glass machinery world plants&accessories

BI-MONTHLY INTERNATIONAL MAGAZINE FOR GLASS MANUFACTURING

YEAR 39 • ISSUE NO. 1/2026

Syngas for cleaner glass melting, courtesy of GLASS SERVICE

Refractory innovation at RHI MAGNESITA delivers furnace sustainability

Cutting CO_2 emissions with SEFPRO electric furnace solutions

Scalable electric and hybrid glass melting advances from FIVES

Advancing glass melting efficiency through LINDE technologies

Poste Italiane Spa - Spedizione in abbonamento postale - 70% - LO/MI • € 2 - Copia omaggio

CUSTOMER ENQUIRIES FOR NEW MACHINERY & NEW COMPLETE LINES ONLY TO OCMI HQ.
ENQUIRIES AFTER MARKET, SPARE PARTS & REFURBISHINGS COME ONLY TO OCMI HQ.

OCMI

GROUP HQ, CENTRAL FINANCE, HR, ENGINEERING AND SALES

GROUP CENTRAL MACHINERY SALES

GROUP CENTRAL AFTER SALES

KEY ACCOUNT MANAGEMENT

MODERNE MECANIQUE

1946 > 78 years as Schott
Part of OCMI since 1998

- MACHINERY PRODUCTION INTER-GROUP
- SPARE PART PRODUCTION INTER-GROUP

KYP ACCESORIES

since 1992 > 32 years
Part of OCMI since 2019

- MACHINERY PRODUCTION INTER-GROUP
- REFURBISHINGS
- SPARE PART PRODUCTION & SALES

OCMI CHINA

since 2016 > 8 years
OCMI agency 30+ years

- LOCAL MACHINERY SALES
- LOCAL SPARE PART SALES & INVENTORY
- LOCAL SERVICE SALES

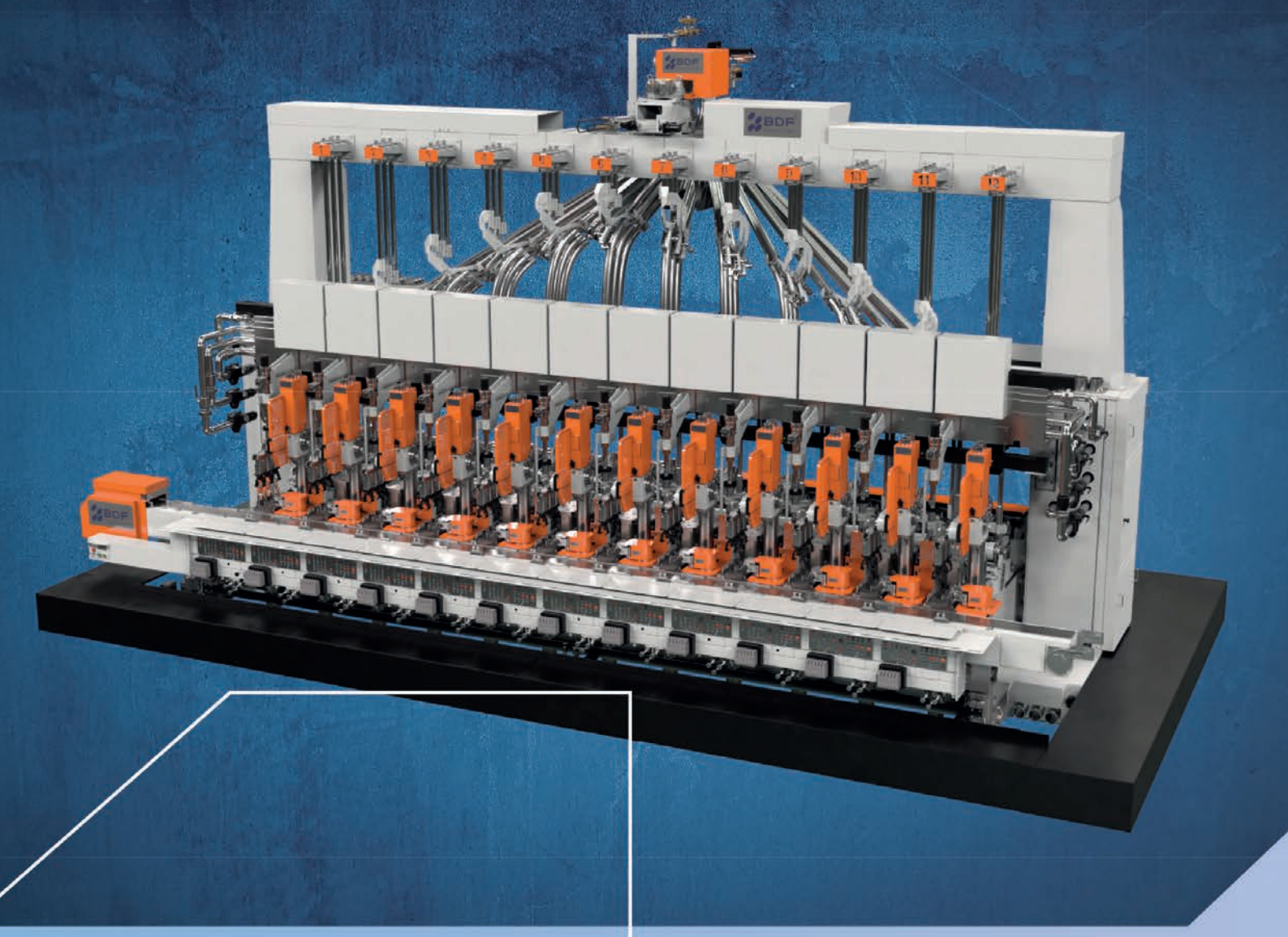
OCMI INDIA

since 2006 > 18 years

- LOCAL MACHINERY SALES
- LOCAL SPARE PART SALES
- LOCAL SERVICE SALES
- REFURBISHINGS

Through a reorganization of its divisions, OCMI is aligning processes and resources for greater efficiency. Sales and After-Sales will be centralized at headquarters to ensure unified standards and a consistent customer experience, while international branches refocus on supporting a more streamlined, integrated production & supply chain model.

www.ocmigroup.com/ocmi/ | info@ocmigroup.com



IS PARALLEL
ADV 8050

8-10-12 SECTIONS AND TANDEM
IS-P: DG 6 1/4"-TG 4 1/4"

IS ANGULAR
ADV 1050-8050

6-8-10-12 SECTIONS AND TANDEM
IS 4 1/4": SG-DG -TG 3"-TG 3 1/8"
IS 5"S: SG-DG-TG 85MM
IS 5 1/2": SG-DG
IS 6 1/4": SG-DG-TG 4 1/4"

Defining versatility: **IS Machines.**

VISIT US AT GLASSMAN ITALY 2026
4-5 February 2026, Bologna, Italy
STAND G02

bdfindustriesgroup.com

Innovation, technology and versatility make the BDF IS Machines the ideal solutions for **high productivity**, low maintenance effort and considerable **energy saving**.

The future we see through.

BDF® industries

35 YEARS

OF INNOVATION

Pushing boundaries to shape a sustainable future.

In advanced machinery and green initiatives, Sigma Group relentlessly pursues technical **progress**, delivering forward-thinking solutions for the refractory industry.

sigmaref.it

RADAR LEVEL MACHINE

ISO 9001 45001

Visit us at

GLASSMAN ITALY 2026
4-5 February 2026, Bologna, Italy

STAND E45

glass SERVICE®

The Future. Today.

BATCH PLANTS, FURNACES, FOREHEARTHS
COMPLETE SOLUTIONS
FOR GLASS MELTING TECHNOLOGY

BLOG

www.glassservice.it

glassserviceitaly

pennekamp

The smart way of thermal processing,
reliable handling & coating systems.

glassmachinery world plants&accessories
BI-MONTHLY INTERNATIONAL MAGAZINE FOR GLASS MANUFACTURING

PUBLISHING DIRECTOR: Arcangelo Altamura

EDITOR-IN-CHIEF: Marco Pinetti

ASSOCIATE EDITOR:
Nicolaas François Fouché | nick.fouche@glassonline.com

CONTRIBUTORS:
Rajeev Jetley, Zoë Elaine Whitten,
Jennifer Pressman, Alexander Roe

ADVERTISING:
ITALY: Maurizio Lozza | maurizio.lozza@glassonline.com
WORLDWIDE: Luciano Molina | luciano.molina@glassonline.com
Alessandro Corboud | alessandro.corboud@glassonline.com

GRAPHIC DESIGN:
Sonia Previato | sonia.previato@glassonline.com
Cristiano Guenzi

PRINTED BY:
BICIDI ARTI GRAFICHE
Via San Felice N° 37d 16138 Genoa - Italy

BACK COPIES: € 29 air mail included | Italy: € 15

Publication registered at no. 4 of the Milan Court Records Office on 11.1.1988 - ROC no. 34927 - ISSN 0394-9893

GLASS MACHINERY PLANTS & ACCESSORIES,
N. 221, ANNO 39, 2026, PERIODICO BIMESTRALE.

REGULAR FEATURES

www.glassOnline.com

WEB SERVICE

WEB PUBLICATIONS

COVER ADVERTISER



ARTICLES

BI-MONTHLY MAGAZINE PUBLISHED BY

Via Antonio Gramsci, 57 - 20032 Cormano (Milan) - Italy
Tel.: +39 - 02 - 66306866 - E-mail: publications@glassonline.com
www.glassonline.com

ANTONINI
FLORENCE ITALY

PURITY THROUGH INNOVATION

ANNEALING LEHRS, DECORATING LEHRS, TEMPERING LEHRS, LEHRS FOR GLASS BLOCKS, LEHRS FOR HV INSULATORS, MOULD PREHEATING KILNS, COLD END SPRAY SYSTEMS, SCRAPERS, UPGRADING AND OVERHAULING.

VISIT US AT GLASSMAN ITALY – BOLOGNA BOOTH F30

ANTONINI S.r.l Italy Tel +39 0571 93221 com@antoninisrl.com www.antoninisrl.com

2026 TRADE FAIRS CALENDAR

The magazine will be distributed at the following Events

2026 1

PHARMAPACK EUROPE | 21-22 JANUARY | PARIS - FRANCE

GLASSMAN ITALY | 4-5 FEBRUARY | BOLOGNA - ITALY

AMBIENTE | 6-10 FEBRUARY | FRANKFURT - GERMANY

Editorial files: **19-12-2025**

Deadline Adv files: 07-01-2026

2026 2

COSMOPACK | 26-28 MARCH | BOLOGNA - ITALY

CHINA GLASS | 7-10 APRIL | SHANGHAI - CHINA

Editorial files: **20-02-2026**

Deadline Adv files: 25-02-2026

2026 3

ICG - ANNUAL MEETING | 13-17 APRIL | LYON - FRANCE

INTERPACK | 7-13 MAY | DÜSSELDORF - GERMANY

FEATURED CONTENT: FORMING

Editorial files: **13-03-2026**

Deadline Adv files: 20-03-2026

2026 4

GLASSMAN LATIN AMERICA | 20-21 MAY | MEXICO CITY - MEXICO

CPHI AMERICAS | 2-4 JUNE | PHILADELPHIA (PA) - USA

Editorial files: **16-04-2025**

Deadline Adv files: 20-04-2026

2026

Glass Industry Directory 2026

Editorial files: **11-06-2026**

Deadline Adv files: 18-06-2026

2026 5

GLASSTEC | 20-23 OCTOBER | DÜSSELDORF - GERMANY

ALL GLASSTEC EXHIBITORS ADVERTISING IN THIS ISSUE ALSO RECEIVE A FREE GLASSTEC PREVIEW

Editorial files: **28-09-2026**

Deadline Adv files: 02-10-2026

2026 6

ATIV GLASS DAYS | 19-20 NOVEMBER | PARMA - ITALY

ALL4PACK- EMBALLAGE | 24-26 NOVEMBER | PARIS - FRANCE

UZ GLASS | 1-3 DECEMBER | TASHKENT - UZBEKISTAN

FEATURED CONTENT: ANNEALING & COATING

Editorial files: **16-10-2026**

Deadline Adv files: 28-10-2026

A151 Srl - Via Antonio Gramsci 57, 20032 Cormano, Milan - Italy
Tel.: +39-02-66306866 - E-mail: publications@glassonline.com

falornitech
glass melting technology

Turning Greenfield potential into performance

From vision to reality,
we deliver results.

GLASS MELTING TECHNOLOGIES

Deep knowledge of glass melting and conditioning processes with up-to-date technologies. The true heart of a glass operation.

TURNKEY Project, EPC - EPCM Formula

Integrated management of all project phases to produce best outcomes with certain, transparent costs, and guaranteed quality.

SERVICES

Civil and process engineering, Utility engineering, Factory auditing, feasibility analysis, Erection supervision, start-up assistance

falornitech
glass melting technology

falornIglass
art glass solutions

famorengineering
glass forming technology

Falorni Group - three generation family business since 1958

... in this issue of **GMP&A**. Advertisers are indicated in **bold**

famorengineering
glass forming technology

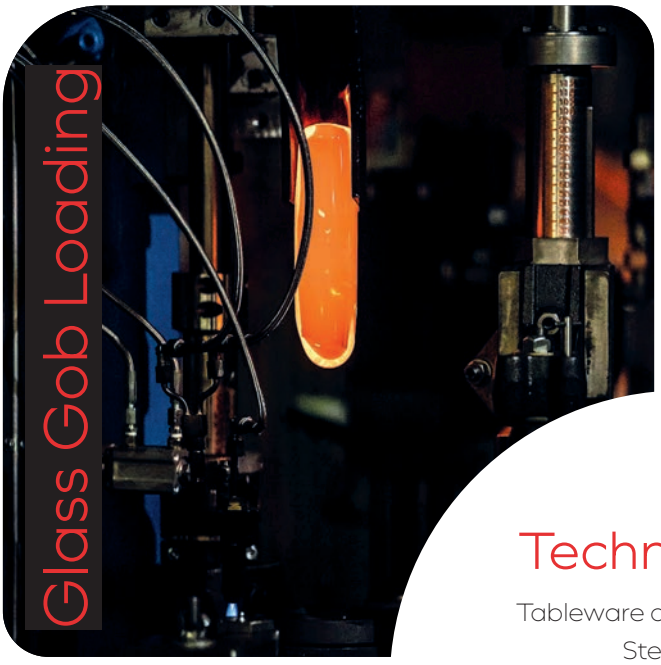
Famor Engineering S.r.l.
via Avigliana, 3
10040 Rivalta (TO) Italy
famoreng.com

member of FALORNI Gianfranco Srl Group

falorniglass
art glass solutions

falornitech
glass melting technology

Research, innovation,
on-going technological development



Technologies

Tableware and kitchenware
Stemware
Lighting ware
High voltage insulators
Glass block
Car headlight lenses
Window washing machines
Thermal tempering

Equipment

Semi-automatic machines
Automatic-machines
Flame Polishing machines
Handling & Conveying System

VETROPACK

Next phase of dismantling at St Prex site

Since **Vetropack Group** announced the painful decision to close its St-Prex plant -the company's last Swiss production facility- there have been some major changes on site.

The cullet processing operation is still active, but the production equipment has been dismantled. All the machines from St-Prex have now embarked on a new phase of their operational lifetimes. Some have been sold, while others (such as the AIS machines) have been reallocated to various locations within the Vetropack Group in recent months.

Many sites have benefited: Vetropack Chișinău, Moldova, has received a complete production line as well as inspection machines, and Vetropack Gostomel, Ukraine, now has additional hot end equipment and inspection technology. The Kremsmünster, Austria, Pöchlarn, Austria, and Boffalora, Italy, plants are set to integrate all the moulds from St-Prex, together with additional equipment: these resources will be ready for immediate use after routine inspections.

St-Prex's MSK shrink wrap machine has also been delivered to Pöchlarn. It will be integrated into the new Rezon production line, which is expected to be operational by the end of the year.

Preparations are now underway in St Prex for the final phase of dismantling the production facilities: the decommissioning of the furnace. Scheduled for 2026, this extensive process will take several months.

Despite Vetropack's withdrawal from production in Switzerland, the home market remains crucially important for the Group. Vetropack is continuing to serve the Swiss market from its St Prex location. Since 1 October, the Swiss logistics provider Camion Transport has been managing the St Prex warehouse, which serves as a depot for finished goods produced at other Vetropack locations. By taking on former Vetropack employees, Camion Transport has retained valuable expertise to ensure a seamless transition. In this way, the partnership with Camion Transport guarantees that Vetropack's customers in Switzerland will continue to benefit from efficient and reliable deliveries.

Vetropack remains committed to the recycling of used glass, and we take responsibility for a sustainable circular economy. The Group's goal is to work with local authorities to develop a good solution for cullet processing by mid-2026, and then to launch the next phase of dismantling. Around 35 employees are currently working on site at St Prex.

WWW.VETROPACK.COM

SCHOTT PHARMA

Launch of large-volume prefillable glass syringe

SCHOTT Pharma, a pioneer in drug containment solutions and delivery systems, has introduced the first 5.5 ml pre-fillable staked-needle glass syringe to the market. As part of the company's syriQ BioPure® platform, this new large-volume syringe facilitates the shift towards large-volume drug delivery devices for biologic therapies administered at home. It is particularly essential for treatments in areas such as immunology, oncology and central nervous system disorders.

"This portfolio expansion marks a significant step for SCHOTT Pharma in advancing the trend of self-administering substantial drug doses subcutaneously at home," said Andreas Reisse, CEO of SCHOTT Pharma. "With device-compatible large-volume options across all our product ranges and collaborations with leading device manufacturers, we provide pharma companies with solutions to efficiently scale home-care offerings and expedite their market entry."

SCHOTT Pharma presented its full portfolio of large-volume drug containment and delivery solutions last year from October 28 to 30 at the CPHI Frankfurt trade show in Frankfurt am Main, Germany.

WWW.SCHOTT-PHARMA.COM

RONDOT GROUP

Acquisition of German company LWN

A leading provider of industrial solutions for the glass sector, **Rondot Group** recently announced its acquisition of **LWN Lufttechnik**, a German company recognised for its expertise in cooling systems for the glass industry. This strategic move reflects the Group's commitment to consolidating its technological know-how and enhancing the energy efficiency of its solutions.

Founded and based in Germany, LWN has developed innovative mould cooling systems for several years, aimed at optimising quality and productivity in glass manufacturing processes. Through this acquisition, Rondot Group expands its offering and strengthens its presence by integrating complementary expertise at the core of its operations.

"The integration of LWN into the Group marks a significant milestone in our growth strategy," said Raphael Constantin, Chairman of Rondot Group. "Together, we will be able to offer our customers comprehensive solutions combining increased productivity, energy efficiency and optimised production quality."

The synergies between Rondot Group and LWN will enable the development of even more efficient industrial solutions, addressing the sustainability and energy efficiency challenges currently facing the glass sector.

The combined entity will achieve a consolidated turnover exceeding EUR 100M, demonstrating Rondot Group's strength and ambition in the international market.

WWW.RONDOT-GROUP.COM - WWW.LWN-LUFTTECHNIK.DE

SGD PHARMA

Innovations presented at CPHI Frankfurt 2025

SGD Pharma showcased its enhanced portfolio of products and services at this year's CPHI, which took place in Frankfurt, Germany, from October 28 to 30.

As part of the company's strategic growth plan to expand its tubular glass offering in Europe, SGD Pharma has significantly reinforced its industrial and commercial footprint with the acquisition of Alphial, a tubular glass converting company manufacturing ampoules, vials and Ready to Use (RTU) products.

This move positions SGD Pharma as a key player in the tubular segment as well as its leadership in moulded, enabling greater responsiveness, increased capacity and innovation tailored to the evolving needs of the European pharma market. The acquisition of Alphial will ideally complement the company's existing operations in Europe and tubular facility in Vemula, India, recently bolstered by a joint venture with Corning. Alphial also attended CPHI so that visitors could find out more about how the expansion is reshaping tubular glass packaging. New for CPHI 2025, SGD Pharma exhibited its flagship Sealian platform. This internal surface treatment for moulded glass vials creates a strong barrier coating that protects sensitive therapeutics, improves chemical durability (especially against alkaline solutions), and reduces interactions between drug products and packaging. Sealian is available in clear and amber glass for vial sizes, ranging from 3 to 500 ml and is suited for every route of administration (parenteral, oral, nasal).

Also seen at CPHI 2025

- IDENCY: now fully completed range of vials in 6, 10 and 20 ml, combining the chemical and mechanical resistance of moulded glass with external dimensions comparable with standard tubular glass for fill & finish lines.
- Sterinity EZ-fill®: SG EZ-Fill's ready-to-use (RTU) moulded glass vials, offering sterile, flexible and high-quality solutions.
- Ensiemo: the full pharma-grade Type III vial and pipette packaging system, now available with tamper - evident and child-resistant caps.
- Velocity® Vials: SGD Pharma's Type I tubular glass vials with external low-friction coating from Corning, designed to optimise fill & finish operations - reducing friction, improving throughput (20-50 percent efficiency gains), lowering particulate generation by up to 96 percent.
- CPHI, SGD Pharma introduced Proseal+, an advanced external treatment for moulded and tubular vials that enhances moisture and oxygen protection to extend shelf life of pharmaceutical contents.

WWW.SGD-PHARMA.COM

TIAMA & RUBIN GLASS

Successful commissioning of IQ Scan

Tiama was recently proud to announce the successful start-up of its IQ scan at the **Rubin Glass** factory in Pleven, Bulgaria.

The milestone marked a new step in quality inspection and process optimisation, thanks to the dedication and collaboration of the Rubin Glass team and the Tiama experts.

Tiama expressed its gratitude to the Rubin Glass team for its engagement throughout the training and commissioning phases, reporting that its enthusiasm and professionalism had made the launch a real success.

WWW.TIAMA.COM

CHECKMATE
IN JUST FIVE MOVES

1 ENGINEERING
2 MANUFACTURING
3 ASSEMBLY
4 INSTALLATION & START-UP
5 SERVICE

INVICTO

VETROMECCANICA

FIND OUT **MORE**

VETROMECCANICA.IT

FEVE

Call to Action to EU for simpler packaging minimisation rules

The CEOs of Europe's leading glass manufacturers have written to the European Commission calling for a technical adjustment to the new packaging minimisation requirements of the Packaging and Packaging Waste Regulation (PPWR) through the upcoming Environmental Omnibus or other legal tools.

Glass manufacturing is one of Europe's oldest industrial traditions, a sector built on craftsmanship, design and continuous innovation. Today, it remains a global benchmark for circularity. The container glass industry strongly supports the ambition of the PPWR and continues to invest heavily in decarbonisation, furnace electrification, improved recycling systems and is supporting the uptake of reuse. Glass already achieves a high recycling rate in Europe and continues to raise the bar on both circularity and innovation.

The new packaging minimisation requirements of PPWR, as currently drafted, would require all packaging to be cut to the "minimum necessary" in a way that leaves no room for creative packaging design and innovation. That means no space for the shapes, features or brand elements that consumers recognise and trust.

For sectors like wines, spirits, cosmetics, perfumery, gourmet foods and beverages, this would severely limit global competitiveness and, in some cases, jeopardise entire value chains.

The request is narrowly focused and constructive; a clarification in the upcoming Environmental Omnibus that maintains ambition while ensuring that the PPWR is workable, proportionate and legally clear:

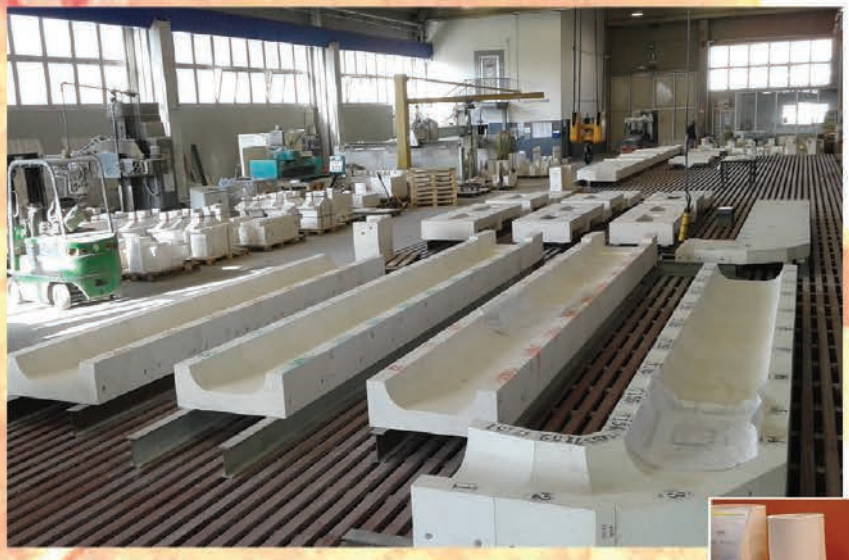
- Ensure a fair balance between packaging minimisation and design freedom: product presentation, marketing and brand identity should be explicitly acknowledged.
- Strengthen IP Protection and review the 2025 cut-off date
- Amend the references to rigid maximum weight limits

With over EUR 140 billion in EU exports relying on glass packaging, getting this right matters for thousands of SMEs, major global brands, and Europe's leadership in circular, high-quality and sustainable manufacturing.

FEVE remains committed to working with EU and national decision-makers to ensure the PPWR delivers both in terms of environmental ambition and industrial competitiveness.

WWW.FEVE.ORG

A WIDE RANGE OF REFRACTORIES



ALUMINA, SILLIMANITE
MULLITE, ZIRCON, INSULATING
BRICKS & SHAPES FOR FURNACE

ITEMIZED BLOCKS FOR
WORKING END & FOREHEARTHS

EXPANDABLES FOR
FEEDERS & STIRRERS

since 1949

3 STATE OF THE ART FACTORIES SUPPLY A WORLDWIDE CUSTOMERS BASE

5 INTERNATIONAL BRANDS

linco baxo

refractories expertise, together

LINCO BAXO INDUSTRIE REFRATTARI SPA
Corporate Headquarters

Via C. Boncompagni 51/8 / I, 20139 Milan, Italy | Tel. +39-02-5520041 | Fax +39-02-5694834
E-mail: info@lincobaxo.com | **www.lincobaxo.com**

Maref

TEC REF
TEC REF RANGE OF PRODUCTS

BETA GLASS

A world-leading DF1 glass furnace rebuild

As a leading manufacturer of glass packaging solutions in West and Central Africa, **Beta Glass** was recently proud to announce the successful rebuild of its DF1 container glass furnace at the company's state-of-the-art manufacturing facility in Ughelli, Delta state, Nigeria. The comprehensive project is set to increase production capacity and integrate cutting-edge technology and was completed in an unprecedented 48 days - setting a new global benchmark in the glass container industry.

The DF1 furnace rebuild encompassed a complete transformation of a 250 tonnes per day, 70-square metre container glass furnace. This ambitious project required meticulous planning, world-class execution, and flawless coordination to deliver within the exceptionally short time frame.

Key project highlights

- Refractories - Demolition and reinstallation of 2,000 MT of refractories, including hot sealing.
- Steel structures - Dismantling, modification, and reinstallation of approximately 90 tonnes of steel works.
- Furnace equipment - Installation of advanced exhaust draught systems, dampers, batch chargers, boosters, probes, cameras and cooling tower relocation.
- Working end & forehearths - Installation of gas reduction units, blowers, burners and state-of-the-art combustion and cooling skids.
- Utilities - Replacement of old water lines with stainless steel across 26 circuits and new air and gas pipelines.
- Combustion & cooling ducts - Fabrication and erection of new ducts, nozzles, skew ducts, blowers and fans for five forehearths.
- Electrical works - Installation of MCC panels, cabling, trays and instrumentation.
- Forming and inspection - Overhaul of three IS forming machines, two new forming machines and installation of an advanced cold end inspection system featuring AI and smart technology.
- Control system upgrade - New PLC, touchscreen HMI, temperature controllers and safety relays.
- Production flexibility - Integration of NNPB (narrow neck press and blow) and Blow & Blow technologies for lightweight food jars.
- The DF1 Furnace Rebuild was led by Chief Operating Officer Jagdish Agarwal, whose leadership ensured flawless execution marked by zero accidents and robust risk management protocols. A special task force of 130 overseas contractors worked in coordinated 24-hour shifts, enabling rapid progress and precision.

The project also benefited from close collaboration with key global suppliers, including BDF Industries, Furnotherm, All Glass, Bottero and Tiama, whose joint expertise and support was instrumental in achieving this record-breaking milestone.

WWW.BETAGLASS.COM

GPI

California approves legislation for glass bottle manufacturers

The Glass Packaging Institute (GPI) recently applauded the leadership of Assembly member Rhodesia Ransom, the support of California's legislative leaders, and Governor Gavin Newsom for their roles in passing and signing AB 899 - a significant step forward for California's glass container manufacturing sector.

AB 899 extends and increases market-development payments for glass bottle manufacturers, helping to level the playing field against subsidised imports of wine bottles and food jars from Asia. By recognising the benefits of higher-quality, U.S.-made glass, California is investing in a strong local manufacturing base that supports well-paying union jobs, fuels the state's food and wine industries and advances economic and environmental sustainability.

"California's action on AB 899 sets a model for how states can invest in circular, resilient manufacturing," said Scott DeFife, President of the Glass Packaging Institute. "By prioritising domestic production, we strengthen supply chains, reduce environmental impact and deliver high-quality packaging that supports the state's world-renowned wine and food industries. Other states with glass industry facilities would do well to emulate California's emphasis on the circular economy of glass."

GPI and its member companies are proud to manufacture sustainable glass in North America, made in California, for California, produced by a workforce committed to quality, circularity and community.

WWW.GPI.ORG

GLASS SERVICE ITALY

Launch of new radar level machine

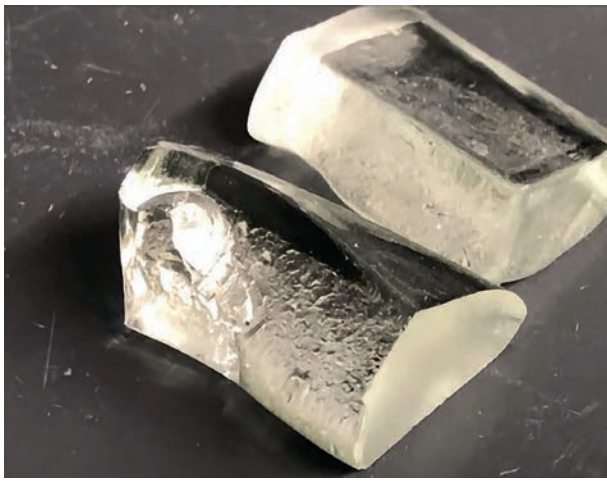
Following an intensive field-testing phase that began in July 2025, the new **Glass Service Italy's** Radar Level Machine system is now officially available. This system represents the evolution of the pioneering interferometric radar technology first developed worldwide by Glass Service in 2012.

Designed for installation on working ends or forehearths, the system combines advanced miniaturisation (antenna size only 130 by 130 millimetres, mechanical support 265 by 265 millimetres) with extreme measurement performance: a reading accuracy of 0.05 millimetre and a distance variation accuracy of ±5 microns. The measurement range covers a distance of 0.3 to 5 metres from the antenna. High-frequency sampling (100 Hz) ensures real-time monitoring of the glass level, with signal filtering adaptable to furnace control needs. The antenna, cooled by compressed air (no water required), withstands 120 C and can be installed in environments up to 160 degrees Celsius.

The system features 4 configurable 4-20 mA outputs, Modbus RTU/TCP/IP communication interfaces, Profinet (optional) and an integrated HMI touch screen for real-time visualisation, data logging (level, antenna temperature) and alarm management.

Ideal for maximising reliability, reducing errors from thermal expansion and simplifying maintenance, the new Radar Level Machine confirms itself as a state-of-the-art solution for the glass industry, now ready for the market after months of validation under real world conditions.

WWW.GLASSSERVICE.IT



VERALLIA

Rethinking glass starts with rethinking how it's made

As the world's third largest producer of glass containers for food and beverages, **Verallia** recently announced its partnership with Penn State - all to scale up the use of LionGlass, a new family of glass developed by researchers at the University. The company has entered into a research partnership with Penn State to test the new type of glass for use in consumer packaging.

