

Kañch



Quarterly Journal of The **All India Glass Manufacturers’ Federation**
Bi-lingual



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27th International Congress on Glass (January 20-24)



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Crimp Neck Press Fit, Blowback
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Kanch

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From the President's Desk

The last FY 2024-25 meeting of the AIGMF Executive Committee was hosted by NES Refractories, Guwahati at Royale de Casa Resort, Kaziranga (ASSAM), a UNESCO World Heritage site from March 7-9, 2025. AIGMF members were offered a complimentary two nights' stay sponsored by NES Refractories. In addition to the normal industry agenda, visits to the Kaziranga National Park, bonding/technical sessions were also organised.

The main theme of the program centred around Women in Glass Manufacturing followed by presentations, Executive Committee meeting and other sessions celebrating International Women's Day on March 8. Kick-off presentation on 'Glass Bottle Manufacturing- The Path to Optimal Sustainability through Automation and Digitalization' was given by Ms. Sudha C Jebadurai, President, AGR International Inc., USA. Another technical presentation on 'Towards Sustainable Glass Manufacturing' was given by Ms. Yuki Uno, Sales Manager, Nippon Electric Glass (NEG) Co., Ltd., JAPAN.



Ms. Sheetal Khanna, General Manager, Gold Plus Glass Industry Ltd., presented, 'Flat Glass for Green Building and CSR initiatives'. Ms. Sangeetha Shenvi, Vice President- Sales, Schott Poonawala Pvt. Ltd., presented a personalized experience of leadership in the workplace, 'The Power of Diversity: Women Leaders Transforming Growth'. Finally, Dr. K Annapurna, Chief Scientist, CSIR-Central Glass and Ceramic Research Institute, presented 'Role of Science in Glass Manufacturing'. A Guest lecture on 'Glass Education' was delivered by Dr. Atima Sharma Dwivedi, Principal of Kanya Maha Vidyalaya (KMV), Jalandhar (Punjab) over a short video on KMV and a report on the present status.

A presentation on 'Indonesia- A Business and Tourist Destination' was given by Ms. Erny Wahyuni, Second Secretary (Social and Cultural Affairs), Embassy of The Republic of Indonesia in India. The last women's presentation on 'UNESCO Heritage sites in Uganda' highlighting the sanctuary for the nearly-extinct mountain gorilla in the wild and safaris was given by the Honourable Amb. Margaret L. Kyogire, Deputy High Commissioner, High Commission of the Republic of Uganda in India. The International Women's Day event ended on a high note with eight women speakers participating from India, Indonesia, Japan, USA and Uganda.

After a gap of 39 years in India, the 27th International Congress on Glass 2025 was held from Jan 20-24 at Biswa Bangla Convention Center in Kolkata INDIA. The theme of the Congress was "Glass: A Smart and Indispensable Material for Sustainable Society" and the focus of the ICG 2025 event was on emerging technologies that can catalyze transformations in the use of glass products in various fields.

The Congress was organised by CGCRI and supported by the AIGMF, Indian Ceramic Society and Glazing Society of India. Dr. Jitendra Singh, Union Minister of State for Science & Technology and Earth Sciences, graced the inauguration ceremony on Jan 20th. The event brought together eminent figures from the global glass community. The Congress included several plenary talks, industry presentations, and roundtable discussions devoted to the theme of the congress, focusing on the contribution of glass in creating a Green World. In conjunction with the main Congress, the 3rd ICG-CGCRI Tutorial on Glass was conducted from Jan 17- 19, 2025, facilitating knowledge exchange and skill enhancement.

The Glass Congress, a triennial event organized by the International Commission on Glass (ICG), serves as a pivotal platform for the global symposia covering a diverse range of topics within glass science and technology. The Congress hosted over 500 delegates, including 150 international participants from 20 countries. The distinguished attendees included eminent researchers, academicians, industry leaders, young faculty members, and students. The event featured 11 Plenary Speakers, 22 Keynote Speakers, and 94 Invited Speakers, who contributed through insightful presentations and discussions. Furthermore, there were around 140 poster presentations and 111 contributory presentations.

AIGMF was allocated a stall that provided an ideal platform to interact with stakeholders, students, research scholars, glass technologists and participants from various glass related institutions and companies.

A prayer meeting was kept at the Executive Committee Meeting at Kaziranga in remembrance of Former President Mr. CA Tatkwala and founder of Shree Vallabh Glass Works Ltd., in the 1960s who left for heavenly abode on February 24, 2025 ■

Rajesh Khosla

President AIGMF and CEO/President AGI Greenpac

GLASS News

CARLO PIRRONE APPOINTED AS NEW FEVE SECRETARY GENERAL



FEVE, the European Container Glass Federation has appointed Mr. Carlo Pirrone as its new Secretary General. Mr. Pirrone succeeds Ms. Adeline Farrelly, who has held the role with distinction, championing the industry's sustainability and circular economy agenda since 2008.

A seasoned government affairs expert with a deep understanding of the packaging sector, European policy, and trade, Mr. Pirrone brings a wealth of experience to this pivotal role. His appointment comes at a critical time for the container glass industry as it navigates challenges linked to competitiveness, innovation, and sustainability within the EU's evolving policy landscape.

"I am honoured to take on this role at such a transformative moment for Europe's container glass industry," said Mr. Pirrone. "I am committed to ensuring our industry's concerns and ambitions are heard at the highest levels. We need EU policymakers to put sustainability and industrial

competitiveness at the heart of Europe's agenda, making it a global hub for innovation and a magnet for investment. This means reducing bureaucracy, enabling the timely scale-up of technologies, and fostering demand for sustainable packaging, including through public procurement policies."

