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BI-MONTHLY INTERNATIONAL MAGAZINE FOR GLASS MANUFACTURING



YEAR 34 • ISSUE NO. 5/2021

Special cast irons & alloys for glass moulds



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SmartLine 2 from HEYE: Where special becomes normal

Enabling vaccine delivery and reducing carbon footprint thanks to **GLASS SERVICE**

MARABU and KOENIG & BAUER: Collaboration to launch an innovative digital printing solution for glass

AI visual inspection from **BUCHER EMHART GLASS** for improved performance and reliability

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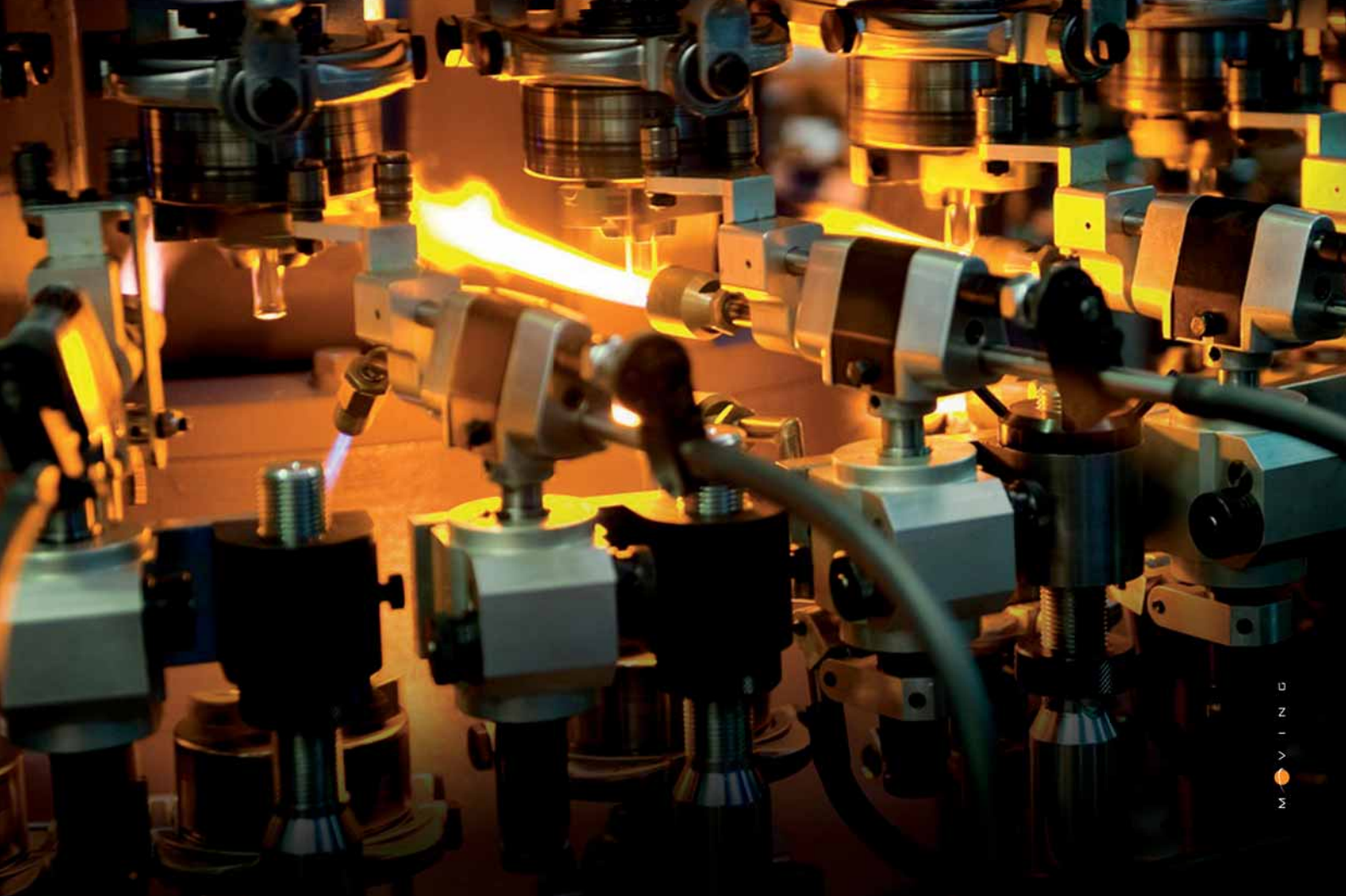
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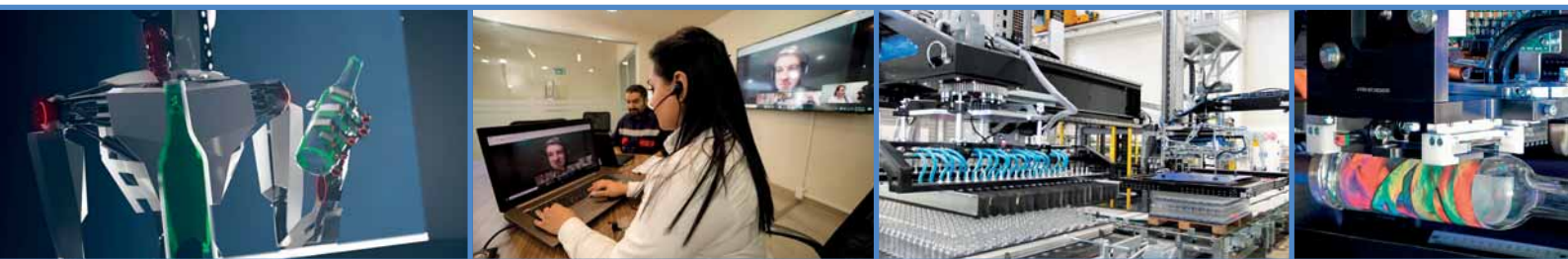
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**Special cast irons & alloys
for glass moulds**

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Don't just look at it, look into it.

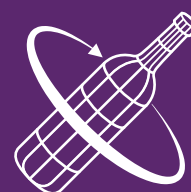
Tiama Xlab – the revolutionary 3D sampling solution

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This highly flexible laboratory module can be installed at the hot end, the cold end or in the laboratory. It loads the container automatically and makes a 3D scan, generating an image composed of millions of facets.

The 3D image can be rotated and "dissected" on all sides. Virtual volume, capacity, and vacuity can be measured as well as glass distribution fully mapped. You can also analyse engraving, embossing and much more. Practically all container types and shapes can be inspected and it's non-destructive because the image (and not the container itself) is "cut" virtually.

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


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Glass furnaces




Glass Service Italy is a 100% Italian company priding itself on **excellence and innovation**. Servicing the **global glass industry** for more than 40 years, GS designs and manufactures **highly-specialized furnaces, automations and systems** and also offers **tailor-made technological solutions**. Our expert engineers work side by side with customers to **provide extensive training, dedicated customer support** and complete **after-sales assistance** for the entire life of the plant.

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STEVANATO GROUP

Debut on the New York Stock Exchange

Stevanato Group S.p.A. celebrates its debut on the New York Stock Exchange under the ticker symbol "STVN." Founded by Giovanni Stevanato in 1949, the company is a leading global provider of drug containment, drug delivery and diagnostic solutions to the pharmaceutical, biotechnology and life sciences industries.

"It is an honour for Stevanato Group to join the New York Stock Exchange and begin the next chapter in our storied history," said Franco Stevanato, Executive Chairman of the Board of Directors of Stevanato Group. "The needs of our customers have always been a driving force behind our decision making in the markets we serve. Listing is the logical next step for our

company and will enable us to further strengthen our integrated offering, increase market penetration across our business segments and accelerate growth. I am proud of what we have achieved and excited for our future as a listed company."

"This is a very exciting time for Stevanato Group," commented Franco Moro, Chief Executive Officer of Stevanato Group. "Our top priority remains driving continuous innovation through our unique engineering services to produce the highest quality drug containment and drug delivery solutions, to help simplify healthcare for patients worldwide."

Moro continued, "As a listed company, we intend to continue to build on our leadership position within the drug development and delivery value chain through further investment in research and development and the expansion of our global footprint and capabilities."

WWW.STEVANATOGROUP.COM

AMETEK LAND

Thai Glass increases quality with thermal imaging

AMETEK Land, a world leader in high accuracy, non-contact temperature measurement systems, has enabled a leading Thai glass producer to optimize its production quality with the installation of a high-performance temperature monitoring system.

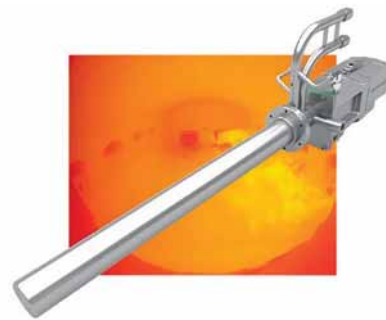
Thai Glass, one of the leading container glass producers in Thailand, was looking to replace its traditional CCTV cameras in its glass melt tanks with a system that would add both visual and temperature measurement to its process control. AMETEK Land's NIR-Borescope-656-Glass thermal imaging solution produces high-definition thermal images and highly accurate temperature measurements in the range of 1000 to 1800°C (1832 to 3272°F).

The NIR-B-656-Glass was installed into the melt tanks, providing round-the-clock monitoring, and allowing a Thai Glass operator to view the melting of the batch, and monitor furnace refractory conditions.

A spokesperson for Thai Glass said, "We have seen significant advantages of using AMETEK Land's NIR-B-656-Glass in terms of process optimization and quality control. The data obtained is invaluable in enabling us to monitor batch flow closely and to ensure optimum efficiency in the operation of the melt tank."

Phillipe Kerbois, Glass Sector Manager at AMETEK Land, said, "Glass producers worldwide are looking for more robust thermal imaging solutions that provide much more than just CCTV images. Our systems offer a truly unrivalled data-driven solution to the challenge of effective temperature measurement of glass melt tanks, and increase production efficiency."

WWW.AMETEK-LAND.COM



VMA

Visuelle Messtechnik
und Automatisierung

VMA

New logo-design represents the four business divisions

VMA's new logo-design represents the four business divisions more than ever: container glass, flat glass, laboratory measuring equipment and special solutions. It distinctly communicates the company's core competence and reflects the solution-oriented approach with its straightforward and pragmatic design.

"We remain dedicated to be a persistent quality partner for our customers in the glass industry. With its timeless design, the logo is the perfect companion for new, ground-breaking projects," said Nico Thomae, Managing Director of VMA GmbH.

In the course of changing the logo, the VMA website was fundamentally revised. The four business divisions are clearly at focus. The updated content and new layout provide a quick and comprehensive overview of the company, product range and services.

WWW.VMA-ONLINE.DE



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HORN

Construction of 560 t/d furnace for Bastürk Cam

Glass melting technology specialist **HORN** is to build a 560 t/d end fired furnace for **Bastürk Cam** at its Malatya plant in Turkey. The new furnace is designed with



six forehearths for the production of container glass. In appliance of the most advanced technology, the furnace will have a melting area of 185.4 m² to produce flint glass. Heating of the furnace will be effected by means of natural gas or back-up diesel oil burners.

In addition to producing jars and bottles, Baştürk Cam is able to quickly respond to the diverse demands of its business partners with bespoke products. Baştürk Cam glass packaging production facility with its state-of-the-art technology machinery, high energy efficient furnace and high automation system has become one of the preferred glass packaging manufacturers in the world.

HORN's scope of supply includes the engineering of the refractory and steel structure, the Combustion System, Boosting System, Measuring and Control equipment, a new HORN HVR® 600F batch charger, supervision of erection, heat-up and commissioning.

Installation is planned to start in the second quarter of 2022.

WWW.HORNGLOSS.COM/

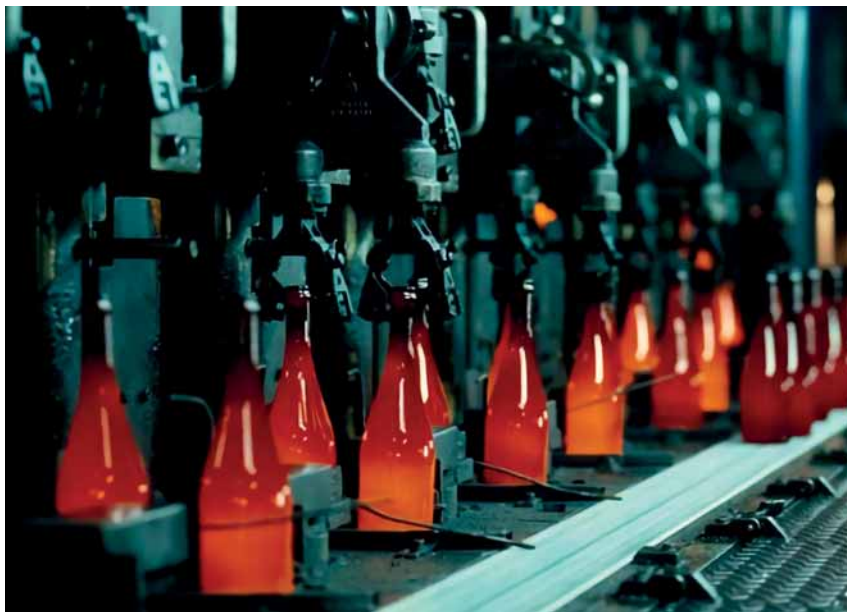
FEVE

Carbon Border Adjustment Mechanism

In the absence of equivalent measures taken by other regions of the world regarding carbon pricing, the Carbon Border Adjustment Mechanism (CBAM) is one of the possible options to protect EU industries against the risk of carbon leakage. In this respect, CBAM deserves to be carefully examined.

However, **FEVE** is of the opinion that, at this stage, it is extremely difficult and somehow premature to answer some precise questions without knowing exactly how CBAM will be organised. Some options proposed in the consultation (e.g. choosing between the four different types of CBAM as proposed by the Commission) may feel attractive under certain circumstances (e.g. co-existence of free allocation, support to exports, etc.), but can raise serious concerns if those circumstances are modified.

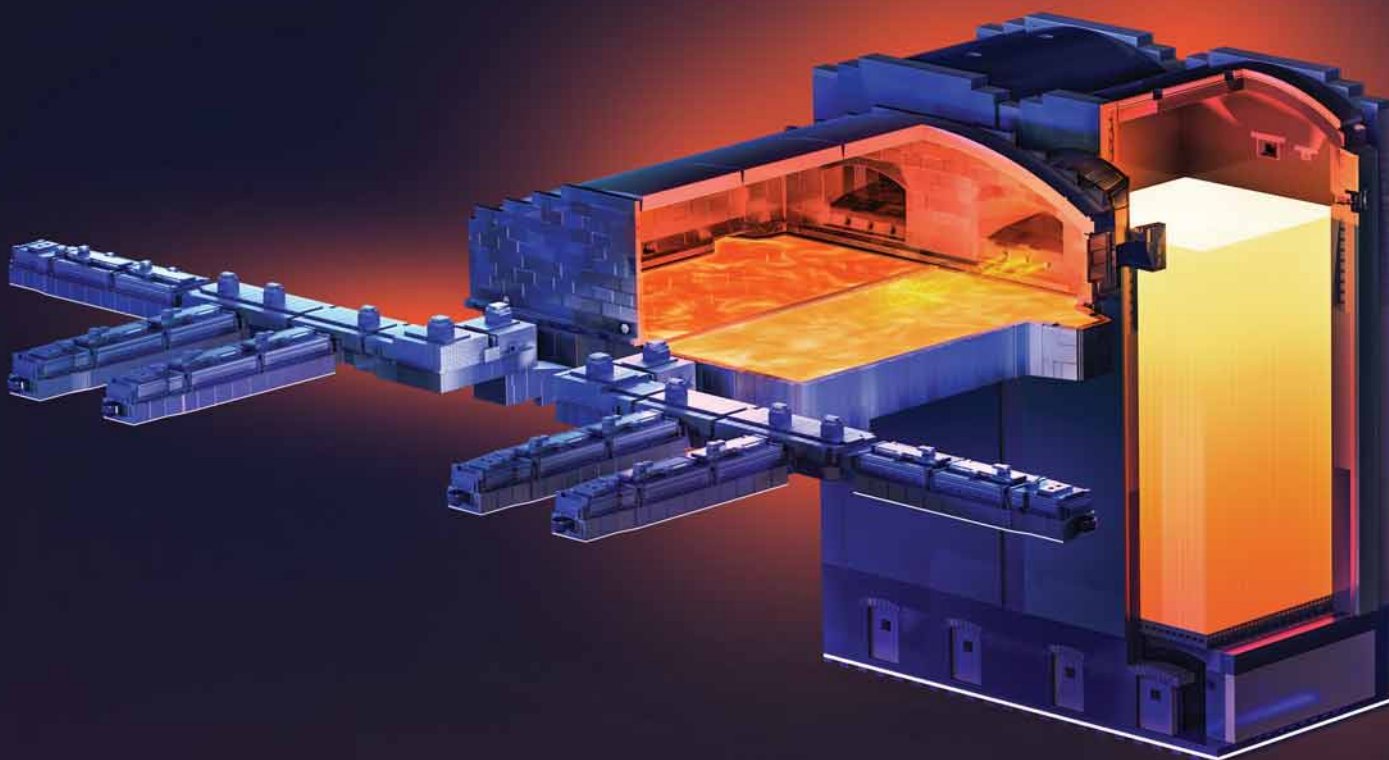
With this in mind, FEVE has decided to answer only those questions from the consultation which are unambiguous, leaving the others blank.



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ITALY

Hydrogen project launched to decarbonise the glass industry

A working group comprising Snam, RINA, *Bormioli Luigi*, *Bormioli Rocco*, STARA GLASS, Università degli Studi di Genova, *Stazione Sperimentale del Vetro*, IFRF Italia, SGRPRO and RJC SOFT have begun collaborating to reduce emissions in the glass industry through hydrogen.

The manufacture of glass objects – of which Italy is the second-largest producer in Europe with over 5 million tonnes per year – is energy-intensive and difficult to power with electricity. To this end, the “Divina” project (Decarbonisation of the Glass Industry: Hydrogen and New Equipment), co-ordinated by Snam, RINA and Bormioli, aims to reduce emissions in the glass melting stage, which accounts for more than 50% of total energy consumption throughout the production process.

In this regard, the availability of an energy source such as hydrogen can provide a viable solution by optimising its use in terms of energy and emissions and managing production and transport challenges.

Marco Alverà, CEO at Snam, said, “Hydrogen will play a key role in decarbonising energy-intensive sectors such as glass production in order to meet domestic and European climate targets. This project complements what we are already doing in the steel, rail transport and ceramics sectors. Snam will be able to draw on its infrastructure and expertise to facilitate the introduction of hydrogen in industry, bringing benefits in terms of economic growth.”

Ugo Salerno, President and CEO of RINA, commented, “We are continuing to work with Snam and other companies to contribute to the ecological transition of the major energy-intensive chains. Following the first test with a mix of natural gas and 30% hydrogen in steel processing that we carried out in May, our expertise and laboratories are also being used for the ‘Divina’ project, an important milestone towards the decarbonisation of another of the most significant sectors in the Italian economy.”

Vincenzo Di Giuseppantonio, CEO of the Bormioli Luigi Group,

remarked, “As heirs to one of Europe’s oldest industrial traditions, high-quality glass production, we want to play a leading role in the decarbonisation of our industry, which is classified as hard-to-abate. The partnership with leading players in the energy sector, the glass industry and academia makes the Divina project a sound and concrete proposal for a path to green transition and sustainability.”

The initiative will make it possible, in the short to medium term, to assess the results of introducing an increasing proportion of hydrogen blended with natural gas into existing melting furnaces operating under regular production conditions. Testing significant quantities of hydrogen on operational furnaces will be an opportunity to evaluate the compatibility of hydrogen combustion with glass material in real industrial production contexts following appropriate testing in laboratories.

Today, the main energy source used by glassworks is natural gas and CO₂ emissions amount to around 1,500,000 tonnes per year: overall, around 3.5% of the emissions of the entire manufacturing industry. Nationwide use of a 30% hydrogen blend in glass melting processes would reduce emissions by 200,000 tonnes, equivalent to the emissions of around 100,000 cars.

The project will also define and subsequently optimise the design rules for future furnaces – so-called “Furnaces 4.0”, which can guarantee the best performance even with higher hydrogen percentages up to 100%.

The all-Italian working group represents the entire value chain since it involves specialists in the energy sector, top-level glass groups, fuel production and transport operators, leading companies in certification and integration of complex systems, companies that design glass melting furnaces as well as university and research centres.



VIDROMECHANICA

Ensuring more efficient operations

Vidromecanica produces modern mould preheating kilns, adapted to glass industry demands, furnished with advanced temperature controls and heating systems. The company uses three different heating systems, which are chosen according to production demands:

- Gas with direct flame;
- Gas with isolated flame;
- Electrical.

A special design of the inside chamber and recirculation ducts, and the use of a re-circulator with adequate features according to the heating type, are fundamental for an excellent performance of the equipment.

To place the moulds inside there are mould carrier carts with

special wheels and charging tables, where the moulds are placed to be heated and withdrawn when they come out of the kiln.

The automatic operation of the carts and of the door opening and closing allows for smooth operation and energy saving.

The standard kilns can have up to four mould carrier carts and four independent doors, that allow placing the moulds by sectors and decrease the energy losses when taking the mould out. Vidromecanica has developed and improved an oven type in which the carrier cars are mobile and can circulate throughout the manufacturing floor, facilitating the transport of the moulds. This eliminates transfer operations, making the job of operators easier and faster.

[HTTP://VIDROMECHANICA.PT/EN/](http://vidromecanica.pt/en/)



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GLASS MACHINERY TECHNOLOGY



OLIVOTTO GLASS TECHNOLOGIES

Entering the container glass arena

Olivotto Glass Technologies (OGT), a leading company in the production of machines and equipment for tableware, technical glass and pharma tubing, expands its product range by entering in the container glass field. With more than 75 years of activity, in the rotary automatic forming machine for tableware and stemware, Olivotto Glass Technologies is undoubtedly recognized at the worldwide level, as one of the main players, in the design and manufacturing of Hollow Glass forming machines using rotary technology.