"LionGlass offers a promising alternative to conventional soda lime silicate glass," said Corinne Payen, director of glass innovation for Verallia. "It melts at temperatures much lower than traditional glass, which saves energy and eliminates the use of carbon-based raw materials, potentially halving the carbon footprint of glass manufacturing."

LionGlass melts at temperatures up to 400 degrees Celsius lower than conventional glass and eliminates direct carbon dioxide (CO2) emissions by removing carbonates from the glass formula. It also offers enhanced crack resistance and durability, in some cases up to 10 times stronger than conventional glass.

"Worldwide, glass manufacturing produces over 86 million tonnes of CO2 annually," said John Mauro, professor and department head of materials science and engineering at Penn State and co-inventor of LionGlass. "LionGlass not only reduces emissions during production but also offers superior mechanical performance -up to 10 times more crack-resistant than standard glass- which could allow for lighter packaging and further reduce transportation-related emissions."

Glass has long been praised for its ability to preserve food and beverages thanks to its impermeability, chemical stability and infinite recyclability, he explained, but traditional glass production is energy intensive.

The Science Based Targets initiative (SBTi), a corporate climate action organisation, recently validated Verallia's long-term Net Zero 2040 trajectory according to its Net Zero Standard. The company, which operates 35 glass production facilities across 12 countries, has committed to reducing its CO2 emissions by 90 percent and offsetting the other 10 percent, making it the first global producer of glass packaging for food and beverages to commit to the Net Zero trajectory for 2040, Payen explained.

"This partnership opens exciting opportunities aligned with Verallia's mission: to reimagine glass for a sustainable future," she said.

WWW.VERALLIA.COM

ZIPPE & AGI GREENPAC

Zippe chosen - again

Zippe Industrieanlagen has been pleased to announce another significant order from Asia: for **AGI Greenpac's** new greenfield project in Gwalior, India, Zippe will be supplying the batch house including the cullet return system. The scope of supply includes full engineering services, delivery of the main components and the control system.

Especially gratifying: AGI is once again relying on proven Zippe technology, a strong sign of trust and quality. The new plant will produce glass for the food, pharmaceutical and beverage industries and is scheduled to go into operation early 2027.

Zippe has thanked AGI Greenpac for its continued trust in anticipation of successfully implementing this forward-looking project.

WWW.ZIPPE.DE - WWW.AGIGREENPAC.COM

SCHOTT PHARMA

Christian Mias to succeed Andreas Reisse as CEO

The Supervisory Board of **SCHOTT Pharma** Management has appointed Christian Mias as CEO of SCHOTT Pharma. He will take over from Andreas Reisse, who will retire as planned in April 2026. Reisse will actively support a seamless leadership transition over the coming months to ensure continuity and stability for the company and the entire team.

Born in Iserlohn in 1974, Christian Mias will succeed Andreas Reisse - starting May 1, 2026. As an industrial engineer with a doctoral degree, he looks back on more than 20 years of management experience, including over 18 years within the SCHOTT group. Before joining SCHOTT, he started his career as Commercial Project Manager at Siemens. Christian Mias gained significant experience in the pharmaceutical industry when joining SCHOTT Tubing, which produces intermediate products for the pharma sector, including SCHOTT Pharma.

Throughout his career at SCHOTT, Christian has held leadership positions across various business units and continents, including roles as Managing Director in Brazil and Chief Operating Officer in the United States. In such roles, he successfully drove profitable growth by optimising processes, improving productivity, and increasing earnings quality. Since 2016, he has served as Vice President, and since 2018 as Executive Vice President, currently heading the Business Unit Electronic Packing. Across his executive positions, Christian combined strategic foresight with operational discipline to drive the organisations toward consistent growth and strong financial performance.

Peter Goldschmidt, Chairman of the Supervisory Board of SCHOTT Pharma, said, "We are delighted to welcome Christian Mias as the new CEO of SCHOTT Pharma. His proven success within the SCHOTT Group, combined with strategic expertise and strong execution, demonstrated through integrative, performance-oriented and participative leadership, makes him an excellent fit to lead SCHOTT Pharma into its next phase of profitable growth.

"We are confident that Christian, together with Reinhard Mayer (CFO), will continue to drive profitable growth and further strengthen SCHOTT Pharma's position as a global leader in pharmaceutical packaging and delivery systems."

WWW.SCHOTT-PHARMA.COM

GRAPHOIDAL DEVELOPMENTS

A key container glass industry partner

For over 60 years, **Graphoidal Developments** has been a key partner of the container glass industry, providing state-of-the-art lubrication and coating solutions for both hot end and cold end applications.

With extensive knowledge in precision dosing, mixing control and accurate spray application, Graphoidal systems ensure optimal performance and consistency throughout the production process.

Graphoidal joined Rondot Group in 2002, further strengthening its technical offering for glass manufacturers worldwide.

Graphoidal delivers:

- Lubrication systems
- Coating solutions
- Hot end and cold end process optimisation
- Reliable, economical and forward-thinking technology

With innovation, precision and efficiency, Graphoidal continues to support glassmakers in gaining crucial competitive advantages.

WWW.GRAPHOIDAL.COM


STARA GLASS
The glass the world wants
Efficient, reliable, sustainable glass melting furnaces.
We design and deliver cutting-edge glass furnace solutions tailor-made to the evolving needs of our clients, while minimizing environmental impact. We adopt the EPC (Engineering, Procurement and Construction) model to ensure efficiency and full project control.
DESIGN AND IMPLEMENTATION
Melting Furnaces | Forehearths | Equipment | Energy Recovery System | DeNOx Technologies
DIAGNOSTIC SERVICES
Heat Balance | Thermography
Endoscopy
DEDICATED SERVICES
Refractories Warehouse | Customer Support
Hot and Cold Repairs
staraglass.com

STEVANATO

Integrated approach to primary packaging for biologics

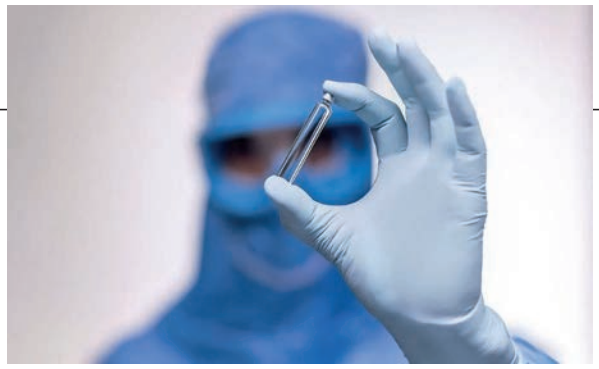
Widely recognised as the fastest growing within the pharmaceutical industry, the biologic segment is consistently outpacing small molecule drugs in sales growth and market expansion. Indeed the biologics market is projected to experience a double-digit (+15 percent) compound annual growth rate (CAGR) until 2027 (source: IQVIA and **Stevanato Group** internal analysis).

In addition to market growth, biological drugs are increasingly complex and sensitive, while product quality requirements are becoming ever more stringent.

To meet the increasingly demanding requirements of biologic drugs - such as sensitivity to packaging materials, precise dosing and compatibility with complex delivery systems - primary packaging must evolve accordingly.

Stevanato Group's proprietary glass converting technology is specifically designed to address these challenges, ensuring that biologic formulations are safely contained and effectively delivered:

- Extended 100 percent forming temperature control by pyrometers
- Monitoring of forming speed (rotation and tool speed)
- 100 percent advanced inline dimensional control systems for the most critical and/or crucial dimensions and statistical in-process controls
- Optimised tool design and use of new materials for improved handling of the containers



- 100 percent online camera inspection for cosmetic defects

Full control over the forming process and continuous product improvements lead to an optimisation of the internal shape, resulting in maximum dosing accuracy. In addition, this enables Stevanato Group to ensure high glass strength against external influences impacting the primary packaging, such as in drug delivery systems.

Stevanato Group develops its lines with an emphasis on all stages of forming, including the feeding of glass tubes, the glass forming process, transport, annealing and packing, and manufactures primary containers that meet different market needs.

Outstanding glass container platforms

Fina®, Nexa® and Alba® comprise Stevanato Group's primary packaging product lines. All ensure improved mechanical strength, excellent cosmetic appearance, tight dimensional tolerances, consistent surface performance and maximum compatibility with drug delivery devices.

These platforms are designed to meet the specific challenges of biologic drug containment, offering tailored solutions for different sensitivity levels and delivery requirements, including the delivery of higher-volume and viscous drugs.

Indeed the Alba®, Nexa®, Fina® platforms are all available in EZ-fill® configuration; ready-to-use solutions that reduce total cost of ownership and time to market, preserving quality and increasing flexibility.

WWW.STEVANATOGROUP.COM

53RD PHOENIX AWARD

Presentation to Carlos Moreira da Silva

Each year the **Phoenix Award Committee** selects a living person who has been active in and has made significant and major contributions to any phase of the glass industry. This may be in the field of science, production or education relating to glass and shall include glass containers, fibreglass, flat glass, scientific glass, tableware and electronic glass. On October 17, 2025, Demetrius Rankin, Chairperson of Phoenix Award Committee presented the 53rd Phoenix Award to Carlos Moreira da Silva at a black-tie Gala dinner at the historic Casa Ferreirinha in Porto, Portugal, a renowned Port Wine cellar that offered a fitting and elegant backdrop for the celebration. The award celebrates Moreira da Silva's lifetime of accomplishments, unwavering commitment to responsible leadership, sustainable industry practices, and community involvement. Today, BA Glass stands as a model of sustainable industry, investing heavily in decarbonisation and innovation. The company's culture, deeply influenced by Moreira da Silva's values, prioritises employee well-being and environmental responsibility. Moreira da Silva's legacy continues through his son, Tiago Moreira da Silva, now leading BA Glass, reinforcing a tradition of excellence and innovation in glass manufacturing. In his heartfelt acceptance speech, Moreira da Silva expressed sincere gratitude to the Phoenix Award Committee, and paid tribute to his colleagues, family, and friends for their unwavering support throughout his journey. Moreira da Silva stated, "I'm very proud and honoured to be a recipient of the Phoenix Award." He also expressed his thanks and happiness in receiving the Award in his beloved City of Porto and for the presentation speeches which he said were moving for his family and for himself.

WWW.PHOENIXAWARDCOMMITTEE.ORG/INDEX.PHP - WWW.BAGLASS.COM

OMSO

EcoVadis bronze medal: recognised commitment to sustainability

A leading manufacturer of machines for direct printing on plastic, glass and aluminium items, **OMSO** recently earned the EcoVadis 2025 bronze medal - an international award that assesses corporate performance in environmental sustainability, human rights, ethics and responsible purchasing. With this result, OMSO ranks among the most virtuous companies in the sector globally Top 35 percent, confirming its focus on sustainable industrial growth and an increasingly efficient production model. "This recognition represents an important milestone for OMSO and for all the people who contribute to our continuous improvement journey every day," said Fausto Savazzi, CEO of OMSO. "Sustainability is a value that we integrate into every business decision: from production processes to relationships with our employees and partners."

The EcoVadis assessment is based on four fundamental pillars:

- Environment - managing the company's environmental impact and implementing low-impact technologies, such as LED systems and energy optimisation;
- Labour and human rights - valuing people and promoting a safe and inclusive work environment;
- Ethics - integrity and transparency in all company activities;
- Sustainable procurement - collaboration with suppliers who share the same principles of responsibility.

The bronze medal is a further step in OMSO's journey towards a more sustainable industrial future, in line with its mission: combining technology and responsibility for efficient, innovative and conscious production.

WWW.OMSO.IT

FRANKLIN PRECISION CASTINGS

40 Years of casting excellence

Franklin Precision Castings (FPC) recently celebrated 40 years of manufacturing precision investment castings. Since 1985, FPC has grown from a supplier of glass mould components into serving the pumps & valves, steel, oil & gas, food processing and defence industries. Originally known as Franklin Bronze & Alloy Company, FPC holds the distinction of being the oldest continuously operating casting foundry in Pennsylvania. In 1978, John and Bob Barber purchased the business, then focused on nickel sand castings. After a fire destroyed the original plant in 1981, the Barbers, with the support of state and local redevelopment agencies, rebuilt from the ground up, re-equipping the foundry and rehiring their dedicated workforce.

By 1985, FPC made its pivotal shift into investment casting when a mould shop manager sought a supplier capable of delivering glass mould parts in under four weeks. Bob Barber seized the opportunity, leveraging his metallurgical expertise to manufacture nickel guide rings, plungers and baffles. Franklin's proximity to glass mould shops in Pennsylvania, Indiana, Illinois and Ohio combined with its ability to deliver quality castings quickly cemented its reputation as a go-to supplier. Guided by Bob's entrepreneurial spirit, FPC continually reinvested in its operations adding state-of-the-art equipment, robotics, and in-house tooling and quickly earned a reputation for fast turnaround and high-quality castings. In 2005, with support from Pennsylvania state and local grants, Franklin took another leap forward with a USD 7M expansion. This investment included construction of a new building and installation of the first Shell-O-Matic robotic shelling system in the US, later followed by an upgraded second system to further boost capacity and efficiency.

As demand grew, Bob recognised the importance of diversifying beyond the glass industry. He led the company's expansion into automotive, mining and safety equipment markets, adding a second stainless-steel pouring centre and refining gating systems to produce more complex, higher-performance castings. In 2014, the company was acquired by Wall Colmonoy Corporation and rebranded in 2024 as Franklin Precision Castings to reflect its expanded capabilities and global market reach.

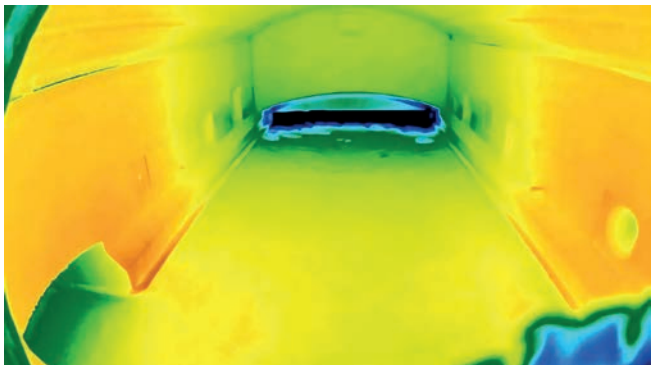
"We've grown from pouring our first investment castings to producing critical parts for industries we never imagined back then," said Jeff Morgan, Tool Design Technician and 40-year FPC veteran. "What hasn't changed is the pride we take in what we do."

WWW.FRANKLINCASTINGS.COM

GLASS FUTURES

Furnace in full flow, continuous melting begins

Following a successful commissioning, the **Glass Futures** technical team has transitioned to 24/7 operation, running a series of experiments to understand furnace performance under standard conditions. These tests will set the benchmark for future trials with low-carbon alternatives such as hydrogen, biofuels and hybrid electric boost, which are due to commence over the next few weeks.



This milestone builds on industrial trials conducted at the end of 2024 and early 2025, during which five different types of liquid biofuels were tested in glass and ceramic production. These trials involved four of the UK's largest glass manufacturers: Ardagh Group, Encirc (part of the Vidrala Group), Pilkington UK (NSG Group) and O-I, as well as DSF Refractories & Minerals, the UK's largest shaped refractory producer.

All of this is part of the government-funded Industrial Fuel Switching (IFS) projects, supported by the GBP 1 billion Net Zero Innovation Portfolio managed by the Department for Energy Security and Net Zero (DESNZ).

WWW.GLASS-FUTURES.ORG

FLUORITAL

THE *Colors* OF SUSTAINABILITY

WWW.FLUORITAL.COM

FLUORITAL has made its eco-sustainability policy a *true pact with the planet*, sealing this pact thanks to its environmental certifications.

For *over 60 years* it has been the main reference in the sector of **high quality paints** and inks for glass, plastic and metal; as well as a pioneer in non-flammable water-based products, with cross-linking at low temperatures and with low contents of volatile organic compounds.

HEADQUARTERS: Fluorital S.r.l. Via Roma 54, 31020 Villorba Italy | info@fluorital.com
FLUORITAL GROUP: FRANCE - USA - ITALY - POLSKA

VERALLIA

Burgundy Air 300g, the world's lightest burgundy bottle

As a leading glass packaging producer for beverages and food in Europe, **Verallia** takes another step in its light-weighting revolution with the launch of the Burgundy Air 300G, the world's first ultra-light Burgundy bottle, standing 290 millimetres tall. A model of disruptive eco-design, it preserves the iconic silhouette of traditional Burgundy bottles while significantly reducing its environmental footprint. With the Burgundy Air 300G, Verallia once again confirms its pioneering role in transforming glass packaging to support the wine industry's sustainability and competitiveness. This innovation stems from years of R&D expertise and state-of-the-art industrial know-how. The challenge was to maintain the distinctive aesthetics of Burgundy bottles while drastically cutting their weight. Weighing just 300 grams (compared to the European average of 450 grams) with a 75 centilitre capacity, the Bourgogne Air 300G reduces raw material use and CO2 emissions by 33 percent. Producing one million bottles saves 66 tonnes of CO2 (scopes 1 and 2), 279 MWh of energy, and 76 cubic metres of water. Depending on the glass colour, it can contain up to 86 percent recycled glass, further minimising its environmental impact.

The "AIR" range: A breath of innovation

Following the success of the Bordelaise Air 300G, launched in November 2023 and now distributed in six European countries, along with the Air jars and My Air, Verallia expands its Air range with Burgundy Air 300G. The Air collection embodies Verallia's conviction: to lighten is to transform, offering producers and consumers a new generation of packaging that combines lightness, aesthetics and logistical efficiency. The Burgundy Air 300G will soon be available with both screw and cork finishes, and in three colours: antique green, dead leaf and flint (clear). It will be showcased at SITEVI 2025 in Montpellier, from November 25 to 27.

Meeting market expectations

Amid rapid changes in the wine and spirits sector, and under new European regulations promoting circular economy and responsible innovation, the Burgundy Air 300G directly addresses key market needs:

- Consumers who value environmental responsibility and respect for tradition.
- Producers and distributors seeking to decarbonise their value chains.

By developing the Burgundy Air 300G, Verallia demonstrates that innovation, tradition and responsibility can coexist in a single bottle.

WWW.VERALLIA.COM

PENNEKAMP

New annealing lehrs for Ambev in Brazil

The Brazil-based brewing company **Ambev** has officially launched its new sustainable container glass plant in Carambeí, Paraná, Brazil and **Pennekamp** played a key role in this landmark project.

As part of the plant's commissioning, Pennekamp successfully installed and commissioned Three gas-heated annealing lehrs, specifically engineered for maximum efficiency and performance.

The plant produces 400 tonnes of container glass per day, placing high demands on precision, process stability and energy efficiency. Pennekamp's engineering team developed custom-designed annealing lehrs, ensuring highly uniform temperature distribution across the entire lehr. Beyond the annealing lehrs, Pennekamp delivered and successfully launched three complete sets of cold-end coating system, mould pre-heating and deflector firing ovens. The project's success is rooted in the close and highly professional cooperation between the Ambev management and operational teams and Pennekamp's engineering experts. Pennekamp is proud to have contributed to one of the region's most innovative and sustainable container glass plants. The company expresses its sincere gratitude to the Ambev team for the trust and exceptional collaboration throughout the project.

WWW.PENNEKAMP.DE

CALDERYS & BINZAGR

Strategic partnership announced

Calderys and **Binzagr** recently entered into a strategic partnership that marks an important step in expanding Calderys presence in the region, through a brand-new refractory facility. The 16,300 square metre production plant, located in Jubail, Saudi Arabia, will include one state-of-the-art monolithics line for dense and lightweight refractory castables and a line for precast shapes and lances. It will primarily serve the evolving needs of Saudi Arabia, the largest Middle East refractory market. Building on Calderys' longstanding commercial footprint and the successful collaboration between HWI - Calderys' brand for the Americas region and Binzagr over the past 20 years, this partnership will further strengthen Calderys' ability to support customers across the region. Production at the new facility is scheduled to begin in April 2026. Michel Cornelissen, President and CEO of Calderys, said, "This partnership is an important step in Calderys Group's strategy and demonstrates the Group's solid growth and potential. It is also a testament to our ambition to serve our Middle East customers and prospects with greater agility while upholding the quality and delivery standards that have earned us our reputation."

Sheikh Abdullah Binzagr, Chairman of Binzagr, added, "We are proud to advance this strategic partnership, reinforcing the region's supply of essential materials. Leveraging over thirty years of industry expertise and comprehensive regional knowledge, this investment demonstrates our steadfast commitment to sustainable economic growth and aligns with the objectives of Saudi Arabia's Vision 2030." The new facility, operated by Calderys, will manufacture industry-leading refractory products under HWI and Calderys' trademarks and will feature the latest safety management standards, technical innovation and quality testing facilities. Aurélien Cadars, Senior Vice President EMEA of Calderys, declared, "We are grateful to our partners at Binzagr for their trust in Calderys. This project is the largest investment in the recent history of Calderys' EMEA region, and it reaffirms Calderys' commitment to excellence, innovation, and local availability of the Group's products and services. Our customers will benefit from an extensive portfolio of both Calderys and HWI solutions, increased product availability, with shorter lead times, and enhanced technical support." Sheikh Ahmed Binzagr, Board Member of Binzagr, concluded, "This partnership combines the expertise and capabilities of two well-established industry leaders, and we are confident that it will become a cornerstone in the Saudi industry value-chain."

WWW.CALDERYS.COM

SORG GROUP

A year of successful CLEAN Melter® operation at CRISAL

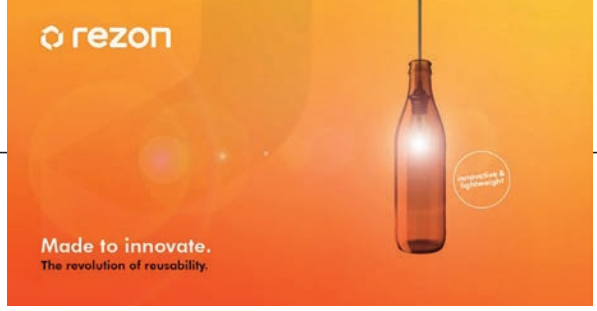
SORG marks one year of successful operation for another CLEAN Melter®, this time at **CRISAL**, replacing the previous regenerative F1 Endport furnace. This investment was supported by the Recovery and Resilience Plan (PRR) under the ECP Agenda (Ecocerâmica e Cristalaria de Portugal). CRISAL is the one-of-a-kind Portuguese glassware producer, located in Marinha Grande, an area well-known for its glass industry. It is part of the Leerdam Crisal Group (LCGlass), a world-renowned glassware manufacturer.

The CLEAN Melter® is an oxi-hybrid melter designed for an electricity share of up to 80 percent, with the remainder provided by gas, and with the capability for later heating with hydrogen power built in from the start.

With a melting surface of approximately 55 square metres, the melter represents a significant step forward in reducing CRISAL's CO2 emissions as part of its sustainability strategy.

SORG supplied the design and equipment (including the electrical and fossil heating systems) as well as the SCADA furnace control software. SORG also provided the conditioning system, consisting of an STW®-type distribution channel and five forehearths of the STF® type. The dismantling of the previous melting tank and construction of the CLEAN Melter®, including heating-up and filling, was carried out by SKS, a company of the SORG Group.

WWW.SORG.DE



VETROPACK

Made to innovate - the revolution of reusability

Three years ago, **Vetropack** unveiled the world's first thermally strengthened lightweight glass bottle, Echovai - a breakthrough in the industry. Years of development work produced a bottle that is up to 30 percent lighter while delivering high durability and a long lifespan. Consequently, the market response was positive: in 2024, the bottle became the standard solution for the Austrian brewing industry. Brands such as Gösser and Rieder have implemented the bottles successfully. Several awards, including the WorldStar Award, the Austrian State Prize for Smart Packaging and the Swiss Packaging Award, confirm the performance of the technology.

A new brand for new possibilities

With the upcoming start of serial production in 2026, Vetropack is opening a new chapter: Echovai becomes Rezon. The new name stands for progress as well as innovative and sustainable potential. This goes not only for returnable systems but also selected single-use applications. Rezon creates new opportunities for the beverage industry, especially where light weight and a premium glass appearance are crucial.

Sustainability that pays off

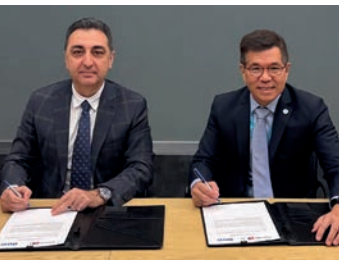
The specially developed thermal strengthening process gives the bottles exceptional durability. At the end of 2024, the Versuchs- und Lehranstalt für Brauerei (VLB, Research and Teaching Institute for Brewing) tested a reusable 0.33l lightweight glass bottle that is currently on the market and a reusable lightweight glass bottle developed by Vetropack specifically for the thermal strengthening process. The comparison showed that even after 60 use cycles, the thermally strengthened bottles exhibited far greater internal pressure and impact resistance than standard bottles. With an average burst pressure of 29.5 bar, they are almost twice as strong as the conventional version of the reusable bottles, which reach an average of 16.8 bar, a clear advantage in terms of reusability, product safety and product life span. The reduced weight not only saves beverage manufacturers material but also lowers transport costs and CO2 emissions. Combined with the bottle's high number of use cycles, this substantially decreases resource consumption per use. As a result, beverage producers benefit from both improved sustainability and economic efficiency, reducing the total cost of ownership (TCO) across the entire life cycle of the bottle.

WWW.VETROPACK.COM

ŞIŞECAM & BGC

Strategic collaboration

Şişecam, a global player in the glass and chemicals industries, and **BG Container Glass Public Co., Ltd. (BGC)**, a leading glass packaging manufacturer in Thailand and the ASEAN region, have jointly signed a strategic Memorandum of Understanding (MoU) to foster innovation and sustainability in the glass industry. This collaboration brings together Şişecam's 90 years of expertise in glass production and chemical industry with BGC's strong regional market presence and operational excellence, creating a powerful synergy to accelerate transformation across the sector. Under the MoU, both companies will jointly explore initiatives focused on sustainability, efficiency and innovation, including:



- Glass Product Properties Development
- Production Optimisation
- Production Planning
- R&D Cooperation
- Finished and Mid-Product Trading

Commenting on the partnership, Şişecam Chief Production Officer Beytullah Şahin said, "This collaboration reflects our shared vision for technology and sustainability. By combining Şişecam's global expertise with BGC's regional strength, we aim to deliver innovative and efficient solutions that create value for the glass industry in the ASEAN region." BGC CEO Silparat Watthanakasetr added, "Partnering with Şişecam allows us to leverage global best practices while reinforcing our commitment to operational excellence and customer-focused solutions. Together, we will drive progress and set new benchmarks for sustainability and innovation in the glass industry."

WWW.SISECAM.COM

China's Leading Glass Mould Enterprise

建华模具
JIANHUA MOULD

Container Moulds

Tableware Moulds

Automatic Production Line

Automatic Foundry

Laser Cladding Technology

HVOF Plunger

PLANT 1

PLANT 2

Add:No.1 Zhongtian East Rd Changkun Industrial Park E
Shajiabang Town,Changshu,Jiangsu,China
TEL:0086-512-52506751
FAX：0086-512-52506790
Web:http://www.jhmould.com
E-mail:info09@jhmould.com
P.C.:215559

Welcome to call

Syngas for cleaner glass melting, courtesy of GLASS SERVICE

Oliver Bellina
GLASS TECHNOLOGIST

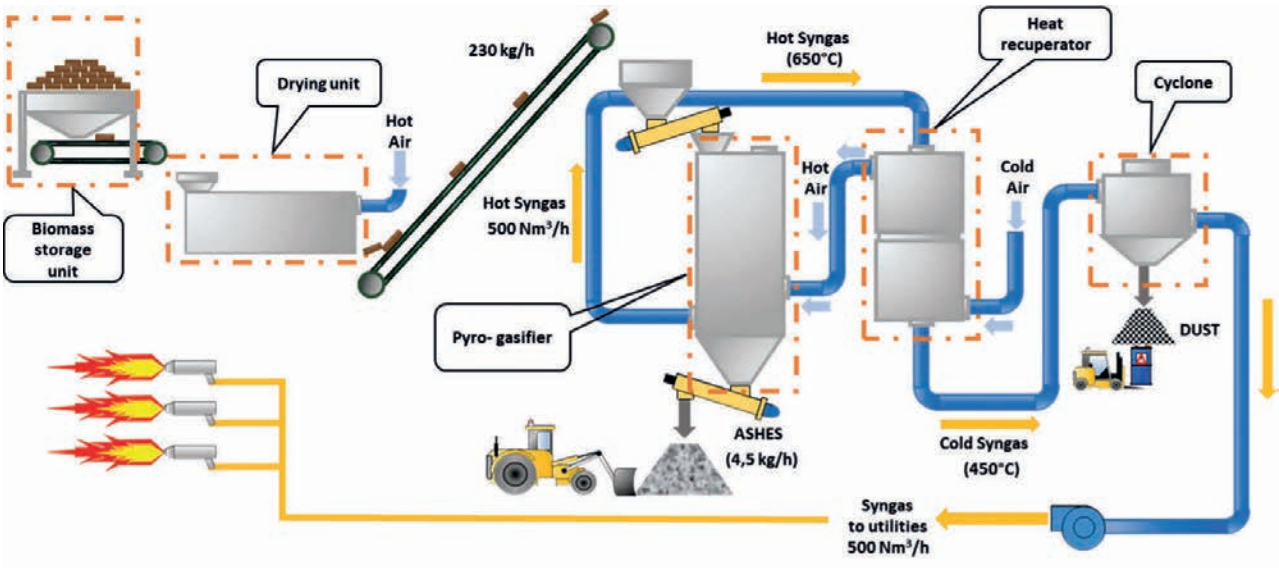
For the glass industry, achieving deep decarbonisation requires reliable alternatives to fossil fuels - especially in high-temperature melting processes. Research presented by Glass Service Italy highlights how syngas, from woody biomass, is a credible solution - aligning with European Net-Zero 2030 targets whilst offering operational, economic and environmental advantages

BIOMASS QUALITY AND FUEL POTENTIAL

Generated through controlled thermochemical gasification (700-1100 °C), Syngas contains a fuel-rich mix of CO, H_2 and CH_4, which makes it suitable for melting furnaces. Indeed when derived from high-quality wood chips with optimal moisture between 10 and 15 percent its calorific capacity, combustion behaviour and stability meet the essential requirements of industrial glass production

The raw-material markets in Italy and Europe provide substantial availability of biomass, with prices influenced by quality class, water content and supply-chain logistics. Here quality classes defined by UNI EN ISO 17225-4, including A1 and B1, show clear cost-performance relationships that impact syngas yield and overall efficiency.

Growing pressure for alternative fuels is driving the glass industry to explore various avenues. Produced from woody biomass, Syngas offers a promising route to reduce natural-gas consumption, CO_2 emissions and operating costs. GLASS SERVICE technical analyses and prototype data show its potential to meaningfully support decarbonisation in high-temperature glass melting.



SYSTEM ARCHITECTURE AND PROTOTYPE RESULTS

Glass Service's analysis details the full system architecture: storage units with moving floors, drying systems, heat recuperators, pyro-gasifiers, dust-separation cyclones and high-temperature exhaust fans. Prototype installations developed with Biosyn and UNIPI confirm syngas compositions averaging 22 percent CO, 18 percent H_2, 2 percent CH_4 and a PCI of 5-6 MJ/Nm³.

With production of up to 500 Nm³/h, the system can replace approximately 80 Stdm³/h of natural gas, saving around 600,000 Stdm³ annually over 7,500 operating hours. This corresponds to an estimated reduction of 1,200 t CO_2-eq and significant economic gains based solely on gas and ETS-certificate savings.

INTEGRATION IN INDUSTRIAL FURNACES

Integration strategies include installing syngas burners in unused tower-burner stations or introducing staged-combustion burners in strategic furnace zones, particularly the front area of end-port furnaces, where excess air is typically managed. These solutions maintain melting performance while lowering fossil-fuel dependence.