Mr. Martin Petersson, President of FEVE, commented: *"We warmly welcome Carlo Pirrone as the new Secretary General of FEVE. His extensive background in European policy, trade, and the packaging sector, combined with his strategic vision and leadership, will be invaluable as we address the challenges and opportunities ahead for the glass packaging industry. At a time when the EU's policy agenda is shaping the future of industrial competitiveness and sustainability, Carlo is well-placed to lead FEVE in strengthening its role as the voice of the container glass industry in Brussels. We also extend our sincere gratitude to Adeline Farrelly for her exceptional service and dedication to the federation over many years. Her leadership has been instrumental in driving the industry's priorities forward, and her impact on our organization has been truly invaluable. We warmly wish her every success in her future endeavours."*

Mr. Pirrone joins FEVE from his role as Director of the Brussels office for Seda International Packaging Group, where he was also a member of the Board of Directors of EUROPEN as well as Chair of Business Europe's Environment Working Group. His

previous experience includes serving as Senior Adviser at Confindustria and as a founding member and leader of AEGIS Europe, further highlighting his strategic vision and expertise in policy advocacy.

He holds a master's degree in economics and management of public administration and international institutions from Bocconi University and is fluent in Italian, English, French, and Spanish.

Outgoing Secretary General Ms. Adeline Farrelly expressed confidence in the leadership transition: *"It has been a privilege to serve this industry and its members over the years. I am reassured to leave FEVE in such capable hands. Carlo's experience, energy, and enthusiasm will undoubtedly help him navigate the challenges ahead while ensuring a seamless transition for the organization with the support of the excellent and highly competent team in FEVE."*

SISECAM JOINS GLOBAL NETWORK OF SUSTAINABILITY PIONEERS

In a significant boost to the Turkish and UK sectors as well as the wider international glass communities committed to decarbonisation, Şişecam has become a strategic member of the research and technology membership organisation Glass Futures.

As the only global company operating in all core areas of glass manufacturing, Şişecam joins Glass Futures' collaborative membership of international flat glass, hollow glass and fibre glass producers working



Mr. Görkem Elverici, Şişecam CEO and Mr. Justin Kelly, Glass Futures CEO at the signing ceremony

alongside major brands, technology suppliers, associations, academia and leading users of glass towards the common goal of achieving sustainable and zero carbon glass production.

A prestigious signing ceremony was held at Şişecam's headquarters on February 13 attended by Mr. Görkem Elverici, Şişecam Chief Executive Officer, Mr. Burak Büyükkırat, Şişecam's Chief Research and Technological Development Officer, Mr. Carl Spychal, Head of Economics and Prosperity at British Consulate General Istanbul, Mr. Pinar Celikcan, Head of Science and Innovation Network at the British Embassy Ankara, Mr. Justin Kelly, Glass Futures' CEO and Mr. Aston Fuller, Glass Futures' General Manager alongside other senior members of the Şişecam and Glass Futures management teams.

Mr. Görkem Elverici commented: "We are proud to become a strategic member of Glass Futures. The collaborative technologies we will develop together will further enhance our environmentally friendly and sustainable production capabilities. These collective efforts will serve as a driving force in achieving our 2050 carbon-neutral commitment."

In partnership with the worldwide

60,000 wine bottles and 4 km of flat glass daily, the 15,000 sqm plant features trailblazing technology including an experimental 30 tpd pilot furnace, cold end inspection,lehr and roll plate line and a revolutionary IS machine.

"As one of the world's leading producers of glass packaging, flat glass and glassware, we look forward to welcoming Şişecam to Glass Futures' industrial scale pilot plant where key industry stakeholders will experiment with alternative low carbon fuels," enthused Mr. Justin Kelly. "Şişecam's strategic membership provides a significant boost to the UK industry by means of overseas R&D investment, as well as advancing the common sustainability and decarbonisation goals of Glass Futures' wider international membership".

Ahead of the furnace going live this spring, 24/7 activity at the Global Centre of Glass Excellence alongside extensive research projects and external trials with industrial partners is already enabling Glass Futures to lead the way with groundbreaking developments in fields such as biofuels, hydrogen, carbon capture, alternative raw materials and technologies around supporting and enabling circularity.

glass industry, Glass Futures is delivering the Global Centre of Glass Excellence in St Helens, UK, the world's first openly accessible, commercially available and unique glass melting facility for R&D, innovation and training. With capacity to produce the equivalent of

Mr. Jill Morris CMG, British Ambassador to Türkiye, added: "I am very happy to see that Şişecam, one of the world's largest glass manufacturers, is becoming a strategic member of research and technology initiative Glass Futures. Building on our shared knowledge, innovation, and determination and uniting our efforts through joint initiatives such as these, we can drive forward sustainable solutions that will benefit future generations and ensure a resilient planet for all."

PROFESSOR A S RAO APPOINTED AS VICE CHANCELLOR TO VIKRAMA SIMHAPURI UNIVERSITY

Prof. Allam Srinivasa Rao, Luminescent Materials in the Department of Applied Physics, Delhi Technological University, Delhi has been appointed as Vice Chancellor to Vikrama Simhapuri University, Nellore (Andhra Pradesh).



Prof. Rao has completed B.Sc and M.Sc in Sri Venkateswara University (SVU) and Sri Krishnadevaraya University (SKU) respectively. He also completed a Ph.D in SVU. Between March 1996 and December 1997, he worked as Research Scientist in Indian Space Research Organisation (ISRO) and Council of Scientific and Industrial Research (CSIR), Government of India.

Prof. Rao is also Member Editorial Board of Kanch.

FORMULATING STANDARDS FOR SCREEN PROTECTOR TEMPERED GLASSES

The Bureau of Indian Standards (BIS) held the second meeting of CHD 10: WG 3 Working Group on February 6, 2025 hosted by Optimus Electronics Limited, Noida in the convenership of Dr. K Annapurna (Chief Scientist & Head-Specialty Glass Division, CGCRI, Kolkata) to develop an Indian Standard for Screen Protector Tempered Glasses.

In India, the demand for chemically tempered screen protectors is rising due to their durability, scratch resistance, and screen clarity. While initially popular for smartphones, these protectors are now widely used for other electronic displays, including tablets, laptops, smart watches, fitness trackers, and gaming consoles like the Nintendo Switch. With tablets and laptops increasingly featuring touch screens, tempered glass protectors help prevent wear and damage from daily use. Smart watches and fitness trackers, often exposed to active environments benefit from added durability. As portable electronics become more prevalent, tempered screen protectors are valued for maintaining screen integrity across various devices.

