



FLATGLASS

2022

world directory



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FLATGLASS

2022 world directory

Annual publication

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PRINTED BY

BICIDI ARTI GRAFICHE - Via San Felice N° 37d 16138
Genoa (Molassana) - Italy

SINGLE COPIES

€ 40 air mail included

Italy: € 30

Published by A151 S.r.l. owned by Smartenergy S.r.l.

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The Court responsible is Milan. Publication registered at no. 136 of the Milan Court Records Office on 11.04.2017 - ROC no. 34927



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PUBLISHED BY



Via Antonio Gramsci, 57 - 20032 Cormano (Milan) - Italy

Tel.: +39 - 02 - 66306866 • E-mail: publications@glassonline.com

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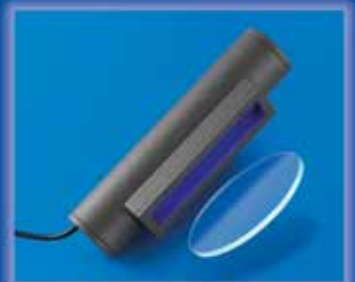
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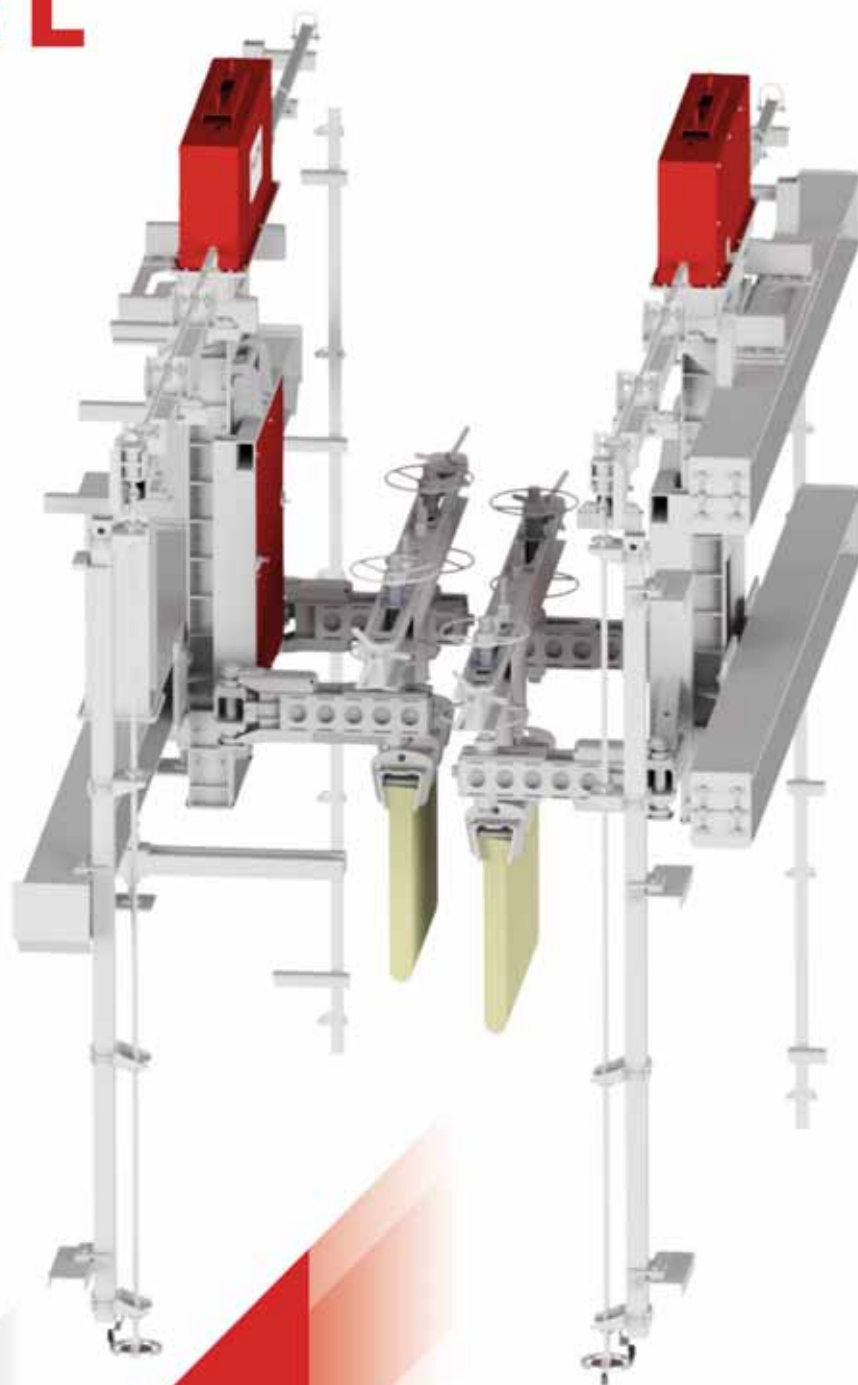
issue	exhibition/conference	date	venue	deadlines
2022 1	GPD FINLAND	postponed to 2023	TAMPERE Finland	Editorial files: 14-01-2022 Deadline Adv files: 24-01-2022
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	FENSTERBAU FRONTALE	postponed to 12-15 July	NUREMBERG Germany	
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2022 2	CHINA GLASS	13-16 April	SHANGHAI China	Editorial files: 11-03-2022 Deadline Adv files: 18-03-2022
2022 3	MIR STEKLA	6-9 June	MOSCOW Russia	Editorial files: 29-04-2022
	GLASS SOUTH AMERICA	29 June/ 2 July	SÃO PAULO Brazil	Deadline Adv files: 06-05-2022
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	ALL GLASSTEC EXHIBITORS ADVERTISING IN THIS ISSUE ALSO RECEIVE A FREE GLASSTEC PREVIEW			Deadline Adv files: 31-08-2022
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	GLASSTECH ASIA	26-28 October	SINGAPORE Singapore	Deadline Adv files: 26-09-2022
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	GLASSTECH MEXICO	23-25 November	MEXICO CITY Mexico	
	ZAK GLASS TECHNOLOGY	1-3 December	NEW DELHI India	Deadline Adv files: 21-10-2022

TWEEL

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

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Glass-Technology International

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for Glass, Windows & Doors



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E-mail: info@a-w.com • www.a-w.com

COMPANY DATA

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Peter Dixen - CEO

Julia Schmidt - CFO

Annual turnover

EUR 26,000,000

Percentage of turnover from glass (%)

75

Number of Employees

190

Founding Year

1977

Registered Trademarks

A+W DynOpt



COMPANY PROFILE

A+W

Software for Glass, Windows and Doors

A+W is the global market leader for software in the flat glass industry as well as the windows and doors business. The company develops ERP-, PPS- and optimization software in order to make glass and window manufacturers even more efficient.

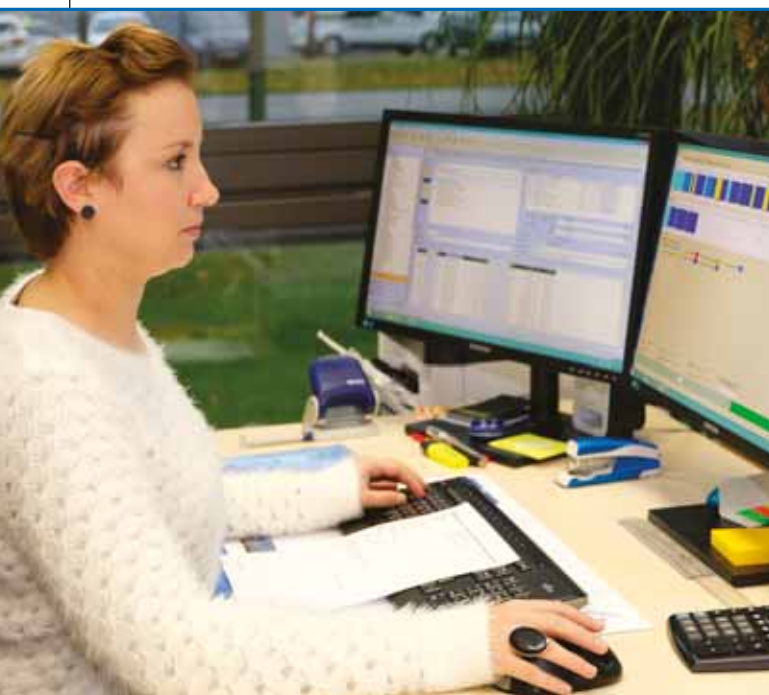
A+W solutions control and optimize the whole value chain, from basic glass to finished windows or façade elements. A+W products are suitable for small-, mid-sized and large companies.

Of course, A+W offers individual advice and consulting for its entire product range and supports users from the presentation of the systems through to live operation.

With automatic updates and upgrades, the global maintenance service makes sure that the installed software is always up to date. A+W optimizes its customers' yield, reduces production costs, shortens lead times, improves quality and thus increases customer satisfaction.

A+W has been active on the market for more than 40 years and sells its products worldwide. A+W cooperates with the most experienced and competent companies in the industry. This close networking helps A+W to always provide the best possible solution for its customers' demands.

A+W is a wholly owned company of Constellation Software Inc., which is listed on the Toronto Stock Exchange under the symbol 'CSU'. The Corporation acquires, manages and builds vertical market software businesses.



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A+W Sales- and Services Global Network

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97133 Mexico

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PO Box 42687, Larnaca 6501, Cyprus

SOUTH AFRICA

Glass Design (Pty) Ltd

1 Eugene Street - Malanshof - Randburg, 2196

JAPAN

Correns Corporation

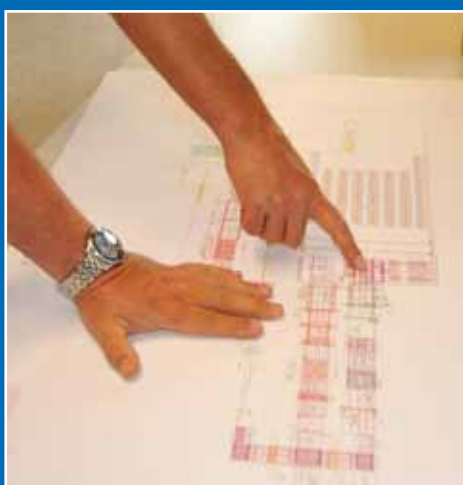
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COMPANY DATA

Contacts

Adelio Lattuada - President
Nicola Lattuada, Michela Lattuada - Partners

Sales

Domestic 5% / International 95%

Area

Office area 500 m² / Plant area 3,500 m²

Number of Employees

43

Founding Year

1978

Capital

EUR 90,000.00

Planned Exhibitions 2022

GPAD - Nashville, USA - 29 / 30 March
GENE - Uniondale, USA - 06 / 07 April
Mir Stekla - Moscow, Russia - 06 / 09 June
Glasstec - Düsseldorf, Germany - 20 / 23 September
GlassBuild America - Las Vegas, USA - 18 / 20 October

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COMPANY PROFILE

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Our strength, always. A variety of solutions taking the shape of a wide range of machines: more than 40 models that can be specifically configured to ensure maximum productivity.

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AUTOMATION AND ROBOTICS SOLUTIONS (CYBERAL)

We are constantly formulating solutions to operate at the highest levels of automation, making the most of integration with robotics to increase productivity and reduce costs.

SPECIAL MACHINE SOLUTIONS

Do you have special needs? Out-of-standard processes? Do you treat composite materials? That's not a problem. We can find the most suitable solution for you and customise our machines to ensure you get the flexibility you need.

COMPLEMENTARY GLASS PROCESSING SOLUTIONS

Do you need to drill or process corners? We can provide a complete range of horizontal drilling machines and automatic radius and straight corners grinding machines.

STONE WORKING SOLUTIONS

We are well aware of the specificities of stone processing. This is why we can design with you the perfect machine to process marble, stone and synthetic and composite materials.

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ADI SRL

a brand of Surfaces Group

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COMPANY DATA

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Dino Zandonella Necca - President
Lorenza Dal Maso - Glass Division Manager

Mother company

Surfaces Technological Abrasives SPA

Annual turnover of the Group

EUR 205 million

Annual turnover of the Company

EUR 44 million

Percentage of turnover from glass (%)

14

Sales

Domestic: 25% / International: 75%

Banks

Unicredit, Intesa San Paolo

Area

Office area: 3,710 m² - Plant area: 14,631 m²

Number of Employees

210

Founding year

1980

Paid-in capital

EUR 2,000,000.00

Patents obtained

3 for the Glass Industry

Registered brands

UHS ; ADI

Parent and Sister Companies

Domestic: 1 / International: 3

Planned Exhibitions 2022

Glasstec - Düsseldorf, Germany - 20 / 23 September
GlassBuild America - Las Vegas, USA - 18 / 20 October



COMPANY PROFILE

ADI SpA has been founded in 1980 and now, after 40 years, ADI has 4 plants in Italy and 3 abroad, 210 people in Italy and 12 abroad. The growth has been possible thanks to the continuous R&D investments and the focus on the real customer's needs. ADI manufactures diamond tools not only for glass, but also for stone, ceramics, mechanics and optics. The big advantage coming from this wide range of products is that the experience made in one application can be transferred to the others. A good example of this is the UHS bond, which has been studied initially for the Glass Automotive industry and now it has been successfully transferred to the CNC tools for glass, stone and mechanics.

Since December 2016 ADI is part of the Surfaces Group. This larger structure is providing synergetic growth thanks to the multiple technologies available and the stronger sales network.



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U.A.E

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ASHTON INDUSTRIAL SALES Ltd.

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E-mail: sales@ashton-industrial.com • www.ashton-industrial.com

COMPANY DATA

Contacts

Steve Ashton - Managing Director

Richard Green - Senior Manager - Business Development

Annual turnover of the Company

EUR 5,000,000

Percentage of turnover from glass (%)

100

Sales

Domestic (20%) / International (80%)

Number of Employees

35

Founding Year

1983

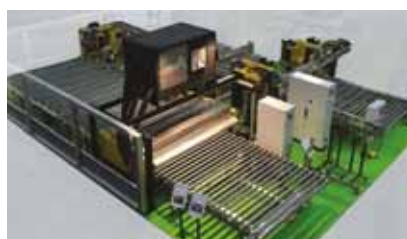
COMPANY PROFILE

Ashton Industrial, founded in 1983, is now a world leading manufacturer of pre-tempering systems, exporting over 80% of machinery to every corner of the world.

We design and manufacture high-quality, heavy-duty machinery for professional glass processors, with 24/7 reliability. Available in standard or custom-built configurations giving maximum production with minimum labour.

AUTOMATIC SEAMING/ARRISSING, WASHING AND FURNACE BATCHING EQUIPMENT

Our range of high performance automatic lines includes:



SeamMaXX PRO

- Fully automatic high-speed seaming, producing a 1m² lite fully processed on all 4 edges, top and bottom every 8 seconds. Maximum glass sizes up to 6mx3m and minimum

size down to 300x150mm. Options include wet or dry operation, on-line laser marking, edge deletion and corner dubbing, out-of-square mode, high volume mode, vertical edge grinding, operating modes to suit customer production flow.

SALES NETWORK

IRAN

Mega Enterprise

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Concept Solutions

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Kat:3D:50 Mimaroba / Büyükcemece

/ Istanbul

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GLOBAL SALES COORDINATOR

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GLOBAL BUSINESS DEVELOPMENT

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NORTH AMERICAN OFFICE

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PRODUCT RANGE

- Fully Automatic Seaming/Arrissing Lines
- Fully Automatic Shape Seaming/Arrissing Lines
- Furnace Batch Building Systems
- Robot Loading & Unloading Stations
- Horizontal & Vertical Washing Machines
- Manual Seaming/Arrissing Machines (Wet & Dry Versions)
- Laser Marking Systems in-line and off-line
- Edge Deletion Systems – manual and automated
- IG Production Lines and associated equipment
- Glass Handling machinery for transporting, turning, rotating, flipping, tilting
- Shuttle conveyors for linking multiple lines
- Custom designed equipment and solutions
- Film Laminating Lines

SeamMaXX SOLO PLUS – Fully automatic seaming in straight line configuration, average 3 lites per minute seamed top and bottom on all 4 edges. Options include wet or dry operations, on-line laser marking, corner dubbing, high volume mode.



SeamMaXX SOLO – Semi-automatic seaming, can be specified for glass sizes up to 5m x 2.8m and handles minimum dimensions as small as 150mm. The output capacity depending on glass size, averages around 2.5 lites a minute. Options include wet or dry



operation, on-line laser marking, edge deletion and corner dubbing, out-of-square mode, high volume mode, vertical edge grinding.

ShapeSeam PRO - Fully automatic high speed processing of any flat glass shape, truly random loading in any sequence, no pre-programming of shape, size or thickness.



HWM PRO – High Performance Compact Horizontal Washing Machines. Fully stainless-steel construction, available in various standard widths from 1.3m to 3.3m. Can be specified with additional pre-spray, washing and drying sections to suit application and speed of operation.



BatchMasta PRO - System to automatically batch lites after seaming, prior to tempering. Totally random mixed sizes, for example from an Ashton SeamMaXX Pro Seaming line, are arranged into multiple-row batches and transported directly on to the furnace load conveyor with absolutely no manual intervention. Batch layout and glass sizes can be passed directly to the end of the furnace to aid identification during unloading.



MANUAL SEAMING/ARRISSING, LASER MARKING, EDGE DELETION & ROBOT HANDLING EQUIPMENT



UNIX Manual Seaming / Arrissing – models available in wet and dry versions, both with the option of castor tables or our 'high float' air floatation tables. Various standard sizes are available.



LaserMark PRO V4 - Standalone Compact Mobile Laser Unit, suitable for rectangular and shaped glass. Mobile with 'plug and play' connection, fully guarded to latest standards.



EDPRO-A Edge Deletion - Fast, efficient and clean deletion of soft coatings on glass. Air floatation table incorporating an edge deletion head and datum alignment bars for simple quick operation. Options of wide band edge deletion and standalone units also available.



RoboLoad PRO - System for high speed loading or unloading of lites and general glass handling. 6-axes robot with custom vacuum frame and conveyor system to suit individual customer requirements. Custom built solutions to suit customer requirements.

PRECISION PROTECTIVE FILM APPLICATION

Protective films, safety backing films, tints, single or double sided application. Metal, Plastic, Ceramic, Mono Glass, Double Glazed Units, Printed, Coated the list is very extensive and encompasses almost any kind of flat smooth substrate. ASHTON INDUSTRIAL guarantee's you the highest attention to detail and quality at every level of automation.





B SOLUTION Srl

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COMPANY DATA

Contacts

Gianluca Bonfanti - General Manager
Raffaello Bonfanti - Technical Manager
Nardo Daniele - Sales Manager



COMPANY PROFILE

B Solution has 30 years of experience and has developed a complete range of products suitable for both small and large glassworks, satisfying the most modern production requirements.

B Solution is specialized in:

GRINDING LINES

- Vertical NC Speed Edge
- Vertical Speed Arris
- Bilateral grinding flat edge
- Bilateral grinding round edge
- Shape rounding
- Shape radius

DRILLING AND MILLING LINES

- Vertical NC Speed drilling and milling
- Multi-head vertical drill
- Vertical drill template
- Horizontal modular drill

AUTOMATION AND MANIPULATION

- Loading manipulator
- Unloading manipulator
- Rotating platform
- Shuttle
- Turning device
- Transfer
- Horizontal diverter 0-90

CUSTOMIZED LINES FOR:

- Home appliance industry
- Automotive industry
- Structural industry
- Furniture industry
- Small sizes

SPEED ARRIS



SPEED ARRIS

Speed Arris is B Solution's high-productivity vertical arrising machine specialized in rough grinding-arrising.

The machine can arris/grind two rectangular glass with different size and thickness, this guaranteeing high Productivity for double-glazing lines and also thanks to the continuous production cycle.

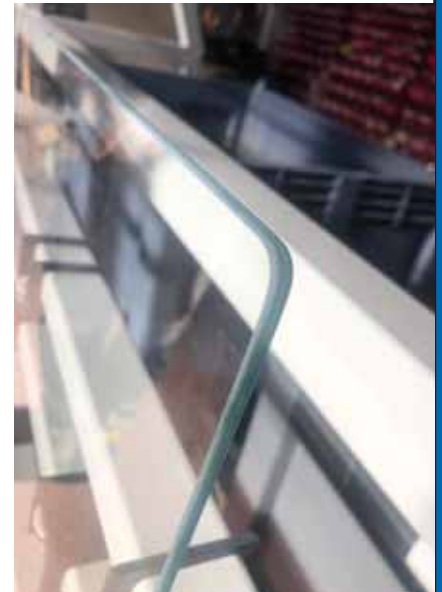
Glass transport and handling is carried out with suction cups, especially important for today's high-performance glass types.

Regular arris is ensuring thanks to the oscillating spindle.

The Speed Arris can be integrated with IG or tempering line or as stand-alone machine.

A software for shaped glass is available upon request.

Available in different size 2.0.3 - 2.6.4 - 2.8.5.



SPEED EDGE



BSolution's Speed Edge is a vertical compact grinder with the innovative patented follow-glass system, which carries out both rough and polished machining, flat and round edging, arising and milling.

Processing of big glass sheets in a limited space thanks to the compact system that integrates the loading and unloading in a single solution.

The machine's suction cups have a locking system that involves the entire glass sheet.

Other features include:

- Maximum precision machining
- Best tool efficiency
- Loading of new glass sheets during the production cycle.

Available in different sizes 2.0.3 - 2.5.4 - 3.2.5 - 3.2.6 - 3.2.9





BOVONE DIAMOND TOOLS Srl

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COMPANY DATA

Contacts

Vittorio Bovone - Owner
Gianni Marengo - Technical Manager
Marta Pesce - Sales & Marketing

Sales

Domestic (15%) / International (85%)

Quality Certifications

ISO 9001:2008 QS - E-16-056

Banks

Intesa San Paolo - Carige Italia

Area

Offices 200 m² / Plants 2500 m²

Number of Employees

29

Founding Year

2003

Paid-in Capital

EUR 100,000

Parent and Sister Companies

1) Elettromeccanica Bovone Srl

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2) Bovone Maquinas e Equipamentos Industriais

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GREECE

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Athens - 14235

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618 00 Brno Ref. Robert
Zmeskal - Jiráňkova
Repubblica Ceca

COMPANY PROFILE



BDT was founded in 2003 to support and complete Elettro-meccanica Bovone: Vittorio Bovone, together with his daughters Federica and Giulia, and all the BDT Staff, wanted to produce and manage wheels for straight-line edgers and bevellers in-house. This represented just the beginning, and now BDT is a strong and consolidated company with well-prepared and experienced staff. Market demand focus and technical improvement are the keywords of BDT history and evolution.

Over the years this small company has grown a lot: 29 employees nowadays and a large production capacity including the complete range of metal bond and resin bond diamond cup and peripheral wheels for bevellers, edgers, double-edgers, CNC peripheral wheels, drill bits and routers.

In 2010 the new revolutionary and performing GOLDNET router was patented. Today it's one of the most highly appreciated tools of the range.

Bovone Maquinas e Equipamentos Industriais, the Sister Company of BDT, based in São Paulo, which deals with Bovone machines and BDT tools all over Brazil, was also founded during this same year.

Since 2010 the company has also been producing stone tools, investing on high-performance machines to provide high quality wheels, which can grind new materials such as Dekton, Laminan and all ceramics materials.

The company has always experienced a step-by-step development recording a steady and progressive increase in sales volumes year after year. The only exception was in 2009 when sales decreased, but in 2010 the previous targets were completely restored. 2015 was a successful year since the company reported a 25% increase on total volume. Even if Covid pandemic has brought to its knees worldwide economy, BDT has registered -3% only of sales volume in 2020 and + 13% in 2021.

The formula never changes: investments in innovation, research, development and performance in machines and human resources, these are the secrets of growth. At BDT, employees are, first and foremost people, and they are, in fact, very responsive people, part of a very big family, always ready to intensify rhythms when a customer needs an order urgently, since their efforts are always rewarded: they are always granted the best working conditions and always receive what they ask for. BDT uses the same philosophy with customers: first of all they are people, who need to be taken care of in the best way. Our company aims at establishing positive business relationships with them, and, thanks to this behaviour over the years, simple partnerships have often evolved into something more. This also happens with agents, dealers, suppliers, both Italian and international, and even forwarding agents (they are always welcome to a good Italian coffee!).

This virtuous circle keeps on producing important advantages, giving our brand name extra value which represents BDT's long-lasting seriousness and reliability.





BOST (Shenzhen) New Material Co., Ltd

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COMPANY DATA

Contacts

Shelly Liu - Sales Director
Yuan Yuzhou - President

Annual turnover of the Company

USD 12.500.000

Number of Employees

120

Founding Year

2000

Area

Shenzhen Offices 350 mm
Huizhou Offices 2500 mm
Huizhou Plants 8000 mm

Sister Companies

LANGBO GLASS TECH CO. LTD

COMPANY PROFILE

Furnace bubbling device:

Bubble tubes are inserted through the furnace bottom, so allowing the continued flow of purified compressed air to release bubbles, which rise rapidly to the surface of the liquid glass before breaking up. As the bubbles rise the surrounding glass liquid flows upward, forming a mechanical circulation by which, through stirring, the cold glass at the furnace bottom is raised to the surface for heating - thus achieving improved glass quality with enhanced glass refinement thanks to a reduction in furnace crown temperature owing to heat transfer.

Bubbling equipment benefits:

1. Glass heat transfer improvement within furnace;
2. Stabilization for melt-out;
3. Reduction of silica scum defects;
4. Increase in output of up to 3-5 percent;
5. Reduction in peak crown temperature for furnace life extension;
6. Improvement in glass mixing and homogenization;
7. Reduction of colour transition loss.



FURNACE BUBBLING WORKSITE

PRODUCT RANGE

1. Glass anti-stain interleaving powder
2. Glass interleaving powder
3. Glass anti-stain coating agents
4. Glass cutting fluid
5. Glass cleaning agents
6. Furnace bubbling device
7. Glass powder spraying system
8. Glass coating liquid spraying system



Glass powder spraying system

In adopting the "electrostatic jet" principle the glass anti-stain interleaving powder is fluidized within the powder tank/bin and stirring tank/bin, resulting in static electricity as it passes through the spray channel. Being evenly sprayed under the compressed air, which is warm and dry, it adheres to the glass surface to form an effective anti-stain isolation layer which is also protective.

Glass mildew-proof coating liquid spraying system

Liquid spraying in this system is characteristically uniform, offering an operation that's easy, stable, reliable and with a high degree of automation, convenient maintenance and a low operating cost. It represents an important means for glass mildew prevention. The mildew-proof coating liquid can form a good protective layer upon the glass surface. Compared with anti-stain powders, liquid spraying exhibits the advantage of strong adsorption, more uniform coverage, extended duration, easy cleaning, etc. Also, by being sprayed with mildew-proof coating liquid the glass can withstand long-term storage, which is why it is widely used within automotive for coated and mirror glass as well as in other high-grade glass processing industries.





BOTTERO SpA

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COMPANY DATA

Contacts

Alberto Masoero - Flat Glass Sales Manager
Paolo Mazzone - Hollow Glass Sales Manager
Marco Giraud - Engineering Sales Manager

Annual turnover of the company

Euro 195,000,000

percentage of turnover from glass (%)

100

Sales

Domestic 10% / International 90%

Quality certification

ISO9001 - ISO14001

Area

Plant area 44,000 m²

Number of Employees

600

Founding Year

1957

Capital

EUR 6,000,000

Patents obtained

102

Registered brands

3



SALES NETWORK

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REPUBLIC OF CHINA, CAMBODIA, MONGOLIA, LAOS, TAIWAN

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COMPANY PROFILE



The glass industry has undergone under a global transformation in recent times. Glassworks are facing a much more variable request from the market: dimensions and order size are difficult to predict, while delivery times are becoming shorter and shorter.

The new challenge for glass makers is to keep pace, raising productivity and staying competitive. This means investing in new equipment, but mainly re-shape the workshop production flow following lean principles.

Bottero S.p.A. has solutions ready to go for all these challenges, based on three main pillars:

- modular machines and platform concept;
- integrated systems tailor-made to customer needs;
- Bottero 4.0: a comprehensive suite for machine learning and artificial intelligence.

For more than 60 years Bottero has been leading the flat glass industry in float and laminated glass with an in-depth and wide range of processing machines, from cutting tables to double edgers and CNC machines.

With more than 200 glass production equipment items, and more than 50,000 processing machines installed around the world for any type of glass, Bottero is the unmissable partner for everyone who wants to cut a piece of glass.

Our product range in cutting (BKM, BCS and EVO) is the widest and most in-depth available today in both stand-alone and dual-line with a laminated glass cutting table, or within an integrated line with stock management systems such as crane loaders or shuttle systems.

Thanks to their modular design, our customers can choose se-

veral options for their cutting tables, such as the Easy Deletion system with baffle grinding wheel, low-E/TPF removal with peripheral grinding wheel, PPL labelling printer and CO2 laser marking, just to name a few.

Every Bottero cutting table gathers more than six decades of experience and know-how in the glass sector, ensuring not only perfect cutting quality and a user-friendly approach, but also remote support and preventive maintenance tools.

Bottero offers a wide range of solutions for laminated glass processing scalable in terms of modularity and automation level, suitable to process laminated glass with PVB (acoustic and/or refrigerated), EVA and special anti-hurricane inter-layers.

Bottero's R&D department is continuously working to innovate its laminated glass product range to ensure that the company remains the undisputed leader in this field.

The company's most advanced equipment is the 548 LAM, a fully automated table that can process different laminated glass types with reduced cycle time and energy consumption. Thanks to a great number of patents, Bottero's PVB heating system focuses energy on the PVB without heating the glass, thus reducing cycle time by 30%, saving up to 40% of energy costs and reducing the number of glass breakages.

Operator manual intervention is eliminated thanks to the patented squaring device for glass positioning and rotating, as well as by means of automatic loading and unloading arms. With regards to laminated glass production, Bottero is currently market leader in the assembly line segment with a full range of solutions ranging from entry level, with manual loading and unloading, up to fully automated with automatic PVB unwinding and trimming with an output cycle time of 38s per JS plate of up to 6,000x3,300mm.

Bottero Flex Lamelines can manage shaped glass from 200x200mm up to XJS glass of 12,000x3,300mm in multiple layers of up to 100mm thickness.

Thanks to a great number of patents and more than 25 years of experience worldwide, Bottero offers state-of-the-art nip rolls and furnace area for laminated glass production, suitable for a huge variety of glass size and dimensions.

Modularity and scalability are also applied to Bottero's wide range of horizontal double edgers and vertical edgers.

While double edgers represent the best solution when high grinding and polishing quality is required, vertical edgers are more flexible and can be easily integrated with robots for loading, unloading and glass rotation.

Of course, double edgers ensure perfect parallelism, squareness and multiple profile finishing, including arrisses, engraving and polished radius corners. With Bottero new Flex Edge, customers can really customise their machines with up to 17 spindles per side, with an unlimited range of dimensions up to 12,000mm opening width.

Remote service, cloud connection and preventive maintenance tools are the basic tool set of Bottero edgers.

Bottero is, and has been since 1957, customer centric. Our Pre-Sales and Sales Department pay special attention to understand customer expectations and limitation to develop the best proposal fitting with customer needs and reducing Total Cost of Ownership (TCO).

Fewer manual operations and more automation has allowed many of our customers around the world to improve their competitiveness and market leadership.

bovone
MADE IN EXCELLENCE



ELETTROMECCANICA BOVONE Srl

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COMPANY DATA

Contacts

Federica Bovone - Sales Manager
Massimo Arata - Sales Manager

Annual turnover of the Group

EUR 18 million

Percentage of Turnover from glass (%)

95

Sales

Domestic (2%) / International (98%)

Quality Certifications

ISO 9001 - ISO 14000 - ISO 18000 - ISO 45001

Nominal Capital

EUR 1 million

Area

Offices 1,000 m² / Plants 12,000 m²

Number of Employees

110

Founding Year

1954

Registered Trademarks

Bovone

Parent and Sister Companies

BDT - Bovone Diamond Tools

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Planned Exhibitions 2022

China Glass: Shanghai, China - 13 / 16 April
Glasstec: Düsseldorf, Germany - 20 / 23 September
Marmomac: Verona, Italy - 27 / 30 September
GlassBuild America: Las Vegas, USA 18 / 20 October

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Innovation and Customization, Flexibility and Reliability, Performance, Quality and Process Speed are the characteristics of each Bovone product. Over 65 years of production at the highest levels, **Bovone Group** has established itself as an international leader in the supply of stand alone machines and full-line systems, accessories and tools for the second processing of glass and natural and synthetic stones.

The continuous analysis of the different and frenetic trends of each single application market originates the technological primacy of Bovone Group, which constantly studies new solutions able to provide clients with cutting-edge technologies for present and future challenges. In fact BRS, the Bovone robotic systems, born well in advance of the other players, express the trends of a market that is increasingly looking for automated solutions, to optimize resources without losing sight of the workmanship quality.

Highly technological solutions for application destinations mainly aimed at the construction, furniture and automotive sectors: the entire production takes place in the Ovada (AL) plants, which constitute an infrastructure of absolute excellence in the Italian and international industrial scene able to manage internally every step, from the supply of the best raw materials to the development and integration of management software, up to the proposal of the most suitable tool, thanks to the synergy with its subsidiary BDT, Bovone Diamond Tools.

In addition to the Ovada headquarters, Bovone is also present in the market with two direct branches, one in the United States dedicated to the North American market, and the other in Brazil for coverage of South America, as well as a widespread network of distributors present throughout the world. An articulated and highly qualified system of technicians, supported by the almost unlimited availability of stock, provides an excellent after-sales assistance service, responding promptly and competently in each geographical area.

On the commercial side, the choices that are building this strategy are the result of a clear and defined vision of business objectives: starting from 2020, the new headquarters in the United States originates from this vision and is aimed at direct control of the



market. The new General Manager who will lead the US office is called to consolidate the presence of the brand on a strategic market such as the US which continues to show real interest in Made in Italy technology. The action plan involves the structuring of an excellent sales service – faster responses and more efficient sales support – and the development of new prospects.

Anticipating market needs and facing high production standards are the drivers that guide production choices:

Bovone machines and systems combine high quality with process speed, the continuous innovative drive with the drastic reduction of downtime thanks to the very high reliability.

There are three production areas of reference in Bovone:

Machines

Stand alone machines for the treatment of glass sheets: grinders, bevellers and washing machines. The main aspect of this area is its high level of customization which, today, is a fundamental strategic plus: Bovone machines are designed to solve each and every production need. They provide perfect finishes for increasing production results thanks to their high speed, and combine the most advanced electronic applications with the construction strength and reliability guaranteed over time: an entry level machine or a more advanced model, Bovone machines are able to guarantee excellent performance.



Plants

Complete systems for mirror silvering and laminated glass lines are fully customizable and can be integrated according to clients' specific needs: with respect to standard configurations, all construction details are customized and calibrated in order to meet every specific need. Bovone systems ensure high performance both for large numbers and for those where high flexibility is required.

BRS – Bovone Robotic System

The production range also includes with the BRS area, fully automated Bovone robotic systems for grinding glass. The BRS integrates straight-line edging machines and articulated, multi-axis robots with different loading and application capacities. And, with regards to the field of applied industrial robotics, BOVONE is Kuka's Official System Partner. BRS conforms perfectly to Industry 4.0 protocols: the islands work

without the presence of personnel and are fully connectable for the traceability and self-adjustment of the production parameters.





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Sergio Gervasoni - Business Unit Manager Glass
Alessandro Colella - Product Manager Glass

Mother Company

SCM GROUP

Annual turnover of the Company

EUR 150 million

Number of Employees

700

Founding Year

1969

Parent and Sister Companies

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Planned Exhibitions 2022

Glasstec

Düsseldorf, Germany - 20 / 23 September

GlassBuild America

Las Vegas, USA - 18 / 20 October

COMPANY PROFILE

CMS Glass Technology: high performance machining centers and exclusive integrated lines for processing glass

CMS Glass Technology is a leader in the flat glass machining sector with advanced solutions like the vertical and horizontal CNC machining centers, cutting tables and waterjet cutting systems. Thanks to the tradition and experience of the long-standing brands Brembana and Tecnocut, today, CMS Glass Technology holds a key position in this sector in devising innovative solutions for the glass industry.

With the aim of expanding its global presence in the glass processing machinery sector, in April 2021, CMS acquired GFP, a company specialized in cutting tables and automatic seaming machines to process glass.

Along with the cutting tables, CMS also offers CNC machining centers with 3-4 axis like GEA and SPEED, or 5-axis like MAXIMA.

CMS's horizontal machining centers for glass, due to the advanced design of the structures and sophisticated technological solutions adopted, guarantee sturdiness, accuracy over time, speed, and flexibility that ensure an exceptional level of finishing and unique precision. These machines perform any kind of edge grinding and polishing, arising, milling, cutting with disk, drilling, contouring, engraving, writing, variable-angle beveling operations, and special machining. Their sturdiness makes them ideal for any kind of glass processing.



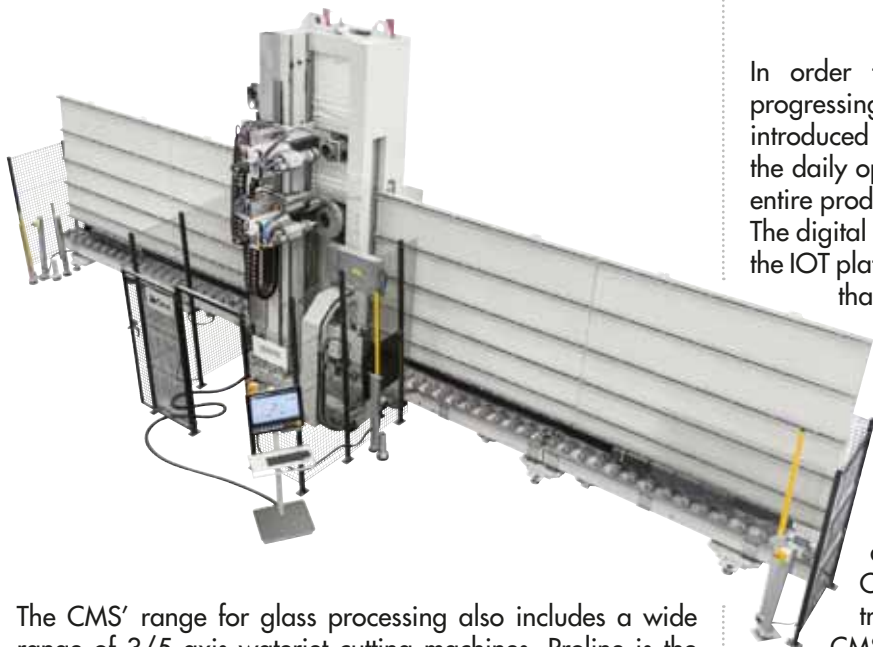


The vertical machining centers are the flagship of the CMS range.

The range includes the vertical CNC machine PROFILE, the drilling machine VERTEC and the new YPSOS.

Ypsos is the best vertical machining center developed by CMS to process float and laminated glass sheets, entirely designed thanks to many decades experience in the tool machining sector. Depending on the configuration chosen, Ypsos can perform operations of seaming, polished and industrial grinding, routing, and co-axial drilling. The machine combines absolute precision and quality with the advantages of productivity and versatility, typically found in vertical processing. Available in 3 standard sizes, it allows for both large and small sheets to be processed up to a maximum of 6000 x 3300 mm (other maximum sizes that can be processed are available on request). Ypsos can be used as a stand-alone machine, in line with a drilling-milling machine, or on a double-glazing line.

water level control for submerged cutting. This innovative, easy configurable concept has not only the abrasive tank installed on-board, but also the electric servodriven high-pressure pump is integrated with the machine frame, a big saving in terms of overall layout.



The CMS' range for glass processing also includes a wide range of 3/5 axis waterjet cutting machines. Proline is the ultimate machine tool specifically conceived and designed with advanced technical solutions for the waterjet cutting technology, in order to achieve unmatched performances. Proline is built around a stainless-steel frame ready for integration with the "Dredge", a fully automated and maintenance free abrasive removal system, and an automatic

In order to maintain the leadership in the continually progressing production world and Industry 4.0, CMS has also introduced new applications and digital services simplifying the daily operations of the operator and management of the entire production process.

The digital services offered by CMS include CMS CONNECT, the IOT platform, perfectly integrated with the CMS machines, that views, analyses and monitors all the data emitted by connected machines supporting the operators' everyday work. The data gathered by the machines in real time becomes useful information to increase the machines' productivity, reduce operating and maintenance costs as well as reduce energy costs.

All machines are equipped with a free remote-assistance programme that allows to link up with CMS remote assistance which can help the operator troubleshoot problems one step at a time.

CMS has also introduced a new Technology Center at the Zogno headquarters (BG). Along with making CMS machining centres available all year round for demonstrations for current and potential customers visiting CMS can provide remote live demonstrations using highly advanced Smart Glasses which, when worn by our technicians, allow them to view the demo directly from their office.



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COMPANY DATA

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Marino Bonetti - Sales Manager

Mother Company

Cugher Glass srl

Annual turnover of the Company

EUR 14,000,000

Percentage of turnover from glass (%)

95

Sales

Domestic 5% / International 95%

Quality certifications

ISO 9001

Area

Office area 600 m² / Plant area 5,600 m²

Number of Employees

100

Founding Year

1967

Planned Exhibitions 2022

Glasstec - Düsseldorf, Germany - 20 / 23 September
GlassBuild America - Las Vegas, USA, 18 / 20 October

SALES NETWORK





PERFORMANCES DRIVING to the FUTURE

when excellence is needed
for Glazing Technology

COMPANY PROFILE

Cugher's success for over 50 years on printing machines for silk-screen printing on glass is the result of an efficient mix of productive resources and cutting-edge technologies and derives from the work of a Team composed by high profile professionals. The production focuses on offering customized and performing solutions for each sector.

AUTOMOTIVE

Fully automated and integrated printing lines for tempered and laminated glasses of windshields, backlites, sidelites and rooftops. The plants guarantee extremely high productivity, print repeatability ($\pm 0,08$ mm) and short cycle time (from 6 to 15 seconds).

HOME APPLIANCE

Solutions for a sector where speed is essential. The production change-over is very simple and fast; it allows to process different glass type very easily and the operations related to different batches can be performed by a single operator.

BUILDING & INTERIOR DESIGN

Architectural LAB, the newest research center, is highly specialized in the creation of long-term specific solutions to manage float, tempered, laminated glasses of civil and industrial applications that go from windows and balconies to furnishing elements and shower enclosures.

SOLAR

Development and engineering of machinery for handling solar panels along the production line and for silk-screen printing of backsheets, guaranteeing wet film uniformity, 98% good parts, 7/7 working plant and high reliability.

Cugher's commercial offer is dedicated to cutting-edge range of product, composed by:

- **Machines for screen printing** that best fits the production needs thanks to options that ensure excellent image definition, precision and uniformity of the ink. Cugher printing machines can be integrated in a turnkey automated plant or used stand-alone with high level of flexibility.
- **Dryers (IR, UV or combined)** with specific features and flexibility to satisfy both silk screen printing and digital printing on glass. Indeed, adapting air recirculation, dryers can accurately dry ink thickness from 15 to 100 microns.
- **Vision systems and quality control** provides opportunity to best control the glass and the print quality in every detail and to monitor and adjust the process through optical systems designed for the automatic screen centering and for the automatic control of broken screen.
- **Dedicated systems for handling, transport and storage** of glasses with any dimension and shape, guaranteeing excellent integration and synchronization with all line components.



DIAMUT - BIESSE SpA

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COMPANY DATA

Mother Company

Biesse SpA

SALES NETWORK

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DIAMUT FRANCE

DIAMUT UK

DIAMUT DEUTSCHLAND

NORTH AMERICA & CANADA

DIAMUT AMERICA & CANADA

OCEANIA

DIAMUT AUSTRALIA & NEW ZEALAND

COMPANY PROFILE

Diamut is the Biesse Group brand that designs, manufactures and distributes a complete range of tools for machining glass, natural and synthetic stone. Its tools can be used on numerical control, automatic and semi-automatic machines. Founded more than 30 years ago, it's the trusted partner of successful companies working in a range of fields from aviation to domestic appliances, and from consumer electronics to furniture and architecture.

Biesse Group designs, produces and distributes systems and machines for processing wood, glass, stone, metal, plastic and composite materials. Founded in Pesaro in 1969 by Giancarlo Selci, it has been listed in the Star segment of the Italian Stock Exchange since 2001. 85% of its consolidated turnover is achieved abroad. It operates in over 160 countries with 14 manufacturing sites and a direct presence in the main world markets. Today it has 4,300 employees.

Diamut has a specific product line for glass and stone processing.





CHEVRON

Ongoing performance

Is the new arrow-cutting profile which has been specially designed to optimize the removal of the plastic film and to ensure removal capabilities that have never been achieved previously with traditional tools. Furthermore, compared to a standard tool, the new V-shaped design limits and delays the generation of the classic cutting at the center of the groove caused by the plastic film which affects the performance of the tool. The new, innovative arrow profile allows the Chevron grinding wheel to channel the water to the center of the tool, facilitating cooling and thus improving the performance and the final result. The tool is available in 100 mm, 150 mm and 200 mm diameters, and can be mounted on both CNC and vertical machines, for trapezoidal, flat and groove profiles.

PRODUCT RANGE

Glass tools

- CUP WHEELS FOR STRAIGHT LINE AND DOUBLE EDGER MACHINES
- CUTTING DISCS
- DRILLS, ROUTERS
- ENGRAVING WHEELS
- PERIPHERAL PROFILE WHEELS
- TOOLS FOR THIN GLASS SHEETS
- TOOLHOLDERS
- WHEELS FOR BEVELLED EDGES
- WRITING BITS AND SPHERICAL TOOLS

Stone tools

- CUTTING DISCS
- DRILLS, ROUTERS
- EDGE POLISHING TOOLS
- FUNERARY ART
- PERIPHERAL WHEELS
- PRESETTER MACHINE
- RECESS DRAIN TOOLS
- TOOLS FOR SINTERED MATERIALS, DEKTON
- TOOLHOLDERS
- WRITING AND BAS-RELIEF



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COMPANY DATA

Contacts

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Enrico Bonanni - Sales Manager

Damelico Gianluca - Technical Manager

Percentage of turnover from glass

90%

Sales

Domestic: 50% / International: 50%





COMPANY PROFILE

DIEFFE MACCHINE designs and develops targeted solutions for water treatment and for the micro-filtration of water for the glass industry.

Thanks to years of experience in solid/liquid separation since 2002, DIEFFE MACCHINE is highly specialized in the development, manufacture and turnkey installation of plants using the most updated and reliable technologies.

The technical staff at DIEFFE MACCHINE carries out exhaustive feasibility analyses, in order to offer clients an accurate technical and economical assessment of the viability of the project and to build plants tailored to clients' specific needs.

DIEFFE MACCHINE provides technical assistance across all phases of machine construction, from order commissioning to plant operation and on-site personnel training.

DIEFFE MACCHINE offers a reliable, easy to operate, wide range of solid/liquid separation equipment:

- Manual centrifuges
- Automatic centrifuges
- Fine filtration
- Micro-filtration
- Reverse osmosis
- Complete plants

Many glass makers are still cleaning out their coolant tanks by hand, or using ineffective underground settling tanks.

These traditional methods simply don't solve the problems, and continue to result in lost machine time (and profits) during clean-outs, increased labour, disposal and coolant costs, and the typical problems caused by dirty coolant (slower operating speeds, decreased cutting/bevelling quality, decreased life of diamond wheels, conveyor bearings and other components, and increased maintenance costs.

- Decreased production costs
- Greater life for diamond wheels, conveyor

- bearings and other components
- Extended coolant life
- Reduced settling tank clean-out
- Reduced maintenance costs
- Reduced disposal costs
- Reduced labour costs
- Increased productivity ND quality
- Less machine/line downtime
- Cleaner coolant increases running speeds
- Less scratches caused by dirty coolant, so less scrap





A Quanex Building Products Company



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Joachim Stoss

Managing Director of Edgetech Europe GmbH,
Vice President International Sales & Marketing

Chris Alderson

Managing Director IG International

Mother company

Quanex Building Products Corporation

Area

Cambridge, Ohio - USA: 38,740 m²

Heinsberg, Germany: 4,368 m²

Coventry, UK: 2,522 m²

Number of Employees

490

Founding Year

1989

Registered brands

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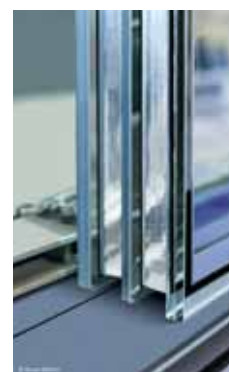
MORE EFFICIENCY IN THE MANUFACTURE OF INSULATING GLASS WITH SUPER SPACER®

The warm edge Super Spacer® prevents the formation of thermal shortcuts at the edges of the insulating glass through which valuable energy is lost. Anyone who decides in favour of Super Spacer® with its several passive house certificates is opting for a mature and future-proof product.

Super Spacer® structural silicone foam design makes the edge seal flexible, cushions the pressure on it so to speak and the risk of breakage for the glass is significantly reduced. Less stress in the edge seal results in an improved seal tightness and durability of the glass units. The full or partial offsetting of the loads acting on the edge seal is an advantage that especially desiccant integrated pre-formed flexible spacers, such as Edgetech Super Spacer® TriSeal™ can claim to possess.

At Edgetech/Quanex we have always embraced a philosophy of "one for all".

Super Spacer® flexible foam spacers are suitable for manual application in custom-made products, automatic processing in the edge seal of classic windows with and without internal or externally applied muntin- and glazing bars, insulating glass units in structural glazing facades and also for hot and cold formed curved insulating glass sections. Furthermore, the structural foam is compatible with all common sealants such as hot melt butyl, polyurethanes, silicone and polysulphide. Last, but not least, insulating glass units with Super Spacer® can be handled, packed and stored outdoors immediately after they have been processed, as the integrated desiccant dries down the interpane cavities very rapidly. Flexible spacers are applied directly in the insulating glass line. Super Spacer® can be applied in various widths via a double-head applicator without interruption and, above all, down to the last millimetre and with no hand touching the glass between the start section of the washing machine and the pick off section behind the sealing robot. Due to the fact they are already factory-equipped with desiccant, barrier film and structural acrylic adhesive, they support automated processes and ensure high levels of manufacturing precision and quality, especially for large-format triple-glazed insulating glass units. So, opt for more efficiency with Super Spacer®.



Planned Exhibitions 2022

We value direct contact with our clients, that is why we will try to attend as many trade fairs as possible.

China Glass - Shanghai (CN) - 13 / 16 April
FENESTRATION BAU China - Shanghai (CN) - 23 / 26 June
FENSTERBAU FRONTALE - Nuremberg (DE) - 12 / 15 July
DAAF - Shanghai (CN) - 31 August / 2 September

glasstec - Düsseldorf (DE) - 20 / 23 September
GlassBuild America - Las Vegas, NV (US) - 18 / 20 October
WINDOOR FACADE EXPO - Guangzhou (CN) - 3 / 13 November
WinDoor North America - Montreal, QC (CA) - 9 / 10 November

SALES NETWORK

GENERAL SALES CONTACT

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FOREL



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Founding Year

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COMPANY PROFILE

Forel is an Italian company and world leader in the design and production of machinery for the flat glass and double glazing industries.

Established in 1976, for more than 45 years Forel has invested, researched and persevered to deliver technical projects using know-how, technical skills and creativity.

"Made in Forel" technology covers the following families of products: Vertical Cutting Line for Laminated Glass, Laminating PVB line, Edging Machines, Sorting System and IGU Machinery.





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COMPANY PROFILE



Founded in 1990, **Forvet** has always aimed at the most advanced market's niches, offering innovative, hi-tech and reliable glass working machines.

Forvet thinks "out of the box", constantly performing its search for special solutions that will fit customer needs perfectly such that, with each choice being excellence-driven, nothing standard is accepted as making the grade.

As with everything in our shared history, from the stone age up to the era of space exploration, progress has always been triggered by ideas.

Every invention, every discovery, every improvement that's afforded human beings the possibility to evolve has been propelled by ideas - however good or bad, right or wrong, motivated or unmotivated.

By the same token, Forvet has invented an entirely new way of conceiving glass working processes: from the first CNC drilling machine of its history through to grinding and polishing lines along which machine heads revolve around the glass, to the Combiflex island - a veritable jewel of technology that's capable of simultaneously performing seven different processes. To this we add the Sortiflex - a glass handling, storage and furnace pre-bed optimization system, as well as the KEY, which is a dedicated cutting/breaking system for straight shape production that feeds glass panels with the "just in time" needs of Forvet's production line.

Fresh ideas, constantly supported by significant R&D investments, have jointly allowed the company to grow at a steady pace. The registration of numerous worldwide patents accounts for an evolution of ideas that become projects - resulting thereafter in the very customer satisfaction that marks Forvet's most distinct commitment.

Forvet is indeed a people-centric company whose heart beats with enthusiasm and passion. Every activity is powered by the keen awareness that customers love to make business with people they like.

As its main target, quality is achieved through the company's robust, excellence-oriented business culture, which is based upon a highly-specialized staff that's both motivated and strong.

On October 2021, Forvet was acquired by the Biesse Group. This allowed the latter to grow still further and thus complete its range of glass machining centres.

Thanks to the introduction of Forvet's proprietary technologies, the group can now bolster its offer towards the high-end of the market by offering highly-automated machines and systems that are also customised and unique.

By so doing, Forvet has made significant gains in terms of in-depth commercial distribution - thanks to Biesse's widespread footprint within all world markets.

As international group, Biesse designs, manufactures and distributes both systems and machines for processing wood, glass, stone, metal, plastic as well as composite materials - all aimed at the furniture, housing & construction, automotive and aerospace sectors. Founded in Pesaro in 1969 by Giancarlo Selci, Biesse has been listed in the STAR segment of the Italian Stock Exchange since 2001. 85 percent of its consolidated turnover is achieved abroad. The group operates in over 160 countries, with 14 manufacturing sites and a direct presence within main world markets. Its customers include industry leading companies as well as some of the most prestigious names in Italian and international design. Biesse's employees number 4.300 today.

FRANCESCA FC 1250 HO

The FRANCESCA FC 1250 HO is a glass working Numerically Controlled (NC) drilling centre, capable to perform drilling, countersinking and milling operations on flat glass sheets, including "out of square" pieces.

The FC 1250 HO was built over years of experience gained with the previous FC1250 model.

Based on the same production philosophy, FC 1250 HO was improved in order to ensure space reduction, productivity increase, operational cost reduction and energy saving. The machine dimension is minimized, an area of 3x3 meters in total, though maintaining the possibility to process 5 sqm glass.

The FRANCESCA FC 1250 HO AIR with vertical or horizontal loading/unloading is the latest evolution of this now proven drilling technology.



FRANCESCA FC 16M 1600 WJ

The NC work centre Francesca FC 16M 1600 WJ is a new machine concept that is able to combine two production technologies, managed by single Numerical Control. The brilliant news conceived by Forvet is to join the drilling basis realized with diamonds tools and the water jet cut. It is traduced in a big advantage for the production

and the operator can choose which type of cuts to use, depending on the work to be carried out.

Forvet water jet technology, developed according to Company philosophy, allows to perform fully automated loading, positioning, processing and unloading operations.



FRANCESCA PORTALS



The Francesca FC 2000/2600/3000 is Forvet's answer to big glass sheets processing problems. The 3300 model processes two glasses simultaneously. Forvet patented system based on dynamic vacuum belts provides the support during transport. The vacuum belts maintain the glass in its correct position along the entire length of the glass. This special feature allows to process low-E magnetron glass without any contact point with its surface.

Francesca FC machines is the only equipment able to carry out drilling and milling fully automated operations, including loading, positioning, setting and unloading.

CHIARA EDGE PROCESSOR



The Chiara project has revolutionized the grinding sector thanks to the high flexibility this equipment ensures. Chiara can produce 1,000 pieces completely different from each other in size, thickness, even out of square, by processing them as all equals.

CHIARA MULTIFLEX



Chiara MTP10 MULTIFLEX is designed to produce large volumes up to 3,300x18,000mm with 10 spindle grinding heads. The integration with a NC work centre enables to carry out radii corners, cut outs, milling (also polished) as well as drilling implementations, without repositioning the glass. It also allows the production of flat and/or pencil polished edge finish. The machine can also manage two glasses (even different from each other) simultaneously. As the glass flow is in a straight line, the Multiflex uses a third of the space required for a traditional double edger machine, for the same maximum dimensions.

COMBIFLEX



The experience gained with the Chiara and Francesca machines and the union of different processing technologies on the same glass, has been extended to realize something unique: the COMBIFLEX work island – COMBination and FLEXibility, which boasts more than 10 worldwide patented systems. The machine is able to perform automated loading, grinding, polishing, drilling, notching, water jet, rounded edges, counter-sinking, washing, drying and automatic unloading operations on flat glass and also out of square. All this in less than 32mq. COMBIFLEX has been created with the possibility to evolve, according to production needs. The machine is already set to be implemented over time, without needs for long machine stops and/or additional wirings. With full configuration, the COMBIFLEX becomes an independent stand-alone productive island, where the positioning of the rack sheets is the only manual operation required.

AUTOMATIC GLASS HANDLING AND STORAGE SYSTEMS FORBOT

Introduced to the market in 2018, the Forbot is a patented automatic glass handling system. It creates an automated link between the working zone (grinding, drilling and milling) and the successive processes (tempering, printing etc...). It is able to temporarily disjoin the upstream and downstream zones, managing a buffer of configurable dimensions. During the storage phase on a dedicate glass stock rack, an

innovative patented system separates glass sheets with a wire automatically recovered during the unloading process.



SORTIFLEX

SORTIFLEX is the latest Forvet invention, presented during the Forvet Showcase in February 2021.

Sortiflex was designed to meet the need for process flexibility that many glass Companies today have to cope with; Sortiflex works as a temporary buffer to optimize the flow of glass from different origins and convey them to a single exit, or from a single origin to several exits. The sheets are removed from the processing line and through a dedicated shuttle.



The glass storage buffers are built with a patented system that provides two overlapping storage levels that double the number of available positions with the same footprint, thus increasing storage potential without requiring more space in the plant. Depending on the length of the glass, each buffer position can accommodate more pieces.

The SORTING optimization software developed by Forvet enables fully automated in-line control of the production cycle. The software dialogues with the different production stations to optimize their processes and also gives the operator a real-time view of the current production status.

Sortiflex, like the whole range of Forvet solutions, is customizable to the specific needs of customers.



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COMPANY DATA

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Paolo De Borzatti - Sales Director
Fabio Gabrieli - Technical Director

Percentage of third-party turnover (%)

5

Percentage of turnover from glass (%)

95

Sales

Domestic 20% / International 80%

Area

Office 280 m² / Plants 1250 m²

Number of Employees

7

Founding Year

1970

Patents Obtained in

4

Registered Brands

2

Suppliers Name

Fratelli Pezza Srl

Planned Exhibitions 2022

Glasstec - Düsseldorf, Germany - 20 / 23 September

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COMPANY PROFILE

Fratelli Pezza S.r.l., founded 1970, is undisputed market leader in the manufacture of **sandblasting cabins and marking equipments for flat glass**. The company has always focused on the development of its products following the trends and the needs of the sector and has recently launched on the market the new **Mistral EV+** series, full optional sandblasters that comply with the standards of **Industry 4.0** and allow to perform many blasting effects, in particular **shading and zonal blasting**. Interconnection, digitalization of the production process and constant monitoring of performance represent key factors for the competitive development of any glasswork. The cabins, equipped with an **abrasion-resistant touch screen display**, enable to manage an unlimited number of working programs, copy, rename, delete them or, on the contrary, backup them. There will be **counters** for monitoring the process, a report of any alarms and **predictive maintenance** information. In addition to this, when a sandblasting area is entered into the program it is displayed through a **graphic simulator**. Fratelli Pezza product range is also vast and varied and truly adapts to the needs of any customer. The **ZEPHIR+** series, for example, is simple and economical and it is ideal for small glazing companies. All automatic cabins are available in three sizes (1200 mm, 1800 mm and 2600 mm, open topped) and are also equipped with a revolutionary system that prevents the accumulation of static electricity in the cabin, **MirrorProtection**: this system enables mirror manufacturers to no longer have to worry about the phenomenon of static electricity sparks. Considered the growing demand



of marking on glass, a result of the increasingly stringent regulations for glass items to be used in the building sector, the company has devoted resources to the expansion of its original line of **sand-jet marking equipments**. The product range now includes two manual and portable devices, the **MARKER T** line, and four fully automatic equipments, the **EASYMARKER** series. All models are available in two versions that provide a maximum diameter of the logo of 25 mm (0.984 in) and 30 mm (1.18 in) respectively, with the latter that enables to convey a large number of information. Fratelli Pezza marking devices provide a clear, sharp and permanent mark, and can be used on any type of glass.

MISTRAL 260 EV+



GLASSCOMPANY



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COMPANY DATA

Contacts

Claudio Bernabucci - CEO

Annual turnover of the Company

EUR 2,499,421

Sales

International > 70%

Banks

BPER - CREDEM - Banco BPM

Area

Offices 250 m² / Plants 550 m²

Number of Employees

9

Third-party suppliers

Pesaro area, as well as international suppliers

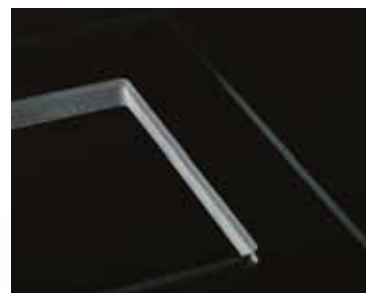
Planned Exhibitions 2022

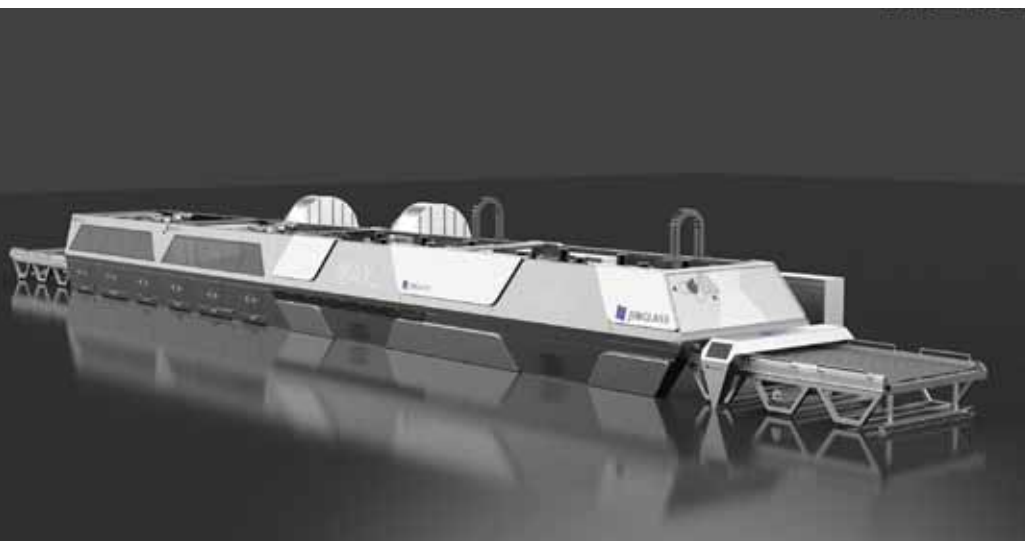
Glasstec

Düsseldorf, Germany - 20 / 23 September

PRODUCT RANGE

- Laser cutting, engraving and ablating machines
- Fire resistant glass production systems
- Flat and bent glass tempering furnace
- Vertical and horizontal washing machines
- Laminating furnaces and turnkey plants
- Glass coating systems





COMPANY PROFILE

Founded in 2001 thanks to more than 30 years experience of its owner Claudio Bernabucci and the continuous research and development in innovative products **Glass Company** has become one of the leading companies in Italy for special glass processing machines and equipment.

Glass Company designed plants are equipped with highly advanced technology and receive extremely positive feedback from the sector.

For the research and innovation purposes Glass Company has introduced **GlassMek division**:

- **LASERMEK**, a highly-configurable modular machine for the laser engraving and ablation of any type of coating and silvering on glass. The machine has been improved with Scanner technology which allows to engrave paint or coating leaving the glass surface completely transparent, with a very high processing speed. Particular interest has been

addressed to the Low-E coating engraving, to produce heating glass for refrigeration sector and for any other sector where anti-fog glass are required, thanks even to a dedicated software HG SoftMek for the automatic calculation of the coating cutting to determine the glass temperature.

Also LaserMek has been expanding with a **DRILLING** Laser which allows to obtain even notches and grooves on the glass edge. The drilling can be of any shape starting from the classic round hole to holes of any geometry (oval, rectangular, trapezoidal, etc.) with a maximum size of 80x80mm which can reach

100x100mm by using very sophisticated optics.

Thanks to a Laser source advanced technology and a dedicated software various solutions have been developed for **CUTTING** monolithic glass up to 25mm thickness. The cut is perfect and without chipping and is suitable for tempering the glass

- **FIREMEK**, is an automated turnkey system designed to Fire-resistant glass production. Particularly appreciated for its ease of use and affordable price which makes E, EW and EI glass production not only the prerogative of a few producers, but even of small and medium firms.
- **PLASMEK**, an innovative technology, created thanks to Glass Company's experience, uses atmospheric pressure plasma for cleaning and treatment of flat glass surface, increasing the adhesion of the applied products in the immediate subsequent stages of processing.

Glass Company Srl has been continuing for over 15 years its collaboration with Jinglass for flat and bent glass Tempering furnaces supplying with very high technology plants such as the new glass tempering furnace VULCAN.

Not at last Glass Company directly supply assistance and technical advice from Italy to give customers a quick response to their needs with the high professionalism already known in the glass field.



glaston
seeing it through



GLASTON CORPORATION

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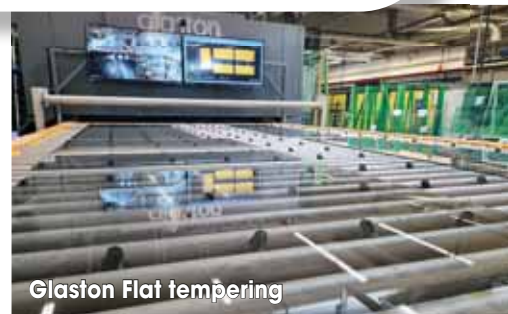
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Glaston MULTI'ARRISER



Glaston flat laminating



Glaston Flat tempering

COMPANY DATA

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<https://glaston.net/contacts/>

Annual Turnover of the Group

EUR 182.7 million

Number of Employees

750

Registered Patents

257

Planned Exhibitions

Glaston will be present at major
glass exhibitions in 2022

COMPANY PROFILE

Glaston in brief

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

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

NEW DIGITAL SOLUTIONS ENABLE BETTER BUSINESS

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



Glaston heat treatment



Glaston TPS Applicator



Glaston CHAMP

Glass heat treatment

Bringing you built-in intelligence with our machinery has been our core focus for quite some time. The latest versions of Glaston flat glass tempering furnaces **Glaston FC Series**, **RC Series** and **Jumbo Series** incorporate high levels of automation and intelligent process control.

Some of the latest innovations in the automation of the flat tempering process are the online fragmentation prediction for every glass and the white haze detection using Artificial Intelligence (AI). The **tempering process autopilot** reduces the operator's influence and offers process control without parameters.

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

Glaston ProL flat glass lamination line provides unprecedented flexibility for mixed production. The ProL convection heating chamber makes switching between glass types and different 'sandwiches' easier than ever. The whole line, from glass handling to the latest PVB cutting technology, has been designed for flexible operations.

The trend in flat lamination is a growing use of structural interlayers and for that Glaston has introduced the new convection control technology, offering a significantly wider operating window even with complex laminates.

A higher degree of automation is also on the agenda for the laminating process and with the lamination process autopilot, the furnace will learn to achieve the most optimal way of running instead of operators having to do adjustments manually.

Insulating glass manufacturing

The advanced architectural glass **TPS® (Thermo Plastic Spacer)** technology provides processors with end products to satisfy the toughest warm edge demands. Insulating glass units made with TPS® improve energy efficiency in buildings, increase durability and reduce energy costs.

A major advantage of TPS® is its production flexibility: the direct application of the Thermo Plastic Spacer onto the glass lite significantly simplifies the processes for I.G. manufacturers. The entire production mix can be manufactured on one line on the various TPS® I.G. production lines – from individually configurable solutions via fast system solutions with shortest cycle times, up to maxi size solutions for glass sizes up to 9 m in length.

Irrespective of whether a fully automatic line for I.G. production with warm-edge spacers or an entry-level solution: At Glaston every I.G. manufacturer will find the line or machine that meets their requirements.

The benchmark in this sector is the modern **Glaston SPEED** production line, which can be used to produce triple I.G. units at the same time it takes other lines to produce double I.G. units. At the other side of the product range is the **Glaston COMFORT**, the ideal entry-level solution to industrial I.G. production. It cannot be overlooked – the trend is always heading towards bigger I.G. units and facade elements.

With the **Glaston JUMBO** production line, XXL units up to 18 meters.

The new arripping machine **Glaston MULTI'ARRISSER**, is a fast and user-friendly solution for the high-quality arripping of

straight glass edges. The proven Glaston cup wheel technology, guarantees the best arripping quality at low operating costs. The cup wheels adapt individually to different edge geometries of rectangular and shaped formats. Glaston's cup wheel technology has a 5 to 10 times longer lifetime than other systems, leading to higher productivity. One cup wheel can be used for multiple functions – arripping of the edge, basic edge planing, and corner dubbing.

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

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

Automotive & Display glass processing

Glaston CHAMP Evo automotive glass pre-processing solutions enable to enhance efficiency in the daily production of windshields, sidelites, backlites or quarterlites. This means a yield greater than 98%, shorter cycle times, reaction-fast software to minimize downtime, and an excellent cost-per-unit ratio.

The new CHAMP Evo machine generation includes two optimization features: a linear drive instead of the spindle on the grinding machine for higher precision and more dynamic movements, and also a honeycomb table on the grinding machine for higher precision and more dynamic movements.

With significantly improved performance parameters, the new **Glaston HYPERFEX grinding wheels** represents a revolution in edge grinding, with a holistic view of the overall process in pre-processing of glasses for different application areas.

Glaston BRIGHT Evo display glass solutions are individualized production systems for automatic cutting, breaking, grinding, and drilling of thin glass down to 0.4 mm in thickness. These thin glasses are used for monitors, TV screens, mobile devices as well as automotive glass displays. The machine configuration offers not only a process-optimized line layout but also various expansion options using upgrade kits.

Glaston Matrix Evo, the automatic windshield bending furnace for fast, efficient, and high-performance windshield production, features a new windshield press for bending deep sags and wraps around corners to match the tightest tolerances. Matrix Evo is available with different size and capacity configurations to reduce cycle times. Glaston's active convection technology in automotive glass heat treatment improves the process with coated, printed, and complex glass types and enables faster heating.

Glaston HTBS bending and tempering system covers a wide range of application areas in the automotive, appliance, and furniture glass industries. With its flexibility and high end-product quality, the HTBS furnace allows meeting evolving market requirements and processing multiple glass sheets in one production load. Glaston HTBS is available with the most dense control matrix in the market to meet the highest quality standards with bent tempered glass.

More about our products and services: www.glaston.net



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COMPANY DATA

Contacts

Markus Gruber - Senior Vice President Business Unit Glass

Florian Nagler - Vice President Sales Business Unit Glass

Number of Employees

1500

Founding Year

1960

Manufacturing locations

China: Jiashan

Germany: Hammlar

Romania: Iași

USA: Newnan, GA

Quality certification

DIN EN ISO 9001

DIN EN ISO 14001

DIN EN ISO 50001

DIN EN ISO 45001

COMPANY PROFILE

Grenzbach supplies plants for the production and further processing of industrial flat glass and has a wealth of experience with over 300 plants installed. Our industry experience is also rooted in the know-how of CNUD EFCO and GFT, which became part of Grenzbach Group in 2019. Thus, Grenzbach covers a large part of a glass production line: from tin bath, annealing lehr to cold end and to transport the final product to the warehouse. Grenzbach regards itself as a reliable partner that accompanies its customers throughout the entire product lifecycle – customers benefit in many ways from the comprehensive expertise in the hot and cold areas. Let us be your guide through the world of glass



Cutting Technology

About Grenzbach

Grenzbach is a leading automatization solution provider for the global glass, building material and intralogistics market. In addition, the company develops new application areas, such as various recycling processes, friction stir welding, the automatization of industrial additive manufacturing or digital networking. Grenzbach ranks among the international technology leaders in its markets. The global manufacturing footprint with production sites in Germany, Romania, the US and China, as well as additional worldwide locations ensure customer support on-site. More than 3,000 systems installed in more than 55 countries stand for quality and reliability. Since the company opened its doors over 60 years ago, it has been owned by the founding family. With an export ratio of more than 90 percent, Grenzbach is a global player.





Annealing Lehr

PRODUCT RANGE

Grenzbachs mission is to cover the journey glass takes from hot to cold. We offer a one-stop solution that encompasses the tin bath to the annealing lehr all the way to the cold end to conveying the finished product to the warehouse.

- Tin bath
- Annealing lehr
- Waste heat recovery
- Utilities and power supply
- Cold end: Conveying, cutting, stacking technology
- Metrology
- Warehouse logistics
- Digitalization platform SERICY



Tin Bath



New Conveying Technology



Digitalization Platform SERICY



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Ingolf Ripberger - COO

Annual Turnover of the Group

EUR 104,000,000

Percentage of Turnover from Glass

100%

Quality Certifications

DIN EN ISO 9001:2015

Number of Employees

750

Registered Trademarks

SortJet, ReMaster, Optimax

Planned Exhibitions 2022

Glasstec - Düsseldorf, Germany - 20 / 23 September
GlassBuild America - Las Vegas, USA - 18 / 20 October
Glasstech Asia - Singapore, Singapore - 26 / 28 October
Glass Industry Fair - Posen / Pozna, Poland - 23 / 25 November



COMPANY PROFILE

Loading

For loading **HEGLA** offers different solutions such as Automatic Floor Loading Systems, Compact and Gantry Loaders. Alongside security aspects for operators, this equipment is suitable to increase output and expand the possibilities of using special glass types. Double sided floor loaders of 3 x 2 metres and 6 x 3 metres are available with up to 6 positions (12 racks), while the gantry systems are infinitely variable and can use 'A' and 'L' frames as well as compact storage systems. 6 x 3-metre gantry loaders can also load directly from Float Liner delivery racks dropped in the crane area.

Float Glass Cutting

With its wide range of cutting systems, **HEGLA** offers a perfect solution for each and every customer needs. For the industrial volume cutting of float glass for example the Galactic with its shortest processing time and full automation was invented. **RAPIDLINE**, with its optional grinding device for low-E, is **HEGLA's** universal cutting machine for float glass.



**Linear Driven Cutting Machine
for float glass: Hegla Galactic**

ProLam LSR – Greater productivity for LSG Cutting

With the ProLam LSR, LSG cutting is faster than ever before. Thanks to the newly developed laser separation technology, the film can be heated up much faster than before. The overall process has also been accelerated, increasing productivity by 20 per cent or more compared to conventional cutting systems. The system's high performance is not only reflected in its cycle time and precise cutting results - with the new laser technology the surrounding glass area remains cold. This systematic improvement counters downstream delamination and visible blurring around the edges.

SALES NETWORK

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ProLam LSR: Improved productivity and edge quality thanks to laser diode heating technology

Laser Markings for Glass

The ES-Guard laser marking system of HEGLA boradient enables a non-destructive marking of coated and uncoated glass surfaces. The glass is marked using our reliable and patented laser transfer technology, UniColor. As an added advantage, the machine is designed for fully automatic operation on production or cutting lines. Besides, thanks to the laser technology the markings are attached within the panel for its entire life cycle, giving us important information that is collected and saved.

ReMaster

The ReMaster for optimised processing of remnant sheets is an innovative system that allows sub-plates of any type be stored without manual handling above the cutting line. Without interrupting the production process the remnant can be used for following glass runs, thus reducing sub plate waste drastically. This creates the basis for efficient production of IG-units of all glass types and thicknesses. It offers optimal

INDIA

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SPAIN

R. MEYER S.L., ROLF MEYER

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E-mail: rolf.meyer@rmeyersl.com



HEGLA SortJet: Invented to reduce material costs and improve production flow

utilization of subplates, decreases material costs and reduces unnecessary handling.

SortJet

With the need for more and more automation and high-speed operations in glassworks, HEGLA invented the SortJet - An innovative product that not only improves material flow but also reduces material costs to a minimum. After cutting the glass in random order to reduce offcuts, all panes are stored in the dynamic buffer of the SortJet. Just 250 bays can accommodate multiple panes to buffer all the glasses in the production process for an insulation glass line.

When the panes for an IG-unit are required on the line, the individual panes are handed over directly in production orientation and sequence. The separate processes in front of and behind the dynamic buffer contribute towards a production process that significantly reduces downtime while at the same time accelerating the material flow and reducing cutting costs.

helios quartz



HELIOS ITALQUARTZ Srl

Production Site / R&D and Technical Center

Viale delle Industrie, 103/A - 20040 Cambiago (Mi) - Italy

Tel.: +39 02 95349318 - Fax: +39 02 95345085

E-mail: italy@heliosquartz.com • www.heliosquartz.com



COMPANY DATA

Contacts

Armando Giro - Chairman

Luigi Gastaldo - CEO

EUROPE (Headquarters)

HELIOS QUARTZ GROUP SA

Production Site / R&D and Technical Center

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Fax: +41 (0) 919233557

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www.heliosquartz.com

Sister Companies

AMERICA

HELIOS QUARTZ AMERICA INC.

**Distributor – Logistic and Technical center
for North America region**

8444 W. Central Ave.

2 Sylvania, OH 43560 - USA

Tel.: +1 (419) 882-3377 - Fax: +1 (419) 787-8307

E-mail: america@heliosquartz.com

www.heliosquartz.com

CHINA

SHENYANG HELIOS TECH. CO. LTD

**Distributor and Logistic center
for China Mainland region**

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Changjiang S.St. Huanggu District

Shenyang - China

Tel.: +86 024-31632308 / 024-31653319

E-mail: china@heliosquartz.com

www.heliosquartz.com

ASIA

HELIOS QUARTZ ASIA LTD.

Distributor and Logistic center for Asia Pacific region

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Quarry Bay, Hong Kong - Hong Kong

Tel.: +86 (132) 38830625

E-mail: asia@heliosquartz.com

www.heliosquartz.com

TURKEY

HELIOS QUARTZ TURKEY

Commercial branch for Turkey region

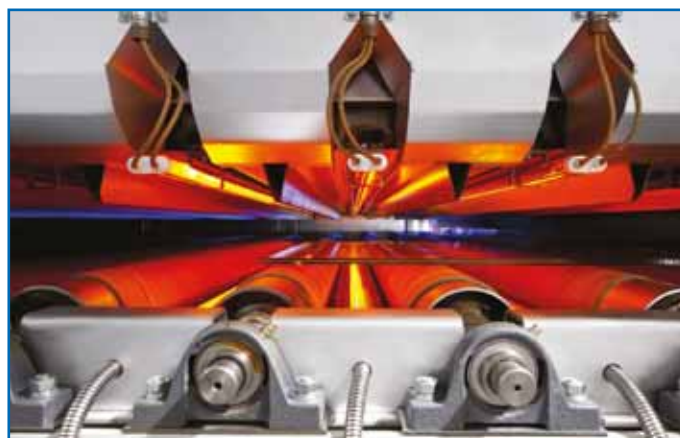
Mimaroba Mh. Mustafa Kemal Bulvarı.

Colorist A Blok. Kat 3 D.50

Mimaroba, Büyükçekmece - Istanbul

Tel.: +90 8502281908 - E-mail: turkey@heliosquartz.com

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Planned Exhibitions 2022

Ice Europe

Munich, Germany - 15 / 17 March

InPrint Munich

Munich, Germany - 15 / 17 March

China Glass

Shanghai, China - 13 / 16 April

China Plas

Shanghai, China - 25 / 28 April

PaintExpo

Karlsruhe, Germany - 26 / 29 April

Print4All

Milan, Italy - 3 / 6 May

Fespa

Berlin, Germany - 31 May / 3 June

Glass South America

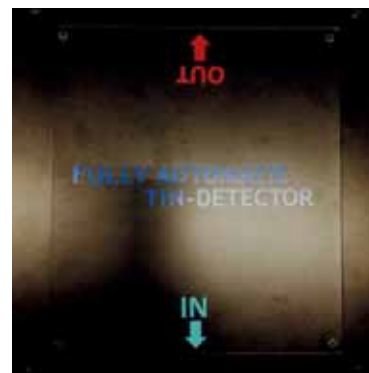
Sao Paulo, Brazil - 29 June / 2 July

Glasstec

Düsseldorf, Germany - 20 / 23 September

K 2022

Düsseldorf, Germany - 19 / 26 October



COMPANY PROFILE

Helios Quartz was founded in 1940 as a family-owned company in the busy city of Milan. Since then, it has grown and developed, becoming an important group of companies with two production plants, the historical one in Italy (Helios Italquartz S.r.l.) and the new facility in Switzerland (Helios Quartz Group SA), combined with distribution channels in the US, South America and Asia.

Helios Quartz is now an international player and a well-known supplier for Quartz Glass processing and the manufacturing of Infrared Emitters and Ultra-violet Lamps. Helios Quartz also produces Specialized Equipment for Industrial, Scientific and Medical applications. TÜV certified, Helios Quartz is a very flexible and dynamic group which is deeply oriented towards internationalization and which is living a strong and stable growth phase with great momentum: in the last 10 years, Helios Quartz has opened commercial branches in the US (Helios Quartz America), in China (Shenyang Helios Tech) and Hong Kong (Helios Quartz Asia).

Thanks to its experience in different fields

and to its cutting-edge testing laboratory located in the historical Helios Italquartz S.r.l. plant in Cambiago (Italy), Helios Quartz can advise customers and provide them with the best solution for each and every specific application.

The focus of all HELIOS QUARTZ companies is to be a partner for their customers, not only a regular supplier.

Helios Quartz product range for the glass industry includes:

- QUARTZ INFRARED HEATERS in short, medium and fast medium wavelength, in single and twin tube, with or without gold reflector for:
 - Laminating lines (plastic film coupling);
 - Screen printing lines;
 - Bending furnaces;
 - Fusion furnaces;
 - Laminated glass cutting tables;
- INFRARED MODULES: complete infrared solutions, designed and customized according to customer needs, and ready to be integrated in existing machines and production lines;

- UV POLYMERIZATION EQUIPMENT: UV high and medium pressure lamps for drying screen printing of reactive inks, paints, coatings and adhesives for the decorating and furnishing sector;
- TIN DETECTOR EQUIPMENT: UV black light devices which are able to detect the tin coated side of the float glass even under high brightness conditions. This kind of detection is crucial before processes such as laminating, mirroring, printing and decorating. Helios Quartz offers two type of device:
 - MANWOOD 25-N: manual equipment.
 - AUTOMATIC TIN SIDE DETECTOR: compact automatic version of this device. It can be fixed directly on the glass transportation line, before the production process, in order to check each and every piece of glass. A user-friendly PLC helps the operator in calibrating and managing the different recipes.



HORN GLASS INDUSTRIES AG

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COMPANY DATA

Contacts

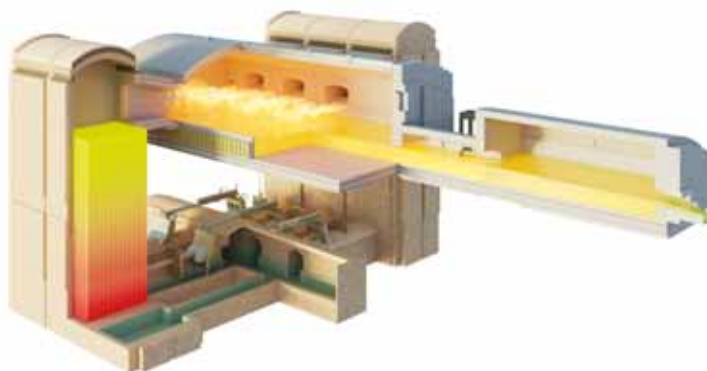
Stephan Meindl - President and CEO
Ekaterina Firsova - Executive Director Glass Plant Technology
Ulrich Imhof - Executive Director Container/Special Glass
Andreas Kopp - Managing Director HORN BAU & SERVICE GMBH

Number of Employees

Approx. 400 (worldwide)

Company founded

1999





COMPANY PROFILE

At its location in Plößberg, Germany, **HORN Glass Industries AG** designs and makes glass melting technology and turnkey projects for the float and container glass industries. The company's high-performance glass melting furnaces and turnkey projects are installed at glass manufacturers all over the world and serve the production of beverage bottles, food containers, drinking glasses, glass panes, glass tubes, glass fibres and special glass.

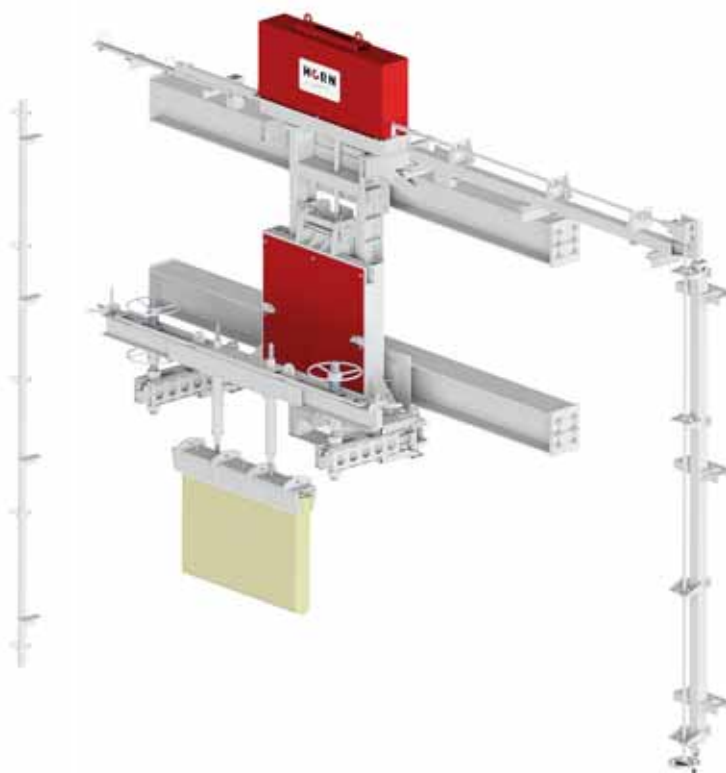
With more than 135 years of experience, HORN has been the specialist and expert in the field of the construction of glass melting furnaces for many years, and is now one of the industry leaders in the implementation of turnkey projects.