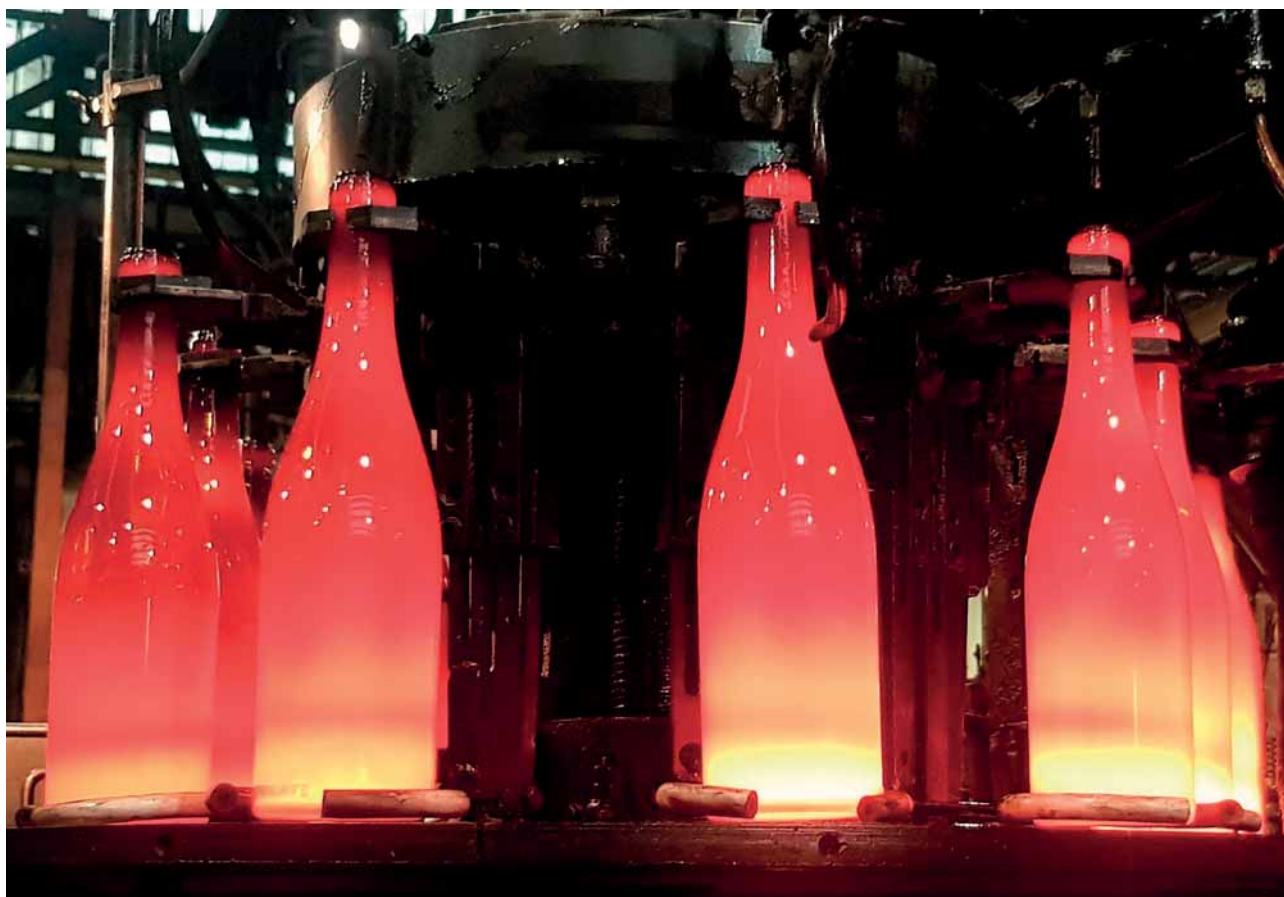
OGT has now decided to leverage its consolidated technology know how on rotary forming machines, applying it to container glass. A modular forming machine, innovative for operations mode (continuous rotary) and for the new forming process ARBV (Advanced Rotary Blow Vacuum).

Quick job change is one of the major characteristic of the new machine, therefore it fits very well to the needs of the producers who have an intense model mix in their production flow; in addition it is suitable to work with low-medium glass pull rate capacity giving flexibility to the container glass manufactures.

The OGT rotary machine ensures premium quality products with low costs of production and maintenance, a significant advantage versus traditional container forming machines actually available in the market.

The first OGT rotary machine for container glass production, CGM-7, was delivered and successfully commissioned at the end of 2020, at an Italian plant of one of the largest and most important producers of container glass in the world. More rotary machines are being delivered in this period

WWW.OLIVOTTO.IT/



INTO THE CONTAINER GLASS ARENA



Forming Process ARBV
Advanced Rotary Blow Vacuum



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CINER GROUP

Domestic investments at full speed ahead

Oğürsel Usta, the CEO of **Ciner Group**, stated that the group is increasing soda ash capacity by 600 thousand tonnes, and that the investment was approximately USD 100 million. He added that the company is continuing to invest because after the pandemic there was an increase in demand for different products.

During a live interview with Bloomberg HT, Mr. Usta also said that the said investment was to be completed by the end of next year.

"In the last five years, we made approximately USD 4 billion worth of investments. As Ciner Group, we have a spirit that loves investing. Therefore, primarily we gave green light to an investment that will increase soda ash capacity by 600 thousand tonnes just because we saw an increased demand there. The amount of this investment is nearly USD 100 million, thanks to scale economy the investment amount is decreasing. Said investment will be completed by the end of next year. Our current capacity there is 2.7 million tonnes. When this additional capacity comes, our total capacity will be 3.3 million tonnes. This will give us additional USD 200-250 million worth of export opportunity. I am honoured to say that this is a 100% value-added export. We already export 85% of our total production.



"We have two furnaces in Bozüyük for glass packaging, and now we are building the third one. This is also an investment that was already given green light. This new furnace will be operational after the first half of next year. We have all the necessary permits for two furnaces of 650 tons in Ankara Kazan. We also applied for incentives, and they are about to arrive. This also means an investment of almost EUR 260 million.

"We are the most eco-friendly company in the soda ash business. We produce based on solution mining. To put it in an easy comparison context, the water amount we use and our waste amount is between one-fifth and one-tenth of what the other best companies consume, whereas our energy consumption is three times less than the others. We are the only firm certified for green products. This certificate is given to companies that are able to produce the most optimum products using the minimum resources, and we have that certificate. Our carbon emission is half of the best companies in Europe.

"Our primary objective is to fill the gap in the market. Turkey produces very qualified glass packaging. The support coming from the currency side is crucial, thanks to that support we have more and more exporting opportunities. Within this framework, when we plan our investment within this framework, we will have additional EUR 150 million worth of export."

WWW.CINERGROUP.COM.TR/EN/ABOUT-US

EME

Partnership continues with Indian solar glass producer Borosil

After a successful upgrade and expansion project in 2019, **Borosil Renewables** and **EME GmbH** continue their partnership. Borosil is expanding its low iron solar glass production capacity with an additional furnace in order to meet increased demand arising from the popularity of photovoltaic panels, flat plate collectors and green building concepts around the world.

EME is designing and supplying the key equipment for the raw material intake, batch plant and cullet return system. The batch plant is specially engineered with future expansion in mind and has the potential to be to the largest batch plant in India.

WWW.EME.DE/GB/INDEX2.HTML





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NIPRO

New facility groundbreaking in Aumale

As announced in 2020, Nipro is investing over USD 60 million in its facilities in France and the US. With this investment, Nipro strengthens its position as a leading global supplier of glass primary packaging for the pharmaceutical industry. The investment addresses the global increase in quality and demand, as well as supports Nipro's growth in its pharmaceutical packaging business. In France, the investment means the construction of a greenfield operation.

On 15 June, the works for the greenfield operation started with an official groundbreaking ceremony by Stephan Arnold, Jean-Michel Rat, and Pierre Sinoquet, supported by François Mozzo – Director of Emdelen, Nipro's construction partner.

"Congratulations – the future of Nipro begins here and now in Aumale. On behalf of Nipro Japan, I want to wish the team lots of success on this big journey. We take pride in you stepping up to contribute to Nipro's responsibility to society and join its mission of improving patient outcomes and healthcare worldwide."



Stephan Arnold, CEO Nipro PharmaPackaging International, said, "We have come a long way with this site in Aumale. We are celebrating our 150th anniversary this year and have had a long history with many different partners."

"When we joined Nipro in 2011, we immediately felt a very strong sense of commitment. This commitment resulted in the biggest investment ever in this plant's history. Together with my team here, I look forward to a stronger future in France. I want to thank Nipro for its trust in us, and I want to thank the team for their relentless efforts in getting this project started. Together, we are building the future here!"

Pierre Sinoquet, Operations Manager at Nipro PharmaPackaging France, added, "You will notice that we are building a completely new infrastructure. This will be an addition to our current manufacturing facility; it is not a replacement. As said before, our market grows, Nipro grows, and thus our tubing capacity also needs to grow. And it is thanks to you – our colleagues – thanks to your good work and your expertise that we have been able to gain the trust of Nipro to invest here. We will need more talent to join us, and we will continue to count on you. Remember, "Ici, on construit le futur!" – today IS a big day!"

WWW.NIPRO-GROUP.COM/EN

GROUPE POCHET

New CEO appointed



Groupe Pochet, a French producer of high-end packaging for the beauty market has announced the promotion of Xavier Gagey to the role of Chief Executive Officer and member of the Executive Board, effective 1 September 2021.

Xavier Gagey was in charge of the Group's Glass Division. He is taking over from Tristan Farabet, who is focusing on personal projects after having dedicated himself since 2014 to the modernisation of the Group's organization and its competitiveness.

Irène Gosset, Chairman and shareholder of the Groupe Pochet, said, "I would like to warmly thank Tristan Farabet for his decisive action in the service of the Group over the past seven years and for the significant progress made. This positive momentum now enables us to look to the future with confidence and to open a new page in the Group's history."

WWW.GROUPE-POCHET.FR/EN/



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WHEATON

Use of biomethane in the production of glass

Wheaton, a Brazilian manufacturer of perfume and cosmetic glass, announced they plan to use biomethane in the productive process.

In partnership with ZEG, a provider of technology and systems for production of clean hydrogen and/or electricity from hydrocarbon gas, Wheaton will implement biomethane as an energy source in the production process.

The initiative will save the emission of approximately 7,000 tons of CO² in one year, which equates to more than 50,000 trees planted over a 20-year period.

Incorporating renewable energy sources into its production represents uniting technology, sustainability and innovation, as well as symbolizing the ideals of Wheaton and its customers.

WWW.WHEATON.COM.BR/EN/



HORN®

New furnace order from HEINZ-GLAS

With glassmaking in the family as far back as 1523, today, the **HEINZ-GLAS Group** is one of the leading manufacturers of glass flacons and caps for the perfume and cosmetics industry. HEINZ-GLAS produces attractive, individually designed flacons and jars made of crystal-white transparent glass, white opal glass and feeder-coloured glass.

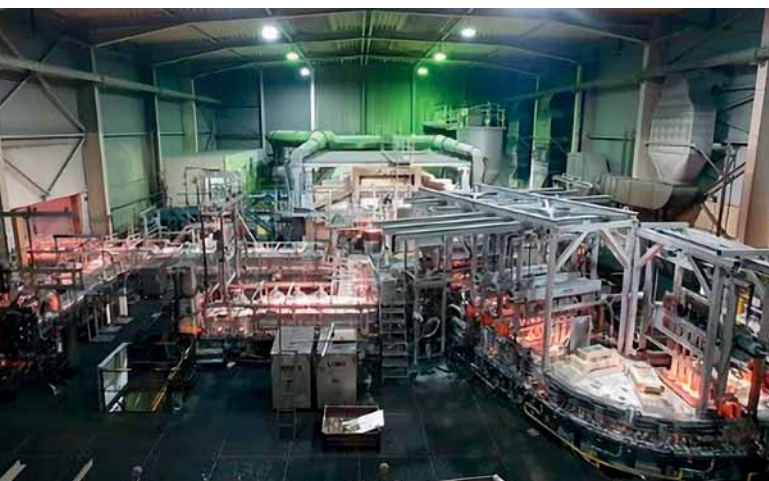
In February, the glass melting technology specialist **HORN® Glass Industries AG** received the order to repair

furnace 7 of the glass flacons and caps manufacturer HEINZ-GLAS at the Piesau plant in Germany. The order comprises a 49 m² end fired furnace with six forehearth for the production of flacons. In the future, the plant will produce 135 tonnes of flint glass per day.

The scope of supply consists of the design of the melting tank, distributor and the forehearth as well as the steel structure. Furthermore, HORN® will supply the equipment for heating, measuring and control, boosting, over the reversing system up to the batch charger HVR® 400 as well as further furnace equipment.

The entire construction as well as the commissioning is supervised and managed by HORN®.

WWW.HORNGLOSS.COM/



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SGD PHARMA

JIC and PAI Partners in final sale negotiations



PAI Partners ("PAI"), a leading European private equity firm, announced that it has made a binding offer for the acquisition of SGD Pharma, a leading global manufacturer of primary glass packaging for the pharmaceutical industry, to China Jianyin Investment Ltd. Headquartered in France, SGD Pharma employs 3,200 people worldwide, with a network of five industry-reference plants located in France, Germany, China, and India. It supplies Type I, II and III, moulded and tubular, amber and flint glass packaging to a wide range of customers including international pharma laboratories, generics manufacturers, CDMOs, biotechs, and wholesalers. SGD Pharma is known in its industry for the quality of its products, its reliability and service levels, and its unique innovation capabilities.

Under JIC ownership, the Company has continuously invested in its industrial footprint and further accelerated its innovation efforts, strengthening its leadership and developing strong positions in attractive higher growth, as well as value, segments and geographies. Christophe Nicoli, Chief Executive Officer of SGD Pharma, said, "By investing in cutting-edge manufacturing technologies, in taking the lead on sustainability and through constantly improving the service level it offers to its clients, the SGD Pharma teams have built a solid platform for performance and growth under JIC's ownership. We are now thrilled to contemplate the next stage of SGD Pharma's development with PAI – an experienced and supportive partner."

Laurent Rivoire, a Managing Partner at PAI Partners, commented, "We look forward to finalising the acquisition of SGD Pharma from JIC. We have closely followed the development of SGD Pharma over the years and have been impressed by the progress made under the leadership of a talented management team. From this solid base, our ambition is to accelerate SGD Pharma's growth trajectory through organic and external initiatives, mobilising PAI's resources and expertise in the packaging and healthcare industries."

The contemplated transaction will be submitted to the relevant employee representative bodies of SGD Pharma and be subject to the finalisation of the process required by the Ministry of Finance of China. The completion of the contemplated transaction would be subject to antitrust approvals.

PAI Partners is advised by Citi and Rothschild on M&A, Willkie Farr Gallagher on Legal, 8Advisory on Finance and Tax, Bain & Company on Commercial, and KPMG on Environment.

JIC is advised by BofA Securities on M&A, Bredin Prat on Legal, PwC on Finance and Tax, Roland Berger on Commercial and ERM on Environment.

WWW.SGD-PHARMA.COM/

EME

Turnkey job at HEINZ-GLAS Dzialdowo in Poland commenced

After receiving an order for a cullet preparation and batch transport system from HEINZ-GLAS at the end of last year, EME recently has started with the installation of the building and equipment in Dzialdowo, Poland.

The supplies and services are being executed on a turnkey basis and include the complete hot and cold end factory cul-

let system, as well as the feeding and storage of external post-consumer recycled glass.

WWW.EME.DE/





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Maref



TEC REF RANGE OF PRODUCTS

QUANTUM ENGINEERED PRODUCTS

Equipping of 12 section machine at GCA

The Quantum Engineered Products production support team has installed equipment for a 12 section machine at GCA (Gürallar Cam Ambalaj) glass container factory located in Kutahya, Turkey. The equipment includes Plunger Mechanisms, Process Equipment, and also a TFA™ Process Controller.

Quantum's Tube-Within-a-Tube (TWT®) was installed on all 36 cavities connected to Quantum's TFA™ (Total Forming Analysis) process controller. Quantum is proud to successfully commission its first machine at GGA after trials and COVID-19 challenges.

GCA operates within the body of the Turkish Gürok Group which has brought its expertise in glass production to consumers and business partners for 25 years. At the GCA production facilities located in Kütahya, every stage from production processes to quality control and packaging processes is carried out with the latest technology and full automation systems. With the second furnace investment, which started operating in 2021, GCA nearly doubled its capacity and currently has export operations to more than 40 countries.

Quantum Engineered Products has been committed since its creation in 1976 to helping glassmakers keep glass as the best packaging choice. Quantum specializes in blank side forming equipment such as quality Plunger Mechanisms for any IS Machine; Process Equipment for BB, PB, and NNPB; Process Controller (TFA™) with full stroke real time sensor to manage gob weight.

WWW.QUANTUMFORMING.COM/



SCHOTT

New tubing facility in China announced

Building a melting tank for high-quality pharma glass tubing requires extraordinary skills. Despite the pandemic, a team of German and Chinese experts managed to complete the construction of the factory in record-breaking "China speed" of just 15 months.

"Of course, our glass stands at the very beginning of an ambitious value chain. But it's one piece of the bigger picture: Turning the vision of "Healthy China 2030" into reality. We're very proud that it also marks the first time that SCHOTT is melting glass in China," said Dr. Frank Heinrich, Chairman of the Management Board of SCHOTT.

"As the most modern tubing production site worldwide, it is equipped with state-of-the-art manufacturing technology. Through our local glass production, we enable a faster and improved supply chain that will subsequently help to improve packaging quality," added Dr. Patrick Markschräger, Executive Vice President of SCHOTT's Business Unit Tubing. With the

help of big data and artificial intelligence, each tube is inspected 100% based on the company's perfeXion® process, which is also in place in SCHOTT's other pharma tubing manufacturing sites.

Borosilicate glass, known under the SCHOTT brand name FIOLAX®, has been the preferred choice of material for pharmaceutical packaging since the company's founder Otto Schott first developed it around 1890. The highly inert glass protects drugs from unwanted drug-container interactions, making it an ideal packaging material for life-saving drugs. More than 90% of all approved COVID-19 vaccines rely on SCHOTT's glass tubing.

The manufacturing site will support the move away from the low borosilicate glass (so called 7.0 glass type) to the higher quality middle borosilicate glass (so called 5.0 glass type), which is already well established globally.

WWW.SCHOTT.COM



GHANI GLOBAL GLASS

Filing for new plant in Serbia

In a report filed with the Pakistani Stock Exchange, **Ghani Global Glass Ltd. (GGGL)**, the largest producer of neutral glass tubing in Pakistan, announced the approval of a memorandum of understanding (MOU) between themselves and Serbia-based company to set up a plant in Serbia.

While a location has yet to be announced, the initial investment cost projection of USD 2 to 2.5 million suggests that the companies will be looking to outfit an existing location with new equipment. GGGL will form a joint venture with the Serbian company, with a 50% sharing ratio, for the production of glass vials and ampoules made from glass tubing supplied by Ghani .

GGGL reportedly expects to invest an additional USD 9 million once the facility is up and running, and will use its own resources to invest in the further development of the proposed plant.

The opening of a plant of this type is expected to lead to exportation of GGGL products to Europe.

[HTTP://GHANIGLOBALGLASS.COM/](http://GHANIGLOBALGLASS.COM/)



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FEVE

Furnace for the Future project – final application submitted

Furnace for the Future was selected in March 2021 as one of the top 70 projects from 311 applications submitted for the EU Innovation Fund, one of the world's largest funding programs for the demonstration of innovative, low-carbon technologies. As part of the process, the industry has now submitted a more detailed second-stage application. "As we enter the second phase of the Innovation Fund application, we remain convinced that this project will greatly contribute to further expanding the leading role of sustainable glass packaging. The support from public institutions and



from our value chain partners has been much appreciated in this process," said Vitaliano Torno, FEVE President.

"Excellent collaboration across the industry and a broad level of expertise from all partner companies have further advanced the project. Glass is endlessly recyclable and ensures quality no matter how many times it is recycled. It preserves the taste and safety of the foods and beverages it protects," added the FEVE President.

The Furnace for the Future project is a breakthrough technology, enabling the industry to switch to renewable electricity and cut CO2 emissions by up to 60% in the furnace (50% across the whole factory). More details on the Furnace for the Future project are available on the FEVE website.

[HTTPS://FEVE.ORG](https://feve.org)

VPINSTRUMENTS

New firmware for VPFlowScope M flow meter

VPInstruments announced new firmware for the Transmitter of the VPFlowScope M flow meter. Firmware 2.2.0 has improved reliability and stability, with this new firmware the VPFlowScope M is even easier to use. Simultaneously, VPInstruments released the VPStudio 3 software to configure and readout the VPFlowScope M.

The VPFlowScope M provides a complete solution for compressed air and technical gas flow measurement. It covers the entire compressed air system, from supply to demand side. Thanks to the built-in pressure sensor and temperature sensor, the VPFlowScope M is a powerful tool to detect what is really going on in your system.

Improvements of the VPFlowScope M firmware and VPStudio 3:

- Easier data logging: No need any more to start/stop your VPFlowScope M data logger. The VPFlowScope M features now a one-year circular memory. When you power your flow meter, your parameters (flow, pressure, temperature) are automatically recorded once per second. Via VPStudio 3 you can select the required period and data interval for your data analyses.
- New graphical display. With a new look & feel, the display can be customized to show one, two or three parameters. Moreover, the display can be adapted according to the surroundings by having black text on a white background or vice versa.
- Unified Modbus functionality. All Modbus functionalities are equally available over RS485 & Ethernet.
- The pipe diameter can now be stored in the Transmitter, so you can replace the VPSensorCartridge without losing your setting.
- The data logger CSV export settings is replacing the prior Project Module, making data export more intuitive and easier.

Customers can now update their VPFlowScope M Transmitter free of charge (only when the VPSensorCartridge has S/N 6100658 or higher). Updating goes via a VPFlowScope M Firmware Updater, which is enclosed with VPStudio 3. It is important to read the complete release notes and follow the upgrade instructions carefully, before updating.

WWW.VPINSTRUMENTS.COM/



ZIPPE

Greenfield plant for Verallia delivered and commissioned

At the beginning of 2021 container glass manufacturer **Verallia** celebrated the inauguration of its eleventh production furnace and demonstrated its intention to continue investing in Italy, strengthening the Villa Poma facility.

ZIPPE Industrieanlagen GmbH was selected to make a major contribution to this extensive project by designing and realizing the complete batch & cullet system for this new furnace.

It is the second furnace modernisation at the Villa Poma site since 2019. Verallia has invested EUR 60 million into this project, this investment comprises most modern production and environmental technologies.

The plant went into operation successfully in March. Towards the middle of the year, the batch plant will be extended by two sand silos, for which ZIPPE will supply the dosing and weighing equipment.



WWW.ZIPPE.DE/EN/

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special solutions





VETRERIE RIUNITE

From Verona to China

The world leader in the production of glass portholes for the household appliance market, **Vetrerie Riunite Group**, reached an agreement for the acquisition of a majority stake in the share capital of Suizhong Ming Hui Industrial Technology Co, Ltd (Minghui), one of the largest Chinese appliance glass manufacturers and the leading Chinese manufacturer of glass portholes for washing machines serving the largest companies in the industry.

Since December 2019, the Verona-based company with over 400 employees with an estimated turnover of EUR 100 million in 2018, is controlled by a company affiliated with the private equity fund Sun European Partners (Sun).

Within the year the acquisition will be concluded, after which the founders of Minghui will remain important minority shareholders and managers of the company. Finally, the agreement is part of an important strategic move: Vetrerie Riunite Group opening up to China has the possibility to "strengthen and increase its presence, benefiting both from the rapid growth of the domestic market and from export opportunities."

"Minghui expands our presence in a rapidly growing Chinese market and positions VR Group as one of the only truly global manufacturers of washing machine doors, with factories in Europe and China, and with the ability to serve its customers around the world. The operation will also strengthen our leadership in the washing machine porthole market," said Davide Vassena, CEO of Vetrerie Riunite Group.

"We will continue to consider further acquisitions in a dynamic and fast-growing industry," said Massimo Vendramini, vice president of Sun.

[HTTPS://VETRERIERIUNITE.IT/EN/](https://vetrieriunite.it/en/)

BDF

E.A.G.L.E. 3.1 AIR

The system **BDF E.A.G.L.E. 3.1 AIR Enhanced Absolute Glass Level** (patented) allows to measure the glass level through the optical reflection of a fixed pointer mounted out of contact with glass.

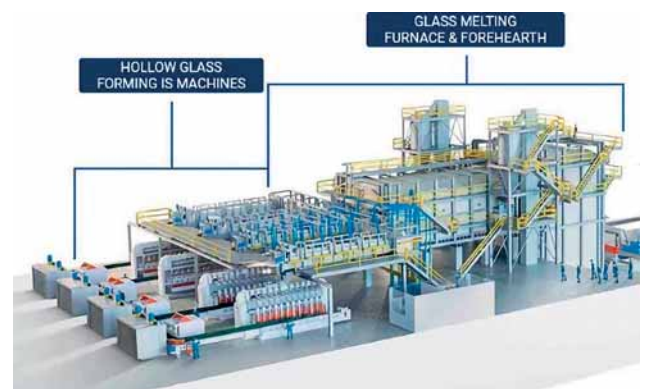
Innovative and technologically advanced, the new release 3.1 introduces a new operator interface, a new cooling system of the CFD Proven camera case and a new method for making a reflection in the glass. The new system through sophisticated vision algorithms can be used without the physical reference of the probe. BDF E.A.G.L.E. AIR 3.1 acquires and processes the images through an advanced and sophisticated algorithms controller using artificial vision inside the fan-less computer. The real and virtual pointer-reflected images are acquired at high frequency enabling to establish the actual level of glass with high revolution of one pixel.

