

# GLASS

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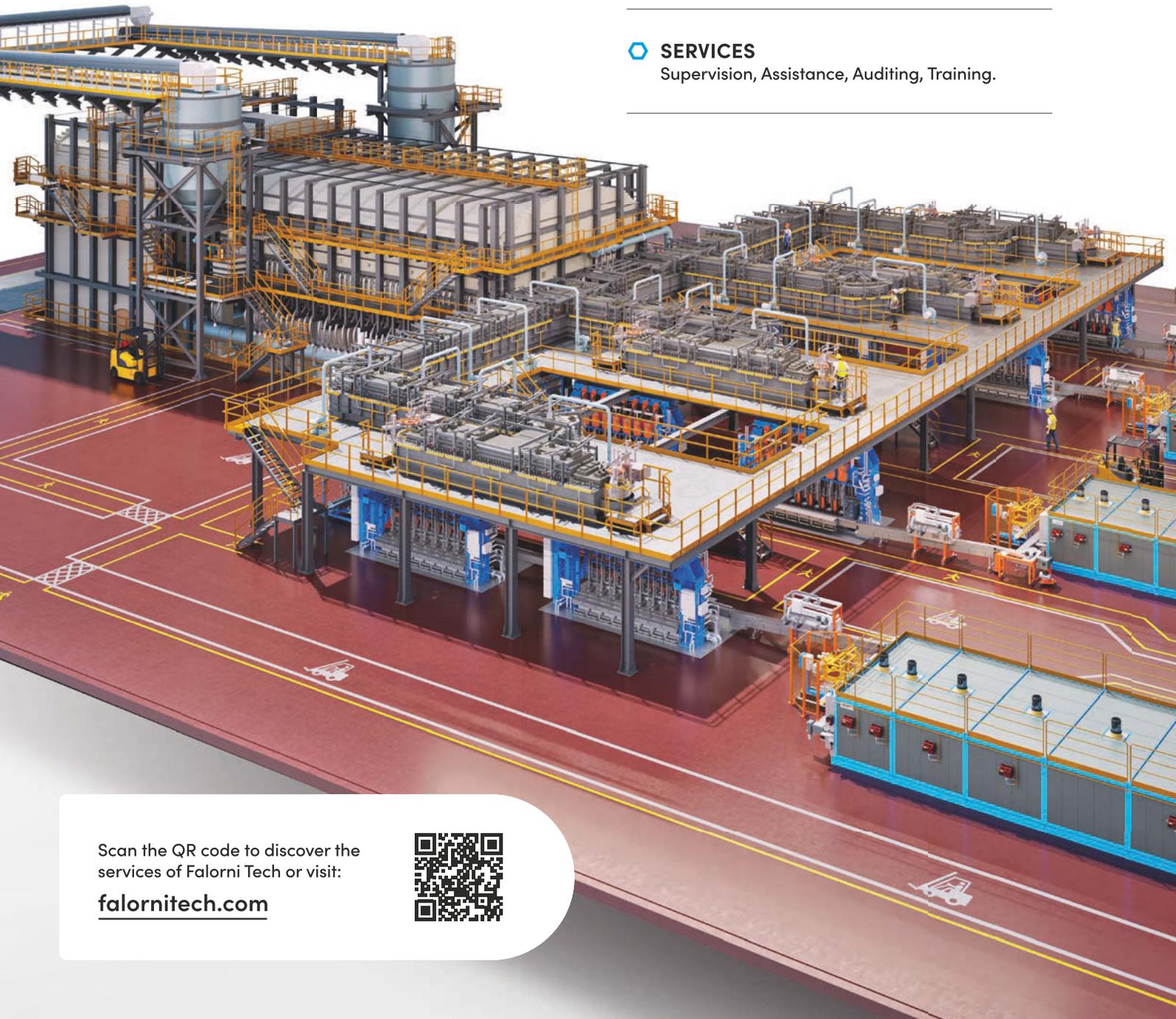
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# GLASS

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GREG MORRIS, EDITOR



**No summer slowdown**

The summer is traditionally a period of time for those in the northern hemisphere to slow down and relax.

But for those of us in the glass industry, the summer of every 'even' numbered year is always busy as we ramp up our preparation for the major Glasstec show in the autumn.

I'm sure many companies will spend the next few months checking the details of their booth and ensuring they have the correct marketing materials for the duration of the trade show.

Ahead of the event there are signs the industry is beginning to pick up again after its recent slump.

Small acorns of investment are being reported by some of the manufacturers.

Recent examples include O-I and Verallia in France, O-I in Peru, Beta Glass in Nigeria and Basturk Cam in Turkey. No doubt this will increase after the Glasstec event when manufacturers go shopping.

Increasingly these investments are focused on sustainability and ensuring any new furnace has reduced its emissions.

Our feature interviews this month are all focused on furnaces and in particular new fuels to fire the oven.

Verallia discusses its all-electric melting concept in its Cognac site, Schott reports on its hydrogen melting trials while technology supplier Fives highlights its hybrid offerings to the glass market.

They may be small steps, but the glass industry is moving forward in its decarbonisation attempts.



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O-I Mexico and glass recycler SILICE have inaugurated a glass recycling hub in Chihuahua, Mexico.

The hub plans to process 300 tons of glass per month; glass is collected locally, then brought to the location.

After being processed at the hub, the glass will be reused at O-I's plant in Monterrey, Mexico, providing part of the raw material used in making glass.

With energy consumption falling by around 3% for

every 10% of recycled glass, or 'cullet', used in the manufacturing process, glass recycling is a key factor in reducing energy consumption and CO<sub>2</sub> emissions.

Randy Burns, Chief Sustainability and Corporate Affairs Officer for O-I Glass, said: "Our goal is to use at least 50% recycled glass by 2030.

"We have taken action in many parts of the world towards this target, and most recently announced our mobile recycling programme,

MOGRA, in North America. This co-operation with SILICE in Mexico is expected to get us yet another step closer."

SILICE was founded in 2020 by two local entrepreneurs and engineers, Paulina Rascón and Ashly Hinojos.

During the Covid-19 pandemic, Ms Rascón and Ms Hinojos started the company, focusing on establishing strategic alliances with collection centres, bars, and restaurants for efficient glass collection.

## Ardagh to halt production at two US manufacturing sites

Ardagh is set to close one glass plant and halt production at another in the USA impacting nearly 500 jobs.

The glass manufacturer said it was to close its Houston, Texas beer glass manufacturing facility where

220 jobs would be lost.

Meanwhile it has also warned of temporary layoffs at its Seattle, Washington wine glass bottle production facility with 244 workers impacted.

Ardagh stated ongoing market conditions for the

wine and beer markets.

Separately, the company is at least temporarily laying off another 244 employees as it halts production at its Seattle facility, according to a Washington WARN notice.

## NEWS IN BRIEF

**Entries open for British Glass Focus Awards 2024**

This year's Glass Focus Awards, hosted by British Glass, will take place on November 21<sup>st</sup>.

Entries for the awards are currently open.

All entry forms must be emailed to [glassfocus@britglass.co.uk](mailto:glassfocus@britglass.co.uk) by 12pm on Wednesday the 25<sup>th</sup> of September 2024.

**Horn to supply oxyfuel furnace to ODE**

Glass melting technology specialist Horn has been entrusted by ODE, who is among the largest manufacturers of the insulation industry, to supply a new oxyfuel furnace.

The project in Turkey includes the repair of an oxyfuel furnace with two production lines for glass wool.

The existing furnace will be stopped for drainage/demolition in the second quarter of 2025.

**Best paper winner named at SGT session**

A paper which focused on reducing Scope 3 emissions from the glass manufacturing process secured an inaugural best presentation award.

The Murano Glass Flame winner was presented to Pete Nisbet from Edenseven sustainability consultancy.

He was among 14 speakers at a Sustainability Session which took place at the Society of Glass Technology's (SGT's) Annual Conference in Cambridge, UK.

**Assovetro awards Antonio Lui for his service to glass**

Italian glass association Assovetro has recognised Mr Antonio Lui for his dedication to glass.

Marco Ravasi, Assovetro president, presented Mr Lui with the 2024 award, which is organised every two years to celebrate a personality who has dedicated their career to the world of glass.



# Verallia completes €230 million Vidrala Italy acquisition

Vidrala has completed the sale of its Italian business to Verallia for €230 million.

Vidrala's Italian subsidiary operates from one production site in Corsico near Milan, with two furnaces.

The Spanish-headquartered glassmaker said the sale will help it re-focus on the core businesses and crystallise the opportunity to realise the value that has been created.

Verallia said: "Equipped with two recently renovated

furnaces, the Corsico-based plant benefits from modern production facilities with a capacity of 225Kt/year and enjoys a strong positioning, particularly in the beer, food and spirits markets.

"Nearly 200 employees will reinforce Verallia's expertise, with a view to sharing knowledge and best practices.

Verallia operates seven production sites in Italy after the completion of the acquisition.

Patrice Lucas, Chief Executive Officer, Verallia, said: "The acquisition of the Corsico plant represents a real asset for Verallia's growth.

"It is in line with our strategic plan to grow in key European markets. It is an opportunity to reinforce our operational excellence for the benefit of our customers. We extend a warm welcome to all Corsico teams."

## Qatar glass manufacturing facility produces first glass containers

Qatar facility Gulf Glass Factory has produced its first glass.

Under the guidance of turnkey project co-ordinator Falorni Tech, the facility produced its first glass on the feeder of its line 2.

More glass is expected to be provided with the launch of two more lines.

Gulf Glass Factory is a subsidiary of Qatar Industrial Manufacturing Company (QIMC).

The design capacity of the plant in the first phase is 200 tonnes per day which equates to approximately 1 million glass containers per day,

through one furnace at a total cost of about QR320m (\$87.7 million).

Future expansion has been considered by adding a second furnace, which will raise the production capacity to about 450 tonnes per day and increase the total investments to about QR400m.

The plant aims to produce glass containers used in the food and beverage industry, including mineral water, soft drinks, and juices.

It will cover local market's need for glass containers, which are currently being imported from foreign sources

at high costs.

Also, a portion of the project's products will be exported to international and neighbouring markets, especially Lebanon, Jordan, Syria, and Iraq.

These countries suffer from shortage of glass containers, as there are only a limited number of glass container factories, despite the need being high considering the size and importance of the food industries within them.

The project will have the opportunity to compete in these markets as well as other global markets.

## NEWS IN BRIEF

**Glassmakers help create iconic Chanel bottle**

Glass manufacturer Koa Glass and Technoglass helped produce the latest Chanel N°5 perfume bottle.

The two manufacturers were involved in the development of the bottle, which took 18 months to create.

The oblong shape is the first time an interpretation of the bottle has taken a turn away from its iconic shape.

**Encirc uses vegetable oil to transport products at Elton glass site**

Encirc will reduce the emissions of its glass production site in Elton, UK, by using vegetable oil to transport its products.

In partnership with haulier Sparks Transport, Encirc will use hydrotreated vegetable oil (HVO) to transport the products from its Elton site to its sister plant in Bristol, UK.

Switching to HVO will substantially lower the company's carbon footprint.

**WE Soda appoints Senior Executive Team members**

Glass raw material supplier WE Soda has appointed Bob Katsioulis as Chief Commercial Officer and Dr Alan Knight OBE as Chief Sustainability Officer.

WE Soda said these new appointments showcased its commitment to commercial excellence and sustainability leadership.

**Nipro Pharma plots Indian furnace upgrade**

Nipro Pharma Packaging is to upgrade its furnace at its Meerut, Uttar Pradesh, India glass manufacturing facility.

The upgrade is designed to enhance its production capabilities and allow the pharma glass manufacturer to offer a broader array of glass tubing sizes.

The furnace will ensure more consistent and higher-quality products that adhere to industry standards and specifications, and will be in operation by mid-2025.



## Sisecam Chairman Prof. Dr. Ahmet Kirman leaves company

Sisecam's Chairman and Executive Director, Prof. Dr. Ahmet Kirman, has left the company.

He has been with the Turkish-headquartered company since 2006 and said the company had achieved great things in his tenure.

Sisecam became a company that operates in 14 countries with 24,000 people with its products distributed around the globe.

"I owe a debt of gratitude to all my Sisecam colleagues in this regard. I experienced

the unbearable lightness of being a team that runs for the same goal, feels the same excitement, rejoices together, and grieves together.

"I would like to sincerely thank everyone with whom I had the opportunity to work together, which allowed me to be a part of the world glass industry."

In a statement to domestic media the company said: "Prof. Dr. Kirman, who has added value to Sisecam since 2006 and made our company a respected and influential

player on a global scale with his achievements, has decided to leave office at his own request.

"Under Kirman's leadership, Sisecam has surpassed regional leadership and become a global company," the company said.

In addition, he was named the Phoenix Glass Person of the Year in 2023 while also honoured with the 'Cavaliere' of the Order of the Star of Italy in 2019.

## Visy completes AU\$150 million 'green' furnace glass investment

Visy is now operating Australia's most energy-efficient glass furnace at its recycling and remanufacturing facility in Sydney.

The \$150 million (US\$101 million) investment in Penrith - which was officially opened by New South Wales Premier Chris Minns and Visy Chairman Anthony Pratt - is the country's first oxygen-only fuelled furnace using less than half the energy than the one it replaced.

"That's the equivalent of saving enough energy to heat more than 32,000 Sydney homes every year," said Mr Pratt.

Visy's Penrith site is the only glass bottle and jar manufacturing factory in New

South Wales.

It produces in excess of 800 million glass containers every year in support of Australia's food and beverage brands such as Vegemite, Cottee's Jam, Toohey's New and Bundaberg Ginger Beer.

The facility will also use recycled cullet pre-heating technology to increase the use of recycled glass in Australia's glass bottle manufacturing sector.

"This new technology is part of our programme to make glass containers with an average 70% recycled content across Australia and New Zealand," Mr Pratt said.

The factory takes recycled glass from household recycle bins and the Return and Earn

container deposit scheme to make the new bottles and jars: "At Visy, we're not just manufacturers - we're in the landfill avoidance business because recycling is an important weapon against climate change," said Pratt.

"We're investing in low energy technology, as well as high paying, green collar jobs, and boosting Australia's manufacturing capability."

The investment is part of Mr Pratt's 2021 commitment to invest \$2 billion over the ensuing decade to reduce landfill, and to help fight climate change while creating and sustaining thousands of green collar Australian manufacturing jobs.



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## NEWS IN BRIEF

**Glass collection rate in EU reaches 80.2%**

The EU average collection of glass packaging for recycling was 80.2% in 2022, with a record volume of collected glass.

The latest data released by Close the Glass Loop shows that the EU average collection for recycling rate of glass packaging remained stable at 80.2% in 2022.

**Otto Schott Research Award honours optical glass scientist**

Prof. Setsuhisa Tanabe, from Kyoto University in Japan, has received the 2024 Otto Schott Research Award.

Prof. Tanabe was recognised for his far-reaching scholarly impact and long-standing contributions in the field of optically active materials.

Named after specialty glass pioneer Otto Schott, the award has recognised outstanding scientists in glass and ceramics since 1991.

**Glass Technology Services to host UK glass packaging event**

The 'Future of Pharma Glass Packaging Forum' will take place at Glass Technology Services' site in Sheffield, UK, on September 25<sup>th</sup> 2024.

The forum will delve into the latest advancements, regulatory updates, and solutions shaping the pharmaceutical glass packaging industry.

**Zippe establishes US office for glass enquiries**

To cope with the increasing demand and activities in the US, batch and cullet specialist Zippe Industrieanlagen has established a service point in the USA.

The office is located in Alpharetta, Georgia.

The person responsible for service and sales-related activities in the US is Mr Marco Cabrera.

# Top 10 stories in the news

Our most popular news over the past month, as determined by our website traffic. All full stories can be found on our website.

- 1. Ardagh to halt production at two US glass sites
- 2. Verallia completes €230 million Vidrala Italy glass acquisition
- 3. O-I Glass plots \$150 million Alloa glass manufacturing investment
- 4. Siscam Chairman Prof. Dr. Ahmet Kirman leaves company
- 5. Verallia plots hybrid glassmaking oven at French plant
- 6. Visy completes AU\$150 million green furnace glass investment
- 7. Qatar glass manufacturing facility produces first glass
- 8. Glassmakers help create iconic Chanel bottle
- 9. Toyo Glass secures approval for hydrogen-powered glass melting furnace
- 10. AGI Greenpac to invest 230 Crore in Indian glass production sites



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## Pilkington NA confirms Ohio glass centre of excellence

Pilkington North America has confirmed its presence in a glass research centre of excellence in Ohio, USA.

The Governor of Ohio recently announced the Northwest Ohio Innovation Consortium (NOIC) will receive a \$31.3 million grant from the Ohio Department of Development's Innovation Hubs programme to establish an Innovation Hub.

Pilkington North America is a member of NOIC, a non-profit born out of local

industry, with a vision to make Northwest Ohio a national leader in innovation, creating new jobs and business opportunities and supporting world-class research aligning with the needs of local industries.

The hub will establish a Glass Centre of Excellence in Northwest Ohio as a shared space for a collaborative effort between the University of Toledo, Bowling Green State University and local private sector companies to expand

world class glass research for the solar panel, container, automotive, architectural, and fibre glass products.

The centre will be located at O-I Glass in Perrysburg, Ohio.

Kyle Sword, R&D Director, North America, said: "The collaboration between local industries and education partners will provide great support for workforce development, sustainable manufacturing, and also spark glass industry innovation."

## Glass & Glass submits production facility expansion plans

Mexican container glass producer Glass & Glass has submitted plans to expand its glass manufacturing facility.

It said the expansion would enable it to produce a greater number of containers used in areas such as perfumery as

well as wines and spirits.

Executives of the firm, which has a facility in Tamaulipas, informed the authorities of the city council of their future plans, in addition to confirming the links with both the municipal

government and civil society.

The general manager Fidel Velásquez Duarte, accompanied by Luis Hamellius Romero, held a talk with Mayor Armando Martínez Manríquez.

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## NEWS IN BRIEF

**Furnotherm completes Beta Glass project**

Furnotherm has completed a furnace rebuilding project at Beta Glass manufacturing site in Nigeria.

It was a cold repair project of a 60m<sup>2</sup> container glass furnace designed by BDF for Frigo Glass (Beta Glass), Nigeria.

The furnace construction was completed ahead of schedule.

**Entries open for 2025 Clear Choice Awards**

The US Glass Packaging Institute (GPI) has begun accepting submissions for the 2025 Clear Choice Awards.

The awards recognise the contributions of North American glass to the image, success, aesthetic appeal and recyclability of a variety of glass products.

Winners will be announced in 2025 and showcased in a variety of digital and print media.

**Sibelco acquires Strategic Materials**

Sibelco has completed its purchase of Strategic Materials (SMI), one of North America's largest glass recyclers.

SMI operates 42 sites across North America, processing around 2 million tonnes of cullet (recycled glass) per year.

This capacity adds to the 3 million tonnes of cullet Sibelco processes annually at its 24 recycling plants in Belgium, Estonia, France, Italy, Poland and the UK.

**Alicia Duran and John M Parker publish book in celebration of glass**

Industry figureheads Alicia Duran and John M Parker have published a book which celebrates the benefits of glass.

The publication, titled 'Celebrating glass, achieving sustainability, inspiring transformation' was inspired by the United Nations International Year of Glass in 2022.

## O-I Glass plots \$150 million Alloa manufacturing investment

O-I Glass plans to transform its Alloa, UK manufacturing plant with a \$150 million investment in sustainable production technology.

Over the next two years, the company plans to invest in a series of upgrades to the site.

The transformation includes a rebuild of one of its existing furnaces, featuring improved sustainability performance through several planned measures including gas-oxy combustion and increased levels of renewable

energy and recycled glass.

In addition, O-I has begun to build a new furnace featuring the same technological advancements.

This furnace will increase long-term flexibility to serve the company's customers, support their growth plans in the spirits segment and strengthen their own sustainability efforts.

The company expects both furnaces to come online in 2025 when these measures will reduce the

plant's emissions and provide another building block of the company's strategy to reduce CO<sub>2</sub> emissions 25% by 2030.

To fuel the gas-oxy furnaces, O-I is partnering with a supplier to establish an oxygen farm adjacent to the Alloa plant.

Bringing more investment into the area, this facility will separate air into oxygen, nitrogen and argon, and is set to also serve the needs of hospitals and other local manufacturing companies.

## AGI Greenpac to invest in Indian glass production sites

Indian glass manufacturer AGI Greenpac will invest 230 crore into upgrading its glass plants in Bhongir and Hyderabad, India.

AGI Greenpac will modernise one of the Bhongir plant's existing furnaces, as well as implementing advanced technologies and optimising production at both sites.

The manufacturer will also make upgrades to its Decoration Unit at the Bhongir plant.

The investment will be implemented across FY25.

The initiative will allow

the manufacturer to better serve the growing demand for high-quality glass packaging solutions.

The global glass packaging market is predicted to grow from \$67.28 billion in 2024 to \$93.69 billion by 2032.

The manufacturer will also explore export opportunities in the Middle East and Europe, following the establishment of a strategic export channel in the USA.

AGI Greenpac CEO Mr Rajesh Khosla said: "Our investment in our production capabilities will ensure we are well-positioned to meet the

demand for our innovative, high-quality glass packaging solutions. This commitment to best-in-class practices not only strengthens our domestic offerings but also allows us to venture into new markets."

The specialty glass plant in Bhongir, Telangana, has been fully operational since January 2023.

With a daily production capacity of 154 tonnes, the facility caters to a range of industries, including cosmetics, perfumery, candle jars, and premium alcohol beverage segments.

## Verallia plots hybrid glassmaking oven at French facility

French-headquartered glass manufacturer Verallia plans to invest in a hybrid furnace at its Saint-Romain Le-Puy facility in Loire, France.

Scheduled to be built in 2025, it should start in early 2026 and will be the third hybrid oven in Europe.

This hybrid furnace, which will replace furnace 2 which has been in operation since 2012, is designed for the production of coloured glass.

It will strengthen the production of different shades of glass (white, green, dead leaf, cinnamon and Tradiver)

that are the particularity of the site.

This oven will be fired by a mixture of electricity/gas, with the majority proportion of electricity (80% of the energy mix).

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**SIEMENS**

# Verallia CEO outlines furnace investments



French container glass manufacturer Verallia recently heated up its €57 million all-electric furnace at its site in Cognac, France. The company will also construct a €100 million heated-oxygen furnace at its facility in Campo Bom, Brazil. Jess Mills spoke to Verallia CEO Patrice Lucas on the projects.

**V**erallia recently heated up its €57 million fully electric furnace at its glass production facility in Cognac, France.

At 180 tpd, the furnace is the largest all-electric furnace for the food packaging in the world.

Verallia CEO Patrice Lucas (**Pic 1**) said scaling up the technology was essential to ensure the furnace remained competitive for the food and beverage industry.

