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ISSUE 2021

GLASS SPECIAL

manufacturing and products

DTP

**The superior solution
for your glass water
treatment needs**

see
page 7



iMMES
PROJECT AND PRODUCT



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GLASS SPECIAL 2021

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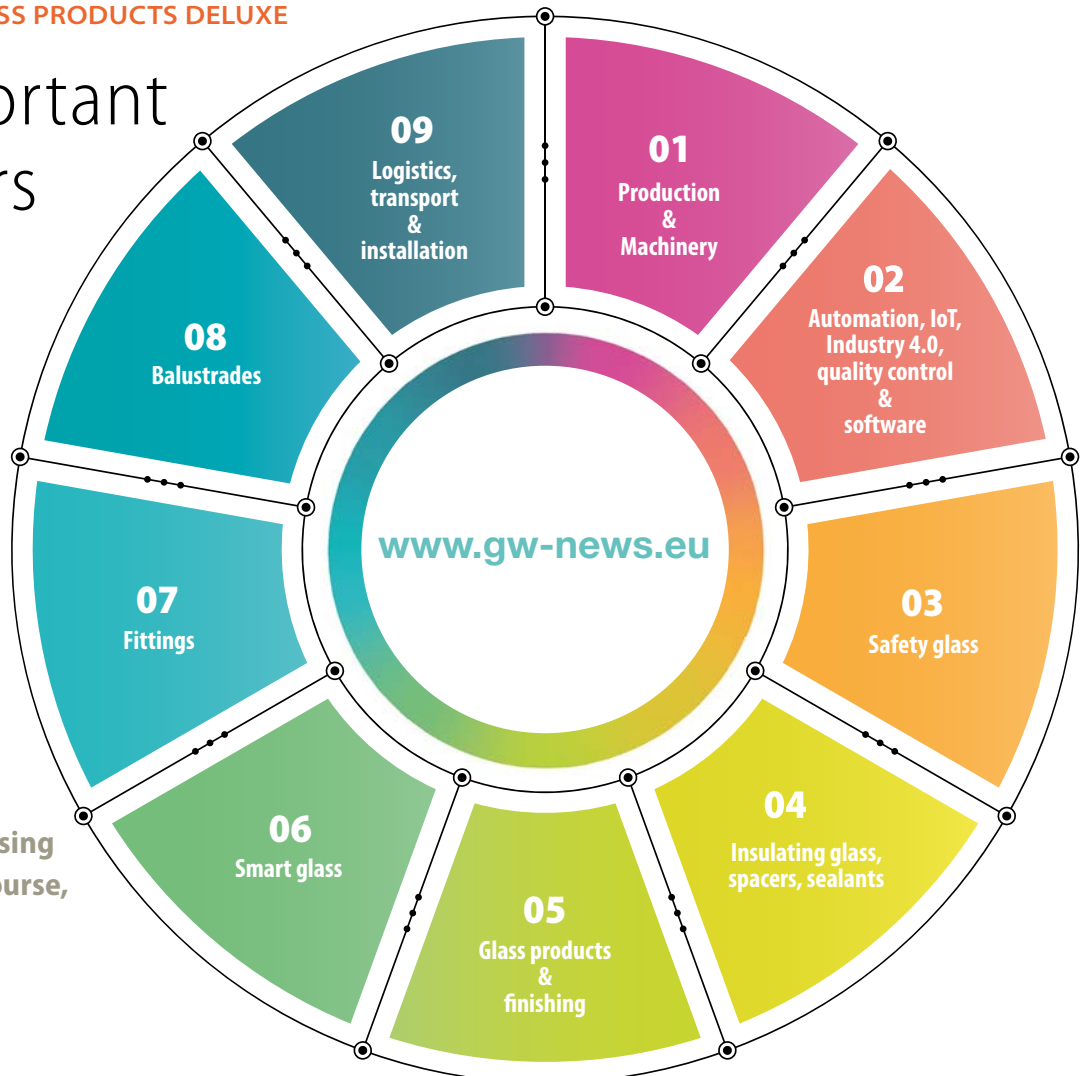
GLASS SPECIAL

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GLASS PROCESSING AND GLASS PRODUCTS DELUXE

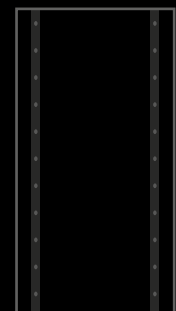
What is important for processors today and tomorrow?

The development of production plants, machines and glass products continues to advance at a brisk pace, as we present in our comprehensive Glass Special. Here you will find details on the state of digitalisation, the latest technologies for glass processing and quality control and, of course, exciting new glass products.



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In our Glass Special here in the Pdf you will find a comprehensive compilation of the latest developments in the glass industry. To help you browse all the innovations and new products from the various glass segments and supplier industries quickly and easily, take a look at this graphic (left) showing you the nine topic areas of the Glass Special:

- Production & Machinery (01), from page 06
- Automation, IoT/Industry 4.0, quality control & software (02), page 20
- Safety glass (03), from page 38
- Insulating glass, spacers, sealants (04), from page 46
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- Smart Glass (06), from page 64
- Fittings (07), from page 72
- Balustrades (08), from page 74
- Logistics, transport and installation (09), from page 76

Faster and more effective through automation

To start off, read our interview with Lisec CEO Gottfried Brunbauer, who explains how Lisec is reinventing itself for its 60th anniversary (page 08). Also very exciting with regard to the digitalisation of glass processing is the article "The periphery is where the potential is" by Glastechnik Holger Kramp (page 20). There you will learn how a robot-like handling system makes a direct link between production stations. New Scanners we present from page 29. We explain further the role that the A+W SmartFactory software plays at Vetrotech, where it now controls the new high-tech glass production after the relocation of production from Aachen to the location at Würselen (page 36).

Clever glass products for more comfort

We show what a new, simple and at the same time ingenious construction method for glass construction is all about (page 42) and how an innovative cast resin process can be used to produce fully transparent safety glass laminates (page 43).

Also fascinating is the vacuum glass Fineo, which can be fitted to old windows a part of refurbishments to ensure thermal comfort (page 70).

And with MicroShade Film, we introduce a system that will redefine sun shading in facades (page 56).

We also answer 11 questions about Pilkington Activ and why, with its self-cleaning properties, it should be used not only for facades but also for conservatories as well as patio and canopy roofs (page 64).

Faster delivery and installation

In the areas of logistics and installation, we present new vacuum equipment and other new construction site assistants (page 76 onwards) and show compact glass transport vehicles (page 78) that can move around urban spaces more easily than large delivery vehicles could.

Do you want more information?

In addition to the articles here in our PDF, we present further exciting innovations about glass and glass processing on our English-language platform www.gw-news.eu and on our German website www.glaswelt.de. In addition, we will be sending out a series of special newsletters in June to coincide with this Glass Special. —

Matthias Rehberger
Head of content, gw-news.eu

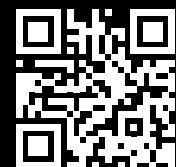


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HEGLA BORAIDENT

How laser-treated glass saves the life of birds

Laser technology is expanding the range of products that glass processors can offer in an unprecedented way: For example, standard products can be given entirely new functionalities through laser finishing. The 'laser upgrade' of bird-protection glass, radio-permeable glass or anti-bacterial glass offers the opportunity to achieve higher profit margins and to tap into new market segments. Here are the details

“The high flexibility and precision is the biggest advantage of laser technology over other processes. It is possible to switch between different finishes without losing time for re-tooling. It is possible to process both the individual pane and the finished ISO unit,” Thomas Rainer, head of development at Hegla boraident, points out. Hegla boraident, points out. For example, a 12-sided pattern of super-thin lines can be etched out of the coating with the Laserbird system for the further processing of glass into glass that allows mobile phone reception. Once the window pane is coated with this pattern, there is full data and telephone reception indoors – ideal for conference rooms, office buildings as well as for public transport. The structure is barely visible and, as part of a finished insulating glass unit, no longer noticeable.



Foto: Hegla

How does the boraident laser help to protect birds?

The protection of birds from colliding with the window is provided by a different geometry, which is introduced into the glass coating by means of a laser. For maximum effect, Mr Rainer recommends processing the pyrolytic layer on the outside of the IG unit.

But it is also possible without this layer. Alternatively, ultra-thin patterns can be applied to the outside of the facade glass using a laser printing process, which birds perceive as a clear obstacle. “In Europe alone, 250,000 birds die every day from hitting a pane of glass,” reports the development manager. “Internationally, as a result of new legal regulations, a large sales market is emerging and demand for such glass is also increasing in many local markets for public or commercial buildings.” The print is weather-, scratch- and lightproof.

A new, patented refinement from Hegla boraident has an antibacterial effect, in which silver ions are introduced into the glass surface by means of a laser. Coming into contact with the glass kills bacteria and germs. Areas of application are mainly in spaces with high hygiene requirements, such as hospitals, doctors’ surgeries, canteen kitchens and other public buildings.

How does the technical application by laser work?

The physical conductivity of the useful layers also makes technical applications possible. For example, the low-E layer is structured using the laser in such a way that conductive paths are created.

In this way, the windows of refrigerators can be slightly warmed, thus preventing the fogging of the glass. Especially in cold countries, this technology can also be found in conservatories, which are thus protected from ex-



Foto: Hegla

Protection against bird strikes is provided by a special geometry that is laser-etched into the glass coating, thus creating an obstacle visible only birds.

cessive snow loads. Conductivity is also used for burglar alarm systems. If a glass pane is damaged or broken, that triggers the alarm system.

The laser is also able to remove the coating of the glass pane along the edge or partially from the surface for lighting effects – the laser works gently and precisely. “The processed area is crystal clear and without scratches, so that this form of de-coating is also well-suited for the high demands of structural glazing, or generally in visible areas,” Thomas Rainer says, describing further possibilities of laser application. The surface of the lasered glass remains completely undamaged and has a high aesthetic value.



Foto: Hegla

The laser can be used to elegantly remove the coating from coated glass.

Are app control and automation also possible with laser application?

Yes, the various finishing programmes of the Laserbird are selected and controlled via an app. The jobs can be created in advance using the preparation software in the office and then saved in the ERP or directly on the system. Once the job has been selected, the glass is automatically loaded and processing is started. For full data access, the system can be integrated into the ERP system.

Even more user-friendly is the decentralised control via a glass marker and an automatic scan. As soon as the pane or an insulating glass unit is available, the marking is read and the finishing process is activated. Equipped with this scan control system, the Laserbird can be loaded in any order of a rack or fan carriage.

Alternatively, a direct connection, e.g. via an AGV, is possible. "Ideally, the Laserbird is placed at the end of the production line as an independent process station," recommends Thomas Rainer. "This way, the finishing process is detached from the glass flow and can be flexibly adapted for the optimisation of the order throughput and delivery dates."

www.hegla.com



Foto: Hegla

Laserbird is very versatile and can even be used to print on glass.



LASERBIRD FROM HEGLA BORAIDENT

Hegla boraident from Halle/Saale specialises in laser systems. With Laserbird, the properties of the glass can be changed by processing the surface layer (bird protection, mobile phone permeability, etc.). Furthermore, the properties of a pane can be enhanced by "laser printing".

www.boraident.de

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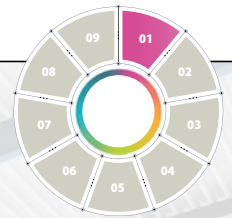
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60 YEARS OF LISEC

How Lisec reinvents itself

Close to the customer, that is Lisec’s credo. Just in time for its 60th birthday, Lisec is presenting its new hub structure at its worldwide subsidiaries, which further promotes this. In an interview with CEO Gottfried Brunbauer, GW News enquired what new opportunities this offers for glass processors as well as customer service and why the first hub is located in Germany. Read also why the Lisec Campus in June is definitely worth a visit.

Image: Lisec

From now on, Lisec’s new hub structure will comprise six regions. We asked Lisec CEO Gottfried Brunbauer what this means in detail, how the new structure is set up and, last but not least, what advantages it will open up for glass processors. Here are his answers.

Follow-up with Gottfried Brunbauer

GW NEWS – Lisec has now set up or is working on a new global company structure. What is new and what is behind this new hub structure?

Gottfried Brunbauer – The central change is that we are now transforming individual branch offices around the world into so-called hubs - i.e. headquarters – around the world. Each hub is responsible for a specific regional market. All of these hub regions together cover the entire world market.

In the hubs we can concentrate more resources and more know-how as well as an expanded range of spare parts than is possible in a conventional branch. Furthermore, the customer service and after-sales activities of the regions will in future be carried out increasingly by the hubs. This will enable us to react to customer enquiries as well as in customer service even more flexibly and quickly. The other country branches of a region will also be coordinated by the corresponding hub. In addition to consulting, sales and customer service, this also includes administrative tasks and activities, which are thus bundled in one place.

GW NEWS – Which hubs have been set up and which countries are served from where?

Brunbauer – Our worldwide network comprises 25 branches on all continents, which we have now divided into six regions with 7 hubs (headquarters). These are the regions North-Western Europe (hub: Germany), Southern Europe/Africa/Latin Ameri-

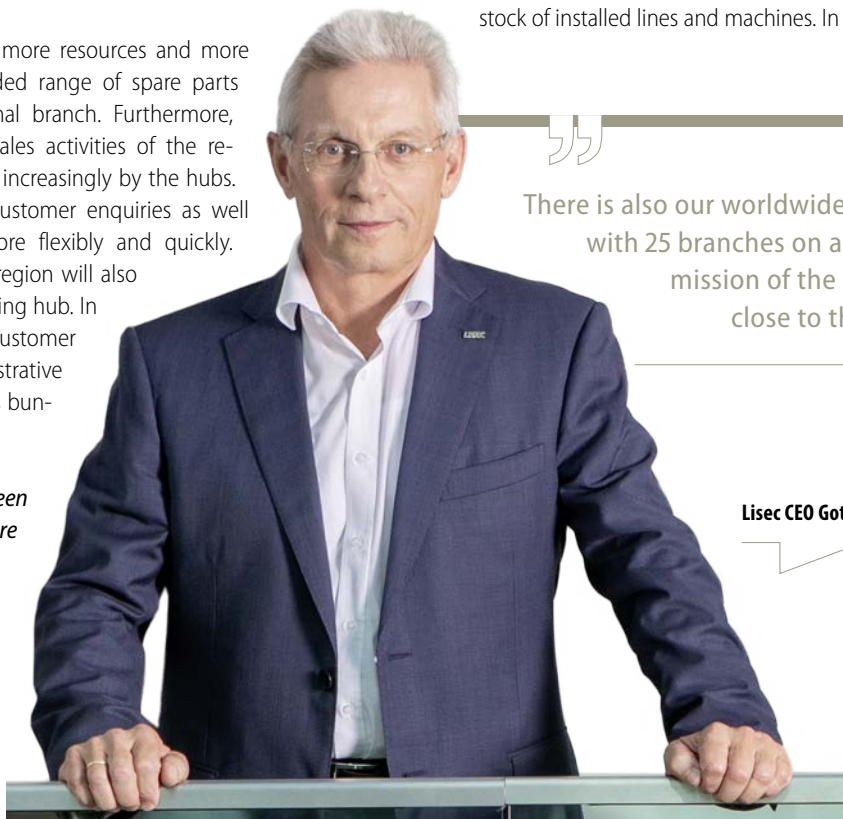
ca (hub: Italy), CEE/CIS (hub: Poland and Russia), North America (hub: USA), Middle East/India (hub: UAE) as well as China/SEA/Oceania with two Hubs, because for this region we have one headquarter in China and one in Australia.

GW NEWS – Will there still be countries that are serviced directly from Austria in the future?

Brunbauer – Yes, Austria, Hungary, Israel and Japan will be serviced directly by our parent company in Austria (➔ www.lisec.com).

GW NEWS – How did the introduction of the hub structure come about?

Brunbauer – In the worldwide Lisec network there are naturally also smaller branches, depending on the country and market size as well as the stock of installed lines and machines. In the smaller branches, how-



There is also our worldwide branch network with 25 branches on all continents. The mission of the branches is to be close to the customer.

Lisec CEO Gottfried Brunbauer

Image: Lisec

ever, it is only possible to a limited extent to maintain all the customer service resources and for the multitude of our products as well as the necessary know-how (e.g. IT and service technicians). As a result, these branches needed the support of the service centre in Austria on a regular basis. Now our new hub structure can simplify this considerably.

GW NEWS – Would you explain this in more detail?

Brunbauer – Communication is much quicker through the request at the nearby hub, compared to a time difference between the customer's location and the Lisec headquarters in Austria, which sometimes takes several hours.

Furthermore, the travel times of the technicians are shortened and in many cases language barriers are eliminated. This is a very important point. Overall, the hubs enable us to react even faster and more flexibly, for the benefit of glass processors and customers alike. Everyone involved will benefit from this.



GW NEWS – What is the added benefit in the hub branches and what services do they provide exactly?

Brunbauer – The hubs will receive additional staff in order to boost the professional customer advice in sales and service in the regions. We achieve this on the one hand through our own staff and on the other hand through (even) closer cooperation with agents to support the different national languages and to look after markets with less continuous demand. All in all, this will significantly speed up our response times. Furthermore, we will increasingly keep important spare parts available at the hubs.

GW NEWS – What will Lisec's HQ in Austria do in the future?

Brunbauer – The head office in Austria will of course continue to be available as a backup at all times for demanding enquiries and complex solutions. However, thanks to the new regional organisation, many more issues can be solved more quickly by the regional organisation than before.

GW NEWS – What are the advantages for Lisec as a company?

Brunbauer – I think, first of all, happier customers, because they can be served even faster than before in every respect. In addition, with the new structure we can offer customers a truly "all-round carefree package". Looking at the results, we can say as an organisation that we are very satisfied with the implementation of the first hub, which is the branch office in Germany, and the improvements that have been achieved.

At the same time, we assume that our performance vis-à-vis the customers will still increase significantly in the coming months, as our adjustments will only take effect step by step. Not least because we will go through a certain learning curve with improvements to our internal processes.

GW NEWS – You are organising the virtual Lisec Campus again in June. Will the new hub structure also be a topic there?

Brunbauer – Of course. From 15 to 17 June, 2021, we will be hosting our Lisec Campus for the second time. On the second day of this digital trade fair, visitors can expect, among other things, the expert talk "Strong partnership: Hubs", which presents the new, worldwide branch structure at Lisec. We will also provide insights into the (new) processes and explain in detail the advantages for our customers.

GW NEWS – What else will be presented there?

Brunbauer – We will be presenting a number of innovations from the Lisec machine and software sector. These will be presented in detail with regard to their capabilities and how processors can benefit from the new solutions. Showrooms with 3D models, 3D animations, insights into live production with the latest machines as well as expert talks complement the respective themed days. In addition to the hubs, the second day will focus on the topic of "reliability".

This reliability is our strong basis, because the durability and robustness of our machines are an important argument for many processors to decide in favour of our systems. On the second day, the focus will continue to be on Lisec Longlife, Glastronic, spare parts and much more. Everyone is invited to the Lisec Campus, participation is of course free of charge. Let us surprise you.

The interview was conducted by Matthias Rehberger.



THE 7 LISEC HUBS WORLDWIDE

In future, Lisec's branch structure will comprise six regions with seven hubs:

- **NWE:** Northwestern Europe (hub-headquarter: Germany)
- **SAL:** Southern Europe/Africa/Latin America (hub-headquarter: Italy)
- **CEC:** CEE/CIS (hub-headquarter: Poland)
- **NAM:** North America (hub-headquarter: USA)
- **COS:** China /SEA/Oceania (two hub-headquarters: China & Australia)
- **MEI:** Middle East / India (hub-headquarter: UAE)

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



Image: Lisec

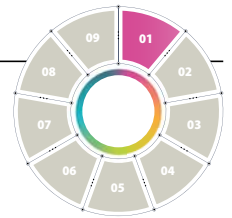


REGISTER NOW FOR THE LISEC CAMPUS!

From 15 to 17 June, 2021, Lisec will host its virtual campus to present new machines and automation solutions over three days. To register, go to

www.campus.lisec.com





GLASTON

Glass edge arrissing with the Multi'Arrisser

Safety glass made of or with tempered glass and laminated glass is increasingly being used in facades. The basis for tempering such glass is the arrissing of the glass edges. For this purpose, Glaston now provides the new Multi'Arrisser, the world's fastest single-head arrissing machine. Here you can also find out why its cup wheels have a five to ten times longer service life.

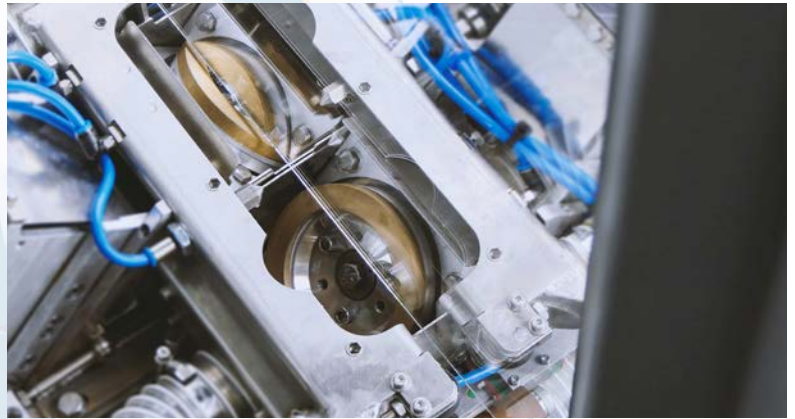


Image: Glaston

Due to stricter safety regulations and higher market expectations of glass quality, simple edge arrissing is no longer sufficient. In addition, high-quality glass should be arrissed on the front surface and the corners should be dubbed before tempering. For this purpose, Glaston now offers the fast and compact glass edge arrissing machine Multi'Arrisser for straight glass edge arrissing. According to the developer, the Multi'Arrisser is the fastest single-head arrissing robot in the world with an arrissing speed of up to 60 m/min. Based on the globally proven cup wheel technology formerly of Bystronic Glass, Glaston Germany has now developed a new process for two additional arrissing functions that enable economical glass edge arrissing at low operating costs.

Homogeneous and uniform arrissing quality

In addition to 45-degree glass edge arrissing, the cup wheels can also arriss the front surface of the glass and also dub the corners. In doing so, they

adapt individually to different edge geometries of rectangular glass and shaped formats with straight edges and radii. Compared to technologies such as arrissing with profiled grinding wheels or with grinding belts, the Glaston cup wheel technology enables a homogeneous and uniformly high arrissing quality, especially at the beginning and end of the process, as the contact surface to the glass is significantly higher with the cup wheels. In addition, when processing high-quality low-E glass, the coated surface is not touched during arrissing. The cup wheels of the Multi'Arrisser have a five to ten times longer service life than other systems, which leads to a significant increase in productivity.

Maximum service life and how it can be achieved

While the service life per tool for profiled grinding wheels and belts is between 20,000 and 40,000 m, the cup wheel allows around

200,000 m. This reduces service interventions and thus machine downtimes to a minimum. With cup the wheel technology, the entire area of the diamond wheel is used evenly for glass arrissing. Due to the higher contact surface between the glass and the tool, the removal rate is distributed over several diamonds, wear is more even and the tool life is many times longer. Since one cup wheel is used for all three machine functions, there is no need to change tools. In addition to the time-savings, this makes the tool very cost-effective as only one wearing part needs to be replaced at a time.

A new way to work without loss of cycle time

Due to the high processing speed and the use of only one tool for all functions, the machine can operate in mixed modes without loss of cycle time. Glass thicknesses between 2 and 25 mm can be processed, with the cup wheel of the machine being individually adjusted to the respective glass thickness. In addition, a special suction system is used to remove the glass dust directly at the arrissing head. Furthermore, the Multi'Arrisser has a cleaning zone where each processed glass is cleaned before it leaves the machine. With its intuitive menu navigation, the Multi'Arrisser is easy and safe to operate. Another advantage of the machine is its small footprint. The Multi'Arrisser can be used as a stand-alone solution or integrated into an insulating glass production line and offers a wide range of applications for all types of tempered, laminated or insulating glass production.

www.glaston.net

i **GLASTON INNOVATION DAYS**

GLASTON INNOVATION DAYS
June 16 - 18, 2021

From 16 to 18 June, 2021 the virtual Glaston Innovation Days will happen for the first time. Register here www.gid-glaston.net



Image: Glaston

Diamond cup wheel from Glaston

Background image: Glaston

TOGETHER ON THE SAME SIDE OF GLASS.

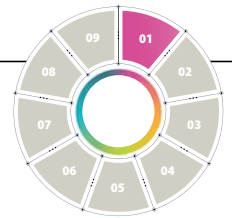
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Vertical processing line from Intermac consisting of the Vertmax One workstation with the new Aqua washing machine.



INTERMAC

Vertical processing and washing

Intermac is strengthening its position as it continues to develop its glass processing offering with new vertical equipment. These include Vertmax One, a vertical workstation, and the new Aqua series washing machines, which can be integrated into vertical processing lines.

Doors, shower stalls, railings, furniture or architectural glass: Due to its compact design, the Vertmax One is also suitable for small and medium-sized businesses. The processing station is able to vertically process glass of up to 3000 x 1500 mm. The concept of vertical glass processing was developed to offer companies all the way up to large industrial enterprises the possibility to produce more flexibly, faster and at lower cost.

What applications are possible with the Vertmax One?

The Vertmax One is particularly characterised by its flexibility, which makes it easy to carry out all machining operations. The range of applications extends from polishing and rough grinding to fast drilling - thanks to the use of HSD electric spindles with double the power - to milling and grinding of both edges and internal cut-outs. The high machining quality is guaranteed by the so-called Pilot System, a system developed to en-

sure a very high polishing quality during vertical machining, to reduce vibrations to a minimum and to keep the tool perfectly centred at all times during glass edge machining. And that even in places some distance from the suction cups. According to the developers, the new compact design of the front processing head also allows the system to perfectly process inner radii of glass.

Here is how the Vertmax One helps reduce set-up times to nothing

Thanks to technology that eliminates set-up times, Vertmax One features rapid automatic loading. Also, all the machining operations required to manufacture a product can be carried out without complicated preparation of the worktable. The Vertmax One is equipped with two independent slides with two suction cups per slide. This completely automatic technology allows the glass to be held correctly according to its dimensions, geometries and machining operations

without wasting time, and in terms of productivity and flexibility, it makes the machine unique for machining any type of glass in batch size 1.

How does the glass stay on the Vertmax One during machining?

The automatic repositioning of the slides allows the most complex machining operations to be carried out without ever having to remove the glass from the machine and feed it in again. The process is fully managed by the brains of the IC software, which makes Vertmax One uniquely user-friendly. IC is Intermac's new software resulting from the iCam experience, characterised by a modern interface, ease of use and optimised performance, for uncompromised functionality and programming flexibility. Vertmax One can be built into a line with Intermac's Aqua vertical washing machines: In fact, the two technologies complement each other and allow line certification in compliance with EU standards.

New: The Aqua vertical washing machines for flat glass

The Aqua series is the range of Intermac washing machines that can be fully integrated into vertical workstations, enabling the cleaning and drying of the processed glass. The washer ensures thorough cleaning of all impurities that have accumulated on the glass panes during processing and perfect preparation of the plates for the next processing or for leaving the processing cycle.

How is the longevity of the Aqua washing machine guaranteed?

The Aqua has been designed for long life in every detail, technical characteristics and finish of the machine. For example, the machine body is made entirely of stainless steel, and the brushes are manufactured in one piece to achieve the highest performance in glass cleaning.

According to the developers, this provides glass processors with a technology that reduces maintenance thanks to the high quality-standards of the materials used.

The Aqua washers can operate at a glass feed speed of up to 7 metres. The working direction can be configured from right to left or from left to right. The intelligent "Eco Save" system limits the energy consumption of the washing machine by switching off the motors of the main elements when the washing machine is in standby mode.

What about the productivity of the Intermac Aqua?

The washing machine, designed for 3-shift operation, can handle glass thicknesses up to 32 millimetres through an automatic regulation system. In addition, the Aqua can be networked with the other machines in the line network, automatically controlling the processing speed and opening of the line according to the thickness of the glass. Large-capacity water tanks, independent for each cleaning section, reduce the cycles



Vertical processing line from Intermac consisting of the Vertmax One workstation with the new Aqua washing machine.

involved in changing the cleaning water in the tanks.

Here is why the Aqua is safe to operate and handle

When developing the Aqua series, Intermac not only focused on optimised setting and set-up times, but also on user-safe handling procedures. For example, the washing machine can be equipped with sensors on the pane in-feed that make automatic gauging of the pane thickness possible.

And for the operator, a comfortable touch screen ensures quick and easy operation of the machine, for example to change the washing temperature or to regulate the working speed. It also allows the thickness of each pane to be set with millimetre precision.

The Aqua series is not only characterised by its robustness, reliability and high performance, as the developers emphasise, the washing machines of the Aqua series can also be perfectly linked to the vertical Vertmax workstations and combined to form a line.

www.intermac.com/en/glass



The Vertmax One holds glass panes in place via two independent slides with two suction cups per slide.

Advertisement

Image: Intermac



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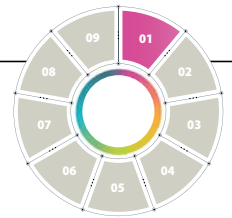
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INTERVIEW WITH MARC BORLINGHAUS ON BONDING FOR STRUCTURAL GLAZING

“Automatic bonding is faster and better”

Marc Borlinghaus is in charge of the development of the new PE-Autoglaze bonding line for filling the adhesive joint of structural glazing facade elements at machine manufacturer Pressta Eisele. We wanted to know from him what advantages automatic bonding offers over manual work, and above all, how much expensive silicone can be saved. Here are his answers.



The new PE Autoglaze bonding line from Preesta-Eisele for automated bonding of SG elements.

GW NEWS – What determines the quality of a good silicone bond for structural glazing (SG) panes?