Thanks to this technology, it is possible to reach a resolution of +/- 0.1 mm.

New E.A.G.L.E. AIR 3.1 features

- Measurement from -15 to + 15 mm (depends on the final tuning)
- Optical resolution +/- 0,1 mm
- Image elaboration up to 30 frames/sec
- Measuring interval 1 sec
- Measurement possible without a probe
- Only air cooled (maximum air consumption 400 slpm)
- Glass level measuring with 4-20 ma analogue output signal
- Process alarms and system alarms with free contact digital output signal
- Remote control for data sharing and support assistance

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BERLIN PACKAGING

Acquisition of Elias Valavanis S.A.

Berlin Packaging, the world's largest hybrid packaging supplier, announced today the acquisition of **Elias Valavanis S.A.**, a supplier of glass packaging for the food and beverage industry.

Based in Larissa, Greece, with locations in Bulgaria, Romania, and throughout Greece, Elias Valavanis has been synonymous with in the region and is a key supplier of bottles and jars for olive oil, wine, spirits, soft drinks, and water. Elias Valavanis has long-term relationships with its supplier partners and its 1,500+ customers, who benefit from the company's value-added services, including package structural design, decoration capabilities, and the company's own glass recycling facility.

"Elias Valavanis is the perfect partner for Berlin Packaging as we expand our operations to the Balkans and continue to augment our Mediterranean glass business," said Paolo Recrosio, CEO of Berlin Packaging EMEA. "Elias Valavanis shares our passion for glass design and artistry and our commitment to help our customers grow their business by offering industry-leading packaging products and services."

"We take tremendous pride in all aspects of our business, and we know we've found a like-minded partner," said Elias Valavanis, CEO of Elias Valavanis S.A. "I am excited about combining our company with Berlin Packaging, as I know together, we can accelerate investments in our products, capabilities, and employees like never before."

"As we enter important new regions like the Balkans, Berlin Packaging looks for industry-leading companies that share our strategic focus, growth mindset, our dedication to customer thrill, and our winning culture," said Bill Hayes, CEO and President of Berlin Packaging. "Elias Valavanis checks all these boxes and more, and they will help us extend our Mediterranean coverage, while adding an exciting new customer base."

This is the 15th acquisition that Berlin Packaging has completed in Europe since 2016, and its 5th acquisition in Europe during 2021.

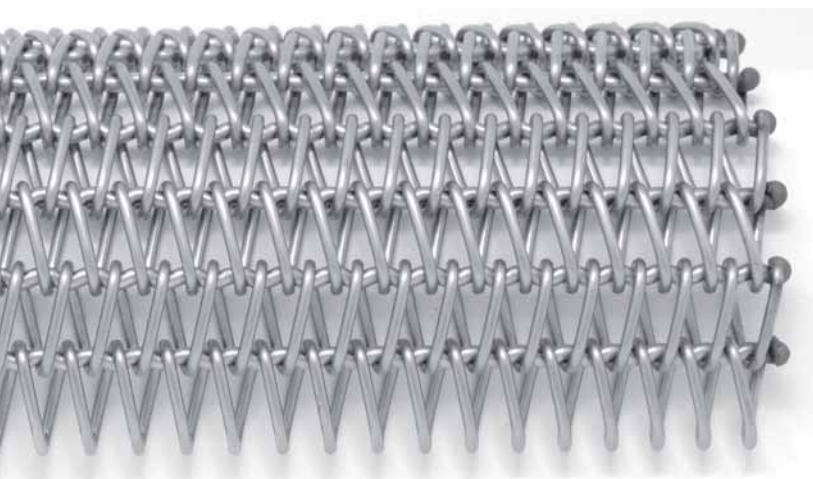
All employees and locations for this acquisition will be retained.

WWW.BERLINPACKAGING.COM/



WBT

High performance and quality with a partnership approach



WBT is a young and dynamic company from Northern Italy which, thanks to constant growth, has become one of the top European players.

WBT provides the support of engineers, designers and skilled technicians in the production of wire mesh belts for Annealing Lehrs, Shear Blades for Feeders and Silent Chains and relative sprockets, for Conveyors and Cross Conveyors for the hollow glass sector.

Focus on customers, with an international approach, is one of the strengths of the company, where the guarantee of the highest performance and quality is oriented to customer satisfaction with a partnership approach.

WWW.WBTSRL.COM

WBT

WBT



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- Fast job changes
- Full connectivity
- Reliable and robust design
- High compatibility with existing tooling sets

www.heyne-international.com



SmartLine 2 from **HEYE:** Where special becomes normal

Heye's SmartLine 2nd generation starwheel inspection successfully combines speed, reliability and flexibility to deliver accurate results. Special operations like mini-ware and non-round containers are now standard with SmartLine 2. Customers award top marks for Heye's SmartLine 2 with the camera based check inspection system Ranger 2.



Hans Renders -
Head of Product Management
HEYE INTERNATIONAL

SmartLine 2 is the latest generation of Heye's starwheel inspection machine series.

Developed and manufactured at Heye International's dedicated Cold End Centre in Nienburg, Germany, SmartLine 2 glass container inspection equip-

SmartLine 2

CONTAINER INSPECTION

Ranger 2 ("Robot")



ment can be configured in several different ways, with up to six inspection stations available. The Nienburg facility employs a team of experts and features a modern production layout. Importantly, the Centre is close to the Ardagh Group's Nienburg glassworks to undertake essential testing work.

CAMERA CHECK INSPECTION BY RANGER 2

Equipped with the best in market camera based check inspection system Ranger 2, customers all over the world have confirmed the SmartLine 2 robustness and reliability. Proved in multiple cases, Heye's Ranger 2 detects more than 99.8 per cent of all critical defects.

Ranger 2 is now able to inspect pharmaceutical mini-ware. With this evolution the system can fulfil all customer requirements to container sizes and shapes.

HOW RANGER 2 WORKS

Each system inspects independently and does not have to be synchronized with others. This means that there is no influence between the systems and there is no need to compromise one system in favour of another. This allows an individual optimisation of all settings, e.g. lighting, camera position etc., on the respective type of crack. If one system is not available or is not optimally adjusted, the others are still fully functional.

Every container produced must be considered as a unique object and every concept of a crack test must take this into account. Therefore, the Ranger 2 uses the concept of 'Intelligent Cloud Masking', which makes any kind of 'teaching' superfluous after a job change.

Assuming that each container is unique, the Ranger 2 inspects each container for itself and

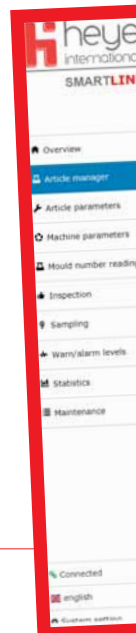
sets one mask for each single container. Therefore, each container is its own reference and has no negative influence on the following ones. So the zones are subject inspection of high dynamics and can immediately adapt to changes that occur during production.

NON-ROUND – HEYE'S CORE COMPETENCE

Container shapes, which differ from the standard round container, are one of the most common tasks in the glass container inspection industry. Heye masters this 'non-round' with consolidated excellence.

The range of inspectable container sizes and shapes is above the average, inspection is possible with almost all imaginable shapes, whether angular, oval or simply round.

With this huge range of testable container sizes and forms, the SmartLine 2 match-



es the market approach to be a real universal check inspection machine.

IMPROVED JOB-CHANGE TIMES

The application of servo technology results in a high degree of flexibility. Fast and easy changes to an item's indexing positions and optimal use of the servo torque for up to four rotation stations are possible. Optimised motion sequences allow faster reactions to changing process parameters. The equipment's innovative design and its large and easy-to-open hood provide more working space between the inspection stations. Job changes become much easier.

The maximum article height accommodated is up to 450mm, with angular, oval and round containers processed. Thanks to the servo-driven starwheel, indexing positions from six to 48 are possible.

STATE-OF-THE-ART USER INTERFACE

The new design of the graphical user interface of SmartLine 2 has been conceptualised in cooperation with a specialised engineering service provider. The main goal of the development was a practicable and fast operating interface. Orientation for the development amount is coming

HEYE INTERNATIONAL

Based at Obernkirchen, Germany, Heye International GmbH is one of the international glass container industry's foremost suppliers of production technology, high performance equipment and production know-how. Its mechanical engineering has set industry standards for more than five decades. Extensive industry expertise, combined with the positive attitude and enthusiasm of Heye International employees is mirrored by the company motto 'We are Glass People'. Its three sub-brands HiPERFORM, HiSHIELD and HiTRUST form the Heye Smart Plant portfolio, addressing the glass industry's hot end, cold end and service requirements respectively.



from our customers. The two-click-management is only one of many advantages next to smart configuration and a great overview over all statistics an operator needs for easy-to-use handling.

Easy configuration of known containers with the Job history

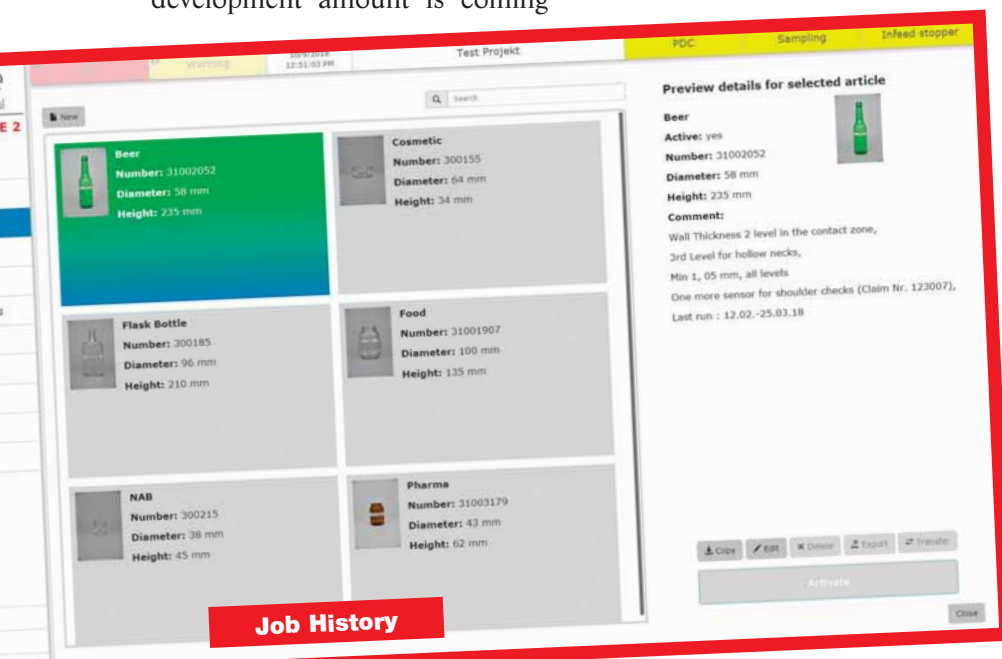
Job history is even customised for:

- quality requirements;

- setups;
- reproducibility data.

POSITIVE FEEDBACK

Feedback generated from Heye International customers has confirmed the SmartLine equipment's robustness and reliability. The mechanical design and drive system in particular are highlighted for their robust design, while the control system is praised for its reliable operation. ■





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www.heye-international.com

Customer contact from afar from **BUCHER EMHART GLASS**

How do you ensure support, instruction and a timely start of operations when you are not allowed on the customer's premises? This was the challenge the Mexican project team of Bucher Emhart Glass and customer Fevisa faced in the spring of 2020.

Angelica Trejo from Fevisa and Antonio Mandujano from Bucher Emhart Glass talking to Bucher colleagues Scott Neubert (large image on screen), Jesus Rosales (lower left) and Juan Saldivar (second from left).



In normal times, Bucher Emhart Glass regularly visits its customers on site to offer advice, install equipment, optimise production lines and provide support in operations. In 2020 this was only possible on a very limited basis. For interacting with its customers, the division therefore relied on video conferencing, animated presentations and training videos, webinars, and training for sales staff in the effective use of these tools. Machinery was also configured by remote access.

With the use of such tools, lots of commitment on the part of both the customer and the division, and an abundance of creativity, the division and one of its customers even managed to successfully install a new glass production line – without the staff of Bucher Emhart Glass being on site. The story on the following pages shows how this was made possible and what lessons were learned for the future.

NEW GLASS PRODUCTION LINE FOR FEVISA

When the pandemic hit in the spring of 2020, Bucher Emhart Glass was in the midst of installing the new glass production line for Fevisa in Mexicali, Mexico. From one day to the next, Emhart project teams had to leave the premises.

From this point on, the company's engineers stayed in continuous contact with Fevisa through a mix of digital applications. Text and video messengers such as 'WhatsApp' and 'Pexip' allowed the customer's engineers to have direct contact with teams, whose members were themselves in different locations. Through regular videoconferencing, in-depth training was provided on the new production line. In addition, direct remote access to the machines enabled specific analyses from anywhere in the world.



POSITIVE EXPERIENCE

In this challenging situation, Emhart's long-term customer Fevisa had an unexpected positive experience: "We never had more ownership over our production line," Angelica Trejo, Project engineer at Fevisa.

"I am very proud of what our teams have achieved working together remotely," Victor de la Torre, Fevisa Plant manager.

BENEFITS FOR FEVISA

- Fevisa saw a number of benefits:
- first-hand knowledge of every aspect of the new production line in operation;
 - greater confidence for future machine commissioning; and
 - established processes for support and training through virtual communication.

"This unprecedented situation brought us a whole new perspective on the opportunities of remote assistance," Scott Neubert, Project manager for Bucher Emhart Glass.

BENEFITS FOR BUCHER EMHART GLASS

- more flexible use of specialists, independent of location;
- new expertise in virtual support;
- successful customer empowerment.

BUCHER EMHART GLASS

Bucher Emhart Glass is the world's leading supplier of advanced technologies for the manufacturing and inspection of glass containers. The equipment and automation technology offerings are supplemented by a broad range of advice and support services – care, empower and academy – to help customers operate and optimise their equipment. Bucher Emhart Glass has its headquarters in Switzerland, while its manufacturing facilities are located in Germany, Sweden, the USA, China and Malaysia. The division operates a research and development centre in the USA.

GOOD PROFITABILITY DESPITE MARKED DECLINE IN SALES

In the first half of the year, the division's operations were severely affected by the closures of production sites in China,

REMOTE SUPPORT

Malaysia and partly in the USA, as well as by travel restrictions and logistics bottlenecks. From the middle of the year onwards, equipment installations and on-site service were resumed at least partially. Overall, sales were down by 14 per cent against the very good previous year but recovered somewhat in the second half of the year. The division implemented various measures to reduce costs, and in China it continued adapting capacities. The operating profit margin could be sustained at a good 10.5 per cent despite the marked decline in sales, supported by a high proportion of spare parts.

ACHIEVING A MILESTONE IN THE REPORTING PERIOD

The first two complete End-to-End production lines commenced operation in recent months. These production lines integrate the entire glass container manufacturing process – from the hot end, where the glass containers are formed, to the cold end, where they are inspected – via a central database, the Control Center. Immediately after forming, the glass containers are marked with a unique laser code.

machine's settings. By means of closed-loop controls, settings can even be updated automatically. The latest example of such a closed-loop control is the Smart Feeder with the GobRadar, which is coming to market soon. It uses a camera-based sensor to optically monitor the weight and shape of each individual gob during forming and automatically adjusts the feeder as required. These technologies allow glass container production to be continuously optimised which reduces production waste and, therefore, energy consumption. They have been well received, mainly in western markets so far. During the reporting period the division also noted growing interest from China in these new technologies.

UNIQUE WORLDWIDE: TRAINING UNDER GLASS

The division completed construction of the training centre in Windsor, Connecticut, USA. The complete production line, including the furnace Bucher Emhart Glass has operated for several years for research and development purposes, has also been utilised for 'Training under glass' for several months. This offer is one of a kind worldwide – glass manufacturers can engage in training designed exactly for their needs and practice their theoretical learning directly on

the relevant machinery. For example, when a customer has invested in new sensors for its production lines, its engineers and technicians learn about the sensors' functionality and application. Not only are they trained with documentation and by specialised trainers, but they can also test first-hand what they have learned on glass production machinery in operation. ■



Sensors measure a wide range of process variables and parameters of the glass containers along the production line. The data is analysed and the glass manufacturer is advised on how to adjust the

BUCHER
emhart glass

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PARMA / ITALY

New image and website for VETROMECCANICA

Continuously growing and going from strength to strength, Vetromeccanica presents its new identity in this article. The use of its traditional company colours are combined with a stylized representation of the company's production lines as logo.

Vetromeccanica, founded and developed in Neviano degli Arduini, in the province of Parma in the heart of the Packaging Valley, has just presented its new corporate image which, from now on, will continue to grow and strengthen the company in its professional growth. The traditional colours of Vetromeccanica, blue and grey, accompany the new shape of the logo, a stylized representation of the company's production lines.

The new payoff 'Smart Moving Solutions' represents the new corporate identity, recalling the flexibility and accuracy of the proposed solutions.

Alongside the new visual identity, the company website has also been redesigned and updated and now is complete and more functional. Vetromeccanica's new image and website include company values, strengths, and all solutions, representing the total transparency that distinguishes this enterprise.

Users can browse through the site pages searching for the right solution, both choosing the sector where the company operates and/or the interested packaging material.

Emphasis was placed on the Engineering and Technical departments, able to study the best solution taking into account the line production needs (type of



accumulation, type of alignment, production speed, criticality of the containers to be handled, space optimization), choosing the most suitable systems for the production environment.

Vetromeccanica service department follows the customer from the feasibility study and design, sale and installation, as well as during the after-sales phase.

“Our sector is constantly evolving, and we want to grow with it, keeping up with the times and continuously improving. This year has been full of opportunities for our company which have confirmed us as a reliable partner in the hollow glass sector,” says Roberto Lucchini, the owner of Vetromeccanica.

NEW INSTALLATIONS IN 2021

The project of an electrical revamping and mechanical maintenance of two 1998 palletizers. Vetromeccanica supplied the new Electrical Panels, the new software and machine conformity certification. Also, the layer formation tables, and the relative separators have been replaced.



The project of the new cold end line has been already delivered, installed and the line is producing bottles. The two production floors of the high-speed cold end are connected by bottles lowerators. Vetromeccanica has installed the new eight-row stacker and the new merry-go-round accumulation table connected to the existing Palletizer.

Another important project has also been finished and delivered to the customer's site, where Vetromeccanica has supplied the feasibility study, design, manufacturing and installation of cold end lines and related accessories as well as the palletizers and shuttle cars.

This new cold end installation for a new furnace includ-

ing inspection lines, decoration area and Palletizers. The Vetromeccanica supply is completed by a telescopic shuttle car with two pallets seats and relevant end of line made up of dressing devices. This new furnace will be connected to the existing one by mass flow conveyors and Alpines lowerators and elevators in order to reach maximum production flexibility. The plant produces different types of beer bottles.

Vetromeccanica plans to deliver other projects related to entire furnaces, palletizing units and cold end lines between the end of 2021 and the beginning of 2022.

“This is the beginning of a long and lasting working relationship with the most important players of the glass industry which Vetromeccanica is looking forward to meet during upcoming trade fairs such as glasstec and others,” says Francesco Cavatorta, Vetromeccanica Cold End and Palletizers Department Sales Manager. ■



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THE GLOBAL PHARMACEUTICAL GLASS MARKET

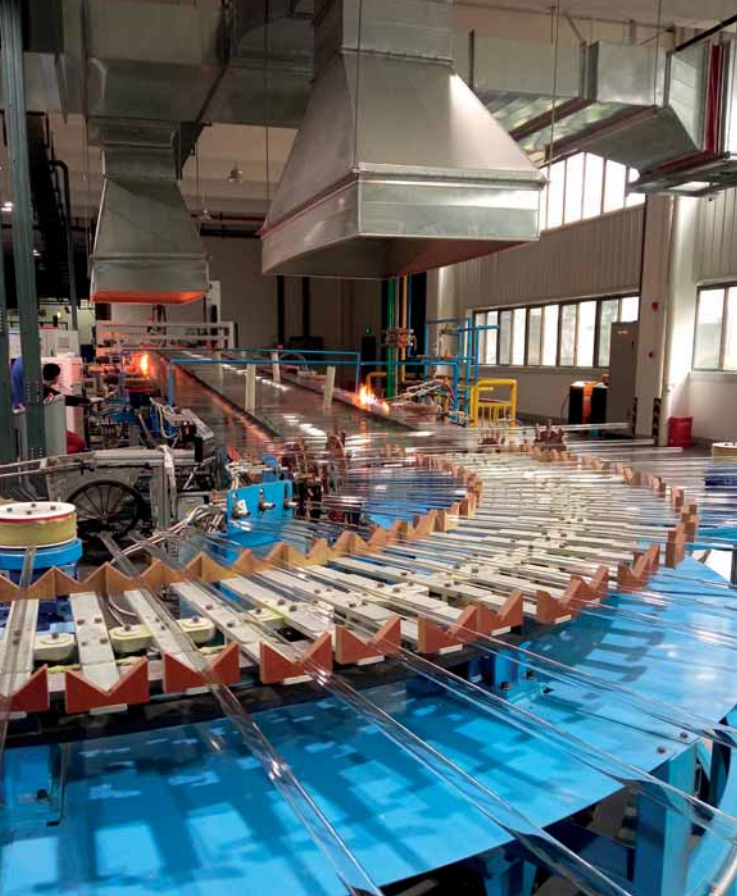
Most vaccines are packaged in borosilicate glass, the benchmark of good quality glass for drug delivery. COVID19 vaccine manufacturers require some very specific properties from their vials as many vaccines need transporting at extremely cold temperatures. Borosilicate glass' ability to withstand a range of temperatures from -200 to +500 makes it the perfect choice to meet this need. As a result, growing applications for high quality neutral borosilicate glass from the healthcare sector have now been compounded by unexpected and astronomical demand from the pharmaceutical industry as part of the ongoing global vaccination campaign against COVID19. With demand sky rocketing, the glass manufacturing industry has a tall order to fulfil.

In response, the glass industry is moving at speed to commission, design, build and fire up glass manufacturing facilities around the world, using the latest technological innovations to simulta-

neously improve plant efficiency, cost, performance and sustainability. To date, Glass Service Italy (GS) has installed 14 furnaces in Belarus, Iran, China, Russia, Pakistan and India.

This case study highlights one of these furnaces that was already in the planning process when the pandemic hit and was, remarkably, completed despite the resulting chaos. Unfolding in

This case study highlights one of these recent furnace installations carried out by Glass Service Italy that was completed despite the chaos and restrictions caused by the COVID19 pandemic. Featuring the latest glass melting technologies, we get an idea of the specific challenges of pharmaceutical glass manufacturing, showing how a bespoke, energy conscious approach can make things happen.



Chongqing, China, and featuring the latest glass melting technologies, this study showcases both the specific challenges of pharmaceutical glass manufacturing and what's possible when a bespoke, energy conscious approach is taken.

THE CLIENT

For more than 18 months now, Glass Service Italy has been working hand-in-hand with a leading glass manufacturer that produces more than 1,000 billion Hydrolytic class II items of pharmaceutical glass, including vials and caps, all complying with YBB, ISO, EP, USP standards, as well as accreditation from CNAS.

Recently, this client wanted to go one step further and level up production to Hydrolytic Class I to better meet their customer needs for volume and value. In order to achieve this they came to Glass Service Italy.

