing, while still delivering the high-quality laminate construction and outstanding operational performance synonymous with the SentryGlas® brand.

These features, combined with the roll format, will make multiple-ply laminat-



ed glass assemblies easier to process while delivering the potential to increase the number of laminates in autoclaves, increasing throughput efficiency.

SENTRYGLAS® XTRA™

SentryGlas® Xtra™ (SGX™), not only improves lamination processing efficiency, but also removes a number of the processing requirements placed on laminators. Of particular interest to laminators is the reduced risk of haze formation caused by an inadequate cooling rate. Adhesion to the air-side of glass has been significantly improved, too, with an adhesion primer no longer being required, making multiple-ply laminated glass assemblies easier to process. There is also the potential to increase the number of laminates in autoclaves, increasing throughput efficiency.

TROSIFOL AND ITS MAIN PRODUCTS

Trosifol is the leading global producer of PVB and ionoplast interlayers for laminated safety glass applications in the architectural segment, offering the biggest product portfolio worldwide, such as:

- Structural: Trosifol® Extra Stiff (ES) PVB and SentryGlas® ionoplast films
- Acoustic: Trosifol® SC Monolayer and Multilay-



- er PVB films for sound insulation
- Trosifol® PVB film for UV control: From complete UV protection to natural UV transmittance

- Trosifol® UltraClear PVB film for the lowest yellowing value in the industry
- Decorative & design: Black-and-white, colour and printable interlayers.

 Kuraray Europe
Trosifol PVB Division

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world of interlayers

Mülheimer Strasse 26
D-53840 Troisdorf - Germany
Tel.: +49-2241-2555220
Fax: +49-2241-2555299
E-mail: trosifol@kuraray.com
www.trosifol.com



FLATGLASS

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ADDELIO LATTUADA Srl
Via Abbondanza, 11/13 - 22070 Carbonate (CO) - Italy
Tel: +39 0331 832713 / Fax: +39 0331 833886 • E-mail: info@adeliolattuada.com
www.adeliolattuada.com • www.lattuada-na.com • cyberal.adeliolattuada.com

COMPANY DATA

Contacts
Adelio Lattuada - President
Nicola Lattuada, Michela Lattuada - Partner

Sales
Domestic 5% / International 95%

Area
Office area 500 m² / Plant area 3,500 m²

Number of Employees
42

Founding Year
1978

Capital
EUR 90,000.00

Planned Exhibitions
Seebe - Belgrade, Serbia - 22 / 25 April 2020
Glass Texpo - San Antonio (TX), USA - 01 / 02 May 2020
Glass South America - Sao Paulo, Brazil - 3 / 6 June 2020
Mir Stekla - Moscow, Russia - 8 / 11 June 2020
Glasstech Mexico - Guadalajara, Mexico - 27 / 29 July 2020
GlassBuild America - Las Vegas (NV), USA - 15 / 17 September 2020
Glasstec - Düsseldorf, Germany - 20 / 23 October 2020

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Austria
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POLYSULPHIDE SEALANT EXTRUDERS

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

GAS FILLING EQUIPMENT

Glaston/Bystronic

Fenzi

Forel

Lisec Group

Neptun

Schiavo

Sparklike

S.T. Group

Tecno Glass

Tenon (Beijing) Equipment

Thermoseal Group

DESICCANT SALTS

Ashton Industrial Sales

Fenzi

Neptun

Schiavo

S.T. Group

Tecno Glass

Thermoseal Group

SPACERS/PROFILES

Ashton Industrial Sales

Edgetech Europe

Fenzi

Schiavo

S.T. Group

Tecno Glass

Thermoseal Group

GEORGIAN BARS

Ashton Industrial Sales

Hegla

Tecno Glass

Thermoseal Group

BUTYL

Ashton Industrial Sales

Fenzi

Thermoseal Group

POLYSULPHIDE SEALANTS

Fenzi

HOT MELT

Ashton Industrial Sales

Fenzi

Thermoseal Group

OTHER SEALANTS

Fenzi

PANTOGRAPHS

Fratelli Pezza

ACCESSORIES

Ashton Industrial Sales

Deltamax Automazione

Diamant - AR Nunziata

Dieffe Macchine

Forel

Forza G / G. Tech

Helios Quartz

Schiavo

Sparklike

S.T. Group

Tenon (Beijing) Equipment

Triulzi

Tempering

TEMPERING FURNACES (ARCHITECTURAL GLASS)