In conclusion, Glass Service's evaluation shows that a pyrogasifier delivering 500 Nm³/h of syngas can reduce natural gas demand by roughly 8 percent. When combined with electrical boosting optimisations or oxy-combustion, potential savings rise to 30-40 percent. Utilizing waste heat for biomass drying further enhances system efficiency and reduces feedstock cost - strengthening the case for syngas as a key contributor to decarbonising this hard-to-abate industrial sector. ■

GLASS SERVICE S.R.L.

Via Cascina Lari, 24
56028 San Miniato (PI) - Italy
glass-service@glassservice.it
Tel.: +39-0571-44-42
www.glassservice.it

Refractory innovation at RHI MAGNESITA delivers furnace sustainability

RHI MAGNESITA demonstrates how refractory design directly drives greener glass production by efficiency increases in the range of various percentage points leading to significant energy savings. By its INNOREG regenerator concepts integrating high-efficiency checker shapes, advanced silica materials and honeycomb crown technologies, the company is showing clear pathways to increasing heat recovery, reducing fuel consumption and lowering CO_2 emissions throughout advanced refractory design.

With glass melting being an energy-intensive process that makes efficiency improvements essential for sustainability, in combination with furnace operation with greater stability and predictability, producers are increasingly turning their attention to a historically underestimated lever: refractories. Far beyond their traditional role as passive materials protecting the furnace structure, refractories today act as active enablers of heat recovery, combustion efficiency, melting performance and overall energy optimisation.

RHI Magnesita demonstrates, through its advanced designs and material innovations, that refractory engineering directly contributes to furnace sustainability. From the INNOREG regenerator concept with high-efficiency checker shapes, to emissivity-enhancing silica crowns, each development represents a precise

intervention designed to reduce consumption, lower CO_2 emissions and improve furnace lifetime and operation.

REGENERATOR CONCEPTS

The regenerator is the thermal heart of an end-fired or cross-fired glass furnace. Its role -recovering heat from flue gases during each cycle- is fundamental to reducing the specific fuel consumption required for melting. A high regenerator performance depends on the proper calibration of several parameters :

- Optimised checker geometry, maximising specific heat transfer area (SHTA).
- Stable materials with high heat capacity, high thermal conductivity, low aging properties and corrosion-resistant grades, specifically-selected for each temperature zone.
- Clean operation, minimising condensation, sodium sulphate deposits and structural collapse.
- Homogeneous gas flow, driven by turbulence-enhancing shapes and well-sized flues.

A key element is INNOREG, RHI Magnesita's integrated regenerator concept that assigns material grades and shapes to different thermal zones:

This zoning strategy matches refractory performance to the severity of operating conditions (temperature, corrosion mechanisms, condensation behaviour). For instance:

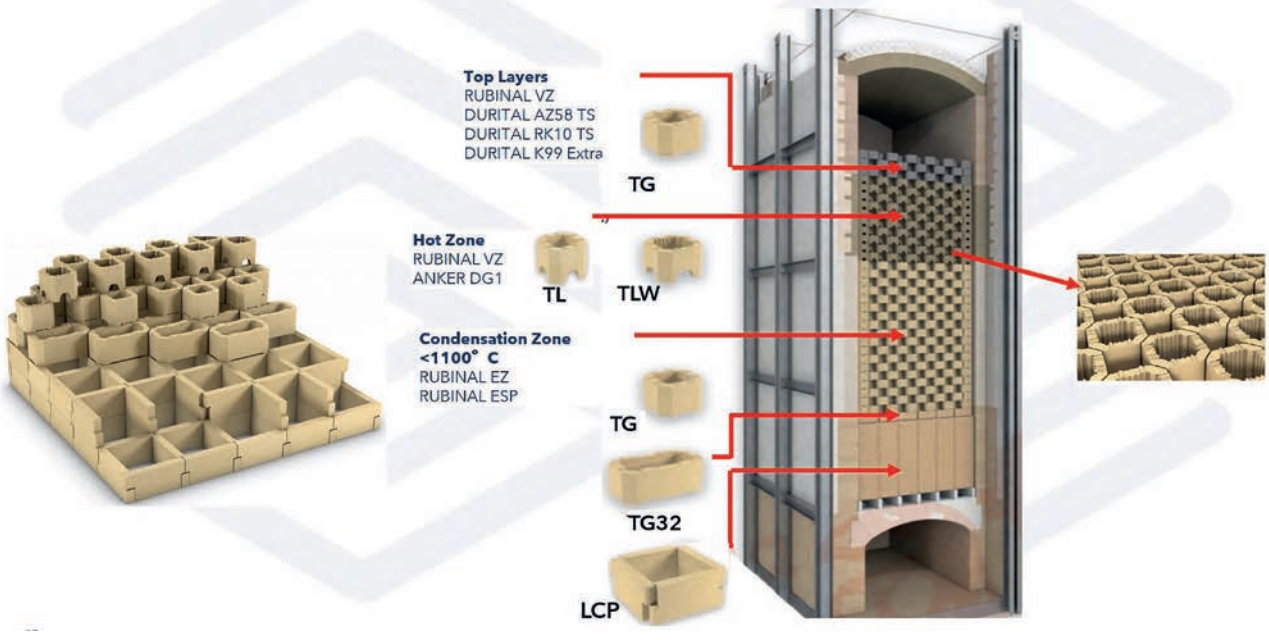
- Top-layer materials must show durability under batch carryover corrosion fluctuations and long-term structural stability.
- Hot-zone shapes need to maximise the heat exchange.
- Condensation-zone shapes must resist gaseous-to-liquid sulphate compound corrosion and accommodate sulphate-based deposits.

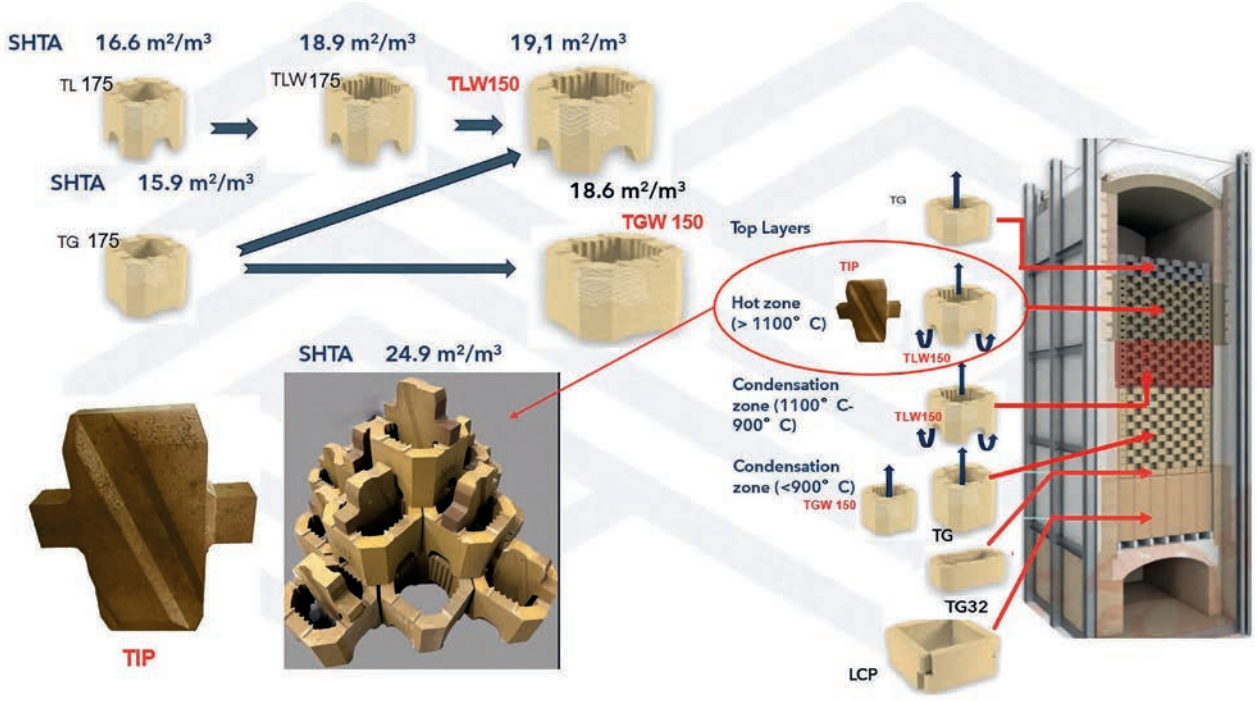
In particular, the LCP shape provides a larger flue cross-section to prevent clogging in areas prone to heavy sodium sulphate condensation - a persistent cause of regenerator underperformance.

INNOREG demonstrates that sustainability is not only about new materials: it relies on precise system engineering where design logic, shape innovation and material science coexist.

TLW, TGW AND TIP

Regenerator efficiency depends heavily upon checkerwork design, section and volume, turbulence, gas distribution, clogging potential and operational cleanliness. To address these requirements, RHI Magnesita, in addition to the traditional TG and TL shapes, has developed high-efficiency shapes such as TLW/15, TGW and the new TIP insert. TLW -already introduced in 2018- has become the company's standard hot-zone checker due to its high specific heat transfer area (SHTA); today the company has improved the design reducing the height to increase the number of openings to promote a better flow and temperature distribution while TGW, a recently developed shape, increases heat recovery in the lower condensation zone. The TIP piece is the latest development and consists of an insert (to be included inside the TLW or TL shape) that enables narrow channels in the hot zone, achieving a SHTA of 24.9 m^2/m^3. Comparative case studies show measurable efficiency gains (up to 5%) when TIP is added to TLW configurations.





The condensation zone typically experiences the highest risk of clogging, forcing the designer to adopt shapes that reduce the turbulence of the flows. TGW shapes address this aspect , and in parallel improve the heat recovery thanks to waves on its internal surface while still mitigating blockage risks. It complements TLW by ensuring that gains in the hot zone are not lost downstream.

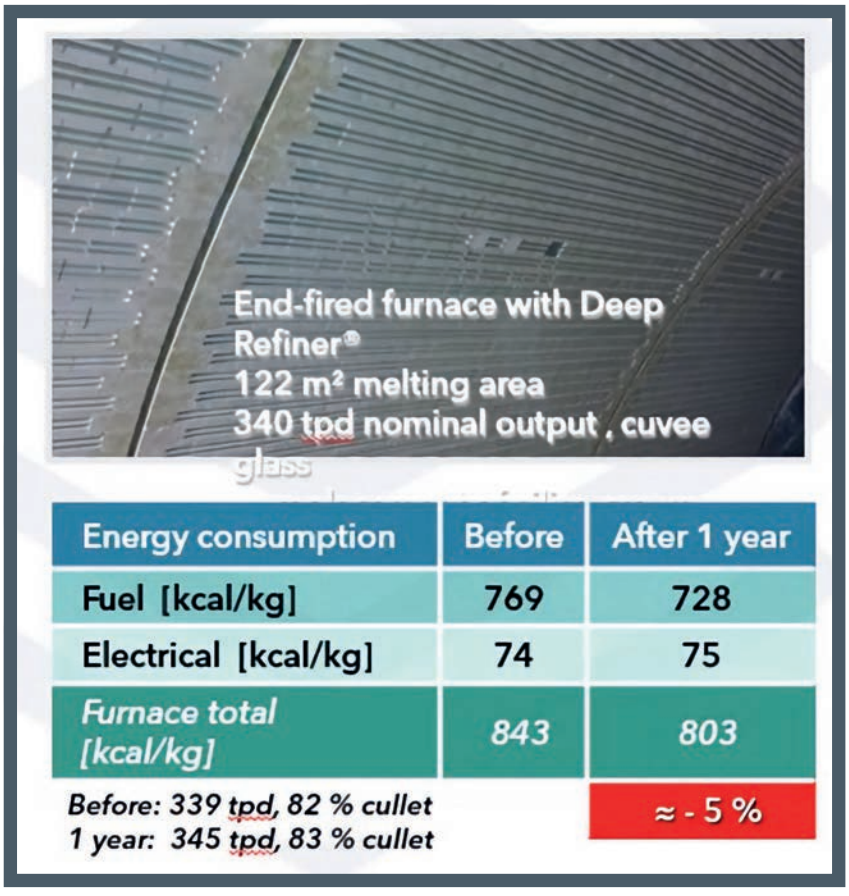
Smart checker designs are able to balance narrow channels in the hot zones and wider channels in condensation areas prone to clogging, by installing the LCP shapes. The result is a high efficiency checker package with high durability during the campaign (less maintenance and less risk of clogging).

HIGH EFFICIENCY CROWN BRICKS

The company also demonstrates how furnace-crown technology can significantly influence energy consumption. Honeycomb shapes increase emissivity simply through geometry. Their cavity structure enhances the chances to absorb and then re-emit radiant energy, increasing the radiation exchange according to the Stefan-Boltzmann law. Field observations show that honeycomb cavities absorb and re-emit more energy than flat sections, with customers reporting fuel savings of about 4 percent. εpsilon silica grade, consisting of high purity silica enriched with an emissivity agent, provides further improvements: modelling suggests that the introduction of the emissivity agent only, can lead up to 1.5 percent energy savings (or 3 percent fuel savings), depending upon combustion chamber geometry, stoichiometry, soot presence, glass emissivity and transmission effects. Combined, honeycomb design and εpsilon grade can deliver more than 5 percent fuel savings-equivalent in one field case to over 607,000 Nm³ of fuel saved and more than 1,190 tonnes of CO_2 avoided that year.

WHY REFRACTORY INNOVATION MATTERS FOR SUSTAINABLE PRODUCTION

Across all case studies and field results, a consistent message emerg-



es: refractories are not a static cost - they are an active lever of furnace sustainability.

Direct Benefits for Glass Producers:

1. Lower fuel consumption - immediate cost savings and reduced carbon footprint.
2. Higher melting efficiency - potential for higher pull without furnace modification.
3. Improved thermal homogeneity - better refining, higher glass quality and reduced defect formation.
4. Lower crown temperatures - extended refractory lifetime and fewer maintenance shutdowns.
5. Reduced clogging risk in regenerators → more stable operation across the campaign.

This aligns with the industry's strategic priorities: controlling CO_2 emissions, increasing furnace longevity, and keeping operational costs predictable in volatile energy markets.

LOOKING FORWARD: THE ROLE OF REFRACTORIES IN DECARBONISED FURNACES

As the industry transitions toward hybrid melters, oxyfuel combustion, hydrogen-enriched firing and electric boosting, refractory materials must evolve in parallel. The innovations presented -INNOREG zoning applying high-efficiency checker geometry, and emissivity-enhanced crowns- represent scalable, ready-to-implement steps that work independently of future energy configurations.

While alternative fuels or electrification require heavy infrastructure changes, refractory optimisation provides immediate, low-risk, high-impact sustainability gains.

CONCLUSION

Refractory innovation sits at the intersection of sustainability, operational excellence and economic performance. By redesigning checker geometries, tailoring material grades to specific temperature zones and enhancing emissivity through shape and chemistry, RHI Magnesita demonstrates that smart refractories are indispensable to the next generation of efficient and low-carbon glass melting.

Whether through advanced INNOREG regenerator concepts, or advanced silica solutions, each development actively contributes to reducing energy consumption, improving heat transfer, enhancing pull and ultimately lowering CO_2 emissions.

In an industry where every percentage point of efficiency matters, refractories are no longer simply the materials that line the furnace - they are an essential part of the strategy for sustainability. ■

RHI MAGNESITA

RHI MAGNESITA

Klingholzstraße 7
65189 Wiesbaden- -GERMANY
Tel. +49-611-7335-0
PI_Global_TechnicalMarketing_Glass@rhimagnesita.com
www.rhimagnesita.com

Driving global decarbonisation with H2GLASS hydrogen technology

Advancing Europe's glass sector by demonstrating green hydrogen combustion at industrial scale, the H2GLASS project is being led by partners across both industry and research - showing how its technology can cut emissions, enhance safety and deliver reliable production pathways toward deep decarbonisation in energy-intensive manufacturing processes Europewide.

Ernesto Cattaneo
- Head of Innovation Department
STARA GLASS

Anke Deckers
- Communication and Dissemination Manager
STEINBEIS EUROPA ZENTRUM

Funded by Horizon Europe, the H2GLASS project was launched back in January 2023 and has now reached mid-term. It unites glass manufacturers, research institutions and service providers from across Europe to develop technology that replaces fossil fuels with green hydrogen in production-facility combustion processes - thereby enabling decarbonised glass manufacturing with potential CO_2 reductions above 80 percent. The consortium includes more than 20 partners from industry and academia, among them glassmakers Hrastnik1860, OVC, Zignago Vetro, Vetrobalsamo and NSG, research institutions SINTEF, Aston University and NTNU, and glass and simulation specialists Stara Glass and Stazione Sperimentale del Vetro.

TECHNICAL CHALLENGES

The glass industry accounts for around 5 percent of Europe's CO_2 emissions, and the sector recognises the necessity of decarbonisation. While some of these emissions derive from chemical reactions during melting, the majority stems from combustion. Hydrogen combustion therefore represents a major opportunity for impactful emissions reduction. Introducing hydrogen into a new industrial sector poses challenges that the consortium is systematically addressing. Owing to hydrogen's hazardous properties, comprehensive safety strategies are essential. Beyond developing innovative burner and furnace designs, ensuring a reliable green hydrogen supply for on-site demonstrations is a central challenge. Another priority is optimising hydrogen combustion -such as mitigating NOx formation and managing high flame speeds- while maintaining premium product quality. A Digital Twin for predictive maintenance will further enhance efficiency and reliability. The project also transfers the technology to aluminium production for validation through a replicability demonstrator.

INDUSTRIAL MILESTONES

Since launch, H2GLASS has reached significant milestones. In late 2023, industrial demonstrator Hrastnik1860 executed two successful oxy-fuel combustion campaigns with high-quality flint container glass, including a single-day continuous trial and a three-day campaign - marking the first commercial hydrogen use in the glass packaging sector. In 2024, Owens Corning became the first to test industrial-scale glass-fibre production using only electrical boosting and oxy-hydrogen combustion. In autumn 2025, a portable 5 MWe PEM electrolyser will be commissioned at Owens Corning to supply green hydrogen for a long-duration combustion trial that was planned for either late 2025 or early 2026. The electrolyser will subsequently serve other H2GLASS demonstration sites - enabling further testing in varied industrial contexts.

FUTURE IMPACT

Additional project progress includes developing measurement protocols, quality-testing procedures and comprehensive safety plans for all demonstrators, as well as collecting data from initial trials to train Digital Twin models. Numerous publications and conference contributions have already resulted from this work. H2GLASS now stands at the forefront of sustainable innovation in the glass sector, demonstrating the transformative potential of green hydrogen combustion. Through cross-sector collaboration and systematic problem-solving, the project is proving the feasibility of hydrogen-powered glass production and creating a transferable model for other energy-intensive industries, paving the way toward a resilient, low-carbon industrial future. ■

H2GLASS
DECARBONISING OUR FUTURE

H2GLASS

Adornostr. 8
70599 Stuttgart - GERMANY
Tel.: +49-711-123-4010
ernesto.cattaneo@hydragroup.it
www.linkedin.com/company/91365747

www.h2-glass.eu

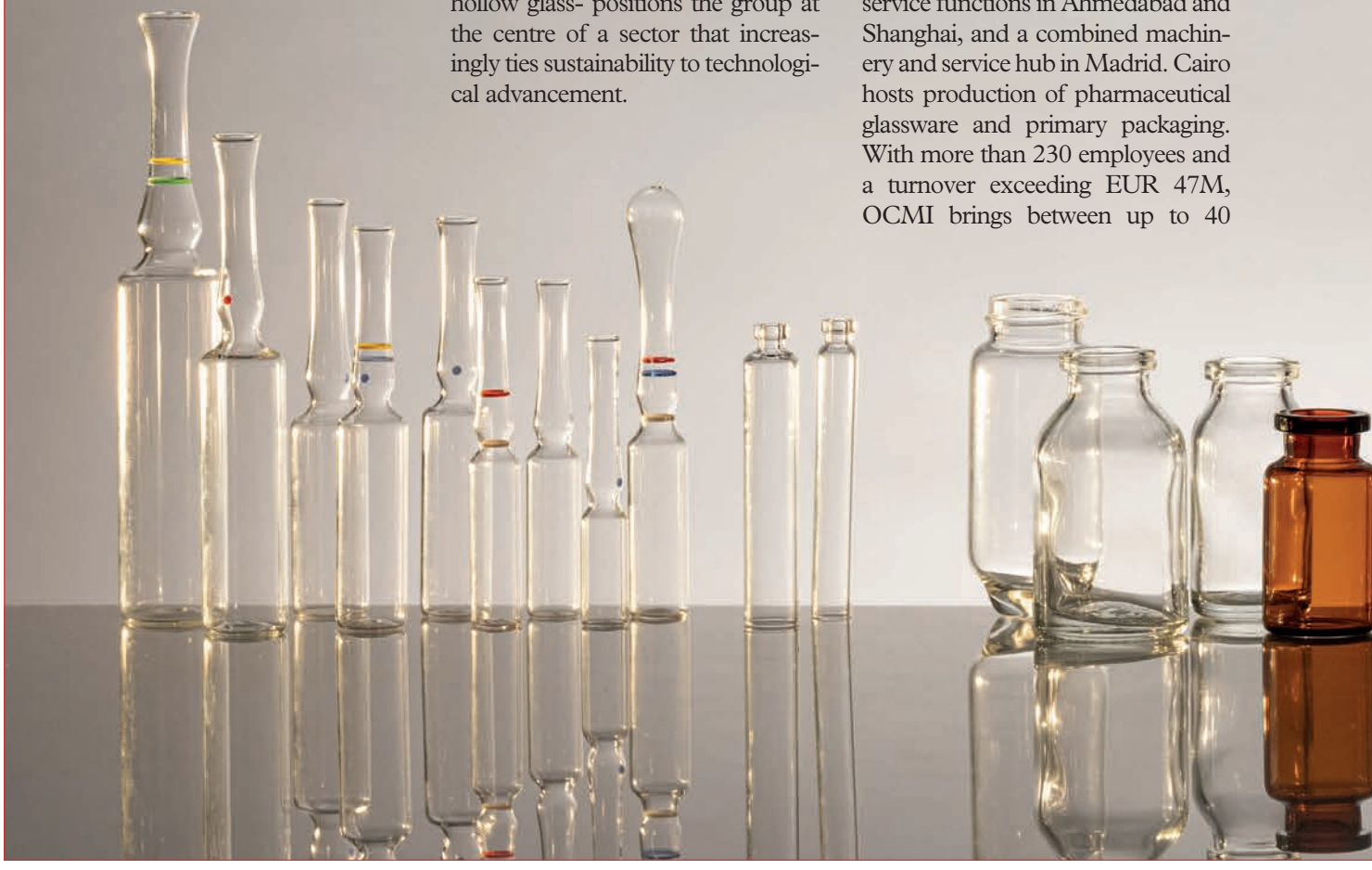
Glass primary packaging at OCMI is always more sustainable

HERITAGE

For more than a century, OCMI has been connected to glassmaking expertise and continuous progress in equipment dedicated to tubular glassware. Today, this accumulated know-how is directed toward a focused technological mission: enabling decarbonisation within the glass industry and, in particular, in the field of pharmaceutical primary packaging where product integrity, stability and resource efficiency must coexist seamlessly every day. OCMI's specialisation in tubular glassware machinery -as well as in equipment for glass stemware and hollow glass- positions the group at the centre of a sector that increasingly ties sustainability to technological advancement.

FOOTPRINT

This strategic orientation is reinforced by a global structure designed for widespread technical impact. Engineering and main machinery production are headquartered in Milan, with additional machinery manufacturing in Paris, extended production and sales and service functions in Ahmedabad and Shanghai, and a combined machinery and service hub in Madrid. Cairo hosts production of pharmaceutical glassware and primary packaging. With more than 230 employees and a turnover exceeding EUR 47M, OCMI brings between up to 40



As it reshapes pharmaceutical glass packaging with energy-saving technologies, hydrogen-ready lines and advanced automatic management of combustion fluids, OCMI continues to show how sustainability goals can be transformed into concrete production solutions that reduce utilities consumption while maintaining performance, reliability and long-term cost-effectiveness across tubular glass processing.

new lines into operation each year, supporting an installed base of over 3,100 machines worldwide. New developments can be deployed rapidly both through new line installations and through enhancements across existing lines in APAC, EMEA, NAFTA and LATAM.

PHILOSOPHY

OCMI frames its work around a group philosophy built on robustness, service and minimised consumption. Its more than 100 years of experience, sustained through ongoing research and development and systematically applied improvement, are described as a core value. Machines are engineered with uncompromising emphasis on durability and proven mechanical solutions, ensuring long-term reliability and stable performance. These design principles are supported by a global service network that maintains productivity and efficiency throughout each machine's lifecycle. Crucially, OCMI places explicit emphasis on optimised and minimised use of utilities and fluids, embedding resource reduction into the core of design rather than treating it as an add-on. This combination of durability, continuous support and consumption-conscious engineering forms the foundation for its approach to sustainable tubular glass production.

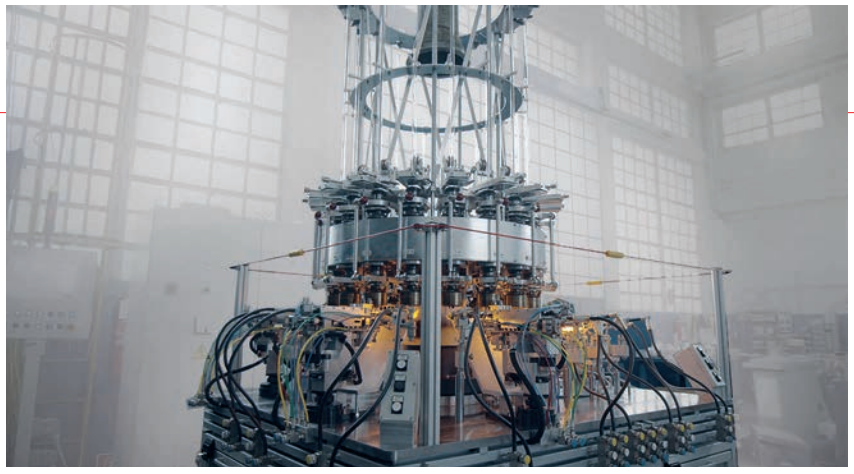
INNOVATION

The group's R&D strategy turns this philosophy into operational innovation. Its development roadmap centres on reducing gas, oxygen, electricity and both high- and low-pressure air consumption, marking these areas as essential targets for engineering advancement. New equipment generations are conceived specifically to lower utilities demand compared with prior versions. Automation plays a decisive role by introducing systems capable of automati-

cally managing consumptions during active production, transitional phases or temporary micro-stops. These innovations are designed to strengthen productivity while reducing the environmental and economic burden associated with each pharmaceutical glass container manufactured. A clear demonstration of this approach is the Mass Flow Control Technology created for vials and cartridges. Designed for attentive, efficient and sustainable management of combustion fluids, it uses only gas and oxygen - eliminating air to ensure precise control. During micro-stops or whenever glass is not loaded, the system reduces consumption automatically rather than maintaining constant output. Under normal production conditions, combustion fluids remain at the minimum levels required for stability. Because the system maintains full automatic control at all times, manual intervention is reduced and process repeatability is strengthened. This contributes directly to productivity gains, especially during fast automated changeovers, where waste of utilities is minimised and transitions become more efficient.

TRANSITION

OCMI's commitment to future-proof technology is also apparent in its readiness for hydrogen as an alternative to traditional combustion gas. Vial and ampoule lines are presented as 'H_2 plug & play,' a capability tested and ready since 2022. This readiness ensures that manufacturers can adopt hydrogen-based combustion when desired without reconfiguring machines, offering a practical pathway toward lower-carbon energy vectors that can be integrated into production strategies as fuel markets evolve. Complementing this are OCMI's state-of-the-art technologies that jointly deliver performance and sustainability. The use of 100 percent servo motion and torque motors supports precision while contributing to efficient energy use. Quartz tubular heaters provide stable, controllable heat input, and the shift to electric actuators reduces reliance on compressed air - aligning directly with the goal of lowering air consumption. Automatic closed-circuit systems for water cooling and lubrication ensure that these necessary resources are managed carefully and efficiently, reducing losses and improving performance stability. Together, these technologies show how OCMI integrates high technical performance and sustainable operation within the same equipment architecture. Taken as a whole, OCMI's philosophy, development priorities and technological capabilities form a cohesive pathway toward decarbonisation in pharmaceutical primary packaging. The company leverages its century-old heritage, global industrial presence and extensive installed base to advance energy-saving solutions that are technically robust, scalable and compatible with both existing and future infrastructures. Through minimised utilities consumption, fully automatic combustion management and readiness for hydrogen, OCMI positions its machinery as a direct contributor to a more sustainable glass industry. This integrated strategy transforms innovation into actionable reduction of environmental impact for every vial, ampoule and cartridge produced - supporting the future of pharmaceutical glass manufacturing through engineering that is both responsible and performance-driven. ■



The 35th China International Glass Industrial Technical Exhibition

Shanghai New International Expo Centre

April 7th-10th, 2026

Host: The Chinese Ceramic Society

Organizer: Beijing Zhonggui Exhibition Co., Ltd.

Tel: +86-10-57811261, 57811409

Fax: +86-10-57811262

E-mail: ceramsoc@chinaglass-expo.com

http://www.chinaglass-expo.com

WECHAT ID: CHINAGLASSEXPO

Cutting CO_2 emissions with SEFPRO electric furnace solutions

XeBOOST™: HELPING GLASSMAKERS CUT EMISSIONS IN ELECTRICALLY-BOOSTED FURNACES

Every year, more than 200 million tons of container, flat and specialty glasses are being produced to serve the needs of the beverage, food, construction and pharmaceutical industries among many others. Historically, glass production has predominantly relied on furnace designs with minimal electrical boosting, usually accounting for less than 10 percent of the furnace's total energy input. Significant reductions in CO2 emissions can be achieved through a considerable increase in electric boosting using renewable energy sources, which also improves furnace thermal efficiency and reduces GHG emissions. The next generation of furnaces, currently in design phase or undergoing construction, is already leaning towards advanced configurations such as super boosted (30-40 percent electric), hybrid (over 50 percent electric), or fully electric melting. These next generation furnace technologies face new challenges, including higher glass temperatures and increased insulation requirements. Additionally, there is a necessity to manage higher electrical current densities. This leads to faster corrosion of the refractories and higher risk of electric boosting failures - ultimately resulting in an overall shorter furnace lifespan.

CONSEQUENCES OF HIGH ELECTRICAL BOOSTING ON GLASS FURNACES

The implementation of enhanced boosting capabilities in the furnace bottom will require thicker paving tiles and the use of more durable refractory materials with tailored electrical properties to ensure reliable operation and a cost-effective furnace lifespan. The expected glass temperature increases of more than 60°C (Figure 1), will more than double the direct corrosion rate of refractories. With higher glass temperature, the furnace bottom can also experience glass infiltration, which could lead to the uncontrollable phenomenon of upward drilling beneath the paving tiles. The risk of glass infiltration is also augmented by the increased number of joints between tiles due to the higher number of electrodes in the paving.