CLIENT OBJECTIVES

For this particular client in Chongqing China, the challenge was to help hit three specific macro targets:

1. production of neutral borosili-



- cate pharmaceutical glass tube alfa 51 to Hydrolytic Class I;
2. reduction of energy consumption by more than 50 per cent compared to their existing furnaces;
3. CO2 emissions reduced by more than 50 per cent (a reduction of

2220 ton/CO2 per year).

Moreover there are further micro quality targets that glass manufacturers are consistently seeking to improve, including: stability across tube outer and inner diameters, consistent bend-

CASE STUDY

ing, vial thickness, absence of bubbles and stones and finally batch and chemical stability.

The specific client objectives regarding Hydrolytic I production and energy consumption represented a substantial change from the existing furnace infrastructure, and required support beyond the initial consultation, design and installation of a new furnace. To achieve new levels of efficiency, factors such as ease of maintenance, monitoring, furnace productivity and consistency of the output quality become even more crucial and for this, longer term support was essential.

In order to hit these targets the team set about addressing several factors that are particular to pharmaceutical glass production, including:

UNIQUE CHALLENGES IN MANUFACTURING PHARMACEUTICAL GLASS

- Very high melting temperatures of 1600 and the resulting increased energy consumption
- The greatly increased level of glass viscosity
- Elevated boron evaporation meaning increased corrosion rate of refractories in the chimney and waste ducts and increased silica salt knots in the glass
- Significant boron content volatilization impacting the thermal and chemical homogeneity of the glass.
- The instability of glass quality and the greater chance of batch pollution as a result of these factors
- The specific geometry of the site and the corresponding design of the melting tank

DIFFERENT CLIENTS AND DIFFERENT SITES

Every client and every site is different and this is where Glass Service Italy comes into its own. With an expert team that is agile enough to design bespoke solutions for glass manufacturing clients, but large enough to have the experience, credibility and resources to tackle a project at

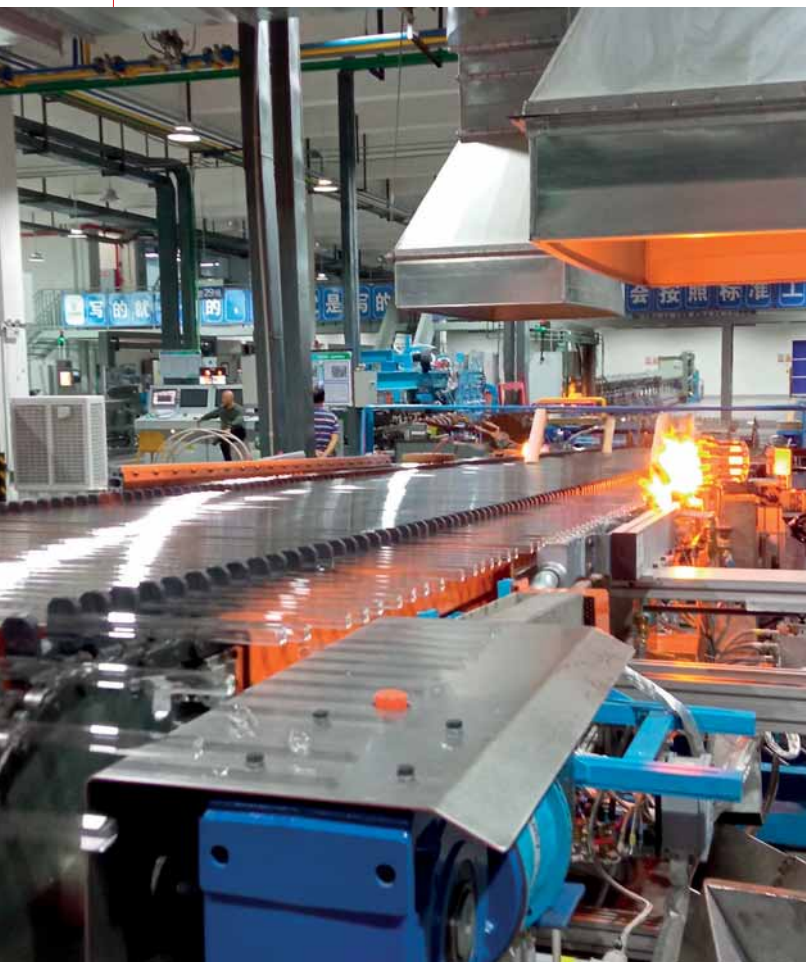
any scale, they are well used to adapting cutting edge design to the specific needs of a client. To meet client objectives whilst taking into account these considerations, Glass Service Italy experts created a customised furnace design and installation plan, combined with comprehensive training on the management, maintenance and testing of the equipment and its output for optimal performance and batch consistency.

TECHNICAL SOLUTIONS FOR THE CHONGQING GLASS MELTING FURNACE

The team began with key adjustments on the furnace design and features to ensure the delivery of both performance and quality targets.

Furnace design and features:

- defining the right heating method for the melting tank, in this case using combined gas fire and electric power;
- the optimal fuel: natural gas and oxygen are the natural choices here due to the high temperatures required;



- batch chargers: these machines and an inbuilt batch charger areas results in low dust, low boron evaporation, high machine life, glass stability and correct batch distribution;
- improving temperature control and glass homogeneity with water cooled bubblers;
- ensuring the quality of refractories for long furnace life;
- managing indirect heating in the working end and forehearth;
- incorporating surface drainage to remove glass defects.

teams came together to mark the occasion with a ceremony to inspire good fortune for the plant and all those who work within it. Everyone gathered with confetti, celebratory banners and speeches as the furnace was fired up.

PROCESS CONTROL SYSTEM

A key part of successful furnace installation is the management, monitoring and maintenance of the machinery. Ensuring a consistent and high quality product and the health of the furnace is

the right training.

THE RESULTS

The data speaks for itself:

- Efficiency: The tube diameter efficiency for this furnace is >80% on the 22mm diameter and the same for 16mm diameter.
- Energy consumption reduction: GS furnaces are lower consumption and meet both CO2 and cost reduction targets with energy consumption of 1250Kcal/kg fossil + 0.46 KWh/ kg electric booster.



THE FURNACE

Using these design features, Glass Service Italy's team designed and installed an Oxy-Fuel furnace, producing 22Tons/24h of high-quality neutral borosilicate pharmaceutical glass tube alfa 51 – designed, engineered, assembled and commissioned in China. The team then remained on site until the production stage to help ensure batch consistency and production efficiency whilst guiding the client on the proper maintenance and performance management.

THE OPENING CEREMONY

The time came to fire up the furnace in November and both the client and Glass Service Italy

crucial for its long life. Process control systems that allow real time monitoring of the temperature, mass flow control, process control loops, alarm management and product accuracy, through an easy to use human machine interface (HMI) mean that monitoring the technology can be done easily by technicians with



FUTURE GLASS MANUFACTURING FOCUS

Glass is set to play a growing role in future sustainable development and has been pushed to the front in the battle against the Coronavirus. Key installations like this one in Chongqing are important in establishing glass's movement towards a more sustainable, technology-led and efficient manufacturing model. Ongoing developments in end-to-end process management continue to reduce the amount of energy used by glass manufacturing and the renewed focus on plant efficiency, maintenance, monitoring and output quality, signals that there is much more to come from this area of the glass sector. ■

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MARABU and KOENIG & BAUER: Collaboration to launch an innovative digital printing solution for glass

Marabu and Koenig & Bauer have recently joined forces to create a pioneering solution that offers glass product manufacturers an attractive alternative to traditional embossing techniques, which is also suitable for three-dimensional decorations on standard glass products.

Digital printing enables sophisticated designs and a high degree of personalisation at low cost. However, this process was, until recently, not suitable for three-dimensional decorations on standard glass products – instead, a costly made-

to-measure mould had to be created for each item. Now, Marabu and Koenig & Bauer have joined forces to create a pioneering solution to this problem. It offers glass product manufacturers an attractive alternative to traditional embossing techniques.

INNOVATIVE INKJET SOLUTION FOR RELIEF PRINTING ON GLASS

The manufacture of glass products with textured decorations conventionally requires a variety of preparatory steps prior to embossing. This process is associated with high energy con-





sumption, and short production runs are prohibitively expensive. Each glass object to be given a textured decorative finish must be made with its own dedicated mould to produce a suitable raised surface for the embossed decoration. Production is time-consuming and requires corresponding planning. However, embossing is not ideal for highly customised glass items, for which there is currently strong demand, for example, in the perfume and beverage industries, i.e. for wines, spirits and beer.

Marabu and Koenig & Bauer have now developed an innovative inkjet solution that allows the direct printing of highly customized glass products of all kinds, from one-off items to large industrial-scale volumes – in conjunction with excellent results. Contours, for instance, are far sharper than with conventional embossing. The precise single pass application of multiple varnish layers is possible, producing extremely textured finishes. This is performed with printing systems from Koenig & Bauer's KAMMANN K15 and K20 family. The method also permits large areas to be printed, including colour gradations, often required for brand logos. In addition, textured

varnish finishes can be combined with coloured elements to produce striking visual effects. All printing process steps are seamlessly integrated into the K15 and K20 systems. Servomotors are employed to accurately position and move the object to be printed and the print unit. This allows the raised decoration of glass products of any shape.

The corresponding varnish was developed in close cooperation between Koenig & Bauer and Marabu to ensure it was perfectly tailored to the printing process. During the development stage, the corresponding decorations achieved excellent results for dishwasher resistance, and resistance to chemicals and abrasion, in line with applicable standards.

This simple yet effective process is therefore a highly attractive alternative to conventional embossing.

THE BENEFITS OF MARABU HIGH-PRECISION VARNISH

Marabu's new varnish was conceived especially for digital printing of textured decorations, in particular on glass substrates. The precise printing method allows designs of extremely sophisticated and elegant appearance on glass objects, such as perfume bottles, drinking glasses and beverage bottles. The number of layers can be varied in accordance with customer-specific needs. The use of this purpose-developed digital-printing varnish permits the creation of highly



customised, personalised decorations without the need for dedicated moulds. The benefits include excellent contour sharpness, extremely fine textures and exact points, coloured and transparent designs, printing of convex and concave shapes, and rapid, simple adjustments during the printing process. Unit costs are not dependent on volume. It is possible to apply any number of designs to the chosen glass product during a single print pass. There is no need for a minimum production quantity or unique moulds. The results comply with the requirements defined for dishwasher resistance: 500 cycles in an industrial dishwasher and 50 cycles in a domestic dishwasher. The varnish is also highly recycling-friendly: the print oxidises entirely without residue when the glass substrate is melted down for reuse.

THE MASS CUSTOMISATION MEGATREND

Demand for customised products is on the rise, and can be observed in a variety of fields: packaging, games, fashion, household goods, and many other everyday items. Consumers are also prepared to pay a premium for such products. According to a survey by the Deloitte Consumer Review, 30 to 50 per cent of respondents are willing to pay up to 20 per cent more for a personalised product. Manufacturers and retailers are responding accordingly, and are keen to find corresponding solutions.

Against this background, Marabu and Koenig & Bauer have pooled their skills and resources to make it possible to produce highly attractive designs quickly and inexpensively, without compromising on quality.

“State-of-the-art technology

has great potential with regard to decorating glass,” emphasises Tobias Lang, Product Manager for Digital Inks at Marabu.

Tim Schnelle, Sales Manager at Koenig & Bauer Kammann, adds, “Koenig & Bauer and Marabu have given the packaging industry a further tool with which to address emerging challenges.”

The new varnish and the matching printing method represent a unique glass decoration process that complements existing techniques.

KOENIG & BAUER



Koenig & Bauer is the world's longest established manufacturer of printing systems, with the widest product range in the industry. For over 200 years, the company has provided customers with innovative technology, tailored processes, and diverse services. Its portfolio includes solutions for banknotes, for cardboard, foil, sheet-metal, and glass packaging, and for books, displays, labels, decor, magazines, advertising materials and newspapers. Koenig & Bauer is a proven expert and often market leader in nearly all printing processes – offset and flexographic printing on sheets and rolls, waterless offset printing, steel engraving, plus simultaneous, screen and digital inkjet printing. In fiscal 2020, its 5,593 highly skilled employees across the globe generated revenues of 1.029 billion euros. Koenig & Bauer Kammann GmbH, headquartered in Löhne, Germany, is the

group's specialist for finishing hollow objects made of glass, plastic, metal and diverse other substrates, by means of screen printing, digital printing, hot stamping and labelling.

MARABU GMBH & CO. KG



Marabu is a leading global manufacturer of liquid coatings and screen, digital as well as pad printing inks with headquarters near Stuttgart, Germany. Marabu's track record of innovation stretches back to 1859, featuring many industry-first solutions for both industrial applications and graphic design. With its 16 subsidiaries and exclusive distribution partners, Marabu offers high-quality products and customer-specific services in more than 90 countries. Exceptional technical support, hands-on customer training, and environmental protection are core elements of its corporate philosophy. Sustainable business practices are also key to Marabu's vision. These have been implemented through a number of initiatives, with concrete results. Marabu will continue to pursue these activities with commitment in the future and is certified according to ISO 9001 and ISO 14001. ■

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COLD-END ALLIANCE

Cooperative dynamics between IRIS and Heye at Carib Glassworks

Leaders at camera and check inspection solutions, IRIS inspection machines and Heye International have collaborated in a unique synergy. The cold end alliance, named WENSPECT, has already proved, working together as one, its ability to overcome even the greatest challenges as for Carib Glassworks, the only glass container plant in the Caribbean.

Located in Port of Spain, Trinidad, Carib Glassworks has a rich history, dating back to 1948. The specialist glassworks is a member of the ANSA McAL Group of Companies, its founding fathers having laid the platform for a highly automated manufacturing facility, employing some of the best regional technical professionals.

The factory produces both standard and custom-made containers in flint, green and amber for customers in the soft drinks, beer, food, alcohol and juice sectors. In 2016, the glassworks dou-



bled production capacity to 70,000 tons/year via the commissioning of a second melting furnace and three production lines.

MANY YEARS OF WORK TOGETHER

Carib Glassworks started working with Heye International almost 50 years ago equipping one furnace with Heye IS machines and Heye carousel machines for Cold end. In 2015, as they were facing new quality challenges, IRIS Inspection machines delivered non-contact inspection solutions for five production lines.

Driven by customer demands, Carib Glassworks continuously invests in their people, and installs cutting edge technology working towards new milestones in safety, quality and precision. Sharing the same passion for collaboration, IRIS and Heye, now joined in WENSPECT alliance, have supported the glassmaker's business expansion initiatives, in a close working relationship.

WIRE EDGE CHALLENGE

Having encountered wire edge



“ This is the kind of cooperative dynamic that we establish with our customers. So we have been delighted to find this level of support and service with IRIS and Heye. Says Ms Tahira Khan, Project Manager at Carib Glassworks. **”**

and overpress defects last year, the glassmaker very naturally turned to IRIS to find a solution. Overpressed and wire edge are widely acknowledged as critical defects in glass container production, each representing major

health and safety risks. They are among the bottling industry's worst nightmares, as well as those of major beer, carbonated beverage and other brands, resulting in potential sealing problems and the possibility of finding glass particles within the packaging.

The Overpressed is generally located on the finish inner rim and composed by a glass protuberance laid up-on the sealing surface.

The Overpressed, can either be continuous and perfectly circular, or partially arranged on the internal side of the rim.

The wire edge instead, is also composed by a glass protuberance and mainly located beneath the sealing inner ring. As the wire edge does not extend above the finish, it is mainly difficult differentiating one from the other,

unless throughout the employment of enhanced inspection solutions.

Futhermore, the press and blow process, in particular narrow neck press and blow, allows glassmakers to increase productivity by reducing weight, although this trend has pushed companies to secure overpressed and wire edge detection.

Both faults are process-related and their root causes are the same:

- Excessive gob weight.
- Wrong plunger dimensions.
- Wrong plunger mechanical adjustment or synchronization.
- Dirt or glass particles disturbing the plunger stroke etc.

A BINARY SOLUTION

Wire Edge/Overpressed defect has become one of the most complex challenge for glassmakers. To meet this new



demand, IRIS has developed a dedicated Wire Edge Module.

The strength of this dedicated solution is that this module enables the precise detection of wire edge even very small, without compromise. This solution benefiting from newest hardware and software technologies makes an accurate inspection of wire edge, yet without false rejections.

The Wire Edge Module is able to differentiate between overpressed/wire edge even on small and saleable ware. In comparison with existing solutions, the recently announced system is easier to set up and goes further. It allows glassmakers to reach an optimal set up with less

compromise and in much quicker time. Therefore, the wire edge station is less dependent on human factor. The Wire Edge Module can be easily integrated within the Evolution 5 NEO machine dedicated to base and finish inspection. Like all the Evolution 5 stations, the module is totally independent so it can be used additionally to all other finish stations. It is also available as a standalone Evolution 2 NEO machine.

FULLY VALIDATED SOLUTION

Carib Glassworks has been impressed with the results achieved, so much so that at the beginning of 2020, all the impacted lines



WENSPECT

Leaders at camera and check inspection solutions, IRIS inspection machines and Heye International, have created a cold end alliance – WENSPECT – which allows the two specialists to overcome challenges for container glass manufacturers.

Since 2002, IRIS has designed, developed and manufactured intelligent inspection solutions for glass containers. The company offers precise and innovative inspection machines with reduced dependence on the human factor for your increased productivity, quality and efficiency. IRIS is a team of passionate engineers, mastering the entire production of machines from ideas and concepts, to the production of CPU boards and on-site installation.

Based at Obernkirchen, Germany, Heye International GmbH is one of the international glass container industry's foremost suppliers of production technology, high performance equipment and production knowhow. Its mechanical engineering has set industry standards for more than five decades. Extensive industry expertise, combined with the positive attitude and enthusiasm of Heye International employees is mirrored by the company motto 'We are Glass People'. Its three sub-brands HiPERFORM, HiSHIELD and HiTRUST form the Heye Smart Plant portfolio, addressing the glass industry's hot end, cold end and service requirements respectively.

were equipped with the dedicated wire edge module. Today the solution has been fully validated by European and American glassmakers on different productions such as Heineken, Desperados, Budweiser, Coca-Cola, Fanta, Sprite, Pepsi, Beck's, Corona, Leffe, ... No matter the glass colour, the Wire edge solution by IRIS brings same inspection results on green, amber or challenging flint. ■

IRIS Inspection machines

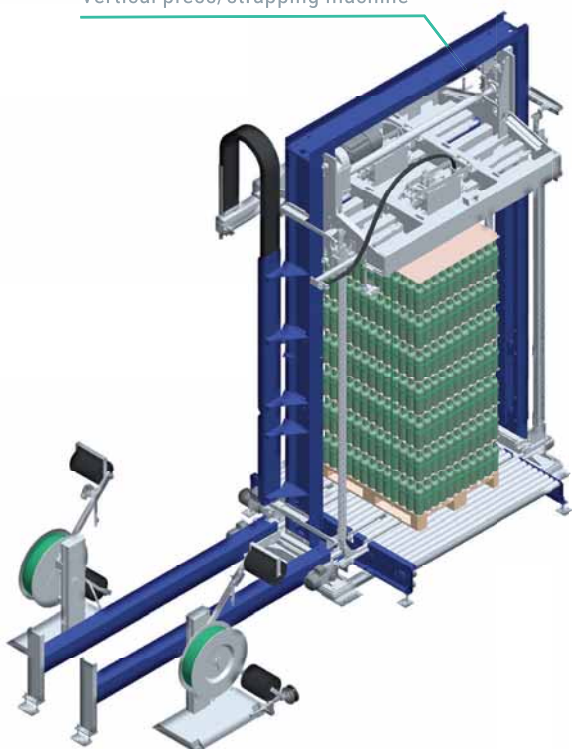
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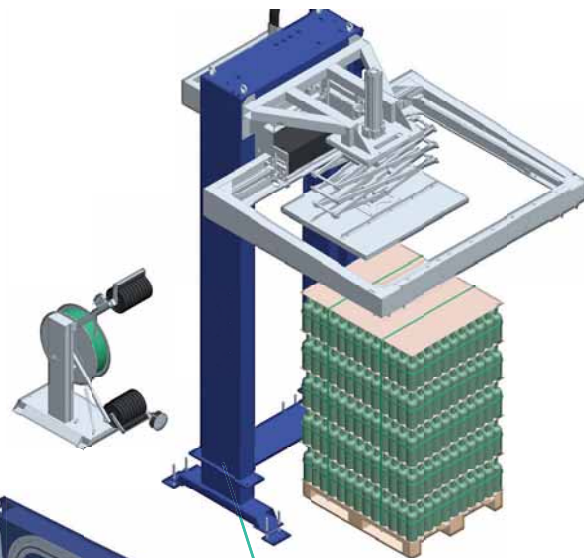
PRESS MASTER GLS

Vertical press/strapping machine



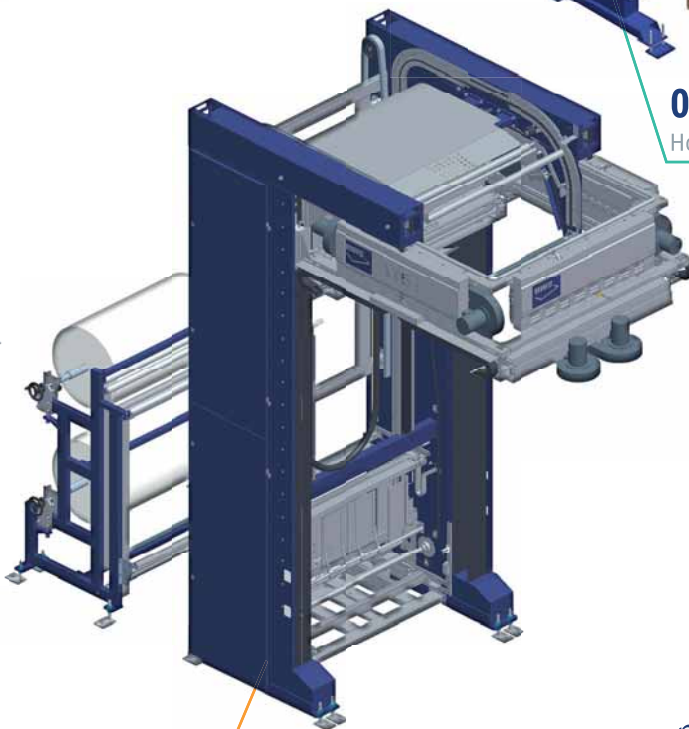
06CL

Horizontal strapping machine



AT55

Thermoshrinking hooding machine



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SPAMI: shaping the future, creating smart solutions for glass converting technology

Spami, a Stevanato Group company, is leading the way in glass converting technology – producing fully automated, high-speed, precision glass forming lines. Since 1971 its equipment has been providing accurate processing of ampoules, vials, cartridges and syringes. It achieves this through delicate container handling throughout the forming process and rigorous product inspection via state-of-the-art camera control systems.

Innovation is at the heart of Spami, with 50 years of pharmaceutical glass manufacturing expertise underpinning a drive to create smart solutions for the factory of the future. Automation, integration and optimization are the three pillars of the company's flexible solutions for even the most stringent pharmaceutical requirements.