Marc Borlinghaus – As is generally the case with all applications of multi-component adhesives, it is important to ensure that the adhesive components are dosed in the correct ratio to each other and then mixed correctly. In manual bonding, this is usually checked once a day with so-called Butterfly tests, in which the material components are applied unmixed in cups and then checked by weight in relation to each other, or in which mixed material is applied to a sheet of paper, which is then folded and opened again to detect any streaking. Streaking or incorrect dispensing ratios would both lead to potential adhesive failure.

Additionally, it is important that the adhesive joint in an SG element is always filled completely and free of bubbles. Any bubble or inadequately filled portion of the joint represents a weak point that could lead to adhesive joint failure. To prevent this, the employee applies more adhesive to the adhesive joint than is technically necessary to guarantee 100% filling and to push out any air pockets. This “overfilling” is then subsequently removed from the outside of the joint using a spatula and disposed of.

GW NEWS – How did the development of the bonding/sealing system come about?



Marc Borlinghaus inventor and co-developer of the PE Autoglaze bonding line at Preesta-Eisele.

Borlinghaus – During a strategy meeting at the beginning of last year, one of the tasks was to make us more independent of the automotive industry (among other things, we supply sawing systems for automotive suppliers), and there I suggested reorienting a system technology that I had already developed many years ago and making it usable for the market. We then spent months designing the new plant and building the test system.

GW NEWS – What are the most important advantages of the automated bonding of structural glazing (SG) elements?

Borlinghaus – Measured against our system, one would be to mention that we can fill the joints without bubbles and without excess. Depending on the skills of the employee and the quality of the joint geometry, this can mean that our system needs up to 40% less adhesive to bond an element than is needed in the case of manual bonding. Because our system constantly measures the joint and adjusts the amount of adhesive, we achieve a bond with a consistently higher quality.

GW NEWS – Where do you see further advantages?

Borlinghaus – The automated application is faster. Thanks to servo axes and the fact that you don’t have to rework the glue joints, the processor produces up to 4 times faster with our system than with the manual process. In addition, the company also needs employees with a high skill level for the manual application of the adhesive, as it is not easy to consistently hit a joint with a height of only 9–12 mm over a distance of up to 12 m with an application gun.

GW NEWS – How is your system operated? Does it require special skills?

Borlinghaus – When using our gluing line, only one employee is needed who presses the start/stop button of the system and carries out a mixer change every 4 to 6 hours, the rest is determined by the system itself. This saves one worker, as two workers would otherwise be needed for manual filling and reworking. In addition, working with silicone adhesives is not one of the most pleasant functions.

GW NEWS – How much adhesive can be saved per glass pane?

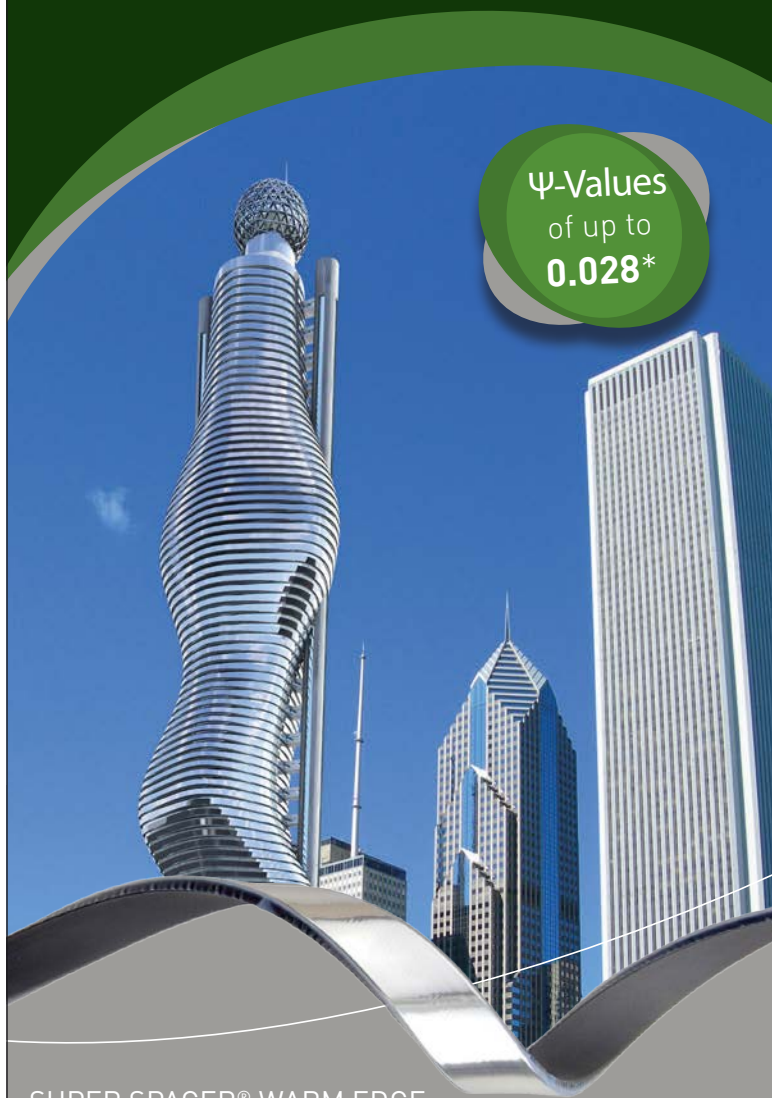
Borlinghaus – It is not possible to give a general answer, because it depends on the quantity and size of the elements produced. Nevertheless, one can assume about 35–45% of the total amount of silicone used, which can amount to up to 1 litre for a 4 × 2 m element.

GW NEWS – What pane formats are currently feasible, and are larger plants planned?

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Borlinghaus – Our standard system can process square and rectangular elements from 300 × 1,000 mm to 3,000 × 4,000 mm. We can also manufacture larger versions of the plant on special customer request. Towards the end of 2021, we will offer an upgrade that can be retroactively applied to existing plants and will also enable us to process round, oval and polygonal (more than 4) elements.

GW NEWS – Which processors do you have in mind for your system?

Borlinghaus – Basically any manufacturer of structural glazing elements, regardless of whether they are used in a mullion-transom construction or are designed as pure SG facades. It would make sense if the fabricator already glues and produces a certain production volume per year.

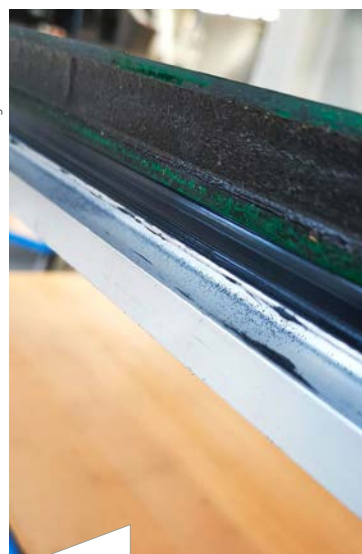
A production volume of about 35,000 m² per year can be taken as the “magic limit”. Apart from that, manufacturers of partition walls and PV elements would certainly be interesting, as there is a similar adhesive requirement there, as well as window manufacturers who would like to produce a bonded window, as our technology can also be used for this.

GW NEWS – How can manufacturers of SG glass gain a stronger position vis-à-vis their customers (facade builders) with the system?

Borlinghaus – Depending on the system used, the glass supplier can already deliver partially finished elements. Meanwhile, some system houses offer similar systems, such as Schüco with the FWS 50 SG or Wicona with the WicTec 50SG, in which a U-profile is used in the edge seal of the insulating glass.

This is later used to connect the glass pane directly to the sub-structure (base frame in the building wall). Until now, these systems had to be bonded by hand or using an automatic insulating glass sealing machine, in which case the U-profile is covered up to prevent the edge sealant from penetrating. Both represent a considerable additional effort.

Our system can also handle this type of bonding, so a glass manufacturer would be able to offer the automated bonding of the U-profiles as an additional service to its customers.



The automatic application produces a clean, even joint.

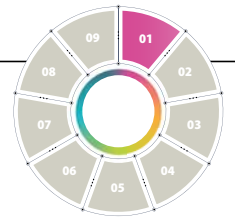
The interview was conducted by
Matthias Rehberger



HOW MUCH ADHESIVE CAN BE SAVED PER SG ELEMENT?

As a rule of thumb, it is possible to save around 35 - 45% of the total amount of silicone used. For a 4,000 × 2,000 mm facade element, the installer saves/gains about 1 litre of silicone.

<https://www.pressta-eisele.de/en>



TOMMASO SABATINO INVESTS IN VERTICAL IG LINE FROM FOREL

Successful with passion and try new things

The family business Edil Vetro was founded in 1984 by Tommaso Sabatino and his wife Antonella, who now run the company together with their sons. Here we show how production was recently expanded to 6,000 square metres and what role Forel’s new “high tech” insulating glass line played in that.

Image: Forel



Glass runs in the family: Tommaso Sabatino with his sons Piero and Michele in front of Forel’s new High-Tech IG line.

“I started working with glass because I enjoy it. And today I’m here,” explains Tommaso Sabatino and sums up his business philosophy in one sentence: Working with passion and venturing into new things. The Sabatinos are a “glass family”: today, in addition to Antonella and Tommaso, their sons Michele and Piero are also active in the company. “We have three children,” says Tommaso. “Our

two sons are glass processors. When they told me that they wanted to take over our company later, it was time to invest. When we invest, it is not only to expand our capacity, but also to make a leap forward and increase the level of automation. Our partner in this big project was Forel.” As part of Edil Vetro’s expansion, the manufacturing facility was tripled in size to 6,000 square metres. There, 30 staff now manufacture high-quality

ty glass and insulating glass products. Says Tommaso Sabatino: “We are proud of this expansion, especially because we owe it to our sons.”

Why does the Sabatino family like working with Forel?

The Sabatino family has a long-standing partnership with Forel. For example, their first Forel insulating glass line was installed over 15 years ago. This was followed by a series of further investments.

Says Tommaso Sabatino: “We like working with Forel because we appreciate the technology, the creativity and that they always have an open ear. In addition, there is the fast service.”

The latest additions at Edil Vetro are a vertical cutting line for LSG and the brand new Forel “High Tech” line for insulating glass up to sizes of 6,000 × 3,300 millimetres. Both lines are now in operation in the new factory.

There is also a tempering furnace and a vertical LSG line (for PVB), plus horizontal equipment for cutting and edge processing.

Highly automated production

The new production is highly automated: The basic glass, including laminated safety glass, is loaded onto an automatic storage system, which in turn loads the cutting lines, also from Forel.

Image: Forel



The new production is highly automated: The basic glass, including laminated safety glass, are sent from an automatic warehouse (I) on to the vertical cutting line.

Image: Forel



With the High-Tech IG line, high-quality window and facade glass can be produced in formats of up to 6,000 × 3,300 mm, even 4-fold structures are possible.



Image: Forel

With the Forel system, the two cutting bridges and the unit for turning the (large) panes allow processing times to be significantly reduced. After cutting to the appropriate formats, the glass is then forwarded to the two insulating glass lines.

Focus on the future

Tommaso Sabatino: "Thanks to the two insulating glass lines, we were able to significantly increase our flexibility and work on several orders in parallel. The first IG line produces standard formats up to 2,000 millimetres high for residential construction with high throughput. And with Forel's High Tech we produce complex, large-format facade glass. We wanted to expand our possibilities in this way and also be competitive with large formats and complex glass."

Says son Piero: "At Edil Vetro, we manufacture glass for windows, facades and interiors. With our new production and machinery investments, we not only want to consolidate our position, but also expand further. Although our new production has only been in operation for a short time, we are already focusing on our first expansion."

Continuing the family tradition

And his brother Michele adds: "Our father passed on his passion for glass processing to us and we have seen how our parents successfully built up the Edil Vetro company with a lot of work, patience and enthusiasm. This always continues to inspire my brother and me and so we decided to join the company as well and continue the family tradition. Investing in new production and machinery is one thing, but another important component is the passion with which you implement it. And that's what makes the difference for us."

Matthias Rehberger

The vertical LSG cutting line Art. VC from Forel



VERTICAL FOREL IG LINE "HIGH TECH"

The "High Tech" insulating glass line is Forel's latest development: The line can be used to produce insulating glass for residential construction as well as high-quality facade glass up to jumbo size (6,000 × 3,300 mm). In addition to double, triple and quadruple insulating glass, stepped insulating glass with pane thicknesses of up to 100 millimetres can also be produced.

These IG units can also be produced with steps: up to 100 millimetres at the front and bottom of the IGU and up to 300 millimetres at the back and top.

In addition to rigid spacers, the IG line can also process flexible spacers as well as thermoplastic spacers from a container. For this purpose, a suitable applicator is integrated into the line. Up to 3 different sealing materials can be processed. A system for changing the rate of dispensation is available as an option, which enables "un-interrupted sealing". Furthermore, the line can be equipped with a gas circuit (argon and krypton). The High Tech can process and compensate bent panes of basic glass up to 2.5 mm/rm.



VERTICAL FOREL LSG CUTTING

Forel's vertical LSG cutting line is equipped with two cutting bridges that can process jumbo panes of laminated glass up to 2 × 8 mm thick + 4.56 mm PVB film, with cutting lengths up to 6,000 mm. The bridges have two attachments for scoring the glass and two breaking units (front and rear) for evenly cutting the pane over its entire length.

After the LSG pane has been scored and broken, the two pieces are pulled apart to expose the PVB film. An infrared heater now heats the film and makes it pliable without heating the glass. In the case of thick PVB films, an additional blade is used. After the first cut, the switching unit rotates the "cut" glass by 90° before the second cutting bridge is used and completes the cutting process. Both bridges can be equipped with an attachment for edge delamination, e.g. of low-E layers. The fully automated line requires only one operator.

www.forelspa.com

Forel is represented in the German-speaking region by Udo Hornung, managing director of Pro-Glas.

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Image: Eurotech

EUROTECH

News inspections for accident prevention

Eurotech now also offers the accident prevention inspection of lifting equipment, which is obligatory on an annual basis. With regard to occupational safety and health protection at the workplace, the accident prevention regulations (UVV), officially referred to as DGUV regulations, represent a binding obligation for companies and insured persons of the statutory accident insurance.

Who should have their equipment inspected?

According to the accident prevention regulations, the operators of lifting equipment and light overhead cranes are also obliged to ensure that this work equipment is inspected by an expert at regular intervals. Without regular accident prevention regulations inspections, the operator, i.e. also fabricators, fitters and other craftsmen who use lifting equipment, lose their insurance cover in the event of damage. Eurotech, a specialist in vacuum lifting and transport technology, now also offers complete services for the accident prevention inspection of light overhead cranes and lifting equipment.

Eurotech's accident prevention regulations include the inspection of lifting devices according to DIN EN 13155 and of light overhead cranes up to a maximum of 1000 kg according to DGUV 52 (BGVD 6) of all manufacturers. With the inspection, which is carried out once a year on the customer's premises or at the headquarters in Geislingen (Germany), Eurotech also offers maintenance and repair of the work equipment as well as optimisation.

Operators of lifting equipment, i.e. workers, fitters and processing companies, benefit from this package in several ways: first of all, they can continue to operate their lifting equipment and cranes safely and with valid insurance cover.

This safety badge proves that the lifting device is working properly.

At the same time, they receive all services from a single source.

The Eurotech specialists inspect the work equipment on the basis of all applicable regulations and provide proof of the accident prevention inspection with an inspection report. Minor repairs are carried out immediately. A safety plate shows that the work equipment is functioning properly.

With regular accident prevention inspections, the operator not only extends the service life of the equipment, but also prevents unplanned, expensive downtimes, increases operational safety and prevents equipment-related accidents. The company develops customised vacuum systems and components for automated handling tasks. The Eurotech modular system allows flexible adaptation of the components to the respective customer requirements as well as fast, cost-effective replacement of spare parts.

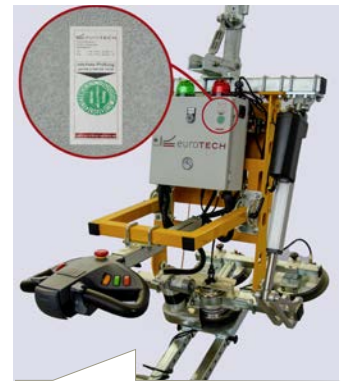


Image: Eurotech

Eurotech offers all services related to the accident prevention inspection of lifting equipment from all manufacturers in accordance with DIN EN 13155.

www.etvac.de

SCHMALZ

A better VacuMaster Comfort

J. Schmalz GmbH has revised the vacuum lifting device VacuMaster Comfort for loads up to 750 kg: With the new control unit for its proven vacuum lifting device, the supplier demonstrates that sophisticated design is not just for looks: in terms of its design, the panel for controlling all device functions as well as the chain hoist movement looks like the steering wheel from a Formula 1 racing car.

The ergonomically shaped, wide operating handle reduces the effort required for handling and allows for healthy working.

The clear design of the control unit with its two rows of buttons ensures intuitive, user-friendly operation of the VacuMaster Comfort: The user can quickly and clearly assign the individual functions using colour-coded buttons with symbols. This in turn reduces the risk of operating errors.

The user activates the vacuum with the green control button and deactivates it by simultaneously pressing the two red switches. The grey drive encoder controls the up and down movement of the chain hoist in two speeds respectively.

Depending on the version, the user of the lifting device activates the swivelling (VacuMaster Comfort 90), turning (VacuMaster Comfort 180) or rotating (VacuMaster Window Comfort) of the load with the blue button. If something should go wrong, Schmalz has installed an emergency stop switch centrally, which can be used to stop the up and down movement and, if necessary, the rotating, swivelling or turning movement. The new operating unit replaces the previous version and is available in three variants: as a rigid var-



Image: Schmalz

The the operating unit for the VacuMaster Comfort was designed with ergonomics and easy handling in mind.

iant, with an infinitely adjustable working height or as a variant for adjusting the working height as well as for tilting the operating panel. With the optional adjustment and tilt function, it allows ergonomic handling even in high or low positions. The control panels are part of the extensive VacuMaster Comfort modular system in different lengths.

www.schmalz.com/en/

4JET LASER GLASS CUTTING SYSTEMS

This laser can even cut facade glass

The 4Jet Group from Alsdorf has introduced new versions of its Pearl laser glass cutting systems. The new systems open up new application areas for laser cutting of glass and are capable of cutting panes up to formats of 3.0 × 2.2 m. Here are the details.

Since the beginning of the year, the 4Jet Group has installed a number of the latest generation of laser cutting systems at international glass processors.

The laser cutting systems for glass can now also be used for new areas of application, such as facade glass. This significantly expands the range of applications for the laser cutting systems, because up to now the systems were mainly used for the production of small to medium-sized display and cover glass. With the latest generation of the system, it is now possible to cut glass up to a size of 3.0 × 2.2 m.

What are practical applications for the new 4Jet laser cutting systems?

Recently, several Pearl systems have been installed for cutting large glass sheets and glass stacks. The systems are capable of cutting glass up to 2.2 m wide and more than 3 m long. This makes it possible for the first time to use the advantages of laser glass filamentation on large mother glass panes for smart windows, for example.

The 4Jet lasers make it possible to integrate the cutting process close to sensitive coating and printing processes by eliminating the need for wet or dusty mechanical scoring and washing processes.

Other advantages compared to conventional mechanical cutting technologies include extremely precise dimensional accuracy and the ability to create very complex cutting geometries.

How are 4Jet's Pearl laser systems designed?

The Pearl laser cutting systems are based on a granite machine platform that offers inherent accuracy and long-term stability. Cutting geometries can be easily imported from CAD drawings. Targeted tuning of the axis controls results not only in high cutting speeds, but also in excellent path accuracy to achieve a highly precise outer contours in the final product.

The Pearl Dynamic Focus ensures that the focus is always within the process window without increasing the process time.

About the 4Jet Group

Based in Alsdorf, the 4Jet Group was founded in 2006 and provides solutions for surface technology. The 4Jet microtech business unit supplies laser micromachining systems for the processing of technical glass, solar cells and other high-tech components.

With 4Jet's systems, laser cutting of glass - from very thin to facade glass - is possible. For example, the new Pearl M-UTG system is used for cutting ultra-thin, flexible glass. The system is integrated into a fully automated processing line and enables the cutting of glass foils up to a thickness of 30 µm with excellent breaking strength at the highest yield.

Since August 2018, the company has been operating a job shop for laser micromachining of technical glass in Prutting near Rosenheim. Subsidiaries in China and the US offer sales advice and technical services to international customers.

www.4jet.de/en



The laser can also take over parts of the glass processing while it is cutting. Here, a filamented and separated display glass from a Pearl laser cutting system.

Image: 4Jet Group



Inside view of a Pearl L laser from 4Jet with substrate table and processing head.



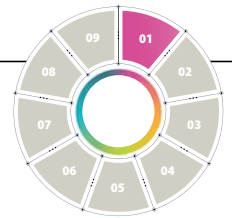
Different sizes and thicknesses of filamented and separated glass.



With the new 4Jet lasers, flexible, laser-based filamentation and separation of glass is possible.

Image: 4JET Group

Image: 4JET Group



GLASTECHNIK HOLGER KRAMP | FORVET

The periphery is the key to success

In an environment of increasingly automated production processes, which are carried out with equally multifunctional machines, time-consuming, cost-intensive peripheral processes are increasingly coming into the focus of plant engineers.

Image: Forvet



Cutting with robots: The further development of the KEY robot-assisted cutting system with integrated glass warehousing is at the same technological stage as the highly productive Forvet processing stations.

While the optimisation of processing machines is already well-advanced, the often manual or semi-automatic loading and unloading processes are increasingly becoming a bottleneck, regardless of whether the associated glass products are to be manufactured in series or in very small batches. The total time that the glass spends at the respective processing stations is determined not insignificantly by the hold times of the batches waiting to be added, by cross-over processes and stand-by cycles of the machines. The latter generate additional production and maintenance costs through lower utilisation, idle consumption of energy and cooling water

as well as through unutilised runtime guarantees of the machine manufacturers. Together with the longer delivery times, this quickly creates competitive disadvantages, also in the end-market. Integrated technical solutions and concepts for the automation of intralogistics represent an alternative here. The so-called digital factory, in which many processes can be simulated and op-

The Forbot system is an important link in networked production. The robot-like glass handling system serves as a direct and controlled connection of manufacturing stations.



Image: Forvet

timised in advance as part of material flow planning and costing.

How could greater automation of intralogistics help out here?

Integrated technical solutions and concepts for the automation of intralogistics represent an alternative here. The so-called digital factory, in which many processes can be simulated and optimised in advance as part of material flow planning and costing.

The efficient interaction of the positions involved in the process is therefore currently one of the greatest challenges in the implementation of intralogistics systems.

Although the flexible product flow typical in the flat glass industry is subject to extensive virtual control thanks to digitalised order management, modern IT systems alone do not achieve significant effects as long as they do not have a real-time effect on the optimisation of processing as well as product handling and internal logistics. In this context, technical aspects of the internal material flow (equipment using robots, fast conveyor systems and “smart” telematics), increasingly require the direct integration of the machines and the internal logistics into the process organisation and the IT interfaces.

How does Forvet deal with increasing automation?

The example of Forvet SRL is a good illustration of the current development steps: Machines for special processing (drilling, milling, edge grinding, etc.) have been gradually equipped with expanded capabilities (tool spectrum, new positioning and conveyor systems) in recent years, which now enable highly flexible and complex glass processing on a compact and energy-saving system. The integration of standard processes such as edge and contour grinding, drilling, milling, countersinking, Water-Jet cutting, washing, loading and unloading as well as supporting process-



Image: Forvet

The Chiara Multiflex Heavy is a flexible and space-saving solution for edge processing. Straight edges and borders – even with non-rectangular contours – in the brilliant quality of cup wheel technology.

es (self-cleaning, maintenance functions) led to a drastic reduction in average throughput times (including the tempering furnace) per product unit from around 30 to currently 5 to 6 minutes and to energy consumption cut by half.

Where can further reserves be tapped in production?

These days, Forvet offers fully automated CNC systems for complete edge and cut-out processing. These can be “organically” combined with automatic sorting and storage systems, robot-assisted glass cutting, “smart” transport and optimisation systems to form a highly efficient production unit. The modular, open IT architecture of these units allows flexible spatial adjustments and the connection of external systems from other manufacturers based on general data transmission standards.

For example, the Chiara Multiflex Edge Processor is an automatic CNC grinding and high-gloss polishing unit capable of processing flat edges and cut-outs with cup wheels on all sides of a glass, even if it is not rectangular. The work cycle is fully automated: the CNC parameterises the incoming glass, clocks its transport, sets the grinding heads at angles from -20° to $+360^{\circ}$, controls glass removal, feed-in and the wear compensation of each grinding wheel. The grinding heads detect the size and shape of the glass before they start edge processing. This avoids errors in the process due to incorrect glass alignment.

Fully software-based control

An additional CNC bridge that can be integrated for contour machining with peripheral wheels

or milling cutters rounds off the Multiflex spectrum. The diameter and profile of the peripheral wheels are permanently monitored by laser; the polishing wheels are also checked and adjusted to achieve a high polishing quality and uniform edge transitions.

The fully software-based control of all the grinding units on the Multiflex makes it possible to operate each working head on a specific glass edge with a different type of processing (i.e. one side for edging, another for grinding, a third for polishing etc.).

In addition, the operator (the programmer) can select the quality of edge processing between different glass panes differently and without manual adjustments. This feature of the machine also reflects another important advantage: The first glass that enters the machine each time after a tool change is guaranteed to be within tolerance without manual re-adjustment.

What is the Multiflex designed for?

The modular Multiflex was designed for a variety of maximum formats. For example, it can process glass on two independent workstations or in large formats up to 18 m long, even in non-rectangular geometries, with precisely butted or polished round corners and cut-outs. It works with high precision and without set-up time. All types of low-E glass can be processed without touching the coated surface.

As an extension, the Francesca FC32M 3300 drilling/milling/WaterJet unit with its two parallel, independent machining sections can take over from the grinding section of the Multiflex.

How can the internal logistics be implemented efficiently?

The question of how such a flexible glass processing system can adequately utilise its potential was answered by the manufacturer Forvet: The Sortiflex “dynamic” system for optimising glass storage, sorting and furnace bed loading is Forvet’s renewed creative response to today’s requirements for controlling and optimising material flow in flat glass production.

The Sortiflex system of multi-compartment racks has been developed to meet the flexibility requirements of diverse manufacturing processes, allowing it to be integrated into Forvet production lines as well as all other manufacturing equipment from leading manufacturers.

The Sortiflex uses a patented two-directional system as a temporary buffer to optimise the flow of glass from different sources to a single outlet, or from a single source to multiple outlets. The extremely short cycle time allows different processes to be directly linked in fully automatic mode.

The patented Sortiflex double-deck compartment storage system doubles the number of available slots in the same footprint, increasing storage volume without taking up more valuable production space. Of course, Sortiflex can safely store low-E glass.

What is the role of Forvet’s Navetta 45 Shuttle?

The glass sheets stored in the Sortiflex are removed or inserted on both sides as required with the Navetta 45 shuttle system. In addition to the extremely high conveying speed and pre- »

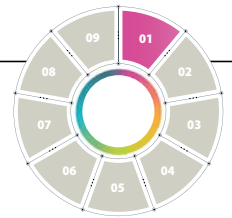


Image: Forvet

Forvet's Sortiflex two-tier compartment storage system doubles the number of storage spaces available in the same footprint, increasing storage volume without taking up more valuable production space.

cision of the glass handling, the system optimally adapts to the downstream processes.

An individual configuration of the system for the connection of glass cutting systems or further processing lines is possible.

The optimisation software developed by Forvet for the Sortiflex system thus enables fully automatic control of the production cycle; it communicates with the connected processing stations to optimise the processes and provides the system operator with real-time data on the status of production at any time.

Here is how the KEY becomes the key

In this context, the successful further development of the KEY robot-assisted cutting system with integrated glass storage is also noteworthy. In its key function, KEY forms an optimising interface to the highly productive Forvet machining centres at the same technological level.

The need to optimise the product workflow is known to apply in particular to glass cutting. In practice, this is a frequent factor in process delays: Numerous packages with customer orders sometimes take up considerable space and not infrequently require a great deal of logistical work and time for transport from place to place. In particular, additional time is lost in the case of necessary subsequent deliveries at short notice. Today's product variety and complexity of the processes also require increased concentration on the part of the operators in order to avoid errors.

Incorrect sorting, glass breakage, incorrect glass orientation when loading the processing machines, etc. can lead to undesired interruptions and loss of quality due to the additional manual interventions, as well as tying up manpower.

This is a thing of the past thanks to the KEY system technology. It enables full utilisation of the flexibility of the grinding and drilling machines by cutting the required glass formats just-in-time and delivering them in optimal sequence and in correct orientation directly for edge processing. Individual pieces that need to be delivered later are still available within one production cycle of the grinding plant.

What is behind the Forbot?

The Forbot system, also developed and patented by Forvet, is another important link in networked production plants. The robot-like, mobile glass handling system is used for direct and controlled connection of production stations and eliminates the need for any intervention by the operator.

The fully automated system temporarily connects and disconnects upstream and downstream zones and manages glass buffers of individually configurable size.

Forbot links both the processing machines of the work zone to do with shaping (grinding, drilling, milling, WaterJet and washing) to the tempering furnace as well as to other intermediate steps (e.g. printing) and different horizontal or vertical storage levels of various stations.

Machine specialist Willi Kühnel's conclusion

The cycle times are minimised by adapting them to the respective cycles of the line segments or to the feed rate of the tempering oven. The system thus optimises the product throughput and the loading of the tempering furnace, which is reflected in a positive energy balance. In addition, the robot shuttle significantly reduces the risk of glass breakage and accidents.

These plant engineering development trends pose greater challenges for the plant organisation as well as for the plant engineers and service providers: Since internal logistics is a very complex system, all components must function perfectly and flexibly. At the same time, the strain on all electronic and mechanical elements is significantly higher than before due to the compression of work steps.