“The technology is not totally brand-new, because it already exists in the cosmetic and pharmaceutical industry, but for food, it is the world premiere.”

Verallia partnered with industrial engineering group Fives for the project, which supplied its Prium E-Melt cold-top vertical melter.

The melter will provide a 60% reduction in CO<sub>2</sub> emissions compared to a traditional furnace, which is in line with the Verallia group’s plans to reduce its global emissions by 46% by 2030.

Mr Lucas said this decarbonisation target was the main motivation for Verallia choosing low-carbon electricity over other fuel sources.

“All the big industries will have to face this

energy transition. The only way to decarbonise is to move to electricity. What is good for the glass industry is that we have a solution to move our processes to electricity.”

## Cognac furnace

The project started in March 2022, and the furnace came to life earlier this year. Two employees from Verallia were selected to be the godmother and godfather of the furnace, and had the honour of lighting it on March 18<sup>th</sup>, 2024.

Since then, Verallia has been ramping up production to achieve 180 tpd of flint glass bottles.

Mr Lucas said the furnace is currently at 150 tpd, and the first deliveries to customers are just starting.

“We are currently ramping up, and getting all the operational standards updated for efficient production. Then we’ll see the literature on that, and discuss how we could deploy the technology at our other plants to meet our 2030 CO<sub>2</sub> reduction target.”

The official inauguration of the furnace will take place on September 10<sup>th</sup>. The event will be attended

◀ Verallia's Châteaubernard factory in Cognac, France.  
[Image credit: Franck Dunouau.]



“We are working on different solutions [for decarbonisation], the all-electric and hybrid furnace are the major ones, but we're taking opportunities to look at other viable energy sources. For instance, we are planning some tests with biofuel as well.”



by Verallia's customers and internal stakeholders, as well as local and national authorities.

“We are proud of the project, and our talented people. It's important for us to pave the way forward for reducing CO<sub>2</sub> emissions. This is a big milestone for the company.”

### Energy transition

Mr Lucas said the installation of the furnace overall went smoothly, citing Verallia's biggest challenge as the switch from natural gas to electricity.

“The construction of the furnace was not

▲ Pic 1 - Verallia CEO  
Patrice Lucas. [Image credit:  
Julien Lutt.]

the challenge. The focus was more on how to design it, and to make sure that it would operate efficiently. The move from gas to electricity, with this different approach of ‘cooking’ the glass, was the big challenge.”

Project partner Fives designed and supplied its Prium E-Melt cold-top vertical melter to the site, which has the capacity to produce 150 to 200 metric tonnes of glass per day.

Mr Lucas said: “The objective was to partner with Fives to get the best of their knowledge, and to work as a team to define the process engineering work for the furnace.”

The melter offers better thermal efficiency and lower emissions, as well as lower operating costs with a reliable supply of renewable energy.

Low carbon electricity, sourced from nuclear power, is supplied via electrodes placed on the sides of the furnace. This should see Verallia achieve its objective of a 60% reduction in CO<sub>2</sub> emissions compared to a traditional furnace.

The change in energy supply has resulted in the all-electric furnace operating differently to a natural gas furnace.

“Unlike a loop furnace, the cullet and raw materials are introduced on the top of the furnace, which makes a kind of insulation cover. This is what we call the cullet roof.

“Traditionally, you have the energy and the flame on top. Here, you have energy and the power of melting the glass inside the path of glass.”

Over 60% of Verallia's employees at the site collectively completed 3000 hours of training in preparation for the fuel switch. The training largely focused on the melting process, as well as how to monitor the new furnace technology.

Verallia also worked with its traditional suppliers for the building section of the project, including the construction of the forming machine and the cold end.

### Campo Bom furnace

Verallia is also constructing a 450 tpd heated-oxygen furnace, costing approximately €100 million, at its Campo Bom site in Brazil (**Pic 2**).

Mr Lucas said the launch of the furnace has been postponed to 2025 due to the heavy rains in the Porto Alegre region of Brazil.

“We had to adapt to this situation, and based on the market situation as well, which is quite challenging at the moment, we have decided to postpone the launch of our furnace. So, it will be launched in 2025.”

Despite the delay, Mr Lucas said the project, which started in December 2022, was moving ahead as planned.

The building phase is now complete, and machines, including the batch house, will be implemented in the following months.

The brownfield investment includes three new

Continued>>



lines, a forming machine and a traditional cold end.

On why Verallia decided to expand the capacity of the site, Mr Lucas said: "There is room for us in Brazil to keep on growing. In the past, we had three furnaces. Last year we started the fourth furnace, in Jacutinga. When we open this new furnace, we will have two furnaces at our Campo Bom manufacturing site."

The furnace is a new capacity for the site. It will produce three colours, flint, green and amber, and be powered with heated oxygen. Mr Lucas described this technology as an "intermediate step" between a traditional furnace and Verallia's vision to decarbonise.

"The furnace will use HeatOx technology. We are going to introduce heated oxygen, which has the big advantage of reducing the energy needed to melt the glass. By doing so, we will reduce our CO<sub>2</sub> emissions by 20%."

Heat oxy-combustion operates with pure hot oxygen and natural gas or fuel-oil as combustible. By preheating the oxygen and fuel, heat oxy-combustion maximises the performance of oxy-combustion by providing 10% more energy savings than oxy-combustion without preheating. The technology therefore improves the combustion efficiency and reduces fuel consumption.

The furnace will serve the wine and spirits markets in the south of Brazil. However, the Brazilian glass market has also been impacted by the recent bad weather.

"It was chaotic for quite a while, due to the difficulties in logistics. Many roads were blocked and closed; it has been like this for a few weeks."

An official inauguration ceremony is yet to be confirmed, although Mr Lucas said the furnace would be heated up by a godfather and godmother next year.

▲ Pic 2 - Verallia's plant in Campo Bom, Rio Grande do Sul, Brazil. [Image credit: Fabiano Ferrari.]

► Pic 3 - Glass bottles being inspected at Verallia's Châteaubernard site. [Image credit: Franck Dunouau.]



## Moving forward

Mr Lucas said Verallia was working on several solutions for decarbonisation, including its first hybrid furnace, which will be launched next year in Zaragoza, Spain.

The furnace will be a mix of 80% electricity and 20% natural gas.

"We are working on different solutions, the all-electric and hybrid furnace are the major ones, but we're taking opportunities to look at other viable energy sources. For instance, we are planning some tests with biofuel as well.

"This is part of us being open minded to all the different solutions we could have, and taking the benefit of the local ecosystem where we are producing. It could be a different solution for France than in Germany, or Brazil, or Spain, depending on the local resources." ■

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# Stoelzle's 'Macca' reflects on 52 years in glass

After 52 enjoyable years of service to the glass industry, Neil MacDonald's abiding memory is that of his colleagues and the family atmosphere of a glass plant. Stoelzle Flaconnage's former Planning and Purchasing Manager speaks to Jess Mills on his career, retirement and how his sons are the next generation of glassmakers at the Knottingley site.



Neil MacDonald, 68, has enjoyed every part of his 52-year career, from his apprenticeship to his promotion, to seeing his three sons join the glass industry, and sharing many jokes with colleagues.

Neil started in the glass industry as an apprentice and took on roles at Rockware Glass (now Ardagh Glass Packaging) before a 30-year stint at the Stoelzle Flaconnage facility in Knottingley, UK.

Macca, as he was nicknamed, fondly remembers the people he worked with and the camaraderie within a glass plant.

He said: "Meeting people, talking to people is what I used to like. I used to talk to the customers quite a lot and have a laugh and a joke with them as well.

"You meet different people all the way through, but whoever you come across in this factory, if you see them outside, they're always willing to have a chat. Nothing changes. They're still the same people, even though you've retired."

His role as a Planning and Purchasing Manager sometimes required difficult conversations, but

▲ Pic 1. Neil MacDonald (second from right) with his three sons, Ryan (left), James (second from left), and Curtis (right).

once the issue was resolved, things would return to normal and those involved would share a laugh or two.

He has now passed the glass torch over to his three sons, James, Ryan, and Curtis (**Pic 1**), who all also work at the Knottingley facility. James and Ryan are Bottle Makers in the Hot End, while Curtis is a Shift Quality Manager.

"Before myself, nobody in my family worked in glass. But now I've got three sons who work at the factory and one of my daughters-in-law. It's become quite a family thing."

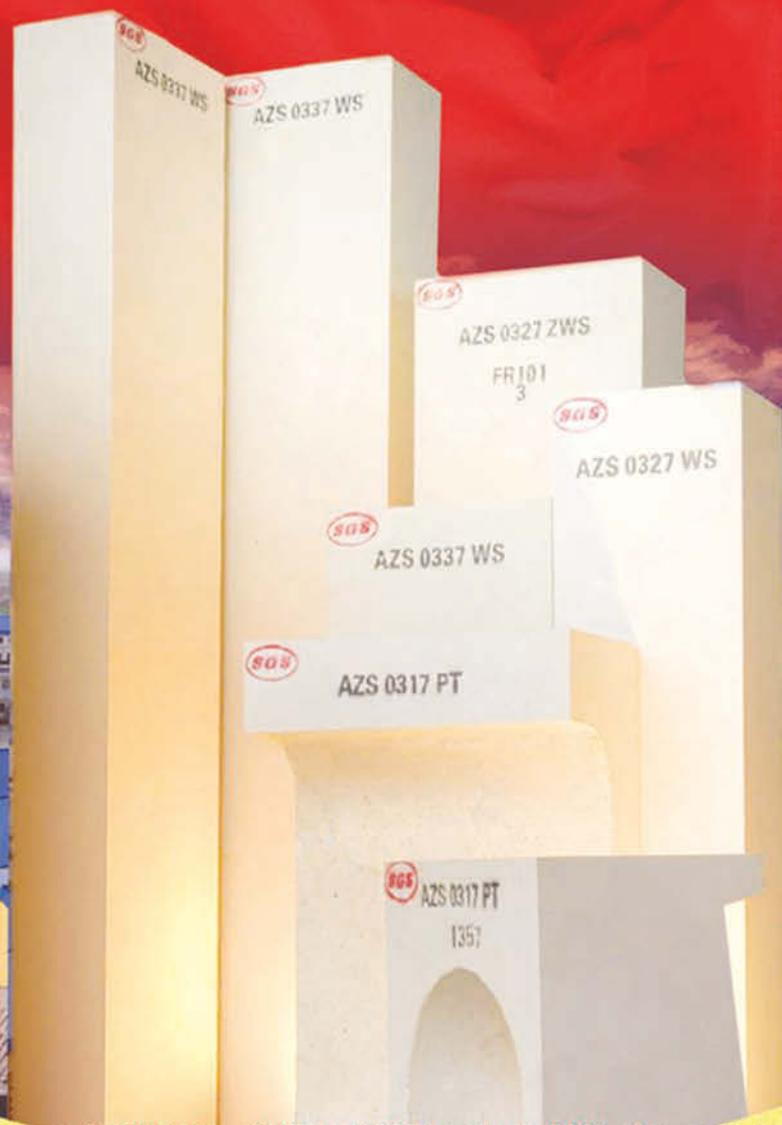
However, the MacDonalds aren't the exception, with many workers in Knottingley being a part of the glass industry.

"Glass is not strange to anybody in this area. Nearly everybody's got somebody in their family that works in one of the three glass factories in Knottingley. We have our own social club, but it's not solely for people from Stoelzle. There are people from Ardagh and Allied Glass (now Verallia) too.

Continued>>

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“The Stoelzle factory has a nice family atmosphere, and people get on. I've worked with the second and third generations of the people I started with.”

“The whole area is revolved around glass, it's the main industry here. So, everybody knows glass, and everybody knows everybody working at the glass factories.”

## Career

Neil began his career at the Rockware Glass facility in St Helens, UK, in 1972. He started as an apprentice before later transitioning into the Planning Department.

“When I started, St Helens was a very glass-orientated town. Pilkington was there, as was United Glass and companies like that. But, in 1982, Rockware decided to sell the factory.”

Neil said this was in part due to the rise of plastic bottles in the 1980s, which caused many glass factories to shut down.

“At the time, the industry was into making beer bottles and soda bottles and things like that. But as plastic was introduced, that's when a lot of factories started to reduce furnaces, because plastic was replacing the old soda and milk bottles. That then contracted the capacity in glass.”

Therefore, when he was offered the job at the Rockware Headlands facility in Knottingley, Neil jumped at the chance.

“It was a big move for me. I was just about to get married, and they were shutting the factory down, so the offer of a job in Knottingley was a no brainer. I had to come, and I've stayed ever since.”

The Rockware Headlands facility later changed ownership when the group was bought by Ardagh Glass Packaging.

Neil then moved to another Rockware facility in Knottingley in 1984, which was purchased by the Stoelzle Glass Group in 1994.

Consequently, Neil has worked for the manufacturer for 30 years, as part of his 52 years of

▲ Pic 2 - The Stoelzle Flaconnage site in Knottingley, UK.

continuous service between the Rockware, Ardagh and Stoelzle facilities.

Neil said: “Stoelzle has been good to me, and I've progressed through the ranks. I started off in the offices, and when I moved from the Headlands factory down to the second facility, I became the Planning and Purchasing Manager.”

He said becoming a manager was the best moment of his career, although the transition did come with several challenges.

At the Headlands facility, the planning and purchasing for glass and decoration was completed by a team of over 30 people, for multiple Ardagh factories. However, at the now Stoelzle Flaconnage facility, the plant's responsibilities were developed into one managerial role.

“It was quite a challenge to move factories and work with just a few people. But it was interesting, the day went very quickly because you were doing more jobs than you would normally do.”

His duties also included managing stocks, handling customers' expectations, and ordering packaging, including glass moulds.

“Generally, you're involved in planning production, which is complicated. The job mix that Stoelzle has is completely different to the rest of the glass industry.”

Today, the Stoelzle Flaconnage site (**Pic 2**) produces and decorates premium spirits bottles, at approximately 100 million glass containers per annum.

“The things that Stoelzle make are completely different to everybody else in the industry. We make bottle shapes that are not produced in any of the mainstream glass factories in the UK.”

Continued>>

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## The glass industry

Neil said the family atmosphere and stability of the role were the two biggest draws to working in the glass industry in Knottingley.

"Once you're in the glass industry, you tend to stay in the glass industry. There are quite a few different glass factories in this area. If people leave this factory, they generally go to another one, or start here from another glass company. Glass is probably the main employer in this area now.

"The Stoelzle factory has a nice family atmosphere, and people get on. I've worked with the second and third generations of the people I started with. I know their kids quite well – I still call them kids, but they're probably in their 30s and 40s. But I've known them for all their lives, they went to school with my children."

To those looking to join the glass industry, Neil advises to not be afraid to ask questions.

"If you find it difficult early on, once you get to know the systems and the people are nice enough, talk to them and explain if you're not sure on something."

On whether his own grandchildren would be among the next generation of glassmakers, Neil was unsure due to their young ages, but said "there's no reason why they shouldn't".

"It's an industry where there's work stability. There's a lot of industries where there's no long-term commitment. But this factory has that."

He continued: "There's quite a lot of people still in the factory. Every October, Stoelzle has its Long Service Awards ceremony, and there's a 25-year, 30-year, 40-year and 50-year award. And there's quite a lot of people in the 30-to-40-year bracket."

He also highlighted Stoelzle's Technical Director Steve Clayton, who started a month later than Neil and is still working one day a week after 52 years.

## Challenges

Neil said one of the most challenging times in his career was during the Covid-19 pandemic, in which he was one of two people working in the Stoelzle Flaconnage offices, despite the factory being down.

Neil and his team member had to work out how long Stoelzle's stocks would last, and when to run the machines, as well as when customers would "call off the glass".

"It was challenging, but we got through it. It was an achievement to come out the other side and for everybody to still be happy. And for everybody to still be employed, which was the other worry when things started to reduce.

"When orders are reducing, you wonder whether the same business that was there before would come back, but it did. It was just the build-up that was challenging to work out, for instance, planning when to bring things back online."

In five years' time, Neil said he'd like to see the Stoelzle factory "booming".

"Hopefully they get back to the full capacity,

► Pic 3 - Thomas Riss, CEO of Stoelzle Flaconnage, presented Neil MacDonald with an award for 50 years of service at the 2022 Long Service Awards.



because obviously I've got a vested interest with my family being here. The way things are going at the moment, just before I left, they were getting some major customers and major accounts which hopefully, for the future, is looking good."

He continued that Stoelzle was looking into addressing more sustainability issues, due to both the manufacturer and its customers becoming more "quality conscious".

"Something that was acceptable a few years ago isn't acceptable anymore, so you've got to keep up with those challenges. I think this factory is doing so."

## Moving on

Neil said he plans to attend Stoelzle's 25-year Service Awards ceremony this October.

"I still see quite a lot of people from the factory. I live quite close, and I get a little bit of knowledge from my sons working there. They tell me about things that are going on, and I pretend I don't want to know. At the end of the day, it's another life. So, I've moved on to something else – my main game is going on holiday now.

"It'd be nice to be able to work forever and live forever, but you can't. I left it until I was 68, but I could have gone earlier."

On the appointment of his successor, he said Tom Daniels was "the right person" for the Planning Manager role and believed he would take Stoelzle Flaconnage forward. ■

Stoelzle Flaconnage, Knottingley, UK  
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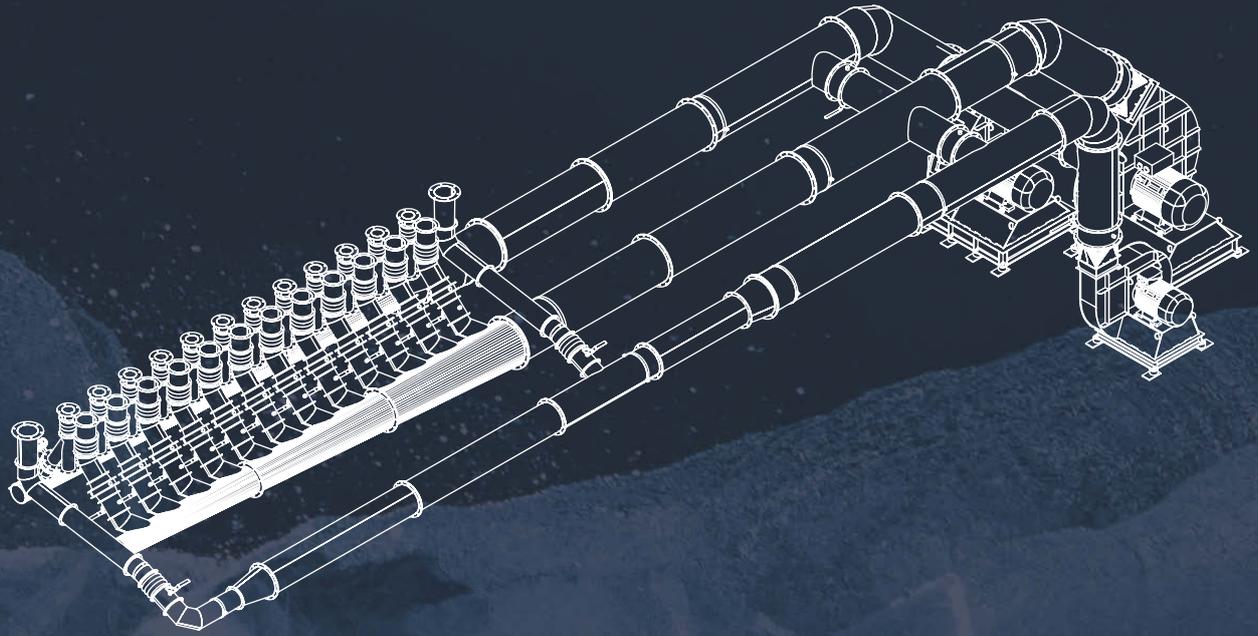
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# An insight into decarbonised melting technology

Industrial engineering group Fives has enjoyed double success in France recently with the installation of its electric melting technology in Verallia's Cognac site and a contract for its hybrid equipment in O-I's Veauche plant. Alexandre Brusset\* discusses the decarbonising technology.

It has been a strong year for Fives in the container glass industry. The French-headquartered engineering group has enjoyed success with its decarbonisation technology at two major glass manufacturing facilities.

After providing Verallia with its fully electric melting furnace at the glassmaker's Cognac, France, plant earlier this year, the technology supplier is celebrating again after being appointed to provide its hybrid technology to O-I's Veauche facility.

Once in place, the furnace at the facility located in the Loire department in central France, about 20km from Saint-Etienne, will be 70% electric-fired with the remainder from combustion.

Fives' Vice President for Glass,

Alexandre Brusset (*pictured above*), said discussions around the environment were much more commonplace now.

"We at Fives are pushing this type of change and technology because we trust in decarbonisation.

"It's very exciting for the teams to see the impact they can have on the glass industry. You can only experience this a few times in your career because of the lifetimes of a furnace, so now is an exciting time."

He added: "There has been a strong push from the glass packaging industry for decarbonised solutions and we have approached them with two solutions - all-electric and hybrid technologies"

A key theme of the technology at the O-I facility, he said, is its flexibility.

"With the hybrid furnace, operators can more easily adapt furnace pull. When you are producing bottles, you can change the frequency of the type of bottles you produce very often.

"So this speed of change in the pull is important for the operational teams who have combustion in the furnace to help to manage this frequent change in production."

The flexibility is also important for customers which produce several types of coloured bottles.

"A small percentage of combustion helps manage the atmosphere on the top of the glass tank which helps with the colouration of the glass.

Continued>>

“The combustion of the fuel could be in the range of 20-30% for a hybrid technology, which provides flexibility for the type of glass and the type of quality of glass that you want,” he stated.

He compared the hybrid solution to that of buying an electric car – while some customers may not be committed to an all-electric car just yet, a hybrid solution is ideal for those looking towards full electrification at a later date.

The technology, named Prium Eco-Flex (**below**), has already been installed in pharmaceutical and at fibre glass production sites. For O-I’s Veauche plant, this will be the first time in the packaging glass industry and on such a large scale, stated Mr Brusset.

“Today the push is from packaging glassmakers but we already have experienced a lot with speciality glassmakers with smaller capacities.

“In some ways it is a first of its kind project but also something which we had experienced previously, especially regarding electric melting, it is a case of upscaling or combining those elements together for this application.”

While the patent for the technology was filed in 2015 Mr Brusset noticed that there has been a real push for such energy-saving equipment since the Covid pandemic in particular.

It was caused by a combination of increased focus on the environment and consumers more aware of decarbonisation.

From a technological point of view, it coincided with the failed Furnace of the Future (F4F) project in which many European glassmakers had participated.

While the project was eventually disbanded after the European Union denied it funding, a lot of the detailed

technical and operational conversations about a decarbonised furnace enabled engineering companies to fine tune their concepts.

“For us, it was important to be ready for when the market required this type of technology, rather than only developing something when the market was ready.

“It sometimes takes time for the market to adopt this type of technology, but now we can see that the glass industry is supportive of it. We patented the technology and the first industrial application was in 2015 in the pharmaceutical glass industry.”