Subsidiary companies in China, Malaysia, India, Croatia, Ukraine, Brazil and the Czech Republic add value to global customers, offering proximity and prompt response in the global market. Almost 90% of HORN's products are exported from Plößberg in Upper Palatinate to more than 75 countries worldwide.

HORN offers its customers complete support and a helping hand at all times. HORN can offer tailor-made solutions because we have a very high level of vertical integration for all our products.

HORN has ventured into unknown areas, e.g. in the construction of its own tin baths and associated equipment. HORN manufactures a large number of products in its workshops in Plößberg:

- Glass melting furnaces (container glass, float glass, etc.)
- Tin baths
- Batch chargers
- Stirrers
- Gas, oil and heavy oil heating for melting furnaces
- Tin bath equipment such as top roller, pusher, flags, fences
- Tweel
- Dross boxes
- Shield gas supply stations



PRODUCT RANGE

MELTING FURNACES
TURNKEY TECHNOLOGICAL PLANTS
PROJECT ENGINEERING
FINANCING & AUTHORISATIONS
PROJECT MANAGEMENT ON SITE
TRAINING
OPERATIONAL SUPPORT
TIN BATHS

HEATING EQUIPMENT
CONTROL EQUIPMENT
ELECTRIC BOOSTING SYSTEMS
BATCH CHARGERS
MEDIA SUPPLY EQUIPMENT
SERVICE WORKS
FOREHEARTHS



IMMES Srl

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COMPANY DATA

Contacts

Paolo Reffo Scarso - Sales Director

Annual turnover of the Group

EUR 7500

Annual turnover of the Company

EUR 7500

Percentage of turnover from glass (%)

80

Percentage of third-party turnover (%)

20

Sales

Domestic (26%) / International (74%)

Banks

Unicredit Bank Group - Italy

Area

Offices 550 m² / Production 4000 m²

Number of Employees

29

Founding Year

1989

Registered Brands

IMMES - DTP - SRS

Parent and Sister Companies

IMMES BRASIL

San Paolo - Brasil

Planned Exhibitions 2022

Glass South America - Sao Paulo, Brazil,
29 June / 2 July

Glasstec - Düsseldorf, Germany, 20 / 23 September
GlassBuild America - Las Vegas, USA, 18 / 20 October

Veteco - Madrid, Spain, 15 / 18 November

Glasstech Mexico - Guadalajara, Mexico,
23 / 25 November

COMPANY PROFILE

Founded in 1989, **IMMES** initially built and assembled wooden structures of medium-heavy dimensions.

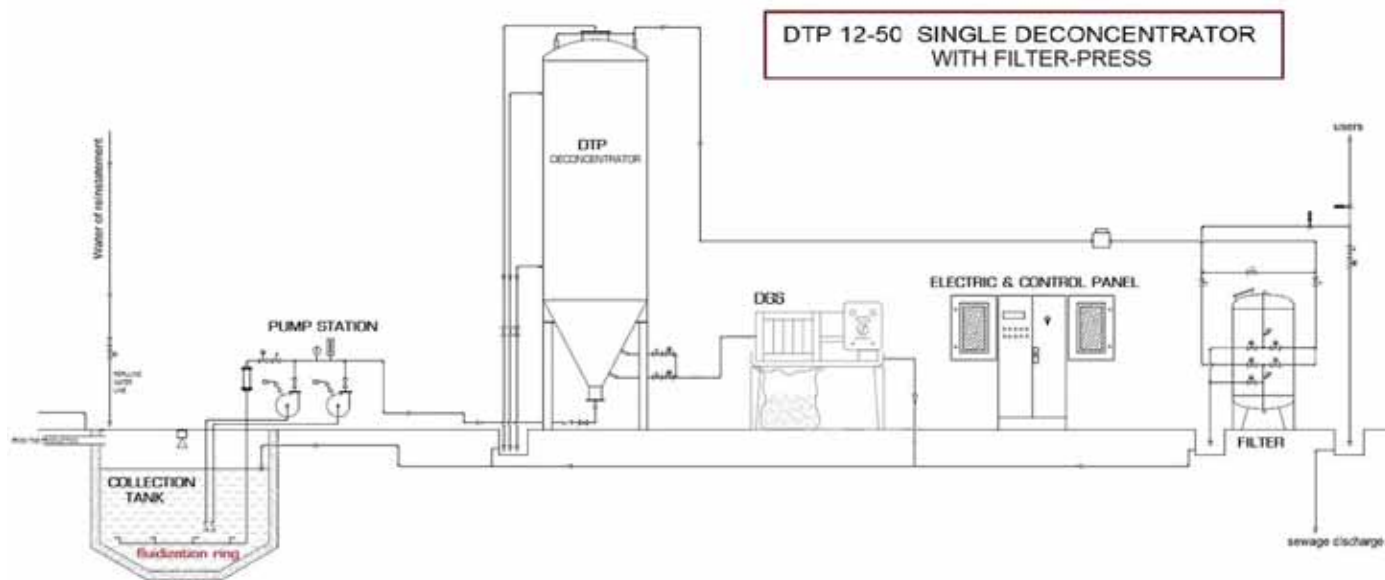
The young company grew quickly, thanks to a passion for work coupled with the great carpentry industry experience of business partners Giuseppe Comberlato and Giulio Vettorato. A technical office was soon opened to begin planning and producing innovative plants and machinery whilst jointly offering to clients customized, advantageous solutions. Being directly managed by the two partners, technical and design solutions accompanied by acute attention to detail as well as prompt assistance service all united to afford the company great opportunities - thus confirming IMMES as a quality brand. By the 90's it already counted more than 20 employees, which precisely coincided with the years that saw the first system for industrial water treatment - an event that was to profoundly mark the company's future.

At that, the water treatment sector grew exponentially, leaving IMMES unaffected by the initial years of the crisis that



spread from 2007, both throughout Italy and Europewide. The company then attained to 150 installed water treatment systems by 2009, further realizing many plants for the glass industry. The following year marked the start of IMMES' relations with foreign markets, leading up to 2021 and an excess of 500 installed plants - and the story goes on!

DTP TREATS WATER BY A COMBINATION OF PHYSICAL-DYNAMIC SEPARATION AND A PROCESS OF FILTRATION
 Technical scheme



INTERMAC



INTERMAC

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COMPANY DATA

Contacts

Lanfranco Fontanelli - Glass, Stone and Advanced
Materials Sales Director

Mother Company

Biesse SpA

Number of Employees

4.300

Founding Year

1987



SALES NETWORK

EUROPE

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INTERMAC AMERICA

Charlotte, NC - Tel. 877 824 3773 / Fax. 704 357 3130

E-mail: marketing@biesseamerica.com

LATIN AMERICA

INTERMAC BRASIL

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OCEANIA

INTERMAC AUSTRALIA

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INTERMAC NEW ZEALAND

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E-mail: sales@biessenewzealand.co.nz



COMPANY PROFILE

Intermac is the Biesse Group brand that designs, manufactures and distributes machines and systems for processing glass, stone and metal. Founded in 1987, it has become a reference name for companies working in various industrial sectors from construction to furniture, and from automotive to aviation.

Biesse Group designs, produces and distributes systems and machines for processing wood, glass, stone, metal, plastic and composite materials. Founded in Pesaro in 1969 by Giancarlo Selci, it has been listed in the Star segment of the Italian Stock Exchange since 2001. 85% of its consolidated turnover is achieved abroad. It operates in over 160 countries with 13 manufacturing sites and a direct presence in the main world markets. Today it has 4,300 employees.

PRODUCT RANGE

TABLES

FOR FLOAT GLASS CUTTING

Genius RS-A

Genius CTA series

Genius CT-Plus series

Genius CT-RED series

TABLES FOR LAMINATED GLASS CUTTING

Genius LM series

Genius LM-A series

LINES FOR LAMINATED OR FLOAT GLASS CUTTING

Genius Lines & Systems

WATERJET

Primus series

DOUBLE EDGING MACHINES AND SYSTEMS

Busetti F-P series

Customised solutions

WORK CENTRES

Master 23

Master ONE

Master series 3 - 5 axis

SPECIAL WORK CENTRES AND AUTOMATIC CELLS

Master 63-65

Master 95

Master 185

Master with belts

Master working cell

WORK CENTRES ENGRAVING

Master 34

VERTICAL MACHINES

Vertmax series

Vertmax One

V-Loader

TOOLS FOR GLASS

Diamut tools

VERTICAL WASHING MACHINES

Aqua series



ITALCARRELLI SpA

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COMPANY DATA

Contacts

Agostino Negrin - President
Alessandro Negrin - President
Stefania Negrin - Vice-President
Ivan Lambertucci - CEO
Davide Schiavon - Sales Manager

Annual Turnover of the Company

EUR 10 / 50 mil

Sales

Domestic (3%) / International (97%)

Quality Certifications

ISO 9001:2015

Banks

Intesa San Paolo - Arzignano

Number of Employees

> 100

Founding Year

1962

Registered Patents

Telescopic Arm for rack handling in autoclaves, Collar Handling Device, ABV Device/EN BOX for glass handling in containers, Battery Exchange System, Side-loader telescopic cab, Side-loaders equipment for handling glass boxes, PTN inloader with adjustable trailer width, Laser guided jumbo frame transporter PTN 330 LGV and laser scanners self-regulation support

Registered Trademarks

Italcarrelli

Planned Exhibitions

China Glass - Shanghai, China - 13 / 16 April 2022

Mir Stekla - Moscow, Russia - 6 / 9 June 2022

Glass South America - Sao Paulo, Brazil
29 June / 2 July 2022

Glasstec - Düsseldorf, Germany - 20 / 23 September 2022

GlassBuild America - Las Vegas, USA
18 / 20 October 2022



SIDE-LOADERS



SPECIAL-APPLICATION SIDE-LOADERS



LAMINATED GLASS HANDLING



PLATFORM TRANSPORTERS



CONTAINER LOAD/UNLOAD



INLOADER TRANSPORTERS

COMPANY PROFILE

SMART WORKING, SAFE WORKING WITH TOP HANDLING SOLUTIONS

ITALCARRELLI® designs and builds special machines, technology and accessories for the transport and storage of glass. After many years of hard work, the Company has put into practice its idea of smart work.

- Smart – with clients to create personalized machines responding to their precise needs and demands;
- Smart – with suppliers to have the constant availability of top class material and components;
- Smart – solutions both with regards to technology and energy savings;
- Smart – for safety each and every day.

Thanks to the perfect synergy between the company's design departments and software development, Italcarelli's machines have the highest levels of performance and ease of use, with low energy consumption levels.

PRODUCT RANGE

PLATFORM TRANSPORTERS

INLOADER TRANSPORTERS

SIDE-LOADERS

SPECIAL SOLUTIONS

CONTAINER LOAD/UNLOAD

LAMINATED GLASS HANDLING



ITALMATIC PRESSE STAMPI SRL

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Tel.: +39 0583 981166 / Fax: +39 0583 981080

E-mail: info@italmatic.eu • www.italmatic.eu

COMPANY DATA

Contacts

Roberto Frediani - Managing Director

Adriano Frediani - CEO

Massimo Ghitturi - Member of Board of Directors

Annual turnover of the Group

EUR 50 million

Annual turnover of the Company

EUR 20 million

Percentage of turnover from glass

20%

Sales

National (30%) / International (70%)

Quality certifications

ISO 9001

Banks

Intesa S. Paolo

Area

Offices 600 m² / Plants 8000 m²

Number of Employees

60

Paid-in capital

EUR 46.481,12

Founding year

1987

Registered Trademarks

Italmatic - Comfort





COMPANY PROFILE

New autoclaves for curved glass and windshield

ITALMATIC, leader in the research, design and construction of autoclaves for various applications, has developed a new generation of advanced and innovative machines for the treatment of curved glass and windscreens.

These autoclaves, the result of research, development and experience acquired over the years, have been designed with the aid of the most sophisticated structural and thermodynamic calculation programs, such as the new dynamic flow simulator C.F.D. (Computational Fluid Dynamics).

In the design, particular attention was paid to energy saving, adopting innovative materials for thermal insulation, high efficiency motors controlled by inverters, heating systems (electric, diathermic oil or steam) with infinitesimal control, as well as new control systems capable of managing power and flow distribution, thus allowing significant reductions in operating costs.

The machine can also be made with two doors, one on each side, to allow the automatic and/or manual introduction and

unloading of the glass holder carriages, thereby speeding up the loading and unloading operations, especially for continuous production of both 24/24h and 7/7g.

For a better internal chamber uniformity, according to the different loads and positioning of the glass under treatment, the motor fan units have been positioned in the upper part in direct contact with the heating and cooling exchangers. This innovation has made it possible to work for defined areas within the chamber, managing each area according to the load and with the best uniformity.

Orientation and modulation of the ventilation, with variation of the fluid transfer speed on the products, ensures that glass quality conforms to even the most restrictive market requirements.

The control system, called **ICS (Italmatic Control System)**, allows you to program, supervise and have complete traceability of production batches - both automatically and manually, in order to allow for analysis of all process cycles. The control system meets every industry 4.0 requirement and can also be interfaced with the company MES.



ITALMOLE SRL

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COMPANY DATA

Contacts

Ivan Rossi - Owner Partner / Sales and Technical Manager
Graziano Venturi - Senior Owner Partner

Sale

Domestic (20%) / International (80%)

Area

Office 50 m² / Production unit 2000 m²

Founding Year

1978

COMPANY PROFILE

Italmole S.r.l., founded in 1978, has more than 40 years of experience and has developed a complete range of polishing wheels for all types of machines, satisfying all requests coming from the glass market.

Every day is a new challenge and new inspiration: trying to propose products leads to improving the work of end users, supporting and assisting dealers in recommending the right wheel for each and every application, and guaranteeing the best service, technical assistance and fast production of orders. The strongpoints of Italmole are a fusion of experience and innovation that it has earned with the awareness and good results obtained in the past that have become the key to maintain and guarantee the continuity of success in the future. Italmole is also a group of people who work together to reach the same goal, to provide a very high standard of quality with precise products, in a constantly evolving way for their customers.

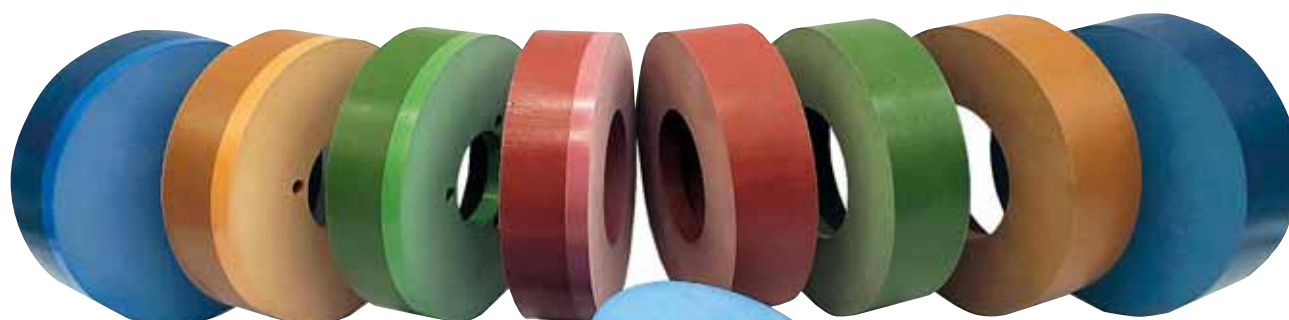
The company's most popular products are peripheral wheels type "BD" and engraving wheels type "BD2". These ranges of polishing wheels are, and have been right from the start, synonymous of adaptability, ease of use and high-level polishing.

Italmole has created numerous ranges of cup wheels, polishing wheels for arris, cerium wheels and wheels for removing low-E glass.





BDCUP AND BLACK WHEELS FOR ARRIS AND BLACK WHEELS FOR ARRIS WITH ALUMINIUM AND PLASTIC PLATE WITH ALUMINIUM AND PLASTIC PLATE FOR BENTELER MACHINE FOR BENTELER MACHINE



CUP WHEEL LINE IN DIFFERENT DIMENSIONS FOR ALL TYPES OF MACHINES, WITH SPECIAL PLATES AND ALL FIXINGS



PRODUCT RANGE

- Peripheral wheels
- Engraving wheels
- Cup wheels
- Edge-deletion wheels



keraglass



KERAGLASS INDUSTRIES Srl

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Tel.: +39 0522 993027 - Fax: +39 0522 993030

E-mail: info@keraglass.com • www.keraglass.com

COMPANY DATA

Contacts

Stefano Spezzani – Founder, Vice President
Maicol Spezzani – Director, Sales & Marketing Officer
Luca Calanca – Director, Administrative & Operating Officer
Paolo Righi – Technical & Service Manager

Mother Company

Voilap Holding

Annual Turnover of the Group

EUR 307,000,000.00

Annual Turnover of the Company

EUR 27,000,000.00



deluxe - PVB laminating line



Vision - oscillating tempering furnace

Sales

Domestic (10%) / International (90%)

Parent and Sister Companies

Keraglass South America do Brasil Ltda

Av.Salgado Filho, 252, sala 612, centro

12655 Guarulhos SP - Brazil

Tel.: +55 11 954407000

E-mail: southamerica@keraglass.com

Keraglass USA Inc.

20 Murray Hill Parkway, Unit 120 - East Rutherford - NJ

07073 USA - Tel.: +1 201 561 2191

E-mail: info.usa@keraglass.com

Planned Exhibitions 2022

Glass South America

Sao Paulo, Brazil - 29 June / 2 July

Glasstec

Düsseldorf, Germany - 20 / 23 September

GlassBuild America

Las Vegas, USA - 18 / 20 October

Glasstech Mexico

Guadalajara, Mexico - 23 / 25 November

Eurasia Glass

Istanbul, Turkey - To be announced

dinamica – single and multi pass digital printing line



COMPANY PROFILE

Keraglass is the world's leading Italian manufacturer of glass processing plants and equipment, thanks to the design and production of a range of high-tech glass tempering, laminating and decorating solutions. An all-round approach that makes this company an ever higher performing and more competitive player on the global market.

SALES NETWORK

SPAIN

GRUPO ADA DISTRIBUCIONES

E-mail: info@ada-distribuciones.com

COLOMBIA - ECUADOR - PANAMA - VENEZUELA

PROTECH COLOMBIA S.A.S.

E-mail: paocol@hotmail.it

MEXICO

CERTECH IMPIANTI DE MEXICO S.A. DE C.V.

MATRIZ GUADALUPE

E-mail: roberto.amaya@certechmexico.com

SUCURSAL PUEBLA

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TURKEY

CONCEPT SOLUTIONS

E-mail: agursoz@keraglass.com

USA - CANADA - PUERTO RICO

MATODI USA

E-mail: jackvm@matodiusa.com

UAE - SAUDI ARABIA - KUWAIT

BAHRAIN - OMAN - QATAR - YEMEN

IBA MIDDLE EAST FZE

E-mail: sudip@iba-me.com

SOUTH KOREA

IGIS

Email: swjung@igisolution.com

VIETNAM

NINH SERVICE & TRADING DIVISION -

HOANG SON CO., LTD

E-mail: n.ninh@keraglass.com

ALBANIA - KOSOVO - MACEDONIA

ARVIS SH.P.K.

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PORTUGAL

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UMBRIA - LAZIO - ABRUZZO - MOLISE -

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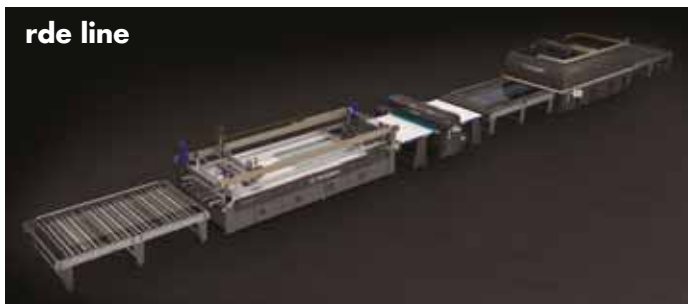
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ARCVS TECHNOLOGY

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rde line



complete printing and roller coating line

iplotter line



high-definition ink-jet digital printing line

LandGlass



LANDGLASS TECHNOLOGY Co., Ltd.

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COMPANY DATA

Contacts

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Planned Exhibitions 2022

China Glass - Shanghai, China - 13 / 16 April

GlassBuild America - Las Vegas, USA

13 / 15 September

Glasstec - Düsseldorf, Germany

20 / 23 September

Glasstech Asia - KMariana Bay, Singapore

26 / 28 October

Eurasia Glass Fair - Address and Date to be confirmed

ZAK Glass Technology Expo

Mumbai, India - Date to be confirmed

LandGlass

For your next leap

COMPANY PROFILE

Landglass: Ideal partner for tempered glass manufacturers

All-New Cyclone™ Series Glass Tempering Furnaces

The legendary and benchmark product in the intelligent glass tempering field with thirteen innovative technologies and nearly a hundred innovations and creations

Capable of providing systematic solutions for flat and curved tempered glass for architecture and furniture, vehicle, home appliances, and solar power industries, fulfilling the ultimate demand for top quality tempered glass!

All-New UltraJet™ Series Glass Tempering Furnaces

With the inherited advantages of the classic JetConvection™ Glass Tempering Furnaces, the all new UltraJet™ series, equipped with six major innovative technologies, fulfills the

Intelligent Glass Tempering Furnace Solutions

- Five Major Advantages
- Hundreds of Innovations
- Remarkable Outcome
- Stimulate the Development of Four Industries



Cyclone™ Series
Glass Tempering Furnaces

UltraJet™ Series
Glass Tempering Furnaces

JetConvection™ Series
Glass Tempering Furnaces



Smart Factory Solutions



Vacuum Insulated Glass Solutions



Efficient Production



Cost Effective



Quality Improvement



Extremely Energy Efficient



Outstanding Noise Reduction



Condensation-free



www.landglass.net
+86-379-80890369

diversified demands from architecture and furniture, vehicle, home appliances, and solar power industries for flat and curved tempered glass with both quality and capacity guaranteed.

All-New JetConvection™ Series Glass Tempering Furnaces

As the pioneer in Forced Convection Technology, LandGlass' high quality and efficiency advantages revealed in high-performance Low-E Glass Tempering made the JetConvection™ series glass tempering furnace a two-time winner of the National Patent Gold Award and an iconic product in the forced convection glass tempering machinery.

At present, more than one thousand furnaces of this series have been sold to over sixty countries and regions worldwide, becoming one of the legendary products of LandGlass.

LandGlass TIGER™ Smart Factory

LandGlass TIGER™ Smart Factory employs the new generation enterprise resource planning system, intelligent manufacturing technology and identification technology to interconnect all machinery throughout the entire process from float glass to finished products. It has realized digital and intelligent processing of supply, manufacturing, and sales information during production, achieving lean and efficient manufacturing and management.

About LandVac

LandVac®: fully tempered vacuum insulated glass

LandVac® is a wholly-owned brand of LandGlass. LandVac® Tempered Vacuum Insulated Glass, is backed by eight major technologies:

Noise Reduction: With its weighted sound reduction index exceeding 39dB, LandVac makes rooms in downtown quiet like a library.

Energy Conservation: U-value as low as $0.4W/(m^2 \cdot K)$. A 8.3 mm thick LandVac has better thermal insulation effect than the 1.5m thick brick wall.

Free of Condensation: Remain condensation-free when the temperature difference between the two sides exceeds $70^\circ C$, keeping away from condensation

Tempered and Safe: Completely retains the high strength, impact resistance, and other safety characteristics of tempered glass with its unique FLAS Flexible Lead-free Alloy Sentry technology.



Outstanding Adaptability: Since there is no thermal expansion or contraction in the high vacuum chamber of LandVac, the use of LandVac is not limited by geographical locations, elevation, or installation angle.

Super Long Life: The service life expectancy of Landvac exceeds 25 years.

Thin and Lightweight: A piece of 8.3 mm thick LandVac weighs only $20kg/m^2$. It reduces the use of materials while extending the service life of hardware. The costs on storage and logistics are also significantly reduced.

Lead-free: The Testing Report from CTI, which is authorized by RoHS EU, has witnessed the outstanding environmental-friendly performance of Landvac.

PRODUCT RANGE

- Cyclone™ Series Glass Tempering Furnaces
- UltraJet™ Series Glass Tempering Furnaces
- JetConvection™ Series Glass Tempering Furnaces
- TIGER™ Smart Factory
- Landvac® Tempered Vacuum Insulated Glass

LiSEC



LiSEC AUSTRIA GMBH

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COMPANY DATA

Contacts

Dipl.-Ing. Gottfried Brunbauer
CEO

Founding Year

1961

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Schraml Glastechnik GmbH

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E-mail: schraml@lisc.com - web: www.schraml.com

Number of Employees

1,050

Planned Exhibitions 2022

China Glass - Shanghai, China - 13 / 16 April

Glasstec - Düsseldorf, Germany - 20 / 23 September

GlassBuild America - Las Vegas, USA - 18 / 20 October



KSD - A

COMPANY PROFILE

LiSEC, with headquarters in Seitenstetten/Amstetten, Austria, is a globally operating group offering individual and complete solutions in flat glass processing and finishing for 60 years.

The service portfolio comprises machines, automation solutions and services.

In 2020, with about 1,050 employees and 24 sites, the Group reached an export rate greater than 94%. LiSEC develops and manufactures glass cutting and sorting systems, single components and complete production lines for fabricating insulating glass and laminated glass, as well as glass edge processing machines and tempering machinery.

With reliable technology and intelligent automation solutions, LiSEC sets standards in quality and engineering and significantly contributes to the success of its customers



SALES NETWORK

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**You can find a full list of
our Sales Network on:
www.lisc.com**

PRODUCT RANGE

- Glass Cutting machines
- Insulating Glass Production machines
- Sorting & Logistic Systems
- Laminated Glass Production machines
- Flat Glass Processing machines
- Glass Processing & Washing machines
- Tempering
- Business Software
- After Sales / Service



MAPPI INTERNATIONAL S.r.l.

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COMPANY DATA

Contacts

Nancy Mammaro - Managing Director
Ermanno Petitti - Sales Manager
Giulio Dalla Costa - Automation Manager
Massimo Grippo - Sales
Stefano Ambrosio - Sales & Marketing

Annual Turnover of the Company

EUR 13,000,000

Percentage of turnover from glass (%)

100

Sales

Domestic (10%) / International (90%)

Area

Offices 1000 m² / Plants 4000 m²

Number of Employees

55

Founding Year

1993

Registered Trademarks

Mappi

Parent and Sister Companies

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SLOVENIA - CROATIA - BOSNIA AND HERZEGOVINA - SERBIA

BULGARIA - SLOVAK REP. - KOSOVO

MACEDONIA - MONTENEGRO

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EUROTECHCORP

E-mail: eurotechline@gmail.com

COMPANY PROFILE

MAPPI INTERNATIONAL:

CONTINUOUS SEARCH FOR INNOVATION

Mappi International has been designing and manufacturing high quality tempering systems for the glass industry since 1993. Hundreds of plants installed all over the world are a demonstration of the company's steady growth, important investments in research and development, uncompromising quality, and attention to the specific needs of each and every customer. Mappi International manufactures each and every product in-house and therefore has complete quality control of all components, guaranteeing the highest quality performance and functionality of its machines – constantly. Mappi America, located in Florida, enables the customer service department to reach each and every plant within 24 hours.

Thanks to collaboration with Siemens, Mappi machines are, first in the entire glass industry, recognized as 'Powered by Siemens'. This means that they are ready to implement all MindSphere applications, ready to enter the world of Industry 4.0, ready to change the way of working in the glass industry, with total integration between the furnace and all production processes, from planning to quality reports. Mappi's path of innovation continues with Supertemper, the exclusive feature that opens up a new frontier of fireproof glass: a furnace equipped with Supertemper can produce E30 certified glass for fire resistance.

From design to assistance, quality is at the centre of every thought and action of Mappi. This quality is found both in the design and in the range of products, where machines are different in size, technical solutions, mechanical engineering, and software solutions. User-friendly machines that have been designed to minimize downtime during shutdown and subsequent restart, along with the constant perfection of glass and important energy savings, show just how Mappi produces tempering furnaces that go beyond perfection day after day. Nancy Mammaro, CEO of Mappi says: "Our payoff, 'beyond glass perfection', sums up in three words our everyday aim shared at every level and in every area in Mappi."

Over the years, Mappi has never changed its aim: to become the leader in tempering furnaces and manufacturing, and to constantly increase quality and customization to satisfy the specific needs of each customer.

Main features:

MHS | MULTIZONE HEATING SYSTEM

Automatically manages the temperature of the furnace by means of a network of electronically controlled sensors that maintain temperatures constant and focus heat only in areas where there is glass.

IHS | INTELLIGENT HEATING SYSTEM

The internal temperature of the furnace is controlled with an accuracy of $\pm 1^\circ\text{C}$, preventing overheating of the ceramic rollers and avoiding downtime for the adaptation of the furnace temperature.

ESS | ENERGY SAVING SYSTEM Heating and forced ventilation stages are coordinated and managed by a computerized system optimizing consumption and significantly reducing the installed power required by the entire system.



SYNCRO | TRASMISSION TECHNOLOGY

The ceramic rollers are driven accurately within $1/1000\text{mm}$ by DC drive motor with a friction transmission between iron/rubber (avoids slack time gaps, gear lash, with resulting risks of marks on the glass).

This eliminates the need of SO_2 . Brushless motors control roller drives to guarantee accurate roller position and speed. Automatic speed management of the ceramic roller oscillation avoids distortions and damage to the glass surface. Full ceramic rolls, which can be easily replaced.

ITS | INTEGRATED TOUCH SYSTEM

The system monitors the parameters of the tempering process and immediately prints the compliance report for CE and ANSI glass standards at the same time, automatically storing this information for each production cycle.

AC | ADVANCED COOLING

A particular design of the blowing system that allows even more specific control while tempering, and substantially decreases the iridescence of the glass.

ATI | ACTIVE THERMAL INSULATION

The ATI completely reduces thermal dispersion thanks to continuous research in the best performing materials for thermal insulation, in association with the most prestigious research centres in Europe, as well as with Knauf and Morgan.

GHBS | XTREME PROFILE CONVECTION GHBS allows to process all last-generation coated glass, including low-E with 0.01 Emissivity.

HEATING CHAMBER EXTRACTION

Mappi is the only tempering equipment manufacturer that has this feature for easier maintenance and better finished product quality. ATS 4.0 is available from 1500×3800 to 3300×6000 mm and also in customizable sizes.





MAZZAROPPI
HIGH PERFORMANCE. ALWAYS



MAZZAROPPI ENGINEERING Srl

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Federico Mazzaroppi - Marketing Manager
Michele Spano - Service Manager

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BELGIUM AND THE NETHERLANDS

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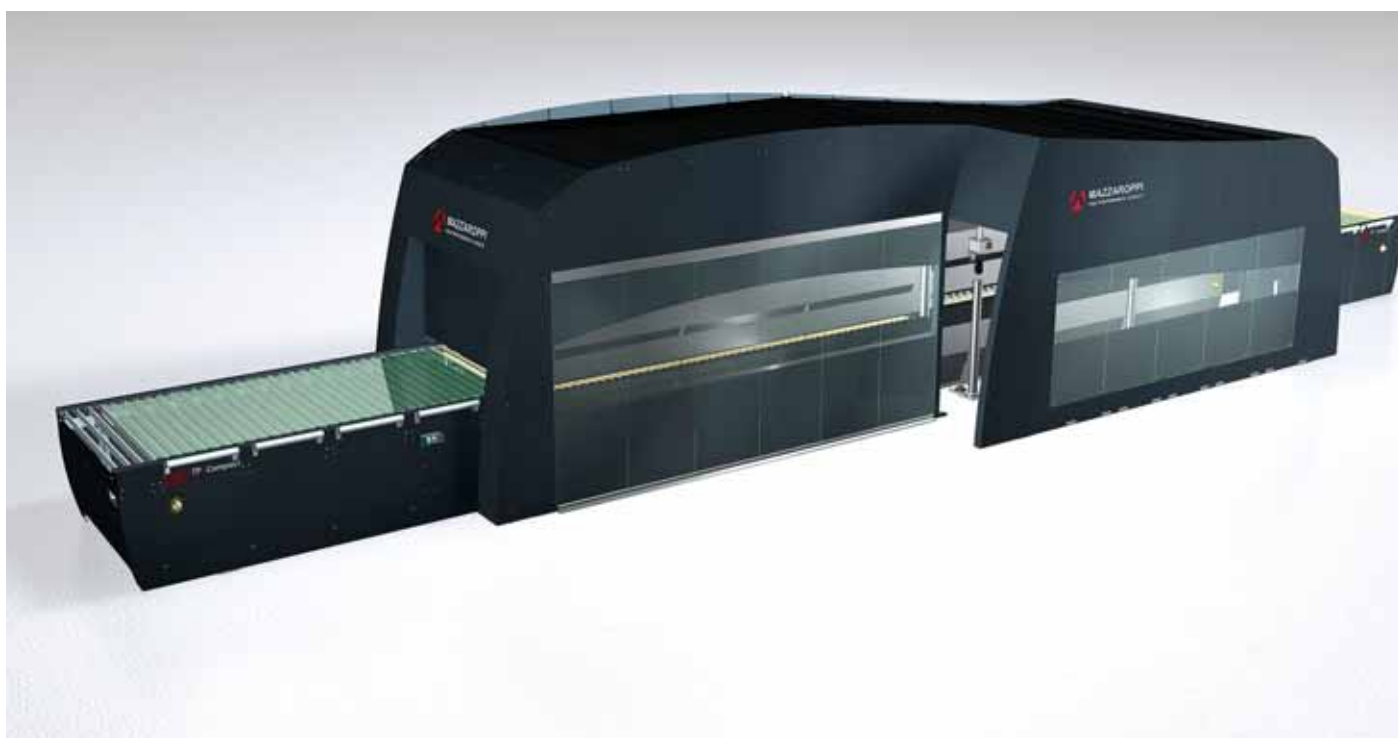
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COMPANY PROFILE

The history of the **Mazzaroppi** family has been closely linked to the glass industry since 1958. From the beginning excellence, high quality of the products, and passion were the values thanks to which the brand was recognized and appreciated all over the world. More than 60 years of experience have led three generations of the family to share the passion for glass processing and to grow exponentially this company, which still stands as a reference point in the field of tempering, bending and laminating glass.

Reliable quality, constant research on energy saving and excellent customer service are our three main qualities, which we are proud to see reflected in our customers' feedback. Each machine is built to be used for more than 30 years and our specialized team is constantly ready to support our customers at any time. It's extremely important for us to receive constant feedback, thus creating a new generation of innovative machinery that are ever closer to our customers' needs.

We are a family company and we strongly believe in the importance of human relationships. Every customer is part of our family, becoming a business partner that shares de-





ades of history with us. The construction of a new machine represents the birth of another of our creations, to whom we are as close as a daughter; in fact, each of our machines has its own name that identifies it and we usually celebrate its birthday with the customer who bought it.

WHY CHOOSE OUR MACHINES?

To answer this question, we list just a few of the recurring features in our products:

ENERGY SAVING APPROCH

- Intelligent Software 4.0
- CNC multi zone control
- Mazzaroppi ultimate convection
- Fem studies
- Studies of materials and geometries
- Just in time ignition
- Flexibility of use
- Reduced electrical system

These features allow us to reduce energy consumption up to 70% compared to other machines, and consequently allow our customers not only to optimize production but also to make significant savings. With our machines we are able to demolish the old concept of enormous energy consumption typical of obsolete tempering furnaces.

MAXIMUM QUALITY

- Anisotropy reduction
- Anti-roller wave technology
- Decreased Edge lifting

To guarantee the quality and high performance of our products we constantly subject them to meticulous tests, which show that we have been able to obtain a decrease in anisotropy of -97%.

Thanks to the technology present on our machines, the heat is distributed in a homogeneous and precise way on the glass surface in order to minimize also the phenomenon of roller wave and Edge lifting.

REDUCED MAINTENANCE

- CERTIFIED EUROPEAN MATERIALS
- NO USE SO₂
- VIRTUAL ASSISTANT

The manufacture of our machinery is based on the choice of the highest quality and certified European materials, so they require rapid maintenance or in some cases nothing. The quality of the machinery is consequently guaranteed and for any problem we have a team of specialized engineers remotely connected to support our customers at any time, so that the problem can be solved promptly and machine downtime reduced.

USER FRIENDLY

- Adaptive oven
- Automatic reporting

All our machines have been built to follow the customer's production needs and adapt very quickly to any thickness or size of the glass without waiting times. Moreover, they store and compose an automatic report with the characteristics of every load in order to facilitate the work of the operators. Thanks to the use of intelligent software 4.0, the machinery adjusts itself according to the different production in an automatic and fast way, so it doesn't need highly specialized operators to be used to its full potential.

RESIDUAL VALUE

All the machine produced by Mazzaroppi Engineering are built with top quality European materials, assembled with an artisan attention to detail and meticulously tested in the production site before being shipped to the customer. These characteristics mean that our machines have an average life that exceeds 30 years and consequently we can say that one of our tempering machine after 10 years of use has a residual value of 40% on the market.

For us, our work is a real mission: to accompany our customers on a path of stable and lasting growth in the future, putting our passion, expertise and experience at their service.



MOLE MORESCHI

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1921-2021
**NEVER
GIVUP** **100+1**

COMPANY DATA

Contacts

Marco Moreschi - Owner

Barbara Doda - Sale Department

Yuri Cattabriga - Technical Department



COMPANY PROFILE

Mole Moreschi has know-how and direct experience in the production of diamond wheels and tools for glass processing, that are the result of more than 100 years of production. The company was first in the production and development of the resin wheels and, today, Mole Moreschi has a complete range of standard and special tools for the glass industry, with very high quality.

Some Italian and international glass machinery manufacturers have chosen Mole Moreschi as their preferred partner and found that the company's wheels have the best reliability and constant quality. This means that tools can be tested and new products developed to increase machine performances.

Mole Moreschi uses the most advanced technologies in tool

production to guarantee the highest quality level possible.

The research and development activities of the company are dedicated to improving tool quality and guarantee production level.

Mole Moreschi's target is to maintain this very high level of quality, while guaranteeing the highest possible performance of customers' machines.

Mole Moreschi is always available to study and manufacture tools as per specific customers' requests for special production.

The company's sales and distribution network is a winner not only for the quality and timing of service, but also with regards to the technical knowledge of its distributors who can assist and suggest the best tools.



/// MOVETRO

MOVETRO Srl

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COMPANY DATA

Contacts

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Giorgio Mistrello - Owner
Davide Mistrello - Owner



Loader

COMPANY PROFILE

Movetro Srl is a leading company for the manufacture and installation of automatic plants for the storage and handling of glass sheets.

The acquisition of Movetro by Intermac, which was completed in July 2017, expands the product range with the offer of special fully-automated and integrated turnkey systems and production lines. Intermac and Movetro are able to offer a high-value consulting approach, providing classifiers, shuttle magazines, automatic loaders, loaders and tilters, in addition to its current range, designing dedicated management software.

Movetro is a real industrial company, able to accept new technological challenges, counting on technical and human resources, listening to and understanding customers' needs, which are always satisfied with highly customized designs and which have, as their main considerations, reliability, safety and efficiency of the plants.

Movetro guarantees a very high quality level which positions the company among the leaders of similar glass industries as all machines are entirely manufactured and tested in-house at the company's metal workshop, while welding, painting and

assembling lines are positioned in order to reach the very ambitious target of 'total product quality'.

Movetro does not only manufacture and install automatic systems, but goes beyond this point thanks to the fact that all plants can be fully connected and integrated to existing processing lines manufactured by any other company.

From the smallest to the largest glass processing company: all can find in Movetro the right partner who can, thanks to a wide product range and well qualified technical staff, provide the correct solution when space, storage or handling needs cannot be satisfied by the standard market offer.



Classifier

Integration with Intermac Cutting Line



Shuttle storage system

PRODUCT RANGE

AUTOMATIC STORAGE AND HANDLING SYSTEMS



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COMPANY DATA

Contacts

Stefano Bavelloni - Director of Operation

Matteo Rolla - Finance & Sales Director

Fabio Palella - Sales Manager

Sales

Domestic (10%) / International (90%)

Area

Production unit 4000 m²

Planned Exhibitions 2022

Mir Stekla: Moscow, Russia - 6 / 9 June

Glasstec: Düsseldorf, Germany - 20 / 23 September

GlassBuild America: Las Vegas, USA - 18 / 20 October

Glasstech Asia: Singapore - 26 / 28 October

Veteco: Madrid, Spain - 10 / 13 November

RUSSIA, UKRAINE, BELARUS

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COMPANY PROFILE

Neptun Srl was founded in late 2008 as a machines and equipment manufacturer for flat glass cleaning. It quickly established itself thereafter as a key player for creating solutions for glass processing. Neptun's Mission is to produce new technical solutions that can provide a competitive advantage to its customers - for which it invests more than 12 percent of its turnover in Research and Development. Together with its sales distribution, the company's customer support is strengthened by its network of experienced collaborators. Neptun stands out as an ideal partner for all glass industry companies that require proven quality, performance and reliability. The company has a trio of product lines, namely straight-edging machines, washing machines and vertical NCs for drilling and milling. All three have a full range which spans both width and depth, while each can be fully-integrated - whether in-line or thanks to the company's anthropomorphic 'Bravo' series manipulators.

QUICK SERIES

Neptun has created a wide range of vertical NC drilling/milling and edging machines for every business need and company size. From single milling machines to fully-automatic drilling machines the quick series is comprised of 5 models, each of which offers different configurations as well as the possibility to work individually or in-line – and all to meet every possible customer need.



ROCK

Neptun's line of straight line edgers is the very definition of tradition and innovation - being characterized by a truly robust structure in thick steel and cast iron which guarantees long-lasting reliability. Rock also offers many patented solutions and cutting-edge functions, ETS squaring systems, the RC-4 for parallelogram processing and, lastly, the AWA version for fully-automatic wheel management.



WASHING MACHINES

As for glass washing, Neptun displays its expertise in a wide range of available washers. The company offers 3 horizontal washing machine models, namely the economical TORNADO EASY, the HP for high performance and the HP-S series for special applications (solar, ceramic ink, ultra-thin glass, medical). Neptun further proposes 4 vertical washer models - from the economical LV Top, going up in performance and automation terms to the LV EVO model and Wave before finally rising to the top-of-the-range, super-equipped standard Superinox.





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Contacts

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Torsten Czech - Head of Marketing
Ingo Stahlkopf - Head of Sales

Number of Employees

110

Company founded

2003

Planned Exhibitions 2022

Glasstec

Düsseldorf, Germany - 22 / 23 September

Conference on Glass Problems

Columbus, USA - 31 October / 3 November

SALES NETWORK

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COMPANY PROFILE

Optris is and has been, one of the leading innovative companies in the field of non-contact temperature measurement by means of infrared radiation since its establishment in 2003. The company's product range covers fixed industrial thermometers, infrared cameras, as well as accessories.

TRADITION AND INNOVATION

Thanks to their extensive know-how and innovative concepts, our experienced engineers and physicists continuously inspire with outstanding solutions.

TOP QUALITY AT REASONABLE PRICES

We provide cutting-edge infrared technology. Cost advantages arising from bulk purchasing of semiconductor products and from the production process are passed directly on to our customers.

PROCESS OPTIMIZATION VIA TEMPERATURE MONITORING

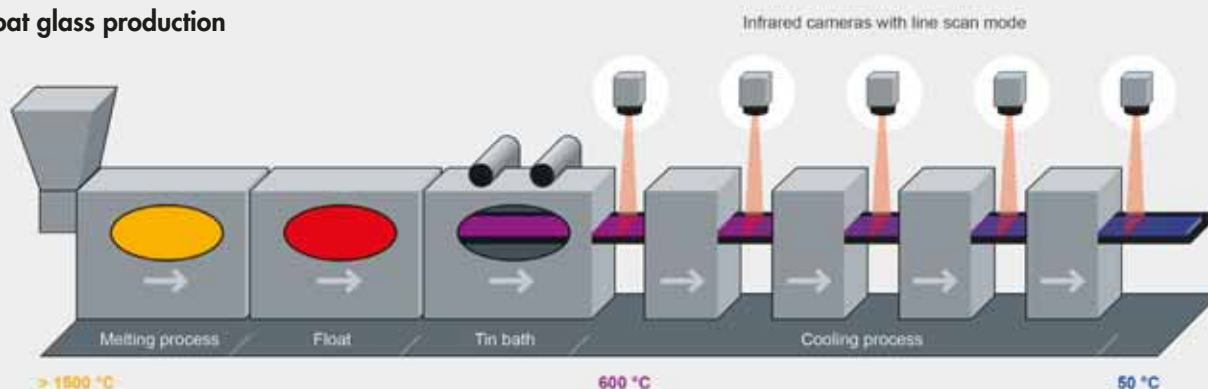
In many manufacturing processes (e.g. the glass industry), product and process temperatures are important physical variables.

Non-contact temperature measurement with Optris sensors and thermal imaging cameras ensures high production line quality standards.

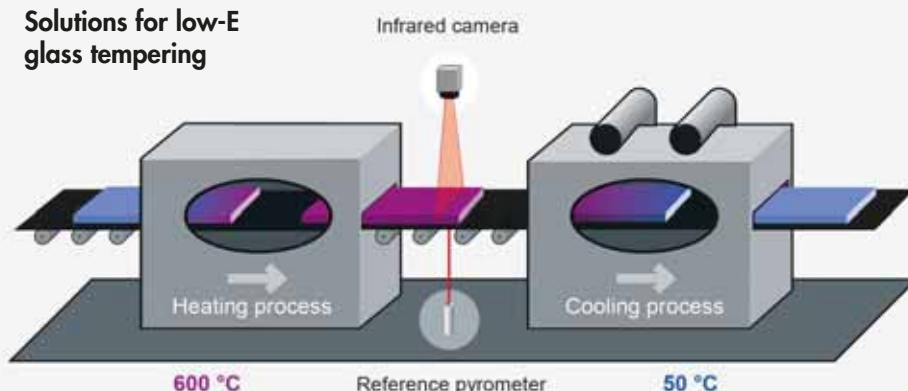
Thermal image of monitoring temperatures of glass sheets



Measurement areas at float glass production



Solutions for low-E glass tempering



Single-pane safety glass production with correct temperature measurement technology

For the production of single-pane safety glass (SPSG), the cut and processed flat glass is heated in a furnace under continuous movement at over 600°C. During the transport of the heated glass in the pretension zone, an infrared camera monitors the temperature distribution on the glass surface in line scan mode. Inhomogeneities can thus be compensated during the tempering process, in which the glass is air-cooled. The quality of the SPSG mainly depends on a

In order to ensure the highest level of quality, the glass industry and its energy-intensive production process relies on dependable means of temperature monitoring. Our glass thermometers and IR cameras are optimally suited to non-contact temperature measurement of glass surfaces and use innovative double lasers to indicate the exact measurement spot.

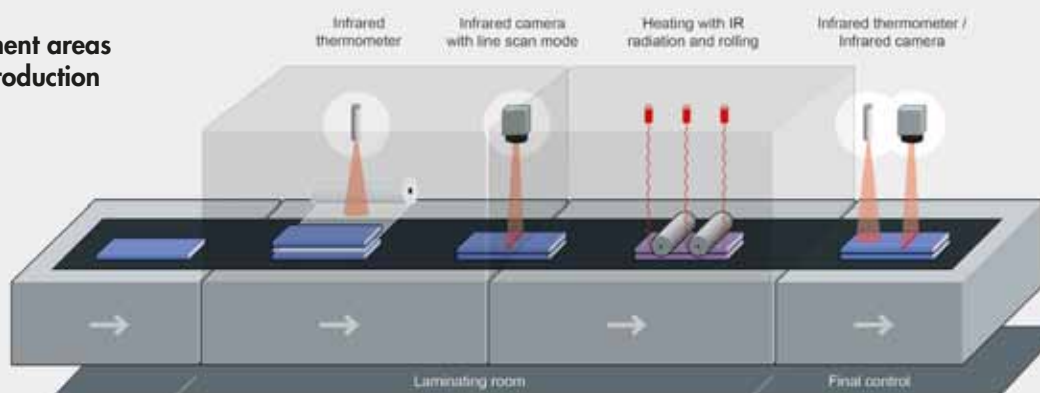
All kinds of glass, coated and uncoated, change their emissivity behavior in dependency of the angle of view. Especially low-E coatings show an unusual behavior. For a reliable and reproducible temperature measurement a reference pyrometer in a Top Down Glass Inspection System from underneath (uncoated glass surface) is necessary.

homogeneous thermal treatment, which is ensured by the application of the correct temperature measurement technology.

Ensuring the quality of laminated safety glass

Laminated safety glass (LSG) consists of at least two flat panes of glass, which are laminated in a clean room with a sheet of PVB film between them. The temperature of the film can be monitored with infrared thermometers. In the pre-heating furnace, the glass panes are heated in order to melt the film and simultaneously press the "sandwich" together, to prevent air pockets. During the transition to the autoclaves, the temperature distribution is monitored with an infrared camera, in order to adjust the heating elements in the pre-lamination furnace for subsequent panes, when necessary.

Measurement areas at LSG production





R.B.M. ITALIA SRL **a brand of Surfaces Group**

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COMPANY DATA

Contacts

Dino Zandonella Necca - CEO
Simona Biamino - Sales
Miriam Munari - Sales
Tomaso Zago - C.O.O.
Lorenzo Cannella - Technical Assistance & R&D

Mother Company

Surfaces Technological Abrasives SPA

Annual Turnover of R.B.M.

EUR 6 million

Annual Turnover of the Group

EUR 205 million

Sales

Domestic 20% / International 80%

Area

Offices 200 m² / Plants 4500 m²

Number of Employees

30

Founding Year

1963

Registered Trademarks

RBM/10S / 9R

Planned Exhibitions 2022

Glasstec

Düsseldorf, Germany - 20 / 23 September



COMPANY PROFILE

R.B.M. ITALIA is an Italian company that produces rubber polishing wheels for flat glass used on the most common edgers and double-edger machinery. Its extensive product range includes many different formulations of wheels with different grit and sizes, commercialized by a global sales network. Nowadays the R.B.M. brand means 100% made in Italy, high consistent quality and reliability. The company has its factory in Baldichieri, Asti, in North West Italy and has still a background of a manufactory company with a long history of technology and experience. Now it has become a part of a bigger group and that gives a big opportunity to grow and invest more and more in R&D and human resources as never before. With a strong focus on customized solutions, which is going to become one of the strongest points for R.B.M., the partnership with the customers is enriched.



PRODUCT RANGE

- Cup wheels
- Peripheral wheels
- Edge-deletion wheels
- CNC polishing wheels



R.C.N. SOLUTIONS Srl

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COMPANY DATA

Contacts

Elena Calvi - CEO
Davide Ricchi - Owner
Simone Vecchi - Sales Manager
Roberta Cometti - International Department

Annual Turnover of the Company

EUR 5,500,000

Percentage of Turnover from Glass

70%

Percentage of Third-Party Turnover

30%

Sales

Domestic (30%) / International (70%)

Area

Offices 500 m² / Plants 2000 m²

Founding Year

1993

COMPANY PROFILE

Giving priority to Made in Italy products, the focus of **RCN SOLUTIONS'** machine construction is upon high quality components.

The company seeks under its motto "essential is better" to privilege technical details -the heart of its machines- over and above those of external appearances.

Great flexibility in customization, together with the ability to innovate, are two of RCN's main strengths.

Last but not least, full technical assistance is provided - given

that the company neither leaves matters unsolved nor underestimates its customers' problems.

RCN's core business is machines with the power to "tame" glass:

- **Tempering** glass - we learned how to temper our own characters, enhancing day after day our drive to reach our goals.
- **Bending** glass - we learned how to mould our ideas to best meet our clients' needs. For them, we took the ideas of "newness" and "uniqueness" and gave them the shape and body of a machine.

- **Laminating** glass - we learned to pile together our know-how and skills, generating a multi-layered experience based on creativity, method, quality standards and the desire of constant renewal.

We generated a know-how embodied by machines that are solid, durable, and succeed in tasks that prove impossible for others.

This is why we show them as they are, with no veils, just as issued from our minds and hands. Glass bears no secrets to us, and we are alike.

"RIVA by RCN"

chemical tempering furnaces

"Riva by RCN" is a double winning solution if we consider the possibility of customizing the machines along with the technical expertise of Gianfranco Rivaroli who has, in fact, more than 40 years of top level professional activity.





POWERLAM and LAMMY SYSTEM laminating furnaces

Developed in 2008, Powerlam is RCN's bagless laminating machine which, for promptness of finished products, laminates in 35 minutes.

This range of special machines operates alongside the more traditional laminating furnaces of different sizes, which are equipped with bags and laminate, for every production need, in 75 minutes.

RCN has also given this product line a series of such special features as easy bag closure and the RD CLEAN CONCEPT: the innovative post-lamination, clean-edge system.



"ECO SPECIAL" bending furnaces

The important comeback in the request for bending furnaces has enabled RCN to start-up and up-grade its production of bending furnaces, now with the possibility of customization and an increase in the number of independent heating zones, a fundamental feature to enable to carry out more complex bending, thanks to independent controls and temperature zones.

REVA BF lamination interlayer

This project started up more than eight years ago with the (limited) introduction of an EVA interlayer combining adhesion quality, transparency, ease of use, characteristics that are no so guaranteed in today's range of EVA products.

Indeed, this balance of very sensitive and difficult to calibrate quality is reached only after years of experience and collaboration with important chemical companies.

REVA BF, which has been validated by international certification institutions, has had a constant development, along with the commitment to maintain high quality based on the targeted choice of raw materials,



supplied by one of the most prestigious international chemical companies and capillary and professional production controls.

Production has also increased thanks to an extension of the extruders range carried out in 2018.





ROLLMAC A DIVISION OF GEMATA SPA

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Sales Managers

Mother Company

GeMaTa Spa

Sales

Domestic (13%) / International (87%)

Quality Certifications

ISO9002, 14001, 9001:2000

Number of Employees

105

Founding Year

1979

Planned Exhibitions

Fimma Brasil - Bento Goncalves,
Brasil 14 / 17 March 2022

Mir Stekla - Moscow, Russia - 6 / 9 June 2022

Fesqua - Sao Paulo, Brasil - 14 / 17 September 2022

Glasstec - Dusseldorf, Germany - 20 / 23 September 2022





COMPANY PROFILE

Rollmac is the branch of Gemata Spa, primary group in the leather finishing manufacturing sector, devoted to the production of machinery for the enameling and satin-coating flat glass. Its specific expertise, acquired over years on the global market, means it can offer the final user a complete know-how service and support from individual machines to complete lines. All the products are designed in-house by the R&D division and tested both internally and later at the premises of those clients with whom it has established close cooperation.

Production

Gemata/Rollmac creates complete systems that integrate the "GlassLine" system, for coating of the edges of glass sheets, "Multiglass" for coating the entire glass sheet, and the IR drying furnace "GlassDrier IR". These systems can also integrate the digital printing system "GlassPrint One" or silk-screen printers by other manufacturers. According to specific factors such as production needs, sheet size, and high automation levels requirements, a wide range of accessories and options are also available.

In compliance with current standards, all Rollmac machines come with remote assistance as standard, thereby meeting the requirements for Industry 4.0.

Rollmac-Gemata is certified as per ISO 9001, ISO 14000, and Italian "Safe Work" standards.



SATINAL



SATINAL SPA - TK - STRATO

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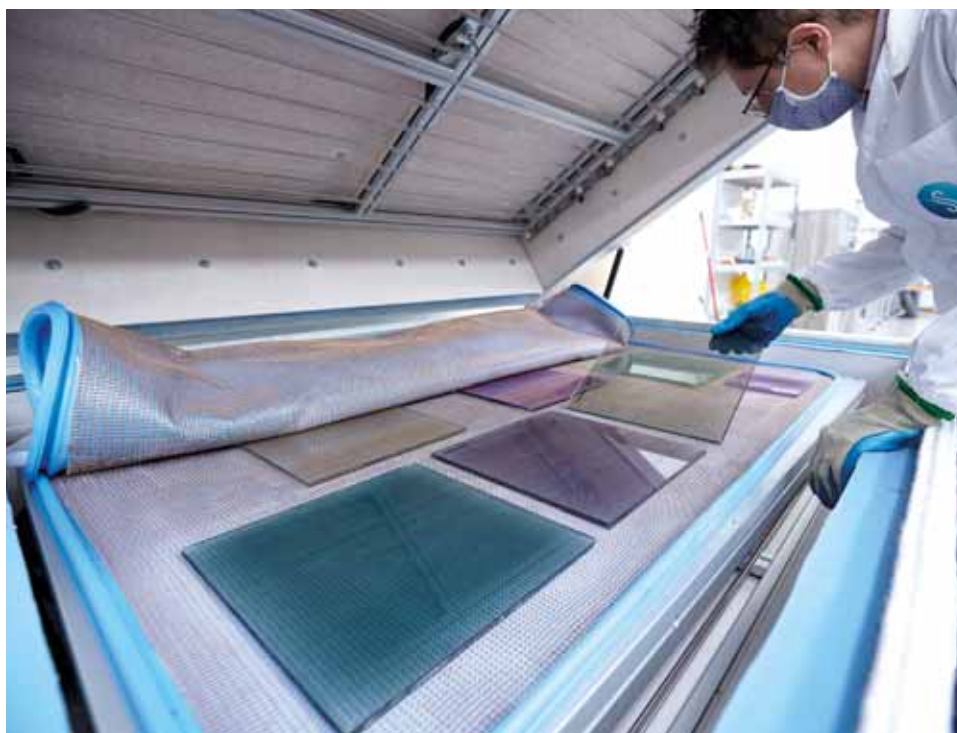
COMPANY PROFILE

Innovative solutions and total support – each and every day, at global level – is what **SATINAL** provides for its customers. The company supplies the widest range of EVA films for safety glass in interior and exterior projects and high-quality glass processing machinery worldwide. SATINAL never stops innovating: in a few years, Satinal established the biggest European production capacity for safety glass EVA film and launched some different innovative products with STRATO® brand. In 2021 the TK brand launches the most advanced technology learning hub for the chemical tempering & glass lamination industry, becoming the European Center of Excellence in the essence of Satinal's



continuous innovative ideas in safety glass technology. Also, some new products have been launched with TK Glass Machinery.

STRATO® is the first ever EVA glass interlayer 'Made in Italy'. SATINAL's proprietary and innovative EVA interlayers are processed from the granular raw material into a cast film that is then used to manufacture laminated safety glass. TK is the SATINAL brand with which it designs and builds furnaces for glass lamination, tempering, chemical tempering and Heat Soak Testing: the Italian brand of innovative and high-quality glass machinery appreciated throughout the world. The glass furnaces are intended for small-, medium- and large companies that need to start or increase their production capacity and improve the quality performance of their finished products.





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COMPANY DATA

Contacts

Angelo Schiatti - President

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Sales

Domestic (25%) / International (75%)

Number of Employees

46

Founding Year

1950

Planned Exhibitions 2022

Glass South America

Sao Paulo, Brazil - 29 June / 2 July

Glasstec

Düsseldorf, Germany - 20 / 23 September

GlassBuild America

Las Vegas, USA - 18 / 20 October

Veteco

Madrid, Spain - 10 / 13 November

COMPANY PROFILE

The Schiatti Elia company manufactured the first glass machine in 1950.

Today the **SCHIATTI ANGELO** (Angelo is Elia's son) designs and produces, for Small, medium and large glassworks from furnishing, construction and photovoltaic sectors, a complete range of glass processing machines, including:

- 7 models of straight grinding machines for the processing of pencil, flat and arris, ogee and waterfall edges. Cerium oxide finishing.
- 25 models of straight-edge grinding machines for the processing of flat edges and arris - 45° mitres - cerium oxide polishing on the edge.
- 16 models of double edging machines for the processing of polished pencil and flat +arris profiles, available in different sizes.
- Corner machine for the production of variable radii or cant corners.
- Straight-edge bevelling machines for the processing of bevels from 0° to 45° - with cerium oxide polishing.
- Glass loaders/unloaders especially suitable for medium/large glass companies for coupling with horizontal edging or drilling machines.
- Drilling machines with opposite heads suitable for the production of mirrors, shelves for furniture, laminated glass, tables tops and household appliances.



- Multi-head drilling machines for the execution of 2, 3 or 4 holes at the same time. Especially suitable for the production of mirrors, shelves for furniture, laminated glass and household appliances.
- Vertical drilling machines for the execution of holes and notches. Especially suitable for medium/large glass companies for the production of mirrors, shelves for furniture, laminated glass, table-tops, household appliances and doors.
- Special machines such as complete vertical grinding lines composed of 4 straight edgers and 3 turnover units for the complete processing of the 4 sides of the glass, drilling centers customizable according to customers' needs and special solutions for smart factories.

Reliability, innovation, service, sustainability are the features that distinguish our way of work and our machines.

Those who choose us do so for the attention we dedicate to the real needs of our interlocutor, even for after-sales service (periodic maintenance, revamping), for a high-performance and innovative technology, always aimed to best adapt the circular economy and the industry 4.0.



**Automatic straight edging line
mod. TURNOVER**



**Straight grinding machine
mod. SME10**

**Vertical milling/drilling machine
mod. TFV2000**



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COMPANY DATA

Contacts

Michele Schiavo - General Manager

Percentage of turnover from glass (%)

100

Sales

Domestic (20%) / International (80%)

Founding Year

2003

PRODUCT RANGE

- Vertical and horizontal washing machines
- Manual, Semi-automatic, Automatic Storage Systems
- Vertical Milling Machines
- Vertical and horizontal drilling machines
- Fixed, Manual, Motorized Vacuum Lifters
- Manipulators
- Unloaders for packs

COMPANY PROFILE

Products

SCHIAVO machines are well-known in the market for their quality, reliability and advanced technology. As of today, more than 5.000 machines have been installed in over 50 countries.

Every machines are 100% Made in Italy with 100% high-quality European components.

Washing machine

SCHIAVO horizontal and vertical washers have been developed to offer high-quality and high-performing machines, for clients requiring affordable and quality machinery.

Our washing machines can be equipped from 2 to 6 brushes or more, and are made entirely of stainless steel.

Milling – Drilling machine

Very precise and CNC controlled, the new FV1000 model is a vertical machines very versatile in order to obtain each and every type of cuts, notches and holes needed for the installation of hinges, handles, locks and accessories on glass doors and glass furniture. Our machine is industry 4.0.

Storage systems

Glass storage systems are essential for glassworks to organize production efficiently and to optimize available space.



HYDRO



FV1000 vertical milling machine

In this area, SCHIAVO is a leader, with highly reliable solutions for the needs of its clients. CLO is a sideways-moving storage system available in manual or semiautomatic version.

UCS is the new, ultra-compact, ultra-low storage system for glass sheets and offcut glass, patented by SCHIAVO.

Vacuum lifters

SCHIAVO offers a wide range of products to lift glass sheets: from simple clamps to vacuum lifters (manual, motorized or hydraulic) for all kinds of flat glass including IG glass, manipulators, jib cranes, package unloaders.



Horizontal glass washing machine HTL2600



GEPI



TALAMONI Srl

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COMPANY DATA

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Rosella Mitidieri - Owner - Sales Director
Laura Broggio - Export Sales Manager
Elisabetta Talamoni - Production Manager
Marco Broggio - Production Manager

Sales

Domestic: 60% / International: 40%

Banks

Banco Popolare

Paid-in capital

EUR 20,000

Area

Offices 100 m² / Plants 150 m²

Founding year

1994

Planned Exhibitions 2022

Glasstec - Düsseldorf, Germany - 20 / 23 September

COMPANY PROFILE

An Italian partner for cutting tools known worldwide

TALAMONI was founded in 1994 and is specialized in the production of cutting tools in hard metal for the glass and ceramics industry.

Craftsmanship, flexibility and customer focus are all Talamoni's strong points. Thanks to our well-stocked warehouse, your order for any destination in the world leaves today.

The know-how of the owner, together with his young dynamic organisation, has enabled the company to grow and to make an impact on the market. Today, Talamoni is a trusted and pro-active partner for many companies, with 50% of its turnover coming from exports.

Raw materials and Operations, Quality Standards

Talamoni cutting wheels and discs, sintered with state-of-the-

art technology are turned by machines that guarantee consistent high-quality batches.

In the quality assurance unit, the physical characteristics of materials, metallurgical properties and all stages of production up to finished products, are examined before being assembled into tool-holders also produced by Talamoni, so as to guarantee ready to use and performing cutting heads.

The "Diamant" line of wheels is produced in various sizes and finishes depending on the type of glass to be cut. The advantages of using "Diamant" wheels are multiple: better quality of cut, easy breakout, triple lifetime and the same cutting angle allows greater thicknesses to be worked.

Talamoni is delighted to be presenting its cutting tools at Glasstec 2022.



Talamoni products are used in the following fields:

FLAT GLASS PROCESSING

- wheels in hard metal with diameter of 3.0 to 12.4 millimetres for automatic- or semi-automatic cutting tables, available with angles from 90° to 165° for cutting monolithic, stratified, laminated, and special glass.
- plastic wheel holders with various wheel models, suitable for installation on Bystronic, Bottero, Bavelloni, CMS, CSM, Euromec, Hegla, Intermac, Lisec, Gfpm, Macotec, OCS, Tuomas cutting tables...
- wheel holders in metal or steel in various models for all cutting tables, CNC-controlled machines and hand-held cutters on the market.
- metal modules complete with wheels for safe, fast and secure tool changes.



LUBRICATION

Talamoni cutting fluid mixtures are formulated to guarantee ideal lubrication of the cut and to optimise the working lifetime of the wheel, the oil enters the cut, maintaining the tension of the glass, facilitating the opening of the cut easy.

Talamoni offers four different types of synthetic fluid for cutting glass:

- T-OIL 3125 for cutting thick glass – low volatility;
- 3130 T-OIL for cutting shaped glass – medium volatility;
- 3133 T-OIL for cutting monolithic glass – high volatility;
- 3232 T-OIL for magnetronic, stratified, coated glass etc. – super volatility.

All products are registered and checked to ensure safe working environment in work areas and on cutting tables.



MANUAL CUTTING

The company produces a complete line of oil-reservoir cutters for manual cutting.

Various models of oil-reservoir hand-held cutters with handles in plastic or anodised aluminium all rigorously "Made in Italy".

Talamoni glass cutters are produced with wheels sharpened to different angles to satisfy diverse cutting requirements – the manual tools are destined for professional use in glassworks or artistic workshops.



HOLLOW GLASS PROCESSING

wheels in hard metal with diameters of 5.0, 5.6 and 6.0 are used for engraving hollow glass in automatic crack-off lines. Talamoni also produces tool-holders for these lines, as well as a series of diamond tools for edge processing and glass beakers.



we are innovation since 1966



GRUPPO TECNOFERRARI S.P.A.

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COMPANY DATA

Contacts

Matteo Grigolo - Sales Manager

COMPANY PROFILE

Managing complexity is what we do best. **Tecnoferrari** is specialized in automation since 1973, following the growth and development of the ceramic industry and acquiring knowledge in this industrial sector that was the first to recognise automation as the key to success.

We carry out ongoing research to improve the products and the functionality of the machines, drawing on our know-how in the world of ceramics, and we can now claim to have considerable expertise and a flexible approach to digital printing as well as storage and logistics systems.

The continuous path of innovation in digital printers has

brought the market to full technological maturity, and it is in this scenario that TecnoFerrari offers the benefit of its skills and experience.

The result has been 900 installations worldwide and a painstaking attention to every detail: of the printing heads and their optical alignment with the mechanics of the printing block, and of the ink distribution system comprising ever-better materials and components for more precise control of the highest coverage and management of new series of ink. And lastly, there is the next-generation GeCo® software suite, which offers additional ways to print jobs, specific screens to improve quality, control of colour spreading uniformity, and compensation for printing defects.

Decora® G is not just a digital printer. It is also an innovative decoration system for flat glass complete with optical centering, high resolution ink-jet printing and ink fixing.





Our services

We make technical improvements and invest heavily to offer an ever better service: advanced tools for remote control, upgrades, and assistance in the field.

With the new DigitalRemoteAssistance service, our highly specialized technicians offer immediate support to solve any unexpected issues.

The use of these technologies allows us to interact directly with the operators and provide instructions and sound advice based on our considerable experience in the field, and to upgrade the machines with the latest and most innovative software updates developed by our R&D department.

TEXPACK®



TEXPACK Srl

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COMPANY DATA

Quality Certifications

ESA (European Sealing Association)
ISO 45001:2018 – Safety System Certification
ISO 9001:2015 – Quality System Certification

Founding Year

1993

COMPANY PROFILE

Texpack® is a manufacturer of packings, tapes, twisted ropes, cloths and sleeves for thermal insulation, for static use, and also manufactures special types of packing and braided packing for dynamic use for pumps and valves. The company manufactures and markets industrial gaskets of different types and sizes, offering a complete range of sealing systems and products for high temperatures, as well as a range of products for the maintenance of fireplaces and stoves dedicated to the consumer market.

Texpack® was founded in 1993 as a result of the business experience of Giorgio Lanza and Simonetta Ghisi, who began specializing in the manufacture of textile products in glass, silica, Texil®, Biotex®, Thermaltex, Pyrotex®, Tenack and Aramtex® for thermal insulation at temperatures from 200°C up to 1,200°C. Since 1993, Texpack® has continued making constant and continuous investments, following the direction of technological research and using cutting-edge production methods.

Texpack® has always looked towards the future, using specialized technical staff for each individual process. This strategy has led to its transformation from its first small premises to occupying its current production and commercial headquarters of over 10,000 sq.m., selling products in Italy and around the world. Since its foundation, the company has changed continuously with the market to meet the needs of customers, becoming an established reality. The company is deeply rooted in the local area, where, since its foundation, it has always maintained its corporate headquarters.

Texpack® continues to give the highest importance to its staff members, which are an integral part of the results achieved and an asset to the company. The success achieved is the result of the synergies, knowledge, abilities and skills of its staff. The combination of skills, their application and commitment, are one of the pillars of the company. Investment in training, refresher courses, specialized development courses, as well as courses regarding production techniques, is an on-going strategy of Texpack®. The best preparation and quality of its staff are a guarantee for the continual improvement of quality, products and services supplied by Texpack® to its customers. Texpack® manufactures specific products for the glass industry, used in the production lines of glass bottles, flat glass and tempered curved glass mould coating.

Tenack products are ideal for covering stacker rods in the hollow glass industry and for lining moulds for the production of car windows, covering rollers and pipes in tempering furnaces, and in lamination furnaces for flat glass.

Aramtex® products are used in the industrial sector where extremely high mechanical resistance is required to running temperatures of about 350°C.



COD. 1204T Tenack square packing

Tenack square packing is made by braiding wires of AISI 316 L stainless steel. This type of packing, which withstands high temperatures and has excellent mechanical properties, is suitable for the glass industry as protection for parts that may come into contact with hot glass that is still soft, to prevent thermal shock and microcracks. The packing is very flexible, elastic and easy to handle, and is an excellent substitute for Aramtex® products when temperatures exceed 350°C.



COD. 1204CM Tenack knitted sleeves

Tenack sleeves are made by braiding AISI 316 L stainless steel wires. These sleeves, which withstand high temperatures and have excellent mechanical properties, are suitable for the glass industry as protection for parts that may come into contact with hot glass that is still soft, to prevent thermal shock and microcracks. They are an excellent substitute for Aramtex® products when temperatures exceed 350°C.



COD. 1203N PBI Tapes

PBI tapes are fire-retardant textile products made of PBI yarns, which are particularly suitable for high temperatures. To improve the use of this tape, a double-sided adhesive has been added, which helps to ensure correct positioning.



COD. 12010N Aramtex® discontinuous filament tapes

Aramtex® tapes are produced using 100% pure para-aramidic yarns with continuous filaments, and are usually woven in several layers, using particularly fine yarns that render the positioning surface extremely homogeneous and smooth, thus preventing the still hot sheets of glass from being scratched. Aramtex® tapes have excellent mechanical characteristics (excellent resistance to cutting, abrasion, tearing and compression) while their heat resistance characteristics remain unaltered.



TUROMAS

OUR PASSION, YOUR PROGRESS



TUROMAS

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COMPANY DATA

Founding Year

1985

Registered brands

Turomas

Planned Exhibitions 2022

Mir Stekla

Moscow, Russia - 6 / 9 June

Glass South America

Sao Paulo, Brazil - 29 June / 2 July

Glasstec

Düsseldorf, Germany - 20 / 23 September

Veteco

Madrid, Spain - 10 / 13 November

Glasstech, Mexico

Guadalajara, Mexico - 23 / 25 November



COMPANY PROFILE

Since 1985, **TUROMAS** has been manufacturing equipment for glass storage, loading and cutting, becoming an undisputed industry reference through its continuous R&D investment and commitment to reliability, versatility and performance. Nowadays the company has an intensive and strong presence in Europe and America, and its products are increasingly acclaimed in Africa, Asia and Oceania.

PRODUCT RANGE

- SMART GLASS STORAGE AND LOADING SYSTEMS
- FLOAT GLASS CUTTING SYSTEMS
- LAMINATED GLASS CUTTING SYSTEMS
- CUSTOMIZED PROJECTS





100% EUROPEAN MACHINERY

Quality, reliability and service are a must. TUROMAS production is carried out 100% in its Spanish factories, using only top rated European components and following the highest quality controls to ensure reliability and performance over the years.

READY FOR THE FUTURE

A future-proof investment needs machines able to integrate with other equipment, flexible enough to adapt to new requirements and even capable of growing with the company. Automation and the philosophy of Industry 4.0 are leading the glass industry towards a new model to be prepared for.

SMART STORAGE AND LOADING MACHINERY

TUROMAS provides an entire range of intelligent warehouses to achieve more performance, reliability and flexibility. The

new range of automatic storage systems SR and LA have revolutionized the concept of storage space utilization, while significantly reducing the loading cycle, making it the current market benchmark. As no two factories or two customers are the same.

TUROMAS designs and optimizes smart glass storage and loading systems individually according to available space, current production needs and future projections in order to generate the ideal solution for each particular case.

PIONEERS IN MAGNET DRIVEN CUTTING TABLES

TUROMAS presented the first-ever cutting table with linear

drives back in 2000, enabling to achieve an accuracy of $\pm 0,1$ mm, maximum speeds of 310 m/min and, most importantly, accelerations of up to 19 m/s², which allowed for unprecedented performance. Since then, many of the world's leading glass processing companies have relied on the reference technology and expertise offered by Spanish machinery.

4-TOOL: CUTTING 4 PERFECTION

The exclusive 4-TOOL cutting technology by TUROMAS offers unparalleled cutting quality in any glass from only 0.55mm to 25mm thickness. It uses specific pressure cylinders, lubrication and cutting wheels for each glass thickness, automatically adjusted without the operator intervention.

The result is a perfect and vertical cutting of any thickness, achieving the famous TUROMAS Open Cut and optimizing the company's time and resources.





VINCENT SRL

a brand of Surfaces Group

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COMPANY DATA

Contacts

Carlo Crescini - Sales Manager Glass Division
Franco Di Nardo - Product Specialist Glass Division

Mother Company

Surfaces Technological Abrasives SPA

Annual Turnover of the Group

EUR 205 million

Annual Turnover of Company

EUR 41 million

Percentage of turnover from glass

17%

Sales

Domestic 35% / International 65%

Banks

Unicredit, BNP Paribas, B PER

Area

Offices 2500 m² / Plant 6000 m²

Number of Employees

155

Founding Year

1974

Paid-in capital

EUR 7,021,000.00

Patents obtained

2 for the Glass Industry

Registered Brands

VINCENT

Planned Exhibitions 2022

Glasstec

Düsseldorf, Germany - 20 / 23 September

SALES NETWORK

EUROPE

AUSTRIA

SCHLEIFTECHNIK NEURURER GMBH
E-mail: office@schleiftechnik-neururer.at

BELGIUM

GEM Europe
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FRANCE

EC GLASS
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GERMANY AND SWITZERLAND

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LITHUANIA

UAB Glasspro
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THE NETHERLANDS

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NEW ZEALAND

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MALAYSIA, PHILIPPINES, SINGAPORE

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Email: enquiry@use2u.com

CHINA / ASIA PACIFIC

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E-mail: sarah.zeng@vincent.tools

AMERICA

MEXICO

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NORTH AMERICA USA & CANADA

IGP Inc
Email: vincent@igptools.com

ALL COUNTRIES

Product: Optics
COSIMCO S.R.L.
Email: sales@cosimco.it

COMPANY PROFILE

VINCENT has been a leading manufacturer of diamond tools since 1974: tools that are used for cutting and grinding, as well as polishing natural stone, quartz agglomerate, glass and ceramic tiles.

Our organization, which includes production sites in Italy and Asia, currently counts over 300 highly qualified employees and a sales force present in over 70 countries, serving more than 1400 customers around the world.

Our customers value us for the quality and consistency in the performance of our tools.

This recognition is thanks to our quest over the past 50 years to find advanced technical solutions to develop innovative and performance geared products. More than just a supplier, we like to distinguish ourselves as partners, an active part of our clients' production process.

We work together with our customers to apply and help define the tool most suited to their needs. The goal is to get the best possible solution to manage the customer's entire production process. VINCENT was founded in Thiene, a small town in the Northeast of Italy, in 1974. The company is specialized in the production of diamond tools for cutting, grinding and polishing stone, natural stone, quartz agglomerate, flat and automotive glass, optic and ceramic tiles. Twenty years after its foundation, in 1994, VINCENT caught the attention of the Austrian Swarovski family, who acquired the company and brought it into the TYROLIT group, manufacturers of abrasives. TYROLIT thus enforced its presence in the world of natural stone, and made its debut in ceramics and glass tools. Over the years, there have been many innovations, covering all applications for the processing of glass.

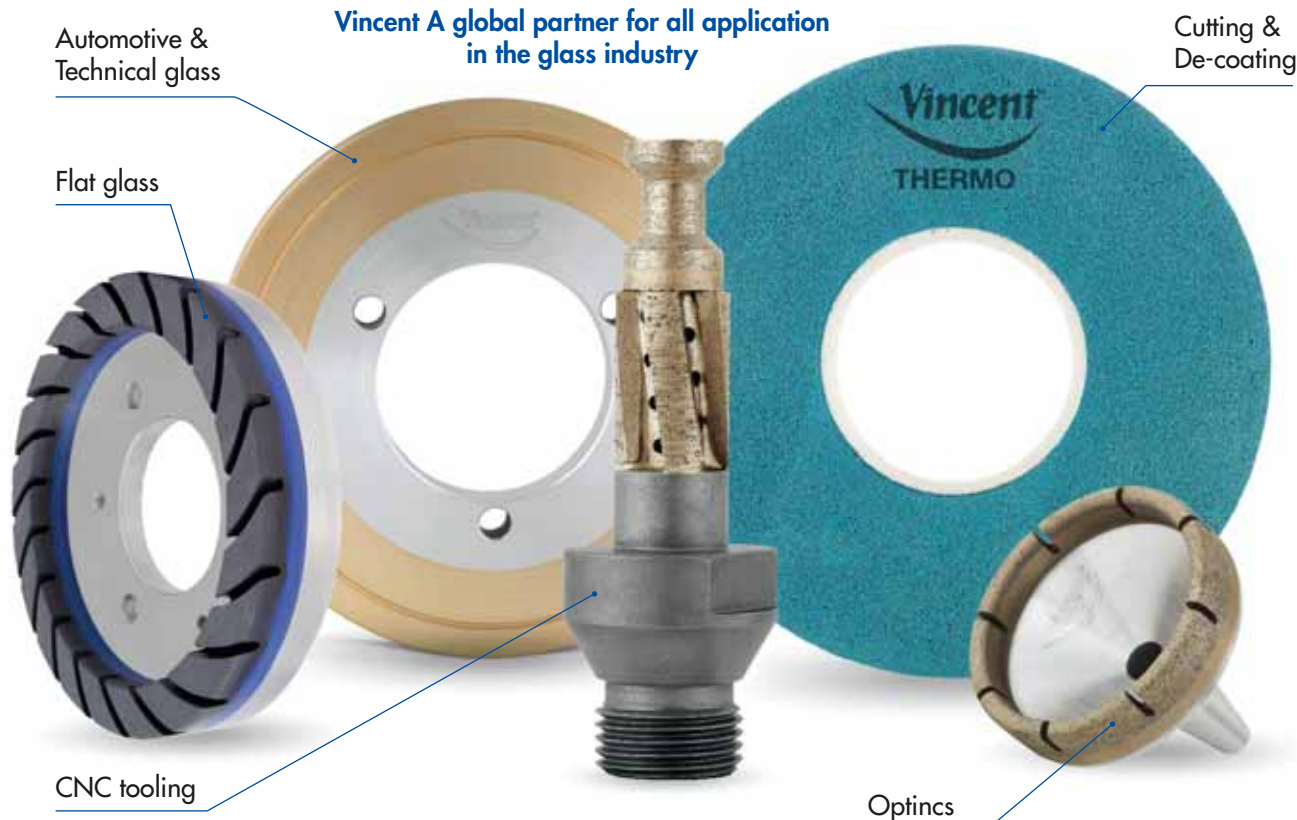


In 2021, the Quartz Industries division left the TYROLIT group to become part of Surfaces group, reviving the historical "VINCENT" brand.

In Glass Industry VINCENT plays an active role in developing innovation and the impressive milestones show it in the daily work of the customers all over the world.

- 2010 high speed automotive edge grinding
- 2013 high speed solar glass edge grinding
- 2014 first single-use automotive wheel: **HALO**
- 2017 new peripheral wheel named **HYLAS**
- 2018 **STARFLEX** the universal set of metal and resin cup wheels for flat edge glass processing
- 2019 **SAVA-ACTIVE** – patented – dressing stick
- 2020 **REVERSE** – patented – peripheral wheel for laminated glass grinding

**Vincent A global partner for all application
in the glass industry**





ZIPPE INDUSTRIEANLAGEN GMBH

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COMPANY DATA

Contacts

Dr. Philipp Zippe - CEO

Dr. Holger Zippe - Chairman

Annual turnover of the Company

EUR 50 - 55 million

Percentage of turnover from glass (%)

100

Sales: Domestic (%) / Foreign (%)

Domestic: 20% / International: 80%

Quality certifications

ISO 9001

Number of Employees

approx. 200

Founding Year

1920





COMPANY PROFILE

Our core business is the development and construction of batch and cullet plants.

We pride ourselves on being amongst our customers' most reliable partners, with an infrastructure, the expertise and capability to deliver projects of any magnitude.

As one of the few full-service providers in our industry, our spectrum covers all service areas within plant construction – engineering, planning, design, production, automation technology, installation, site management for all disciplines, commissioning, training for personnel, and services for on-going operations.

Be it flat glass or hollowware, **Zippe** batch plants ensure that the batch for every glass type is fully automatically fed into the furnace with the exact consistency and homogeneity needed, at the required amount and at the right point in time – 24 hours a day, every day.

State-of-the-art control technology is a key element for optimal operation of a batch plant. There are around 40 Zippe automation and control systems specialists hard at work for you. This means we are one of the few companies able to

develop and realise complete control systems in house.

Our 24-hour support service enables our customers to contact an expert around the clock either by phone or email.

Zippe has been focused on the future for more than 100 years and, having realised well over 650 batch plant projects, has the longest standing experience in our industry sector.

ZIPPE. The future of batch plant technology - today.

PRODUCT RANGE

BATCH PLANTS

CULLET PLANTS

ENGINEERING

AUTOMATION

MODERNIZATION

FACTORY CULLET RECYCLING

GLASS RECYCLING

BATCH CHARGING

GLASS LEVEL CONTROLLING

PREHEATING

MAINTENANCE AND SERVICE

The world's leading glass publications!



SINCE
1988



SINCE
1989



SINCE
2013



SINCE
1990



WEB
PUBLICATIONS

WWW.GLASSONLINE.COM



Review

March - April - May

2021

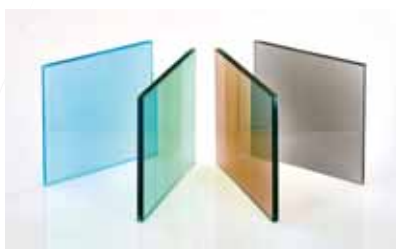
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March 2021

SATINAL: LAUNCH OF STRATO® COLOUR AND SECOND EVA-FILM LINE IN ITALY

SATINAL launched a radical innovative product from its S-LAB laboratory, the new colour range STRATO® COLOUR: colour becomes freedom, creative elegance, transparency and brilliance in the latest collection of STRATO® COLOUR interlayers for glass lamination, designed to reflect the global trends of the modern world. Over the years, SATINAL has continued to invest in the enhancement of production capacity and flexibility, as



well as in research and development activities. The company installed a second EVA-film production line in its manufacturing plant in Italy in 2020.

TVITEC GLASS AND TECGLASS TECHNOLOGY CONTRIBUTE TO STUNNING FACADE

Glass made by Tvitec played a key role for Italian Pichler Projects, in construction of the new Aleja shopping centre, in Ljubljana, Slovenia.

Tvitec processed nearly 4,000 metres of glass into unique specimens, using Tecglass digital printing technology for the decorated glass panels. They include insulating, tempered and laminated glass, some of which incorporate sun protection film. Crafted using pearl white colour points with 60 percent opacity, these exclusive design pieces maintain visual continuity between the glass panels.

The striking prismatic glass shapes, in many cases IG units filled with argon gas to ensure

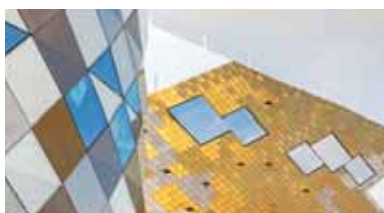


perfect insulation, add to the unique appearance of the facade. Tempering and lamination add outstanding safety.

The shopping centre was



designed by ATP Architekten Ingenieure.



VITRO - SOLARBAN 70® GLASS FOR NET ZERO ENERGY BUILDINGS

Solarban® 70 Atlantica® glass by Vitro Architectural Glass is among the advanced products that helped the Environmental Nature Center and Preschool (ENC) in Newport Beach, California, earn a coveted spot on the 2020 American Institute of Architects (AIA) Committee on the Environment (COTE®) Top Ten Awards list.

The LEED® Platinum Net Zero building, designed by LPA, Inc., Irvine, California, and currently pursuing Living Building Challenge (LBC) petal certification, incorporates operable and clerestory windows fabricated with Solarban® 70 Atlantica® glass to help meet stringent daylighting, energy and occupant comfort requirements.



With its great solar control, blocking nearly 80 percent of the sun's heat energy while letting in high levels of daylighting, Solarban® 70 Atlantica® glass helped reduce the school's Energy Use Intensity (EUI) by more than 100 percent compared to the national average for preschool/daycare building types.

In addition to the operable windows, the building's low energy footprint is further supported by large sliding doors, also made with Solarban® 70 Atlantica® glass, which capitalise on Southern California's mild climate, enabling natural ventilation year-round. A 32-kW rooftop photovoltaic array provides 105 percent of the net energy for the preschool's electrical needs.