The working group brought together the key stakeholders, including industry experts (Corning India Pvt. Ltd., Optimus Electronics Ltd., Ace Mobile Manufacturers Pvt. Ltd., Federation of Safety Glass (FOSG), The All India Glass Manufacturers' Federation (AIGMF), regulators (Ministry of Electronics and Information Technology), R&D Institute (CSIR-Central Glass & Ceramic Research Institute) and users (Consumer Electronics and Appliances Manufacturers Association, India Cellular & Electronics Association), to ensure a comprehensive and inclusive approach.



Following the discussions, the WG visited one of the leading manufacturers of screen protectors in the country, i.e. Ace Mobile Manufacturers Pvt. Ltd., Noida, for a firsthand understanding of the manufacturing and testing processes of these glasses. The industry visit provided valuable insights into quality parameters, durability assessments, and advanced technologies used in production.

This initiative aims to enhance consumer safety, promote high-quality standards, and support Make in India by fostering innovation in the sector.

GROUNDBREAKING ALTERNATIVE FUEL TRIALS ACHIEVE MAJOR MILESTONE TOWARDS INDUSTRIAL DECARBONISATION

The successful completion of major industrial fuel switching trials mark a significant step towards improving energy efficiency and reducing carbon emissions within energy-intensive industries, supporting the UK's goal to transition towards net zero while ensuring alternative energy solutions are viable long-term.

Three £6 million government funded Industrial Fuel Switching (IFS) projects each focus on transitioning high temperature industrial manufacturing processes away from fossil fuels. Glass Futures is leading this effort for the glass and foundation industries

by exploring alternative fuels such as waste-derived biofuels, electrical boosting, and hydrogen.

These projects form part of the UK's Industrial Fuel Switching (IFS) Programme, supported by the government's £1 billion Net Zero Innovation Portfolio managed by the Department for Energy Security & Net Zero (DESNZ).

Industrial trials conducted at the end of 2024 and the start of 2025 utilised five different types of liquid biofuels in glass and ceramics production. The trials involved four of the UK's largest glass manufacturers — Ardagh Glass Packaging, Encirc (part of Vidrala), Pilkington UK Ltd., (part of NSG Group), and O-I — as well as the UK's largest shaped refractory producer, DSF Refractories & Minerals, who also supply refractory products into the glass sector.

The trials included modification and adoption of the existing liquid fuel systems in a number of the plants taking part in the project. The successful biofuel demonstrations will help Glass Futures to develop an economic model for switching to biofuels, providing insights into the feasibility of this low-carbon alternative fuel as an option to help rapidly decarbonise industry.

Electric boosting technology involves heating the molten glass via electrodes that are inserted into the molten glass within the furnace. E-boosting enhances furnace efficiency and is

an enabler to heat the glass using electricity, thus reducing reliance on natural gas and other fuels.

Glass Futures' members and one of the world's largest manufacturers of float glass, Guardian Glass successfully implemented and trialled a new e-boosting system at Guardian's plant in Goole. Another prominent glass container manufacturer, Encirc also carried out e-boost trials on its existing production line.

Glass Futures is currently developing its 30T/day oxy-fired pilot furnace to reach a higher percentage of electrical boosting. Further pilot trials are planned for later this year, and will assess the maximum levels of e-boost that can be achieved (potentially >60%). The trials will also assess the rate at which the boost system can be turned up or down, to respond to supply/demand constraints on local electricity grids.

In a project led by Ceramics UK, Glass Futures and its member, Ryze Power (a supplier of hydrogen and hydrogen infrastructure), have successfully demonstrated hydrogen and hydrogen-natural gas blend firing in a custom-designed ceramics pilot-kiln at the Glass Futures pilot facility in St Helens, part of the Liverpool City Region.

The successful operation of the pilot kiln firing on 100% hydrogen and other blends has provided valuable insights into the impact of hydrogen on ceramic products including bricks, tiles, refractories, pipes, sanitaryware, tableware and specialty ceramics. These findings further support the case for hydrogen as a viable alternative for direct combustion processes where electrification is currently not an option.

Mr. Justin Kelly, CEO of Glass Futures said: *"The successful completion of these trials is a crucial milestone in the UK's journey to net zero. It not only*

demonstrates the technical feasibility of low-carbon fuel alternatives but also opens up new opportunities for economic growth through sustainable energy supply chains. Glass Futures' continued commitment to decarbonisation is reflected in its collaborative approach, working closely with international industry leaders, government agencies, and research partners."

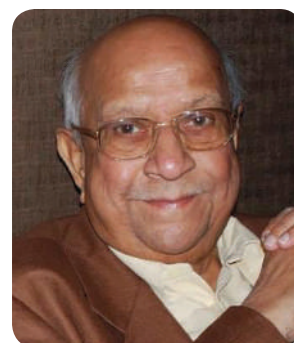
Mr. Habib Khosroshahi, Projects Team Manager at Glass Futures added: *"The involvement of key supply chain partners such as Argent Energy and Watson Fuels highlights the potential for waste-derived fuels to play a critical role in industrial decarbonisation without disrupting food supply resources. Collaborating with organisations such as Supergen Bioenergy Hub at Aston University helps us to transition towards more sustainable energy solutions by prioritising the most sustainable fuel choices."*

"As the glass and foundation industries continue to embrace these transformative technologies, Glass Futures work to ensure that sustainability does not come at the cost of efficiency or economic viability. By

working collaboratively with industry, we have demonstrated the technical viability, but now we need help from wider stakeholders throughout the supply chain to make it a reality."

SAD DEMISE OF C A TAKTAWALA

Mr. C A Taktawala (85 years old) Former President AIGMF and founder of Shree Vallabh Glass Works Ltd., in the 1960s left for heavenly abode on February 24 at Mumbai.



Mr. Taktawala is survived by wife Mrs. Urmila and two daughters Ms. Neelima and Ms. Mamta.