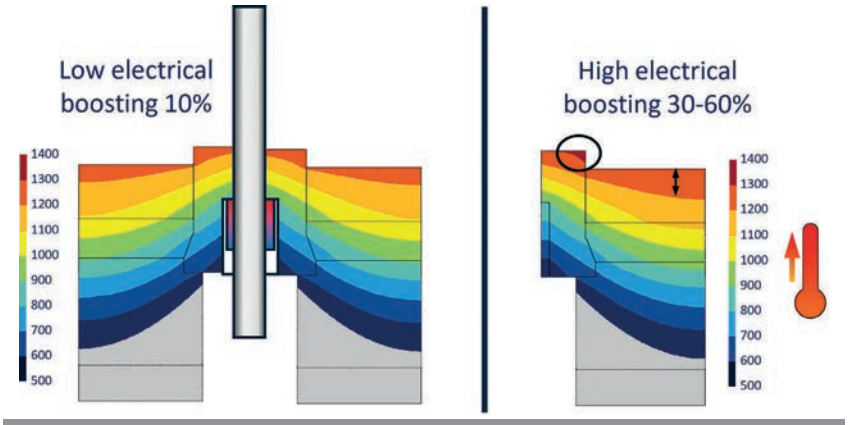


Fig 1 - Bottom paving temperature typically rises by +50°C / +60°C

Advances such as SEFPRO XeBOOST™ refractories are reshaping electric-boosted glass melting by enabling higher reliability, reduced CO_2 emissions and greater electrification. With furnaces transitioning toward hybrid and super-boosted designs, durable high-resistivity materials have become essential to protect equipment, extend lifespan and sustain decarbonisation goals.

Additionally, the increased glass temperature and velocities in highly boosted furnaces are expected to accelerate the corrosion of the sidewalls. Recent designs for hybrid furnaces feature soldier blocks with increased thickness from 250mm to 300mm and are made with AZS exhibiting higher zirconia grades.

CHALLENGES ASSOCIATED WITH ELECTRODE BLOCKS

With at least 3 times more electrodes implemented in hybrid melters compared to conventional furnaces, electrode blocks are now subjected to higher current density and increased glass velocity. As the soda contained in the glass diffuses deeply into the refractory over the furnace lifetime, the electrical resistivity of AZS refractories dramatically decreases from 150 ohm.cm down to ~20 ohm.cm (Figure 3). The refractory corrosion resistance also declines, accelerating the wear of the top of the electrode block. This phenomenon is amplified by higher temperatures and the glass convection currents.

When the electrical resistivity of the refractory material gets close to the electrical resistivity of melted glass, current can be deviated through the refractory and eventually could lead to shorts-circuits (also called floor tracking). This ultimately could lead to the melting and failure of the electrode block. Consequences could be dramatic for the glass furnace: power and pull rate limitations, potential glass

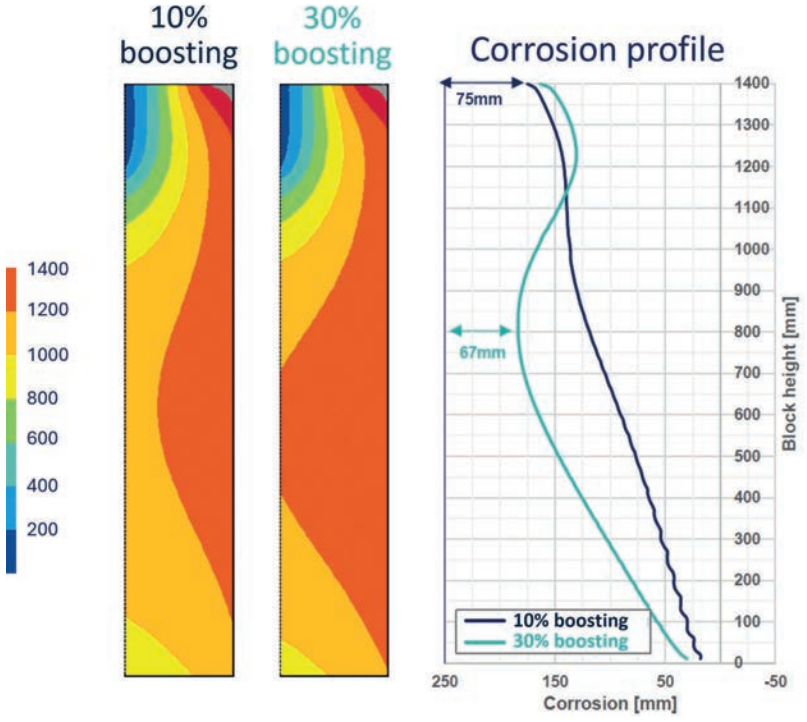


Fig 2 - Effect of high boosting on sidewall temperature

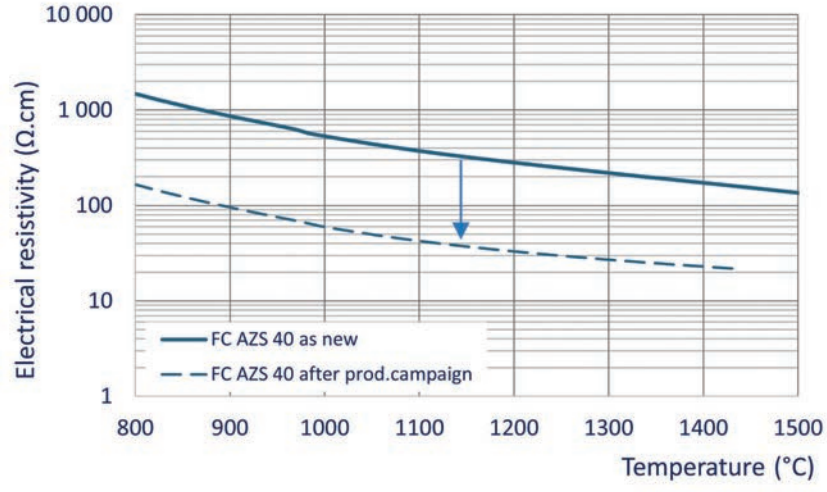


Fig 3 - Refractory electrical resistivity drop after campaign in Sodalime glass

leaks or glass defects. Any failure of an electrode block would require an increase in fossil fuel consumption to maintain the energy input, counteracting the initial goal of decarbonisation.

HIGH ELECTRICAL RESISTIVITY

Decades ago, isopressed zircon bricks and resistive fused cast High Zirconia (HZ) were the only materials known for their high electrical resistivity and were predominantly used for display glasses, reinforcement glasses, and specialty glasses. However, isopressed zircon cannot be used for sodalime glass because of its dissociation ($ZrSiO_4$ ZrO_2 + SiO_2) at approximately 1,400°C. Even though High Zirconia (HZ) could be a high-performing paving solution, the associated CAPEX difference is considerable, and their use is limited to niche applications. Engineered by SEFPRO as part of the AZS refractory family, XeBOOST™ refractory aims to achieve higher reliability and safer operation. XeBOOST™ solution tackles the electrical boosting challenges mentioned earlier by providing three times greater electrical resistivity (Figure 4) than a standard AZS containing 40 percent ZrO_2.

Even after soda infiltration, the electrical resistivity of XeBOOST™ technology remains significantly higher than of AZS40. Figure 4 also evidences that the electrical resistivity of XeBOOST™ material remains at least one order of magnitude higher than that of sodalime and borosilicate glasses, suggesting that XeBOOST™ innovation can significantly strengthen the reliability of furnace boosting systems.

IMPROVED CORROSION RESISTANCE

With 46 percent of Zirconia, XeBOOST™ refractory is setting a new AZS standard for tank side wall blocks, usually made of AZS fused cast with a 36 percent or 41 percent ranking of Zirconia.

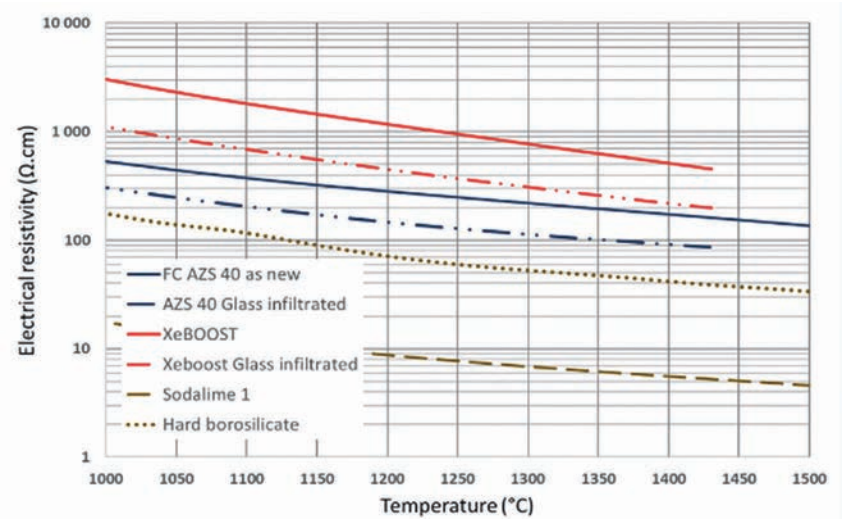


Fig 4 - Electrical resistivity drop after glass infiltration test

Laboratory-based qualification tests performed on a wide sample panel are predicting a total MGR corrosion resistance improvement of up to 15 percent compared to AZS 40 (Figure 5).

Furthermore, MGR dynamic corrosion tests are evidencing a significant improvement in corrosion at the glass line (Figure 6), by +20 percent.

SEFPRO developed a dedicated pilot glass furnace able to replicate melting conditions close to the ones in industrial glass furnaces. During the test, this furnace was powered by electrodes with electrical input varying from 15 to 20kW and voltage up to 200 V. It features bottom electrodes embedded in refractory blocks, allowing the evaluation of corrosion not only for the electrode blocks but also for the sidewalls. The furnace was tested over a two-month period, achieving an average glass temperature of 1,420°C, with peaks at 1480°C to replicate the severe conditions of high boosting. This pilot setup is able to evaluate up to three materials simultaneously for both locations (bottom paving and sidewalls). Post-mortem anal-

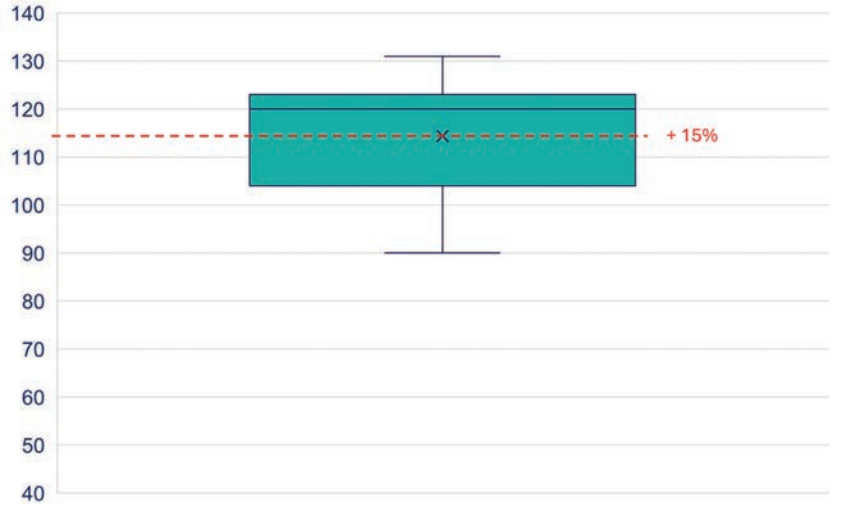


Fig 5 - Total corrosion index vs ER 1711 at 1500°C

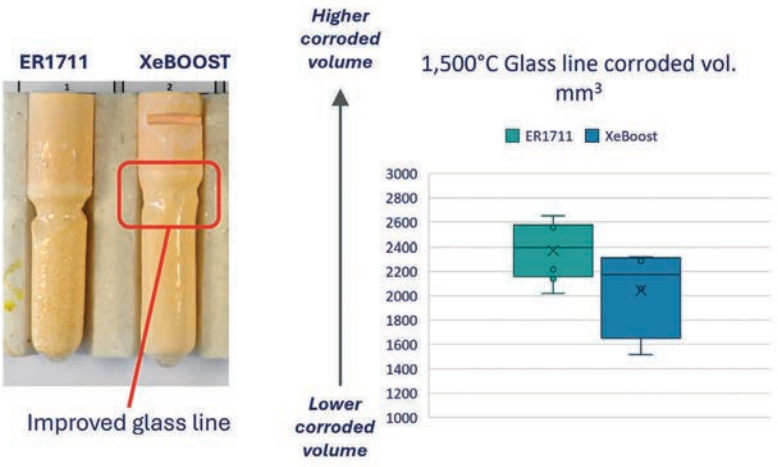


Fig 6 - MGR - Glass line corroded volume © SEFPRO, 2025. All rights reserved.

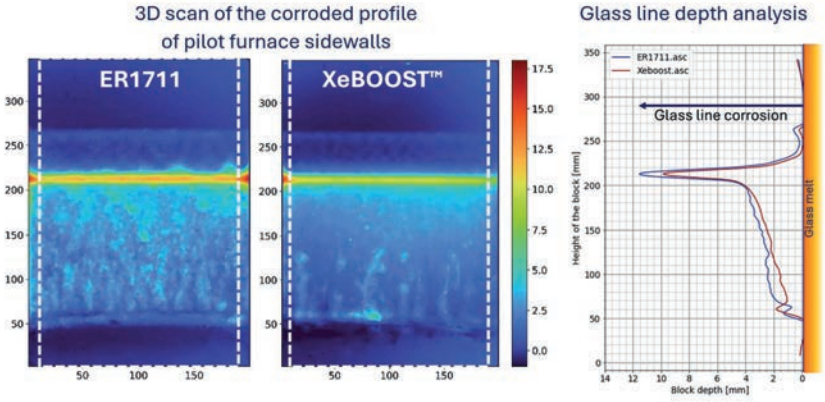


Fig 7 - Pilot glass furnace test © SEFPRO, 2025. All rights reserved.

yses and 3D scans confirmed that the glass line corrosion resistance of XeBOOST™ solution exceeds that of AZS 40 by 20 percent, resulting in enhanced performance for XeBOOST™ side wall blocks (Figure 7).

XeBOOST™, A PATENTED AZS MATERIAL FOR FURNACES WITH HIGH ELECTRICAL BOOSTING

XeBOOST™, a groundbreaking AZS refractory, is establishing a new standard, particularly under the demanding conditions expected in super boosted or hybrid soda-lime glass melting furnaces. Its exceptional properties, including high electrical resistivity and the highest corrosion resistance among commercial AZS refractories, make it an optimal choice for addressing challenges associated with increased glass temperatures and high electrical densities. Extensive laboratory qualification tests indicate a potential improvement in total corrosion resistance of up to 15 percent compared to AZS 40, along with a notable 20 percent improvement in glass line performance. As the industry shifts towards sustainability and reduced emissions, glass industry engineering teams should prioritise the adoption of advanced materials such as XeBOOST™ material to improve furnace reliability, facilitate higher electrification levels, and give sidewalls higher corrosion resistance. ■

SEFPRO
BRIGHTER SOLUTIONS TOGETHER
SEFPRO
2539 Route de Sorgues
BP30040
84130 Le Pontet - FRANCE
Tel.: +33-04-9032-7252
communication.SEFPRO@saint-gobain.com
www.SEFPRO.com

AUTHORS

Patrice FOURNIER
SEFPRO - Market Manager - Specialty Glass

Isabell GROSS
Saint-Gobain Research Provence - R&D Project Leader

Damien BOLORE
Saint-Gobain Research Provence - R&D Group Leader

SmartLine 2 powers HEYE upgrade at Wiegand-Glas plant

Following a successful trial, Wiegand-Glas has installed six SmartLine 2 inspection machines equipped with Ranger 2 optical check devices for its Ernstthal plant in Thuringia, Germany. Wiegand-Glas has been established for more than 450 years and produces about 8 million bottles daily at four glass plants. Ernstthal manufactures approximately 1.3 million bottles a day, focusing on short runs and complex shapes for the spirits sector. As part of last year's furnace renovation, the company sought new hot and cold end equipment to optimise performance. The plant's high output of non-round containers was the primary motivation for testing Heye SmartLine 2 with Ranger 2 technology. With a colourant forehearth and extra flint containers. Such high-quality glass containers have very tight specifications and, therefore, require the most accurate inspection equipment to remove all defects without over-rejecting and making the plant less productive than it should be.

Heye International has collaborated with the Ernstthal team for more than a decade, first installing equipment in 2012. Over time, Heye systems have demonstrated stability and robustness. A dedicated test line allowed Wiegand-Glas to assess Ranger 2. Heye engineers were confident the system would outperform competitors on non-round containers. Wiegand evaluated the equipment with multiple toolings and diverse container shapes and sizes.

"Our glassmakers are highly skilled and know what good glassmaking looks like," says Dr. Thomas Struppert, CEO of Wiegand-Glas. "We soon realized the advantages of Heye's SmartLine 2. It handles complex containers in a fast and stable manner and provides excellent data to help us rectify problems before they multiply."

TECHNICAL INNOVATION

At the hot end, Heye installed a new Multi-weight assortment feeder, part of its Industry 4.0 Smart Plant initiative.

The system uses servo drive control, in combination with a servo plunger and dual motor shears, to deliver gobs of different weights to the same IS machine, even in NNPB format. This enables Wiegand to produce varied containers simultaneously on one forming line. Heye overhauled and upgraded the line's existing servo plunger and dual motor shears. Working in tandem, the plunger and shears reduce energy consumption and eliminate gob waste. The solution is ideal for samplings and short runs, minimising downtime. The manufacturer needs fewer moulds for each low volume item and fewer machine-wide job changes, so longer jobs keep running alongside several shorter ones.

At the cold end, Heye installed six SmartLine 2 machines, all fitted with Ranger 2 optical detection systems. The modular system captures five images simultaneously through one camera, assessing horizontal, vertical, bottom and shoulder features. The containers tested were largely heavy, premium designs.

Following a rigorous evaluation, Wiegand-Glas upgraded its Ernstthal plant with SmartLine 2 and Ranger 2 technology from HEYE, enhancing precision for complex containers and supporting high-quality, short-run production - all while improving process stability, defect detection accuracy and sustainable operational performance across all lines after furnace reconstruction.

Uwe Schitter, Head of Cold End at Heye International, notes, "Heye SmartLine 2 is just as comfortable in this complex environment as it is in a high-speed NNPB scenario." Wiegand-Glas views lightweighting as essential to its sustainability strategy. The SmartLine 2 interface provides full control of job parameters, offering visibility and detailed feedback on check results. The SmartLine 2 can be tailored precisely to customer needs via an intuitive graphic interface. Its strength in non-round containers is especially valuable for the specialist, short-run mix at Ernstthal.

SPEED AND REPEATABILITY

SmartLine 2 with Ranger 2 addresses the key challenges of modern container inspection. It operates at speed with accuracy across varied bottle types and ensures repeatability, identifying the same defect consistently. Ranger 2 pinpoints defects and locates affected machine sections. Its fixed camera position provides higher accuracy than competing systems and performs reliably across diverse samples and inspection demands.

Uwe Schitter concludes, "A specialist glass plant like Wiegand Ernstthal is made for Ranger 2. We tested all its capabilities and it passed with flying colours. Now it is running on all six lines after furnace reconstruction last summer."

Wiegand-Glas speaks of itself as a company where experience meets the latest technology and an innovative spirit. Its partnership with Heye International exemplifies this philosophy. ■

ABOUT WIEGAND-GLAS

The Wiegand-Glas group, with more than 2,100 employees, draws on over 450 years of history and expertise in container glass development and production. With four state-of-the-art plants in Bavaria and Thuringia, the company manufactures more than 8 million bottles and jars daily for global food and beverage customers. Its glass, PET, logistics and energy divisions provide comprehensive packaging solutions from a single source.

ABOUT HEYE INTERNATIONAL

Based in Obernkirchen, Germany, Heye International GmbH is a leading supplier of production technology, high-performance equipment and know-how for the container glass industry. For more than six decades, its mechanical engineering has set industry benchmarks. Through its HiPERFORM, HiSHIELD and HiTRUST sub-brands, Heye delivers Smart Plant solutions that support efficient, sustainable and safe glass production worldwide.

heye international

HEYE INTERNATIONAL GmbH

Lohplatz 1
31683 Obernkirchen - GERMANY
Tel.: +49-5724-26-452
marketing@heye-international.com
www.heye-international.com

Wiegand-Glas

WIEGAND-GLASHÜTTENWERKE GmbH

Otto-Wiegand-Straße 9
96361 Steinbach am Wald - GERMANY
Tel.: +49-9263-80-0
mail@wiegand-glas.de
www.wiegand-glas.de

Local industry partnerships strengthen ANTONINI legacy

ORIGINS

Antonini's history is deeply intertwined with the Empoli area - a region that glowed for decades with the light of furnaces just as it echoed with the rhythm of glassmakers at work. Indeed throughout much of the twentieth century, Empoli was one of Italy's most vibrant glassmaking districts - an industrial ecosystem where entire families built their livelihoods around the craft of glass. In this dynamic environment, Antonini took shape - drawing strength from a territory rich in artisanal knowledge, manual skill and a strong sense of community.

INNOVATION

Over the years, the company has preserved this heritage, making it a defining part of its identity while constantly evolving through innovation and new market demands. Today, Antonini stands as a bridge between tradition and modernity: honouring the memory of the glass furnaces that shaped generations, while pursuing a forward-looking vision centered on quality, sustainability and technological progress.

COMMUNITY

This deep connection with the territory was once again reaffirmed through a recent initiative promoted by Federmeccanica, during which

Rooted in Empoli's historic glass district, ANTONINI embodies a legacy shaped by craftsmanship, community and innovation. The company blends tradition with modern industry - engaging future generations through educational initiatives whilst reinforcing its cultural role in the region and sustaining progress through creativity, technology and shared responsibility.

Antonini opened its doors to students from local schools. The visit offered young people a firsthand look at the world of manufacturing, helping them understand the skills, opportunities and innovation that define contemporary industry. Representatives from local institutions participated as well, underscoring the shared commitment to fostering dialogue between companies and the community. Adding a special and unexpected presence to the event was Francesco Caputo, former Serie A footballer and now an entrepreneur in craft beer and gin production. His story of reinvention inspired students to embrace curiosity, resilience, and the courage to explore new paths. Through initiatives like this, Antonini continues to honour its past while investing in the future - strengthening ties with the territory, promoting knowledge, and contributing to the cultural and economic life of the Empoli area. This commitment also reflects Antonini's broader mission to remain an active cultural reference point for the region. By collaborating with schools, associations, and local organizations, the company fosters a shared vision of progress in which industrial expertise, creativity and social responsibility move forward together. It is a continuous investment in people and ideas. ■

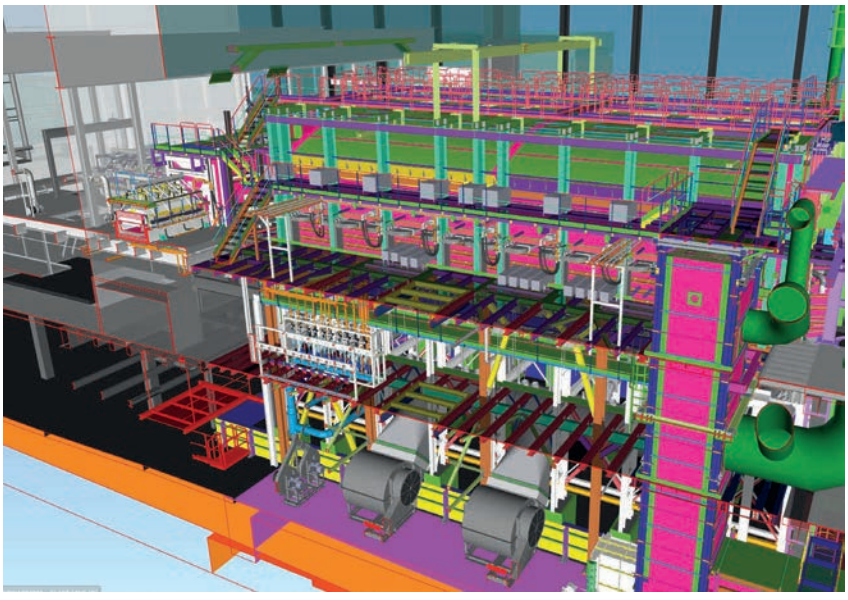
ANTONINI
FLORENCE ITALY

ANTONINI SRL

Via Medaglie d'Oro della Resistenza, 2
50053 EMPOLI Loc. Ponte a Elsa (FI) - ITALY
Tel.: +39-0571-93221
com@antoninisrl.com
www.antoninisrl.com

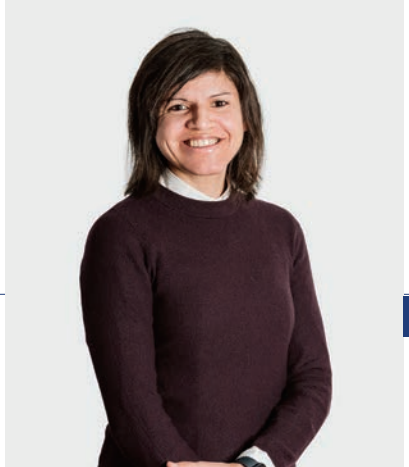
The BIM-centred design culture at STARA GLASS

Tailored digitalisation in the glass production industry has taken shape at Stara Glass through the long-term evolution of its Technical Department. For more than thirty years, the department has acted as a driver of growth, grounded in engineering expertise, operational flexibility and design capability. Founded in the 1990s with a focus on refractory design for melting furnaces, it progressively expanded into steel structures, heat recovery systems and special equipment, enabling full EPC project management shared transparently with clients via collaborative digital platforms. A significant step forward came with the adoption of laser scanning technology, enabling highly accurate surveys that are essential during revamping projects in active production environments, where minimising interference between existing structures and new installations is critical.



FROM ENGINEERING TO INTEGRATED BIM PROCESSES

Since 2019, Stara Glass has pursued a structured digital transformation based on BIM, adopted not as a support tool but as a core working methodology. BIM now underpins every stage of glass plant design and construction, reshaping coordination, decision-making and risk management across projects. The BIM model developed by Stara Glass extends far beyond three-dimensional visualisation. Structural elements, piping systems and equipment are enriched with technical, economic and management data. Tools such as Tekla Structures, combined with shared environments like Trimble Connect, support high-precision modeling and real-time collaboration among designers, suppliers and clients, while automated notifications ensure all stakeholders work on the latest data set.

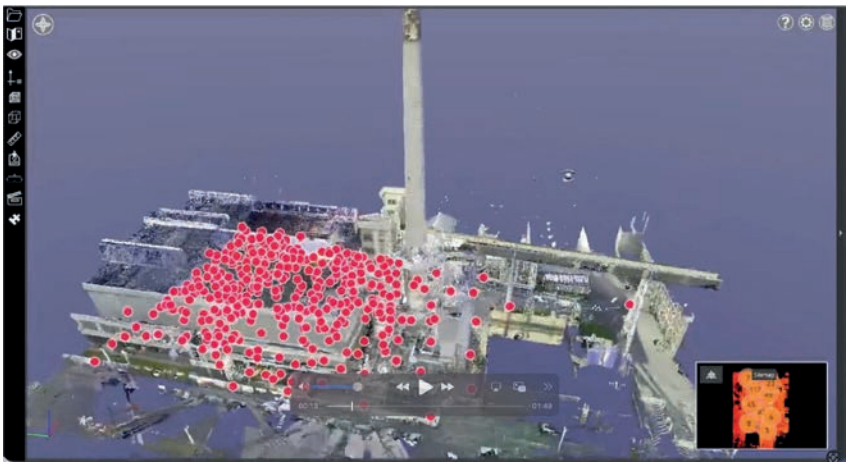


Laura Trichilo - Technical Designer

SMART FABRICATION AND DIGITAL TWIN APPLICATIONS

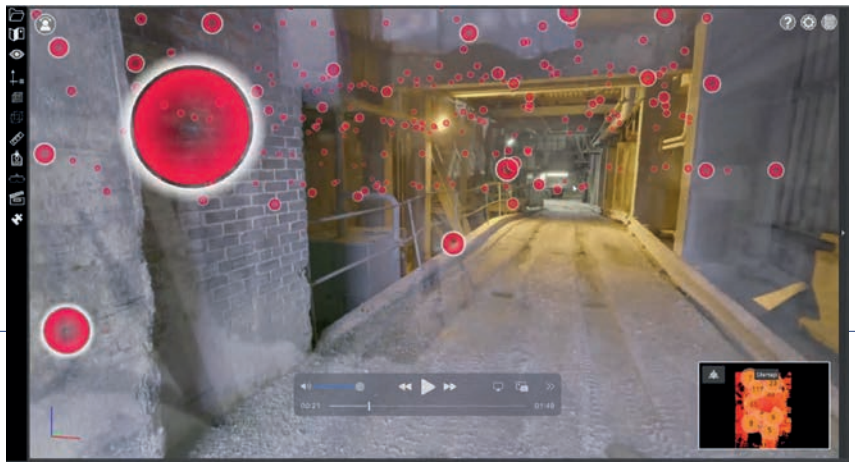
Key innovations include the generation of NC files for automated metal cutting and the integration of augmented reality systems. QR codes applied directly to components provide immediate access to drawings, operating instructions and system diagrams via tablets or headsets - improving traceability and on-site efficiency. The development of a digital twin -a faithful digital replica of the physical plant- delivers measurable advantages in monitoring and managing glass production systems. Through IoT sensors, the model supports continuous monitoring, simulations, predictive maintenance and technical training, significantly enhancing safety, reliability and operational continuity.

Built on three decades of engineering practice, STARA GLASS has embedded BIM into glass plant design to improve coordination, accuracy and lifecycle control. The approach combines laser scanning, data-rich modeling and collaborative platforms - turning digital tools into operational assets for complex furnace and plant projects.



ORGANISATION, STANDARDS AND FUTURE BIM DIMENSIONS

Usability remains a central focus of the BIM system, ensuring accessibility even for less experienced operators. Intuitive, contextual interfaces allow rapid understanding of each project phase, while sensors installed on critical components such as valves and bolts detect real-time stress conditions and anomalies. The Technical Department consists of seven specialised professionals capable of independently managing complete projects and supporting Project Managers during execution. This internal structure is reinforced by a consolidated network of external collaborators, allowing Stara Glass to handle complex EPC refurbishments that require close coordination among multiple technical disciplines and suppliers. In projects where existing structures cannot be modified, custom design capability becomes decisive. Laser scanning, combined with early collaboration with site managers, ensures accuracy during preliminary phases. Under the guidance of BIM Specialist Laura Trichilo, the practical implementation of BIM -covering 3D modeling, clash detection and shared data environments- has become a strategic asset. "The strength of BIM lies in its ability to foresee problems before they arise. It's not just a technological tool, but a system for operational and design safety," Trichilo explains. In compliance with EN ISO 19650 and UNI 11337 standards, Stara Glass has launched a certification programme targeting 50 percent of the technical team as BIM Coordinators by the first half of 2026, alongside BIM Specialist qualifications within Stara Tech. Future development will integrate advanced BIM dimensions: 4D for scheduling, 5D for cost control, 6D for sustainability analysis and 7D for plant management and maintenance, transforming the digital model into an active, value-generating system for the glass manufacturing industry. ■



STARA GLASS

Piazza Rossetti 3A/1
16129 Genoa (GE) - ITALY
Tel.: +39 010 576391
staraglass@hydragroup.it
www.staraglass.it

Winning VETROMECCANICA solutions for WIEGAND-GLASS cold-end

Across a major furnace refurbishment, VETROMECCANICA has delivered and commissioned a new-generation cold-end at WIEGAND-GLAS' Ernstthal plant – combining high configurability, advanced palletisation and ergonomic design. The project reinforces Vetromeccanica's role as a technology partner for complex glass container operations.

A strategic project for Vetromeccanica has been realised with the supply and installation of a new-generation cold-end system at the Ernstthal plant of the Wiegand-Glas Group – one of Europe's largest glass container manufacturers. Integrated within a broader furnace refurbishment, the installation represents a significant step in consolidating Vetromeccanica's position as a reliable technological partner for highly flexible, customised solutions.

TECHNICAL ARCHITECTURE OF THE COLD-END SYSTEM

The core of the project consists of a complete end-of-line system engineered to maximise versatility, human-machine interaction and overall production efficiency. The supplied configuration includes six latest-generation palletisers and two assisted manual packaging stations, all designed to operate seamlessly within a high-mix manufacturing environment.

The primary objective was to develop machines capable of handling an exceptionally wide range of glass formats. The systems were specifically engineered to process both standard and non-standard containers, including conical and irregularly shaped geometries, supported by an active catalogue of several hundred different moulds.