Having specified Solarban 70 glass with emerald-green Atlantica® glass for the centre's original building in 2008, LPA chose the same glass make-up to match its new 8,000-square-foot facility.

The glass helps with building's NZE (net-zero energy) pursuit through the efficiency and orientation for daylighting and occupant views.

Solarban® 70 Atlantica® glass offers views to the outdoors in addition to ambient classroom lighting and contributes to the building envelope's exceptional energy performance.

FGIA: NEW COLLABORATION AGREEMENT WITH FEN-BC

An official agreement for collaboration between the Fenestration Association of British Columbia (FEN-BC) and the Fenestration and the Fenestration & Glazing Industry Alliance (FGIA) was finalised in February 2021, developing mutual synergies that will allow both organisations to best support their respective members. The collabo-



ration enhances the reach and visibility of both organisations while ensuring efficiencies in monitoring codes and regulatory affairs in Canada.

In order to recognize the work of FEN-BC and FGIA and to

support the publication and dissemination of the respective organisations' products, the associations have agreed to collaborate in the following primary areas:

- Events
- Education
- Advocacy
- Technical standards
- Product certification
- Research

The partnership also strengthens both organisations' collective ability to influence Canadian code and regulatory decisions to affect positive outcomes for members and the industry.

GUARDIAN GLASS: DEWITT PLANT EARNS EPA'S ENERGY STAR® CERTIFICATION



The Guardian Glass float glass plant in DeWitt, Iowa, USA, earned the U.S. Environmental Protection Agency's (EPA) ENERGY STAR

certification, which signifies that the industrial plant performs in the top 25 percent of similar facilities nationwide for energy efficiency and meets strict energy efficiency performance levels set by the EPA.

Guardian Glass improved its energy performance by managing energy strategically across the entire organisation and by making cost-effective improvements to its plant.

Operating since 1996, the DeWitt plant completed a major capital project in 2017 that expanded glass production and added new environmental control technologies. The plant applied for certification based on 2019 data.

Guardian Glass is a major business unit of Guardian Industries, which is owned by Koch Industries, Inc. (KII). This Certification aligns with Koch's philosophy of "being the operator of choice in the community". Earning ENERGY STAR Plant Certification is one way to give the DeWitt community a reason to choose to have the Guardian float glass plant operate in its community.

Dewitt joins four other Koch facilities in diverse industries that have earned ENERGY STAR certification in the past 12 months. KII was awarded the prestigious ENERGY



STAR Partner of the Year Award in 2017. ENERGY STAR was introduced by EPA in 1992 as a voluntary, market-based partnership to reduce greenhouse gas emissions through energy efficiency. To date, tens of thousands of buildings and plants across the country have earned the ENERGY STAR.

CANADIAN PREMIUM SAND PLANS FLOAT GLASS MANUFACTURING FACILITY

Canadian Premium Sand Inc. announced a shift in the direction of the Company's business strategy to focus on developing its Wanipigow, Manitoba, Canada, silica sand deposit into a sustainable float glass manufacturing and coating facility.

The facility will be designed to utilise the best available technology with a focus on sustainability initiatives such as waste heat recovery, and optimising use of Manitoba's abundant and inexpensive renewable electricity to set a new standard for low-carbon footprint glass manufacturing.



Establishing a float glass facility in Canada using responsibly sourced local raw materials and responsibly produced Canadian energy creates a unique opportunity to provide much needed sustainably manufactured float glass to Canadian, North American and international markets in an environmentally responsible manner.

Demand for solar glass to manufacture solar panels is expected to accelerate in the coming years as a result of global electricity grid de-carbonization and net-zero climate action plans. Energy efficient architectural glass and solar glass are both carbon-negative products based on a life-cycle carbon assessment as they save or avoid more energy consumption and associated emissions after installation of end use products than is consumed during manufacturing.

Preliminary test work shows that the Wanipigow Lower Black Island Formation (LBI) sand at the test site has potential for use in the manufacture of ultra-clear, energy efficient architectural float glass as well as solar glass for



use in solar panels. The testing of a small subset of the Company's silica sand was conducted by an independent ISO/IEC 17025:2018 accredited laboratory specialising in glass and raw materials analysis, the IGR – Institut für Glas- und Rohstofftechnologie. The preliminary results demonstrate that the LBI sand at this locale:

1. contains high calculated silica (94.1% to 97.2% SiO₂) with low detrimental elements such as iron,
2. is easily beneficiated to higher calculated silica (99.3% to 99.5% SiO₂) using standard methods such as a bumping table and a magnetic separator, and
3. melt tests yielded no microscopic relics of un-melted grains.

TRULITE NEW BERLIN INVESTS IN OSPREY 9 INSPECTION SYSTEM

Trulite's New Berlin Wisconsin facility recently commissioned the latest anisotropy and distortion inspection technology for their new 112" furnace – they installed a LiteSentry Osprey 9 Complete.

The Osprey 9 Complete measures highly accurate anisotropy and true optical distortion in any form. Quality tests for total stress (nm), iridescence, and centre/white haze along with pocket distortion, roller wave, and edge kink ensure that Trulite's New Berlin facility fabricates the highest quality tempered glass for IG and laminated products.

Trulite operates over 26 fabrication facilities throughout the United States and Canada, making it one of North America's largest architectural glass and aluminium fabricators and distributors.



PILKINGTON IGP EXPANDS PLANT IN OSTROŁĘKA, POLAND

Insulating glass leader Pilkington IGP is expanding its plant in Ostrołęka, Poland.

The size of the plant will be more than doubled compared to the current situation. The new space will allow for further investments, such as retrofitting with modern

equipment and doubling the production lines. The main goal of the implemented activities is to increase productivity and output, as

well as increasing the efficiency and ergonomics.

Pilkington IGP manufactures toughened, enamelled, screen-printed and IGUs for structural glazing, as well as glass processing and distribution. The company's plants are in: Skierniewice, Kraków, Bydgoszcz, Białystok, Ostrołęka and Szczecin.



VITRO LAUNCHES LUMAX® REFLECTIVE VISION GLASS FOR LATIN AMERICA

Vitro Architectural Glass announced the launch of LUMAX® 51 and LUMAX® 68 glasses, two neutral-reflective glasses specially formulated for commercial buildings in many of the warm/hot climate zones in Latin America.

Designed with a neutral, light-grey aesthetic, both products were created for use in areas where coated low-emissivity (low-e) and multi-pane insulating glass units (IGUs) have low market penetration or have not been widely adopted. Each is formulated with a basic magnetron sputtered vacuum deposition (MSVD) coating, which is applied to the interior side (second surface) of a monolithic glass panel.

Compared to conventional clear glass, LUMAX® 51 and 68 glasses can limit solar heat gain by up to 33 percent compared to uncoated clear glass yet transmit nearly six times as much daylight as uncoated reflective glasses. Dark, uncoated reflective glasses are commonly used to block heat energy from entering commercial buildings in Latin America, but these also can limit the health benefits and energy cost savings associated with natural daylighting.

While LUMAX® glasses perform well as single, monolithic panes of glass, Vitro Glass recommends pairing either



glass with clear glass in double-pane IGUs to maximise solar performance, reduce noise and increase durability. LUMAX® glasses can be laminated, tempered or heat-strengthened to meet strength or safety glazing requirements. They are available coated on clear glass substrates in 6-millimetre (mm) thicknesses. Sheet sizes are 1.80 x 2.50 and 2.50 x 3.60 metres.

GLASS FOR EUROPE - NATIONAL CERTIFICATION SCHEMES FOR AUTOMOTIVE GLASS

The European automotive glass industry is concerned by the increasing number of national certification schemes for automotive glass put in place worldwide. Glass for Europe calls on the national authorities to continue co-operating in the United Nations framework and reconsider the introduction of unilateral national schemes and trade barriers.

The safety of glass pieces mounted in vehicles is consistently ensured by the uniform provisions of the United Nations Regula-



tions GTR6 and R43. Over the last years, the automotive glass industry witnessed the introduction of new national certification schemes and marking in countries where ECE R43 tests and marking were considered sufficient to import automotive glass. For their vast majority, these national schemes are only mirroring R43 and do not substantially differ from the tests already performed to comply with the UN Regulation. However, their impact on the production costs and trade is substantial.

GUARDIAN GLASS INTRODUCES GUARDIAN BIRD1ST™ ETCH GLASS

Guardian Bird1st™ Etch glass joins Guardian Glass' family of bird-friendly products to give architects additional options to achieve their desired design aesthetic and glass performance while reducing the likelihood of bird collisions with windows.



Guardian Bird1st™ Etch glass gives architects greater flexibility to select the best coated glass for their project. By pairing a Bird1st Etch pattern on surface 1 and a Guardian SunGuard® low-E coating on surface 2 of an insulating glass unit, the project can achieve desired energy performance while meeting bird-friendly standards.

Available in four different patterns on translucent glass, Guardian Bird1st™ Etch glass products include Threat Factor scores (Threat Factor scores indicate the percent of times in which birds will not avoid collision) to quantify collision-avoidance effectiveness.

These products are available on Guardian UltraClear® low-iron glass and standard clear glass and can be paired with Guardian SunGuard® SuperNeutral® 68, SNX 62/27 and SNX 51/23 coatings on the same lite of glass, as part of an insulating glass unit. The glass can be heat-treated and used with laminated glass for safety and other benefits. Guardian Bird1st™ Etch glass is currently available in 96"x130" size on 6mm thick float glass through the Guardian Select® Fabricator network.



Four unique acid-etch patterns to mitigate bird collisions

SEDAC: GLASS ART IN ARCHITECTURE - IMPRESSIVE DOWN TO THE DETAILS

One of the most characteristic design features of the recent project '22 Bishopsgate', in central London, is the use of glass canopies, designed by artist Alexander Beleschenko. sedac's safety glass was chosen for the project as it met the requirements, both in terms of accurate printing and quality.

The lively design is strengthened by the many different formats of the glass. They vary in size and form: quadratic, trapezoid, triangular, free-form. No two glass elements are the same, each is unique, a highly imaginative work of art.

Alexander Beleschenko has been using glass to set identity-creating architectural accents for many years. For this project he was inspired by the traditional coats of arms of the trade guilds, which were historically omnipresent in London. He reinterpreted them in a new, abstract way, thereby connecting modern with historic – a phenomenon that is part of everyday life in the British metropolis.





VITRO ARCHITECTURAL GLASS LAUNCHES SOLARVOLT™ BIPV GLASS MODULES

Vitro Architectural Glass announced the launch of Solarvolt™ building-integrated photovoltaic (BIPV) glass modules, which combine aesthetics and performance of Vitro Glass products with CO₂-free power generation and protection from the elements for commercial buildings.

Solarvolt™ BIPV modules can be used to enhance various components of commercial building exteriors, including balustrades and balconies, overhead glazing and skylights, façades and opacified spandrel glass – all while passively generating solar power, reducing air conditioning costs and even replacing conventional cladding materials.

To meet a wide range of design and environmental performance targets, Solarvolt™ BIPV modules can be used with virtually any Vitro Glass product, including Starphire Ultra-Clear® glass, Acuity™ low-iron glass and the company's full range of tinted glasses. Performance can be further optimised by using Solarban® solar control, low-emissivity (low-e) coatings.

The modules are available in a variety of configurations, including multiple solar cell arrangements and three unique photovoltaic crystalline silicone types for various effects on aesthetics and performance.

Vitro will manufacture Solarvolt™ BIPV modules using

both glass-glass composite – solar panels with solar cells arranged between two glass lites – and glass-film techniques. The modules will be available in sizes up to 98" x 146" and in thicknesses of up to two 12mm lites.

Vitro Architectural Glass has long been committed to sustainability

as both the first U.S. glass manufacturer to have its entire collection of architectural glass products recognized by the Cradle to Cradle Certified™ Products Program and the first North American float glass manufacturer to publish third-party verified Environmental Product Declarations (EPDs) for its Flat Glass and Processed Glass products. This latest offering represents Vitro's recommitment to realising the full potential for environmentally friendly glass innovations on a global scale.

To realise its offering of Solarvolt™ BIPV modules, Vitro Architectural Glass acquired assets from solarnova, a Germany-based manufacturer of BIPV modules with successful commercial installations throughout Europe and North America.



Solarvolt™ BIPV modules have been previously tested by Kiwa, according to IEC standards, under the solarnova brand. All Solarvolt™ BIPV certifications and

warranties are registered under ILUMIMEX S.A. de C.V., a Vitro company. Solarvolt™ BIPV also is undergoing new certification testing to IEC, UL and CAN/CSA standards and is pursuing CEC and SGCC certification.



PILKINGTON UK DEVELOPS GLASS VISIBLE TO BIRDS TO PROTECT WILDLIFE

Pilkington AviSafe™ features a UV enhanced pattern, more visible to birds than it is to humans, which helps to prevent collisions and ensures maximum transparency, while maintaining the aesthetic appeal of glass in architecture. The glass reflects at the wavelength where birds can see UV light at its sharpest, which means birds see a really bright pattern disrupting

the reflection, so they know something is there and don't fly towards it. The pattern is aesthetically appealing to the human eye on the exterior surface, and barely visible from the inside, allowing uninterrupted views and high light transmittance. The glass will support building design professionals as legislators begin to enforce the use of bird-friendly materials in construction. New York and San Francisco have adopted mandatory codes for commercial development that encourage the specification of glass that's visible to birds.

Pilkington AviSafe™ helps architects to create projects that have a minimal risk to local wildlife, without having to compromise on the amount of glass used as part of the building envelope. Pilkington AviSafe™ would be used on the exterior surface of an insulating glass unit (IGU), and can be combined with other NSG products for additional benefits, such as thermal insulation, solar control, safety and noise control. The glass has been successfully trialled at Mere Sands Wood, a nature reserve near the company's research and development hub in Lancashire, UK. It's used in the new visitor centre and café to help diminish the risk of the park's 170 different species of birds from colliding with its windows. The site, operated by the Lancashire Wildlife Trust, is a former sand quarry used to harvest minerals for glass manufacturing.



April 2021

AGC: PLANIBEL EASY GLASS HELPS TO REDUCE COVID-19 CONTAMINATION

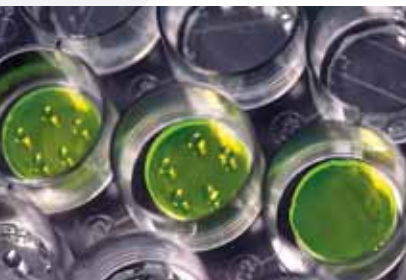
AGC Glass Europe now has good news to share about coated glass that helps to protect against COVID-19 contamination.

A study published in the Coatings Journal with support from AGC was done on different materials ranging from metallic materials to float glass, acrylic glass (such as Plexiglas®, Perspex® etc.) and coated glass (Planibel Easy). The result shows the time taken for the number of infectious viral particles TCID₅₀ to decrease, and demonstrates that SARS-CoV-2 viral particles stay active for a shorter time on Planibel Easy coated glass previously exposed to daylight (photocatalytic effect).

The study was carried out in an experimental setting that mimicked real-life conditions, under the responsibility of Prof. Muylkens of the University of Namur (Belgium) and confirmed by Prof. Lucet, Dr Visseaux and Dr Jérémie Guedj of INSERM / Assistance Publique-Hôpitaux de Paris (France). The study used real human SARS-Co-2 viral particles at the same concentration as the actual viral load observed in a cohort of patients infected with COVID-19.

The time needed to inactivate 90% of the SARS-Cov-2 viral particles is 37.5% shorter for Planibel Easy exposed to daylight than for float glass or acrylic glass. This means that using Planibel Easy greatly reduces the risk of viral transmission when we touch the surface.

This makes Planibel Easy the appropriate choice for windows, partition walls, doors and a wide variety of shared or frequently touched surfaces, for instance in com-



Material	Half-life TCID ₅₀ (hours)	Time to 90% decrease of TCID ₅₀ (Median, hours)
Planibel Easy exposed to daylight	4.1	13.5
Float glass	6.9	21.6
Acrylic glass	3.5	11.9
Aluminium	2.3	7.3

mercial and public buildings, public transport, hospitals, schools, sports facilities, leisure facilities, the hospitality industry and so on.

Independently tested and certified, Planibel Easy was already known for the self-cleaning properties of its coating. It has now been shown that when daylight activates the coating this accelerates the destruction of SARS-CoV-2 particles (the virus responsible for COVID-19) on its surface.

Planibel Easy can be combined in double glazing with other AGC products such as low-E glass. Resistant to corrosion and chemical damage, Planibel Easy can be delivered in toughened, laminated, bent and processed forms, and even in insulating double or triple glazing. As long as the glass is exposed to daylight and/or UV(A) light there are plenty of possibilities to make spaces safer.

NSG GROUP MAKES MAJOR INVESTMENT IN ITS LAURINBURG PLANT

NSG Group is rebuilding one of the furnaces at its float glass plant in Laurinburg, North Carolina. The project started on March 10, 2021 and is expected to be completed in late June 2021.

The Laurinburg plant manufactures float glass for the commercial architectural and export markets. It is located approximately 100 miles south-west of Raleigh and currently employs around 400 people.

The Flat Glass business (Architectural and Automotive) of the NSG Group operates under the Pilkington brand.



POLISH GLASS JOINS GLASS FOR EUROPE AS NATIONAL PARTNERS

The Polish Glass Manufacturers' Federation, national association of the Polish glass industry, is a new national partner of Glass for Europe. With the support of 8 national glass and glazing national associations represent-





ing thousands of flat glass processors and transformers from all over Europe, Glass for Europe pursues its mission of supporting a dynamic, influential, and valued flat glass industry in the European Union.

"The flat glass producers are among our founding members and are very active in the Federation's advocacy actions including buildings and building renovation policies," said Piotr Kardas, Secretary General of Polish Glass. "During the last 5 years, flat glass companies present on the Polish market have massively invested in the modernization of their production lines. Thanks to this increased capacity, Poland is today the 3rd biggest float glass producer in Europe with a production of circa 1,5 million tonnes per year."

KELLGLASS CHOOSES GLASTON TO HELP ADD VALUE

KellGlass Limited has worked with Glaston to install a new furnace. The company's business is split 50-50 between glass for the double-glass glazing business and glass for the processing market, and so the perfect choice was a Glaston RC Series furnace, which does both.

A team of two main operators was initially trained to run the furnace with the idea that they will train another two operators as backups, with the furnace already running glass for commercial sales.



Kellglass began operations in Meath County, Ireland in 2005. Today, the company is one of Ireland's leading glass processors and tougheners. The company's goal is to continue developing its process over the next few

years to add more value for customers. Ireland is still a growing market with substantial potential. References include the Dublin Airport and the Dublin Zoo.



NSG GROUP ANNOUNCES CLOSURE OF ALEXANDRA WORKS PLANT IN ST HELENS, UK

NSG Group, owner of Pilkington UK, has said that the Alexandra Works site on Borough Road, St Helens, is to close. The company anticipates it will cease manufacturing at the site by the end of December.

The decision to close the site was made due to it being no longer profitable, the closure could affect a total of 90 jobs in St Helens.

A spokesperson for NSG Group said, "Despite the extensive efforts of everyone involved to make our Pilkington Architectural – Alexandra Works site profitable, we have decided to cease manufacturing activities at this St Helens facility at the end of this year."



VITRO GLASS: THE PERFECT REFLECTION - INTRODUCING SOLARBAN® R77

Solarban® R77 glass joins Vitro Architectural Glass' family of neutral-reflective low-e glasses to showcase reflectivity that is higher than that of Solarban® 67 glass, but lower than that of Solarban® R100 glass. It utilises a magnetron sputtered vacuum deposition (MSVD) solar control and low-emissivity (low-e) coating.

Solarban® R77 glass is ideal for realising façade and curtain wall designs intended to capture the visual character of the sky and ambient environment. On the building exterior, Solarban® R77 glass offers a crisp, silver-blue transmitted colour. On the building interior, Solarban® R77 glass provides clear exterior views and soft, natural, neutral daylighting. Its low interior reflectance means Solarban® R77 glass offers crisp, lively views of the outdoors.

Solarban® R77 glass must always be heat-treated, even for laminated applications commonly suited for annealed glass. Solarban® R77 glass allows specifiers to meet increasingly stringent building code mandates and satisfies performance requirements for all climate zones in the United States and Canada under ASHRAE 90.1 standards.



GUARDIAN GLASS HONOURS CUSTOMERS

FCCL . RATIO Architects



Guardian Glass honoured the glaziers and fabricators of seven commercial projects at its annual Commercial Project Awards event April 15. More than 40 projects were

nominated for works completed in 2020.

"Guardian Glass is privileged to recognize incredible glass designs in architecture from our glazier and fabricator partners," said Rick Zoulek, Vice President, Guardian Glass, Americas. "These impressive façades showcase why glass is a preferred building material in commercial construction.

"We thank the glaziers and fabricators for their commitment to excellence and ongoing partnership," he continued. "Congratulations to all the nominees for their hard work and dedication to our Guardian SunGuard® coated glass program. We look forward to working together on exciting new projects as architects continue to innovate and execute with glass."

This year, the 2021 projects and the glass professionals who brought them to life were celebrated virtually. The nominated and winning projects spanned a wide variety of architectural segments and locations across North America.

VANCEVA - KALEIDOSCOPE IN TIANSHUI

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

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

Recognizing the architects' intent to create a joyful learning environment, World of Color Awards (WOCA) juror

Ammar Al Assam says of Kaleidoscope's design, "Beautiful and playful application of coloured glass makes the kindergarten look inviting, cheerful, and inspiring to the



© CreatAR Images

children. The proportions of the colour splashes against the white envelope feel just right—and the choice of soft gradient colours too."

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



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EDIL VETRO TRIPLES ITS PLANT WITH FOREL MACHINERY

The cooperation between Forel and Edil Vetro, a Company established in 1984 in Benevento (Italy), is a long-standing one. After the first insulating glass line, installed over fifteen years ago, a succession of other successful projects has followed. The latest of these are a complete vertical cutting line for laminated glass and the recently installed "High Tech" insulating glass line. Both of these solutions are already installed and fully operational at the new production site, along with all the other machines purchased by Edil Vetro for tempering, laminating, horizontal cutting and edge processing.

The entire insulating glass units production cycle of the plant is carried out with Forel machinery: laminated glass sheets (Jumbo size: 6,000 x H=3,300 mm) are loaded into the automated storage, which feeds the vertical cutting line, which is equipped with two cutting bridges and a central rotation section.

Using two separate IG production lines has significantly increased the company's flexibility and allows for processing of different orders simultaneously.

The first of these two insulating glass lines is dedicated to residential applications. This line is producing mainly single chamber units up to 2000 mm in height, and can also process shaped units. It is very precise and is capable of ensuring high production outputs, within a specific



Piero, Tommaso and Michele Sabatino
Edil Vetro, Italy



range of sizes, allowing the company to be competitive with more challenging sizes and characteristics.

The "High Tech" IG line represents Forel's last evolution in terms of IG units production, designed to offer the most effective choice of options for the production of IG units for residential and commercial applications, like glass facades. Boasting a host of exclusive, innovative solutions, this line is capable of producing double, triple or quadruple insulating units up to 6000 x H=3300 mm, including stepped units and shapes, as well as offering many other possibilities. The impressive production capacity of this IG line and the superior quality of the finished products make it a strategic choice.



Forel 'High Tech' IG Line in Edil Vetro plant

GFE: HIGH-PERFORMANCE GLAZING ESSENTIAL FOR EU'S CLIMATE NEUTRALITY

The European Commission adopted the EU Taxonomy Climate Delegated Act as part of a package aiming at directing private financing towards sustainable activities across the European Union. Glass for Europe welcomes the recognition by the Taxonomy Climate Delegated Act of the role of building glass and glazing to contribute to climate change adaptation and mitigation.

"Glass for Europe has always been clear that high-performance glazing is essential for Europe to move towards climate neutrality," said Bertrand Cazes, Secretary General of Glass for Europe, in a statement released right after the adoption of the delegated act. The EU requires deep energy demand reductions in key sectors of the economy such as the building sector. High-performance glazing is the indispensable component of the energy-efficient windows that EU buildings will need to cut their CO₂ emissions. "This taxonomy classification comes as a fair recognition of the instrumental role our sector plays in this transition," Bertrand Cazes concluded.



Whilst the flat glass contribution to clean mobility advocated by Glass for Europe was not acknowledged in this first legislative act, since the EU Taxonomy Delegated Act will be modified over time, further efforts will be necessary to ensure that automotive glazing is fully covered. Once formally adopted, the first EU Taxonomy Climate Delegated Act will go under the scrutiny of the European Parliament and the Council. Glass for Europe keeps on following the work-stream of the Taxonomy Regulation in view of the release of a second delegated act for the remaining objectives in 2022.

AGP GROUP ANNOUNCES LONG-TERM PARTNERSHIP WITH BDT CAPITAL PARTNERS

AGP Group, a premier global leader in designing and manufacturing high-tech automotive glazing, announced a strategic partnership and investment by funds affiliated with BDT Capital Partners, a merchant bank that provides family and founder-led businesses with long-term, differentiated capital, alongside the Mannheim family who will continue as the controlling shareholder. This new minority investment aims to provide long-term capital to accelerate the company's global expansion plans of their eGlass division.



"We are very pleased to welcome BDT as our long-term investment partner," said Arturo Mannheim, CEO and Chairman of the Board of AGP Group. "With their support, we will build two Tech Innovation Centers and two eGlass manufacturing facilities in North America and Asia. This will round-up our global strategic footprint to continue working closely with Automotive OEMs."

"AGP Group is a highly innovative family-led business with advanced manufacturing and R&D capabilities that will continue to shape the future of mobility," said Björn Robens, Partner at BDT Capital Partners. "We look forward to our partnership with Arturo and his strong management team to support the company's global expansion and strengthen its technological leadership in the industry."

"Our partnership with AGP and the Mannheim family is another example of our differentiated model, partnering with global family businesses with extraordinary leadership teams to help them achieve their long-term objectives," added Edgar Legaspi, Partner at BDT Capital Partners. Goldman Sachs, which became an investor in 2018, will remain as a minority shareholder supporting the long-term strategy.

SAINT-GOBAIN INVESTS £30 MILLION IN UK GLASS SUPPLY

A 30 million GBP investment will secure the long-term high quality glass supply in the UK is being made at Saint-Gobain's glass manufacturing factory in Eggborough, East Yorkshire (United Kingdom).

The complex engineering and construction programme will see the complete rebuild and installation of a state-of-the-art float glass furnace. The upgrade will provide greater automation and enhanced control systems, with the use of the very latest equipment and integrated digital technologies, while minimising both the energy used for glass production and emissions from the process. The enlarged capacity furnace will replace the existing furnace which has reached the end of its design life.

The investment programme also includes upgrades to other areas of the factory. The project will result in securing the long-term supply of high-performance glass that meets the stringent quality requirements of customers in the UK.

The components for the new furnace are already on site and include more than 7000 tonnes of specialist 'refractories', the building blocks used in the construction of the furnace. Many of these refractories are manufactured by Saint-Gobain's own manufacturing business, illustrating the expertise that exists within the group.

The new furnace will use less energy and will help the company to optimise manufacturing efficiency, increase production capacity, ensure consistent high quality glass manufacturing and further enhance Saint-Gobain's already market-leading environmental and sustainability credentials.

The new facility is strategically important to support and serve the UK window industry with domestically manufactured high-performance products developed specifically to meet the needs of the UK window industry. It demonstrates Saint-Gobain's commitment to the long-term future of glass manufacturing in the UK and confidence in the wider construction industry.



May 2021

FAOUR GLASS: SLIMPACT® WITH INSULATED GLASS RECEIVES FLORIDA APPROVAL

Faour Glass Technologies (Faour Glass), innovator of frameless impact glazing solutions for high-end residential and commercial markets, announced the first Florida product approval (FL #25673.4) for a frameless impact window with insulated glass.



SLIMPACT® XLIG is now approved for large missile with design pressures up to +90/-90 PSF with sizes up to 8' wide by 12' high. Providing an IG glazing option with the SLIMPACT window meets the growing demand for thermal performance with an impact-resistant glazing system.

The SLIMPACT® product line offers the combination of beauty, elegance and performance in a frameless impact glazing system. The first of its kind, SLIMPACT®, was introduced in 2015 and featured a frameless structural glazing technique designed for the luxury residential and commercial markets in hurricane-prone regions. SLIMPACT® offers designers and owners unobstructed views while still meeting Florida's stringent large missile impact requirements. The SLIMPACT® portfolio of frameless glazing solutions includes windows, jumbo windows, pivot entry doors, automated doors, skylights, and railings.

DOW: A BREAKTHROUGH IN FULL VISION GLAZING

Dow has introduced a flexible, optically clear, spacer for connecting glass, named DOWSIL™ Crystal Clear Spacer. Insulating glass with full transparency with a potential for use in a variety of glass designs and connections is now a reality.

The silicone spacer is intended for use in the assembly of air-filled insulating glass. Flexibility and movement accommodation are just two of the key features. It is chemically reactive and builds full adhesion almost instantly. Easy, efficient and durable – it is an ideal solution for commercial refrigerator doors, where good product visibility in a retail environment is desirable and is also suitable for many other glass applications. Supplied ready to use, its inherent flexibility offers durability and reduces the risk of glass breakage.





Designs in glass have become increasingly popular due to their aesthetically pleasing appearance when used for applications with architectural impact or for utility appliances with doors or side elements. One particular example where greater transparency and full vision can be achieved is commercial refrigerator doors.

DOWSIL™ Crystal Clear Spacer provides a very low thermal conductivity and can enhance the performance of energy efficient glazing systems. Different spacer dimensions are available to help enable creative flat and curved glass designs.

AGC GLASS EUROPE UNVEILS BRAND-NEW PRODUCT WEBSITE

AGC's new YourGlass website will serve as a fully integrated hub guiding visitors to appropriate AGC products and services based on each user's needs and knowledge. New content – ranging from case studies to customer testimonials and innovation stories – will inspire existing customers, architects, installers and homeowners alike.

The site features improved navigation and functionality designed to provide a relevant and customised user experience for four key target groups: 1) distributors and processors, 2) architects and specifiers, 3) installers and 4) homeowners. Visitors will be smoothly and seamlessly guided to relevant product information and documents, including direct links to well-known digital tools, such as the Glass Configurator.

Distributors and processors will easily find product information and documents while also being prompted to explore new innovations. Architects and specifiers will be inspired by relevant case studies and customer testimonials and will be able to explore different lifestyle themes, applications and glass features so they can find the best possible solutions for their projects. Installers can learn more about glass and its many applications through hands-on tutorials and case studies and also easily access useful accessories. And homeowners can explore the many applications and features that glass offers for their homes.



AGC Glass Europe unveils brand-new product website:
www.agc-yourglass.com - © AGC Glass Europe

From this new foundation, the YourGlass experience will evolve into even more personalised journeys, including private login areas for customers and architects, offering access to certain functionalities.

The new site is the result of a thorough strategic and analytical process that included extensive teamwork with many internal and external stakeholders – the ultimate aim being to deliver the best possible experience for customers throughout their journey.

The site's main functionalities include:

- A customised user experience based on four navigation profiles
- Easy search for products and services by type of glass, key features, lifestyle theme and application
- Vast choice of inspirational content: innovation stories, news, AGC Expert Corner, customer testimonials, tutorials and architectural reference case studies, including extensive image galleries
- Regularly updated country-specific news
- Direct access to online tools, such as the Glass Configurator, product catalogues and more
- Comprehensive document library: easily find and download the documents you need.

The site is available in nine languages: German, English, Spanish, French, Italian, Dutch, Polish, Russian and Czech. Users can also choose their country, which means the information displayed will vary depending on product availability in each market.

TECNOGLASS CHOOSES MAPPI FOR NEW HST TESTING EQUIPMENT

Tecnoglass Group has chosen HST by Mappi to test for the risk of spontaneous breakage during production. The HST, Heat Soak Test, is a component of the Tempering Furnace with all the design accuracy and production quality that have always distinguished Mappi's products.

The risk of spontaneous breakage can derive from a peculiarity of the glass production process. Invisible nickel sulphide particles are created inside the glass sheets, and following the tempering process they tend to change size. Over time this causes internal tensions in the tempered sheet which can lead to a spontaneous breakage. During the test, glass sheets are brought to about 290 degrees Celsius and maintained at this temperature. This speeds up the breaking process: plates destined to spontaneously break should explode during the test. The HST



is regulated by the UNI EN 14179 standard, a mandatory test for sheets intended for building façades. Tecnoglass, which has established itself as a model of quality and technical expertise in the production of insulating, safety and acoustic glass, already has an ATS 4.0 installed, and so it was natural to choose the HST to complement it. HST by Mappi is the ideal partner for the furnaces of the Fox and ATS 4.0 series.

APPLE AWARDS CORNING 45 MILLION USD

Apple is awarding 45 million USD from its Advanced Manufacturing Fund to Corning Incorporated, a supplier of precision glass for iPhone, Apple Watch, and iPad. The funding will expand Corning's manufacturing capacity in the US and drive research and development into innovative new technologies that support durability and long-lasting product life, building on both Apple and Corning's deep commitment to protecting the environment.



Apple's 45 million USD award to Corning will expand manufacturing capacity in the US and drive research and development into innovative new technologies.

Corning's US operations in Kentucky, USA, and other facilities. The investment has also helped facilitate research and development into state-of-the-art glass processes, which led to the creation of Ceramic Shield, a new material that is tougher than any smartphone glass.

"Apple and Corning have a long history of working together to accomplish the impossible, from the very first iPhone glass, to the revolutionary Ceramic Shield on the iPhone 12 line-up, their collaboration has changed the landscape of smartphone cover design and durability.

With support from Apple's Advanced Manufacturing Fund, experts at both companies worked together to develop a new glass-ceramic, which gets its strength from nano-ceramic

Corning has already received 450 million USD from Apple's 5 billion USD Advanced Manufacturing Fund over the last four years. Apple's investment helps support more than 1,000 jobs across



Skilled technicians in Harrodsburg, Kentucky, are part of the more than 1,000 jobs Apple's investment supports across Corning's US operations.

crystals, produced in Corning's plant in Harrodsburg, Kentucky, the facility where every generation of iPhone glass has been made.

The new material was enabled by a high-temperature crystallisation step which forms nano-crystals within the glass matrix. Those specialised crystals are kept small enough that the material is transparent. The resulting material makes up the revolutionary Ceramic Shield, which Apple used to fashion the new front cover featured on the iPhone in the iPhone 12 line-up. Prior to Ceramic Shield, embedded crystals have traditionally affected the material's transparency, a crucial factor for the front cover of iPhone because so many features, including the display, the camera, and sensors for Face ID, need optical clarity to function.



The new front cover of the iPhone 12 line-up features Ceramic Shield, a glass-ceramic which gets its strength from nano-ceramic crystals

GUARDIAN GLASS: NEW FLOAT GLASS FURNACE IN LUXEMBOURG

Guardian Group will invest in a new float glass production line in its Bascharage production site in Luxembourg. The existing furnace will be replaced at the end of 2022, and the new furnace is expected to be operational in 2023.

The new facility will improve energy efficiency as well as the overall environmental performance of float glass production, significantly reducing energy consumption and carbon emissions. This facility modernisation programme will receive investment aid for environmental protection from the Ministry of the Economy.

Guardian merged its two production sites located in Dudelange and Bascharage in 2020. As part of the investment programme, Guardian Glass will consolidate all of its production activities, including the Dudelange rolling mill in Bascharage.

Thanks to this new investment, glass production in Luxembourg will continue for the next 15 to 20 years.





SAINT-GOBAIN TO CONTINUE PLANNED INVESTMENTS IN INDIA

Saint-Gobain said it will continue its planned investment of more than 25 billion INR in greenfield and brownfield expansion in India in two years.

Based on the long-range plan, as a group, Saint-Gobain will be completing investments of 25 billion INR in FY22 and FY23, including creating larger facilities, looking at potential acquisitions, investments in start-ups, accelerating spends on digital transformation and increasing R&D spend.

The plan includes two investments of 5 billion INR each in capacity expansion and an investment of 10 billion INR in a greenfield plant to manufacture building materials for which the location is yet to be finalised.



The investments in start-ups and inorganic growth would be over and above the committed investment.

Santhanam B., chairman and managing director of Saint-Gobain India, said, "We are ahead of the curve on the investment front."



FINEO PARTNERSHIP BETWEEN AGC GLASS EUROPE AND SCHÜCO

AGC Glass Europe and Schüco have agreed to enter into a strategic development cooperation to pool know-how and technical expertise, synergies in research and actively promote the development of innovative solutions for vacuum insulating glass and aluminium systems. This cooperation further strengthens their collaboration.

Requirements for high sustainability and future viability of buildings are increasing. Smart and innovative technologies and materials are becoming more and more important. This includes, among other things, the use of vacuum insulating glass (VIG) inside window or façade systems.



© AGC Glass Europe - Schüco

With its FINEO vacuum insulating glazing, AGC Glass Europe embraces innovative technology. The ultra slim glazing (from 6 mm total thickness) achieves unmet thermal and acoustic performances, and better light transmission.

The Schüco Group is at the cutting edge of technology, always setting high quality standards and premium solutions. The obvious adequation of Schüco with FINEO®

makes it a perfect partner for AGC Glass Europe. In addition to meeting the highest comfort and design requirements through slim constructions and low weight, Schüco façade and window systems with FINEO® vacuum insulating glazing above all meet demands in terms of sustainability and energy saving – through optimum thermal insulation performance and the unrestricted recyclability of FINEO®.

NORTHGLASS: QUALITY AND ELEGANCE ON SYDNEY HARBOUR

Opera House No. 1 was designed by the Australian architecture firm Tzannes.

The project selected high-quality materials, including imported pure, natural marble from Italy, high-grade oak flooring from the Netherlands, and the world's top home appliance brands, aiming to create a supreme experience for residents, and it is determined to make Opera House No. 1 into a world-class boutique residential project.

The high-end curtain wall glass provided by NorthGlass' Shanghai Glass Company, with its ultimate craft, excellent beautiful lines and meticulous proportional details creates an extraordinary quality, smooth and elegant appearance and complements Opera House No. 1, which maps brilliant colourful Sydney Harbour onto the glass.

Shanghai Glass Company relies on the technical strength of Tempering Furnace Business Unit of NorthGlass to ensure that the positive and reverse bending Low-E glass on the same surface, which makes the colour of curtain wall glass integrated; ultra-small radius tests the accuracy of glass manufacturing and optical deformation, while continuous testing and improved equipment and technology upgrade the glass quality. Soft glass curves with a blue-gray system shows its extreme elegance, and at the same time, the open glass curtain wall enlarges the indoor space and proportion, allowing enjoyment of all four seasons.



VITRO GLASS: SOLARBAN® 90, STARPHERE® GLASS TRANSFORMS OLD BUILDING

1217 Main Street – once a 1950s-era bank building – has been transformed into a mixed-use architectural gem in downtown Dallas, USA. The project has been named one of the ten best structures in Dallas by Dallas Morning News' architecture critic Mark Lamster. Designed by 5G Studio Collaborative, Dallas, the adaptive reuse features a colourful handmade ceramic perimeter framing a ground-level storefront and four-story curtain wall system with Solarban 90 Starphire® glass from Vitro Architectural Glass.

Josh Allen, partner, 5G Studio Collaborative, said it was critical for the six-coloured blue mosaic façade, designed by well-known artist and sculptor Jorge Pardo, to be paired with the right glass system. "Numerous options were considered and after reviewing them all in combination with the artistic tile on the building, Solarban® 90 Starphire® [glass] was selected because of its clarity, reflection and lack of colour," he explained.

Starphire Ultra-Clear® low-iron glass offers industry-leading clarity while Solarban® 90 glass delivers high-performance solar control. United in a standard one-inch insulating glass unit (IGU), they block 77 percent of the sun's heat energy and achieve a crystal-clear aesthetic with visible light transmittance (VLT) of 54 percent. "This allowed us to provide a building that is both alluring and efficient," Allen added.

Complementing the seamless aesthetic, the individual ceramic tiles are held together with no visible control or expansion joints, panel or module seams. "To achieve this, a custom rain screen system was developed, which is a grid of vertical and horizontal aluminium t-shaped extrusions that support the 36,215 glazed ceramic tiles," Allen continued.

The original 1958 Guardian Savings Bank survived two fires in the last couple of decades. Preserving the core and shell of the historical building, the design team transformed the dilapidated structure into an urban revitalization success. Passers-by can observe the flurry of activity within the ground floor's bakery, café and commissary, and upper four levels of office space through the floor-to-window Solarban® 90 Starphire® glass. The top floor also features exterior balconies.



GLAS TRÖSCH EXPANDS ITS TECHNICAL GLASS DIVISION

The Swiss family-owned company Glas Trösch has acquired the technical glass division of the Berliner Glas Group from ASML Holding N.V.

The transaction includes companies in Schwäbisch Hall and Syrgenstein, that specialise in the production of display glass and touch assemblies. Both companies will operate under the brand name EuropTec in the future. The Glas Trösch Group bundles the entire technical glass division under this brand.

"We are pleased that as a result of this acquisition EuropTec is able to significantly expand its capacities and market position," said Fabian Zwick, CEO of Glas Trösch. "The companies have interesting technologies and offer promising potential for the future."

Andreas Nitze, CEO of the Berliner Glas Group, added, "As a part of Glas Trösch, Berliner Glas Technical Glass can benefit even better from the growth opportunities that the market is currently offering. The companies have a lot in common – above all their expertise and passion for glass as a building material. These are the best prerequisites for a joint success story."

The acquisition will not result in any changes for the business partners in terms of personnel and ongoing activities. The two acquired companies will continue to concentrate on their core activities in the display glass and touch assembly businesses.



PULP STUDIO CONTRIBUTES GLASS TO HURRICANE MARIA MEMORIAL

The Hurricane Maria Memorial, recently opened to the public in New York, is also known as "My Cry into the World". Designed by Puerto Rico-based architect Segundo Cardona and Puerto Rican artist Antonio Martorell, the glass spiral aims to be a symbol of resilience for the Puerto Rican community.

The glass in the memorial uses Pulp Studio's D2G process for ceramic application, and then is bent, tempered and laminated.

The memorial reflects and refracts multi-hued beams of sunlight and is crowned by the star





of the Puerto Rican flag, emblematic of hope rising from devastation. The glass panels are painted by Martorell and include the poem, "Farewell from Welfare Island," by Julia de Burgos, a Puerto Rican poet. Located on Chambers Street overlooking Rockefeller Park, the multicoloured glass curve will mimic both the spiral shape of a hurricane and a shell to represent protection against the elements.



VITRO GLASS: BIRD-FRIENDLY FAÇADE FOR THE UNIVERSITY OF SASKATCHEWAN

The state-of-the-art Collaborative Science Research Building at the University of Saskatchewan in Canada delivers an integrated, sustainable environment for the school's biology and agricultural departments.

Decorated with stone columns to blend into the campus's Gothic style, the 72,118-square-foot building features floor-to-ceiling AviProtek® E bird-friendly, solar control low-emissivity (low-e) glass consisting of Solarban® 70 glass by Vitro Architectural Glass and acid-etched AviProtek® bird-friendly patterns by Walker Glass. In addition to protecting the school's thriving bird population, the glass showcases the work of researchers affiliated with the University's Global Institute for Food Security, who are devoted to pursuing developments related to drought-tolerant crops and pest-control.

Responding to the school's request that bird-friendly glazing be incorporated on all vision glass, Walker Glass recommended AviProtek® Pattern 217, consisting of bird-friendly, acid-etched visual markers on the exterior-facing surface of Vitro Glass's high-performing solar control, low-e glass.

Designed in accordance with the Canadian government's Bird-Friendly Building Design Standard CSA A460-19, AviProtek® Pattern 217 fulfils requirements that bird-friendly visual markers be placed on the exterior surface of the glass and at a minimum distance of 50 millimetres from each other. These two mandates make it easier for birds to see and avoid colliding with glass building panels and facades, regardless of lighting conditions.

Spandrels finished with colourful OPACI-COAT 300® coatings by ICD High Performance Coatings further



enhance building design and bird safety. AviProtek® E glass also was specified for the pedestrian bridge and rooftop greenhouses.

Helping the building qualify for Green Globes certification, Keith Henry, FRAIC, SAA, LEED AP, a partner with Henry Downing Architects, said that insulating glass units (IGU) with Solarban® 70 glass were selected to reduce heat gain and maximize visible light. "Energy modelling was conducted to encompass all aspects of the building envelope, including airtightness for the curtain-wall," he explained. Flad Architects served as the design architect and laboratory planning consultant for the project.

One of industry's highest performing solar control, low-e glass, Solarban® 70 glass provides visible light transmittance (VLT) of 64 percent and a solar heat gain coefficient (SHGC) of 0.27 in a one-inch IGU with clear glass.

Walker Glass AviProtek® E glasses combine low-glass coatings by Vitro Glass with decorative patterns that birds can see in flight, enabling them to avoid collisions with windows and glass-walled building facades. The past year has seen a surge in legislation for bird-safe building materials in the U.S., Canada and around the world, including the Bird-Safe Buildings Act, which was passed by the U.S. House of Representatives in July 2020, as well as New York City's bird-friendly building materials law, which was enacted in January 2021.

SCHOTT ROBAX® WINS GERMAN INNOVATION AWARD 2021

SCHOTT's latest development, heat-reflective coating IR SuperMax, ROBAX® won the "Materials & Surfaces" category at the German Innovation Awards 2021. The company has produced and sold over 100 million fire-viewing glass-ceramic panels during the last 40 years under the ROBAX® brand.

The German Innovation Awards, organised by the Ger-



ROBAX® IR SuperMax impressed with its new IR coating for fire-viewing panels, which reflects significantly more heat than an uncoated ROBAX® fire-viewing panel - Photo: SCHOTT

man Design Council since 1953, honour achievements in design, branding and innovation on an international level, across different sectors.

In the 2021 award year, around 680 entries were received and prizes were awarded in two competition classes and 40 categories.

ROBAX® IR SuperMax impressed judges with its new IR coating for fire-viewing panels, which reflects significantly more heat than an uncoated ROBAX® fire-viewing panel. This results in higher temperatures in the burning chamber and more efficient combustion. Among other things, this can reduce the amount of particulate matter and CO. The higher heating also reduces sooting on the inside of the glass-ceramic panel. At the same time, the use of ROBAX® IR SuperMax enables a more comfortable room temperature. The latest product from SCHOTT ROBAX® Smart Heat portfolio was launched in the fall of 2020 and the first samples were already delivered to customers earlier this year.

"The German Innovation Award is a great honour for us. We are delighted that the jury has recognized the innovative strength of our development in this way. Together with the great response immediately after the launch, this is a great confirmation that we have brought a highly relevant product to the market," said Stephanie Schwarz, Vice President Sales & Marketing at SCHOTT ROBAX®.

SWISSPACER - PERFECTION DOWN TO THE SMALLEST DETAIL

Sky-Frame values the optimal combination of state-of-the-art technologies and unmistakable, architectural design above all else. Product development and construction demand precision and perfection down to the smallest detail – which is why it continues to rely on innovative warm edge spacer bars from SWISSPACER for its frameless sliding window systems.

Using large, sill-less glass façades, Sky-Frame blurs the boundary between indoors and outdoors – to create unique living experiences. For the sliding window specialist, the high claim to quality and design begins with selecting and collaborating with suppliers. Purchase manager René Knup said, "We opt exclusively for partners who can meet our high requirements for future-proof technologies, flexibility, security of supply as well as a comprehensive process and environmental management system."

"Our systems thrive on maximum transparency, clear forms and very narrow profile views. The spacer bars from SWISSPACER can be integrated harmoniously into the filigree glazing edge – without visible offset. The look of the black plastic also goes better with our product than solutions involving chromium steel."

The SWISSPACER Ultimate also impresses fully from the perspective of key energy values. Used in the glazing edge of the sliding windows, it achieves much lower thermal conductivity and raises the temperature there by up to 2 °C. For double-glazed aluminium systems with a thermal break, this means a very good Psi value of 0.036, and in triple glazing even 0.031.

With the lower Psi values, the Uw value of the overall system is also considerably improved. René Knup said, "Energy efficiency and sustainability are very important criteria for us in the area of product development. The spacer bars from SWISSPACER help our systems meet the highest of requirements." The spacer bar also has very good stability – against the backdrop of ever larger glazing formats and thus heavier components, this is an aspect that cannot be ignored.

Sky-Frame also sets new standards in terms of aesthetics and energy efficiency in the new variant 3 of the "Plain" system, which was recently launched on the market. The special feature: the sliding window glides over the extremely narrow and almost invisible floor opening. The area between continues the floor covering, thus reinforcing the impression of a flowing transition from inside to outside.

The up to 2.3 x 4 metre triple-glazed elements are equipped with state-of-the-art insulation materials – including the SWISSPACER Ultimate. This ensures a consistent thermal break and also enables the use of the "Plain 3" system in particularly cold regions.

Founded in 2002, Sky-Frame currently employs around 180 people at the development and production site in Frauenfeld (CH) and is represented worldwide with branch offices in Antwerp, Rothrist, Vienna, Milan, London and Los Angeles. The company's extraordinary frameless sliding window systems have been installed in over 8,500 construction projects on six continents.



SUPPLIERS GUIDE

Sales Network

Suppliers Guide

Complete and updated information
about agents & sales offices worldwide

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June 2021

TVITEC: HIGH-PERFORMANCE GLASS FOR BATTERSEA POWER STATION



High-performance glass from Tvitec System Glass ensures comfort and energy efficiency for apartment residents in the redeveloped iconic Battersea Power Station. The project was realised by WilkinsonEyre with Focchi Group.

At its peak, Battersea Power Station supplied a fifth of London's electricity. After decades of sitting derelict, it is now being re-developed into a new destination for the city.



CORNING: GRAND OPENING OF GEN 10.5 LCD GLASS PLANT IN WUHAN, CHINA

Corning Incorporated hosted an opening ceremony for its Gen 10.5 liquid crystal display (LCD) glass substrate manufacturing facility in the city of Wuhan, China. The facility is co-located with a BOE Technology Group Co., Ltd. (BOE) plant. With the successful operation of the plant, and the easing of restrictions in the region, Corning is commemorating this important step in building its presence in China and strengthening its relationship with an industry leader.

This high-volume manufacturing facility will allow Corning to deliver Gen 10.5 glass substrates, measuring approximately 3 meters wide by 3 meters high, directly to BOE for its production of large-size display panels. Gen 10.5 glass provides the most economical cuts for 65- and 75-inch TVs, which are expected to drive display-glass market growth over the next several years. The market for large-size TVs, defined as 65-inch and larger, is projected to grow at a double-digit compounded annual growth rate through 2024.



"Our decade of experience in G10+ glass manufacturing enabled us to apply the learnings and the technical know-how necessary to ramp this facility rapidly, even during

the most challenging of times," said Chris Hudson, international division vice president and general manager, Corning Display Technologies China.

Corning began shipping production samples from the Wuhan plant in January 2020 and achieved finishing line mass production by mid-2020, despite pandemic-related challenges. The Wuhan manufacturing facility is Corning's sixth LCD glass plant on the Chinese mainland and its second Gen 10.5 facility along with the company's He-fei plant in the Anhui Province, which opened in 2018.

John Zhang, senior vice president and general manager, Corning Display, said, "Our Wuhan plant is the most recent demonstration of Corning's commitment to China's display industry. We appreciate the support we have received from the Dongxihu District, Wuhan municipal, and Hubei provincial governments. With our advanced glass technology and skilled local talent base, we are poised to make even greater contributions to growth in the region."

GLASS GROUP PROXIMITY MEETING: FUTURE PROSPECTS

Glass Group members gathered as guests of the Vetreria Termovetro Sud in Bari, Italy to discuss the current market and development of prospects for the future. Vetreria Deserto and Vetromat were in attendance and all the others on call – Saint-Gobain and the main partners Technoform, Pellini Industrie and Fenzi.

The opportunity to meet responded to a development program launched last year, when Glass Group decided to focus on a synergy between the processing industries and the producers of industrial materials, to promote a paradigm shift to transform customers and suppliers into partners.

Saint Gobain provided an overview of the market that confirmed a strong recovery with demand prevailing over supply. The current market situation is characterised by growing demand, glass shortage and rising commodity prices. It is therefore more essential than ever for companies to take action now in medium- and long-term purchase planning.

Fenzi Group pointed out the serious conditions hindering the transport of goods on a global level, which they are deliberating to continue to ensure the availability of their products throughout the country. Green Building was also discussed with Fenzi, as the group is oriented towards developing products to respond to market needs that will emerge in the near future.

Technoform's rebranding was presented to the group,



which led to a change in strategy from supplying individual components to offering complete solutions capable of guaranteeing greater quality and durability depending on the applications. This has led to a change in the name of all the products as well as the development of new services and products created in response to the increasing customization needs of companies.

Pellini Industrie launched a training programme for both employees in commercial and production areas. The programme will aim to specialise in production of stained glass windows with integrated blinds. After a discussion on the various aspects of the market and on the growth of requests for solar shading integrated in insulating glass, members expressed a desire to deepen their technical knowledge on the product.

Daniele Predari, President of Glass Group said "working in total synergy and shortening distances is the only possible way to support each other and to dominate events."

SAINT-GOBAIN SELLS PART OF ITS GLASS PROCESSING BUSINESS IN GERMANY

Saint-Gobain announced the sale of Saint-Gobain Glassolutions Objekt-Center, which specialises in glass processing operations as part of the Glassolutions network in Germany, to the German privately-owned AEQUITA group based in Munich.

This sale concerns two sites, Döring Berlin and Radeburg, which employ a total of almost 200 people, and generated 20 million EUR in sales in 2020. AEQUITA had already purchased the operations of Glassolutions in the Netherlands in 2019.



Saint-Gobain Glassolutions Objekt-Center - Radeburg.

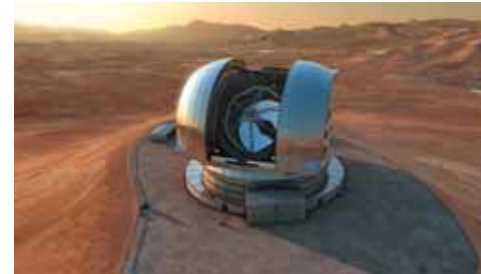
AGC TO DELIVER THIRD COATER FOR MIRRORS OF WORLD'S LARGEST TELESCOPE

AGC Glass Europe, with its business unit AGC Plasma Technology Solutions, and The European Southern Observatory (ESO) have signed a second contract to deliver a coater specially equipped for the large mirrors (M2, M3, M4 and M5) of the world's largest telescope.

The ESO telescope will be installed in the Atacama desert (Chilean Andes) at Cerro Armazones (3,046 m), equipped

with a gigantic 39-metre segmented primary mirror and additional 4-metre wide large mirrors. The telescope's purpose is to acquire scientific data to study the universe, and through specific observations address certain unsolved problems of fundamental physics, study exoplanets and investigate other objects and phenomena across the universe.

In 2018 AGC was selected to assemble and install the two magnetron sputtering coaters for the primary mirror segments of the Extremely Large Telescope (ELT). The third coater is for the additional 4-metre wide mirrors. The magnetron sputtering coaters are important to maintain the performance of the telescope optics. The coaters must be on site for ESO to be able to re-coat the mirror segments regularly with a protective silver layer stack. The telescope's location in the Chilean desert has harsh climate conditions, such as sandstorms, that affect the silver layers of the mirrors. The coater will be installed on the Paranal observatory site in Chile within 32 months. The uniformity control of the highly reflective coating over the entire surface of the 4-metre wide mirrors is a real challenge for this project. AGC is proposing a technical solution by including an Online Shimmable Magnet Bar technology in the cathodes that allows superior thickness control of the deposited thin layers. The teams of AGC Plasma Technology Solutions in Gosselies, Belgium and in Lauenförde, Germany are acknowledged for their expertise and know-how in building custom-designed plasma coating equipment.



Artist's impression of the Extremely Large Telescope (ELT) - Credit: ESO/L. Calçada.

GLAS TRÖSCH: ENERGY-EFFICIENT & AESTHETIC BUILDING WITH GLASS

Glas Trösch has supplied the glass used for both the façade and the railing systems for the new four-storey apartment building "B-Five", the project realised by local architectural office mls.

The architects chose SILVERSTAR EN2Plus triple insulating glass for the floor-to-ceiling panes. On the 300 or so days of sunshine a year, the highly effective thermal insulation coating SILVERSTAR SUNSTOP Silver 20T prevents unwanted heating

of the room while at the same time ensuring high light transmission. In addition, it accentuates the building





envelope with colour reflections and confidently conveys its own identity.

The unique view can also be enjoyed unhindered from the large terraces, where the fall-proof all-glass railing system SWISSRAILING LIGHT with its free glass edge ensures complete transparency. The SWISSRAILING TWO SIDED on the first floor, specially developed for French balconies, is just as transparent and light.

VITRO ARCHITECTURAL GLASS LAUNCHES NEW SAMPLE ORDER WEB APPLICATION

Vitro Architectural Glass launched an all-new web application for ordering glass samples and sample kits at samples.vitroglazings.com. The new order system features several key upgrades that improve the user experience and offers customers and designers additional information about the company's sample products, and provides a more streamlined ordering process and dynamic virtual tools that help them select the best samples for their needs.



Vitro worked closely with a group of Vitro Certified™ Network glass fabricators to pilot the new web application, and will continue to look for additional ways to improve this tool and innovate the range of digital resources moving forward.

Among the highlights is an improved, mobile-friendly web design and a new Vitro Glass Assistant, which collects information about a user's project considerations and offers recommendations from available glass samples and sample kits. There is also a tutorial on viewing glass samples in multiple environments to help customers best evaluate the unique characteristics of a particular sample product.

The new system also allows dynamic configuration of individual glass samples, as opposed to pre-determined configurations. This allows users to customise the surface placement of low-e coatings on Vitro's full range of glass substrates while selecting 4" x 6" or 12" x 12" sizes.

The tool includes an all-new fulfilment process that allows customers and design professionals to view a live inventory of sample products, receive immediate confir-

mation of an order, track orders through FedEx and save delivery addresses and previous orders.

VITRO GLASS: SOLARBAN® HELP UNIVERSITY BUILDING FUNCTION AS MINI-CITY

Vitro Glass Solarban® was chosen to enhance the Peter George Centre for Living and Learning (PGCLL) at McMaster University, Hamilton, Ontario.

Solarban® 67 and Solarban® 70 solar control, low-emissivity (low-e) glasses by Vitro Architectural Glass were used to enhance the building's aesthetics and environmental performance, while "Nuance" acid-etched patterns from Walker Glass make the glass curtain walls more decorative.

Diamond Schmitt's innovative architectural design includes a four-story, skylit atrium; a 650-seat auditorium and connecting helical staircase; and a U-shaped block of daylight residential and study spaces.



Jeff Mitchell, lead architect on the project for Toronto-based Diamond Schmitt, said Solarban® 67 and Solarban® 70 glasses were specified after extensive performance reviews to ensure they would help the building meet energy targets for LEED® certification at the Silver level. "We did a visual review to ensure the glass had enough visible light transmittance (VLT) for daylighting and conducted further visual analysis with physical samples to ensure the glass was clear enough and had the right colour tint to match the project's overall design intent," he explained.

Solarban® 67 glass was used on all the building's vertically installed glass, as it provided the best balance of energy performance and clarity. Solarban® 70 glass was selected for the atrium skylight due to its increased energy performance, lower VLT and protection against glare. The facility also features acid-etching on select portions of the curtain wall.

The glass composition and patterns, in addition to the form and appearance of the building, went through a long design review process, assisted by 3D modelling, to match design intent to the finished building.

The building includes daylight at the end of every hallway, light-filled study nooks and a central atrium extending access to daylight into the levels below grade. Further, the high-performance glass reduced the building's heating and cooling loads, which was critical in the south-facing kitchen and lounge spaces, and the west-facing study areas which could have been prone to overheating.

PILKINGTON MIRROpane™ CHROME: MORE COLOUR, MORE FREEDOM

Pilkington Mirropane™ Chrome is a mirror which is resistant to corrosion and moisture, due to its special off-line coating. The product enables outstanding creative design and proves wholly dependable in areas that require maximum performance in terms of safety and durability.

It combines reliability with a brilliance that outshines classic silver mirrors that have reached their design limitations.

The mirror can be toughened, bent and laminated – this results in a number of different design options. Since the product is very robust, it can be used both indoors and outdoors.



The new colour palette of Pilkington Mirropane™ Chrome Plus offers all the advantages of the silver-coloured mirror, as well as providing the added benefits of greater opacity and uncomplicated processing options. Pilkington Mirropane™ Chrome Plus Colour is ideal for the following applications:

- kitchen splashbacks
- bathrooms and wellness areas
- partitions
- doors
- stylish interior design applications

The mirror can be easily installed with a special adhesive, thus avoiding drilling holes, to create modern, frame-free and drill-free surfaces.

Pilkington Mirropane™ Chrome Plus Colour can incorporate additional design ideas: for example, logos and graphics can be applied to the mirror by sandblasting. The entire range of glass mirrors can help to create the appearance of space, add a decorative element, or produce visual effects by playing with reflections.

VITRO TO BUILD NEW FLOAT FURNACE AT GARCIA PLANT

“The approval of the board of directors for the construction of this new float plant shows Vitro’s commitment to meet the needs of the markets we serve,” said Adrian Sada Cueva, CEO of Vitro.



“Vitro is constantly developing new products with improved efficiency, aesthetics and value. With building construction on the rise in the region, these are the attrib-

utes that the industry is looking for in glass. The expansion of our capacities will help to meet this demand and enable us to deliver glass to our customers faster with the latest production technologies.”

POLFLAM EXPANDS WITH A NEW PLANT IN TARCZYN, POLAND

POLFLAM, a leading manufacturer of fire-resistant glass, is increasing its production capabilities. A modern office space, a production factory and a warehouse facility are being built on an 8-hectare site in Tarczyn, near National Road No. 7, which connects Warsaw with Kraków.

CFE Polska – part of the renowned multinational CFE Group – is heading up the building project. The investment in this state-of-the-art, high-capacity production facility will triple POLFLAM’s total output.

Since 2005, POLFLAM has been creating fire-resistant glass using its own innovative technology. Export of POLFLAM products to most European markets is growing exponentially with interest in



among foreign markets rapidly expanding. The construction of the new plant will allow further consolidation of the customer base and meet growing demands for glass products. The facility is expected to be operational within a few months, and test production will begin by the end of 2021.

The first batches of fire-resistant glass to roll off the line are expected to hit the European market in the first quarter of 2022.

POLFLAM’s glass products, available in several different fire-resistance classes and used for a wide variety of applications, will be manufactured on modern, automated production lines. Specialised machinery, equipment and tools for the new plant will be supplied by such innovative companies as FOREL, Mappi, Bottero and MC DIAM. Comprehensive process management will be provided by FeneTech’s FeneVision ERP system. POLFLAM is currently owned by the investment fund Baltisse and is headquartered in Runów, near Piaseczno, Poland.

CUGHER AND VISMARAVETRO: SILK-SCREEN PRINTING FOR INTERIOR DESIGN

Vismaravetro, historical Italian producer of glass shower enclosures and prestigious customer of Cugher Glass, opened its production site to show how silk-screen printing is a performing technology for decorations on glass for the interior design sector, thanks to customised Cugher’s solutions.



Marino Bonetti, Cugher Sales Manager, together with Elia Vismara, CEO of Vismaravetro, described the characteristics required by the market for the shower enclosures. They showed how the Sketch series printing machine, designed by Cugher to meet its customers needs, is able to satisfy the requests, allowing flexibility in the printing process and guaranteeing a highly defined final result.



PEARSON'S GLASS SECURES MADE SMARTER SUPPORT

Pearson's Glass, a glass manufacturer based in Liverpool, has received backing from the Made Smarter Adoption programme in the North West for a technology project. This will involve upgrading and integrating its internal systems including website, warehouse and transport operations.



Simon McKay, Managing Director, said, "The project is a huge step forward for our business, moving away from a very manual and paper

driven process towards real-time stock management and automating processes from customer through to distribution.

"The changes will improve efficiencies, reduce the mundane tasks, thus enabling our staff to carry out value added processes and drive sales." Since 2019 Made Smarter has supported 161 businesses with 3.9 million GBP matched funding for 201 projects, leveraging 10.5 million GBP of private sector investment.



Simon McKay, Managing Director

AGC: OPENING CEREMONY AT THE YOKOHAMA TECHNICAL CENTER

AGC Inc. has completed the integration of its R&D bases, previously split between the Research Center (Kanagawa-ku, Yokohama) and the former Keihin Plant (Tsurumi-ku, Yokohama), to create a new R&D structure: the AGC Yokohama Technical Center (Tsurumi-ku, Yokohama).



Exterior view of the AGC Yokohama Technical Center.

AGC held a commemorative event to celebrate the centre's opening with distinguished guests, including Yokohama Mayor Fumiko Hayashi and Tokyo University Executive Vice President Tatsuya Okubo.



A scene from the ceremony.

In November 2020, a collaborative creation space called AO (AO/AGC OPEN SQUARE) was opened to accelerate internal and external collaboration. In June 2021, the relocation and integration of the dispersed R&D organisations was completed, and AGC's new R&D structure was launched.

In his address to open the event, AGC Group CEO Yoshinori Hirai said, "The facility was named the AGC Yokohama Technical Center after 'Yokohama' because the port has always actively embraced and developed new culture since its opening.



"AGC will contribute to the further development of Japan's manufacturing industry by developing cutting-edge technologies while integrating internal and external technologies in Yokohama, where a number of development bases are being successively established."

AGC Group will promote technological innovation to provide products and solutions that satisfy customers and add new value through internal and external collaboration under its AGC plus 2.0 management policy.

July 2021

VITRO CONTRIBUTES TO WEBER STATE UNIVERSITY'S SOLAR DECATHLON SUCCESS

Vitro Architectural Glass donated Solarban® 70 solar control, low-emissivity (low-e) glass, which played an integral role in Weber State University's (WSU's) achievement of first place in the energy performance contest of the U.S. Department of Energy's Solar Decathlon® 2020 Build Challenge.

In addition to earning the energy performance contest win, the WSU team's project – now a 2,540 square-foot home in Ogden, Utah – finished fifth overall in the 2020 Build Challenge. More than 70 collegiate teams competed in the 2020 Solar Decathlon®.

The WSU team chose Solarban® 70 glass for the 2020 Build Challenge project after researching its benefits and determining its cost-saving features and increased efficiency would offer the best solution for meeting the project's budget and performance demands.

The windows for the WSU project were supplied by AMSCO Windows in Salt Lake City and contained Solarban® 70 solar control, triple-silver-coated low-e glass combined with the AMSCO Studio Series vinyl frame to create windows that provide superior thermal control while optimising visible light transmittance. The windows were maximised on the eastern side of the home to allow more solar heat gain in the winter and limited on the western and southern sides to minimise heat gain in the summer, further capitalising on the energy efficiency benefits of Solarban® 70 glass.

Combining Solarban® 70 glass with conventional clear glass in a standard ¾-inch residential insulating glass unit (IGU) offers visible light transmittance (VLT) of 63 percent and a solar heat gain coefficient (SHGC) of 0.27, meaning the glass prevents more than 70 percent of heat energy from the sun from entering the home.

Lighting and temperature control are two of the largest energy consumers in a home. In addition to helping cut summer cooling costs and reducing energy expenses related to indoor lighting, Solarban® 70 glass has a high U-value that helps to cut winter heat loss from residential windows in half compared to ordinary clear glass. The glass's ability to block ultraviolet (UV) light also can help protect furniture, fabrics and carpet from fading.

"Since 2005, Vitro and its legacy company PPG have supported multiple Solar Decathlon® Build Challenge teams in maximizing their energy performance with solar control, low-e glass windows," said Nathan McKenna, director of marketing and innovation, Vitro Architectural Glass. "The Solarban® family of glass features superior thermal control and energy efficiency attributes that are

essential to designing sustainable buildings and unmatched in the architectural glass industry."

The U.S. Department of Energy Solar Decathlon® has hosted 10 Build Challenge contests since 2002

that have challenged collegiate student teams to design and build highly efficient and innovative buildings powered by renewable energy. The Build Challenge energy performance contest score represents the combined total of five related sub-contests, including: energy efficiency, energy production, net-zero plus energy, demand response and off-grid functionality.

The goal of the WSU project was to manage the "true cost of home ownership," making sustainable living more affordable for the average homeowner. The team estimates it will cost just over 100 USD annually (approximately 9 USD per month) to power the home through its connection to the electrical grid, which is a drastic reduction in annual energy costs compared to similar homes in Ogden.



Photography from Weber State University

SEMCO TEAMS UP WITH LISEC

SEMCO and LiSEC worked together on the replacement of a pre-lamination unit on an Armatec lamination line at SEMCO Glastechnik Neubrandenburg, with the expectation of millimetre-precise pre-lamination that optimally integrates into the existing line and can be adapted to the existing clean-room.

With 19 sites in Germany, the SEMCO Group produces almost 5 million square metres of insulating and safety glass, and more than 5 million square metres of coated glass. SEMCO's product portfolio is comprehensive: From the sustainable multi-function product SEMCO Klimaglas to insulating glass applications for sound or break-in protection to glass construction and interior design applications, SEMCO treats every request as a completely individual project.

In searching for a new pre-lamination unit for an existing laminated glass production line from Armatec, LiSEC learned about SEMCO Glastechnik Neubrandenburg. Together they developed a solution based on the technology used, the expected quality and replacement and speed that met SEMCO's expectations.

Based on SEMCO's expectations, LiSEC integrated the pre-lamination unit into the existing line with millimetre precision and adapted it to the existing clean-room. No changes to the established spaces were needed. Additionally, LiSEC integrated automatic film trimming into



Images credits: LiSEC

the existing line. Coordination of the existing line components with their own controls and the controls of the new solution went off without a hitch. Even the safety zones were adapted to the new requirements.

After the project meetings and project confirmation, it took only two weeks before the conversion was done and production could be started up.

"The constructive collaboration with SEMCO and their highly professional employees, along with their deep process knowledge made quick implementation of the project possible," said Rupert Wellner, Sales Manager LAMI at LiSEC Germany.

Kevin Bosse, CEO of SEMCO Glastechnik Neubrandenburg, was impressed with the cooperation: "In LiSEC, we've found a partner who really understands what it's about. The collaboration went harmoniously, and we were very satisfied that, in every phase, our LiSEC colleagues looked at the project from our point of view, so we could complete the installation very fast, and without any major downtime."

The conversion's benefits are many. For one thing, the line's output increased by 10 percent to 20 percent, and operating the system is significantly easier. The system automatically controls and regulates all recipes. The operator just releases the system for inward transport. All major parameters

are automatically validated by the system. Thanks to the replacement of the pre-lamination unit, the existing laminated glass line can now be run many more years with high quality.

At the same time, the conversion achieves significant energy savings of about 25 percent to 30 percent compared to the old solution. This fits perfectly with SEMCO's sustainability activities. Every year, recycling of used and broken glass routes so much material back into raw glass production that over 25,000 tonnes of CO₂ can be saved. And in its production facilities, in a project with energy provider EWE AG, SEMCO has successively converted all its sites to energy-saving LED lighting.

Alexander Akgül, technical director of the SEMCO Group, said, "As a middle-sized company, we have always stayed close to our roots and live our team and family values throughout the company. On the one hand, our group structure makes us flexible enough to react quickly, and

on the other hand large enough to offer our customers security and uniform quality over the years. At SEMCO, we invest in the future of the company and thereby in growing customer satisfaction and product quality."

PILKINGTON UK RAISES THE ROOF AT PERFORMING ARTS SCHOOL

The Liverpool Institute for Performing Arts (LIPA) was created following a multi-million GBP refurbishment of the Liverpool Institute High School for Boys.

The 160sqm new space will allow students to host dramatic, musical and dance performances using the facades of its existing buildings as a backdrop, while also benefiting from the large amount of natural light that floods the courtyard.

The rooflight was created using the Pilkington Planar™ structural glazing system, employing a series of four toughened and laminated glass fins to transfer the weight of the glass to the surrounding structures. This avoided the need to use any steel elements in order to deliver maximum light transmission and clarity, and also to complement the aesthetics of the wider building.

Architect Maggie Mullan explained how the glazing system helped achieve the design vision for the space. She said, "LIPA is a cherished place, and one with a complicated construction history going back to the creation of the original school building in 1837. One of the key challenges for us was to respect the architectural history and coherence of the campus while also creating a new space with its own identity.

"To inform the decisions made in this project, we worked closely with the client to establish a design code, based on a detailed understanding of the many complex layers of the building, that would allow our intervention to coalesce and unite its existing features.

"The Pilkington Planar™ system with its unobtrusive countersunk flush stainless steel point fixings, along with



Images courtesy of Christian Smith

the structural glass fins, allowed us to achieve our aims with minimal aesthetic impact on the much-loved character of the existing building.”

In order to deliver the required structural strength and energy performance, the roof glazing was made up of double glazed units featuring 10 mm thick Pilkington Suncool™ 66/33 THS outer pane with a 16 mm wide air-filled cavity and an inner pane of 13.5 mm-thick laminated glass.

For extra safety, all the glass was toughened and heat-soak tested (THS). The horizontal fins are made from the Planar™ | SentryGlas® System, which offers increased strength and durability.

Phil McKibben, head of special projects at RED Systems, said “The location of the rooflight in the centre of the building meant accessing the site was an interesting challenge and we worked closely with Aztec to plan the installation and safely hoist the glass over the surrounding buildings to create this fantastic finished structure.”

Gary Stonelake, business development manager at Pilkington UK, added, “The Pilkington Planar™ structural glazing system allows architects to design buildings with reduced sight lines for highly attractive environments with more light and a greater feeling of space. “This can be achieved without compromising on the structural and thermal performance of the system.

“The Pilkington Architectural design engineers worked closely with our accredited installer to meet the client's expectations in this building that once housed the old school of singer and songwriter Paul McCartney of The Beatles.”

The glass also delivers outstanding energy performance, thanks to use of Pilkington Suncool™ coating. This improves the temperature control of the building in respect to heat loss or gain through the glass, and maximises natural light entering the internal space to help reduce the need for artificial lighting creating a comfortable controlled environment.

FGIA RELEASES NEW TECHNICAL MANUAL FOR IG UNITS

The Fenestration and Glazing Industry Alliance (FGIA) released a new technical manual providing generic design considerations for cavity compensation for insulating glass (IG) units and determining conditions which impact the pressure in the IG unit cavity. IGMA TM 3200-21, Design Considerations for IG Unit Cavity Pressure Compensation, is FGIA's newest technical manual. Insulating Glass Units (IG, IGU or IG units) are dynamic



assemblies in which the cavity can change dimensionally based on environmental factors (temperature and barometric pressure), dynamic load factors (wind load) and location (elevation). Since the cavity of a standard IG unit contains air, a fill gas

or a mixture, the pressure and volume within the cavity are subject to these factors. As the IG unit temperature increases, or the elevation is higher than point of manufacture, or lower barometric pressures, the volume of gas inside the IG unit increases relative to its original volume, causing outward deflection of the glass panes.

Similarly, if the temperature decreases, or the elevation is lower than point of manufacture, or higher barometric pressures, the volume of gas inside the IG unit decreases relative to the conditions external to the IG unit, causing inward deflection of the glass panes. The amount of deflection is dependent upon the IG unit dimensional ge-



ometry, glass thickness, edge seal design and materials, glazing or framing design and materials and other factors.

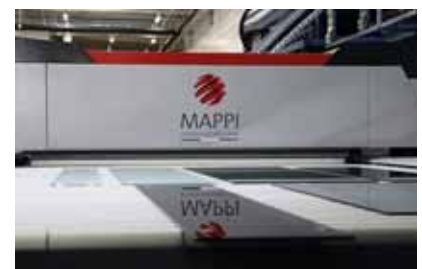
IGMA TM-3200-21, as well as other IGMA documents available from FGIA, may be purchased from the online store at the discounted member rate of 125 USD or the non-member price of 250 USD.

MAPPI SUPERTEMPER AND POLFLAM STRENGTHEN THEIR PARTNERSHIP

Polflam has chosen Supertemper, a Mappi innovation that allows production of E30 certified glass for heat resistance, using a new generation Mappi furnace, both ATS 4.0 and Fox, suitably updated.

Polflam offers state-of-the-art fire-resistant glass, and will be the first company to install a Mappi Supertemper system in Europe, in a ATS 4.0 2500×5000 furnace, at its new Tarczyn plant.

In 2019 Belgian investment fund Baltisse took over control of Polflam, and a further cycle of investments in infrastructure, technology and patents





POLFLAM®

began, with the aim not only to confirm Polflam's leadership on the European market, but also expansion to new markets and new territories. The company continues to grow its production capabilities, and the investment in a new high-capacity production factory within a total area of 20,000 sqm in Poland will triple its total output.

The company was very impressed by Mappi's Supertemper and by the possibility of producing E30 certified glass for heat resistance starting from a tempering furnace like ATS 4.0, which offers constant quality, ease of use and energy savings.

They were pleased by how Mappi Supertemper is able to produce glass with a "Surface Stress" that goes from the usual value of > 69 MPa to 160 MPa, or higher, all using a

tempering furnace that at first glance is very similar to a standard one.

The tempering furnace is a fundamental component in the production



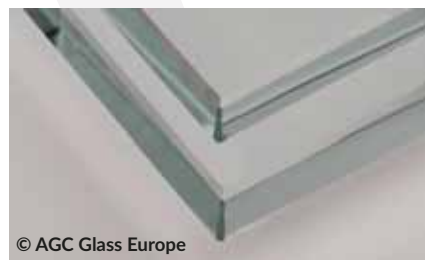
chain of a glass factory. Being able to have a state-of-the-art oven such as Ats 4.0, capable of bringing glassworks into the world of industry 4.0, and above all being able to take advantage of the possibility of creating Supertemper glass, which stands out not only for its resistance to fire, but also for the simplification of production processes, for the competitiveness of costs, for its optical qualities, are all elements that make Polflam very confident in the future.

AGC GLASS EUROPE: PLANIBEL CLEARVISION - EXTRA PURE, EXTRA THICK

AGC Glass Europe's Planibel Clearvision is the perfect choice for architects and designers in projects that demand superb transparency, when crystal-clear vision and total clarity count. The Clearvision range now offers a wide variety of thicknesses ranging from 3 mm to 19 mm, having added two new thicknesses, enabling designers and furniture makers to work with thicker low-iron glass for larger pieces.

Planibel Clearvision is produced in Boussois, France (3 to 12 mm) and Cuneo, Italy (4 to 19 mm). For the 15 and

19 mm version, special technology is used to ensure perfectly uniform thickness, making the glass easier to process (cutting, laminating, etc.). In



© AGC Glass Europe

addition, the product's extra-clear, neutral colour is the same in all thicknesses. Even in 15 and 19 mm, Clearvision is perfectly neutral – proof of just how pure this product is.

Planibel Clearvision is Cradle to Cradle Certified™ Bronze. The focus is on developing products that have a positive impact on the environment during their lifetime. By committing to C2C standards, AGC can deliver high-quality products while protecting people and the environment, and supporting its customers in their socially and environmentally responsible purchasing decisions. More than 75% of our products are Cradle to Cradle Certified™.

SEDAK GLASS GIVES PANORAMIC VIEW IN MESSETURM FRANKFURT

For its 30th anniversary, Frankfurt's landmark The Messeturm building was remodelled according to architect Helmut Jahn's plans and upgraded with the latest technology. Minor but striking changes were envisaged by the architect for the conversion. The base of the building features four semicircular bays made of curved laminated insulating glass for the facades and insulating glass for the flat roof.



The curved glass facade panels, with dimensions of 2.8m x 17m high, provide a spacious light-flooded lobby area that invites you to linger.

sedak supplied several units of 2.8m x 17m façade glass for the light-flooded lobby area, which today invites employees and visitors to linger in the new café bar and the new restaurant, both designed so that employees and visitors can enjoy both indoor and outdoor settings.

This is the first time in the world that laminated curved glass of such dimensions has been installed in a high-rise building. The laminated, curved façade panes of the "pencil", as the Frankfurt residents lovingly call the skyscraper, were artificially aged in order to minimize spring-back during the bending process. The heat-soak furnace had to be adapted to accommodate the unusual size of the glass panels for this process. The 36-coat shaped insulating glass units with Double Vision print for the glass roof of the exposed bay windows complete the project and provide optimal solar protection.

The tower facade is made



View out of the glass lobby of Frankfurt Messeturm - ©sedak

of polished red granite. The addition of the impressive glass rotunda now gives the tower a unique combination of traditional and modern elements.

The Messeturm is the second-tallest building in Germany, with a height of 265.5m and 63 floors. It is located in the Friedrich-Ebert complex and is adjacent to the Frankfurt trade fair grounds. The Messeturm was built in 1990 in an Art Deco style and was considered the highest building in Europe at the time.

ONYX SOLAR SIGNS LARGEST PHOTOVOLTAIC INTEGRATION PROJECT IN AFRICA



Pedestrians pass Sterling Towers, headquarters of Sterling Bank Plc, in Lagos, Nigeria

Onyx Solar signed the largest project of photovoltaic integration in Africa with Privida and Sterling Bank. This project aims to remodel the bank's headquarters in

Lagos, Nigeria with Onyx Solar's photovoltaic glass. Onyx Solar will supply up to 6,500 m² of crystalline silicon photovoltaic glass to be installed over the building's spandrels. As a result of this integration, the leading bank in Nigeria will also become a reference in terms of modernity and sustainability. Onyx Solar has also committed to plant up to 6,500 trees in Africa as part of its tree-plant program "one square meter, one tree". The installation of 3,250 crystalline silicon glass units imply up to 1 MWp of installed power, which will substantially reduce greenhouse gas emissions and its ecological footprint.



Onyx Solar continues its international expansion in Africa with new photovoltaic integration projects. Soon, the Spanish company will also install its photovoltaic glass for Microsoft's headquarters in Nairobi, Kenya. Thanks to this innovative technology, the tech giant takes a step forward to be aligned with 10 Sustainable Development Goals established by the United Nations.



Microsoft's headquarters in Nairobi will soon install Onyx Solar's photovoltaic glass

Onyx Solar's photovoltaic glass was

previously integrated into I&M Bank's headquarters in Nairobi, which led to the construction of the largest photovoltaic skylight in Africa. This skylight is made up of 2,200 m² of amorphous photovoltaic glass with different degrees of transparency. Other projects in Africa worth mentioning are the Union National Bank of Egypt's photovoltaic façade and a photovoltaic canopy located at the Mohammed VI Polytechnic University of Morocco.

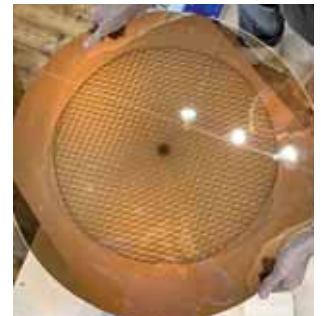


The largest photovoltaic skylight in Africa at the I&M Bank headquarters.

NSG PILKINGTON: MOMENTUM INTERSECTION RECONNECTS ARTIST TO INDUSTRY

Momentum | Intersection is a collaboration of art, design, engineering, and industry. Each year, artists are selected to work with NSG Group to create new works of art to be displayed during the Momentum Toledo Festival, a one-of-a-kind glass program which is held in Ohio, USA. NSG Pilkington North America is thrilled to partner with University of Toledo's Department of Art and The Toledo Museum of Art for the 2021 exhibition.

The Arts Commission invites creative individuals to reimagine the potential of Pilkington float glass toward the creation of projects funded through Momentum | Intersection, a collaboration of industry, design and art. To this end, The Arts Commission seeks to provide new partnerships between applications of glass as an artistic medium and manufacturing processes with a call for proposals.



This exhibition is a unique opportunity to see the inside workings of the float glass process, gain access to career professionals who make the glass and integrate this industrial material into their own work.

Inspired by the experimental glass workshops held in Toledo in 1962 The Arts Commission is requesting interested artists, designers, architects, engineers and other creatives working with glass to submit a portfolio and statement of interest to participate in the fourth edition of an industrial collaboration with Pilkington Glass North America, part of Nippon Sheet Glass Co., Ltd. (NSG).

The Momentum | Intersection 2022 exhibition will coincide with the International Year of Glass, an initiative approved by the UN and led by the International Commission on Glass (ICG), the Community of Glass Associations (CGA), and ICOM-Glass. This is a year long celebration of the essential role of glass in human history, art, technol-



ogy and science. The City of Toledo, also known as the Glass City, is proudly embracing this opportunity with a number of glass related exhibitions and celebrations.

A panel of jurors will select up to six artists to tour Pilkington Glass North America facilities and be given demonstrations of their materials. Applicants will be given a glass sample of their choice and three months to experiment with materials before submitting final project proposals due December 2021.

Proposals selected from the candidates will be given materials, an honorarium and exhibition space during the Momentum Festival in 2022. Accepted participants will be invited to tour NSG's manufacturing plant; attend seminars on the history of glass manufacturing; learn about materials from NSG research and development engineers; be given demonstrations on various applications of glass materials; be provided with materials of the participant's choice; and receive ongoing support from NSG technical teams, who will continue to be available throughout the process.

GFE: FITFOR55 PACKAGE, A TURNING POINT FOR THE FLAT GLASS SECTOR

With the release of the so-called Fitfor55 package, the European Commission does not fall short of its ambition. Bertrand Cazes, Secretary General of Glass for Europe, defined this "a turning point and a remarkable moment for a sector like ours".



Philippe Bastien, President of Glass for Europe and Regional President of AGC Glass Europe, said, "In this journey [EU

climate-neutrality], high-tech glazing will play a crucial role to renovate aging buildings, to support the clean mobility transition and to increase the share of solar energy. In Europe's flat glass sector, we stand ready to make this essential material available while developing novel ways to lower our own industrial emissions."

Among the dozens of legislative proposals released by the European Commission, Glass for Europe is particularly supportive of measures which have the potential to support the market uptake of CO2 avoiding products, such as measures aimed at boosting energy efficiency and renewables in both buildings and transport. Among others, Glass for Europe welcomes:

- The proposal to increase the energy efficiency target and to make it binding at EU level as proposed in the proposal on the Energy Efficiency Directive.
- Both articles 6 and 8 of the EED, which respectively

extend the requirement to renovate public buildings and increase the level of ambition for energy savings obligations, which can be leveraged to increase rates of building renovation.

- The increase in funding potentially available for building renovation through several instruments, including funds coming from the EU Emission Trading Scheme and the New Social Climate Fund.
- The proposal to increase to 40% the target of the Renewable Energy Directive.
- The bold ambitions in terms of lowering CO2 emissions from passenger cars and other vehicles, yet technological neutrality should be preserved.
- Additional funds made available to support innovation in low-carbon manufacturing, for example through the EU ETS innovation fund.
- The careful introduction of a trial phase for a Carbon Border Adjustment Mechanism, with progressive phase-in and provisions designed to avoid opportunistic trade flows, that will have to be tested before the inclusion of other sectors may be envisaged, including that of the flat glass sector.