A prayer meeting was kept at the Executive Committee Meeting of the AIGMF at Kaziranga (ASSAM) on March 8.



AIGMF Member company 'Nirmal Glasstech Industries' participated at MIR STEKLA, the 26th International Exhibition for Glass Products, Manufacturing, Processing and Finishing Technology from March 11-14, 2025, at Expo Centre Fairgrounds, Moscow, RUSSIA. Under the auspices of the Russian Chamber of Commerce and Industry, the show was supported by the Russian Ministry of Industry and Trade, the Glass Union, the Russian Union of Designers, the National Association of Manufacturers of Building Materials, Products and Structures.

RELEASE OF “GUIDELINES FOR THE USE OF FIRE RESISTANT GLAZING IN BUILDINGS”

The Guidelines on the use of Fire Resistant Glazing in buildings by IIT Tirupati and Glazing Society of India was released by Mr. Ajay K Lal, Head - Chemical Department, Bureau of Indian Standards in the presence of Mr. Gopal Ganatra, Chairman, GSI, Prof. Dr. Anil Kumar E, Dean - Sponsored Research and Consultation, IITT, Dr. Jashnav Pancheti, Assistant Professor, IITT and Mr. Gohul Deepak G N, Executive Director, GSI in the “National conference on Fire Resistant Glazing: Building design, standards and testing” jointly organised by Bureau of Indian Standards, IIT Tirupati and Glazing Society of India at IIT Tirupati on March 10, 2025.

Fire-resistant glazing plays a critical role in modern architecture, offering vital protection to people and infrastructure against fire hazards, while maintaining transparency, energy efficiency, structural integrity, safety, aesthetic appeal and other functional benefits. Fire-resistant



glazing is commonly used in various building components, such as doors, windows, partitions, facades, and more, aligning with construction standards that mandate its use to contain fire. In India, the use of fire-resistant glazing has surged, particularly in densely populated metropolitan areas such as Mumbai, Delhi, and Bangalore in both residential and commercial buildings. It is therefore essential to build a complete technical infrastructure in

India including mandatory standards, policies, codes, third party testing and capacity building. It is also equally important to educate the builders and key decision makers to ensure understanding of applicable building and fire codes. This technical document of “Guidelines on use of Fire-Resistant Glazing in buildings” covers the design and location of FRG, Selection of materials, Fabrication and Installation, Testing, Maintenance and Inspection of FRG in buildings.

HIGHLIGHTS OF THE UNION BUDGET OF INDIA 2025-26

The Union Minister for Finance and Corporate Affairs Mrs. Nirmala Sitharaman presented the Interim Union Budget 2025-26 in Parliament on Feb 1, 2025. The key highlights of the Budget are as follows:

- Customised Credit Cards with a ₹ 5 lakh limit for micro enterprises registered on Udyam portal. In the first year, 10 lakh such cards will be issued.
- For 5 lakh first-time entrepreneurs, including women, Scheduled Castes and Scheduled Tribes, a new scheme, to be launched, to provide term loans up to ₹ 2 crore during the next 5 years.
- Establishment of a National Institute of Food Technology in Bihar, enhanced income for the farmers and skilling, entrepreneurship and employment opportunities for the youth.
- 5 National Centres of Excellence for skilling to be set up with global expertise and partnerships.
- Centre of Excellence in Artificial Intelligence for education with a total outlay of ₹ 500 crore.
- Intensive skill-development programmes for the youth.
- Allocating ₹ 20,000 crore to implement private sector driven Research, Development and Innovation initiative.
- Gig workers to get identity cards, registration on e-shram portal and healthcare under PM Jan Arogya Yojana.
- With sectoral and ministerial targets to facilitate easy access to export credit, cross-border factoring support, and support to MSMEs to tackle non-tariff measures in overseas markets.
- Significant enhancement of credit with guarantee cover to MSMEs from ₹ 5 to 10 crore.
- Revamped Central KYC registry to be rolled out in 2025.
- Rationalisation of requirements and procedures for speedy approval of company mergers.

- FDI limit for the insurance sector will be raised from 74 to 100%.
- Make in India- Exemption to open cell for LED/LCD TV, looms for textiles, capital goods for lithium ion battery of mobile phones and EVs.
- Time limit fixed for finalisation of provisional assessment; new provision for voluntary declaration of material facts post clearance and duty payment with interest but without penalty; IGCR Rules amended to extend time limit to 1 year and file quarterly statement instead of monthly.
- 36 lifesaving drugs/medicines in exempted list; 6 medicines in 5% duty list; 37 medicines and 13 new patient assistance programmes in exempt list.
- Expansion of scope of safe harbour rules to reduce litigation and provide certainty in international taxation.
- Tax deduction limit for senior citizens doubled from ₹ 50,000 to 1 lakh.
- The annual limit of ₹ 2.40 lakh for TDS on rent increased to ₹ 6 lakh.
- Extension of time-limit to file updated returns, from the current limit of two years, to four years.
- No income tax on average monthly income of upto ₹ 1 lakh; to boost middle class household savings and consumption.
- Salaried class to pay nil income tax upto ₹ 12.75 lakh per annum in new tax regime.
- Reduced compliance for small charitable trusts/institutions by increasing their period of registration from 5 to 10 years.
- Tax payers to be allowed to claim the annual value of 2 self occupied properties (previously 1) without any conditions.
- Tonnage Tax Scheme for Inland Vessels.
- Extension for incorporation by 5 years of Start-Ups.
- Certainty of taxation to category I and category II AIFs, undertaking investments in infrastructure and other such sectors, on the gains from securities.
- Jan Vishwas Bill 2.0 to be introduced for decriminalising more than 100 provisions in various laws.