A central concern is therefore to ensure fail-safety and sufficient redundancy of the machine capacities through permanent, automated monitoring of the systems. In addition to reliable plant technology, the intensive use of control and visualisation software requires constant updating of IT system security.

Plant operators and service providers are therefore equally required to establish routines of preventive maintenance that can be programmed.

Willi Kühnel, Sales Manager of Glastechnik Holger Kramp GmbH

The TLR 11 C edge grinding machine from Lattuada

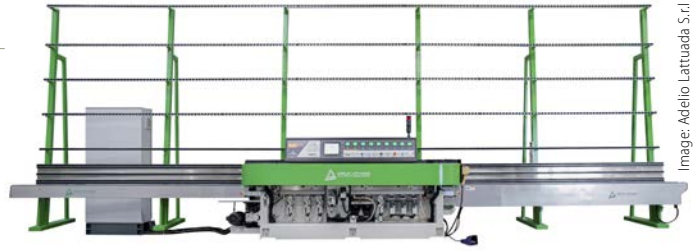


Image: Adelio Lattuada S.r.l

ADELIO LATTUADA

How automation increases your productivity

Automated glass edge processing is en vogue. Machine manufacturer Lattuada offers systems for this purpose that are capable of independently setting a wide range of working parameters such as speed, contact pressure, glass removal etc. The operator only has to enter the glass thickness.

The automatic presettings include diamond and resin discs (metal bonds and plastic bonds) as well as the automatic compensation of the polishing disc welding. What follows are two current installations.

What does the Lattuada A-WR system do?

The system is able to perform all wheel adjustments in less than 1 minute compared to a manual

adjustments which take on average 20 to 30 minutes. At the same time, the adjustments are always made evenly, regardless of the work shift and the operator at the machine.

The A-WR is very easy to operate and can be started directly without a test disc, with the disc depletion always being uniform for consistent processing quality.

The automatic cleaning function optimises spindle cleaning and an early alarm prevents maintenance problems.

What does the i-AL system include?

The i-AL has a comprehensive package of software, mechanical and electronic systems specifically designed to ensure maximum automation in

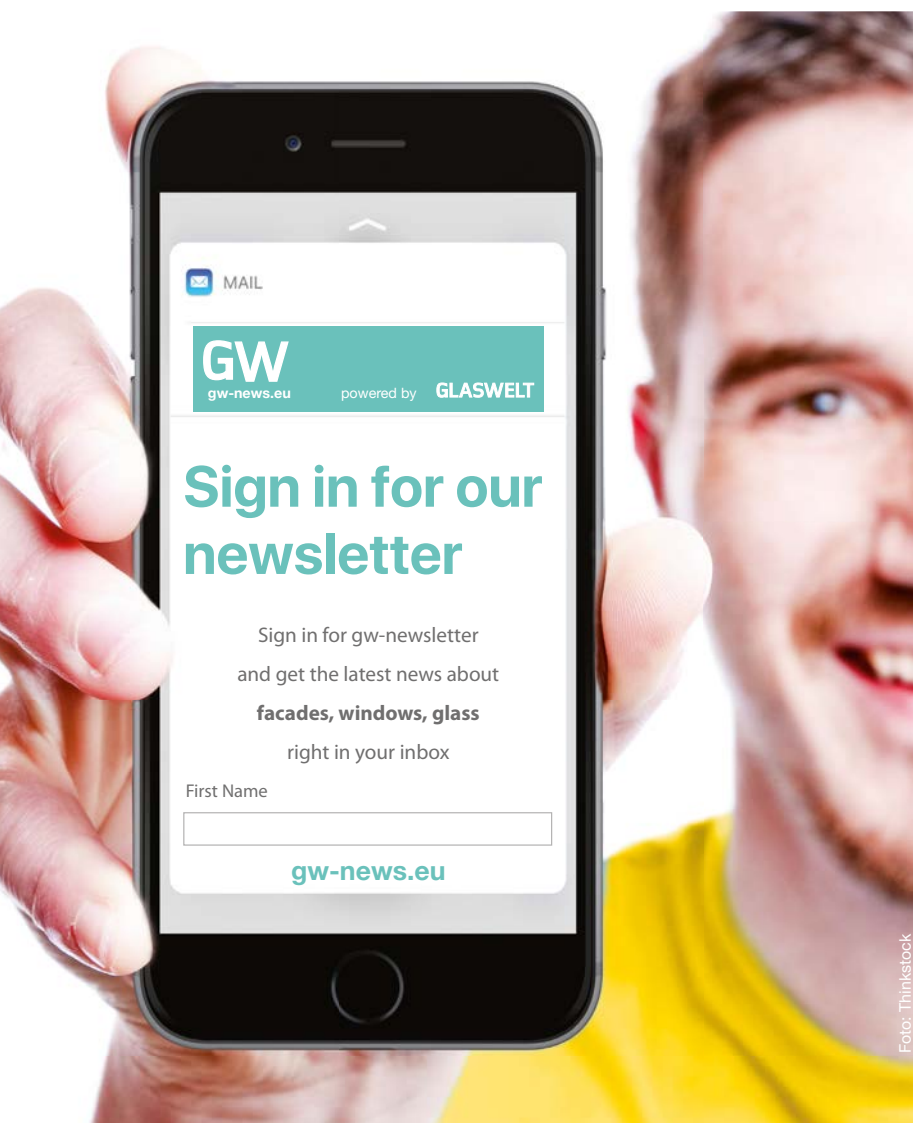
glass processing and full integration with the entire production line. Shorter machine set-up times result from the automatic adjustment of grinding wheel pressure, motorised glass removal and adjustment of wheel speed according to thickness and measurement of glass length. Proportional valves are used for automatic pressure control of the polishing spindles.

Furthermore, an early alarm sounds in case of possible maintenance stops. In addition, remote maintenance by the Lattuada customer service is possible (remote management).

The high degree of automation allows constant quality and productivity of the i-AL at all times, regardless of the shift or the training level of the operator.

www.adeliolattuada.com

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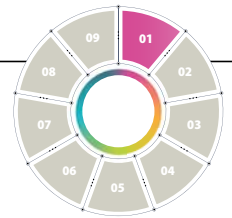
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KURARAY

A way to remotely do production and provide customer service

Kuraray is testing 5G applications at its Troisdorf site and is involved in a project on 5G technologies in industry. The aim is for technicians and engineers to control production and keep it running from their homes using mixed reality and real-time sensor technology. The German government is funding the project with 3.6 million euros.

In the project in Troisdorf, Kuraray is testing, among other things, a virtual toolbox that enables remote monitoring and maintenance of complex industrial plants via mixed reality (MR) glasses, as well as new sensor technology for real-time control of manufacturing processes. “Our project in Troisdorf brings the latest findings from research directly into practical applications,” says Dr Holger Stenzel, Kuraray manager at the Troisdorf location. There the company manufactures high-quality PVB films, which are used as laminated glass interlayers.

5G toolbox and mixed reality for working from home

One application Kuraray is testing in the project is a 5G toolbox that enables maintenance work on production equipment and service visits to customers remotely to keep production running. With new technologies such as MR glasses, the specialty chemicals manufacturer’s process engineers and technicians get an accurate virtual image of each plant and can access additional information such as real-time data, operating instructions and design plans.

“With the 5G toolbox, our engineers can get a detailed picture of the situation, regardless of where they are, and provide precise instructions to staff on site, for example to repair faults,” says Holger Stenzel. “With this new technology, we will be able to link the expertise of our staff even better in the future and create completely new, more flexible forms of work – that would even allow our technicians to work from home.”

Real-time sensor technology in milliseconds

Furthermore, Kuraray will test how new sensor technology networked via 5G can further improve the quality and efficiency of production. “Complex process steps go hand in hand in the production of our PVB films. In order to achieve the best quality for our customers, we adjust our processes to within fractions of a second,” says Simon Fuchs, Global Demand Manager at Kuraray and head of the project in Troisdorf. In the pilot project, Kuraray is working with researchers from the Fraunhofer Institute to investigate how new 5G sensor technology can provide an even more precise picture of the process flows. With the data in real time, the processes can then be further optimised – for higher quality and less waste, emissions and energy consumption in production. Kuraray is also testing an intelligent guidance system for industrial trucks used at the Troisdorf site.

3.6 million euros in funding from the German government

The German federal government is providing 3.57 million euros for the project, which is scheduled to run for three years. It was launched in January 2021, and now individual applications are being realised and the 5G campus network is being set up. The 5G pilot project in Troisdorf is intended to provide insights into how industrial processes can become more efficient, better and more environmentally friendly with modern 5G technologies. One focus is on completely new concepts that could not be realised with the previous 4G standard – for example, the safe remote maintenance of plants via MR glasses or an intelligent control system for industrial trucks. Scientifically, the project is accompanied by the Fraunhofer Institute for Applied Information Technology, the Institute for Technology and Innovation Management at RWTH Aachen University and the Institute for Work, Performance and Society. About the company: Kuraray Europe GmbH generated an annual turnover of 593 million euros in 2020, with more than 800 staff throughout Germany.

Image: Kuraray



Working remotely for engineers and technicians: Simon Fuchs from Kuraray demonstrates how the maintenance of complex plants can work from home using MR glasses and a virtual toolbox. He heads the project at Kuraray in Troisdorf.



In the 5G pilot project at the Troisdorf site, Kuraray is investigating with researchers from the Fraunhofer Institute how new 5G technologies can optimise and accelerate process flows. In addition, Kuraray is testing an intelligent guidance system for industrial trucks already in use there.



“With 5G technology, we can link the expertise of our employees even better and create completely new, more flexible forms of work, then even working from home would be possible for our technicians,” says Holger Stenzel from Kuraray.



At the Troisdorf location, Kuraray produces PVB films that are used as laminated glass interlayers in architecture and the automotive industry. Together with researchers from the Fraunhofer Institute, they are now testing how new 5G sensor technology can be used in production.



5G AND MR GOGGLES FOR THE PRODUCTION OF TOMORROW

In the unique research project at the industrial park in Troisdorf, stakeholders from science and industry are jointly exploring ways in which innovative 5G technologies can make industrial processes better and more sustainable. Kuraray is one of the participants. Among other things, the speciality chemicals manufacturer is testing possible benefits of real-time sensor technology and mixed reality for its PVB interlayer production in Troisdorf. Kuraray, an speciality chemicals manufacturer and parent company of Trosifol, is also involved. The company is intensively committed to making Germany and Europe fit for the 5G era as technology locations.

www.kuraray.eu/materials-for-5g

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The horizontal washing machine Tornado from Neptun



Image: Neptun

NEPTUN

High-speed washing for glass processors

Neptun offers various glass washing machines: the top model is the Superinox, the Wave is available for maximum flexibility in configuration and the LV Top is available as a basic system. Glass with a thickness of 0.7–80 mm in formats from 80 × 100 mm to 3,300 × 6,000 mm can be handled vertically and horizontally (e.g. with the Tornado washing machine). The washing and drying area automatically adapts to the glass thicknesses up to 60 mm (optionally up to 80 mm). With the top models, high-speed washing of glass panes at up to 20 m/min is possible.

The Neptun washing machines can also be adapted for complex tasks, such as LSG and insulating glass production (e.g. with a low-E glass reading sensor). This involves, a constant and precise control of the temperature and the water quality.

What IoT applications are possible for this washing machine?

For IoT/Industry 4.0 applications, the washing machines can be equipped with automatic loading

and unloading systems and can be integrated into IG lines as well as with vertical machining stations and the CornerCut module, a system for automatic edge processing. The washing machines can be equipped with the A-qual system for automatic control and monitoring of water quality as well as for minimising water consumption. The Ecosave system reduces energy costs by automatically switching off all machine functions at a set time. A night-care function is available for emptying, rinsing and filling the tanks, e.g. while the machine is not running at night. At the beginning of the shift, the operator simply finds the machine with clean water at the required temperature.

Special brush sets are available to match the required cleaning intensity: the 180 mm diameter brushes provide high washing efficiency, and the brush configuration can vary depending on the glass type; the brush rotation (RPM) is regulated accordingly.

How does the washing machine do for drying glass?

In the drying section, the SmartSpeed function automatically manages the speed to achieve perfect drying of both glass surfaces at maximum speeds. Here again, the Ecosave system optimises air flows and reduces the noise of the washers by several decibels.

For glass to be printed (screen and ceramic printing), ionising devices can be installed to prevent electrostatic charging.

All processing data can be controlled and exported via the control panel to check on working parameters and diagnostics. The Quick Service allows online technical assistance via the “Sevio Router” remote control module with specific IP address for maximum security.

www.neptunglass.com

TK | SATINAL

Safety glass is made here

Tk of the Satinal Group specialises in the design and construction of furnaces for thermal and chemical tempering as well as for glass laminating. The furnaces can be adapted to the requirements of each glass processor, whether it is a small, medium or large company.

For optimal furnace operation, Tk has developed two methods for the remote control of production: Thanks to PLC or thermocomputer, the processor can also constantly monitor automated IoT/Industry 4.0 production processes.

For safety glass, Tk offers different product lines: Laminating ovens, chemical tempering ovens, heat soak test ovens and thermal tempering systems. For thermal tempering, there are three lines in the range: Easy Temper, Star Temper and Master Temper, which cover every production need from small lines to large systems.

The TC furnaces for chemical tempering are complex plants with special details that allow the glass to obtain better mechanical properties than those obtained by a thermal tempering process. The mechanical strength of chemically toughened glass can be 5 to 8 times stronger than

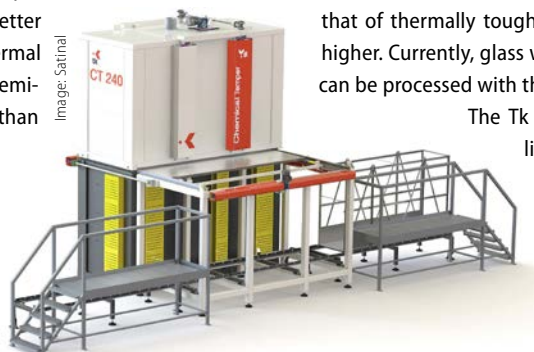


Image: Satinal

The CT 240 furnace from Tk for chemical tempering



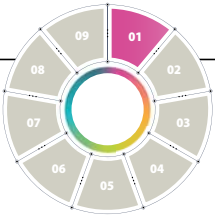
Image: Satinal

The Lamijet laminating line from Tk

that of thermally toughened glass, and its strength to impacts is also higher. Currently, glass with a maximum size of up to 2,500 × 4,000 mm can be processed with the Tk furnaces.

The Tk portfolio also includes these three laminating lines: Lamijet, Convection and Breva, which are designed for different productions, depending on the type of film processed, the heating and cooling systems required and the need to add a heat soak test cycle.

www.satinal.it



BAVELLONI SPA

How a robot can help

For automation, Bavelloni Spa now also offers customised machining robots that can be integrated with the supplier's machines, including grinding machines or CNC machining stations. In addition, special solutions can be implemented to convert existing stand-alone machines into an automated system.

A recent project consisted of a fully automated processing island with a robot on rails and a Bavelloni VE500 V10 variable-angle grinding machine. In this solution, the robot picks up the glass, loads it into the machine, rotates it to grind the four edges before unloading the glass pane.

Another configuration consists of two VE 500 11 straight-line grinders and a robot that takes the glass sheet from the first grinder, turns it 90° or 180° and transfers it to the second machine.

The VE 500 series grinding machines are now also available in the SCS version. By means of Spindle Control Systems, the VE 500 SCS models enable the automatic adjustment of the diamond and polishing discs in order to always optimally position the discs automatically: The diamond discs are motorised, while the pressure of the polishing discs is controlled by electronic proportional valves.

The Bavelloni HE500 double-sided grinders can be equipped with many other options to ensure automatic operation, including presetting of the grinding wheels, motorised spindles (both diamond and polishing spindles) etc.

All this enables automatic operation of the machines and easy linking with other equipment, such as loading units and robots. In a newly installed robotic island consisting of a Bavelloni double-sided grinding line HE500 12 1200 x 2800 U and a Yalos Bavelloni horizontal washing machine, the automatic loading station is equipped with an anthropomorphic robot that takes the glass panes from racks that automatically move in and out of the loading zones.



Image: Bavelloni Spa

Today, Bavelloni Spa provides customised automation, including robotics and automatic loading and transport systems.

www.bavelloni.com

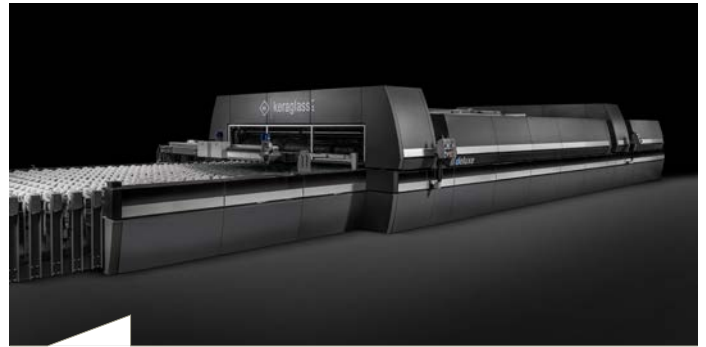


Image: Keraglass

Keraglass Deluxe: fully automatic PVB lamination system for high productivity

KERAGLASS

Deluxe lamination

The Deluxe lamination line was developed by Keraglass as a fully automatic PVB laminating line, equipped with all heating systems, two presses as well as buffers to avoid down time and thus enable high productivity. In addition to quality, the Deluxe is also designed for high efficiency.

Each system is precisely adapted to the respective requirements of the processor, depending on the type and format of the glass to be produced.

Thanks to the double radiation heating as well as the integration of different glass loading systems and conveyor belts, the Deluxe is able to process the most diverse types of glass in different formats into laminates. The joining of the glass in the climate chamber as well as the cutting of the film are automated to the highest precision.

The system can be adapted very flexibly to the requirements of the glass processors in order to achieve high efficiency in laminating.

The Deluxe is controlled by Allen-Bradley systems which, in combination with software, enable the production of any type of laminated glass in a completely automated process run. There are a number of control panels along the line to monitor the production process.

www.keraglass.com

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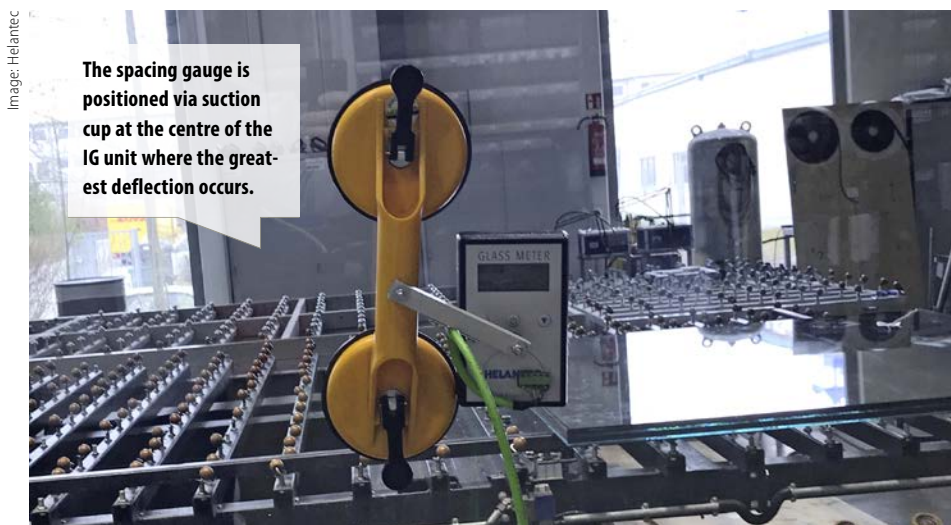




HELANTEC

A safer way to produce big IG units

For risk-free production of large-format insulating glass, Helantec has developed a new filling technique. Silatec, a manufacturer of high-quality safety glass, commissioned Helantec to find a solution for triple IG units that would protect the panes from breakage. Here you can find out how it works.



The spacing gauge is positioned via suction cup at the centre of the IG unit where the greatest deflection occurs.

As the size of insulating glass increases, so do the challenges in manufacturing it. One of these is filling the space between the panes with inert gas for an increased insulating effect. Some of these insulating glass products cannot be easily processed on gas presses due to the special constructions or other reasons, so the gas filling of the IG unit has to be done manually.

For doing so, the filling device is connected to the gas space by means of hoses and probes. The probes are inserted through holes in the frame or through existing holes in the corner connector. The overpressure created when injecting the gas (argon, krypton, xenon or similar) is kept low with the help of a second probe with active suction and the return to the filling device.

The accepted pressure here is a few millibars. With larger formats (from 2.5 x 2.5 m), even a very low pressure would be enough to deform the panes.

Especially with triple pane structures, this can lead to the middle pane bending in one direction or the other without any particular pressure build-up being measurable.

Since the two chambers influence each other, even less than 0.2 mbar can pose the risk of two glass panes coming into contact. This must be

avoided at all cost, as such contact can lead to surface defects and even glass breakage.

So how can large-format IG units be manufactured safely?

To ensure that such insulating glass units can still be manufactured safely, Helantec has equipped its existing Rapide L900 filling line with a distance sensor, which continuously monitors the two spaces between the panes of the triple insulating glass units.

“We did not want to change the pressure sensors we had been using so far, so that we could continue to be flexible and fill small and rigid formats in the future,” says Helantec managing director Gregor Witrofsky. “By adapting the software, our systems can work either by pressure detection or by distance measurement.”

For the distance measurement of the panes, a solution was developed for Silatec (www.sicherheitsglas.de) that allows continuous measurement, for which a distance meter with a suction cup is placed in the centre of the pane where the greatest deflection occurs.

As soon as the distance between the glasses changes, the output of the

pump is adjusted accordingly. This is done independently for both gas gaps.

What does Helantec’s customer say?

The customer is satisfied with Helantec’s new application. “Now we can be sure that the glass panes do not touch each other,” confirms Silatec Managing Director Christoph Hahn. “None of the previously available devices based on pressure measurement could ensure this permanently.”

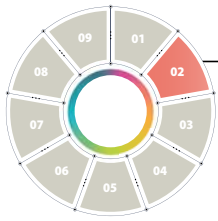
In the course of development at Helantec, it became apparent that this measuring method has further advantages. Since the distance is measured to an accuracy of 0.1 mm, the glass panes can maintain the desired distance permanently, so that only the volume that is actually present is filled with gas. Any bulging inevitably leads to an increase in volume with an associated increase in gas consumption.

Christoph Hahn: “The bottom line is that with the Helantec distance sensor we can not only ensure that the panes do not touch each other. The optimal position of the glasses also ensures the shortest filling time with the lowest gas consumption.” Especially with krypton as the filling gas, the use of the new filling method pays off quickly. The main focus, however, is on avoiding glass damage during production. Every glass that does not have to be repaired or produced again saves time, trouble and resources.

www.helantec.de/index.php/en



In order not to exceed the distance between the glass panes of the IG unit when filling with gas, it is measured 0.1 mm steps.

**INTERVIEW WITH ERICH STRUWE OF STRUWE GLASS ENGINEERING**

The benefit of using scanners

The demands that ESG has to meet today are increasing as far as the appearance of the glass is concerned; what is needed is tempered, flat and distortion-free glass without anisotropies. In order to avoid complaints about ESG, glass processors are increasingly using scanner technology. We asked Erich Struwe, who represents the scanner supplier LiteSentry, what such systems should also be able to do and detect.

GW NEWS – Mr Struwe, what are current scanner systems capable of?

Erich Struwe – In recent years, technology has made a real push forward. Whereas in the past it was surface damage and scratches that could be detected, today scanners are also able to check the glass dimensions and the flatness of the pane as well as warping. In addition, anisotropies and white haze can be detected - and all of this in real time.

GW NEWS – Why is real-time important?

Struwe – Effective process control requires immediate feedback to the operator or production manager. Real-time feedback enables the operator of an ESG furnace to immediately adjust tempering parameters to prevent tolerance deviations, optical distortions and anisotropies. And by avoiding complaints and production downtimes, this saves a lot of cost.

GW NEWS – And what happens if distortions in the glass are not detected during tempering.

Struwe – During tempering, the pane is heated and then cooled in a controlled manner. This always causes some physical distortions, we also call it deviations in planarity (flatness). However, without immediate adjustment of the process control and the use of scanners, such distortions can easily reach a level that would later be criticised. With high-quality laminated glass, the flatness of the toughened/partially toughened glass is decisive for the end product. If the installed tempered glass panes are not exactly flat, the defects add up and quickly lead to severe optical impairments and delamination of the laminates.

The distortions pose a challenge for the producer, because they are often not detected by the staff during the visual inspection and then remain unnoticed until assembly. And at that point it becomes expensive.

GW NEWS – What actually are the advantages of using a scanner?

Struwe – With scanners for quality control of toughened/partially toughened glass, processors can significantly



These days, glass processors demand that the scanners used should detect distortions in the glass as well as any anisotropies.

cantly reduce their scrap or substantially increase their yield. In addition, they are able to carry out further process optimisations during further processing, e.g. the use of thinner interlayers (laminated safety glass foils). A 100% measuring system/scanner that displays the results on the screen in real time is the key to producing high-quality tempered glass products.

GW NEWS – What systems does LiteSentry have in its range?

Struwe – For glass processors, LiteSentry's (www.litesentry.com) range of products includes the Osprey 9 Inspection System and the Osprey 9 Complete. The latter uses grey-field polariscope cameras and appropriate software processing to measure planarity, optical distortions, white haze, roller waves and anisotropies. The methodology and results are in accordance with the new ASTM C 1901-2021 standard. Another inspection system is the Owl 3.

GW NEWS – And what does the Owl 3 do?

Struwe – The Owl 3 system is designed for automated tempering and a variety of different tempering processes that are processed into a batch tempering furnace. It is a contactless optical system that measures glass thickness, type and number of low-E coatings, glass dimensions and plate positions before the batch of glass enters the furnace.

The Owl 3 system transmits the data directly to the furnace controller, allowing the furnace to automatically select a recipe and optimise the heat profile during tempering. This reduces cycle times, minimises distortions in the glass and optimises the flatness of the panes.

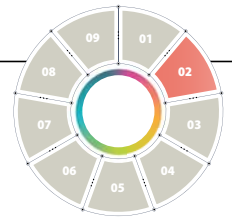
If the Owl 3 is combined with a Load Validator system, faults in the glass as well as in the load can be detected. In this case, the pane transport is immediately alerted, and the load is stopped before it enters the furnace.



Image: Erich Struwe

Erich Struwe is LiteSentry's representative in Germany.

The interview was conducted by Matthias Rehberger



SOFTSOLUTION | GLASTON

What challenges are ESG suppliers facing?

The increasing automation in glass processing also includes tempering lines and requires automated quality control at more and more positions in the production process. Against this background, Glaston and Softsolution have joined forces in a new partnership. Here you can find out what results glass processors can expect from this.

Tolerances in production are becoming tighter and tighter for processing companies. At the same time, the need for quality control systems is also growing rapidly, with such systems having to detect more and more different defects in the glass. At the same time, the increasing automation in glass processing, including ESG production, must be taken into account.

A fully integrated solution and thus a closed loop from the control of an ESG furnace to automated quality feedback will be the key to future requirements and success. This is where the partnership between Softsolution and Glaston (www.glaston.net) comes into play.

In what ways are Softsolution and Glaston already working together?

The first joint project focuses mainly on anisotropy measurement after the pre-stressing process. As quality control continues to evolve, the integration of measurement data into the pre-stressing process is becoming increasingly important. In the future, Glaston will use the anisotropy measurement technology of the Softsolution LineScanner as part of its iLook quality control products. With Glaston's "Insight Service Platform", the LineScanner's data can be collected and used as part of R&D and the automation of the annealing oven.

"When we started thinking about a partnership between our companies, we immediately realised that both companies are particularly focused on pushing boundaries further," explains Peter Pfannenstill, Sales Director of Softsolution.

By combining know-how and experience, the cooperation is aimed at providing the best and most efficient setup for high-quality heat-treated glass, the companies state. If technology development proceeds as planned, Glaston will use the jointly developed technologies as part of the iLook product family.

How the LineScanner needs to operate for anisotropy inspection

The LineScanner for anisotropy inspection is based on a telecentric design. This means that each individual area of a glass is constantly scanned at an angle of 90°, regardless of where and in which position the glass is located on a conveyor belt during processing. This also benefits the scanner systems used for anisotropy inspection.

The following requirements were on Softsolution's agenda for the further development of the LineScanner for anisotropy inspection:

- Position and rotation independence
- Reproducibility/reliability
- Large measuring range [nm]
- Simultaneous measurement of edge tension

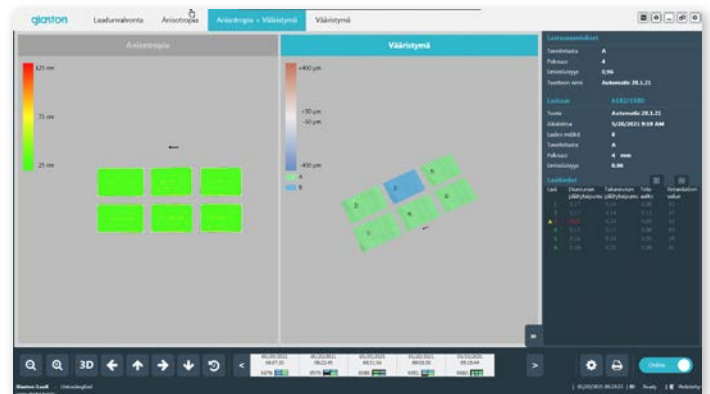


Image: Glaston/Softsolution

Glaston user interface displaying Softsolution anisotropy results.

- Flexibility in defining tolerances and quality limits
- Provision of statistical data for future optimisation

In addition, the use of multiple light sources and thus different wavelengths extends the measurement range. Softsolution expects that in the future anisotropy will not only be checked at tempering furnaces.