This experience of working with all-electric and hybrid technologies has also enabled Fives to help glass companies with their transition to a decarbonised path, both operationally and in terms of staff training. For a furnace operator in particular, a hybrid furnace has variables and requires a new way of thinking.

“When you speak about a hybrid furnace, the majority of the power is from electricity, so bringing our experience makes the projects safer.

“Based on our long experience in this field, we can accompany the customer in the transition. There is a kind of change management to be handled.

“We support the customer in that change with training at an early stage of course, but also with solutions such as digital systems which support the teams in how to define the settings of the furnace to maximise its efficiency.

“It is not easy for operators as there are many variables on a hybrid furnace, such as reducing the power of the individual burners or switching off one burner and keeping the other on.

“So training is the first step but there are also tools on board the furnace to assist in its operations.”

Other specifics which Fives can take care of revolve around the civil engineering works of a facility, particularly as many glass sites are brownfield and will be constrained by current building structures.

Another important point, is how much

electricity supply the site will receive from the grid? Is the grid ready to serve an industrial furnace?

“It is not an easy question, and it has to be anticipated long in advance because if there is a change to be done locally from the electricity supply it has to be done several years before. You have to connect with local authorities to ensure there is enough energy from the grid.”

While glassmakers from container, specialty and pharmaceutical glass have started to implement electric-fired or hybrid furnaces on a small or medium scale, the next challenge is with float furnaces, Mr Brusset believes.

Such furnaces, usually larger in size, would require a significantly higher supply of electric energy.

“My dream is that for tomorrow we can also apply such technology to the float industry. It will go step by step some higher boosting at first, but I’m sure that the concept of a hybrid furnace providing quality glass will generate new ideas and new solutions for the float sector.”

Mr Brusset believes that several ‘green’ solutions will be available to glass manufacturers in the future, both in terms of fuels such as hydrogen and bio-gas, as well as electricity and combustion.

“I’m sure there will be more than one solution. While all-electric melting technology is a proven solution available today, it doesn’t answer all the applications and has less flexibility in terms of operation than a combined solution with combustion.

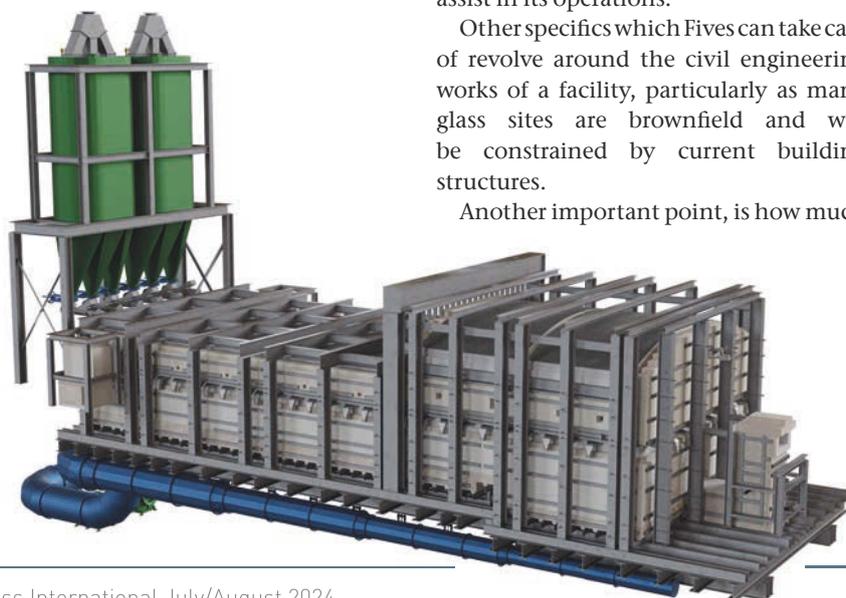
“We will certainly still need combustion, especially with coloured glass, so I have no doubt that both solutions - all-electric and hybrid technologies - will coexist in the future.

“Wherever combustion is used, the issue is how to decarbonise the technology and there is good hope around bio-gas or ultimately hydrogen.

“However, I think the need of other industries will outweigh glass because they don’t have electric solutions to decarbonise available to them.

“So, I think the availability of hydrogen may be limited to the glass industry. That is why I think a hybrid furnace served by 80% electricity and 20% bio-gas combustion is ultimately a solution that is well suited to the glass sector.” ■

\*Vice-President-Glass, Fives, Paris, France  
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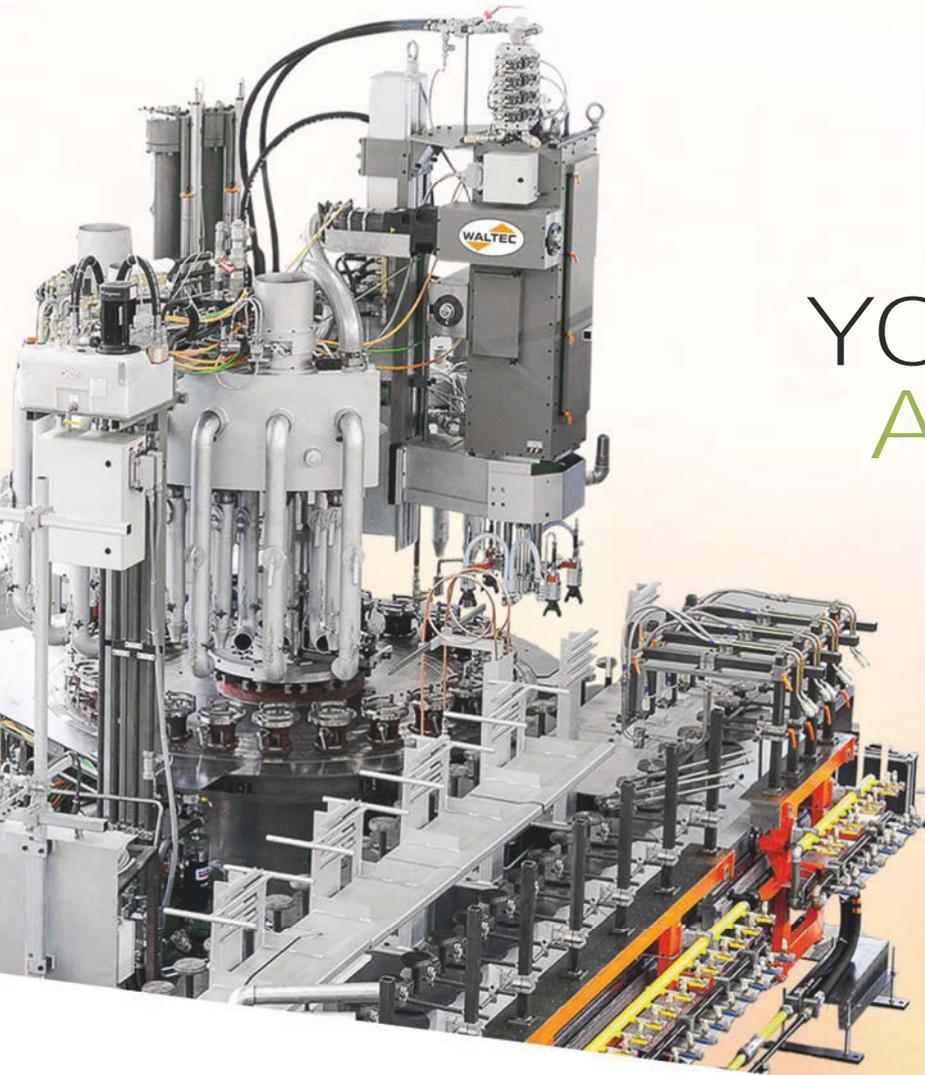
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# Schott focuses on sustainable melting technology

◀ Schott has produced an optical glass with 100% hydrogen for the first time. Photo: Schott.

Speciality glass manufacturer Schott recently conducted successful industrial scale trials with 100% hydrogen at its Mainz, Germany, facility. The manufacturer will also build a €40 million electric melting tank at its Mitterteich site in 2026. Matthias Kaffenberger\*, Dr Lenka Deneke\*\*, Rainer Eichholz\*\*\* and Tim Gnädig\*\*\*\* outline the projects.

**W**e aim to build an electric melting tank in Mitterteich, Bavaria, Germany by the spring of 2026 under Project “Prospect”.

Approximately €40 million has been invested in the project, including €14.8 million of funding.

The tank will use green electricity to melt glass for the pharmaceutical industry in a more climate-friendly way.

It is expected to reduce greenhouse gas emissions by approximately 80% compared to our current melting tanks.

As well as green electricity, Schott has also been experimenting with hydrogen.

We recently produced an optical glass with 100% hydrogen for the first time at our Mainz, Germany facility on an industrial-scale.

## Electric melting tank

Project Prospect is the vision to pioneer a new technology for the whole specialty glass industry.

The German Government is funding this scientific scheme, and there is a

groundbreaking planned during summer next year. The project is an investment of approximately €40 million, including €14.8 million of funding.

Schott gauged existing glass products melted in electrical tanks and the high standards of the pharmaceutical glass industry could not be reached. So, Schott decided to pioneer, and everything started from scratch.

There are no external partners in lead of this project, Schott is developing the technology by itself. This can only be achieved as some of the world’s experts in melting technology work both in Mainz and Mitterteich for Schott.

Every day, dozens of Schott colleagues work on this vision of building the first pharmaceutical glass tank with electric melting technology. Schott finished the technical architectural planning in November last year.

Now the implementation is in focus as we construct details and order parts.

The start of production is scheduled for the spring of 2026.

## Melting process

The energy infrastructure needed for this kind of tank is a new development. This new technology focuses on the energy-intensive melting process.

The refining tank with free glass surface will have hybrid heating by electric power and combustion to fulfil required airline specification.

This single tank will save 12,000 tons of CO<sub>2</sub> equivalents a year. This equals 80% of the emissions Schott currently expels with existing technology.

In the future, residual fossil combustion may be replaced by hydrogen or biofuel.

The postprocessing lines today already fulfil Schott’s PerfeXion standard. The process of PerfeXion offers 100% inspection of individual FIOLAX tubes, linking inspection technology with integrated data collection and analysis.

This path will continue as we invest for this pilot plant, there will be a cost-down project succeeding the successful

Continued>>



► **Pic 1: Schott successfully melted glass using 100% hydrogen in laboratory tests. Photo: Schott.**

implementation.

Since 2019, Schott has bought only certified green electricity from its contractors, which will be supplied to the melting tank. Furthermore, there are power purchase agreements (PPA) Schott signed with wind farms in Germany.

This path will continue and as the demand of green electricity increases, Schott has already planned on a future infrastructure with its contractors.

### Industrial hydrogen trials

After successfully testing glass production with 100% hydrogen on a laboratory scale in 2023 (**Pic 1**), we decided to conduct our first industrial-scale application earlier this year.

For three days, we melted optical glass in a furnace using our new technology for the first time – exclusively heated by hydrogen, completely free of natural gas.

We chose optical glass for the industrial-scale test primarily because it allowed us to utilise our existing medium-sized melting tanks designed for optical glass production.

Optical glass has an abundance of applications and has high requirements on its physical properties, making it an ideal candidate to evaluate the potential impact of using hydrogen and the resulting higher water content in the flue gas on these crucial properties.

To achieve 100% hydrogen firing, we

constructed a new pipeline from the H<sub>2</sub> tank to the melting tank. From here, the existing infrastructure allowed the use of the melting tank to be fired with either 100% natural gas or 100% hydrogen.

All additional safety requirements regarding hydrogen were incorporated. In the first phase of the trials, the glass was produced conventionally using natural gas as a reference. In the second phase, the whole gas supply of the tank was switched to hydrogen. Throughout the trials, process parameters and glass quality were constantly monitored.

During testing, the process was stable, and no visible anomalies could be detected. The analysis of the glass quality is still in progress and will take quite a while due to the high number of samples taken.

The results of the conducted tests are in good agreement with our test in laboratory scale. In addition to the laboratory tests, we now have a product, which can be evaluated in regard to cold end processes.

If all internal quality requirements are met, the product could be sent to our end customer for additional testing.

### Hydrogen

There are still open questions on the long-term use of hydrogen. The next step would be a long term study to evaluate refractory corrosion, burner stability, evolution of

the water content in the glass and flue gas measurement especially regarding NO<sub>x</sub>. Yet, the infrastructure and hydrogen in sufficient quantities is still missing.

There are many new hydrogen sources planned all over Germany. However, an import of hydrogen will be necessary to cover our needs. Continued research and development into more efficient and cost-effective hydrogen production technologies will play a crucial role in ensuring a sustainable and scalable supply chain.

When hydrogen will be used on a commercial scale strongly depends on the availability and cost of (green) hydrogen and the development of CO<sub>2</sub> taxing.

Today, the green hydrogen price exceeds the natural gas price by a factor of up to 10. A benchmark could be the completion of the hydrogen backbone which is dated to 2032. ■

#### Hydrogen Tests – Contributors:

\*Expert in Melting Technology

\*\*Principal Expert in Melting Technology

#### Electrical Tests – Contributors:

\*\*\*Leader Glass Developer

\*\*\*\*Project Manager

Schott, Mainz, Germany

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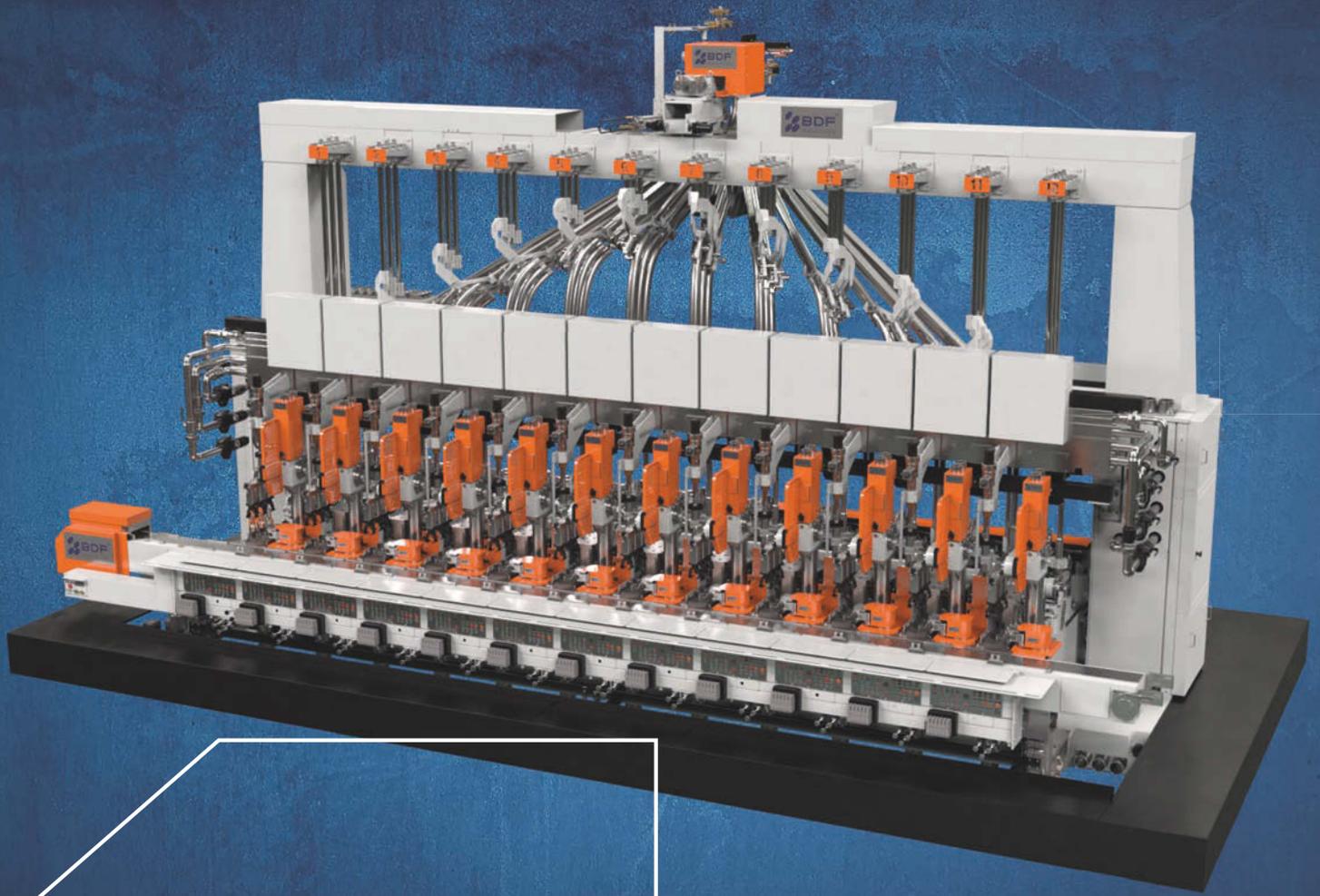
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A photograph of Erik Muijsenberg, a man with glasses and a beard, wearing a black tuxedo and a bow tie. He is smiling and holding a microphone in his right hand and a piece of paper in his left. He is standing in front of a backdrop with a palm tree pattern. A name tag is pinned to his lapel.

The Phoenix Committee Chairman for 2024, Erik Muijsenberg, discusses this year's event in Prague and why glass sculptor Karen LaMonte is a worthy winner of the Glass Person of the Year award.

▲ Erik Muijsenberg speaking as Vice Chairperson at last year's Phoenix Committee banquet.

# Phoenix Chairman discusses 2024 award winner

## 1. How flattered do you feel to be PAC Chairman this year?

I am not sure flattered is the right word, but I feel enormously honoured, privileged, and humbled to fulfill this position, leading a group of suppliers that are shaping the future of the glass industry.

It is a unique position to be in, and I am still sometimes surprised when I wake up and remember that I was asked to do this after just three years of being active—though we added two years due to the Covid pause. So, technically, I was Vice Chairperson for three years, with many discussions about when we could move forward. Of course, during Covid, it was not possible to organise an award banquet.

“It is a unique position to be in, and I am still sometimes surprised when I wake up and remember that I was asked to do this after just three years of being active.”

## 2. How long have you been associated with the PAC?

I was first asked to become a new member in 2017. The first award banquet I attended was for Glass Person of the Year 2017, James O'Callaghan, held in London. This event made a great impression on me. It was perfectly organised, including a boat tour on the River Thames. The banquet was in the County Hall Westminster with a view of Big Ben. Later, James talked about all the beautiful glass structures he was involved in and even about how he met Steve Jobs and discussed designing Apple (Glass) Shops.

The PAC has one purpose: “The Phoenix Award Committee is comprised of individual members who are employed by supplier companies to the glass industry. It is their duty to select, each year, the recipient of The Phoenix Award. The recipient is a living person who has been active in and has made significant and major contributions to any phase of the glass industry.”

We all take pride in this duty. We invest time and resources to find a Glass Person who deserves recognition for their hard work. I feel proud of those we have selected over the years, starting with Oliver Wiegand, Alicia Durán, Li Shenhua, and most recently Ahmet Kirman. Meeting them in person, they all have shown to be great individuals with hearts made of glass. As I was the banquet chair for Alicia in Madrid, which was a great success, I believe this led to my opportunity to become the chairperson.

Continued>>



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**3. When did you first hear about PAC and what benefits has it brought to you personally and the overall glass industry?**

I first heard about PAC from my colleague and friend Glenn Neff. Combustion Tec had been active in the USA for a long time, and PAC started out in 1971 as a US member-based organisation. Glenn was the chairperson in 2009 when Javier Gutierrez received the Phoenix Award, so he has remained a member since, which is a right after you have been a chairperson.

Glenn motivated me for several years to become a member, and you can only be asked by the committee to join. I have to say I am very glad to be part of this committee. Most of the active members and past chairs have become good friends. You can discuss the future of the glass industry and all its aspects with them. Members are from all areas, such as furnace, refractory, forming and inspection machine suppliers. I have been more active in the hot end, so it also opened my eyes more to the cold end of glass production.

Personally, I have grown a lot with the opportunity to speak with those leading the glass industry. It gives you new insights into what drives the industry. The other suppliers and recipients have become close friends and family. I remember well how Alicia became a real personal friend, how I was chatting with Surasak Decharin on the Thames about the glass industry in Thailand, how I had the honour to dine with Ahmet Kirman and his closest business friends from Turkey, and when I visit the Wiegand factory, I cannot forget the nice time we had at Lake Constance. These are experiences I will never forget.

“Karen is such a pleasant, open person to chat with, and I was astonished by her deep investigations when preparing to make something, such as her more recent work on cloud structures.”

**5. As someone who is employed by a company based in the Czech Republic, were you particularly pleased that the winner was located in Prague?**

Yes, this was a surprise to me. I was thinking about how I would organise and manage a banquet in Australia or somewhere far away. Then it turns out we unanimously elected an American-born citizen from New York who has lived and worked in Prague since 1998, and she agreed to have the award banquet in Prague. This makes my life a little easier, organising it together with my banquet chair Aleksander Pinda, who is based in Dresden, fairly close to Prague.

It is indeed special. I am originally from the Netherlands and started my work at TNO Glass (now CelSian) in 1990, but I began working with Glass Service Czechia in 1998 by opening the Glass Service office in Maastricht, the Netherlands.

Karen and I both made significant steps in our lives. Later in 2010, I moved to Czechia and have never regretted it. Compared to New York and the Netherlands, Czechia feels less populated, with more nature and hills that give you lots of space to breathe and think.

Karen, as an artist working with glass, feels at home in what is still called Bohemia. For me, she is more Bohemian than some locals are. She found in Czechia the glass expertise she was looking for.

**4. Tell us about this year’s winner. What was it about her work that stood out?**

The committee tries to find a balance between continents, industry and art. We felt it was time for an artist who can create miracles from glass. That is exactly what we found with Karen. The life-size figures she creates are impressive to see up close. Also, her deep study into clothing and her recent topics like clouds show the depth of a real artist. For her, it is not just an art object; there is so much more in what she makes.

I also asked her why she sometimes uses other materials besides glass, and she replied that it is so difficult to work with glass. Sometimes it takes her a year to make a successful new object. So, you can imagine the time and effort that goes into her work. During the visit to her studio in Prague, I learned that recently she has primarily been working with opal cast glass, which is not the easiest type of glass to manipulate.

Additionally, Karen is a female artist, and considering that in 51 years PAC had only found two female glass persons before, I felt extra happy we elected Karen. When I shared the news with Alicia Durán and Alev Yaraman, they were immediately confirmed their attendance at the next banquet in Prague.

▼ Karen LaMonte, the 2024 Phoenix glass person of the year, is a sculptor based in Prague, Czech Republic.

Continued>>





**6. Is it unusual for a glass artist to win the award?**

I would say a little yes to this question. We published a fantastic book showing 50 years of the Phoenix Award organisation with all past winners and chairs documented.

Over the 50 years, there have only been three glass artists before, but they were, like Karen, truly great artists: Lino Tagliapietra (2012) Dale Chihuly (1998) Dominick Labino (1977).