OPERATIONAL FLEXIBILITY AND STRATEGIC IMPACT

To manage this extreme product variability, the cold-end was equipped with advanced

engineering solutions focused on operational flexibility. Dual gripping and pushing modes allow the machines to operate with either system, both at the stacker level and during palletisation. Table-level palletisation is achieved through a dedicated pit design that maintains a constant working height aligned with the table, improving ergonomics and ensuring process stability. In addition, dedicated equipment for the handling and insertion of partitions has been integrated to protect delicate and complex formats during packaging.

Beyond its technical success, the Wiegand-Glas project holds strong strategic value for Vetromeccanica. Managing hundreds of moulds alongside dual gripping and pushing technologies confirms the high technical capability and adaptability of its cold-end solutions. Collaboration with an industrial group of Wiegand-Glas' scale further strengthens Vetromeccanica's presence in the European market and creates opportunities for future high-complexity projects. The Ernstthal installation now stands as a benchmark reference, reinforcing Vetromeccanica's positioning as a key supplier of complete cold-end systems capable of delivering efficiency under the most demanding operating conditions. ■

Industry capacity grows thanks to HORN projects

Global glassmakers expanded capacity and sustainability efforts as HORN delivered advanced furnaces, critical reconstructions and precision repairs across multiple continents. HORN strengthened regional manufacturing, accelerated low-carbon melting technologies and enabled customers to modernise production, illustrating a cohesive industry-wide shift toward efficiency, electrification and resilient furnace lifecycle management.

RECONSTRUCTION

HORN has successfully reconstructed a regenerative end fired furnace at PGP Glass' Kosamba plant in India. The 60-tonnes-per-day unit, designed for cosmetics and perfumery bottles, was restored on schedule and produced first glass on 16 July 2025. Expert supervision by the German company and by HORN India ensured a smooth restart, consolidating an existing reputation for extending furnace life cycles while improving operational reliability - an expertise that's echoed across HORN's global project portfolio.

EXPANSION

Complementing these lifecycle improvements, the company launched a new 170-tonnes-per-day end fired furnace for Sichuan Skyhorse Glass in Shehong, China. Featuring a 101m² melting surface and six lines for super flint production, it integrates the company's newest low-CO_2 technology. First glass was achieved on 21 August under the joint supervision of HORN and its Beijing subsidiary. This expansion demonstrates the same commitment to sustainable, high-efficiency melting seen in HORN's work with PGP and other partners.

SCALE-UP

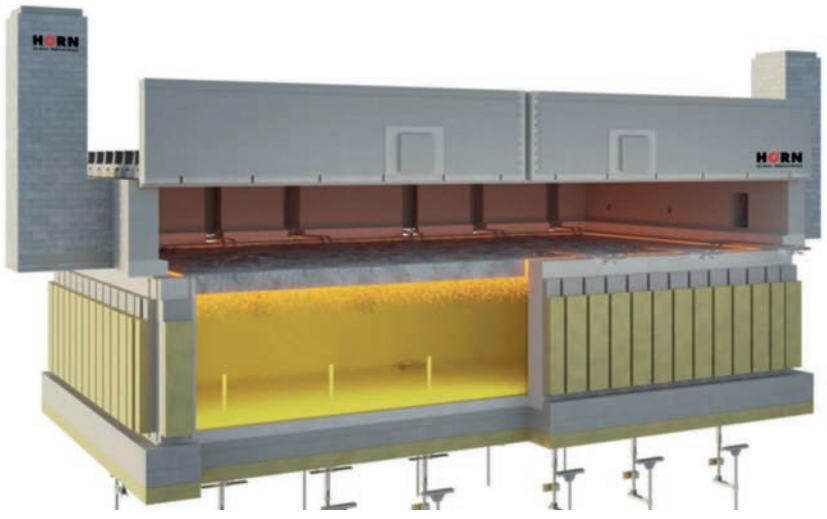
Moving to Brazil, the company further showcased scalable innovation by commissioning Ambev's 400-tonnes-per-day regenerative furnace. Equipped for flint, amber and green glass while using electricity from zero up to 20 percent with HORN e-fusion power boosting, the project exemplifies the strength of HORN in boosting systems. As turnkey supplier, the company provided full technological integration -from refractories and steelworks to commissioning and training- paralleling the comprehensive support provided in India and China.

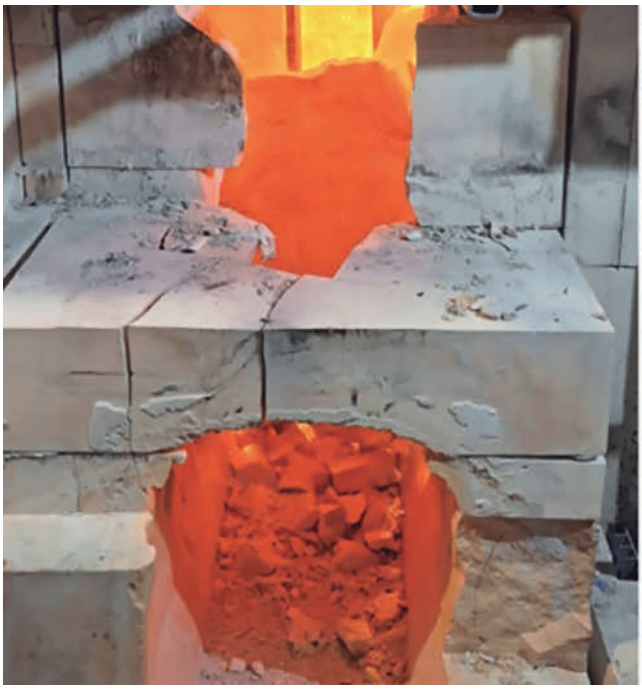
PIONEERING

Also, Reinforcing regional capability building, HORN completed a greenfield project for SNJ India Glasses in Tamil Nadu: the state's first-ever container glass furnace. The 230-tonnes-per-day end-fired design, with three production lines for flint, green and amber, marks a significant step in decentralising India's glass production footprint. This pioneering project aligns with the broader trend seen in Ambev's and Skyhorse's expansions: increasing local autonomy supported by the company's technology.

ELECTRIFICATION

Advancing the future of low-emission melting, HORN is also delivering an all-electric furnace to Shandong Linuo Pharmaceutical Packaging. The 70-tonnes-per-day furnace,





enhanced with HORN e-Fusion power boosting systems, focuses on neutral flint production for pharmaceutical packaging. Its fully-electric design deepens the sustainability trajectory already reflected in Skyhorse's low-CO_2 furnace and Ambev's flexible boosted furnace, positioning the company at the forefront of decarbonised glass melting.

TRANSITION

The German glass furnace manufacturer is also helping the glass industry transition from fossil fuel to electric furnace heating. HORN built an oxygen hybrid furnace with up to 50% electric heating for the German glass manufacturer Gerresheimer. Equipped with state-of-the-art heating systems and HORN E-Fusion Power Boosting, the new melting furnace achieves up to 40% lower CO_2 emissions compared to conventional technology.

PRECISIO REPAIR

Moving on to Ritzenhoff in Germany, HORN Bau & Service GmbH executed a complex hot repair within a whopping 21 days - rebuilding the doghouse palisades, including the corners, and plated various other critical areas. after a controlled drain. Around-the-clock coordination, endoscopic inspections and meticulous sequencing ensured rapid return to production. This project exemplifies the company's holistic approach to furnace lifecycle management -from new-build electrification to end-of-life reconstruction- creating continuity between global innovations and local operational resilience.

IN SUM

Across all these, namely reconstructions, expansions, electrification projects and precision repairs, a single narrative becomes clear: glass producers worldwide are modernising rapidly and HORN is a unifying force enabling that transition. By delivering sustainability-driven designs, extending furnace longevity and strengthening regional production ecosystems, the company is helping shape a more efficient, lower-carbon and globally-connected glass industry. ■

GLASS Week

SAVE-*THE*-DATE

2026

September 14–17

Glass City Center | Toledo, Ohio

where the glass manufacturing industry meets

87th GLASS PROBLEMS CONFERENCE

Organized by

GMIC GLASS MANUFACTURING INDUSTRY COUNCIL

Alfred University
OUTSIDE of ORDINARY

gmic.org/glass-problems-conference

Compact printing platforms, courtesy of OMSO

Driven by continuous engineering development, OMSO has refined glass decoration technologies that balance precision, efficiency and sustainability. The latest SB021.25 platform reflects this approach, combining servo-driven mechanics, integrated quality control and UV LED curing to meet evolving production, energy and regulatory demands in glass packaging.

For more than seventy years, OMSO has developed technologies for direct printing on objects, combining precision mechanics, electronics, and accumulated application know-how. Glass packaging decoration remains one of the sectors in which the company has invested most heavily, supporting manufacturers with solutions designed to ensure consistent quality, robust process control and long-term operational reliability. Last year, OMSO was awarded the EcoVadis Bronze Medal, which evaluates corporate performance across environmental, social, and ethical criteria. This recognition confirms the company's direction, focused on

waste reduction, consumption optimisation and improved efficiency across its decoration lines.

PLATFORM EVOLUTION AND MACHINE ARCHITECTURE

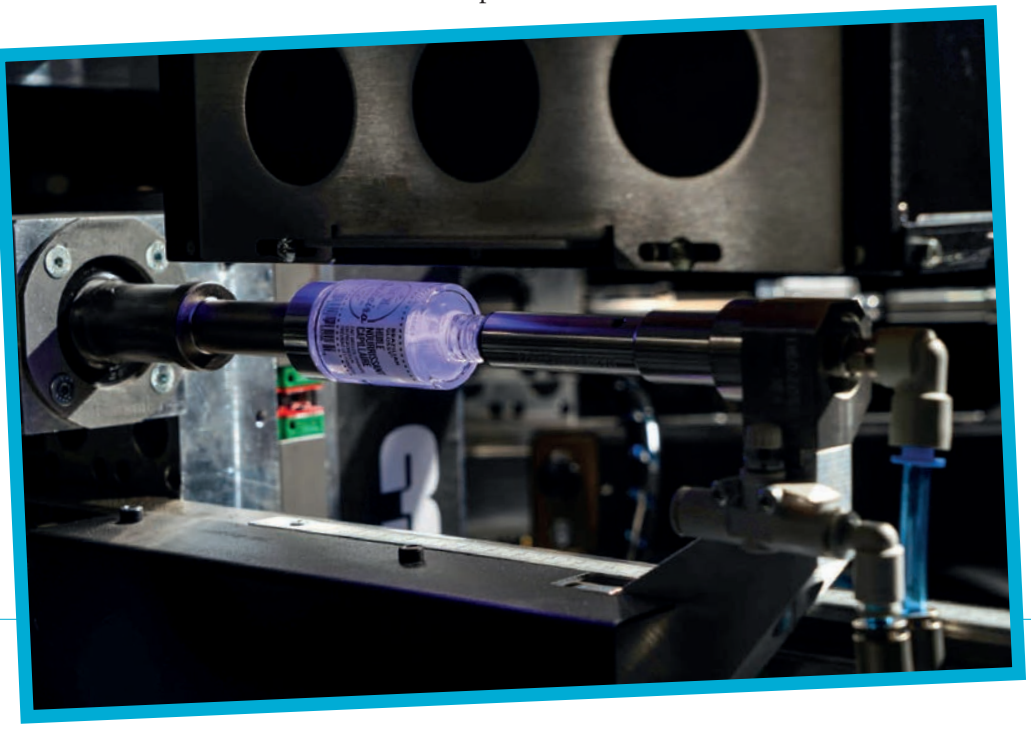
This context led to the development of SB021.25, the latest evolution of the OMSO platform dedicated to screen printing on glass. The machine is equipped with fully servo-assisted movements, increasing positioning accuracy, improving repeatability, and supporting continuous production even on complex container geometries. A defining feature of the new version is single-station loading and unloading. This configuration frees an operating station and allows the machine to be set up for up to three printing colours, or two printing colours plus a hot-stamping station, with integrated quality control available for both layouts. These options were not available on the previous version, delivering greater flexibility, faster changeovers and improved adaptability to variable sizes and shapes.

QUALITY CONTROL AND ENERGY EFFICIENCY

Integrated quality control enables immediate intervention in the event of non-conformities, reducing waste and supporting zero-defect production. The result is a measurable improvement in line efficiency alongside enhanced process sustainability. The adoption of UV LED lamps follows the same efficiency-driven logic. Compared with mercury vapour lamps, UV LED technology delivers significantly lower energy consumption, longer operating life and reduced maintenance requirements. A dedicated simulator, available on the SB021.25 page of the OMSO website, allows precise estimation of energy consumption across different configurations. This technological choice also anticipated the definitive ban on certain mercury vapour lamps that came into force on December 31 - in line with the Minamata Convention.

COMPACT DESIGN AND MARKET OUTLOOK

SB021.25 integrates a complete printing platform within a compact footprint, combining three-colour capability, quality control, servo-assisted movements and UV LED technology engineered to optimise energy use and operating costs. It is a solution designed for manufacturers seeking measurable performance gains and tighter control over the decoration process. OMSO will open 2026 by presenting SB021.25 at PCD Paris, scheduled for February 4-5, where the company will showcase its latest developments for the cosmetic packaging sector. ■



OMSO SpA

Via Adige, 11/E
42124 Reggio Emilia - ITALY
Tel.: +39 0522 382696
info@omso.it
www.omso.it

ILS EVO unveils LUBEN GLASS' next-level lubrication precision

A cutting edge lubrication solution that enhances precision, reliability and operational control for glass manufacturers, the ILS EVO system from LUBEN reduces oil waste, prevents downtime, enables real-time monitoring and supports multiple lubricant types – all whilst redefining efficiency standards and strengthening plant performance across diverse production environments.

OPTIMISATION

Driven by the ambition to offer glassmakers a solution capable of further optimising and rationalising oil distribution for mechanism lubrication, Luben Glass' engineering department has refined the ILS lubrication unit, giving rise to the new Evo version - an even more functional and high-performing product than current lubrication systems available on the market. Indeed, existing lubrication units often fail to ensure a rational and efficient management of oil delivery to the injectors. As a result, the mechanisms of IS machines may not receive the correct amount of oil, leading either to excessive lubrication, with unnecessary waste of material and money, or to insufficient lubrication, which can cause component seizure and costly downtime. Moreover, only a few control units can effectively sig-

nal operating alarms, and none can offer the same level of precision and real-time operational monitoring as the ILS EVO, which stands out as a new benchmark for reliability, performance and process control. ILS EVO is the new benchmark in intelligent lubrication for the glass industry.

ARCHITECTURE

Designed to work with multiple types of oil simultaneously, the system equips each oil circuit with two pumps - one for continuous operation and one backup to guarantee maximum reliability and zero downtime. Thanks to a patented automatic switching system, the pumps alternate autonomously with no need for electrical or hydraulic intervention. This unique technology eliminates the need to use the operating pump to depressurise the line, making ILS EVO truly one of a kind in its category. The ILS EVO system incorporates a comprehensive set of technical features designed to optimise lubrication processes and enhance system reliability. The integrated touchscreen HMI provides an intuitive platform for configuring and managing all operational parameters, enabling precise control and rapid adjustments during plant operation. The system architecture contributes to a marked reduction in operating costs and oil consumption, improving overall process efficiency.

VERSATILITY

Its capability to handle two or three different lubricant types simultaneously ensures high operational versatility, allowing adaptation to diverse production requirements. ILS EVO features advanced diagnostic and monitoring tools, including remote alarm management, which ensure real-time supervision of system performance and immediate identification of anomalies. The unit offers detailed consumption tracking for each lubrication point, with full historical data logs that support predictive maintenance and process optimisation.

INTEGRATION

Through Real Operative Line Monitoring, the system provides real-time status visualisation for each lubrication line, supporting precise functional control. Full compatibility with fire-prevention systems enables seamless integration into the plant's safety infrastructure. Synchronisation with the IS machine ensures accurate coordination between lubrication cycles and production phases. The latest installation, due to go live this January as part of a major furnace refurbishment project where Luben Glass plays a central role. This milestone further reinforces ILS EVO as the trusted choice for high-performance lubrication in the glass industry. ■

LUBEN GLASS

LUBEN GLASS SRL

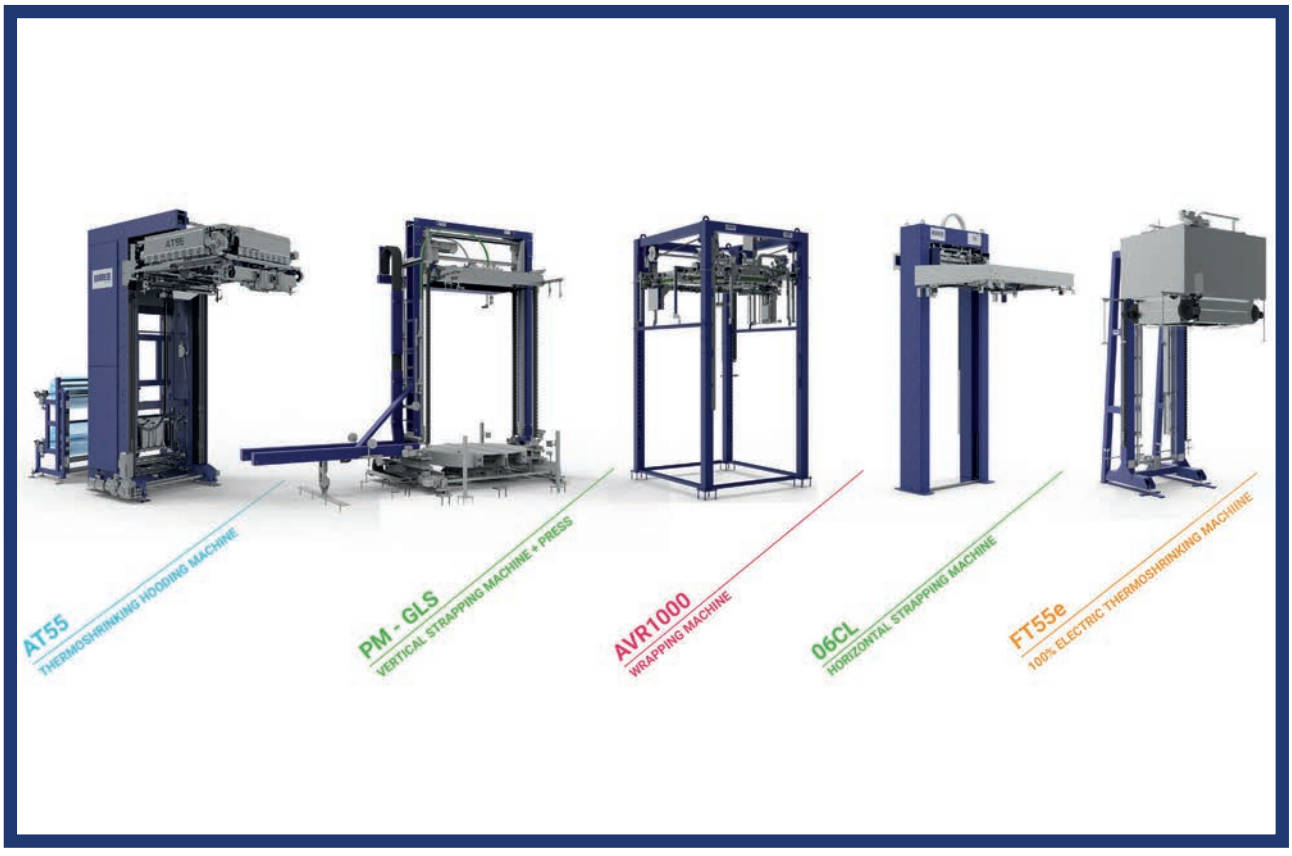
Via Antonio Meucci, 23
26010 Offanengo (CR) - ITALY
Tel.: +39-0373-244396
Fax: +39-0373-244401
info@lubenglass.it
www.lubenglass.eu

The end-of-line excellence of OMS Group technologies

Renowned for its innovation, OMS Group delivers advanced end-of-line packaging solutions and complete lines worldwide. Built upon Italian craftsmanship, the group combines vertical integration, sustainability and customer partnership - all to support diverse industries, including glass, with efficient, high-performance machines and environmentally-responsible technologies.

As a global leader, OMS Group specializes in the design and production of end-of-line packaging solutions and complete packaging lines. Established in Italy, the group currently operates 12 branches worldwide and provides cutting-edge and custom technologies for every stage of the end-of-line process.

With its vertical integration and in-house production of all spare parts, OMS Group can adapt to each specific sector industry whilst main-



taining high quality standards and reducing CO_2 emissions during all logistics operations. The group also provides technologies compatible with ever-evolving consumable materials, anticipating and promoting new solutions that meet the highest green standards.

TECHNOLOGY

Below is a selection of OMS Group' leading machines dedicated to the glass industry. The AT55 thermoshrinking hooding machine is an automatic system that, on a single workstation, applies and shrinks the hood on pallets of bottles. Depending upon the chosen model, it can use up to three different coils of shrinkable tubular film with side gussets. The film is shrunk onto the product by a flameless gas ring system.

The Press Master GLS vertical strapping machine with press for palletised products has a top press capacity of up to 2,400 kg. Thanks to the perfect combination of strapping heads, swords bayonets and a turntable positioned under the machine, it can apply multiple strapping patterns in both directions, from 2x0, 2x2 up to 6x4.

The 06CL horizontal strapping machine features an arch driven on a linear rack that guarantees perfect strap positioning upon pallets, simplified head maintenance with quick-action connectors and multiple strapping programmes easily managed from the operator panel.

The AVR1000 wrapping machine incorporates a carbon fiber ring, slip ring contacts and a patented pre-stretch carriage with up to a 300 percent ratio. It allows starting and stopping the wrapping cycle at any pallet height, delivering high speed, flexibility, increased reliability, reduced maintenance and stable loads with minimal film consumption.

Recently introduced to the market, the FT55e electric thermoshrinking machine exemplifies OMS Group's commitment to a better environment, achieving the same performance as a gas shrinking ring using only electricity. Heaters activate on demand, only when a pallet is present and OMS R&D technology drastically reduces power consumption. ■

OMS GROUP

Via Borgomanero 44
28040 Paruzzaro (Novara)
ITALY
Tel.: +39-0322-541411
info@oms-group.com
www.oms-group.com

New to the RATH portfolio: High-quality checker bricks, made in Europe

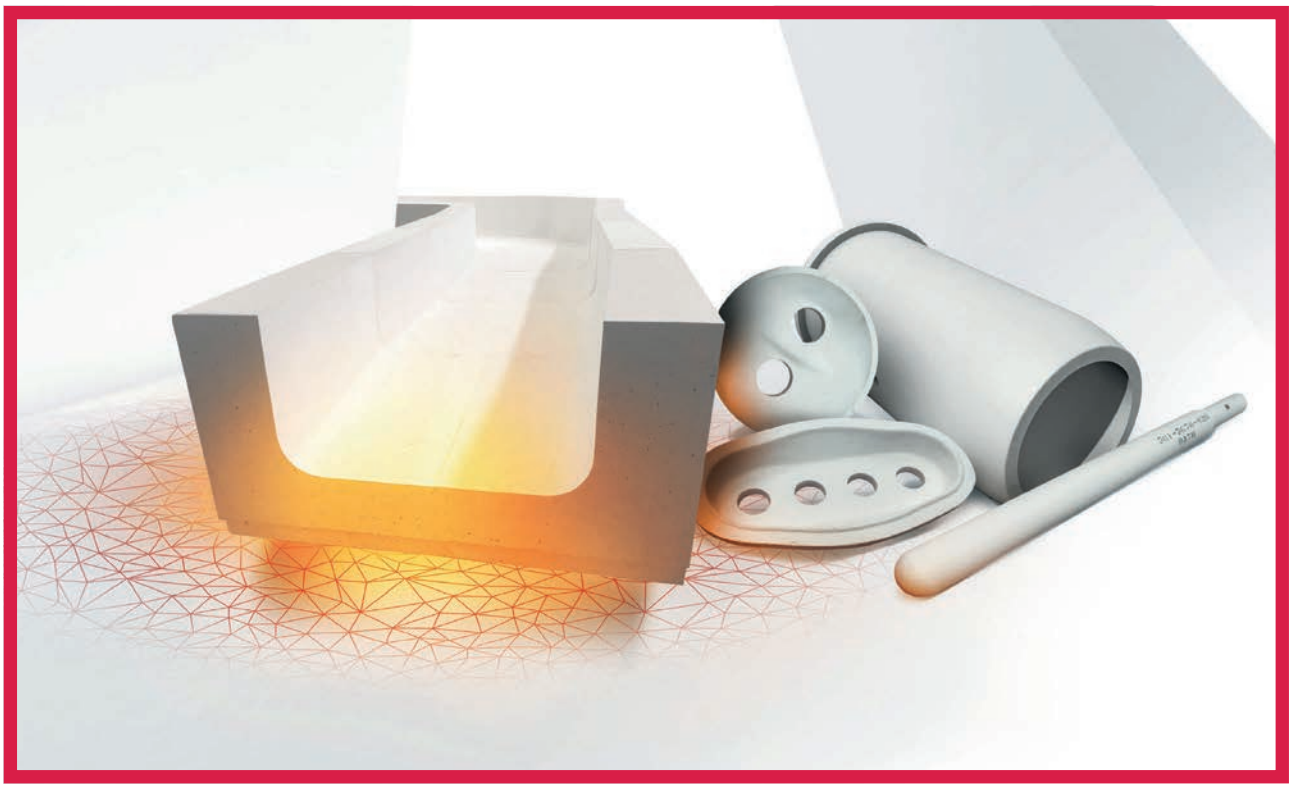
Delivering advanced refractory innovations, RATH expands its offerings to support global glass manufacturers with high-performance checker bricks and comprehensive regenerator concepts - all to enable stronger sustainability, improved process reliability and long-term operational efficiency across diverse glass production environments worldwide today.

MADE IN EUROPE: HIGH-QUALITY CHECKER BRICKS

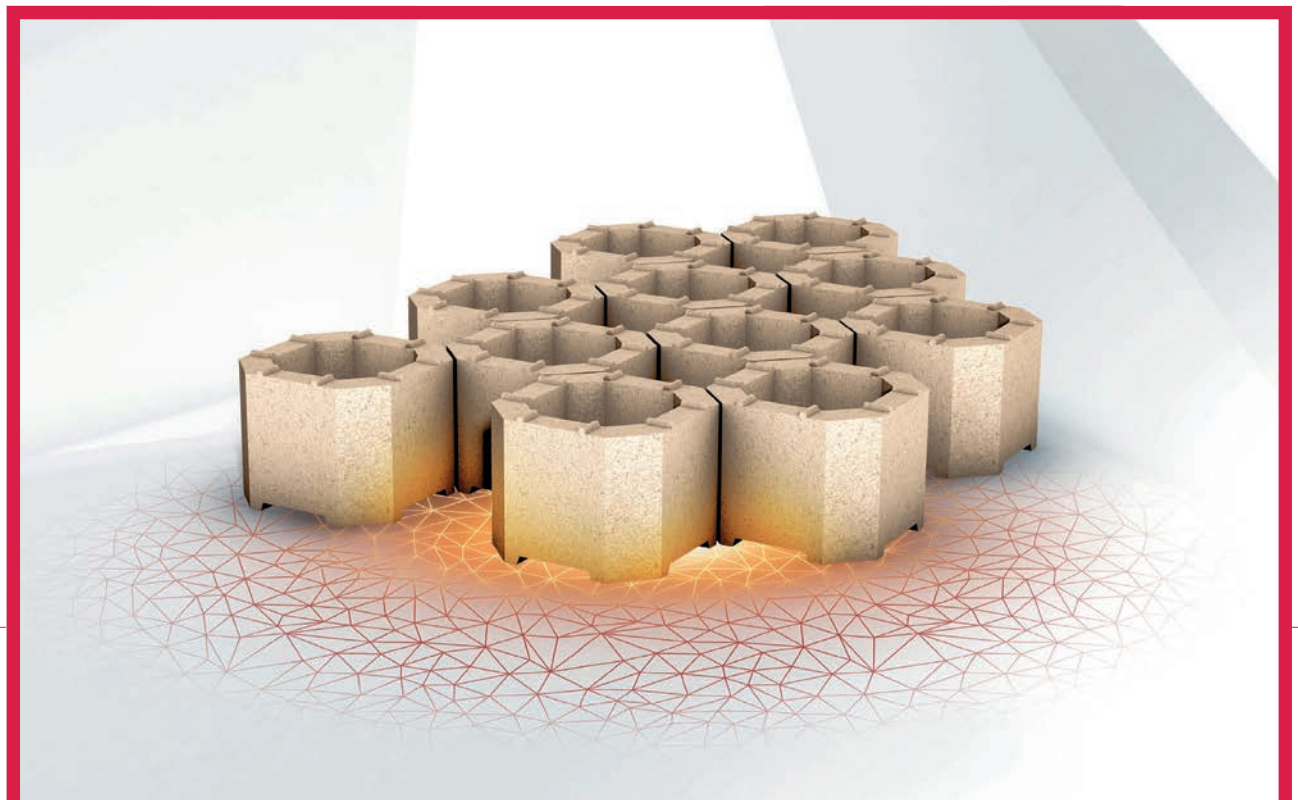
Internationally operating refractory manufacturer RATH has steadily expanded its portfolio of future-proof refractory solutions for the global glass industry. Indeed the company is now a full-range supplier of bonded materials in this sector. Most recently, as part of the R² technology alliance with the renowned refractory partner Refratechnik, RATH added high-quality checker bricks to its offering. Manufactured in Europe (Germany) from high-purity raw materials using state-of-the-art technology, these provide a genuine European alternative for the international glass market. RATH now offers a complete range of refractory solutions for glass manufacturing - from customised solutions for melting tanks, distributors and forehearths to feeder wear parts. The company has also introduced a complete refractory concept for regenerators - including checkerwork.

NEW CHECKER BRICKS: BUILT FOR PERFORMANCE

The latest addition to RATH's glass industry portfolio is its range



of premium checker bricks - a genuine high-quality European-made alternative for the international glass market. Made in Europe, these bricks use only high-purity raw materials under strict quality control. The result is stable, consistent quality that meets the industry's toughest standards. They are manufactured in Germany on a fully automated line, complete with calibration. RATH checker bricks combine a range of benefits designed to meet the highest operational demands. They deliver superior chemical resistance, supported by multiple options for fully customised solutions. High durability and outstanding corrosion resistance ensure long-term reliability, even in the toughest environments. Engineered for stability and strength, the optimised geometry also maximises efficiency by ensuring uniform distribution of flue gases and airflow. In addition, the checker bricks are designed for quick, straightforward installation and maintenance, helping to reduce construction time. An optional highlight is the PLUS Concept: basic bricks with a shelf life of up to 24 months, offering greater flexibility in planning and project scheduling.



FUTURE-ORIENTED REFRACTORY SUPPLIER WITH DEEP INDUSTRY EXPERTISE

RATH has been developing and producing high-quality refractory materials for more than 130 years. In recent decades, the company has, among other things, specialised in the production of refractory materials for the glass industry, and offers refractory solutions especially for the container glass industry - but also flat glass, E-glass, C-glass, tableware, art glass and special glass manufacturers worldwide.