While a clear political direction is provided with this package, Bertrand Cazes said, "that some fine-tuning will be needed (...) for example to make sure this framework supports our industry's efforts to reduce its manufacturing emissions'. In this respect, some provisions of the EU Emissions Trading System may need improvement to ensure that frontrunners are not penalized and that sectors are thoroughly protected against the risk of carbon leakage. In the same vein, a recast Energy Taxation directive should continue to provide an exemption for 'mineralogical processes'."

In the field of building policy, Glass for Europe calls on extreme vigilance with regards to the extension of the EU ETS for buildings. While it may generate funds for building renovation, citizen's buy-in for the measure should remain a prerequisite.

Based on this first assessment and strong of the experience gathered when developing its vision "2050; Flat glass in a climate-neutral Europe", Glass for Europe's President, Mr Philippe Bastien, concluded, "Glass for Europe will work in the coming months to make sure today's legislative package does trigger a virtuous decarbonisation cycle."

AGC REVISES PRICING FOR ARCHITECTURAL GLASS PRODUCTS IN JAPAN

AGC announced it will raise the sales price of its architectural glass-related products in Japan. The scheduled price increases are 15–20 percent for float glass and mirrors, 30 percent for wired glass and figured glass, and 10–20 percent for fabricated glass for architectural use.

The Company's architectural glass business in Japan is



Your Dreams, Our Challenge

facing an increasing cost burden to ensure a stable supply of architectural glass due to rising costs for maintenance and renewal of manufacturing-related facilities. In addition to the above, AGC's profitability continues to be pressured by persistently high prices of raw materials and sub materials, and logistics costs. In this environment, AGC has implemented a number of measures including re-examining its investments, improving productivity, reducing costs, and streamlining its organization. However, AGC has determined that it will be difficult to secure the revenues necessary to maintain and renew its facilities in the future through corporate efforts alone, and therefore has decided to implement price revisions for architectural glass-related products in Japan. Under its AGC plus-2023 medium-term management plan, announced in February 2021, the AGC Group has focused on improving the profitability and asset efficiency of its architectural glass business as a priority issue for the Group management, and is implementing a variety of initiatives in this area. In the architectural glass business in Japan, the AGC Group will continue to create social and economic value through the provision of a stable supply of architectural glass over the long term and improved business profitability.

CANADIAN PREMIUM SAND: 5.2 MILLION USD NON-BROKERED PRIVATE PLACEMENT

Canadian Premium Sand Inc. announced that, due to investor interest, it had closed an upsized, non-brokered private placement. Pursuant to the Offering, the company issued an aggregate of 20,799,200 common shares (the "Common Shares") at a price of 0.25 USD per Common Share for gross proceeds of 5,199,800 USD. After giving effect to the Offering, the company will have 42,043,660 common shares issued and outstanding. The Corporation's two significant shareholders and certain directors and officers participated in the Offering. On a combined basis they subscribed for an aggregate of 8,330,700 Common Shares for 2,082,675 USD. The net proceeds of the Offering will be used to fund the initial phase of the Front-End Engineering and Design for a glass manufacturing facility in the greater Winnipeg area, initiate permitting applications and other key activities to progress the business plan, as well as for general working capital purposes.



Conceptual generic rendering of facility - Source: CM Project Ing.

SCHOTT SELLS 200,000,000TH CERAN® GLASS-CERAMIC COOKTOP PANEL

SCHOTT CERAN® celebrates its 50th brand anniversary this year, with news of a total of 200 million pieces sold. Special properties such as near-zero expansion of the material at high or low temperatures made glass-ceramic ideal for applications in satellites and the world's largest telescopes. In the 1970s an interdisciplinary team of researchers came up with the idea of using glass-ceramic in the kitchen - rather than in space.

The black glass-ceramic cooktop from Mainz sparked an international revolution in the kitchen. In the beginning, electric radiant heaters provided the heat, while alternating magnetic fields now provide the modern and energy-efficient heating of cookware (induction).



A particularly attractive feature is that CERAN® glass-ceramic is suitable for all types of heating and, as a true icon, is constantly setting new trends in kitchens around the world. No wonder SCHOTT CERAN® has been named "Brand of the Century" several times.

PILKINGTON NEDERLAND - NEW SMART TINYLAB OPENS

The new Smart TinyLab at Saxion University of Applied Sciences in Enschede, The Netherlands, is officially open. It is a unique test space where companies involved in construction can develop, test and demonstrate their products. Experiments for energy saving, generation, installations and comfort are possible. Pilkington Nederland has contributed to the lab with Pilkington Insulight™ HeatComfort insulating glass units made of heated glass. At Smart Tinylab the voltage is applied to the special coating of Pilkington Insulight™ HeatComfort and the glazing generates heat, so that the triple insulating glass also becomes a heating element in addition to its standard properties.

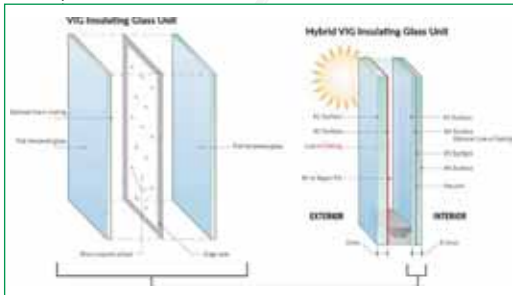


Pilkington aims to discover more about Insulight™ HeatComfort in terms of energy consumption, comfort, noise, hygiene, connections and its applications in new construction and sustainable renovation. The company also wants to collect more information on investment and maintenance costs compared to other heating technologies.



VITRO ACQUIRES EXCLUSIVE RIGHTS TO TEMPERED VACUUM INSULATING UNITS

Vitro Architectural Glass announced that it has reached an agreement with LandGlass and VIG Technologies to sell their tempered vacuum insulating glass (VIG) products in North America.



Vacumax tempered vacuum insulating glass units consist of two fully tempered lites of glass separated by a non-lead metal seal and a vacuum space

that eliminates gas heat transfer and provides an R-value greater than 14, which is closer to the R-value of a traditional wall than a window.

"LandGlass and their LandVac® brand uses the world's best VIG technology, so their products are a natural fit in Vitro's already expansive and trusted product portfolio," said Martin Bracamonte, vice president, marketing and innovation, Vitro Architectural Glass. "For Vitro customers, designers and other channel partners, this agreement will unlock an entirely new paradigm of high-performance glass possibilities."

Vitro also plans to install LandVac® equipment and begin manufacturing VIG units in its North American facilities as the market for VIG products develops.



The new 8.3mm tempered VIG units consist of two fully tempered lites of glass separated by a non-lead metal seal and a vacuum space. The inclusion of fully tempered glass enables the LandVac® VIG unit to be used globally across indoor and outdoor temperature extremes,

which can cause failures in non-tempered VIG units.

VIG units deliver an R-value of 14, which is closer to the R-value of a traditional wall than glass. Improved R-values in cladding materials are increasingly in demand as building owners and developers face imperative incentives to minimise their environmental impact, from new stringent energy code updates to Net Zero energy goals. "Building envelope materials with extraordinary R-values, such as VIG products, have the ability to significantly reduce demand for artificial heating and cooling," added Bracamonte. "That energy use reduction results in commensurate reductions in greenhouse gases. Vitro is proud to provide this new product platform as yet another way to maximise the environmental value of our products."

VIG units can be used alone as a replacement for mono-

lithic glass or as a substitute for the interior lite in a traditional one-inch insulating glass unit (IGU) where it forms a secondary airspace and creates a hybrid IGU that significantly improves the unit's thermal efficiency, delivers better noise abatement and eliminates condensation.

The VIG units will be available with Solarban® 60 solar control, low-e coatings by Vitro Glass. When a VIG unit is used as the interior lite in a hybrid IGU, the exterior lite will be available with the full range of Solarban® coatings and Vitro Glass substrates. VIG units will be available exclusively through the Vitro Certified™ Network of glass fabricators and window manufacturers.

In January Vitro Launched Solarban® R77 glass, followed in March by Solarvolt™ building-integrated photovoltaic (BIPV) glass modules, the product of Vitro's acquisition of solarnova, a Germany-based manufacturer of BIPV technology. Bracamonte concluded, "This is just the beginning of a new generation of sustainable, environmentally and technologically focused products emerging from Vitro's intense innovation culture."

UE AND ANTAMEX PARTNER FOR TRANSPARENT SOLAR COMMERCIAL GLAZING

Ubiquitous Energy, a leader in truly transparent solar energy technology, and Antamex Industries have agreed to form a partnership to bring transparent solar glazing to the commercial glazing market in North America.

This partnership advances Ubiquitous Energy's go-to-market strategy to bring its UE Power™ window products to market with Antamex, who is a widely recognized, and reputable design-engineer-manufacture-install unitized curtain wall facade supplier for the commercial glazing market primarily across North America.

UE is focused on seamlessly integrating transparent solar renewable energy technology into everyday products and surfaces, without aesthetic compromises.

Antamex has a portfolio of new construction and retrofit commercial glazing projects and has customers that are looking for ways to make their glazing more energy efficient without sacrificing appearance or performance.



By working together, the companies will bring a transparent solar enabled curtain wall glazing solution to architects, designers, façade engineers, developers, and building owner customers. This unique façade solution will significantly increase the performance of glass curtain walls into glazing that will meet the most stringent building codes without compromising on aesthetics and performance all while helping buildings achieve

net zero energy and beyond by the renewable energy it provides.

Susan Stone, Ubiquitous Energy CEO, said, "We are very pleased to announce our partnership with Antamex. We know that Antamex shares our vision to bring a renewable energy generating glazing solution to the commercial glazing market in North America. Given Antamex's brand and reputation, we couldn't have found a better glazing partner to help us do this."

Ryan Spurgeon, Antamex President, added, "Antamex has a rich history of offering and delivering reputable, customised and high-quality unitized glazing solutions to our global customers. We are excited to be working with the Ubiquitous Energy team to bring a new type of solar energy generating glazing to the market."



KALCIYAN INSTALS NEW FOREL VERTICAL PROCESSING LINE

Kalciyan Tecnología del Vidrio s.a. is one of the most important companies in Argentina's glass business, and a leading name throughout South America.

A long-time Forel partner, Kalciyan's most recent installation was made just

a few months ago, at the Buenos Aires site – a Forel line consisting of an Art. EM edging machine, an Art. DM drilling and milling machine, and an Art. VW vertical washing machine.

This is one of the

most sought after solutions for this type of processing, and can handle glass arrissing, grinding, polishing, drilling, milling and washing.

The advantage of having three different stations in the line is an elevated productivity: thanks to this layout in fact, several glass panes can be processed at the same time.

The company, founded in 1977, inaugurated a new plant in 2008 and is one of the most modern flat glass processing sites in Latin America, boasting over one hundred employees.



Forel vertical processing line in the Kalciyan plant.

SCHOTT BREAKS GROUND FOR FLAT GLASS PROCESSING PLANT IN TURKEY

Specialty glass manufacturer SCHOTT is investing 9 million EUR in state-of-the-art production technology and highly digital infrastructure in its Flat Glass plant at SCHOTT Orim in Bolu, Turkey. Production is planned to begin in early 2022.

"The investment will increase the production capacity in Bolu by 50 percent and underlines the importance of the home appliance business to SCHOTT. The home appliance industry is an important pillar for us, reinforced by mega-trends such as cocooning or urbanisation,

which result in people upgrading their home and living," said Dr. Heinz Kaiser, member of the SCHOTT Management Board. "Our commitment makes us an innovation partner that enables customers to turn product ideas into reality," continued Kaiser.

SCHOTT has continuously invested in its home appliance manufacturing – almost 15 million EUR in Turkey alone in the past five years. Alongside increased production capacity, the new infrastructure will create new employment, adding up a double-digit number of jobs per year to the current 700 employees.

The engagement in Turkey is part of SCHOTT's global growth strategy: for the second year in a row, the SCHOTT technology group is running a record investment program, with 350 million EUR being invested this financial year.



IFC INVESTS IN NSG GROUP TO SUPPORT MANUFACTURING CAPACITY IN ARGENTINA

The International Finance Corporation (IFC), a member of the World Bank Group, announced an investment of 40 million USD in NSG UK Enterprises Limited (NSG UK), a long-standing IFC client and a member of the NSG Group – one of the world's largest manufacturers of glass and glazing products for architectural, automotive, and technical applications.





The corporate loan will finance the completion and start of operations of the group's greenfield glass production plant in Argentina, with an estimated production of 900 tons per day, and help address the macro challenges facing the South American country.

Located in an industrial site in Cardales, approximately 70 kilometres north-west of Buenos Aires, the plant will utilise the latest NSG worldwide technology supporting the achievement of industry and sustainability targets. This includes aspects such as application of Industry 4.0 standards and technologies that support the decarbonization ambition of NSG Group.

In addition, IFC's loan to NSG UK, through the company's subsidiary in Argentina, Vidriería Argentina S.A. (VASA), will positively impact the local economy by supporting FDI, substituting imports and generating exports, adding value to domestic raw materials, and enhancing value chains. Furthermore, IFC will provide an advisory service to VASA to help identify energy efficiency opportunities.

"We are pleased to finance the completion of this project and to strengthen our relationship with NSG UK, a repeat global IFC client with a firm commitment to corporate governance practice and green standards," said David Tinel, IFC's Regional Manager for the Southern Cone. "In the context of the pandemic, IFC has stepped up to continue supporting the private sector in emerging economies."

"Since first partnering in 1992, we have built a strong long-term relationship with IFC and are excited about this new opportunity to work together so that we can contribute to the region's economy and the greener environment," said Leopoldo Carlos M. Garces Castiella, Head of Architectural Glass South America. "The NSG Group is aiming to be a global glass supplier contributing to the world with high value-added glass products and services."

GLASS GROUP: ASSOVIETRO MARKET TRENDS AND TWO NEW ACQUISITIONS

Glass Group, the first independent group of flat glass manufacturers, draws the guidelines for the coming months. In the scenario in which the flat glass converting industry has dealt with the recent crisis and is recovering rapidly, it is forecasting a growth of 8.9 percent in 2021, compared to the previous year.

Demand is driven by restart of investments in the construction sector, while the furniture sector is struggling to restart. However, prices and availability of raw materials could slow down the recovery and negatively affect the profitability of companies in 2021, according to market research on the flat glass sector in Italy. The flat glass market in Italy (to industrial and final customers

resident in Italy) was worth around 790 million EUR in 2020, slightly down compared to 2019 when it reached 838 million EUR.

Daniele Predari, President of Glass Group, said "The particular economic period we are experiencing sees, on the one hand a boom in demand and, on the other hand, scarcity of raw materials with consequent skyrocketing prices. The current situation of availability of glass provides for a change in the approach to the supply chain, planning for the long term, creating partnerships with reliable companies to give continuity and guarantee orders through more managerial management. This is why purchasing management with Glass Group has come into operation, with long-term strategic planning for both production and consumption. In 2020 we managed the purchases for this year, asking for guarantees on the supply of materials, even if availability of materials will be lower because such significant growth was not expected."

The first completely independent Italian group that brings together leading glass companies with decades of experience in the transformation of high quality insulating glass around its brand, the number of Glass Group affiliates has risen to 20. OmniDecor glassworks in Sant'Angelo (TE) and Vetreria Pistillo in Barletta (BT) joined recently.

"Glass Group's goal is to 'create a system', through strategic synergies and partnerships such as those with our Main Partners Pellini, Fenzi and Technoform, with Business Partners Aluvetro, AIGO, glassAdvisor, Sapiens and with the glass factories, effectively designing a large supply chain hub," explained Predari "We are pleased to welcome the new affiliates OmniDecor and Pistillo to the group, hoping it will be an opportunity for growth for them and enrichment in terms of know-how for all of us." In this perspective of innovation and development, the group was established thanks to the aggregation of 5 founders (Mornagoglass Srl, Predari Vetri Spa, Vetraria Pescini Srl, Vetreria Romagna Srl, Vetreria Valfon Srl) and today boasts 15 affiliates (Aluvetro, Vetreria Lucana of Vetromat Srl, Vetreria Deserto Srl, Vetreria Biava, Podda Vetri Srl, Termovetro Sud Srl, Vitrum & Glass Srl, Vetreria Tacca Srl, Vetropadana Srl, Guidi Glass Srl, Cappelletti & Roleri, Glastebo, Quidam, OmniDecor and Pistillo).



August 2021

R.C.N. SOLUTIONS VISITS VITROCELOS VIDRARIA, PORTUGAL

R.C.N. SOLUTIONS recently visited an important customer Vitrocelos Vidraria, in Portugal. A young, dynamic company, Vitrocelos is growing in both space and equipment capacity, increasing its offers for specialised end products.



Vitrocelos has worked on projects for laminated glass installed exteriors, exposed to weathering and to oxidising agents such as chlorine as in the recent case of a private swimming-pool. Composed of six glass sheets

of 15mm each, for a total thickness of 93mm, which includes 2.28mm of REVA BF for each panel, the project was accepted and validated by an engineer after several tests including a perpendicular compression test.

The glass was processed with a full RCN laminating system, namely one Lammy System 2, one chamber, 2 shelves, active size 5000mm x 2500mm, the process taking six hours and resulting in the utmost transparency and adhesion. The capacity to load such a weight while maintaining the flatness of the glass sheets is significant.

The RCN philosophy for complete quality supply is a winning point, the company strongly believes this added value confirms that its choices in building machines are the right ones, enabling customers to work in total confidence, relying on a time-tested combination.



GUARDIAN GLASS ACHIEVES NEW UL PRODUCT LENS CERTIFICATION

Guardian Glass is the first float glass manufacturer to achieve UL Product Lens™ Certification, covering three global product categories: Uncoated Float Glass, Sputter (Vacuum) Coated Float glass (including Commercial SunGuard® and residential ClimaGuard® products) and UltraMirror™ products.

UL's Product Lens program was developed to address the needs of archi-



tects and designers seeking greater material transparency throughout the building product lifecycle. Guardian is excited to offer its customers third party certified data for glass products based on an established assessment methodology scheme to help them meet the strict requirements of green building program requirements such as LEED v4.1. The Product Lens™ Certification for Guardian Glass products will enable customers to make informed decisions based on credible information that is transparent and easy to understand.

"The Guardian Africa, Middle East and India teams had previously collaborated with UL to achieve Product Lens™ Certification for glass products manufactured in those regions," said Coleen Dykstra, Guardian Glass Global Product Stewardship Manager. "Utilising our Market-Based Management® Framework, a global team was able to leverage that work along with the Cradle-to-Cradle certifications achieved by the European region to substantiate the expansion of those certifications to create the UL Product Lens™ reports covering these three global product categories."

Guardian chose this third-party, verified program because UL's Product Lens Certification adds context and clarity by offering greater transparency throughout the product life cycle. The addition of the Product Lens Certifications to a global portfolio of sustainability tools including product specific Environmental Product Declarations (EPD) and the award-winning Sustainability Calculator further enhances Guardian's commitment to being a preferred partner to fully support our customers in their pursuit to design and construct of innovative green certified buildings by providing accurate information in readily available formats.

PRESS GLASS PLANS NEW PRODUCTION PLANTS - IN LITHUANIA AND UK

Press Glass Group obtained bank financing in the amount of approximately 1.2 billion PLN to refinance its current debt and finance further investments, i.e. the construction of two new production plants – in Lithuania and in the United Kingdom.

The consortium participating in the financing consists of four commercial banks: PKO BP S.A., BNP Paribas Bank Polska S.A., ING Bank Śląski S.A. and





Santander Bank S.A. It is one of the largest transactions of this type on the market recently.

The new financing, obtained in large part for the further foreign development of the Group, will enable the creation of new, most modern, and automated plants of this type in Europe. The dynamic investment plan will allow the Group to maintain the title of the leader on the European market of window and façade glass.

AGC COMPLETES TRANSFER OF ARCHITECTURAL GLASS BUSINESS IN NORTH AMERICA

AGC Inc. announced the transfer of its architectural glass business in North America to Cardinal Glass Industries ("Cardinal"), closed on August 2, 2021.



Under the medium-term management policy AGC plus-2023, the Company has strived for improvements of the profitability and asset efficiency of its architectural glass business which have been designated as one of the AGC Group's priority issues. As part of this initiative, the Company announced on June 15, 2021 that it would transfer its North American architectural glass business to Cardinal. For details of this transaction, please refer to the "Notice regarding Transfer of Architectural Glass Business in North America".

The transaction is expected to generate a profit of approximately 25 billion JPY, which is expected to be recorded as other income in the consolidated financial results for the third quarter of the fiscal year ending December 31, 2021.

There is no change to the full-year consolidated financial forecast for the fiscal year ending December 31, 2021 as announced on August 2, 2021 in the press release titled "Notice regarding Revision to Full Year Consolidated Financial Forecasts, Dividend Forecasts and Interim Dividends from Surplus for Fiscal Year Ending December 31, 2021".

AGC GLASS EUROPE JOINS TO SUPPORT THE RESTART OF SOLTECH

AGC Glass Europe, together with a number of other partners, is helping to give Soltech a new lease of life. The imec spin-off, specialising in tailor-made building-integrated photovoltaics (BIPV), collapsed in March 2021, due to insufficient funds for the innovation and automation needed.

Metal processor Hegge B.V., Limburg investment compa-

ny LRM, environmental holding company Nuhma, RSQ Investors and AGC Glass Europe have faith in Soltech, led by entrepre-

neur Bas van de Kreeke, as a promising business so decided to infuse new life into it by means of a joint capital injection of 1.9 million EUR. It will process tailor-made solar panels for applications in roofing, canopies, glazing or acoustic screens, but also solar modules for vehicles. From the existing production site in Tienen (Belgium) the highly specialised team stands ready to resume intensive collaboration with renowned knowledge institutions such as Energyville, imec, IMMOMEC and UHasselt.

Bas van de Kreeke, the new CEO of Soltech, believes firmly in the future of the business and said, "The market of solar panels or photovoltaic cells is still growing strongly. Innovation in materials and processes remains necessary for greater and stable profitability, new applications and lower production costs. The traditional solar panels are mostly produced in China and sold at prices that European producers can no longer match. Thus, Soltech is switching approach and will focus on building-integrated PV panels that require very considerable know-how and flexible, fast, customised production. And this we can produce in Belgium and even make a reasonable margin on it."

What appeals particularly to AGC Glass Europe in this respect is the presence of a local value chain and the fact that the development of solar panels is being driven strongly by increasing moves towards sustainability and circularity. Patrick Van Bortel, Vice President Industrial & New Business at AGC Glass Europe said, "As the European leader in flat glass with its headquarters in Belgium we're stepping into this initiative fully convinced. The BIPV market is in full development, and – in line with the EU Green Deal – AGC Glass Europe is determined to play a leading role in making the construction sector sustainable."

Existing customers will continue to be served from the production facilities in Tienen and there will also be investments in innovation and product development. There are plans on the drawing board for a completely new production facility in Thor Park in Genk. Delivery of this high-tech business campus, which is being developed by LRM, the City of Genk and KU Leuven, is planned for the end of 2022.



STRUCTURAL GLAZING SPECIALISTS AGS LAUNCH GLASHAUS DESIGN

Architectural glazing specialists, Architectural Glass Systems Ltd (AGS), have launched GlasHaus Design, a luxury glass garden room company, following a huge rise in demand for outdoor living spaces.



Garden rooms and outdoor living spaces have become the latest luxury home addition as homeowners look to enhance their properties and create additional living space, particularly since the Coronavirus pandemic.

As employees were asked to work from home, 'garden office' also experienced a huge increase in online searches, growing by 271 percent from March 2020 to March 2021. As modern working methods adjust, the trend for garden offices shows no sign of slowing down. Many



workers are searching for a more balanced lifestyle, spending less time commuting and more time at home with friends and family.

In response to this rise in demand, GlasHaus Design was launched. GlasHaus Design tailor-makes luxury glass garden rooms, including garden offices, that

provide the perfect extension to any home as well as stunning panoramic garden views.

While many garden room suppliers offer turnkey outdoor living spaces, GlasHaus Design works with customers to design, manufacture and install bespoke glass garden rooms that suit their needs and fit their aesthetic requirements.

The unrivalled functionality of garden rooms means they can be used as luxury entertaining areas, tranquil office spaces, contemporary gym rooms and more. What's more, garden rooms often don't require prior planning permission, so they're a great way to add extra space to a home in a short amount of time.

To ensure quality, garden rooms from GlasHaus Design are built to last using precision German manufacturing methods and double-glazed, energy-efficient glass as standard. SIP insulation panels are also used in each build to ensure the outbuildings can be used all year round – they ensure the rooms stay cool in the summer and warm in the winter.

Director of GlasHaus Design, Ed Dupuy, said, "The Coronavirus pandemic brought to light a gap in the residential market for a luxury structural glazing supplier. Having pre-



viously served companies such as Apple and Hugo Boss, we're excited to bring our structural glazing knowledge and skills to the residential market. By offering tailor-made outdoor living solutions that capture the essence of a property, we hope to inspire house-proud homeowners to spend more time at home in comfort and style."

NSG AUGMENTED REALITY HEAD UP DISPLAY TECHNOLOGY CHOSEN BY MERCEDES-BENZ

The NSG Group is proud to announce that they have been selected by Mercedes-Benz AG to showcase their Augmented Reality Head Up Display technology on the all-new Mercedes Benz S-Class model.

The NSG Group introduced the pinnacle of automotive glass technology with the world's first Head Up Display powered by Augmented Reality (AR).

Through its trusted development-partner relationship, NSG was selected to help make this advanced technology a reality. The complex AR-HUD utilises an enhanced version of NSG's proprietary Advanced Press Bending technology that provides world-class display image quality.



2021 Mercedes-Benz S-Class - Photo courtesy of Mercedes-Benz SG via Daimler Media Site

As an additional innovation, solar reflecting technology that de-ices the windscreen using invisible heating was developed to work in tandem with the Augmented Reality display. This will allow a high content of solar reflecting technology to extend through to the rear of the vehicle providing ultimate passenger comfort.

NSG's continuous investment in advanced glass technologies has positioned the group to respond to expanding customer needs generated by the rapidly advancing technology for driving assistance systems. The launch of the all-new Mercedes-Benz S-Class model is just one example of NSG Group's global effort to meet current and future customer demands in the automotive glass market.

WERU & LISEC: TRUST IS THE BASIS FOR DECADES OF SUCCESS

In 2020 WERU installed a new VSL-A, LiSEC's high-performance automatic laminated glass cutting machine. Following WERU's decision to invest further in the laminated safety glass (LSG) sector, the decision was made in favour of a LiSEC system, and the purchase was made directly at a trade fair.

"Data, facts and figures were very important to us, in



was very high, thanks to our experience of outstanding cooperation with LiSEC in the past,” said Jens Reimann, Factory Manager at WERU.

WERU distinctly positions itself as a complete solution provider. True to the motto: everything from a single source. With LiSEC as a long-standing business partner, the decision was made in favour of a company with the same objective.



Sustainability is very important to WERU. The traditional company focuses on sustainable production and material processes, as well as smart, future-oriented products. Not only when it comes to glass, but across the entire production process. The VSL-A sup-

ports this by reducing glass consumption. On average, the VSL-A can save 6 percent of glass consumption.

The cooperation between WERU and LiSEC began when WERU started to manufacture insulating glass. At that time (and still today), LiSEC was the only company on the market to offer complete systems, from glass cutting to logistics, including its own LiSEC software.

Behind WERU's success lies a history that is rich in experience, sustainable thinking and the attitude of never being satisfied with the standards achieved. WERU performs continuous quality assurance from production to installation, certified by the RAL Quality Mark. Production takes place at the three German locations in Rudersberg (Baden-Württemberg), Triptis (Thuringia) and Salmtal (Rhineland-Palatinate).

GUARDIAN GLASS: NEW JUMBO LAMINATED GLASS LINE AT ITS RYAZAN PLANT

Guardian Glass is adding a new jumbo laminated glass production line at its Ryazan, Russia, plant, to support the increasing demand for laminated glass in Russia and the

Commonwealth of Independent States. Guardian is taking a natural step forward in its strong, long-standing laminating capability, as one of

the world's largest manufacturers of float, coated and fabricated glass products, with 26 float lines around the globe. As a result, Guardian Glass Russia will offer the region an improved product mix including SunGuard® and ClimaGuard® coatings on laminated substrates for various applications. Rising global demand for laminated glass is driven in part by architects and building owners demanding:

- **Safety:** When laminated glass breaks, it tends to stay within its frame because of the clear PVB interlayers, lessening the chance of injury.
- **Maximum natural light:** Larger insulating glass units, that combine Guardian high performance coatings and laminated glass, deliver expansive views as well as safety and security while managing light transmission and solar heat gain.
- **Noise reduction:** Acoustic laminated glass helps to reduce noise to create a more peaceful ambience.

“This investment illustrates our continued optimism and excitement about Guardian Glass’ expansion in Russia and the CIS,” said Guus Boekhoudt, Executive Vice President, Guardian Glass. “This project underwrites our vision to be a preferred partner to our customers, suppliers, employees and communities based on a foundation of mutual benefit.”

“We appreciate our customers’ support and are happy to keep evolving our relationship by offering them additional product options,” added Elena Rassudimova, General Manager, Guardian Glass Russia. “We are very proud of what our team and our partners are accomplishing in a challenging environment.”



GLASPRO ADDS DIAMON-FUSION® PROTECTIVE COATING TO GLASS PRODUCTS

Diamon-Fusion International (DFI) announced that GlasPro has chosen Diamon-Fusion® protective coating to bring additional value to their commercial glass offerings. The Company went with DFI's patented protective coating to offer a superior product to their customers. Diamon-Fusion® comes with an industry-leading warranty, unparalleled customer service, and can be applied to a wide range of glass surfaces including acid-etched glass, sandblasted glass, textured glass and much more. Diamon-Fusion is an ultra-thin, UV resistant, protective glass coating that transforms ordinary glass into a high-performing, water-repellent surface that helps prevent staining.

Similar to how a non-stick cooking pan works, surfaces treated with Diamon-Fusion become easier to clean





and require less care to maintain. The invisible barrier created in the Diamon-Fusion process is also extremely smooth, which helps prevent

environmental pollutants, mineral contaminants, and soap scum from damaging the glass.

GlasPro's 75,000 square-foot facility in Santa Fe Springs, California, houses complete tempering, lamination, and fabrication operations all under one roof. They will offer Diamon-Fusion® on commercial glass railings, canopies, interior glass, IGU's, and storefronts. For more than 25 years, the company has worked within the commercial market, and adding Diamon-Fusion® to their product line will continue the Company's mission of offering quality products backed by a trusted name.

Ed Lemley, VP of Manufacturing at GlasPro, said, "Our company is focused on overall quality, on-time delivery, and customer service. When looking at a new product offering, we wanted to go with a company that could help differentiate our business and partner with us to bring something new to our customers. Going with Diamon-Fusion® was an easy decision since many of the largest glass fabricators trust Diamon-Fusion® for their protective coating needs."

ARMOR SOLAR POWER FILMS: GENERATING SOLAR POWER WITH GLASS FAÇADES

ARMOR solar power films GmbH from Kitzingen, Germany, known under the brand name ASCA®, has developed a new technology that allows organic photovoltaic (OPV) cells to be integrated quickly, easily and flexibly into any glass format and facade.



Flat glass processor BGT Bischoff Glastechnik GmbH, based in Bretten near Karlsruhe, Germany, is now offering the transparent, energy-generating glass modules to the global construction industry.

In addition to manufacturing the OPV components, ARMOR ASCA also plans the system integration, from cable routing and connection technology to the inverter. The solar power is fed into the public grid or consumed directly.

While the balustrades are transparent from the inside, they are translucent from the outside, thereby guaranteeing privacy. The solar power is produced by carbon-based

organic solar cells, which ARMOR ASCA applies in very thin layers to fine films using a special printing process.

"With the glass balustrades, ARMOR ASCA closes a gap in facade construction. For the first time, safe-

ty glass for high-rise buildings can also generate energy," said Martin Sulzer, who heads technical sales at BGT. The modules are ideally suited for facades because they are attractive, and there is also no complete loss of power even when partial shading occurs thanks to their technical properties."

Unlike conventional crystalline solar cells, the organic solar films are not only flexible and transparent, but can also be bent and shaped as desired. The solar film can be produced in blue, green, grey and red. There are also no limits in terms of shape, length, size and design.

"We can produce any shape of solar cell, which thus becomes part of the architecture and design," explained Hermann Issa, senior vice president in charge of Business Development & Project Management at ARMOR ASCA. Once the design has been completed, the system can be planned within about ten days. The first glass balustrades with integrated solar films went into operation in May at condominiums in Stuttgart Möhringen. "We are pleased to demonstrate how well our balustrades perform in this project. This proves that our technology also works excellently in commercial housing," added Issa.



Glass balustrades with integrated green-transparent OPVs that generate energy on the building in Stuttgart Möhringen - Copyright: ©ARMOR ASCA

ŞİŞECAM LAUNCHES NEW COATED GLASS PRODUCT

Şişecam has launched a new product, Şişecam Solar Control Low-E Glass Neutral 50/33, which creates comfortable living areas by providing optimum light transmittance, efficient solar and heat control.

Şişecam contributes effectively to the fight against climate change by minimising energy consumption, its new Şişecam Solar Control Low-E Glass Neutral 50/33 provides solutions for projects such as residences, schools and small/medium sized commercial buildings where optimum





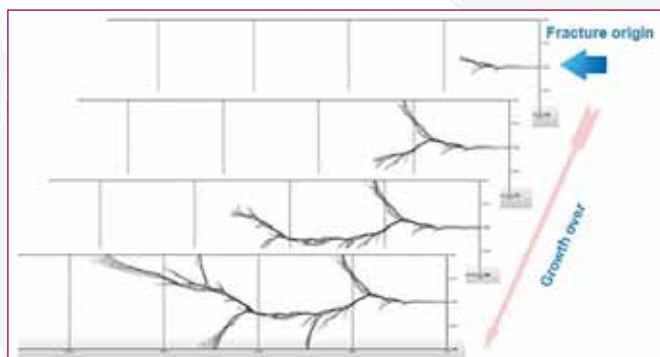
daylight transmittance, neutral appearance and efficient solar control are necessary.

Due to its efficient solar control and thermal insulation properties, Şişecam Solar Control Low-E Glass Neutral 50/33 reduces heat loss by 50 percent compared to ordinary IGU. Therefore, effective heat insulation in winter is provided and heating expenses are reduced. It also decreases solar energy transmission by 45 percent compared to ordinary IGU. Neutral 50/33 provides extremely high levels of protection against UV radiation, over 70 percent, helping to reduce fading and ageing effects. Neutral 50/33 also has the same colour and performance in temperable form which can be used in the same project.

AGC: WORLD FIRST TO PREDICT FRACTURES IN CHEMICALLY STRENGTHENED GLASS

AGC Inc. (AGC), in partnership with the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), has succeeded in simulating the fracture patterns of chemically strengthened glass—used for smartphone cover glass—in detail using a numerical analysis method.

By combining AGC's fracture observation technology with JAMSTEC's numerical analysis technology that has been applied to soil and ground fracture analyses, the novel theory and simulation method, which can consider the effect of the stress field on the crack propagation, were developed. This is the first time that the process of crack propagation and the branching patterns in chemically strengthened glass have been accurately reproduced using numerical simulations.



KURARAY CLARIFIES SENTRYGLAS® IONOPLAST INTERLAYER BRANDING

Kuraray has consolidated reference for SentryGlas® products as "SG™" and has recently obtained a US trademark registration for SG™.

While the acronym SGP was used when the product "SentryGlas® Plus" was first introduced by DuPont in 1998, the "Plus" was dropped from the name over 10 years ago. Unfortunately, the SGP moniker has persisted in the in-

dustry, and its use is now causing confusion with authentic SentryGlas® products.

In recent years, other manufacturers have produced and sold interlayers that do not have the same properties as SentryGlas®, but they are using the name "SGP" to refer to those interlayers in order to benefit from the long-standing quality and reputation associated with the SentryGlas® brand. Kuraray feels it is important for the glass industry to understand that authentic SentryGlas® products are not associated with SGP, and one should not expect SGP products to perform at SentryGlas® product levels.

The proper designation SG™ should be used when requesting or referencing authentic SentryGlas® interlayers to avoid confusion.

In addition to SentryGlas®, Kuraray also produces the next generation in the product line, SentryGlas® Xtra™ (SGX™).



The next generation in the SentryGlas® product line, SentryGlas® Xtra™ (SGX™)

NORTHGLASS HELPS BUILD PHASE II OF NATIONAL CONVENTION CENTER

Phase II of the Beijing National Convention Centre is located in the central area of the Olympic Park in Chaoyang District, Beijing, close to Beijing National Stadium (Bird's Nest/Olympic Stadium) and National Swimming Center. The project was designed by French architect Portzamparc, winner of the Pritzker Architecture Prize, and consultant of Afa Architectural Design Consulting Ltd (RFR). The building boasts a concave curved façade, and above is a huge reception canopy. The consistent curvature unifies the façade, while the overall shape gives a sense of elegance and solemnity.

The large eaves of the east facade convey the charm of traditional Chinese architecture, while the facades of the east, south and north of the



main building consist of "bird windows," or special curtain wall units. The 2,376 curtain wall units are connected into surfaces, just like a flock of light birds. The first curtain wall of the second phase of the National Convention Center is 6 metres high ribbed glass curtain wall, 5 layers of 12mm ultra-white tempered laminated Low-E insulating glass unit. The curtain wall of the east facade is installed with nearly 6 metre glass transverse framed



curtain wall, and the inner curtain wall uses curved laminated glass with a height of arc of 10 metres in height.

RFR specially formulated the whole process from materials to production process including cutting, grinding, tempering, homogenization, laminating and insulating, and finished product inspection, quality control plan

and evaluation standards; Tianjin NorthGlass implemented the standard requirements of the owner and management company, and proposed its own higher standards in each process to ensure the smooth implementation



of the project. The total construction area of the centre is 780,000 square metres, and the main construction area of the conference centre is 270,000 square metres. The length of its main part of the building is 460 metres from north to south, width is 150 metres from east to west and height is 45 metres. There are 3 floors on the ground and 2 floors underground. In the future, it will be used mainly to hold state affairs, government affairs and high-end business exhibition activities.

FRATELLI PEZZA: POCULUM, WEARABLE SANDBLASTED GLASS

"A dreamer craftsman", Umberto Tofoni, a third generation glassmaker from the Marche region, had an illumination one day in March 2014 that literally changed his life: creating the first sandblasted glass bow tie, which has since grown to become a cult object.

Today POCULUM is one of the trending brands in the fashion accessories sector, with a truly amazing growth in popularity. Who would have even imagined being able to wear a glass bow tie? Umberto, a



forge of ideas and enthusiasm, in the glass factory founded by his grandfather in Porto Sant'Elpidio, in the Fermo province, Italy, tells us how his project was born.

"It all started seven years ago. I was in our workshop with my father, who was cutting a mirror, giving it the silhouette of a person. At that precise moment I got the inspiration: I took a piece of waste glass from a previous process and carved the shape of a bow tie! The first result was a bit rough but I decided to wear it myself at a party with friends and the success was simply sensational! That experience made me realise that I had created an object with great potential, which only needed to have an adequate showcase."

Umberto began to work on the development of the item until he managed to manufacture the "glass bow-tie" available today. Using a sandblasting technique each piece is unique, authentic and can even be customised on request.

"I have been using the GHIBLI sandblasting cabin manufactured by Fratelli Pezza for years now and I must say that I am really happy with it. I need cleanliness and precision when I sandblast my POCULUM and this sandblaster is perfectly fit to it! It is a truly flexible and reliable machine manufactured by a healthy company that is always striving for quality."

Umberto can create stylish designs of any kind on glass, such as the textured effects, obtained by blasting at different depths. POCULUM aroused interest in major international fashion magazines such as VOGUE ACCESSORY, at Toronto Mens' Fashion Week and the Amato Couture





August 2021

in 2017 where bow ties completed the outfit of several international fashion designers.

Italian movie makers chose POCULUM. "In fact, Enrico Brignano wore one of my bow ties at the premiere of his film 'A Whole Other Life'."

The POCULUM accessories were worn by some of the players of the world of glass who attended Vitrum, the international leading exhibition held in Milan in October 2021 and combined with "Glass Week," a week characterised by events in the heart of Milan.

ROLLPLAST & LISEC: SERVICE, INNOVATION AND STRONG COLLABORATION

Rollplast was founded in 2000 by Svetlin Nikolchev with the goal of producing and installing indoor and outdoor blinds. The Bulgarian company's success and constant growth is evident in its product portfolio, and in large investments in organisational infrastructure and technical expansion.

LiSEC has accompanied Rollplast on this road since 2008, when the latter invested in its first cutting and insulation production line. Since then, the Bulgarian company has

continuously increased its fleet of LiSEC machines.

A decisive competitive advantage for Rollplast came last year with installation of the LiSEC TPA line

for glass units. Production was increased by about 800 square metres per day, and this reduced operation costs, human intervention and production errors.

The LiSEC machine portfolio at Rollplast includes the following: insulation line for glass units – LiSEC 50/27, insulation line for glass units – LiSEC – 25/20, insulation line for TPA units – LiSEC – TPA-Line, LiSEC BASE cutting table, LiSEC ESL 60/30 cutting table, laminated

glass cutting table VB/ GFB-60 / 30RE-S, automatic and manual butyl extruder LISEC LBH-25ARS / LBH-25V, two spacer benders – BSV 30 / K / BSV 45NK, automatic pick-up – PKL 60/30 / SBL 60/30 and other auxiliary machines.

To optimise these LiSEC machines, Rollplast uses a broad spectrum of LiSEC software, such as GPS.prod, GPS.order, GPS.opt, GPS.hand, GPS.lineserver, GPS.perfectscan, GPS.ident step, GPS.ident IG, GPS.ident delivery, along with many add-on modules for the LiSEC software programs.

Rollplast has clear values not only toward customers, but also toward suppliers: correctness, professionalism, striving for continuous improvement and innovation, along with

speed and punctuality. Most of all, collaboration with LiSEC's Bulgarian field representative, Mario Bodakov, has been simple and satisfying since the first meeting. This is based on reciprocity: "First, and extremely important is maintaining the mutual trust built over years. That means fast, simple reaction when solving problems in after-sales service, service parts delivery and software issues. Then nothing stands in the way of conversations about new project collaborations," said Mario Bodakov, LiSEC Sales and After-Sales Service since 1994.

In addition to competent on-site support, Rollplast finds LiSEC's offerings and continuous development of software for complete production crucial, along with innovations in the design and development of LiSEC machines.



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Glaston Group
Hegla
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Keraglass
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Macotec
MOVETRO
Schiavo
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Tuomas

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Bottero

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ECOL
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Hegla
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Keraglass
Lisec Group
Macotec
North Glass Technology
Schiavo
Torgauer Maschinenbau
Tuomas

MACHINES FOR HANDLING GLASS SHEETS

Ashton Industrial Sales
Bando Kiko
Bavelloni
Bottero
CMS
Di Gregorio
ECOL
Forel
Glaston Group
Hegla
IOCCO Group
Italcarrrelli
Keraglass
Lisec Group
Macotec
Schiavo
Torgauer Maschinenbau
Tuomas

HANDLING ROBOTS

Ashton Industrial Sales
Bavelloni
Bottero
CMS
ECOL
Hegla
IOCCO Group
Lisec Group
Neptun
Schiavo
Torgauer Maschinenbau
Tuomas

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ECOL
Glaston Group
Hegla
IOCCO Group
Italcarrrelli
Lisec Group
Schiavo
Torgauer Maschinenbau
Tuomas

TROLLEYS AND CLASSIFIERS

CMS
Di Gregorio
Forel
Hegla

Lisec Group
Macotec
MOVETRO
Schiavo
Si.Ste
Tecno Glass
Torgauer Maschinenbau
Tuomas

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Italcarrrelli
Lisec Group
Schiavo

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Di Gregorio
ECOL
Fenzi
Forel
Glaston Group
Hegla
Lisec Group
Schiavo
Si.Ste
Torgauer Maschinenbau
Tuomas

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Bottero

Di Gregorio
Fenzi
Glaston Group
Hegla
Lisec Group
Schiavo
Tuomas

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SUCTION CUPS

ADI - Surface Group
Bottero
CMS
Fenzi
Glaston Group
Hegla
Schiavo
Si.Ste
Tuomas

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Cugher Glass
Di Gregorio
ECOL
Glaston Group
Schiavo
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ECOL
Hegla
Schiavo
Vismara

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BOST
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Hegla
Helios Quartz
Mole Moreschi
Schiavo
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Straight-edge and shape cutting

COMPLETE STRAIGHT-EDGE LINES

Bando Kiko
Bavelloni
Bottero
CMS
Euromec
Forvet
Glaston Group
Hegla

Lisec Group
Neptun
Schiavo
Schiatti Angelo
North Glass Technology

COMPLETE SHAPE CUTTING LINES

Bando Kiko
Bavelloni
Bottero
CMS
Glaston Group
Hegla
Lisec Group
Macotec
Schiavo
North Glass Technology
Tuomas

AUTOMATIC CUTTING MACHINES FOR AUTOMOTIVE GLASS

Bando Kiko
Bottero
CMS
Glaston Group
IOCCO Group
Lisec Group
Macotec
Schiavo

LOADING AND TILTING MACHINES

Bando Kiko
Bavelloni
Bottero
CMS
ECOL
Euromec
Forel
Glass Company
Glaston Group
Hegla
Intermac - Biesse
IOCCO Group
Lisec Group
Macotec
Neptun
Schiavo
Tuomas

CUTTING TABLES

Bando Kiko
Bavelloni
Bottero
CMS
Euromec
Fenzi
Forel
Glaston Group
Hegla
IOCCO Group
Lisec Group
Macotec
Schiavo
Tekno Kilns
Triulzi
Tuomas

CUTTING OPTIMIZERS

Bando Kiko
Bavelloni
Bottero
CMS
Deltamax Automazione
Euromec
Forel
Glaston Group
Hegla
IOCCO Group
Lisec Group
Macotec
Optima
Schiavo
Tuomas

CUTTING PATH OPTIMIZERS

Bando Kiko
Bottero
CMS
Euromec
Glaston Group
IOCCO Group
Lisec Group
Macotec
Optima
Schiavo

CAD SYSTEMS

Bavelloni
CMS
Lisec Group
Prodim
Schiavo

ARMOURED AND LAMINATED GLASS CUTTING MACHINES

Bando Kiko
Bavelloni
Bottero
CMS
Glaston Group
Hegla
Lisec Group
Macotec
Schiavo
Tuomas

ROUND OR SHAPE CUTTING MACHINES

Bando Kiko
Bavelloni
Bottero
CMS
Fenzi
Glaston Group
Hegla
Lisec Group
Macotec
Schiavo
Tuomas

CUTTING ACCESSORIES

ADI - Surface Group
Ayrox
Bando Kiko
Bottero
Fenzi

Lanzetta
IOCCO Group
Macotec
Schiavo
Softeco
Talamoni
Tuomas
Vincent - Surface Group

SAW MACHINES

Di Gregorio
Schiavo
Tecno Glass

AUTOMATIC SAWS FOR CUTTING LAMINATED AND BULLET-PROOF GLASS

CMS
Schiavo

BREAKING SYSTEMS

Bando Kiko
Bavelloni
Bottero
CMS
Euromec
Glaston Group
Hegla
IOCCO Group
Lisec Group
Macotec
Schiavo
Tuomas

CUTTING MACHINES WITH BREAKING AND EDGE DELETING DEVICES

Bando Kiko
Bottero
CMS
Euromec
Glaston Group
Hegla
IOCCO Group
Lisec Group
Macotec
Schiavo
Tuomas

GLASS CUTTING FLUIDS

Schiavo
Tuomas

ACCESSORIES

Schiavo
Schiatti Angelo
Talamoni
Tuomas

Edging and bevelling

COMPLETE EDGING LINES

Adelio Lattuada
Ashton Industrial Sales

B Solution

Bando Kiko

Bavelloni

Bottero

CMS

Forel

Forvet

Hiseng Glass Machinery

IOCCO Group

Neptun

Schiavo

Schiatti Angelo

SKG - Skill Glass

COMPLETE BEVELLING LINES

Adelio Lattuada

Bando Kiko

Bottero

CMS

Hiseng Glass Machinery

IOCCO Group

Schiavo

COMPLETE AUTOMOTIVE GLASS EDGING AND BEVELLING LINES

Adelio Lattuada

Bando Kiko

Bavelloni

Bottero

Glaston Group

Hiseng Glass Machinery

Intermac - Biesse

IOCCO Group

SKG - Skill Glass

DOUBLE-EDGE GRINDING MACHINES

Ashton Industrial Sales

B Solution

Bando Kiko

Bavelloni

Bottero

CMS

Forvet

Hiseng Glass Machinery

Intermac - Biesse

IOCCO Group

Schiatti Angelo

VERTICAL-EDGE GRINDING MACHINES

Adelio Lattuada

B Solution

Bando Kiko

Bavelloni

Bottero

Di Gregorio

Forel

Glass Company

Glaston Group

Hiseng Glass Machinery

Neptun

Schiavo

Schiatti Angelo

SGM - Special Glass Machinery

North Glass Technology

SKG - Skill Glass

GRINDING SPINDLES

Schiavo

Tecno Glass

BEVELLING MACHINES FOR ROUND AND SHAPED GLASS

Adelio Lattuada

Bando Kiko

Bavelloni

CMS

Hiseng Glass Machinery

Intermac - Biesse

Schiavo

STRAIGHT-EDGE BEVELLING MACHINES

Adelio Lattuada

Bando Kiko

Bavelloni

Bovone Elett.

CMS

Glass Company

Hiseng Glass Machinery

Schiavo

Schiatti Angelo

BEVEL POLISHING MACHINES

Adelio Lattuada

Bando Kiko

Bavelloni

Bovone Elett.

CMS

Hiseng Glass Machinery

Intermac - Biesse

STRAIGHT-EDGE ENGRAVING MACHINES

Bavelloni

Bottero

CMS

Intermac - Biesse

SKG - Skill Glass

SHAPED GLASS ENGRAVING MACHINES

Bavelloni

Bottero

CMS

Intermac - Biesse

CORNER GRINDING MACHINES

Adelio Lattuada

Ashton Industrial Sales

B Solution

Bavelloni

CMS

Intermac - Biesse

SGM - Special Glass Machinery

SKG - Skill Glass

SHAPED GLASS GRINDING MACHINES

Adelio Lattuada

Ashton Industrial Sales

Bando Kiko

Bavelloni

Bottero

CMS

Forel

Glass Company

Hiseng Glass Machinery

Intermac - Biesse

BELT GRINDING MACHINES

Adelio Lattuada

Ashton Industrial Sales

Fenzi

Hiseng Glass Machinery

IOCCO Group

Si.Ste

LATHES - VERTICAL AND HORIZONTAL

CMS

Fenzi

EMBOSSING MACHINES

CMS

Fenzi

PORTABLE MACHINES

Fenzi

Helios Quartz

Si.Ste

Tecno Glass

DIAMOND TOOLS

Adelio Lattuada

ADI - Surface Group

Ashton Industrial Sales

Bando Kiko

Bovone Diamond Tools

Bottero

Diamut - Biesse

Fenzi

Glaston Group

Lanzetta

Marrose Abrasives

Mole Moreschi

Neptun

Schiavo

Talamoni

Vincent - Surface Group

DIAMOND BELTS

Mole Moreschi

SEAMING LINES

Ashton Industrial Sales

MANUAL LINES

Ashton Industrial Sales

POLISHING WHEELS

Adelio Lattuada

ADI - Surface Group

Bando Kiko

Bovone Diamond Tools

Diamut - Biesse

Fenzi

Glaston Group

Italmole

Marrose Abrasives

Mole Moreschi

RBM Italia - Surface Group

Schiavo

Si.Ste

Vincent - Surface Group

POLISHING AGENTS AND OXIDES

ADI - Surface Group

Bovone Diamond Tools

Fenzi

Schiavo

Vincent - Surface Group

POLISHING BELTS

Di Gregorio

Fenzi

Schiavo

Si.Ste

COOLANTS

Adelio Lattuada

Bovone Diamond Tools

Fenzi

Schiavo

GLASS GRINDING AND BEVELLING COOLANTS

Schiavo

SEPARATORS FOR GLASS-SOLIDS

Ashton Industrial Sales

Dieffe Machine

Filteraglass

Immnes

Schiavo

Vitrosep

ACCESSORIES

ADI - Surface Group

CMS

Fenzi

Helios Quartz

IOCCO Group

Lanzetta

Mole Moreschi

Schiavo

Schiatti Angelo

Vincent - Surface Group

Washing

HORIZONTAL WASHING MACHINES

Ashton Industrial Sales

Bando Kiko

Bavelloni

Bovone Elett.

Di Gregorio

ECOL

Forel

Glass Company

Glaston Group

Hiseng Glass Machinery

IOCCO Group

Lisec Group

Neptun Schiavo
SGM - Special Glass Machinery
Si.Ste
Triulzi

VERTICAL WASHING MACHINES

Adelio Lattuada
Ashton Industrial Sales
Bavelloni
Best Makina
Di Gregorio
ECOL
Forel
Glass Company
Glaston Group
Hiseng Glass Machinery
IOCCO Group
Lisec Group
Neptun Schiavo
SGM - Special Glass Machinery
North Glass Technology
Si.Ste
S.T. Group
Stefglass
Triulzi

WASHING MACHINES FOR AUTOMOTIVE GLASS

Bando Kiko
ECOL
Glaston Group
IOCCO Group
Triulzi

WASHING PURIFICATION SYSTEMS

Dieffe Macchine
Forel
Glass Company
Glaston Group
Immes
IOCCO Group
Schiavo

LIQUID WASHING CONCENTRATES

Schiavo

ACCESSORIES

Helios Quartz
Idrotecnica
Neptun Schiavo
S.T. Group

Mirror production

COMPLETE PLANTS & CONVEYORS FOR MIRROR PRODUCTION

Bovone Elett.
IOCCO Group
Triulzi

PAINTING EQUIPMENT

Fenzi
IOCCO Group
Triulzi

DRYING OVENS

Bovone Elett.
CMS

AUTOMOTIVE MIRROR BENDING FURNACES

Bovone Elett.

MANUAL SILVER- SPRAYING EQUIPMENT

Fenzi
Glass Company

PAINTS AND CHEMICAL PRODUCTS

Fenzi

ACCESSORIES

Fenzi
Helios Quartz

Insulating glass

COMPLETE INSULATING GLASS LINES

Ashton Industrial Sales
Bavelloni
Best Makina
Di Gregorio
Forel
Glass Company
Glaston Group
Neptun Schiavo
SGM - Special Glass Machinery
S.T. Group
Thermoseal Group
Triulzi

AUTOMATIC SEALING LINES

Bavelloni
Forel
Glaston Group
Lisec Group
S.T. Group

AUTOMATIC SPACER BENDING MACHINES

Bavelloni
Best Makina
Fenzi
Forel
Glaston Group
IOCCO Group
Lisec Group
Schiavo
S.T. Group
Thermoseal Group

DESICCANT SALT FILLING MACHINES

Ashton Industrial Sales
Bavelloni
Best Makina
Di Gregorio
Fenzi
Forel
Glaston Group
Lisec Group
Neptun Schiavo
Stefani
S.T. Group
Tecno Glass
Thermoseal Group
Triulzi

SPACER CUTTING SAWS

Ashton Industrial Sales
Bavelloni
Best Makina
Di Gregorio
Fenzi
Forel
Lisec Group
Neptun Schiavo
S.T. Group
Tecno Glass
Thermoseal Group

BUTYL EXTRUDERS

Bavelloni
Best Makina
Di Gregorio
Forel
Glaston Group
Lisec Group
Neptun Schiavo
Si.Ste
Stefani
S.T. Group
Tecno Glass
Thermoseal Group
Triulzi

HOT-MELT EXTRUDERS

Bavelloni
Best Makina
Di Gregorio
Fenzi
Forel
Lisec Group
Neptun Schiavo
Si.Ste
Stefani
S.T. Group
Tecno Glass
Thermoseal Group
Triulzi

POLYURETHANE EXTRUDERS

Bavelloni
Best Makina
Fenzi
Forel

Glaston Group

Lisec Group
Schiavo
S.T. Group
Tecno Glass

POLYURETHANE ENCAPSULATION

Glaston Group
Lisec Group
Schiavo

SILICONE EXTRUDERS

Best Makina
Di Gregorio
Fenzi

Forel
Glaston Group
Lisec Group
Schiavo
S.T. Group
Tecno Glass
Triulzi

POLYSULPHIDE SEALANT EXTRUDERS

Best Makina
Fenzi
Forel
Glaston Group
Lisec Group
Schiavo
Stefani
Tecno Glass
Triulzi

GAS FILLING EQUIPMENT

Di Gregorio
Fenzi
Forel
Glaston Group
Lisec Group
Neptun Schiavo
Si.Ste
Sparklike
Stefani
S.T. Group
Tecno Glass
Thermoseal Group

DESICCANT SALTS

Ashton Industrial Sales
Di Gregorio
Fenzi
Neptun Schiavo
Stefani
S.T. Group
Tecno Glass
Thermoseal Group

SPACERS/PROFILES

Ashton Industrial Sales
Edgetech Europe
Fenzi
Schiavo
S.T. Group
Tecno Glass
Thermoseal Group

GEORGIAN BARS

Ashton Industrial Sales
Hegla
Tecno Glass
Thermoseal Group

BUTYL

Ashton Industrial Sales
Fenzi
Stefani
Thermoseal Group

POLYSULPHIDE SEALANTS

Fenzi
Stefani

HOT MELT

Ashton Industrial Sales
Fenzi
Stefani
Thermoseal Group

OTHER SEALANTS

Fenzi
Stefani

PANTOGRAPHS

Fratelli Pezza

ACCESSORIES

Ashton Industrial Sales
Deltamax Automazione
Forel
Helios Quartz
Schiavo
Sparklike
Stefani
S.T. Group
Triulzi

Tempering

TEMPERING FURNACES (ARCHITECTURAL GLASS)

Glass Company
Glasstech Inc.
Glaston Group
Hornos Industriales Pujol
Jinglass
Keraglass
Landglass Technology
Lema
Lisec Group
Mappi International
Schiavo
North Glass Technology
Tekno Kilns
Texpack

TEMPERING FURNACES (AUTOMOTIVE GLASS)

Glass Company
Glasstech Inc.
Glaston Group
Jinglass
Keraglass

Landglass Technology
Mappi International
Mazzaroppi Engineering
Satinal Spa
SGLASS

North Glass Technology
Taifin
Texpack

CHEMICAL TEMPERING EQUIPMENT

Glass Company
R.C.N. Solutions

ROBOT FOR CLEANING SILICA ROLLERS

Eurotech Way

ACCESSORIES

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

Bending

BENDING FURNACES (ARCHITECTURAL GLASS)

Hornos Industriales Pujol
Jinglass
Keraglass
Mappi International
Mazzaroppi Engineering
R.C.N. Solutions
SGLASS
Tekno Kilns
Texpack

BENDING FURNACES (AUTOMOTIVE GLASS)

Glass Company
Glasstech Inc.
Glaston Group
Jinglass
Keraglass
Mappi International
Mazzaroppi Engineering
R.C.N. Solutions
Satinal Spa
Si.Ste
Taifin
Texpack

ACCESSORIES

Ayrox

Deltamax Automazione
Glass Company
Glasstech Inc.
Glaston Group
Hornos Industriales Pujol
Keraglass
Mappi International
Satinal Spa
Softeco
Tekno Kilns

Laminated glass production

COMPLETE PLANTS

Bovone Elett.
Bottero
Forel
Glass Company
Glaston Group
Hornos Industriales Pujol
IOCCO Group
Italmatic
Lisec Group
Mazzaroppi Engineering
R.C.N. Solutions
Satinal Spa
Si.Ste
Texpack
Triulzi

LAMINATED WINDSCREEN BENDING FURNACES

ECOL
Glass Company
Glasstech Inc.
Glaston Group
Keraglass
Mappi International
Taifin
Texpack

AUTOCLAVES

Bürkle
Glass Company
Glaston Group
Hornos Industriales Pujol
Italmatic
Lisec Group
Triulzi

AUTOCLAVE-FREE LAMINATED GLASS PRODUCTION

Bürkle

CLIMATIC CABINS

Forel
Glaston Group
IOCCO Group
Lisec Group
Triulzi

INFRARED OVENS

ECOL
Forel
Glass Company
Glaston Group
Hornos Industriales Pujol

IOCCO Group
Lisec Group
Satinal Spa
SGLASS
Triulzi

PRESSES/BENDING MACHINES

Forel
IOCCO Group
Lisec Group
Triulzi

RESIN LAMINATING MATERIALS AND EQUIPMENT

IOCCO Group
Satinal Spa
Torgauer Maschinenbau

EVA (ETHYLENE VINYL ACETATE)

Satinal Spa

PVB

Everlam
Kuraray - Trosifol

PVB - SHAPING AND CUTTING EQUIPMENT

Ayrox
ECOL
Forel
Glaston Group
IOCCO Group
Lisec Group
Softeco

PVB - WIRING TECHNOLOGY FOR HEATABLE LAMINATES

Ayrox
ECOL
Softeco

ACCESSORIES

Ayrox
Bottero
Deltamax Automazione
Eurotech Way
Glaston Group
Helios Quartz
Hornos Industriales Pujol
IOCCO Group
Lisec Group
Satinal Spa
Softeco
Taifin
Triulzi

Drilling

AUTOMATIC DRILLING LINES

B Solution
Bando Kiko
Bavelloni
Forvet
Glaston Group
Intermac - Biesse
IOCCO Group
Neptun

Schiatti Angelo
SKG - Skill Glass
Vismara

MULTI-SPINDLE DRILLING MACHINES

B Solution
Bando Kiko
Bavelloni
CMS
Forvet
Glass Company
Glaston Group
Intermac - Biesse
IOCCO Group
Neptun
Schiavo
Schiatti Angelo
SKG - Skill Glass
Vismara

DRILLING MACHINES WITH OPPOSITE DRILLING HEADS

B Solution
Bando Kiko
Bavelloni
Bottero
CMS
Di Gregorio
Fenzi
Forvet
Glaston Group
Hiseng Glass Machinery
Intermac - Biesse
IOCCO Group
Neptun
Schiavo
Schiatti Angelo
SKG - Skill Glass
Vismara

COLUMN DRILLING MACHINES

B Solution
Bottero
Di Gregorio
Fenzi
Neptun
Schiavo
Si.Ste
Vismara

PORTABLE DRILLING MACHINES

CMS
Fenzi
Schiavo
Si.Ste

DRILLING AND MILLING MACHINES

Bavelloni
Bottero
CMS
Forvet
IOCCO Group
Neptun
Schiavo
SGLASS
Vismara

DIAMOND DRILLS

ADI - Surface Group
Bovone Diamond Tools
Diamut - Biesse
Fenzi
Glaston Group
Lanzetta
Mole Moreschi
Neptun
Schiavo
Si.Ste
Vincent - Surface Group

ACCESSORIES

CMS
Fenzi
Neptun
Schiavo
Si.Ste

Other equipment and plants

TURNKEY PLANTS / ENGINEERING - FOR BUILDING GLASS

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

TURNKEY PLANTS / ENGINEERING - FOR AUTOMOTIVE GLASS

Bando Kiko
Bottero
Cugher Glass
Horn
Glaston Group
Intermac - Biesse
IOCCO Group

KEY PLANTS / ENGINEERING - FOR DISPLAY GLASS

Bando Kiko
Cugher Glass
Torgauer Maschinenbau

EDGES ROLLER COATING MACHINE

Eurotech Way

WORK CENTRES - CNC CONTROLLED

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

FLOAT PLANTS/LINES (EQUIPMENT & ACCESSORIES)

Bovone Elett.
Horn
IOCCO Group

CULLET HANDLING SYSTEMS

ECOL

COMPLETE BATCH PLANTS

Zippe

VACUUM COATING EQUIPMENT AND PLANTS

Glass Company
North Glass Technology

ENAMELLING EQUIPMENT AND PLANTS

Glass Company
Rollmac division of GeMaTa

DRYERS AND ENAMELING FURNACES

Bürkle

SPRAYING TECHNOLOGY

Bürkle

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

Bürkle

SANDBLASTING SYSTEMS, EQUIPMENT AND PLANTS - OPTIMIZERS

Di Gregorio
Fenzi
Fratelli Pezza
Glass Company
Schiavo
SKG - Skill Glass

DIGITAL INKJET PRINTERS

Glass Company
System Ceramics
TecnoFerrari

SCREEN PRINTING EQUIPMENT AND PLANTS

Ayrox
COMSS
Cugher Glass
Deltamax Automazione
ECOL
Eurotech Way
Glass Company
Keraglass
Rollmac division of GeMaTa
North Glass Technology
Softeco
TecnoFerrari

SCREEN PRINTING FRAMES

COMSS

SCREEN PRINTING DRYING SYSTEMS

COMSS

Cugher Glass
Glass Company
Rollmac division of GeMaTa

ACIDING GLASS EQUIPMENT AND PLANTS

Lisec Group
Rollmac division of GeMaTa

LASER DECORATING MACHINES

Ashton Industrial Sales
Glass Company

LASER MARKING

Ashton Industrial Sales

Artistic glass production

CERMAMIC INKS

Glass Company

CHAMBER ELECTRIC KILNS

Glass Company
Keraglass
Tekno Kilns

ACCESSORIES

Deltamax Automazione
Helios Quartz

CUTTERS

Si.Ste

CUTTING WHEELS

Si.Ste

MANUAL GRINDING MACHINES

Di Gregorio

UV ADHESIVES

Si.Ste

Miscellaneous

ADHESIVES FOR GLASS BONDING

Si.Ste

AUTOMATION

Ashton Industrial Sales
Horn
IOCCO Group
Torgauer Maschinenbau
Zippe

AUTOMOTIVE GLASS APPROVAL SERVICES

Ayrox
Softeco

AUTOMOTIVE GLASS QUALITY CONTROL

Ayrox

Bando Kiko
Cugher Glass
 Deltamax Automazione
Glaston Group
 IOCCO Group
 Softeco

CE MARKING - QUALITY CONTROL EQUIPMENT FOR GLASS IN BUILDING

Ayrox
 Softeco

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

Bürkle

COLOURS & ENAMELS - OTHER APPLICATIONS

Ayrox

DEIONIZING AND WATER SOFTENING EQUIPMENT

Fenzi
Forel
Glass Company
 Idrotecnica
Lisec Group
 Triulzi

DEIONIZING AND WATER SOFTENING EQUIPMENT

Immes

FLAT GLASS QUALITY CONTROL DEVICES

Ayrox
 Deltamax Automazione
Forel
 IOCCO Group
 Softeco

FURNACES

Glass Company
Horn
Texpack

FURNACES / HYDROGEN GENERATORS (WATER ELECTROLYSERS)

Nel Hydrogen

GLASS COATING AND TINTING

Bürkle
Glass Company
Rollmac division of GeMaTa

GLASS TREATMENT FILMS

Glass Company

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

Horn
Keraglass
Texpack

HINGES FOR GLASS DOORS

Si.Ste

METAL ACCESSORIES

Si.Ste

INFRARED TUBES

Helios Quartz
 Deltamax Automazione

KILNS

Glass Company
Keraglass
Lisec Group
 Tekno Kilns
 Fenzi

METALLIC SECTIONS

Fenzi

NUMERICAL CONTROL SYSTEM (CNC) FOR ALL GLASS PROCESSING MACHINES

Glass Company
 IOCCO Group
 Prodim

OPTICAL DISTORTION ANALYSERS FOR AUTOMOTIVE GLASS

IOCCO Group
Keraglass

OPTICAL INFRARED THERMOMETERS

Optris

POWDER OR LIQUID APPLICATION SYSTEMS FOR PROTECTING FLOAT GLASS

BOST
Cugher Glass
Glass Company

PUMPING AND APPLICATION SYSTEMS (AUTOMOTIVE GLASS)

IOCCO Group

PURIFIERS FOR REFLUENT WATER

Dieffe Macchine
Immes

PUTTIES AND SEALANTS

Fenzi

QUARTZ EQUIPMENT

Helios Quartz

SHAPE CHECKING DEVICES

IOCCO Group

RAW MATERIALS

BOST

SHOWER ENCLOSURES

Vismara

SIC HEATERS

Helios Quartz

SOFTWARE SYSTEMS FOR PRODUCTION CONTROL

A+W Software

CMS

Cugher Glass
 Deltamax Automazione
Edgetech Europe
Forel
Lisec Group
 Optima
 Prodim

SOLDERING EQUIPMENT FOR ELECTRICAL CONNECTORS FOR WINDSCREENS AND BACKLITES

Ayrox
 Softeco

SORTING SYSTEMS

Glaston Group
Lisec Group

SURFACE STRESS MEASUREMENT INSTRUMENT

Ayrox
Glass Company

TESTING FOR SOLDERINGS

Ayrox
 Softeco

TESTING DEVICES OF BACKLITES ELECTRICAL HEATING

Ayrox
 Softeco

THERMAL IMAGING SYSTEMS

Glass Company
Optris

TIN FLOAT BATH FURNACES

Horn
 IOCCO Group

UV LAMPS

Helios Quartz

UV PORTABLE MACHINES

Helios Quartz



**OUR PUBLICATIONS
 FOR INTERNATIONAL
 FLAT GLASS INDUSTRY**

Section for advertisers, with presentations of their machinery and accessories, and technical data sheets

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for Glass, Windows & Doors

A+W SOFTWARE GMBH

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A+W BUSINESS

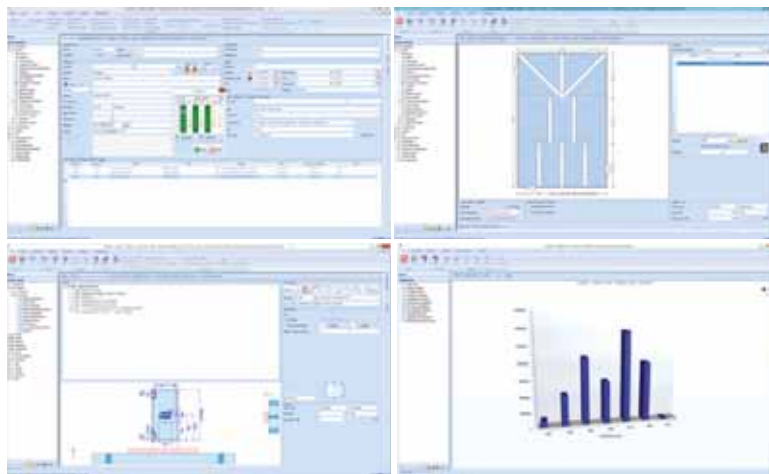
THE PERFECT SOLUTION THAT GROWS WITH YOU

A+W Business is a complete ERP system for small and medium-sized companies in the flat glass industry. The A+W commercial solution allows not just the entry of quotations, orders, credit notes, complaints, delivery notes, and the management of purchase orders and inquiries, but also control of other company areas (e.g. stock, purchasing, dispatch, etc.).

The main functions are master data management, quotation creation, order processing, the creation of partial deliveries and complaints, and all associated documents and evaluations. With its graphic interface, A+W Business is easy and quick to use, and it simplifies all company-internal processes relating to order processing.

FUNCTIONS AND BENEFITS

- Modern look & feel like MS Outlook: multi tasking, multi dialogue, easy usage, everything graphical
- Construction & processing via BOM Concept: every level and part of a product can be processed (processing = article number)
- Easy order handling: copy documents (order -> P.O.), automatic purchasing
- User and/or automated order/P.O. processing: define work flows and user rights, time and cost savings thanks to automation
- Interconnection with A+W Production: transfer of orders & P.O.'s, production status & feedback



- Full integration of CAD Designer (Shapes & Bars): easy Technical Order Entry (TOE)
- Integration of A+W standard shape & standard processing catalogue
- Simple master data replication (in the case of several subsidiaries)

A+W PRODUCTION

EVERYTHING PERFECTLY PLANNED AND OPTIMIZED

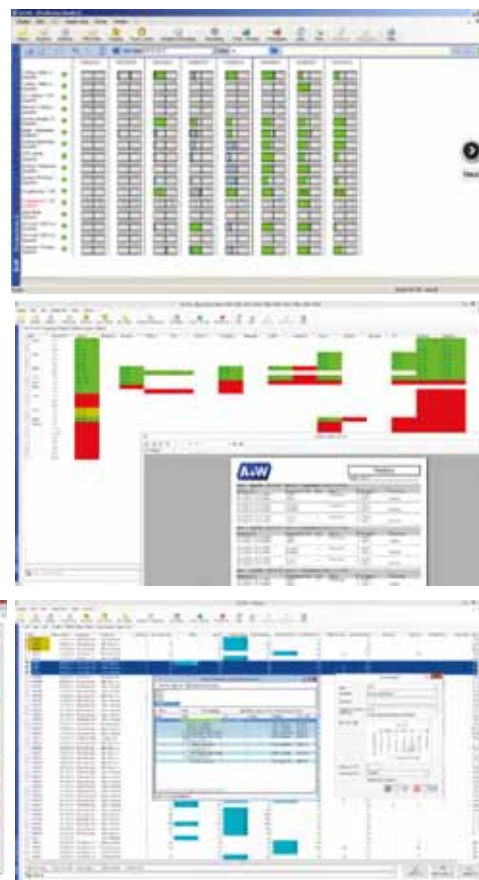
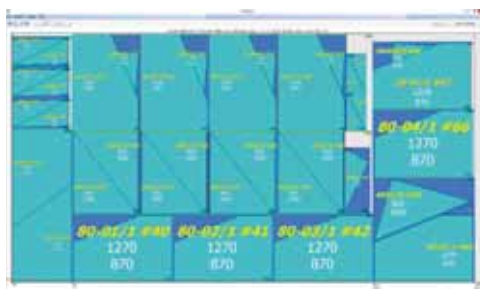
An expanded product line and state-of-the-art machines are placing ever-higher demands on organizational concepts, as well as planning and control software. These machines, which are highly complex and sensitive high-tech systems, enable high cycle rates and thus quick throughput times, but only if the overall concept is right and the production process is optimally planned and controlled. Therefore, scalable software systems and integrated solutions are the key to an optimized production environment.

A+W Production is an extremely flexible PPS solution for complete rough and detailed scheduling for insulated glass, tempered glass, and laminated glass production. The system allows planning and control of even the most demanding multi-level production flows.

The latest improvements within capacity planning and scheduling such as campaign planning, simplified rescheduling possibilities, and improved scheduling algorithms have expanded A+W Production's functions and simplified the daily business of production management and work preparation.

FUNCTIONS AND BENEFITS

- Production planning and control by means of various restrictions (machines, process sequence ...)
- Job management using predefined and self-defined views thanks to open database and views
- Yield optimization by state-of-the-art optimization kernel
- Sequence optimization, rack and stacking organization and optimization
- Optimization directly onto racks and boxes in despatch sequence (Add-On A+W Rack Optimizer)
- Cutting plan visualization and modification
- Easy machinery management and direct machine control
- Efficient and graphical Capacity Planner (Add-On)
- Full integration of barcoding and tracking (Add-On A+W Barcode Manager)
- Always up to date statistics using Crystal Reports or QLIK
- Printout of production papers, bender texts and barcode labels
- Possibility to grow with your company based on add-ons such as Capacity Planner, Barcoding, Production Terminal





A+W iQUOTE

GLASS ORDERS 24/7

A+W iQuote brings your online shop into the future. Your customers can enter and manage quotations and orders 24/7 and view quotation/order status – even when they're on the road. This not only gives you an additional sales channel, it also provides competitive advantages. It reduces the work involved in recalculating quotations and orders and making changes, for, depending on the status, your customers can make these changes themselves and also enter notes (for example, different delivery address or requested delivery date).

A+W iQuote relies on your ERP system, which means that the data comes directly and online from your database. There are no more delays due to e-mails or telephone calls only to find out that a customer inquired about a product that cannot be built. The products and prices that your customers see online are always up-to-date and you can manage them in your ERP system. A+W iQuote follows the rules of your A+W ERP system, with the same prices, feasibility and plausibility checks that you have defined there. Functions and Benefits

BROWSER-BASED PRODUCT CONFIGURATION

- Online construction and price calculation
- Data directly calculated and saved in A+W ERP
- Products, prices and discounts from your A+W ERP System
- Integrated authorization based on A+W ERP
- Paperwork done by ERP
- Interface for touch screen
- Order history
- Attractive design
- Responsive Design: made for modern and portable devices (tablets)
- Creation of orders and quotes
- Restrictions and prices from ERP for that customer (login)
- Entry of single glass, Lami and IG (including exchange of glasses and spacer), stock sizes and boxes (cases)



A+W SMART COMPANION



SCAN SMARTER WITH SMART DEVICES

Barcode scanners have established themselves as indispensable tools in the flat glass industry. From incoming goods receipt in the warehouse to status registration in production, on through to delivery confirmation; data is recorded via barcode scanning and transmitted to ERP and production systems. However, the industrial scanner as we know it is quickly becoming obsolete. Smart devices, equipped with the A+W Smart Companion app, great computer power, and outstanding algorithms for handling graphics, is taking its place. The A+W Smart Companion assists along the entire value-creation chain and contributes to its digitalization, saving time and money.

With its A+W Smart Companion app, A+W is demonstrating where software development is heading. Scanning via a smart device app is easier than with customary scanners, it offers a multitude of possibilities, and is cheaper too.

FUNCTIONS AND BENEFITS

- Scan, inform, evaluate – securely and efficiently
- Use on mobile, user-friendly devices
- No learning required – familiar hardware that everybody uses every day
- Runs with iOS and Android
- Depending on requirements, can be used on different smart devices
- Scanning of several bar codes in continuous mode
- Easier work for employees – higher productivity





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AUTOMATIC MACHINES

All Lattuada edgers can be equipped with **A-WR** and **i-AL** packages to increase machine automation to the top level.

The exclusive A-WR System introduces a completely automatic wheels setting management, which includes:

1. Automatic pre-setting "ZERO" procedure of diamond and resin wheels, without glass in less than one minute
2. Automatic recover of the polishing wheels' wear
3. Automatic positioning for the wheel's replacement
4. Jog increase/decrease of the spindle position (accuracy 0.01 mm)
5. Automatic positioning on setpoint
6. Automatic backlash recovery
7. Automatic spindle cleaning procedure
8. Wheels wear warning
9. Spindle's problems warning
10. Manual unlocking for any situation
11. Motorized adjustable inlet conveyor
12. Digital ammeters and automatic alert system for the polishing wheels wear
13. Automatic detecting and compensating procedure of the inlet conveyor belt wear

Advantages of the Lattuada A-WR system:

- Wheels setting in less than 1 minute, instead of an average 20/30 minutes manual setting.
- Homogeneous wheels setting regardless of the work shift and the operator on the machine.
- Extremely simple to use, no sample glass needed.



- Homogeneous wheels wear and consistent processing quality.
- Increased spindles cleaning thanks to the automatic cleaning function.
- Reduced exit conveyor belt wear or damaging due to an incorrect wheels "zero" setting.
- Early warning on potential maintenance issues.

i-AL is a comprehensive pack of mechanical, electronic and software systems especially designed to deliver the maximum possible automation in glass processing and a full integration with your entire production system.

i-AL pack includes:

1. Digital ammeters displayed on the touch-screen panel
2. Motorized glass removal setting with portable push-button panel

3. Automatic management of wheels pressure, glass removal and speed according to the thickness
4. Proportional valves for pressure regulation of the polishing spindles
5. Glass length measurement
6. Remote assistance

The main advantages of i-AL are:

- Reduced machine set-up time
- Constant quality and productivity throughout the shift or day, regardless of different operator's skills.
- Early warning on potential maintenance stops.
- Remote management
- More quality, more productivity, less maintenance, less errors... more marginality.



TLR 13 AVC

Electronic straight-line edging machine for the processing of flat edges with arris, and with variable angle from 0 up to 45°, polished by liquid cerium oxide.

Read-outs placed on the control panel enable to set adjustments such as glass thickness, working speed, mitre inclination and edge thickness. A centralized lubrication system avoids wheel wear and tear. The conveyor is composed of pads, made of a special material, which are mounted on precision chains. Mechanic glass clamping system. Automatic polishing wheel intervention thanks to PLC-control. Automatic adjustment of the arris wheels when the glass thickness changes. Adjustable inlet conveyor with which glass removal can be adjusted up to 5 mm.

VERTICAL EDGE POLISHERS (petrA SERIES)

petrA by Adelio Lattuada: a line of vertical edge polishers dedicated to the processing of stone, ceramic and composite materials.

Thanks to decades of experience in the processing of these types of materials, the petrA series of machines can perform high precision and quality processing in an extremely simple way: flat edges, mitres up to 45° or 60°, grooves for drips or other uses and alternate arrises for perfect coupling of two angled slabs. All these processes can also be performed on very small strips or pieces.

Available in standard versions from 9 to 13 spindles, with many options and accessories available (including innovative automation solutions and robotic integrations) and with the possibility of including customized features according to customer needs.

petrA machines are strong, reliable and easy to use, designed to work continuously for many hours a day in continuous cycles. Maintenance is extremely simple and economical, with immediate and customized assistance.



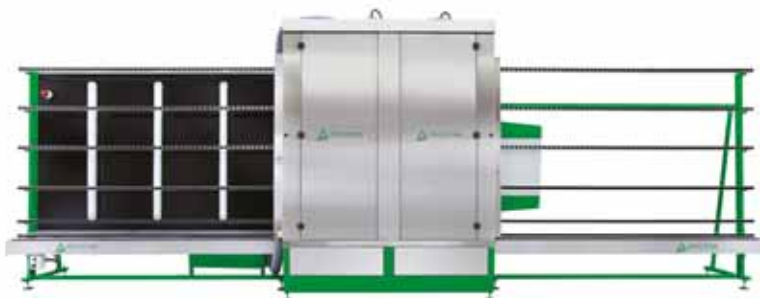
www.adeliolattuada.com

ADELIO LATTUADA

OT 1600/500/4S

Open top vertical washing and drying machine for glass with a thickness from 3 up to 25 mm and with minimum dimensions of 350 mm.

The body of the machine and all parts in contact with water are made of stainless steel while an anti-corrosion covering is granted by epoxy and polyurethane paints. The machine is equipped with four brushes which are also available in the special version for low-E coated glass. Hot water can also be required. Drying is carried out by a pair of blowers powered by a high-pressure soundproof ventilator. The inlet and outlet conveyors, as well as glass thickness adjustment, are motorized, thus guaranteeing improved washing quality on every thickness. A black panel with inspection lamps can be applied on the outlet conveyor.



LATTUADA ROBOTIC SOLUTIONS

Adelio Lattuada, together with its strategic partner Knittel Glass, is offering robotic solutions for any type of need and application.

Increased automation levels, higher flexibility, big increase of the productivity, production optimization, costs reduction and increased safety are only few of the main characteristics.

Any kind of robotic application related to the glass industry can be evaluated (CNCs, double-edgers, cutting, tempering or IG lines, etc.).

Regarding the pre-processing area, many different solutions and configurations can be offered: from the most sold solution with 2 edgers and 1 robot to fully automated cells with 2 machines and 2 or 3 robots. Also other configurations can be offered like 1 machine and 1 robot or 4 machines and 3 robots, for example.

Lattuada vertical washers as well as other new or already existing (Lattuada or third party) machines can be added to the lines.

Lattuada Robotic Solution is part of Lattuada's cyberAL project, which includes also A-WR and i-AL packages to increase machines automation to the top level.



The advantages of this solution are many, some examples:

- The quickest solution available on the market, a couple of real examples
 - 44 pieces/hour (1000 x 2000 mm)
 - 375 m/hour (1000 x 2000 mm) including dubbed corners
 - Up to 5 m/min
- The most sold and installed (more than 150 projects already installed by Knittel Glass)
- The widest experience in this field (since 2000 Knittel supplies robotic application in the glass industry)
- Easy use and reduced maintenance. What happens if the line stops? Our lines can, in most of the situations, continue from the point they have been stopped or resume and empty the line automatically
- Integration with third party software and many different ways to receive or read glass dimensions to be processed

TLR 10 C DD

Electronic straight-line edging machine for the processing of flat edges with arris, polished by liquid cerium wheels. The machine is also equipped with a dubbing device.

Read-outs placed on the control panel enable to set adjustments such as working speed and glass thickness. Mechanic glass clamping system. A centralized lubrication system avoids wheel wear and tear. The conveyor is composed of pads, made of a special material, which are mounted on precision chains.

Automatic adjustment of the arris wheels when the glass thickness changes. The wheels are fitted on spindles to which the movement is transmitted via toothed belts linked to the motors. Automatic polishing wheel intervention thanks to PLC-control. Adjustable inlet conveyor with which glass removal can be adjusted up to 5 mm.



www.adeliolattuada.com

ADELIO LATTUADA

AL 10 M

Electronic straight-line edging machine for the processing of flat edges with arris, polished by cerium wheel. Read-outs placed on the control panel enable to set adjustments such as working speed and glass thickness. Mechanic glass clamping system. A centralized lubrication system avoids wheel wear and tear. The conveyor is composed of pads, made of a special material, which are mounted on precision chains. Automatic adjustment of the arris wheels when the glass thickness changes. The wheels are fitted on spindles to which the movement is transmitted via toothed belts linked to the motors. Automatic polishing wheel intervention thanks to PLC-control. Adjustable inlet conveyor with which glass removal can be adjusted up to 3 mm.



CTS 3300/1000/6S

Closed-top vertical washing and drying machine for glass with thicknesses from 3 up to 80 mm and minimum dimensions of 400 mm.

The body of the machine and all parts in contact with water are made of stainless steel, while an anti-corrosion covering is granted by epoxy and polyurethane paints. The machine is equipped with six brushes, which are also available in the special version for low-E coated glass. Hot water can also be required. Drying is carried out by a pair of blowers powered by a high-pressure soundproof ventilator. The inlet and outlet conveyors, as well as glass thickness adjustment, are motorized, thus guaranteeing improved washing quality on every thickness. A black panel with inspection lamps can be applied on the outlet conveyor.



GAMMA 614

Straight-line bevelling machine for the processing of bevels polished by liquid cerium oxide.

Available both with electronic systems and PC.

This machine, conceived in order to satisfy the medium production levels, is equipped with all the devices that are necessary to simplify its use and maintenance. Read outs placed on the control panel enable to set adjustments such as glass thickness, bevel inclination and edge thickness in order to process the desired bevel. The wheels are fitted on spindles in order to allow rotation homogeneity and to avoid vibrations; movement is transmitted thanks to toothed belts linked to the motors. The mechanical seal, an essential element of the spindle, is obtained thanks to the application of diaphragms. The conveyor is composed of pads, made of special material, which are mounted on precision chains. One of the peculiarities of the GAMMA 614 is that it is the first machine with four felts, positioning it at the top as far as working quality and speed are concerned.