So even in this respect Karen is the first female Artist to receive this recognition.

**7. What were your impressions of Karen's studio in Prague?**

Working in Czechia, I have been in Prague many times, and as you may know, there are many glass stores to buy souvenirs in Prague centre. I was surprised to learn that Karen's studio is just a few footsteps away from the city centre. I was not sure what to expect exactly; I can only say that her studio looks like an artist's studio and more. Being in a busy, growing capital city like Prague, it was much larger than I envisioned. Everywhere you could see objects and articles she is or was working on. After a hospitable welcome by Karen and her partner and husband, Steve Polaner, we walked around to see some of her latest work. Finally, we went into her basement, which seems like an underground art/wine cellar, and I felt like I was walking in a museum. She had several of her life-size glass sculptures standing, including several from her Japanese series, which was so impressive to see. Karen is such a pleasant, open person to chat with, and I was astonished by her deep investigations when preparing to make something, such as her more recent work on cloud structures.

**Phoenix Award Committee,**

**<https://www.phoenixawardcommittee.org/>**

**8. Are you able to give an indication of what lies in store for the banquet event on Friday, October 11?**

Aleksander has visited several hotels and venues and selected a beautiful hotel with a fantastic banquet room that fits well with the artistic input Karen will provide. I do not want to disclose too much, but we expect many past recipients to attend, as the last few years were more complicated due to Covid. Prague, being a Bohemian glass city, will attract more attendees, making it a memorable event.

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# Hydrogen-produced glass bottles lead the way to sustainability



Slovenian glass manufacturer Hrastnik1860\* successfully used hydrogen as a main energy source to produce more than 200,000 premium glass bottles. This resulted in a reduction of more than 30% of indirect CO<sub>2</sub> emissions. Tilen Sever\* reports.

**H**rastnik1860 recently achieved the commercial production of premium glass spirits bottles using hydrogen as the primary energy source.

This was in collaboration with Bacardi and marks a major advancement toward sustainable production in the glass industry.

Following the successful initial production, the manufacturer has reopened orders. Customers can produce glass bottles, including lightweight options, during its 'Sustainable Week' in

December.

Matevž Fazarinc, CEO of Hrastnik1860, said: "At Hrastnik1860, we have embarked on a pioneering journey by integrating hydrogen as a primary fuel source in our glass production processes.

"In 2023, we achieved a milestone by utilising more than 60% of hydrogen for our combustion needs during the production of 200,000 of Bacardi's 70cl premium glass bottles.

"This transition resulted in a reduction of more than 30% indirect CO<sub>2</sub> emissions



Continued>>

from combustion compared to fossil fuel - natural gas - combustion.”

The implementation of the clean hydrogen technology was partially achieved through the H2GLASS project, co-funded by the European Union.

### Sustainable week

Mr Fazarinc emphasised Hrastnik1860's commitment to reducing greenhouse gas emissions in production processes and anticipated a considerable increase in its production of sustainable, low-carbon glass packaging.

Hrastnik1860 has utilised hydrogen to melt glass in one furnace and has hybrid technology incorporating up to 40% electricity in another.

The manufacturer said its dedication to sustainability is valued by consumers, who increasingly prefer products that are not only high-quality and visually appealing but also environmentally responsible.

“This is also one of the reasons why we have decided to have a ‘Sustainable Week’ in December and renew this type of production. We have already opened orders for interested customers,” said Mr Fazarinc.

Hrastnik1860 has successfully produced glass bottles with hydrogen technology for Bacardi as well as for brands such as Château d'Esclans.

### Hydrogen

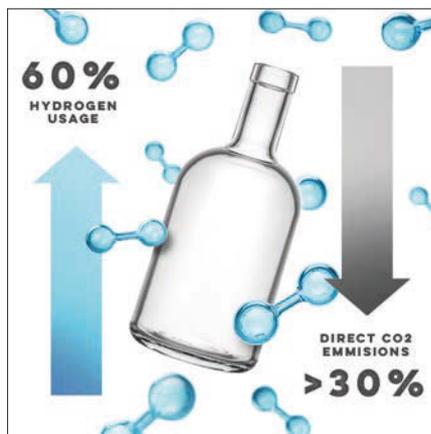
Hydrogen is emerging as a crucial energy vector in the drive toward sustainable industrial processes, particularly in energy-intensive industries, such as glass manufacturing.

As a clean fuel, hydrogen only produces water vapour when burned, eliminating direct carbon dioxide emissions typically associated with the combustion of fossil fuels. Additionally, hydrogen can be easily produced from renewable energy sources via electrolysis, further enhancing its potential as a sustainable and versatile energy solution.

These characteristics make it an excellent alternative for industries aiming to rapidly and substantially reduce their carbon footprint.

“Our successful adoption of clean hydrogen technology has not only reduced our carbon footprint but also reinforced our position as a leader in the European premium glass packaging market.

“This shift towards hydrogen utilisation presented several challenges, particularly



in maintaining the high-quality standards expected of our products. However, through successful R&D efforts, we have effectively managed to use hydrogen in our furnaces without compromising the quality or efficiency of glass production,” said Mr Fazarinc.

Hrastnik1860 is pleased that customers have shown interest in producing bottles using this technology, especially for the premium segment, where quantities are often smaller.

Production with hydrogen as the primary energy source allows its customers to order series starting from as low as 30,000 pieces, which is particularly appealing for producers of exclusive premium spirits.

These customers aim for purest possible glass, the so-called ‘extra white flint’, which is sought after for limited edition bottles.

### Lightweight bottles

Redesigning bottles to be lighter is another factor contributing to sustainability by

reducing energy consumption, water usage and CO<sub>2</sub> emissions.

Hrastnik1860 combines customer-driven design changes with its production techniques to enhance overall efficiency and product performance.

“Our design studio works closely with customers to create lightweight premium bottles that meet their specific needs while not compromising on brand style,” said Mr Fazarinc.

Redesigning bottles to be lighter optimises operational and logistical aspects of glass manufacturing and transport costs. Lighter bottles require less raw material, substantially reducing the energy needed for production.

Additionally, this type of production also consumes less water, a critical factor in conserving the natural resource. Together, reductions lead to lower operational costs and minimise the strain on resources, directly benefiting clients with cost savings.

### Environmental certification

Hrastnik1860 offers its clients expertise in environmental certification, leveraging the standardised framework of the Greenhouse Gas (GHG) Protocol to help them accurately measure and manage their carbon emissions.

“Additionally, we provide support for achieving carbon neutrality through carefully selected carbon offsetting projects tailored to clients’ products. Our team guides clients from emission assessment through the development and implementation of strategies aimed at reducing or offsetting emissions, ensuring precise and compliant carbon management,” said Mr Fazarinc.

By assisting clients in obtaining the appropriate environmental certifications for their specific production runs, they enable clients to demonstrate their commitment to environmental responsibility and enhance their market competitiveness with the highest level of transparency.

“We are confident that together with our customers, who share a similar green vision, we are setting the stage for a sustainable transformation that will impact the glass industry,” said Mr Fazarinc. ■

**\*Director of Development Technology and Innovation, Hrastnik1860, Hrastnik, Slovenia**  
<https://hrastnik1860.com/>



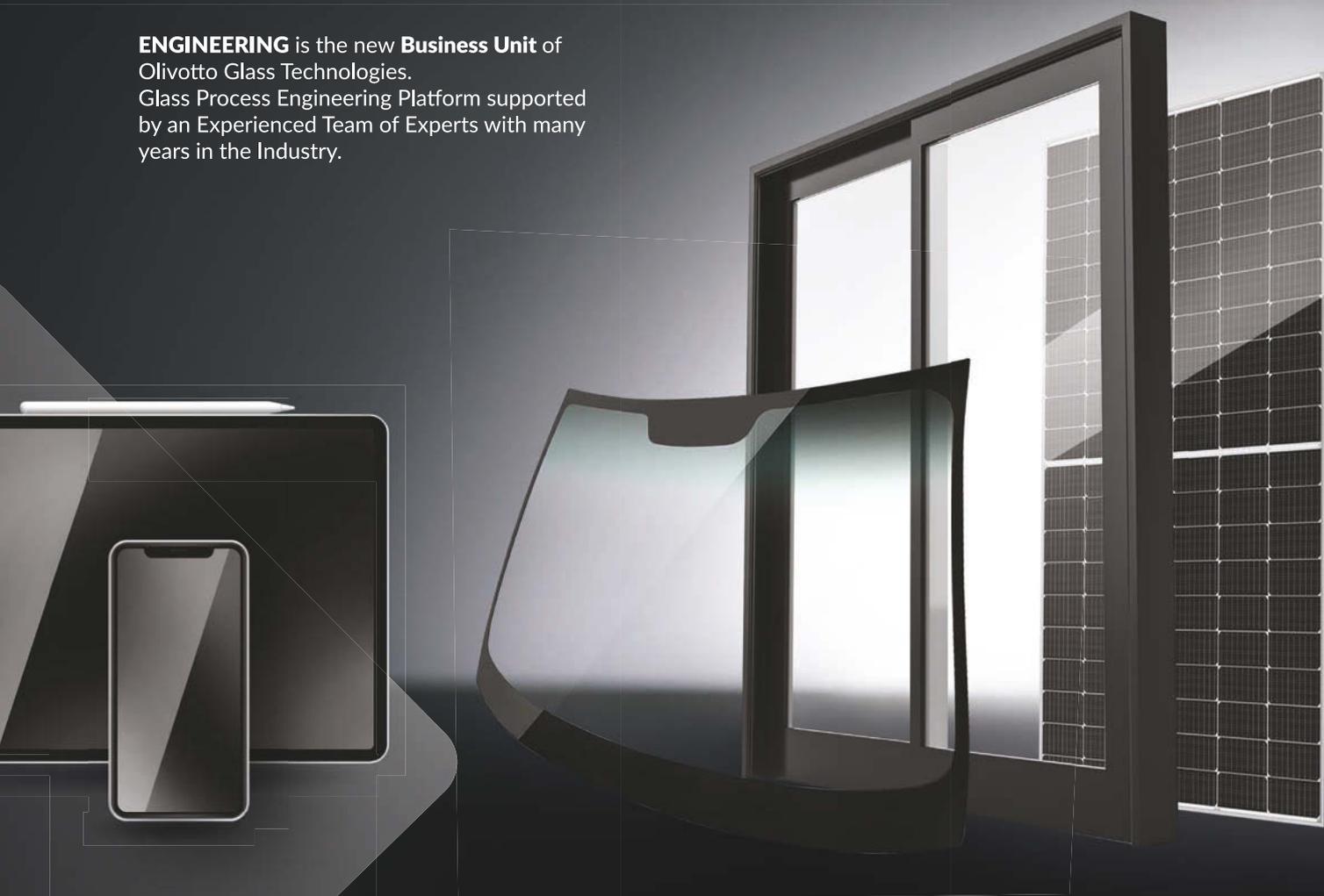
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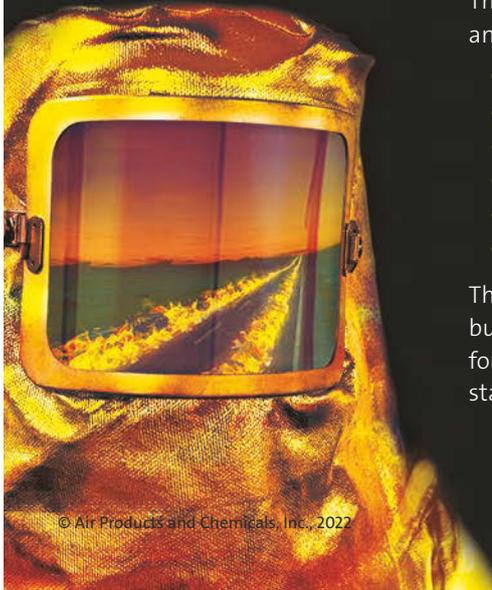
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# The future of the European glass industry

At Glass Alliance Europe's recent annual meeting, delegates discussed the future of the European glass industry. A report on the industry was also supplied to delegates. Véronique Favry\* reports.

**G**lass Alliance Europe recently held its annual General Assembly in Brussels.

The organisation represents the European glass industry, and is composed of 14 national glass associations from the five main sectors of the industry: container glass, flat glass, special glass, domestic glass and continuous filament glass fibres.

At the event, representatives of glass sectors and national associations' members delved into numerous critical EU topics vital for the future of the glass industry.

These included decarbonisation, competitiveness, industrial policy, circular economy and glass recycling, energy policy and CBAM, to name just a few.

The session provided a platform for discussions with all members from across Europe about policy developments shaping the continent and the glass industry.

Members were eager to collaborate with the newly elected President Thomas Davreux, from Belgian InDUfed Sustainable Goods, and Vice-President Walter Da Riz, from the Italian association Assovetro (**Pic 1**).

Glass Alliance Europe's new Chairman emphasised the importance of unity in today's challenging landscape for European glass manufacturing. Now, more than ever, we must work together as a cohesive glass family.

## Industry overview

At the event, delegates received Glass Alliance Europe's statistical report on the European Glass Industry from 2023 to 2024.

In the report, it stated that for the first time in decades the European glass industry ended 2023 with negative results in all glass sub-sectors.



▲ Pic 1. Chairman Thomas Davreux with Secretary-General Bertrand Cazes.

The glass market in 2023 saw minimal advancement and continues to move at a slow pace in early 2024.

Despite considerable technological progress and heavy investments in zero-emission initiatives, the European glass industry is facing several challenges.

These include high energy costs, the repercussions of the conflict in Ukraine, stiff competition from non-EU countries, and stringent EU regulations.

These challenging conditions are casting a shadow over the future of the glass industry in Europe, leading to plant closures and a decline in employment opportunities.

Key figures 2023 in tonnes, compared to 2022, include:

- Overall glass production decreased by 8% in 2023, totalling 37 million tonnes (**Pic 2**).
- EU imports decreased by 8%.
- EU exports decreased by 18%.

Despite these setbacks, European production levels continue to rank among the world's largest glass producers alongside China and North America.

Germany leads the EU as the top

producer, followed closely by Italy, Turkey, France, Spain, Poland and the UK.

Regarding foreign trade, imports from Asian countries, particularly China, remain high.

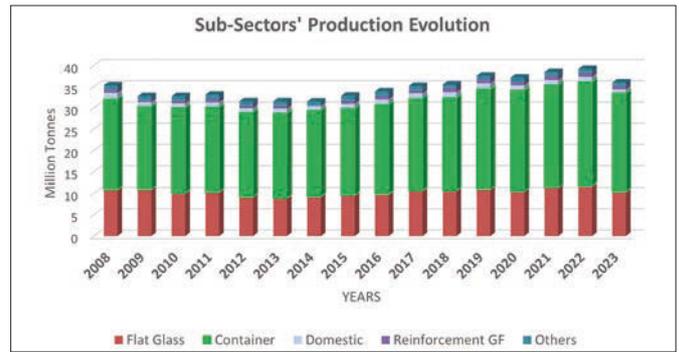
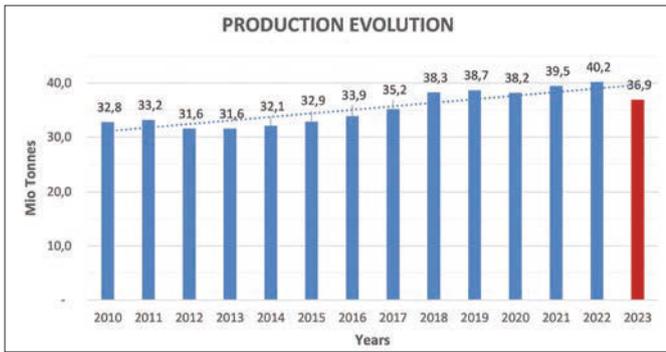
In 2023, extra EU-27 exports decreased by 18% in volume (3.4 million tonnes) and by 4% in value (€9 billion) compared to 2022.

The EU-27's four major export destinations include the rest of Europe (66%), with UK (22%), Switzerland (13%), Turkey (6.8%), Serbia (5%) and Ukraine (5%), followed by the USA (9%), North Africa (5%) and Far East Asia (4.5%).

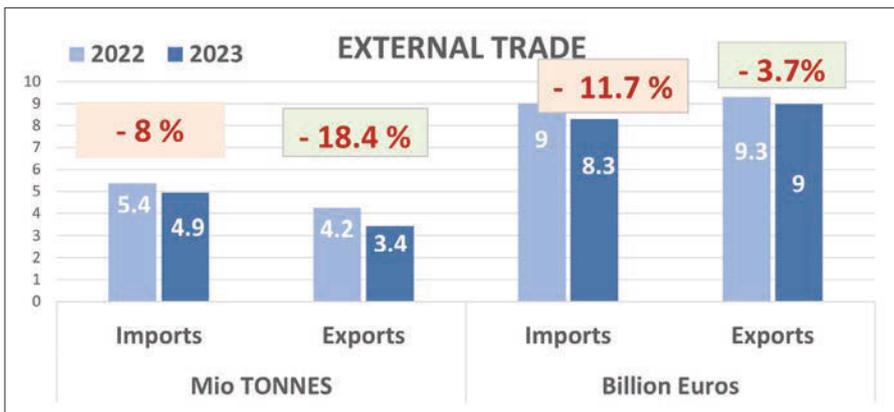
On the import side, there was an 8% decrease in volume (4.9 million tonnes) and a 12% decrease in value (€8.3 billion) for extra-EU27 imports in 2023 compared to the previous year (**Pic 3**).

Far-East Asia accounted for 35% of EU imports (including 28% from China alone), the rest of Europe for 50% (including UK (18%), Turkey (12%), Switzerland (7%)) and North Africa for 6.3%.

Continued>>



▲ Pic 2. EU Glass production in millions of tonnes. [Source: Glass Alliance Europe.]



▲ Pic 3. External trade. [Source: Eurostat – COMEXT Chapter 70 – Extra EU27.]

### Employment 2023

Employment in the industry has been gradually declining since 2019. In 2023, the number of employees decreased by 1.7% compared to 2022, dropping from 181,500 to 178,500.

Looking at the various sub-sectors within the glass industry, 2023 saw a uniform decline in production and employment levels (Pic 4).

The flat glass sector experienced an unprecedented 11% drop in production, while other sectors also reported significant decreases: container glass (-6%), domestic glassware (-24%), reinforcement glass fibres (-14%) and other glass (including special glass) (-12%).

### Outlook

Challenges persist for the European glass industry, with investments outside the region impacting prices and intense competition from non-European manufacturers.

Restoring consumer confidence and maintaining productivity are key concerns, especially in the face of rising energy prices.

The industry is investing heavily in zero-emission technologies and advocating for a level playing field with

strict regulations for imported glass products.

Emphasis is placed on compliance with EU standards related to climate change, pollution control, recyclability, consumer protection and worker safety.

While facing these challenges, it's important to recognise the vital role glass plays in supporting the green and digital transition, sustainability and prosperity.

Glass remains a crucial material for energy efficiency, safety and comfort in various applications, contributing to Europe's sustainable living goals.

As the industry works towards reducing greenhouse gas emissions and embracing

decarbonisation, it is essential to ensure that the European glass sector can thrive under competitive conditions, preserving its longstanding tradition on the continent.

Glass still plays a key role as a material, helping to enable our green and digital transition and supporting our society in achieving long-term sustainability and prosperity.

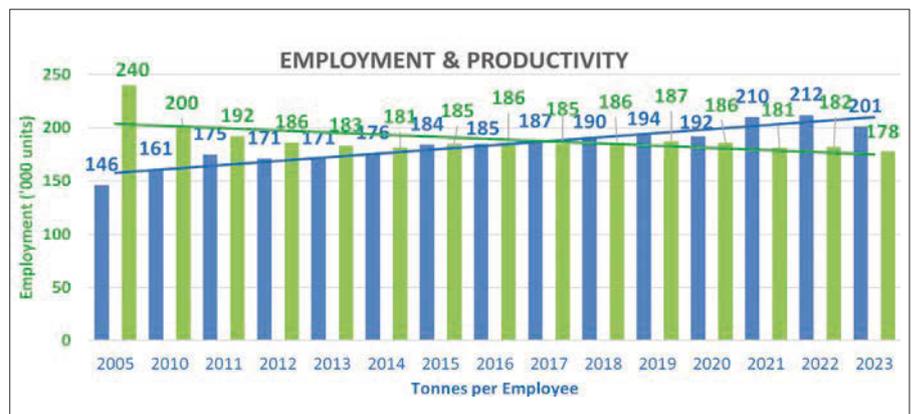
For example:

- Glass as a high-tech material vital to the energy performance, safety, security and comfort of our homes, offices, buildings and cars and is essential to make Europe fit for sustainable living.

- Glass delivers on the EU's Circular Economy Action Plan to ensure that waste is prevented and used resources kept in the EU economy for as long as possible.

- Glass commits to ensuring that greenhouse gas emissions from glass production drop substantially in the next decades. Decarbonisation is underway with new furnaces using electricity or hydrogen to progressively drop the use of fossil fuels. ■

\*Co-ordinator, Glass Alliance Europe, Brussels, Belgium  
[www.glassallianceurope.eu](http://www.glassallianceurope.eu)



▲ Pic 4 – Employment and productivity. [Source: Glass Alliance Europe.]

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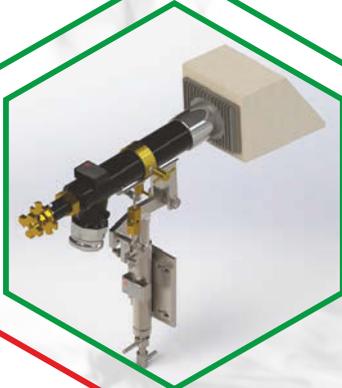
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# Will a hydrogen/natural gas blend work in glass melting?

Bledar Islami\*, Jörg Leicher\*, Tim Novakowski\*, Anne Giese\*, Johann Overath\*\* and Bernhard Fleischmann\*\*\* investigate the impact of natural gas/hydrogen blends and hydrogen on combustion and availability of hydrogen in the state of North-Rhein-Westphalia, Germany.

To achieve the goals of the 2015 Paris Accords, the glass industry has to reduce its CO<sub>2</sub> emissions.

The German glass industry alone covers about 80% of its energy demand with natural gas and is thus responsible for about 2% of the nation's gas consumption<sup>[1]</sup>.

To reduce CO<sub>2</sub> emissions considerably, the glass melting furnace should be decarbonised because about 80% of the total CO<sub>2</sub> emissions in the glass industry are emitted from the glass melting furnace. The industry has to re-think its manufacturing processes, but at the same time maintain standards in terms of product quality, process efficiency and also comply with other environmental regulations such as in regard to the emission of nitrogen oxides (NOX).

To achieve this melting furnaces could be electrified but this technology is established primarily for smaller plants<sup>[2]</sup>. To decarbonise large glass melting furnaces, hydrogen instead of natural gas could be used.