Since, in addition to toughened glass (toughened safety glass and toughened laminated safety glass), finished insulating glass units as well as laminated safety glass and laminated glass made of or with toughened safety glass/toughened laminated safety glass also (should) undergo quality control for anisotropies before delivery to the end customer, a wide measuring range is crucial for quality control via scanner.

Which customer uses the technology from Glaston and Softsolution?

A long-standing customer who actively uses equipment from both companies as part of their operations is the glass processor Agnora from Canada (www.agnora.com), where the LineScanner is used to measure anisotropies in the glass.

"We used our Softsolution scanner to inspect raw glass and find defects before cutting. This way we can show a first-class result and reuse unsuitable panes for less demanding projects if necessary. Each pane is also re-scanned after CNC machining and before lamination," says Louis Moreau, Agnora's head of technology and innovation.

A new industry standard

The glass company has been actively addressing the issue of anisotropies for years. Louis Moreau, for example, played a leading role as chairman of a



Image: Agnora

Glass installation at the control tower of O'Hare International Airport in Chicago.



Image: Agnora

Large glass panels in the South Airport Traffic Control Tower provide an unobstructed view of the runway.

working group that worked on an ASTM International standard test method for anisotropies. The result: the ASTM C1901-21 standard method for measuring anisotropies in architectural glass. Louis Moreau explains: "Some glass manufacturers are better able to deal with stress-related optical deformations and distortions (anisotropies) than others. Nevertheless, variables such as season, humidity, glass thickness, tempering furnace performance and operator, among others, can change the heat-treated properties of glass from day to day." Glass scanners capable of mapping deformation values first cleared the way for the ASTM C1901-21 method for measuring anisotropy in architectural glass, he said. With this new industry standard, it is now possible to provide a reproducible test method for measuring anisotropy in architectural glass.

i ABOUT SOFTSOLUTION

For more than 20 years, the Austrian company from Waidhofen/Ybbs has been providing quality control systems for the glass industry. Today, more than 1,100 systems are in use worldwide. The close cooperation with machine manufacturers such as Glaston and the resulting challenging research projects are constant drivers of innovation for Softsolution.

www.glass-iq.com

Jumbo glass in the control tower of Chicago O'Hare Airport

Eines der beeindruckendsten Projekte, die der Softsolution LineScanner bei Agnora erfolgreich inspizierte, waren die Glaspaneele für den South Airport Traffic Control Tower des Chicago O'Hare Flughafen. One of the most impressive projects that the Softsolution LineScanner successfully inspected at Agnora was the glass panels for the South Airport Traffic Control Tower at Chicago O'Hare Airport. The tower received eight defect-free jumbo units from Agnora with the following key data, which were executed as trapezoidal 3-pane laminates. The 176" x 108" glasses are constructed of Pilkington Optiwhite (12 mm/6 mm/12 mm) with Saflex QS41 Acoustic PVB interlayers. The project involved 12 independent inspectors who spent two days on site at Agnora, inspecting the 10 panes of glass. All the panes passed the stringent specification required for airport use. The use of the scanner not only provided Agnora with the appropriate test results, but also with proof of data, which not only satisfied the parties involved, but also opened the doors to new projects, as Agnora was awarded future Federal Aviation Administration (FAA) projects as a result of the contract with the airport.

Matthias Rehberger

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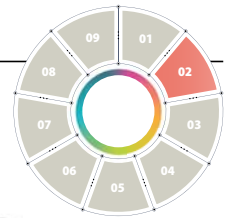
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OPTRIS

Temperature + quality monitoring for tempering furnaces

Optris has now launched a new complete system for toughening systems that not only takes over quality control, but also monitors temperature. Here are the details of the new system.



Image: Optris

The camera-based GIS 640 R System allows the monitoring of tempered and partially tempered safety glass.

During glass tempering, the material undergoes a specific heat treatment, also known as thermal tempering, to produce toughened safety glass or heat-strengthened glass. To do this, the panes are first heated uniformly to more than 600°C in a furnace. This is followed by sudden cooling in a cooling section by blowing air over the glass. The exact adherence to slightly different temperatures in the oven, depending on the type and thickness of the glass, is decisive for the desired quality of the end product. This involves both the exact temperature and the most homogeneous temperature distribution possible within the glass sheets. Optris GmbH has now developed a special system, the TD GIS 640 R, for such an application. This system is based on the PI 640 IR camera and can be optimally used with any tempering furnace thanks to selectable optics with different aperture angles.

In order to achieve high energy efficiency in insulating glass, the basic glass is now equipped with low-E coatings as standard. This means that these insulating glass has a coated side with a very low emissivity (low-E). The low emissivity of the low-E glass poses a great challenge to the infrared measurement technology used during tempering, as the glass coatings also influence the measurement detectors.

What is the focus of the Top Down GIS 640 R?

The new Top Down GIS 640 R solves this issue with a special configuration: above the glass, at the exit of the furnace, an infrared camera of the type PI 640 is installed, which determines the temperature distribution of the individual panes over the entire width of the system very quickly and at high resolution.

Below the glass - i.e. on the side without low-E coating - a pyrometer type CT G5L reproducibly measures the exact glass temperature. The individual pixels of the IR camera image are referenced to this measured value. This



Image: Optris

For inspection of tempered glass, Optris now offers the Top Down GIS 640 R as a pre-assembled system, which includes an infrared camera of type PI 640, the pyrometer of type CT G5L, shutter systems and a compact control cabinet with all electronic and control components, including all cables.

enables automated emissivity correction for standard and low-E glasses. In addition to determining the temperature distribution, the system also calculates the glass area. Both the infrared camera and the pyrometer are equipped with a digitally controlled optics shutter system. These shutters significantly increase the maintenance intervals for cleaning the optics and completely eliminate the need for additional and costly blowing of the optics with compressed air.

How can the new Top Down GIS 640 R system be installed?

Optris supplies the Top Down GIS 640 R as a pre-assembled system for easy installation on preload furnaces. The size (depending on the lens) is 46 × 56 × 76–100 mm and the weight is 269–340 g (also depending on the lens). In addition to the infrared camera, pyrometer and shutter systems, package also includes a compact control cabinet with all electronic and control components as well as all necessary cables.

Compared to line scanner systems, the camera-based GIS 640 R system allows the exact alignment of the scan line in the software - exact mechanical positioning of the system above the oven is not necessary here. The effort required for installation and commissioning can thus be reduced to a minimum, as supplier Optris emphasises.

www.optris.com

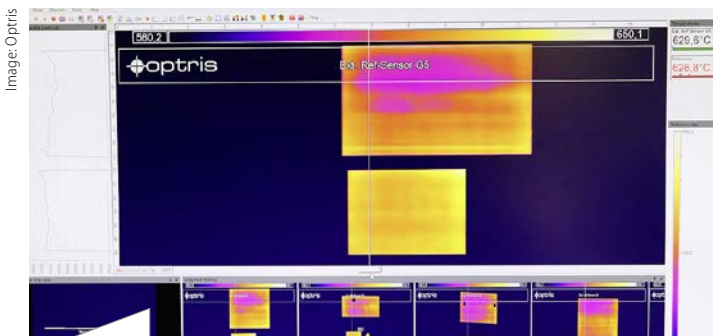


Image: Optris

With the camera-based GIS 640 R system, the scan line can be aligned from within the software.

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VIPROTRON

8 questions to consider about using scanners

Many glass processors already use scanners for quality control. Others not yet. Sometimes the scanner is the answer to tasks that one would not initially associate with it. Examples of this are given by Sandra Kugler, Viprotron Sales Manager for Europe.

Quality Scanner for IG production



Image: Viprotron

“For some problems, the scanner is the solution that a glass processor might look for elsewhere at first,” says Sandra Kugler of Viprotron. Below, she and the scanner specialist’s technicians have listed eight questions and the answers to them.

1. Have you recently lost important customers and orders?

This is a sure sign that, apart from prices or inadequate service, product quality is certainly behind that of your competitors. The use of scanners helps to achieve and maintain a customer-oriented level of quality. This leads to satisfied customers and they stay, even if you are not the supplier with the lowest prices.

The same applies to the acquisition of new customers. Delivery reliability and product quality are the decisive parameters here. Just being cheap is not an alternative, because if you do not deliver in the expected product quality, you will not be able to keep your new customers. The use of our scanners helps to maintain quality.

2. Do you have a high fluctuation of staff?

The plant manager looks at the quantities, the quality manager at the required quality level. Without a reliable evaluation system of which product quality is acceptable for which customer, staff at the visual inspection station easily get caught between two masters with diverging objectives. The result is dissatisfaction with the operation. Staff need defined procedures and a clear specification of what is to be assessed as

“good” or “bad”. A scanner is the objective basis for setting quality levels for individual customers or the company standard. These determinations should be made in cooperation between the operations manager and the quality manager.

3. What does automation have to do with scanners?

The new possibilities for automation in various areas of production and the trend towards IoT/ Industry 4.0, “umati” or “OPCUA” are bringing new momentum to the linking of operational steps. The more closely these steps are linked, the less people have access to the glass product. Cutting staff for cost reasons is a desired effect of automation. Nevertheless, if there are no production staff, there is no one to keep an eye on product quality. Complaints are almost inevitable. Can this be what you want?

Viprotron scanners can provide a remedy here and be used at various points in production to avoid precisely this.

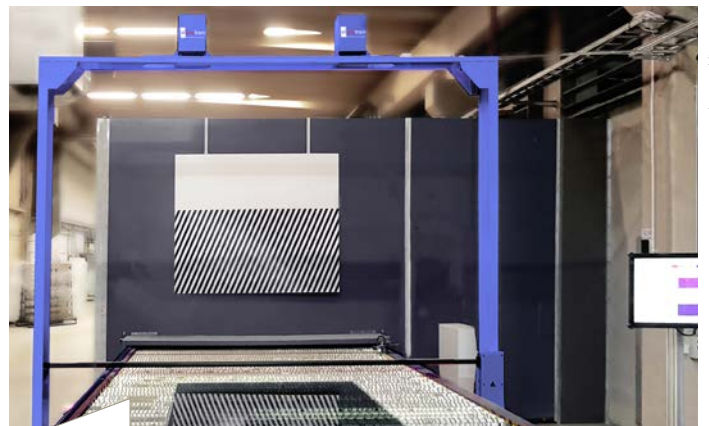
With up to three channels and a defect classification based on these, quality control is then carried out, which is also possible in the context of automation. For example, the Quality Scanner 3D can distinguish

between water drops and bubbles in the glass, because you don’t want to stop your lines because of water drops.

4. how to plan the expansion of the factory equipment?

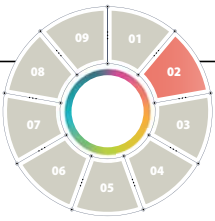
You are planning a new location and ask different suppliers for their quotes and layouts. This often leads to planning through new sites without including the issue of quality control.

If at all, this aspect often only comes into play “five to twelve” – and then work processes and thus layouts have to be rescheduled. But by this time, the machinery for the cutting area has often already been ordered, the clean room for the LSG can no longer be changed or the insulating glass line has been incorrectly configured for reasonable quality control. Viprotron is happy to



Here is a horizontal anisotropy scanner (blue) at the rear of the tempering furnace.

Image: Viprotron



help with the design of the desired inspection equipment, which helps to avoid expensive conversions later on.

5. Are your reclamation costs going up?

Many companies often have only a vague idea about their reclamation costs. Some only see it in the glass containers with customer returns. Others try to find out the reasons for complaints manually and thus cost-intensively. If the processor uses one or more scanners, it gets an overview of problem areas in production long before the product is on its way to the customer. In this way, scanners not only help to avoid unnecessary stress in production, but also third-party costs (including special transports, scaffolding/crane costs, reglazing).

6. How can products be "tracked" through the production process?

Do you already feel that the obligations to provide proof and the necessary documentation are a major bureaucratic act? And now the customer is al-

so asking you to "track" product quality? Viprotron scanners can help here, because the inspection results as well as the other data generated by the scanner itself or read in before the scanning process can be assigned to the respective glass pane with a time stamp etc., and stored in any location on the customer's server. This data is thus available for ERP or PPS packages and supports efforts to track the glass and its components very precisely throughout production.

7. Is your manufacturing environmentally friendly?

Glass consumes a lot of energy in its production, we should not waste it, not only because of the cost. Viprotron scanners can reduce scrap rates because they can find defects before they are cut or during the production process. If defects are found before the final product is finished, the glass can



Sandra Kugler, Viprotron Sales Manager for Europe

Image: Viprotron

often be cleaned or reworked. This does not only apply to the glass. In this way, all materials that are processed later, such as interlayers or spacers, can be salvaged. If defects are only found in the finished product, unnecessary transport of the glass panes can at least be avoided.

8. Would you like to sleep easier?

How often has this happened: You come into the company in the morning and during the late or night shift, dozens of glass panes or even the entire shift's output had to be scrapped due to a series defect. The fault was found too late and now not only are additional costs looming, but production also has to make up for the shortfall. And this with an already very full production schedule. Viprotron scanners will allow you to sleep easier again. The right scanners used correctly help to avoid unnecessary stress. What could be better? —

www.viprotron.de/en

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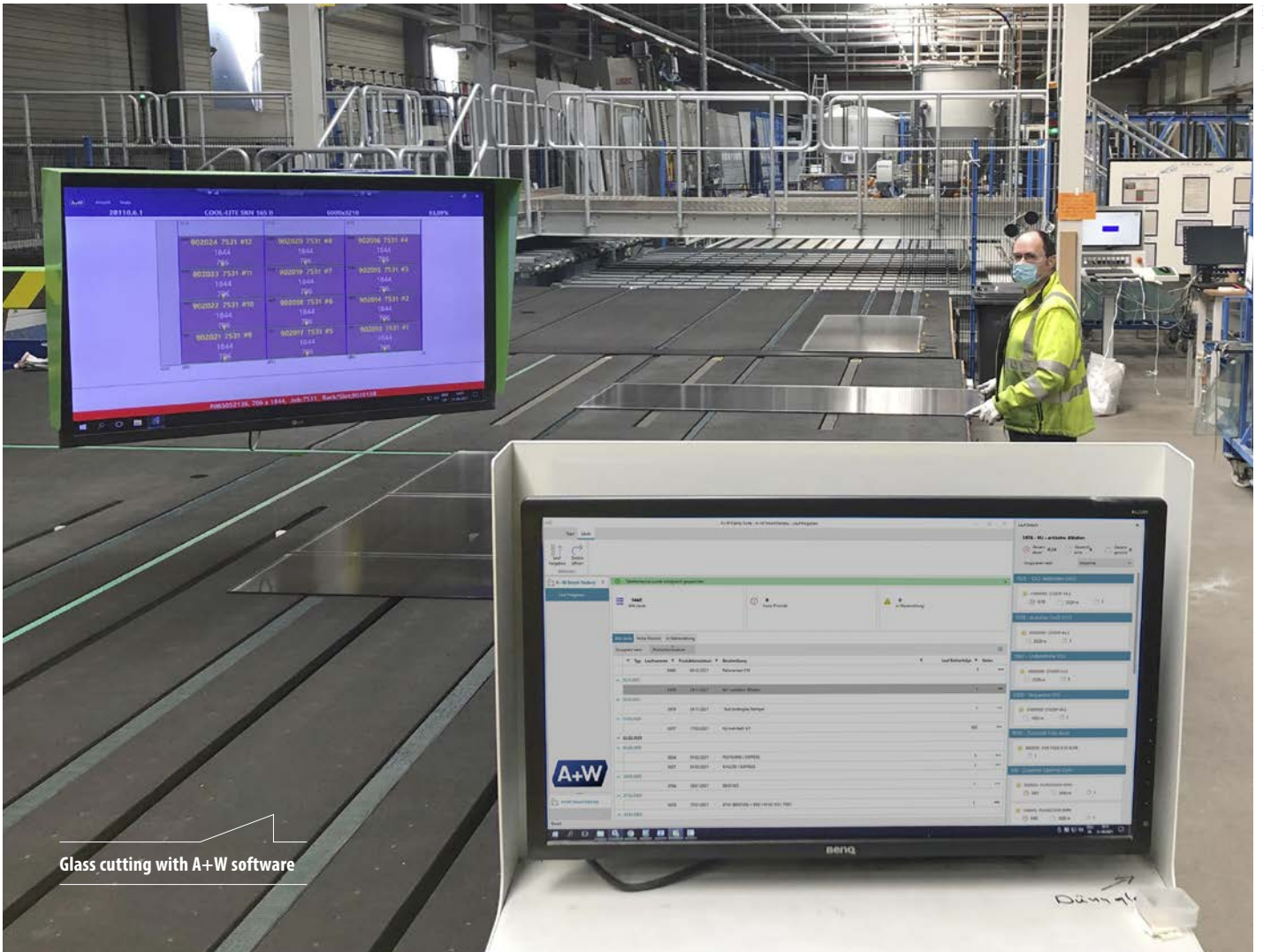
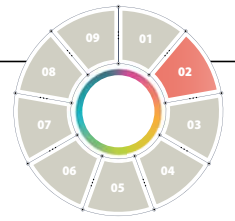


Image: A+W

Glass cutting with A+W software

A+W SMARTFACTORY CONTROLS HIGH-TECH GLASS PRODUCTION IN WÜRSELEN

Vetrotech on the way to Glass 4.0

A+W recently implemented one of the most demanding software projects in its history at Vetrotech. Following the relocation of Vetrotech production from Aachen to Würselen, A+W SmartFactory now controls the highly automated production there. Here you can find out exactly how it works.

“Setting up the automated production in Würselen was a challenge for everyone involved,” explains Guido Plum, Operational Director at Vetrotech, “because what we were planning in the context of moving our production had never been done before in the

20-year partnership between Saint-Gobain and A+W. When it came to the software, we relied on A+W, even though we knew that a brand-new system was being used, the convincing concept of A+W SmartFactory made our decision easy.”

What does the A+W SmartFactory do at the Würselen site?

A+W SmartFactory, a manufacturing system of the latest generation, today fully automates and controls the highly complex Vetrotech production of fire protection and safety glass in Würsel-

en. According to the software provider, the A+W SmartFactory coordinates the process sequences as a higher-level production system for an optimised glass flow.

For the first time, multi-stage production with backward planning is continuously controlled by smart software - without papers, lists and long distances to walk - based on an A+W patent, with an automatic sorter upstream and a second one downstream of the tempering furnace. The new system now ensures faster throughput times. This can be seen, for example, in the TPS insulating glass line, in LSG production and on the ESG furnace. For example, the LSG production has gained significantly in performance through the use of software-controlled sorters. The system is able to responsively control all linked machines and software modules using the production data provided. The connected machines communicate permanently with the system via so-called A+W SmartFactory Clients, which enables real-time control of the machine status and the machine capacity.

The needs of the customer determine the production sequence

According to the principle of backward scheduling, the requirements of the shipping department and thus ultimately of the customer determine the production sequence. Scheduling is done in real time and can be adjusted at any time if necessary due to urgent orders, capacity bottlenecks, machine breakdowns etc. The shipping department is usually affected by this.

As a rule, the dispatch department does not notice this, and so deliveries to the customer can almost always be sent out on time. As a result, Vetrotech customers benefit from even better performance and delivery reliability.

The intelligence required for this is exclusively based on the software that controls the communication between machines, as well as between machines and people: A new industry standard on the way to IoT/Industry 4.0, which is constantly being optimised through the expertise contributed by our pilot customers.

Dennis Tiegs, COO A+W Clarity, says: "What is special about A+W SmartFactory is its scalable use, which helps smaller companies to grow large and the large companies to automate further! The advantage of the lean production approach is taken right from the start."

How did the implementation of A+W SmartFactory work out?

"The fact that the implementation phase of A+W SmartFactory went so well is due in no small part to the dedicated efforts of the Vetrotech project group," says Dennis Tiegs. "In a Herculean effort, together with the A+W project managers, they got the project done."

Guido Plum from Vetrotech adds: "The implementation phase led to a win-win situation despite all the problems that are inevitable in such projects. We got to know the new software down to the last detail. At this point, my compliments once again to the colleagues from A+W who accompanied the project on site. At the same time, we were able to shape and improve A+W Smart-

Factory with our expertise for our mutual benefit from the very beginning."

Is automation also possible with existing machinery?

Yes, this is also possible with A+W SmartFactory. If the possibilities of direct machine communication are missing, the A+W SmartFactory clients themselves function as imitated machines and can determine the status and capacity of the respective machine through the integrated production data acquisition.

A control centre allows the production management and the general management to access a wide range of information from A+W SmartFactory and, if necessary, to intervene directly in production, e.g. by manually adjusting production chains.

Due to this possibility, less automated companies can also use A+W SmartFactory in their production and benefit from this newly developed control software.

In such productions, A+W SmartFactory primarily controls the activities of the employees and informs in real time about necessary production steps and changes in the production process. Here, too, exactly what needs to be shipped first is always produced, urgent orders are easily integrated and WIP (work in process) is significantly reduced.

www.a-w.com

Our tip: You may also want to read the article on the following page which gives details about the Vetrotech production. »

WHAT DENNIS TIEGS HAS TO SAY ON THE MATTER:

GW News _ What does the scalability of an automation solution mean for less digitised companies?

Dennis Tiegs _ The software does not control the machines here, but in the first step it controls the staff in real time and thus the entire production chain. Staff are told which racks have to be at which units at what time and whether there are urgent changes in the production sequence. The system knows the current production requirements, the priorities as well as the machine utilisation and reacts immediately with necessary changes in the production process.

GW News _ How exactly does A+W SmartFactory control the activities of the staff?

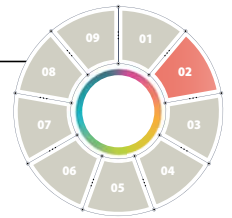
Tiegs _ The information from barcode readings is dynamic and always up-to-date, even if the system has only been aware of changes in the production process for seconds. Production terminals display the necessary work steps at each production unit in real time and provide information about production sequences, necessary changes and transport dates to other units.

www.a-w.com



Image: A+W

Dennis Tiegs,
COO A+W Clarity



VETROTECH SAINT-GOBAIN

State-of-the-art glass production at Vetrotech

Vetrotech has recently started manufacturing its fire protection and high-security glass with ultra-modern machines and a high degree of automation at its new plant in Würselen. Here are the details of the new, state-of-the-art production facility.

Compared to the historical Vetrotech Kinon production site in Aachen, the new location offers 25 % more production space and can thus combine all manufacturing processes under one roof. As part of the relocation of production, Vetrotech Saint-Gobain Kinon GmbH was renamed Vetrotech Saint-Gobain Würselen GmbH.

With the relocation of production to Würselen and the highly automated production (details on page 48/49), Vetrotech is laying the foundation for even higher production quality, planning reliability and safety at work. Guido Plum, Operational Director Vetrotech, says: "The new location enables consistently stable delivery times thanks to a very good alignment with the sequence of the individual production processes, including the adapted IT landscape." The automation and operation within a state-of-the-art IT environment, lead to more flexibility in production as well as more stable process flows, as this enables product traceability.

"The new building structure has finally made it possible for us to accommodate the entire production in one hall," adds Christoph Mertens, Plant Manager Vetrotech Saint-Gobain Würselen. "Only now did we have the possibility to automate certain processes. This automation is definitely the big innovation in Würselen, because we work with a two-stage automation system: an automatic sorting system upstream and one downstream of the prestressing furnace. This two-stage nature was the big challenge for the mechanical engineering and especially for the software system (A+W) to support these logistical flows."

The new infrastructure, he says, makes it possible to use the data to further develop the processes.

What types of glass does Vetrotech make?

Vetrotech manufactures a wide range of fire-retardant, impact-resistant, attack-resistant, bulletproof and pressure-resistant high-security glass products – also as multifunctional glass – which combine several protective functions and design. In addition to Germany, all international markets are also supplied.



Image: Vetrotech Saint-Gobain / Olaf Rohl

Production of fire-resistant glass in the clean room at Vetrotech Saint-Gobain in Würselen.

The relocation of production to the new location is accompanied by an improvement in product quality due to automation and less manual work on the glass. In addition, production now takes place under one roof.

150 years of tradition in glass

The 150-year tradition of Vetrotech still influences the thinking and actions of the employees today, so it was clear to build the new plant in Germany again.

Guido Plum: "We definitely wanted to preserve the know-how acquired over decades for the factory. Machines are easy to relocate, people are not: our complexity does not make it easy to relocate product knowledge. The know-how we have acquired over many years is the basis of our constant improvements. We are proud to have our employees in the product development team for a very long time. This pays off in the end and is part of our long tradition."



VETROTECH - KNOW-HOW OF 150 YEARS

Since its foundation in 1871 and its takeover by Saint-Gobain in 1952, Kinon Sicherheitsglas GmbH in Aachen has grown to become one of the leading experts in safety and high-security glass. As early as the 1980s, Kinon developed Contraflam, the first transparent fire-resistant glass.

www.vetrotech.com



Image: Vetrotech Saint-Gobain / Olaf Rohl

Guido Plum, Operational Director Vetrotech Saint-Gobain



Image: Vetrotech Saint-Gobain / Olaf Rohl

Christoph Mertens, Plant Manager Vetrotech, Würselen

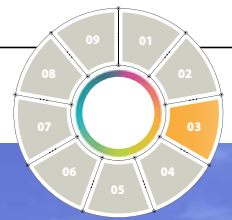
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Floating: The glass walkway was lifted over the Bründl Sports building to the installation site on the fourth floor with the help of a 45-metre-long jib, on the fourth floor.



Foto: seele

A GLASS SKYWALK FOR KAPRUN IN AUSTRIA

seele installs a 9-tonne skywalk in 4 hours

With its new flagship store in Kaprun, Bründl Sports is creating an architectural highlight. The main attraction is the over 10 m long, free-floating skywalk, which offers a breathtaking view of the alpine panorama and the Kitzsteinhorn. Here you will find out how the installation happened so fast.

Facade specialist seele installed the glass skywalk on the 4th floor of the Kaprun sporting goods store on 5 May. The assembly of the nine-tonne glass construction was observed by many spectators and a television crew. The project was also special for seele from a technical point of view: it is the first free-floating glass walkway that seele realised in Austria. The self-supporting construction made of glass and minimal stainless steel fittings provides an unobstructed view of the surroundings thanks to transparent floors and glass stringers. The exposed location of the building directly by the mountain stream required a carefully thought-out installation concept. The glass walkway was therefore pre-assembled in Gersthofen and

transported to the installation site in one piece. The panorama bridge was designed by the Stuttgart-based architecture and design office Blocher Partners together with the engineering office Baucon ZT GmbH.

Great cooperation between sedak and seele

A high degree of attention to detail and coordination between the glass fabricator and seele's construction team was required even in the run-up to installation. Glass specialist sedak GmbH handled the glass processing and pre-assembly. First, two 11 m long glass trolleys (6x12 mm LSG) were inserted into an assembly frame to act as structural supports for the glass walkway.



Foto: seele

The glass walkway protrudes by 10 m from the flagship store of Bründl Sports. The special connection to the existing building allows maximum transparency



ABOUT SE-AUSTRIA

The seele branch in Schörfling/Austria is responsible for projects around the world that, with their size, aesthetics and technical sophistication, are regarded as milestones.

Around 120 employees worldwide design, plan and realise complex steel and glass architecture or spectacular building envelopes made of aluminium, wood and membranes.

The constructions are developed in intensive dialogue with the clients. The portfolio ranges from customer consulting, design and engineering to production. Project management controls all activities up to logistics and installation on site. se-austria is closely integrated into the global seele network.

For more information, contact

anna.haas@se-austria.com



Foto: seele

At 15 m height, seele's installation technicians dismantle the installation frame after fixing the glass walkway.

Then the four base plates made of LSG were placed on top. As a last step, the end piece was inserted precisely. After gluing, the glass walkway was loaded and transported to Kaprun, Austria.

The sedak Skywalk was installed using a telescopic crane

Three days after completion of the pre-assembly, the walkway was lifted into its final position in Kaprun. The direct location on the river Ache was not only a challenge for the seele installation team, but also for the 250t telescopic crane. The 45 m long jib of the crane lifted the glass walkway from the street side over the building to the installation site on the fourth floor.

There, the fitters adjusted and fixed the glass construction in the building by means of com-

pensating brackets. Two stainless steel stays attached to the glass stringers penetrate the building and are fixed by means of two M48 threaded bolts.

These minimal building connection points create the imposing, free-floating appearance. The construction carries its own weight and counteracts other forces such as payload (max. 45 persons each weighing 100 kg), snow (3kN/m² surface load) and wind (up to 140 km/h).

Wind and weather almost prevented the installation

The installation was made more exciting by the weather forecasts, as bad weather and strong winds were predicted for the day. So it had to be brought forward to the early morning hours at short notice. Without wind and weather, the

walkway was then successfully fixed before the weather changed. Shortly after the installation, the rain started and wind speeds of over 12 m/s were recorded, which would have prevented the installation.

"In addition to the equipment and the installation team, the weather, which can change quickly in mountainous regions, plays a major role. You simply have to keep an eye on everything and react flexibly," Manuel Hofmair, the installation manager, explains. "Complex installations are actually the order of the day at seele, but the Bründl skywalk was a special project for me."

Clearly, the planning was to enable a time-effective installation. This meant that everything could be done very quickly on site and the walkway could be assembled in just 4 hours.

www.seele.com

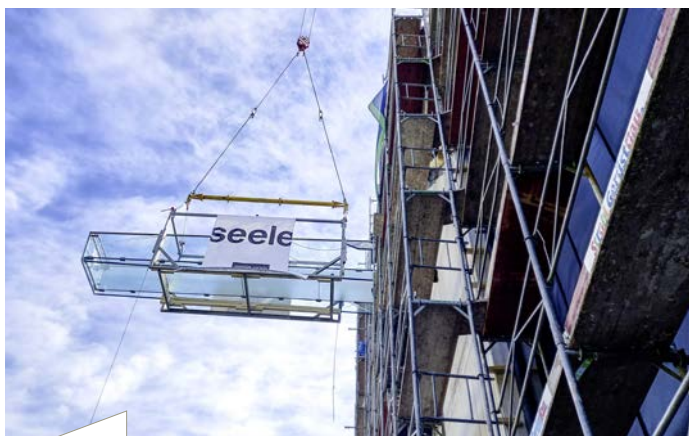


Foto: seele

Bad weather forecast: As strong winds were forecast for the date, so the assembly was brought forward to the morning. Shortly after the assembly, the rain came.