ADI SRL

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ADI is one of the very few companies in the world with all sintering technologies in house. ADI is in fact able to manufacture metal bond, resin bond, vitrified and plated bonds. In the last years an increasing number of patents has been registered worldwide. In particular, related to the glass industry, ADI was the very first to propose:

- the **ONE SHOT** concept of wheel in the automotive industry to the market. This kind of wheel has been engineered to be a throwaway tool (the real life allows anyway one reprofiling) and avoids customers of the automotive industry investing time in reprofiling processes. In addition, continuous research is being carried out to achieve better performance in terms of life, start-up and working speed for high productivity machines;
- the **UHS® BOND** is just one of the multiple achievements. Initially used in the Automotive industry, this bond is now used in the routers and in the CNC wheels, to grant high feeding speed and long profile retention. The new segmented cup wheel for single and double edgers enables to process different kind of glass with excellent results with the same wheel, with the important advantage of not being obliged to change tool every time the glass thickness changes.

ADI is extremely proud to offer products that are **100% Made in Italy**.

Many Companies have tried to reduce the production costs by selling imported products or by setting production plants in Countries with lower labour and healthcare costs. ADI reduces the customer's **Total Cost of Ownership** with products innovation.

Since Dec. 2016 ADI is part of the **Surfaces Group**. This larger structure is providing synergetic growth thanks to the multiple technologies available and the stronger sales network.





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SPEED ARRIS FOR INSULATED AND TEMPERED GLASS

Arrissing or rough grinding in continuous cycle by two spindles follow-system.

Equipped with transport system with suction-cups for high performance glass types.

Automatic survey of glass sizes and thickness.

High-productivity guaranteed for double-glazing and tempering lines.

System with oscillating spindles which ensures the regular execution of threads.

Possibility of stand-alone installation or integrated with existing lines.



Mod.	Min glass size mm.	Max. Glass size mm.	Arris glass thickness mm.	Rough grinding glass thickness mm.	Spindle	Kw	Process
VAS 2.0.3	380 x 500	2000 x 3200	4 ÷ 19	4 ÷ 12	2	2.5	Arrising/ Rough grinding
VAS 2.6.4	380 x 500	2600 x 4000	4 ÷ 19	4 ÷ 12	2	2.5	Arrising/ Rough grinding
VAS 2.8.5	380 x 500	2800 x 5000	4 ÷ 19	4 ÷ 12	2	2.5	Arrising/ Rough Grinding
VAS 3.2.6	380 x 500	2800 x 5000	4 ÷ 19	4 ÷ 12	2	2.5	Arrising/ Rough Grinding

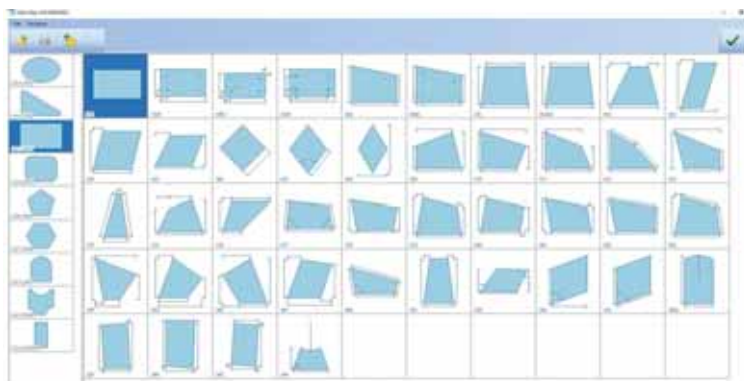
OPTIONAL: Z AXIS DOUBLE TOOL

Flexible automatic system with tool holder cone which houses up to two wheels allowing to work float or laminated glass with different thicknesses.



OPTIONAL: SOFTWARE FOR SHAPED GLASS

Optiway (Optima) software it's a CAM program provided with functions for the two-dimensional drawing and with a 3D graphic simulator of the working process allowing generation of arrising/rough grinding cycles.



STANDARD SHAPED

OPTIONAL: PRE-WASHING

Stainless steel pre-washing device by pressure sprayed clean water washes the front and rear faces of the glass sheet, eliminating the glass powder produced during the processing.



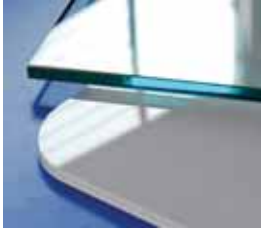
TURBO OUTLET CONVEYOR WITH DOUBLE MOTORIZATION

Turbo outlet conveyor is divided in two section allows an accelerated transport speed in the second section for a quick evacuation of the glass.



SPEED EDGE

High-production vertical grinding machine for rough or polished grinding, round or flat edges, low-E glass with the possibility of performing shaped glasses with a straight horizontal support side and a maximum vertical angle of 90°.



The innovative suction cup system guarantees the locking of the entire sheet to be machined, allowing higher processing of squaring and respect of the size of the glass being machined.

Processing of big glass sheets in a limited space thanks to the compact system that integrates the loading and unloading in a single solution.

Ideal for series and to be combined with drilling lines or as stand-alone machines.



Mod.	Min glass size mm.	Max. Glass size mm.	Glass thickness mm.	Max. Tool ø	Spindle	Kw	Rapid tool holder	Process
VAS 2.0.3	420x500	2000x3200	3 ÷ 21	1 ÷ 50	1	7.5	ISO 40	Arrissing - Rough grinding - Polishing
VAS 2.5.4	420x500	2600x4000	3 ÷ 21	1 ÷ 50	1	7.5	ISO 40	Arrissing - Rough grinding - Polishing
VAS 3.2.5	420x500	3200x5000	3 ÷ 19	1 ÷ 50	1	7.5	ISO 40	Arrissing - Rough grinding - Polishing
VAS 3.2.6	420x500	3200x6000	3 ÷ 19	1 ÷ 50	1	7.5	ISO 40	Arrissing - Rough grinding - Polishing

OPTIONAL: SOFTWARE FOR SHAPED GLASS

Optiway (Optima) software it's a CAM program provided with functions for the two-dimensional drawing and with a 3D graphic simulator of the working process allowing generation of arrissing/rough grinding cycle.



OPTIONAL: PRE-WASHING

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BOTTERO Spa

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CNC PRATICA PLUS

PRACTICALLY PERFECT IN EVERY SITUATION

Bottero machining centres are extremely powerful and flexible machines that can perform many processing operations with precision and reliability, such as profiling, drilling, edge finishing, cutting and much more. The ease and intuitiveness of the software are a great strong point for these machines that can be used in any high-tech glass factory. Bottero machining centres can operate both on glass and on stone, making their use even more flexible.

After the success of the first version, the Bottero Pratica CNC workcentres have evolved with the new PLUS version.

Both 3- and 4-axes versions are equipped with the new high performance pressurised spindle.

THE STANDARD VERSION OF THE MACHINE IS ABLE TO PERFORM THE FOLLOWING OPERATIONS ON GLASS SHEETS:

- Milling on the sheet with a rectilinear and/or curvilinear path.
- Edging and radial polishing on a straight and/or curved path on the edge of the sheet.
- Drilling and/or countersinking perpendicular to the surface of the sheet.
- Writing and drawing on the top side of the sheet.

BY USING OPTIONAL EQUIPMENT, THE POSSIBILITIES ARE EXPANDED TO:

- Cutting with a straight diamond disc.
- Cutting with a straight diamond disc angled at 45°.
- Writing and drawing on the side surface of the sheet.
- Straight and/or curved bevelling on the top side of the sheet.
- Straight and/or curved engraving on the top side of the sheet.
- Straight and/or curved cup grinding on the side surface of the sheet.
- Drilling on the underside of the sheet.



Electro spindle		2500	3300	4000
Maximum rotation speed	rpm	10.000	10.000	10.000
Power in continuous service (S1)	Kw	9,2	9,2	9,2
Torque in continuous service (S1)	Nm	30,3 up to 3.000 rpm	30,3 up to 3.000 rpm	30,3 up to 3.000 rpm
Power in intermittent service (S6)	Kw	11,04	11,04	11,04
Torque in intermittent service (S6)	Nm	36,4 up to 3.000 rpm	36,4 up to 3.000 rpm	36,4 up to 3.000 rpm

Tools magazines		2500	3300	4000
Magazine type	-	fixed	fixed	mobile
Without C axis	pos.	10 + 10	13 + 13	18 + 18
With C axis	pos.	max. 8 + 8	max. 11 + 11	max. 15 + 15
Maximum tool diameter	mm	150	150	150

Weight		2500	3300	4000
Weight		3.990 Kg	4.180 Kg	4.800 Kg

Maximum glass processing *		2500	3300	4000
Standard configuration **	mm	2545 x 1620	3300 x 1620	4300 x 2320

* With 100 mm tool diameter

** Standard configuration for 3300 = left fixed tools storage / 3 axis

Standard configuration for 4000 = left mobile tools storage / 3 axis. For all the other configurations check the technical specifications



DOUBLE EDGERS FLAT EDGE

THE IDEAL CHOICE FOR INTENSIVE APPLICATIONS

Bottero produces a complete range of solutions for flat edge bilateral grinding, which can satisfy the requirements of small-, medium- and large glass factories with fixed or flexible production, thanks to the vast possibilities of choice and configuration of the products.

Bottero machines are ideal for processing structural glass, partition walls, shower cubicles, shelves, balustrades, steps and furnishing elements, providing productivity, precision and reliability over time to operate on multiple shifts, up to 24/7 service.

The Bottero flat edge bilateral machines are designed to support the high production flows typically required by the industry. Thanks to the significant flexibility, however, these machines are effective and profitable even when applied in small- and medium glass factories with flexible production.

TwinEdge

The four configurations that make up the Twin-Edge range enable the processing of flat edges, threads and possible edge-removal.

Twin Edge	220 N	222 D	222 L	224 N
Minimum glass dim	160 x 160 mm	160 x 160 mm	160 x 160 mm	160 x 160 mm
Glass thickness	3 ÷ 30 mm	3 ÷ 30 mm	3 ÷ 30 mm	3 ÷ 30 mm
Speed	0,6 ÷ 6 m/min (1 ÷ 10 m/min opt.)	0,6 ÷ 6 m/min (1 ÷ 10 m/min opt.)	0,6 ÷ 6 m/min (1 ÷ 10 m/min opt.)	0,6 ÷ 6 m/min (1 ÷ 10 m/min opt.)
Installed power	55 KVA (45 KW)	61 KVA (45 KW)	61 KVA (45 KW)	66 KVA (45 KW)
Weight	6090 Kg	6170 Kg	6170 Kg	6250 Kg

Minimum glass dim*	115 x 115 mm
Glass thickness	3 ÷ 40 mm
Speed	up to 12 m/min
Max glass weight	1000 Kg
Worktable height	970 ± 50 mm
Max opening speed	30 m/min

* the minimum glass dimension can change depending on options included

Flex Edge

Flex Edge bilateral edging machine can be configured with 10, 12, 14,15 or 17 grinding wheels. The machine is particularly suited to process large sizes and thickness and the double edger platform can be integrated with totally automatic lines for flexible production, in small or large batches, with automatic dimension changeover managed by dedicated software.

TECHNOLOGY AT THE SERVICE OF THE INDUSTRY

Bottero pencil-edge bilateral machines are the ideal machines for processing at high production rates, typical of the household appliance, automotive, industrial refrigeration, TV screen and solar panel production sectors. In these contexts, where the demand for productivity is accompanied by the need for reliability and automation, the solutions offered by Bottero have been chosen by some of the largest industrial groups in the world for the implementation of plants that can treat thousands of square metres of product per day.

Bottero's pencil-edge bilateral machines contribute to the treatment of glass elements used in numerous industrial manufacturing products.

The Bottero range of double edgers for pencil edge machining has been designed to guarantee high precision and to minimise maintenance.

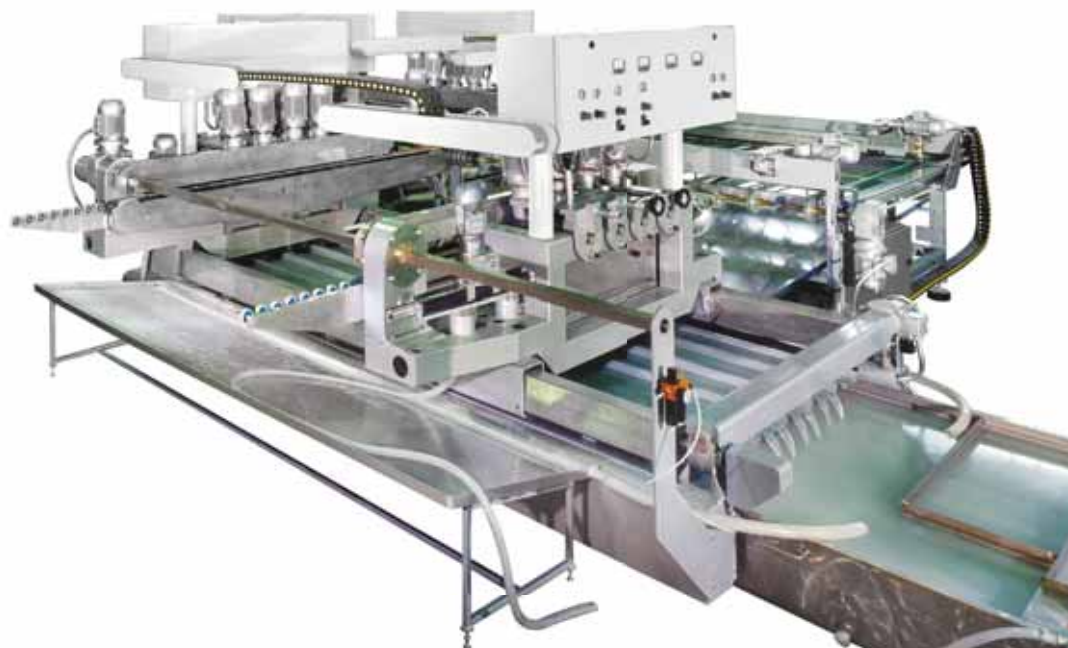
Gemini

The Gemini double edger is a safe and reliable machine, designed to guarantee high precision and limit maintenance as much as possible.

DOUBLE EDGERS PENCIL EDGE

Gemini	306 N	306 HP	308 N	308 HP
Minimum glass dim	80 x 80 mm	80 x 80 mm	80 x 80 mm	80 x 80 mm
Glass thickness	2 ÷ 12 mm	2 ÷ 12 mm	2 ÷ 12 mm	2 ÷ 12 mm
Speed	1 ÷ 12 m/min	2 ÷ 20 m/min	1 ÷ 12 m/min	2 ÷ 20 m/min
Installed power	24,5 KVA (19,2 KW)	47,5 KVA (38KW)	28 KVA (22,4KW)	47,5 KVA (38KW)
Weight	2420 Kg*	2420 Kg*	2500 Kg*	2500 Kg*
Worktable height	900 ± 50 mm	900 ± 50 mm	900 ± 50 mm	900 ± 50 mm

*Max glass 1600 mm



FLEX LAMILINES

FLEX LAMILINES - PRODUCTIVITY AND FLEXIBILITY AT THE HIGHEST LEVELS

Bottero's Flex lines offer high performance and great flexibility, thanks to the possibility of laminating jumbo sheets with particularly short production cycles that laminate already shaped glass of up to 10 layers. Bottero technology, chosen by the world's largest laminated glass producers, is now available to all state-of-the-art glassworks thanks to the Flex lines. Laminated glass finds new and ever more interesting applications every day, offering architects and designers unique and expressive opportunities. Bottero is committed to supporting the development and diffusion of this material, constantly researching and developing technologies to improve its processing, thus widening its horizons of use.

Bottero experience

Since its first line in 1989, Bottero has always been partner of companies worldwide for laminated glass production.

In 25 years, Bottero has reached and maintained an undisputed technological leadership in laminated glass processing, serving all multinational companies and developing top-performance devices for maximum productivity and the highest quality.

Today, all this know-how is also available in custom-sized production at an affordable price.

- 25 years of experience
- 52 lines worldwide
- Complete process know-how

Bottero flex Lamilines are the most advanced custom-sized laminated assembly systems in the market today. The nip rolls and furnaces, which are provided as standard, are the same ones up and running all over the world by the most important glass manufacturers.

The IR furnace and the patented mechanical press system on the nip rolls are just two of the several patents and innovations which guarantee the best final result in lamination.

Bottero produces laminated glass lines both for stock sheets, high capacity production, as well as for the custom market of cut-to-size laminated glass. These lines are capable of easily manufacturing different product types irrespective of dimensions, shape and make-up. This key factor is achieved



by implementing a strategy focusing on quality, reliability and total flexibility of the manufacturing plant.

Unique features

Flex Lamiline is equipped with the most advanced solutions for the pre-lamination process, such as the nip roller with anti-torsion system and forced air convection furnaces. Moreover, it can easily be adapted according to customers' needs with optional equipment and accessories such as automatic loaders, additional PVB rolls, automatic PVB foil application, cutting and trimming... Bottero is capable of providing complete turnkey packages, including autoclaves, climatic rooms and all accessories required.

Technical features

Bottero Flex Lamiline is a modular system which is completely configurable, according to each customer needs from small to large glass sheets.

Most options and upgrades can also be added later with a simple and effective intervention.

	Metric	Imperial
Glass sizes (min)	350 x 180 mm	14" x 7"
Glass thickness	3 - 19 mm	8/64" - 48/64"
Type of glass allowed	Float Low-e Tempered Coated	
Glass thickness output (max)	100 mm	4"
Glass weight output (max)	1350 kg	2980 lb
Interlayers thickness	0,38 mm 0,76 mm 1,14 mm 1,52 mm	1/64" 2/64" 3/64" 4/64"
Type of interlayers allowed	Interleaved PVB EVA SentryGlass Plus	

FLOAT CUTTING BKM

BKM, THE ART OF CUTTING GLASS

Designed for glassmakers who want to evolve their business by adopting automated and flexible cutting systems, BKM tables offer all the quality and ease of use typical of Bottero products.

Thanks to the shared single development platform, common to all cutting systems, BKM tables use technological solutions and components that are also adopted on top of the range Bottero systems, thereby ensuring uncompromising performance and reliability.

BKM cutting systems can perform linear cuts and shapes on sheets with a thickness of up to 19 mm, thereby offering the possibility of carrying out small and medium production runs in series, as well as special pieces.

Working speed	
Maximum bridge speed	150 m/min
Maximum carriage speed	150 m/min
Maximum grinding speed with Easy deletion	80 m/min

Accuracy	
Cutting accuracy on straight processes	± 0,15 mm

Thicknesses which can be cut	
Glass thickness	2 ÷ 19 mm

Work table	
Worktable height	930 ± 40 mm



BKM cutting systems are available both in stand-alone versions, for loading, cutting and breakout of material on the table, as well as in fixed structure version for high productivity in-line integration. All models can be equipped with a wide range of accessories. Each constructive and functional feature of the BKM range is designed to ensure extreme processing precision and maximum productivity, at the service of each specific production requirement.

Performance

A complete, modular and versatile range, fully configurable according to each specific production requirement.

Bottero tables guarantee top performances at 360°: cycle execution speed, accuracy and reliability over time.



FLOAT CUTTING BCS

BCS: THE HIGHEST PRODUCTIVITY AND QUALITY STANDARDS IN THE INDUSTRY

BCS cutting tables are designed to withstand the high workloads typically adopted during single- or even multiple-shift production of windows or panels in the furniture sector, as well as components for household appliances, in the automotive industry and in many other areas. BCS cutting tables are among the most popular and sought-after in the world, representing a major benchmark in terms of production capacity and reliability in today's market.

The BCS range stands out due to its modularity and versatility, thanks to which the float cutting tables can be configured completely according to specific customer requirements: from stand-alone cutting tables intended for small production runs, up to intensive high automation level production systems, fully integrated with low-E grinding devices and marking, as well

as loading and breakout modules. With the aim of meeting all production needs, the BS cutting tables also enable the fitting of the cutting carriage with one of the numerous accessories available. Each constructive and functional feature of the BCS range is designed to ensure extreme processing precision and maximum productivity, at the service of each specific production requirement.

Performance

A complete, modular and versatile range, fully configurable according to each specific production requirement. Bottero tables guarantee top performance at 360°: cycle execution speed, accuracy and reliability over time.

Working speed	
Maximum bridge speed	140 m/ min
Maximum carriage speed (*)	200 m/ min
Maximum grinding speed with Easy deletion	80 m/ min
Maximum grinding speed with LMT	160 m/ min

(*) the maximum carriage speed is 160 m/min in the presence of LMT, PPL or LAM Shape set-ups.

Thicknesses which can be cut	
Standard thicknesses	2 ÷ 19 mm
Optional thickness	19 ÷ 25 mm

Accuracy	
Cutting accuracy on straight processes	± 0.15

Work table	
Worktable height	930 ± 40 mm

FLOAT CUTTING EVO

EVO, THE PLATFORM THAT GOES BEYOND CUTTING

The EVO cutting platform is the top of the range of Bottero cutting systems, offering exclusive performance and flexibility. Thanks to the option of equipping the machines with two additional tools besides the cutting tool, EVO systems can, in addition to low-E glass grinding, also be equipped with laser cutting or labelling of the processed pieces. This option makes EVO systems ideal to form part of automated and controlled production flows, typical in high-tech glass factories and indicated in "Industry 4.0" regulations.

The EVO range stands out due to its modularity and versatility, thanks to which the float cutting tables can be configured totally according to specific customer requirements: from stand-alone cutting tables intended for small production runs, up to intensive high automation level production systems, fully integrated with low-E grinding devices and marking, as well as loading and breakout modules.

Each constructive and functional feature of the EVO range is designed to ensure extreme processing precision and maximum productivity, at the service of each and every specific production requirement.

Working speed	
Maximum bridge speed during cutting	160 m/min
Maximum carriage speed during cutting	200 m/min
Maximum carriage speed during cutting	200 m/min*
Maximum carriage speed with 2 tools (Cut + PPL)	200 m/min
Maximum carriage speed with 2 tools (Cut + Laser)	160 m/min
Maximum cutting bridge speed with 2 tools	160 m/min*
Maximum cutting bridge speed with 3 tools	160 m/ min*

(*)100 m/min with TPF

Thicknesses which can be cut	
Standard thicknesses	2 ÷ 19 mm
Optional thickness	2 ÷ 25 mm

Accuracy	
Cutting accuracy on straight processes	± 0,15 mm

Work table	
Worktable height	930 ± 20 mm



Performance

A complete, modular and versatile range, fully configurable according to each specific production requirement.

Bottero tables guarantee top performance in terms of cycle execution speed, accuracy and reliability over time.

LAMINATED CUTTING MACHINE

THE VALUE OF A UNIQUE EXPERIENCE

Bottero was among the first companies in the industry to believe in the potential of laminated glass, and started developing automatic cutting machines as early as the 1970s. For over 25 years, Bottero has been, and still is, the only company in the world with the know-how and organisation required to manufacture both machines and lines for the production of laminated glass, and can therefore provide its customers with a unique experience, which turns into excellent processing results and extremely reliable solutions.

Bottero's range of applications of laminated glass is becoming more and more interesting and diverse, thus offering architects and designers unprecedented expressive opportunities. Bottero is committed to promoting the development and popularity of this material by constantly researching and developing new technological solutions able to improve processing opportunities and thus increase its possible range of applications.

All manufacturing and running features of the laminated glass series have been designed

in order to grant top level accuracy in glass processing and the highest production level aimed at meeting any production need.

Dual Line

Combined lines for cutting laminated and float glass.

Semi-Auto

520 LAMe + 353 BCS

The 520 LAMe cuts and breaks trims with a minimum width of 20 mm. In addition to scoring the float glass, the BCS cutting bridge can be used to label, cut the laminated glass to shape, remove low-E on all types of sheets based on the chosen set-up (see specific BCS catalogue) and, when combining the two machines, can assist the 520 LAMe during sheet positioning, thanks to a specific suction cup system.

Fully-Auto

548 LAM + 363 BCS/EVO

The 548 LAM can be combined with a belt loading table. Breakout and detachment of 20 mm trims and automatic positioning for diagonal cuts ensure fully automatic, high production levels. If combined with the float glass



	511 LAM-S	515 LAMe	520 LAMe	548 LAM
Cutting speed	65 m/min	100 m/min	100 m/min	140m/min
Grinding speed with Easy deletion	N/A	N/A	up to 80 m/min*	N/A
Grinding speed con opt. Low-E	N/A	N/A	N/A	140m/min
Max cut	3700 mm	3700 4600 mm	3700 4600 mm	3800 4950 mm 6100mm
Min cut	250 mm	250 mm	250 mm	150 mm
Min thickness	2.2.0,38 PVB mm	2.2.0,38 PVB mm	2.2.0,38 PVB mm	2.2.0,38 PVB mm
Max thickness	8.8.4,56 PVB mm	8.8.4,56 PVB mm	8.8.4,56 PVB mm	8.8.4,56 PVB mm
Opt. thickness	N/A	N/A	10.10.2,28 PVB mm	12.12.2,28 PVB mm
Max squaring length	3210 mm	3210 mm	3210 mm	6100 mm**
Max weight loadable on arms	450 Kg	450 Kg	450 Kg	700 Kg
Tolerance	+/- 0,5 mm	+/- 0,5 mm	+/- 0,5 mm	+/- 0,5 mm
Height of working table	930 +/- 20 mm	930 +/- 20 mm	930 +/- 20 mm	930 +/- 20 mm

(*) Depending on type of glass and quality requirements.(**) With optional unloading table.

cutting table, the bridge can also be used to label, cut the laminated glass to shape, remove low-E on all types of sheets based on the chosen set-up (see specific BCS/EVO catalogues).

Performance

Bottero tables provide 360° top level performance in all areas: cycle time speed, accuracy and reliability in the long term.

GLASS STOCK MANAGEMENT SYSTEMS

THE SOLUTION TO ALL REQUIREMENTS

Bottero solutions for material storage and handling are the answer to the requirements of all glass factories that want to make the connection between material storage areas and production lines more efficient and rapid. Bottero systems make warehouses compact and optimised, and speed up the connection between the storage area and processing lines, while offering the possibility of quickly managing sheets that differ in material, format and thickness.

Automation or optimisation of the warehouse management system is an important development element for any glass factory.

The widest range of products for any production and storage management requirement with any automation level. Whether you have large or small spaces, whether you process numerous types of glass in variable formats, or whether you produce a single product, Bottero can provide the machine or combination of machines that is suitable to improve work flows.



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605 Movable racks

An extremely cost-effective and flexible solution for compact automated glass storage. The comprehensive range of racks keeps floor space requirements to a minimum.

636 Rack system

Reliable and practical stand-alone, or automated overhead loader integrated warehouse systems. Every rack system is made up of one fixed rack and one motorized rack, whereas the following are movable racks.

620|630|640 Loaders

These machines are recognized worldwide for their high degree of flexibility, reliability and ease of use. They can handle glass from 2 up to 25 mm with a Glass rack depth of 1200 mm. Unique system for pneumatically assisted glass detachment, with mechanically actuated arm movements.

621|631 Loaders

These loaders are suitable for standard line configuration to handle glass sheets from 3 up to 19 mm with a Glass rack depth of 1000 mm.

650 Shuttle system

Ideal system for the management and storage of different types of glass and for buildings with restricted height not suitable to accommodate overhead type loaders. The ultimate solution to manage an unlimited number of racks feeding an unlimited number of cutting lines.

695 Gantry system

A unique telescopic frame system allows to organize a very flexible storage area with a combination of jumbo and regular sized glass positions: in particular it



is possible to load only one regular glass size, when needed, from racks with two rows of regular sheets placed at the side. This system provides the most versatile solution for warehouse management and is designed to load glass sheets from any rack with any pack depth.

680 Management system

Simple vertical type storage system to manage remnant sheets efficiently and minimize waste.

It can handle glass sheets with minimum dimensions of 1500 x 2000 mm and maximum dimensions of 6100 x 3300 mm with maximum weight of 1000 kg.

STRAIGHT LINE EDGING & BEVELLING

UNCOMPROMISED QUALITY

Bottero's vertical edge grinding and bevelling machines allow the highest quality results to be achieved when processing edges, thereby guaranteeing perfect finish in the most elegant applications, in which quality is considered an essential element.

Bottero's vertical edge grinding and bevelling machines offer great expressive possibilities and are well suited to produce sophisticated furnishing elements.

These vertical edgers and bevelling machines are designed to ensure maximum production and maximum reliability. The availability of numerous machine set-up configurations allows to choose the right product for both simple and extremely advanced processing operations.

Victralux

Victralux is Bottero's range of Straight Line Edgers. The five models available within this range of machines enables to process edges with arrisses, as well as the possible dubbing system.



Victralux	108 FX	108 FX-HP	110 FX	110 FX-HP	111 FX	111 FX-HP	109 CDX	109 CDX-HP	112 FX	112 FX
Minimum glass dim	40 x 40 mm	100 x 100 mm	40 x 40 mm	100 x 100 mm	40 x 40 mm	100 x 100 mm	40 x 40 mm	100 x 100 mm	40 x 40 mm	100 x 100 mm
Glass thickness	3 ÷ 30 mm	3 ÷ 30 mm	3 ÷ 50 mm	3 ÷ 50 mm	3 ÷ 50 mm	3 ÷ 50 mm	3 ÷ 30 mm	3 ÷ 30 mm	3 ÷ 30 mm	3 ÷ 30 mm
Speed	0,6 ÷ 6 m/min	0,6 ÷ 6 m/min	0,6 ÷ 6 m/min	0,6 ÷ 6 m/min	0,6 ÷ 6 m/min	0,6 ÷ 6 m/min	0,6 ÷ 6 m/min	0,6 ÷ 6 m/min	0,6 ÷ 6 m/min	0,6 ÷ 6 m/min
Installed power	23,5 KVA	23,5 KVA	27 KVA	27 KVA	27 KVA	27 KVA	23,5 KVA	23,5 KVA	29 KVA	29 KVA
Weight	3200 Kg	3200 Kg	3600 Kg	3600 Kg	3600 Kg	3600 Kg	3200 Kg	3200 Kg	3600 Kg	3600 Kg

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BOTTERO

Variant

Variant is Bottero's range of variable angle Straight Line Edgers.

The eight models available within this range of machines allows to process the flat edges of an angle up to 45° as well as to remove arrisses.

Variant	810 BC-BR	810 BCS-BRS	810 CD	810 CDS	814 BC-BR	814 BCS-BRS	815 BC-BR	815 BCS-BRS
Minimum glass dim	100 x 100 mm	40 x 40 mm	100 x 100 mm	40 x 40 mm	100 x 100 mm	40 x 40 mm	100 x 100 mm	40 x 40 mm
Glass thickness	3 ÷ 55 mm	3 ÷ 55 mm	3 ÷ 55 mm	3 ÷ 55 mm	3 ÷ 55 mm	3 ÷ 55 mm	3 ÷ 55 mm	3 ÷ 55 mm
Speed	0,4 ÷ 6 m/min	0,4 ÷ 6 m/min	0,4 ÷ 6 m/min	0,4 ÷ 6 m/min	0,4 ÷ 6 m/min	0,4 ÷ 6 m/min	0,4 ÷ 6 m/min	0,4 ÷ 6 m/min
Processing angle	0 ÷ 45°	0 ÷ 45°	0 ÷ 45°	0 ÷ 45°	0 ÷ 45°	0 ÷ 45°	0 ÷ 45°	0 ÷ 45°
Installed power	27 KVA	27 KVA	27 KVA	27 KVA	36 KVA	36 KVA	38 KVA	38 KVA
Weight	4600 Kg	4600 Kg	5200 Kg	5200 Kg	5200 Kg	5200 Kg	5400 Kg	5400 Kg

Vision

The five models available within this range, produce bevels on the front face of the glass and either simple pencil edge profiles on the edge of the glass, or with the 913T, full flat edges and arris profiles.



Vision	907	910	913
Minimum glass dim	40 x 40 mm	40 x 40 mm	40 x 40 mm
Glass thickness	3 ÷ 30 mm	3 ÷ 30 mm	3 ÷ 30 mm
Speed	0,4 ÷ 6 m/min	0,4 ÷ 6 m/min	0,4 ÷ 6 m/min
Processing angle	3 ÷ 45°	3 ÷ 45°	3 ÷ 45°
Max corner edge dim.	40 mm (50 mm opt.)	40 mm (60 mm opt.)	40 mm (60 mm opt.)
Installed power	23,5 KVA	32 KVA	40 KVA
Weight	3600 Kg	4600 Kg	5200 Kg

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HIGH SPEED WHEELS FOR CNC MACHINES BY BDT



Three types of wheels are available: flat edge wheels, trapezoidal wheels and routers.

The particular feature of the flat profile wheels is the new design of the sectors, which are smaller and set more closely together; as a result, they can reach speeds of 10 metres/minute, operating at 7,500 RPM.

Trapezoidal wheels are made differently compared with traditional ones and have a different grit size.

Accordingly, they can reach speeds of up to 8 metres/minute, again at 7,500 RPM.

New routers also feature the modified sector design and can reach speeds 50% higher than traditional ones, being estimated to operate at around 12,000 RPM.

NEW ARRIS POLISHING WHEELS - MADE IN BDT

Our range is available for all machines in the market equipped with these tools. Two kinds are offered: wheel SD and wheel CD. Diameter 150mm and 100mm.

Wheel SD: it is suitable for arris processing without diamond wheels.

Wheel CD: it is suitable for arris polishing after diamond wheels.

The wheels diameter 150mm are mounted on aluminum plate granting maximum rigidity and duration of the geometric tolerances.

These characteristics are fundamental for the high performances of the wheels in terms of life and process quality.



GOLDNET ROUTERS FOR LAMINATED GLASS OR HIGH THICKNESSES - BDT PATENTED



Less Chips And Breakages
Even Wearing
Noiseless
No Vibrations
High Cutting Power
Longer Life

CUP DIAMOND METAL BOND WHEELS AND PERIPHERAL WHEELS FOR ALL BEVELLING AND EDGING MACHINES

BDT produces wheels for all machines for flat glass working.

The cup metal bond wheels for beveling and edging machines have diamond band from 4 to 20 mm and the band is continuous or segmented, open or closed segments.

The peripheral wheels for beveling machines, edging machines and double edgers are produced in diameters going from 100 to 200 mm, with different shapes and grits accordingly to their position on the spindle.

Also in this case we can supply special wheels on request.



CUP RESIN BOND WHEELS

Cup resin bond wheels for beveling and edging machines are supplied with band 10-12-15-20 mm and with different band thicknesses and can be continuous, open segments or closed segments.

Customer can also ask for standard wheel thickness or, to improve life, can find other two types with higher diamond band. We think that the advantage of finding by only one supplier so many kinds of wheels and the possibility of asking for special tools for special production is very important, giving the opportunity of having a very high quality of the final product.



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EDGING MACHINES

The Bovone ELB series straight-line edging machines guarantee the highest quality of both flat and inclined edges, even at the highest working speeds, optimizing customers' production. Most machine models are also equipped with Cerium oxide processing, elevating polishing quality to the utmost.

The machines' solid cast iron base and cutting-edge construction solutions are integrated with high-end electronics, while the dedicated software allows a very intuitive use of the machine.

The wide range of models enables to satisfy each and every need, from the processing of 'micro' pieces with extraordinary finish, up to large panels for outdoor architecture. The very high customization potential of each individual model is then oriented towards maximizing the response to specific customer needs.

The edging machines of the ELB series can be integrated into fully automated robotic systems: the Bovone Robotic Systems - BRS.

Machine type	Wheels number	Min piece dimension	MAX Speed	MAX thickness
Straight	10 to 14	35 x 35 25 x 50	from 5.4 m/min to 10 m/min	From 30 mm to 100 mm
45° miter	10 to 17	65 x 65 at 0° 105 x 105 at 45°	Up to 5.4 m/min	From 30 to 90 mm



Wheels number	Min piece dimension	MAX Speed	MAX thickness
From 8 to 12	35 x 35 25 x 50	from 5.4 m/min to 10 m/min	25 mm



BEVELLING MACHINES

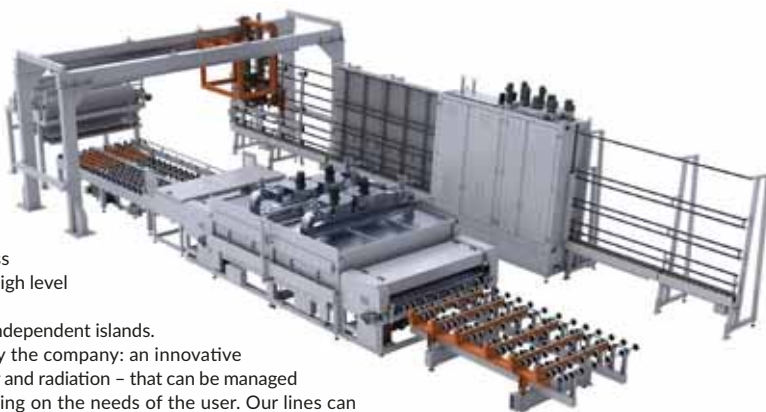
On the market since 1974, Bovone's range of straight-line beveling machines have, since then, been unbeaten for quality, performance and durability – the trend setter and reference point for the whole market, always a step ahead of competition. Bovone beveling machines are internationally recognized for their extreme reliability: they are, in fact, solid machines capable of ensuring minimum maintenance levels and reduced downtime. The finishing quality obtained with a Bovone machine is first-rate: this aspect is in synergy with the very fast execution times, the versatility of the models and the high customization potential work to guarantee the final customer higher productivity. The beveling machines, like the whole range of Bovone machines, are driven by dedicated software for simple and immediate use.

LAMINATING LINES

In the 1980's Bovone introduced its first laminated glass lines, which, right from the start, were already one of the most accurate and fastest lines manufactured, and also by far the most reliable – as always with Bovone products. The lines are:

- **Modular:** in fact, they are configured according to the customers' specific needs, who can also gradually integrate their line in different steps;
- **Versatile:** ensuring excellent performance both in the production of large numbers and for those in which high flexibility is required;
- **Reliable:** with minimal maintenance, they allow very short machine down-times; they guarantee high precision and quality of the finished glass sheets, thus increasing the productivity of the system together with the high level of automation;
- **Automated:** they can be integrated with robotic elements, configured in independent islands.

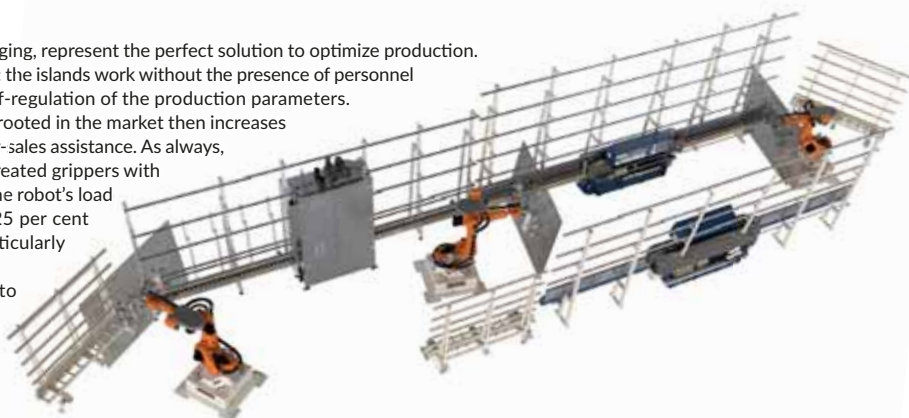
The lines are equipped with the latest generation of furnaces developed by the company: an innovative technology that integrates two heating systems – convection of forced hot air and radiation – that can be managed either completely independent from each other or in combination, depending on the needs of the user. Our lines can process 'sandwiches' of glass and PVB up to 80 mm and glass width from 1600 mm up to 3300 mm and length up to 6000 mm.



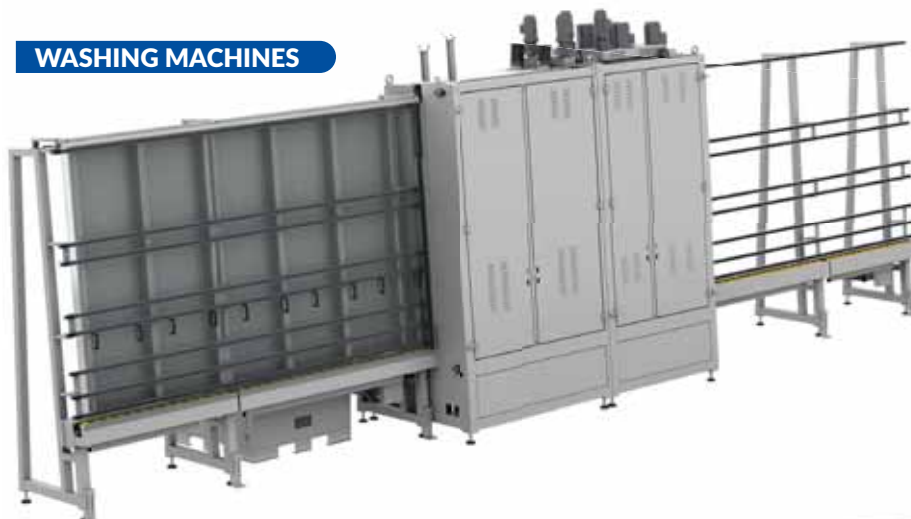
BRS

Bovone Robotic System, the automated islands for edging, represent the perfect solution to optimize production. The systems are compliant with Industry 4.0 protocols: the islands work without the presence of personnel and are fully connectable for the traceability and self-regulation of the production parameters. The use of robotic elements produced by companies rooted in the market then increases the levels of safety and reliability, also in terms of after-sales assistance. As always, with a view to safety and productivity, Bovone has created grippers with reduced weight and size that allow to weigh less on the robot's load capacity, improving performance in terms of time (25 per cent less) and energy used during the processing of particularly heavy plates.

The robots can be supplied stand-alone, applied to existing edgers or as customized robotic islands according to specific needs.



WASHING MACHINES



Bovone offers a full and complete range of glass washing machines for every need and purpose. The company's product range includes both vertical and horizontal washing machines that can be stand-alone or integrated with other machinery such as robotic systems, laminating or silvering lines, all with high quality, especially with regards to finishing – which is, as with all Bovone products, a fundamental strong point.



	Speed	Maximum glass size	Minimum glass size	Glass thickness	Electrical power	Brushes	Air-knives
2LAS 30	1,5 m/min (optional 2 m/min)	300 mm	30 x 45 mm	1,5 ÷ 8 (optional 4 ÷ 12)	5 Kw	2	2 ÷ hot air
2LAS 130 VE	4 m/min	1300 mm	80 x 150 mm	2 ÷ 12 (optional 2 ÷ 19)	9 Kw	2	2
BMW 1.6	0,4 ÷ 12 m/min	1600 mm	150 x 300 mm	2 ÷ 25 mm	19 ÷ 27 Kw	2-3	2-3
BMW 2.3	0,4 ÷ 12 m/min	2300 mm	250 x 390 mm	3 ÷ 25 mm	21 ÷ 40 Kw	2-3	2-3
BMW 2.6	0,4 ÷ 12 m/min	2600 mm	250 x 390 mm	3 ÷ 25 mm	23 ÷ 43 Kw	2-3	2-3
BMW 3.3	0,4 ÷ 12 m/min	3300 mm	250 x 470 mm	3 ÷ 25 mm	37 ÷ 60 Kw	2-3	2-3



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GEA

3-4-AXIS HORIZONTAL MACHINING CENTER

3 or 4-axis (optional) Numerically Controlled machining center to machine both thin and thick flat glass as well as laminated glass and bullet-proof glass. This machine can perform all types of grinding, polishing, drilling, milling, sawing with diamond blade, V-Grooving, engraving, and 5° bevelling.

- gantry system on the Y-Axis provides the bridge motion via two brushless servo motors synchronized by the Numeric Control, in order to ensure extreme accuracy by reducing positioning errors caused by mechanical elasticity
- large duraluminum work surface. The 780 mm (31 in) worktable height makes it easier to load and unload
- monoblock, ribbed, electrically welded, and stress relieved ultra-thick steel base guarantees sturdiness and rigidity for difficult machining work and the longevity of the machine
- pre-setting is integrated into the tool magazine as to not infringe on the working area of the table
- dynamic compensation of the polishing wheels for excellent machining quality



X AXIS STROKE	3800 mm	
Y AXIS STROKE	2550 mm	
Z AXIS STROKE	420 mm	
MAXIMUM WORKABLE PART SIZE	3700 x 2000 mm	
ROTARY AXIS (OPTIONAL)	C = 360° stepless	
TOOL CHANGE STATIONS	12 ÷ 120	
ELECTROSPINDLE	13,5 KW (S1) - 21 KW (S6) 0 ÷ 15000 rpm	30 KW (S1) - 36 KW (S6) 0 ÷ 12000 rpm



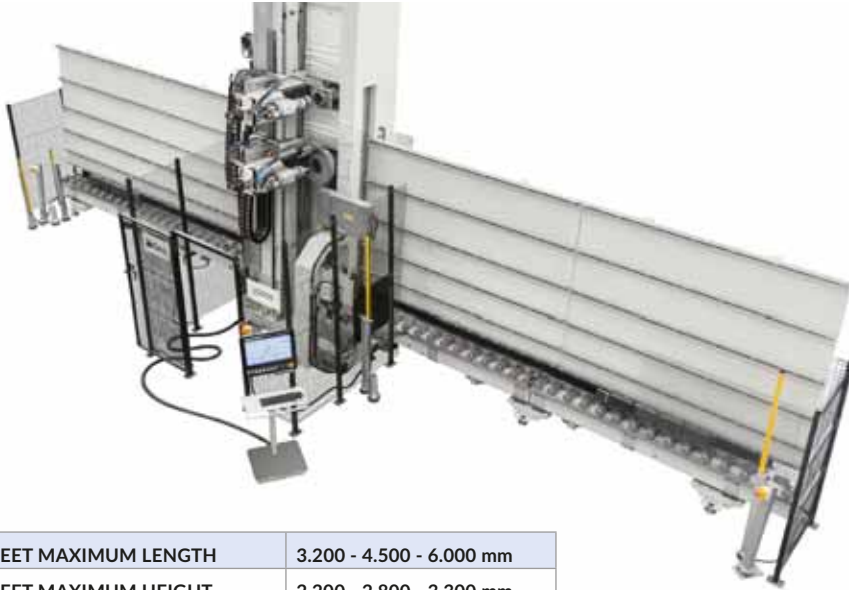
X AXIS STROKE	3800 mm	
Y AXIS STROKE	2400÷7200 mm (configuration available Y>7200 mm)	
Z AXIS STROKE	460÷900 mm	
MAXIMUM XY WORKING DIMENSIONS	It changes according to the configuration	
ROTATING AXES (OPTIONAL)	B = ± 100° / C = ± 270° (540°)	
TOOL CHANGE POSITION	13÷180 + 1 blade holder Ø 500 mm	
ELECTROSPINDLE	13,5 KW (S1) - 21 KW (S6) 0÷15000 rpm	30 KW (S1) - 36 KW (S6) 0÷12000 rpm

MAXIMA

5-AXIS CNC MACHINING CENTER

5-axis interpolated Numerically Controlled machining center with automatic tool change for the working of flat glass sheets of all thicknesses and bent glass. It carries out all types of edge grinding and polishing, arising, milling, cutting with disk, drilling, contouring, engraving, writing, variable-angle beveling operations and special machining. It's the sturdiest machining center in the field, which makes it ideal for any type of working condition.

- wide rotation of axes C (4th axis) and B (5th axis) for the realization of 0-90° variable-angle beveling and dynamic variation of the bevel depth. The configuration with diamond disk is also available for straight and inclined cuts
- Z-axis stroke from 460 to 900 mm for the most demanding works on bullet-proof, military, aerospace and special glass sheets
- thanks to the high configurability of the machine, it is possible to process glass sheets in massive sizes



YPSOS

THE NEWEST VERTICAL MACHINING CENTER

Ypsos is the newest vertical machining center developed by CMS, ideal to process float and laminated glass sheets, entirely designed thanks to many decades of experience in the glass industry. This is the first and only vertical CNC machining center capable of grinding and polishing with two heads at the same time. This project was conceived to reach the best reliability ever in the vertical CNC category. The new software has been designed to make the user interface more efficient and intuitive than ever. Based on the configuration selected, Ypsos can carry out seaming, polished and industrial grinding, milling and coaxial drilling operations. This machine provides absolute accuracy and quality, accompanied by the classic benefits in terms of productivity and versatility given by the vertical machining process. Available in 3 standard sizes, it allows the processing of small and large-sized parts up to 6,000 x 3,300mm max. (additional maximum processable sizes available upon request). Ypsos can be used as a stand-alone machine, in line with a drilling-milling machine or inside an insulating line.

SHEET MAXIMUM LENGTH	3.200 - 4.500 - 6.000 mm
SHEET MAXIMUM HEIGHT	2.200 - 2.800 - 3.300 mm
SHEET MINIMUM LENGHT	420 mm
SHEET MINIMUM HEIGHT	270 mm
SHEET THICKNESS	3÷30 mm
GRINDING WHEEL PACK MAXIMUM THICKNESS	50 mm

VERTEC

CNC VERTICAL DRILLING MACHINE

CNC vertical machine for drilling, countersinking, milling and notching operations on monolithic, laminated and Low-E glass.

- possibility to work both rectangular and shaped glass sheets (one rectilinear side required)
- two coaxial opposed electrospindles and tool cooling system with internal and external water, which enables a higher finishing and machining quality
- two 9+9 stations NC-controlled rotating tool crib installed on a carriage fixed to the electrospindle, ensure tool change operations in the shortest time
- high-pressure water cushion (patented)



MAXIMUM WORKABLE LENGTH	3200 - 4500 - 6000 - 7500 mm
MAXIMUM WORKABLE HEIGHT	1600 - 2220 - 2600 - 3300 mm
MINIMUM WORKABLE DIMENSION	420x180 mm
GLASS WORKABLE THICKNESS	3 ÷ 30 mm
DRILLING BITS DIAMETER	3 ÷ 70 mm
ELECTROSPINDLE	3,7 KW (S1) - 4,4 KW (S6)

KART

AUTOMATIC LOADING SYSTEM

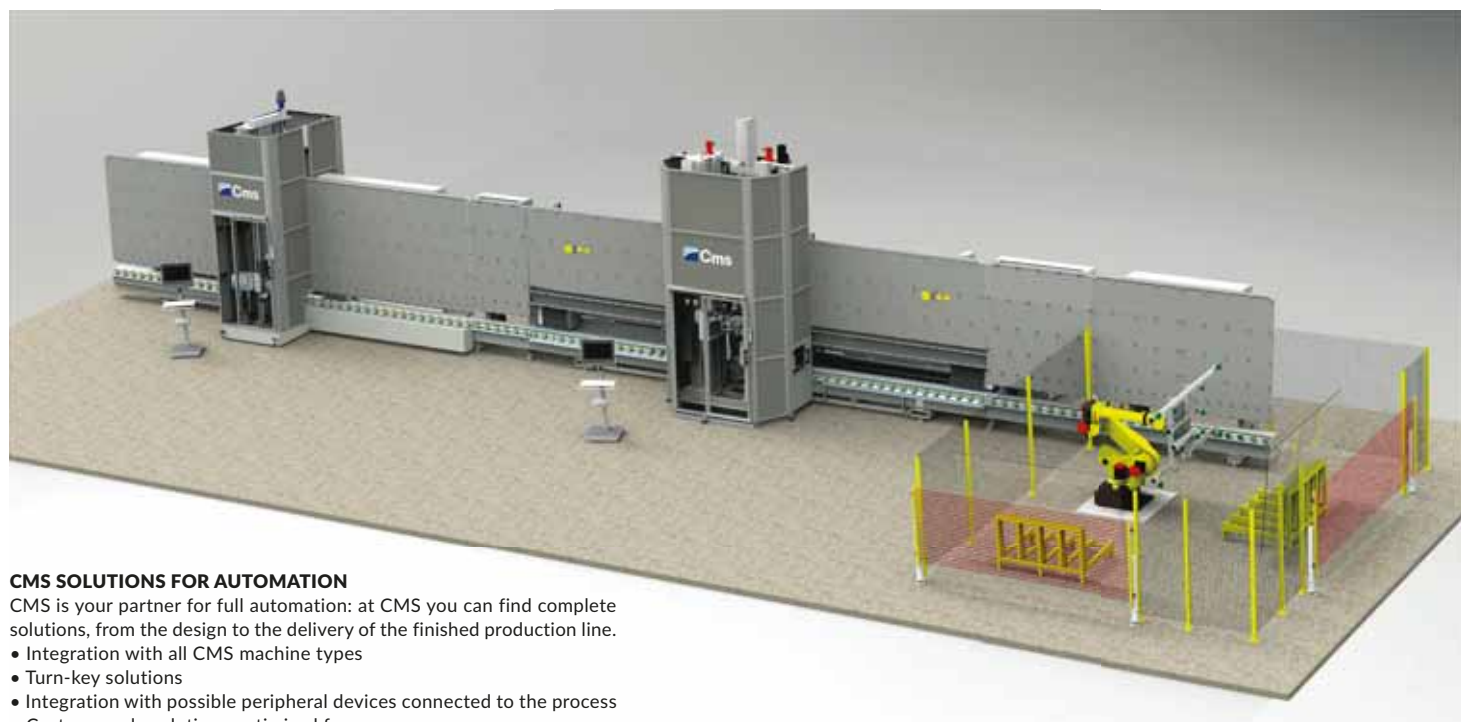
CMS Glass Technology offers a wide range of Kart model loaders/unloaders for the automatic handling of glass sheets. All such systems are easily integrated into any straight line edger (vertical or horizontal), machining centers and double edge machines. They enable the operator to carry out loading/unloading operations in complete safety, minimizing all risks of breakage and increasing productivity.

- the movements (approach, pick-up, lifting, tilting, release, etc.) are managed by a CMS designed PLC
- the glass sheet is picked up by a suction cup group connected to the vacuum circuit through a Venturi system or a liquid ring pump; according to the sheet dimensions, the software decides on the number of suction cups to use
- it is possible to load/unload two or more glass sheets simultaneously from butted rows and/or overlapping surfaces
- the (optional) brushless motors make movements smoother and faster
- they can be easily integrated into other manufacturers' plants

MODEL	Max loading dimensions	Min Loading dimensions	Max loading weight
50	2200x1200 mm	300x200 mm	50 kg
150	3000x1600 mm	300x200 mm	150 kg
200	4000x2200 mm	500x200 mm	200 kg
400	4800X2800 mm	500X200 mm	400 kg



AUTOMATION



CMS SOLUTIONS FOR AUTOMATION

CMS is your partner for full automation: at CMS you can find complete solutions, from the design to the delivery of the finished production line.

- Integration with all CMS machine types
- Turn-key solutions
- Integration with possible peripheral devices connected to the process
- Custom-made solutions optimised for your success

PROLINE

HYDRO-ABRASIVE WATERJET CUTTING SYSTEM

The ultimate machine tool specifically conceived and designed with advanced technical solutions for the waterjet cutting technology, in order to achieve unmatched performance. Proline is built around a stainless-steel frame ready for integration with the "Dredge", a fully automated and maintenance free abrasive removal system, an automatic water level control for submerged cutting and rotary option. This innovative, easy configurable concept has not only the abrasive tank installed on-board, but also the electric servodriven high-pressure pump is integrated with the machine frame, a big saving in terms of overall layout. The overall machine structure, especially the rugged gantry system, offers unmatched rigidity and thus consistent cutting accuracy over time, thanks also to the ground helical rack and pinions, combined with high precision gearboxes.

The linear guides are protected by the innovative "Powder free" system composed of overlapping way covers, which ensures the highest protection against moisture, dirt and dust.



PROLINE: STANDARD TECHNICAL DATA*

X AXIS STROKE (1 HEAD)	4250 mm
Y AXIS STROKE	2000 mm
Z AXIS STROKE (3-AXIS HEAD)	300 mm
Z AXIS STROKE (5-AXIS HEAD)	200 mm
C AXIS (5 AXIS ONLY)	Infinite
B AXIS (5 AXIS ONLY)	± 62°
XY AXIS RAPID SPEED	40000 mm/min
WORKTABLE SIZE	4650 x 2050 mm
WORKTABLE LOAD CAPACITY	1000 kg/m2
POSITION ACCURACY	+/- 0,035 mm
POSITION REPEATABILITY "PS"	+/- 0,025 mm
INSTALLED POWER	3 kW / 4 HP
FOOTPRINT LXPXH	8158 x 3483 x 3900 mm
WEIGHT MAX. (EMPTY)	8000 kg

* Technical data changes according to the configurations

EASYLINE

3- AND 5-AXIS WATER JET CUTTING SYSTEM

easyline is a high-performance, versatile, modular water jet cutting system - either pure or hydroabrasive - which can be employed in a number of application fields for the most diverse production demands.

- the cantilever structure, with a separate tank, allows an easy access to the worktable. Loading and removing material is quick and easy.
- all axes' motions are carried out through hardened and ground rack and pinion.
- the thermowelded bellows provide complete protection of the guides and the rack from water and dust.
- the steel structure undergoes an anti-rust treatment through sandblasting and ceramic painting, which results in a higher resistance against corrosion.
- the tank is set up for the installation of a dredge system for the abrasive removal



MODEL	1010	2020	2040	2060
X AXIS	1000 mm	2000 mm	4000 mm	6000 mm
Y AXIS	1000 mm	2000 mm	2000 mm	2000 mm
Z AXIS	220 mm (150 mm with 5 axis head)	220 mm (150 mm with 5 axis head)	220 mm (150 mm / with 5 axis head)	220 mm (150 mm with 5 axis head)
B AXIS	±60°	±60°	±60°	±60°
SUPPORT PLANE	1210x1225 mm	2210x2225 mm	4210x2225 mm	6210x2225 mm
OVERALL DIMENSIONS WITH LIGHT BARRIERS	4680x4174 mm	5680x5174 mm	5689x7208 mm	5680x9242 mm



CUGHER GLASS SRL

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Tel.: +39 02 66207762 - Fax: +39 02 66202917
E-mail: info@cugher.com • www.cugher.com

J SERIES

The fully automatic silk-screen printing machine is composed of an entry/pre- alignment conveyor, the printing machine body and an exit synchronized conveyor. The machine has a firm structure with the printing table made by a specially treated aluminum and it is equipped with a belt transport system and an auto-centering. It is ideal for glasses of medium and large dimensions, typical of Automotive and Architectural sectors.



Glass size: from 400x300 mm to 6000x3200 mm

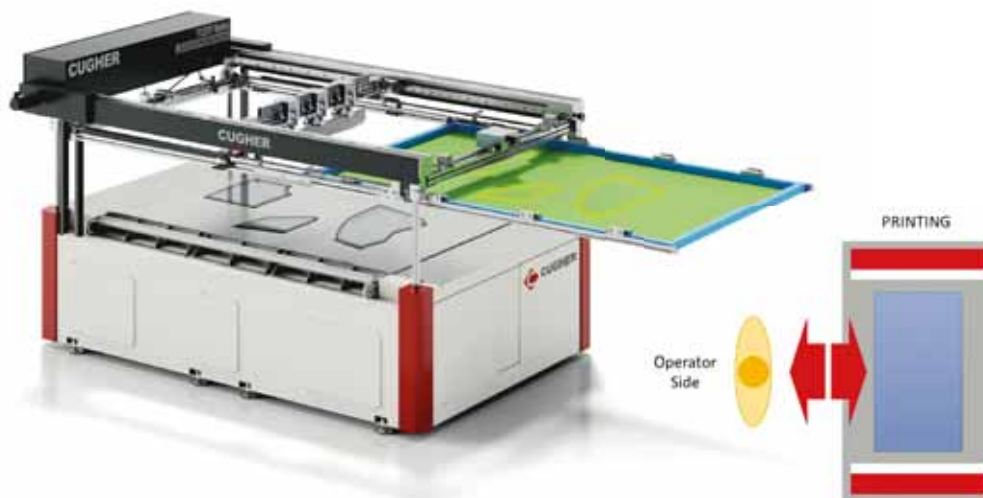
G SERIES

The printing machine transports the glasses through a shuttle with two independent cross shaped holders and centring out of the printing table. The system consists in one cross shaped holder with a vacuum cups system. The glass is collected by the walking beam while it is still in the centring device of the inlet conveyor; thanks to this operation it is possible to transport the glass with great accuracy. This solution enables reaching the maximum speed of the printing process for glasses with small and medium dimensions, guaranteeing high productivity required in the Automotive sector.

Glass size: from 250x150 mm to 2500x1600 mm

FLEXY SERIES

The printing machine manages multiple glasses type (thin, standard, coated, polycarbonate) and it is extremely versatile for small and different lots. The stainless-steel magnetic table, worked with micro holes, is equipped with vacuum and blow system for easy nesting. The Flexy Series is a stand-alone machine with manual loading/unloading and finds application in all type of sectors. Max glass dimensions 1300x2000 mm - Min. printing size 200x200 mm



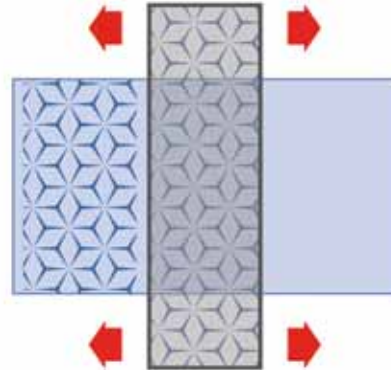
www.cugher.com

CUGHER GLASS

SKETCH SERIES

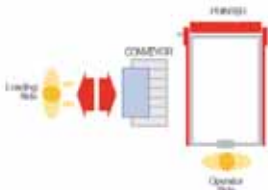
The printing machine is completely stand-alone and ready for in line operations. The frame is usable for several glass dimensions with reference on left-front side and the movable screen allows to personalize the print. In fact the image can be printed on different parts of the glass. It is ideal for interior design sector, in particular for shower doors.

From small to big glasses with rectangular shape – from 500×200 mm to a maximum of 2700×1600 mm

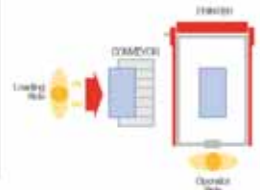


Stand-Alone

Version 1
Manual loading and unloading,
on the same side.

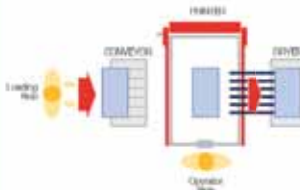


Version 2
Manual loading upstream, manual unloading
downstream.



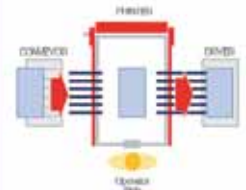
Semi-Automatic

Manual loading of the glass on the loading side. Automatic
rear discharge with transport belts.



Full-Automatic

Automatic glass loading and unloading
by a belt transportation system.



COMPACT SERIES

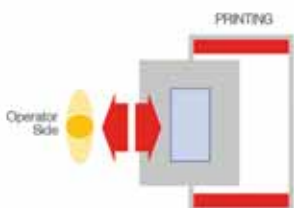
The printing machine has the flexibility to be used as a stand-Alone printing machine or to become the heart of a full automatic printing line. A real solution for the high productivity demands, being, at the same time easy to use. The Compact Seires is able to satisfy specific production needs and represents the perfect solution for huge batches and squared/ rectangular glasses that have to be printed quickly and precisely, characteristic of home appliance sector.

Glass size: from 100x35 mm to 1300×700 mm



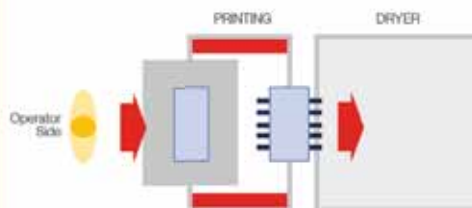
Stand-Alone

Manual loading and unloading,
on the operator side, with
extractable printing table.



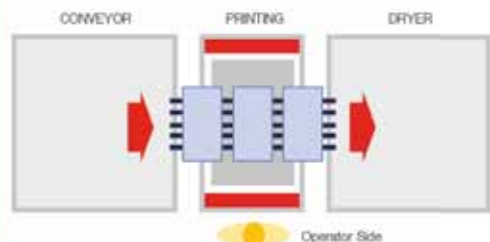
Semi-Automatic

Manual loading and unloading of the glass, on the
operator side, with extractable printing table.
Automatic rear discharge with transport belts.



Full-Automatic

Automatic glass loading and unloading by a belt
transportation system.



www.cugher.com

CUGHER GLASS

DRYERS

Cugher Dryers (IR, UV or combined) with specific features and flexibility are able to satisfy both silk screen printing and digital printing on glass. Indeed, adapting air recirculation, dryers can accurately dry ink thickness from 15 to 100 microns. Moreover, dryers are able to accelerate the drying process through the efficient transfer of energy to the ink/enamel and the capability of evacuating vapours generated by solvents during the drying process.



SYMPHONIA

The Automated Harps Rack System is the ideal glass handling solution for small and medium glassworks. Symphonia is created to facilitate the loading and/or the unloading of glass sheets onto vertical production lines, such as those for insulating glass, for glass dimensions up to 3000 mm x 1500 mm. The solution enables:

- Eliminate the need for manual loading/unloading
- Modularity: it includes as many positions as the production needs of each customer
- Customized engineering as per the available space in the warehouse and the processed glass dimensions



VISION SYSTEMS

AUTOMATIC GLASS QUALITY INSPECTION VISION SYSTEM

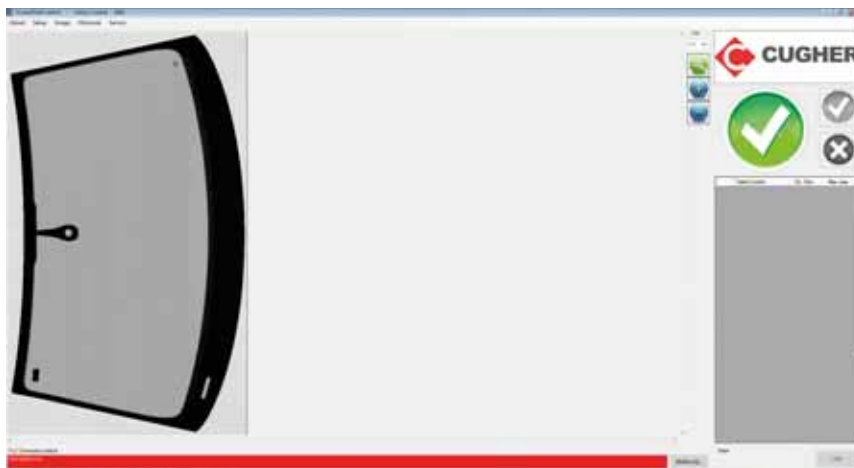
The system, typically installed downstream the washing machine, is able to scan the whole glass and detect any defect present on the raw glass such as scratches, breakages, air bubbles, chips, contaminations, water drops, wet edges.

www.cugher.com

CUGHER GLASS

AUTOMATIC PRINT QUALITY VISION SYSTEM

The system, installed immediately after the printing machine, recognizes any "slavering" or "widening" of the design's details due to an excess of ink coming from the screen.

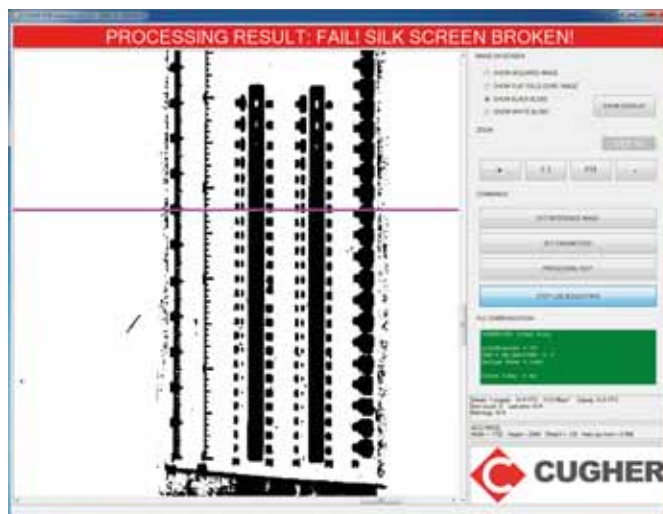


AUTOMATIC SCREEN REGISTRATION SYSTEM WITH CAMERAS

The system allows to automate the register of the screen with the glass to be printed, performing a complete model changeover in an extremely short time.

BROKEN SCREEN DETECTION SYSTEM

This unit is positioned just downstream the printing machine; it detects automatically if there is a broken screen, by controlling the presence of ink spot on the lower surface of the glass.





DIEFFE MACCHINE SRL

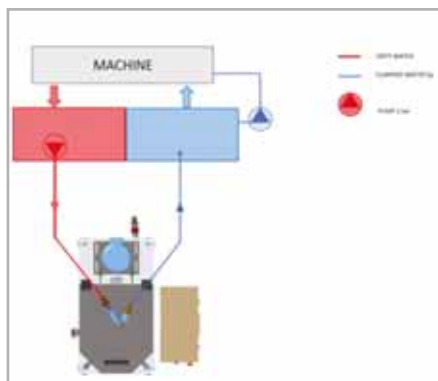
Via delle Industrie Due, 58 - 30020 Meolo (VE) - Italy

Tel.: +39 0421 345300

E-mail: info@dieffemacchine.it • www.dieffemacchine.it

DFL 50 M

Manual centrifuge for a single machine

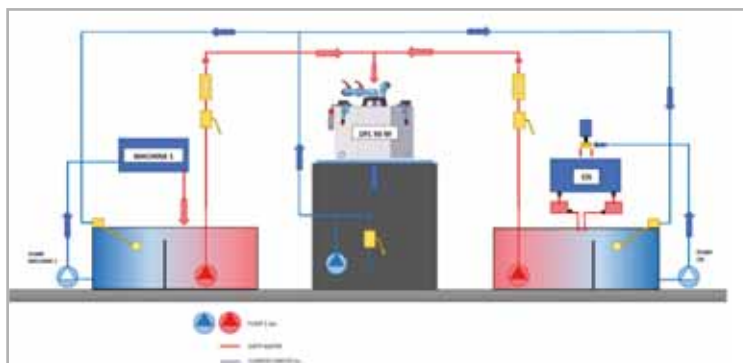


Manual centrifuges



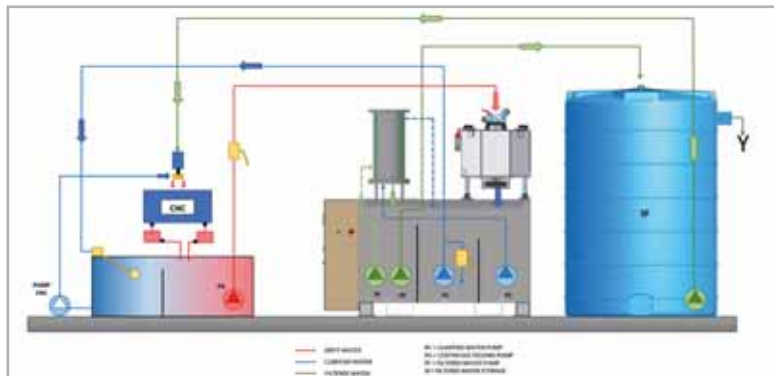
DFL 50 M DUPLEX

Manual centrifuge for two machines



DFL 50 MMF S3

Manual centrifuge for machine with additional microfilter and storage tank



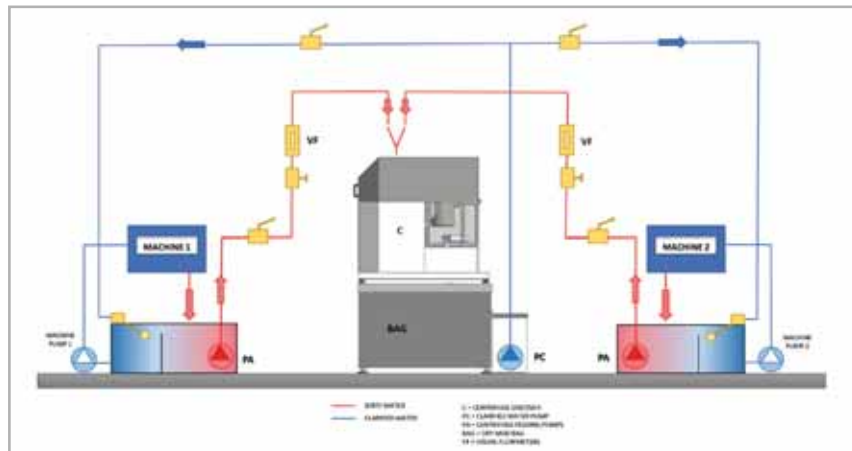
www.dieffemachine.it

DIEFFE MACCHINE

Automatic centrifuges

DFL 150/250 A DUPLEX

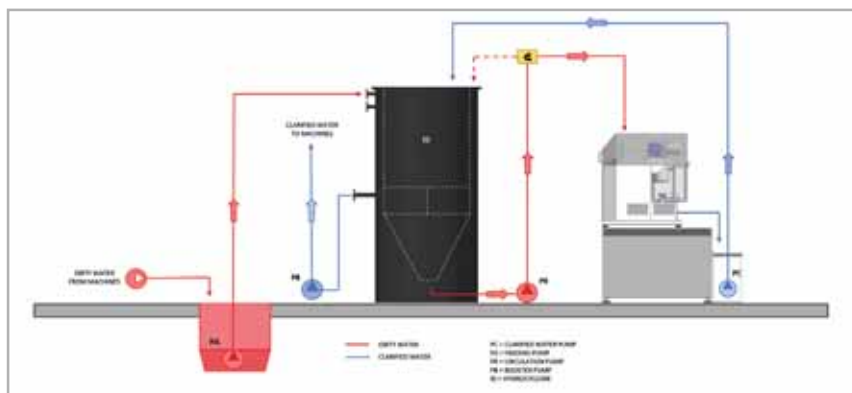
Automatic centrifuge for two machines



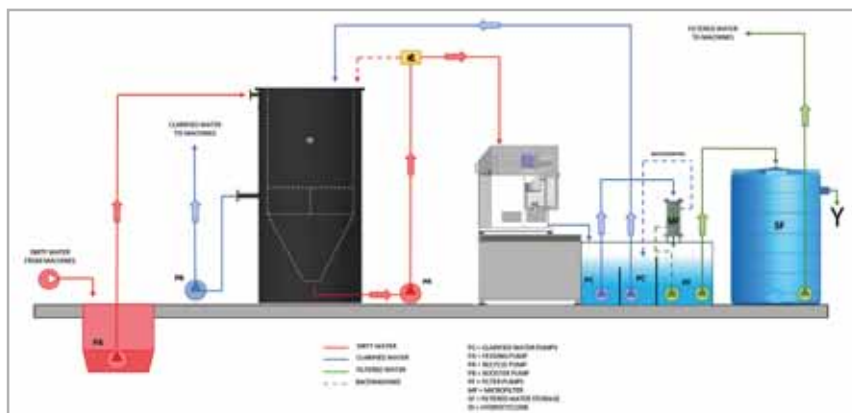
COMPLETE PLANT

Plant includes:

- Automatic centrifuge
- Hydro cyclone



- Automatic centrifuge
- Hydro cyclone
- Spindle water microfilter





DIAMUT - BIESSE SpA

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E-mail: sales@diamut.com • diamut.com

EVOX 10

EVOX 10: NEW PERIPHERAL WHEELS FOR CNC MACHINES - RENEWED DESIGN FOR GUARANTEED PERFORMANCE



The Diamut EVOX 10 peripheral diamond wheels for CNC machines are Diamut's high tech product to obtain maximized performance. The design has been completely renewed: the wheel body has been reduced to allow the assembly of different wheels on the same tool holder (packed wheels). Thanks to the new bond and cuts through the diamond crown, the tool guarantees improved processing performance: +20% in working speed.

EVOX 15

EVOX 15: NEW PERIPHERAL DIAMOND WHEEL FOR VERTICAL MACHINES - A NEW ERA FOR GLASS GRINDING



The new line peripheral diamond wheel EVOX 15 made by Diamut for vertical machines (diameter 15 mm) is the perfect change to carry out an uncompromising glass grinding.

A shape with innovative features: cut through the diamond crown to guarantee a unique and perfect grinding on all types of monolithic glass. A new formulation allows to use EVOX 15 with the new parameters that guarantee optimized processing performance, reducing the effort of spindle machines. Savings also for maintenance and energy consumption costs.



HYPER SPEED

HYPER-SPEED, UNMATCHED PERFORMANCE

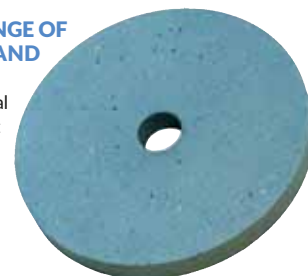
Hyper-speed is a new range of high-speed tools, ideal for vertical and horizontal grinding machines, developed to help customers boost the productivity of their production cycles. The set of Hyper-speed grinding wheels consists of an innovative segmented grinder with filler, the newly designed continuous band grinder and the polishing grinder. Another strength of Hyper-speed grinder is the new high-performance binder, derived from the Automotive sector. The binder was obtained through new sintering technology that allows for increases in temperature and pressure to be controlled constantly during the cycle. Hyper-speed is the answer to the market's unmet need for ever-higher speed and performance levels, while maintaining high quality standards.



SHINY LINE

SHINY LINE: DIAMUT'S NEW RANGE OF POLISHING WHEELS FOR CNC AND VERTICAL MACHINES

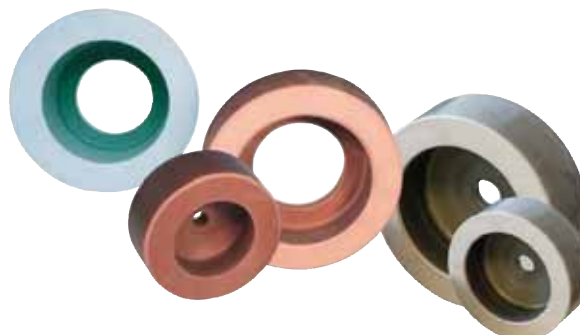
A new wheel that no longer needs internal water holes: this ensures a significant improvement to the final polishing wheel.



KERS LINE

KERS LINE: POLISHING CUP WHEELS

Kers range are suitable for edge polishing and for arris polishing. The first ones are available in two lines: k9 and k10, they grant an excellent finishing on any kind of glass. They can be used on double edgers and straight line edgers/bevellers of any machine manufacturer. Their dimensions are: 100/130/150/170 mm. Regarding Arris polishing they are 3 different types: green, red and black. They grant maximum rigidity and the maintaining of geometric tolerance thanks to their technical features. Their dimensions are: 100/130/150 mm.





EDGETECH EUROPE GMBH

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E-mail: info@edgetech-europe.com • www.superspacer.com



THE ADVANTAGES OF THE SUPER SPACER®

- low thermal conductivity
- fast dew point drop
- durable edge seal, continuous vapour barrier at corners
- moisture-adsorbing, flexible foam matrix
- high desiccant content adsorbs more moisture than two-sided and generally also more than four-sided filled conventional systems
- no chemical fogging*
- attractive aesthetic appearance
- high-quality silicone for superior resistance to UV-light and oxidation
- very good gas-loss rate values according to EN 1279 part 3
- optimum values for energy efficiency (Psi-Values up to 0.031**)
- enhanced comfort and well-being near windows
- excellent condensation resistance, shape retention and colour stability
- excellent durability for sustainable performance
- higher productivity through ease of processing (only three process steps)
- North America ASTM E2188/E2189/E2190
- Passive House ph A+ certificate for Arctic Climate
- Europe EN 1279
- Canada CGSB 12.8
- CEKAL - certified for France
- RAL Quality Label
- ISO 5001 Energy Management
- P1 Industry standard USA

* safe up to approx. +80°C, higher depending on the test method

** Super Spacer® T-Spacer™ Premium Plus made from structural foam processed in triple-pane insulating glass; source: Bundesverband Flachglas e.V. (German flat glass association)



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FOREL SPA

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Arrissing Machine

ART. EG ARRISSING MACHINE

The vertical arrissing machines series Art. EG remove the sharp edges of glass sheets by eliminating irregularities, ensuring safe and smooth finishes. Art. EG significantly increases the productivity of arrissing operations as is equipped with **two operating heads**, that are capable of working simultaneously on two different sheets of glass, or by synchronizing both operating heads onto one sheet of glass.

The **"self-learning"** mode automatically acquires the dimensions for

	EG04020HT	EG04025HT	EG05028HT	EG06033HT
Height (mm)	3.670	4.170	4.470	4.970
Length (mm)	9.650	9.650	9.650	9.650
Depth (mm)	3.260	3.260	3.260	3.260
MAX glass length (mm)	4.000	4.000	5.000	6.000
MAX glass height (mm)	2.000	2.500	2.800	3.300
MAX glass weight (kg/linear meter)	200			



the square shapes, while a separate device measures the thickness of the glass being processed. During the arrissing process, **the double suction cup carriages** secure the sheets of glass and move them forward. Depending on the sizes of the glass sheets being processed, the suction cup carriages automatically move to the correct position.

The presence of two independent suction cup carriages allows Art. EG to **reduce processing cycle time, guaranteeing high productivity.**

Art. EG can also process different shapes of glass sheets. (shape must be linear, such as triangles, trapezium, etc.). Art. EG is equipped with two operating heads with **"V" shape diamond tools ø 200 mm.**

The arrissing machine is able to process **glass thickness between 3 and 21 mm with processing speed up to 300 mm/sec.**

Edging - Drilling - Milling Line

ART. EM EDGING MACHINE

The edging machine Art. EM, one of the most appreciated of the Forel range, is for the edge processing of monolithic and laminated glass sheets.

The machine can perform three different processing operations: arrissing, grinding, polishing. Thanks to the different technological measures used, Art. EM guarantees total stability and high processing speed during the different processes. It can also process low-E glass without damaging the coating.

The operating head of the **Art. EM** edging machine is equipped with a **patented system for the localized holding of the glass sheets.**

The device consists of **two self-adjusting glass-pressing wheels** that rest on the glass sheet and hold it in place. The system guarantees a perfect hold, centring with respect to the tool, as well as the absence of vibrations during processing. Thanks to this device, **Art. EM** offers precise processing even when the glass sheet is not perfectly flat.

The **Art. EM** vertical edge processing machine is equipped with an exclusive feeler that controls the edge of the sheet locally during processing, 'guiding' the grinding wheel.

It can therefore operate in **dynamic self-learning mode for rectangular glass**, guaranteeing consistently uniform results in both arrissing and edging.

The edging machine is equipped with a pre-setting system that controls consumption and the contact of the tool.

	EM04020HT	EM04525HT	EM05028HT	EM06033HT	EM09033HT
Height (mm)	4.000	4.000	4.300	4.800	4.800
Length (mm)	10.800	10.800	10.800	11.900	20.170
Depth (mm)	2.600	2.600	2.600	2.600	3.180
MAX glass length (mm)	4.000	4.500	5.000	6.000	9.000
MAX glass height (mm)	2.000	2.500	2.800	3.300	3.300
MAX glass weight (kg/linear meter)	200	200	200	200	200



ART. DM DRILLING AND MILLING MACHINE

Enriched with specific features to guarantee precision and stability, the vertical drilling and milling machine art. DM represents an irreplaceable resource, both for stand-alone use and in line with an edging machine art. EM. The quality of processing of the glass sheets depends mostly on the stability of the glass while the various tools are being used. For this reason, the art. DM is equipped with **two opposite operating heads (which are independent and equipped with an automatic tool change system, with 6 rear positions + 8 front positions) and two exclusive suction cups systems**, both patented. The first group of **fixed suction cups** offers a strong grip on the glass sheet, while a



	DM04020HT	DM04525HT	DM05028HT	DM06033HT	DM09033HT
Height (mm)	3.950	3.950	4.250	4.750	4.750
Length (mm)	12.085	12.085	13.185	15.085	21.920
Depth (mm)	3.500	3.500	3.500	3.500	3.450
MAX glass length (mm)	4.000	4.500	5.000	6.000	9.000
MAX glass height (mm)	2.000	2.500	2.800	3.300	3.300
MAX glass weight (kg/linear meter)	200				
Automatic tools change	8 tools (front) + 6 tools (rear)				

second group of smaller **adjustable suction cups** offers greater stability close to the processing tools. These suction cups can be positioned differently depending on needs.

An additional system of suction cups can be applied directly on the rear spindle. In addition to ensuring greater stability during drilling and milling, the rear suction cup group holds the cuts and releases them in the bottom tank. Alternatively, a **buffer** can be set in contrast to the tool for the execution of particular processing operations. This tool can be applied **both on the rear spindle and on the front spindle**.

ART. EM-DM COMBINATION

Art. DM vertical drilling and milling machine can work together with the **Art. EM** vertical edging machine. This configuration, by far one of Forel's most popular solutions, combines the **arrissing, rough or polished edging, drilling and milling** processes in a single line. The line can be completed with an Art. VW vertical washing machine. As well as demonstrably improving the quality of the finished product, spreading the workload of edge processing over more machineries also over offers significantly better productivity than other solutions: indeed, while a glass sheet is being grinded or polished, another one is already being drilled and another one is being washed.



Sorting System

ART. SS SORTING SYSTEM

The **Art. SS Sorting System** is the complete solution for the automation of the handling, storage and reordering of products in glass factories.

The **Art. SS Sorting System** consists of highly customizable handling and sorting units.

Its modularity allows it to adapt to the specific needs of glass factories. However, it is not just a matter of 'moving' the glass sheets: **Art. SS organizes and manages the progression of outgoing pieces** depending on the work programs (both previous and subsequent lines), contributing immediately in terms of productivity, speed and efficiency. Made up of glass sheet handling shuttles and storage units, the Sorting System solves the problem of so-called 'bottlenecks'.

In fact, different production lines often have different production times: thanks to its automated storage system, **Art. SS** guarantees order within the glass factory and allows to **optimize available space**.

Several advantages are obtained by decreasing manual **handling** of the glass sheets in favour of **automated** handling:

- **more rapid flow**, with time saving in supplying processing lines.
- **less risk of breakage or damage**.
- reduction of **waste**.
- **fewer risks for operators**.

The installation of the Sorting System results in a clear improvement in the order and efficiency of glass factories.

In fact, the Sorting System assigns a **unique ID (identification number)** to all glass sheets: **the sheets are constantly tracked, localised and managed according to the program**. The position of each single sheet can be monitored at any time from a PC station and the progress of each single order is therefore always known.



	SS04028HT	SS05028HT	SS05033HT
Shuttle height (mm)	3.570	3.570	4.070
Shuttle length (mm)	4.200	5.270	5.270
MAX glass length (mm)	4000	5000	5000
MAX glass height (mm)	2800	2800	3300
MAX glass weight (kg/linear meter)	200		

Vertical Cutting For Laminated Glass

ART. VC VERTICAL CUTTING LINE FOR LAMINATED GLASS

The vertical cutting line for laminated glass **Art. VC** combines high productivity and excellent quality: equipped with two cutting bridges and an automatic sheet rotating element, it has been designed to process Jumbo size sheets, optimizing cutting on X, Y, Z axes. The Art. VC offers precise, fast and safe processing. During cutting, the sheet remains in a vertical position throughout the duration of the production cycle, for high productivity in a reduced space. Cutting optimization is elaborated by means of a special software that reorganizes data, speeding up processing and assisting operators.