Hydrogen is a different fuel from natural gas with much lower densities (-86%) and volumetric lower calorific values (-70%), but higher adiabatic combustion temperatures (+150°C) when firing with air as oxidiser<sup>[3], [4]</sup>.

To analyse the effect of hydrogen on combustion and on glass quality as well as the availability of local hydrogen in the state of North-Rhine -Westphalia (NRW), different studies were carried out by the Gas- und Wärme-Institut Essen (GWI) in the projects HyGlass<sup>[5]</sup> with the Federal Association of the German Glass Industry (BV Glas) and in H<sub>2</sub>-Glas<sup>[6]</sup> with the Research Association of the German Glass Industry (HVG).

Both computer simulations (CFD: computational fluid dynamics) as well as experimental investigations with semi-industrial burner test rigs were used to assess the impact of the changing fuels on combustion and manufacturing processes in the glass industry and to develop solutions to address these issues.

Some of the key results of those projects will be presented here.

## Experimental investigations

One focus of the H<sub>2</sub>-Glas project was to investigate the effects of various levels of hydrogen (0, 30, 50 and 100 vol.-%) in natural gas on oxy-fuel-combustion.

The experiments were carried out in one of GWI's semi-industrial high-temperature test rigs (**Fig 1**). A firing rate of 366kW and an air excess ratio of 1.1 were set.

These operating conditions were kept constant when hydrogen was added to the natural gas. The test rig is actively cooled by a number of water-cooled tubes to avoid damage to the furnace that could be caused by excessively high temperatures. These tubes also serve as a heat load, to maintain a constant furnace temperature.

**Fig 2** shows the measurements at the chimney. In this series of measurements, the burner firing rate, air excess ratio, were kept approximately constant ( $P = 366\text{kW}$ ,  $\lambda = 1.1$ ).

A notable point of interest are the NOx emissions. Although the combustion is done with pure oxygen, NOx-emissions are still produced, because infiltration air enters into the combustion chamber as industrial furnaces are never entirely airtight.

Also, natural gas tends to contain small amounts of nitrogen. In general, such



▲ Fig 1. High-temperature burner test rig used in the investigations

uncertainties complicate an accurate prediction of NOx emissions in oxy-fuel-applications.

But independent of these difficulties, it could be shown that in fact the NOx emissions decrease in oxy-fuel-combustion when hydrogen is added to natural gas.

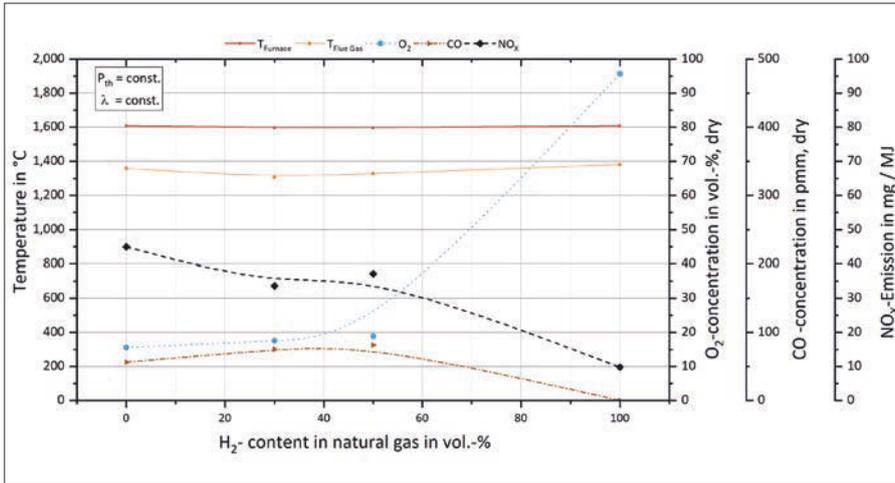
At this point, it is important to emphasise that NOx emissions should be referenced to the energy input to allow a fair and consistent comparison between the different fuels, I.e. units such as [mg/MJ] should be used.<sup>[7]</sup>

The more hydrogen there is in the fuel, the more water vapour will be present in the exhaust gas, and the smaller the dry exhaust gas volume to which the concentrations are related.

The exhaust gas sample is dried before measurement due to technical measurement reasons.

Consequently, comparing NOx-concentrations in conventional units like

Continued>>



▲ Fig 2. Measurement results of oxy-fuel combustion [Source: GWI]

[ppm] would distort the comparison and lead to incorrect interpretations.

**CFD simulations**

In the H2-Glas project steady-state RANS simulations (RANS: Reynolds-Averaged Navier Stokes) were also performed to analyse the impact of different natural gas-hydrogen blends and even pure hydrogen firing on industrial-scale furnaces and processes.

A typical oxy-fuel glass melting furnace was used as a test bed to see how such a system would respond to the changing fuel in terms of heat transfer, efficiency and NOx emissions, always a concern for such a high-temperature process.

In addition to a detailed look at temperature and species distributions in the furnace space, such simulations can also be used to describe the response of the furnace system as whole to the changing fuel composition.

**Fig 3** shows the temperature behaviour in the glass melting furnace when using natural gas and H<sub>2</sub>.

For these CFD simulations, the firing rate and air excess ratio were kept constant at each burner.

The total burner output was around 3.4MW and the average air ratio was 1.13. This implies that in a real-life system, there is a hydrogen-capable gas quality measurement system and a control system that is able to independently adjust gas and oxidiser volume flows is installed.

The results show that as long as the operating conditions (burner firing rate and air excess ratio) are kept constant by such an appropriate control system, the temperature levels remain approximately constant as well as the flame lengths

are in the same range. The flame shapes can be inferred from the temperature distributions.

In addition to the impact of hydrogen combustion one key question is, whether the hydrogen or changes in the exhaust atmosphere due to the increased water vapour content will have any negative impact on product quality.

Glass manufacturing in particular is known to be sensitive to small changes, making the industry a valuable test case for all kinds of high-temperature manufacturing industries.

Detailed information on this topic is provided in the project reports H2-Glas and HyGlass, which are published on the GWI homepage.

**GIS analysis**

In addition to the impact of hydrogen on combustion and glass quality, the availability of hydrogen plays a central role in transitioning the glass industry to hydrogen.

In this context in the HyGlass project a location-based GIS analysis (GIS =

Geographic Information System) was carried out for the glass industry in NRW to determine whether wind turbines and PV panels in the vicinity of glass production sites (max. distances 10 and 20km) could potentially generate sufficient green electricity to produce the required H<sub>2</sub> on-site.

It was assumed that all the locally generated renewable electricity would exclusively be used for the production of hydrogen.

For the full load hour of wind turbines, a value of 1,800 h/a was assumed, for PV panels 980 h/a.

The efficiency of the electrolyser was assumed to be to 0.7, which is a reasonable value according to literature.

The results made clear that even with the optimistic assumption that local wind turbines exclusively serve the glass manufacturing sites, only one site (out of nine) could be supplied with sufficient H<sub>2</sub> in a 10km radius.

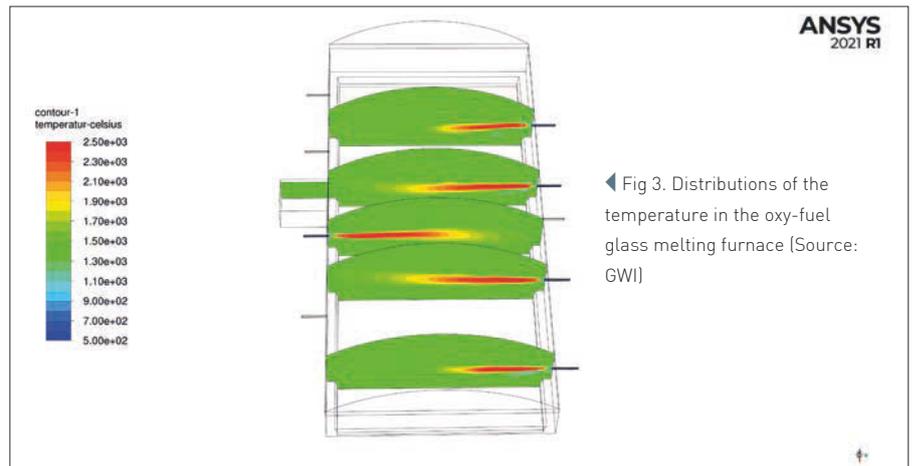
If the radius is extended to 20km, three sites could potentially be sufficiently supplied. For PV, no site even comes close. This estimate underlines that for energy-intensive industries, access to a decarbonised energy infrastructure, be it a fully green power grid, or a hydrogen grid, is crucial for their own decarbonisation efforts.

Local power generation and/or hydrogen production will generally not be sufficient to cover their needs, especially for applications which are operated continuously and thus rely on a secure energy supply.

**Conclusion**

In addition to electricity from renewable sources, hydrogen is likely to be an essential energy carrier for decarbonised

Continued>>



◀ Fig 3. Distributions of the temperature in the oxy-fuel glass melting furnace [Source: GWI]



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energy utilisation in many sectors, including hard-to-abate applications where electricity may not be an option for technological or economic reasons.

While all-electric glass melting furnaces exist today, they tend to be considerably smaller than their gas-fired counterparts.

At the same time, the European natural gas industry is pushing forward with its own decarbonisation efforts.

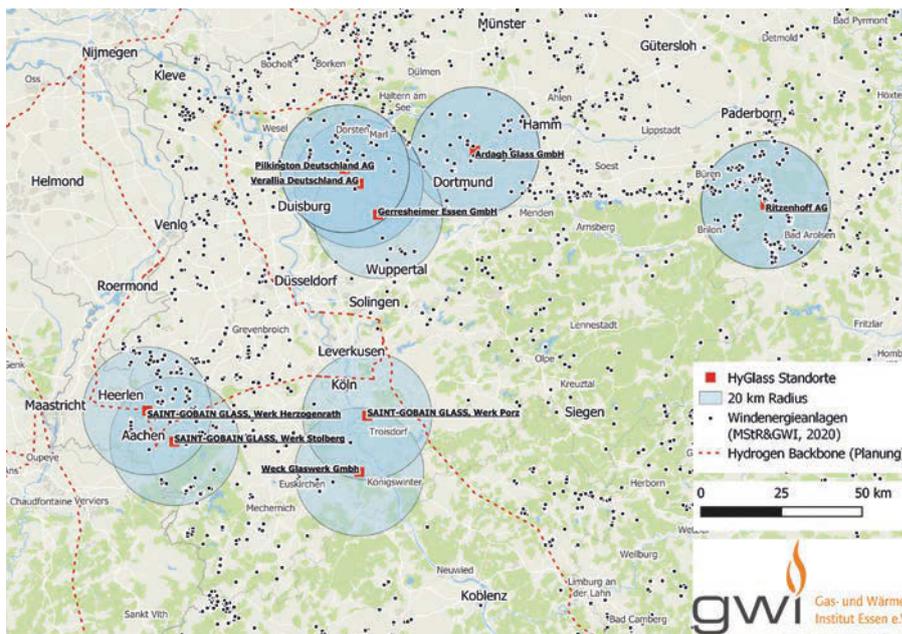
Both a 'hydrogen backbone' and the admixture of hydrogen into existing natural gas infrastructures are planned.

In terms of fuel characteristics, hydrogen is different from natural gas, and this has to be taken into account when discussing the use of hydrogen or natural gas/hydrogen blends as a decarbonisation option.

The HyGlass and H<sub>2</sub>-Glas project investigated the impact of both natural gas/hydrogen blends and pure hydrogen on combustion processes in the glass industry, with a focus on heat transfer, efficiency and pollutant emissions as well as aspects of product quality and potentials for decarbonisation.

The results shows that in terms of combustion the use of hydrogen instead of natural gas in the glass melting furnace is possible. To use various blends of natural gas and hydrogen an appropriate measurement and combustion control technologies should be installed in to keep the air excess ratio and firing power constant when the gas compensation changes from time to time.

The GIS analysis made clear that it is not sufficient to generate locally H<sub>2</sub> with



▲ Fig 4. GIS map – wind power potential within 20km of a glass production plant in NRW [Source: GWI]

green electricity in order to decarbonise glass melting industrial plants, even if all the green power generation capacities were to be used to produce hydrogen.

This means that full decarbonisation via hydrogen will usually require either a completely green power grid with local electrolysis or a dedicated H<sub>2</sub> grid.

**Acknowledgments**

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- \*\*\* Hüttentechnische Vereinigung der Deutschen Glasindustrie (HVG), Offenbach am Main, Germany <https://www.hvg-dgg.de/de/>

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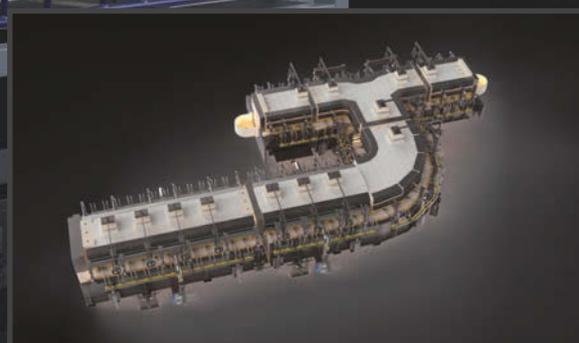
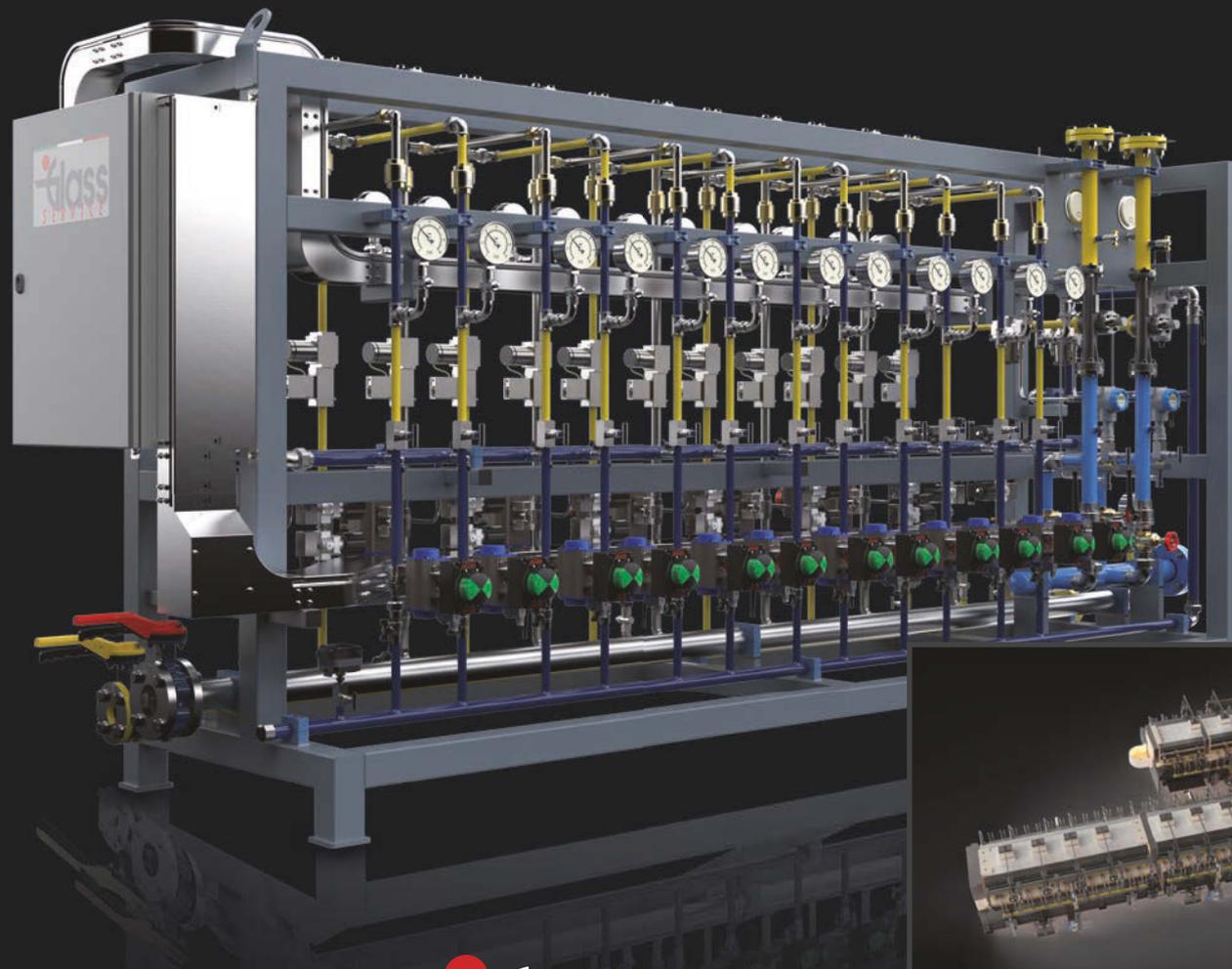
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# Furnace Solutions focuses on decarbonisation

More than 120 glass industry professionals attended this year's Furnace Solutions conference in St Helens, UK, this June, where the focus was on technologies to reduce emissions in the glass production process. Jess Mills was in attendance.



▲ Members of the Society of Glass Technology's (SGT's) Sustainable Melting Technical Committee (SMTC), who organised the Furnace Solutions conference.

*This year's conference returned to the theme of a net zero future, amid concerns for the environment. Discussions focused on electric and hybrid melting, hydrogen, alternative raw materials, and sustainable refractory development.*

*Over 120 people attended the annual glass manufacturing conference, which is organised*

*by the Society of Glass Technology (SGT). The event was held at the Totally Wicked Stadium in St Helens, UK, for the third time.*

*Among the registered attendees were glass manufacturers O-I, Guardian Glass, NSG Pilkington, Saint-Gobain and Stoelzle, alongside suppliers such as Fives, PaneraTech, Zippe, Ametek Land and HFT.*

*Visitors came from the US, Portugal, France, Italy, Turkey, Holland and Belgium, as well as the UK.*

*The two-day conference included 15 presentations from glass manufacturers and suppliers, including Sisecam, Stara Glass, AGC Glass Europe, Ardagh Glass, Sefpro and Glass Service.*

Continued>>



◀ Delegates at the Furnace Solutions conference, held at the Totally Wicked Stadium, in St Helens, UK.

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## BEST PAPER-AGC Glass Europe

Every year, the Michael Garvey award is given for the best conference paper. This year, Fabrice Fasilow, Sustainability Manager at AGC Glass Europe, won for his paper which discussed AGC's journey towards net zero emissions (*see right picture*).

In his presentation, Mr Fasilow highlighted two upcoming sustainability projects from AGC. The first is an electrical boosting project in Belgium, which is supported by the Belgian government.

The aim is to achieve electric boosting up to 10 MW, which Mr Fasilow described as 'challenging' due to traditional electrical boosting ranging from 1 to 3 MW.

Meanwhile, the Volta project will focus on developing a new type of hybrid, oxy-fired furnace for float glass which aims to have an electricity share in excess of 50%.

The project is in partnership with Saint-Gobain, and Mr Fasilow said the works have already started, with plans to restart the furnace at the beginning of January next year.

He said the project in Belgium would help inform the Volta project, which could see electro boosting of up to 20 MW for the float.

On winning the best paper award, Mr Fasilow said: "I am very happy and glad that my paper was well appreciated. For me it is a big surprise, I was not expecting this very nice award."

He continued: "The key theme of the paper is that there is no unique solution to decarbonise the glass industry. You have to analyse all the technical solutions on offer today and, for a company like us, to try and see which solution is best for each plant according to the constraints and benefits the solution can bring you."

"Among all the technologies, the two main pillars AGC is working on until 2030 are electrification and the circularity of the cullet."

He said that teamwork and collaboration would also be vital for further progress in the glass industry to meet its sustainability aims.

"I hope the paper will help inspire the glass community to speed up its decarbonisation efforts and to not be



▲ Kevin Rivers (left), SMTC Chairman, presented the Michael Garvey award to Fabrice Fasilow (right), Sustainability Manager at AGC Glass Europe.

afraid to face challenges. My message is let's work together to overcome these challenges, we will need courage and vision."

Afterwards, Sustainable Melting Technical Committee (SMTC) member Nigel Longshaw said the paper was relevant, due to it being the experience of the glass producer as opposed to a supplier to the industry.

He said: "What's been very interesting this year, is that we've had papers from glass producers, which is what we want to learn. It's their experience of the technologies and the challenges that they are facing now, and in the coming years with decarbonisation, which is the top of everybody's list of challenges."

"There's not going to be one solution that covers everybody because there are different economic and geographical factors to consider for each plant. The decisions must be made as to which technology is the best for that particular factory."

“I am very happy and glad that my paper was well appreciated. For me it is a big surprise, I was not expecting this very nice award.”

Continued>>

## DAY ONE-NextGen and Hydrogen

Speakers for Day One included AGC Glass Europe, DSF Refractories and Minerals, Ardagh Glass Packaging (AGP), Stara Glass and Glass Futures.

Joris Goossens, R&D Project Manager at AGP-Europe, provided an update on AGP's NextGen furnace in Obernkirchen, Germany. The furnace produces 350 tpd of amber glass, using up to 70% recycled glass cullet.

The furnace has now achieved an average rate of 60% electrical heating, which should result in a 64% reduction in CO<sub>2</sub> emissions. Since the start of 2024, the furnace has saved AGP approximately 18,000 tonnes of CO<sub>2</sub>.

Mr Goossens described this 60% electrical heating as “uncharted territory” in terms of what has been achieved previously.

Since starting commercial production in October 2023, the furnace has ramped up direct electrical heating via electrodes, towards a goal of 80% electrical heating and 20% gas. Based on modelling data, at 80% electrical heating, the furnace should achieve a 69% reduction in CO<sub>2</sub> emissions.

He continued that there had been no issue with glass quality or colour, or any changes to the raw materials, although acknowledged that this could change as the furnace reaches higher levels of electrical heating.

Ernesto Cattaneo (*right*), Head of the Innovation Department at Stara Glass, also discussed decarbonising the glass production process in his presentation.

He said: “In the next 30 years, the glass industry must be completely decarbonised. The average lifetime of a glass furnace is about 10-15 years. Innovations for glass production are urgently needed now, because the year 2050 is only two furnaces away.”



He continued that politics would decide the fuel of the future, and that the glass industry would have to be “prepared for anything”. Consequently, Stara Glass plans to pursue all lines of development, including hydrogen.

The H2Glass project, co-ordinated by SINTEF Energy, will see a portable electrolyser supply 100% green hydrogen to five industrial glass sites in Europe. The first trial was carried out this year by Steklarna Hrastnik, while the other trials will take place in 2025 and 2026.

The project is driven by 23 partners, including Stara Glass, from eight European countries. Partners include glass manufacturers, as well as research and industry institutions.