Foto: seele

After the glass walkway was fixed to the building, the mounting frame was removed. The Skywalk rises freely from the 4th floor of the Bründl Sports flagship store.

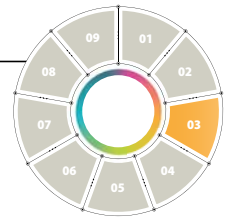


Image: Knippers Helbig

EASTMAN: SELF-SUPPORTING GLASS STRUCTURES

A major innovation in glass construction

Recently, Eastman and Knippers Helbig Advanced Engineering have collaborated to develop a frameless glass structure using entirely new laminated glass products. Here we take a look at the revolutionary glass structure here.

This revolutionary development does not require an “external” construction, as the panes support themselves through the laminated glass and the (laminated-in) metal parts.

— This is what innovation should look like: Together, Eastman and Knippers Helbig Advanced Engineering have presented a revolutionary glass construction that has never existed before. It consists of 38 frameless laminated safety glass panes, which together form one large pane. The special feature of this new application: the panes are self-supporting, as they do not require any “external” construction, just the laminated glass and the laminated metal parts.

How is the frameless glass construction put together?

A total of 38 panes of laminated safety glass (LSG) were used for the construction. The frameless glass construction, which weighs almost 1400 kg, reaches a height of 4.5 metres and a diameter of 3.5 metres. 244 high-precision stainless steel fittings are laminated into the glass panes.

The glass laminates were manufactured with the composite films Saflex Structural (DG41) and Vanceva Arctic Snow (www.saflex.com) from the glass processor Thiele Glas (www.thiele-glas.de). Looking behind the scenes: The project required almost half a year of preparatory work, with Matthias Haller from Eastman Technical Service playing a leading role. The specialist engineers from Knippers Helbig Advanced Engineering (www.knippershelbig.com) were responsible for the static calculation of the load on the individual panes.

Why does this glass construction work at all, and how?

With the help of the laminated metal elements, the construction can support itself without screws. The project is unique, but the special features are not limited to the frameless glass construction itself.

Each laminated safety glass pane consists of two 8 mm thick, individual partially tempered glass panes of low-iron white glass. The panes are connected by several Saflex Structural foils. In addition, high-precision stainless steel fittings were laminated into the structure.

One of the goals of the project was to expand the possibilities and range of products offered by glass finishers and metal specialists, according to Eastman technician Matthias Haller. In addition, new possibilities in and for structural glass engineering were to be explored and new processes developed.

Matthias Haller: “The extraordinary thing about this new type of glass construction is that no additional construction parts are needed. Only the laminated fittings and standard connecting elements hold the overall construction together.”

www.eastman.com

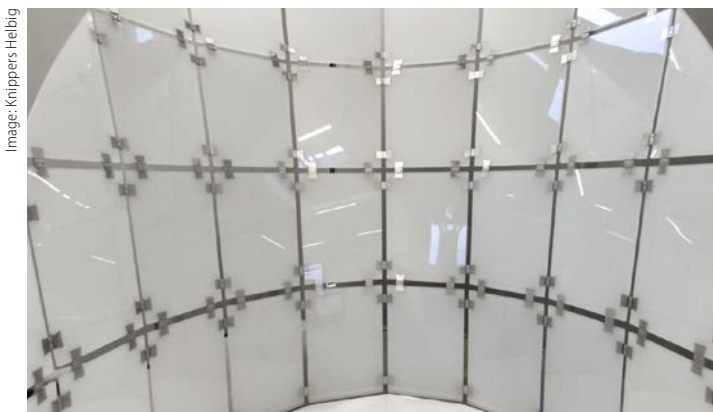


Image: Knippers Helbig

The inside view the self-supporting glass construction.

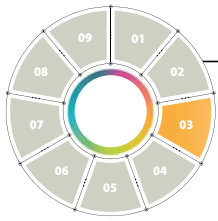
i **THOSE INVOLVED IN THE PROJECT**

Concept/Engineering:
Knippers Helbig Engineering
www.knippershelbig.com

Glass laminator: Thiele Glas
www.thiele-glas.de/en/

Assembly: Hüttinger
www.huettinger-nuernberg.com

Laminates: Saflex Structural, Vanceva Arctic Snow
www.saflex.com

**H.B. FULLER | KÖMMERLING: LIQUID LAMINATION WITHOUT EDGE SEALANT**

Transparent optics for LSG panes

H.B. Fuller | Kömmerling now offer for the first time a system solution for Loca glass elements with Clear Edge technology. Here you can find out what is behind the new process, which enables liquid lamination of laminated glass without a visible edge seal.

Image: H.B. Fuller | Kömmerling



According to H.B. Fuller | Kömmerling, the new Loca elements with Clear Edge combine the design advantages of liquid lamination with an edgeless, fully transparent look for the first time.

The new Clear Edge technology for liquid lamination makes it possible to produce laminated safety glass and laminated glasses that are completely transparent all the way to the edge. This application was developed by H.B. Fuller | Kömmerling together with partner TTEC as an extension of Loca (Liquid Optical Clear Adhesives), a process for manufacturing laminated safety glass using cast resin. Since the Loca glass elements can thus be manufactured completely transparent up to the edge, such safety glass is suitable for use in sophisticated architectural buildings.

What is the difference between Loca and older processes?

According to the developers, the new Loca elements with Clear Edge combine for the first time the constructive advantages of liquid lamination with a borderless transparent appearance. Until now, the technique of liquid lamination required a filling chamber between the glasses of the laminated glass element, in which case the edges of the glass are sealed with butyl tape or acrylate tape. This edge seal holds the liquid cast resin securely in the space between the panes

during the production process until it has completely hardened. However, the edges of the panes are still visible in such processes, so that it is not possible to produce consistently clear glass without discernible pane edges. In Loca glass with Clear Edge, the pane is completely clear and transparent.

Loca combines stability with a fully transparent look

According to the developers, the special design properties of Loca laminated glass offer a whole range of advantages: in contrast to conventional laminated glass films, Liquid Optical Clear Adhesives form a chemical bond with the glass surface during curing. In addition, the material itself forms a three-dimensionally cross-linked composite that is characterised by high structural stability even under strong temperature fluctuations and does not splinter even under extreme stress. In addition, according to the developers, the composite elements have a significantly lower weight, a smaller package thickness and a better acoustic performance than conventional safety glass. Moreover, the shape of the glass does not play a major role even with clear-edge tech-

nology. In principle, three-dimensionally shaped glasses can also be realised.

Due to the passive curing, sensitive electronic components such as LEDs and functional films can also be safely embedded in the polymer intermediate layer of the laminated glasses. Since the Liquid Optical Clear Adhesives have a very low viscosity during processing, they adapt completely to any surface and thus deliver an optically flawless result.

The new process can currently be used to produce laminated glass in sizes up to 3000 × 2000 mm. These safety glasses can be mounted with commercially available fastening systems.

What other goals do the Loca developers have?

H.B. Fuller | Kömmerling would like to involve manufacturers of safety and insulating glass in the process development and train them in such a way that the processors themselves can produce the Loca elements that are exactly right for them.

The supplier supports glass processors with an extensive test and start-up phase, during which an application engineer is on site until production runs smoothly.

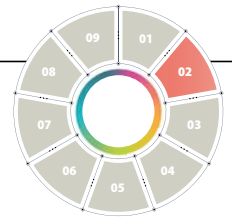
The developers expect that Loca will make it possible to manufacture completely new curved glass products, switchable glass, functional and high-security glass without edge sealants.

www.koe-chemie.de/en



Image: H.B. Fuller | Kömmerling

With the Clear Edge technology from H.B. Fuller | Kömmerling, the most visually sophisticated glass products can be manufactured.



FRAUNHOFER IWM

The trick with the crease – using artificial intelligence for glass bending

Artificial intelligence (AI) is part of the increasing digitalisation. At the Fraunhofer IWM in Freiburg, AI is being combined with the material glass. More precisely, with a project on innovative glass bending. The result is a self-learning process that uses lasers to precisely bend very narrow glass radii. Here, the developers explain how this works, even with triple insulating glass.

Image: Fraunhofer IWM



Here is a triple insulating glass, as it is possible with the new Fraunhofer bending process, because the basic panes for double and triple insulating glass can now be bent with extreme precision. Among other applications, such glass panes can be installed as glass corners.

What is different about the Fraunhofer bending process?

The products mentioned above would not be possible with conventional gravity bending. On the one hand, the non-bent areas would also be somewhat deformed at the contact points due to the softened glass (restrictions on the optics), and on the other hand, such extremely tight radii of a few millimetres would not be possible to realise. The new approach at the Fraunhofer IWM is to heat the glass in locally defined areas to such an extent that it can only be deformed there. This is implemented in a special furnace developed at the Fraunhofer IWM. In this furnace, a glass pane is specifically heated to the required temperature range. The precise local heating of the areas to be bent follows directly after the global heating. Depending on the requirements, this is done by a laser, radiant heater or other radiation source.

In the new bending process, the glass pane is heated over a limited area, which then allows the glass to be deformed locally without also causing (undesired) deformation in adjacent areas. With this technique, the glass panes are practically creased. Such a crease can be applied to several sections of a glass pane.

What are the advantages of the new process?

During the development work, the process was further improved and transferred to new applications. On the one hand, successful bending tests were carried out on different types and thicknesses of glass, and on the other hand, parameters such as bending accuracy and process time were further optimised.

This is where the artificial intelligence (AI) comes in, in the form of a machine learning application. The design freedom extended by the new process requires adapted temperature curves for different geometries. The temperatures in the fur-

The Fraunhofer IWM has developed a glass bending process to bend glass in very tight radii (e.g. 15 mm = 90° bending angle) while maintaining the optical quality of the glass surface of float glass.

The curved glass panes, double and triple insulating glass are possible, can replace existing architectural solutions: For example, an obvious use of the laser-curved glass panes is as a glass corner of buildings or as an application in interiors, such as for showers.

What are the benefits of curved or bent insulating glass?

Using curved insulating glazing as a corner solution eliminates the time-consuming assembly of the glass panes at the edges of the building as well as the associated increased material and personnel costs. At the same time, the usual "thermal bridge" in the corner area, which results from the use of spacers, is eliminated. In addition to cost

advantages, this also results in positive changes for the energy rating of a building and within the product life cycle (cradle-to-cradle).

The new design freedom opens up completely new fields of application for glass. Bent glass combines a protective function with modern, functional designs as a cover for technical products or for touch screens.



Such bent flat glass with a "sharp" corner can be used in facades and interiors.

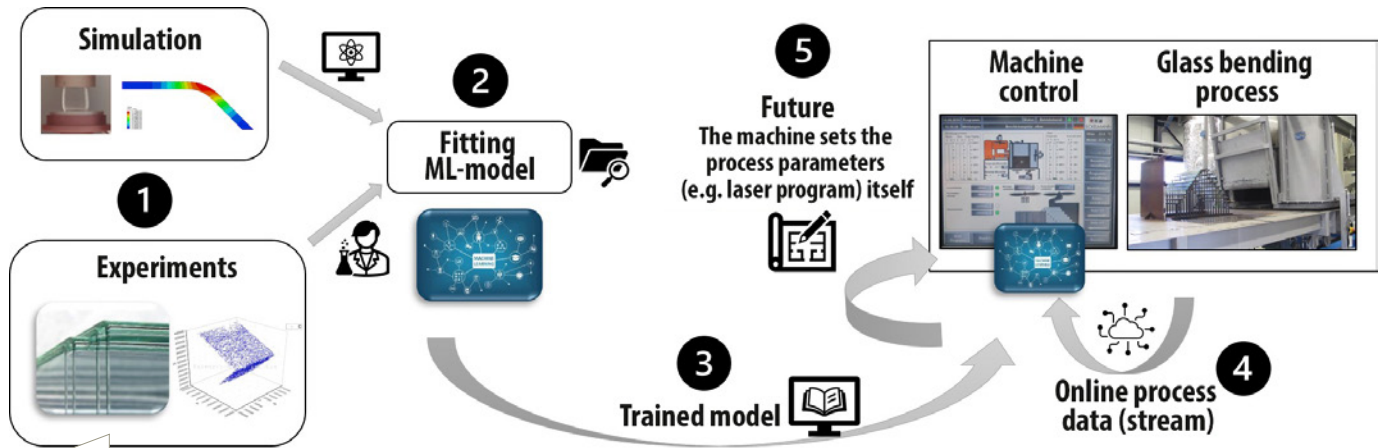


Image: Fraunhofer IWM

The process flow of laser-based glass bending with AI support, which was developed at Fraunhofer IWM.

nace chamber and on the glass are recorded every second by thermo couples and stored in a database. The implemented AI “machine learning model” accesses this data – as well as the data from more than 20 other sensors – and calculates a probability distribution from a selection of laser programmes when a so-called trigger temperature is reached.

Shorter time-to-market

This in turn represents the ranking of the laser programmes for heating the bending surface with which the target radius and bending angle are most likely to be achieved and thus helps to select the optimum programme for that specific geometry. In view of individual geometries, development times can thus be shortened, allowing a shorter time-to-market can be realised.

Currently, the creation, adaptation and selection of the laser programme is still done manually, but the goal is for the self-learning models to have a direct influence on machine control and regulation (see graphic).

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 Matthias Quast, Tobias Rist,
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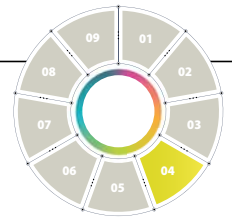
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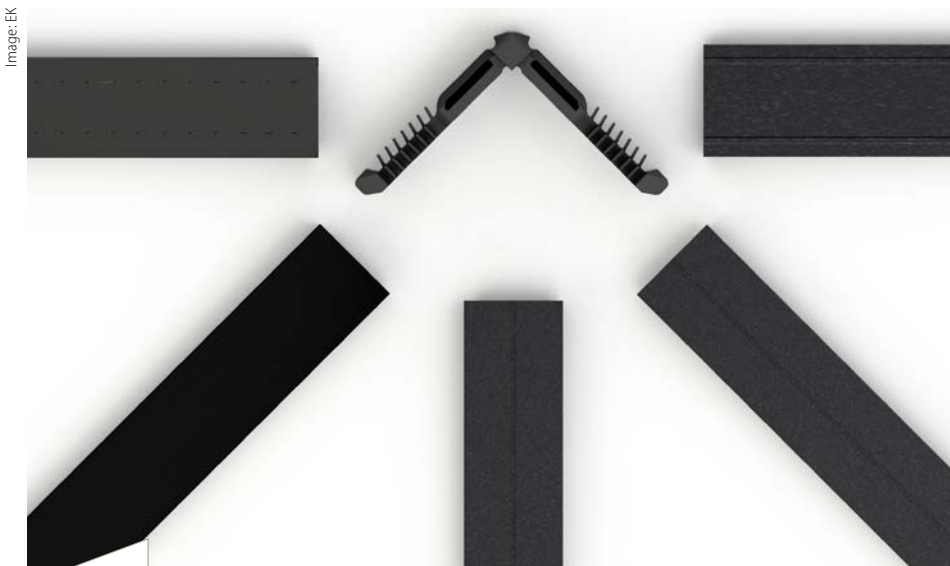
FIERA MILANO



EDUARD KRONENBERG (EK)

“Warm edge is standard today and is gaining in market volume.”

Germany as a business location is facing challenging times, according to Ralf M. Kronenberg, Managing Director of Eduard Kronenberg GmbH in Haan. In an interview with GW News, he explains why EK consistently focuses on precision and quality, why warm edge profiles for insulating glass are gaining market share and which joining technology is at the cutting edge.



EK's plastic corner brackets ensure that the sealing of warm edge spacers at the joint is secure and that the application of the butyl as the primary sealant is even and without separating the butyl thread.

Insulating glass manufacturer Eduard Kronenberg (EK) has interesting products for the warm edge in its range for insulating glass manufacturers: the motto for the EK Polo Connect plastic corner brackets of the HPS series is “One key fits all”, because they work with numerous warm edge profiles.

In addition, according to the developers, they set a new standard in terms of safe processing, high stability and the prevention of cracking, for example of the brittle warm edge profiles made of SAN material.

The corner angles of the series, which are available in grey and black and in profile widths of 12 to 20 mm, have numerous lamellae with a saw-tooth structure to seal the profile joint and to absorb tolerances. Their extended connector legs provide increased load-bearing capacity, especially for large frames.

Due to recesses for sealant absorption, these corner connectors allow the manual application of butyl in the process. This allows the fresh butyl to be applied and pulled around the corner area of the joint during processing for sealing.

EK Polo Connect longitudinal and corner connectors for CT Ultra

And the new plastic longitudinal connectors from the EK Polo Connect Ultra series are characterised by their U-shape, which is adapted to the profile inner chamber for efficient desiccant filling.

The centre channel is modelled in such a way that safe filling of the frames with the desiccant is ensured, according to the EK developers.

The micro-lamellae of the connectors are used for permanent locking in the profile perforation and for tolerance absorption. The longitudinal connectors also have a sealing field for even better sealing of the profile joint, serration for better grip in the profile and secure profile centring. Bevelled connector ends also ensure easy profile coupling.

Furthermore, there are matching EK Polo Connect corner and flexible model angles for the CT Ultra profiles. The plastic corner angles ensure

that the sealing of the warm edge profiles at the joint is secure and that the application of butyl with the primary sealant at the joint (corner area) is trouble-free, evenly and without separating the butyl thread.



Ralf M. Kronenberg, CEO Eduard Kronenberg GmbH

A word with Ralf M. Kronenberg

GW NEWS – Mr Kronenberg, how do you see the current market development?

Ralf M. Kronenberg – In times of the Covid crisis, we are experiencing the vulnerability of the system in which we live and work. Challenging times await Germany as a business location, in which some of the players will have to reposition themselves on the market and reflect on what has made us strong in the first place: quality Made in Germany.

GW NEWS – *What do you think is most important for a successful future?*

Kronenberg – A real strength of our business location is our claim to high quality. Made in Germany – innovation, reliability & quality – still reflects our competence in “quality”. This includes the technical quality of the products and a flawless execution of everything to do with the product.

GW NEWS – *How do you implement this in your company?*

Kronenberg – The consistent focus on quality and customer satisfaction, now and tomorrow, brings a great competitive advantage. Our goal is to address the competition on the market focusing on the customer, the process and our staff.

GW NEWS – *What is your recipe for EK's future success?*

Kronenberg – Quality and partnership! Acting in the spirit of quality is a fundamental part of our corporate responsibility. Because this advantage now gives us an ace for the future. This creates space for more, where all actions mesh and the companies in the supply chain work together in partnership. A space for new processes that promote quality and service excellence. —

The interview was conducted by Matthias Rehberger



ABOUT EK POLO CONNECT LONGITUDINAL CONNECTOR CT ULTRA

Image: EK



Longitudinal and corner connectors of the EK POLO Connect CT Ultra series.

- High process reliability, dimensional stability at the joint, no deformation of the spacer geometry, serration for better bonding in the profile
- U-shape adapted to the profile inner chamber for efficient filling with desiccant
- Micro-lamellae for locking in the perforation and for tolerance absorption
- Sealing field for improved sealing of the joint
- Reliable profile centring



ABOUT EK POLO CONNECT CORNER CONNECTORS OF THE HPS SERIES

Image: EK



Special HPS corner brackets for warm edge profiles from EK Kronenberg.

- High stability, no splitting as, e.g. with brittle warm edge profiles made of SAN materials
- Lamellae for sealing the profile joint and for tolerance absorption
- Longer connector legs for increased load capacity with large frames
- Recesses for sealant absorption

www.kronenberg-eduard.com

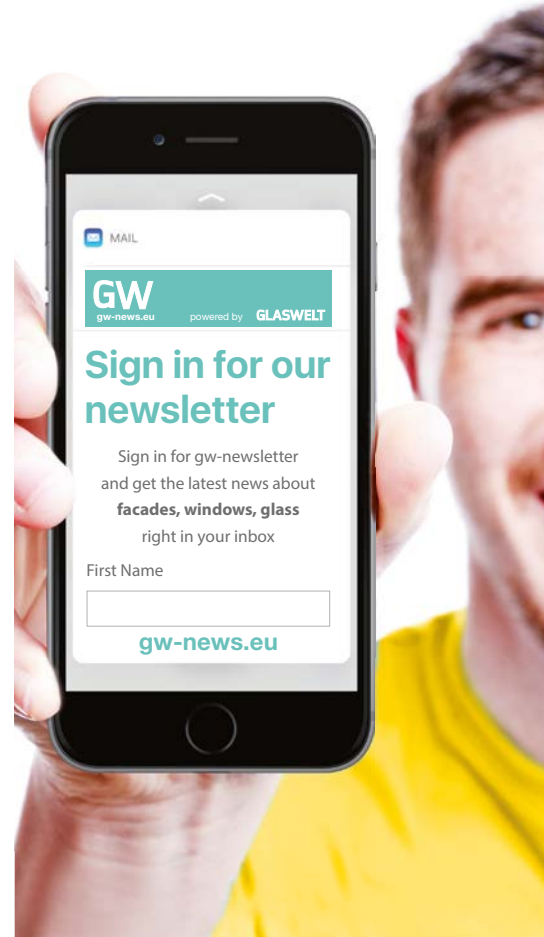


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10 YEARS OF SUPER SPACER PRODUCTION IN HEINSBERG

“Spacer production in Germany has proven its worth”

The silicone-based Edgetech Super Spacer for the warm edge have achieved a respectable position in the market. The production site in Heinsberg, which is now celebrating its 10th anniversary, has contributed significantly to this.

“Edgetech recognised the importance of energy efficiency as a market driver for window technology at an early stage. The metal-free, silicone-based Super Spacer was a huge milestone and is still one of the leading products in terms of energy performance,” says Joachim Stoß, Managing Director of Edgetech Europe GmbH. “The Super Spacer contributes to the Edgetech/Quanex Group being the world’s largest spacer manufacturer by combined sales,” Stoß added. In 2004, Edgetech opened a sales office in Neuss. From there, a team of three started to work the EU market together with the field sales force, thus also supporting the British production site. From North Rhine-Westphalia, contact was maintained with leading insulating glass manufacturers and the spacer business was established and expanded.

Own production in Germany

The next step was to set up the second spacer production in Europe in 2011. Heinsberg was chosen as the location, which is not only centrally located in Western Europe, but also in the border triangle of Germany, the Netherlands and Belgium. This means that these markets can also be served quickly and directly. Several Super Spacer lines now run around the clock on the 12,000 m² site in Heinsberg.

Image: Edgetech



Different Edgetech Spacers have been manufactured in Heinsberg for 10 years.



Image: Edgetech

Many international architectural projects could only be realised with Super Spacers.

“Our spacer production in Germany has proven itself. But the potential for flexible spacers is far from exhausted,” says Johannes von Wenserski, authorised signatory at Edgetech Europe.

Looking at the market, he explains further: “Insulating glass production is currently changing at a rapid pace. Automated processes are the new normal. Super Spacer support the idea of lean manufacturing with high quality. Contemporary glass architecture demands the greatest possible flexibility in glass structures, formats and shapes. A whole series of worldwide architectural projects would not have been realisable without the Super Spacer, at least not within the given budget and time frame. We are very proud of this.” Due to the constantly growing demand for flexible spacers, capacities are constantly being expanded in Heinsberg. In addition, the Super Spacer TriSeal Premium Plus, which is installed, for example, in the spherically curved insulating glass of the Elbphilharmonie, is only produced there.



Foto: Edgetech

Der Super Spacer TriSeal Premium Plus

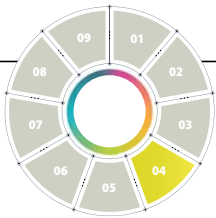


Image: Edgetech



Joachim Stoß, Managing Director of Edgetech Europe GmbH



Johannes von Wenserski, authorised signatory of Edgetech Europe GmbH

Image: Edgetech

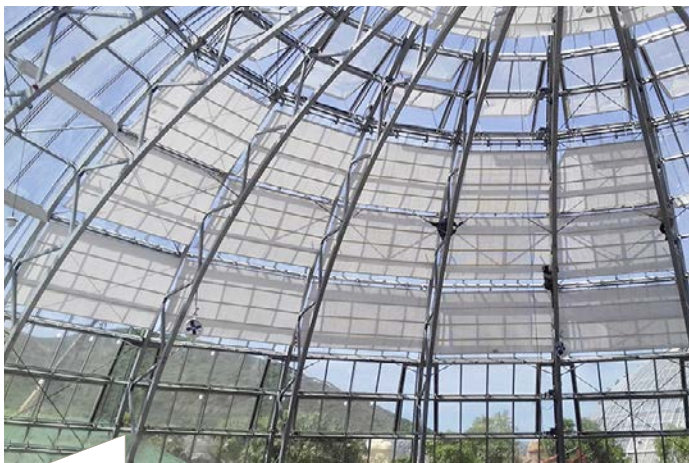


Image: Deschanet

The Edgetech spacers come into their own most clearly in curved insulating glass.



EDGETECH EUROPE GMBH IN HEINSBERG

Foto: Edgetech



Spacer production in Heinsberg is now celebrating its 10th anniversary.

As a wholly owned subsidiary of Quanex Building Products Corporation, Edgetech Europe GmbH is one of the three Edgetech production sites worldwide and also acts as the sales location for continental Europe. A total of 480 employees work at the Heinsberg site with its 17 extruders.

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INTERVIEW WITH JÖRG LENZ FROM TECHNOFORM

What IG manufacturers want from the switch to warm edge systems?

In addition to quality and durability, the efficient production of insulating glass units with warm edge plays a central role for manufacturers. We wanted to know from Jörg Lenz, Product Manager at Technoform, how high-quality flexible spacers with warm edge can be processed economically and efficiently and how Technoform supports producers in this.

GW NEWS – After more than 30 years at Technoform, you are an expert in all things warm edge. What are the main arguments in favour of warm edge spacers?

Jörg Lenz – If you want to meet the increasing demands on the energy performance of insulating glass units, there is no getting around warm edge. This applies equally to end users, planners and insulating glass manufacturers who have to supply corresponding glass products. In terms of energy efficiency, warm edge systems are now state of the art after more than 20 years on the market, with a market share of over 70%. However, this also means that many insulating glass units are still manufactured and installed with metal spacers.

GW NEWS – Why do building owners still rely on metal spacers?

Lenz – On the consumer side, this certainly has to do with the fact that the traditional glass edge seal with spacers made of aluminium or stainless steel is somewhat cheaper to purchase than the warm edge. The fact that the warm edge saves costs in the long run is often overlooked under short-term pressure to save money; a lot of educational work needs to be done here. In order for warm edge systems to become more widespread, everyone involved, from the planner to the window manufacturer to the insulating glass manufacturer, must pull together.

GW NEWS – Are you confident in this case?

Lenz – Yes. There is a growing awareness of quality, but it comes up against limits when it comes to economic efficiency in production and processing. No doubt about it:

Insulating glass manufacturers must be able to produce efficiently in order to participate in this shared project called “warm edge”.

A manufacturer who has always processed spacers made of metal will consider very carefully whether and how it will pay off for him to switch to hybrid spacers made of thermoplastic material and metal foil. Furthermore: Without productivity, there is no warm edge, which is why the topic of productivity is so important to me. Our goal at Technoform is to support our partners who are dealing with such questions with our experience and know-how.

GW NEWS – Is there one warm edge system for all situations? And what are the differences between the various systems?

Lenz – When selecting the right system, a number of factors are relevant for the insulating glass manufacturer. That is why there are different systems. To simplify, one can distinguish between two types of warm-edge systems: On the one hand, there are the “flexible”, one could also call them the “soft” systems, where the spacer is ap-

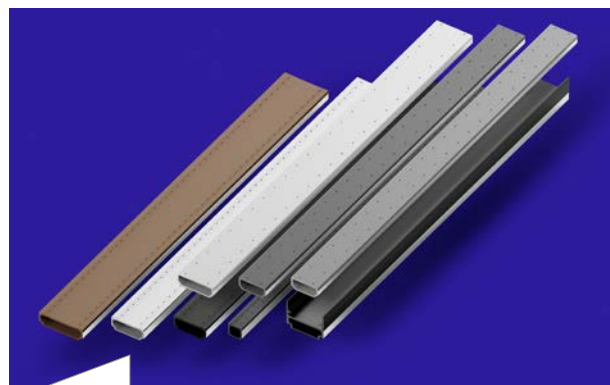


Image: Technoform

Technoform has a wide range of warm edge spacers in its portfolio and offers comprehensive services for insulating glass manufacturers.

plied directly to the glass panes from a roll or from a barrel. On the other hand, there are the “rigid” systems, such as the hollow chamber profiles from Technoform. These are almost identical to common metal spacers, except that they are made of thermoplastic material with a metal foil as a diffusion barrier against moisture penetration into the gas gap and against loss of noble gases. They are also much more energy efficient.

GW NEWS – What distinguishes “flexible” spacer systems?

Lenz – “Flexible” systems have the advantage that machine processing can be automated very well. The panes pass through the process almost without manual support. This saves manual effort and increases the production speed, but the IG manufacturer needs additional machines and processes for this. Warm edge systems with rigid profiles,

on the other hand, can be produced with common machines and processes for processing metal spacers. In addition, profile bars made of thermoplastic material are very resistant to bending and thus stabilise the edge seal. Both types of warm edge systems have their advantages and disadvantages, depending on the objective. There is no one system for all requirements, which is why large insulating glass manufacturers in particular operate on two or



Image: Technoform

Our experts support insulating glass manufacturers on site with the set-up and optimisation of bending machines and, if necessary, also with the procurement of machine parts.