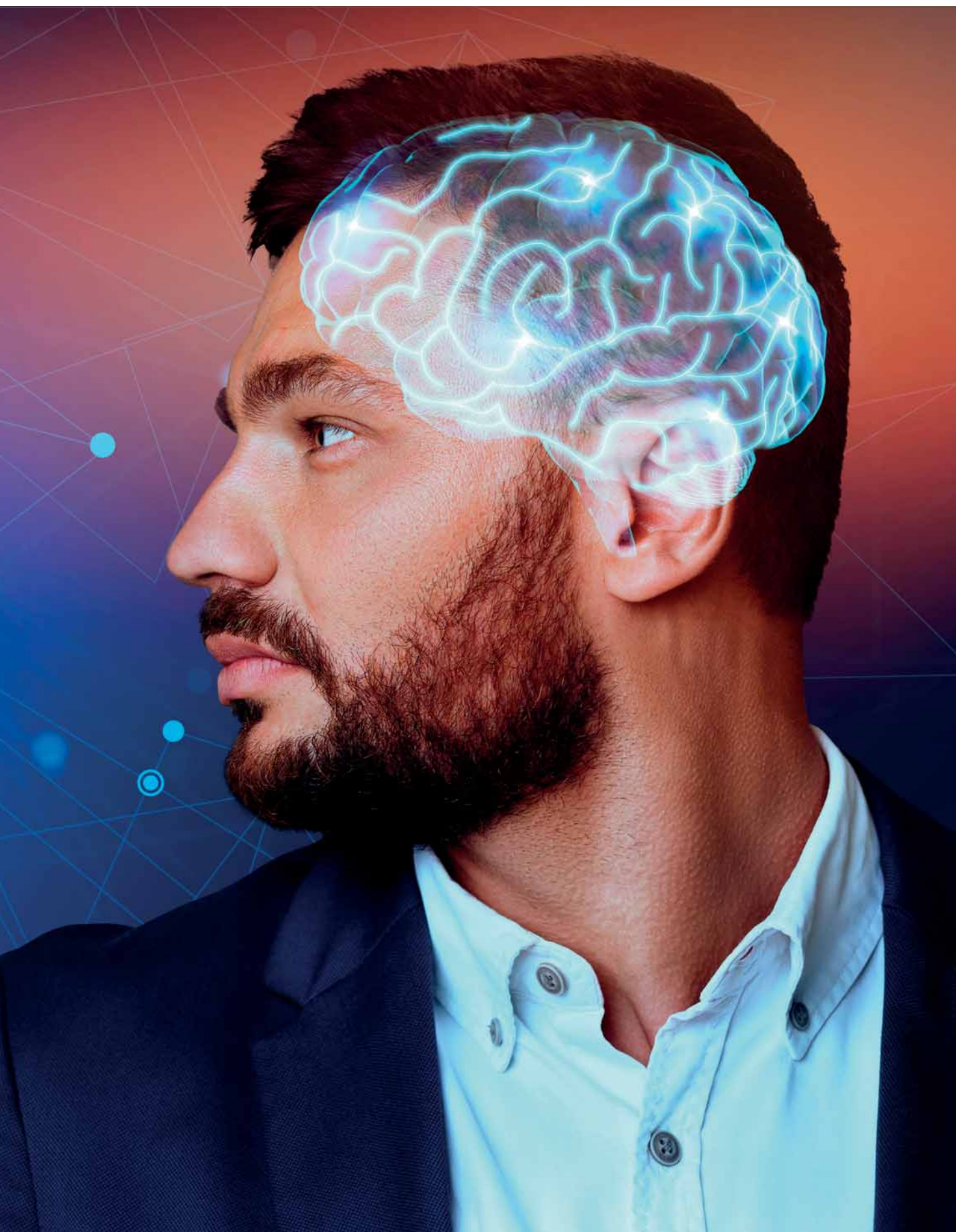
When it comes to glass converting technology, there are three main trends Spami is actively investigating:

- Artificial intelligence
- Packing automation
- Predictive maintenance

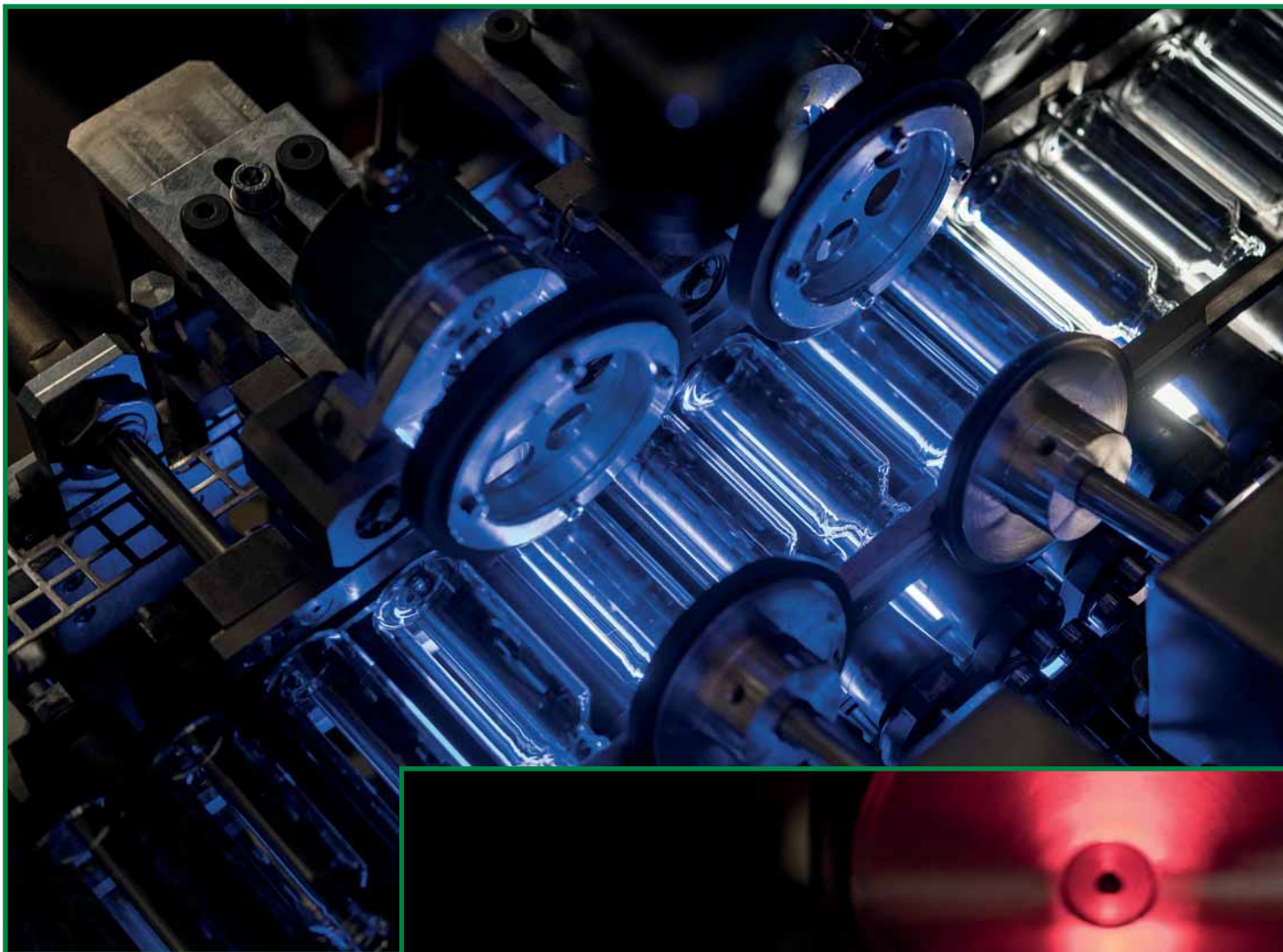
ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI)

– in particular, deep-learning algorithms – is a crucial new tool for boosting performance when it comes to inline cosmetic controls. It can help reduce false rejects, while increasing the detection rate – leading to cost savings and reducing the total cost of ownership.



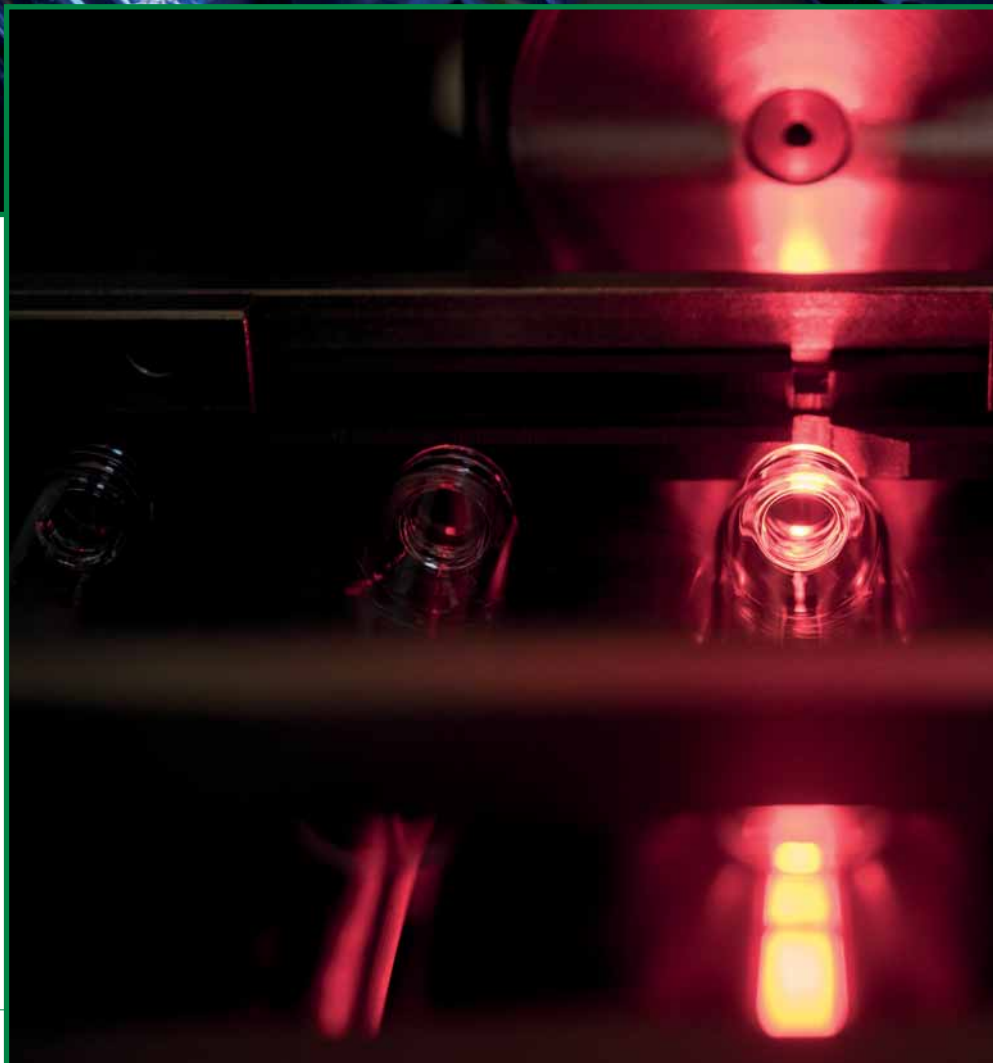
GLASS CONVERTING TECHNOLOGY




Applying AI to the forming process can bring precision and optimization. It offers more accurate identification of cosmetic defects and the ability to differentiate them from processing marks that are not really defects but normal glass appearance. And thanks to its capacity to abstract and adapt to a high number of production variables, AI helps reduce false rejects and optimizes production. In recent production tests, there was a tenfold reduction in the false rejection rate when AI was used in the inspection of different containers for cosmetic defects.

PACKING AUTOMATION

Improving end-of-line automation is another way to optimize production. The latest





Spami technology is paving the way to a fully automated packing system – from making the box and adding the label to bringing the final bulk packaging directly to the pallet, ready for product delivery, without human intervention. The benefits include a reduction in errors and production time, as well as an increase in overall equipment efficiency.

PREDICTIVE MAINTENANCE

Automatic analysis of production data and a machine that alerts you when maintenance is required sound like the factory of the future. But, in fact, the latest Spami technology is taking things a step further, as well as improving line capability to auto-analyze production data and plan maintenance services before the line stops.

Collecting and interpret-



ing data produced by machine motors and sensors can reveal crucial new information. As well as routine maintenance, it can highlight, for example, if an obsolete component is causing rejects. This helps reduce product waste and enables maintenance operations to be planned in advance. It also ensures machines are always running in optimized conditions – and safeguards production by reducing the risk of downtime.

ONE-STOP-SHOP

Ten billion containers are produced every year with Spami's equipment, and the company is a one-stop shop when it comes to glass converting technology – for everything from tube loading to packing. Whether a complete forming production line is required or single modules, everything is tailored to a customer's requirements – to deliver state-of-the-art lines for converting glass tubing into ampoules, vials, cartridges and syringes.

Spami's equipment is trusted by many of the largest pharma packaging manufacturers – and its manufacturing lines are certified and validated to process type 1 glass around the world, with local after-sales support covering all regions. Professional project

management is also available for plant design, construction and engineering for the production of bulk and ready-to-use pharmaceutical primary packaging.

Uniquely in the industry, Spami systems are FULL CE-compliant, within a culture of innovation, rigorous standards, continuous improvement and rapid response to market needs. In Europe, this includes EU Directives 2006/42/EC, the Machinery Directive; 2014/35/EU 'On the safety of low-tension apparatus'; and 2013/30/EU 'On electromagnetic compatibility'. They also comply with North American standards, as laid down by ANSI, UL and NFPA, and Russian and Brazilian standards. ■



Spami
Stevanato Group

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FUTRONIC supplies controls and servo technology to Taiwan

Taiwanese conglomerate TTL, the Taiwan Tobacco and Liquor Corporation (TTL), is modernising its glassworks. As part of the project, a major European plant and equipment manufacturer will supply a completely new IS machine. The machine control system and servo technology, on the other hand, will be provided by futronic. The new machine is scheduled for commissioning in September this year.

Futronic's most recent important order comes from the Taiwan Tobacco and Liquor Corporation (TTL), a state-owned conglomeration which unites some of the country's biggest breweries and distilleries under one roof. The company is currently modernising one of the two production lines in its glassworks.

The project centres around the hot and cold ends; amongst other things, the line's eight-section IS machine is to be completely replaced. The new glass machine will be built by a major European plant and equipment manufacturer, the leading Western supplier in the Asian world. Yet in spite of the fact that the firm's portfolio



Hoping for a lighthouse effect throughout the Asian market: Murat Yolaçan, Sales Engineer at futronic (photo: Lisa Berger/futronic)

includes machine controls and drives of their own, the end customer is insisting on futronic technology.

COMPETITIVE EDGE OVER BIG PLAYER

"We're very proud to have succeeded in convincing the customer of our products and our expertise," says Murat Yolaçan, sales engineer at futronic and the man responsible for the project. futronic is well-connected in Asia, with many EPRO controls and other models from older generations still doing duty to the utmost satisfaction of their users. The two production lines at TTL have also worked with EPRO control systems until now. "We have an excellent reputation there," Yolaçan confirms with pride in his voice. "All the same,



On its way to Taiwan: futronic's FMT24S control system, housed in a cabinet similar to this one (photo: futronic)

it's not every day that we can gain a competitive edge over such big players in such an extensive refurbishment project."

ALMOST THE ENTIRE FUTRONIC PORTFOLIO

The order comprises almost the entire futronic portfolio of control and drive systems for IS machines with up to 24 sections: the package's core items are a futronic FMT24S machine control system and an FDU24S servo drive. The drives for the servo take-outs (STO24S), 2-axis pushers (PDU24S) and servo inverts (SIU24S) will likewise be furnished by the control system specialist and housed in a total of five control cabinets. Last but not least, an FMT training module will double as a supply of spare parts.

COMMISSIONING IN JANUARY 2022

Installation and commissioning are scheduled for January 2022. The plan is for several representatives from the customer's

organisation to travel to Tett nang in parallel for training at futronic, the pandemic permitting. The two parties have agreed not to disclose any details regarding the order volume.

LIGHTHOUSE CONTRACT

Yolaçan is now hoping that the project will have a lighthouse effect throughout the Asian market: "There are an awful lot of glassworks that are due to be modernised in the next few years. This contract is a chance to show how our controls are ideal for controlling machines from different manufacturers." The 36 year-

FUTRONIC

Futronic GmbH is one of the world's leading providers of complex automation solutions for plant and equipment manufacturers. The emphasis is on the container glass, tableware, bulk materials, beverage and handling & assembly industries. The company has grown considerably in recent years: a team of around 90 staff currently support some 1,000 installations worldwide in the glass producing industry alone. futronic was established in 1972 and is today a Jetter AG company. Its Managing Directors are Michael Preuss and Christian Benz.

old is confident "that our product portfolio will become very attractive for more and more potential customers as a result." ■

futronic
automation

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INTERVIEW

Interview

MINERALI INDUSTRIALI: 100 years of experience in the mining processing sector

A recent interview with Minerali Industriali gave us the chance to find out more in detail about this group and the important work it carries out for the glass sector.

G LASS MACHINERY
PLANTS &
ACCESSORIES
(GMP&A):

Could you please give us an overview of your Group?

Minerali Industriali (MI): Minerali Industriali (MI) is an independent mining company, founded about 40 years ago, owned and managed by two Italian families. MI has around 620 employees, half of them in



Italy, as well as hundreds of sub-contractors working in non-strategic roles.

In 2020, MI produced more than 3.5 million tons of raw materials for a total turnover of about EUR 132 million.

MI's mission is to be a reference company in the:

- extraction, treatment and sale of raw materials destined to our main markets: glass, ceramics, engineered stone, paint& coatings and others; recycling and recovery of non-dangerous industrial waste;
- production of innovative products;
- geological and mining survey, design and implementation of plants for the mining sector and for the recovery of non-dangerous industrial waste.

Our targets remain to:

- work safely;
- respect the environment;
- guarantee high quality of our products;
- maintain a strong long-term relationship with our customers, contractors and more in general, with our stakeholders;
- have a sustainable development approach.

South America (three in Mexico, Colombia, Brazil and Guatemala). We are present globally in 11 countries with 21 mines and 26 operating sites.

Our main markets are: Glass 40%, Ceramics 37% (30% tiles + 7% sanitaryware), other markets 15% (E-Stone, Waste management, P&C), 8% from the sales of plants and machinery (MIE).

Sales are: 86% Europe, 11% America, 3% Africa with more than 800 customers, while we have business activities in 33 countries.

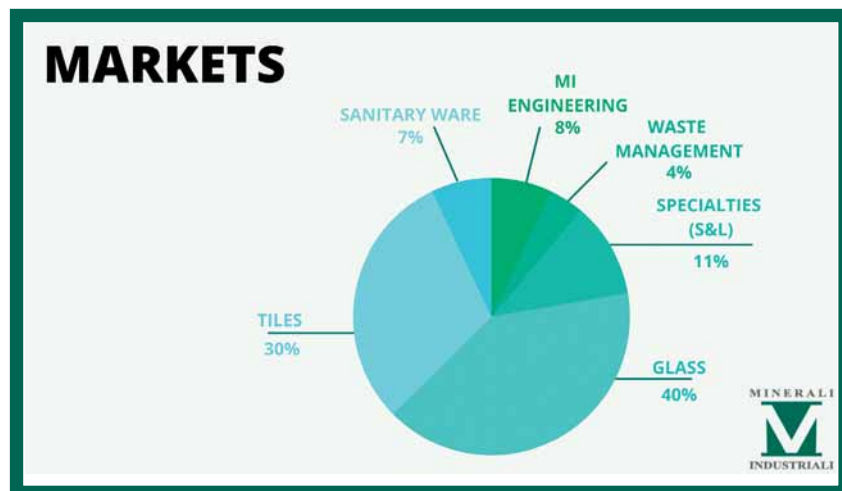
MI: Minerali Industriali supplied more than 1.2 Mt of raw materials to the glass market in 2020.

A huge range of Sands (Silica and Feldspathic Sands) with Fe₂O₃ content between 80 and 600 ppm can be supplied to Float and Container manufacturers. Feldspar and Recycled Glass Sand complete the range of products.

Minerali Industriali can also supply milled silica for fiber glass production and high quality silica sand to silicate producers.

In detail:

1 LQS (Lochaline Scotland) is an underground mine where



Minerali Industriali owns five companies in Italy (13 industrial sites and two offices), three in Europe (Czech Rep, Bulgaria and UK), one in Turkey, two in Africa (Tunisia and Egypt) and six in

GMP&A: Concerning the Glass Market, could you please indicate more in detail the raw materials that you can provide and the location of your production sites?



we are able to produce about 140.000 t/y of top quality silica sand with Fe₂O₃ content from 90 to 200 ppm (different grades). We are located just in front of a fiord and on the mine

INTERVIEW

exit we have the washing plant, the warehouse and the dock for ships loading. We supply float glass producers and containers glass producers.

2 **SASIL** is the oldest plant of our Group and it is also the most complicated and complete one. We can perform many different types of mineral treatment, such as: Washing, Grinding, Flotation, Magnetic Separation (wet and dry), Acid Leaching, drying optical sorting and micronization. An important water treatment plant complete the installation. We produce there feldspatic sands with Al_2O_3 between 6 to 11% and Fe_2O_3 from 600 ppm to 0.3%. In this plant we also produce Glassy Sand, while a micronized line can produce quartz powder for fiber glass application.

plants in Italy use our sand. The final products are transported by trucks to Sousse port where we own a 20,000 ton warehouse and from this port we are able to load ships destined for our Italian warehouses or directly to our customers.

4 **MSS**: in Sardinia we own a large open-pit feldspatic sand mine and a fully equipped washing plant. We produce final products destined to glass and ceramics. We supply about 220,000 t/y of sands with Fe_2O_3 from 200 ppm to 380 ppm and Al_2O_3 from 3.1 to 4.6% for the glass sector. Our products are used by the most important Italian container glass producers.

Our product range also includes feldspar coming from our Verbania quarry (Fe_2O_3 0.16% and 0.35% and Al_2O_3 around 13.5%), as well as top

to our customers.

About 100,000 tons of sand are always stocked in our warehouses to be able to supply customers also in case of unexpected events (e.g. strikes, bad weather conditions, mine troubles, pandemic etc.).

GMP&A: Are you involved in Glass Recycling?

MI: **SASIL** has always been engaged in research and development concerning the treatment of materials typically considered waste, for their enhancement and reuse in various industrial sectors.

SASIL currently processes around 410,000 tons/year of raw materials, of which 260,000 tons/year (63.5%) are represented by waste materials and only 150,000 tons/year (36.5%) natural raw materials. In particular, processes have been developed on glass coming from primary recovery units to be able to recycle 95% of the collected product. At present, glass cullet represents the core business of **SASIL** production.

In a circular economy and process sustainability vision, this process has led to a triple advantage:

- reduction of energy consumption;
- drastic reduction of the material destined to disposal;
- Important saving of natural raw materials and therefore less environmental impact due to mining activities.

In the last years the R&D department has been working in



3 **MIT**: in Tunisia we own an open pit mine and a washing plant in the Kairouan area. We are able to produce about 600 kton/y of silica sand with different grades with Fe_2O_3 content from 250 ppm up to 600 ppm. The mine and the plant have been operational for more than 15 years, while the washing plant has been up-graded and enlarged during the last years. A new magnetic separation line was installed last year. We can guarantee the PSD required by the float glass producers and, in fact, several float glass

quality silica sand (Fe_2O_3 = 85 ppm) that we import from one of our partners based in Portugal.

Last but not least, we have a dedicated Logistic Team involved in the Service that Minerali Industriali can provide to this market. **MI** owns a company (Seagull) operating in Oristano Port and has a participation in a Logistic and Port Service Company based in Livorno.

Long term contracts with players operating in the main Italian ports and in some UK ports, are, in **MI**'s opinion, essential to be able to provide complete service





for the sands and wastes, are you selling your 'technology' or it is only for 'internal use'?

MI: Minerali Industriali has recently created a specific branch named MIE aimed at supporting new mining projects (for industrial minerals), as well as to provide turnkey plants to our partners.

Our slogan is 'Solution 360: from mine to final products', which summarizes the service that MIE can provide. ■



order to recycle 'special glass' still largely destined to disposal, for example glass light bulbs, old television screens or solar panels at the end of their life.

The results obtained have confirmed that these special types of glass can also be recycled and Sasil is, in fact, processing about 8,000 tons/year destined to the B&C market.