The line offers absolute precision, showing to be a true top product for the cutting of laminated glass. Each of the two cutting bridges has **two opposite ripping units** for the scoring of the glass and two breaking bars (front and rear), to also allow the uniform opening of the sheet along its



	VC04533HT	VC06033HT
Height (mm)	5500	7000
Length (kg)	26000	26000
MAX glass length (mm)	6000	
MAX glass height (mm)	3300	
MAX glass thickness	from 6,3 mm to 20,5 mm	

entire length. In the case of Low-E glass, the cutting bridges can also be equipped with a **special coating removal system**. After scoring, the two pieces of the sheet are pulled, uncovering the PVB film. A **special infrared emitter** heats and softens the PVB film without heating the glass. A **patented motorized drawing system** totally or partially detaches the two panes. In the case of thick interlayer, a blade can also operate.

COMPLEMENTARY EQUIPMENT

The art. VC cutting line can be combined with:

- The automatic stock selector unit **Art. ST** has been developed for a quick and safe handling of the Jumbo size glass sheets, up to 12 tons each one. The shuttle is also equipped with a clamping system for the glass packs, allowing fast and safe positioning. Art. ST is equipped with an automatic glass storage with multiple racks.
- **Art. VL** automatic glass loader manages large size sheets, up to Jumbo size (6,000 x 3,300 mm).
- **Art. TT** tilting table at the end of the line.

IG Lines

The extensive choice of insulating glass solutions is the pride of the Forel range. Versatile and configurable to cater to a wide variety of needs, these machines are the result of over 45 years of research and development in this sector. Boasting a host of exclusive, patented technological solutions, Forel's products are a strategic choice, helping businesses attain the highest possible productivity and process quality. Forel offers three different series of solutions for insulating glass production: 'Residential', 'High Tech' and 'No Limits'.

THE RESIDENTIAL IG LINE

The Residential IG line is mainly designed for the production of double- and triple insulating glass units, with sizes, thicknesses and conveying weight capacity suited to residential architecture. This range consists of Forel's classic offering of machines for the industrial production of insulating glass. Designed to offer Forel quality in a version focused on a specific goal: IG units in commonly-used sizes, with rigid or flexible spacers. Compact but still with outstanding performances, this is the ideal solution for standardised production. The line is capable

MAX glass length (mm)	4.000
MAX glass height (mm)	2.500
IG unit thickness (mm)	65
IG unit weight (kg/linear meter)	200
Number of chambers	up to 2 (triple glazing)
Spacer	rigid/flexible
Gas filled	argon
Sealing products	up to 2



of working with individual glass sheets of up to 4.000 mm length and 2.500 mm height, weighing up to 200 kg/linear meter. It can also process up to two chambers and using up to two different sealing products.

THE HIGH TECH IG LINE

The cornerstone of Forel's product range for insulating glass. The result of Forel's decades of experience in this field, the "High Tech" range is complemented by a choice of exclusive devices and systems for work with offset and shaped glass

MAX glass length (mm)	6.000
MAX glass height (mm)	3.300
IG unit thickness (mm)	100
IG unit weight (kg/linear meter)	400
Number of chambers	up to 3 (quadruple glazing)
Spacer	rigid or flexible
Gas filled	argon and krypton
Stepped unit	up to 100 mm (leading and lower edge) up to 300 mm (trailing and upper edge)
Sealing products	up to 3



sheets, as well as for double, triple and quadruple IG units. This line can process assembled glass units up to 6.000 x 3.300 mm in size, weighing up to 400 kg per linear metre (assembled panel), and thicknesses up to 100 mm. Equipped with a flat plate coupling press with gas filling function (argon/krypton) and sealing machines, the High Tech line can process rigid or flexible spacers and can use up to three different sealing products. Special technology also enable the management of possible curvatures of the glass sheets.

THE NO-LIMITS IG LINE

The "No Limits" IG line meets all requisits for the ultra large sizes and facade markets: capable of managing the pane curvatures, weights and stepped units required by the extra-jumbo format, "No Limits" IG line goes beyond the restrictions of commercial architecture. It can process extra-Jumbo units up to 12 meters of length and 3,3 meters of height, with a capacity per linear meter of up to 350 kg for single panes and 550 kg for assembled panes, with thicknesses up to 40 mm single glass and 100 mm single glass. "No Limits" IG Line can also assemble units with up to 3 chambers and is able to handle offsets up to 250 mm on the upper and lower edge and 1.000 mm on the leading and trailing side, thanks to the dynamic support of the coupled panes. Each machine that makes up the line is equipped with devices developed specifically to handle large dimensions, substantial weights and any non-planarity throughout every phase. The line can process both rigid and flexible spacers and the sealing robot can use up to 3 different sealing products in a "continuous sealing" mode, offering an astonishing quality.

MAX glass length (mm)	12.000
MAX glass height (mm)	3.300
IG unit thickness (mm)	100
IG unit weight (kg/linear meter)	550
Number of chambers	up to 3 (quadruple glazing)
Spacer	rigid or flexible
Gas filled	argon and krypton
Stepped unit	up to 1.000 mm (leading and trailing edge) up to 250 mm (upper and lower edge)
Sealing products	up to 3



Lamination Line

ART. LL LAMINATION LINE

The lamination line Art. LL has been designed and engineered specifically for the laminating of flat glass with PVB interlayers.

The line is made up of the following operating zones:

Loading area.

Washing: The washing zone features a six brushes washing machine (brushes diameter Ø 200 mm) equipped with a self-learning device for measuring the glass thickness. Low emissivity (Low-e) glass is detected automatically. An antistatic bar can be fitted to the washers out feed conveyor to prevent dust contamination of the glass surface.

Transferring area: equipped with a suction cups system to pick up the glass sheets, with variable arrangements and glass sheets detection sensor.

Interlayer positioning: a multiple PVB reels holder is located in a dedicated mezzanine within the clean room and is connected to lines management software. The positioning station is equipped with an automatic sheet centering system that guarantees the perfect alignment of the glass relative in the pressing rollers.

Heating and pressing: the pressing rollers are coned shaped in design to allows the exhaust of air from the centre of the glass out through the sides. The management of the rollers is independent of the glass thickness and is accurate in both dimension and pressure. The heating and pressing areas are made up of two temperature controlled zones and two sets of pressing rollers.

	LL04526HT	LL05026HT	LL06033HT
MAX pane length (mm)	4.500	5.000	6.000
MAX pane width (mm)	2.600	2.600	3.300
Single glass thickness (mm)	3- 20 mm		
MAX laminated unit thickness	60 mm		
MAX assembled panes	4		
MAX assembled panes	150 kg/linear meter		

Both ovens are equipped with thermo regulated electronic resistors which work in conjunction with a forced air convection system.

Unloading: The lamination line is equipped with a tilting table, with a capacity of 1.500 Kg.

The lamination line can be supplied with an external rotary 8 station PVB magazine, with a table and semiautomatic cutter. The line is equipped with a self-diagnostic system that identifies faults with codes, descriptions and images with an additional system that allows remote assistance.



*Forel is constantly working on the development of new solutions.

Some data present in this report may differ from the models available on the market.

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GLASSLINE DAILY NEWS



Massimo Antonini passes away

There is mourning in the glass industry following the passing on Sunday 27 February 2022 of Massimo Antonini, President of Antonini Srl, an Italian...



Consol Glass chooses SORG Group

Following the SORG Group's successful first furnace build at the newly established Nigal plant near Johannesburg, South Africa in 2011, Consol Glass (Pty) Ltd...



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GLASS SERVICE - 16th Int'l Seminar on furnace design



Every two years GLASS SERVICE sponsors an educational furnace design... operation & process simulation seminar in the Czech Republic, for the benefit of its customers. The next Seminar will be held on 22-23 September 2021 at the Hotel Horal mountain resort in Velké Karlovice, Czech Republic. The Seminar will be open to everyone wanting to learn more about industry...

Libbey to invest 30 million USD in Toledo, USA, operations



Libbey Glass ("Libbey"), one of the world's largest glass bottle manufacturers, will expand production in Toledo, OH, USA, with an additional stemware line, bringing its fourth production line, bringing...



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FRANCESCA SERIES

The **FRANCESCA FC 1250 H.O.** and **FRANCESCA FC 16M 1600 Mill** are Numerically Controlled (NC) glass processing drilling centres, capable of performing drilling, countersinking and milling operations on flat glass sheets, including "out of square" pieces.

The **Francesca FC 2000/2600/3000** is Forvet's response to large glass sheet processing problems.

The **Francesca FC 16M 1600 WJ** NC work centre is a new machine concept combining two production technologies, managed by a single Numerical Control.



Working area	X axis: free (according to conveyor length) Y axis: maximum from 1250 mm to 3000 mm
Glass thickness	3 to 19mm (25mm optional)
Maximum drilling diameter	65 mm (70mm optional)
Number of spindles	16 (8+8)
High Pressure Pump (only for FC 1600 WJ)	up to 400 MPa

The brilliant news conceived by Forvet is to join the drilling basis realized with diamond tools with water jet cutting technology. This results in an important advantage for production, and operators can choose which type of cuts to use, depending on the work to be carried out. Forvet water jet technology, developed according to company philosophy, allows to perform two different processes (water jet, drilling and milling) on the same machine with fully automated loading, positioning, processing and unloading operations. The **FRANCESCA FC 16M 1250 H.O.** and **FC 16M 1600 Mill** can be equipped with the **AIR** option which allows vertical loading and unloading.

The **FRANCESCA FC 32M 3300 Mill** is a fully Numerically Controlled (NC) glass work centre, capable of performing drilling, countersinking and milling operations on flat glass sheets, ranging in thickness from 3 to 19 mm. (25 mm optional), including "out of square" pieces.

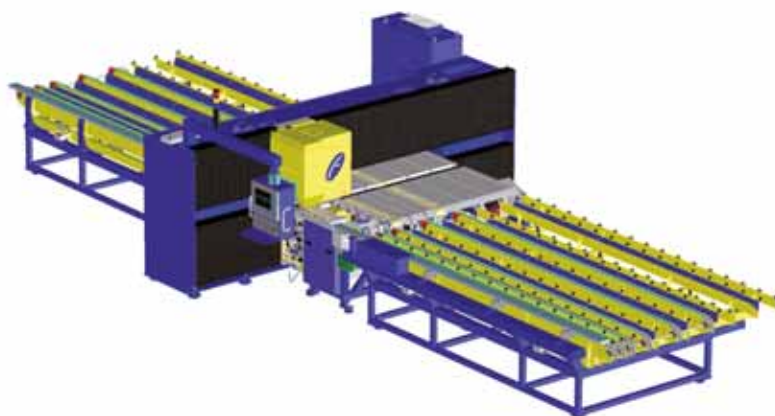
Francesca FC 3300 can load, work and unload two glass panels simultaneously, without intermediate handling.

The maximum useful working field for width is 3300 mm. and without limits for length (according to conveyors sizes)



It is possible to operate on this machine either one piece of glass max. 3300x6000 mm. (according to the conveyors size) or two simultaneous pieces of different sizes (within 1600mm of width).

The **FRANCESCA FC 32M 3300 WJ** is the first machine in the world that automatically controls the positioning of the glass, executing drilling, countersinking and milling operations both with diamond tools and water jet. Another advantage of the combination of the two technology is that the water jet will not need to switch between two pressures to carry out the break through the glass thickness, as it can simply use a drill bit, and then start the cutting motion, leaving the pump working with a single pressure i.e. reducing the pump wear and increasing the maintenance intervals.





Working area	
One glass sheet	X axis Minimum 500mm, Maximum acc. conv Y axis Minimum 400mm, Maximum 3300mm
Double glass sheet	X axis Minimum 500mm, Maximum acc. conv Y axis Minimum 400mm, Maximum 1600 mm
Glass thickness	from 4 to 19 mm. (25 mm. optional)
Maximum drilling diameter	65 mm (70 mm. optional)
Number of spindles	32 (8 each head)

CHIARA SERIES

The Chiara has been designed to achieve flexibility and productivity for glass from 2000x3000mm up to 3300x18000mm with 8/10 spindles grinding heads working on multiple sides and out of square. The possible integration with a CNC work centre on the Multiflex model, allows to perform polished radii in the corners, notches, milling, drilling, without having to reposition the glass. Moreover, it allows to obtain both flat and round edge profiles. The overlapping of two different machining processes on a stationary sheet doesn't require any large sheets handling thus eliminating the risk of damage during transport and zeroing errors, with the consequent dimensional inaccuracies of the machining. Moreover, the machine is able to handle two pieces simultaneously, even if they are different from each other. What really makes the Chiara a unique solution in the configuration for large glass sizes is its small footprint on the shop floor. In fact, when comparing a Chiara straight line to a double edger with the same maximum dimensions, the Chiara will only use 1/3 of the space required.



Maximum glass dimension	from 2000 x 3000 mm to 3300 x 18000 mm (dimensions can vary according to the Chiara model)
Minimum glass dimension	400 x 500 mm (200 x 930 mm optional)
Glass thickness	from 4 to 19 mm (25 mm optional)
Heads achievable angles	-45° + 90° or -120° +120° according to the model
Grinding speed	from 0.5 to 10 m/min

KEY SYSTEM

The KEY concept improves the production expanding the flexibility, reduces the space requirement, shorten the delivery time, improves the quality and makes free workers to operate in other tasks.

This process has to interface with the Forvet equipment, as the technological level requested need the unique flexibility of the Forvet machines range.

The line can cut, break, grind or polish flat and arrisses and can drill, countersink and mill on straight edges or out of square glass.

Storage maximum glass weight	3/4/6 T. based on position
Maximum glass weight	270 kg
Maximum glass size (defined also according to the glass weight)	<=3660x2750 mm
Minimum glass size	400 x 500 mm
Glass thickness range	4 - 15 mm
Minimum trimming cut & snap	5 times the thickness
Glass to glass	110 sec.



COMBIFLEX - COMBINATION & FLEXIBILITY

Combiflex, a multi-purpose machine able to execute multiple glass processes in reciprocal synergy. Glass dimension up to 1500x3000mm with different type and quality of edge finish can be processed on each glass side in less than 32m2. The machine performs automatic loading, grinding, polishing, drilling, notching, water jet cutting, rounding corners, chamfering, washing and automatic unloading operations on flat glass, even out of square or shaped.

COMBIFLEX has been designed to be self sufficient in the execution of all processes. From the loading of the raw glass to the unloading of the completely processed glass, the operator is not required to perform any adjustment during

all processes, even with regards to thickness, shape or dimensional changes. The machine configuration can also be implemented with optional equipment such as:

- Water jet technology
- Compact washing machine
- Automatic loading and unloading system
- MC - CNC work centre
- MC - CNC working centre



Maximum glass dimension	1524 x 3050 mm (60x120 inches)
Minimum glass dimension	410 x 500 mm (13.6 x 16.1 inches) (200 x 900 mm optional)
Glass thickness	from 4 to 19 mm
Heads achievable angles	-120° +120°
Grinding speed	from 0.5 to 10 m / min
Maximum drilling diameter	65 mm (70 mm optional)
Number of spindles	16(8+8)

WASHING MACHINE

Washing and drying operations are carried out by a special washer 1000/1900 mm. long only, conceived and developed by Forvet!

The machine has been designed to obtain excellent result in washing and drying within the specific space limits.

New generation of washing system, granting very high quality.

The machine is equipped with some specific technical new features: in state of the prewash with rinsing water, we have developed an area where the water contaminated with silica and chips is eliminated from the glass before getting to the washing area.

The glass thickness is automatically measured at the beginning of the machine, with a system ensuring that the brushes are optimally positioned against the glass surface. The complete body of the machine is made of stainless steel, and all welds are specially treated to guarantee resistance to rust over time.

Voltage	3/PE - 50 Hz - 400 V or 3/PE - 60 Hz - 480 V
Maximum glass width	1600 mm / 2600 mm
Maximum glass length	according to the line
Number of brushes	2 pairs
Transport speed	1 to 8 m/min
Glass thickness	3 mm - 19 mm



FORBOT

Forbot creates an automatic connection between the working zone (grinding, drilling and milling), and the following processes (tempering, printing, etc.) It temporarily disjoins the upstream and downstream zones, managing a buffer of configurable dimension, it also optimizes the glass sheet load in the tempering furnace and selects the glass located on the rack, positioning it on the following work-bench. Everything is carried out fully automatically resulting in optimized cycle time.



Horizontal glass transport minimum height	885 mm
Glass dimensions with standard structure Load/unload both side Maximum weight	1500x3050x19mm max. 220 Kg
Translation speed axis	60 m/min

SORTIFLEX

Sortiflex is Forvet's response to glass flow sequencing control and optimization requirements. It has been designed to meet the flexibility requirements of various processes, thus it can work with Forvet machinery or integrated with all the other major equipment in flat glass field. It works as a temporal buffer to optimize glass flows from different origins toward single output, or from single origin toward multiple outputs.

The patented double-deck storage area doubles, improving the number of available slots on the same footprint, and increasing the storage area without requesting more factory floor space.

The extremely fast and reliable cycle time allows various processes to be directly linked in full automatic mode. Sortiflex can work only with **Forvet Navetta 45 system (loading/unloading shuttle)**

STORAGE FOR H=1100 mm GLASS

Overall storage dimensions	6140 x 2255 x 1700 mm
Maximum glass dimensions	5850 x 1100 mm
Minimum glass dimensions	400 x 200 mm
Number of slots	29 slots
Slot inclination	3°
Maximum sheets weight Single slot capacity Single storage capacity	max 300 kg max 5000 kg
Maximum glass thickness	15 mm

STORAGE FOR H=2500 mm GLASS

Overall storage dimensions	6140 x 2255 x 3050 mm
Maximum glass dimensions	5850 x 2500 mm
Minimum glass dimensions	400 x 200 mm
Number of slots	28 slots
Slot inclination	3°
Maximum sheets weight Single slot capacity Single storage capacity	max 300 kg max 10000 kg
Maximum glass thickness	15 mm



NAVETTA 45

Maximum glass dimensions	2500 x 4500 mm
Minimum glass dimensions	200 x 400 mm
Maximum sheets transfer speed (X axis)	60m/min
Maximum NAVETTA speed on running guides (Y axis)	200 m/min



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AUTOMATIC SANDBLASTING CABINS FOR FLAT GLASS

NO LIMITS TO SANDBLASTING

Sturdy and compact machines with small overall dimensions, easy to use by any operator, they are characterized by **high productivity** and **low consumption** of electricity and compressed air, and provide a wide range of processing options. It is possible to operate both automatically and manually and the maximum working height can be doubled thanks to the fact that the cabin is **open topped**. As an option, all versions can be equipped with additional **extensions for glass support**, which are 1400 mm long/each.

SANDBLASTING WITHOUT STICKING A MASK ON GLASS

The **Amacor stencils** are purpose-made masks for the automatic carrying out of modular patterns on the glass plate (strips, squares, small circles ...). This system (supplied as an optional item) allows to sandblast without sticking a mask on each glass, with huge reduction of both process cost and production time.



READY FOR INDUSTRY 4.0

All automatic versions are compliant with the requirements of Industry 4.0. thanks to the software **FPSandConnection4.0**. Interconnection, digitalization of the production process and constant monitoring of performance are key factors for the competitive development of glass companies.

TIMELY CUSTOMER SERVICE & E-SHOP

Fratelli Pezza has ex-stock availability of all consumables, from nozzles to technical **spare-parts**. Original spare-parts are made of highly abrasion resistant materials to ensure long lifespan and safeguard proper machine operation. Customers can also count on the **shop**. fratellipezza.com portal through which it is possible to consult the complete spare parts catalog, make orders and take advantage of many other complementary services.

DUST PROTECTION

The sandblasters are equipped with a high efficiency **filtration system** with automatic recovery and recycling of the abrasive material and separation of waste dust. The **rubber gaskets** ensure airtight seal, preventing the dust from escaping into the surrounding environment.



MISTRAL EV+ SERIES, top of the range automatic sandblasting machines for flat glass and mirrors

A STEP BEYOND PERFECTION

The automatic sandblasters of the **MISTRAL EV+** series represent the top of Fratelli Pezza's product range. This series is available in 3 models: **MISTRAL 120EV+**, **180EV+** and **260EV+** (max. working height 1200, 1800 and 2600 mm).

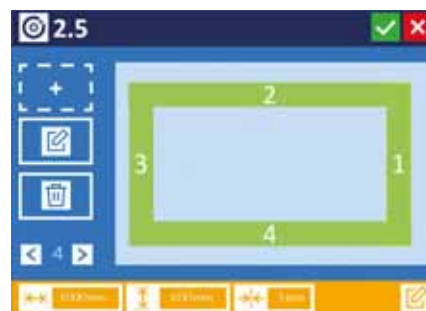
THE BEST OPTION TO SANDBLAST MIRRORS

Mistral EV+ is the most used sandblaster by **LED mirrors** manufacturers. They take advantage of the custom-made software (in particular of the zonal blasting feature) which allows to effectively remove the silvering and optimize the process. Moreover, all models are equipped with "**MirrorProtection**", a revolutionary system that limits the accumulation of static electricity within the cabin avoiding sparks, a phenomenon that often occurs during sandblasting on mirrors.



ZONAL BLASTING

The software of the Mistral EV+ series enables to set several sandblasting areas on the glass plate, and this allows to optimize the processing times and reduce the consumption of abrasive material. A **graphic simulator** shows the programmed blasting areas so that the operator can verify if the programming was properly performed.



www.fratellipezza.com

FRATELLI PEZZA

A NEW WAY TO DESIGN PRIVACY

The **shading effect** on glass, in particular for **shower boxes**, has become a trend in bathroom furniture design. Mistral EV+ allows to carry out different kinds of **gradient effect**, giving a **wide range of decoration options** to interior designers.



		260 EV+	180 EV+	120 EV+
GLASS PROCESSING				
Max working high	mm	2600	1800	1200
Max. glass thickness	mm	50	50	50
Open top		•	•	•
SANDBLASTING TYPES				
Light		•	•	•
Normal		•	•	•
Shading / gradient		•	•	•
Engraving		•	•	•
Zonal		•	•	•
FEATURES				
Automatic gun	nr	3	1	1
Optional automatic gun (on request)	nr		1	1
Manual gun	nr	1	1	1
Self-cleaning filter		•	•	•
MirrorProtection		•	•	•
SOFTWARE				
Storable programs	nr	•	•	•
Multiple blasting passes (for deep engraving)	nr	99	99	99
Adjustable forward step		•	•	•
Adjustable gun speed		•	•	•
Pause&Check		•	•	•
Predictive maintenance		•	•	•
Counters		•	•	•
CONSUMPTION & PERFORMANCE				
Electrical consumption	kW	3	2	2
Compressed-air consumption (for each gun)	L/min.	500	500	500
Working pressure (line pressure)	Bar	6-8	6-8	6-8
Max working speed / 1 m ² *	Min	2	2,5 -3	2,5 -3
OPTIONALS				
Extensions		•	•	•
Amacor stencils		•	•	•
Software FPSandConnection4.0		•	•	•

* This data is purely indicative as it is influenced by several factors.



MISTRAL 260 EV+



MISTRAL 180 EV+



MISTRAL 120 EV+

ZEPHIR+ SERIES, entry-level automatic sandblasting machines for flat glass

SIMPLE AND HIGH-PERFORMING BLASTING

ZEPHIR+ automatic sandblasters represent the best compromise between quality and cost. This series is available in 3 models: ZEPHIR 120+, 180+ and 260+ (max. working height 1200, 1800 and 2600 mm).

ZEPHIR 260+, SANDBLAST LARGE GLASSES WITH A SMALL BUDGET

The new architectural trends have required an increase in the size of the windows and for this reason Fratelli Pezza has decided to add to its product range ZEPHIR 260+, a cheaper version than the top of the range MISTRAL260EV+, for those companies that need to process large glasses but have a **limited investment budget**. The ZEPHIR+ series has always been the ideal choice for those companies that do not have complex decorative needs but simply need to sandblast entire glass sheets quickly and with quality.

CIRCULAR ECONOMY PERSPECTIVE

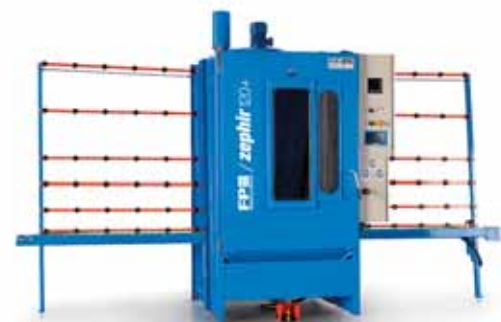
Sandblasting machines are also proving to be very interesting from a perspective of **circular economy**. Glasses with surface defects can in fact be sandblasted and put back on the market, giving them new life and at the same time generating **added value for the glassworks**.



ZEPHIR 260+



ZEPHIR 180+



ZEPHIR 120+

		260+	180+	120+
GLASS PROCESSING				
Max working height	mm	2600	1800	1200
Max. glass thickness	mm	50	50	50
Open top		•	•	•
SANDBLASTING TYPES				
Light		•	•	•
Normal		•	•	•
Shading / gradient				
Engraving		•	•	•
Zonal				
FEATURES				
Automatic gun	nr	2	1	1
Optional automatic gun (on request)	nr	1	1	1
Manual gun	nr	1	1	1
Self-cleaning filter	•	•	•	•
MirrorProtection	•	•	•	•
SOFTWARE				
Storable programs	nr	1	1	1
Multiple blasting passes (for deep engraving)	nr	99	99	99
Adjustable forward step		•	•	•
Adjustable gun speed		•	•	•
Pause&Check		•	•	•
Predictive maintenance				
Counters		•	•	•
CONSUMPTION & PERFORMANCE				
Electrical consumption	kW	3	2	2
Compressed-air consumption (for each gun)	L/min.	500	500	500
Working pressure (line pressure)	Bar	6-8	6-8	6-8
Max working speed / 1 m ² *	Min.	2 min.	2,5 -3	2,5 -3
OPTIONALS				
Extensions		•	•	•
Amacor stencils		•	•	•
Software FPSandConnection4.0		•	•	•

* This data is purely indicative as it is influenced by several factors.

GHIBLI SERIES, manual sandblasting cabin for flat and hollow glass



GHIBLI 70



GHIBLI 140M

		140M	70
GLASS PROCESSING			
Max working height	mm	1400	700
Max. glass thickness	mm	50	50
Open top		•	•
FEATURES			
Manual gun	nr	1	1
Self-cleaning filter		•	•
Foot-pedal control		•	•
CONSUMPTION			
Electrical consumption	kW	1,2	1,2
Compressed air consumption/gun	L/min.	500	500
Working pressure	Bar	6-8	6-8
OPTIONALS			
Turning table		•	•
Easel		•	•

GLASS ARTISTS CAN EXPRESS THEIR CREATIVITY

Ghibli manual sandblasters are the perfect solution to express one's creativity; thanks to the double aperture in front door, the operator can easily handle the glass piece and work on it in the desired way. Fratelli Pezza is proudly supplier of the main Italian glass artists and decorators. An example? "Un artigiano Sognatore", alias Umberto Tofoni, third generation of a family of glassmakers from the Marche region, has created the first **glass bow tie** making it a cult object thanks to the sandblasting technique and the Pezza "Ghibli" sandblasting cabin.



Umberto Tofoni, "Un artigiano sognatore" and Ghibli 70 limited edition

THE IDEAL SOLUTION TO SANDBLAST SHAPED ITEMS

An inclinable platform and a turntable, on which to place shaped objects (vases, sculptures, plates, glasses, etc.) can be assembled into the cabin, this making the manual sandblasting process even easier.

SANDER FP 101, portable sandblasting unit

SANDBLASTING IN YOUR HANDS

SANDER FP 101 is a portable sandblasting unit ideal for **small glass pieces** and artistic purposes. It is equipped with an automatic system for recovery of abrasive material which allows to optimize consumption. A brush, installed on the blasting gun, prevents the abrasive material from being spread around during operation.

SANDER FP 101		
FEATURES		
Manual gun	nr	1
Built-in filter		•
Brush for dust protection		•
CONSUMPTION		
Electrical consumption	kW	1,3
Compressed air consumption/gun	L/min.	350
Working pressure	Bar	6-8



FRATELLI PEZZA, SAND-JET MARKING EQUIPMENTS FOR GLASS AND MIRRORS

GLASS MARKING, A KEY REQUIREMENT

Glass identification requirements, and increasingly stringent regulation in the field of glass for the building industry, make glass marking an important factor today. These equipments represent the ideal solution for every marking need on any type of glass.

EXAMPLES OF POSSIBLE LOGOS

- Company's logo
- Numbers
- Safety standards
- Codes
- Indication of glass type
- Small designs

A CLEAR AND PERMANENT MARK ON THE GLASS

Sand-jet marking equipment allows to carry out a clear and permanent mark on the glass. This fact, together with the high cost-effectiveness of the process, make this technique advantageous in comparison with other marking techniques. Considered the low investment needed and the minimal process costs, this method can represent a convenient solution for large companies as well as for small and medium sized enterprises



GLASS MARKING GETS BIGGER

Marker 101T, Easymarker EV30 and Easymarker UP30 enable to imprint on the surface of glass and mirrors a mark with a diameter of up to **30 mm** in a totally automatic way, ensuring the same quality and sharpness of marking as the standard version with 25 mm diameter. This new solution was designed to respond to the needs of a leading international company in the production and processing of flat glass, which needed to imprint on the glass surface extensive information about the compliance of their products with the international standards related to material safety in the building industry (ANSI, CFR, SCGG, UNI, EN, CE, etc.).



ON/OFF BUTTON FOR LED MIRRORS

The glass marking devices produced by Fratelli Pezza are ideal to carry out on/off touch buttons on LED mirrors as well as to imprint any other sign on smart mirrors. Our marking devices are nowadays the first choice of the major international bathroom furniture manufacturers, as they are very demanding in terms of finish quality and found our device the one that best meets their requirements.



OPTIMIZATION OF THE STEEL MASK

All devices are equipped with a timer to ensure proper use and optimize the production times as well as the life of the steel masks.

MARKER T line, portable sand-jet glass marking units

MARKER 101T / 301T



		101T	301T
WORKING FEATURES			
Portable		•	•
Max. marking area (ø)	mm	25	30
FEATURES			
Manual timer	nr	•	•
CONSUMPTION & PERFORMANCE			
Electrical consumption	kW	1,3	1,3
Compressed air consumption/gun	L/min.	350	350
Working pressure	Bar	6	6
Indicative lifespan of the steel mask (marks)*	nr	500-900	200-400
OPTIONALS			
SQ 101 - Metal Bracket		•	•

* This data is purely indicative as it is influenced by several factors.

EASYMARKER LINE, AUTOMATIC SAND-JET GLASS MARKING EQUIPMENTS

		EASYMARKER UP 25	EASYMARKER UP 30	EASYMARKER EV 25	EASYMARKER EV 30
WORKING FEATURES					
Fixed		•	•	•	•
Max. marking area (ø)	mm	25	30	25	30
Vertical operation		•	•		
Horizontal operation				•	•
FEATURES					
Electronic timer		•	•	•	•
Mark counter		•	•	•	•
Regulation of gun run		•	•	•	•
Foot pedal		•	•	•	•
Start button		•	•	•	•
Connectivity with other machinery		•	•	•	•
CONSUMPTION					
Electrical consumption	kW	1,3	1,3	1,3	1,3
Compressed air consumption/gun	L/min.	350	350	350	350
Working pressure	Bar	6	6	6	6
Indicative lifespan of the steel mask (marks)*	nr	500-900	200-400	500-900	200-400
OPTIONALS					
SQ EMUP - Metal bracket + column		•	•		

* This data is purely indicative as it is influenced by several factors.



EASYMARKER UP 25 / 30



EASYMARKER EV 25 / 30

CONNECTIVITY

A further advantage given by this device is the possibility to totally automate the process by connecting the equipment to other machinery such as washing machines, cutting tables, double-glazing lines, tempering and laminated furnaces, etc.

www.fratellipezza.com

FRATELLI PEZZA

ALUMINIUM OXIDE FOR AN EXCELLENT SANDBLASTING QUALITY

In a very particular and complicated period as regards the availability of raw materials, FRATELLI PEZZA, "one-stop supplier" for everything related to sandblasting and glass marking, is able to offer **immediate availability of aluminum oxide** thanks to consolidated agreements with one of the main international players in the sector and to the wide logistic structure it has at its disposal. Aluminum oxide is the most suitable abrasive material for glass sandblasting and its quality is crucial for the correct functioning of the machinery. The aluminum oxide supplied by FRATELLI PEZZA S.r.l. guarantees to always obtain **maximum performance** from the sandblaster and also offers an excellent ratio between cost and yield. Other abrasives available on the market can perform up to 3 or 4 times lower and often produce an excessive amount of dust, which can compromise the smooth operation of the filtration system. The material is packaged in **25 kg bags** and is available in **different grains**, from the finest to obtain satin effects to the most consistent ones suitable for engraving work. The price varies according to the size of the order, with great economic advantages for the higher quantity ranges.

FRATELLI PEZZA makes its experience available by offering a **free consultancy** service thanks to which it is possible to identify the most suitable grain for the processing to be carried out.



PROTECTIVE COATINGS FOR TRANSPARENT AND SANDBLASTED GLASS

Fratelli Pezza has recently launched on the market MIX 30 PRO and GHOSTGLAZE, two coating products for the protection of sandblasted glass and transparent glass respectively. These products make the glass surface water-repellent, anti-fingerprint and stain resistant. The treatment makes the surface "easy to clean", which is a crucial in a period of time in which surfaces must be regularly cleaned to ensure proper sanitation.

READY TO USE AND QUICK DRYING TIMES

Both products are ready to use and must not be diluted. For a proper application it is necessary to clean the surface to be treated and wait until the surface has completely dried before applying the product. After that, the operator has to spray the product onto the surface and spread it with a clean microfiber cloth until it dries evenly over the surface. Once sprayed, the liquid must be immediately spread. The drying process is very quick, about 1 minute to the touch.

HIGH COMPATIBILITY WITH MOST OF THE MATERIALS

Both products are compatible with many materials: aluminum, steel, gaskets, ceramic, marble, wood, corian, etc. The treated surface can be installed with the use of neutral silicone, acetic or MS polymer.

The products can be applied on glass that has previously undergone nano-ceramic inks digital printing (after oven treatment). The coatings do not yellow and resist to UV rays.

YIELD & DURATION OF TREATMENT

The coverage is about 100 m² / liter with a single pass even on etched or very porous sandblasted surfaces. With proper maintenance, the treatment lasts for more than 6500 washes. The product can be easily reapplied. To ensure a proper maintenance of the treated surface only use water and neutral detergents with a soft cloth.

MIX 30 PRO, PROTECTIVE AND ANTI-FINGERPRINT COATING FOR SANDBLASTED GLASS

A PROTECTIVE COATING FROM THE WORLDWIDE LEADING MANUFACTURER OF SANDBLASTING MACHINES

Sandblasting is one of the most used techniques for glass decoration as well as to ensure privacy in public and private environments. The sandblasted surface, becoming porous, tends to capture fingerprints and impurities, with unsightly results. For this reason, Fratelli Pezza, leader in the production of sandblasting machines for flat glass, has been offering quality products for the care and protection of sandblasted surfaces for more than 20 years, so that its customers can create design solutions suitable for any environment. **MIX 30 PRO** is the enhanced version of the protective coating for sandblasted glass Fratelli Pezza has been selling for many years. The new formula is the result of an innovative nanotechnology which creates a filler that prevents the adhesion of **dirt, limescale, fingerprints and impurities** that tend to deposit into the micropores created by the sandblasting process. The treated surface can be immediately handled, packaged or laid on site.

APPLICATION

The product can be applied on entirely, partially, lightly decorated sandblasted glass or frosted glass.

It is ideal for partition walls, shower boxes, doors, parapets, stairs, windows, tables, furnishing elements, kitchen tops and splash guards, bathroom furniture, floor tiles and many other items.



GHOSTGLAZE, PROTECTIVE AND WATER-REPELLANT COATING FOR TRANSPARENT GLASS



IDEAL FOR SHOWER ENCLOSURES

GHOSTGLAZE is a new nanotechnology product for the protection of transparent glass and it has been formulated to protect the glass surface by making it water-repellent and more resistant to the action of atmospheric agents, without altering its mechanical and aesthetic characteristics. Ease of application, quality of protection and a highly competitive price make GHOSTGLAZE the ideal product to be applied on **float glass, shower enclosures** and any other type of untreated glass, to protect the surface and facilitate cleaning. The glass can be installed and wet after 24 hours from the treatment and can be cleaned with neutral detergents after 72 hours using a soft microfiber cloth.

Nov 23-25, 2022
Mexico City
Mexico



Exhibiting Fee:

Standard Booth: USD368/sqm (min.9sqm)

Raw Space: USD326/sqm (min.36sqm)

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LASERMEK FOR CUTTING AND DRILLING

LASERMEK is expanding with a new technology for float glass straight and shaped CUTTING for thickness up 8/10mm, in an optimal area of 200x200mm adjustable on the customer needs

The cutting laser is suitable to process any geometrical shape cutting for hinges, square holes and similar processes with a perfect cutting result and without chippings, suitable even to glass tempering.

The DRILLING laser allows the holes creation of any shape starting from the classic round hole to holes of any geometry and also of notches on the edge of the glass, with a maximum size of 80x80mm that can reach 100x100mm using very sophisticated optics.

The work times are close to the classic waterjet cutting systems but with a great advantage, in addition to work in the absence of water and abrasive, do not generate waste to be disposed of and above all work with a power of about 3Kw against the power required by the waterjet which is about 40 Kw

Type	Useful dimensions
	1500 x 3000mm
	2000 x 3000mm
	Others on request



LASERMEK SCANNER

LASERMEK SCANNER, laser developed for engraving and ablation of any kind of coating on glass surface.

Able to remove by ablation portions of coatings, including Low-E, which vary from 0.05mm to several tens of millimeters in a single step

For the furniture sector, in particular bathroom furniture and in general where the mirror is required, the laser is able to remove the silvering from the mirror leaving the glass completely transparent, to enhance decorations, for the insertion of TVs, etc.

By choosing an adequate laser source, it is possible to create graphic and decorative workings on the glass surface with matt effect, particularly appreciated for the furniture and building sector, to create logos on already tempered glass, to create partitions, glass doors, windows, etc. .

Ultra fast process, it is an innovative technology for all those companies that are looking for quality and perfection.

Available in various sizes, also on specific customer request.

Type	Useful dimensions
Scanner	1300 x 2500mm
	1500 x 3000mm
	2000 x 3000mm
	Others on request



LASERMEK BEAM

LASERMEK with Beam technology, is a Laser machine designed for the straight and shaped engraving and ablation of the electroconductive coating, pfor all those sector where heating glass is requested. By micro-ablation of Low-E glass for both hard and soft coating is suitable for:

- Refrigeration
Processing of electro-resistive tracks on coating for various types of anti-fog heating glass such as fridge doors and so on.

- Transport
Low-E coating ablation to increase the radio waves permeability for personal passengers devices, in trains, campers, aeroport facades, etc.
- Heating
Engraving of invisible heating coils on heating glass products for heated towel rails. Sophisticated laser process which allows to set the glass temperature with decorative effect
Available in diverse dimensions even on specific customer request.

Type	Useful dimensions
Beam	1000 x 2100mm
	1500 x 3000mm
	2000 x 3000mm
	Others on request



FIREMEK

Firemek is a turnkey Fire resistant glass production system for the production of fire resistant glass appreciated for its use of innovative technology combined with its ease case of use which makes the EI glass production no longer exclusive and even thanks to its affordable price which makes it suitable for medium/small business. The transition from semi-automatic system to an automated system was the natural result of Glass Company continuous desire to research and develop this product. An intumescent and extremely transparent mixture based on Silica is prepared using a vacuum mixer following a process controlled by PLC and by a special dispensing pump is poured between two or more glass sheets according to the fire resistance to be obtained E130, E160, E190, etc. The process is completed in the furnace, where cross-linking takes places by means of specially designed technology.

The Silica intumescent gel under normal conditions, is perfectly transparent and in case of fire the intumescent gel swells creating a rigid and opaque thermal insulation foam that guarantees both fire resistance and mechanical resistance (stability).

Fire resistant glass protects by flames, smoke and toxic gases, prevents the heat transmission through the glass surface and are approved to meet the European and international EI fire prevention standards requirements.





PLASMEK

Plasmek is the most recent Glass Company innovative technology.

Plasmek uses atmospheric pressure plasma for flat glass surface treatment.

It is a cleaning and treatment cell that allows an alteration of the surface tension of the glass in a single step, increasing the adhesion of the products applied in the immediate subsequent stages of processing. Among its many applications, the cleaning and preparation of glass, fundamental prior to digital printing or spray painting, as well as coating of any kind such as antibacterial, antiviral, etc. with the use of technical gases if necessary, in addition to compressed air, are the most impressive characteristics of this technology.

This processing is also essential for certain gluing and adhesion processes with other materials, or in flat glass lamination processes to obtain highly performing finished products compared to standard ones.

HORIZONTAL GLASS WASHING AND DRYING MACHINES

Glass Company Srl, knows how excellent glass cleaning and drying are fundamental in the manufacturing process and offers horizontal Washing and Drying machines that combine high-performance technology, ease of use and competitive price, with functions designed for noise reduction and energy saving, both in terms of the drying fan power consumption and for the water use.

- Especially suitable for float, reflective, Low-E (soft coating) glass and solar glass
- Glass deep cleaning, by means of disc brushes or cerium oxide pads before digital printing, silk screen printing or enameling, lamination both with PVB and EVA
- Water-resistant construction materials (stainless steel)
- Manually operated by selectors or equipped with an intuitive touch screen system controlled by PLC.



VERTICAL GLASS WASHING AND DRYING MACHINES



Vertical washing and drying machines that combine high-performance technology, ease of use and competitive price, with functions designed for noise reduction and energy saving, both in terms of the drying fan power consumption and for the water use.

Composed of loading section, washing section (pre-washing, washing and drying) and quality inspection section

Our vertical washing machines are equipped with:

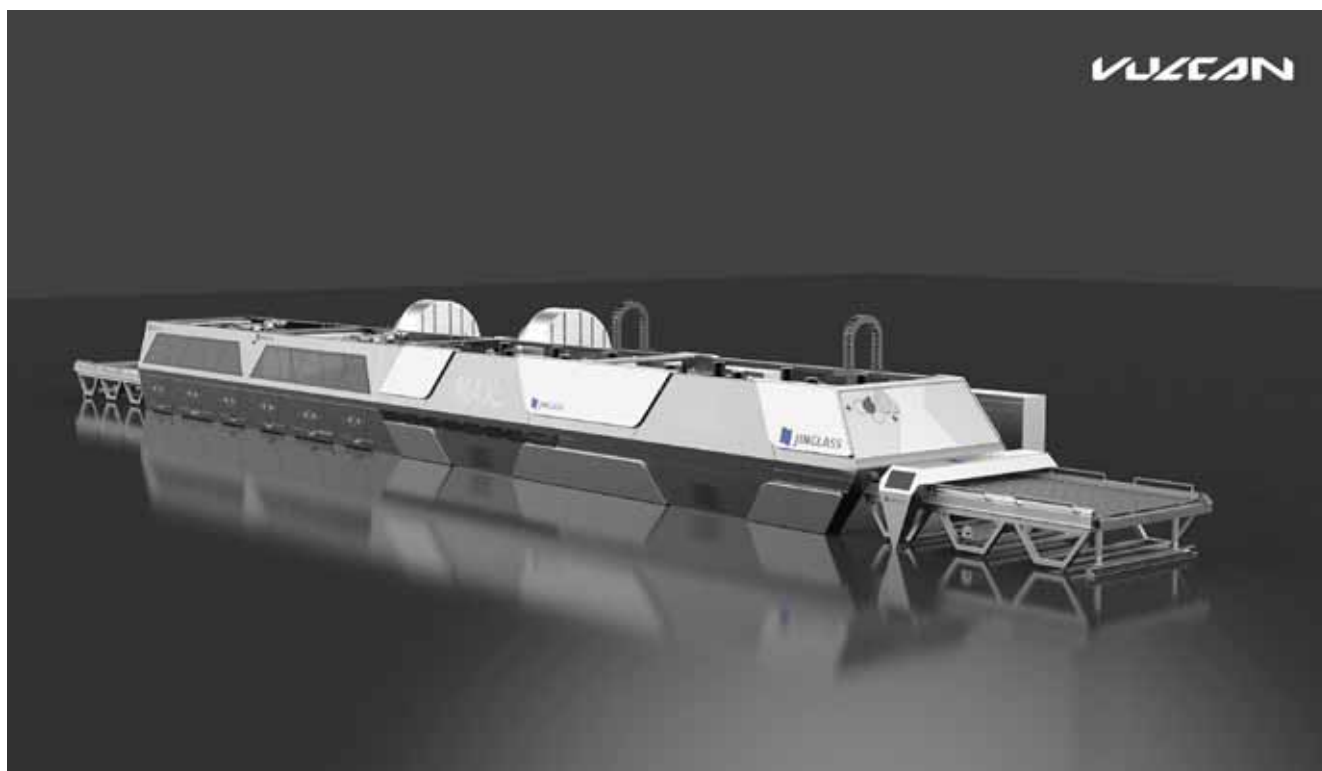
- Double pair of powerful air blades for fast drying
- Stainless steel pre-ashing and washing tank
- Soft brushes for Low-E glass

FLAT AND BENT GLASS TEMPERING FURNACES

Glass Company Srl has been continuing for over 15 years its collaboration with Jinglass for flat and bent glass Tempering furnaces and proposes tempering furnaces for all the glass types in the market, also for thin glass sheets of 2.5mm and semi-tempering for 2.2mm glass, used in the solar and furniture sectors. The furnaces are also suitable for large-sized glass sheets compared to the glass thickness. Our furnaces can be supplied in different sizes and models, for both flat and bent glass.

The tempering furnaces proposed by Glass Company carefully take into consideration the technical needs of the customers and are equipped with a patented real convection Matrix technology suitable for all Low-E glass including triple-silver coating

The new tempering furnace VULCAN combines excellent glass optical quality with very low energy consumption thanks to a very high technology.



helios quartz



HELIOS ITALQUARTZ SRL

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INFRARED MODULES



Complete infrared solutions, designed and customized according to customer needs, and ready to be integrated in existing machines and production lines;

QUARTZ INFRARED HEATERS

In short, medium and fast medium wavelength, in single and twin tube, with or without gold reflector for:

- Laminating lines (plastic film coupling);
- Screen printing lines;
- Bending furnaces;
- Fusion furnaces;
- Laminated glass cutting tables;

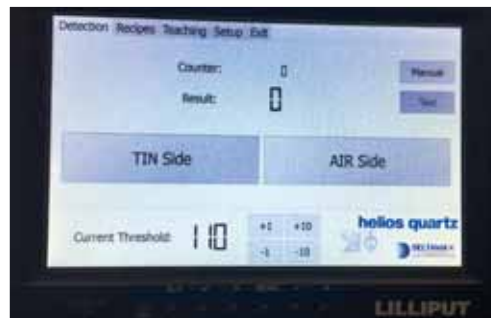


UV POLYMERIZATION EQUIPMENT

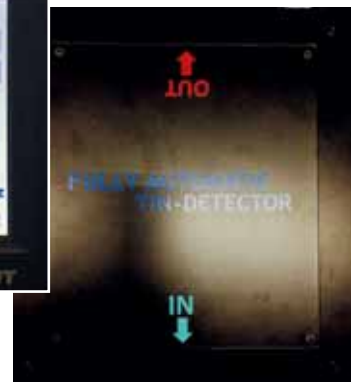


UV high and medium pressure lamps for drying screen printing of reactive inks, paints, coatings and adhesives for the decorating and furnishing sector;

AUTOMATIC TIN SIDE DETECTOR



Compact automatic version of this device. It can be fixed directly on the glass transportation line, before the production process, in order to check each and every piece of glass. A user-friendly PLC helps the operator in calibrating and managing the different recipes.





HORN GLASS INDUSTRIES AG

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HORN Tweel

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

HORN tweel type TW is distinguished by its highly robust mechanical design. With HORN tweel, a glass plant is fully prepared for any situation.

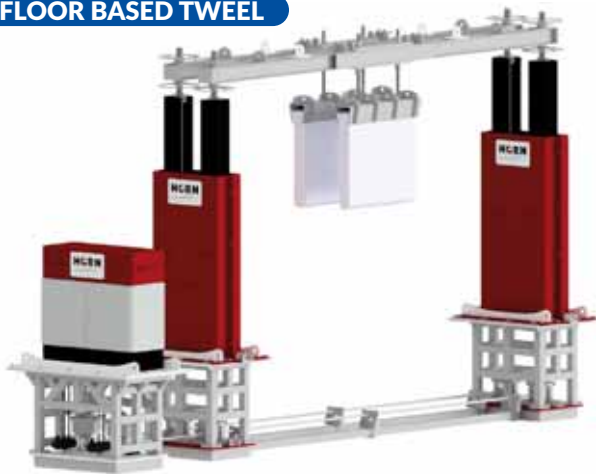
HORN offers two different types of tweels:

- Floor based tweel, which is installed as standard on the working floor
- Suspended tweel, which is installed on the tin bath support steel structure

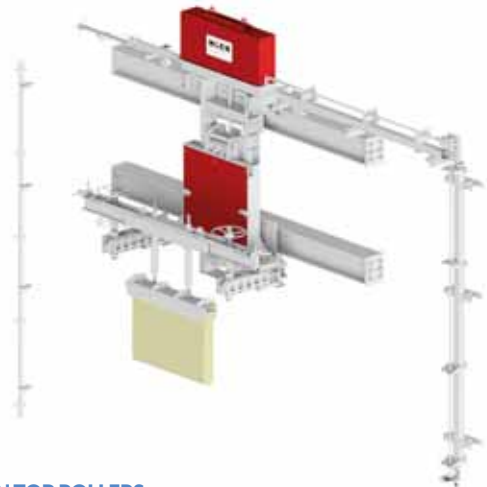
BENEFITS FLOOR BASED AND SUSPENDED TWEEL

- High positioning accuracy of 0.1 mm
- Fast installation due to compact design
- Emergency tweel can be made of refractory material or stainless steel at choice
- Manual adjustment option in the case of failure of power supply of the control system
- Completely free access to spout area with the suspended tweel type

FLOOR BASED TWEEL



SUSPENDED TWEEL



HORN Top Roller

Top rollers are among the most important machines of a tin bath. Top rollers are used in pairs to form the glass ribbon with precise control of its width and thickness. Each pair works synchronously and thereby creates optimal conditions for a smooth production process.

Top rollers are used to produce a glass ribbon that is thinner or thicker than the equilibrium thickness of around 7 mm.

HORN offers two different types of top roller machines:

- The HRTM-F type floor-based top roller, which is installed on the hall floor
- The HRTM-S type suspended top roller, which is suspended from the tin bath steel structure

BENEFITS OF HORN TOP ROLLERS

- Easy and quick installation, operation and maintenance
- Optimised set-up operation and on-site control by means of a mobile touch panel
- Compact design with integrated switch cabinet: the complete wiring and internal pipework up to the interfaces are pre-installed by the manufacturer
- Supplied fully mechanically and electrically tested
- Possibility of installing the periscope on the top roller support frame
- Complete media supply from below at the pivot point of the machine – no bothersome hoses, etc. in the work area
- High safety standard for handling and operation

TOP ROLLER TYPE HRTM-F



TOP ROLLER TYPE HRTM-S





IMMMES Srl

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DTP100

Filtration system for dirty water from glass process.
Size: 100.000 litres/hour.



Subdivided phases follow here:

PROCESSING WATER COLLECTION

Dirty factory water flows through channels to the Collection Tank with possible big parts and extraneous material stopped from entering by an initial filter in a small pit before the collection tank. A fluidization ring with several water jets fed by the primary pump operates at the bottom of the collection tank (see **PUMP STATION**), preventing sludge from collecting within the tank at its corners and bottom.

PUMP STATION

Two identical pumps operate with alternate daily cycles, conducting the water from the tank to the treatment system - each installed with a non-return valve, filter and anti-cavitation system fitted on its intake pipe. To supply the fluidization ring, a small part of the pumped flow returns into the collection tank. The entire DTP system is filled with water, operating completely by pressure from the initial pump, which is maintained right through to the processing machines. Several visual, electronic pressure meters control pump work, so providing information to the main CPU.

DECONCENTRATOR

The physical-dynamic water and glass mud separation occurs within the main tank. Dirty water is pumped into a small hole at the bottom part of the tank before flowing out almost completely cleaned from the tank top. The Deconcentrator has a particular fixed circuit that forces different water flow speeds, so achieving the separation of the suspended solids and glass particles from the main body of water. The glass mud remains automatically in two chambers within the lower part of the Deconcentrator and the clean water at the end of this circuit flows out from the tank top. The glass mud is regularly disposed of from the Deconcentrator by the programmed operation of 2 pneumatic valves (see **SLUDGE DISPOSAL**) whose sequence is controlled at scheduled times by data from the flow controls.

MICRO FILTRATION

Upon exiting, the Deconcentrator water - still pushed by the initial pump pressure - is filtered through a traditional multi-mineral filter whose filtration quality results from this MICRO FILTRATION. Residual solid particle dimensions that are less than 10 microns and total ppm are now at less than 10 mg/lit, leaving the water quality clear (LIMPID). After filtration, the clean water flows directly to the processing machines through an existing distribution ring (always with the pressure generated by the initial pump). Taking about 35/40 minutes,

this mineral filter is self-cleaning on a daily cycle and is typically programmed for night operation at some convenient time (set to automatic start, which can also take place at weekends or during holidays. In automatic-mode, the mineral filter combination of circuits allows for the following: WORK - SELFWASHING - RINSE - FILTER BYPASS - the last being only in safety mode). The rinse (back-flushing) water is dumped to waste. The filter has 2 iron plates inside with dozens of holes on each one - all fitted with an ejector that holds the minerals within the unit and lets the water pass through during the WORK, SELFWASH and RINSE cycles. Dirty water discharged during the self-washing cycle returns into the initial collection tank.

DECONCENTRATOR SLUDGE DISPOSAL

With water heavily charged with glass mud, the Deconcentrator's two sludge discharge lines lead to a "Big-Bag" filtration station. Two disposable big bags filter the water, keeping the bag the solids (sludge) inside and filtering the residual water into a base tank/basin and, from there, back to the initial collection tank. The removal of the big bag, when filled with solid sludge, is made with a simple forklift and replaced with a new one. For a faster dried sludge extraction, the Filterpress (DGS) is available as an OPTION to replace the Big-Bag station. The DGS is given as standard for the systems from 70 m3/hour and bigger.

ELECTRIC PANEL AND CONTROLS

All functions are selectable in Manual or Automatic mode, with normal use being in Automatic. Switches from the control cabinet for each single function enable all these options and a PLC touchscreen enables the management of all parameters and system controls, divided into several user menus. To ensure appropriate power supplied for required water flow, an inverter manages the pump/s RPM and power consumption. The main control board registers all warnings or alarms and a combination of warning lights and/or sounds will raise any situation alerts (customizable). The system includes a connection board to enable aftersales assistance Remote Control or for Remote Staff Control of the system, as desired. The DTP system is equipped with a station for real-time pH measurement and, if necessitated, an automatic adjustment or maintenance system of the value within limits preset by the customer can be performed.

OPTIONAL EXPANSION AND MODULES

The DTP system is perfectly expandable by simply adding other purification modules (Deconcentrator + Filter) to the existing system. Here it's advisable to install the **Predisposition**, where pumps and control systems already support future expansion. If necessary, the DTP can take water to be treated either from the underground tank or from one above-ground (point 1). On request, the system can be controlled remotely, whether directly by management or via mobile devices/PC by operators based at home or in the office (user authentication required). Should the factory be operational 24/24 then there are various ways to keep the system active around the clock - even during the Backwash phase (points 20 and 21). Fully-automatic management, based upon constant analysis and work parameter processing, renders a DTP interface with any machine or central control system possible. On the basis of settable values, expansion is available for data-export or bidirectional consent management (e.g. sending a message to some machine operator - or to the machine itself - in the event of pressure dropping below the 2.0 bar).

GENERAL INFORMATION

In a single water outlet, the DTP supplies its nominal water capacity - all treated and cleaned with the abovementioned quality parameters (see **MICRO FILTRATION**) and suited to 23.5 hours of work on a 24 cycle. If required, a 24/24 (continual operation) module can be an option. To satisfy all requirements from the small laboratory to the giants of glass processing, the system is available in different sizes from 12 to 250 m3/hour (see table). Finally, we invite readers to refer to the **DTP Advantages** sheet to match the above info to a collection of unique benefits and performances. A **Business Plan** template, available upon request, will afford a comparison of current investments and operating costs - either with your existing system or with potential competing choices.

DTP50

Filtration system for dirty water from glass process.
Size: 50.000 litres/hour.



OSMOSIS 300

Reverse Osmosis for water demineralization.
Size: 300 litres/hour for washing machines.



DGS 250-350

Filterpress unit for extraction and compaction of grinding sludges. Size: 250-350. Can be used either as stand-alone filtration unit or as DTP-type systems component.



OSMOSIS 6000

Reverse Osmosis plant for water demineralization.
Size: 6.000 litres/hour for washing machines and cooling systems.



ANTEAONE

Unit for purifying water contaminated by paint and varnish, residue from washing the painting machines.



DGS 630

Filterpress unit for extraction and compaction of grinding sludges. Size 630. Can be used either as a stand-alone filtration unit or as DTP-type systems component.



SLUDGE DGS

Example of compacted and dewatered sludge bricks from the Filterpress, collected in a large bag.





INTERMAC

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MASTER ONE

Master One is a 3- or 4 axis machining centre (3-axis +C) for processing glass and is capable of performing a wide range of machining operations using the best technology, without compromises on performance. Master One boasts an unbeatable balance of quality and market competitiveness, making it a perfect investment. Featuring minimal and ergonomic design, while maintaining a complete range of functions, the Master One work centre is an especially good match for large industries that need elevated productivity, but is also suitable for small artisan glassmakers.

- Reliable and suitable for a wide range of machining operations;
- High performance and speed;
- Ultimate simplicity when tooling, with a wide range of tools;
- Safe and ergonomic;
- Reduced footprint;
- Simple and intuitive.



		Master One	Master One C
Maximum machinable piece size (3-axis grinding with tool of diameter 100 mm)	mm	3300x1500*	3300x1500*
Z axis stroke	mm	285	285
Overall machine dimensions	mm	L-7650 (doors open and vacuum tank) L-7050 (doors closed and vacuum tank) L-6200 (doors closed with-out vacuum tank) W: 4100 H: 2550	L-7650 (doors open and vacuum tank) L-7050 (doors closed and vacuum tank) L-6200 (doors closed with-out vacuum tank) W: 4100 H: 2550
C axis stroke		-	∞
Max axis speed (X - Y - Z)	m/min	70 - 70 - 19	70 - 70 - 19
Work table height	mm	740	740
Electrospindle power in S1	kW	9,2	9,2
Max electrospindle rotation	rpm	12000	12000
Tool coupling		ISO 40	ISO 40
Maximum tool diameter	mm	150	150
Fixed tool magazine	positions	23	23
Tool magazine on head (optional)	positions	8	6
Working air pressure	bar	7	7
Max air consumption	NI/min	200	200
Internal water consumption	l/min	10.5	10.5

*The maximum size that can be machined changes on the basis of the optionals installed on the work table.

VERTMAX

Vertmax is Intermac's range of vertical machining centres based on the revolutionary concept of work piece movement: ideal both for single-batch production and large-scale manufacturing, it also enables less experienced operators to start producing immediately.

Vertmax is the perfect solution for the 'just-in-time' creation of doors, shower cubicles, display cases, cupboard doors, furnishing items, household appliances, windows for industrial vehicles, and structural façades.



- Maximum ergonomics and optimised space thanks to the vertical position of the glass;
- All machining operations in a single machine;
- Tooling times reduced to zero thanks to the automatic configuration of the suction cups which hold the glass in place;
- Extensive scope for machining sheets of both small and large dimensions;
- Maximum flexibility thanks to fully-automated machining and tool setting;
- Ideal for machining monolithic, laminated and low-E glass.

		Vertmax 2.2	Vertmax 2.6	Vertmax 3.3
Maximum machinable sheet size	mm	3500 x 2200	5000 x 2600	6000 x 3300
Minimum machinable sheet size (without the pilot system)	mm	500 x 300	500 x 300	500 x 300
Machinable glass thicknesses	mm	4 - 25	4 - 26	4 -26
Suction cup carriage speed	m/min	80	80	80
Y-axis speed	m/min	40	40	40
Speed of glass feed on input and output roller modules	m/min	30 (optional)	30	30
Electrospindle power	kW	2 x 6.5 (S1)	2 x 6.5 (S1)	1 x 14 (S1) 1 x 6.5 (S1)
Maximum spindle rotation	rpm	12000	12000	12000
Maximum diameter of the front head grinding wheel	mm	150	150	150
Maximum diameter of the rear head grinding wheel	mm	100	100	100
Maximum drill diameter	mm	80	80	80
Tool coupling		ISO 40	ISO 40	ISO 40
Tool magazine	positions	up to 18+19	up to 18+19	up to 18-19
Maximum power required	kW	63	63	63

BUSETTI F-P SERIES

Competitive and efficient, those are the key words when responding to an increasingly demanding market: Intermac meets the expectations of the glass industry with highly personalised solutions and elevated reliability.

Intermac develops cutting edge machines and systems for bilateral grinding, allowing our customers to exploit the Fourth Industrial Revolution and become "Smart Factories".

The Intermac technological solutions guarantee high-quality, reliable performance over time. The Busetti F and P series are two ranges of double-edging machines and systems that are ideal for applications such as structural façades, interior structural elements, glass for furnishings, household appliances and solar panels, which call for reliable and customisable solutions that provide for the highest quality and precision along with total flexibility, with minimum operator intervention.

Our spindles allow for several configurations, which means they can be completely personalised to achieve special machining of borders for furniture, the structural sector, and dividing walls.

Innovative solutions, including automation, make for a production line that is flexible and performs well even for small batches and a variety of thicknesses. At the same time, innovative systems like the presetter for diamond grinding wheels, automatic management of polishing pressures, motorised lubber lines and other optionals help reduce setting times and simplify use of the lines.



GENIUS CT-PLUS

Genius CT-Plus is the range of cutting tables for float glass particularly suited to extremely high performance lines. Thanks to the option of being able to integrate the breakout bars with the transport belts, the Genius CT-Plus guarantees maximum productivity and optimisation of the cutting process in small spaces, allowing for handling and breakout to take place on a single work bench without having to resort to the use of service tables.

The range of Genius CT-Plus cutting tables is perfect for the most demanding glassworks, which require heightened performance in order to sustain elevated production loads.

Intermac and movetro glass machining technologies incorporate the key concepts of industry 4.0, propelling our customers into the era of digital manufacturing. The combination of Intermac and Movetro technologies generates ideal solutions for every need.



TECHNICAL SPECIFICATIONS		38 CT-PLUS	GENIUS 61 CT-PLUS	GENIUS 61 CT-LINE
IN LINE CONFIGURATION				
Machinable dimensions	mm	3810x2800	6100x3355	6100x3355
Machinable thickness	mm	2-19 (opt 25 mm)	2-19 (opt 25 mm)	2-19 (opt 25 mm)
Max axle movement speed	m/min	200	200	200
Max acceleration	m/sec ²	10	10	10
Precision of cut according to specifications	mm/m	± 0,15	± 0,15	± 0,15
Straight and shaped optimisation (optional)		yes	yes	yes
Sheet transfer speed	m/min	40	40	40
Work table height	mm	900 (-15 / +40)	900 (-15 / +40)	900 (-15 / +40)
Installed power	KW	12 (13.2 Comby)	16.3 (20 Comby)	10.5 (opt air 16.3)
Overall weight	Kg	2500 (2850 Comby)	4150 (4500 Comby)	4150 (4500 Comby)

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DIGITAL TEMPLATES WITH THE PROLINER



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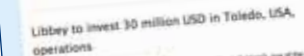


Just some of today's news on GlassOnline...

GLASS SERVICE - 18th Int'l Seminar on furnace design



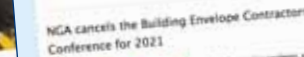
Libbey to invest 30 million USD in Toledo, USA, operations



NGA cancels the Building Envelope Contractors Conference for 2021



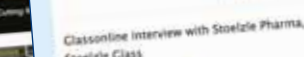
Glassonline interview with Stoelzle Pharma, unit of Stoelzle Glass



Heye International - advantages of process visualisation



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STOELZLE MASNIÈRES PARFUMERIE: Working closely with brands, using an eco-responsible approach



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PLATFORM TRANSPORTERS

Self-propelled transporters with loading capacity ranging from 5 to 60t and beyond, used for handling flat glass on stillages. They find application in the handling of glass racks from the stackers to processing lines and warehouse handling.



INLOADER TRANSPORTERS

Vehicles for transporting glass on jumbo size stillages from the stackers of the float line to the warehouse, as well as for performing normal handling within premises. They are usually equipped with a 33t loading capacity; upon request, versions with a loading capacity of 45t and over can be made available.



SIDE-LOADERS

Machines for transporting glass packs within the factory. They have independent PLC-controlled wheels for moving in all directions. Versions with loading capacity ranging from 3 to 20t and more are available, which can transport all glass sizes, from DLF or LES to jumbo and XXL jumbo sheets.



SPECIAL-APPLICATION SIDE-LOADERS

By continuing to design innovative vehicles that are applied in different sectors of the glass industry including laminated and solar glass, Italcarrelli develops tailored side loaders with hydraulic equipment, attachments and clamping devices, for handling packed glass or on special racks.





CONTAINER LOAD / UNLOAD

The patent by Italcarrelli for the loading and unloading of box glass from closed top containers thanks to its hydraulically extensible arm which can rotate by 90° to the right or to the left. This machine finds application in the handling of glass from containers and 40ft containers, on warehouse racks, from containers on loading deck or on truck.

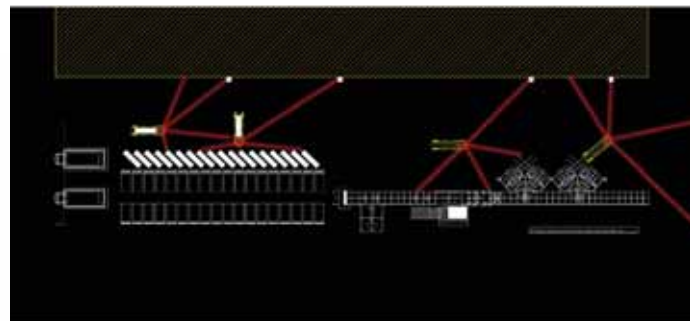
LAMINATED GLASS HANDLING

Available with load capacity beyond 60t, these lift trucks can be used in the handling of laminated glass within the autoclave, depositing the rack with glass inside the autoclave and moving it again once the process is finished.



AGVS/LGVS

Italcarrelli can transform its machines into Automated Guided Vehicles, featuring inductive and optical guidance systems, yet above all Laser Guided Vehicles.



The laser guidance is an innovative and smart system that can be installed on any vehicle to turn it into a self-driving machine. This system provides very high accuracy, even more than 5 mm in terms of positioning. It is very flexible since the routes can be easily generated, modified or extended, without particular impact on the facilities.



ITALMATIC PRESSE STAMPI SRL

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AUTOCLAVES AIV SERIES 3.000 - 3.300 - 3.800



The new line of autoclaves, "Industry 4.0 ready", designed to process curved and flat glass with the best loading flexibility both horizontally and vertically, with silicone bags or disposable bags.

The autoclave can be placed on the floor without needing to be pits and can produce laminated glass up to 3210mm sheets.

The vacuum is controlled automatically by means of an advanced control system that satisfies the most restrictive process requirements.

The plant can be supplied with automatic or manual loading systems complete with all operating safety devices.

AUTOCLAVES AIV SERIES 4.000 - 4.200 - 4.400

Where production needs become important Italmatic presents the new line of autoclaves for large glass production "Industry 4.0 ready", with load capacity up to 40 tons.

The autoclave is pits into the floor and served by an automatic loading system that allows effective handling of the glass to be processed and processed, in the shortest time and in complete safety.

Laminated glass up to 3210mm sheets can be treated in both curved and flat versions. The lamination cycle is controlled automatically by an advanced control system ICS (Italmatic Control System) which allows the complete traceability of the process with identification of the production batches.

The plant can be supplied with integrated MES systems for interfacing with factory management systems.



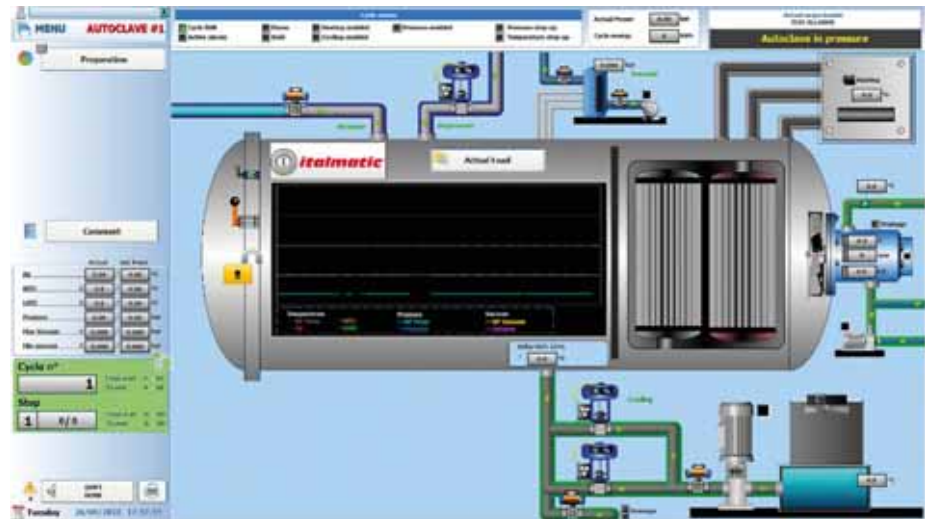


ICS (ITALMATIC CONTROL SYSTEM)

ITALMATIC has its own "software house" which develops all the control systems for all its machines. This means that ITALMATIC always ensures direct assistance and possible customized development to all its customers, not having to resort to third-party companies that can create delays or even waivers to assist customers.

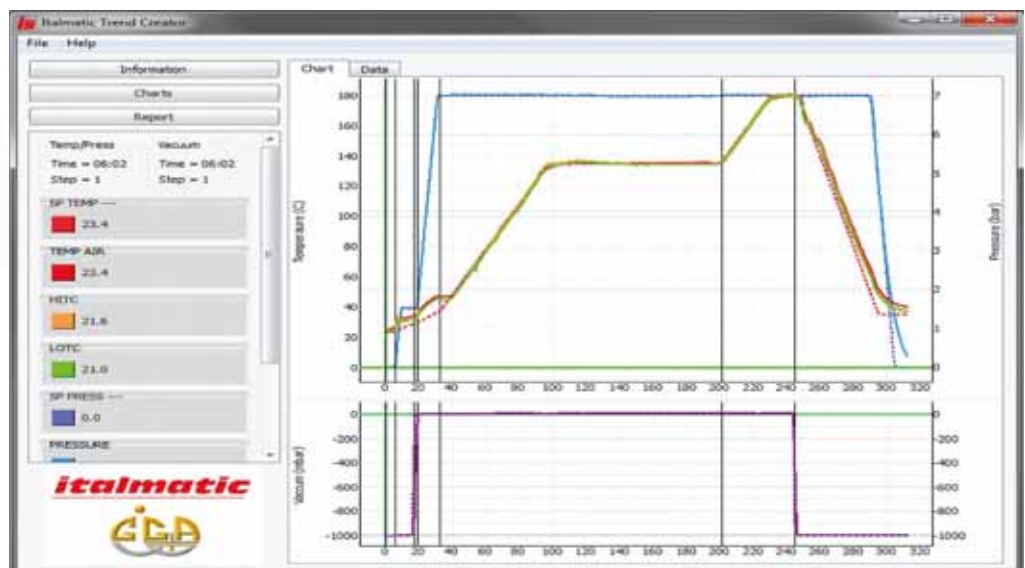
The ITALMATIC advanced control system **ICS (Italmatic Control System)** consists of a software application package dedicated to the application of glass lamination with PVB and EVA, which fully satisfies the most restrictive regulations on the market in terms of quality and traceability.

All our software is "Industry 4.0 ready" and interfaceable with company management systems with dedicated MES, and all our machines are assisted with remote assistance from our dedicated technical service, which supports all our customers anywhere in the world.



ITW (ITALMATIC TREND VIEWER)

ITALMATIC offers its customers free of charge a special software called "Viewer" that can be installed on any PC, which allows you to view all the cycles carried out in the autoclave in order to carry out qualitative tests and / or in-depth reporting for each batches produced.





ITALMOLE SRL

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ASTRA

A new technology wheel: high performance, super polishes with excellent adaptability, excellent durability with much lower price. Available with internal cooling and in peripheral form, excellent on vertical CNC machines such as Vertmax, CMS, Skillglass and horizontal machine such as Master, CMS and Bottero-Bimatech.



ARRIS WHEELS LINE

Types BLACK/AR2 are advised to polish the arris after diamond wheel, types RED/AR1 are advised to make the arris without diamond wheel. All types it can be supplied with any type of plate for all type of machines.

AB4 type, becomes very famous in recent times, is advised to polish arris on double edger and straight machine. It guarantees a perfect and brilliant result.



CUP WHEELS LINES

Wheels product for all type of machines in grit 40-60-80-120, available with rigid plastic plate, aluminium plate and special plate J40 for Bavelloni. On request with slots for laminated glass.





KERAGLASS INDUSTRIES SRL

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VISION 800

OSCILLATING TEMPERING FURNACE TO TEMPER THE LATEST GENERATION GLASS SHEETS

Regarded as a revolutionary machine in the flat glass tempering sector due to its high quality and efficiency standards (particularly its ability to produce low-E and large panes with an emissivity of 0.01), combined with an aesthetic profile that ensures functionality, high performance and visual appeal all in one. This marvel of innovative technology is the result of long-term research backed up by ongoing dialogue and discussion with client companies. The heart of the machine is the Supervision Intelligent system with live-sight control, which allows the operator to clearly see and precisely monitor each stage of the process. The result is a glass end-product without any hidden defects that is made to measure and tailored to clients' requirements, with all the requisites needed to decorate the walls of modern buildings while ensuring energy saving and environmental sustainability. Numerous installations around the world confirm the immense success of this machine, which is recognised as a best-seller in the production of the latest generation tempered glass.



CHARACTERISTICS

- Big size low-E glass sheets E=0.01
- Tronik System: modular convection system based on blowing air preheated to 700°C
- Minimises optical distortion of the glass
- Dynamic heating cycle (DHC)
- Thermal insulation up to 1250°C
- Scanner control for constant monitoring of glass surface temperature, with storage of loads and product certification
- Supervision Intelligent: live-sight control system with large touchscreen monitor providing perfect visibility, plus a simple and intuitive user interface for fast and accurate diagnostics
- Kerasoft: software interface to control power consumption and scheduled maintenance
- Compatibility with RCK, an extremely precise roller cleaning machine with a rapid system of interchangeable pads

DINAMICA

SINGLE AND MULTI-PASS DIGITAL PRINTING LINE

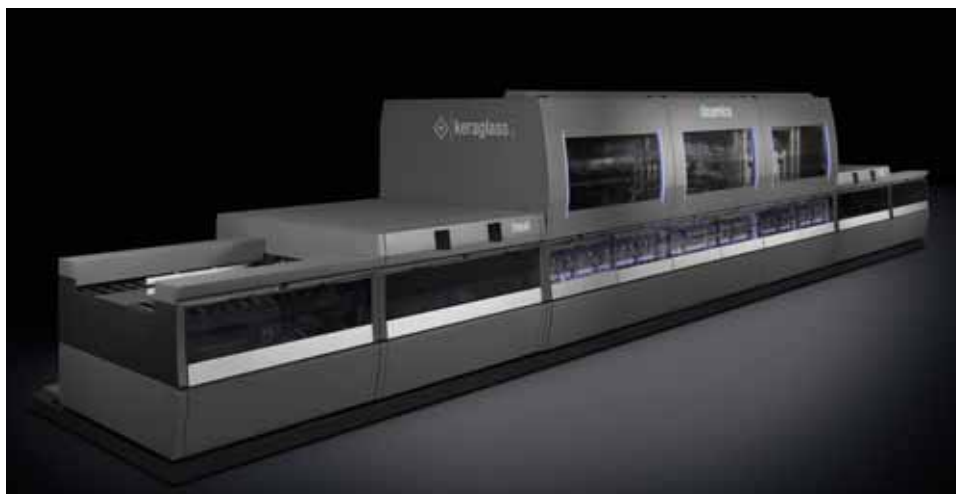
The Dinamica digital printing line combines the flexibility of digital printing with the high speed typically associated with traditional screen printing. This innovative solution can satisfy the requirements of the most exclusive design projects, in the home appliances, interior design and automotive sectors in particular.

This revolutionary dynamic digital printing system allows faster reproduction of any image on glass surfaces. The operator can choose between two printing types: "multi-pass" or "single-pass".

CHARACTERISTICS

- Excellent versatility both in "single-pass" and "multi-pass"
- Dimensional pre-check of the glass sheet
- Extreme flexibility in size and graphic
- Consisting of 3 or more colour bars, individually removable for easy maintenance and cleaning
- High colour intensity and fast print speeds, electronics for each printing head with 7 variable drops, fast replacement and alignment
- The supervision software provides full control of ink management parameters: temperature, pressure, circulator pumps and level sensors

- The heating and post-drying processes are provided by IR lamps mounted above the roller conveyor
- A large touchscreen with a full graphic interface supervision system allows total control of the line. Easy to use, the system reduces machine downtimes and operator errors thanks to the integrated scheduled maintenance system





LISEC AUSTRIA GMBH

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KSD-A

VERTICAL EDGE SEAMING AND GRINDING MACHINE WITH LITEC SLIDER TECHNOLOGY

The new KSD-A from LISEC is currently the fastest vertical seaming and grinding machine with peripheral wheels. The machine combines massive processing flexibility with stable and reliably high quality.

HOW IS THE KSD-A CONFIGURED?

Depending on the machine length, the KSD-A consists of several elements in a modular construction. At the heart of the system is the processing tower with a high-speed X-axis for glass transport and optionally one or two processing heads mounted on separate vertical axes. The perfect waterproofing of the axes ensures long-term stability and easy accessibility.

HOW DOES THE KSD-A WORK?

The KSD-A was developed for the fastest possible cycle times and the greatest possible flexibility. The sheet is received by a high-speed axis with suction cups, which measures the position of the sheet a few times. After automatic measurement of the height of the glass sheet "on the fly", the edge is seamed or ground in an arbitrary number of cycles. The flexible tool configuration allows processing of different glass thicknesses without changing tools.



WHAT ADVANTAGES DOES THE MACHINE OFFER?

The two greatest advantages of the system are the perfect seaming quality - independent of the quality of the cut glass - and the outstanding processing flexibility. The newly developed and patent-pending floating tool of the LITEC slider series ensures perfect edge seaming and grinding results even with poorly cut or faulty glass. LITEC slider seaming and grinding tools use water pressure to feed the tool. This enables highly ergonomic and efficient feeding of the processing tool to the glass.

HIGHLIGHTS

- Perfect seaming quality every time, thanks to the use of LITEC slider technology.
- Rapid seaming and grinding of a wide variety of glass lites sheets in one machine.
- Maximum dynamics and speeds of all axes.
- Optimised for use in insulating glass lines and after glass cutting.
- Automatic measurement of rectangles possible as standard.
- Flexible tool configuration for processing without tool change.
- Tool holder change directly from the front side of the machine. Tool set-up on the tool holder is possible during processing.
- Optional: Second processing head for even faster cycle times.
- Modular extension of the glass length possible with additional transport sections.
- Perfect waterproofing of all axes for maximum system availability.
- Easy access to all components for service and maintenance work.



PERFECT SEAMING QUALITY IN EVERY SITUATION

By using the LITEC slider technology, the seam quality is no longer dependent on the quality of glass cutting. Even glass sheets with poorly cut or broken edges are processed reliably on the KSD-A.

RAPID AND RELIABLE

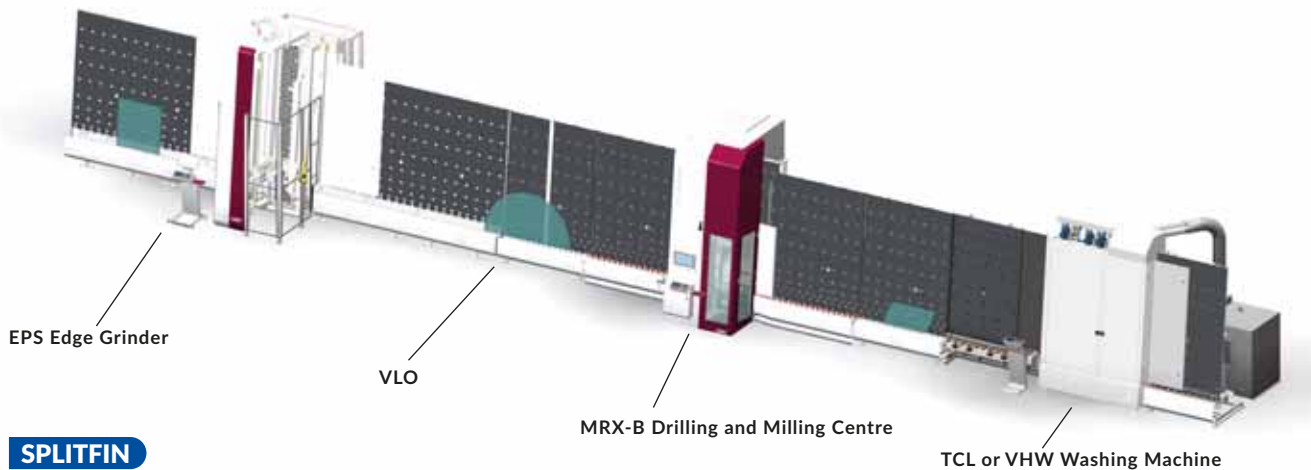
The machine was developed for use in highly productive lines, based on decades of experience in processing glass sheets. The KSD-A is a dual system for edge seaming and grinding applications in the flat glass processing industry, delivering the shortest cycle times in combination with the utmost in reliability and complete flexibility.

DIVERSE CONNECTION OPTIONS

The machine's control options are as diverse as the customers' requirements. From the manual input and the automatic measurement of rectangles, to direct connection via production control systems, the KSD-A enables every form of integration.

TECHNICAL DATA

	KSD-A20	KSD-A25	KSD-A30	KSD-A33
Maximum glass height (mm)	2,000	2,500	3,000	3,300
Maximum glass length	Modular			
Minimum glass dimension	Seaming 350 x 180 mm / grinding with material removal 700 x 180 mm			
Glass thickness	2.3–19 mm (seaming from 4 mm glass thickness)			
Number of processing heads	One processing head is standard, with the option of a second head			
Transport height	520 mm / other transport heights on request			
Tilt angle for glass transport	6°			
Tools	LITEC slider - diameter: 150 mm / holder: HSK-50			



THE TURBO FOR YOUR GLASS PROCESSING

The SplitFin is a vertical processing line for edge and inner processing of flat glass lites sheets, and is currently the fastest vertical processing line on the market.

HOW IS THE SPLITFIN CONFIGURED?

To significantly reduce the cycle time for processing, the SplitFin is divided into two processing towers. The first tower - the EPS-B - performs the sheet grinding and polishing, i.e. the complete edge processing. The second tower - the MRX-B - implements all internal processing and is optionally equipped with a water jet unit. After processing is complete, the VHW reliably cleans the sheets. The line is flexibly configurable and can also be designed with only one processing tower. Subsequent integration of the second machine is possible at any time.

HOW DOES THE SPLITFIN WORK?

Loading can take place either manually or by means of automation (sorting / robot / etc.). Inputting the processing data is also flexible (simple graphic input at the machine / DXF import / data interfaces), whilst the processing that follows is fully automatic. The entire weight of the sheet is borne in the EPS-B by a stable suction axis and it is polished with the utmost precision using either one or two processing heads.

Once edge processing is complete, the sheet is automatically transported to the MRX-B. Here, internal processing is also carried out fully automatically. This takes place either using diamond tools or by means of a modern water jet unit. A combination of both is also possible.

Following automatic transport to the washing machine and successful cleaning of the sheet, it is removed from the line or automatically transferred to downstream processes. In line operation, both processing machines outwardly appear to operate as a single unit. Data is automatically transferred between the machines, which can also be operated individually or in combination mode. It is therefore additionally possible to load sheets from other edge processing machines (e.g. DOUBLE-EDGING Grinding-Machines) directly at the MRX-B inlet.

FOR WHOM IS THE SPLITFIN SUITABLE?

The SplitFin is modular by design. This applies to both the machine sizes and the available options. Due to this broad scope of possibilities, the SplitFin is designed for all glass processors who specialise in high-quality processing in interior areas, as well as for roofing, railings, etc. The rapid cycle times equate to correspondingly high sales levels, and the focus is therefore on industrial applications.

WHAT ADVANTAGES DOES THE MACHINE OFFER?

The biggest advantage of the machine is the high productivity and the associated rapid ROI. The SplitFin is currently the fastest vertical processing line on the market, and even the standard version is able to achieve incredibly short cycle times thanks to the cycle time-optimised systems and the split processing. By integrating the second grinding spindle on the EPS, cycle times of < 200 seconds for a finished door (polished edge, 2 Mickey Mouse cut-outs and handle hole) can be achieved in real production. An output of 80 to 120 sheets per shift is realistic in average production.

The SplitFin impresses with high flexibility, both in application and processing. Operation in stand-alone machine mode is possible in equal measure to the subsequent extension of the line with the second tower or the retrofitting of certain options (automatic tool changer, water jet) to increase the output. The SplitFin can be operated entirely flexibly from a batch size of 1. With this system it is irrelevant whether a small sheet is followed by a large one, or if a rectangle is followed by a shape. Each sheet is finished fully automatically with the highest quality and speed.

The SplitFin is also setting a new standard when it comes to operability and ease of maintenance. The automated system reviews the actual situation on the machine constantly and detects deviating process parameters fully autonomously (incorrect sheet dimensions, deviating forces during processing, deviating vacuum values, etc.). The deviations are resolved independently by the machine if possible, for example through an autonomous reduction of the feed rates. Thanks to the intelligent design, all maintenance positions are readily accessible and important components are kept completely separate to the wet area. Machine maintenance and cleaning are simple and straightforward.