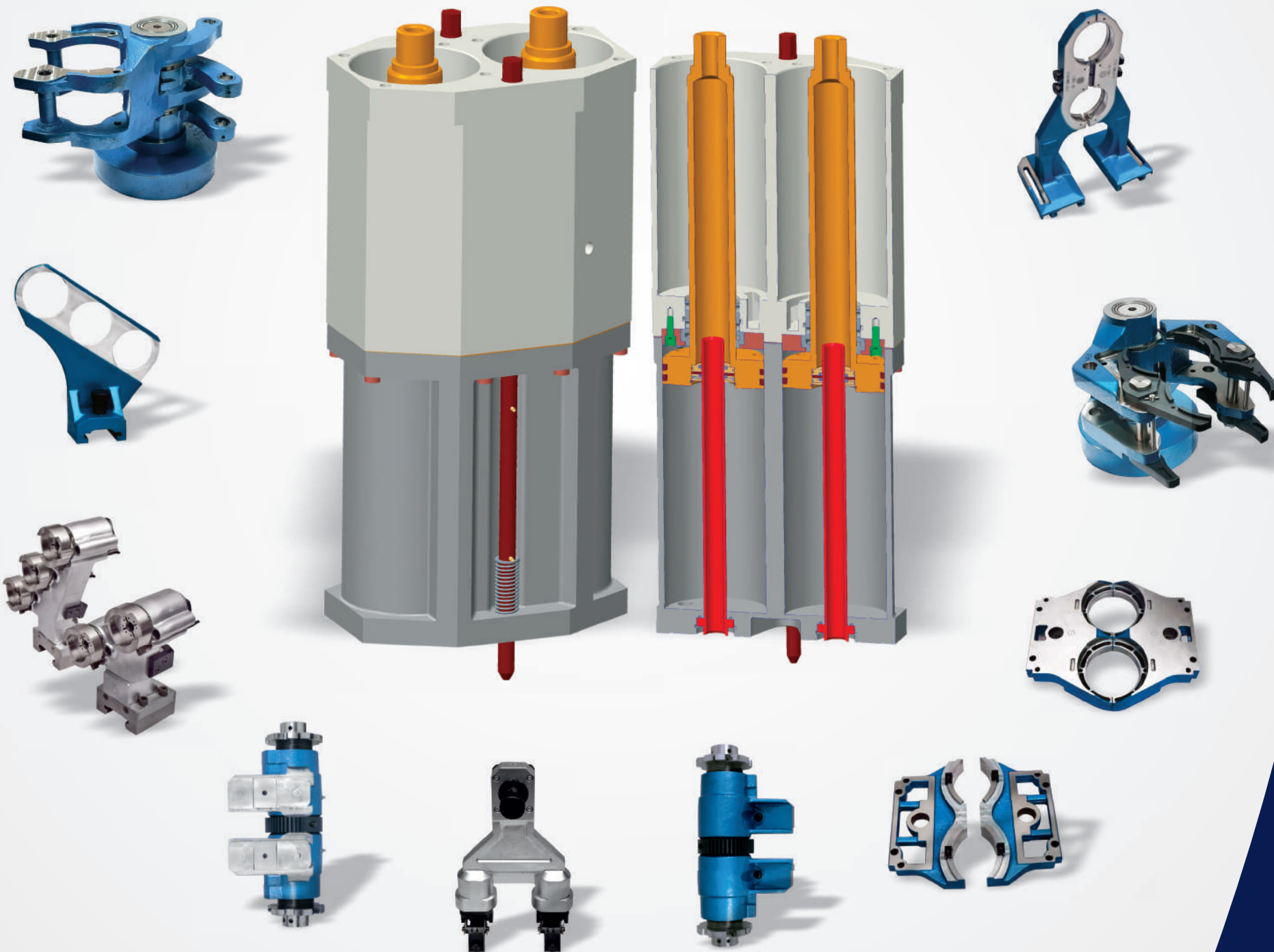
भारत सरकार का केंद्रीय बजट: 2025-26

केन्द्रीय वित्त और कॉर्पोरेट मामलों की मंत्री श्रीमती निर्मला सीतारमण ने 1 फरवरी, 2025 को संसद में अंतरिम केंद्रीय बजट 2025-26 पेश किया। बजट की मुख्य बातें इस प्रकार से हैं:

- एक लाख रुपए तक प्रति माह की औसत आय पर कोई आय कर नहीं; इससे मध्यमवर्ग परिवारों की आय व खपत में वृद्धि होगी।
- वेतनभोगी करदाताओं को नई कर व्यवस्था में 12.75 लाख रुपए तक कोई आयकर नहीं देना होगा।
- एमएसएमई को गारंटी के साथ दिए जाने वाले ऋण को 5 करोड़ से बढ़ाकर 10 करोड़ किया गया।
- मेक इन इंडिया को निरंतरता देने के लिए लघु, मध्यम व वृहद उद्योग को शामिल कर राष्ट्रीय विनिर्माण मिशन का शुभारंभ।
- 500 करोड़ रुपए के कुल परिव्यय के साथ शिक्षा के लिए आर्टिफिशियल इंटेलिजेंस में उत्कृष्टा केन्द्र।
- बैंको से ऋण में वृद्धि सहित पीएम स्वनिधि, 30 हजार रुपए की सीमा के साथ यूपीआई लिंकड क्रेडिट कार्ड।
- गिग वर्कर्स को पहचान पत्र दिया जाएगा, पीएम जन आरोग्य योजना के तहत ई-श्रम पोर्टल और स्वास्थ्य देखभाल में पंजीकरण।
- विकास केन्द्र के रूप में शहरों को एक लाख करोड़ रुपए का शहरी चुनौती निधि 20 हजार करोड़ रुपए परिव्यय के साथ लघु मॉड्यूलर रिएक्टर्स के आरएंडडी के लिए अणु ऊर्जा मिशन।
- बीमा क्षेत्र में एफडीआई की सीमा 74 से बढ़ाकर 100 प्रतिशत किया गया।
- विभिन्न कानूनों में 100 से ज्यादा प्रावधानों को गैर-अपराधीकरण रूप देते हुए जन विश्वास विधेयक 2.0 लाया जाएगा।
- संशोधित आयकर रिटर्न की समय-सीमा दो से बढ़ाकर चार साल किया गया।
- टीसीएस भुगतान में देरी अब अपराध नहीं।
- किराया पर टीडीएस 2.4 लाख रुपए से बढ़ाकर 6 लाख रुपए किया गया।
- कैंसर, आसाधारण रोगों और अन्य गंभीर जीर्ण रोगों के उपचार के लिए 36 जीवनरक्षक औषधियों को बुनियादी सीमा-शुल्क (बीसीडी) से छूट।
- बैट्री उत्पादन को बढ़ावा देने के लिए विद्युतीय वाहन और मोबाइल बैट्री उत्पादन के लिए अतिरिक्त पूंजीगत वस्तु में छूट।