Jörg Lenz, Product Manager at Technoform

more tracks. The goal should always be to create the highest quality for the end user; this should be followed by questions of productivity, and not vice versa. Which technology is strategically the right one in each individual case has to be determined on a case-by-case basis. Here, too, the experts at Technoform are happy to provide support with a great deal of experience and know-how.

GW NEWS – When you say that flexible warm edge spacers are a “safe bet” for manufacturers who previously processed metal spacers, what do you mean by that?

Lenz – Before warm-edge spacers came onto the market, insulating glass was manufactured with metal spacers. The metal profiles were cut to size, bent, filled with desiccant and applied to the pane in the manufacturing process, and the edge seal was finally sealed.

Most insulating glass manufacturers have mastered this process for decades. Since the same process also applies to Technoform’s hollow chamber profiles, it is very easy for them to convert to flexible profiles. The producers stay on the safe side because they do not have to purchase new machines and equipment or retrain employees. It hardly makes a difference in production whether spacers are made of metal or not, which is why warm edge spacers made of thermoplastic material and metal foil are a safe bet for producers and a ticket to the future, because the signs of the times are clearly pointing to warm edge.

GW NEWS – What additional services do you offer for IG manufacturers?

Lenz – We support our insulating glass customers on site with the adaptation of bending systems and advise them if new machine parts have to be purchased in individual cases. However, this all involves much less effort and cost than converting to a completely new system. In addition, we have expanded our service portfolio by providing a new online shop platform that further simplifies ordering for our customers.

In addition, we offer the service of a Kanban system, which ensures a steady supply and improvements in process costs on the customer side. Due to the restrictions of the Covid pandemic, we rely on remote service for customer support, in addition to personal con-

tact, and support our customers, for example in production, by means of various digital tools. In this way, we remain close to the customer despite the physical distance.

The interview with Jörg Lenz was conducted by Matthias Rehberger



SWITCHING TO PLASTIC SPACERS MADE EASY

The switch from metal spacers to hollow chamber profiles made of plastic is small and can be managed without risk or effort, since insulating glass manufac-

turers who previously used metal spacers can fully retain their machines and processes.

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FENZI GROUP

Simple automation with Butylver TPS

Windows and facades are seeing an increasing demand for customized products with special design and high performance, as well as ever larger formats. This requires insulating glass with a warm edge and spacers that are easy to process. One solution is the Butylver TPS from Fenzi, which combines the spacer, the desiccant and the primary seal in one product.

Today, the Fenzi Group offers the most comprehensive range of warm edge spacers for insulating glass. Among the top products in this segment is Butylver TPS, a spacer made of thermoplastic material of the latest generation. This was specially developed for processing with commercially available applicators to enable high-quality IG production on highly automated insulating glass lines.

Like all the other warm edge spacers of the Fenzi group, the Butylver TPS is characterised by a very low Psi value, which ensures a strong reduction of heat losses at the glass edge.

Advantages of the Butylver TPS warm edge system

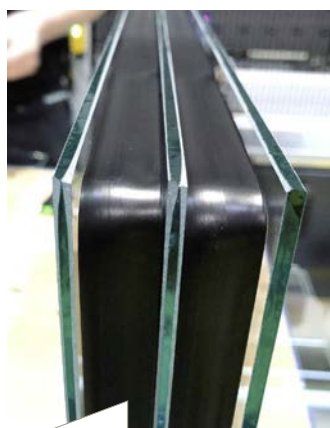
According to Fenzi, the Butylver TPS, which combines spacer, desiccant and primary seal in one product, guarantees perfect contact with the glass, minimum heat transmission and optimum mechanical stability. These factors all make an important contribution to the high insulating effect and the long service life of an insulating glass unit. In addition, the spacer enables the automated production of insulating glass units in a wide variety of designs and dimensions. Other properties include low heat transmission, low gas and vapour permeability and very good reproducibility.

The special feature of the TPS spacer is its fast, stable and consistent adhesion to the glass pane directly after application. This is not only crucial for the performance of the insulating glass unit, but also creates safety for the processor when handling and transporting the insulating glass during the production process.

Resistant to thermal loads

The mechanical stability of the Butylver TPS offers advantages in terms of resistance to breakage under constant load changes at the glass edge caused by weathering, wind and temperature fluctuations.

The mechanical properties of the spacer can compensate for such loads, which has a positive effect on the service life of the IG unit. In addition, the following advantages of Butylver TPS have a positive effect on production:



The Butylver TPS allows clean corners



Image: Fenzi

Like all warm edge spacers of the Fenzi group, the Butylver TPS has a very good Psi value, which minimises heat loss at the glass edge.

- Fast and efficient adhesion to the glass pane.
- Low material consumption per unit of insulating glass.
- Very high reproducibility.
- No misalignment of the two spacers in triple insulating glass.
- Flexible design and uniform colour.

The formulation and structure of the spacer has been optimised for fast handling of the insulating glass in production.

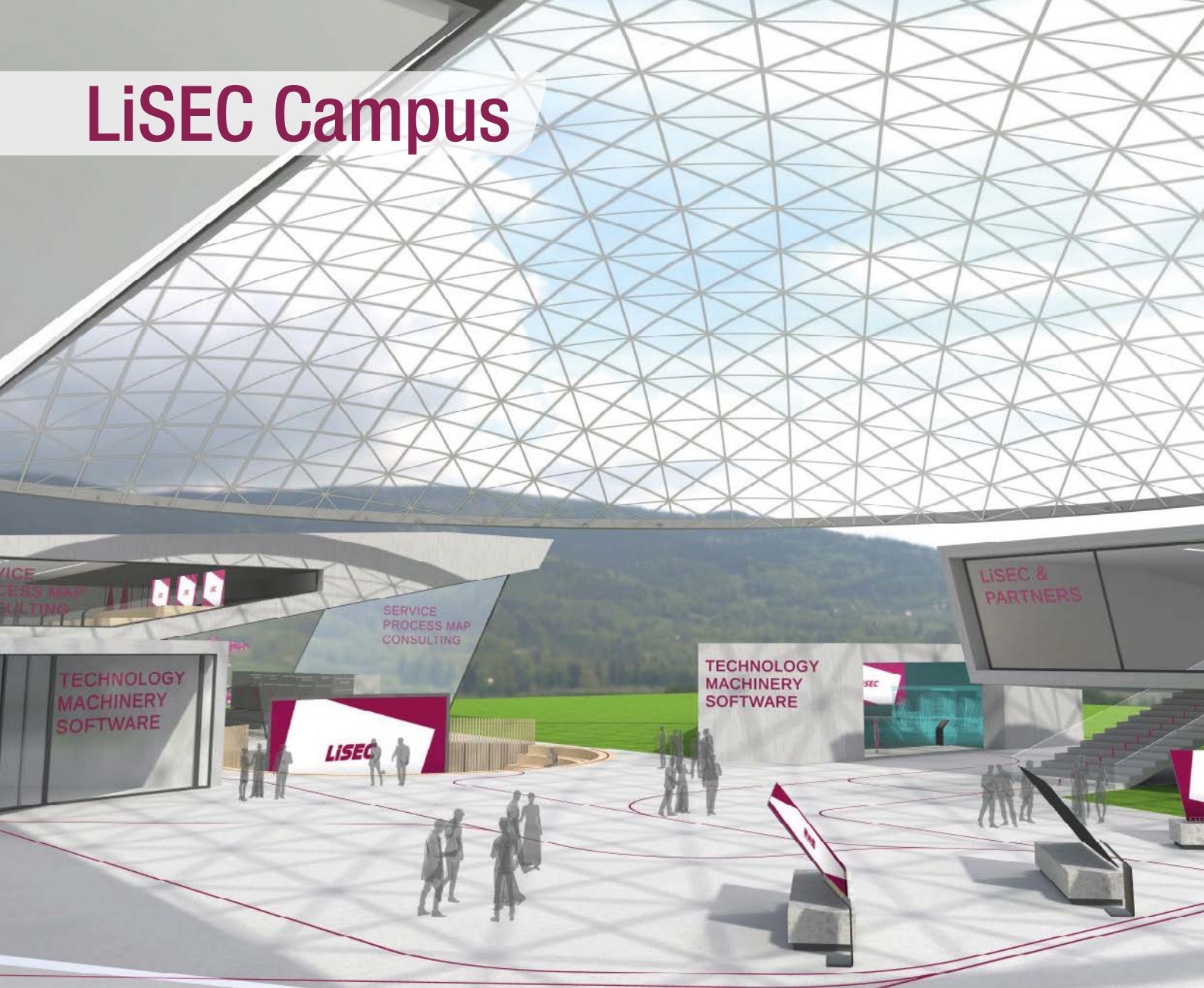
Important properties for optimised production

The automated application of the Butylver TPS enables millimetre-precision and one hundred percent parallel alignment, including at the corners, all factors that are becoming increasingly important in the production of triple insulating glass. This precision and the quality of the material prevent condensation from forming on the edge of the glass and ensure a long service life for the insulating glass unit.

The high degree of automation also allows the entire production process to be optimised and, in addition to high efficiency, also enables a significant reduction in material waste, optimisation of stock management (because stored in barrels). In addition, the Butylver TPS enables a wide variety of insulating glass geometries in terms of shape as well as an easy switch to different widths in the space between the panes.

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Image: Swisspacer / Jürgen Krall Photographie



Image: Swisspacer / Jürgen Krall Photographie

The Swisspacer Ultimate spacer was used in the renovation of the listed buildings of the Academy of Fine Arts in Nuremberg.

In order to achieve the 80 mm construction depth of the original elements, an unusually wide warm-edge spacer was required.

SWISSPACER FOR THE ACADEMY OF FINE ARTS IN NUREMBERG

Successful renovation with Swisspacer

Being a listed monument often makes the renovation of buildings a challenge, as in the case of the Academy of Fine Arts in Nuremberg. Here you can find out how the building's energy balance was significantly improved by the use of Swisspacer.

The adequate renovation of the façades of the Academy of Fine Arts in Nuremberg, designed by architect Sep Ruf, was supported by the use of a warm-edge spacer system from Swisspacer. This enabled the filigree appearance of the buildings to be preserved and the building energy balance to be significantly improved.

The visual lightness, minimal constructions, floor-to-ceiling glazed walls and slim roofs are characteristic of the buildings, which were listed in 1988. Over the years, however, the large window areas, among other things, have caused difficulties. Especially in the winter months, they made for an uncomfortable indoor climate and very high energy consumption for heating. In the course of modernisation, the facade glass was also replaced. The single glazing on the inner courtyard façades was replaced. They were replaced by double insulating glazing.

“Our objective was to improve the energy efficiency of the building envelope while taking into account the protection of historical monuments,” explains Swantje Schröder, head of department at the Erlangen-Nuremberg State Building Authority.

“For this purpose, the new façades were to match the existing windows in terms of their dimensions and profiles. This was the prerequisite for replacing the façades on the building.”

In order to achieve the construction depth of 80 mm of the original elements, a large distance between the panes and thus an unusually dimensioned warm edge spacer was required for the customised facade elements.

It had to be 36 mm wide and white. The search for a suitable product finally led the planners to the Swiss manufacturer Swisspacer: its Swisspacer Ultimate warm edge spacer is also available in the required width of 36 mm.

sired uniform appearance of the academy buildings could be maintained.

The appearance of the buildings is thus preserved unaltered, and the building is assured of optimised thermal insulation and thus long-term energy cost savings.

www.swisspacer.com



Image: Swisspacer / Jürgen Krall Photographie

Here is the exterior view of the renovated filigree facade of Pavilion 1 of the Academy of Fine Arts

Who manufactured the insulating glass with the Swisspacer spacers?

The Saint-Gobain Glassolutions Objekt-Center in Radeburg manufactured the glass facade elements with a precise fit using the warm edge spacer.

The Swisspacer Ultimate spacers used here ensure very good thermal insulation in the transition area from the glass to the frame. By using this passive house certified component, the de-

i CALUWIN TOOL FOR IG MANUFACTURERS

Image: Swisspacer

The Caluwin simulation tool provides more certainty in planning and allows a determination of the service life of the insulating glass.

With the tool, insulating glass manufacturers can check whether pressure equalisation is necessary to prevent damage from climate loads. The calculation is based on common regulations, including prEN 16612:2017, DIN EN 673 and DIN EN 1279-2.

<https://en.swisspacer.com/caluwin>

RELIABLE PROCESSING & SELF-SEALING: Corner keys for long lasting gas tightness for IG units

The innovation S&T self-sealing corner key providing significantly time reduction and costs for manufacturing IG frames. Passed evidence of performance in accordance with EN 1279-3 with Polysulfide-, PU- and silicone edge seal.

Now available in a range of colours for these profiles:

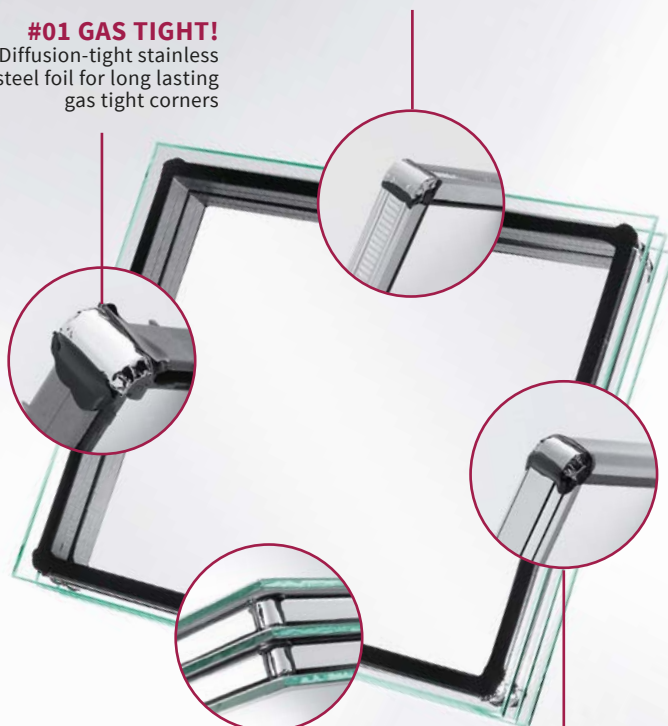
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- » Rolltech Chromatech Ultra
- » Rolltech Multitech
- » TGI - M
- » Thermoseal Thermobar
- » Termoprofi

#01 PROCESS RELIABLE!

No expanding of the corners of the spacer frame

#01 GAS TIGHT!

Diffusion-tight stainless steel foil for long lasting gas tight corners



#02 GAS TIGHT!

Self-sealing due to integrated Butyl seal: No additional manual sealing required

#02 PROCESS RELIABLE!

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DOW SILICONE SPACERS

This is as transparent as it gets



The new Dowsil Crystal Clear Spacer is a fully transparent silicone spacer.

Dow introduces the Dowsil Crystal Clear Spacer, a clear silicone spacer for manufacturing insulating glass units where maximum transparency is desired. The transparent spacer was developed to meet the growing demand for fully transparent insulating glass units.

The Dowsil Crystal Clear Spacer is a pre-formed material that forms a chemical bond with the glass within minutes of application. According to Dow's developers, the spacer is easy to install and eliminates the need for adhesive tape to hold it in place, offering fabricators improved productivity in insulating glass fabrication.

The flexibility of the spacer allows the production of (right-)angled and curved insulating glass. An additional feature is the low thermal conductivity of the silicone spacer. The dimensions of the spacers can be tailored to specific design and customer requirements.

Has there already been practical experience with the Crystal Clear Spacer?

The new spacer is currently already being used for interior glass applications, including glass doors as well as sliding doors of commercial refrigerators in shops and supermarkets, where full visibility and high light transmission at the glass edge helps to improve the presentation of goods.

Dowsil Crystal Clear Spacer is compatible with all Dowsil silicone secondary seals for insulating glass and the new Dowsil 335 butyl sealant for primary seals of insulating glass units.

For more detailed information and step-by-step application instructions, refer to Dow's technical data sheet.

www.dow.com



FINEOGLASS

Vacuum glass brings comfort behind old windows

If you live in a house built before 1980, you are often still stuck behind windows without good thermal insulation. In old half-timbered houses, you can even still find single-glazed lattice windows. Here you will find out how Fineo vacuum insulating glass can now remedy this situation.



Image: Fineoglass

The vacuum glass Fineo manages to insulate even old lattice windows while also preserving the beautiful wooden profiles and window frames.

When winter comes, it can get cold and draughty near the old windows and the house loses a lot of expensive heating energy. Replacing the windows is possible if it is not a listed building. However, this is often only a good choice in terms of energy, but not visually, because the original character of an old house is often lost with new windows. A better solution for historic buildings is to replace the old glass with the vacuum insulating glass Fineo. For this purpose, a certified window builder prepares the old profiles and wooden frames and then fits the very thin vacuum glass, if desired even in combination with historicising panes that look like the original glass.

Is Fineo vacuum glass also suitable for transom windows?

Old half-timbered houses are often still equipped with single-glazed lattice windows. If you replace these small-format panes with “Fineo” vacuum glass, they insulate windows like contemporary insulating glass, while at the same time the old windows retain their light and lattice character. The trick: The vacuum glass consists of two glass panes at least three millimetre thick that are light and bright, separated only by a 0.1 millimetre thin vacuum and a nano thermal insulation coating. There are no seals or wide spacers inside the glazing, which is why Fineo looks like a single pane of glass. The difference is that you do not “through heat out of the window”, as it is kept inside.

Allows in 15 per cent more daylight

Interesting for skylights: There are no losses due to convection, so Fineo insulates the roof as well as the wall. Maintenance is not necessary, the technical values remain constant as long as the glass does not break. Compared to standard triple glazing, the thin pane structure allows around 15 per cent more daylight into the room, and, according to the developers, sound insulation is also significantly improved. Not having a veil of cold near the windows thanks to Fineo makes the house is much more



Image: Fineoglass / René Müller

It looks like thin laminated safety glass, but it is vacuum glass with excellent thermal insulation.

comfortable – the surface of the room-side glazing always remains close to the room temperature. In winter, when the sun is low, the house even achieves solar energy gains so that much less heating is needed.

Energy efficiency for historic windows, even in special shapes

The latest generation of Fineo vacuum glass can also be implemented in free-form shapes, including arches. This means that potentially any historic glass can now be replaced with Fineo and used in existing profiles and frames, e.g. in the often rounded top panes of historic mullioned windows. Due to the narrow structures of the vacuum insulating glass, the filigree aesthetics of the original windows are preserved. There are no conventional seals, because the panes are permanently fused together in a narrow edge area of only 5 mm. Convection losses with horizontal or sloping installation are also a thing of the past. And with the new “Fineo Heritage” glass, there is now also historicising vacuum glass that looks like cast glass. For refurbishment, “Heritage Classic” and “Heritage Classic Strong” are available for glasses that were common in the 1920s to 1960s. For pre-1920 buildings, “Heritage Traditional” and “Heritage Traditional Light” glasses are available on request.

www.fineoglass.eu



IN CONVERSATION WITH MICROSHADE CEO EIK BEZZEL

“MicroShade Film invisibly takes over the facade’s sun shading in the insulating glass.”

With MicroShade Film, the Danish company MicroShade A/S is launching a transparent solution that CEO Eik Bezzel calls a revolution. In an interview with GW News, he explains what exactly is behind it and how the system works. You can also read why he considers MicroShade Film to be a solution that will redefine sun protection in facades.



Image: MicroShade A/S

MicroShade CEO Eik Bezzel

GW NEWS – *Mr Bezzel, what is behind your new sun protection solution?*

Eik Bezzel – The MicroShade Film is a passive microstructure film that almost completely blocks the incident solar energy, but at the same time allows natural daylight into the building. The film is applied to a facade/insulating glass and is barely visible as it is only 0.2 mm thin.



Our MicroShade Film protects against incoming sunlight and at the same time allows the building's occupants to look out.

GW NEWS – *Where do you see the special added value from this new application?*

Bezzel – Our MicroShade Film protects against solar radiation and at the same time allows building users to look out. Other, classic sun protection systems cannot do that.

GW NEWS – *What formats can be realised with your new sun protection?*

Bezzel – The maximum available format of the film is currently 1,500 × 2,450 mm (without seams). However, several films can be combined. This

means that there is no limit on the size or shape of the film, which can be adapted to the glass format. The same applies to the glass or pane shape, which is particularly interesting for customised shapes.

GW NEWS – *Does this also apply to triple glazing, which is increasingly becoming the standard?*

Bezzel – Yes, the MicroShade film can also be used with triple insulating glass. And it also makes sense, because it creates a good indoor climate that the occupants feel comfortable in.

er properties, MicroShade Film will redefine sun shading.

GW NEWS – *When will the new film be available?*

Bezzel – We expect the new MicroShade Film to be available to fabricators from the 4th quarter of 2021.

The interview was conducted by Matthias Rehberger.

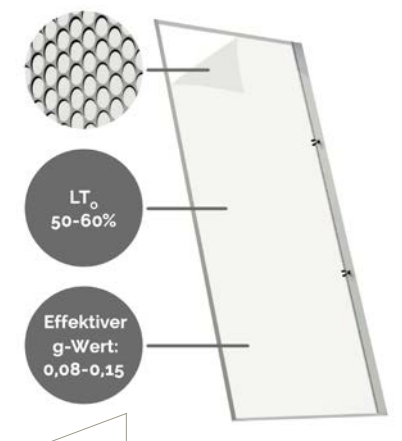


Image: Microshade

The functional principle of the only 0.2 mm thick MicroShade Film, which is bonded to a carrier glass.

GW NEWS – *And where else can MicroShade Film be used?*

Bezzel – Our solution works both in facades and for (glass) roofs, where it keeps out the heat of the sun, while still allowing natural daylight to be used in the building. Especially with roof glazing, this makes it possible to go without the construction of complex, expensive sun protection systems.

GW NEWS – *Does the new system also require maintenance, like conventional sun protection?*

Bezzel – Our system is a passive solution and requires no maintenance because it is installed inside the glazing. In combination with its oth-



Image: Microshade

Transparent sun protection: Incoming sun rays are blocked by the microstructure of the film, which is fixed to one pane of the IG unit.

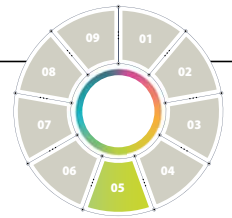


Image: Marcus Pietrek, Düsseldorf

The Building "BAU 11" in Munich was given a modern, visually striking façade with blue glass façade bands and Infrastop solar control insulating glass.

FLACHGLAS WERNBERG

Building "BAU 11" shines in new splendour with new façade glass

The Rohde & Schwarz technology group has renovated the "Bau 11" technology building in Munich's factory district. Read why it was equipped with a striking lamellar structure façade fitted with Infrastop solar control insulating glass.

The Rohde & Schwarz "Bau 11" was built in 1988 for the research and development departments. The multi-storey building, which was getting a little long in the tooth, needed a general refurbishment – the façade, interior fittings and the entire building services were to be completely renewed and brought up to the latest technical and energy standards. A special challenge for the companies involved in the renovation was that a clean room had to remain in operation during the entire construction period.

How is the new façade of "Bau 11" constructed?

Now "Building 11" was given a contemporary, striking lamellar structure façade with blue glass façade bands and Infrastop solar control insulating glass from Flachglas Wernberg to meet current building physics require-

ments, especially "summer thermal insulation". The building envelope, constructed by Schindler Fenster + Fassaden GmbH, is designed as an aluminium element façade made of prefabricated parts and has 5050 m² of window elements and 1350 m² of surrounding glass panels. The advantage of prefabrication is that the individual elements only had to be fitted together and assembled on site.

What do the Pilkington basic glasses do?

Schüco system profiles were used for the 2700 × 4100 mm window units; the opening units are equipped with bottom-hung casements. Grey glass panels made of laminated safety glass with printing on the back limit the units in the upper area. The architects wanted the glazing to be made of insulating solar control glass with a "neutral appearance". These should not be



The façade of the BAU 11 building consists of 5050 m² of window elements and 1350 m² of surrounding glass panels. The glass was manufactured by Flachglas Wernberg.

too reflective and at the same time have a high light transmission. In addition, the building physics requirements for a low total energy transmittance had to be met and the glass had to have a low U_g value.

The selected Infrastop type Brillant 59/32 (with Pilkington Suncool 66/33 coating on position 2) has a light transmittance of over 60% with a total energy transmittance of 33% in the triple construction. The U_g value of the glass is 0.6 W/(m² K).

To prevent falls, the glass superstructures were designed with safety glass. The glass manufactured by Flachglas Wernberg also makes a significant contribution to the energy efficiency of the building.

Satisfied building owners and satisfied employees

Thanks to the high light transmission of the glass, the offices are bright and flooded with daylight. This is an important aspect that takes into account the well-being and health of the employees working here.

The glare protection required in summer is provided by externally integrated external venetian blinds. The all-round light boxes characterise the appearance of the building and at the same time serve to accommodate the external sun protection.

The boxes for this are made of aluminium with grids screwed in at the top and bottom. The shiny blue glass panels are made of laminated safety glass with inlaid coloured foil.

www.flachglas-markenkreis.de



OBJECT DATA "BAU 11" IN MUNICH

Client: Rohde & Schwarz GmbH & Co. KG, Munich

Architect: RKW Architektur + Düsseldorf

Project management: R&S Immobilienmanagement, Munich

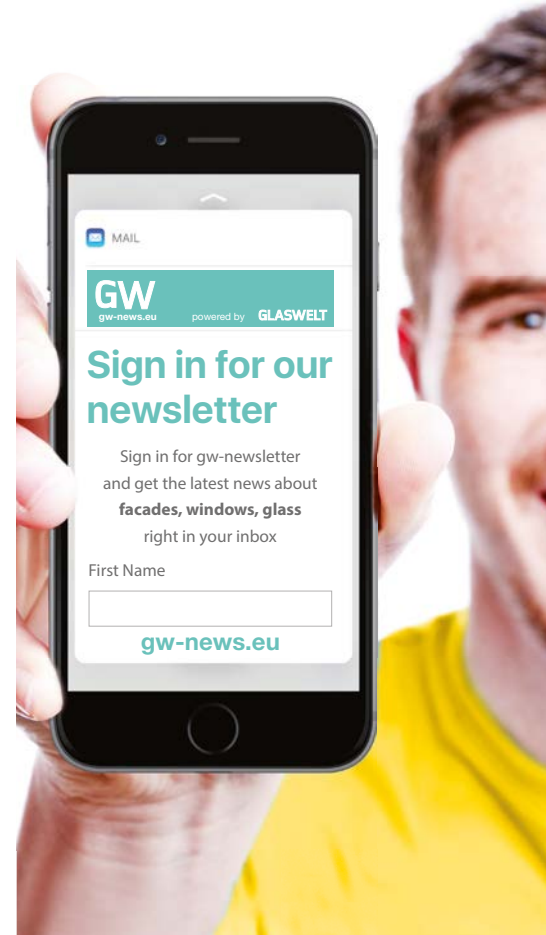
Façade consulting: DS-Plan, Stuttgart

Façade construction: Schindler + Fenster Fassaden GmbH, Roding

Glass consulting: Flachglas MarkenKreis

Glass: Pilkington Deutschland AG, Gladbeck

Insulating glass: Flachglas Wernberg, Wernberg-Köblitz



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SCHOLLGLAS

Special glass for the new airport quarter in Zürich

In Zurich, Switzerland, the facade of the new office centre “The Circle” at the airport was designed as a Gartner closed cavity facade. We explain which types of facade and safety glass from Schollglas were used there.



Image: R. Dürr

The 8600 facade elements of “The Circle” complex were manufactured at Gartner in Gundelfingen, partly as a Closed Cavity facade and then hung and fixed into the substructure at the construction site at Zurich Airport.

An architectural innovation opened directly at Zurich Airport last autumn: With The Circle, Japanese architect Riken Yamamoto designed his vision of a modern city with a high quality of living – from the outside a building, from the inside a city centre in miniature on several levels, with alleys, squares and streets, with public and private spaces. The largest Swiss high-rise project with a construction volume of around 1 billion Swiss francs makes reference to the larger forms of the airport. The new

building nestles on a hill that is almost surrounded by the airport road in a circle - hence the name. On up to eleven floors, there is space for science and research, art and culture, shops and offices, services and healthcare projects, conferences and congresses as well as hotels. The Circle was officially opened in November 2020. The ambitious building project is certified with the highest LEED standard and Minergie. Both building standards stand for sustainability and a responsible approach to energy.

How is Gartner’s Closed Cavity facade constructed?

An essential component of the Circle’s ambitious energy concept is the construction of the glass façade, which encloses all buildings on the outside. It was planned as a double façade in order to use the thermal buffer in the intermediate space for energy saving.

This type of facade was developed by facade specialist Josef Gartner from Gundelfingen into the so-called Closed Cavity facade (CCF), for which LSG panes Gewe-safe from Schollglas were used, among others. For The Circle, Josef Gartner installed 83,900 m² of his climate-friendly facade construction.

What is a Closed Cavity facade and how does it work?

With the Closed Cavity facade, the 135 mm deep cavity between the two facade levels is hermetically sealed. Specially treated air is fed into the resulting closed cavities through a central supply system.

The dried and cleaned air is pre-tempered and blown into the chamber at a slight overpressure. This prevents condensation from forming on the glass panes.

The outdoor climate is monitored by control electronics and the dry air production in the technical centre is controlled accordingly. In this way, the energy consumption due to heating and cooling in the building can be reduced to a minimum. With its structural-physical values, the CCF has already set new standards.

What does the safety glass from Schollglas achieve?

The production of the approximately 8600 facade elements for the Circle (excluding fire facades) took place in Gundelfingen, Bavaria. A special production line there ensured the highest cleanliness and precision during production.

“The Circle” was executed by Josef Gartner GmbH as a Closed Cavity facade (CCF), for which, among other things, Gewe-safe LSG from Schollglas was used.



Image: R. Dürr

This was the only way to guarantee the perfect functioning of this special façade type. At the construction site, the elements were hung into the substructure and fixed. The glass was stored in a continuous linear dry storage system using specially extruded silicone profiles.