CNUD-EFCO

Glaston/Bystronic

Glass Company

Glasstech Inc.

Hornos Industriales Pujol

Keraglass

Landglass Technology

Lema

Lisec Group

Mappi International

Schiavo

Shanghai North Glass

Technology

Tekno Kilns

Tempering furnaces

(automotive glass)

Glaston/Bystronic

Glass Company

Glasstech Inc.

Keraglass

Landglass Technology

Mappi International

Mazzaroppi Engineering

Satinal Spa

SGLASS

Shanghai North Glass

Technology

CHEMICALS TEMPERING EQUIPMENT

Glass Company

R.C.N. Solutions

ACCESSORIES

CNUD-EFCO

Deltamax Automazione

Fenzi

Glaston/Bystronic

Glass Company

Helios Quartz

Hornos Industriales Pujol

Keraglass

Landglass Technology

Mappi International

Mazzaroppi Engineering

R.C.N. Solutions

Satinal Spa

SGLASS

Tekno Kilns

Torgauer Maschinenbau

Bending

BENDING FURNACES (ARCHITECTURAL GLASS)

Glaston/Bystronic

Glass Company

Glasstech Inc.

Hornos Industriales Pujol

Keraglass

Mappi International

Mazzaroppi Engineering

R.C.N. Solutions

SGLASS

Tekno Kilns

Bending furnaces

(automotive glass)

CNUD-EFCO

Glaston/Bystronic

Glass Company

Glasstech Inc.

Keraglass

Mappi International

Mazzaroppi Engineering

R.C.N. Solutions

Satinal Spa

ACCESSORIES

Ayrox

Deltamax Automazione

Glaston/Bystronic

Glass Company

Glasstech Inc.

Hornos Industriales Pujol

Keraglass

Mappi International

Satinal Spa

Softeco

Tekno Kilns

Laminated glass production

COMPLETE PLANTS

Bovone Elett.

Bottero

Glaston/Bystronic

Forel

Glaston/Bystronic

Glass Company

Hornos Industriales Pujol

IOCCO Group

Lisec Group

Mazzaroppi Engineering

R.C.N. Solutions

Satinal Spa

Triulzi

LAMINATED WINDSCREEN BENDING FURNACES

ECOL

Glaston/Bystronic

Glass Company

Glasstech Inc.

Keraglass

Mappi International

AUTOCLAVES

Glaston/Bystronic

Glaston/Bystronic

Glass Company

Hornos Industriales Pujol

Lisec Group

Triulzi

CLIMATIC CABINS

Glaston/Bystronic

Forel

IOCCO Group

Lisec Group

Triulzi

INFRARED OVENS

Glaston/Bystronic

ECOL

Forel

Glass Company

Hornos Industriales Pujol

IOCCO Group

Lisec Group

Satinal Spa

SGLASS

Triulzi

PRESSES/BENDING MACHINES

Forel

IOCCO Group

Lisec Group

Triulzi

RESIN LAMINATING

MATERIALS AND EQUIPMENT

IOCCO Group

Satinal Spa

Torgauer Maschinenbau

EVA (ETHYLENE VINYL ACETATE)