(News Source: AIGMF Research Team / World Wide Web)

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International Women's Day celebrated by Indian Glass Industry

(March 8, 2025)

The last FY 2024-25 meeting of the AIGMF Executive Committee was hosted by NES Refractories, Guwahati at Royale de Casa Resort, Kaziranga (ASSAM), a UNESCO World Heritage site from March 7-9.

AIGMF members were offered a complimentary two nights' stay sponsored by NES Refractories. In addition to the normal industry agenda, visits to the Kaziranga National Park, bonding/technical sessions were also organised.

The main theme of the program centred around Women in Glass Manufacturing followed by presentations, Executive Committee meeting and other sessions celebrating International Women's Day on March 8.

Members arrived on March 7 who were received at Guwahati and then transferred to Kaziranga by taxis. A welcome dinner was hosted in the evening by M/s NES Refractories.

On March 8, a morning safari on elephant and jeeps were organised, followed by breakfast and a tour of the Biodiversity and Orchid Park.

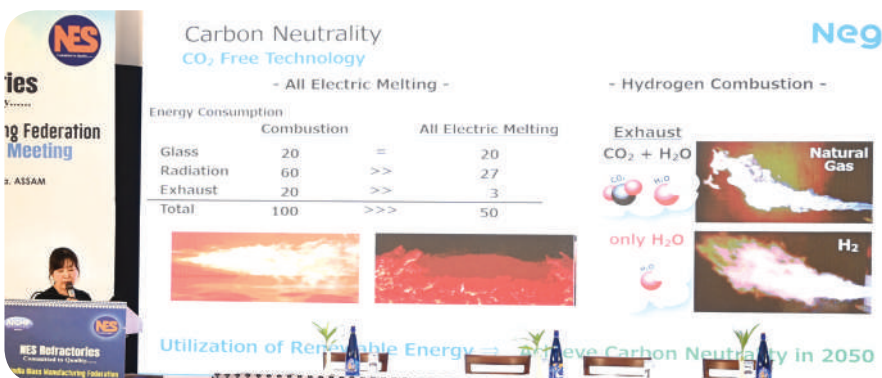




After lunch, the technical meeting started with the Opening Address by Mr. Rajesh Khosla, President AIGMF and CEO/President AGI Greenpac, followed by a welcome speech by Mr. Aman Gupta, Managing Director, NES Refractories and host of the event.

Kick-off presentation on 'Glass Bottle Manufacturing- The Path to Optimal Sustainability through Automation and Digitalization' was given by Ms. Sudha C Jebadurai, President, AGR International Inc., USA. AGR International offers a broad line of products and testing/research services specifically designed to help bottle manufacturers produce high-quality containers while improving efficiencies, reducing costs and contributing to the responsible management of resources. AGR's products include testing and measurement of dimensions, burst-pressure, thickness, vertical load, volume, fill height, impact and more.





Another technical presentation on 'Towards Sustainable Glass Manufacturing' was given by Ms. Yuki Uno, Sales Manager, Nippon Electric Glass (NEG) Co., Ltd., JAPAN offering oxy-fuel combustion technology; H₂ fuel technology, electric melting technology and carbon-neutral glass melting furnace technology. Ms. Uno was joined by her colleagues Mr. Hitoshi Kanaya, Senior Vice President and Mr. Yoshio Iwatsubo, Sales Engineer & Furnace Consultant with NEG from Japan.

Ms. Sheetal Khanna, General Manager, Gold Plus Glass Industry Ltd., presented, 'Flat Glass for Green Building and CSR initiatives'. She discussed topics such as dynamic shading system controlled by electrochromic and thermochromic coatings. Thermochromic coatings are interesting in that the glass shading changes automatically with temperature.

Ms. Sangeetha Shenvi, Vice President



– Sales, Schott Poonawala Pvt. Ltd presented a personalized experience of leadership in the workplace, ‘The Power of Diversity: Women Leaders Transforming Growth’. She indicated that many women had “fear to lead” out of the belief that they would be ‘swimming with sharks’. These should be addressed by the glass industry at some point.

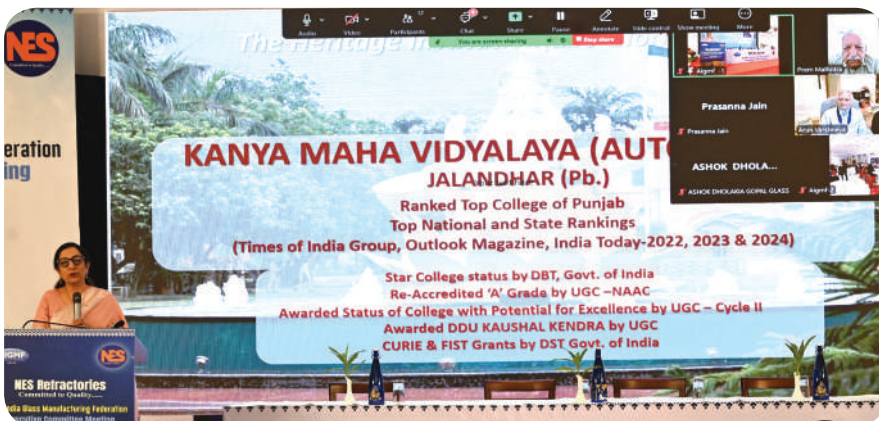
Finally, Dr. K Annapurna, Chief Scientist, CSIR-Central Glass and Ceramic Research Institute, presented ‘Role of Science in Glass Manufacturing’. She briefly reviewed science behind glass batch calculation, glass melting in large tanks, the heat requirements and forming of the products; the volume-temperature diagram of a glassmaking substance, viscosity control and avoiding crystallization paths being the more important science behind glass manufacturing.