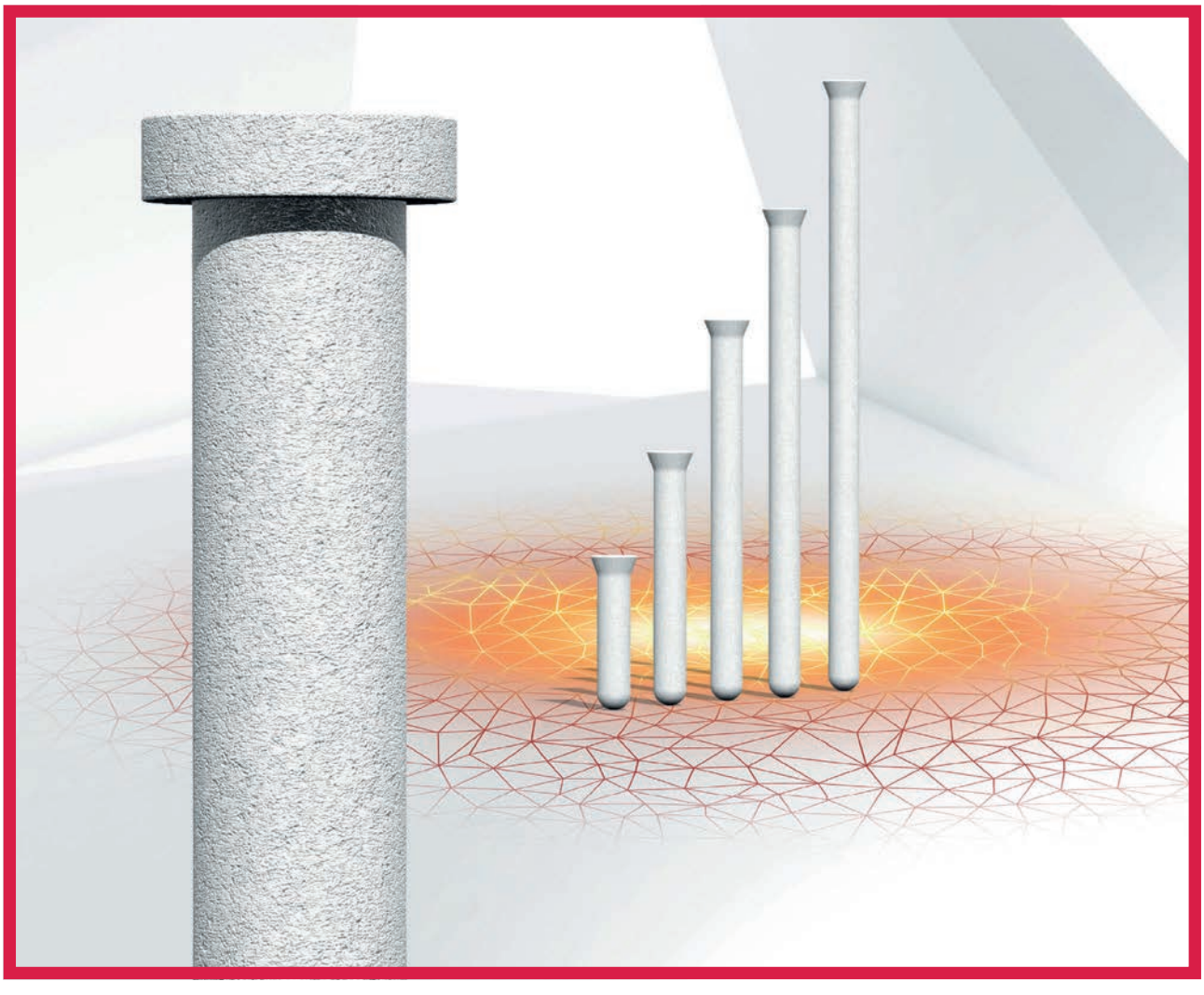
READY FOR THE FUTURE WITH RATH CERAMIC HOT GAS FILTER ELEMENTS

A hot topic in the glass industry is the early removal of dust from particulate-contaminated exhaust gases at high temperatures - an approach that offers both ecological and economic benefits. The need for inefficient cooling of exhaust gases solely for filtration is eliminated by RATH's innovative ceramic hot gas filter elements. Using RATH ceramic filter elements improves the energy balance, as the exhaust gas temperature doesn't need to be lowered and then reheated. For many years, the company has developed innovative ceramic hot gas filter elements that enable the filtration of particle-laden industrial flue gases at temperatures up to 1000 °C, reducing emissions of nitrogen and sulfur oxides, as well as of fine particulates. These hot gas filter elements are manufactured in Europe using RATH fibres and are available in variable lengths from 1 to 6 metres. This technology helps the glass industry meet stringent emission protection requirements in industrial plants. In addition to ensuring compliance with environmental regulations, plant operators can return e.g. dusts to the production process by filtering them from the exhaust air, thus improving plant efficiency and conserving raw material resources. ■

RATH

RATH AG

Walfischgasse 14
1010 Vienna-AUSTRIA
Tel.: +43-1-513-44-27-0
info@rath-group.com
www.rath-group.com

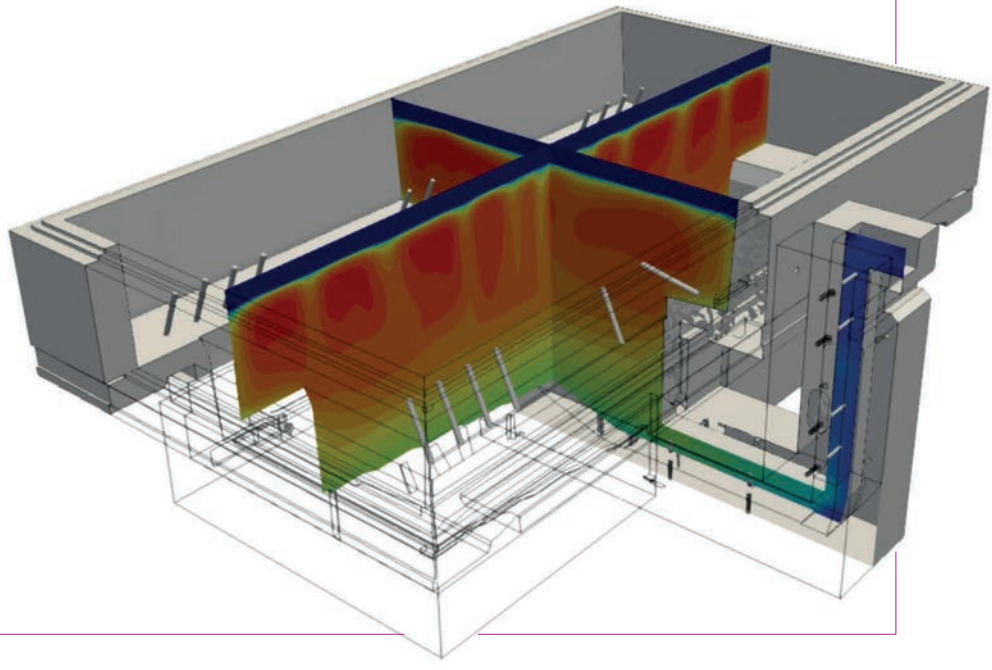


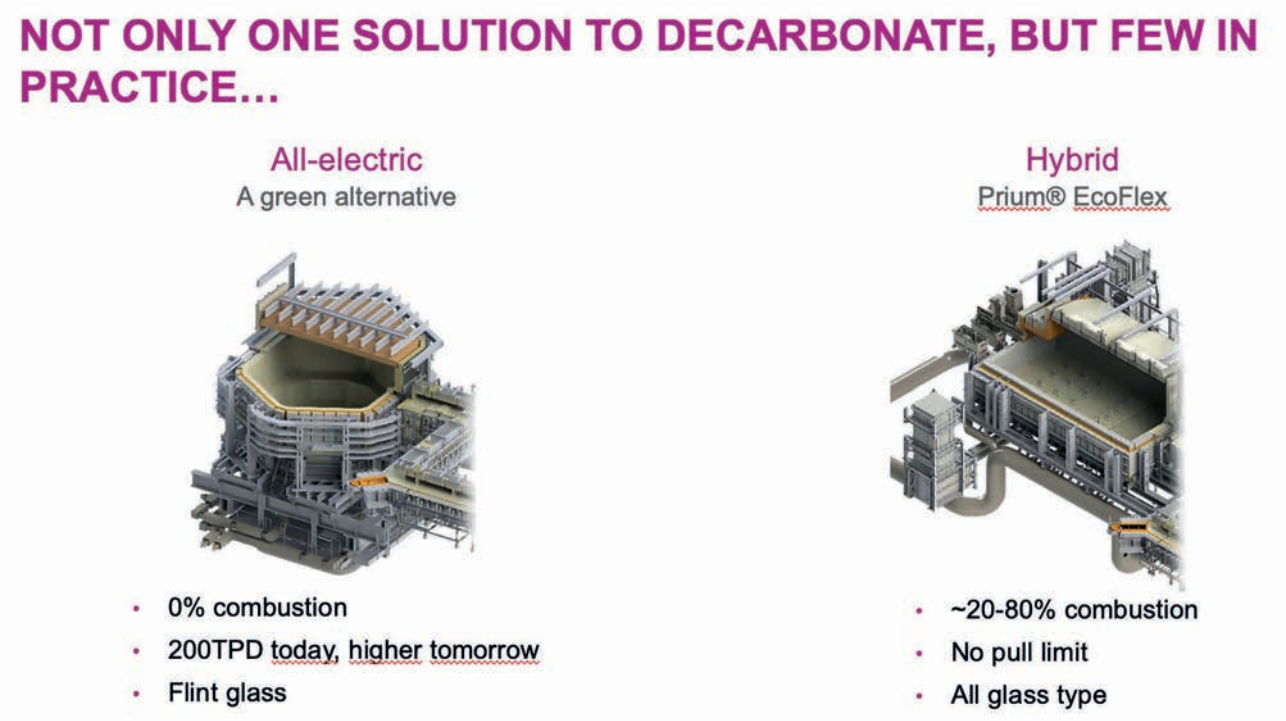
Scalable electric and hybrid glass melting advances from FIVES

Glassmakers face escalating energy costs, stringent decarbonisation goals and rising demand for flexible production. Here FIVES is accelerating the shift toward electric and hybrid melting - delivering industrial-scale performance, advanced heat-transfer designs and adaptable furnace configurations that support large-volume output while driving significant emissions reductions across operations.

LOW-CARBON MELTING THROUGH HYBRID AND ALL-ELECTRIC TECHNOLOGIES

Glass manufacturers around the world are navigating a period of rapid change: rising energy costs, stricter decarbonisation targets and the need for more flexible production. Against this backdrop, the shift toward electric and hybrid melting is no longer experimental - it is becoming a central pillar of long-term strategies. Drawing on more than 45 years of experience in electric melting and furnace design, Fives is playing a key role in this





transition, and its recent projects offer a window into how the technology is maturing.

ELECTRIC MELTING REACHES INDUSTRIAL SCALE

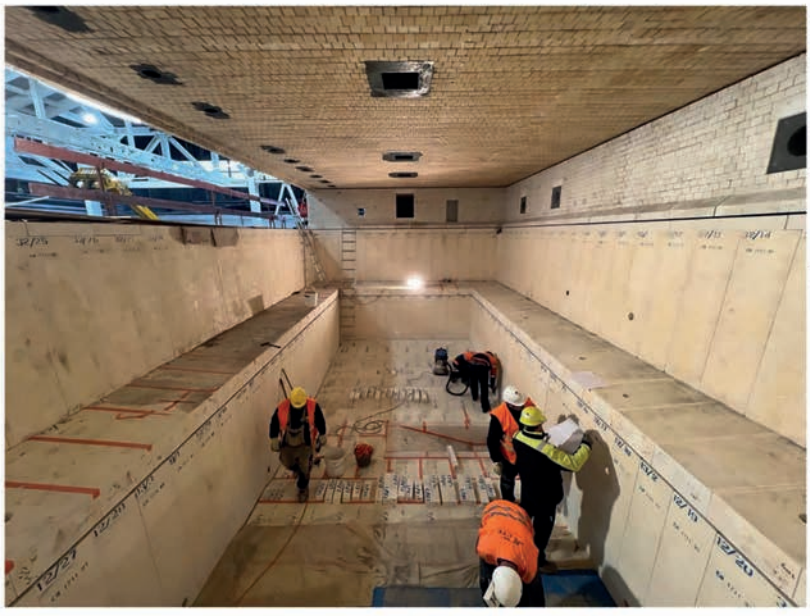
Electric melting furnaces first appeared in production applications in the 1960s, but only recently have grown to capacities relevant for large-scale container production. One of the clearest indicators of this progress is the all-electric furnace with a capacity of 180 tonnes per day, developed and delivered by Fives to Verallia's Cognac plant in 2024. The furnace reached nominal pull within a month for premium glass bottles - an outcome that would have been difficult to imagine a decade ago. Ongoing adjustments, such as fine-tuning composition, refining melt-rate strategies, and aligning batch-blanket and melt temperatures, reflect a mature technology now operating at a level suitable for high-volume industrial production. Current development paths targeting 300-400 tonnes per day capacity and extending the technology into coloured glass production, illustrate how quickly the ceiling is rising. What is particularly interesting for glassmakers is how routine these technologies are becoming. The current work on new temperature - control approaches, melt-rate strategies, and furnace superstructures suggests not an emerging technology, but a mature one steadily pushing its upper limits. Development paths targeting 300-400 t/d capacity, including for coloured glass, illustrate how quickly the ceiling is rising.

HYBRID MELTING: FLEXIBILITY AS A DESIGN PRINCIPLE

While electric melting is advancing quickly, some glass producers require production flexibility that hybrid melting can provide. Over the years, hybrid designs at Fives have evolved from modest electric boosting to systems capable of 20-80 percent electric input with no pull restriction. They are also compatible with all types of glass. Technologies such as Prium® Eco-Flex and Heat Recovery Area (H.R.A.™) originated from innovations, such as oxy-gas cross-fired furnaces incorporating up to 80 percent electric boosting and heat recovery systems, which later became a foundation for hybrid melting. These efforts produced a remarkable result. Fives is supplying the first air-gas hybrid furnace for glass packaging applications to O-I's Veauche plant in France in 2026. The furnace is capable of replacing up to 70 percent of conventional fossil fuel with electricity. CO2 emissions at the site will be reduced by 43 percent in comparison to conventional technology. The furnace is equipped with a revolutionary heat recovery and air preheating system which creates further efficiency gains. In addition to the decarbonisation impact, the new technology will also further reduce NOx emissions.

HEAT TRANSFER RESHAPING FURNACE DESIGN

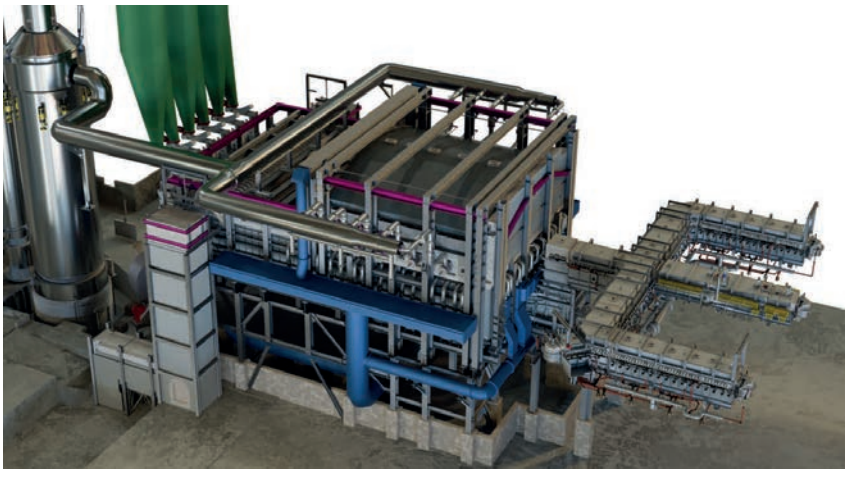
The HRA™ superstructure marks a significant shift in the management of heat transfer in contemporary melting furnaces. By lowering the superstructure section and preheating the batch, the fur-



nace can operate efficiently across a wider temperature range than conventional crowns can sustain. This expanded operating envelope is essential for maximising electric boost usage, as it reduces the need to overheat the melt surface during fining. This also helps to avoid the efficiency losses associated with traditional crown designs. The HRA™ technology also plays a key role in dust management. The modified geometry creates optimal conditions for capturing and evacuating particles generated during charging or decrepitation, which helps protect the superstructure from corrosion.

VARIETY OF CONFIGURATIONS FOR GLASSMAKERS

A variety of configurations are emerging from these developments, including Prium® Float-Melt regenerative furnaces, which are capable of producing 350 to 1,000 tonnes of container and flat glass per day, as well as oxy-fuel melting technology enhanced with L.E.M.® technology. Hybrid technology and various super-boosting configurations with different levels of electric input demonstrate how manufacturers are combining combustion and electric energy in various proportions to achieve decarbonisation targets. Rather than pointing to a single "best" solution, the current landscape shows a diversification of furnace architectures - regenerative, recuperative, oxy-fuel, hybrid or all-electric - each suited to different raw material mixes, energy-price environments, and carbon reduction objectives. The inclusion of high boosting or fully electric operation within these designs reflects a broader industry trend toward modular, adaptable melting strategies. This long-term evolution has helped establish a clearer understanding of how decarbonised melting approaches can be scaled and integrated within existing production infrastructures. ■



Optimised mould lifecycles with VERTECH' SILXMold

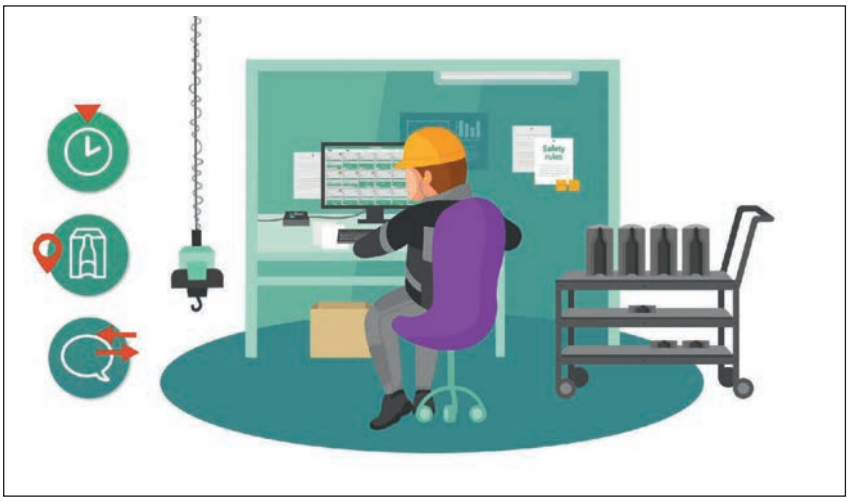
As glassmakers face constant pressure to improve efficiency, sustainability and cost control, Vertech' continues to support this challenge through digital supervision tools used worldwide – just as it has done since 1995. Today SILXMold extends that expertise further – delivering advanced mould traceability, lifecycle analytics and operational visibility that help manufacturers maximise both mould performance and production reliability.

In the glass manufacturing sector, efficiency, sustainability, and cost-effectiveness remain core operational priorities. Since its inception in 1995, Vertech' has consistently supported glassmakers worldwide in meeting these demands. Its SIL supervision system, now deployed in more than 35 countries, continues to drive the digitalisation of production processes. Within this ecosystem, SILXMold stands out as

a dedicated module engineered to optimise mould management and enhance productivity across glass production lines.

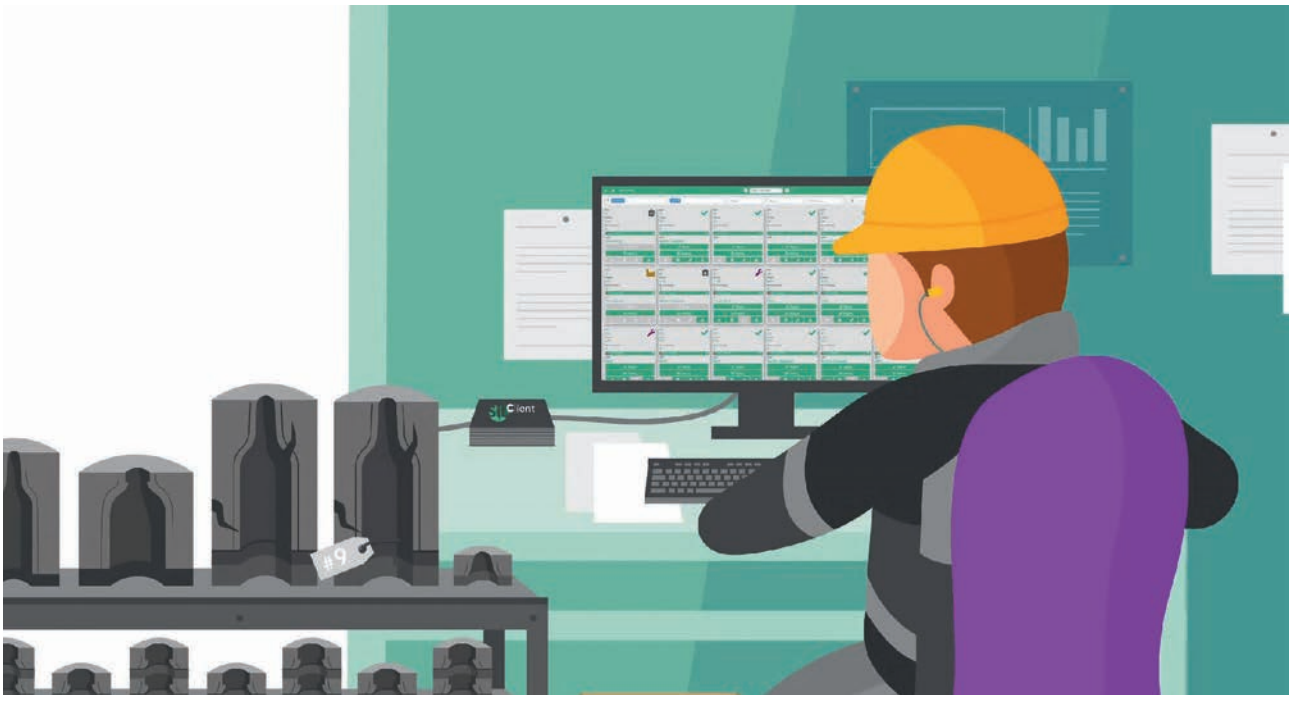
THE ROLE OF MOULDS IN GLASS PRODUCTION

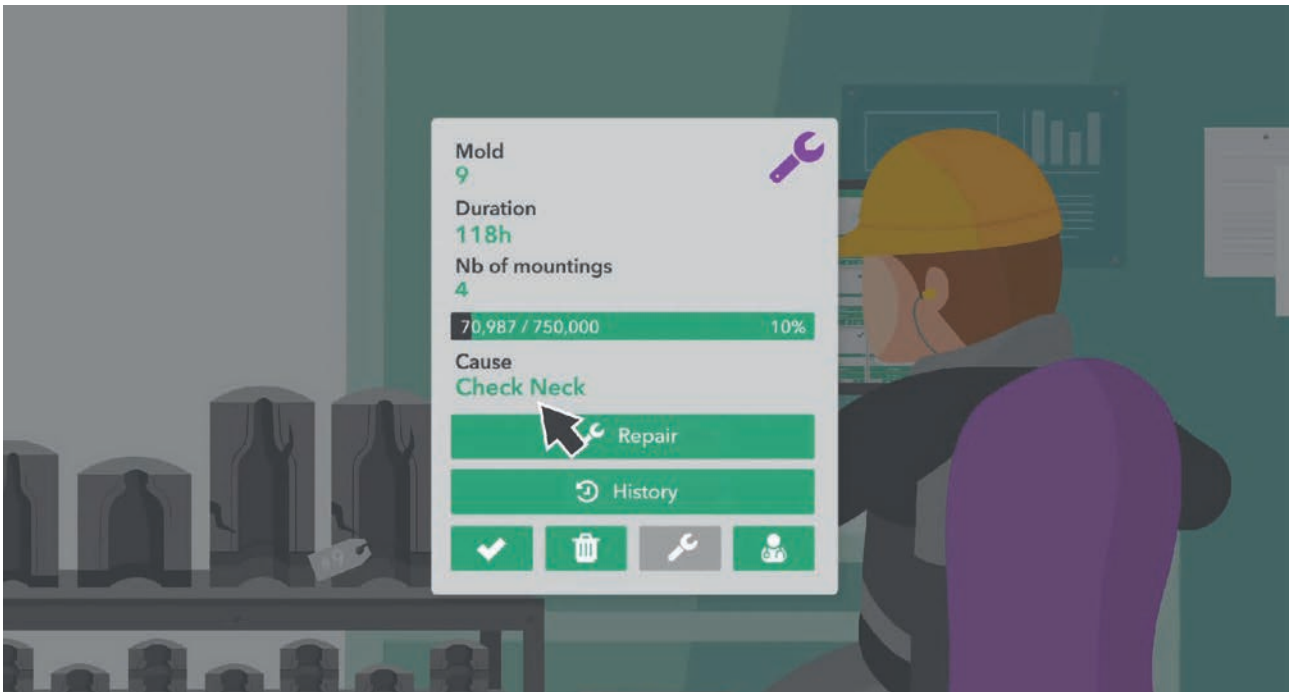
Moulds are fundamental to glass quality, influencing wall thickness, volume accuracy and defect prevention. Their condition and availability directly affect product consistency and conformity, particularly in high-speed production environments. Effective mould management is therefore essential to sustaining throughput while maintaining quality standards. SILXMold addresses this requirement through comprehensive mould traceability. As one of six modules within the SIL system, it enables operators to monitor the full lifecycle of each mould, from initial commissioning through repair cycles and eventual replacement. This visibility supports both unit and series production, ensuring mould resources are deployed efficiently and cost-effectively.



REAL-TIME MOULD TRACEABILITY FOR SMARTER DECISION-MAKING

Real-time data access is central to SILXMold's value. Operators benefit from an intuitive dashboard featuring a colour-coded alarm system that clearly indicates mould status and maintenance priorities. Whether a mould is operational, requires servicing, or is unavailable, the system enables rapid, informed decision-making. Detailed mould histories, including repair records and dimensional inspections, are instantly accessible, accelerating diagnostics and reducing repair lead times. The software also tracks time spent on specific repair types, allowing workshops to refine workflows and minimise downtime. This level of traceability reduces the risk of mould shortages and supports consistent production performance



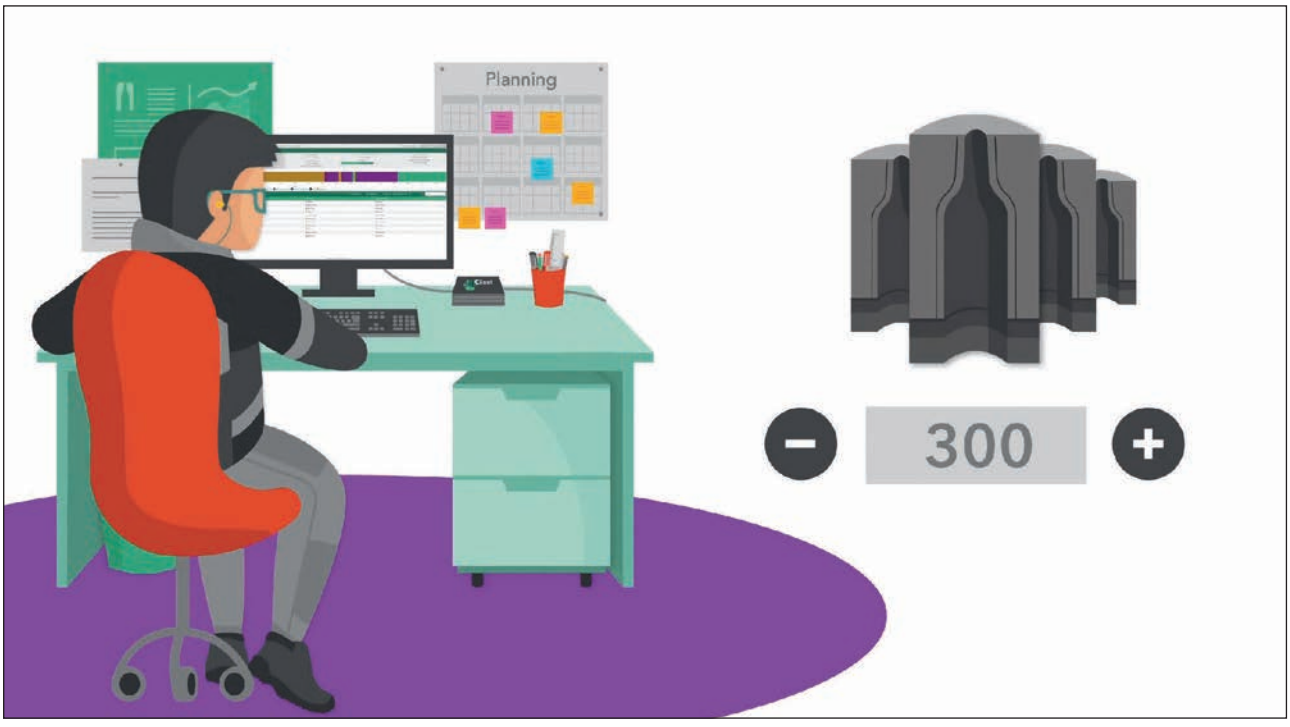


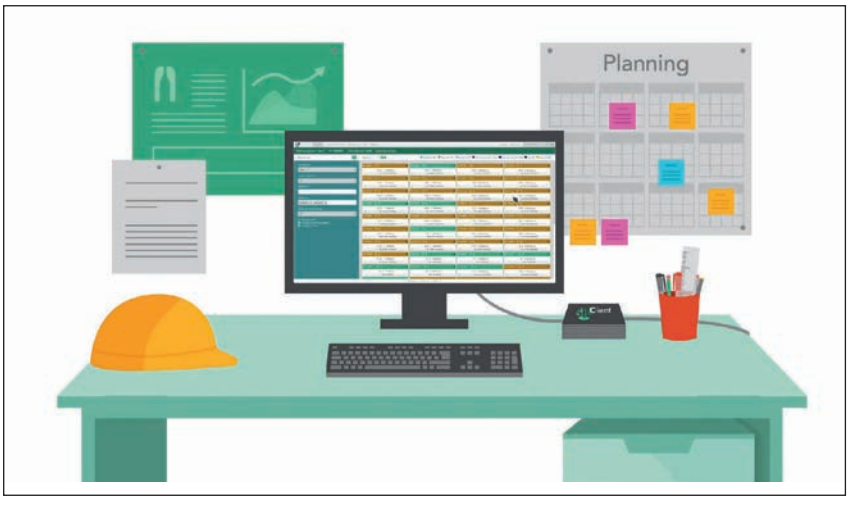
STREAMLINING OPERATIONS WITH DETAILED MOULD INSIGHTS

Beyond tracking, SILXMold provides in-depth performance analytics. The system records rotations, machine gobs, and remaining service potential for each mould, giving operators early warning when end-of-life thresholds are approaching. Planned replacements can therefore be scheduled in advance, avoiding unplanned production interruptions. The software also captures the reasons for mould disassembly, whether due to wear, damage, or process-related issues. This contextual information allows teams to prioritise corrective actions and return moulds to service as quickly as possible.

FINANCIAL AND OPERATIONAL BENEFITS: A WINNING INVESTMENT

From a financial perspective, SILXMold enables more accurate assessment of mould profitability. By comparing theoretical and actual machine cut counts, manufacturers gain insight into true mould performance and cost efficiency. This supports informed investment decisions regarding





refurbishment or replacement. Based on customer experience, Vertech' estimates that systematic mould rotation can extend mould set lifetime by approximately 15 percent. SILXMold further optimises mould stock management by reducing unnecessary purchases and limiting downtime. Real-time visibility of mould availability ensures production requirements are met without excess inventory. Vertech' reports that customers can achieve stock value savings of up to 10 percent through improved planning and utilisation.

ENHANCING COMMUNICATION ACROSS THE PRODUCTION LINE

Clear communication across production teams is another operational advantage. SILXMold includes an integrated messaging function that connects hot-end operators with the mould shop, reducing miscommunication and improving response times. With availability in 23 languages, the system is well suited to multinational manufacturing environments.

A SMART INVESTMENT FOR THE FUTURE

As competition intensifies within the glassmaking industry, the ability to increase efficiency while controlling costs has become critical. SILXMold delivers the tools required to manage mould assets strategically, reduce downtime, and improve decision-making. Through real-time traceability, advanced analytics, and enhanced collaboration, it represents a long-term investment in operational resilience. For manufacturers seeking to optimise existing mould inventories or streamline production workflows, SILXMold offers a practical, data-driven solution. By extending mould life and improving utilisation, it helps glassmakers achieve higher productivity and stronger returns in an industry where every minute counts.