Steklarna Hrastnik, Vetrobalsamo, Zignago Vetro, PTML Pilkington, and

Owens Corning will conduct full-scale hydrogen trials at their European sites as part of the project. Mr Cattaneo said the manufacturers represent 98% of the European Union's glass production. He continued Glass Futures was also interested in the project.

Stara Glass will also investigate the design of future H2 furnaces, with plans to implement automation, including digital twin technologies and smart production processes, for predictive maintenance and easier monitoring of the system.

While this project is focused on hydrogen, Mr Cattaneo said this was not Stara Glass's only focus for decarbonising the industry. He said the company was also looking into energy saving, carbon capture and electrification.

Continued>>





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## GLASS FUTURES UPDATE

Glass Futures is a not-for-profit research technology organisation. It officially opened its £54 million Global Centre of Excellence in St Helens, UK, at last year's Furnace Solutions conference. The research and technology centre aims to help the global glass industry to create greener and cleaner products.

In the final session of Day 1, Dr Daniel Backhouse, Senior Glass Technologist at Glass Futures, gave an update on the centre before providing a tour of the facility.

On the pilot line, Glass Futures will install a 13-silo batch plant with a 500-litre mixer, a 30 tonne/day furnace, a refractory-lined flue system, and a forehearth for 600 mm rolled plates.

Dr Backhouse said the furnace would be oxy-fired, with the capability to run on a range of fuels, such as natural gas, hydrogen and liquid fuels.

Much of the steelwork for the furnace has already been installed, with plans to fire it later this year.

On hydrogen, Dr Backhouse said: "We have intentions to run 100% oxy-hydrogen on the furnace and we want to look at the impact on glass quality, refractories and foaming in particular."

The furnace will also have bottom boost and bubblers supplied by F.I.C.

"We are looking to have up to 60 to 80% boost in our furnace and we'll also be looking at demand side response modelling, so the ability to cut back on

electricity when demand is high, or to increase when the cost is low, because the demand is low.

"With this, we'll be looking at the impact of glass quality, validation of furnace modelling - that Guardian Glass have been doing on our furnace - and rapid switching between top fire and boost."

The facility will be run on Siemens PCS Neo control system, which will be designed in-house by Glass Futures' control engineers (*see Glass International's February 2024 issue, page 15, for more details*). There will also be space to install and test carbon capture, as well as waste heat recovery technologies.

## DAY TWO-AI and Alternative Fuels

Speakers for Day Two included Ametek Land, Glass Service, Nippon Gases and Siseam.

In the first session, Neil Simpson, Independent Consultant at Simpson Combustion and Energy, discussed improved process automation for regenerators on behalf of Ametek Land. Afterwards, Erik Muijsenberg, Vice President of Glass Services, spoke on camera systems, batch monitoring and control technology.

After these presentations, a joint discussion then took place between the two (*see left picture*), in similar style to last year's debate on the use of cullet.

Mr Simpson began by talking about the move towards alternative fuels.

He said: "Nobody wants to take the risk. You need the security of supply as well as before you try something new. Why would you put a hole in your crown, and use oxy-fuel, when you can use known technologies instead?"

"It's often a 'last chance saloon' situation before you try something. For example, seven years is an acceptable amount of time for the industry to accept technology."

The discussion soon moved onto the use of Artificial Intelligence (AI) in the industry. While Mr Muijsenberg said AI was currently "over-hyped", he believed

it had the potential to "change the world even more than the internet".

He said: "Many people think AI is something very strange and special. It's just a different way of organising data, and from that smart organising you can select what you need more easily.

"It uses software routines that we didn't think about before, or routines similar to how our brain works. But it has nothing to do with our brain. It's simply a software routine. It allows you to do things, faster, better than a normal software, but AI cannot be used everywhere."

Mr Simpson also agreed that AI was a useful tool for collating information, but was concerned that the industry could become too reliant on the technology. He said: "When something extreme happens, you need the operator to be able to decide what to do."

Mr Muijsenberg also believed that an operator was imperative for a glass plant. He said that systems, such as Glass Services' Expert System (ES III), could help operators keep the furnace under control and make suggestions, but the final decision would remain with them.

However, Stuart Hakes, F.I.C. CEO and former SGT President, said that as time went on there would be an increased use of automation, which would eventually

become more efficient than a human operator.

He said: "The real world is that we are going to eventually become redundant. We're going to rely on automation. There are many factories currently where there are no people - there are only robots making things."

After the session, Joaquín de Diego Rincón, Director of Combustion Applications Europe at Nippon Gases, discussed the company's DiluJet Swing FH oxy-fuel burners.

Compared to air-based forehearth, the oxy-fuel based forehearth and refiner can offer a higher uniformity of molten glass, a 50-70% reduction on fuel consumption, and the number of burners can be reduced with wide heating.

After its first customer installation, it was found that the burners can successfully reduce CO<sub>2</sub> emissions by 66.6%, as well promoting uniform heating and approximately double the amount of heat transfer efficiency.

Adnan Karadag (*see right*), Modelling and Simulation Manager at Siseam, gave a presentation on the manufacturer's sustainability initiatives.

Dr Karadag said that, in general, the glass industry was excelling in decarbonisation, particularly in Western

Dr Backhouse said Glass Futures was also scoping hydrogen firing capabilities on the forehearth, as part of an ongoing project. He continued that the superstructure for the forehearth has been installed, but the organisation was waiting on the refractory installation.

There will also be a full annealing lehr and cutting machine for producing samples, but the majority of the glass will go back into the crusher to become cullet for the furnace.

Due to Glass Futures members requesting research into low carbon fuels above all other areas, such as Industry 4.0 and raw materials, the organisation has created the Sustainable Low Carbon Fuel Trials – or the ‘START’ Programme.

Dr Backhouse said the programme would be delivered from Q4 2024 into Q2 2025. It will be supported by Glass Futures members, as well as the UK’s

Department for Energy Security and Net Zero (DESNZ).

The programme will see Glass Futures investigate different fuels, including liquid biofuels, hydrogen and electric boost, and hybrids thereof.

On biofuels, Dr Backhouse said: “The industry knows how to run on oil. It’s done it before, it could easily do it again. The real key is to find low cost and sustainable biofuels that are economically feasible for the industry.

“As part of this, we will have five industrial trials. Four glass plants in the UK, as well as one refractory plant, will run biofuels trials on their plants as part of the project.”

Glass Futures will also examine carbon capture, as discussed by Dr Masimba Toperesu, R&D Projects Lead at Glass Futures.

The organisation’s current Carbon

Capture Utilisation and Storage (CCUS) projects include the C-Capture trials, and the Horizon COREu project, which is made up of a consortium of over 40 companies.

As part of the C-Capture project, a carbon capture trial is currently taking place NSG Pilkington’s float glass line at its Greengate site in St Helens, UK.

A carbon capture solvent compatibility unit (CCSCU) was connected at the base of UK5 furnace chimney last year, which will separate CO<sub>2</sub> from the waste flue gas.

The trial will assess the compatibility of C-Capture’s solvent-based technology with flue gases from an industrial glassmaking furnace.

Dr Toperesu said that the CCSCU would be moved to Glass Futures’ Global Centre of Excellence in August for further trials.



▲ Erik Muijsenberg (left), Vice President of Glass Services, and Neil Simpson (right), Independent Consultant at Simpson Combustion and Energy after their panel discussion on alternative fuels.



▲ Nigel Longshaw (left), SMTC Member, presented Adnan Karadag (right), Modelling and Simulation Manager at Sisecam, with a certificate of appreciation.

Europe, while the Northern hemisphere was achieving adequate results. However, other countries, such as West Africa, were lagging.

He continued that energy trends looked promising. While 71% of total energy comes from fossil fuels today, this is expected to go down to 36% by 2050

Dr Karadag highlighted achieving zero carbon for raw materials as one of the most difficult challenges for the glass industry, saying that, at this point, it was impossible to produce carbon free glass

on an industrial scale. Although it was still possible to produce low-carbon glass.

Sisecam is currently involved in several projects to reduce its Scope 1 and 2 emissions, such as the European Union’s HYSouthMarmara Project. The project includes 15 organisations from four countries, and aims to create a green hydrogen ecosystem to achieve a carbon-free Southern Marmara, Turkey, by 2053.

With the project, green hydrogen obtained from renewable resources will be produced and distributed, which

Sisecam plans to use for the production of flat glass.

The project also broke a record in Turkey by receiving a grant of €8 million within the scope of the Horizon Europe Framework Programme and became one of the 90 Hydrogen Valleys globally.

Dr Karadag also said Sisecam was in talks with different partners to commission a full-electric furnace in the future.

**The Society of Glass Technology, Sheffield, UK: <https://sgt.org/>  
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► EME was awarded the contract to install a batch plant at the Glass Futures' Global Centre of Excellence in St Helens, UK.

Batch plant

Glass Futures™



# Glass Futures prepares for a sustainable tomorrow

EME has designed and installed a pilot batch plant facility for Glass Futures' Global Centre of Excellence in St Helens, UK. The 30 tpd batch plant is planned to start later this year. Dr Sebastian Woltz\* discusses the project.

The not-for-profit, research and technology organisation, Glass Futures, is nearing completion on its Global Centre of Excellence in St Helens.

The facility will execute trials and generate ideas that will support the glass industry's move towards decarbonisation.

Following a tender process, EME was selected by Glass Futures for the conceptual engineering and supply of the pilot batch plant. Once operational, the facility will have a complete glass plant including a full-scale batch plant with a capacity of 30 tpd.

The design and installation of the batch plant facility (**Pic 1**) has been an incredibly ambitious and exciting challenge for EME.

The project, which is nearing completion, was made even more challenging by starting during the

restrictions of the global pandemic.

It was essential for our design concept to deliver the height of operational flexibility. One that would allow for varied raw materials and batch composition, as well as unknown characteristics like different bulk densities and cullet ratios.

Another important goal was the ability to adapt and integrate with new technologies, taking advantage of the best technical solutions available today and those that may be available tomorrow.

## Engineering solution

By involving members and consultants in early discussions and decisions during the conceptual engineering phase, we improved every aspect of the design, from health and safety to structural integration and operational efficiency.

Once the physical design of the plant

was agreed by all stakeholders and set in place, we developed a detailed technical specification. This was supported by technical documentation and drawings, together with a preliminary project schedule and budget, to provide a complete engineering solution.

The design phase was further complicated by having to maintain the building as a high bay warehouse during construction.

Bolting on all steel interfacing with the structure made it easy to remove for the start of the installation. In addition to drilling and other modifications, EME purchased structural steel from UK suppliers for the project as soon as the preliminary design was completed.

Continued>>



► Pic 1 - EME's technical department started working on the project in 2022.

## Installation

Installing the steel construction, platforms and silos began in early 2023. We worked closely with EU suppliers of the equipment and machineries throughout to ensure shorter delivery times, high-quality products, site acceptance tests and full legal compliance.

This meant we were able to use their site installation engineers, fabrication workshops and approved sub-contractors, which helped to avoid delays or reworks, as well as give greater control over labour, production and building regulations.

Next, a local team directed by one of our supervisors installed the EME equipment, electric cabling and machineries.

These included belt conveyors, bucket elevators, scales, dosing screws, vibratory feeders, mixer system, magnets, metal detectors and filter systems.

Meanwhile, EME's project manager was also there to oversee both the installation and commissioning.

Having UK-based installers and fewer sub-suppliers improved communication, safety and co-ordination, with additional personnel on hand to support and speed up progress if required.

The installation is now finished, and we are waiting for the batch plant to be hot commissioned with a planned start-up in Q4.

Flexibility has been the key driver of this modern research facility, which called for innovative engineering solutions.

EME installed mechanical, pneumatic, and manual raw material intake systems, as well as a weighing system with eight individual scales, which will be capable of weighing single raw materials individually to create any recipe Glass Futures can dream of.

## Technologies

The batch plant has an upgradable two stage design. The first stage includes a silo row, mixer and batch transport to furnace #1, followed by a second silo row, additional mixer and batch transport to furnace #2.

At this stage, the mixers are prepared with a second outlet to charge both batch transport systems to both furnaces. By using a modular 3D design during the conceptual phase, we were able to plan for any eventuality and avoid a major rebuild for the later additions.

As well as accommodating a range of silos that can store various amounts of raw material (**Pic 2**), we've made it possible to handle and unload in different ways. For example, by charging the cullet and the premix into the mixer or adding it directly to the batch transport system.

The modern facility features a Siemens

PCS Neo control system, which allows multi-user engineering and remote access from any location.

In addition, careful consideration has been given to accessibility throughout the plant for easy maintenance and a safer, well-controlled environment.

## Batch plant

When the batch plant is up and running later this year, the operation will have a capacity of 30 tpd.

From developing cullet processing technology to testing alternative batch compositions and raw materials, glass producers will have the rare opportunity to conduct live trials in a full-scale pilot plant, rather than in the unrealistic, small-scale setting of laboratory.

Additionally, it is a great opportunity to train operators on a running batch plant. Typically, while a batch plant is in operation, there is not enough time or availability of experienced staff to train operators properly. At Glass Futures, however, experienced staff are available to provide practical and theoretical training, as well as advice on plant operation.

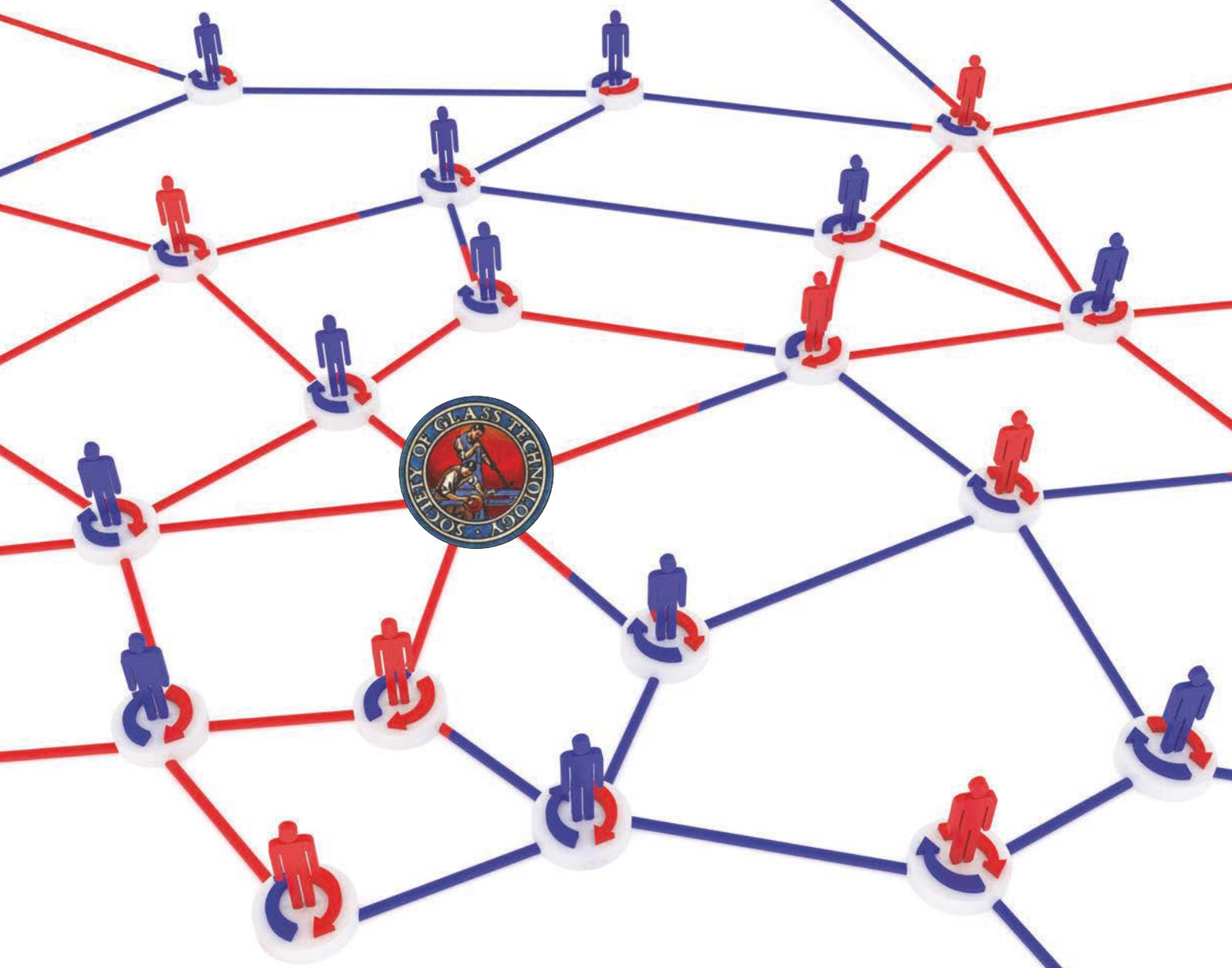
Through a membership scheme with industry partners, customers and suppliers, Glass Futures will also be at the forefront of training and development, bridging the technology gap between research activity and commercial implementation.

At EME, we are extremely proud of what has been achieved to date and cannot wait to see the pilot plant in action, as it welcomes glassmakers from around the world to work in partnership to foster sustainable ideas in support of decarbonisation. ■

\*Sales Director, EME, Erkelenz, Germany  
www.eme.de



► Pic 2 - EME technology inside the 165,000 ft<sup>2</sup> Glass Futures R&D facility.



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# A laser to recycle all types of glass

Not all glass is recyclable. Dianna Bautista\* discusses a project which aims to develop laser technology to recycle contaminated glass into new products.

▶ Everglass Consortium at the University of Vigo, Spain during the project's launch.



Even though the glass industry is investing heavily in designing breakthrough technologies and increasing glass recycling, glass production is a carbon and energy intensive process.

Much of this comes from the combustion of natural gas used for melting (approximately 80% of its CO<sub>2</sub> emissions).

The remaining 20% comes from virgin raw materials (carbonates decompose in the furnace and release CO<sub>2</sub>).

Glass is the most suitable material for reducing these energy-intensive demands. It is a permanent material. It can be recycled over and over again, without losing its physical properties.

"Recycling is actually one of the main decarbonisation pathways for the sector," notes Iva Ganev, Environment and Climate Policy Manager for Glass for Europe, the trade association for Europe's flat glass sector.

## Recycling

Recycling glass involves collecting and sorting glass waste.

Glass is then crushed and combined to produce a granular material, called cullet.

The cullet is added to a furnace where it is melted together with virgin raw materials of sand, soda and limestone to produce glass.

Since cullet melts at a lower temperature than the raw materials, adding them to the batch reduces energy consumption and carbon emissions while saving raw materials.

Collection and recycling of used glass containers began in Europe in the 1970s as a voluntary initiative by the glass industry.

"Today recycled glass is the most important raw material used in container glass production, representing on average more than 50% of the batch," says Vanessa Chesnot, Head of Public Affairs & Product Policy at FEVE, the European Container Glass Federation. Within Europe the current rate of collection is above 80%, with rates differing from one country to another.

Ms Chesnot co-ordinates Close the Glass Loop, a European initiative aimed at increasing the European average recycling rate to 90% by 2030. The initiative involves collaboration along the glass packaging value chain.

She has closely followed European

efforts to increase glass recycling: "The container glass industry is strongly committed to decarbonisation and many paths are being explored and deployed. Increasing recycled glass uptake is one of these paths.

"This has been a priority for container glass manufacturers for decades."

## Technical challenges

However, despite most container glass being collected, sorted and recycled, certain types of glass are not being recycled to their potential capacity.

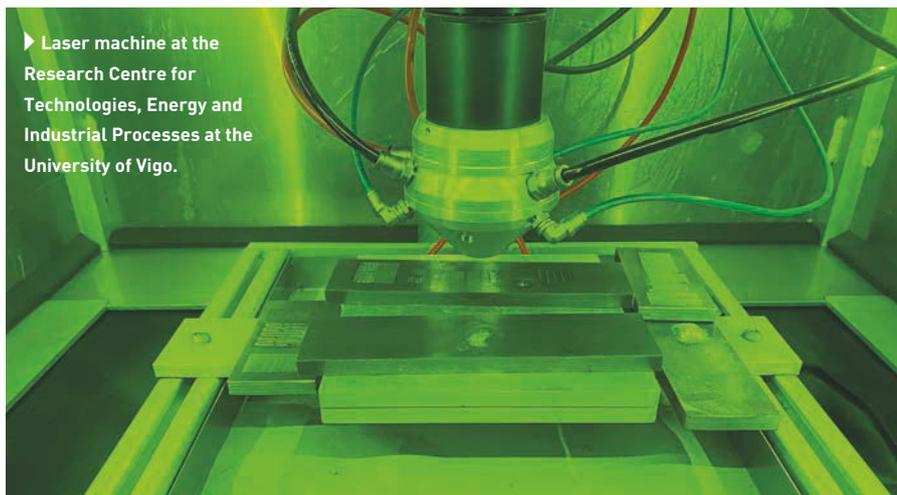
Much of the current glass recycling infrastructure is designed for packaging (usually sodalime silica) glass, such as beverage bottles or food jars.

Non-packaging glass usually has a different chemical composition and must be collected and recycled separately and within their own production streams.

Electronic screens, glass fibres, and borosilicate or heat resistant items are some examples of such glasses.

If melted with sodalime silica glass, they can affect the melting conditions or potentially introduce contaminants.

Continued>>



▶ Laser machine at the Research Centre for Technologies, Energy and Industrial Processes at the University of Vigo.

They need their own production and recycling installations to suit their needs. This requires technical and infrastructural support, which can be lacking depending on the specific glass subsector.

### Obstacles

For other glasses, the obstacles can occur at the collection and sorting stage.

Flat glass refers to the windows, doors, and other sheet glass from buildings and automobiles. Dismantled buildings are potential sources of recycled flat glass, yet from a demolished building, only a small portion of the windows are well preserved and separated. Often the window is still in its frame. If the window and frame are then shredded together, the result is glass mixed with containments such as plastic, wood, aluminium. This is not usable for cullet and can potentially ruin a whole batch of melted glass.

### Contamination

For flat glass, the purity of the final product is important, since it is pressed into thin, wide sheets after leaving the furnace.

“No contamination whatsoever can be tolerated. The tiniest contamination could provoke bubbles or imperfections which would actually break the glass.

“And obviously you cannot have that neither in a window nor in a windshield for a car, because it would cause safety issues,” says Ms Ganev. “There is strict control of the whole process and the quality of the final glass.”

Glass for Europe aims to improve the collection and sorting steps by advocating for audits and policy that encourage separation of glass during deconstruction. They also aim to improve the current use of cullets to further decrease CO<sub>2</sub> emissions and energy usage.

Within the flat glass sector, cullets account for 26% of the materials used in the flat glass melting process. The remaining percentage of flat glass is used either to produce other types of glass or is lost to landfills.

Increasing the cullet percentage to 37%, can reduce CO<sub>2</sub> emissions by 7%.

### Purity

Similarly, contamination is also a challenge for recycling pharmaceuticals.