A Guest lecture on ‘Glass Education’ was delivered by Dr. Atima Sharma Dwivedi, Principal of Kanya Maha





Dr. Arun Varshneya President of Society of Glass Technology (UK) along with his wife Mrs. Darshana Varshneya, Chief Financial Officer of the Saxon Glass Technologies, USA; the winner of the prestigious C K Somany Award for Excellence 2024, Dr. Manoj Choudhary and Former President of International Commission on Glass was among the online participants who joined in the early morning hours from the USA.



Vidyalaya (KMV), Jalandhar (Punjab) over a short video on KMV and a report on the present status. KMV, a not-for-profit, heritage women's educational institution was established in 1886, with a mission to support community development and particularly help the less privileged students.

Glass Research at KMV has been going on since 2007 with challenges in terms of support for students for their academic fellowships, internships, R&D equipment and raising funds significantly to improve education at KMV. Dr. Sharma indicated that Dr. Arun and Mrs. Darshana Varshneya from USA had visited the KMV and pledged several tuition assistance scholarships and professional travel support for the students.

She sought further support from the glass industry in terms of 3-6 month internships and employment for the senior class women students and graduates.



Kaziranga from the Lens of
Mr. Yoshio Iwatsubo
Sales Engineer & Furnace Consultant
Nippon Electric Glass Co. Ltd., JAPAN
( Member Company)





A presentation on North East Sillimanite 'NES Refractories offering industry solutions' was given by the host represented by Dr. A K Misra, Director Technical of the NES Refractories. Dr. Misra emphasized on refractory being a 'partner' in glass manufacturing. He discussed the range of refractories available from NES for the various components of a glass-melting tank, and the extensive testing laboratories to assure the quality. Dr. Misra reiterated the NES commitment to high quality refractories for the glass industry, zero-defects, and on-time delivery. He further indicated future directions at the NES to be developing fusion-cast refractories, super duty silica bricks, silica insulation bricks for the tank crown, high-strength insulation blocks and feeder expendables soon.

A presentation on 'Indonesia- A Business and Tourist Destination' was given by Ms. Erny Wahyuni, Second Secretary (Social and Cultural Affairs), Embassy of The Republic of Indonesia



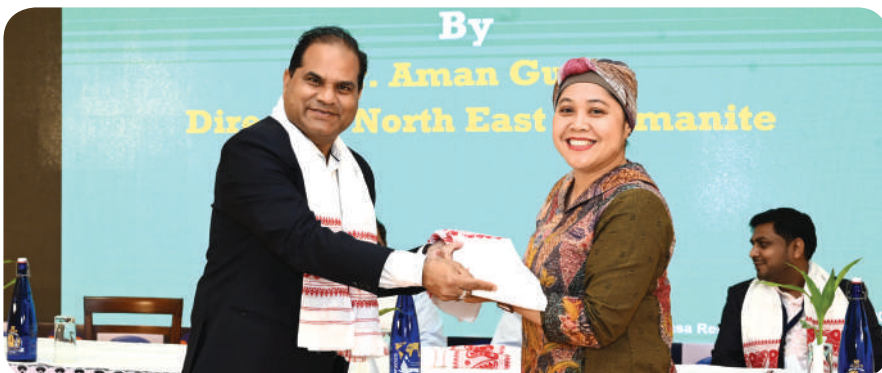


in India. Her presentation started with a video on Tourism opportunities in Indonesia followed by a video on Glasstech Asia Fenestration Asia 2025 to be hosted from Nov 6-9, 2025 at Jakarta, Indonesia, thereby inviting all to visit Indonesia at that time.

The last women's presentation on 'UNESCO Heritage sites in Uganda' highlighting the sanctuary for the nearly-extinct mountain gorilla in the wild and safaris was given by the Honourable Amb. Margaret L. Kyogire, Deputy High Commissioner, High Commission of the Republic of Uganda in India, who was joined by the Financial Attaché Mr. Michael Agaba of the Ugandan Mission in India.

Concluding Remarks on technical sessions were given by Dr. Arun K. Varshneya, PhD HonFSGT President of Society of Glass Technology (UK); Professor of Glass Science & Engineering Emeritus, Alfred University, USA and President Saxon Glass Technologies, Inc., USA, who joined online in the early hours from





the USA along with his wife Mrs. Darshana Varshneya, Chief Financial Officer of Saxon Glass Technologies, Inc.

Dr. Varshneya noted that the current meeting focused on two of the 17 sustainable development goals in the UN 2030 resolution: Goal 5.5 “Gender Equality” and Goal 13 “Climate Action”. Glass industry picked up momentum towards meeting these goals following the UN declaration of 2022 as the “International Year of Glass”. Prof. Varshneya noted that the glass industry appeared to have been marching ahead of Goal 13. However, Goal 5.5 needed attention. He mentioned that for a long time, women engineers worldwide have faced male-driven prejudice in their career paths. There should be no place for such bias in a civilized society. Man or woman, they should each receive opportunity and encouragement to excel themselves, to reach the highest for their intellectual abilities, and to





be as much a productive member of the society as possible.

Having daughters only, both Dr. and Mrs. Varshneya made an appeal to the glass industry to help build the glass program at the KMV College by strengthening the foundation. They asked the Indian glass industry to review their employment needs by making investment in engineering schools ('One school at a time') to upgrade their glass characterization laboratories in order to strengthen their curriculum; institute more tuition assistance for engineering students based upon merit and need; provide enhanced internship opportunities with focused training to the women engineering students such that they can develop their career paths to match their skills, and be not afraid to lead, and by sending senior industry staff to present lectures at such institutions to encourage networking.