VERTECH'

11, Rue Alfred Kastler
71100 - Chalon-sur-Saône - FRANCE
Tel.: +33-0-385-981-919
vertechsales@vertech.fr
www.vertech.fr

'Glasy' has STOELZLE and BRANTNER reclaiming cullet

Enabling thousands of tons of recovered material to return to the furnace, 'Glasy' technology delivers 99.9999 percent glass purity – all to reduce raw material demand, energy consumption and CO_2 emissions.

For Stoelzle, a global leader in premium glass packaging, the decarbonisation of glass manufacturing begins with the batch itself. Working alongside circular economy specialist Brantner green solutions, the company has helped develop and validate 'Glasy' - a globally unique recycling technology that recovers exceptionally pure glass from incineration residues and upgrades it into high quality cullet suitable for demanding packaging applications.

In Austria alone, residual waste incineration generates around 600,000 tons of residues each year, with glass accounting for up to 30 percent of the material. Historically, available sorting technologies could not process this glass to a quality level that met the glass industry's stringent standards, particularly for high end flint glass. Contaminants such as metals, and ceramics limited the use of recovered glass and meant that a large potential resource remained locked in the waste stream.

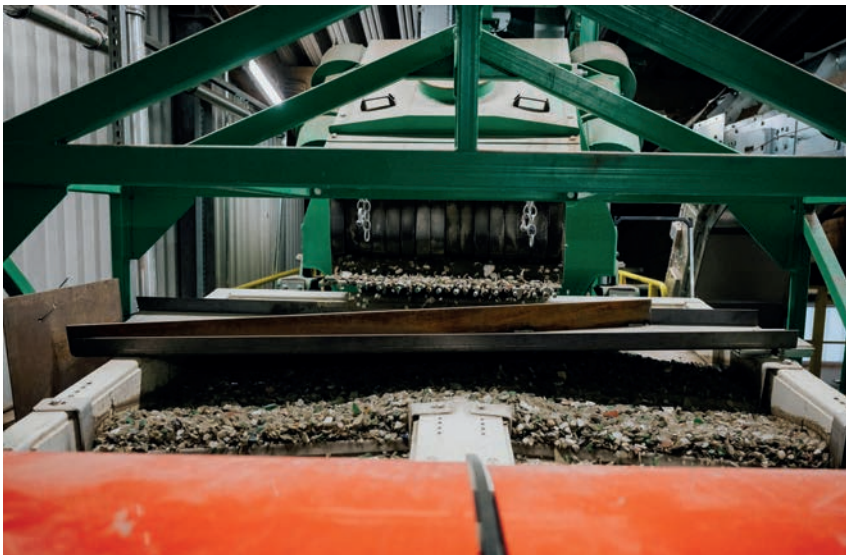
'Glasy' changes this equation. By the upstream thermal process step of the incineration the material is already free of organic making it an ideal potential source for cullet. Downstream, an advanced sorting process isolates the glass fraction and delivers a recovered material whose purity reaches 99.9999 percent - a level that opens the door to sensitive packaging applications rather than relegating the material to lower value uses.

WHY ULTRA-PURE CULLET MATTERS

As a manufacturer of premium glass packaging, Stoelzle depends on a consistently available supply of extremely pure cullet. Recycled glass substituted into the batch reduces the consumption of virgin raw materials, lowers energy demand in melting and cuts associated CO_2 emissions. However, to protect the performance and appearance of high end packaging, even minute contaminants can be problematic. Metals, ceramics or mineral particles can negatively influence the batch and reduce the quality of the finished container, particularly in colour-sensitive flint glass.

Stoelzle's research and development team at Stoelzle Oberglas in Austria therefore played an active role in the development and validation of 'Glasy'. In the company's in-house glass laboratory, cullet samples from the new recycling process were analysed in detail and subjected to lab scale melting trials. These series of tests were designed to verify whether the cullet quality achieved by Brantner's system met Stoelzle's internal requirements for industrial production of premium packaging glass.

The tests confirmed that the 99.9999 percent purity level delivered by 'Glasy' satisfies Stoelzle's strict specifications. Laboratory analyses of material composition supported the melting results, confirming that



the recovered cullet can be used safely in high end glass packaging without compromising quality. For Stoelzle, this means that a previously unusable secondary resource can now be integrated into the batch on an industrial scale, contributing directly to the company's circular economy ambitions.

RETHINKING RESIDUAL WASTE INCINERATION

The innovation lies not only in the purity of the recovered glass but also in the way the process redefines residual waste incineration residues as a raw material source. Without advanced treatment, these residues have traditionally been treated as a disposal challenge, despite containing significant quantities of recoverable materials. Brantner's 'Glasy' technology reframes them as a valuable feedstock for the glass industry, closing a loop that previously remained open.

Thanks to the innovative recycling plant, around 20,000 tons of glass can now be recovered from waste incineration residues in Austria every year and made available to the glass industry as secondary raw material. In doing so, the system returns thousands of tons of previously discarded glass to the furnace, transforming incineration residues into a high quality resource and reinforcing the circular economy in the Austrian glass sector.

INSIDE THE 'GLASY' RECOVERY LINE

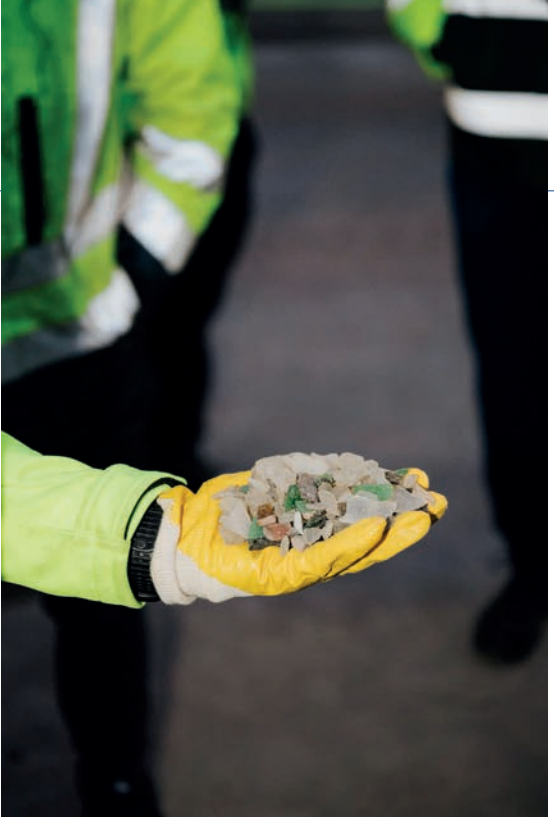
From a technological perspective, the 'Glasy' process incorporates several advanced features that ensure consistent quality and traceability. One key element is integrated advance sampling taken directly from the product stream of the sorting system. These real-time samples feed into an AI-based evaluation of the cullet quality, assessing parameters such as colour distribution and the presence of residual contaminants.

The combination of in-line sampling and artificial intelligence analysis enables near real time determination of the recovered product's properties. For Stoelzle as a glass manufacturer, this translates into seamless traceability of cullet quality, strengthening process control from the recycling plant through to the melting furnace. The system is described as globally unique, and Brantner green solutions has filed a patent application to protect the technology.

The success story at Brantner Glasy plant underlines the industrial reality of this innovation: the first recovery system is already successfully in operation, supplying high quality cullet for glass production and demonstrating that the concept has moved beyond pilot scale into real-world application.

WHAT STOELZLE'S TESTING CONFIRMED

In Stoelzle's glass laboratory, the cullet obtained from 'Glasy' underwent thorough analysis before being cleared for use in premium packaging applications. Lab-scale melts were designed to replicate industrial conditions as closely as possible, allowing the R&D team to observe how the cullet behaved in the batch and in the resulting glass. Any traces of metal or ceramic contamination would have revealed themselves through defects or colour shifts - effects that Stoelzle cannot



accept in its high value product portfolio.

The melting tests showed that the ultra-high purity achieved by 'Glasy' meets Stoelzle's strict standards and that the cullet can be safely used in the production of high-end flint glass packaging. Complementary laboratory analyses confirmed the excellent material composition of the recovered glass. As a result, Stoelzle can incorporate this new cullet stream into its production processes with confidence, using it as a direct substitute for part of the primary raw materials previously required.

FROM WASTE STREAM TO CIRCULAR ECONOMY

The impact of this substitution is significant. For every ton of cullet used at Stoelzle, around 1,200 kilograms of primary raw materials can be saved. At the same time, using cullet avoids the release of approximately 200 kilograms of CO_2 that is bound in this quantity of primary raw materials. These savings are additional to the energy benefits associated with melting recycled glass.

Each 10 percent share of cullet in the overall batch reduces the energy required for melting by about 2 to 3 percent. With Stoelzle's glass furnaces currently fired with natural gas, that means that every 10 percent cullet content can avoid roughly 6 kilograms of CO_2 emissions per ton of glass produced in the melting process itself. As 'Glasy' enables the recovery of around 20,000 tons of glass annually from Austrian waste incineration residues, the cumulative potential in terms of raw material and CO_2 savings is considerable.

Looking ahead, the cooperation between Brantner green solutions and Stoelzle is set to deepen. The aim is for Stoelzle to use a significant proportion of the cullet recovered with 'Glasy' in the production of packaging glass for the pharma and consumer segments at its Köflach plant. This move will convert incineration residues into a stable, high quality secondary raw material stream and further reinforce the circular economy in the Austrian glass industry.

PARTNERS IN TRANSFORMATION

The 'Glasy' project also reflects the complementary strengths of the partners involved. Stoelzle, founded more than two centuries ago in Austria and part of the family-owned CAG Group since 1987, has grown into an international specialist in glass packaging for premium spirits, beauty, healthcare and consumer brands. Six production sites and four decoration facilities across Europe and North America, supported by an international network of sales offices, allow the company to serve brands of all sizes with solutions that blend quality, creativity and responsibility.

Brantner green solutions, in turn, brings deep expertise in waste management and the circular economy. With a philosophy that 'the waste of today is the resource of tomorrow,' Brantner operates a wide portfolio of recycling and treatment facilities, including 12 sorting plants, one biogas plant, 13 landfills and 11 composting plants across Europe. The company serves around 1,000 municipalities and more than 26,000 customers, acting as both an innovation driver and a key regional employer.

Together, Stoelzle and Brantner green solutions are demonstrating how cross sector collaboration can unlock new secondary raw materials for glass production and translate circular economy principles into industrial reality. By enabling ultra-pure cullet recovery from waste incineration residues and validating its use in high-end packaging, 'Glasy' offers the glass industry a concrete pathway to reduce its reliance on virgin raw materials, cut CO_2 emissions and keep more glass circulating where it belongs: in the loop. ■

STOELZLE OBERGLAS GmbH

Fabrikstraße 11
A-8580 Köflach - AUSTRIA
Tel.: +43-3144-706
office@stoelzle.com
www.stoelzle.com

BRANTNER GREEN SOLUTIONS

Dr. Franz Wilhelm Straße 2A
3500 Krems an der Donau
Brantner - AUSTRIA
Tel.: +43-59-444
office.brantner@brantner.com
www.brantner.com

Advancing glass melting efficiency through LINDE technologies

Together, LINDE's latest OPTIFIRE® oxy-fuel burner portfolio and OPTIMELT™ Thermochemical Regenerator (TCR) system demonstrate commercially proven and economical pathways to higher melting efficiency, lower NOx emissions and meaningful CO_2 reduction. With long-term industrial results, these technologies enable safer, cleaner and more flexible furnace operation across container, fiberglass and hybrid melter designs.

For glass manufacturers pursuing practical, high-impact decarbonisation, Linde's OPTIFIRE® oxy-fuel burner portfolio and OPTIMELT™ Thermochemical Regenerator (TCR) system offer a robust technological foundation backed exclusively by years of industrial experience. From wide-flame burners to thermochemical reforming, the company's solutions address the central challenges in modern melting: efficiency, stability, emissions and fuel flexibility.

BURNER INNOVATION FOR STABLE, LOW-EMISSION MELTING

Linde's broad family of OPTIFIRE® oxy-fuel burners enables furnace-specific optimisation. The Wide Flame Burner (WFB) generates a rich, luminous flame with up to 200 percent greater surface coverage, reducing volatilisation, lowering particulate emissions and cutting NOx by more than 50 percent thanks to staged combustion. The quick-release metallic components simplify installation and maintenance, supporting stable operation across diverse furnace types.

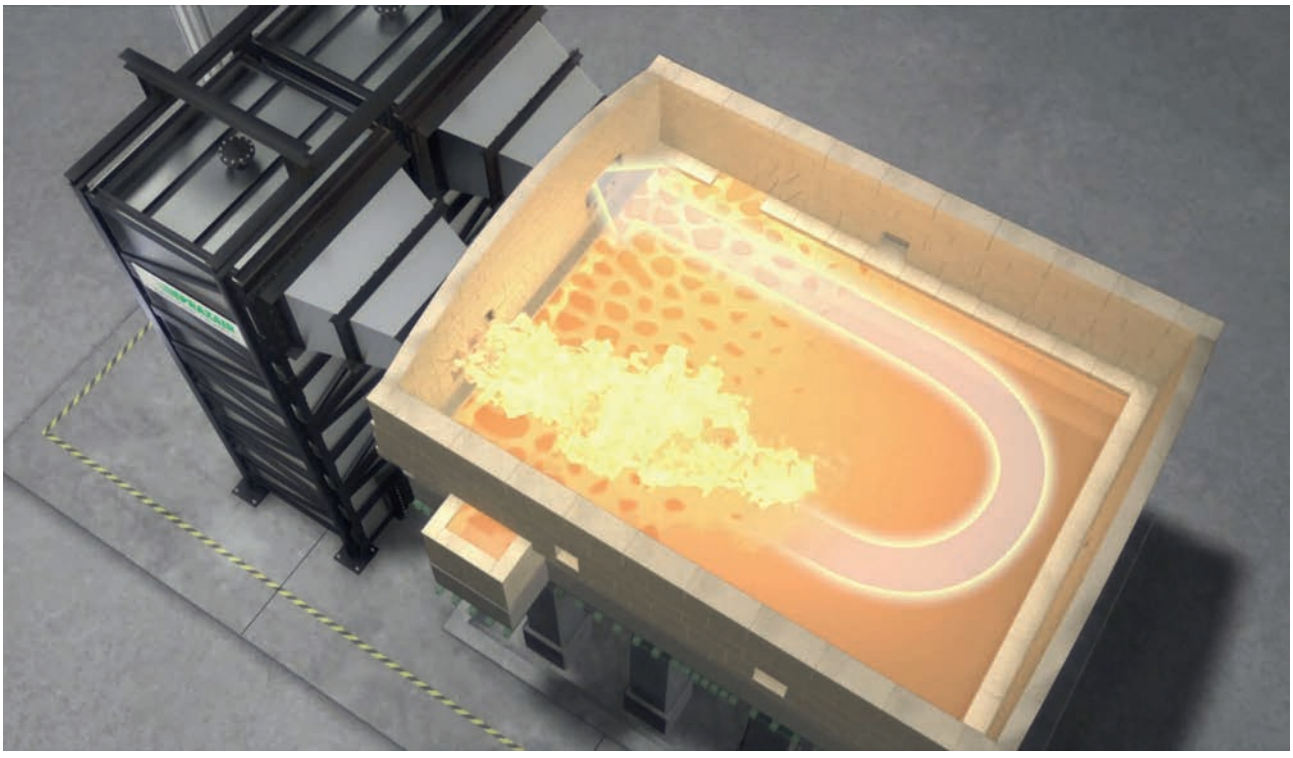
The OPTIFIRE® XD burner, a variant of the WFB, is optimised for volatile-rich environments. By diverting a small flow of natural gas to the staging oxygen ports, the XD design mitigates condensate formation around cooler oxygen surfaces. This prevents alkali build-up, an issue demonstrated clearly in comparative operating images and has delivered multiple years of uninterrupted industrial operation in fiberglass, tableware and container furnaces.

The OPTIFIRE® FLEX burner integrates the advantages of WFB and XD while adding an important new capability: automated switching between 'Melt' and 'Foam Control' modes. In commercial container glass operation, FLEX burners have achieved approximately 15 cm of foam-layer reduction in the refining area during colour-change transitions. Quality results were enhanced – seeds and blisters were reduced by 40-75 percent across multiple colours. Hot oxygen ports decrease fouling risk, while lightweight metallics and quick-release clamps support easy handling. Stable flame switching and wide firing flexibility further enhance process control.

THERMOCHEMICAL REFORMING FOR HIGHER ENERGY EFFICIENCY

Beyond burner optimisation, Linde's OPTIMELT™ TCR system provides a thermochemical pathway to higher energy efficiency and lower carbon intensity. The system recycles a portion of flue gas -rich in CO_2 and water vapour- into regenerators, where endothermic reforming of natural gas produces a hot syngas stream. Combined with oxy-fuel combustion, this syngas delivers a luminous, high-temperature flame while enabling substantial heat recovery. Sizes of regenerators are compact relative to regenerators for air-fuel furnaces. The thermochemical regenerators exhibit a unique self-cleaning mechanism, no sulfate accumulation in the checkers, resulting in low maintenance requirements. Flue gas temperatures exiting the OPTIMELT™ TCR system are typically around 650 °C creating potential for additional energy capture, further lowering CO2 emissions.

Industrial results from the Leerdam furnace illustrate the system's durability and efficiency. Operating for more than seven



years, the furnace has maintained an exceptionally low aging rate - approximately 0.25 percent per year. Fuel consumption remained stable despite typical furnace wear and seamless mode-switching (TCR syngas firing to oxy-fuel firing and vice-versa) ensured uninterrupted glass production during maintenance cycles.

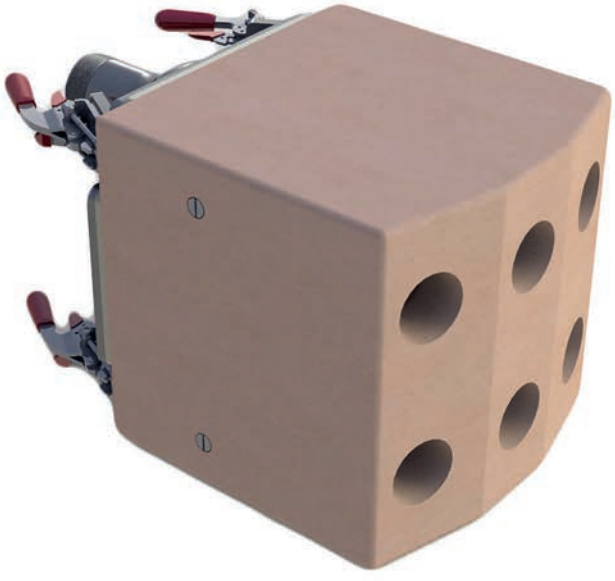
PATHWAYS TOWARD HYBRID AND FUTURE-READY FURNACES

Linde's developments also support hybrid furnace concepts, with ongoing collaborations focused on burner adaptation and integrated oxygen-supply (VPSA system) solutions. Whether through optimised combustion or heat recovery, e.g. thermochemical reforming Linde's technologies are compatible with green and low-carbon fuels.

While it may take time for green / low carbon fuel infrastructure to develop, a practical first step that can be taken today is converting furnaces to oxy-fuel firing with OPTIMELT™ TCR heat recovery. Taking this step will also make the glass furnaces future-ready when green fuels become economically available. ■

LINDE GmbH

Dr. Carl von Linde Strasse 6-14
82049 Pullach - GERMANY
Tel.: +49-89-31001-5680
info@linde.com
www.linde-gas.com



Innovation partners VETROPACK and BARILLA advance global packaging

As two industry leaders that continue to strengthen their long-standing partnership through lighter glass packaging and higher recycled-glass content, BARILLA's heritage, quality focus and sustainability ambitions all align with VETROPACK's expertise - enabling continuous packaging improvements that support the global growth of both companies.

Packaged, improved, reliable: Italian food company Barilla sets high standards for the quality and service of its suppliers and pursues continuous improvement - particularly in the area of sustainability. Barilla has enjoyed a successful partnership with Vetropack for many years. Together, they are striving to make glass packaging lighter and increase the proportion of recycled glass.

INDUSTRY PROMINENCE

When it comes to pasta, bread and snacks, Barilla is undoubtedly one of the world's most recognizable

Guglielmo Bozano - packaging procurement

food brands and the global market leader in its segment - certainly for pasta. Based in Parma, Italy, the company boasts a history spanning more than 140 years. Pietro Barilla senior, who laid the foundations of the business with a small bakery producing bread and pasta, founded it back in 1877. Despite early setbacks, the family succeeded in building the company. As early as 1910, Barilla embraced industrial production, opening a factory capable of producing around eight tons of pasta a day - a significant milestone on the road to the modern food industry. In the decades that followed, Barilla became a pioneer in product quality, brand development and innovation. Under the leadership of Petro Barilla (1913-1993), the company placed increasing emphasis on advertising campaigns, packaging design and streamlined production processes. This not only secured a dominant position in the Italian market, but also paved the way for successful expansion across Europe. Today, Barilla employs over 9,000 people, operates 30 production sites worldwide and owns a number of well-established brands - including Mulino Bianco, Wasa and Voiello - with a worldwide presence. Initiatives such as the Academia Barilla, founded in 2004, and the Barilla Centre for Food & Nutrition, launched in 2009, underscore the company's long-term commitment to sustainable food and packaging solutions.

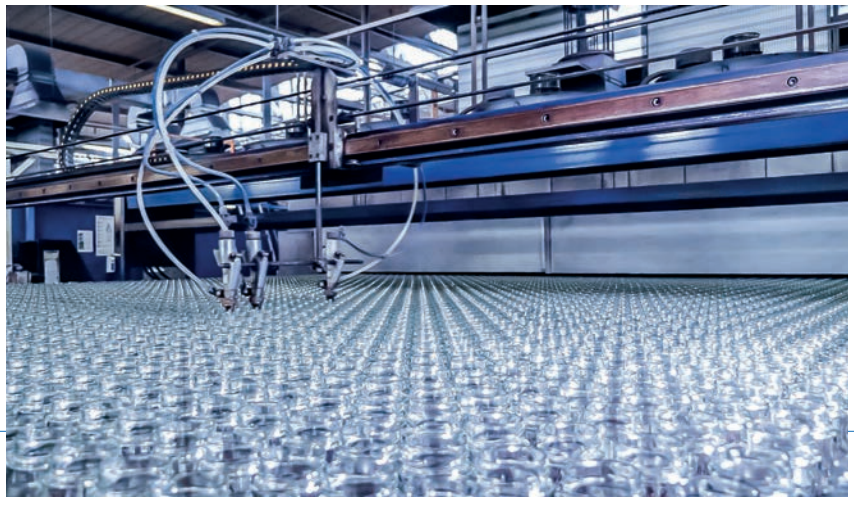
LESS MATERIAL, MORE QUALITY

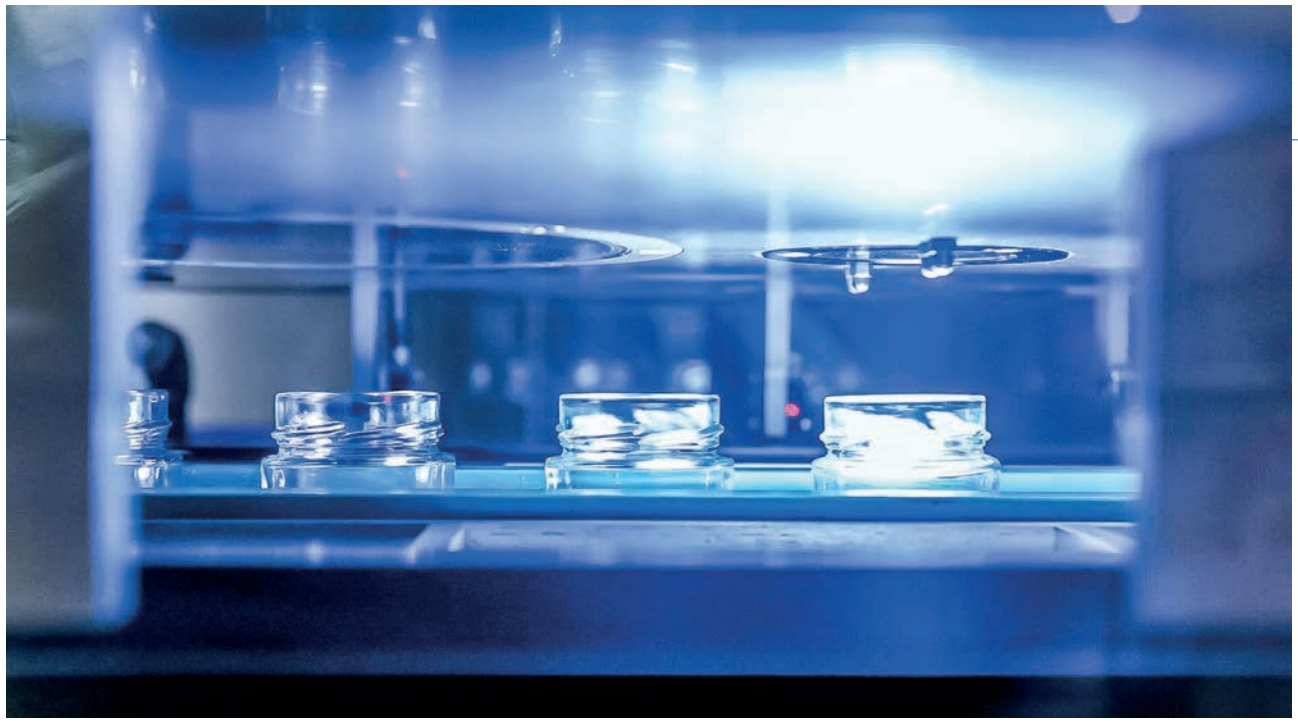
The Barilla philosophy is founded on the following purpose: "The joy of food for a better life." Making no compromises on quality and ensuring comprehensive protection for consumers are among Barilla's core values. Guglielmo Bozano, who has been with the company since 1997 and involved in packaging procurement since 2000, explains what this means in practice: "We select materials very carefully and we reduce the packaging materials - from cardboard to plastics and glass - to what is absolutely necessary. This allows us to save valuable resources while continuing to package high-quality food in high-quality packaging. And we're always looking for ways to further both improvement and innovation."

Glass packaging is primarily used for pesto varieties and sauces - and here too, Barilla is committed to continuous improvement. Indeed its partnership with Vetropack plays a key role in this. The two companies were already collaborating when Bozano began sourcing glass. "We have high standards when it comes to quality and service. And we expect our partners to provide us with expert support in the development of new packaging," says Bozano.

VETROPACK AS STEADFAST, TRUSTWORTHY PARTNER

When optimizing glass packaging, Bozano focuses upon two key aspects: reducing material usage and increasing the proportion of recycled glass. "When we develop a new jar, we first try to anticipate potential issues. Drawing on the experience of both our suppliers and our own teams, we can then implement targeted improvements. In the case of the 400-gram jar, for sauces, we achieved a straightforward weight reduction by ten percent after around five years. This





was in 2016/17."

Another successful project was the development of a 525-gram jar again in collaboration with Vetropack. "From the outset, Vetropack identified the right shape. The glass has shown no weaknesses or breakage issues. This clearly demonstrates Vetropack's expertise," Bozano explains. He particularly values the cultural alignment between the two companies: "As family-owned businesses, we share the same mindset. For me, openness and working together on equal terms are essential - and this works seamlessly with Vetropack."

RECYCLED GLASS: PACKAGING OF THE FUTURE

Looking ahead, Barilla intends to further increase the proportion of recycled glass in its packaging. "Initially, we used the classic transparent flint jar. During a visit to a supplier, I noticed jars with a slight tint. That sparked my curiosity. After thorough studies and collaboration with marketing, the benefits became clear. We are still working on it today. I have always believed that the future lies in using more and more recycled glass," Bozano says.

BARILLA CONTINUES TO FOCUS ON GROWTH

In today's market environment, Barilla faces intense competitive pressure. The company's strategy includes clear targets for each business unit over the next three to ten years, with a strong focus on increasing efficiency and optimizing costs. For sauces and pestos, the priority remains the expansion into new markets.

At the same time, expectations around supply chains and sustainability are rising. In fact, Barilla has launched concrete initiatives to make its production increasingly sustainable. Over the past three years, it has tripled the power of photovoltaic systems at its Italian factories, for self-generation of renewable electricity - and plans to triple it again by 2026. Reducing emissions, improving energy efficiency and increasing production independence are just some of the commitments made by Barilla, supported by concrete actions outlined in its Science Based Target initiatives (SBTi) plan. Sustainability is at the heart of Barilla's strategy and the company is set to continue growing. To support this growth, its successful partnership with Vetropack could be further expanded in the future. ■

vetropack

VETROPACK HOLDING AG

Schützenmattstrasse 48
Ch-8180 Bülach - Switzerland
Tel.: 0041-44-8633362
info@vetropack.com
www.vetropack.com

BARILLA G. E R. FRATELLI S.P.A.

Via Mantova 166
43122 Parma PR - ITALY
Tel.: +39-0521-2621
ufficiorelazioniesterne@barilla.it
www.barillagroup.com

suppliers guide
YELLOW PAGES

Listing in this section is reserved for advertisers.