“In the pharmaceutical class, purity and high quality of the product is critical,” notes Dušan Galusek, the Director of the FunGlass Centre in Slovakia.

“It can actually affect the content. It can damage the drugs which are stored inside and of course threaten human health.”

When glass items are not recycled, they end up in landfill where their raw materials are lost.

“You lose these materials forever,” says Prof. Galusek.

Prof. Galusek is part of Everglass, an EU-funded research project that aims to

develop new glass recycling technology.

The project seeks to improve the current state of this industry, with a focus on infrastructure and technical limitations.

They aim to introduce novel technology that would take glass waste and use laser technology to 3-D print new glass. The proposed technology will involve assessing the properties of glass waste and conditioning said glass so that it can be converted into a glass powder.

The glass powder will be input into the project’s prototype, where a laser morphing process will produce the new glass. The cycle can be repeated with new glass waste, thus allowing for infinite recycling of the glass, regardless of the type.

The project’s technology could increase accessibility of glass recycling in places with limited capacity.

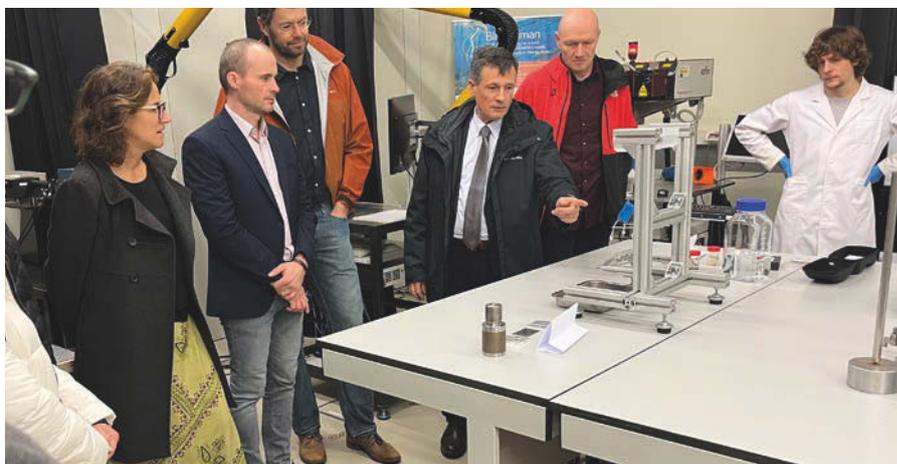
For example, in communities where the collection of a recyclable glass is more difficult because of transportation and the amount of glass collected.

Though glass recycling might not be the first thought for a sustainable future, it is an integral part. It protects humanity and society from further environmental damage. And as Prof. Galusek concludes: “Whatever we do, nature and the environment will always survive, but the question is whether it will be here with humans or without them.” ■

\*Science Communicator at European Science Communication Insitute (ESCI),

Contact information: Luiza Beirão Campos, Science Communicator and Project Manager, Everglass, lbc@esci.eu

<https://www.everglassproject.eu/>



▶ Everglass Project Co-ordinator, Juan Pou, giving a tour on the Research Centre for Technologies, Energy and Industrial Processes at the University of Vigo.



Glassman is an industry focused event which brings together leading experts in the field such as manufacturers, technology suppliers and glass associations to discuss sector topics. Visitors and exhibitors can attend the free conference sessions to hear from industry experts.

These exhibitions bring together hollow and container manufacturers and businesses that use glass containers, to discover the latest innovations which include energy efficiency, quality control, packaging, logistics and decorative possibilities.

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12-13 February 2025, Bangkok, Thailand [glassmanevents.com/asia](https://glassmanevents.com/asia)

The banner for Glassman Asia 2025 features a night-time aerial view of a city with illuminated buildings and a river. The logo is overlaid on the left side.

**GLASSMAN**  
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The banner for Glassman Europe 2025 shows a daytime view of a densely populated city with a mix of modern and traditional architecture. The logo is overlaid on the left side.

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# Enhancing glass forming precision

German glass machinery supplier Iprotec has utilised Siemens' technology for its drinking-glass blowing machine, which can produce up to 60 glasses per minute. Ruediger Steingruebl\* and Johannes Rahm\*\* outline the partnership.

Iprotec specialises in the construction of glass machines and special machines as well as solutions for the automotive industry.

Based in Zwiesel, Germany, the company develops, plans, designs, manufactures, installs, and commissions machines and entire production lines.

Among Iprotec's most impressive solutions to date is its large blowing machine for drinking-glass production (**Pic 1**). The continuously rotating machine has a pitch diameter of up to five meters.

Thanks to its modular design, it can be precisely modified to meet user requirements, which allows the drinking-glass production line to be flexibly equipped with six to 32 blow-moulding sections, according to the customer's needs.

Depending on the configuration selected, up to 100 servo axes are used in one machine, making it possible to manufacture up to 60 glasses per minute while maintaining the highest quality.

Tobias Weiss, Head of Electrical Engineering at Iprotec, said: "It takes extremely powerful control and drive systems to reliably control such a large number of axes. There's no room for compromise, which is why Iprotec has long been completely reliant on Siemens technology, including the SIMOTICS-S 1FK7 servo motor."

Maximum energy efficiency is also ensured by Siemens' SINAMICS S120 Active Line Module, which feeds regenerative energy back into the system so it can be reused multiple times.

"In Siemens, we have a reliable partner with a global service and support concept. These are essential requirements for a globally active company like Iprotec. Customers worldwide know and trust Siemens technology and quality."

In particular, the global availability of spare parts and maintenance services is a key decision-making criterion for Iprotec customers.

Iprotec drinking-glass production lines



▲ Pic 1. The blowing machine from Iprotec has a modular design and can consist of up to 32 sections.

are deployed around the world. Customers benefit from the fact that Iprotec is a certified Siemens Solution Partner with a focus on factory automation and motion control.

Tobias Bredl, Head of Sales and Projects at Iprotec, said: "We've been part of Siemens' global partner network for two years. For our customers worldwide, this means uniformly high-quality standards and complete customised solutions for automation, control technology and drive technology."

The next step will be certification as a Siemens Solution Partner in SCADA Basis.

## Iprotec solutions

The segment design of the blowing machine makes it very easy to replace individual sections. The replacement process only takes about 15 minutes, and production can continue without a lengthy delay. The segments can also be connected to a separate small test control system outside the machine and quickly serviced, tested, and repaired.

This allows users to perform predictive maintenance on individual sections at regular intervals without impacting production; this approach offers opportunities for increasing the availability and productivity of the entire production line.

As soon as the blowing machine has completed its task and the glasses have been produced, the tempering of the glasses in the annealing lehr is initiated.

This is immediately followed by the next Iprotec solution: a modern glass moil-cutting machine that can process up to 60 glasses per minute (**Pic 2**). What makes this machine unique is the laser filament-cutting (LFC) technology for round-ware developed and patented by Iprotec – a key innovation in glass cutting.

“This process is extremely demanding and requires absolute precision,” says Mr Weiss. “Inside the LFC machine, the glass is initially rotated, and its concentricity is precisely measured. With tenth-of-a-millimetre accuracy, the cutting laser then follows a direct axis along the measured concentricity while the glass is simultaneously rotated. If the laser were to move a little too far toward the outside or inside, it would nullify the physical procedure.”

The machine moves large masses and precisely positions the glasses to nearly one-hundredth of a millimetre (**Pic 3**). In a single rotation, it cuts wall thicknesses of up to three millimetres.

This newly developed procedure has none of the disadvantages of traditional moil-cutting machines. Because the process is contactless, the glass is no longer subject to mechanical or thermal stress during cutting.

As a result, there’s no need to remove residue from the glass surface, and follow-up processes like grinding and washing have been completely eliminated. Glasses are perfectly clean and dry immediately after cutting, and chipping and micro-cracks are also a thing of the past.

### Precision

Mr Bredl said: “Obviously, precision is our top priority. With the LFC machine, we’re at the cutting edge of what’s possible in the industrial production of high-quality glass today.

“We achieve this precision only because we use the best control system and the best direct drives, all from Siemens.”

Siemens’ SIMOTICS T high-performance torque motors are powerful as well as extremely reliable and low-maintenance because they neither have nor require a gearbox. As a result, operating and maintenance costs are also lower than those of traditional moil-cutting machines.

Iprotec’s moil-cutting machine can be configured for both the hot and cold

▼ Pic 2. The glass moil-cutting machine cuts up to 60 glasses per minute with laser filament-cutting (LFC) technology.



end of production and can either be fully integrated or deployed as a standalone solution.

Like the blowing machine, the LFC moil-cutting machine also has the integrated SINAMICS S120 Active Line Module, which returns an extremely large amount of drive energy. This pays off because the moil-cutting machine’s powerful direct-drive cycles in 0.6 seconds.

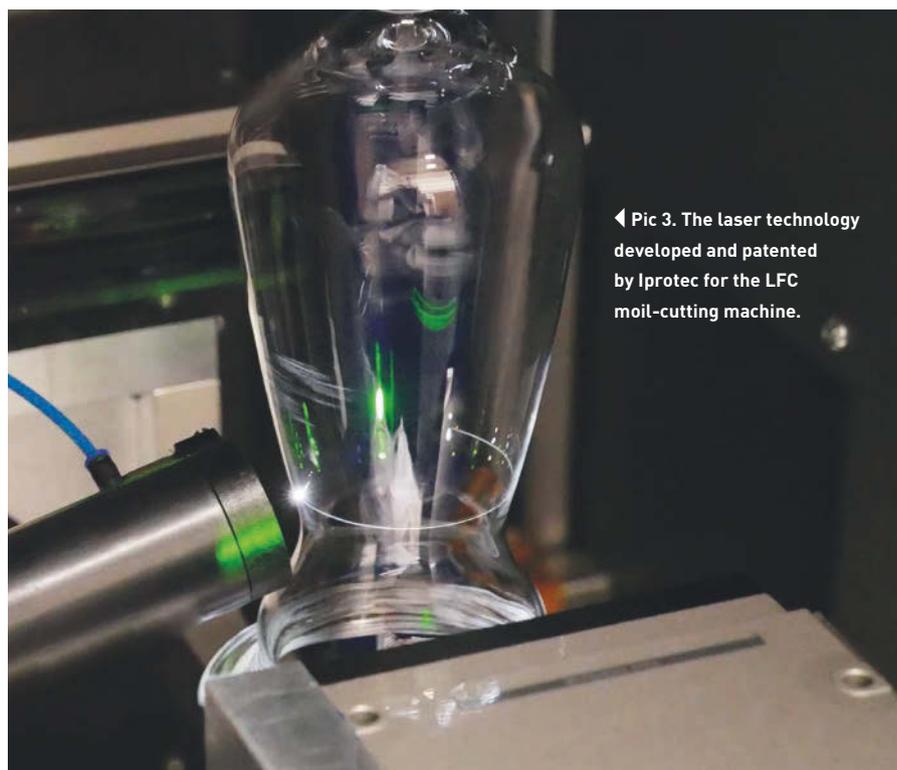
The LFC’s overall energy costs are

much lower compared to the traditional procedure.

“Thanks in part to technology from Siemens, our LFC machine achieves the lowest electricity consumption that’s currently possible. This is hugely beneficial for the user,” says Mr Bredl.

As is the case with many other machines, Iprotec used the Totally Integrated Automation Portal (TIA Portal)

Continued>>



◀ Pic 3. The laser technology developed and patented by Iprotec for the LFC moil-cutting machine.



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to implement its blowing and moil-cutting machines.

Siemens' engineering framework makes motion control easier and provides complete access to the entire digitalised automation system, from planning to transparent operation.

### Virtual machine models

Iprotec also utilises the possibilities of Digital Twins. In the area of special machine building, the company first tested potential applications on a virtual model of a glass-tube squeezing machine.

"The model served as a benchmark for optimisations and virtual commissioning. It allowed us to compare the tools available on the market, avoid collision scenarios, and significantly reduce commissioning time," says Mr Weiss. "It became apparent that the virtual model is an effective means for improving processes."

As a result of the pilot project, machine programmers can work more quickly and have much less work to do.

"Ultimately, we were able to build the machine more efficiently and speed up commissioning at the customer's site," says Mr Weiss. The glass-tube squeezing machine has already been designed and assembled and is currently in the last phase of commissioning.

### Digital testing

For the simulation, the Zwiesel-based company specifically relies on the synchronous coupling of two Siemens products: the SIMIT process simulation platform and the SIMATIC PLCSIM Advanced software.

SIMIT simulates control cabinet and machine behaviour, and SIMATIC PLCSIM Advanced simulates the behaviour of the PLC. This makes it possible to both develop and test all the machine software without having to change the software code for the simulation. All this is accomplished with no hardware.

For new and complex mechanical developments, the company also relies on NX MCD 3D kinematic software from Siemens, which can also be synchronously linked to the central SIMIT simulation platform.

The combination of the three tools allows users to realistically test automation applications in detail, even before actually commissioning them. As a result, processes can be optimised in advance and the commissioning and market launch can be accelerated.

Errors in machine design and software can also be prevented, and building machine prototypes can generally be eliminated altogether.

Iprotec's experience with Digital Twins and the various tools has been uniformly positive.

"For future projects, using PLCSIM Advanced and SIMIT will benefit our overall machine engineering process. The added value of the 3D Digital Twin obtained through NX MCD is highest when the processes are very complex, as they are with the glass-tube squeezing machine," says Mr Bredl, who sees a future where the real and digital will increasingly collaborate.

■  
\*Vertical Sales,  
\*\*Business Development Glass,  
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# Forglass delivers batch plant to Mexican glass manufacturer

Engineering company Forglass recently supplied batch plant machinery to a glass container producer in Mexico, including its 'Vibe' dosing feeders. Piotr Gawel\* discusses the project.

Forglass recently set its business expansion sights on Central America and established representation in Mexico for the entire region.

This move has now borne its first fruits in the form of batch plant machinery, which was recently delivered to a container glass producer on the Pacific coast of Mexico.

The order included high-performance vibratory dosing feeders, known by their trade name Vibe, together with its control system.

Vibe has the precision of electromagnetic drives, high capacity, and low operating costs. With Vibe, it is possible to smoothly adjust the amount of transported material from zero to the machine's maximum capacity.

The effects of adjustments are immediate, so it is possible to calibrate the dosing during the process and achieve exactly the desired result.

Among several technological solutions, at the heart of Vibe is an innovative, patented vibration damping system, which controls the drives and the transport process throughout the entire range of the machine.

This allows it to halt material transport without any of the spillage that normally occurs when the resonance of slowing inertial vibrators causes the material to spill over uncontrollably.

Vibe offers these key advantages:

- Precise dosing.
- Fully adjustable speed of material transport.
- Lightweight.



► High performance vibratory dosing feeders, known by the trade name 'Vibe'.

- Variable capacity.
- High performance – material capacity capable of exceeding 100 t/h.

The control system allows Vibe to achieve a dosing precision of up to 0.05% while maintaining the highest listed capacities. The control panel allows the operator to control the feeder from the main control room, as well as locally, using the local control mode.

The second key component delivered by Forglass was the Double-Roll Crusher (DRC) for the cullet return system. The crusher, designed for both functionality and safety, gives the operator great flexibility in adjusting cullet output parameters to meet present and future demands for optimising operations.

The DRC can be used for crushing both container glass and float glass (**Pic 1**). Other features include:

- Low fines fraction produced by crusher – fraction below 5 mm almost eliminated. The tests show that such fraction can be reduced to as little as 1%.
- Easy-maintenance system – a system of hatches and inspection windows for easy service access to critical areas of the unit.
- Solid construction – the crusher is designed for the toughest material, like thick float glass pieces and the thickest bottle bottoms.
- Safety system – special construction of the device to ensure damage-free operation by cushioning metal objects that could fall into the crushing chamber.
- Replaceable wear lining for



▲ Pic 1. Double-Roll Crusher (DRC).

different types of glass, such as nickel-free materials to meet strict float glass restrictions.

Before the shipment of the goods, the client's representatives arrived at Forglass' factory in Poland for the Factory Acceptance Test.

They were able to inspect and test the machines on Forglass' testing range, simulating various conditions and confirming the feeders' dosing accuracy and maximum capacity of up to 110 tonnes per hour.

They had the opportunity to verify the parameters of the cullet at the crusher's output, test all electrical components and verify the equipment's overall quality.

All the tests were successful, not only meeting the client's requirements, but actually exceeding their expectations in some areas. Following the tests, the machines were packed and protected for the sea voyage to Central America.

As it turns out, delivering batch plant machinery across the ocean to another continent is not a problem at all and Forglass has proved it. ■

\*Project Manager - Batch Plants  
Department, Forglass, Kraków, Poland  
[www.forglass.eu](http://www.forglass.eu)

# A lightweight solution for cosmetic glass containers

Deepanker Agarwal\* discusses the advantages of adopting lightweight glass bottles for the perfume industry, including decarbonisation, reducing glass consumption and lowering production costs.



▲ Pic 1. Pharmaceutical bottles as perfume bottles.

The cosmetics industry, known for its intricate packaging, finds itself at the forefront of discussions on sustainable practices, recognising the need to address the environmental consequences of increased glass weight.

Looking at the growing use of heavier glass bottles, it becomes apparent that the demand for such packaging intensifies resource depletion and energy consumption, as well as contributing to more carbon emissions.

The extraction of raw materials for heavier glass production places an unsustainable strain on the environment, while the energy-intensive manufacturing process further amplifies the ecological footprint. Transportation of these glass products adds to carbon emissions, amplifying the environmental challenges our planet faces.

## Reducing glass consumption

The contemporary landscape of sustainable practices demands a paradigm shift in the way

industries approach packaging. The mantra of “reduce, reuse, recycle” has become a guiding principle, and within this ethos, the cosmetics industry emerges as a pivotal focus.

With cosmetics being one of the major consumers of packaging materials, the imperative to address its environmental impact has gained traction among brands and consumers. The focus on reducing glass consumption through the use of lightweight bottles emerges as a crucial strategy.

Traditionally, the pursuit of sustainability is often perceived as an endeavour accompanied by increased costs. However lightweight bottles can reduce costs and aid in environmental conservation.

The reduction in glass weight results in less demand for raw materials, easing the environmental strain associated with resource extraction.

In the manufacturing phase, the benefits extend further, requiring less energy to melt and

shape these lighter glass bottles. There is also a decrease in carbon emissions when transporting the bottles due to the reduced weight. Not to mention, lightweight bottles are easier to handle when transporting, resulting in greater consumer satisfaction.

Companies, including Bormioli Luigi, have already embraced the concept of lightweight glass packaging. The company has half-weight stock refillable glass bottles for premium perfumes.

### Ajanta Bottle

Ajanta Bottle has been a global provider of glass packaging solutions since 1981. It has sold over 5 billion glass bottles and jars over the past 43 years.

It is used by more than 12,000 consumer brands across perfume, cosmetics, food, beverage and pharmaceutical industries. The company's premium glass bottles and jars undergo rigorous certifications to ensure safety and quality.

Customer satisfaction is key, starting with 3D prototyping and first sampling. After client approval, the company proceeds to commercial moulds, followed by mass production.

Ajanta Bottle also has an in-house decoration unit that offers 110+ glass bottle decoration options, as well as caps and closures.

### Redefining packaging

In recent years, the glass industry has faced challenges, with production costs soaring due to increases in energy, raw material, gas, and transport costs.

The surge in soda ash prices, a key ingredient in glass production, has contributed to higher manufacturing costs. The glass industry, being energy-intensive, has suffered from rising energy prices, affecting various stages of the production process.

In India, furnace oil and natural gas are primarily used for glass, with the latter experiencing a substantial price hike in the last 18 months.

To address the escalating production costs and environmental concerns, Ajanta Bottle has focused on producing lightweight glass bottles.

The company's initiative began with repurposing pharmaceutical glass vials into perfume bottles (**Pic 1**), resulting in a 100 ml bottle weighing only 100 grams.

This translates to a 41% reduction in glass usage, as well as a 36% saving across time, cost, energy, and raw material consumption (see **Table 1**). There is also a 62.5% saving on the new net price.

### The Ripple series

In realising the potential of lightweight glass bottles for cosmetics, Ajanta Bottle introduced the 'Ripple' series. The name reflects the light, effortless, and transformative nature of these glass bottles.

Under the series, Ajanta Bottle has launched P6 and P10 (**Pic 2**). These lightweight glass perfume



▲ Pic 2. Ajanta Bottle has launched P6 and P10 under the Ripple series.

bottles have not only been commercialised, but have garnered acclaim within the industry, earning a nomination for the Cosmopack India Awards 2023.

The bottles are created with thinner walls than traditional fragrance bottles, which reduces the bottles overall weight without comprising their structural integrity. The bottle's neck size remains the same, even with the lower glass weight.

The bottles are said to decrease costs by 40%, as their reduced weight lowers shipping costs. They also reduce a product's environmental impact and carbon footprint, and they require less material to manufacture, thus costing less, a saving that can be passed on to the end consumer.

The bottles are available in 10ml, 30ml and 100ml in a range of designs.

**Table 1** compares the weight and cost of P6 and P10 against industry standards, showcasing a substantial reduction without compromising quality.

### Advantages include:

#### 1. Direct-to-Consumer:

In an era where 21% of cosmetic and perfume sales occur online, the Ripple series provides a sustainable solution for Direct-to-Consumer (D2C) channels. The lightweight design ensures cost-effective shipping directly to consumers' doorsteps.

▼ Table 1. Weight Comparison: P6 & P10 vs. Industry Standards

| Parameter      | Traditional Bottles | Ajanta Bottle's P6 & P10 |
|----------------|---------------------|--------------------------|
| Weight         | 250-260 gm          | 110 gm                   |
| Glass Saving   | N/A                 | 41%                      |
| Process Saving | N/A                 | 36%                      |

Continued>>

The shift towards online sales presents an opportunity for perfume and cosmetics manufacturers to invest more in glass bottle decorations. With products being showcased online, the aesthetic appeal becomes vital.

Manufacturers can now allocate additional resources to elevate their brand presence through printing, coating, foiling, frosting, and other decorative techniques instead of spending more on the bottle itself.

### 2. Catering to mobility needs:

The Ripple series caters to the evolving lifestyle trends, particularly the increasing mobility needs of women in the Indian workforce.

With women playing a significant role in the professional sphere, the lightweight and ergonomic design of the Ripple series is essential when considering many women are constantly on the move for their jobs.

### 3. Embracing the rise of men's cosmetics in India:

As the cosmetics industry witnesses a considerable surge in the demand for men's grooming products in India, the Ripple series is strategically positioned to meet this growing market trend.