Satinal Spa

PVB

Everlam

Kuraray - Trosifol

PVB - SHAPING AND CUTTING EQUIPMENT

Ayrox

Glaston/Bystronic

ECOL

Forel

IOCCO Group
Lisec Group
Softeco

PVB - WIRING TECHNOLOGY FOR HEATABLE LAMINATES

Ayrox
ECOL
Softeco

ACCESSORIES

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

Drilling

AUTOMATIC DRILLING LINES

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

MULTI-SPINDLE DRILLING MACHINES

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

DRILLING MACHINES WITH OPPOSITE DRILLING HEADS

B Solution Licensee of BF
Project
Bando Kiko

Bavelloni
Bottero
Glaston/Bystronic
CMS
Fenzi
Forvet
Hiseng Glass Machinery
Intermac - Biesse
IOCCO Group
Schiavo
Schiatti Angelo
SKG - Skill Glass

COLUMN DRILLING MACHINES

B Solution Licensee of BF
Project
Bottero
Fenzi
Schiavo

PORTABLE DRILLING MACHINES

CMS
Fenzi
Schiavo

DRILLING AND MILLING MACHINES

Bavelloni
Bottero
CMS
Forvet
IOCCO Group
Schiavo
SGLASS

DIAMOND DRILLS

ADI
Bovone Diamond Tools
Diamant - AR Nunziata
Diamut - Biesse
Fenzi
Glaston/Bystronic
Mole Moreschi
Schiavo
Tyrolit Vincent

ACCESSORIES

CMS
Fenzi
Schiavo

Other equipment and plants

TURNKEY PLANTS / ENGINEERING - FOR BUILDING GLASS

Bando Kiko
Bottero

Glaston/Bystronic
Cugher Glass
Horn
Intermac - Biesse
IOCCO Group
Keraglass
Lisec Group
Torgauer Maschinenbau

TURNKEY PLANTS / ENGINEERING - FOR AUTOMOTIVE GLASS

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

KEY PLANTS / ENGINEERING - FOR DISPLAY GLASS

Bando Kiko
Cugher Glass
Torgauer Maschinenbau

WORKING CENTRES - CNC CONTROLLED

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

FLOAT PLANTS/LINES (EQUIPMENT & ACCESSORIES)

Bovone Elett.
Horn
IOCCO Group

CULLET HANDLING SYSTEMS

ECOL

COMPLETE BATCH PLANTS

Zippe

VACUUM COATING EQUIPMENT AND PLANTS

Glass Company
Shanghai North Glass
Technology

ENAMELLING EQUIPMENT AND PLANTS

Giardina Finishing + HS
Glassprinting
Glass Company
Rollmac division of GeMaTa

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

Giardina Finishing + HS
Glassprinting
Goldglass Technologies

SANDBLASTING SYSTEMS, EQUIPMENT AND PLANTS - OPTIMIZERS

Fenzi
Fratelli Pezza
Glass Company
Schiavo
SKG - Skill Glass

DIGITAL INKJET PRINTERS

Glass Company

SCREEN PRINTING EQUIPMENT AND PLANTS

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

SCREEN PRINTING FRAMES

COMSS

SCREEN PRINTING DRYING SYSTEMS

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

ACIDING GLASS EQUIPMENT AND PLANTS

Lisec Group
Rollmac division of GeMaTa

LASER DECORATING MACHINES

Ashton Industrial Sales
Glass Company

LASER MARKING

Ashton Industrial Sales

Artistic glass production

CERMAMIC INKS

Glass Company

CHAMBER ELECTRIC KILNS

Glass Company
Keraglass
Tekno Kilns
Accessories
Deltamax Automazione
Helios Quartz

Miscellaneous

AUTOMATION

Ashton Industrial Sales
Goldglass Technologies
Horn
IOCCO Group
Torgauer Maschinenbau
Zippe

AUTOMOTIVE GLASS APPROVAL SERVICES

Ayrox
Softeco

AUTOMOTIVE GLASS QUALITY CONTROL

Ayrox
Bando Kiko
Glaston/Bystronic
Cugher Glass
Deltamax Automazione
Easy Automation
Glaston/Bystronic
IOCCO Group
Softeco