A closed cavity element consists of the outer impact level with laminated safety glass and the inner thermal insulation level with insulating glass. For the Circle, Gartner used safety glass of the type

Gewe-safe LSG 12/2 (66.2) for the production of the CCF elements, in some cases with special requirements on the resistance to break-through in the P4A version.

For the inner sides of the CCF elements, the Gewe-therm heat insulation glass from Schollglas was

used. For the three glass layers, 2 × 6 mm TVG in the ClimaGuard Premium² design + 1 × 10 mm LSG were used. de (CCF), for which Gewe-safe LSG panes from Schollglas were used, among others.

www.schollglas.de/en



Image: Flughafen Zürich AG

“The Circle”, designed by the Japanese architect Riken Yamamoto, nestles against the hill that is circled by the airport road, hence the name.

GLAS TRÖSCH

Neutral facade glass in vogue

Facade trends change quickly: currently, there is a move away from pronounced shades of blue, green or brown, towards more optical neutrality. To meet this trend, Glas Trösch also offers neutral facade glass. With its extensive Silverstar High Performance range, the manufacturer offers a series of glasses that are characterised by their neutral coatings.

Glas Trösch thus manages to avoid intense colours in its coated glasses by supplementing the silver layers with intermediate layers of metal oxides. These reduce the reflection of light and thus make the glass appear more neutral.

Which Silverstar coatings are most in demand?

Among the products currently in high demand are the Silverstar Combi coatings with a light grey tone, which are available in various degrees of light transmission from 70 % to 40 % and g-values from 0.35 to 0.22. The Silverstar Combi coatings, for example, are suitable for use in the glass industry.

For example, Silverstar Combi Grey 40/22 with its low g-value – is particularly suitable for facade elements – which are to be installed in highly energy-ef-

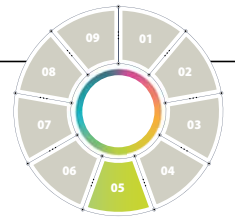


Image: Glas Trösch Gruppe

Glas Trösch is able to avoid strong glass colours by supplementing the silver layers with intermediate layers of metal oxides.

ficient building projects. In this context, the appropriately coated Silverstar glasses also support LEED and BREAM certifications.

www.glastroesch.com



The architecture of the Deichman Bjørvika Library in Oslo features a concrete roof structure and a light-flooded atrium that extends over six floors and is illuminated by large roof lights with Okalux glazing.

Image: Einar_Aslaksen / Okalux



Image: Einar_Aslaksen / Okalux

The glass roof in the Deichman Bjørvika Library consists of 440 square metres of Okatech insulating glass.

OKALUX GLASS FOR DEICHMAN BJØRVIKA LIBRARY IN OSLO

Insulating glass for a curious interplay of light and shade

An outstanding example of what a contemporary library can look like today is the new main building of the Deichman Bjørvika Library in Oslo: the new building combines energy-efficient architecture and innovative study. Here you can find out why Okatech, a daylight system for glare-free light from Okalux, was used.

— The three Okatech skylights from Okalux meet high thermal requirements, while they supply the deep room with evenly distributed daylight thanks to their large span width. On the fjord of Bjørvika Bay in Norway's capital, the local Atelier Oslo and Lund Hagem Architects recently completed the new

main building of the Deichman Library. Adjacent to the new opera house and the planned Munch Museum, it is part of the new development project in the old harbour southeast of the city centre.

Founded in 1785, the Deichman Library Network is one of the oldest and largest public libraries

in the country, with over 20 branches. Bjørvika is a new main library that houses more than 450,000 books on around 18,000 m² as well as a sound studio, cinema and 3D printer.

Individually adapted daylight system

The striking architecture is characterised by a folded concrete roof structure and a light-flooded atrium that extends over six storeys and creates a flowing transition to the outside space. In order to fill the room structures sufficiently with daylight, the architects opted for roof glazing consisting of three skylights with a total of 440 m² of Okatech insulating glass. The shimmering aluminium and metal inserts in the space between the panes create a distinct shine.

Thermal insulation as well as sun protection

The triple insulating glass ensures the thermal insulation required above all in Scandinavian regions and at the same time the necessary solar

protection with a low U-value of 0.9 W/m²K and g-value of 21%.

For energy reasons, the steel mullion and transom facade was also designed in such a way that only half of the new building is glazed, allowing a reduced amount of heat to enter the interior.

Due to the typically low level of sunlight for northern latitudes, the architects also chose a larger mesh size for the asymmetrically exposed Okatech metal perforation. Depending on the incidence of the sun, this creates a unique interplay of light and shadow.

At the same time, the structure of the mesh ensures glare-free daylight by refracting the sun's rays and provides the library's visitors with a pleasant reading experience.

Another special feature of the Okatech daylight system, and thus part of the future-oriented architecture of the library built to the passive house standard, is its good recyclability, durability and maintenance-free use.

www.okalux.com



Image: Einar_Aslaksen / Okalux

The triple insulating glass of the skylights, fitted with Okatech expanded metal, has a U-value of 0.9 W/(m²K) and a g-value of 21%.

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20 YEARS OF PILKINGTON ACTIVE GLASS WITH SELF-CLEANING EFFECT

11 Facts about Pilkington Activ

Pilkington Activ has been used in commercial and residential construction for 20 years due to its self-cleaning properties. Thanks to this function, it is predestined not only for facades and windows but also for conservatories, patio and canopy roofs. Here, Hannah Rullkötter from Pilkington and Frank Horstmann of the Flachglas MarkenKreis answer the most important questions.



Image: Pilkington Deutschland AG

Pilkington Activ with its self-cleaning properties is particularly effective on glass that is difficult to access.

Pilkington Activ has a titanium dioxide coating on the outside that reacts to UV light from the sun and triggers a photocatalytic reaction. This dissolves organic dirt from the glass. The hydrophilic (water attracting) property of the coating then removes the dissolved dirt particles with (rain) water. Here are the most important answers about Pilkington Activ and its processing.

01. What do I have to bear in mind when glazing with Pilkington Activ?

Answer 01: Installation is the same as for other types of glass. The only important thing is that no sealants containing silicone are used. Silicone oils can overlay the coating at the edge of the glass due to possible creeping effects and deactivate the function in this area. In addition, silicones are hydrophobic and can become visually apparent at the edges when it rains. The sealants that are compatible with Pilkington Activ are listed in the manufacturer information. Manufacturers can request this information from Pilkington Germany.

02. What formats are available and is it necessary to store the glass in a special way?

Answer 02: The glass is supplied as a pane measuring 6 × 3.21 m. It is sufficient to store the panes like conventional float or insulating glass. It should be stored in a dry and well ventilated place.

03. What needs to be considered when cutting the glass to size?

Answer 03: Processors can cut the panes like conventional float glass to produce the glass for facades, conservatories etc.

04. How durable is the coating?

Answer 04: Since the coating is applied at over 600 °C during glass production, it is inseparably bonded to the glass. This means that the coating lasts for the lifetime of the window and does not wear off over time. This is also confirmed by customers who installed the glass almost 20 years ago.

05. Where is Pilkington Activ best used?

Answer 05: The glass is particularly suitable for all roof glazing, e.g. for conservatories, terrace roofs and canopies. As these types of glazing are often very difficult to access, the self-cleaning effect makes cleaning the glass much easier. Ultimately, however, the glass can be used in all outdoors applications. The important thing is that the glass is exposed to rain or water and sunlight.

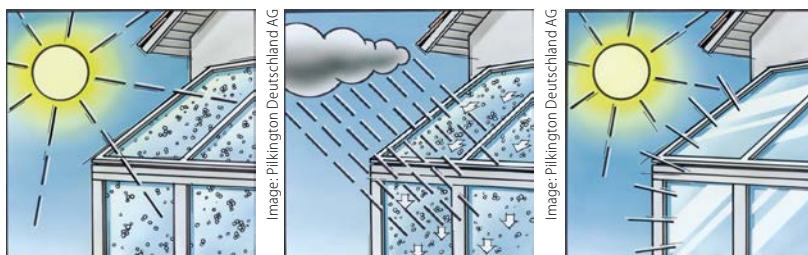


Image: Pilkington Deutschland AG

Image: Pilkington Deutschland AG

Image: Pilkington Deutschland AG

Here is how Pilkington Activ works: Sunlight dissolve the dirt on the panes, rain or water from the garden hose rinses it off. That's it, the glass is clean.

06. Does Pilkington Activ also work facing north places?

Answer 06: The orientation of the glass has no influence on the function of the coating. Even when facing north, there is enough light to activate the coating.

07. What is the minimum pitch in roofs?

Answer 07: With very low roof pitches, dirt may not be washed off properly, possibly remaining behind due to concavity of the glazing. Therefore, we generally recommend minimum roof pitches of approx. 10°. Roof pitches below 5° should be avoided.

08. What do I have to bear in mind when cleaning, is just water enough?

Answer 08: Due to its self-cleaning function, the glass needs to be cleaned much less frequently than conventional glass. However, if the glass is installed in such a way that little rainwater reaches the glass surface, the glass should occasionally be sprayed with water. This quickly rinses off the organic dirt that is dissolved by the photocatalytic effect of the coating.

In principle, you can also use cleaning agents for cleaning. In general, one can use all alcohol- or ammonia-based cleaners as well as slightly acidic cleaning agents. A list of compatible cleaning agents can be found in the Pilkington Activ cleaning instructions.

09. Can the glass also break down verdigris and moss?

Answer 09: Pilkington Activ breaks down organic dirt and therefore also verdigris and moss.

10. And what about condensation?

Answer 10: The surface of Pilkington Activ is hydrophilic, so individual drops of water combine to form a water film over the entire surface. As a result, the transparency in the case of condensation is significantly better than with conventional glass. The same applies during and after rain, as no individual drops form on the glass.

11. What information material is available?

Answer 11: The Flachglas MarkenKreis provides a brochure for end customers (info@flachglas-markenkreis.de). Pilkington Germany also provides handling and processing guidelines, cleaning instructions with a list of compatible cleaning agents and processing information with a list of tested sealants (marketingDE@nsg.com).

Conclusion on Pilkington Activ

Pilkington Activ is no more difficult to process than conventional glass. The only point to note is that installation is carried out without sealants containing silicone. However, as with all more complex products, it requires competent service from a salesperson to work successfully with the customer. Through its members, the Flachglas MarkenKreis provides active advice to processors and dealers on Pilkington. Detailed questions are answered by Hannah Rullkötter from Pilkington Germany and Frank Horstmann from Flachglas MarkenKreis.

www.flachglas-markenkreis.de | www.pilkington.com



Image: Titgemeyer

Pilkington Activ is very suitable for all roof glazing, e.g. for conservatories, patio roofs and canopies. It is important that it is exposed to rain or water and sunlight.

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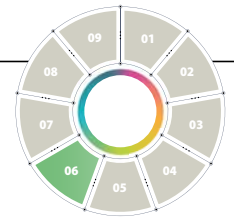


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EYRISE GLASS BASED ON LIQUID CRYSTALS

How liquid crystal glass works

In buildings with large-scale glass facades, energy loss, solar control and cooling costs are key issues. In addition, an intelligent building envelope can also significantly reduce CO₂ emissions. One key to this is optimised facades using glass with variable g-values. Here you can find out what such glass based on liquid crystals can achieve.

Smart buildings and especially smart facade design are now regarded as an essential part of climate protection. In addition, more and more attention is being paid to the well-being and health of the people who spend time indoors. Thus, dynamic or smart glass has become increasingly popular in recent years, as it offers greater flexibility in facade design compared to static solutions.

What is switchable or smart glass?

Switchable glass that changes its optical and thermal properties (e.g. variable g-value) when an electrical voltage is applied are being used more and more frequently. Used as solar control glass, they can replace mechanical solar control systems such as roller shutters, blinds or interior venetian blinds. This saves space and helps reduce ongoing building maintenance.

Switchable solar control glass, whose switchable element is based on liquid crystals, offer several advantages here. Thus, eyrise B. V., a subsidiary of the Darmstadt-based chemical and technology company Merck, has developed liquid crystal glass of the same name whose light and heat transmittance can be regulated continuously and within seconds.

The eyrise s350 solar control variant is suitable for facade glazing, while the eyrise i350 type, which can be switched from transparent to opaque, offers a visual protection solution for interior glazing. Applications here include partitions, privacy screens and projection screens.

How does liquid crystal glass work?

The eyrise system is based on a liquid crystal technology developed and patented by Merck, which has so far been used primarily for flat screens or smartphone displays.

The basis is the transparent iicrivision liquid crystal mixture, to which specific colour molecules



Image: eyrise

04: The 82 m² glass front of the cafeteria in the Orkla City complex in Oslo consists of 23 eyrise liquid crystal panes of different sizes.

can be added as desired. It is sandwiched between two sheets of glass, which are coated with an invisible conductive layer. When a low electrical voltage is applied, the molecules in this liquid crystal cell change their orientation and thus

influence the light and heat transmission of the glass (Image 01).

The glass can be controlled (manually) via switches as well as via a smartphone app. In addition, the control can be integrated into the building services.

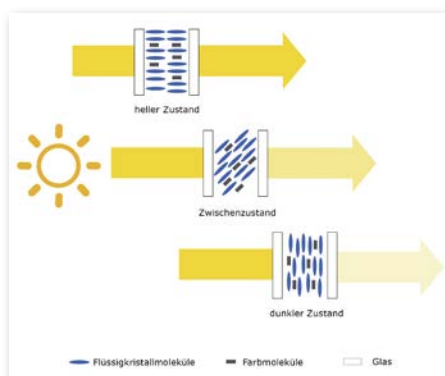


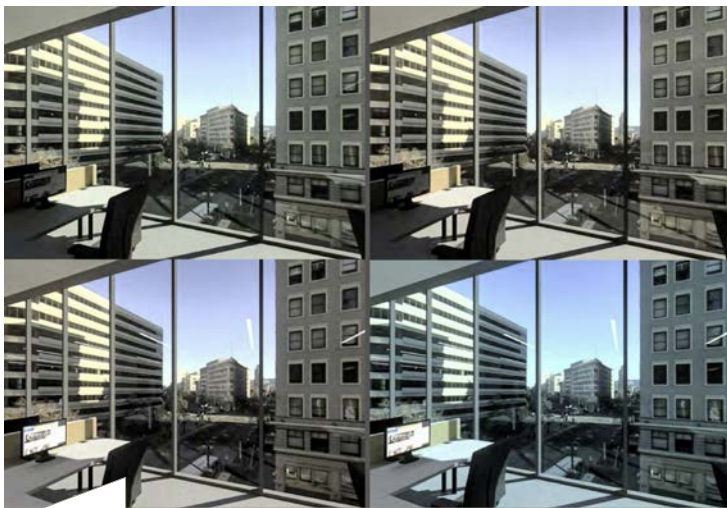
Image: eyrise

01: The operating principle of eyrise liquid crystal switchable solar control glass.

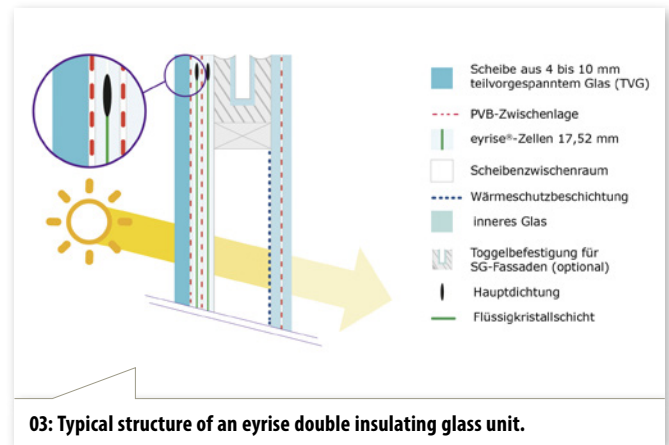
Very fast switching and neutral tinting

With conventional electrochromic solar control glass (EC glass), the switching process is based on a chemical reaction and takes several minutes. In addition, these types of glass change colour as they darken, usually to blue.

With eyrise solar control glass, the switching of the liquid crystal molecules from maximum to minimum light transmission is a physical process that takes only about one second. Up to 256 increments are possible, so that the light transmission can be adjusted according to changing needs and the solar radiation, e.g. on cloudy



02: eyrise (l.) and EC glass (r.) in both the fully clear (top) and darkened (bottom) states. eyrise retains its neutral tint at all times, while EC glass changes colour.



03: Typical structure of an eyrise double insulating glass unit.

days. Image 02 shows an eyrise glass and a common EC glass, both in the fully clear and darkened state [1].

Due to the fast switching and because eyrise retains its neutral tint in every state, the switching process is hardly perceptible to the people inside. Thus, an undistorted view to the outside is maintained at all times. In addition, the furnishings and objects in the room appear in their natural colour.

Designed as multi-pane insulating glasses

According to the developers, the switching process can be repeated infinitely often without impairing the effectiveness of the sun protection. That gives liquid crystal windows a very long service life.

eyrise solar control glass is designed as multi-pane insulating glasses. Image 03 shows the typical structure of a 2-pane insulating glass unit. The outer pane is a laminate of 4 to 10 mm thick heat-strengthened glass and two identical liquid crystal cells, each 17.52 mm thick. These three elements are each linked to each other by PVB interlayers. The inner pane consists of heat insulating laminated glass.

Great design freedom along with high efficiency

Due to its colour neutrality and the short switching times, eyrise offers a very high degree of design free-

dom. The supplier manufactures the glasses in formats from 450 × 410 mm to 1,600 × 3,505 mm. In addition, different geometric shapes are possible.

On request, the liquid crystal mixture can also be individually coloured to meet particular specifications of the building owner or architect. Thus, this intelligent glass can be seamlessly integrated into traditional and modern architecture.

In terms of costs, eyrise is within the range of complex facade solar protection systems, as the supplier points out. However, comparing individual solutions requires looking at the big picture. Compared to mechanical sun protection systems, eyrise's dynamic liquid crystal glass does not require maintenance, and it can be integrated into the facade in a space-saving manner, which has a positive effect on the utilisation of space, especially in tall buildings with many storeys. These kinds of calculations and comparisons as a basis for decision-making are part of the service that the manufacturer provides.

Proven in practice

Architects and building designers all over the world already rely on eyrise to create customised

glass structures and facades in a wide variety of shapes, sizes and colours. Examples in Germany include the Niemeyer Sphere in Leipzig, the new FC Group headquarters near Karlsruhe and Merck's conference centre in Darmstadt.

One of the first projects to be equipped with switchable eyrise glass was an office building in Oslo. This was inaugurated in February 2019. The glass panes were used for the large-scale glazing of the cafeteria of the 16-storey Orkla City complex (Image 04).

For the 82 m² glass front, a total of 23 rectangular glass panes in a neutral grey colour were installed in seven different sizes. The largest of these measures 1,200 × 3,300 mm. The darkening of the glass is automatically controlled by an external light sensor, but can also be readjusted by the user through the building services if necessary.

Smart control of incoming light and room temperature

The client, Orkla Real Estate, attached great importance to environmentally friendly and energy-saving technologies in this project. On the one hand, as much natural daylight as possible should

come into the room - an important contribution to people's well-being during the long Norwegian winter. On the other hand, glare and excessive overheating of the room in the summer months, when the sun is low on the northern horizon, was to be prevented in order to minimise the need for air conditioning.

Gjert Brun, Managing Director at Orkla Real Estate, concludes: "The eyrise liquid crystal glass enables smart control of incoming light and room temperature, while helping to reduce our energy costs."

www.eyrise.com



05: The eyrise glazing allows natural daylight into the interior while preventing glare and overheating when the sun is low in the sky.

Literature: [1] Elementa Consulting (2019), Out of the Blue – eyrise Dynamic Liquid Crystal Windows, London



SAGEGLASS 3-PANE INSULATING GLASS CLASSIC FOR SPORTS CAR SPECIALIST IN ZURICH

Well in the race with Smart Glass

For sports and luxury car lovers, octane126 in Zurich is an interesting place to have their bolides serviced. The official service partner for Ferrari and Maserati is located in a former commercial building. The noble cars are now protected there by switchable SageGlass.



The facade of sports car specialist octane126 features 1900 m² of switchable solar control glass. The dynamic SageClassic was used, which was processed into triple insulating glass.

Image: Aepli Metallbau AG/Fotograf Zeilko Gataric

Directly next to the new Serliana Tower, the vehicle specialist octane126 has its headquarters in Zurich Wallisellen as a contact point for the professional servicing of sports and racing cars. This includes an unusual car hotel where sports car owners can leave their vehicles in care. Here, the self-tinting solar control glass SageGlass triple insulating glass Classic

helps the existing building to achieve completely new qualities.

The commercial building is arranged parallel to the nearby motorway in front of a high-rise office building and a more compact hotel building. While the seven-storey hotel of the B&B Group is open to business and city travellers, the 20-storey, 68 m high Serliana Tower captivates with its architecture with retro charm: it serves as an office building and is strongly reminiscent of the high-rise buildings from 1930s New York. This makes it a real eye-catcher when passing by. The ensemble is complemented by an underground car park.

“Autohotel” for noble cars

In keeping with the location on the busy motorway, the sports car specialist octane126 has set up shop in the commercial building. The company actually has its own Ferrari racing team. In addition to service, octane126 also operates a “car hotel”: The well-protected parking areas and the showroom for fancy sports cars are spread over about 1000 m².

The building in which the company is based was extended by three storeys as part of renovation work and the existing façade was replaced by an ultra-modern, slenderly constructed element façade. Like the Serliana Tower, the industrial building is reminiscent of early 20th century architecture.

Switchable protection from the sun

The brick facade and the floor-to-ceiling 1900 m² window elements meet today’s highest standards. Thanks to an ingenious, stable construction by the Gossau-based metal construction company Aepli, the clinker brick elements could be pre-assembled directly onto the slim facade.

At the same time, Aepli used triple insulating glass for the 229 large windows, most of which are constructed using SageGlass Classic. Thanks to its electrochromic coating, the dynamic solar control glass in the triple structure darkens automatically depending on the amount of incoming light. The indoor spaces thus do not overheat even in strong sunshine and glare is avoided.

The glass adapts to the lighting environment in three stages. In the non-tinted state, the Ug value of the glass is 38%, in the tinted state it is 3 to 8%. The reduced solar radiation not only protects the high-quality vehicles, but also ensures a permanently pleasant indoor climate, while at the same time significantly reducing the building’s energy consumption.

Not only with its racing team, but also with its new, well thought-out company building, octane126 is now in a good position to get off to a good start in the race.

www.sageglass.com

Image: Aepli Metallbau AG/Fotograf Zeilko Gataric



Car aficionados can put their race cars up for safekeeping at the “Autohotel”. Here, SageGlass Classic, as part of a triple IG unit, darkens depending on the amount of sunlight and thus protects cars and staff.

GLASSLINE

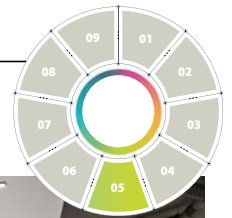


Enamelling of float glass edges

- > No drops or excess deposit on the sheet entry edge
- > Automatic Sheet Rotation (ASR) device for automatic rotation and positioning of glass sheets

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rollmac.it

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ARCON

decodesign design coatings

With the decodesign coatings in the colour variant chrome, supplier arcon offers even more possibilities to design glass surfaces of facades as well as in interiors individually and at the same time economically. The colours gold and copper will follow by the end of 2021. Various gradations of light transmission are available for the chrome variant. The surface glass can be non-tempered float glass or thermally toughened safety glass / heat strengthened safety glass.

How can individual coatings be realised for decodesign in a cost-effective way?

The economical production of the coated glass is due to the highly automated production process, which allows cost-effective manufacturing of the glass. In addition, arcon uses a no-screen manufacturing process for the production.

Another advantage: in contrast to conventional screen printing, which is based on baked-on ceramic colours, decodesign coatings do not affect the strength of the glass.

Moreover, the coating can be partially applied to a substrate (float, toughened safety glass, LSG) – completely individually and according to the customer’s wishes.

Why is decodesign very suitable for facade glass?

Thanks to their special composition, the new arcon decodesign coatings are resistant to weathering. Owing to its resistance to abrasion, acid and condensation water as well as its high durability in exposure to neutral and salt spray, decodesign fulfils the requirements of EN 1096-2 class A. Consequently, the coating can be used on exterior glass surfaces (level 1). The new technology also offers some advantages in terms of sustainability: Since no screens have to be produced, less waste is generated. Secondly, water consumption during production is significantly reduced. And energy consumption is also much lower, since the glass panes do not require any additional hardening. Furthermore, only environmentally friendly materials are used in the process.

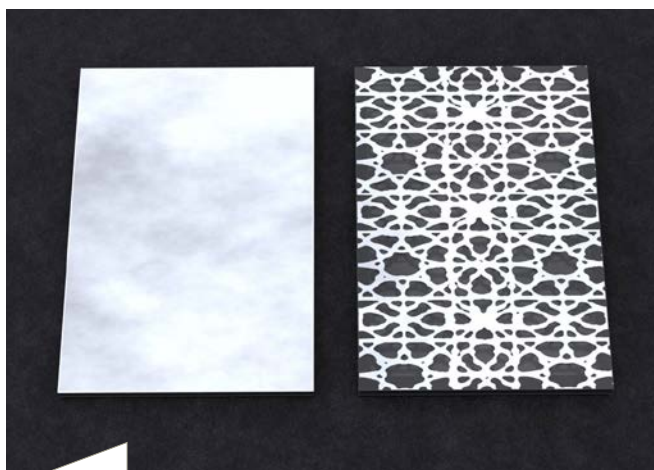


Image: arcon

Currently, arcon’s decodesign coating for facade glass is available in chrome. Gold and copper will follow in the course of the year.

www.arcon-glas.de



Image: AGC Glass Europe

The new colours allow seamless interaction with many materials to create a calm and clear spatial atmosphere.

AGC

New brilliant colours for Lacobel and Matelac

The Lacobel (glossy) and Matelac (matte) design glass ranges have now been released in new colours to create more design freedom in interiors.

AGC Glass Europe’s design glass ranges Lacobel and Matelac have been brought together in a palette of fresh colours focusing on four design lifestyle themes to offer designers, architects and end users even more freedom in interior design. To structure the colours aesthetically, they have been divided into four lifestyle themes, which are also based on combinable materials.

AGC (www.agc-glass.eu) has added nine colours to the glossy Lacobel range and five colours to the matte Matelac range. Lacobel is now available in 24 colours, Matelac in 15. Ten of the shades are available in both versions, so that high-gloss and matte surfaces can be combined.



Image: AGC Glass Europe

Together with the new Lacobel and Matelac glasses, there are now almost 40 colours to choose from.

What colours are included in the new palettes?

- Minimalist: Blue Ice, White Traffic, White Extrasoft... contemporary and subtle shades for seamless interplay with stone and ceramics to create a calm and clear spatial atmosphere.
- Natural: Pink Nude, Green Safari, White Pearl. Earthy natural colours combine with untreated wood or cork to create a warm and harmonious environment.
- Traditional: Blue Vintage, Green Artichoke and exclusive silver shades. Classic colours that create an atmosphere of modernity, calm and elegance in combination with dark wood, marble and other high-class materials.
- Dynamic: Yellow Yuzu, Orange Tangerine, Green Teal. Intense, luminous shades which, in combination with coloured synthetic resin or concrete, catch the eye in an expressive way.

In addition to the series, AGC offers the “MyColour by Lacobel/Matelac” service for designers to create matching colours.

www.agc-yourglass.com

BILOBA

DUO

The first set of door-closer hinges for heavy doors



- Closing speed adjustment system
- Upper adjustable braking system
- Suitable for outer doors
- Compatible with Biloba Unica glass notches
- Max. weight 150 kg
- Max. door width 1200 mm
- Glass thicknesses from 8 to 19,5 mm
- Minimal design with finishing covers



DUO is available with two different cover sets which you will be able to choose in the usual Colcom finishes



We Build the Invisible [f](#) [ig](#) [yt](#) [in](#) colcomgroup.it



COLCOM GROUP

Fittings designed in Italy

The Colcom Group is known for its strong technical competence and decades of experience with hardware, which is closely linked to Italian design and style. Here you find out what distinguishes Colcom’s hardware products.



Image: Colcom

Colcom’s hydraulic Biloba Unica, shown here in use in a bathroom.

Continuously understanding the needs of the market in time and anticipating trends have enabled the company to develop a broad portfolio full of innovative and successful products.

Today, the applications of Colcom’s high-quality branded products can be found in numerous fields of application: shower enclosures, interior and exterior doors, partition and sliding door systems, as well as versatile complementary accessories.

Thanks to its continuous commitment to the development of innovative products, the Colcom Group Weise has firmly established itself in the market and has become the “reference brand” for construction and furniture worldwide over the past decades.

Customised hardware products on offer

The engineering team and design office are also geared towards designing customised items for projects. In this way, the Colcom Group offers further versatile glass fitting options.

The technological development of new OEM applications, in co-design or design commissioned by the industry, also demonstrate the company’s strengths and possibilities.

Specialist in hydraulic fittings

An important element and competence of the Colcom Group’s research and development is the hydraulic principle. This hydraulic function integrated into the fittings for the controlled movement of glass doors, is a patented further development of the classic automatic-mechanical fittings.

This is also implemented in fittings and systems that allow application in damp and wet rooms such as glass showers or saunas.

2 years of intensive development and testing

The hydraulic fittings of Colcom products are protected by a wide range of international patents and undergo rigorous testing to guarantee the performance, quality and durability of the products.

In May 2021, after more than 2 years of intensive development and testing, Colcom launched the new hydraulic door closers called “Biloba Duo”. This means: once again innovative hydraulic fittings and a next development step in our core business that sets us apart.

A completely new product

As in 2006, when the first hydraulic fitting developed by Colcom was presented to the market and was a completely new solution, Biloba Duo is also a completely new product and a real innovation in the market.