COMPANY	website
AGR INTERNATIONAL	www.agrintl.com
ANTONINI	www.antoninisrl.com
BDF INDUSTRIES	www.bdfindustriesgroup.com
BOHEMI CHEMICALS	www.bohemichemicals.com
CHANGSHU JIANHUA MOULD TECHNOLOGY	www.jhmould.com/En
EME	www.eme.de
FALORNI TECH	www.falornitech.com
FAMOR ENGINEERING	www.famoreng.com
FLUORITAL	www.fluorital.com
FONDERIE VALDELSANE	www.fonderievaldelsane.com
GLASS SERVICE ITALY	www.glassservice.it
KYP ACCESORIES	www.kypaccesories.com

COMPANY	website
LINCO BAXO	www.lincobaxo.com
MODERNE MECANIQUE	www.ocmigroup.com
OCMI OTG	www.ocmigroup.com
PENNEKAMP	www.pennekamp.de
S.I.G.MA.	www.sigmaref.it
SKS - SORG KERAMIK SERVICE	www.sks.net
SORG NIKOLAUS	www.sorg.de
STARA GLASS	www.staraglass.com
VETROMECCANICA	www.vetromeccanica.it

AGVS/LGV

Tecnoferrari

A.I. NIR FURNACE CAMERAS

GS - Glass Service

AIR COOLING SYSTEMS

KYP Accesories
Luben Glass
Stara Glass
Tecsiglass

AIR COOLING SYSTEMS FOR I.S. MACHINES

Bottero

AIR COMPRESSORS

Pneumofore

ALLOYS FOR MOULDS

Changshu Jianhua Mould Technology
Fonderie Bartalesi
Fonderie Valdelsane

AMPOULE AFTER FORMING MACHINES/ LINES

KYP Accesories
Moderne Mecanique
OCMI OTG
Pennekamp
Stevanato Group

AMPOULE FORMING MACHINES/LINES

Euromatic
KYP Accesories
Moderne Mecanique
OCMI OTG
Stevanato Group

AMPOULE PACKAGING MACHINES

Euromatic
KYP Accesories
Moderne Mecanique
OCMI OTG
R.Cestaro
Stevanato Group

ARCHITECTURE OF A FURNACE HEAT RECOVERY SYSTEM

Stara Glass

ARTICLE PRODUCTION

Olimerk

ARTIFICIAL INTELLIGENCE

Video Systems

AUTOMATIC TUBE LOADERS

Euromatic
KYP Accesories
Moderne Mecanique
OCMI OTG
R.Cestaro
Stevanato Group

AUTOMATION

EME
GS - Glass Service
Lahti Glass Technology
Luben Glass
Mimsan Conveyor Systems
R.Cestaro
Stara Glass
Tecsiglass
Vetromeccanica
Video Systems
ZIPPE

BAG FILTERING PLANTS

BDF Industries
Stara Glass

BATCH CHARGERS

BDF Industries
Electroglass
EME
Falorni Tech
GCG - Glass Consulting
Glass Service
Horn
Lahti Glass Technology
MT Forni Industriali
Sorg Nikolaus
Stara Glass
TECO Group
ZIPPE

BATCH AND CULLET HANDLING SYSTEMS

EME
Falorni Tech
Lahti Glass Technology
ZIPPE

BATCH/CULLET PREHEATERS

EME
GCG - Glass Consulting
Sorg Nikolaus
ZIPPE

BATCH PLANTS

EME
Falorni Tech
GCG - Glass Consulting
Glass Service
HFT
Lahti Glass Technology
Stara Glass
TECO Group
Tecsiglass
Vidromecanica
ZIPPE

BLOWING MACHINES

Bucher Emhart Glass
Famor Engineering
Olivotto Glass Technologies
Waltec Maschinen

BURN-OFF MACHINES

Famor Engineering
Olivotto Glass Technologies
Waltec Maschinen

BURNERS & ACCESSORIES

BDF Industries
Car-Met
Falorni Tech
Famor Engineering
GCG - Glass Consulting
KYP Accesories
Glass Service
Horn
Luben Glass
Moderne Mecanique
MT Forni Industriali
OCMI OTG
Olivotto Glass Technologies
Pennekamp
Sorg Nikolaus
Stara Glass
Tecsiglass
Waltec Maschinen

BURNERS/ LOW NOX

BDF Industries
Falorni Tech
Famor Engineering
GCG - Glass Consulting
Glass Service
Horn
KYP Accesories
Pennekamp
Sorg Nikolaus
Stara Glass

BURNERS/ OXY-FUEL

BDF Industries
Falorni Tech
Glass Service

suppliers guide

YELLOW PAGES

KYP Accesories
MT Forni Industriali
Olivotto Glass Technologies
Sorg Nikolaus
Stara Glass

CARPOULE AFTER FORMING MACHINES LINES

Moderne Mecanique
OCMI OTG

CARPOULE FORMING MACHINES LINES

Moderne Mecanique
OCMI OTG

CAST IRON FOR MOULDS

Changshu Jianhua Mould Technology
Fonderie Bartalesi
Fonderie Valdelsane

COATING OF GLASS - SYSTEMS & MATERIALS (HOT- / COLD-END)

Bohemi Chemicals
Fluorital
Graphoidal Developments
Luben Glass
Pennekamp
R.Cestaro
Tecnosens
Vidromecanica

COGENERATION AND TRIGENERATION THROUGH HEAT RECOVERY SYSTEMS

BDF Industries

COLD-END LINES

ACH - Advanced
Container Handling
All Glass
Bucher Emhart Glass
Heye International
Iris Inspection Machines
KYP Accesories
Mimsan Conveyor Systems
MSK Covertech
Pennekamp
R.Cestaro
Regina Catene Calibrate
Tecnosens
Vetromeccanica

COLOURS & ENAMELS

Bohemi Chemicals
GCG - Glass Consulting
Fluorital

CONSULTING SERVICES

AGR International Inc
BDF Industries
Bucher Emhart Glass
Falorni Tech
Bucher Automation
Fives
GCG - Glass Consulting
GS - Glass Service
HFT
Horn
Luben Glass
Olivotto Glass Technologies
Stara Glass
TECO Group
Tecsiglass
Video Systems

CONTROL & AUTOMATION SYSTEMS

BDF Industries
Bottero
Bucher Automation
Bucher Emhart Glass
Falorni Tech
GCG - Glass Consulting
Glass Service
GS - Glass Service
Lahti Glass Technology
Luben Glass
Horn
Iris Inspection Machines
Marposs
MSK Covertech
Nirox
Olivotto Glass Technologies
Stara Glass
TECO Group
Tecnoferrari
Tecnosens
Tecsiglass
VMA
Video Systems
Waltec Maschinen
ZIPPE

CONVEYING & STOCKING SYSTEMS

All Glass
MSK Covertech
Olimerk
OMS
Ramsey Products
Regina Catene Calibrate
Tecnoferrari
Vetromeccanica

CONVEYOR BELTS

Bonaiti Pietro
Bottero
Car-Met
Famor Engineering
Luben Glass
Olivotto Glass Technologies
Pennekamp
Pennine
Ramsey Products
Regina Catene Calibrate
Vetromeccanica
Vidromecanica
Waltec Maschinen
WBT
ZIPPE

CONVEYOR CHAINS & SPROCKETS (HOT-END)

Bonaiti Pietro
Bottero
Luben Glass
Pennine
Ramsey Products
WBT
ZIPPE

CRACK-OFF MACHINES

Olivotto Glass Technologies
Waltec Maschinen

CROSS CONVEYORS

BDF Industries
Bonaiti Pietro
Bottero
Bucher Emhart Glass
Car-Met
Ergon Meccanica
Famor Engineering
Heye International
Luben Glass
MT Forni Industriali
Olimerk
Pennekamp
Ramsey Products
Vidromecanica
Waltec Maschinen
WBT

CULLET SEPARATION & TREATMENT SYSTEMS

EME
Falorni Tech
GCG - Glass Consulting
Lahti Glass Technology
Vidromecanica
ZIPPE

DATAMATRIX READING DEVICES

TIAMA

DECORATING MACHINES

Fermac
Koenig & Bauer
Kammann
Pennekamp
Omso

DECORATION CUTTING MACHINES

Waltec Maschinen

DECORATIVE ENAMELS

Fluorital
GCG - Glass Consulting

DEDUSTING & FILTERING SYSTEMS

BDF Industries

DOSING SYSTEMS: COLD-END EMULSIONS

Bottero
GCG - Glass Consulting
Graphoidal Developments
Luben Glass
Pennekamp
R.Cestaro
Vidromecanica

DOSING SYSTEMS: GOB CUTTING LUBRICATION

Bottero
Graphoidal Developments
Luben Glass
R.Cestaro

DOUBLE SHELL RECUPERATOR

Stara Glass

DRIVE SYSTEMS / VARIABLE SPEED

BDF Industries
Bottero
Bucher Automation
Fives
Heye International
Olivotto Glass Technologies
Pennekamp
Tecnoferrari

DROPPER AFTER-FORMING MACHINES/LINES

Moderne Mecanique
OCMI OTG

DROPPER FORMING MACHINES/ LINES

Moderne Mecanique
OCMI OTG

ELECTRIC BOOSTING SYSTEMS

BDF Industries
Bock Energietechnik
Electroglass
Falorni Tech
Fives
GCG - Glass Consulting
Glass Service
Horn
Sorg Nikolaus
Stara Glass
TECO Group

ELECTRONIC CONTROL SYSTEMS AND IT

BDF Industries
Bock Energietechnik
Bucher Automation
Glass Service
Horn
Olivotto Glass Technologies
Sorg Nikolaus
Stara Glass
TECO Group
Tecsiglass
Waltec Maschinen
ZIPPE

ELECTRODE HOLDERS

Bock Energietechnik
Electroglass
Fives
GCG - Glass Consulting
Glass Service
Horn
Sorg Nikolaus
Stara Glass
TECO Group

ELECTRODE HOLDERSHOT AND COLD FURNACE INSTALLATION

Horn
TECO Group

EMISSION MONITORING SYSTEMS

BDF Industries
GS - Glass Service

EMULSION DOSING SYSTEMS

Bottero
Graphoidal Developments
Luben Glass
Pennekamp
R.Cestaro

ENERGY RECOVERING SYSTEMS

BDF Industries
Falorni Tech
Luben Glass
Novaxion
Stara Glass
Tecsiglass
ZIPPE

ENGINEERING SERVICES

Falorni Tech
TECO Group

ENGINEERING AND MODELLING FOR BOOSTING SYSTEMS

Bock Energietechnik
Horn

ENGRAVING MACHINES

TIAMA

FEEDERS & MECHANISMS

BDF Industries
Bottero
Bucher Emhart Glass
Ergon Meccanica
Famor Engineering
Fives
Glass Service
Heye International
Olivotto Glass Technologies
Waltec Maschinen

FIBREGLASS/ GLASSWOOL PRODUCTION LINES, EQUIPMENT & PRODUCTS

Falorni Tech Falorni Tech
Glass Service
HFT
Olivotto Glass Technologies
Stara Glass
TECO Group
Tecsiglass

FINISHING MACHINES

KYP Accesories

FIRE POLISHERS & EQUIPMENT

Bucher Automation
Famor Engineering

Luben Glass
Olivotto Glass Technologies
Vidromecanica
Waltec Maschinen

FOREHEARTHS & SYSTEMS

BDF Industries
Bock Energietechnik
Bottero
Electroglass
Falorni Tech
Fives
GCG - Glass Consulting
Glass Service
HFT
Horn
MT Forni Industriali
Sorg Nikolaus
Stara Glass
TECO Group
Tecsiglass

FORMING MACHINES

Amig - Ocmi - MT Forni
BDF Industries
Bottero
Bucher Emhart Glass
Ergon Meccanica
Famor Engineering
Heye International
KYP Accesories
Novaxion
OCMI OTG
Olivotto Glass Technologies
Stevanato Group
Waltec Maschinen

FURNACES: BUBBLING SYSTEMS

BDF Industries
Bock Energietechnik
Electroglass
Falorni Tech
GCG - Glass Consulting
Glass Service
Horn
Sorg Nikolaus
Stara Glass
TECO Group
Tecsiglass

FURNACES: CLEANING SYSTEMS

Glass Service
Stara Glass
Tecsiglass

FURNACES: DRAINING SYSTEMS

Bock Energietechnik
Falorni Tech
GCG - Glass Consulting
Glass Service
Horn
Sorg Nikolaus
Stara Glass
Tecsiglass

FURNACES: ELECTRIC

Bock Energietechnik
Electroglass
Falorni Tech
Fives
Glass Service
GS - Glass Service
Horn
KYP Accesories
Sorg Nikolaus
Stara Glass
TECO Group
Tecsiglass

FURNACES: HEAT-UP

BDF Industries
Falorni Tech
Glass Service
Horn
Sorg Nikolaus
Stara Glass
Tecsiglass

FURNACES: HOT CULLET FILLING

Falorni Tech
Stara Glass
Tecsiglass

FURNACES: MELTING

BDF Industries
Bock Energietechnik
Falorni Tech
Fives
Glass Service
Horn
MT Forni Industriali
Sorg Nikolaus
Stara Glass
TECO Group
Tecsiglass

FURNACES: METAL STRUCTURES

BDF Industries
Car-Met
Falorni Tech
Glass Service
HFT
Horn
Stara Glass
Tecsiglass

FURNACES: OXY-FUEL OR RECUPERATIVE

BDF Industries
Falorni Tech
Fives
Glass Service
HFT
Horn
MT Forni Industriali
Sorg Nikolaus
Stara Glass
TECO Group
Tecsiglass

FURNACES: PREHEATING SYSTEMS

Commersald Impianti
Falorni Tech
Glass Service
Horn
Olivotto Glass Technologies
Sorg Nikolaus
Stara Glass
Tecsiglass

FURNACES: REPAIR, MAINTENANCE & REVAMPING

BDF Industries
Bock Energietechnik
Electroglass
Falorni Tech
Glass Service
HFT
Horn
Sorg Nikolaus
Stara Glass
TECO Group
Tecsiglass

GASES

Glass Service

GLASS ANALYSIS AND TESTING SERVICES

AGR International Inc

GLASS BRICK PRODUCTION LINES

Amig - Ocmi - MT Forni
Olivotto Glass Technologies
Stara Glass
Waltec Maschinen

GLASS LEVEL CONTROL DEVICES

BDF Industries
Bock Energietechnik
Electroglass
Falorni Tech
GCG - Glass Consulting
Glass Service
Horn
MT Forni Industriali
Olivotto Glass Technologies
Sorg Nikolaus
Stara Glass
ZIPPE

GLASS METALISATION PROCESS MATERIALS

Fluorital

GLASS RECYCLING PLANTS

EME
Falorni Tech
GCG - Glass Consulting
Lahti Glass Technology
Vidromecanica
ZIPPE

GOB WEIGHT CONTROL SYSTEMS

BDF Industries
Bucher Emhart Glass
Heye International
Olivotto Glass Technologies
Waltec Maschinen

HANDLING EQUIPMENT

All Glass
BDF Industries
Bottero
Bucher Emhart Glass
Famor Engineering
Luben Glass
MSK Covertech
Olivotto Glass Technologies
OMS
Pennekamp
R.Cestaro
Vetromeccanica
Waltec Maschinen

HEAT RECUPERATORS

BDF Industries
Falorni Tech
Glass Service
Horn
Luben Glass
MT Forni Industriali
Sorg Nikolaus
Stara Glass

HEAT REGENERATION PLANTS

Falorni Tech
Glass Service
Horn
Stara Glass

HEATING SYSTEMS

Bock Energietechnik
Falorni Tech
Glass Service
Horn
Pennekamp
Stara Glass

HYBRID FURNACE & FOREHEARTH SYSTEM

Stara Glass

HYDROGEN BURNERS

Stara Glass

HOT-END PROCESS MONITORING SOLUTIONS

Falorni Tech
TIAMA

HOT GLASS CONTACT MATERIALS

Bucher Emhart Glass
Olivotto Glass Technologies

HOT GLASS SCRAPES

Car-Met
Falorni Tech
GCG - Glass Consulting
Stara Glass
Vidromecanica
ZIPPE

INFRARED THERMOMETERS

GCG - Glass Consulting
GS - Glass Service
KYP Accesories

INFRARED THERMOMETERS

Famor Engineering
Heye International
Olivotto Glass Technologies

INSPECTION MACHINES: COLD-END

AGR International Inc
Bucher Emhart Glass
Euromatic
Heye International
KYP Accesories
Iris Inspection Machines
Luben Glass
Marposs
Regina Catene Calibrate
TIAMA
Tecnosens
Video Systems
VMA

INSPECTION MACHINES: HOT-END

BDF Industries
Bucher Emhart Glass
Euromatic
Heye International
KYP Accesories
Marposs
Moderne Mecanique
OCMI OTG
Olivotto Glass Technologies
TIAMA
Tecnosens
Video Systems

INSPECTION MACHINES: VIALS & AMPOULES

Euromatic
Iris Inspection Machines
KYP Accesories
Marposs
Moderne Mecanique
Nirox
OCMI OTG
Stevanato Group
Tecnosens
Video Systems

I.S. MACHINES

BDF Industries
Bottero
Bucher Emhart Glass
Ergon Meccanica
Heye International
Novaxion

I.S. MACHINES LUBRICATION SYSTEMS

BDF Industries
Bottero
Bucher Emhart Glass
Graphoidal Developments
Heye International
Luben Glass
Novaxion

I.S. MACHINE RECONDITIONING

BDF Industries
Bottero
Bucher Emhart Glass
Ergon Meccanica
Heye International
Luben Glass
Novaxion

LABORATORY FURNACES POLARISCOPES

MT Forni Industriali

suppliers guide

YELLOW PAGES

LABORATORY TESTING AND MEASUREMENT EQUIPMENT

AGR International Inc
Marposs

LASER CUTTING MACHINES

Olivotto Glass Technologies
Waltec Maschinen

LEHR DRIVES

Fives
Heye International
Pennekamp

LEHRS: ANNEALING

Antonini
Bonaiti Pietro
Car-Met
Euromatic
Fives
Heye International
KYP Accesories
Moderne Mecanique
MT Forni Industriali
OCMI OTG
Pennekamp
Tecnosens
Vidromecanica

LEHRS: DECORATING

Antonini
Bonaiti Pietro
Car-Met
MT Forni Industriali
Pennekamp
Vidromecanica

LOW NOX BURNERS

Pennekamp
Stara Glass

MAINTENANCE AND REPAIR SERVICES

Bock Energietechnik
Bottero
Ergon Meccanica
Fives
Luben Glass
Olimerk
Pennekamp
SKS - Sorg Keramik Service
Stara Glass
Tecsiglass

MARKING MACHINES

Luben Glass
Sorg Nikolaus

MEASUREMENT & CONTROL SYSTEMS

AGR International Inc
BDF Industries
Bock Energietechnik
Bucher Emhart Glass
Bucher Automation
GS - Glass Service
Horn
KYP Accesories
Luben Glass
Marposs
Nirox
Novaxion
Olivotto Glass Technologies
Stara Glass
Tecnosens
Video Systems
VMA
Waltec Maschinen

MICRONIZATION

Stm Microtec

MILLING AND GRINDING

Stm Microtec

MIXERS

EME
GCG - Glass Consulting
KYP Accesories
Lahti Glass Technology
MT Forni Industriali
R.Cestaro
Stara Glass
Teka
ZIPPE

MOLYBDENUM ELECTRODES

Electroglass
Stara Glass

MOULDS

Changshu Jianhua Mould Technology
Officine
Perego Giancarlo

MOULDS: CLEANING POLISHING MACHINES

BDF Industries
Ecotecne
Luben Glass

MOULDS: COMPONENTS & ACCESSORIES

Changshu Jianhua Mould Technology
Officine
Olimerk
Perego Giancarlo

MOULDS: INSPECTOR SYSTEM

Luben Glass

MOULDS: LUBRICANTS & SPRAY EQUIPMENT

Graphoidal Developments
Luben Glass
Novaxion
R.Cestaro

MOULDS: MAINTENANCE EQUIPMENT

Ecotecne
Luben Glass

MOULDS: POLISHING MACHINE

Luben Glass

MOULDS: PREHEATING OVENS

Antonini
Bottero
Car-Met
Luben Glass
MT Forni Industriali
Olivotto Glass Technologies
Pennekamp
Vidromecanica

MOULDS: WELDING LINES

Commersald Impianti

MOULDS & PLUNGERS COATING SYSTEMS & MATERIALS

Commersald Impianti

NECK RINGS

Changshu Jianhua Mould Technology
Olimerk
Perego Giancarlo

PALLETIZING/ DEPALLETIZING LINES

ACH - Advanced Container Handling
All Glass

Messersì Packaging
Mimsan Conveyor Systems
MSK Covertech
Olivotto Glass Technologies
OMS
R.Cestaro
Regina Catene Calibrate
Vetromeccanica

PASTE MOULD MACHINES

Olivotto Glass Technologies

PHARMACEUTICAL LEHRS & HANDLING

Pennekamp

PLANT UTILITIES

GCG - Glass Consulting
Pneumofore
Tecsiglass

PLATINUM FEEDER SYSTEMS

BDF Industries
Glass Service
Olivotto Glass Technologies
Stara Glass

PLUNGER HONING MACHINES

Bottero

PLUNGERS & MECHANISMS

BDF Industries
Bottero
Bucher Emhart Glass
Changshu Jianhua Mould Technology
Olimerk
Olivotto Glass Technologies
Perego Giancarlo
Waltec Maschinen

POLISHING/ GRINDING MACHINES

Luben Glass
Olivotto Glass Technologies

POWER REGULATION/ TRANSFORMERS

Bock Energietechnik

PREDICTIVE SOLUTIONS

Video Systems

PRESS MACHINES

Bucher Emhart Glass
Famor Engineering
MT Forni Industriali
Olivotto Glass Technologies
OCMI OTG
Waltec Maschinen

PRESS & BLOW MACHINES

Bucher Emhart Glass
Famor Engineering
Heye International
Messersì Packaging
MT Forni Industriali
Novaxion
OCMI OTG
Olivotto Glass Technologies
Waltec Maschinen

PRESS RECONDITIONING

Famor Engineering
Luben Glass
Olivotto Glass Technologies

PRODUCTION ASSISTANCE FOR HOLLOW GLASS

Olimerk

PUSHERS

BDF Industries
Bottero
Car-Met
EME
Famor Engineering
Fives
Heye International
Luben Glass
Olivotto Glass Technologies
Waltec Maschinen

RAW MATERIALS

Bohemi Chemicals
GCG - Glass Consulting
Minerali Industriali

RECYCLING PROCESSES

EME
Lahti Glass Technology

RECYCLING SYSTEMS

Bucher Emhart Glass
EME
Falorni Tech
GCG - Glass Consulting
Lahti Glass Technology
Linco Baxo
Olivotto Glass Technologies
SIGMA
Waltec Maschinen
ZIPPE

REFRACTORIES

Tecsiglass

REFRACTORIES INSTALLATION SERVICES

Bucher Emhart Glass
Falorni Tech
HFT
Horn
SKS - Sorg Keramik Service
Stara Glass
Tecsiglass

REPLACEMENT PARTS

Fives
Olimerk
Olivotto Glass Technologies
Stara Glass
TECO Group
Waltec Maschinen

ROBOTS: BALL GATHERERS

Falorni Tech
Glass Service
Novaxion
Olivotto Glass Technologies
Waltec Maschinen

ROBOTS: HANDLING & PACKAGING

ACH - Advanced Container Handling
All Glass
Euromatic
Falorni Tech
Famor Engineering
KYP Accesories
Messersì Packaging
MSK Covertech
Novaxion
Olivotto Glass Technologies
R.Cestaro
Stevanato Group
Vetromeccanica
Waltec Maschinen

ROLLING MACHINE

Fives

ROTATING TABLES

Messersì Packaging

suppliers guide

YELLOW PAGES

Olivotto Glass Technologies
OMS
Vetromeccanica
Waltec Maschinen

SANDBLASTING MACHINE

Luben Glass

SAW MACHINES

Olivotto Glass Technologies

SECOND-HAND EQUIPMENT

BDF Industries
Ergon Meccanica
Falorni Tech
Heye International
KYP Accesories
Novaxion
Olivotto Glass Technologies
Pennekamp
Vidromecanica

SERVICES

AGR International Inc
Bock Energietechnik
EME
Ergon Meccanica
Falorni Tech
Fives
Novaxion
Olimerk
Stara Glass
TECO Group
Tecsiglass

SERVICES IN HOT-DRILLING AND CHANGE OF ELECTRODE HOLDERS

Bock Energietechnik

SHEAR BLADES

BDF Industries
Famor Engineering
Heye International
Luben Glass
WBT

SHEAR BLADES LUBRICANTS

Graphoidal Developments
Luben Glass

SHEAR SYSTEMS

BDF Industries
Bottero
Famor Engineering
Graphoidal Developments
Heye International
Luben Glass
Olivotto Glass Technologies
Waltec Maschinen

SHUTTLE CARS

Tecnoferrari

STRETCH & SHRINK FILM WRAP MACHINES

All Glass
Messersì Packaging
MSK Covertech
OMS
Tecnosens
Vetromeccanica

SHRINK OVENS

Messersì Packaging
OMS

SILKSCREEN INKS

Fluorital

SILKSCREEN PRINTING LINES: HOLLOWARE & TABLEWARE

Euromatic
Fermac

SILKSCREEN PRINTING LINES: VIALS & AMPOULES

Moderne Mecanique
OCMI OTG

SOFTWARE

BDF Industries
Bottero
Bucher Emhart Glass
Bucher Automation
GS - Glass Service
Heye International
Olivotto Glass Technologies
Stara Glass
Tecnoferrari
Tecsiglass
TIAMA
Vertech'
Vetromeccanica
Video Systems
Waltec Maschinen

SPINNING MACHINES

Famor Engineering
Olivotto Glass Technologies
Waltec Maschinen

SPOUT ELECTRICAL HEATING ELEMENTS

Bock Energietechnik

STACKERS

All Glass
BDF Industries
Bottero
Bucher Emhart Glass
Car-Met
Famor Engineering
Luben Glass
MT Forni Industriali
Olivotto Glass Technologies
Pennekamp
Regina Catene Calibrate
Vidromecanica
Waltec Maschinen

STEMWARE PRODUCTION LINES

Falorni Tech
Olivotto Glass Technologies
Vidromecanica
Waltec Maschinen

STEMWARE SEALING MACHINES

Falorni Tech
OCMI OTG
Olivotto Glass Technologies
Waltec Maschinen

STIRRERS

BDF Industries
Bottero
Falorni Tech
Fives
GCG - Glass Consulting
Glass Service
Horn
MT Forni Industriali
Olimerk
Olivotto Glass Technologies
Stara Glass
Vidromecanica

SUCTION GATHERERS

Falorni Tech
Olivotto Glass Technologies

SYRINGE AFTER FORMING MACHINES/LINES

Euromatic

SYRINGE FORMING MACHINES/LINES

Euromatic

SYRINGE FILLING INTO TRAY MACHINES/MODULES

Euromatic

SUPERVISORS MODEL BASED PREDICTIVE CONTROL

GS - Glass Service

TAKE-OUT DEVICES & EQUIPMENT

BDF Industries
Bottero
Bucher Emhart Glass
Falorni Tech
Famor Engineering
Luben Glass
Olimerk
Olivotto Glass Technologies
Ramsey Products
Vidromecanica
Waltec Maschinen

TEMPERATURE MEASUREMENT & CONTROL

BDF Industries
Bock Energietechnik
Bucher Emhart Glass
Falorni Tech
Graphoidal Developments
GS - Glass Service
Horn
KYP Accesories
Novaxion
Pennekamp
Stara Glass

TEMPERING LINES

Pennekamp
Vidromecanica
Waltec Maschinen

THERMAL CLEANING SYSTEM FOR FURNACE

Stara Glass
Tecsiglass

THERMAL SHOCK TEST MACHINES

Vidromecanica

THERMOCOUPLES & ASSEMBLIES

Bock Energietechnik
Falorni Tech
Fives
GCG - Glass Consulting
Stara Glass

THERMO SHOCK TEST MACHINES

BDF Industries

TIN OXIDE ELECTRODES & CONNECTORS

Horn
Stara Glass
TECO Group

TRAINING SERVICES

AGR International Inc

TOOLS & EQUIPMENT

Bottero
Fives
Luben Glass
Stara Glass

TUBING LINES

Falorni Tech
Olivotto Glass Technologies
Stara Glass

TURNKEY PLANTS ENGINEERING & CONSTRUCTION

Amig - Ocmi - MT Forni
BDF Industries
Falorni Tech
EME
Glass Service
HFT
Horn
Olivotto Glass Technologies
Stevanato Group
Stara Glass
TECO Group
Waltec Maschinen

UV LAMPS

Graphoidal Developments

VACUUM PLANTS & ACCESSORIES

Pneumofore

VACUUM PUMPS

Pneumofore

VIAL AFTER FORMING MACHINES/LINES

Euromatic
Moderne Mecanique
OCMI OTG
Pennekamp
Stevanato Group

VIAL FORMING MACHINES/LINES

Euromatic
Moderne Mecanique
OCMI OTG
Pennekamp
Stevanato Group

VIAL PACKAGING MACHINES

Euromatic
KYP Accesories
Moderne Mecanique
OCMI OTG
R.Cestaro
Stevanato Group

VIBRATING EQUIPMENT

EME
Lahti Glass Technology
Vetromeccanica
ZIPPE

WASTE GAS CLEANING SYSTEMS

BDF Industries

WASTE GASES DUCT WORKS AND VALVES CLEANING SYSTEMS

BDF Industries

WATER CLEANING SYSTEMS

BDF Industries
Graphoidal Developments
Luben Glass
Tecsiglass
ZIPPE

WATER COOLING SYSTEMS

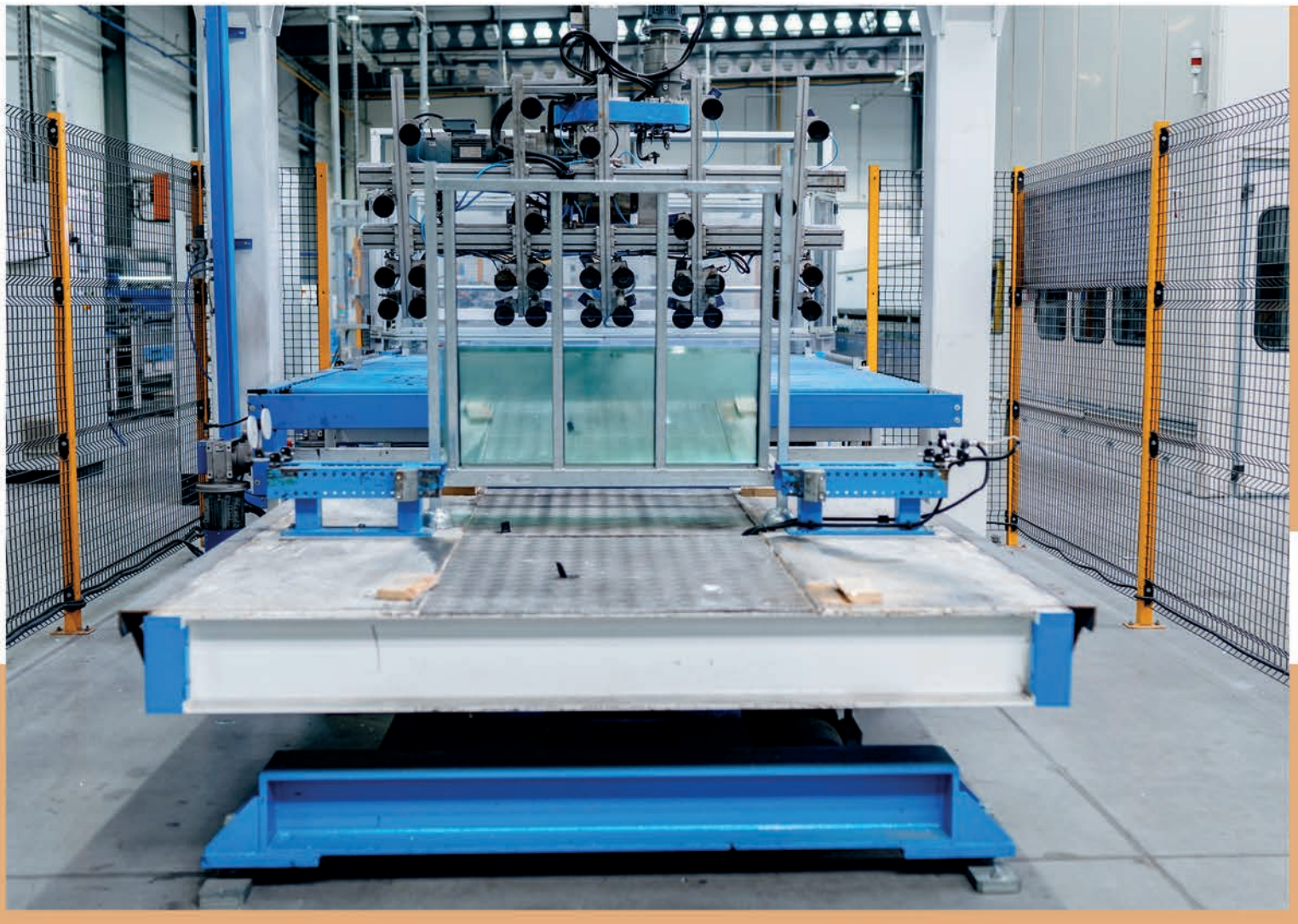
Bock Energietechnik

INTERNATIONAL GLASS MANUFACTURING SHOW

21 - 23 April 2026
Dubai World Trade Center

FROM SAND TO HANDS

EXPLORE THE FULL GLASS MANUFACTURING JOURNEY AT IGMS DUBAI 2026



GLASS-SHOW.COM

ATIV
Associazione Tecnici Italiani del Vetro

19-20 NOVEMBER 2026

AUDITORIUM SANTA ELISABETTA
UNIVERSITA' DEGLI STUDI DI PARMA
PARCO AREA DELLE SCIENZE 95,
43124, PARMA

ATIV GLASS DAYS XXXIX CONFERENCE

"Innovations in Furnace Efficiency, Glass Quality & Defects Control"

SAVE THE DATE

Call for abstracts - Submission deadline 30/06/2026

Sponsorship packages available

For enquiries or to express an interest in attending please contact us at **segreteria@ativ.eu**

Associazione Tecnici Italiani del Vetro
Sede legale: Viale Basetti 14, 43121 Parma – Italy
Cod.Fisc.: 01881950347 www.ativ.eu

Special cast irons & alloys for glass moulds

Fonderie Valdelsane S.p.A.

Strada di Gabbricce, 6 - P.O. BOX 30 - 53035 MONTERIGGIONI (Siena) - ITALY
Tel. +39.0577.304730 - Fax. +39.0577.304755 - com@fonderievaldelsane.com
www.fonderievaldelsane.com