GMP&A: We have understood that your Group has invested a lot in mineral process and you have developed some specific treatment

ENGINEERING SOLUTION 360: FROM MINE TO FINAL PRODUCTS

100 years of experience in the mining processing sector make Minerali Industriali the ideal partner for the treatment of non-metallic ores.

With treatment plants all over the world, Minerali Industriali draws upon its know-how and experience to offer streamlined solutions based on its experience as an industrial mineral producer rather than a mining machinery producer alone.

MI can offer treatment solutions for raw materials right from the very first step – the geological survey and analysis of the relevant samples – up to the final implementation of the turnkey plant, running through the engineering and design of each and every single treatment process.

Our design team grants the best solutions for any kind of ore dressing: washing, grinding, drying, sorting, flotation, leaching, magnetic separation, optical sorting, etc..

MI can also support customers during the start-up phase and also by means of personnel training.



GLASS PACKAGING

O-I's Catalyst Collection sparks connection with consumers

O-I's Catalyst Collection is taking science-backed principles behind behavioural and human emotions and applying it to glass packaging design to give brands a new authentic way to connect with consumers.

O-I recently partnered with Dr. Constantinos Pantidos, the founder of Brand Aviators, whose research indicates all human emotions stem from 12 fundamental motives. Those motives create THE WHEEL OF MOTIVES™, a key tool to show how biology and neuroscience shape consumer behaviour.

O-I then took those principles of how neuroscience influences human behaviour and designed glass packaging – The Catalyst Collection – that works on an unconscious level to connect with consumers to stand out from the competition and drive loyalty.

TAKING THE TRANSFORMATIVE POWER OF GLASS TO NEW LEVELS

Glass already has a sense of magic to it. It plays with an array of senses, from sight to sound to touch. But the glass packaging that's part of The Catalyst Collection builds on glass's shape-shifting power.

"Glass already transforms experiences into something amazing, but these new shapes can take your brand to the next level of being an icon that stands





out from the shelf,” says Paul Harris, O-I Industrial Design Business Partner.

Harris was among O-I’s global designers that came together at the Perrysburg, Ohio, headquarters in 2019 to collaborate on the novel collection.

“We brought our entire global design team into our headquarters in Perrysburg,” explains Sarah Brennan, North America Beer Category Lead at O-I. “We gave them a deep dive into the 12 driving motivations Brand Aviators developed in terms of understanding how to connect with consumers on an emotional scale.”

“Using this technique really allowed us to align consumer needs states to specific categories,” Harris says. “That really influenced our thinking.”

COVID-19 PANDEMIC INNOVATION PENDULUM SWING

The work for the collection that would eventually be named The Catalyst Collection started before the COVID-19 pandemic. But

when lockdowns impacted people worldwide, and consumer behaviours changed overnight, there was a moment of pause for many food and beverage producers.

“At the beginning of the pandemic, our customers told us they weren’t interested in innovations,” Brennan explains. “They needed to understand what was happening in the market at a very unprecedented time.”

But as food and beverage analysts showed consumers were shopping differently and interacting with brands differently, the pendulum quickly swung the other way.

“We started hearing customers say ‘Give us all the innovation you have,’” Brennan says. “The Catalyst Collection was arriving right on time.”

THE MISFIT BOTTLE FITS THE “DEFY” MOTIVE

The Misfit bottle from The Catalyst Collection is a clear example of how O-I’s designers infuse THE WHEEL OF MOTIVES into glass packaging design. The 12 oz. glass bottle

has asymmetrical shoulders that visually make a six-pack stand out on the shelf.



“Our goal within The Catalyst Collection is giving a voice to the motives that are drawing people into a certain category,” Harris says. “One of our key motives, particularly for craft beer, was ‘to defy.’ We really wanted to embody the revolutionary spirit that aligns with craft brewers’ identity. We really wanted to bring a bottle that had more attitude to offer something special and unique.”

GLASS PACKAGING



The Snifter is designed to “connect” motive. The glass bottle uses a Drinktainer™ wide-mouth finish, which unlocks the beverage’s aromatic potential straight from the packaging—no extra glass needed. The Snifter both recalls traditional barware while also signalling the future in size and sensory opportunity.

THE CATALYST COLLECTION: MORE TO COME

The current offerings, aimed at beer and adjacencies, are just the beginning. Motive-inspired designs for food producers and other beverage producers are expected to roll out later in 2021 and beyond.

“A customer is looking for a different experience when they go to pick up a beer or

a handle of tequila or even a coffee. There are different biological needs they have in those moments” Harris says. “Through the Brand Aviators methodology, we were able to bring new ideas and new shapes to categories that may have been a little stagnant.”

For more than 100 years, O-I has transformed brands into icons through unforgettable glass packaging – packaging so recognizable, it doesn’t need a label for consumers to recognize it. Using principles backed by neuroscience to design The Catalyst Collection is just the latest way O-I is leading through innovation.

O-I will be at the Craft Brewers Conference (CBC) September 9-12 at booth #3251 to allow visitors to see and feel the difference. ■



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AI visual inspection from **BUCHER EMHART GLASS** for improved performance and reliability

In the first article of this series, published in issue 4/2021 of Glass Machinery Plants & Accessories, Niki Estner, Software Development Manager at Bucher Emhart Glass, described how Emhart Glass Vision started using artificial intelligence (AI) for visual glass inspection in 2017. Since its original introduction, several additional AI based inspection solutions have been added to the already powerful inspection portfolio.

Niki Estner
Software development manager
BUCHER EMHART GLASS

A I PART 2
In this article, Niki highlights a few of the advantages and potential cost savings that are associated with the improved performance and reliability that is gained when using artificial intelligence (AI) for visual glass inspection. This state of the art technology, in fact, was first used by Emhart Glass Vision in 2017, which now includes numerous inspections solutions.

For AI to be successful in glass inspection machines, it has to have a clear benefit for the customer. As you may assume, using AI technology comes at a higher costs. Some of the cost drivers are obvious, like the need to use high-end hardware (super computers) that lead to increased development costs. However, the increase in cost is not just mon-

ARTIFICIAL INTELLIGENCE

etary, there are other technical issues associated with AI that are less obvious. An example of this is the need for training samples used to teach the system, along with the time required for the system to complete its training.

When discussing AI technology with colleagues or customers, two important questions always seem to be asked:

1. What are the financial benefits of using artificial intelligence to inspect a glass bottle?
2. How do you deal with the lack of training samples? For example, you have samples for some critical defect for job "A", but not for job "B" but you still need to detect the defect on job "B".

Answering these questions with facts, figures and methodologies can be one of the hardest tasks for someone applying AI technology to this type of industrial application. The detailed answers of the "how"-questions are very specific for the application and are highly guarded trade secrets. However, to better explain the financial benefits that can be gained, we will give a high-level explanation using the Emhart Glass Vision AI based seven-segment numeric code reader.

SEGMENT CODE TASK

The task of a seven-segment numeric code reader is simple; it is designed to decode the mould number embossed on the base of glass containers. This number identifies the mould in which each

container was formed. Reading the mould number with a high level of accuracy and repeatability is essential for process control, as this mould number is also used to reject defective containers from the line when defects are found that are mould related.

This is where the financial benefit of having a more accurate mould reader comes into play. When sorting bottles by a specific mould number, unreadable mould are often time rejected as well. Every fractional percent increase in the reading rate, saves money!

As an example, let us assume a typical container glass production line is equipped with a ten section, triple gob machine (10 x 3). That means the machine has 30 moulds that produce a bottle every cycle. If the machine is running production at 12 cycles per minute. ($30 \times 12 = 360$ bottles every minute) That same line produces just over 500,000 containers per day.

During the course of the day, it is

common to have an event that will force the operator to reject all of the bottles created on a certain mould. If you have 5 events that force you to place a mould on the reject list during the day and each event last for 1.5 hours, that means that 27 per cent of the time, at least one mould number and all non-readable mould numbers are being rejected. (The actual time may be less than 5×1.5 hours because sometimes, more than one mould will be on the reject list at the same time.)

If we assume that each rejected container costs around EUR 0.04, the total cost of one per cent non-readable containers is around EUR 20,000 each year.

With the AI based seven-segment numeric code reader, even difficult codes like the ones shown can be reliably identified.

Typically, switching from a conventional vision mould reader to our AI based reader increases reading rate from < 95 per cent to more than 99 per cent. The total



return on investment is then higher than EUR 80,000 in the first year!

UNSEEN DIGITS

Common questions: What happens if I do not have a training sample for mould number 37? If AI technology is based on learning from samples. Is it possible to read a number that the system has not seen before? What if there are no training samples for the digit 7 for one job?

TRAIN WHAT WE WANT TO LEARN

If we picked off-the-shelf AI solutions, then the answer would probably be “Yes”, you need to train all 99 mould numbers if you want to read them. In addition, if the next job looks darker, brighter, thicker or smaller – you will have to train all 99 moulds for that job, as well.

Off-the-shelf AI solutions use the “brute force” approach to AI: If we give a neural network millions of training samples of very possible case we want to detect, then eventually it will figure out what we want it to detect. For Google or Facebook, this is perfect, because they do not know much about the images they are processing.

However, in machine vision tasks, we typically know a lot about the images we work with. The

smart approach is to then incorporate this knowledge into the network and the training. For the seven-segment code, that means we add information about where each segment is, where the corners and the t-crossings are to the training task, and ask the network to reproduce those:

With that, a neural network is smart enough to transfer knowledge (e.g. how one digit looks) from one type of container to the next.

INDUSTRY EXPERIENCE

The engineering development of the neural network-based seven-segment numeric code reader began in 2018 with the first production version delivered in 2019. Since then, it has been integrated into the FlexInspect B Gen-III machines and is available as an upgrade option for older Symplex machines.

As you can see on the screenshot taken from live production, the system running with AI was decoding these difficult to see numeric codes at a reading rate of 99.91 per cent.

Before the upgrade, the customer was using a seven-segment numeric code reader supplied by another supplier that could only achieve a reading rate of approximately 70 per cent valid reads on this container.

CONCLUSION

Using AI technology for glass container inspection improves the reliability of the inspection, improves the accuracy of the inspection as well as the repeatability. In the example of the seven-segment numeric mould code reader as described in this article the system quickly pays for itself while providing you with better process control data, less good ware loss and reduced setup times between job changes.

When AI is used in a smart way, it improves your pack quality, reduces your job change times and minimizes the need for defective samples to setup the control limits of your inspection equipment. That is the difference between a good AI system and a great AI system. ■

BUCHER
emhart glass

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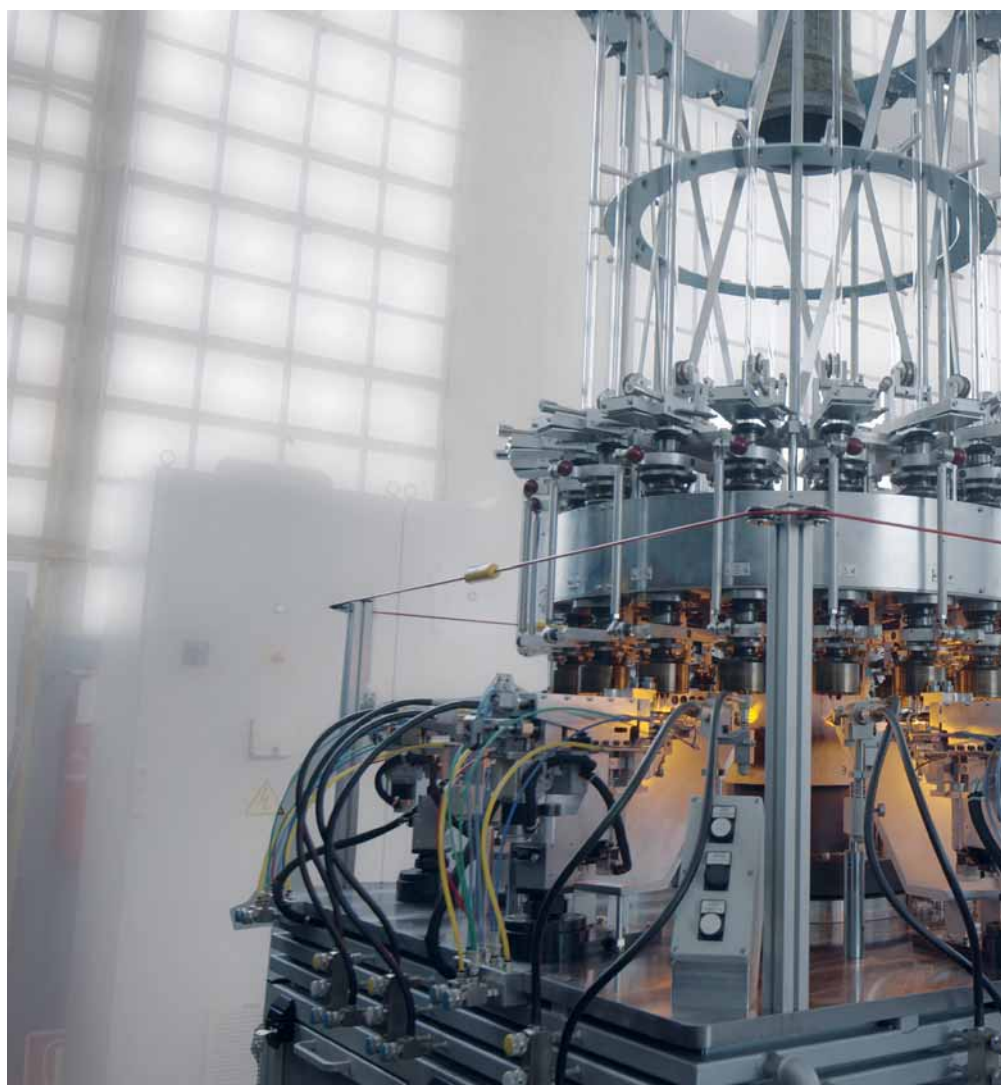
The screenshot displays the Symplex-MNR software interface. At the top, a menu bar includes options like Start, Aktionen, Ansicht, Kommunikation, Dateien & Extras, Kommentar, and Remote Update. The status bar shows the current user as 'NOT LOGGED IN' and the group as 'NOT LOGGED IN'. The main interface is divided into several sections:

- Top Left:** Version: R2019.1.03-Dev.561
- Top Center:** Symplex-MNR
- Top Right:** SYMPLEX logo
- Left Panel:** Last Container. A camera feed shows a glass container with a seven-segment numeric code. Below the feed, there's a 'Base' indicator and a 'Filter' section with options: Good Containers, All Rejecters, Rej 1, Rej 2, and Freeze.
- Center Panel:** Segment code. Last 1h. Total Containers: 14521. MNR Read: 14508. Read Rate: 99.91%. A grid of numeric codes is displayed, with some codes highlighted in red. Below the grid, there's a checkbox for 'Infrequent mold numbers (potential false reads)'.
- Right Panel:** Mold Number. (Click to modify). Rejected by: Base. A list of rejected mold numbers (MNR) is shown, including 50, 24, 08, 65, 64, 34, 64, 26, 56, 27, 39, 32, 64, 27, 26, 54, 25, 26, 56, 58, 36.
- Bottom Panel:** A row of icons for various functions: Operation, White Screen, Rejecter Mapping, Malfunctions, Administration, Job Change, Statistic, Switch to Parameters, Help, and Login.

OCMI: 100 years of flexibility, innovation and timely support to all customers

OCMI-OTG is celebrating its 100 years of activity in the sector of glass processing machines for the production of borosilicate tubular glass containers for medical use and of glass tableware articles in 2021.

For the past 100 years, OCMI-OTG has been equipping and supporting the main medical and tableware glass factories worldwide during their growth, becoming much more than a supplier



for them. The essential aspects that distinguish the whole history of OCMI-OTG consist in maximum flexibility according to market trends, willingness to innovate continuously, and timely support to all customers.

AN IMPORTANT ACQUISITION

OCMI-OTG's 100 years have been crowned with the acquisition of a former competitor Kyp Accesorios, a Spanish manufacturer of ampoule manufacturing lines with almost 30 years of experience in the market, that joined its know-how and manpower with OCMI and is now contributing to create a fully integrated group offering the best commercial and technical support.



CELEBRATIONS AND SPECIAL EVENTS

The celebration of this important anniversary will find its peak in the second half of year 2021 with two main events that will see OCMI as protagonist.

OCMI-OTG will be present at Vitrum 2021, International Trade Show specialized in machinery for flat/hollow glass, that will be held from 5 to 8 October in Rho, Milan.

The company's commercial staff present will be available at the stand to provide information about its machines for the production of tubular pharmaceutical containers and glass tableware items.

During Vitrum, just a few kilometres from the Milan Exhibition Centre, OCMI will inaugurate its new showroom where visitors will have the possibility, even by remote connection, to see the last technological innovations applied to the manufacturing of ampoules and vials.

FLA 18 FORMING MACHINE

The new index rotation FLA 18 forming machine will be introduced as the last innovation developed by OCMI for the production of tubular vials.

This machine has been developed with 18 stations on the upper mouth forming crown, and 9 stations on the lower bottom finishing turret. This configuration and combination between the upper and lower working turret ensures maximum productivity even in the case that a lower station is out of service for any reason.

The machine has been developed to reach a maximum output of 55 items per minute with 2R vials, with the possibility to process glass tube diameters from 10mm to 30mm.

Turret rotation is driven by torque-motor, which is supplied together with the water chiller for its cooling. The same chiller can be used for the cooling of the forming plungers.

Forming operations are performed through three dedicated stations respectively dedicated to roughing and shoulder preparation, pre-finishing and finishing. As in OCMI continuous rotation forming machines, these stations follow the rotation of upper chucks through rotating bearings mounted on forming heads, and therefore do not need any manual alignment with the chucks. All these three stations can be removed to make maintenance and job-change operations much easier for the operator.

Tools, plungers and rollers are servo-driven, making setting and forming operations much more precise and smoother. Thanks to this feature, the operator can adjust the parameters concerning tools starting/ending position and their acceleration from the machine control panel.

After mouth forming operations, main dimensions can be controlled by the OPTIVIAL camera system, coming from the experience acquired with other OCMI vial forming machines.

A new generation camera allows to take up to 15 pictures of the same rotating vial and, consequently, have more precise average value for each dimension.

Servo-motors also drive the setting of the tube receiving plates and cutting station.

Nine lower chucks of the lower turret are driven by independent motors. Before the unloading device, a dedicated station flattens the bottom by means of a containment buffer, which is important especially for large size vials.

The lower chucks are equipped with blowers enabled by solenoid valves, aimed to remove fumes from the inside of the vials in order to keep alkalinity within the limits fixed by ISO standards.

Take-out, with a servo-driven transfer system, has been developed for connection with OCMI after-forming lines.



From the machine control panel, the operator can easily set the starting and ending positions of the plates and cams driven by servo-motors via user-friendly software. During setting and job-change operations, the operator can use remote push-button by enabling the jog mode.

The FLA18 machine is also suitable to be connected with OCMI automatic loaders, now available in different versions for the pick-up of single tubes from bundles or for the collection of complete bundles inside the loader deposit.

GLASS AMPOULE PRODUCTION

OCMI will be introducing the latest developments applied to its forming machines and after-forming lines with regards to glass ampoule production. The after-forming line, in particular, has been upgraded with a new series of motors and servo-motors, with



parameters that can be controlled from only one panel.


Electronic control can now be extended to the ampoule lifting devices of the different processing stations that are driven by electronic parametrizable cams.


Setting recipes can be saved inside the line control panel with their names, and called up if necessary for future production batches.

One of the main features of OCMI upgraded ampoule lines consists in the possibility to centralize the control of all functions. The operator can manage all operations related to colour rings, OPC, printing, Form B cutting and Form D closing (if present) from a single integrated panel.

All information regarding the new equipment is now available and will soon be loaded on OCMI's new website, updated according to the recent renovation of the group.


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COUNTRY OUTLOOK

CHINA's container glass industry for the wine sector

Rajeev Jetley

WINE CONSUMPTION AND PRODUCTION IN CHINA

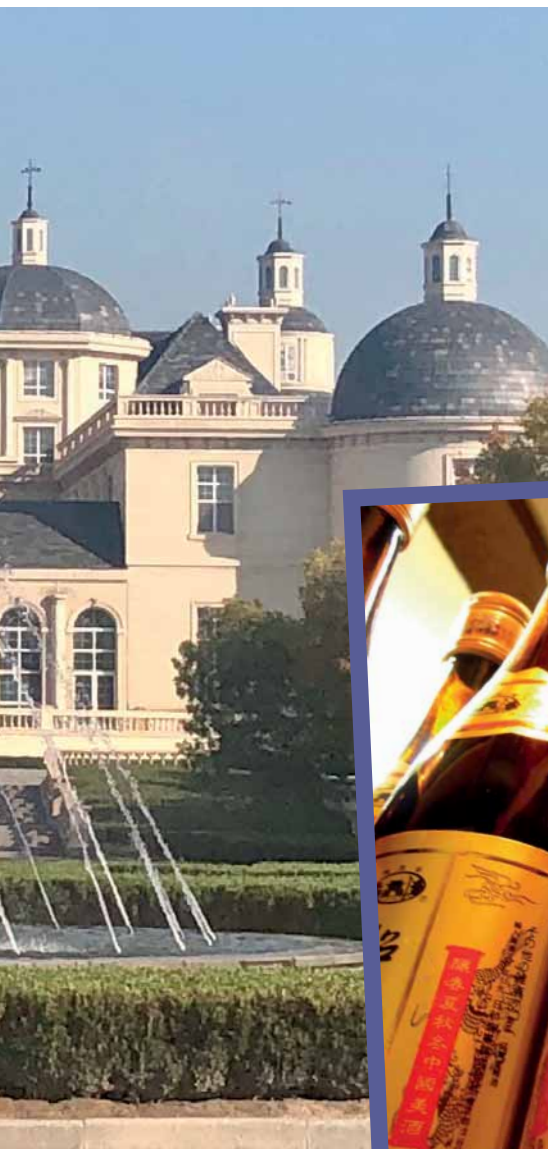
China is the largest wine consuming market on the Asian con-

tinents. With a total consumption of 19,456 thousand hectolitres in 2019, China is the sixth largest consumer of wine, globally. Though the per capita consumption is still very low (The average Chinese citizen consumed a lit-

tle over two bottles of wine (1.2 litres) in 2018, and 1.23 litres in 2019) as compared to high per capita consumption in the Western countries, one should remember that mass-scale wine consumption started very recently in the country.



Wine culture is relatively new in China, but in a short period of time it has surprised both European and American wine industry stalwarts. Consumption and production of wine in China has grown exponentially in the last ten years. The rising affluence of the vast and aspiring middle class, along with increasing expenditure on wine products, has presented a unique opportunity to container glass producers to cater to this important sub-segment of the container glass industry. Glass Machinery Plants & Accessories presents an insight of container glass industry for wine industry in China in this feature.



In 2019, China produced more than 800 million litres of grape wine and had the second largest vineyard area worldwide. That makes it the tenth largest wine producer in the world. While the industry is still considered relatively small, there is plenty of scope for it to grow in coming years, with the quality of its wine continuously improving.

Chinese wines are considered new world wines — a term used

by the industry to describe wines which are not grown from traditional regions such as France or Italy. China has the second largest vineyard area in the world after Spain, and is ahead of France and Italy. While most of that area is currently used for table grapes, the production of wine is increasing rapidly.

Shandong and Ningxia provinces dominate the wine production in China. Shandong province is China's largest wine



COUNTRY OUTLOOK



region, producing over 40 per cent of the country's wine. This is where China's first modern winery, Changyu, started up in 1982. Yantai and Penglai sit along the same latitude as Bordeaux, so it is easy to point out the similarities between the two wine growing regions. The other prominent producing region, Ningxia, is home to some of the most critically acclaimed wines in China. The region specializes in Bordeaux varieties, including Cabernet Sauvignon, Merlot, and Cabernet Gernischt

(Carmenere). The region is home to about 93,900 acres of vineyards (38,000 hectares), making it the second largest wine region in China. Most of the (about 200) wineries found here work vineyards on the low foothills of Helan.