CE MARKING - QUALITY CONTROL EQUIPMENT FOR GLASS IN BUILDING

Ayrox
Softeco

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

Goldglass Technologies

COLOURS & ENAMELS - OTHER APPLICATIONS

Ayrox
Goldglass Technologies

DEIONIZING AND WATER SOFTENING EQUIPMENT

Fenzi
Forel
Glass Company
Idrotecnica
Lisec Group
Triulzi

FLAT GLASS QUALITY CONTROL DEVICES

Ayrox
Deltamax Automazione
Forel
IOCCO Group
Softeco

FURNACES

Glass Company
Horn

FURNACES / HYDROGEN GENERATORS (WATER ELECTROLYSERS)

Nel Hydrogen

GLASS COATING AND TINTING

Giardina Finishing + HS
Glassprinting
Glass Company
Goldglass Technologies
Rollmac division of GeMaTa

GLASS TREATMENT FILMS

Glass Company

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

Horn
Keraglass

INFRARED TUBES

Helios Quartz
Deltamax Automazione

KILNS

Glass Company

Keraglass

Lisec Group
Tekno Kilns
Metal accessories
Fenzi

METALLIC SECTIONS

Fenzi

NUMERICAL CONTROL SYSTEM (CNC) FOR ALL GLASS PROCESSING MACHINES

Glass Company
IOCCO Group
Prodin

OPTICAL DISTORTION ANALYSERS FOR AUTOMOTIVE GLASS

IOCCO Group
Keraglass

OPTICAL INFRARED THERMOMETERS

Optris

POWDER OR LIQUID APPLICATION SYSTEMS FOR PROTECTING FLOAT GLASS

Cugher Glass
Giardina Finishing + HS
Glassprinting
Glass Company

PUMPING AND APPLICATION SYSTEMS (AUTOMOTIVE GLASS)

IOCCO Group

PURIFIERS FOR REFLUENT WATER

Dieffe Macchine
Forza G / G. Tech

PUTTIES AND SEALANTS

Fenzi

QUARTZ EQUIPMENT

Helios Quartz

SHAPE CHECKING DEVICES

Easy Automation
IOCCO Group

SIC HEATERS

Helios Quartz

SOFTWARE DATABASE, PROPERTY PREDICTOR

Synerglass Soft

SOFTWARE SYSTEMS FOR PRODUCTION CONTROL

A+W Software

CMS
Cugher Glass
Deltamax Automazione
Edgetech Europe

Forel

Lisec Group

Optima
Prodin
Synerglass Soft

SOLDERING EQUIPMENT FOR ELECTRICAL CONNECTORS FOR WINDSCREENS AND BACKLITES

Ayrox
Easy Automation
Softeco

SORTING SYSTEMS

Glaston/Bystronic

Lisec Group

SURFACE STRESS MEASUREMENT INSTRUMENT

Ayrox
Glass Company
Jeffoptics

TESTING FOR SOLDERINGS

Ayrox
Easy Automation
Softeco

TESTING DEVICES OF BACKLITES ELECTRICAL HEATING

Ayrox
Softeco

THERMAL IMAGING SYSTEMS

Easy Automation
Glass Company
Optris

TIN FLOAT BATH FURNACES

Horn
IOCCO Group

UV LAMPS

Helios Quartz

UV PORTABLE MACHINES

Helios Quartz



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vertical and horizontal washing machines for low-e glass

SOLUTIONS FOR GLASS STORAGE:

manual, semiautomatic and automatic storage systems

SOLUTIONS FOR CUTTING:

manual, semiautomatic and automatic cutting tables for float and laminated glass

SOLUTION FOR GLASS HANDLING:

automatic loader and unloaders, clamps, vacuum lifters, manipulators

SOLUTION FOR PROCESSING:

CNC Milling machines, vertical drillers

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