Further advantages:

- Fastest cycle time with complete flexibility and stability
- Glass surface is not touched throughout edge processing
- Final polishing possible without a tool change (three tools on one tool holder)
- Two equivalent processing spindles are installed at the front and rear of the MRX-B
- Rapid tool changer on the MRX-B internal processing unit, tools always carried along with the spindle
- Autopilot for processing (speed adjustment, validation systems, etc.)
- Production of sheets from other edge processing machines possible on the MRX-B, even during line operation
- Possible to produce polished round corners and bevelled corners without lost cycle time
- Cycle time pre-calculation for operators facilitates simplified planning

TECHNICAL DATA	
Glass thickness	4 - 20 mm
Maximum glass height (mm)	2,000 / 2,500 / 3,000 / 3,300
Maximum glass length (mm)	3,300 / 4,000 / 5,000 / 6,000 / 8,000
Minimum size	600 x 180 mm
VLO (second vertical transport lane)	Yes / No
Water jet	Yes / No
Washing machine	TLC / VHW



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ATS XTREME PROFILE CONVECTION

ATS 4.0 is the series of furnace for tempering architectural glass that includes all Mappi International technology: their use guarantees great production results and quality thanks to innovative solutions that meet the most demanding market standards.

This tempering furnace has been designed for medium and large glassworks, which want to add an extremely flexible and efficient machine into their production. Some of the features that make each ATS 4.0 furnace unique:

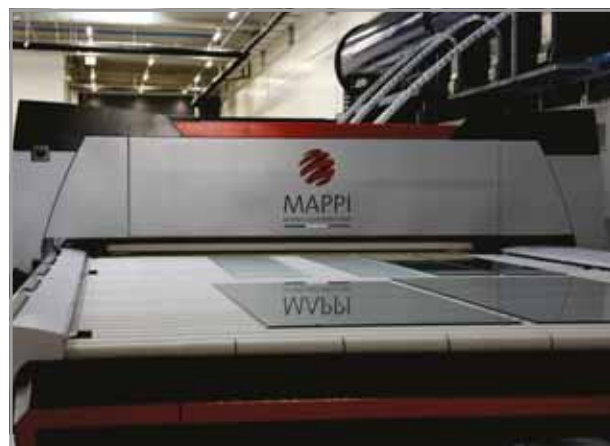
- **Minimize the tempering cycle and maximizes productivity:** ATS 4.0 guarantees high production volumes, as set-up times for each workload are nearly zero. Equally important, the time required to cold start the tempering furnace is minimized to just an hour. This translates into many more production hours saved each year which, when multiplied by the lifetime of the Mappi furnace (estimated at least 20 years) - best expresses its superb production efficiency.
- **GHBS Xtreme Profile Convection:** Real Convection, top and bottom, is the State of the Art in Convection Systems allowing reliable processing of "Low E" glasses down to 0.01. The new GHBS Xtreme Profile Convection was developed following an in-depth study on the upcoming coated glass that will be soon on the market. There is precise control of convection air distribution in the upper and lower heating chambers separately.
- **Extraction of the heating chamber:** allows maintenance operations quickly and efficiently.
- **ATI Active Thermal Insulation:** No energy loss thanks to **Hi-Tech 350mm State of the Art Insulation**. The furnace is perfectly insulated thanks to excellent insulation materials and state-of-the-art construction - so much so that you can even touch it with your hands while it is in operation.
- **Energy saving:** Thanks to the coordinated use of software solutions (such as MHS, ESS, IHS etc.) the furnace only heats up to the right temperature in the area where the glass is located. Here energy saving can be up to 40%.

- **Advanced Cooling:** a new quench cooling nozzle design and a new angle empathize the already very low anisotropy and iridescence of the glass.
- **Use of the best components on the market:** we use the best components and the latest technology to be unrivalled in quality and product life cycle. This is also great for the customer who can source components from any market.
- **First in the glass industry to be appointed "POWERED BY SIEMENS":** all Mappi tempering furnaces are certified "Powered by Siemens", ready to be integrated with a potentially infinite number of software applications compatible with Siemens MindSphere, and to communicate in real time with other machines and with the Company Management, Logistics, Maintenance and Planning.
- **Safety first:** Mappi furnaces do not use SO₂, a material that is harmful to the health of the workers and the furnace. In fact, being dangerous and corrosive, the use of SO₂ causes the deterioration of the rollers handling the glass and makes it necessary to stop the machine for maintenance every 15 days.
- **Made in Italy:** Completely manufactured at Mappi's Cisterna di Latina headquarters
- **SUPERTEMPER™**



LOADING AREA	1500x3800	1800x3000	1800X3800	1800X4200	2200X3800	2200X4200	2500X4200	2500X5000
mm	1500x3800	1800x3000	1800x3800	1800x4200	2200x3800	2200x4200	2500x4200	2500x5000
inches	60x150	70x120	70x150	70x165	86x150	86x165	98x165	98x196
thickness	3 to 19 mm	3 to 19 mm	3 to 19 mm	3 to 19 mm	3 to 19 mm	3 to 19 mm	3 to 19 mm	3 to 19 mm

ATS J XTREME PROFILE CONVECTION



ATS J XTREME CONVECTION is the series of furnace for the tempering of architectural jumbo glass dedicated to those who need a large furnace while maintaining all the quality and innovations of the ATS 4.0.

Some of the features that make each ATS 4.0 furnace unique:

- **Minimize the tempering cycle and maximizes productivity**
- **GHBS Xtreme Profile Convection**
- **The removal heating chamber**
- **ATI Active Thermal Insulation**
- **Energy saving**
- **Advanced Cooling**
- **Use of the best components on the market**
- **First in the glass industry to be appointed "POWERED BY SIEMENS"**
- **Safety first**
- **Made in Italy**

LOADING AREA	2500X6000	2700X6000	3300X6000
mm	2500X6000	2700X6000	3300X6000
inches	98X236	106X236	130X236
thickness	4 to 19 mm	4 to 19 mm	4 to 19 mm

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MAPPI INTERNATIONAL

FOX SERIES

Fox is a series of compact tempering furnaces, with loading dimensions starting from 1050x2300 mm, designed for medium and small glass processing companies. The Fox series has the most advanced features offered by technology in the industry.

Some of the features that make each Fox series furnace unique:

- Minimize the tempering cycle and maximizes productivity
- GHBS Xtreme Profile Convection
- ATI Active Thermal Insulation
- Energy saving
- Advanced Cooling
- Use of the best components on the market
- First in the glass industry to be appointed "POWERED BY SIEMENS"
- Safety first
- Made in Italy
- SUPERTEMPER™



LOADING AREA	1050X2300	1250X3200	1500X3200
mm	1050X2300	1250X3200	1500X3200
inches	41X90	49X126	60X126
thickness	3 to 19 mm	3 to 19 mm	3 to 19 mm



SUPERTEMPER™

SUPERTEMPER™ the latest technical solution we have developed to meet a precise market requirement for fire-resistant glass (Certified E30). The higher mechanical resistance required for this type of glass (160 MPa) led us to study a unique and innovative solution.

Thanks to **SUPERTEMPER™**, through the use of a different management of heating and cooling phases, anyone with a MAPPI furnace will be able to:

- Enter a niche market with high profit margins.
- Offer fire resistant glass with the same production costs of normal tempering.
- Open new commercial horizons as this type of glass is making its way into a wide range of applications (Construction and Interior Design)

All this without adding boosters or compressors, changing the layout of the furnace or needing more electrical capacity.

HST

The heat soak test is used to minimize the risk of spontaneous breakages of heat-treated glass caused by nickel sulfide inclusions. In this process, glass panels are placed inside a chamber and subjected to a furnace temperature of 290°C for two hours (with a tolerance of $\pm 10^\circ\text{C}$) to accelerate the expansion of the nickel sulfide. This causes the glasses containing nickel sulfide inclusions to break in the heat soak chamber, thus reducing the risk of potential in the field breakages. The full heat soaking process involves testing all glass in order, virtually eliminating any possibility of nickel sulfide breakage. Heat soak testing is recommended for all tempered glass intended for outdoor applications subject to variable temperatures. It is not normally required for interior applications.

The furnace is manufactured in accordance with European standard EN 14179-1.





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TP COMPACT

Try to imagine a glass tempering machine so compact that it can enter in a small glassworks.



It shall let the owners of the business to manage the whole tempering productive system without outsourcing it. This machine is so **efficient** and **adaptive** that it can guarantee you the best quality on the market combined with the **lowest energy consumption** of the category. Now try to imagine that you can use this machine whenever and however you want and also you do not need to be an engineer or a specialized technician.

To use this machine proficiently, you just need to handle a user-friendly touch screen interface as you do every day with your smartphone.

We are pleased to introduce you the new **Mazzaroppi TP Compact**. The result of the experience and the hardworking of our creative atelier, is just the tempering machine you always wanted and even more. The new Mazzaroppi TP compact, is **the first tempering machine** which is specifically designed and built to offer to our customers who are owner of a **small-medium glassworks** and want to reach the following goals:

- **Internalizing the tempering productive process**
- Combining the improving of the **quality** of the final product and the **lowest price** of the market
- Tempering their own glasses with an **average consumption** of **100 kWh**
- Streamlining and speed up the whole manufacturing process without upsetting your business structure.
- Providing a fast and timely service to the customers.

Model	Loading area	Minimum dimensions	Thickness	Plant dimension	Avarange consumption	Load/hour
	mmxmm	mm	mm	mt	kWh	4mm
TP 130L	1300x3200(3600) mm 51x125 inch	Ø 200 mm 7,87 inch 140x140 mm 5,5x5,5 inch	3.8-19 mm 5/32 - 3/4 inch	17,15 x 5,8 x 4,2 mt 56 x 19 x 13 ft	100	≈20
TP 160	1600x3200(3600) mm 60x125 inch	Ø 230 mm 9 inch 160x160 mm 6,30x6,30 inch	3.8-19 mm 5/32 - 3/4 inch	18 x 6,13 x 4,6 mt 60 x 20 x 15 ft	130	≈20
TP 190	1900x3600 mm 74x141 inch	Ø 230 mm 9 inch 160x160 mm 6,30x6,30 inch	3.8-19 mm 5/32 - 3/4 inch	18,75 x 6,5 x 4,6 mt 61 x 21 x 15 ft	170	≈20

TP ADVANCED

Tp advanced is a tempering machine for processing flat glass.

It has been specifically designed for **medium-big glass making companies** which produce glass panes for different fields (furniture, architectural glass, household appliances, shower stalls and automotive glasses).

This machine has been built for those glassmakers who are planning to buy a tempering oven for reaching the following goals:

- **Cutting the energy cost up to 70%**
- Increasing the productivity
- Increasing the **quality** of the final product
- Streamlining and speed up the whole manufacturing process.

The machinery has a minimum size of 1900mm x 4200mm and a maximum size of 3200mm x 6000mm.



Thanks to the "**Ultimate Convection**" a Mazzaroppi Engineering patented system, this machine can process every kind of hardenable glass with a thickness by 2,8mm up to 19mm, including the Low-e glasses which have emissivity $e=0,01$. TP Advanced, can also be customized in many ways according to the requirements of individual customers in order to let them to meet their needs.

We are going to offer you the best technical option that can guarantee you the **highest level** of performance with the **lowest energy consumption** of the glass field.

Model	Loading area	Minimum dimensions	Thickness	Plant dimension	Consumption	Load/hour
	mmxmm	mm	mm	mt	kWh	4mm
TP 1942	1900x4200 74x165	Ø 230 mm 9 inch 160x160 mm 6,30x6,30 inch	3.8-19 mm 5/32 - 3/4 inch	21 x 5,5 x 3 68 x 18 x 10 ft	200	≈20
TP 2242	2200x4200 mm 86x165 inch	Ø 250 mm 9,84 inch 175x175 mm 6,89x6,89 inch	3.8-19 mm 5/32 - 3/4 inch	21 x 5,8 x 3,4 mt 68 x 19 x 11 ft	230	≈20
TP 2550	2500x5000 mm 86x165 inch	Ø 260 mm 10,24 inch 185x185 mm 7,28x7,28 inch	3.8-19 mm 5/32 - 3/4 inch	24,35 x 6 x 3,5 80 x 19,5 x 12 ft	330	≈20
TP 2851	2800x5100 mm 110x200 inch	Ø 280 mm 11,02 inch 198x198 mm 7,79x7,79 inch	3.8-19 mm 5/32 - 3/4 inch	26,7 x 6,2, x 4mt 85 x 20 x 13 ft	370	≈20
TP 3162	3100x6200 126x244 inch	Ø 350 mm 13,77 inch 250x250 mm 9,84x9,84 inch	3.8-19 mm 5/32 - 3/4 inch	28,7 x 6,6 x 4 mt 94 x 21,6 x 13 ft	550	≈20

T+C (TEMPERING AND BENDING MACHINES FOR FLAT GLASS)

The tempering and bending machine for flat glasses have always been one of the **flagships of the Mazzaroppi's product portfolio**, as demonstrated by the **several machines installed** all over the world.

This range of product needs a very deep and **accurate preliminary study** case in order to meet the specific productive needs of the customer.

In this way, every T+C machine is **tailored** to each individual customer.

The tempering and bending machineries can be of three different types:

- Transversal bending by means of rollers with regular radius and CNC-controlled.
- Longitudinal sector bending by means of rollers with regular radius and CNC-controlled.
- Bending by means of press with variable radius and CNC-controlled.

The target of this machines are all those companies that operate in the field of shower stalls, refrigeration, automotive, furniture, solar panels, architectural glass, household appliances.

These machines have been built for those glassmakers who are planning to buy a tempering oven for reaching the following goals:

- Cutting the energy cost up to 50%
- Increasing the productivity
- Increasing the quality of the final product
- Streamlining and speed up the whole manufacturing process.



Model	Loading area	Minimum dimensions	Thickness	Max glass arrow	Min. bending radius	Plant dimension	Consumption	Load/h
	mmxmm	mm	mm	mm	mm	mt	kWh	4mm
TCP 2212 2C	2200 x 1200 mm 86 x 47 inch	250 x 500 9,84 x 19,68 inch	4 - 8 mm 5/32 - 5/16 inch	300 mm 12 inch	100 mm	20 x 9,5 x 3,6 mt	350	≈20
TCP 2518 1C	2500 x 1800 98 x 70 inch	350 x 600 mm 13,77 x 23,62	4 - 8 mm 5/32 - 5/16 inch	300 mm 12 inch	100 mm	15 x 10 x 3,6 mt	380	≈20
TCR 2212 2C	2200 x 1200 mm 86 x 47 inch	250 x 400 9,84 x 15,74 inch	4 - 8 mm 5/32 - 5/16 inch	300 mm 12 inch	100 mm	23 x 6,5 x 3,6 mt	350	≈20
TCR 2518 1C	2500 x 1800 98 x 70 inch	300 x 550 mm 11,81 x 21,65 inch	4 - 8 mm 5/32 - 5/16 inch	300 mm 12 inch	100 mm	14 x 7 x 3,6 mt	380	≈20

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MAZZAROPPI

CS

The bending oven CS allows to bend the glass resting on moulds by heat. A lot of shapes can be realized in order to differentiate the production. The oven consists of several workstation called "Box" in which are positioned the moulds and the related glass package.

The special features of this machine are:

- The ground of each Box is covered by heat proof metal grid which make it possible to walk on it.
- The height of the perimetral walls allows the moulding process to be carried out completely inside the box.

This limits any thermal shocks that may occur at the beginning of the cooling phase.

- Vision system: special portholes are positioned on the side of the box to check the laying of the glass on the mould during the heating process.
- Heating section: This module is mobile and moves on the boxes by means of special rails, so that the moulds that support the glass are not affected by any movement or vibration during positioning. The closing system of the heating section has been designed for reducing the friction to a minimum and therefore having a longer lifespan.

These machineries are designed for those companies that operate mainly in the architectural glass field and are planning to purchase a moulded glass bending system for the following reasons:

- Reducing the energy consumption
- Increasing the quality of the final product
- Simplify and speed up the entire production process
- Increasing their productive capacity.



The CS, moreover, like all the machines produced by Mazzaroppi, can be customised according to the customer's needs. In this way we can offer the best technical option that allows our customers to satisfy their production requirements with the lowest operating costs of the glass field.



HST: HEAT SOAK TEST OVEN

This oven is used for checking the tempered glass panes.

The test consists in heating the glass panes up to $290^{\circ}\text{C} \pm 10^{\circ}\text{C}$ and then keeping those glasses at that temperature according to the European reference standards.

This oven uses an advanced temperature control system that allows it to regulate both the internal air of the oven and the real temperature of the glass panes.

At the end of each process the machine generates a detailed report like the ones the authority draws up at the end of the preliminary calibration test of the oven.

The heating system consist of several independent sections and each of them is equipped with its own resistor, thermocouple, a fan for the air circulation system and another set of fans for the cooling cycle at the end of the test.

Another important feature of this HST machine is the archive of all the reports generated at the end of the thermal tests in a printable format, so whenever you want you will be able to examine all the parameters of each test you run in the past and sharing this documents with your customers.

Thanks to all these special features Mazzaroppi HST fully complies the European standards for the heat soak test and offers an efficient and reliable solution.

CUSTOM MACHINERY

The special machineries are the **highest expression** of the **technology**, of the **creativity** and the **experience** of the **Mazzaroppi Engineering** in the field of the glass industry.

These are machines that have been designed from scratch, thanks to the joint venture between our skills and the specific needs of our customers.

In fact, these are **tailored machines** and even the single **detail** can be **customizable**.

The great international glass corporations often chose Mazzaroppi as partner to realize their projects.

Our technical staff cooperate with the customer for drawing up a technical specification that includes: the size of the machine, the maximum and the minimum size of the glass that can be processed, the capacity of the machine, which kind of process the machine will do or if the machine will be able to do more than one kind of process.

For example, one of the customised machinery made by Mazzaroppi Engineering is called **"Multifunction"** and was created from a specific customer request: the need to have a single machinery made up of several production lines to allow the customer to have a roller bending line, another die bending line and finally a line for flat tempering, in a "all in one" solution.

Another type of machinery we find in this section is that of furnaces with **several heating chambers**.

These systems with two or more independent heating chambers make it possible to **reduce the thermal shock** during the tempering process significantly, in order to obtain an **unrivalled quality** of the final product in terms of glass flatness, absence of optical distortions and, above all, a **97% decrease** in the phenomenon of **anisotropy**.

These machines are regarded by **Europe's largest glass manufacturers** as the only way to **achieve** the very **high quality standards** to which they aspire.

The machines in the "custom" section are suitable for those who **cannot find the best solution** for their production needs on the **market**, and therefore are looking for a **product designed exclusively** for their specific needs, unique in its kind.



LM

LM Revolution is the new glass laminating furnace patented by Mazzaroppi Engineering and indicated for all companies that need to produce laminated glass with different thicknesses. Laminated glass complements tempered glass in an important way, giving greater resistance to impact and safety against falling/shattering, given by the ability of glass to retain fragments even after breakage.

LM Revolution allows us to laminate 2 or more sheets of glass with one or more sheets of EVA plastic in order to achieve a higher degree of safety in full compliance with regulations.

With our **2 patented systems** we have a **higher speed** in the production cycle and we obtain a product with **low plastic spillage**.

With regard to this type of product, our team of engineers has upgraded the standard LM revolution model by creating the "LM Tower" oven, which offers, in addition to the features described above, the possibility of **optimising production** thanks to **two or more independent worktables**, capable of laminating different types of product at the same time.

Model	N° Platform	Platform dimension	Glass dimension	Max weigh on platform	Machine dimension (LxWxH)	Power
		mmxmm	mmxmm	kg	mm	kW
LM Revolution 1.1	1	1750 x 3400 69 x 134 inch	1600 x 3250 63 x 128 inch	200	2350 x 4300 x 1500 7,7 x 14 x 4,9 ft	16
LM Revolution 2.1	2	2200 x 3400 86 x 134 inch	2050 x 3250 80 x 128 inch	250	2450 x 4300 x 1500 8 x 14 x 4,9 ft	30
LM Tower 2.2	2+	2350 x 4350 92 x 171 inch	2200 x 4200 86 x 165 inch	500	4554 x 3000 x 2600 15 x 9,8 x 8,5	26+26
LM Tower 2.2	2+	2750 x 4650 108 x 183 inch	2600 x 4500 102 x 177 inch	600	4850 x 3100 x 2650 16 x 10 x 8,7	35+35
LM Tower 2.2	2+	3000 x 5000 118 x 196 inch	2850 x 4850 112 x 190 inch	650	5580 x 3470 x 2700 18 x 11 x 8,8	40+40



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TOOLS FOR GLASS ONLY

The company started its activities about 100 years ago, with artisan-based production, and now has more than 75,000 different items in its product range.

We are probably the only company that produces diamond wheels exclusively for the glass sector and so we can certainly be defined as 'specialists'! In fact, our entire R&D, production etc., are focussed totally on glass and – in some cases – materials very similar to glass, aiming at supplying the complete range of glass grinding tools.



PERIPHERAL WHEELS

Mole Moreschi has invested a lot in the development of a complete and performing range of peripheral wheels.

In addition to the traditional, widely tested products, we have added new ranges capable of effectively covering all areas of use.

We have developed solutions and services able to support even the most demanding customers, we are today confident of being able to offer a highly performing product, capable of satisfying any type of need.



POLISHING WHEELS

The polishing wheels were created to replace the felt wheels with cerium where management is much more complex; in fact, the management of a normal polishing wheel has no type when it is managed except to be replaced when the ability to use the wheel ends. In this area, then, the water must not be particularly hard and contain a saline concentration that must not exceed certain parameters.



CUP WHEELS

Diamond and resin cup wheels Mole Moreschi has a very wide range of cup wheels among which you can surely find the most suitable tools for your machine and your specific processing. A wide variety of binders, grits, geometries are available, each of which can be completed with a specific fixing body for each individual machine model. In addition to domestic production, we also sell the polishing wheels of the main international manufacturers. Moreschi cup wheels are products of the highest quality, widely tested, known and appreciated all over the world.



ROUTERS

In addition to a complete range of products able to effectively meet the most common needs, in terms of speed, finish, durability, we offer "customized" tools, optimized to the specific needs of the customer. To the sintered tools we add tools with electroplated diamond, to offer solutions also to the requests of geometries not achievable with more traditional technologies (diameter 4,5)





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STATIC STORAGE | AUTOMATIC CLASSIFIERS

Movetro automatic classifiers are the perfect solution for those wanting to gain more space on their business premises, ensuring safe and highly automated handling operations.

READY FOR AUTOMATIC LOADING

OPENING WITH A SINGLE MOVEMENT

Automatic, high-tech magazines entirely managed and moved by a single command console with a touchscreen panel where the operator only needs to key in the number of the required element in order to have it available for loading or unloading operations.



TELESCOPIC LOADING DEVICES

ADVANCED DYNAMIC STORAGE FOR POWERFUL PRODUCTION

Movetro offers a wide range of single-direction or twin-direction telescopic loading devices for loading regular-, jumbo- or extra-jumbo sheets. The supervisor software shows the magazine situation in real time and receives the instructions for loading, moving and returning sheets in an entirely automatic manner thanks to its integration with the cutting line optimiser. This same information can be shared with the materials provisioning office.

R - REGULAR		
Maximum sheet size	mm	3660 x 2750
Minimum sheet size	mm	1500 x 1500

J - JUMBO		
Maximum sheet size	mm	6100 x 3355
Minimum sheet size	mm	1500 x 1500

XJ - EXTRA-JUMBO		
Maximum sheet size	mm	6100 x 3355 2 x 3210 x 2750
Minimum sheet size	mm	1500 x 1500



OVERHEAD LOADING DEVICES

ADVANCED DYNAMIC STORAGE FOR FLEXIBLE PRODUCTION | OVERHEAD LOADING DEVICES | OVERHEAD LOADING DEVICES WITH TILTERS

The CAM single-beam and CAB twin-beam overhead loading devices are automatic solutions for the handling and overhead loading of single sheets. They have been designed for those looking not only for space savings, safety and automation but also top production flexibility, given that they need to load several cutting lines simultaneously.

The possibility to load several cutting lines: the perfect combination of productivity and flexibility.

FAST AND FLEXIBLE
BOOSTED CUTTING CAPACITY
ENHANCED SAFETY



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MOVETRO

SWIFT SHUTTLE

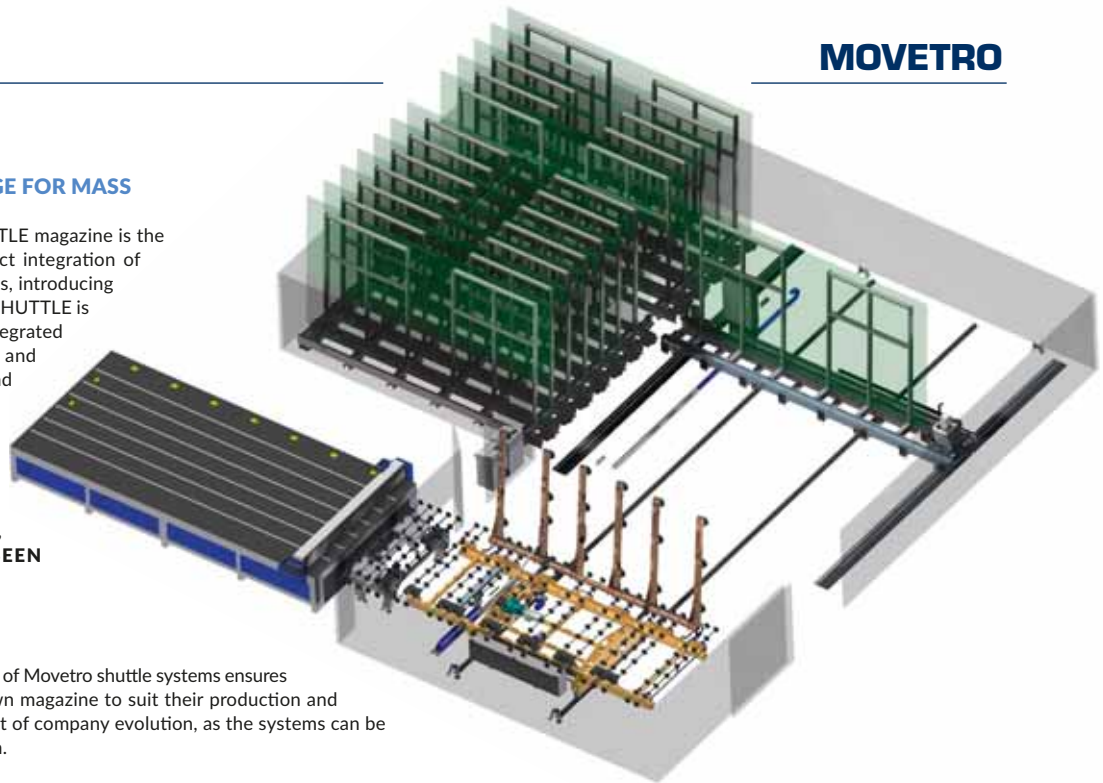
ADVANCED DYNAMIC STORAGE FOR MASS PRODUCTION

The automatic Movetro SWIFT SHUTTLE magazine is the most compact solution for the perfect integration of automatic loading with cutting systems, introducing the new '3-part line' concept. SWIFT SHUTTLE is the latest addition to the range of integrated magazine solutions for cutting lines, and is the ideal technology for storing and handling jumbo and regular glass sheets, purposely designed to provide a higher number of cutting references in a very compact space.

INSERTING THE SWIFT SHUTTLE IN THE PRODUCTION CONTEXT, THE ADVANTAGES CAN BE SEEN IMMEDIATELY:

- Footprint reduction
- Increased productivity
- Greater safety

The design and construction modularity of Movetro shuttle systems ensures that customers can configure their own magazine to suit their production and logistics needs, always keeping abreast of company evolution, as the systems can be expanded at any time after installation.



PRIME SHUTTLE

AUTOMATIC PRIME SHUTTLE RACKS WITH LOADING DEVICES

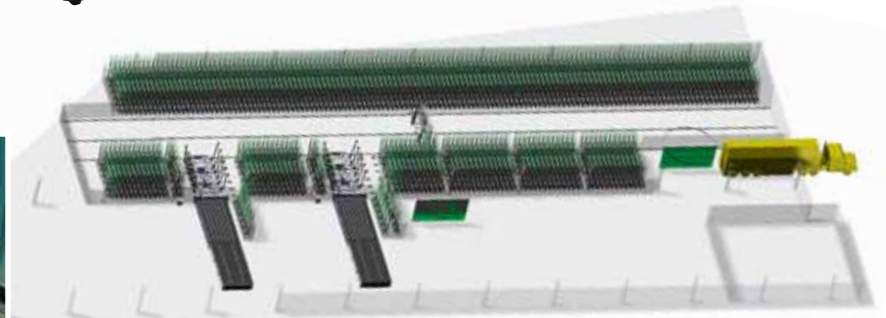
PRIME handling systems with shuttles are designed for those who not only need storage for large glass sheets, but also need to be able to work non-stop in complete safety, without interrupting cutting operations to load the racks.

Thanks to their modular form, they can be extended and/or modified at any time after installation.

PRODUCTIVITY ON A CONTINUOUS CYCLE FEEDS SEVERAL CUTTING LINES SIMULTANEOUSLY ENHANCED SAFETY

This solution offers advantages in terms of:

- **SPACE:** a reduction in the space occupied, thanks to the higher concentration of glass compared with classic storage systems.
- **PRODUCTIVITY:** the shuttle can automatically move frames with a 15-tonne capacity from the magazine area to the cutting area, and manage several cutting lines simultaneously.
- **CONTINUOUS CYCLE:** the dedicated loading stations ensure that the new material is entered in the magazine without interrupting the cutting operations.
- **FLEXIBILITY:** the shuttle can move between the various bays of the plant, taking full advantage of the space and using it as magazine areas even if the plant is not equipped with a bridge crane.
- **SAFETY:** the operator only needs to intervene during the loading of the frame in the outdoor station; glass handling is minimal and all the operations are carried out automatically.



PRIME shuttles can interface and be integrated with any type of cutting line, allowing the glass racks to be managed entirely and directly via the optimiser that controls and manages cutting operations.



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ROCK 10-45

Straight-line edger with 10 wheels, for flat edge, polished arrises and wide chamfer up to 54 mm with variable angle $0^\circ \div 45^\circ$. Neptun's line also propose Rock 14-45 with variable angle, Rock 8 and Rock 11.

Rock stands out for its extraordinary production speed combined with high precision and processing quality. The structure is fully made of cast iron and high thickness steel processed with innovative technological solutions aimed to maintain precision and reduce mechanical wear and thus maintenance costs. This also leads to an unprecedented low noise level. Many advanced and patented solutions, such as the conveyor pad in double material, the ETS squaring system and the RC-4 system for parallelogram shaped glass, are the result of a consolidated know-how and heavy investment in R&D.



ROCK 11 AWA

The Rock AWA version is added to the vertical straight-line edging machine segment, which now has automatic management of both diamond and polishing tools AWA (Automatic Wheels Adjustment), in order to guarantee constant quality and also be used by non-expert operators. AWA system is applicable to all Rock models.

Rock AWA allows:

- Automatic adjustment of diamond and polishing wheels
- Management of processing recipes in order to immediately set different sets of wheels which, require different settings: tool sets for standard glass, for laminated glass, or for small thickness



- Possibility of storing specific processing recipes
- The peculiarity of the AWA system is the hydraulic spindle management system without electrical and electronic components in the spindle area, with a water resistance class IP68, thus ensuring high reliability.
- Indication on the control panel of the need to replace a tool when worn
- Clear and accurate diagnostics with online troubleshooting guide

LV EVO

In the washing machine segment, the entry level range is now enhanced with the new LV EVO series which, while maintaining the simplicity of the well-known LV Top, it has a high level of automation and superior performance with processing speed increased by 50%.

The new peculiar features are:

- Machine body entirely in stainless steel and with base frame in hot-dip galvanized steel
- Touch screen with PLC for managing all functions
- Workable thicknesses $3 \div 30$ mm with automatic adjustment by means of an input thickness reading sensor
- Speed regulation $1 \div 8$ m / min by inverter
- Brushes $\varnothing 140$ mm with 350 RPM speed (500 RPM with brush inverter option)
- Automatic water quality management and relative replacement

- PLC interface for in-line integration with other upstream or downstream machines via ethernet and production data export that can be integrated with Industry 4.0
- Energy consumption control with precise and graphic indication of the last 8hrs
- Available in 1600 Open Top, 2200 and 2600mm sizes.





WAVE HP

The main strength of Wave HP is its maximal flexibility of configuration. The entry-level Wave comes with a very robust structure, suitable for intensive processing. Controlled by PLC, this version can be enriched with several solutions, up to the full-optional model, Wave HP, for total automation and superior performances in all fields: output, washing quality, integration in business processes. In both cases, the construction and components ensure the highest reliability over time. Wave can meet the requirements of each specific production context, respecting the required level of investment.

Wave HP is equipped with a powerful touch screen control unit for managing machine functionality, remote diagnosis, scheduled maintenance and numerous innovative functions: **A-Qual** water quality control, **Ecosave** energy saving, **SmartSpeed** for differentiated speed management and optimal drying of the tail of the glass, **NightCare** for water heating pre-ignition and automatic water change programming out of order. Wave can be supplied in Heavy Duty configuration for Jumbo sheets up to 3.3 x 6 meters size and 80 mm thickness.

TORNADO HP

Tornado HP is ideal for intensive industrial processing where **maximum production efficiency** is required in terms of quality and speed. The total management, even remotely, of the production and maintenance parameters, makes it suitable for the Industry 4.0 environment. Tornado HP is equipped with a powerful PLC with touch screen that allows the management of numerous advanced functions, for glass with thickness up to 38mm and width from 1 to 3.3 meters.. The high level of **automation and flexibility** places no limits on integration into all existing production lines of different manufacturers. Lamination, tempering, painting, screen printing, double edger grinding, all processes become smooth with Tornado washers.



QUICKLINE

QuickLine consists of two Quick modules combined according to the type of production required:

- QuickDrill with QuickMill to perform milling, drilling and countersinking on the entire work area, without any shadow area;
- QuickEdge with Quick2 to have a complete cycle of polished grinding, milling and drilling.

The Quickline has 3 working modes: in line for maximum productivity, in single mode with the processing of two different production batches simultaneously for maximum flexibility, or you can work with a single machine when the other has no work or is in maintenance, for maximum return on investment. Although there is an optimal working direction, glass loading / unloading can take place at any point on the line depending on the operator's needs of the day. The Quickline can be combined with our wide range of vertical washing machines type LV or Wave and completed with loading and unloading automatic for an unmanned work island.

The investment is also flexible because the line can be completed in steps as production needs grow.



QUICK 2 T8

Quick2-T8 combines the drilling and milling phases in a single machine. All the advantages of the Quick series now also within reach of who, due to lack of space, cannot opt for the solution with the two units. Powerful numerical control with touch panel 15" for fast programming directly on board of the machine.

- DCS (Dynamic Control System): innovative tool management system for automatic management of the feed rate in function of the cutting capacity of the tool.
- High precision thanks to the system for measuring the effective position of the glass by means of a linear encoder, guaranteeing an accuracy of $\pm 0.15\text{mm}$ constant over time.
- Still glass milling, thanks to the solid glass locking system, the milling and grinding operations of the notches guarantee high quality and speed, up to 0.5
- Axes speed up to 30 meter/minute



- Available in sizes 160-30 or 280-45 for large glass sheets
- Brushes Ø140mm with 350 RPM speed (500 RPM with brush inverter option)
- Automatic water quality management and relative replacement
- Available in 1600 Open Top, 2300 and 2800mm sizes.
- PLC interface for in-line integration with other upstream or downstream machines via ethernet and production data export that can be integrated with Industry 4.0
- Energy consumption control with precise and graphic indication of the last 8hrs

QUICKMILL 100

The smallest three-axis machining center for milling, grinding and one side drilling. Quickmill 100 has as its primary processing the milling and grinding of notches and cut-outs, but is also able to perform holes with high quality finishing. Programming on the machine with a simple and fast CAD / CAM. Possibility of having the optional CAM WAY CAD / CAM with over 1000 parametric shapes and the work station for programming in the office. Derived from the famous best seller model Quickmill 160-30, despite being the entry level version for milling, it is designed with industrial solutions and a high degree of automation.

Compact and robust construction, mainly in stainless steel. It has a 1 x3 mtr open top work area.

- Automatic handling of the slabs
- Possibility of in-line insertion with upstream or downstream machines
- Maximum glass size 1800x3000 mm
- Workable dimensions 1000x2400 / 3000mm open top for 15 mm thickness
- Simple and parametric programming from touch screen
- Made of stainless steel



ACCELERATING NEW TECHNOLOGIES IN GLASS PROCESSING



After a resounding success at the first post pandemic edition, Zak returns to New Delhi with the 19th edition of India's leading expo on glass processing and its allied technologies. Be a part of the display of latest advancements in the field with industry pioneers.

01-03 DEC 2022
PRAGATI MAIDAN
NEW DELHI



Organised by: ZAK TRADE FAIRS & EXHIBITIONS PVT. LTD.
For enquires contact: Sulaiman Khan | +91 98999 52189
skhan@zakgroup.com | www.zakglasstech.com
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CONCURRENT SHOWS



**DOORS &
WINDOWS**
EXPO



**ALUMINIUM
EXTRUSIONS**
EXPO



R.B.M. ITALIA SRL

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The most popular product is still the 10S, a wheel that can be considered universal, easy to be used on every type of machinery, while the top product is the cerium wheel X5000 for buffing. The range of products can count on new entries:

X510

X510 which is a semi-rigid bond with cerium oxide. This wheel grants an excellent shine finishing, with extremely long life and very low water consumption. This is specific for double edger machines.



RP320

RP320 is the new wheel for the arris polishing. It is suitable for very high speed applications on all machines. It performs well at all RPM and grants an extremely long life.



CL600

CL600 is the last development made by RBM and it gives the best performances on CNC machines, both vertical and horizontal. The special composition with Cerium Oxide, grants an extra shine to the edge of the glass. Rigid wheel with the addition of cerium oxide (hybrid-semi rigid bonding).

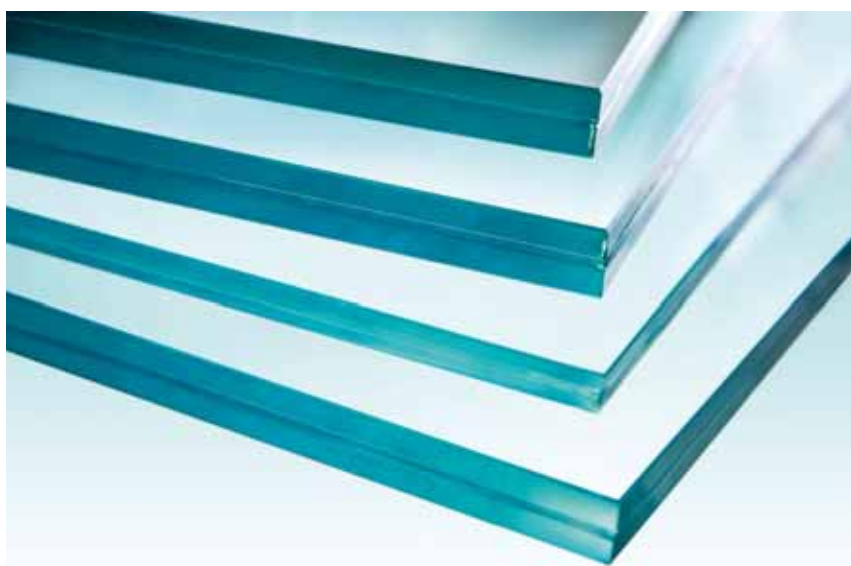




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RD CLEAN CONCEPT



Laminating furnaces in multiple combinations,
customization and oversized dimensions



New system for clean edges after lamination.
No need for tools and labor to remove the exceeds
of EVA on the edges. Patent pending

RIVA BY RCN

CHEMICAL TEMPERING FURNACES

"Riva by RCN" is a double winning solution if we consider the possibility of customizing the machines along with the technical expertise of Gianfranco Rivaroli who has, in fact, more than 40 years of top level professional activity

Model	Active Size (mm)	Handling	KW
CT 320	700 x 450	Manual	16+6
CT 330	700 x 450	Automatic	16+6
CT 331	1000 x 1000	Automatic	39+12
CT 900	2000 x 1000	Automatic	60+24
CT 950	3200 x 2200	Automatic	100+40



'EASY CONNECT APPLICATION'

- Latest generation man/machine interface:
- product process checked from smartphone, tablet or PLC
 - exclusive FTP Cloud for automatic download of the daily production process
 - chat and technical assistance with RCN from remote



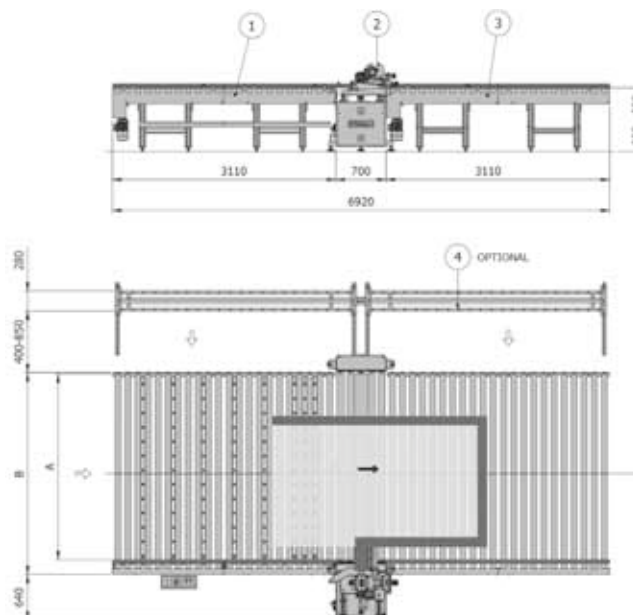


ROLLMAC A DIVISION OF GEMATA Spa

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GLASSLINE

ROLLERCOATER MACHINE FOR THE ENAMELING OF FLOAT GLASS EDGES



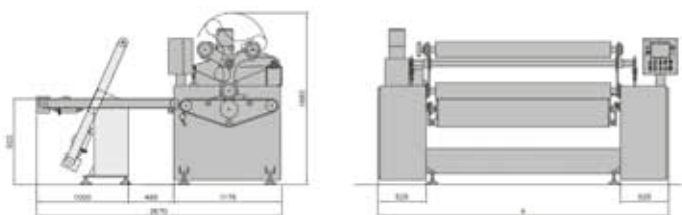
GlassLine is a machine based on the technologies of enameling the edges of float glass sheets by means of a reverse roller. It has been designed in response to a special need of glasses for building and interior decoration, i.e. the coating of a frame on the four edges of the sheet. Frame sizes: min. 5 mm max. 300 mm. This operation is performed in 4 passes with the return and 90° rotation of the sheet between one pass and the next. After all four sides have been processed, the sheet is sent to the oven for drying. The machines grant enable to enamel sheets with thicknesses from 2 mm. to 25 mm. and sizes up to 2,600 mm. A constant and uniform quantity of enamel can be applied up to 400 g/sq.m. in a single pass. It is possible to coat by ceramic enamels and organic paints.



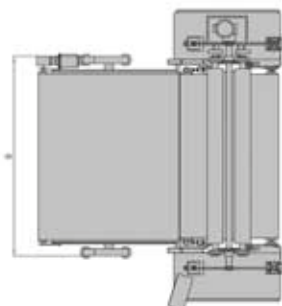
Working Width	A	B
1300	1300	1525
1800	1800	2025
2200	2200	2425
2600	2600	2825
3400	3400	3625

MULTIGLASS

THE MULTI-ROLLER MACHINE FOR THE ENAMELLING AND DESIGN PRINTING OF FLOAT GLASS SHEETS



Working Width	Maximum Sheet Width	Machine Weight without cylinders	Engraved cylinders max n°	Engraved cylinders weight	Conveyor belt weight
1300	1200	1660 kg	4	157 kg	219 kg
1800	1700	2180 kg	4	197 kg	303 kg
2200	2100	2280 kg	4	233 kg	370 kg
2600	2500	2540 kg	3	271 kg	437 kg



Working Width	A	B	Installed Power	Air consumption with 7 bar supplying		Sheets Thickness
				Production pump	Mixer Piston	
1300	1200	1200	4	1620 L/h 55 Cycles/min	285 L/h	1-19 mm
1800	1700	1700	4			
2200	2100	2100	4			
2600	2500	2540	3			

MULTIGLASS is the multi-roller machine that combines the latest technical innovations with high operational flexibility. It is used for enamelling, painting and design printing operations of small and large float glass sheets, by means of an engraved roller. The machine is particularly suitable for companies that need to make frequent item changes. The machine allows both

www.rollmac.it

ROLLMAC A DIVISION OF GEMATA

reverse processing, for generic coating, and synchro processing, to obtain design effects, with easy coating all types of flat glass sheets on the market, with sheet thicknesses from 2 to 25 mm and working width from 600 to 2600 mm.

As in all Rollmac machines, for MULTIGLASS was paid special attention to ergonomics and easy-to-use features:

- moving mechanisms have been reduced to significantly minimize wear parts, spare parts and maintenance operations;
- on request, the machine can be equipped with a motorized and basculating entry belt which facilitates both the coating of large sheets and the cleaning operations.



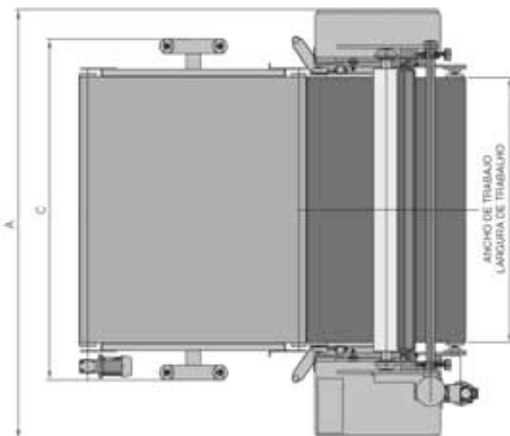
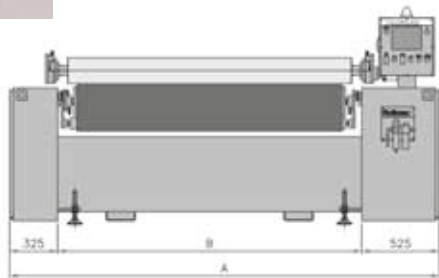
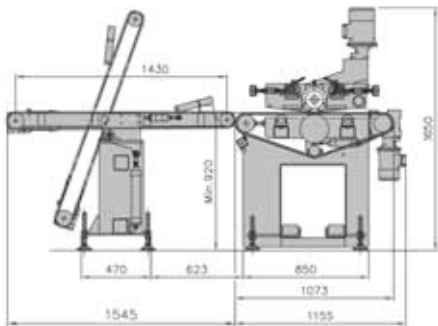
COLORGLASS

QUICKER AND EASIER ENAMELLING AND DESIGN PRINTING

COLORGLASS is the single-roller machine for the enamelling and design printing of glass sheets by means of an engraved cylinder. It is suitable from small dimensions such as tiles and decorations to big sizes such as internal walls, doors and façades.

Its single-roller design makes it particularly suitable for companies that work with large production quantities and do not need frequent articulation changes.

With COLORGLASS it's possible to easily enamel and print any kind of flat glass on the market with sheet thicknesses from 2 mm to 25 mm and sizes from 600 mm to 2600 mm; in addition, it is the ideal working tool for in-house laboratory and production lines.



Model	Useful Working Width	A	B	C	Installed Power	Absorbed Power	Working Speed	Working Speed Engraved Cylinder
COLORGLASS 600	600	1830	950	1100	2,00 kW	1,3 kW	m/min min. 0,5 max. 6	m/min min. 1 max. 35
COLORGLASS 1000	1000	2230	1350	1500	2,00 kW	1,3 kW		
COLORGLASS 1300	1300	2420	1650	1800	370 kg	1,3 kW		
COLORGLASS 1800	1800	2900	2050	2300	2,00 kW	1,3 kW		
COLORGLASS 2200	2200	3300	2450	2700	2,00 kW	1,3 kW		
COLORGLASS 2600	2600	3700	2850	3100	2,00 kW	1,3 kW		
COLORGLASS 3400	3400	4585	3735	3900	2,00 kW	1,3 kW		



SATINAL SPA - TK - STRATO

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TK KILNS

LAMIJET CONVECTION

Innovative fast curing and fast cooling laminating oven with forced-air convection for high production volumes, interlayer flexibility and lower operating cost. It allows laminating EVA, PVB and SentryGlas without the use of autoclave. The modular system allows quick and easy loading of the trolleys for laminating or for HST processes.

KEY FEATURES

- Lower operating costs
- High production volumes
- Fast curing and fast cooling through forced-air convection system
- Up to a maximum of 6 trays
- TK Connect 4.0
- Real time production analysis
- Maximum temperature uniformity
- Independent heating areas with automatic temperature adjustment
- Smart heating areas with automatic temperature adjustment
- Smart heating system for lower energy consumption
- Intelligent vacuum system that adapts to the requirement of the laminating interlayer
- TKlean Bag for clean glass-edges after lamination



LAMIJET CONVECTION							
18/36	1800 x 3600	71" x 142"	4	87	10000 x 3100 h 3400	33'x10' h 11'	
24/36	2400 x 3600	94" x 142"	4	97	5700 x 7000 h 3400	19'x23' h 11'	
25/50	2500 x 5000	98" x 1997"	5	192	15000 x 3100 h 3300	49'x10' h 11'	
LAMIJET CONVECTION + HST							
18/36*	1800 x 3600 laminating 2000 x 3600 hst	71" x 142" 79" x 142"	4	121	10000 x 3100 h 4070	33'x10' h 13'	
24/36*	2400 x 3600 laminating 2000 x 3600 hst	94" x 142" 79" x 142"	4	162	5700 x 7000 h 4070	19'x23' h 13'	

* Max loading capacity for HST is 2000 kg.

LAMIJET BREVA

LE 200	1000 x 2000	39" x 79"	56	7300 x 3000	24' x 10'
LE 300	1800 x 3200	71" x 126"	125	11000 x 4500	36' x 15'
LE 400	2100 x 4500	83" x 177"	176	16000 x 6000	52' x 20'
LE 500	2500 x 4500	98" x 177"	176	16000 x 6000	52' x 20'

LAMIJET BREVA

The design of Lamijet Brevia is the synthesis of technical knowledge acquired through years of design and construction of glass ovens. The peculiarities of this system are the speed of lamination and the lamination of EVA, PVB and SentryGlas without using any autoclave, which allows to quickly meet any production requirement. With the new technology applied to Lamijet Brevia cycle times can be reduced by 50%. This oven is suitable for those customers who do not have high productive capacity but however want to keep high degree of flexibility and agile production.



TK CHEMICAL TEMPER

Automatic Kiln for glass chemical tempering

KEY FEATURES

Electrical heating

- TK Connect 4.0
- Touch screen programmable operator's panel
- Salts melting tank in thick stainless steel
- Power failure security system - UPS
- Pre-heating hood
- Electromechanical glass lifting system
- Maximum temperature 500° C

APPLICATIONS

- Aeronautical
- Architectural
- Automotive
- Electronics
- Military
- Naval



CHEMICAL TEMPER

MODEL	TANK DIMENSIONS	PLANT DIMENSIONS (L x W x H)	MAXIMUM GLASS SIZE	Kw	ELECTRIC FEEDING	SALTS' WEIGHT (KNO)
CT 75	700 x 700 x 700 mm 27" x 27" x 27" inch	2,3 x 1,5 x 2,3 m 7,5' x 5' x 7,5'	600 x 550 mm 23" x 21" inch	50	400V / 50Hz / 3Ph	0,7 tons
CT 200	2300 x 900 x 1300 mm 91" x 35" x 51" inch	10 x 4,5 x 4,2 m 33' x 15' x 14' ft	2000 x 1000 mm 78" x 39" inch	180	400V / 50Hz / 3Ph	5,2 tons
CT240	2700 x 900 x 1600 mm 106" x 35" x 63" inch	10,7 x 4,5 x 4,2 m 10,7 x 4,5 x 4,2 m	2400 x 1300 mm 94" x 51" inch	210	400V / 50Hz / 3Ph	6,5 tons
CT320	3600 x 900 x 2500 mm 142" x 35" x 98" inch	11 x 4,5 x 8,7 m 36' x 15' x 28,5' ft	3200 x 2200 mm 126" x 86" inch	500	400V / 50Hz / 3Ph	23 tons
CT 360	4470 x 1870 x 2900 mm 176" x 74" x 114" inch	22 x 4,5 x 8,7 m 72' x 15' x 28,5' ft	4000 x 2500 mm 157" x 98" inch	650	400V / 50Hz / 3Ph	42 tons

* Temperable glass: minimum thickness 0,5 mm

TK SERVICES & PRODUCTS

TK Glass Machinery offers additional services and products in addition to the ovens' range to increase customer care activities.

TKCONNECT 4.0

Process traceability, remote process control, quality and data analysis: the TKconnect 4.0 remote system from Satinal allows to follow the production process of TK Glass Machinery via Smartphone or computer, no matter how far away from your factory you are. The new software connects TK Glass Machinery controllers safely to the internet, combining a new concept of fully intuitive user interface with the latest technology available. TKconnect 4.0 allows also to monitor production lines with the swipe of a finger: thanks to the smartphone app plant operations can be observed in real time.

TKARE

Remote technical assistance designed for your training: hassle-free remote H24 technical service from Satinal team, access machinery from everywhere without the need of any software, data Connection- Download production reports over the Internet from any type of device in CSV and Excel format. This latest innovation is based on a powerful



microprocessor-based controller for continuous process supervisory and continuous auto tune. The new innovative TKconnect 4.0 system enables fully flexible programme profiles, actual power measurement and energy consumption, Email alerts on defined deviations and much more.

TKLEAN BAG

The innovative laminating vacuum bag that avoids edge cleaning in any glass lamination oven: TK Glass Machinery has introduced TKlean Bag that, combined with STRATO® Glass Interlayers, allows

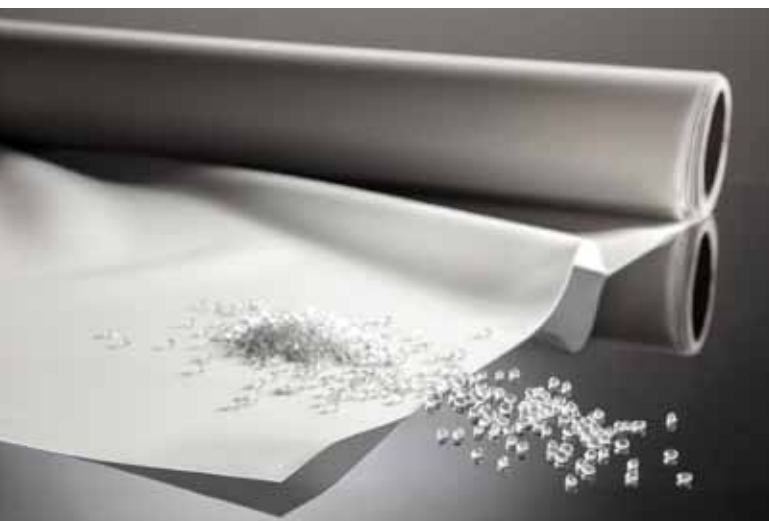
perfect edge finishing and improved glass flatness after the lamination process, drastically reducing the need of expensive labor and cleaning operations. TKlean Bag is compatible with any brand of glass laminating machinery and can be easily installed by Satinal technicians worldwide, without the need of any capital investment.



STRATO® EVA FILMS

SATINAL, faithful to its vocation as a market innovator, launches the line of transparent colored EVA films, suitable for high-end indoor and outdoor applications. All the Italian quality of safety glass with STRATO® EVA interlayers is now available for architects and designers also in 4 transparent colors designed for the contemporary and to reflect global color trends:

- **STRATO® BRONZO SICILIA**, to express comfort, kindness, human care, to finally gain the trust of the customer.
- **STRATO® GRIGIO DOLOMITI**, to express a shift from global efficiency to local resilience, the disruption of global supply chains and decoupling economies. To express a new balance between daily working hours and time for oneself, in this new world where past habits have been disrupted.
- **STRATO® AZZURRO MEDITERRANEO**, to express pride in supporting local brands and a renewed localism: your purchase is produced locally. Support to human-to-human relations, a new human dimension of the post-pandemic world.
- **STRATO® VERDE TOSCANA**, to respond to the new trends of sustainability, green, proximity to nature and changes in our habits: a revolution of what we do and how we do it. It expresses a new concept of home-office, integrated with nature.



The mechanical performances remain unchanged from the STRATO® CLEAR range, such as the anti-burglary, adhesion to glass, acoustic insulation and UV resistance properties, shielding up to 99% of UV rays.

All this thanks to the intense research and Development activity of the SATINAL laboratory, S-LAB.

Thanks to the quality of SATINAL's EVA film, the colours have an extreme durability over time, they remain stable giving light and charm to the project. This prodigious collection has all the advantages of safety glass on the façade, such as resistance to atmospheric agents, weathering, safety in the event of impact, protection against UV rays and acoustic insulation qualities from the external environment.

In interior and exterior architectural projects, the new colours are added to the STRATO® DECORATIVE range, which includes products such as:

- **STRATO® SATINATO**: it makes the glass very elegant, refined and adaptable to any type of environment and internal and external element. Furthermore, it gives the glass a special and charming privacy effect.
- **STRATO® LEGGERO**: formulated to makes glass with a slightly satin finish, with a special see-through effect. It allows natural light to freely cross the environments of homes and offices, at the same time safeguarding privacy. It is functional and adapts to any type of application.
- **STRATO® BIANCO**: the ideal solution for designers who want to create bright-white glass elements. It gives rooms a sense of brightness, as well as amplifying the sense of space. It guarantees uniform colour and coverage, while giving character to classic safety glass.



- **STRATO® LATTE**: it gives a glass a glossy, milky-white effect. It captures and diffuses the light in the environment, without creating reflections. It is the perfect solution for all those products that are used in environments that require a soft diffusion of light.
- **STRATO® NERO**: par excellence, it is the colour of elegance, it gives surprising effects, guaranteeing an always appreciated refinement and uniqueness. In addition, it gives a uniform coverage to the glass.
- **STRATO® COLOUR STUDIO**: in glass, colour can take on a particular beauty and intensity, in combination with the light that passes through it. They are coloured inserts developed by Satinal with high performance. Each film is characterized by an advanced colouring technology and is produced through a coating process controlled with precision using the most innovative technological solutions.

Among the latest new products, we can find:

- **STRATO® RIGIDO**: is a special structural interlayer that ensures one of the highest grades of protection against strong impacts: even if the glass component breaks, the laminated structure is not weakened, so the stability and safety is preserved. Perfect for needs related to anti-hurricane glass, building facades, glass balustrades and stairs, partition walls, bulletproof glass or ballistic resistance.
- **STRATO® NATURAL UV**: it transmits the full natural spectrum of solar radiation and is a specially formulated EVA film that allows a total UV transmission for solar radiation with enhanced permeability for short wave UV A and UV B radiation. Thanks to its outstanding clarity, it provides a completely natural and neutral-looking glass while providing exceptional durability when exposed to weathering conditions.





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After more than 50 years, we can say that Schiatti Angelo srl has a tradition as a manufacturer of machines for the glass processing. Over the years, it has acquired the necessary experience to manufacture innovative, reliable and quality machines.

The company's core business is the production of straight- and double edgers for the processing of the flat and pencil edges, as well as drilling machines.

EDGING MACHINES

The FPS range of vertical edgers is able to process the finest flat edges and arrisses. The most important part of these machines is the conveyor-track composed of rubber pads-bearings-chain that assure high performance in terms of glass holding and durability, without requiring continuous lubrication.

Some models are equipped with cerium oxide polishing on the edge and the arrisses for extra bright finishing, while all models are equipped with a PLC touch screen to adjust and display the machines' working parameters and diagnosis fault situation.



	Wheels number	Min workable dimension	Max workable thickness	Max speed
Straight	From 4 to 13	45x60mm	Up to 90mm	5 m/min
45° miter	From 8 to 14	50x100mm	Up to 55mm	5 m/min

A wide range of optional equipment is available for machine customizing, including the automatic adjustment of the diamond wheels and Industry 4.0 solutions as to interconnection to remote control and maintenance.

DOUBLE EDGING MACHINES



Since 1969, main improvements have been made both in mechanical and software developments in order to enhance the machine's performances. In this age of 'digital manufacturing', Schiatti Angelo srl would like to highlight its Industry 4.0 solutions with particular attention on the BFT and BFP ranges of double edging machines. Complete lines can be integrated in smart factories production process. The software offered by Schiatti provide smart solution in order to optimize the production cycle and increase customer satisfaction by reducing operational costs and increasing productivity; thanks to the continue technological improvements and digitalization in manufacturing, it has been developed to improve automation machine-to-machine and human-to-machine.

	Wheels number per side	Min /max workable dimension	Max workable thickness	Max speed
BFT	From 2 to 6	80 - 3000mm	Up to 12mm	10 m/min
BFP	From 5 to 11	100- 4500mm	Up to 35mm	10m/min

DRILLING MACHINES

	Max workable thickness	Max drilling Ø
Horizontal	28mm	3 - 200 mm
Vertical	19mm	3 - 40 mm

Also the drilling is an important part of the Schiatti's production. The offered solutions are various in order to satisfy any customer's need; from the small/medium to large glassworks of furnishing, construction and photovoltaic sectors. In the drilling range you find drillers with opposite heads, multi heads drillers, drilling centres and vertical drilling/milling machines.





SCHIAVO S.R.L.

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Washing Machines

Customisation, long working life and high quality have always been the features that make Schiavo washing machines stand out in the market. The company's range of glass washing machines includes vertical and horizontal machines, those for straight line grinders, as well as machines for special applications.

VERTICAL WASHING MACHINES

EASY is Schiavo's entry-level series of vertical washing machines, with good quality and an affordable price. These machines are suitable for small glassworks or low production runs, and are available with 4 or 6 brushes, and for maximum glass heights of 1,600 or 2,000 mm.

TOP is a high-quality range of vertical washing machines. These machines, made entirely in stainless steel, to process glass thickness from 3 up to 40mm, and glass heights from 1600 up to 3300 mm.

HYDRO is a no-compromise series of full-option, made entirely of stainless steel, to process glass thickness from 3 up to 40mm, and glass heights from 1600 up to 3300 mm. The HYDRO series is equipped with touchscreen, and can work in-line with vertical, work centres, drillers, as well as straight line millers and grinders. This machine adjust both speed and glass thickness automatically, depending on the previous machine. HYDRO washing machines are equipped with remote assistance and are Industry 4.0 ready.

HYDRO - Technical features

- High quality of materials
- High energy efficiency motors

- Long working life
- 24/7 intensive machine use
- Low maintenance
- Low noise levels
- Low water consumption
- High quality washing and drying

HYDRO



Horizontal glass washing machine HTL2600



HORIZONTAL WASHING MACHINES

HTL is Schiavo's series of horizontal flat glass washing machines, with structure and casing entirely made of stainless steel. The HTL series has been designed for intense production runs, ensuring high washing quality. This machine can work stand-alone and inline, such as, for example, in-line bilateral grinding, lamination lines and digital printing. HTL is available from 4 up to 8 brushes, glass width from 500 to 3,400 mm.

WASHING MACHINES FOR STRAIGHT-LINE EDGERS

The LVM400 washing machine can be installed on the output rack of any type of beveller or straight-line edger. This machine washes glass heights up to 400 mm, and is equipped with a fan to dry the glass sheets. This compact washing machine is the ideal solution to remove cerium from the glass immediately after polishing, without taking extra space.

SPECIAL WASHING MACHINES

FIRE is a series of washing machines designed especially for washing fire-resistant glass, which requires machines with special technical features. Schiavo is, and has always been, in the forefront in offering special machinery for all types of application.



www.schiavotech.it

SCHIAVO

Vertical milling and drilling machine

FV1000

FV1000 is a CNC vertical milling and drilling machine, equipped with four CNC-controlled axes that enable any type of drilling, milling and countersinking operation on glass sizes of 200x1000 mm. This machine is equipped with an automatic response system, and includes a memory base of editable shapes.

With the optional for fast remove spindle you can change tools in 30 seconds, cutting wasted time and allowing faster and smoother operation while changing tools.



Storage systems

CLO

The CLO Series is a sideways-moving storage system available in manual or semi-automatic version and it could be made with countless racks according to customers' requirements. Sturdy anti-overturn system with underneath bearing allow it to operate even in case of unbalanced weight.

Vacuum lifters

LIFTER SERIES

Schiavo boasts a wide range of vacuum devices that cover many of the application where it's required a lifter. We have the fixed, manual operated, motorized or even the hydraulic one or manipulators. All of that to be able to supply to our customer, every single time, the perfect machine to do their job. Our machine are well designed and well produced, each one of our machine are tested before leaving our warehouse to ensure that each machine that goes to our customer are always perfect.



GEBI



TALAMONI SRL

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WHEEL HOLDERS

Steel and metal wheel holders: our holders guarantee a perfect cut.

Talamoni holders are made of high quality metal alloy - precision worked and compatible with all cutting tables models. The right wheel and axes are in hard metal or diamond.

For Armatec, Bavelloni, Bottero, Bystronic, Hegla, Intermac, Laser Lisecc, MacoTec, Maver, Pannkoke, Tecnometal, Tuomas.



Hard metal and diamond wheels - totally "made in Italy".

Cutting wheels are available in a variety of different dimensions, cutting angles and grinds. A range of the most commonly used types is listed below. Other sizes and angle are produced to order.

For Bystronic, Bavelloni, Bottero, CMS, Hegla, Intermac, Lisecc, MacoTec, Maver, Pankoke Tecnometal, Tuomas, etc.

Wheel Holder Module with h.m.wheel

For Bystronic Bavelloni Bottero Hegla Intermac Lisecc MacoTec Pankoke Tecnometal Tuomas...



CSHM METAL HOLDERS WITH WHEELS

CSHM series: The new metal wheel holder can be used with all the cutting tables, that normally use the plastic clips. By using this product it is possible to optimize the cutting tolerance of your wheel due to it being more precise than a plastic model. The special wheel type in diamond are used to ensure a perfect cut whether its cutting straight, shape, laminated or float glass.

TALAMONI METAL CSHM HOLDERS ARE UNIVERSAL

Plastic coloured rings helps to identify the cutting angle of the wheel, we can supply it as a spare part as the axes.

The CSHM holder can be used on the following cutting tables: Bystronic Bavelloni, Bottero, Copmes, CMS, GFPMeccanica, Lisecc, MacoTec, Hegla, Tuomas etc...



PLASTIC HOLDERS WITH WHEEL (CLIPS)

CSM clips with hard metal wheels allow to work precisely and give outstanding results - float, laminated, shaped, stratified... This model fits all shapes and glass types to be cut.

CSM clips, made of high quality plastic to ensure wheel slide and ideal lubrication, have the further advantage of being colour-coded to identify the respective cutting angle.

The internal part of CSM wheels have a diameter of 5.8 mm, which is the perfect choice for all glass thickness.

CSM is suitable for Bavelloni, Bottero, Bolla, CMS, GFP Meccanica, Intermac MacoTec, Hegla, Tuomas, etc...



CUTTING FLUIDS FOR AUTOMATIC CUTTING

Use of the correct oil is essential to have the perfect cut.

The formation of dust and glass particles is an unavoidable part of glass processing. A cutting oil is the ideal solution to keep residual pieces of cut glass together. Using cutting oil does not only reduce dust formation, but also helps maintain the tension of the glass surface by entering into the cutting trace. The

oil helps keep the opening cut of the glass clean and safe.

Talamoni fluids are formulated to ensure perfect lubrication of your cuts, also giving longer life to your cutting wheels, by cooling and protecting them from erosion.

Choose from our four different types of cutting liquids

T-OIL3125	Slow	For straight and shaped cuts. Facilitates the opening of the cut and the removal of the glass does not damage washing machines. Maintains glass pieces while cutting, the wheels are cooled. Technical sheet of product T-OIL3125
T-OIL3130	Medium	For straight and shaped cuts in thick glass. Facilitates the opening of the cut and maintains glass pieces. Solid breaking edges thanks to its low surface tension. Synthetic bases and tension-decreasing substance, optimizing processing quality. Technical sheet of product T-OIL3130
T-OIL3132	Super fast	Synthetic bases and tension-decreasing substances, optimizing processing quality. Especially suitable for coated glass • evaporates after use without leaving residues • small glass particles are bound • low surface tension • for mirrors, patterned and float glass as well as painted or printed glass. Odourless, neutral to glass, residue-free. Technical sheet of product T-OIL3132
T-OIL3133	Fast	100% evaporation, Appropriate for use in processing lines, (screen printing, automotive glass etc.) The low surface tension allows a better break and reduces the formation of small particles of glass. Technical sheet of product T-OIL3133

Manual glass cutting: oil glass cutters

Talamoni's product range includes a selection of products for manual glass cutting.

Our hard metal tool production experience guarantees the quality of our manual glass cutters

Proper cuts requires cutting fluids – to open the cut more easily (the cutting fluid penetrates into the fissure) and to lubricate the wheel and axle.

Talamoni produces the following model of manual oil glass cutters



MANUAL CUTTING

The company produces a complete line of oil-reservoir cutters for manual cutting. Various models of oil-reservoir hand-held cutters with handles in blue or transparent plastic or blue or grey anodised aluminium all rigorously "Made in Italy". Talamoni glass cutters are produced with wheels sharpened to different angles to satisfy diverse cutting requirements – the manual tools are destined for professional use in glassworks or artistic workshops.



EXAMPLE OF CUTTING WHEELS DATA

CUTTING WHEELS FOR: Bystronic, Bavelloni, Bottero, CMS, Hegla, Inytermac, MacoTec, Maver, Pankoke, Tecnometal and Turomas tables

	Wheel Part. No.	Ø x hole bore x thickness	Angle	Holder Part No.
RO5614				
	RO5614R135	5.6 x 1.42 x 1.08 mm	135°	CP4, T245 or B50
	RO5614R140	5.6 x 1.42 x 1.08 mm	140°	CP4, T245 or B50
	RO5614R145	5.6 x 1.42 x 1.08 mm	145°	CP4, T245 or B50
	RO5614R150	5.6 x 1.42 x 1.08 mm	150°	CP4, T245 or B50
	RO5614R155	5.6 x 1.42 x 1.08 mm	155°	CP4, T245 or B50
	RO5614R160	5.6 x 1.42 x 1.08 mm	160°	CP4, T245 or B50
	RO5614R165	5.6 x 1.42 x 1.08 mm	165°	CP4, T245 or B50

CUTTING WHEELS FOR: Bystronic, Bavelloni, Bottero, CMS, Hegla, Inytermac, MacoTec, GFP, Meccanica, Maver and Turomas tables

	Wheel Part. No.	Ø x hole bore x thickness	Angle	Holder Part No.
RO6015				
	RO6015R135	6.0 x 1.50 x 1.06 mm	135°	CSH
	RO6015R140	6.0 x 1.50 x 1.06 mm	140°	CSH
	RO6015R145	6.0 x 1.50 x 1.06 mm	145°	CSH
	RO6015R150	6.0 x 1.50 x 1.06 mm	150°	CSH
	RO6015R155	6.0 x 1.50 x 1.06 mm	155°	CSH
	RO6015R160	6.0 x 1.50 x 1.06 mm	160°	CSH
	RO6015R165	6.0 x 1.50 x 1.06 mm	165°	CSH

CUTTING WHEELS FOR: Lisec tables

	Wheel Part. No.	Ø x hole bore x thickness	Angle	Holder Part No.
RO5013				
	RO5013R135	6.0 x 1.3 x 1.0 mm	135°	T45
	RO5013R145	6.0 x 1.3 x 1.0 mm	145°	T45
	RO5013R155	6.0 x 1.3 x 1.0 mm	155°	T45
	RO5013R160	6.0 x 1.3 x 1.0 mm	160°	T45
	RO5013R165	6.0 x 1.3 x 1.0 mm	165°	T45

CUTTING WHEELS FOR: Bystronic, and Bottero tables

	Wheel Part. No.	Ø x hole bore x thickness	Angle	Holder Part No.
RO6016				
	RO6016R127	6.22 x 1.60 x 3.05 mm	127°	T255
	RO6016R135	6.22 x 1.60 x 3.05 mm	135°	T255
	RO6016R145	6.22 x 1.60 x 3.05 mm	145°	T255
	RO6016R155	6.22 x 1.60 x 3.05 mm	155°	T255
	RO6016R160	6.22 x 1.60 x 3.05 mm	160°	T255



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DECORA®G

Decora® G is not just a digital printer. It is also an innovative decoration system for flat glass complete with optical centring, high resolution ink-jet printing and ink fixing.

The Decora® G solution, involving a unique hybrid printing process with inorganic inks, combines the excellent print quality typical of plotters with the productivity and reliability of single-pass technology.

Digital production with Decora® G also guarantees no stock of screen printing frame and zero set-up times, the complete traceability of the single piece, and the consistency of the final result from the first to the last printed glass.

Decora® G uses the latest industrial printing technologies and already has 4 patents, demonstrating TecnoFerrari's capacity for innovation in this sector.

Technical aspects:

- High precision belt conveyor system
- Optical centering system with quality inspection
- Automatic cleaning of the conveyor and printheads
- High discharge ink recirculation system, active ink temperature control
- Integrated low energy ink fixing system with LED technology
- Optical micrometric printheads alignment
- Print engine with vectorial graphic and variable data management
- HD print resolution, maximum accuracy of logos, dots and fonts
- Automatic ink storage, filtration and refilling system
- Industry 4.0, integrated diagnostics and remote support
- Scheduled maintenance service

MAIN CHARACTERISTICS

Scope of application:

- Production lines for flat, tempered or laminated glass
- Use of inorganic hybrid inks that are unalterable over time
- Possibility of coloured inks and RAL inks
- Edge-to-edge printing, cutting and grinding wear compensation
- Automatic management of APBL cycle (inner-outer)





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COD. 1204T TENACK SQUARE PACKING

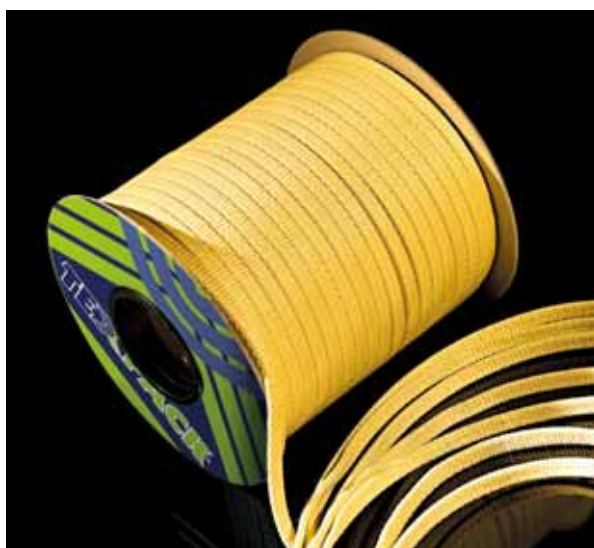
Tenack square packing is made by braiding wires of AISI 316 L stainless steel. This type of packing, which withstands high temperatures and has excellent mechanical properties, is suitable for the glass industry as protection for parts that may come into contact with hot glass that is still soft, to prevent thermal shock and microcracks. The packing is very flexible, elastic and easy to handle, and is an excellent substitute for Aramtex® products when temperatures exceed 350°C.



COD. 1204CM TENACK KNITTED SLEEVES

Tenack sleeves are made by braiding AISI 316 L stainless steel wires. These sleeves, which withstand high temperatures and have excellent mechanical properties, are suitable for the glass industry as protection for parts that may come into contact with hot glass that is still soft, to prevent thermal shock and microcracks. They are an excellent substitute for Aramtex® products when temperatures exceed 350°C.

COD. 12010N ARAMTEX® DISCONTINUOUS FILAMENT TAPES



Aramtex® tapes are produced using 100% pure paraaramidic yarns with continuous filaments, and are usually woven in several layers, using particularly fine yarns that render the positioning surface extremely homogeneous and smooth, thus preventing the still hot sheets of glass from being scratched. Aramtex® tapes have excellent mechanical characteristics (excellent resistance to cutting, abrasion, tearing and compression) while their heat resistance characteristics remain unaltered.

COD. 1203N PBI TAPES

PBI tapes are fire-retardant textile products made of PBI yarns, which are particularly suitable for high temperatures. To improve the use of this tape, a double-sided adhesive has been added, which helps to ensure correct positioning.





VINCENT SRL

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Vincent A global partner for all application in the glass industry



HALO



HALO product line: a new concept for edge grinding of automotive glass.
Main product features
+ Minimum startup time;
+ Increased productivity;
+ Machine set up minimized;
+ Easy installation

HYLAS



HYLAS, VINCENT: a new line of wheels for grinding furniture and technical glass.

The most significant benefits are: fast startup, high speed, excellent quality finishing as well as extreme flexibility of use. Main product features:
+ Fast startup;
+ Maximum performance;
+ Machine set up minimized;
+ Increased productivity;

STARFLEX



STARFLEX: Universal set of metal and resin grinding cups for flat edge processing of float and laminated Glass, Focused on process efficiency and flexibility.

- Main product features
- + High speed;
 - + Flexibility;
 - + Long lifetime;
 - + Optimized edge finishing

LOW-E DELETING WHEELS



REVERSE: wheels designed to improve the productivity of machinery for processing of laminated glass for architectural and structural facades.

- Main product features
- + Improvement of diamond tool life;
 - + Enhanced edge finishing quality;
 - + Increased working speed;
 - + Fragmentation of plastic waste;
 - + Complete range of wheels geometries and thicknesses

VINCENT PRODUCT ASSORTMENT FOR GLASS PROCESSING

INDUSTRY	APPLICATIONS	VINCENT PRODUCT
TECHNICAL GLASS	<ul style="list-style-type: none"> • Edge grinding and drilling of automotive, home appliance, solar and LCD glass 	<ul style="list-style-type: none"> • Peripheral grinding wheels 60 to 250mm diameter • Straight and countersink diamond drills for automatic machines
ARCHITECTURAL GLASS	<ul style="list-style-type: none"> • Edge grinding and chamfering of architectural glass • Removal of metal coating 	<ul style="list-style-type: none"> • Cup wheels in metal and resin bond for grinding and finishing • Peripheral wheels • Saw blades • Elastic wheels • Cerium polishing wheels
FURNITURE GLASS	<ul style="list-style-type: none"> • Edge grinding and profiling, chamfering, drilling and cutting of furniture glass • Engraving of crystal glass 	<ul style="list-style-type: none"> • Cup wheels in metal and resin bond for grinding and finishing • Peripheral wheels with various profiles to be used on automatic or manual machines • Straight and countersink drills • Milling cutters • Cutting blades • Engraving wheels • Cerium polishing wheels
OPTICS	<ul style="list-style-type: none"> • Grinding and polishing of optical lens • Lens edge grinding 	<ul style="list-style-type: none"> • Frontal cup wheels • Diamond pellets • Edge grinding and polishing wheels (also combined)

TUROMAS
OUR PASSION, YOUR PROGRESS

TUROMAS

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TUROMAS is a global reference in the manufacture of machinery for storing, loading and cutting glass, thanks to its continuous investment in R&D and its support to the customer during the whole purchase process. It is something that it has committed to since the first contact: trust to obtain a close relationship. No two factories are the same. For this reason, the Spanish company promises a tailor-made solution for every need, from semi-automatic equipment to fully automated cutting lines for all glass sizes.

FLOAT GLASS CUTTING



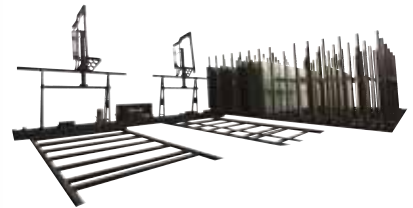
RUBI monolithic glass cutting tables are high-performance machines that offer exceptional cutting quality, meeting the requirements of low-emission glass manufacturers. There is a specific solution for each company, from independent and flexible cutting units to fully automated cutting lines.

LAMINATED GLASS CUTTING



LAM laminated glass cutting tables are autonomous machines that satisfy medium production needs or machines designed to be integrated into a mixed cutting line that responds to demand for maximum automation. Both types of machines are compatible with Low-E glass and guarantee a very high quality cut.

SMART STORAGE



TUROMAS smart storage systems can be ground-based, aerial or 'shuttle', for glass sheets of any size and thickness, supplying one or more cutting lines, depending on available space, current production needs and future projections.

SOFTWARE



Comprehensive solutions to interpret and manage your company's production data: Complete line automation, including non-automated plant warehouses. Information available and updated in real time. Generation of reports in spreadsheet format (MSExcel) Preventive management of stocks, faults and maintenance. Compatibility with the main software in the market.

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SWISSPACER: TRANSPORT SAFETY FROM POLAND TO THE ROCKY MOUNTAINS



The recently completed "Humboldt Project" in the Whittier neighbourhood of Denver, USA is a modern residential complex of three single-family homes with cubic architecture and large windows.

To meet the high demands for the design and energy efficiency of the project, experts from Vonderhaus constructed the windows using modern triple glazing units with warm edge spacer bars from SWISSPACER – produced in Europe by the Polish glass specialist Vitroterm (Murow).



The triple glazing units were fitted with the innovative SWISSPACER Air – an intelligent solution for pressure-equalised insulating glass, not least because of the enormous variations in height along the transport route from the production site in Poland to the installation location.



The three buildings, designed by local architecture office Studio Limited (Denver), are harmoniously integrated into the existing development, and combine modern building design with sustainability. The two-storey buildings are noted for their clear,

purist design, a high proportion of transparent surfaces, lots of daylight and openness in the room design, as well as the use of high-quality materials.

The architects relied on the expertise of Vonderhaus as an optimal solution for the 48 windows and sliding doors, some of which are quite large. As one of the leading providers of high-performance window systems in North America, the company combines decades of experience with high-quality craftsmanship and the latest technologies.

Matthew VonderHaar, managing director at Vonderhaus, said, "For new buildings in Denver, the locally applica-

ble standard IECC 2018 requires a maximum U_w value of $1.70 \text{ W}/(\text{m}^2\text{K})$ for windows. With the selected glazing and the thermal break in the glazing edge, we were able to meet the requirements without any problem and achieve a U_w value of $0.9 \text{ W}/(\text{m}^2\text{K})$." The SWISSPACER Air enables a larger cavity between the panes, which also improves sound insulation.

Another challenge on this project was the long transport route with enormous variations in height of almost 1,400 metres between the Polish production site and the installation location in Denver.

Matthew VonderHaar added, "For projects situated more than 1,000 metres above sea level, we only use the SWISSPACER Air. It is the best option for reducing the hazards that can be caused by the difference in pressure. And we can be completely relaxed in case of last-minute changes to the transport route. Unlike common height measuring systems, the component reacts to each and every load that can occur during unplanned deviations from the chosen route. It adapts constantly to the air pressure in the immediate environment and constantly regulates the pressure in the cavity between the panes. In our opinion, it is far superior to the capillary systems previously used."

The SWISSPACER Air is a metal sleeve with a special membrane, and is integrated directly into the spacer bar. The special structure brings about a permanent, slow equalisation of pressure between the surrounding environment and the cavity between the panes. This enabled safe transport, even given the extreme conditions. The insulating glass units were transported over several thousand kilometres by freight ship, train and lorry, and with many differences in temperature and height.

The SWISSPACER Air was installed in the glazing edge of the insulating glass units produced at the factory of the Vonderhaus's long-standing partner Vitroterm in Poland. Once drilled, the component was screwed into the SWISSPACER Ultimate warm edge spacer bar.

For insulating glazing units delivered to the USA and Canada, Vitroterm and Vonderhaus have long used this intelligent solution as standard, ensuring greater transport safety and a minimised risk of breakage.

PILKINGTON UK TRIALS HYDROGEN-POWERED ARCHITECTURAL GLASS PRODUCTION

Pilkington United Kingdom Limited, part of the NSG group, has successfully manufactured architectural glass at its St Helens facility using hydrogen power in a world-first trial.

The trial is a key step in the manufacturer's plans to decarbonise and could see a transition to using hydrogen to power all production at the site, which currently uses natural gas. The switch means that the float glass furnace



– which accounts for the majority of the company's overall carbon emissions – would be able to run with hugely lower emissions.

The aim of the trial was to demonstrate that the

furnace, in which the raw materials of the glass are heated to around 1,600 degrees centigrade, could run safely at full production without impacting product quality.

Matt Buckley, UK MD of Pilkington United Kingdom Limited, said, "The trial was a significant success. Thanks to NSG's advanced fuel combustion expertise, and the preparation and efforts of the team, we managed to achieve a seamless transition between the two different fuels. It proves that hydrogen is just as capable as natural gas in achieving excellent melting performance, and that it could be possible to operate the furnace with vastly reduced carbon emissions.

"Decarbonisation of the construction supply chain is a vital part of the UK's ambition to achieve net-zero by 2050, and the ability to produce float glass in this way is an important step in this journey.

"It was in St Helens that the float glass process was developed in 1952, revolutionising how glass is made around the world. Now, 70 years later, this trial represents another major milestone for the global glass industry and it's appropriate that it has once again been pioneered here."

David Parkin, Director of Progressive Energy and Project Director of HyNet North West, said, "Industry is vital for the economy but is difficult to decarbonise. HyNet is focused on removing carbon from industry through a range of technologies including the capturing and locking up of carbon and the production and use of hydrogen as a low carbon fuel.

"This trial at Pilkington UK is a significant step in demonstrating that it is possible to use hydrogen to power glass production and provides a valuable blueprint for further trials and implementation."

HyNet North West is an innovative low carbon and hydrogen energy project that will unlock a low carbon economy for the North West and North Wales and put the region at the forefront of the UK's drive to net zero.

The three-week trial on the float glass line used approximately 60 road tankers of hydrogen, but the longer-term plan is to create a network of hydrogen pipelines to supply key industrial sites, avoiding the need for road transport.

The initiative is part of the 'HyNet Industrial Fuel Switching' project to decarbonise industrial processes across the North West. By 2030, it is expected to cut 10 million tonnes of carbon per year – the equivalent of taking four million cars off the road.

VITRO SOLARBAN® 67 ADDS TO SUSTAINABILITY AND AESTHETICS

As Oregon's first project to pursue LEED® certification at the Platinum level, the Meyer Memorial Trust in the heart of Portland's, USA, urban community combines investments in social equity and sustainability. Building elements include a saw-toothed photovoltaic (PV) roof, textured metal cladding and large, inviting windows fabricated with Solarban® 67 glass by Vitro Architectural Glass.

Portland-based Lever Architecture specified the advanced solar control, low-emissivity (low-e) glass to support daylighting goals and to create a transparent barrier between the indoor and outdoor spaces of the new centre.

"We typically use Solarban® 60 glass, but for this building we needed a glass coating with a lower SHGC (solar heat gain coefficient), especially with large façade exposures on the west, south and east," said George-Michael Rusch, RA NCARB, an associate with Lever.



With a SHGC of 0.29 in a standard one-inch insulating glass unit (IGU), Solarban® 67 glass not only met the project's performance goals, but it also helped achieve the specific aesthetic Lever was seeking for the project.

The glass "has a nice greyish hue without much green tint," Rusch explained. "On the top floor, the glass reflects the sky while still allowing inviting views to the interior on the ground floor when under a canopy or overhang."