Although Shandong is currently the largest wine producing region in China, Ningxia is, however, the most talked about wine producing region in the country. A number of winemakers are working hard to make their

region well known. Twenty years ago, few had heard of Ningxia wines. Many of the wine estates have been created in the last five- to ten-year period, and are still learning the intricacies of the trade. The producers themselves say they lack experience and technology, while many seek help and advice from international oenologists.

Initially, wines were consumed mainly by urban youths and middle aged and high salaried professionals in first tier (Beijing, Shanghai, Guangzhou, Shenzhen and Tianjin) and second tier (including Dalian, Qingdao, Hangzhou, Nanjing and Xiamen) cities in the developed coastal regions. In last ten years, wine consumption has also reached smaller cities and towns.

GLASS CONTAINER PRODUCERS FOR THE WINE INDUSTRY

China is the largest container glass producing country in the world. Accounting for nearly half of the global container glass output, China's container glass producers have also become leading exporters of glass bottles to a



number of countries.

In the wine bottles category, Chinese container glass producers have been exporting their products to leading wine producing markets of France, Italy, Spain, USA, Australia and South Africa for more than three decades. The exports, which started on a small scale in the early 1990s, reached high volumes by the start of the last decade.

Rapid growth in China's domestic wine production at the start of the last decade offered the wine bottle producers a profitable market in their own country. The wine movement also led a number of new producers and existing container glass producers, who were supplying to domestic beer and spirits producers, to diversify into wine glass bottle production. By 2015, the number of glass wine bottle producers reached 40.

During the last five years, the number of container glass producers for the wine segment has remained at this level. Nevertheless, the volume produced has almost increased by more than 30 per cent due to growth in wine production in the country.

Along with the bottling demand of the domestic wine industry, Chinese wine bottle producers also meet the bottling demand of wine imported in bulk from international countries.

In 2020, China imported approximately 430 million litres of wine, a decrease from around 610 million litres of the previous year. The Covid-19 pandemic was the main reason behind the huge drop in import volumes in the year 2020.

About 60 per cent of the total wine imports are in bottles form, while the remaining 40 per cent comes as bulk wine imports. These bulk imports are bottled in the country. Demand from this segment also offers plenty of opportunities for Chinese wine bottle producers.



LEADING WINE BOTTLE PRODUCERS

China has nearly 40 container glass producers, including most of the large container glass producers, who produce glass bottles for the wine industry. The wine rush in the country has also produced some specialist wine bottle producers, who produce container glass bottles exclusively for wine packaging.

YANTAI CHANGYU WINE AND GLASS COMPANY

Founded in 1892 in Shandong province, Chateau Changyu is the oldest and largest wine producer in China. Today, the Changyu brand is recognised as one of China's famous trademarks and has been included in the World's Most Admired Brands.

Changyu wine bottles are made by its affiliate, Yantai Changyu Glass, which started production in the late 1990s and has grown to become China's largest wine glass bottle producer, using the latest European process technology, including automatic decorating lines. Changyu is the first to use glass enamels to decorate wine bottles, in place of traditional paper or plastic labels.

With 500,000 tons of production capacity, it is the executive director of China Daily Glass Association and Yantai

Branch of the China Chamber of International Commerce. The company has seven furnaces and 20 automatic production lines. Most of the production equipment is imported from Europe.

WENDENG WENSHENG GLASS COMPANY

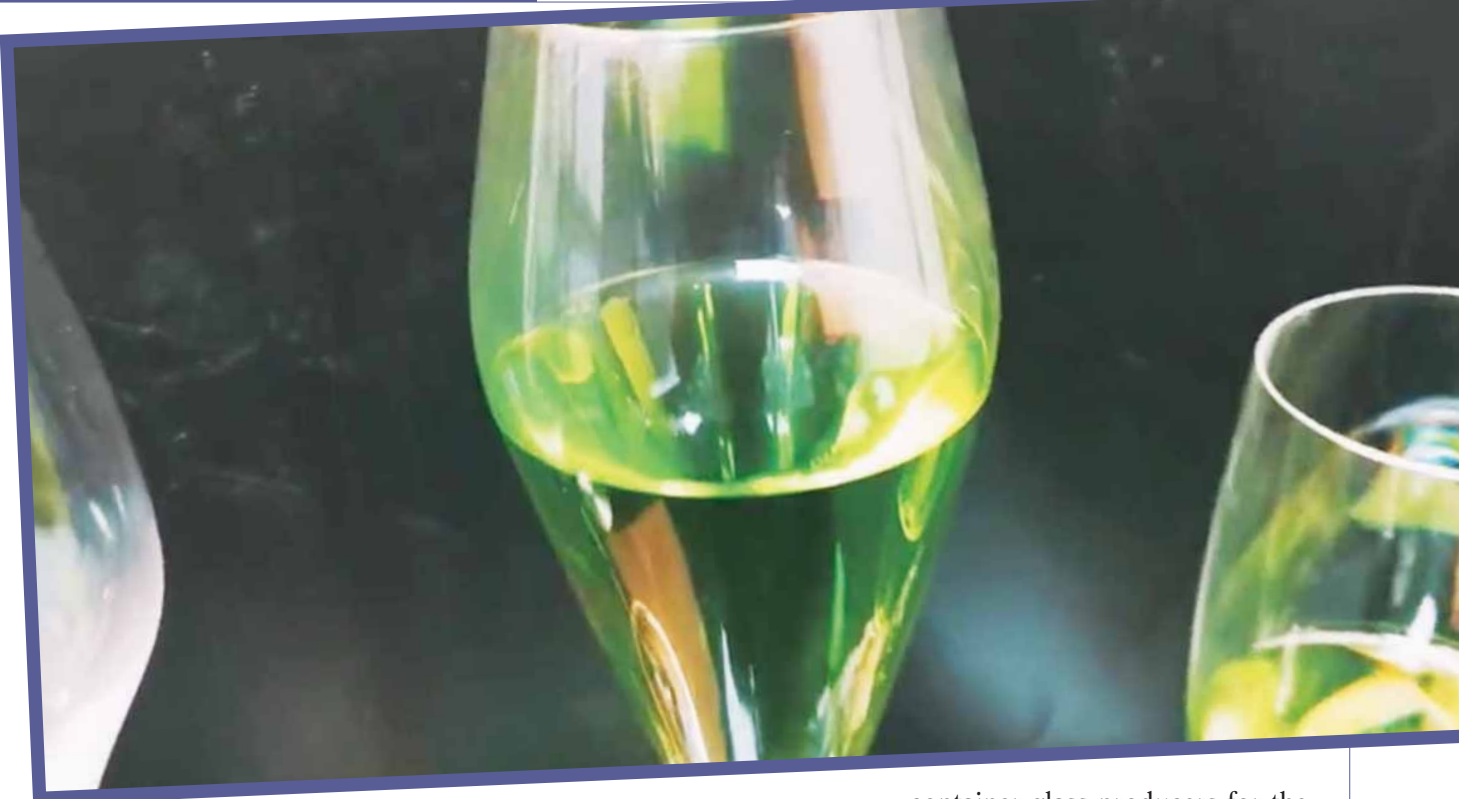
Established in 1977, Wendeng Wensheng Glass Company specializes in glass container production for the wine industry. With automated production equipment and decades of production management experience, Wensheng Glass is able to produce 80,000 tons of glass bottles (around 140 million bottles) per year. The company's premium quality wine bottles are widely used by winemakers in the US, Australia and New Zealand.

GUANGDONG HUAXING GLASS

The largest container glass producer in China in terms of tonnage, Guangdong Huaxing Glass, is one of the major suppliers of glass containers to the Chinese wine industry. The company owns 15 production facilities with an output tonnage of more than 3.5 million tons of glass containers per annum, making it Asia's largest container glass producing company.

The company produces glass

COUNTRY OUTLOOK



containers for wine, beer, soft drinks, pharmaceuticals and cosmetics industries.

YANTAI NBC GLASS PACKAGING COMPANY

Yantai NBC Glass Packaging Company is one of the pioneer glass bottle suppliers to the wine industry. The company can produce 150,000 tonnes of glass containers on a yearly basis. The company's production area comprises of two advanced automatic feeding lines, two Sorg automatic control melting furnaces, Emhart electronic timing 8-group 2-drop bottle maker, 2 BDF full servo electronic timing 8-group 2-drop

bottle makers, 3 home-made 8-group 2-drop bottle makers, 2 STRUTZ high-speed printers, ROSARIO printer, 1 Italian automatic RB-4/6 six-colour printer and 6 automatic packaging lines, achieving automatic stacking, automatic sampling, automatic shrinkage and automatic packaging.

The company supplies glass bottles to well-known Chinese wine producers including Great Wall Wine Corporation, CITIC Guoan Wine Co., Ltd., Shanghai Bacchus Wine Co. Ltd.

SHANGHAI VISTA PACKAGING GROUP

Shanghai vista packaging company is one of the well-known

container glass producers for the wine industry in China. Founded in the 1974, the company currently operates 4 container glass production plants and 24 production lines.

The annual installed capacity of Shanghai Vista Packaging group is 800 million containers in crystal, high and common flint, brown and green. The company is also among the leading exporters of container glass from the country. It exports wine bottles to more than 20 countries.

ANHUI FENGYANG GLASS PRODUCTS COMPANY

Anhui (Fengyang) Glass Products Company is a state-owned container glass producer based in the Anhui province of the country with an annual production capacity of 150,000 tons of glass.

Founded in 1953, Anhui Glass supplies beer and wine glass bottles to a number of leading wine producers such as Anhui kouzi Wine Group, Jiangsu Shuangou Wine Group, Zhejiang Yue Lungshan rice wine and Shaoxing rice wine. ■

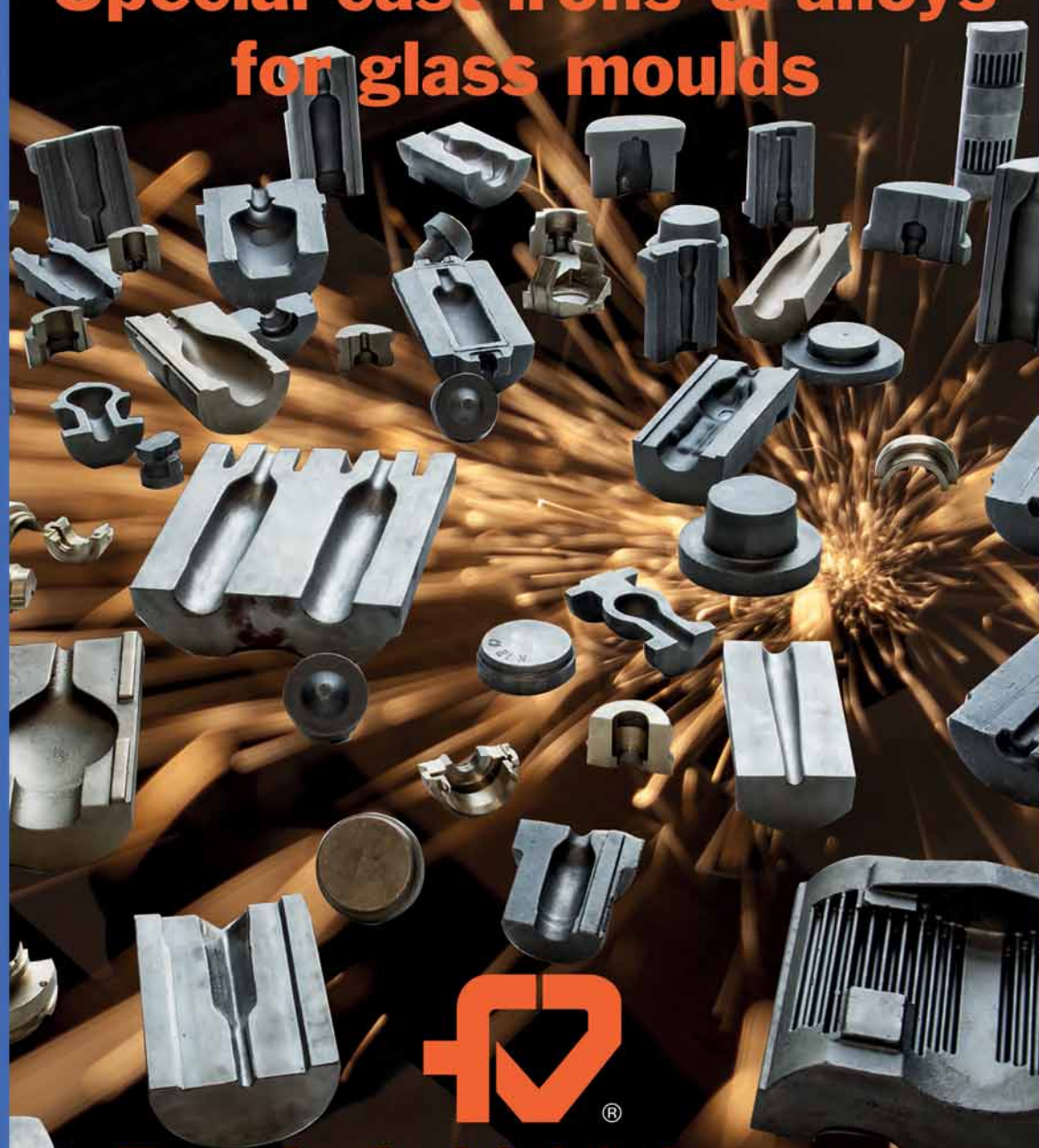


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More and more ambitious projects for glassmakers thanks to SIMTECH

SIMTECH and its team are continuing to focus on highly skilled design and manufacture of specific products used in diverse industrial sectors. This article takes a look at how the company's products are used in the hollow glass industry, where meeting important requirements is an essential part of work.

Simtech, located in Belgium, was founded in 1992 and specializes in the design and manufacture of technical products in vulcanized rubber, plastomer, elastomer and composite. The company has been certified ISO 9001 since 2002 and exports more than 85 per cent of its production on all five continents.

Part of Simtech's production is destined for the glass industry and, depending on the type of glass, Simtech has to face a series of important requirements.

HOLLOW GLASS

Palletization

The palletization of hollow glass – a fundamental step since the bottles have already been checked

upstream – requires flexibility and cleanliness. We respond to this with rubber grippers tubes, designed in such a way that none of their rigid parts come into contact with the glass. Thus, there is no risk of damaging the glass. Simtech's range, very complete, adapts to all shapes and sizes.

With regards to vacuum plates used for palletizing glass jars or tableware, the company has different coatings to match the required hygienic properties.

Handling

For handling hollow glass (bottles and jars) and PET bottles,





Simtech manufactures gripper tubes (pneumatic grippers), vacuum heads and plates, coated belts, engineering services through its Flexgrip range.

Flexgrip® - Glass transporting equipment

Simtech's Flexgrip® range of gripping solutions is for glass manufacturers whose machines palletize, handle or inspect glass or

PET containers.

Bottle handling (gripper tubes and gripper heads)

Simtech offers a wide range of gripper tubes capable of handling all types of bottles, whether they are round and long-necked or non-round and short-necked. Our gripper tubes are not only used for handling beverage bottles but

also for pharmaceutical products, cosmetics, perfumes, etc..

Handling of jars (plates and vacuum heads)

For the handling of jars or wide-mouth bottles, Simtech offers a complete vacuum palletizing system: a vacuum plate mounted on its vacuum head. The vacuum plates are suitable for all types of jars, are available in different materials, dimensions, thicknesses, hardness, etc. and are covered with a special natural rubber for food contact.

Accessories for cold inspection machines

Simtech offers a wide range of accessories such as coated belts, spacer or transport wheels, rollers, etc... suitable for all types of inspection machines. ■

Simtech

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SOFTWARE DEVELOPMENTS

SIL Manufacturing Execution System especially dedicated and developed for glassmakers from **VERTECH'**



Vertech' has been the reference provider of software solutions for the glass industry since 1995. With a wide range of products, SIL provides glassmakers with very precise, real time KPIs on the performance of the whole plant. Thanks to all this shared data and the full traceability of products, production rates improve, losses decrease and customer risks are reduced.



Vertech' is an international company specialized in the development of software solutions for glassmakers since 1995. The SIL Manufacturing Execution System – or Line Information System – has been especially dedicated and developed for glassmakers. SIL offers five comprehensive modules (SILProd, SIL4.0, SILXQual, SILXMold and SILXManager), as well as over 300 functionalities to meet glassmakers' every need.

SIL is a supervision system (Manufacturing Execution System, M.E.S.) that can be installed at the hot end and cold end, as well as in the mould shop, palletizer and quality labs. SIL has been developed for glass-

makers producing hollowware, tableware and tubes or decorating glass.

SPEAKING TO VERTECH'

A recent video interview with the CEO of Vertech' Ulas Topal, gave us some first-hand information on the process for installing SIL: timeframe, steps, price, support.

glassOnline (GOL): SIL seems to be quite a complex system – does it take a long time to install in a plant?

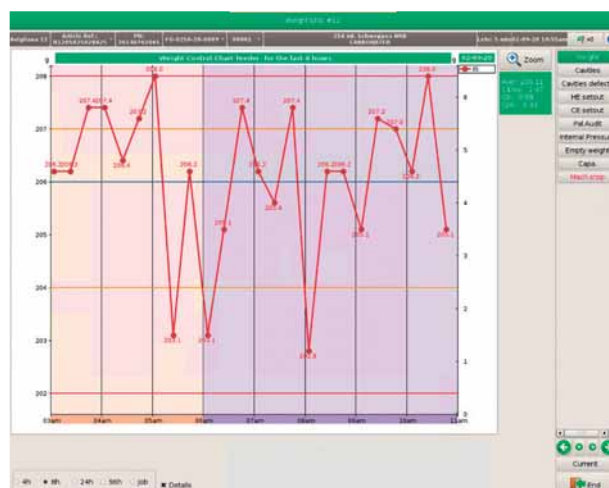
CEO of Vertech' Ulas Topal (Vertech'): From the time the order is placed, it takes between 2 and 3 months for the system to be fully installed, including 3 weeks of on-site installation with a Vertech' expert. Of course, it also

depends on the size of the plant.

(GOL): What are the different steps to installing SIL?

(Vertech'): First, Vertech' conducts a technical survey of the plant to draw up specifications for wiring. After that, the client has the plant wired accordingly while Vertech' prepares the required equipment and arranges for it to be shipped. When the equipment arrives, it can be connected by the plant's personnel. Once everything is set up, a Vertech' expert or team of experts travels on-site to finalize the system installation and train those who will be using it, so everything is operational.

(GOL): Can the system be installed 100 per cent remotely?



Without direct presence on-site? (*Vertech'*): When a plant already has the system, new lines and connections can be installed remotely. For new customers, however, having a *Vertech'* expert on-site is indispensable so they can take account of the specific parameters and ensure the effective implementation of the project. Plus, being present at the plant allows us to provide quality face to face training to make sure operators are using the system properly.

(GOL): What type of support is provided during the installation process?

(Vertech’): With over 25 years in the sector and 750 production lines in 29 countries around the globe equipped with SIL, we draw on our experience at Vertech’ to assist and guide glass plants step by step in their move toward digitization. In addition to that, we share our field expertise via personalized SIL training sessions, and provide post installation follow-up.

(GOL): Are the systems you install identical for every plant? Are they standard or do you also carry out customization?

(Vertech'): The installation project itself is designed and customized to the plant's specific needs, which is why the

core architecture of the system is identical for all plants around the world. Minor customizations can also be made to the system to suit a plant's quality procedures. Versioning also applies to all plants in order to ensure stability and proper functioning of the SIL system.

(GOL): Is customization carried out exclusively before installation or can it also be carried out when the system is already up and running?

(*Vertech'*): Our approach with our customers is that of satisfying their needs and requirements. Therefore, during product specifications we ask them if they require more or additional developments to match their needs. Customers can also request new developments while the system is already in use.

(GOL): How is cost calculated for a project like this? And how long does it take a glassmaker to see that his money has been well-spent?

(Vertech[®]): Feedback from our customers show that between 5 and 10 per cent payback is usually seen within one year. Cost depends primarily on the choice of modules and functionalities for the SIL being installed, the number of IS machines and lines to connect, and the amount of

material ordered. There can also be costs relating to additional developments requested by the plant when necessary.

In any case, a glassworks can also see between 2 to 5 per cent earnings from pack to melt.

CONCLUSIONS

(GOL): Anything else you would like to tell us about SIL? Are there any further developments in the pipeline for the future?

(*Vertech*): To conclude, I would say that implementing a supervision system is within the reach of all plants seeking to increase their productivity and efficiency. Projects are closely monitored by our teams both during and after installation, and invested costs are quickly amortized by the benefits and advantages a supervision system offers. We know from experience that the return on investment is under one year. ■



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COMPANY UPDATE

LUBEN GLASS: Variable equipment and spare parts for forming machines – an added value all along

GUARANTEED QUALITY

Over the years, Luben Glass has become established on both national and international markets, also thanks to investments culminating in an office dedicated to design and consulting, as well as R&D regarding new products. This attention to production, together with a versatile operational approach, is a characteristic of all Luben Glass brand products. The use of superior quality materials, the design and production control phases using state-of-the-art technology are the unmistakable strong points of Luben Glass' mechanical division.

A RELIABLE PARTNER

Focus on production, flexible working methods, special care and attention paid to its customers' demands are the main features that distinguish Luben



Glassmaking is a complex and continuously evolving industrial sector, and to stay ahead it is essential that companies involved are ready to respond to the needs of their clients at all times. In this article, Luben Glass gives us an update on how it is facing these challenging times.



holder with quick change inserts with which it is possible to make numerous assemblies with different diameters, the single gob mould holder with opening system for three- or four-part-moulds or, again, the tong holder with cam movement system that allows a stable and defect-free grip of the bottle neck are just some of the numer-

Glass and its products.

The use of innovative production techniques, high quality and the management of production processes, accurate design and quality controls of the different processes are the main strengths that have enabled Luben Glass to establish itself as a serious and reliable partner.

Engaged for years in the development of new products thanks to the use of innovative technologies, the company can now count on the use of highly qualified personnel who carry out effective research and innovation of its products.

Through the work and expertise of the personnel assigned to the various departments, with particular reference to produc-

tion and research and development, the company is constantly engaged in the process of evolution that has always been one of its main characteristics.

COMPETENCE AND INNOVATION

This policy allows the constant enrichment of the company know-how which, through the design and development phases and through the support of advanced technologies such as CAD/CAM design software and Reverse Engineering technologies aimed at obtaining increasingly faithful 3D mathematical models, allows the creation of items that meet the continuous needs of the market.

The special single gob mould

ous examples that highlight Luben Glass' serious approach in dealing with the problems connected to production and the simplifying of operations that glassware operators have to face every day.