The development of Biloba Duo involved a lengthy efforts in terms of design, technical tests and functional tests. The result is impressive: all specifications and the expectations placed in the product have been completely met.

The market needs Biloba fittings

The naming is not accidental either: Biloba refers to the best-selling line of well-known and established Biloba fittings. The term Duo refers to the fact that it is a hardware combination consisting of a bottom and top hardware that can support 150 kg of weight as well as accommodate 8 to 19,5 mm thick glass. This is Colcoms’ response to the demands of a market that increasingly wants large area glazing also for doors and expects durable and reliable performance.

www.colcomgroup.it

The new Colcom Biloba Duo hydraulic fitting

Image: Colcom



**BERNER-SUPEERO ENTRANCE GATES**

All-glass floating gates

Cantilevered, comfortable, frameless and made entirely of glass: Presenting the Supeero SL entrance gate “Floating Glass”. The glass gate systems from Supeero, a brand of Berner Torantriebe, can be designed in a variety of ways and are delivered completely prefabricated and ready for installation.



Image: Berner Torantriebe

More transparency: Siegle+Epple from Stuttgart chose “floating glass” from Berner for the entrance area of their engineering building. The cantilevered, frameless Supeero SL glass gate was used.

— A representative entrance gate has to live up to a variety of expectations. It must keep uninvited guests out and fit in with the architecture of the house. It is therefore also a signpost for the property and serves an ornamental function.

The Supeero SL glass gates are available in a wide range of designs, with coloured, matte or glossy glass as well as printed or frosted glass effects. In addition, the SL entrance gate can be ordered transparent or opaque. Protection against burglary and vandalism is provided by the 20 mm thick pane of laminated safety glass.

For these reasons, more and more companies and private builders are opting for the “floating glass” from Berner Torantriebe KG in Rottenburg am Neckar, according to the supplier.

**MONTAGE-VIDEO**

In addition to this installation video, Berner also offers individually tailored product and technical seminars, both face-to-face events and in digital formats. For more information, go to

www.berner-torantriebe.eu

How is it possible for the Supeero SL glass gate to “float”?

The effect that glass gates seem to be floating above the ground comes from the almost frameless construction. With a special adhesive technique, the pane is glued onto a profile, which thus remains invisible. In this way, the gate adapts perfectly to its surroundings.

The glass can be coloured, with or without printing, as well as with a frosted glass effect, all according to customer requirement. This makes the “floating glass” a suitable application not only for commercial buildings but also for prestigious private properties.

How is the glass door operated?

Openings of up to 5 m are possible, the height is variable up to 1.5 m. The glass gate comes ready for plugging in on the assembly and transport console specially designed by Berner and manufactured according to the customer’s project requirements.

Different profile lengths and little waste due to the patented insertion and expansion system ensure a tight profile connection.

The SL entrance gate from Supeero meets all safety requirements and can be controlled in a safe operating condition at all times. The TÜV-certified compact electric drive with its smooth rack and pinion technology operates quietly and smoothly.

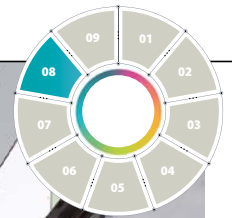
Up to 40 cycles a day are no problem, the drive opens and closes the door at a speed of 150 millimetres per second.

The glass gate can be operated by a remote-control hand transmitter, key and code buttons or an app.



Image: Berner Torantriebe

The SL entrance gate “Floating Glass” from Supeero impresses with its clear and aesthetic design language and offers a great deal of design freedom, for example in the glass colour or printing.



GLAS MARTE

Loggias vs. noise

During the construction of an apartment building with 137 flats, a lot of noise and vibrations had to be expected due to the nearby urban light rail station. Here you can find out how the planners were able to meet the noise protection requirements with the help of a sliding glass system from Glas Marte, as well as cope with the expected subsidence of the cantilevered precast elements.

The metal fabricator needed only 12 weeks to install the loggia glazing with the GM Toproll 6/8 system. The glazing can be locked by means of a locking bolt or a push cylinder lock.



Image: Glas Marte / Lothar Hennig

The new apartment building in Markt Schwaben near Munich not only required a lot of thought from the planners due to a triangular building plot, but the Munich-Freilassing railway line directly bordering the property as well as the urban light rail station in the immediate vicinity also posed challenges, especially in terms of sound insulation. The building, with its 137 flats of around 50 m² each, had to meet the high sound insulation requirements imposed by the railway traffic. For this reason, the planners decided to provide all flats with loggias equipped with sliding glass elements to keep the sound away from the living spaces.

Why was the GM Toproll 6/8 such a perfect match?

In their search for a suitable system, the planners came across the GM Toproll 6/8 from Glas Mar-

te. This is a frameless sliding system for glass elements that can be used to protect balconies, loggias and terraces from the weather. The sliding system from Glas Marte is hung from the top and can be designed in two, three or four panels. The doors can slide to the right and left, allowing an opening of the glazing of up to 75 per cent. This prevents heat from accumulating behind the glass in summer. To keep uninvited guests out, the glazing can be locked by means of a plug-in bolt or a push cylinder lock. However, the crucial aspect why the planners decided on GM Toproll 6/8 was that the system can also compensate for larger differences in height.

Can differences in height also be compensated?

The loggias are designed as precast concrete elements that are hung in front of the facade. Calculations showed that the cantilevered precast elements on which the glazing rests could settle by up to 8 cm due to external influences, which the planners had to take into account. Lehmann Stahlbau GmbH from Geretsried was entrusted with the assembly of the sliding glass elements. Managing director Heinz Lehmann: "We needed two weeks just to measure the loggias, but thanks to the sliding elements from Glas Marte, the installation was relatively easy." With this system, the glass is held in place in the upper runner by bonding and additionally by a mechanical safety device with bolts. The sliding doors are therefore not only fixed by means of glue or just clamps. This ensures the exact positioning of the glass: the panes do not slip. In addition, the glass is centrally positioned. The

perpendicular positioning of the glass elements is based on a simple principle: two rollers on two tracks.

Specific solutions directly from Glas Marte

Although the Toproll system is designed to compensate for larger height differences, this was not sufficient for the project in Markt Schwaben. Due to usage, even greater deviations had to be expected. For this reason, Glas Marte produced a special solution in which the top track is embedded in a pre-assembled U-profile and can compensate for any unevenness in the ceiling area by being recessed to different depths. Due to the proximity to busy railway tracks, increased vibrations and building movements are to be expected. For this reason, Glas Marte also developed a new bottom guiding rail.

www.glasmar-te.at

Image: Glas Marte / Lothar Hennig

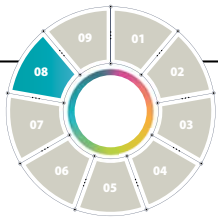


Due to the proximity to the railway, building movements were to be expected, so the GM Toproll 6/8 was adapted accordingly.

Image: Glas Marte / Lothar Hennig



The GM Toproll 6/8 glass elements can be moved to the right and left, allowing an opening up to 75 per cent.



C.R. LAURENCE

This CRL railing is made for faster installations

Linear glass railings are very much in vogue. These systems without posts allow a clear view without visual obstructions. An interesting system in this segment is the Taper-Loc balustrade system from C.R. Laurence. According to the manufacturer, this not only allows very fast assembly – and, if necessary, disassembly – but also very high repeatability: from the first to the last pane of a project, each pane is locked in place with the same force by the Taper-Loc assembly tool and thus securely fixed.

How much time can be saved during installation using Taper-Loc railings?

“The very simple installation of the glass reduces the assembly time by 50%, and this with very high quality specifications”, says Dominik Hinzen, Managing Director of C.R. Laurence of Europe and adds: “The Taper-Loc installation blocks are simply installed with the TLK12 assembly/disassembly

tool. This tool slides the specially designed blocks horizontally into the floor rail and wedges them into place with always the same force.”

As the wedges are pressed together, they precisely adjust to the respective glass thickness and settle into their final position. There is no need to use sealants, grouting compounds or adhesives, says Hinzen.

During final installation of the glass in the floor rail, the torque spanner of the TLK12 installation tool makes a “clicking” sound. This sound serves as a signal to the user that the installation is complete. And this significantly increases the speed of installation.

Further advantages of the Taper-Loc floor rail

Incidentally, the installation of the floor rails can also save time and money: In contrast to other systems, Taper-Loc only requires a floor anchor every 300 mm.



Image: C.R. Laurence of Europe

The Taper-Loc glass railing by C.R. Laurence provides crystal-clear views without supports.

The latest member of the Taper-Loc family is the floor rail 9BL21FLBN. The profile has a lug and is ideal if drill holes directly at the edge of the component are to be avoided.

A special honeycomb structure makes the aluminium profile 30% lighter than the standard floor rail. The lower weight thus helps to reduce shipping and material costs.

The bottom rail is suitable for 21.52 mm LSG.

www.crl.eu

The brand new Q-railing catalogue is available in two versions: an online version and a printed copy.

Q-RAILING

The new catalogue – finding instead of searching

Q-railing, developer of high-quality railing systems for stairs and balconies and more, presents its brand new catalogue. The new Q-railing catalogue shows a comprehensive range of railing components - including five new railing systems and extensions. There are two versions available: the printed catalogue and the online version.

The new Q-railing catalogue introduces two all-glass balustrades featuring the adjustable Q-disc system. This system was developed to further simplify glass installation and alignment. The glass is securely fixed with the help of an internal disc; only the inlay needs to be moved for alignment.

The Easy Alu aluminium railing is also presented. Here, fabricators and installation specialists can order either individual components or prefabricated and completely site-ready railing modules.

What else does the Q-railing catalogue present?

In addition to the complete railing systems and extensions, the new Q-railing catalogue shows an extensive range of railing components, numerous individual parts for glass railings, post railings and handrails.

Among the numerous individual components, some products stand out. For example, the new generation of Q-lights Linear Light LED strips for illuminated handrails – in lengths of up to 30 m.

Also available is the elegant glass connectors for glass thicknesses up to 21.52 mm as well as the prefabricated Q-line balusters with MOD 2500 glass clamps. These products are designed to save fabricators time during installation.

In addition, there are many new features that make navigating through the more than 4000 products even easier and faster. Product sections are clearly labelled; and links and QR codes take the users to installation instructions, videos, test reports and certificates etc.

According to Q-railing, this means “finding instead of searching”.



Image: Q-railing

www.q-railing.com

TGT TEUPEN

“Pick and Carry” now also emissions-free

With the TGT Robby 900 S “Ecoline”, TGT is breaking new ground in pick and carry crawler units. The tracked lifting device has a new type of electric drive, which enables emission-free lifting and

installation work indoors and outdoors. The ECO series from Teupen thus allows assembly work to be carried out in sensitive facilities and areas where no emissions are allowed, e.g. in production facilities, hospitals and airports. The units are powered by a strong, rechargeable battery pack, which according to TGT Managing Director Heinz Teupen is unique in the “pick and carry” segment.

The technical features, such as chassis width of 78 cm as well as the large lifting capacity of up to 900 kg and the flyjib, are the same as the performance characteristics of the predecessor units. Its narrow width allows the TGT Robby 900 S “Ecoline” to drive through front doors. In addition, it is easy to transport to the construction site.

Does TGT also offer lifting equipment for roof and canopy installation?

Yes. As Managing Director Teupen explains, with the TGT EasyLift/XL pane lift, his company has the ideal installation device to install large glass elements for roofs and canopies.



Image: Rene-Strickstock / TGT Teupen

The TGT Robby 900 S “Ecoline” with tracks has a new type of electric drive for work in buildings where emission-free installation is required.

Thanks to the enormous mobility and flexibility of the EasyLift/XL, it is easy for two people to insert heavy and large panes into high roof constructions and to carry out canopy glazing.

What other exciting products do TGT Teupen offer?

Another product in the range is the TGT GlasKuli with manual winch, a compact, lightweight transport device for doors, glass and elements weighing up to 180 kg, which stands out for its easy handling during transport and use.

www.tgt-teupen.com

Image: TGT Teupen



With the TGT EasyLift/XL pane lift, two fitters can even insert heavy panes in glass roof constructions as well as in conservatories.

HEAVYDRIVE

Transport trolley up to 3,000 kg

The new Heavydrive HDL 3000 Transport-Wagen (transport trolley) can safely transport glass panes, insulating glass, window elements and sheet materials weighing up to 3,000 kg. The HDL 3000

units can be rotated and easily handled.

An inclination of 10 degrees ensures that the panes are stored securely. In addition, glass and construction elements can be secured with tension belts. The holder can be adjusted in width and depth in just a few steps and also prevents the load from slipping.

Despite the high load capacity, the HDL 3000 weighs only 220 kg, runs easily and is very manoeuvrable. In addition, the HDL 3000 is variable: the length of the connecting tube between the roller elements can be flexibly adjusted up to 10 m to transport panes from 1.7 to 14 m. The tubes can also be adjusted for a load distribution system



Image: Heavydrive.com

Glass, windows and construction elements with a total weight of up to 3,000 kg can be transported safely with the new Heavydrive HDL 3000 transport trolley.

as well as be removed for space-saving transport to the construction site.

The transport trolleys are entirely manufactured in Germany; they are available for rent and for purchase from Heavydrive.

www.heavydrive.com

Image: Heavydrive.com



The HDL 3000 glass transport trolley weighs 280 kg, can be easily dismantled and transported in a van.



BOHLE

Maximum flexibility with the Liftmaster Quadro

Bohle engineers have recently developed an electric vacuum lifting system that is quite something to behold: According to Bohle, the Liftmaster Quadro series is characterised in particular by its flexible application options: Four modular plug-in arms can double the lifting capacity of the system as required. Furthermore, exchangeable batteries, which can be replaced without tools in a few simple steps, allow non-stop use on the construction site.

The developers also wanted to set new standards in terms of safety and ease of use.

Background: The trend towards ever larger (insulating) glass and facade elements continues and is a real challenge for technicians and fitters. Such elements require the use of vacuum lifting systems to get them where they are needed. The Liftmaster Quadro series is a suitable answer to this.

How is the safety concept of the Liftmaster Quadro structured?

The safety concept is based on five pillars: With the continuous handrail along the entire design as well as a patented, centrally located control panel, every move makes sense for safe and intuitive use – no matter from which side the operation takes place.

Furthermore, all cables and lines are protected inside the body shell, so that the risk of damage is virtually eliminated.

The reliable dual-circuit vacuum system in accordance with EN 13155 promises redundant safety when picking up and holding any gas-tight panels with a smooth surface. In addition, optical and acoustic signals warn the operator of a low battery or insufficient vacuum.

What does the modular design accomplish?

A high degree of flexibility at the place of use is also provided by the four additional extension arms, which double the load-bearing capacity of the unit and are attached via a plug-in connection. All four units in the series can be rotated through 360° (12-way locking) and swivelled through 90°, making them reliable aids for indoor and outdoor installation.

www.bohle.com

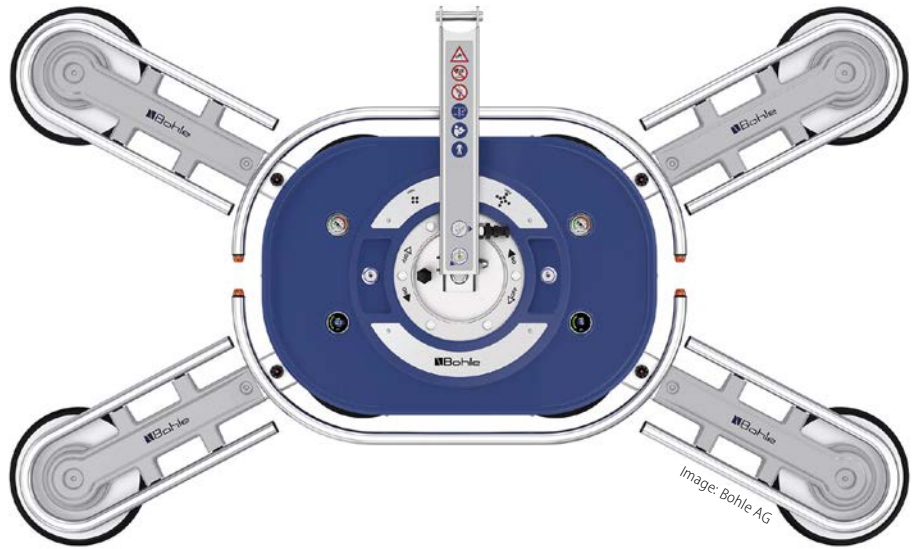


Image: Bohle AG

The four modular plug-in arms of the Liftmaster Quadro allow a doubling of the lifting capacity of the jacks if required.



Image: Bohle AG

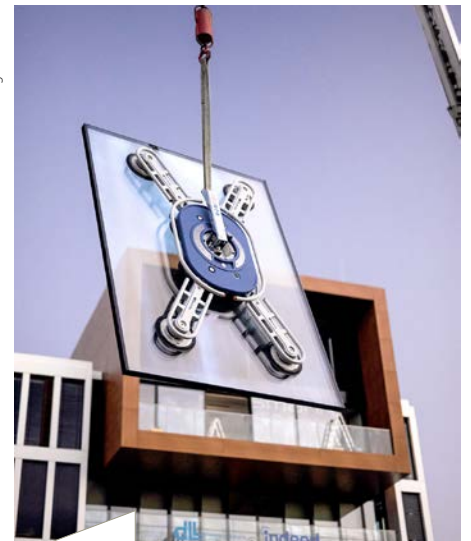


Image: Bohle AG

The Liftmaster Quadro series is characterised by its flexible application possibilities.

With its transport trolley, the Liftmaster easily fits in a construction site vehicle.

Advertisement





Glasboy

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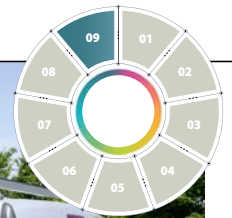


Image: Hegla

A van with removable Hegla external racks and roof carrier offers plenty of space for cargo and is suitable for urban traffic due to its compactness.



Image: Hegla

A van with removable Hegla external reeving and luggage racks offers plenty of space for cargo and is, due to its compactness, suitable for city traffic.

HEGLA FAHRZEUGBAU

Faster deliveries with the City Transporter

Manoeuvrable, small and very versatile – smaller urban transporters shine with their suitability for everyday use and are still often underestimated. Yet the compact delivery vans with their small size and a fitted transport rack offer enough space for urgent courier and delivery trips.

Everybody knows this situation: The phone rings, quick customer service is required – what could be solved quickly in principle often takes longer than planned. It is not uncommon for delays to occur because people are desperately searching for a suitable parking space for the transport vehicle. A problem that could easily be avoided, according to Hegla Fahrzeugbau Managing Director Hans-Peter Löhner.

“For service calls and deliveries of glass, windows and building elements, it is common to use the larger 3.5-ton industrial vehicles,” knows Hans-Peter Löhner. However, when it comes to trips in urban areas, city transport vehicles offer far more everyday possibilities due to their compact size. “The use of such a vehicle makes sense especially when a large truck or panel van is not necessary for the journey or would only make it unnecessarily difficult,” says Hans-Peter Löhner.

Increased versatility with the external Hegla reeving system

For maximum comfort and proper transport, the expert recommends the transport superstructure with the torsion-stable and height-adjustable external reeving from Hegla. Depending on the wheelbase of the vehicle, this creates an additional loading position with more

than 2.0 m of useable space. The useful height of the van can even be variably extended to up to 2.25 m. External loading allows the transport of goods with larger dimensions while keeping the interior of the van free for tools, installation materials or other goods.

In this way, IG units, windows or large formats can be placed on the height-adjustable reeving with easy access, properly secured with padded clamping slats and then transported safely in the Transporter.

Flexible – removable outer reef and pull-out interior reef

If the City Transporter has been equipped with a removable reeving system, it is possible to dismantle the superstructure quickly and in just a few steps. “The outer reef can be removed within a few minutes. This is a great advantage if the vehicle is to be used for non-service calls and errands or if it itself has to go to the garage,” says Hans-Peter Löhner.

In order to further maximise the loading possibilities of the delivery van, all vehicles can be equipped with a pull-out interior reeving system. This allows easy loading without the hassle of bending over in the cargo area. At the same time, tours can be planned even more flexibly and ma-

terials requiring special protection can be transported in the best possible way.

“For fast customer service, courier and delivery trips, our customers rely on the small and manoeuvrable City Transporters. In order to make maximum use of the vehicle’s loading capacity, our technical experts coordinate the transport superstructures in close exchange with the manufacturers,” explains Hans-Peter Löhner.

www.glastransportaufbauten.de/en/



Image: Hegla

The pull-out interior reeving allows IG units and windows to be loaded in a way that causes less strain for the workmen. Still, they are well protected inside.

BOTT

New interior reefing system for vans



Image: Bott

The glass reefing system in the bott vario3 in-vehicle unit.

Vehicle outfitter Bott has now introduced an interior glass reefing system with which glass, IG units and construction elements can be safely secured in a van. The bott vario3 modular design allows optimised division of the available space and integration in the van.

How are the interior reefing systems constructed?

The interior glass reefing consists of the elements of the bott vario3 modular system. The modular arrangement ensure that other elements of the equipment supplier, such as a rack for long parts, can be easily added. Lashing rails are integrated into the glass reefing so that the technician can secure the cargo quickly and easily for the journey. The protective profile made of soft TPE plastic protects it from scratches and damage.

What other options does Bott offer?

As a further option, Bott also offers outriggers that support the cargo at the lower end of the glass reef. These outriggers are also equipped with the TPE protective profile. An adjustable foot supports the profile on the ground. This is to ensure that the system stands evenly and has a high load-bearing capacity.

The angle of inclination of the glass reefing can be adjusted to suit the conditions in the van. The bott vario3 system components also allow the integration of holders for Systainers³ as part of the inside reefing system itself. This makes optimum use of the available space for small parts or tools.

www.bott.de/en



Image: Bott

With the Bott-Reef, glaziers as well as facade and window installers can safely bring their glass and doors to the customer and to the construction site.

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- Dead weight with vacuum cross 1,400 kg (vacuum cross 150 kg)
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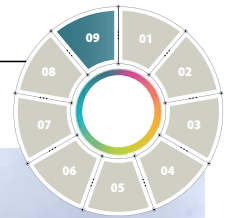
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UPLIFTER

20 years of success

Company founder Martin Lobinger had big plans more than 20 years ago. And he has successfully implemented them, because Uplifter’s lifting and vacuum technology is now used worldwide. Read how the company has been achieving at least 30 per cent growth annually to this day.



Image: Uplifter

— Martin Lobinger, the founder of Uplifter, had big plans more than 20 years ago. He has successfully implemented them: Uplifter’s lifting and vacuum technology is now used all over the world.

“We need an Uplifter” is how many customers start their enquiry with the sales and rental support of the specialist for lifting technology from Oberaich. The range includes machines and systems for lifting, moving and installing glass, construction elements and other loads, including the Maeda mini cranes or the self-developed Glassworker with vacuum suction system.

Special Glassworker edition

With its range of products and services, Uplifter (www.uplifter.de) has not only become an established brand over the years, but also from a mere retailer to a manufacturer with self-developed products. In addition, to mark the company’s anniversary, the 20th anniversary special edition of the Uplifter Glassworker has been available since the beginning of the year.

“We are delighted to be celebrating Uplifter’s 20th anniversary this year,” says company found-

er Martin Lobinger. In doing so, he has always remained true to the goal of making building with machines easier.

Today, the company has over 100 staff, seven branches in Germany and ten subsidiaries abroad. The know-how of the lifting specialists from Oberaich is now also in great demand internationally.

From Oberaich all over the world

It all started with the “Aierl”. That is the name of the Lobingers’ house in Oberaich (Bavaria). Martin Lobinger was originally supposed to take over the farm. But the 24-year-old was drawn to the wide world at that time: far travels, other countries – Lobinger worked in a wide variety of industries, first as a crane operator, then as an arborist, where he came into contact with cranes and lifting platforms.

With great enthusiasm, he increasingly focused on such machines and equipment and laid the foundation for the Uplifter company on the family estate in Oberaich.

With his ideas and his range of machines, Lobinger had the right intuition and within a few years the company grew steadily, branches offices and even a production facility was established, including a development department, which is his pride and joy.

There has not been a year without at least 30 per cent growth. The annual turnover in the Uplifter Group is over 20 million euros.

When asked about the recipe for success, the company founder explains: “At Uplifter, ideas are born, new machines are developed with sophisticated (vacuum) technology and special machine construction is constantly pushed forward.” Today he is supported by his two partners Peter Jauernig and Sebastian Bayer.

What do fitters look for at Uplifter?

Minikane, Glassworker or vacuum lifters have not only become indispensable in the construction industry, but are also becoming increasingly important in many other sectors. And customers appreciate Uplifter’s lifting technology and service.

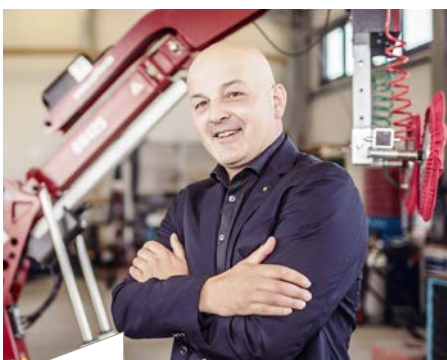
Flexible solutions and individual support for every project are the company’s hallmark: The Uplifter fitters have been smiled upon by the Mona Lisa during work in the Louvre in Paris, window fronts were transported to dizzying heights at the Burj al Arab in Dubai and their machines were also successfully used in the construction of the new main railway station in Dresden.

And what will the future bring?

“International business can only advance with digitalisation,” says Martin Lobinger. That is why Uplifter (<https://uplifter.de>) will increasingly focus on self-propelled machines and innovative laser technology. Lobinger’s goal is to double turnover in the next few years.

— Matthias Rehberger

Image: Uplifter



Martin Lobinger, founder of Uplifter

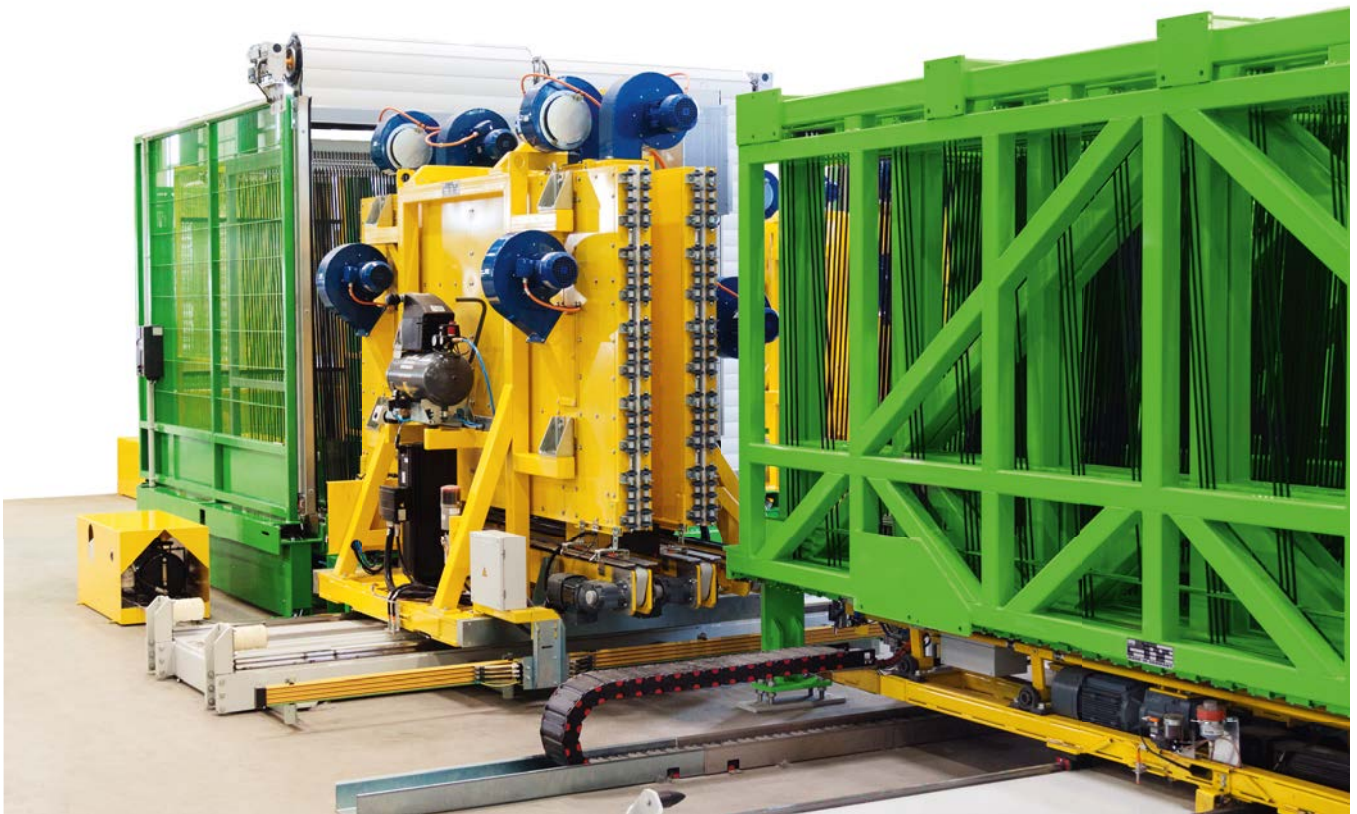
Image: Uplifter



Today, Uplifter also offers lifting technology and equipment developed and manufactured in-house.

Shop-Floor Logistics

Automation High Performance Logistics



The Automated Shop Floor Organiser

Turn your glass flow into a fully automated logistics system. The SortJet stores panes in the order of cutting and supplies them in precise synchronisation with the cycle and in the correct order. Depending on your production needs, the glass is transferred directly to the processing line, in harp racks and by optional AGV.

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- Reliable glass quality thanks to automated handling
- Maximum optimisation options thanks to real-time monitoring