The building is deliberately set back from the property line to create a welcoming "front porch" with plants, seating and views of the centre's large conference room, which is called the "Center for Great Purposes," a phrase from Meyer's will.

The ground-floor curtain-walls on the east and south facades feature large glazing bays that emphasise the transparency of the Trust's public programs and showcase the beautiful timber interior and large blue-grey display wall in the lobby and function space. Mounting the curtain-wall system directly to the load-bearing mass plywood columns enhanced this effect.

On the second and third stories of the 19,800-square-foot facility, Lever specified tall, punched windows, which, according to Rusch, "create a simple rhythm that does not take away from the massing and allows the texture of the metal panels to accentuate the form with shadow and light play."

The openings are intentionally staggered, with each window group corresponding to a specific program area. To maximise daylight and views, each grouping contains at least three windows across the width of a 12-foot office



area. "That gave us around a 40-inch width when allowing for structure between the punches," Rusch added. For consistency on the elevations, all the window punches appear to be the same full floor-to-ceiling height, except for offices with furniture on the perimeter where, for contrast, Lever added a dark aluminium composite panel below the windowsill.

Reflecting the organisation's equity goals, all workspaces are afforded the same natural light and views, with the prime corner spaces reserved for conference rooms, a dining space and a library.

In addition to turning its benefactor's former tow-truck storage lot into a community anchor, the Meyer Memorial Trust building is enrolled in the Path to Net Zero with Energy Trust of Oregon. Beyond the high-performance glazing and solar roof, the structure incorporates multiple other sustainability features, including an energy-efficient building enclosure and heating, ventilation and air-conditioning (HVAC) system, on-site stormwater management, regional materials and native plantings.

GLAS TRÖSCH LAMINATED SAFETY GLASS USED IN SCULPTURE



From 8 May to 31 October 2021, the idyllic spa town of Bad Ragaz in Sarganserland was transformed into what has become one of Europe's largest open-air sculpture exhibitions.

This year, the motto of the Swiss Triennial was "Distance sharpens the gaze". Along streets, squares, parks and hotel complexes, various sculptures allowed visitors to take a tour of several kilometres.



Directly in front of the Grand Resort Bad Ragaz was the almost three-metre-high sculpture "Tri Colore" by Kathrin Severin, for which she designed ten steles made of glass in the three primary colours magenta, cyan and yellow. The artist chose laminated safety glass with SWISSLAMEX

COLORDESIGN PVB films by Glas Trösch.

In addition to façades, balcony railings or staircases, beautiful art objects can also be created and specifically accentuated with colour. Depending on the perspective and light intensity, the sculpture changes and thus inspires the viewer, true to the motto of the year, to find their own way of seeing.

SAINT-GOBAIN SELLS GLASS PROCESSING COMPANIES IN FRANCE AND GERMANY

Saint-Gobain announced the sale of the French company Aurys, specialised in shaping and processing of flat glass, to a former manager of Saint-Gobain.

The Group has also sold the German company GVG Deggendorf, which specialises in tempered glass, to the Swiss Arbonia group.

Aurys employs around 145 people at its Carentan-les-Marais, Manche, site and in 2020 generated around 20 million EUR in sales. The Deggendorf site in Bavaria employs 160 people and in 2020 achieved a turnover of around 20 million EUR.

The transaction is part of Saint-Gobain's continued portfolio optimization strategy to enhance the Group's growth and profitability profile.



VITRO ARCHITECTURAL GLASS: SOLARBAN® GLASS ENHANCES SUSTAINABLE DESIGN

Vitro Architectural Glass and Walker Glass teamed up to provide AviProtek® E bird-safe glass for three new buildings on the campus of Swarthmore College: The Whittier Hall pavilion, The PPR Apartments at Swarthmore and The Maxine Frank Singer Hall.

As one of the first projects constructed under Swarthmore College's new sustainability framework standards, AviProtek® E bird-safe glass by Walker glass was combined with Solarban® 67 glass by Vitro Architectural Glass to enhance the eco-friendly character of the PPR Apartments.

In a standard 1-inch insulating glass unit (IGU), Solarban® 67 glass provides a solar heat gain coefficient (SHGC) of 0.29 and visible light transmittance (VLT) of 54% to deliver abundant daylight while reducing loads for artificial heating and cooling. The glass also provides clear views of the Swarthmore College campus, which further enhances its connection to the community. Heated by geothermal energy, The PPR Apartments at Swarthmore's suite-style living spaces are located near downtown Swarthmore.

Designed for the college's art department, the 19,000-square-foot Whittier Hall pavilion features overhead skylights that provide natural lighting for the painting and draw-



The PPR Apartments at Swarthmore College - Photography by Andy Shelter

ing studios. The building also houses studios designed for sculpture and ceramics work, along with a student workspace and an outdoor sculpture garden.

A signature element of the pavilion is a glass curtain wall that unites bird-friendly AviProtek® E patterns acid-etched on Solarban® 60 solar control, low-e glass by Vitro Glass. In addition to providing a safer environment for the school's abundant bird population, the curtain wall delivers year-round heating and cooling cost savings. Even finished with Walker Glass's bird-friendly acid-etched patterns, Solarban® 60 glass provides a solar heat gain coefficient (SHGC) of 0.39 while allowing 70% of its visible light to pass through. Whittier Hall also incorporates sunshades to further reduce solar heat gain, a photovoltaic array for electricity generation and a large geothermal well field for heating and cooling.

The Maxine Frank Singer Hall, built to honour molecular biologist Maxine Singer, also features bird-friendly AviProtek® E patterns acid-etched on Solarban® 60 solar control, low-e glass by Vitro Glass. This expanded building houses new engineering and science facilities for Swarthmore College students and includes flexible classrooms, as well as enhanced indoor and outdoor common spaces.

AviProtek® E bird-safe low-e glass by Walker Glass helps architects and building owners to achieve their environmental goals, earn LEED® credits and meet solar-performance targets. The only bird-safe glass product available with an Environmental Product Declaration (EPD), the product features a selection of patterns that can be applied as horizontal, vertical or decorative visual markers on the first (exterior) surface of clear, Acuity™ low-iron and Starphire Ultra-Clear® glass substrates by Vitro Glass; and with Solarban® 60 glass or Solarban® 70 glass on the second (interior) surface of an IGU.

NEW USES FOR RESEARCH FRONTIERS' SPD-SMARTGLASS UNVEILED AT IAA

BMW has created a new visionary headlight design for its BMWi Vision Circular Showcar. The vehicle utilises SPD-Smart light-control film, invented by Research Frontiers and manufactured by Gauzy, that is laminated into automotive thin glazed curved glass. The all-electric car features dynamic shading headlights that support a futuristic exterior. As the car starts, the SPD glass switches from dark to transparent, revealing headlights that illuminate surroundings.

SPD-based headlights open new design possibilities that support cutting edge designs executed by BMW with sporty elegance and precision. The first of its kind, the BMWi Vision Circular Showcar has reimagined headlight design with dynamic headlights. Light is controlled instantly transforming the exterior of the vehicle from a



uniform and sleek black panel design with hidden headlights to a dynamic machine as the car starts and light is revealed.

Also for the first time ever displayed at an automotive show, LG Display showcased its latest state-of-the-art Transparent OLED technology. Through its first collaboration with Gauzy at IAA 2021, LG Display visitors experienced the many entertainment and informative possibilities that Transparent OLED panels can bring to public transport.



LG Display's Transparent OLED screens laminated with Gauzy's SPD (Suspended Particle Device) smart glass technology enables even higher contrast ratios, thereby making Transparent OLED displays even more adaptable to bright environments and shifting light conditions.

"LG Display is pleased to showcase Transparent OLED displays designed for trains in the European market for the first time ever," said Cho Min-Woo, head of the Transparent OLED business at LG Display. "LG Display will bring new possibilities with its Transparent OLED to the signage and mobility markets while delivering innovative and trendy new ways for all kinds of companies to display information through eye-catching spatial designs and interior effects."

These innovations by BMW and LG Display were made possible by Gauzy Ltd., a material science technology company which is a manufacturer of SPD, licensee, and strategic investor in Research Frontiers, the inventor of patented SPD (Suspended Particle Device) SmartGlass technology.

Eyal Peso, Gauzy CEO, said "The future of displays is transparent, and it's here now. The ability to make any window active, multifunctional, and the ability to provide both visual and thermal comfort alongside communication is one of Gauzy's core goals. By adding our LCG® smart glass technologies to glass and other technologies like transparent OLED, together, we are setting a new standard in signage."



CRICURSA MAKES THE LEAP TO 18 METRES WITH NEW TUROMAS CUTTING LINE



CRICURSA has acquired a new TUROMAS cutting line for monolithic glass, placing itself at the forefront of special architectural glass processing.

The new cutting line enables the processing of glass up to 18.10m by 3.30m. It features a state-of-the-art decorating system capable of removing a wide range of Low-E, TPF, Easypro coatings, as well as a 4-tool cutting system.

GUARDIAN GLASS ADDS SUPER JUMBO CAPABILITY

Guardian Glass is responding to demand from architects who are pushing design boundaries with building facades that maximise views and natural light, while also reaching energy performance codes and standards.

"Super jumbo helps our fabrication customers improve yields on many common commercial sizes and produce oversize insulating glass units that aren't possible with standard jumbo coated glass," said Chris Dolan, Commercial Segment & Technical Services Director at Guardian Glass North America.

Independent Guardian Select® fabricator Press Glass is capitalising on this advantage. Press Glass brought its long-standing expertise in super jumbo – its Polish facility fabricates glass up to 275" – to North America last year. Its Ridgeway, Va. factory was built to accommodate 130" x 240" glass. The fabricator has some of the largest glass sizes available in North America.

"Our customers want larger glass, whether it's commercial or residential," said Piotr Styk, Senior Estimator/Project Manager at Press Glass. "Everyone is calling for expansive views, and the bigger the better. When we were deciding on equipment to purchase for our new facility, we researched the maximum glass size available in North America. Guardian offered the largest size at 240", so we made sure to equip our facility with machines that could handle that size. At Press Glass, we strive to exceed qual-

ity standards. Every order is a custom order, so it's essential that we work together effectively. Our communication with Guardian works very well. It's a very effective partnership."

The partnership has delivered on projects that range from Press Glass' Ridgeway facility, which boasts 231" x 115" triple insulating glass units that include Guardian SunGuard® SNX 51/23 coated glass and SunGuard® SuperNeutral® 68 coated glass, to the under-construction Terminal 5 at Chicago O'Hare International Airport, which uses Guardian SunGuard® SNX 62/27 coating on UltraClear® low-iron glass in a large variety of sizes.

"Even in circumstances where we're not using super jumbo as the standard size, it helps us maximise yield and minimise waste because the cutting optimization is better," said Spencer Green, Area Sales Representative, Press Glass.

Guardian Glass super jumbo glass is available with multiple high-performance Guardian SunGuard® coatings on clear and UltraClear™ low-iron substrates, at 6, 8, 10 and 12mm thickness. These coatings allow architects and designers greater flexibility to specify coated glass that meets their performance and aesthetic goals.

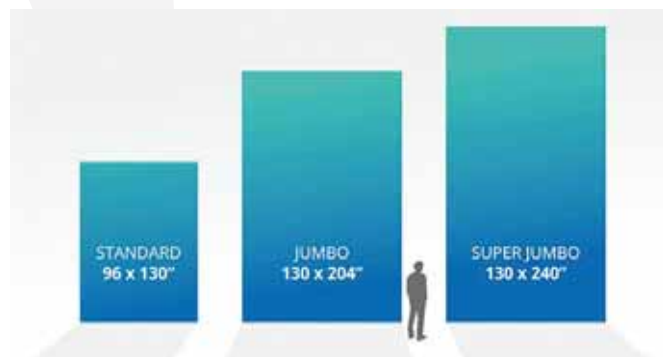
AGC AUTOMOTIVE BELGIUM PLANS RESTRUCTURE

AGC Automotive Belgium informed its works council of its intention to restructure the Fleurus operation. A repositioning of the activity is essential to ensure the long-term survival of the site. A reduction in the workforce of 40 people out of a total of 188 workers employed at the plant is envisaged.

The European group's windscreen business has been under pressure for several years, and has struggled to make profit on this product range. This is the consequence of fierce competition between European glassmakers, accentuated for several years by the arrival of Chinese suppliers in the same geographical area. This pressure has increased, as with the technological evolutions linked to vehicle connectivity, specifications have evolved, and production tools must be able to adapt to them.

At the same time the automotive market is undergoing profound changes, such as changes in vehicle engines, the growing success of car-sharing systems and the expected advent of autonomous cars. All of this is causing potential buyers to delay purchase decisions, resulting in a widespread decline in the automotive market.

Car manufacturers – AGC's customers – are reacting by merging to form "heavyweights" capable of achieving significant economies of scale, intensifying competition between suppliers, and ultimately lowering the prices of components, including glazing. Unfortunately, this price war is often accompanied by strong pressure on the level of quality required, on the one hand to stand out from



the other manufacturers, but also on the other hand to have leverage and put additional pressure during consultations for future contracts to be awarded.

The AGC Group is finding it difficult to position itself on



enough new vehicle models to ensure a correct level of saturation on all its laminated glass production lines, hence the sharp drop in activity over several years

now. This difficult situation has clearly been exacerbated by the COVID-19 crisis, with a drop that economists believe will not be compensated before a period of 3 to 5 years.

In this context, the Fleurus plant has so far been unable to obtain any new models for the coming years. Considering that the average development time for a new vehicle is 3 years, its production level will be around 500,000 units per year, with a forecast drop of around 100,000 units per year from 2023. In other words, if no new impetus is given, the forecast for 2026 is less than 200,000 pieces. It has become essential to find solutions to reduce the factory's production costs, both fixed and variable, to adapt them to the reduction in activity, to reduce the expected financial losses for the years 2021-2022, and to try to ensure the site's long-term survival by attracting new models and/or new investments.

The Group is therefore forced to initiate a restructuring plan at the Fleurus site. The factory currently employs 188 people and is considering reducing its workforce by 40 people. A social plan, as well as the related support measures, will be examined with the various partners concerned.

VITRO ARCHITECTURAL GLASS LAUNCHES INTERCEPT LITELOCK™ SYSTEM

Vitro Architectural Glass and GED Integrated Solutions, LLC (GED) launched Intercept LiteLock™, a new extruder tip and sealant bead application system that provides licensees of Intercept® insulating glass technology with enhanced efficiency, performance and quality improvements.



Intercept LiteLock™ facilitates 30 percent to 50 percent faster processing speeds on GED's Intercept® Oven & Roll Press while creating a wider manufacturing process window.

This results in a more consistent, uniform and secure seal between the Intercept® spacer and the glass lite, which maximises the service life of Intercept® insulating glass units (IGUs) and enhances window makers' operations by offering increased throughput, lower oven and roll press exit temperatures, reduced energy consumption, reduced consumable parts costs, precise sealant application and a smoother, more forgiving application process. Compared to the standard GED nozzle tip, which applies a rounded sealant bead during the extrusion process onto the Intercept® spacer, the patent-pending Intercept LiteLock™ nozzle tip applies sealant in a unique bead geometry, resulting in robust adhesion to the spacer metal substrate at near-finished bond line width.

"Chief among the many benefits of Intercept LiteLock™ is the high-speed processing power unlocked by this new sealant bead application technology," said William Davis, Senior Technical Services Engineer at Vitro Architectural Glass. "The Intercept LiteLock™ nozzle tip design reduces the amount of required squeeze-out during the roll-pressing process, so Intercept® can run faster and at lower post-heating process temperature, which results in a cooler IGU at the oven and roll press exit conveyor that is near ready for argon filling and fourth corner sealing."

In addition to standard double glazed IGUs, the Intercept LiteLock™ system has been rigorously tested with triple glazed IGUs across multiple oven and roll press speeds and temperatures to establish effective processing recommendations that will ensure robust glass and spacer adhesion, including the traditionally difficult to bond centre lite.

Residential window manufacturers can upgrade their existing GED SmartExtruder™ i-3 sealant and desiccant application systems to the new Intercept LiteLock™ system with a minimally invasive process.

The Intercept® spacer system, which is constructed in a U-channel design with tin-plated steel or stainless steel rather than traditional box shaped metal or foam, has been fabricated into more than 600 million windows in Europe and North America.

AGC INAUGURATES RENOVATED FLOAT GLASS PRODUCTION LINE

A ceremony was recently held for the inauguration of the renovated float glass production line in Bor, Russia. This float line was shut down to carry out a cold repair and was upgraded with new technologies improving its performances in terms of safety, environment, en-





energy consumption, productivity and quality – true to AGC Glass Europe's commitments.

In presence of numerous guests, partners, local authorities and representatives of the press, the ribbon was cut by Andrey Sanosyan (Vice-Governor of Nizhny Novgorod region) and Marc Michielsens (Ambassador of Belgium in Russia), together with AGC managers.

NSG GROUP: BATTERY STORAGE SYSTEM FOR PILKINGTON PLANT IN CANADA

NSG Group has partnered with Convergent Energy + Power (Convergent) to provide a battery storage system for its Pilkington plant in Collingwood, Ontario, Canada, in line with its commitment to reducing energy consumption and carbon (CO₂) emission, by using energy more efficiently and effectively.



The battery storage installation represents NSG Group's first mutually beneficial co-operation between an energy storage developer and a glass manufacturing plant. The 5 MW / 10 MWh battery energy storage system is fully operational and uses

Convergent's PEAK IQ® proprietary software to reduce the facility's electricity usage during the most costly, carbon-intensive grid consumption peaks.

As the project was constructed during the 2020-21 winter season, in the height of the COVID-19 pandemic, construction teams adhered to particularly strict safety regulations. In order to achieve the projected savings of around 450,000 USD / MW during the 2021 summer, Convergent coordinated with local partners to ensure pandemic-related travel restrictions did not slow down construction while navigating extensive supply chain disruptions.

"Locally, this battery storage system is part of our commitment to support our community in Collingwood and the broader efforts in Ontario to create a more efficient, sustainable grid," said Ron Young, Collingwood's Engineering Group Leader. "We value Convergent's expertise from system design to dispatch, bringing the battery storage system online as quickly and safely as possible during the pandemic," added John Wilgar, NSG Group Head of Procurement.

"NSG Group has been an excellent partner from start to finish and demonstrated a deep commitment to all of its stakeholders," said Johannes Rittershausen, Convergent's CEO. "We are proud to build on our track record of successful, operating energy storage assets for commercial and industrial facilities here in Ontario and across North America."

AGC PHOTOVOLTAIC GLASS FEATURED AT NEW SINGAPORE INSTITUTE OF TECHNOLOGY CAMPUS



An overview of the Singapore Institute of Technology's new Punggol campus.

AGC Inc. announced that its photovoltaic glass will be used at the Singapore Institute of Technology's new Punggol campus, scheduled to open in 2024.

The new Punggol campus of the Singapore Institute of Technology is planned to be the first in Southeast Asia to install an urban multi-energy microgrid that will decentralise energy sources and enable the effective use of local renewable energy sources, with the aim of obtaining the Super Low Energy (SLE) certification (awarded to buildings that reduce the energy requirements by at least 40 percent through energy conservation and creation) established by Singapore's Building and Construction Authority. AGC's photovoltaic glass, to be installed in the skylight of the food court on the campus, will be used as one of the energy sources, contributing to the reduction of the campus' reliance on electricity derived from the main grid.



Conceptual diagram of the food court interior.

The area of AGC's photovoltaic glass used in the campus is about 400m², equivalent to 57.7Kwp rated output. It will also enable natural lighting, which is an inherent feature of glass, to create a bright and inviting interior space.

AGC Asia Pacific Pte. Ltd., the reference point for the project, was also highly evaluated for its one-stop service from basic design to material supply and construction, which led to the selection of AGC's photovoltaic glass. Under its AGC plus 2.0 management policy, the AGC Group is creating products that add various pluses for society including safety, security, and comfort and for customers including new value and functionality. The AGC Group will continue to strive to provide new possibilities for glass that can contribute to the realisation of a carbon neutral society.

PRESS GLASS AWARDED "ICONIC AWARDS 2021" FOR HEADQUARTERS



Photos: Nate Cook Photography

PRESS GLASS' office building in Konopiska, Poland, was awarded in the Iconic Awards 2021 competition in the Innovative

Architecture category. Importantly, the seat of PRESS GLASS SA, designed by Konior Studio project, also won an additional Best of Best award.

The office building in Konopiska was built on the basis of an architectural design by the renowned Polish Konior Studio. The building is distinguished by a dynamic shape, and its harmonious integration into the surrounding nature.

Press Glass headquarters received several other awards, including the Gold A'Design Award 2021 in the Architecture, Building and Structure Design category and two awards in the Polish Architecture XXL 2020 Poll.

The Iconic Awards is held annually and is one of the most prestigious competitions for architecture and design. The organisers, German Design Council, pay particular attention to the architect's unique vision, reflected in the innovative technological and architectural solutions used in the project. An independent international jury is responsible for the selection of the winners.

POLFLAM FIRE-RESISTANT GLASS - EXPANDING PRODUCT SIZE OFFERINGS



POLFLAM announced the development of a new glass product, created by successfully increasing the maximum height of a single pane of POLFLAM BR glass to 4800 mm.

This latest glass offering comes with an EI 120 fire-resistance rating, one of the highest for this product size. It has also passed all safety testing protocols in the notified laboratory Gryfitlab.

The company developed this new line in response to architects' expectations and current market trends.

POLFLAM BR glass is used for fire-resistant structural glazings. The large glass pane surface area does not require any additional structural elements. This allows for better lighting of interior spaces and makes glass partitions aesthetically pleasing. POLFLAM BR glass solutions are a popular choice for the interior design of office, commercial and public utility buildings.

POLFLAM manufactures fire-resistant glass both for in-

door and outdoor use. The company's products are sold in most markets across the European Union.

POLFLAM is due to open a new factory in Tarczyn, near Warsaw, allowing the company to triple its production capacities.



NSG GROUP: INVISIBLE CONNECTIVITY THANKS TO HIGH-TECH GLASS

A collaboration between NSG Group and innovative product design company Cohda has made possible the vision of a high-tech world



Photography: Cohda Design Limited

that combines the beauty and design possibilities of glass with the complete absence of the wires required for our everyday technology.

With technology that uses transparent conductive coatings to transfer power to any device without the need for wires, Power-Tap, developed by Cohda, is a transparent lamination of non-conductive and conductive glass such as NSG TEC™. The arrangement allows power or data to be transferred across individual layers within the lamination. Pre-machined apertures create taps to the positive and negative charged inner coatings that supply power delivery to embedded devices. These connected devices appear to be freely floating within an optically clear glass panel with no visible means of power connection.

NSG TEC™ is an electrically conductive glass that is suitable for a wide range of applications, for example in visual displays. Thanks to its high light transmission, durability of the glass coating and the potential for thermal treatment, it is a versatile product. It is perfectly suited for applications with P-Tap technology.

Removing the need for wires offers designers, architects and engineers limitless opportunities for creativity by being able to locate powered devices within transparent structures.

Devices such as USB sockets, induction charging pads, motors, cameras, sensors and digital displays can be seamlessly integrated.



Photography: Cohda Design Limited



Early applications include LED lit display cases and shelving units for museums and induction charging 'smart' tables for high-end retail stores. Wider applications, some perhaps yet unimagined, will span a multitude of markets including Architecture, Security, Automotive, Retail and Lighting.

MORLEY GLASS SHORTLISTED FOR 6 NATIONAL FENESTRATION AWARDS

Uni-Blinds® integral blinds manufacturer, Morley Glass, the UK's largest manufacturer of Screenline® blinds integrated within double glazed units, was shortlisted for six awards in the 2021 National Fenestration Awards (NFAs). Three of the 2021 nominations for Morley Glass are for awards that the company won in 2020: Best Use of Video, IGU Manufacturer and Integral Blinds Company. This time, Morley Glass is also in the running for Digital Marketing Campaign of the Year and New Product and Recycling Company, reflecting the depth of its proactive approach to sales and marketing, R&D and sustainability. In addition to being a finalist in these corporate awards, two members of the Morley Glass team have also received nominations for individual awards. Marketing assistant Charlotte Gilbert has been named a finalist in the Social Networker and Young Person categories, along with Bryony Shaw, sales advisor, also on the shortlist for the Young Person award.



"Being shortlisted matters hugely because it provides important external recognition that we are on-track with our business. The whole Morley Glass team works hard every

day to create the highest quality products backed with outstanding service, but the best way to gauge how well we are doing is through industry awards – that's why the NFAs are key to the fenestration industry."

In the past 12 months, Morley Glass has experienced an upsurge in demand for its range of integral Venetian and pleated Uni-Blinds®, all of which are produced in its state-of-the-art factory near Leeds using the world-renowned Screenline® blinds systems from Italian manufacturer Pellini S.p.A.

In tandem with increased production volumes for its established integral blinds range in 2021, Morley Glass has launched several new products and developed its glass recycling operation, which takes post-consumer glass back from installers working on replacement projects to be recycled – raising funds for good causes in the process.

TVITEC WINS THE INNOVATIVE PRODUCT OF THE YEAR AWARD WITH ROCALUX

Rocalux by Tvitec has won the Innovative Product of the Year Award, organised annually by the Castilla y León Económica group.

Through digital printing and by means of an inkjet system and other sophisticated transformation processes,



Rocalux can faithfully reproduce any natural construction material finish, especially that of stone and all its derivatives. Rocalux's product range can be manufactured in both flat and curved pieces and in large sizes of up to 12 metres.

The award announcement explained the recognition of this innovative glazing material: "The company Tvitec Sys-

tem Glass has developed Rocalux, an innovative textured architectural glass surface that is capable of sustainably reproducing any type of building material. The innovation and digital technology implemented by the company,



headed by Javier Prado Ovalle, makes it possible to eliminate the inherent light reflection of glass to give it an optimal matt appearance for opaque enclosures, among other applications."

October 2021

PROXIMUS TRIALS INNOVATIVE AGC ENHANCED CONNECTIVITY GLASS ANTENNA

Proximus and AGC have joined forces to demonstrate the efficiency and great performance of WAVEATTOCH, a new glass antenna developed by AGC that not only integrates seamlessly into building facades, but also enables operators to accelerate deployment at low cost due to its ease of installation.

Since the new glass antenna is transparent and installed indoors (while delivering outdoor coverage), it blends in perfectly with the surrounding urban environment. This makes WAVEATTOCH the perfect transparent alternative to antennas in city centres to provide enhanced mobile data services at higher speeds and for more people.

The WAVEATTOCH antenna is available for most telecommunication frequencies used in Belgium and can be used with any technology (2G, 3G, 4G, 5G). In addition to



Inside view on WAVEATTOCH - Photographer: Tom Vandewiele, Digital Imaging - © AGC Glass Europe

WAVEATTOCH, AGC has developed the GIL (Glass Interface Layer) and WAVETHRU technologies, allowing WAVEATTOCH antennas to be being installed on any type of insulating glazed facades and ensuring that EMF emissions are within defined regulatory limits.

Bernard Monville, Head of WAVE Venture, said, "Glass antennas can be installed at lower heights and require less transmission power to cover dense urban areas, enabling Proximus to comply with one of the world's most stringent EMF standards."

The glass antenna being tested at the Proximus Tower is a 5G antenna (3.7 GHz, 4x4 MiMo) connected to the Proximus 5G network. It was developed at the AGC research centre in Gosselies, Belgium, a state-of-the-art facility that develops and tests integrated antenna glazing technology (for buildings and cars) designed to meet growing connectivity needs.

Geert Standaert, Chief Technology Officer at Proximus,



Outside view of WAVEATTOCH - Photographer: Tom Vandewiele, Digital Imaging - © AGC Glass Europe

said, "We will continue our trials with AGC. The potential for urban, dense urban and indoor configurations is promising. We look forward to more roll-outs in the future."

SAFELITE GROUP ACQUIRES UNIQUE PAYLESS AUTO GLASS

Safelite® Group, a leading vehicle glass services and recalibration company in the USA and owner of Safelite AutoGlass®, announced an agreement to acquire the assets of Unique Payless Auto Glass in Fremont, California.

"We're pleased to welcome Unique Payless Auto Glass associates to the Safelite family," said Tom Feeney, president and CEO of Safelite Group. "Open since 2017, their



focus on exceptional customer service and treating each other like family nicely align with our

mission and values, making this acquisition a terrific addition to our business."

Safelite is known for its excellence with vehicle glass repair, replacement and recalibration services. "This is a fantastic opportunity to utilize the skills and talents of their team while honouring their legacy," continued Feeney. "Together, we will deliver the value of personal care and memorable customer service we provide through the Safelite AutoGlass brand in every community."

Unique Payless Auto Glass will leverage Safelite's excellent operational systems, advanced safety system expertise (recalibrations), world-class distribution network, global purchasing power and strong insurance and commercial relationships.

AGC GLASS EUROPE: STRATEGIC PARTNERSHIP BETWEEN FINEO AND MASTERFRAME

FINEO Glass and Masterframe will launch a FINEO sash window, to be exclusively offered to the UK market.

With FINEO vacuum insulating glazing, AGC Glass Europe embraces innovative technology. The ultra-slim glazing (10 millimetre total thickness) achieves unrivalled thermal and acoustic performances, along with better light transmission.

Masterframe is a recognised sash windows specialist in the UK. Manufacturing to the highest quality, they focus on bringing innovative and premium products to the market. This standard of excellence makes Masterframe a perfect partner for FINEO.



Requirements for low-energy homes, reduced fossil fuel use for heating and reduced greenhouse gas emissions are increasing. High-performance glazing plays a vital role to bring warmth and comfort to homes. This can now be achieved even better with vacuum insulating glass (VIG) installed in new sash windows.

Carol Slade, Managing Director of Masterframe Windows Ltd said, "Masterframe is delighted to be entering into this strategic partnership with FINEO. Although we are true sash window specialists, we are now operating in a highly competitive sector. To remain a specialist and to stay ahead of our competition, we are completely design and performance focussed and seek to offer customers brand new and exclusive innovations."

Serge Martin, CEO FINEO Glass welcomes this new step,





saying, "This partnership with Masterframe is key for FINEO deployment in the UK, where sash windows are a staple of the windows market. We have been working closely together over the past months to design a premium window that will stand out in the UK market, and we are very confident about its future success." Masterframe and FINEO together bring an environmental solution for new windows with the sustainability aspect of an ultra-thin product being both 100 percent recyclable and lead free.

ŞİŞECAM OTOMOTIV A.S. INVESTS IN FURTHER SOFTSOLUTION LINE SCANNERS

Şişecam Otomotiv A.S. has relied on LineScanners from Softsolution for many years and has recently invested again in two horizontal LineScanners for the detection of specially applied defect markings. The two LineScanners are each 2900 millimetres wide and were positioned after cutting to check unwashed slices for their defect marks.

Şişecam Otomotiv A.S. is one of the leading flat glass manufacturers in Europe, and measured by production capacity, the fifth largest flat glass producer in the world. Numerous innovations originate from Şişecam,



with which the company has left a lasting mark on the development of the flat glass industry in the long term. Currently, Şişecam operates in the flat glass sector with 10 production facilities in six countries, supplying the construction, furniture, energy and household appliance industries with an ever-expanding range of products. "Softsolution is proud to supply Sisecam Otomotiv A.S. as a long-term customer with quality assurance systems for defect detection," said Area Sales Manager Jonas Pfannenstill.

GUARDIAN GLASS INVESTS IN GOOLE PLANT, UK

Guardian Glass is investing significantly in its Goole, East Yorkshire float glass production plant, to increase the company's ability to supply float glass, primarily to the United Kingdom (UK) and Ireland, while also improving the plant's energy efficiency.

The cold tank repair, which began in April, 2021, and completed in October, will rebuild the furnace with one of the most advanced technologies available, and expand the melting capacity by 20 percent to 825 metric tonnes per day.

"Guardian Glass is investing in the future of commercial and residential building in the UK and Ireland," said Guus Boekhoudt, Executive Vice President, Guardian Glass.

"This work assures that Guardian can continue to support the evolving demands of our customers with greater capacity, efficiency and environmental stewardship. It also underscores our Vision to be a preferred partner to our customers, suppliers, employees and communities based on a foundation of mutual benefit."

As one of the world's largest manufacturers of float, coated and fabricated glass products, and the only UK glass manufacturer with building products achieving the bronze Cradle to Cradle Certified™ Products Standard version 3.1, Guardian is committed to our Stewardship Framework. This core principle ensures that we consider environmental, social and corporate governance priorities in our day-to-day operations as we strive to find more efficient uses of resources, continuously improve our products and services and strengthen partnerships with our local communities around the world.

The Goole facility produces a wide range of float, coated and laminated glass products. Almost 100 percent of the solar control glass produced at the facility supplies projects within the UK.

Enhancements to the facility include:

- A furnace with improved energy efficiency and increased output.
- Enhanced automation to provide more reliable operations and reduce manual tasks. This enables team members to advance their skills by taking on more challenging responsibilities.
- Ongoing initiative to recycle cullet.
- Increasing the cullet ratio in products cuts energy consumption, reduces raw materials and reduces waste.

"Operations transformation improves efficiency and effectiveness, which boosts productivity and gives Guardian Glass a competitive advantage," said Goole Plant Manager Chris Duguid.



EYRISE EARNS FIVE INTERNATIONAL ARCHITECTURE AND DESIGN AWARDS

The Eyrise Cubicle, centrepiece of the dynamic glass specialist's Innovation Centre in Darmstadt, Germany, was recognised with two Innovative Architecture awards by Iconic Awards 2021.

Organised by the German Design Council, these annual awards honour architectural and interior projects, product design and materials and are selected by a panel of industry experts.

Named a winner in the Event/Exhibition and Innovative Material categories, the cubicle displays the benefits of Eyrise's



privacy and solar shading glass. Viewed from the exterior, it forms a complex installation, providing multi-layered views through the two types of glass, while the interior provides an intimate space for working and social interaction.

"The Eyrise Cubicle represents our progressive architectural approach," said Baldur Steimle, Head of Architectural Design at Merck, Eyrise's parent company. "Buildings should be a dynamic environment that combine light-flooded open spaces while also offering areas that provide privacy."

In addition, the Eyrise Cubicle won a Red Dot 2021 Award for Brands & Communication Design. Red Dot is an international design competition that honours the best brand and creative work of the previous year. Awards are given to submissions that demonstrate the highest standard and performance.



FC-Campus, a newly built office complex in Karlsruhe, Germany, designed by 3deluxe and glazed with Eyrise dynamic glass, saw success at Iconic Awards 2021 too,

taking home awards in the Corporate and Innovative Material categories of the Innovative Architecture section. Comprising two white cubes set diagonally opposite each other, the FC-Campus buildings merge into one sculptural form when viewed from a distance. Specially produced in a variety of organic shapes and in a distinctive blue colour, Eyrise's dynamic liquid crystal windows provide instant solar shading that enhance occupant well-being. "These awards recognise Eyrise's significant contribution to modern building design," said Celina Glipa, CEO of Eyrise. "Our dynamic liquid crystal glass enables architects to create exciting, forward-looking buildings that support light wellness while helping to reduce energy consumption."

PARAGON TEMPERED GLASS RENEWS PARTNERSHIP WITH TECGLASS

The partnership between Paragon Tempered Glass and Tecglass began in 2017 through IGE Glass Technologies, Tecglass' exclusive representative for North America, with the installation of the first VITRO-JET SINGLE PASS EVOLUTION digital line at their Niles, Michigan, USA, facility.

A fully automated digital line providing capacities with a

constant printing speed of 9 metres per minute, positioning Paragon as a reference and pioneer in the USA market betting on Tecglass digital printing systems for high industrial production within the principal glass markets.

Solidity, reliability, high levels of flexibility and high production capacities provided during these 3 years of operations with Tecglass technology, have made Vitro-Jet Single Pass Evolution a fully consolidated

and proven technology, heading to Paragon Tempered Glass to the acquisition of another complete SINGLE PASS EVOLUTION digital line for its facilities at Antwerp, Ohio.

AGC GLASS EUROPE INAUGURATES RENOVATED FLOAT GLASS LINE IN ŘETENICE

A ceremony was held in AGC Glass Europe's plant in Řetenice, Czech Republic, to inaugurate the renovated float glass line, which was shut down to carry out a cold repair of the furnace and connected utilities.

This float line features the innovative hot oxy-combustion technology, using 100 percent oxygen as an oxidiser instead of air, which results in a decrease of melting energy consumption and a reduction of CO₂ and NO_x emissions. This furnace design is one example of AGC's continuous quest to reduce its #environmental impact.

The ribbon was cut by AGC managers in the presence of employees of the plant, the engineering team and overhaul team.



ESG: HIGH QUALITY RESIDENTIAL IGU, THANKS TO FOREL MACHINES

ENERGY SAVING GLASS LTD (ESG) is a glass processing company located in Kingswinford (UK), founded in 1997 by Ken Walker.

ESG operates from a 30.000 square foot factory. IGU production is the core business of the company and is mainly



From left to right: Alex, Elliot and Luke Walker, Energy Saving Glass



Forel Arrissing Machine Art. EG

managed by machinery produced by Forel, a long time partner of ESG. Alex Walker, Director of ESG, said, "We have always found Forel's products are of a very good quality and very reliable:

we actually own two lines for IG production, a Forel vertical cutting line for laminated glass Art. VC and a arrissing machine Art. EG.

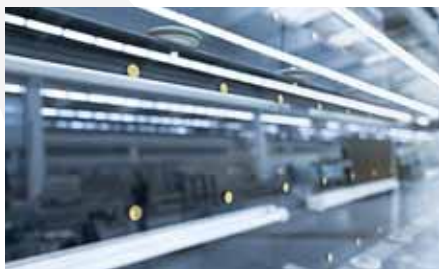
"We chose Forel Arrissing Machine because it is known for being a very fast solution for edge processing. With its 2 operative heads, the double carriage system and the patents for a perfect hold on the glass sheet, the Art. EG can offer at the same time high speed and the constant quality of edging we require. It's also very user-friendly, our staff find it very easy to operate with the Forel Arrissing Machine Art. EG."

SEDAK CREATES EFFECTIVE BIRD PROTECTION WITH MINIMAL PRINTING

sedak has achieved optimal collision protection (efficiency: collisions reduced to ten percent) whilst printing less than two percent of the glass area.

No other bird-protection glass needs so little printed area for its protective effect, and at the same time it achieves a higher level of protection (defined according to norm ONR 1040) than the alternative concepts. This has been confirmed by a scientific analysis performed by the internationally recognized institute "Collision Laboratories" (Hohenau-Ringelsdorf / Austria), specialised in bird protection.

Scratch and UV-resistant patterns are put onto the glass using digital printing. When it is further processed into laminated panes, the printing is on the outside (POS1). Thus insulation and safety glass with highly effective bird protection can be created up to a format of 3.60 x 20



metres.

Large-area glazing on buildings brings with it the risk of not being seen by birds. Reflections of trees or particular lighting con-

ditions cause danger for birds as they have only limited spatial vision. The basis of the idea is to make the glazing recognizable for birds without having too much negative effect on the view through the glass.

ISTANBUL TV AND RADIO TOWER COMES TO LIFE WITH ŞİŞECAM

Istanbul TV and Radio Tower is one of the reference projects brought to life with the innovative products of Şişecam Flat Glass, the largest flat glass manufacturer in Europe.

The tower has already become one of the city's landmarks. Şişecam Tinted Float Glass Grey and Şişecam Laminated Low-E Glass were chosen for this, to provide



low reflectance, effective heat and solar control, safety, security and noise control in order to meet the different needs of the project.

Architect Melike Altınışık described the project and the use of glass in the project, "The art of natural lighting allows the designer to use light as a design material in the design process, as well as shaping the space and designing extraordinary spaces.

"While the relationship between architecture and light is shaped by physical environmental conditions, architectural space is created by limiting the space to surfaces.



In this context, glass plays one of the most important roles and the magic of extraordinary elegance in the space is hidden in its transparency. Light enhances the space while enriching its function, and besides that makes an emotional contribution to the users of that space.

"The contribution of glass surfaces to the form that takes its existence from the strong bond it establishes with light, actually

says a lot in regards to glass. "Panorama Elevators" rising on both sides of the tower are architectural elements that both feed and divide the monolithic body.

"Visitors can see Istanbul from the observation and restaurant floors at an altitude of about 400 metres above sea level, while experiencing a vertical journey that extends 180 metres across the Historical Peninsula and the Black Sea coast on the other, with panorama lifts. In this adventure, thanks to the grey tinted glass that form a threshold between the exterior and the interior, while the thermal conditions are optimally provided for the users. Also they assume the necessary role in the formation of spatial continuity between the interior and the exterior through the opacity and contrast offered in the facade setup."

GFE: EU INDUSTRY CALLS FOR ACTION TO ADDRESS RISE OF ENERGY PRICES

As a member of Glass Alliance Europe, Glass for Europe supports the EU industry's calls for immediate action to address the steep rise of energy prices and for the adoption of policy measures ensuring access to abundant and affordable renewable energy in the long-term.

Through two statements released October 20, 2021, the European energy-intensive industries draw the attention of Member States on the threats that the current rise in energy prices puts on both EU competitiveness and the EU's climate ambition. While it stands clear that structural interventions are needed to secure affordable low carbon energy and make Europe more resilient to future shocks, urgent actions are critically needed to mitigate the impact of today's high energy prices on the European industry.

Energy represents around one third of flat glass manufacturing costs. In the short-term and without intervention from national governments, high energy prices are endangering the viability and competitiveness of European manufacturing operations. The toolbox presented by the European Commission needs to be complemented with more systematic recourse to state aid in the very short term.



Caution Sign - Gas Price Increases Ahead

NSG GROUP: ROSSFORD SOLAR ARRAY

Construction is well underway on a 1.4 MW solar array installation at the NSG Pilkington North America, part of the NSG Group, float plant in Rossford, Ohio, USA.

This project, constructed by AEP OnSite Partners, is scheduled to be completed by the end of 2021 and will supply about 2.5 million kWh of renewable energy annually. By way of comparison, that is enough to power about 200 houses or offset about 50 percent of the electricity used at the site's Automotive Advanced Assembly Facility.

AEP OnSite Partners, an affiliate of American Electric Power, is a leading provider of behind-the-meter solutions.



November 2021

SEDAK BULLET-PROOF GLASS NOW ALSO CURVED

sedak has managed to combine bullet proofing and curved glass, and now has two different lines in its portfolio: the insulation glass "sedak isosecure" and the laminate system "sedak secuprotect".

The glass is splinter-free and available up to a maximum format of 3.60 x 20 metres, with radiuses of one metre upwards possible.

It is certified as thermally toughened glass according to DIN EN 1063, and is industrially curved therefore usable statically. Both of the outside surfaces are made from glass, which is more attractive and easier to clean than conventional solutions with Im on one of the external surfaces. The insulation glass construction does without a polycarbonate system, thereby achieving better protection.

As with its flat variants, both of the curved versions are certified, sedak isosecure

from BR 2 NS to the highest bullet-resistance class BR 7 NS. As a bullet-resistant laminate system "sedak secuprotect" is also certified for the class BR 7 NS. Because of its symmetrical construction, the laminate even provides security from both sides.



MANKO WINDOWS: ALL THREE PLANTS ADD DFI GLASS COATING MACHINES

Diamon-Fusion International announced that Manko Window Systems has added FuseCube™ Express glass coating machines to all three of their manufacturing locations in Des Moines, Iowa, Manhattan Kansas, and Aurora, Colorado.

Manko services 28 states throughout the Midwest of the USA and plans to offer Diamon-Fusion® as an easy-to-clean glass coating solution

for their full line of shower doors, windows, and insulated glass on storefronts, curtain walls, and more. The coating is machine-applied to both sides of the glass, providing uniform coverage and maximum protection.





NSG GROUP: SMARTWINDOWS

An innovative collaboration between NSG Group and technology experts PHYSEE has created an architectural glass that is both “smarter” and more ergonomic than ever before – crucial elements when combining sustainability with boosting productivity in the workplace. The broad technical knowledge and testing capabilities of NSG Group, and ground-breaking sensor technology provided by PHYSEE, has resulted in windows that generate energy and provide data. The technology optimises daylight and contributes to making buildings energy neutral, providing perfect indoor climates and ambience.



Developed by PHYSEE, the “SmartWindow” contains sensors that measure data, such as light, air quality and temperature – information that is used to optimally cool, heat and/or

illuminate buildings. When integrated into NSG Group's IGUs the possibilities with regard to comfort, noise control, safety and security, are virtually endless.

“Dedicated NSG Group processing sites will integrate the PHYSEE sensors into standard double or triple IGUs made by us for SmartWindows. This will provide the flexibility to use all kind of glass combinations – our low emissivity glass for improved thermal insulation, our solar control and noise control glass, safety and/or security glass and other functional glazing products,” explained Alderlan Vitalino, Value Added Director Architectural Glass Europe NSG Group.

“The result is a reduction in energy costs by up to 30 percent and increased levels of comfort in the building – all of which contributes to the happiness, health and an 18 percent productivity increase in working environments.” The collaboration aims to equip multiple office blocks across Europe with a total of 15,000 SmartWindows.

SEDAK PUBLISHES FACT SHEET SERIES

sedak has become a technology leader in the industry with its oversized glass panes and the development of pioneering glass technologies – especially lamination and printing techniques.

The company has now published its expert knowledge in fact sheets for specific areas. This provides specialists



Compact knowledge: with the sedak fact sheets the glass specialist from Gersthofen is passing on its technical know-how - Picture: sedak

in architecture and civil engineering with compact, easily understandable and yet technically detailed information on glass quality, production technologies and design etc. These are the initial themes:

- ‘Anisotropies’ explains which factors of influence cause optical irregularities to occur and which possibilities there are to reduce them.
 - ‘Bullet-resistant glass’ provides an overview of the different bullet-resistance classes and explains which level of protection can be achieved with which glass construction.
 - ‘Lamination’ discusses the determining factors for high-quality glass laminates and compares different lamination procedures.
- Further themes including bird protection and printed glass are being prepared.

DOW: FIRST PROGRAM FOR CARBON-NEUTRAL SILICONES IN BUILDING FAÇADES

Dow announced the plans for 2022 to launch the world's first commercially available carbon-neutrality program for silicone materials used for structural glazing, insulating glass, and weather-sealing. Selected DOWSIL™ Materials will include PAS 2060-certified carbon certificates from Dow's backward integrated siloxane productions and carbon reduction investments. This carbon offset program, whose theme is “Designing with more freedom by engineering less impact,” can help to decrease the environmental impact of buildings and achieve better green building certification ratings.



“The commercial introduction of our carbon-neutrality program for DOWSIL™ Silicones for building facades represents a true evolution in silicone carbon-neutrality,” said Markus Plettau, Dow's global segment leader for building facades. “Aligned with the industry efforts towards developing net-carbon-zero buildings to reduce CO2 emissions, Dow is leading the way in decreasing the embodied carbon present in construction materials.”

According to the World Green Building Council, the building sector is responsible for approximately 39 percent of global CO2 emissions. This includes both embodied carbon and building operations. While the production of Dow's silicon products requires energy, the use of these products requires very low energy in applications such as prefabricated façade elements and glass insulation, helping to significantly improve the energy efficiency of buildings. In addition, their proven durability allows the insu-

lated building envelope to last more than 50 years. The energy or carbon ratio for silicone sealants conserves up to 20 times more energy than what is needed to produce them for insulated glass, according to the Global Silicones Council.

Carbon-neutral silicones can reduce to net zero the carbon needed to produce the silicone polymers that are the building blocks of Dow's products. Carbon-neutral silicones for specific building projects is a revolutionary offering, especially for technologies linked to the silicon metal manufacturing process, where Dow is uniquely positioned.

Plettau is positive that silicone will remain the technology of choice when it comes to building and construction, not only because of its long-term performance and carbon footprint but also because it equips buildings with enhanced energy and greenhouse gas emissions performances. "The carbon-neutrality program for DOWSIL™ Silicone materials is not only an advantage for architects, builders and building owners, but also a key to achieving significant ongoing carbon reduction through integrated design solutions, allowing these industry professionals to design with more freedom by engineering less impact," added Plettau.

Backed with PAS 2060 certification, internationally recognized for organisational carbon-neutrality, Dow's carbon-neutral silicones will be able to contribute to additional international green building certification points. Each product will have an Environmental Product Declaration (EPD) that communicates transparent and comparable information about the life-cycle environmental impact of our products.

In addition to carbon neutral silicones, Dow continues to develop innovative and sustainable solutions for the building and infrastructure markets.

ISOCLIMA ACQUIRES GLOBAL SECURITY GLAZING AND DLUBAK SPECIALTY GLASS

Isoclima S.p.A., global leader in high performance glass and transparent solutions, announced the acquisition of Global Security Glazing and Dlubak Specialty Glass Corporation from SSI Consolidated Holdings.

"We are very excited about this acquisition. This is a major step towards achieving our strategic plan for Isoclima by 2023. With this acquisition Isoclima will strengthen its leadership in the ballistic transparencies industry, expanding in a new market segment and establishing local production capabilities in a region which is pivotal to the achievement of its growth targets. From this strong base, Isoclima plans to become the North American leader of the armoured transparencies market", said Paolo Cavallari, CEO of the Isoclima Group.

The Isoclima Group was established in 1977, in Este, in



the province of Padua in Italy's Northeast. Isoclima, in partnership with some of the world's leading companies in the automotive, aerospace, marine and rail businesses, has developed a series of products that have proven to be market game-changers, such as Omniarmor, Omnilite, Isolite, and many more.

"We are thrilled to be a part of the Isoclima family," said Lance Cotton, President and CEO of Isoclima Specialty Glass, LLC. "Isoclima is known for the commitment to quality, innovation, culture, and the industries it serves. This is an organisation that is deeply ingrained into the design and manufacturing of engineered glass and we couldn't be more excited to have ownership that will provide us with the resources to deliver the best experience to our customer base. The combination of our production and innovation capabilities will enable us to further strengthen our ability to meet or exceed our customers' expectations."

LiSEC: OVERHAUL INCREASES SERVICE LIFE

Glas Müller AG is a family-owned glazier's workshop in Switzerland, which processes the full spectrum of glass products for buildings with around 30 employees at its site in Schlieren.

With a proud 36 years in operation and full production capability, its LiSEC GTI insulating glass machine supports the production of insulating glass at the workshop in Zurich and is primarily used for repairs and insulating glass for cat flap holes. The company recently requested a general overhaul from the LiSEC After Sales Service team.



In addition to this special offer of a general overhaul of a vintage insulating glass unit from LiSEC, the company is also offering targeted conversions and improvements to the systems – in particular for machines built after 2000 – which can increase the service life of many machines. The LiSEC After Sales Service department provides modifications that extend beyond normal replacement parts sales. This includes PC upgrades, drive modifications, and similar modifications and improvements.

A preventive replacement of obsolete elements ensures



the supply of replacement parts and service for the long term. This ranges from upgrades to drives using industrial PCs to the complete replacement of the machine control system. The advantage is modernisation of the machines at low cost, compared to purchasing a corresponding new machine. The solid, basic machine properties remain preserved.



Glas Müller also intends to optimally realise future strategic goals with the LiSEC GTI insulating glass machine. The company will continue to focus on niche products with rapid delivery times and tailored adaptations directly for the customer. To ensure these goals remain feasible, the machine must also be serviced and maintained accordingly – and not

simply supplied with spare parts.

Mr Stöcklin, Managing Director of Glas Müller, is thoroughly impressed with the LiSEC machine, “The machine has not caused us any major problems at all to date. A few spare parts have been replaced over the years and the washing machine has been exchanged once. But all in all, it has been in constant use. And we want it to stay that way.”

PILKINGTON: THE FUTURE IS GOLD

With the widespread use of Pilkington Eclipse™ Gold, the Hotel Britannique Naples has become a shining example of creativity and functionality.

Glass features prominently in the interior design, not only as a finishing material, but also as a structural and technological element. But for the key role, which was to create a unique and welcoming interior with a touch of refinement, only Pilkington Eclipse™ Gold, with its rich reflective properties fulfilled the Gnosis design studio's overarching vision – that of providing the hotel with a seamless flow of natural light from the rooftop restaurant to the bar counters on ground floor.



The glazed surface version of Pilkington Eclipse™ Gold 8 mm provides a distinctive golden reflection that works wonderfully with decorative

motifs to produce astonishing light effects and shapes at different hours of the day.

Further effects are created throughout by the use of ‘Linen’ – a partial glaze finish complete with a geometrical decoration created by OmniDecor. It is fingerproof and scratch-proof with an irregular surface mesh that blends perfectly with the surrounding environment, providing rich golden reflections from every angle.



Elettra Bresciani, Marketing Manager at OmniDecor said “The reason for choosing Pilkington Eclipse™ Gold is clear. Glass is a solid barrier, very thin and permeable to light: these properties allow you to separate and distinguish spaces in a delicate, non-invasive way. However, since partitioning in many cases must also be a visual and enriching experience, transparent glass is unsuitable.”

Pilkington Eclipse™ Gold made it possible to create perfect partitions, which combine creativity and functionality, while maintaining the brightness of the interior spaces and at the same time providing an attractive aesthetic result, “The reflective side of the pane provides a depth that is created between the polished and the glazed finishes and enhances the glass with golden reflections.” Pilkington Eclipse™ Gold is available in 6 and 8 mm thickness through the usual supply channels. Due to its highly durable pyrolytic coating, the product can be toughened to provide a safe interior glass, in accordance with the national legislation.

HEAVYDRIVE INSTALS GLASS ART IN CRAIOVA ART MUSEUM

Renowned Romanian architect Dorin Ștefan presented his latest work in the Brâncuși Pavilion at the Craiova Art Museum, Romania. The work of art consists of large glass panes in various special arrangements, mounted horizontally and vertically.



For the glass pavilion, six panes from Finnglass measuring 2.4 by 12.5 metres and weighing 2.8 tonnes had to be set vertically into grooves.

Heavydrive developed a special suction system as the glass elements could not be installed using conventional equipment.

During the installation process, there was very little stability – only the finished work of art itself was stable. The panes could not be suctioned on directly because of their crossbars and special shape.

Heavydrive developed special spacers on the suction plates to bridge the distances to the crossbars over the entire span width of the glass pane. This allowed the adapted VSG 4000 K MH vacuum suction system to install the panes safely and without incident, despite the strong wind.

For the second construction phase, twelve glass panes measuring 3 by 12.5 metres and weighing 3.4 tonnes, three roof panes measuring 3 by 9 metres and several four-tonne glass panes measuring 2.5 by 11 metres were set in place using the VSG 4000 K MH vacuum suction lifter.



"This project presented immense challenges," said Guenter Uebelacker, Managing Director of Heavydrive. "We are all the more thrilled to have

been able to complete the installation on schedule and without any problems, using our custom-built system."

Heavydrive worked with the customer during the planning phase to develop an ideal solution, adapted to the construction site situation.

VITRO GLASS INTEGRAL TO FIVE CITY CENTER FAÇADE IN ALLENTOWN

With an artistic blend of blue- and grey-tinted Solarban® 60 glass from Vitro Architectural Glass, Five City Center in Allentown, Pennsylvania, USA, features a striking façade and daylit interiors.

The Allentown-based developer City Center Investment Corp. wanted a beautiful glass building for its 13-story mixed use tower, and contractor North Star Construction Management required a buildable building that stayed within the installation and cost boundaries of a unitized system.

"Within those parameters, we worked to create something that could be iconic for downtown Allentown, while being clean and simple," relates Kaman Skinner, RA,



LEED® AP, associate, project manager, JDavis Architects, Philadelphia. To successfully fulfil its design objectives, the architectural team devised the tinted mosaic design for the façade facing the city's commercial corridor.

To achieve the mosaic look, the architects reviewed multiple shading and tinting options with representatives of Vitro Glass to determine the percentage and patterning for each colour. The 300,000-square-foot building façade incorporates rich blue Solarban® 60 Pacifica® glass,

aqua-blue Solarban® 60 Azuria® glass, light sky-blue Solarban® 60 Solarblue® glass, warm-grey Solarban® 60 Opitgray® glass and coated Solarban® 60 glass on a clear glass substrate.

On the southern façade, the firm designed mullion caps to blend Five City Center more effectively into the texture and scale of the surrounding residential area. For enhanced interior comfort and glare control,

JDavis deliberately specified darker shades of glass for the southern and western façades.

Located in a tax-incentive district, Five City Center makes a valuable contribution to the city's efforts to re-invigorate a designated Neighborhood Improvement Zone. The building offers active street views from the first three stories and panoramic, 360-degree views from floors four through 13. Initially brought in to design the residential portion of the mid-rise and the 800+-car parking structure behind the building, the developer eventually tasked JDavis with developing the entire block.

"This was a win-win for us in that we were able to work on both the Five City Center commercial tower and the residential community of Center Square Lofts to design a single urban block where interior and exterior worked hand in hand to create a vibrant, walkable and energetic community," said Skinner.

With its advanced double-silver coating, Solarban® 60 glass offers a clear, colour-neutral appearance. When used with Pacifica®, Azuria®, Solarblue® and Optigray® performance-tinted glasses, Solarban® 60 glass delivers solar heat gain coefficients (SHGCs) ranging from 0.23 to 0.30, and visible light transmittance (VLT) of 34 to 50 percent, offering architects and specifiers an expansive palette of colour and performance options.



ACRISTALAMIENTOS VINUESA ONCE AGAIN CHOOSES TUOMAS

ACRISTALAMIENTOS VINUESA SA, Spain, which produces flat glass, printed glass, decorative glass, safety glass and manufactured glass for both professional and private customers has recently installed two new TUOMAS cutting machines.

The increased demand for products with high performance, larger dimensions and higher thicknesses meant that the machinery had become obsolete. In addition, new machines are faster and produce with a higher quality and precision that is transferred to the rest of the edg-



ing, seaming and washing processes. These factors motivated them to renew both cutting lines; the RUBI 516C for float glass cutting and the LAM 506SX for laminated glass cutting.



On the RUBI 516C, an extra software – Cutting TV – was installed to assist in the process of opening cuts. It automatically displays the optimisations so that, at a glance, the operator has all the information

needed for the cutting process. Once the cutting table has evacuated the workpiece, the display changes automatically without the need to operate any buttons or foot pedals.

Meanwhile the LAM 506SX was integrated with a second cutting bridge – LAM 304 – to speed up processing. For this purpose, a defragmenter for cross-cutting optimisations was installed on the second line to distribute cuts and keep the two tables productive at the same time.

VINUESA has been a licensed manufacturer of the SGG Climalit (Insulating Double Glazing) insulating glass brand since 1990, and its cutting process has been managed entirely by TUOMAS machinery, VINUESA's supplier since its origins.

"Although we had other options from manufacturers of machines we already had in other processes, the cutting tables from the beginning have been TUOMAS," said Felipe Parra, director of ACRISTALAMIENTOS VINUESA. "They have always been very responsive to our needs, providing us with full support and exceptional after-sales service and that is very important to us."

VITRO GLASS: SOLARBAN® USED ON THREE TOP 10 GREEN BUILDINGS

Vitro Architectural Glass announced that three of the 10 buildings selected by the American Institute of Architects (AIA) Committee on the Environment (COTE®) as the top green building projects of 2021 were glazed with Solarban® solar control, low-emissivity glasses.

The award-winning projects include:

Rockwell Integrated Sciences Center, Lafayette College – Easton, Pennsylvania



Designed by Boston-based Payette, the 103,000-square-foot structure replaced the college's energy-intensive biology building with a LEED® Platinum-certified office and classroom center. Featuring an open, airy "vertical commons,"

daylit with energy-efficient Solarban® 70 glass, the new science building combines an array of energy-saving products and strategies to generate a predicted EUI (Energy Use Index) of 76 kBtu per square-foot, per year, which places it in the 99th percentile for energy performance among cold-climate labs. Constructed as part of a campus-wide initiative to reduce carbon emissions, the project produced a net 40% reduction in operating carbon emissions compared to the existing biology building.

Hayden Library Reinvention, Arizona State University – Tempe, Arizona



Rockwell Integrated Sciences Center, Lafayette College
Photo by Robert Benson



Life Sciences Building, University of Washington – Photo by Francis Zera

architectural heritage. Double-height insulating glass units (IGUs) fabricated with Solarban® 70 glass highlight a new ground-level plaza that reconnects the library tower to the surrounding campus community. Salvaged granite panels and stained glass characterise the façade above the plaza, which features new double-pane IGUs fabricated with Solarban® 70 glass as energy performance upgrades to the library's existing single-pane glazing. Combined with LED lighting, demand-controlled ventilation and a rooftop solar array, the glass enables the building to achieve an EUI of 42 kBtu per square-foot, per year, a 32% reduction in energy use compared to its pre-renovation performance.

Life Sciences Building, University of Washington – Seattle, Washington

Building integrated photovoltaic (BIPV) panels and a highly transparent glass façade fabricated with Solarban® 72 Starphire® glass are signature design elements for the new Life Sciences Building at the University of Washington. Designed by Perkins+Will, the 12,400 square-foot, seven-story building achieves its sparkling jewel-box design despite a deceptively narrow 48.2 percent window-to-wall ratio (WWR) that helps reduce energy use by 80 percent compared to baseline structures of its type. Featuring a proprietary triple-silver, solar control, low-e coating, Solarban® 70 glass combines visible light

transmittance (VLT) of 64 percent with a solar heat gain coefficient (SHGC) of 0.27 in a standard one-inch IGU. Solarban® 72 Starphire® glass unites the same coating technology with Vitro Glass's premium low-iron glass to achieve heightened levels of clarity and solar control performance. In a standard one-inch IGU, Solarban® 72 Starphire® glass has VLT of 68% and a SHGC of 0.28.

KAZAKHSTAN: FLAT GLASS PRODUCTION TO BE LAUNCHED IN 2022

Beibut Atamkulov, Minister of Industry and Infrastructure Development of the Republic of Kazakhstan, announced a plan to commission a project for the production of flat glass in the Kyzylorda region in 2022. The plant will have a capacity of 197.1 thousand tonnes per year. The investments will amount to 42.1 billion KZT. The production is expected to cover 98 percent of the demand of flat glass in the domestic market. "By 2025, it is planned to put into operation 2 more new plants for the production of soda ash. The commissioning of these projects will fully meet the needs of the domestic market," the minister said.



RAVENSBY GLASS INVESTS IN EDGETECH'S SUPER SPACER® TRISEAL™ LINE

Dundee-based Ravensby Glass has responded to growing demand for high-performing commercial IGUs by installing a new automated Forel line for applying Edgetech's Super® TriSeal™. Ravensby has been providing quality IGUs to businesses throughout the commercial, residential, public and medical sectors for over 30 years, and today processes and toughens its own glass at two high-tech facilities in Dundee.



The firm has significantly increased its ability to provide high-performing IGUs for demanding commercial clients with the installation of the new TriSeal line.

Managing Director

Gordon Dickson said "We use TriSeal because we know it guarantees the kind of long-lasting, top quality IGUs that commercial projects require. In recent years, we've experienced growing demand from the commercial sector, and so investing in an automated TriSeal application line was the natural next step."

"It's now fully up and running, and we're delighted with the speed, efficiency and consistent quality it's able to offer."

Edgetech Managing Director Chris Alderson said "It's hugely gratifying to see long-standing customers like Ravensby succeeding and investing in the future. "With their new TriSeal line, they're excellently positioned to reach new heights in the months and years ahead."

NORTHGLASS: SUPER GLASS CURTAIN WALL AT BEIJING CENTRE LIBRARY

In October 2021 the first large curtain wall glass supplied by NorthGlass was installed at the site of Beijing's municipal administrative centre library project, and construction officially began.

The two sections of the project have 138 pieces of glass each, and a total of 276 pieces of large glass are supplied by Tianjin NorthGlass. Among them are the largest 38 glass panes with a height of 15.3 metres, width of 2.5 metres, an area of 37.625 square metres and a single total weight of 11.5 tonnes.

The design concept of the Beijing municipal administrative centre library comes from the traditional Chinese cultural



symbol "red ink paste used for seals." The square and red appearance is like a dignified seal on the picture of "Oriental Green Star." The tree-like architectural structure of the roof is like a forest umbrella cover, and its inspiration comes from ginkgo tree leaves, which imply the inheritance of local culture and knowledge.

Two continuous hills are created in the interior space, and the NorthGlass glass creates possibilities for the extension of the outdoor landscape to the interior space, blurring the boundary sense of the building and creating an experience where the building is wrapped in nature. With the rise and fall of the terrain, the height of the 276 pieces of glass varies from 8 to 15 metres. Super large, ultra-thick and super-white glass brings a "pure" natural effect of temperature, light and space to the building,





providing excellent conditions for reading and attracting readers to step into the warm and quiet spaces.

To ensure success, the project team prepared a plan during the preliminary stage,

organised experts for demonstration and decided on the construction process. Strict control measures during construction meant the work of lifting the first large glass was successfully completed.

Beijing municipal administrative centre library project is scheduled to be completed by the end of December 2022. The super large, ultra-wide, long-span glass curtain wall will become a new landmark in Beijing.

EDGETECH SUPER SPACER® AT THE TOP OF ARCHITECTURAL MEGA-PROJECTS

Whether refurbishing or new projects, high quality insulating glass manufacturer AGC INTERPANE has a constant stream of projects in New York, where architects demand excellence in façades and glazing.

The Super Spacer® T-Spacer™ SG warm edge spacer system, specially developed for glass edge sealing with silicone sealants fits the bill.



Aging office buildings are being brought up-to-date to include fully-glazed façades which make the most of the city skyline views. For decades AGC INTERPANE has been one of Europe's top producers of high-quality, multifunctional, large area insulating glazing. In addition to coating expertise and outstanding insulation values, the high quality of the insulating glass is the decisive benefit.

The Plattling-based company receives requests for the glazing of mega-projects all over the world, including new construction, glass for energy-related façade renovation and modernization.

The Super Spacer® T-Spacer™ SG is the latest product

from Edgetech and was developed in close coordination with AGC INTERPANE specifically for structural glazing and XXL glazing. "Quality manufacturers like AGC INTERPANE provide long warranties on insulating glass units. This means no visible aging, no thermal breakage, no water vapor diffusion, no relevant gas loss, no migration of the butyl seal," said Christoph Rubel, European Technical Manager at Edgetech Europe. "The refurbishing projects in New York used a UV-resistant, but gas-permeable silicone secondary sealant. So, the primary sealant bears the brunt of keeping the edge seal gas-tight," he said.

For this reason, the lateral areas of the Super Spacer® T-Spacer™ SG are enlarged for the application of the polyisobutylene compared to the Super Spacer® T-Spacer™ Premium Plus. The spacer design also supports millimeter-precise application of the spacer in the automatic ISO line.

"The parallelism of the spacer to the glass edge and minimal tolerances are not only optical criteria for large panes with narrow joints that architects and



façade construction customers explicitly pay attention to, but these properties contribute to the stability of the entire element," said Daniel Bruckelt, head of insulating glass production at AGC INTERPANE. "The decision to use Super Spacer as a spacer is also a strategic one. We know from experience that we can use it without hesitation to give assurances for the service life of the edge seal, even in silicone applications," he said.

The AGC INTERPANE project in Midtown Manhattan offers a perfect view of Two Bryant Park. Just a few buildings away, right next to Grand Central Station, One Vanderbilt rises 77 stories and 427 meters high. AGC INTERPANE supplied the glazing for the four floors of "The Summit" observation deck at a height of 335 meters. Cantilevered glass boxes, a digital art installation by Kenzo, a restaurant as well as a bar and, above all, the glazed elevators that rise from Grand Central on the outside of the building up to the platform, characterize the latest attraction in New York.

To ensure that the view is not only safe but also completely clear, LSG panes of 4 x 10 mm Clearvision white glass with SGP interlayers and ClearSight™ layers were installed at positions 1 and 8 for the terrace area and the cantilevered glass boxes. The double insulating glass units for the interior areas of the four floors consist of laminated safety glass 1010.4 with Sentry interlayer and have dimensions of up to 2 x 5.3 metres.

December 2021

GUARDIAN RELEASES SUNGUARD® SNX 70

Guardian Glass Europe has launched the latest product in their leading SunGuard® eXtraSelective range - Guardian SunGuard® SNX 70.

SunGuard SNX 70 is a new triple silver-coated glass that boasts outstanding solar control and light transmission approaching 70 percent – plus high thermal insulation. Yet it also has a uniquely clean, natural appearance and a subtle reflective quality that achieves a strikingly uniform aesthetic across design contours and different viewing angles.

This means SunGuard SNX 70 offers architects the opportunity to introduce more natural light, possibility of improvements in energy efficiency and comfort for inhabitants, along with a superior design aesthetic. This in turn can lead to enhanced well-being for occupants



and is particularly relevant for office, healthcare and educational buildings, where higher levels of natural light could help encourage focus, recovery and learning.

The glass is especially effective when combined with Guardian UltraClear as a base – available as SunGuard SNX 70 Ultra. In standard double insulating units this provides 68 percent light transmission, 32 percent solar factor, and a Ug value of 1.0 W/m²K. Just as impressive, in standard triple glazed units it offers 62 percent light transmission, 30 percent solar factor and a Ug value of 0.5 W/m²K. The glass' superior transparency also means that views from both inside and out are truer in colour.

SunGuard SNX 70 can also assist environmental certification. As part of the SunGuard range in Europe and Russia, SunGuard SNX 70 has an EPD (Environmental Product Declaration) and has been independently assessed under the Cradle to Cradle Certified® Products program, where it's certified Bronze.

Aesthetically the glass' external reflection of 13 percent can bring an elegant character to buildings – helping them appear more alive in their surroundings and offering greater visual appeal to passers-by.

SNX 70 is available in both annealed and heat treatable versions (HT).

DECEUNINCK AND AGC GLASS EUROPE SEAL STRATEGIC PARTNERSHIP

Deceuninck, specialised in the development and production of PVC and aluminium window and door profiles, and AGC Glass Europe, a European leader in flat glass,



have entered into a strategic partnership.

The combination of know-how and expertise in their respective fields

has resulted in new innovative solutions that enable the integration of Fineo vacuum glass into the PVC and aluminium profiles of the Elegant and Decalu series respectively. Architects, building contractors and owners can have access to solutions that meet the ever stricter requirements in the field of thermal and acoustic performance and light transmission. The first systems solutions will be presented during the Polyclose fair at the stands of both brands.

Although the two elements have been inextricably connected for centuries, window frames and glazing were two very distinct things until recently. Lately, manufacturers and suppliers of both components have started working together in order to offer high-quality comprehensive solutions.

"In late 2014 we reached an agreement with AGC Glass Europe to launch innovative solutions together. Over the years, we renewed our successful cooperation a few times, and made it stronger," said Bernard Vanderper, sales manager Western Europe at Deceuninck.



"On 12 October of this year, we took this cooperation a step further and signed a strategic partnership, enabling us to

now offer the Elegant PVC and Decalu aluminium window profiles with Fineo vacuum glass. Our R&D division revised and adjusted the sealing concept for these different series, so that we can now integrate this ultra-slim glazing into our profiles without losing the unrivalled level of thermal and acoustic insulation and light transmission."

Stefan Lips, sales director Fineo with AGC Glass Europe, added, "Contemporary architecture is characterised by large windows. In order to comply with the stricter demands where insulation is concerned, we need to constantly adjust and develop our glazing solutions. One of the things we did is replace double glazing with triple



glazing. Obviously, this has an impact not only on the cost, but also and especially on the weight of the window systems.

"We are approaching the limits that can be supported by the hardware. In addition, the concept of circular economy not only includes window profiles, but glazing as well. The Fineo vacuum glazing, with a thickness as from 6 mm, offers a solution the characteristics of which are comparable to and even better than those of triple glazing but which has only two panes of glass. This type of glazing requires less raw materials, is much lighter and 100 percent recyclable."



Over the past few years, both of these strong brands have made major investments in the optimisation of their solutions so as to be able to respond to market

demand. With the Elegant series, Deceuninck has developed an innovative product platform for window and door solutions, incorporating iCOR as a revolutionary building block and modular heart of the profiles. Apart from the seals on the inside and outside of the profile, this solution also has a central seal, which acts as an additional barrier for heat and cold.

"This way we achieve better results where thermal and acoustic insulation, wind resistance and water-tightness are concerned. We have gone even further by combining these profiles with the Fineo vacuum glazing," concluded Bernard Vanderper. "We want to inform architects, building contractors and owners of the advantages of these systems. Today our focus is on the Benelux, but we also plan to introduce the systems in other European countries."

SCHOTT: DIVESTMENT OF FLAT GLASS OPERATIONS IN NORTH AMERICA

SCHOTT Corp., together with JV Partner AGC Flat Glass North America Inc., a subsidiary of AGC Inc., entered into definitive agreements to divest its shares in



SCHOTT Gemtron Group to SSW Advanced Technologies LLC, a portfolio company of Trive Capital LLC. The parties agreed not to disclose any transaction details.

SCHOTT Gemtron specialises in the production and sale of flat glass products mainly for the home appliance industry in North America.

GUARDIAN GLASS - PEMA 2 PROJECT

Glass plays a very important role in the design and function of PEMA's P2 building, a multifunctional commercial and residential building located in Innsbruck, Austria.



The glass chosen for the stunning-looking façade is Guardian SunGuard Solar Light Blue 52, which reduces glare from the sun and helps to reduce the demands on the building's air conditioning, as well as helping to improve control of temperatures inside the structure. The glass is coated with Guardian ClimaGuard® 1.0 on the inner pane, which provides enhanced thermal insulation during colder months.

The design of P2 combines a range of functions within a consciously architectural and yet spatially restricted building. P2 consists of a two-storey base building – which accommodates the new City Library – topped with an eleven-storey disc-shaped tower that houses 173 student apartments. One floor between the base and tower is open to the public, acting as a cultural platform. There is also a public space on the roof that offers additional space for restaurants.

CPS SELECTS SELKIRK FOR SOLAR GLASS MANUFACTURING FACILITY

Canadian Premium Sand (CPS) has chosen Selkirk for its solar glass manufacturing facility, following an extensive evaluation of possible options in Canada and the United States. Selkirk provides logistical, operational efficiency and environmental advantages over alternatives and meets the following key selection criteria:

- Proximity to CPS's high grade silica sand quarry operation. The quarry is located near Hollow Water First Nation and the community of Seymourville, approximately 160 kilometres north of Selkirk;
- Access to abundant and cost-efficient supplies of natural gas, renewable hydroelectricity and industrial grade water;
- Access to end markets through rail and highway infrastructure with direct connection to the major logistics hub in Winnipeg, Manitoba;
- Access to a sizeable labour pool encompassing management, engineering, technical, trades and semi-skilled personnel;
- Availability of industrial zoned land parcels of sufficient size to accommodate the initial manufacturing facility with room to accommodate CPS's growth ambitions for future facilities; and
- Alignment with the community's vision of sustainable

and responsible commercial development for the next 30+ years.

The company's manufacturing facility will produce high specification patterned solar glass utilising a rolled manufacturing process and will provide approximately 300 direct employment opportunities once in operation. CPS' products will predominantly be used in the manufacture of solar panels in North America – a rapidly expanding industry driven by an objective to decarbonize the electrical grid with solar power's proportional contribution increasing from 5 percent today to as much as 40 percent by 2035.



"It is difficult to imagine a better location than the City of Selkirk and the Province of Manitoba for our solar glass

manufacturing facility based on the criteria we set. Collaborating with the City of Selkirk has been extremely positive, highly professional and I commend their drive to realise their community's vision for sustainable economic development," said Glenn Leroux, President and CEO of CPS.

There are currently no facilities in North America that produce this type of glass. All solar panels manufactured in North America using patterned solar glass are made with glass imported from China and other Asia Pacific countries. Locating a solar glass manufacturing facility in Selkirk will add significantly to the sustainability and supply chain security for CPS's solar panel manufacturing clients. Additionally, CPS believes its glass manufacturing facility will be the anchor industry for an expanding centre of excellence, enabling other complementary businesses to locate in Manitoba.

"We are very pleased CPS has selected Selkirk to build and operate its solar glass facility," said Tim Feduniw, the Director of Sustainable Economic Development at the City of Selkirk. "This initiative aligns with our commitment to sustainable development and will create significant economic benefits for our community. The City of Selkirk is committed to working with CPS in securing a suitable site within urban limits that supports and enables the successful launch of this initiative."

The Company's solar glass project would not be possible without the support of its Participation Agreement partners; the Hollow Water First Nation and the incorporated community of Seymourville. These communities have a historic relationship with Selkirk and the supply of silica sand to industry from nearby Black Island dating back to the 1920s through to the 1980s.

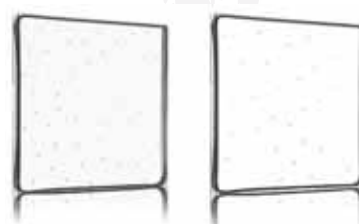
"We have received encouragement, understanding and

patience from leadership groups in both communities as we transitioned our business plan from a focus on fracture proppant to our future Selkirk-based solar glass manufacturing facility," noted Mr. Leroux. "We will continue to work closely with the communities as we bring this project from planning into operation."

WALKER INTRODUCES TWO NEW AVIPROTEK® BIRD FRIENDLY GLASS SOLUTIONS

Walker Glass has developed two designs crafted specifically to meet the market's needs, after almost a year of development and consultation with architects and other building professionals. The new patterns, 226 and 227, are acid-etched on the first surface of the glass. They are available on regular AviProtek® bird friendly glass, or on AviProtek® E with a Solarban® low-e coating from Vitro Architectural Glass.

Patterns 226 and 227 are an elegant solution to architects' and glaziers' needs for bird friendly glazing that is attractive, effective, efficient and easy to install. The designs comprise scattered patterns of 5mm squares. Both are non-linear and multi-directional, eliminating the need for pattern alignment. With markers covering less than 1 percent of the glass, they offer clear sight-lines wherever the glass is installed. There's no need to choose between views and bird safety.



From left to right: AviProtek® E pattern 226 and AviProtek® E pattern 227

The patterns have a Threat Factor of 25 from the American Bird Conservancy and a 95 percent avoidance rate based on field experiments by Dr. Klem.

Walker's Director of Products and Business Development, Marc

Deschamps, said, "We have created these new non-directional pattern options to facilitate the fabrication process, improve cutting optimization and eliminate installation challenges, thereby reducing the overall glazing cost. "We also like the fact that the patterns cater to prescriptive requirements such as the Bird Friendly Design Guide recently published by the National Glass Association, and the Canadian CSA standard published in 2019. They also meet a vast range of legislative requirements such as Local Law 15 in New York city and the Toronto Green Standard."



HEAVYDRIVE: RELIABLE GLAZING AT LOW TEMPERATURE

The façade of the Grand Théâtre de Québec was in need of a complete renovation, as the envelope around the theatre, built from prefabricated panels and exposed concrete elements in 1971, had been damaged by moisture.

The large façade sections were installed by Heavydrive's VSGW 900 KS suction system equipped with a winter package.

The suction system has a load-carrying capacity of 900 kilograms and boasts an extremely flat design. Its depth of just 16 centimetres makes it the ideal solution for installing and transporting sections between façade and scaffolding. Thanks to its variable and detachable arms, the system is capable of suction sections measuring up to 4.3 by 3.2 metres.



The façade of the Grand Théâtre de Québec, Canada, was in need of a complete renovation.



VSGW 900 KS with winter equipment in action at the Grand Théâtre in Quebec – Image rights: Heavydrive.com

The assignment was carried out during the winter months and the VSGW 900 KS had to withstand icy temperatures. Which is why Heavydrive developed special winter plates that reliably provide suction for glass panes at temperatures down to -20 C°. The large glass elements around the theatre's façade were placed in position on schedule and without any problems. The customer was so satisfied that they ordered another Heavydrive system.

LANDGLASS: 5TH GLASS TEMPERING FURNACE AT JINJING GROUP IN MALAYSIA

Jin Jing Group became the largest photovoltaic glass producer in South-east Asia, with the commissioning of a fifth LandGlass' glass tempering furnace at its production base in Penang, Malaysia in August 2021.

It represents not only the strategic transformation of Jin Jing from the building industry to the photovoltaic industry, but also an important measure of Jin Jing's response to the trend of green energy development and applications, and to seize the opportunities of the times. Carbon neutrality goals, green energy, energy conservation and emissions reduction have become the core keywords in Jin Jing Group's development strategy.



Glass production and processing are energy-intensive industries and are facing unprecedented emission reduction requirements and energy-saving challenges. Being an industrial leader in the R&D and manufacturing of glass tempering machine, in recent years LandGlass has introduced two leading technologies that can help glass processing companies to improve efficiency and reduce energy consumption:

- The Turing 2.0 intelligent glass tempering control system can automatically adjust and optimize the tempering process parameters to generate the best manufacturing data required. The system reduces the time and costs spent on product switching, commissioning, and trial runs. It ensures the quality of tempered glass while lowering the energy consumption in production.

- LandGlass' TIGER™ smart factory achieves energy consumption reduction by improving loading and operating efficiency. Furthermore, compared with traditional factories, the smart factory greatly reduces the need for staffing, floor areas and peripherals. It improves both production efficiency and energy efficiency in all stages. Taking a small to medium-sized traditional glass processing enterprise with an annual output of 800,000 square metres as the example, when it is upgraded to a smart factory model, based on a 12-hour shift system, the annual savings from reduced energy consumption and other costs can be nearly CNY 3 million.

Achieving the goals of energy saving and carbon neutrality remains a long-term and arduous task. In addition to the energy-saving measures of the flat glass industry, it relies more on the R&D breakthroughs of the machine manufacturing industry.

In the current trends towards "Energy Conservation and Emission Reduction" and "Dual Control System of Total Energy Consumption and Energy Intensity," LandGlass follows its innovation-oriented strategy and offers state-of-the-art glass tempering machines and solutions to help glass processing companies to achieve better quality and higher energy efficiency.

SEDAK: CURVED GLASS UP TO 18 METRES

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FLORA PANORAMA: A ŞİŞECAM PROJECT IN BULGARIA

Şişecam's flat glass products were chosen for the Flora Panorama project in Burgas, Bulgaria. Şişecam Solar Control Low-E Glass products were used in the housing complex designed to blend in with their natural and urban surroundings.

The Flora Panorama project, designed by Sharenkov Architects, is one of many projects brought to life with innovative products from Şişecam Flat Glass. Şişecam Solar Control Low-E Glass offers high light transmittance, heat insulation and solar control, all provided by a single coating as requested by the project.



Sharenkov Architects aimed to create a building integrated into the environment, both part of nature and part of the city, while keeping a memorable appearance. The architecture of the building resembles sea waves diverging in space. Composed of soft curved shapes of glass and concrete, the building volume offers gradual expansions of the floors in the upper parts of the façade. This volumetric play is made possible by complex oval shapes, large concrete consoles up to 3 metres and elements such as curved glass railings.

The building has a photovoltaic system installed on the roof, providing electricity for the common parts. The structure is detailed for energy efficiency with an effective natural insulating system that includes bricks with enhanced insulating properties, window profiles and glazing units with Şişecam Solar Control Low-E Glass.

GLASTON CLOSES DEAL FOR TWO TPS[®] INSULATING GLASS LINES

Glaston Group has received an order for two Glaston Thermo Plastic Spacer (TPS[®]) in-insulating glass lines to be delivered to French win-dow manufacturer TRYBA. The order is booked in Glaston's Q4/2021 order book and the lines will be delivered in Q3/2022.

The French glass manufacturer TRYBA, specialising in windows, doors, verandas and pergolas, has a long customer relationship with Glaston, and the company already operates Glaston tempering, flat laminating and insulating glass lines equipped with the latest glass processing technology. As the company is expanding its operations, TRYBA was looking for an automated and flexible solution for the manufacturing of insulating glass units.

The insulating glass line Glaston TPS[®] offers a versatile and individual production system. The fully auto-mated line enables excellent productivity, quality and high flexibility as well as long service life due to pre-mium quality components. The individually configurable production lines are equipped with the Thermo Plastic Spacer TPS[®], a "warm edge" technology introduced to the market more than 25 years ago.

"A high capacity and high reproducible quality, as well as high flexibility in mixed production were the key criteria for TRYBA in selecting Glaston TPS[®] technology," said Marco Stehr, SVP Sales & Service for Glaston's EMEA region. "In addition, it was Glaston's commitment to fulfilling TRYBA's special service and support needs that convinced them to choose Glaston."

"We want our customers to succeed in their business," said Sasu Koivumäki, CSO, Glaston Corporation. "The Glaston TPS[®] is an excellent choice for this customer, as they are paying attention to detail and quality while at the same time looking for a combination between state of the art technology and reliability."

"Progress and innovation are the driving force leading us to constantly renew our products and make them even more efficient," said Jerome Oberle, Project Manager of TRYBA S.A. Portugal. "Our team is paying attention to detail and constantly seeks perfection and reaching a balance between technology and design. With Glaston technology and service capabilities, we are confident of successfully expanding our glass business."





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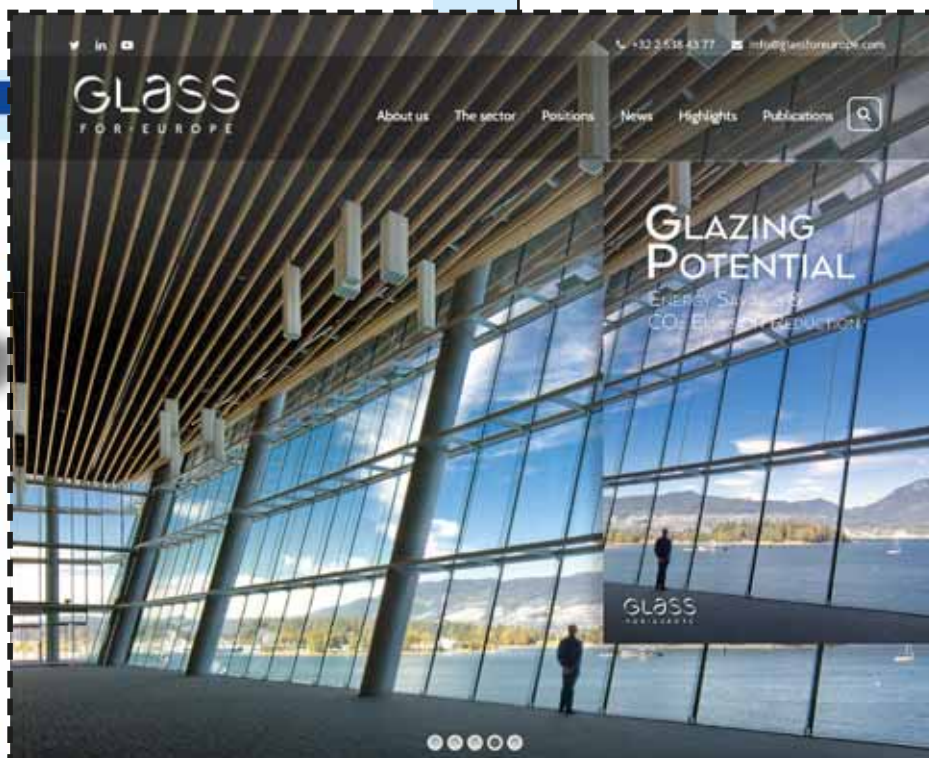
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