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Moderne Mecanique

OCMI OTG

CARPOULE FORMING MACHINES/LINES

Moderne Mecanique

OCMI OTG

CAST IRON FOR MOULDS

Fima-Olimpia Fonderie

Fonderie Valdelsane

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

Bohemi Chemicals

Fluorital

Forglass

Graphoidal Developments

Luben Glass

Vidromecanica

COGENERATION AND TRIGENERATION THROUGH HEAT RECOVERY SYSTEMS

BDF Industries

Stara Glass

COLD-END LINES

ACH - Advanced Container Handling

All Glass

Bucher Emhart Glass

EMS Group

Forglass

Forma Glas

Heye International

Iris Inspection Machines

KYP Accesories

Mimsan Conveyor Systems

MSK Covertech

Regina Catene Calibrate

Stara Glass

Vetromeccanica

EMS Group

COLOURS & ENAMELS

Bohemi Chemicals

GCG - Glass Consulting Group

Fluorital

Forglass

CONSULTING SERVICES

BDF Industries

Bucher Emhart Glass

Falorni Tech

Forglass

futronic

GCG - Glass Consulting Group

GS - Glass Service

HFT

Horn

Luben Glass

Olivotto Glass Technologies

Stara Glass

TECO Group

CONTROL & AUTOMATION SYSTEMS

BDF Industries

Bottero

Bucher Emhart Glass

Falorni Tech

Forglass

futronic

GCG - Glass Consulting Group

Glass Service

GS - Glass Service

Luben Glass

Horn

Iris Inspection Machines

MSK Covertech

Olivotto Glass Technologies

Stara Glass

TECO Group (EAE Tech)

VMA

Video Systems

Waltec Maschinen

ZIPPE

CONVEYING & STOCKING SYSTEMS

All Glass

Forglass

MSK Coverttech

Olimerk

OMS

Ramsey Products

Regina Catene Calibrate

Vetromeccanica

EMS Group

CONVEYOR BELTS

Car-Met

Famor Engineering

Forglass

Forma Glas

Luben Glass

Olivotto Glass Technologies

Pennine

Ramsey Products

Regina Catene Calibrate

Revimac-Bottero

Vetromeccanica

Vidromecanica

WBT

ZIPPE

CONVEYOR CHAINS & SPROCKETS (HOT-END)

Luben Glass

Pennine

Renold

Revimac-Bottero

Ramsey Products

WBT

ZIPPE

CRACK-OFF MACHINES

Forma Glas

Olivotto Glass Technologies

Waltec Maschinen

CROSS- CONVEYORS

BDF Industries

Bucher Emhart Glass

Car-Met

Famor Engineering

Forma Glas

Heye International

Luben Glass

MT Forni Industriali

Olimerk

Ramsey Products

Revimac-Bottero

Vidromecanica

Waltec Maschinen

WBT

CULLET SEPARATION & TREATMENT SYSTEMS

EME

Falorni Tech

Forglass

GCG - Glass Consulting Group

Vidromecanica

ZIPPE

DATAMATRIX READING DEVICES

TIAMA

DECORATING MACHINES

Fermac

Forma Glas

Koenig & Bauer Kammann

DECORATION CUTTING MACHINES

Waltec Maschinen

DECORATIVE ENAMELS

Fluorital

GCG - Glass Consulting Group

DEDUSTING & FILTERING SYSTEMS

BDF Industries

Forglass

Stara Glass

DOSING SYSTEMS: COLD-END EMULSIONS

GCG - Glass Consulting Group

Graphoidal Developments

Luben Glass

Revimac-Bottero

Vidromecanica

DOSING SYSTEMS: GOB CUTTING LUBRICATION

Graphoidal Developments

Luben Glass

Revimac-Bottero

DRIVE SYSTEMS / VARIABLE SPEED

BDF Industries

Bottero

Forglass

futronic

Heye International

Olivotto Glass Technologies

Revimac-Bottero

DROPPER AFTER-FORMING MACHINES/LINES

Moderne Mecanique
OCMI OTG

DROPPER FORMING MACHINES/ LINES

Moderne Mecanique
OCMI OTG

ELECTRIC BOOSTING SYSTEMS

BDF Industries

Bock Energietechnik

Falorni Tech

Forglass

GCG - Glass Consulting Group

Glass Service

Horn

Sorg Nikolaus

Stara Glass

TECO Group

ELECTRONIC CONTROL SYSTEMS AND IT

BDF Industries

Bock Energietechnik

Forglass

futronic

Glass Service

Horn

Olivotto Glass Technologies

Sorg Nikolaus

TECO Group

Waltec Maschinen

ZIPPE

ELECTRODE HOLDERS

Bock Energietechnik

GCG - Glass Consulting Group

Glass Service

Horn

Sorg Nikolaus

Stara Glass

TECO Group

ELECTRODE HOLDERS HOT AND COLD FURNACE INSTALLATION

Horn

Stara Glass

TECO Group

EMISSION MONITORING SYSTEMS

BDF Industries

GS - Glass Service

Stara Glass

EMULSION DOSING SYSTEMS

Graphoidal Developments

Luben Glass

Revimac-Bottero

ENERGY RECOVERING SYSTEMS

BDF Industries

Falorni Tech

Luben Glass

Stara Glass

ZIPPE

ENGINEERING SERVICES

Stara Glass

TECO Group

ENGINEERING AND MODELLING FOR BOOSTING SYSTEMS

Bock Energietechnik

Horn

ENGRAVING MACHINES

TIAMA

FEEDERS & MECHANISMS

BDF Industries

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Famor Engineering

Forglass

Forma Glas

Glass Service

Heye International

Olivotto Glass Technologies

Revimac-Bottero

Waltec Maschinen

FIBERGLASS / GLASSWOOL PRODUCTION LINES, EQUIPMENT & PRODUCTS

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Glass Service

HFT

Olivotto Glass Technologies

TECO Group

FINISHING MACHINES

KYP Accesories

FIRE POLISHERS & EQUIPMENT

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futronic

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FOREHEARTHS & SYSTEMS

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Bock Energietechnik

Bottero

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Forglass

GCG - Glass Consulting Group

Glass Service

HFT

Horn

MT Forni Industriali

Revimac-Bottero

Sorg Nikolaus

Stara Glass

TECO Group

FORMING MACHINES

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FURNACES: CLEANING SYSTEMS

Glass Service

FURNACES: DRAINING SYSTEMS

Bock Energietechnik

Falorni Tech

Forglass

GCG - Glass Consulting Group

Glass Service

Horn

Sorg Nikolaus

Stara Glass

FURNACES: ELECTRIC

Bock Energietechnik

Falorni Tech

Forglass

Glass Service

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Horn

KYP Accesories

Sorg Nikolaus

Stara Glass

TECO Group

FURNACES: HEAT-UP

BDF Industries

Falorni Tech

Forglass

Glass Service

Horn

Sorg Nikolaus

Stara Glass

FURNACES: HOT CULLET FILLING

Falorni Tech

Forglass

Stara Glass

FURNACES: MELTING

BDF Industries

Bock Energietechnik

Falorni Tech

Forglass

Glass Service

Horn

MT Forni Industriali

Sorg Nikolaus

Stara Glass

TECO Group

FURNACES: METAL STRUCTURES

BDF Industries

Car-Met

Falorni Tech

Forglass

Glass Service

HFT

Horn

Stara Glass

FURNACES: OXY-FUEL OR RECUPERATIVE

BDF Industries

Falorni Tech

Glass Service

HFT

Horn

MT Forni Industriali

Sorg Nikolaus

Stara Glass

TECO Group

FURNACES: PREHEATING SYSTEMS

Commersald Impianti

Falorni Tech

Forglass

Glass Service

Horn

Olivotto Glass Technologies

Sorg Nikolaus

Stara Glass

FURNACES: REPAIR, MAINTENANCE & REVAMPING

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

GASES

Glass Service

GLASS BRICK PRODUCTION LINES

Amig
Olivotto Glass Technologies
Waltec Maschinen

GLASS LEVEL CONTROL DEVICES

BDF Industries
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Falorni Tech
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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 Group

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 Coverttech
Olivotto Glass Technologies
OMS
Revimac-Bottero
Vetromeccanica

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
Forglass
Glass Service

Horn

HIGH TEMPERATURE INSULATION PRODUCTS

Stara Glass

HOT-END PROCESS MONITORING SOLUTIONS

TIAMA

HOT GLASS CONTACT MATERIALS

Bucher Emhart Glass
Olivotto Glass Technologies

HOT GLASS SCRAPERS

Car-Met
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GCG - Glass Consulting Group
Vidromecanica
ZIPPE

INFRARED THERMOMETERS

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GS - Glass Service
KYP Accesories

INJECTION MACHINES

Famor Engineering
Heye International
Olivotto Glass Technologies

INSPECTION MACHINES: COLD-END

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Euromatic
Forma Glas
Heye International
KYP Accesories
Iris Inspection Machines

Luben Glass

Regina Catene Calibrate

TIAMA

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VMA

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

INSPECTION MACHINES: VIALS & AMPOULES

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Iris Inspection Machines
KYP Accesories
Moderne Mecanique
OCMI OTG
Spami-Optrel-Stevanato
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Video Systems

I.S. MACHINES

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I.S. MACHINE LUBRICATION SYSTEMS

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Bucher Emhart Glass
Graphoidal Developments
Heye International
Luben Glass
Revimac-Bottero

I.S. MACHINE RECONDITIONING

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Heye International
Luben Glass
Revimac-Bottero

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LASER CUTTING MACHINES

Forma Glas
Olivotto Glass Technologies
Waltec Maschinen

LEHR DRIVES

Heye International

LEHRS: ANNEALING

Antonini
Euromatic
Falorni Tech
Heye International
KYP Accesories
Moderne Mecanique
MT Forni Industriali
OCMI OTG
Vidromecanica

LEHRS: DECORATING

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MT Forni Industriali
Vidromecanica

MAINTENANCE AND REPAIR SERVICES

Bock Energietechnik
Forglass
Forma Glas
Luben Glass
Olimerk
Revimac-Bottero
SKS - Sorg Karrena Service
Stara Glass

MARKING MACHINES

Luben Glass
Sorg Nikolaus

MEASUREMENT & CONTROL SYSTEMS

BDF Industries
Bock Energietechnik
Bucher Emhart Glass
futronic
GS - Glass Service
Horn
KYP Accesories
Luben Glass
Olivotto Glass Technologies
Video Systems
VMA
Waltec Maschinen

MIXERS

EME
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GCG - Glass Consulting Group
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MT Forni Industriali
Teka
ZIPPE

MOULDS

Legé Mould Technology
Officine SL
Perego Giancarlo
Strada

MOULDS: CLEANING POLISHING MACHINES

BDF Industries
Luben Glass
Ecotecne

MOULDS: COMPONENTS & ACCESSORIES

Officine SL

Olimerk

Perego Giancarlo
UniMould

MOULDS: INSPECTOR SYSTEM

Luben Glass

MOULDS: LUBRICANTS & SPRAY EQUIPMENT

Graphoidal Developments
Luben Glass

MOULDS: MAINTENANCE EQUIPMENT

Ecotecne
Luben Glass

MOULDS: POLISHING MACHINE

Luben Glass

MOULDS: PREHEATING OVENS

Antonini
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MT Forni Industriali
Luben Glass
Olivotto Glass Technologies
Revimac-Bottero
Vidromecanica

MOULDS: WELDING LINES

Commersald Impianti

MOULDS & PLUNGERS COATING SYSTEMS & MATERIALS

Commersald Impianti

UniMould

NECK RINGS

Olimerk
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PALLETIZING/ DEPALLETIZING LINES

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Handling
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PASTE MOULD MACHINES

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PLANT UTILITIES

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PLATINUM FEEDER SYSTEMS

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Glass Service
Olivotto Glass Technologies

PLUNGER HONING MACHINES

Bottero

PLUNGERS & MECHANISMS

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Olimerk
Olivotto Glass Technologies
 Perego Giancarlo
 Revimac-Bottero
 UniMould
 Waltec Maschinen

POLISHING/ GRINDING MACHINES

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 Luben Glass
Olivotto Glass Technologies

POWER REGULATION/ TRANSFORMERS

Bock Energietechnik

PREDICTIVE SOLUTIONS

Video Systems

PRESS MACHINES

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 Famor Engineering
 Forma Glas
Olivotto Glass Technologies
 Waltec Maschinen

PRESS & BLOW MACHINES

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 Famor Engineering
Heye International
 Messersi Packaging
Olivotto Glass Technologies
OMS
 Waltec Maschinen

PRESS RECONDITIONING

Famor Engineering
 Luben Glass
Olivotto Glass Technologies

PRODUCTION ASSISTANCE FOR HOLLOW GLASS

Olimerk

PUSHERS

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 Car-Met
EME
 Famor Engineering
 Forma Glas
Heye International
 Luben Glass
Olivotto Glass Technologies
 Waltec Maschinen

RAW MATERIALS

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 GCG - Glass Consulting Group
 Minerali Industriali

RECYCLING PROCESSES

EME

RECYCLING SYSTEMS

EME
Falorni Tech
 GCG - Glass Consulting Group
 ZIPPE

REFRATORIES

Bucher Emhart Glass
Falorni Tech
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Linco Baxo
Olivotto Glass Technologies
S.I.G.MA.
 Stara Glass
 Waltec Maschinen

REFRATORIES INSTALLATION SERVICES

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Falorni Tech

HFT

Horn
 SKS - Sorg Karrena Service
 Stara Glass

REPLACEMENT PARTS

TECO Group
Olimerk
Olivotto Glass Technologies
 Waltec Maschinen

ROBOTS: BALL GATHERERS

Falorni Tech
Glass Service
Olivotto Glass Technologies
 Waltec Maschinen

ROBOTS: HANDLING & PACKAGING

ACH - Advanced Container
 Handling
 All Glass
EMS Group
 Euromatic
Falorni Tech
 Famor Engineering
KYP Accesories
 Messersi Packaging
 MSK Coverttech
Olivotto Glass Technologies
 Spami-Optrel-Stevanato
 Group
Vetromeccanica
 Waltec Maschinen

ROTATING TABLES

Messersi Packaging
Olivotto Glass Technologies
OMS
Vetromeccanica
 Waltec Maschinen

SANDBLASTING MACHINE

Luben Glass

SAW MACHINES

Olivotto Glass Technologies

SECOND-HAND EQUIPMENT

BDF Industries
Falorni Tech
 Forma Glas
Heye International
KYP Accesories
Olivotto Glass Technologies
Vidromeccanica

SERVICES

Bock Energietechnik
EME
Forglass
 Forma Glas

Olimerk
 Stara Glass
 TECO Group

SERVICES IN HOT-DRILLING AND CHANGE OF ELECTRODE HOLDERS

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SHEAR BLADES

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Heye International
 Famor Engineering
 Luben Glass
WBT

SHEAR BLADES LUBRICANTS

Graphoidal Developments
 Luben Glass

SHEAR SYSTEMS

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Falorni Tech
 Famor Engineering

Forma Glas
Graphoidal Developments
Heye International
Luben Glass
Olivotto Glass Technologies
Revimac-Bottero
Waltec Maschinen

SHUTTLE CARS

EMS Group

STRETCH & SHRINK FILM WRAP MACHINES

All Glass
Messersi Packaging
MSK Covertex
OMS
Vetromeccanica
EMS Group

SHRINK OVENS

Messersi Packaging
OMS

SILKSCREEN INKS

Fluorital

SILKSCREEN PRINTING LINES: HOLLOWARE & TABLEWARE

Euromatic
Fermac

SILKSCREEN PRINTING LINES: VIALS & AMPOULES

Moderne Mecanique
OCMI OTG

SOFTWARE

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Bucher Emhart Glass
futronic

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Heye International
Olivotto Glass Technologies
Stara Glass
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Video Systems
Waltec Maschinen

SPINNING MACHINES

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Olivotto Glass Technologies
Waltec Maschinen

SPOUT ELECTRICAL HEATING ELEMENTS

Bock Energietechnik

STACKERS

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

STEMWARE PRODUCTION LINES

Falorni Tech
Forma Glas
Olivotto Glass Technologies
Vidromecanica
Waltec Maschinen

STEMWARE SEALING MACHINES

Falorni Tech
Forma Glas

OCMI OTG
Olivotto Glass Technologies
Waltec Maschinen

STIRRERS

BDF Industries
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Falorni Tech
Forglass
GCG - Glass Consulting Group
Glass Service
Horn
MT Forni Industriali

Olimerk
Olivotto Glass Technologies
Revimac-Bottero
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

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Bucher Emhart Glass
Falorni Tech
Famor Engineering
Forma Glas
Luben Glass

Olimerk
Olivotto Glass Technologies
Ramsey Products
Vidromecanica
Waltec Maschinen

TEMPERATURE MEASUREMENT & CONTROL

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

TEMPERING LINES

Vidromecanica
Waltec Maschinen

THERMAL SHOCK TEST MACHINES

Vidromecanica

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GCG - Glass Consulting Group

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UV LAMPS

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VIAL FORMING MACHINES/LINES

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Moderne Mecanique
OCMI OTG
Spami-Optrel-Stevanato Group

VIAL PACKAGING MACHINES

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KYP Accesories
Moderne Mecanique
OCMI OTG
Spami-Optrel-Stevanato Group

VIBRATING EQUIPMENT

EME

Forglass

Vetromeccanica

ZIPPE

WASTE GAS CLEANING SYSTEMS

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Stara Glass

WASTE GASES DUCT WORKS AND VALVES CLEANING SYSTEMS

BDF Industries

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GLASS MACHINERY PLANTS & ACCESSORIES is the leading international magazine for glass manufacturing, and is targeted at glassworks involved in the production and processing of hollowware and special glass (bottles, containers, household, lighting, technical, scientific, industrial and medical glassware).

GLASS MACHINERY PLANTS & ACCESSORIES is a bi-monthly periodical with about 100 pages of product news, current world news, focus on..., technical articles and dossiers, worldwide exhibitions, glassworks in the world, Yellow Pages, etc.

1989



Glass-Technology
International

GLASS-TECHNOLOGY INTERNATIONAL is the leading international magazine for professionals involved in the flat and bent glass industry, from building to automotive, and from furniture to household appliances. **G-TI** is useful for those working in float glass plants as well as glass processors/fabricators, glazing contractors, automotive glass installers, window and door manufacturers, glass merchants, wholesalers, etc. With about 100 pages per issue, it is the bi-monthly tool for keeping abreast of new technology, new products, company life and all innovations in the world of flat and bent glass.

1990



Glass Industry
Directory 2021

The **GLASS INDUSTRY DIRECTORY** is a unique international annual guide which gives a complete overview of international glassworks and suppliers involved in hollowware and special glass manufacturing. About 300 pages of complete company profiles: addresses, management, sister companies, plants, number of employees, turnover, banks, year of company foundation, capital, trademarks, areas of activity, innovations, product-by-product and country-by-country breakdowns. The **GLASS INDUSTRY DIRECTORY** is the annual reference point for the international glass manufacturing industry comprising bottles and containers, domestic glassware, tubing, vials and ampoules, lighting glassware, technical and industrial glassware, scientific, laboratory and medical glassware and much more.

2013



FLATGLASS
2021 world directory

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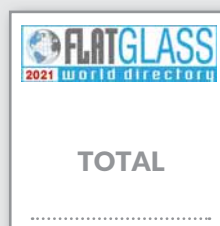
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2021/2022 Glass Events

12-15 September 2021	GULF GLASS	DUBAI - UAE
13-15 September 2021	GLASSBUILD AMERICA	ATLANTA (GA) - USA
5-8 October 2021	VITRUM	MILAN - Italy
20-22 October 2021	GPD-GLASS PERFORMANCE DAYS	TAMPERE - Finland
1-4 November 2021	CONF. ON GLASS PROBLEMS	COLUMBUS (OH) - USA
3-6 November 2021	EURASIA GLASS	ISTANBUL - Turkey
2-5 December 2021	ZAK GLASS TECHNOLOGY	MUMBAI - India
17-18 February 2022	GLASSMAN ASIA	SEOUL - South Korea
3-5 March 2022	GLASSPEX INDIA	MUMBAI - India
10-13 March 2022	COSMOPACK	BOLOGNA - Italy
April 2022 (date to be announced)	CHINA GLASS	SHANGHAI - China
11-12 May 2022	GLASSMAN LATIN AMERICA	MONTERREY - Mexico
6-9 June 2022	MIR STEKLA	MOSCOW - Russia
29 June-2 July 2022	GLASS SOUTH AMERICA	SAO PAULO - Brazil
6-9 July 2022	GLASSTECH MEXICO	MEXICO CITY - Mexico
20-23 September 2022	GLASSTEC	DÜSSELDORF - Germany
September 2022 (date to be announced)	GLASSBUILD AMERICA	LAS VEGAS (NV) - USA
26-28 October 2022	GLASSTECH ASIA	SINGAPORE - Singapore
15-18 November 2022	VETECO	MADRID - Spain
December 2022 (date to be announced)	ZAK GLASS TECHNOLOGY	DELHI - India

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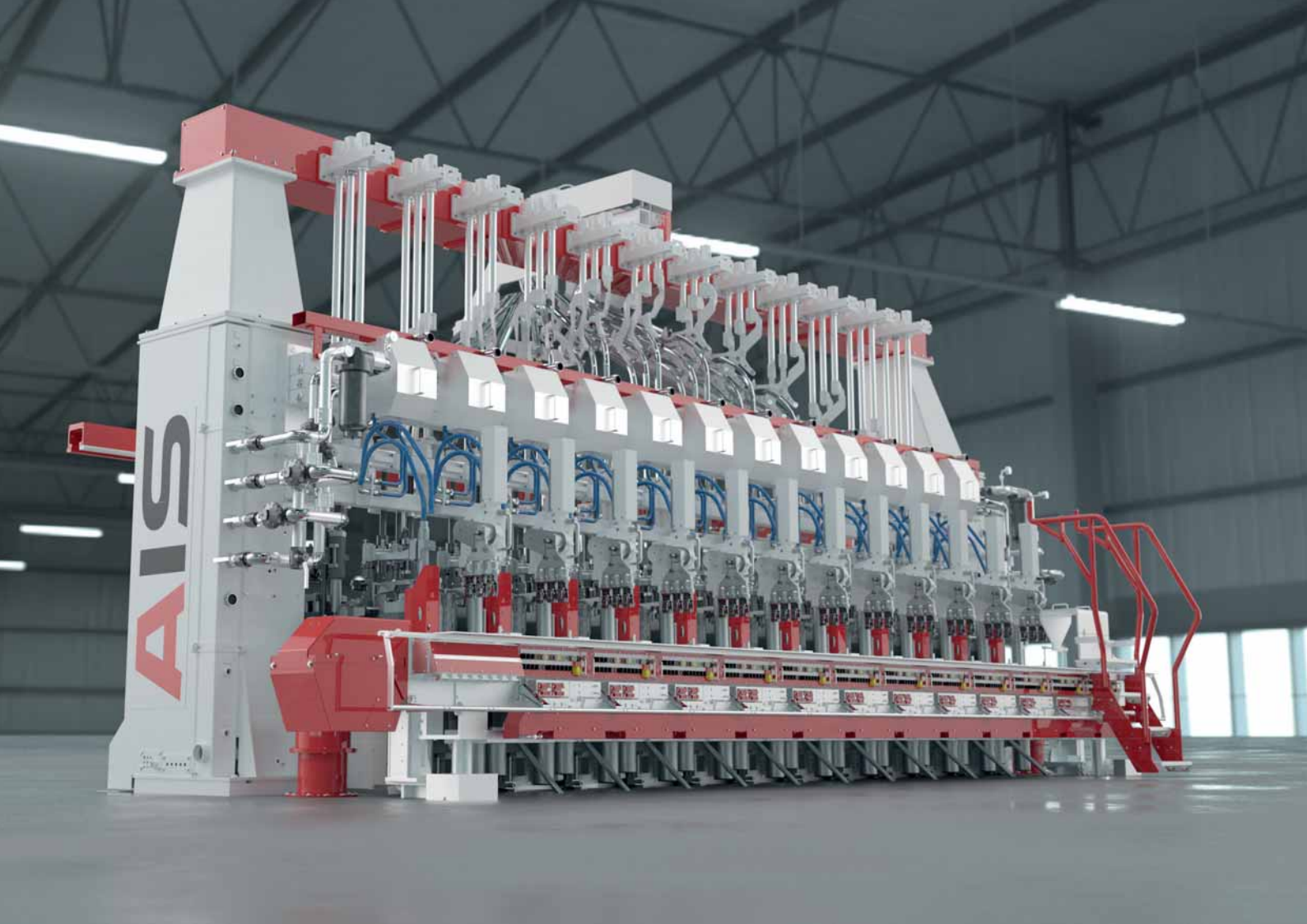


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