\*Director, Ajanta Bottle, Delhi, India  
<https://www.ajantabottle.com/>



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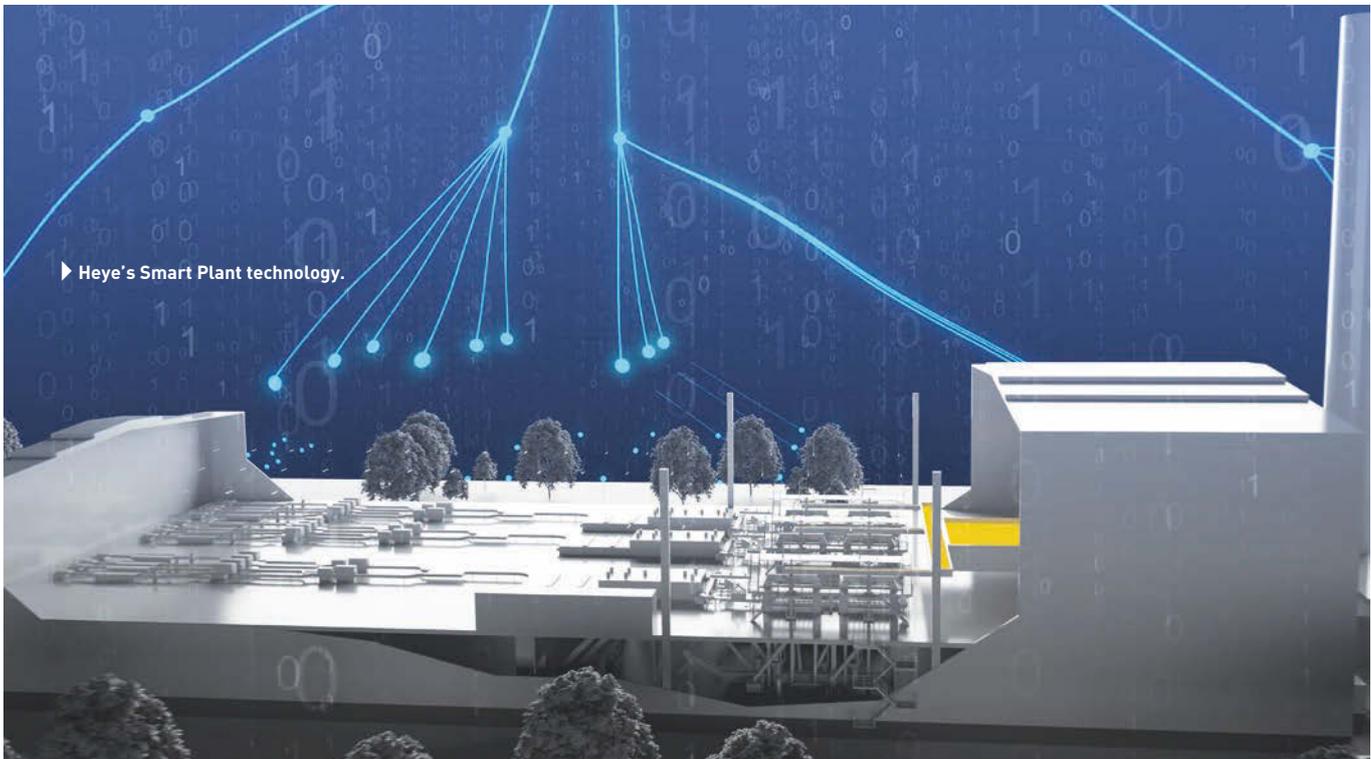
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# Heye to showcase glass production technologies at Glasstec



German equipment supplier Heye International\* will showcase its technologies for efficient and safe glass production at this year's glasstec trade fair.

**G**lasstec is a much anticipated event in the glass industry. From brand new innovations to enhancements of existing products, Heye International is excited to showcase its latest advancements at glasstec 2024 in Düsseldorf, Germany.

Visit Stand C18 in Hall 14 to discover Heye's product highlights and learn how they can take your glass production to new heights.

One of the highlights at Heye's exhibition stand will be the introduction of the Multilevel Safety and Protection Concept, featuring the Heye BlankSideRobot and Heye Protection Grids designed to enhance safety and efficiency on the blank side of IS machines.

The Heye BlankSideRobot, with its compact design, performs mould lubrication on the blank side. In addition to key features such as precise swabbing

with minimal lubricant consumption and the elimination of the need to reject bottles after swabbing, significant emphasis has been placed on ensuring the safety of both the system and the operating personnel.

The robot is equipped with a three-stage collision detection and prevention system to prevent potential collisions between the robot and the invert, along with intelligently designed safety features aimed at enhancing the safety of the personnel.

Complementing the BlankSideRobot are specially developed Heye Blank Side Protection Grids. The grids, positioned on each section and integrated into the machine control system, provide additional safety on the blank side. They can be synchronised with the Heye BlankSideRobot or function autonomously.

When operating in standalone mode,

the protection grids are controlled manually, facilitating tasks such as manual lubrication or section maintenance on the blank side.

In combination with the Heye BlankSideRobot, the protection grids synchronise with the robot's lubrication cycle, ensuring optimal safety.

Heye will also showcase its Dual Motor Shears at its stand (**Pic 1**). The key enhancement lies in the redesigned shear arms featuring a drop guide. This new design offers improved rigidity, resulting in enhanced precision and extended durability for this easy-to-maintain equipment.

Additionally, Heye's Smart Plant will be showcased at the glasstec exhibition with two products: Heye GobMaster and Heye SmartLink.

Heye GobMaster is a camera-based

Continued>>

system, which provides precise control of the gob weight in BB production processes.

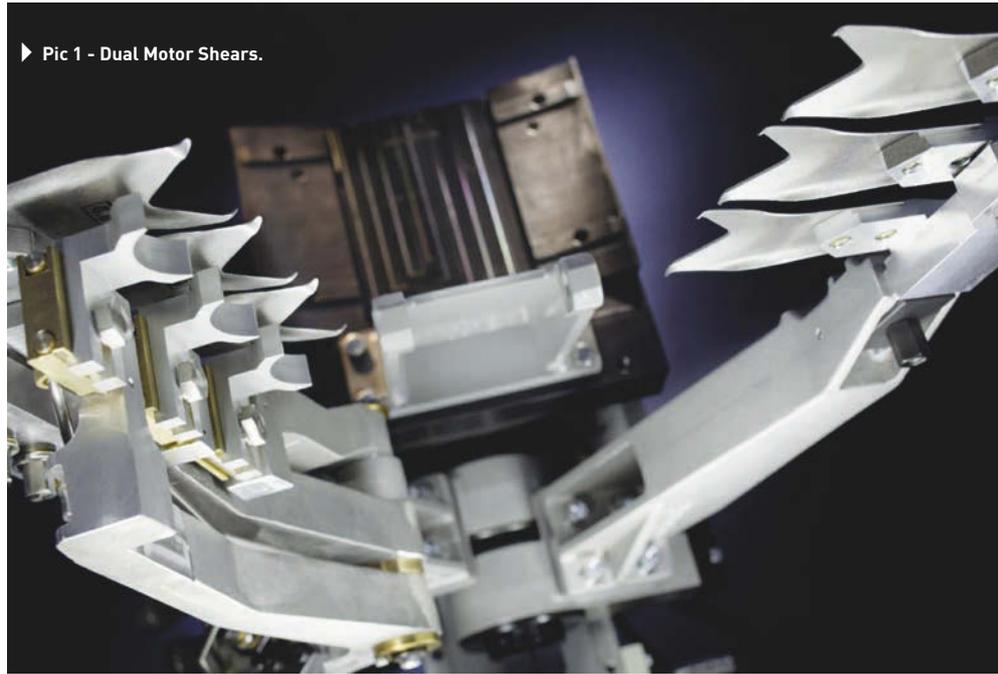
The software analyses geometric data from 3D images generated by two cameras, allowing for accurate calculation of the gob volume and weight.

Should malfunctions or deviations be detected, the system responds immediately by rejecting the article at the hot end. Simultaneously, mechanical adjustments are made automatically to correct the deviations by adjusting the tube height and plunger position at the feeder.

The Application Programmable Interface Heye SmartLink provides glassmakers with detailed manufacturing process data for individual analysis, acting as a secure data gateway.

Users can store and analyse equipment data to gain insights into key production metrics, utilising features such as JSON data exchange format and MQTT-Broker communication for a truly smart manufacturing process.

As equipment for the cold end, the SmartLine 2 to be presented at the show contains an improved motion control



Pic 1 - Dual Motor Shears.

concept, reducing the costs of spare parts inventory and improving performance.

Further developments have been made in the area of Artificial Intelligence (AI). As a complement to the Ranger 2 check detection system, Heye are launching an

additional image processing variant that includes additional AI functions. ■

\*Heye International, Obernkirchen, Germany [www.hey-international.com](http://www.hey-international.com)



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# Future of glassmaking highlighted at Glasstec

German machinery supplier Grenzebach will discuss the future of glass production, as well as digitalisation and sustainability, at this year's glasstec trade fair in Düsseldorf, Germany. Markus Gruber\* reports.



▲ Grenzebach staff Markus Michels and Franz Krommer in front of the booth.

**D**ecarbonisation, digitalisation, and tackling the shortage of skilled workers are currently important areas of focus in the glass industry.

Grenzebach will address these topics at glasstec 2024 on Stand C43 in Hall 15, presenting technical solutions from the hot end to the cold end that contribute to more sustainable and future-oriented glass production.

The company will demonstrate how productivity and quality can be improved through digital solutions. The generated and analysed data also makes digitalisation an additional tool for production managers and operators.

This year, customers will again have the opportunity to find out about Grenzebach's high-performance, future-oriented services that can help them remain competitive in the long term.

Markus Gruber, Senior Vice President Business Unit Glass at Grenzebach, said: "We are delighted not only to be able to showcase our technological innovations, but also to demonstrate how we can work in partnership with our customers to

tackle future issues together.

"Complex challenges are often difficult to overcome alone. Together we can find the solutions that will make the future of glass production sustainable, but also more efficient."

## Digital platform

The SERICY digitalisation platform enables previously unused data to be recorded, processed, and analysed at field level.

Production areas that were previously considered separate, but whose individual parameters influence each other overall and thus represent a complex interplay, are now networked with each other.

This enables production managers and plant managers to gain deeper insights for better decisions in production.

To utilise the full potential of digitalisation, it is necessary to create full transparency along the value chain. To achieve this, the field equipment and process areas must be enabled to provide data to the SERICY platform to have it collected and stored at one central spot.

These data and process values help customers create various reports. By the help of the recipe management app process and machine settings can be stored, assigned to a certain production scenario and recalled when needed once again.

Based on the data collection and systematisation necessary for implementing the digitalisation of glass production, targeted data analyses can be carried out, which in turn identify deviations in the production process quickly and precisely.

Data evaluation and trend recognition using Artificial Intelligence (AI) even allow entire error patterns to be identified, patterns to be recognised in the data, and conclusions to be drawn regarding potential causes.

AI can translate this evaluation into recommendations for action for the respective operators in order to directly improve quality and productivity.

Continued>>

### Annealing Lehr tests

Grenzebach will present new findings from practical tests on its annealing Lehr, which the company unveiled at glasstec 2022.

The annealing Lehr offers energy savings due to its cooling capacity and more precise control of the heating and cooling sections.

This, in addition to the improved insulation, leads to a reduction in the primary energy required and facilitates the decarbonisation of glass production process. The low-steel design contributes to a lower carbon dioxide footprint during the production of the annealing Lehr.

Visitors can gain a detailed insight into how the new annealing Lehr works at first hand at the exhibit on display.

### Partnerships

Grenzebach fosters partnerships with customers. The company draws on an understanding of systems and process know-how to develop solutions tailored to the challenges faced by customers.

Mr Gruber said: "Glasstec offers an

opportunity to jointly shape the future of glass production in direct dialogue with our customers, and to think ahead with sustainable solutions.

"At this year's glasstec trade fair, visitors can experience in real time how working in partnership can lead to technically solutions, resulting in more efficient and sustainable glass production.

"We look forward to welcoming many guests to booth C43 in Hall 15. Anyone who would like to find out more is welcome to make personal appointments with our experts today."

Other products and topics at the booth:

- **Dross box:** Grenzebach's dross box is suitable for temperatures of up to 850°C in the premium version, offers motor-adjustable lift-out rollers, optimised atmosphere separation and temperature distribution, and much more.

- **Glass transport:** The process of glass transportation has been redesigned for the solar glass industry. The sheets can now be moved laterally without lifting and the associated height changes. For

customers, this means reduced cycle times compared to conventional angle transfer conveyors. The new Mecanum conveyor is more flexible, with the ability to travel straight ahead, perpendicularly or at an angle.

- **Power & Energy systems:** As part of the Grenzebach Group, Millennium Control Systems will be presenting its Power & Energy systems, as well as automation solutions. The showcase will feature a control cabinet for supplying power to a glass production facility.

- **High-performance services:** Customers can discover a range of individual and high-performance services enabling maximum availability for their glass production facilities. Visitors to the stand will also find out how upgrade services can not only extend service life, but also contribute to sustainability. ■

\*Senior Vice President Business Unit Glass, Grenzebach, Bavaria, Germany  
<https://www.grenzebach.com/en/>

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# RATH presents new channel block qualities at glasstec Düsseldorf



*Supporting the glass industry in the best possible way is top of the agenda for the international refractories manufacturer. RATH's contribution at glasstec Düsseldorf is proof of this: The experts at the RATH booth will be showcasing the company's latest developments – from the new, advanced FOURATH®4 feeder expendables series, which supports maximum efficiency and quality in glass production, to new channel block qualities.*

Continuous research and development are a top priority at RATH. A recent example of this: FOURATH®4, a new, advanced feeder expendables series, based on an optimized formulation that has been exclusively developed and produced by RATH. FOURATH®4 has been tested thoroughly in the RATH laboratories and confirmed by outside, independent laboratories. Working with several customers, FOURATH®4 has successfully passed the first glass factory trials in the last 2-3 years.

“The customer feedback regarding the product performance of the FOURATH®4 series supports maximum efficiency and quality in glass production”, says Robert Nusszer, Head of Sales Glass, RATH.

During the R&D process, RATH selected the highest quality raw materials to keep the impurity level to a minimum and achieve the lowest possible glass corrosion, infiltration, devitrification, and blistering rate. To be more competitive on the market, the entire manufacturing process was converted from clay-bonded slipcasting to chemically bonded vibrocasting. This brings some significant advantages to the customers: The product quality is improved, with better corrosion, infiltration and devitrification

resistance, better thermal shock and crack resistance, and longer service life due to a more compact mix, better surface quality, significantly lower porosity and higher CCS.

## **Newly developed: FOURATH®420 and 433 zircon-mullite channel blocks**

High-quality channel blocks are in great demand on the market. This is why RATH has resumed the production of forehearth 333 channel blocks at the US facility in Owensville: the channel blocks are manufactured using the original 333 formulas with the original casting technology, which made the mix popular on the market, from Europe to the USA and Asia.

In addition, RATH has developed new, premium zircon-mullite channel blocks: RATH has recently started supplying its customers with the FOURATH®420 and 433 zircon-mullite channel blocks to its customers. “The first installations were done in May/June 2023 with great success. Currently we have several ongoing projects in the production phase, and in 2024 we continue to expand our forehearth business segment, offering a complete refractory package to our customers”, Robert Nusszer says.

**Meet the RATH experts at glasstec Düsseldorf (Oct. 22-25, Germany) at booth 13 E16 and learn more about premium refractory solutions for the glass industry.**  
[www.rath-group.com/glass](http://www.rath-group.com/glass)

**RATH**

# Stara Glass and Deref celebrate 70<sup>th</sup> anniversary



Engineering company Stara Glass together with the glass refractory recycling company Deref celebrated their 70<sup>th</sup> anniversary recently.

The two companies of the Hydra Group celebrated 70 years of activity in the picturesque location of the Hotel Miramar in Santa Margherita Ligure, Italy.

Around 150 customers, suppliers, business partners and employees of the Hydra Group celebrated this important day of the third

generation family-owned company at the Hotel Miramar in Santa Margherita Ligure, Italy.

The Fasolini family, main owner of the group since its beginning, fulfilled the desire of celebrating their anniversary with all the people that, with their trust and efforts, contributed to the reaching of this goal.

Giorgio Fasolini, Board member of Deref and of Stara Glass, gave an extended presentation about the group history,

enriched by the passion that drove his 60 out of 70 years of participation and guidance.

His two daughters, Stara Glass President Sara Fasolini and Board Member Serena Fasolini, rounded the picture by their contributions to the current business situation.

Group employees joined together to manifest their gratefulness for the commitment of the Fasolini family with a special gift in form of a plate that was



handed out to the family during the event.

This team visibly enjoyed each other's company, the constant sound of laughter was the most evident symbol of a strong team, that works together daily with common goals and mutual appreciation.

The global glass industry demands innovation and sustainability: Stara Glass

and Deref know that such things grow more spontaneously in an environment where commitment and targets are sided by kindness and care.

Starting with an extended Aperitif on the open air terrace overlooking the sea, participants met together and networked in a beautiful surroundings.

The typical Italian hospitality continued during a five-course dinner of the Ligurian cuisine with excellent wines and champagnes.

The anniversary celebration continued into the morning hours with a dance floor party on the beach.

**Stara Glass, Genoa, Italy:** <https://www.staraglass.com/en/>  
**DEFREF, Genoa, Italy:** <https://www.deref.com/en/>

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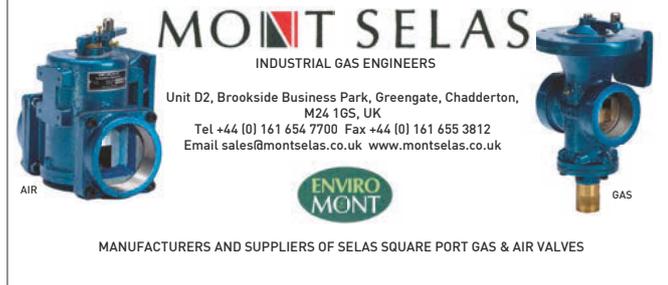
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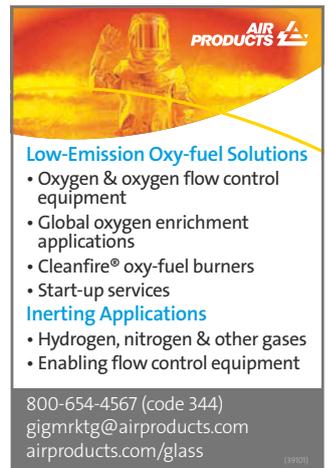
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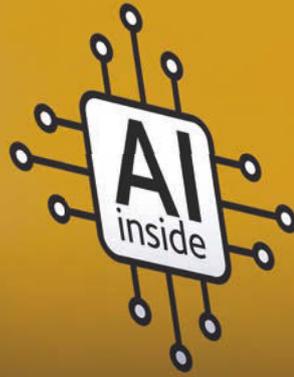
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**GLASSMAN EVENTS**



# Switch on **A.I.**



## ...in **your** MCAL

Yes, Tiamo can retrofit any existing MCAL with AI.

**No hassle, only benefits:**

- **False reject reduction**  
saving large amounts of containers
- **Faster & easier job change**  
with only two parameters to set, no further expertise required
- **Improved inspection performance**  
with clear defects recognition for process optimization



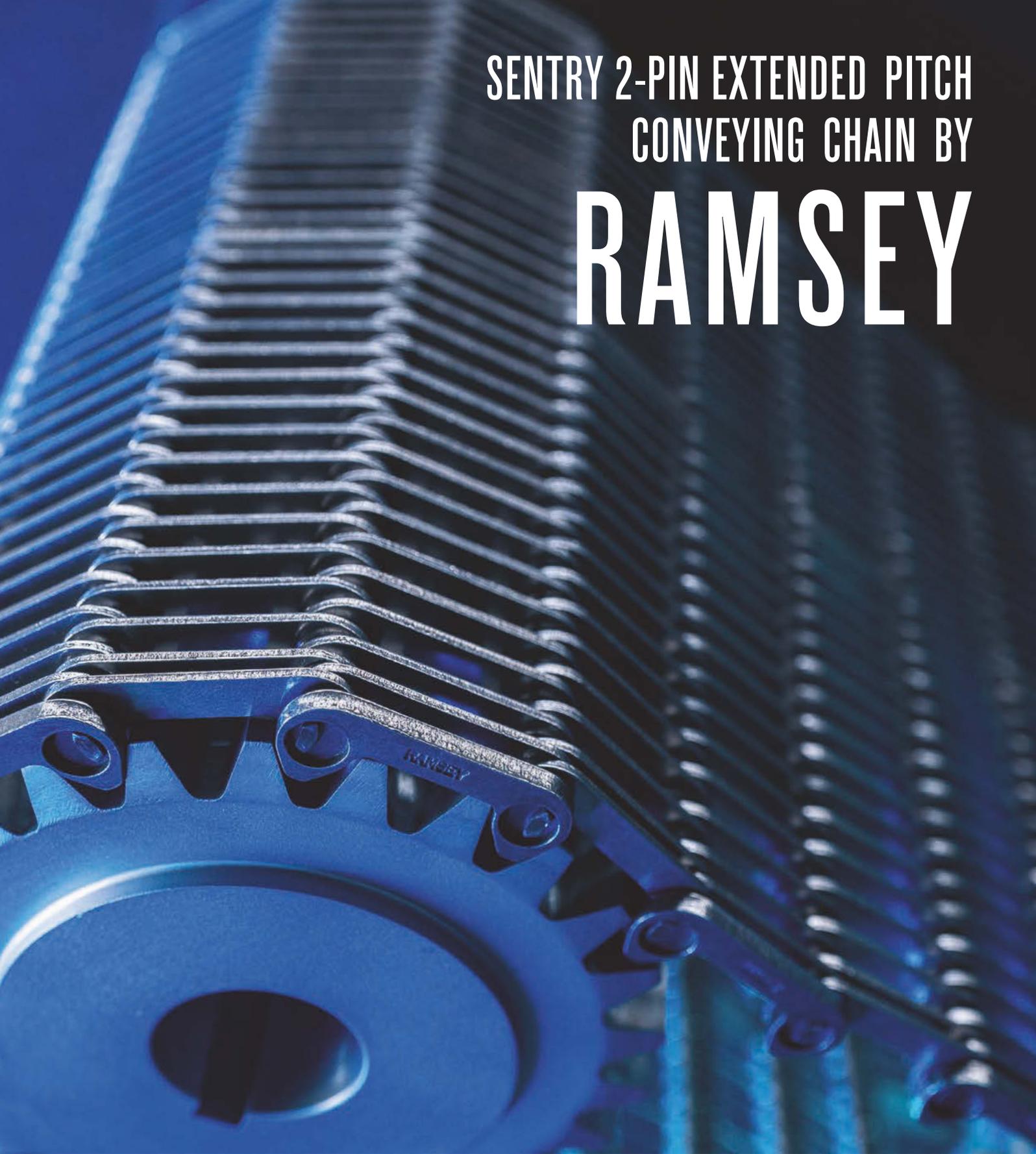
We don't blame you if you don't believe us, so contact us today to get it **in your MCAL**.



artificial intelligence – it's here

SENTRY 2-PIN EXTENDED PITCH  
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