The meeting was organized in a hybrid mode which was attended by over 80 participants in both



PROFESSOR ARUN VARSHNEYA SEEKS YOUR HELP IN LOCATING INTERNSHIPS FOR KMV STUDENTS

During participation at the AIGMF's International Women's Day event on March 8, Dr. Arun Varshneya, Emeritus Professor at Alfred University USA pledged to act as an outside-India guide to the women glass engineering students of the Kanya Maha Vidyalaya, Jalandhar (Punjab) INDIA (KMV- a not-for profit, heritage women's educational institution established in 1886, with a mission to support community development and particularly help the less privileged students).

One important component of improving instructional standards is for all junior/senior Glass Engineering class students to receive approximately 6 weeks of internship beginning the middle of June 2025 in a domestic glass (or refractory) industry or R&D location. **Please help !**

CONTACT's: Dr. Gopi Sharma of the KVM at sharmagopi28@yahoo.com or Dr. Arun Varshneya at varshneya@alfred.edu or Mr. Vinit Kapur, Secretary AIGMF at info@aigmf.com

physical (60) and online (20) mode from various parts of the world. The winner of the prestigious C K Somany Award for Excellence 2024, Dr. Manoj Choudhary and Former President of International Commission on Glass was among the online participants who joined in the early morning hours from the USA.

A vote of thanks was given by Mr. Shreevar Kheruka, Sr. Vice President AIGMF and Vice Chairman & MD Borosil Ltd., to conclude the International Women's Day event which ended on a high note with eight women speakers participating from India, Indonesia, Japan, USA and Uganda.

Secretary, AIGMF and the Office Bearers thanked Mr. Aman Gupta of the NES for the very kind hospitality extended to AIGMF Members which was truly appreciated by one and all.

A group photo was captured after cake cutting by all women speakers and other ladies who participated. In the last session of the event,





Remembering Former President Mr. C A Tatkawala in the Executive Committee Meeting of the AIGMF who left for heavenly abode on Feb 24, 2025



Tiger was spotted on March 8 by Ambassador Margaret L. Kyogire, Deputy High Commissioner, High Commission of the Republic of Uganda, AGI Greenpac representative Mr. Indranil Ranu and AIGMF Team (Mr. Dilip/Monu/Kailash)



meeting of the Executive Committee discussed industry issues with a view to promote 100% eco-friendly packaging and building material glass under the natural and beautiful backdrop of Kaziranga.

At the end of the day, a cultural program was organised for the delegation at Bio-diversity and Orchid park, followed by a pool side dinner at Royale de Casa Resort.

All presentations, select photos, safari videos and press coverage of the event are available under past events at www.aignmf.com

Before the departure of all guests on March 9, a final round of morning safaris on both jeeps and elephants were organised.

All women speakers and overseas guests were felicitated by gifting a traditional Assamese scarf and 80 Years AIGMF Glass Mementoes specially made by La-Opala RG Ltd., market leaders in opalware and crystalware, an AIGMF Member company ■

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1st – 3rd September 2025

The conference is a forum for the discussion of all aspects of glass, including industrial, scientific, artistic, and historical.

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Cambridge is about one hour from central London by train.

The conference theme is
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The conference will have four strands, Glass Science, Glass Industry, Sustainability, and History & Heritage:

Science co-chair: Alex Hannon
alex.hannon@stfc.ac.uk

Industry co-chair: Owen McGann
o.mcgann@glass-ts.com

Sustainability: Collin Wilkinson
WilkinsonC@alfred.edu

H&H co-chair: John Parker
j.m.parker@sheffield.ac.uk

Conference website: <http://sgt.org/SGTAnnualConference2025>

27th International Congress on Glass

(Jan 20-24, 2025)



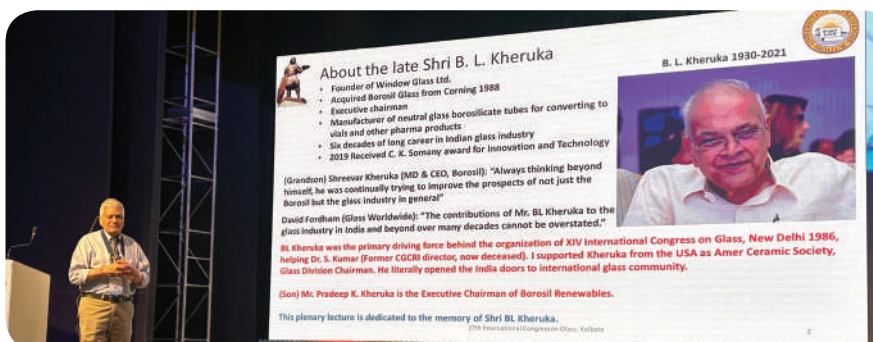
(L to R:) Mr. Sitendu Mandal (ICG 2025 President), Prof. Hiroyuki Inoue (ICG President), Prof. Reinhard Conradt (Past President ICG), Dr. Bikramjit Basu (Director, CGCRI), Honorable Dr. Jitendra Singh (Union Minister of State for Science & Technology and Earth Sciences), Prof. Arun Varshneya (President, Society of Glass Technology), Dr. Manoj Choudhary (Past President ICG), Dr. K. Annapurna (ICG 2025 Program Chair), and Dr. Atiar Rahaman Molla (ICG 2025 Organising Secretary)

After a gap of 39 years in India, the 27th International Congress on Glass 2025 was held from Jan 20-24 at Biswa Bangla Convention Center in Kolkata INDIA.

The theme of the Congress was “Glass: A Smart and Indispensable Material for Sustainable Society” and the focus of the ICG 2025 event was on emerging technologies that can catalyze transformations in the use of glass products in various fields.

The Congress was organised by CGCRI and supported by the AIGMF, Indian Ceramic Society and Glazing Society of India.

Dr. Jitendra Singh, Union Minister of State for Science & Technology and Earth Sciences, graced the inauguration ceremony on Jan 20th. Dr. Singh praised the significance of the Glass industry in driving India's future economic growth, while highlighting the need for enhanced collaboration and awareness among





academics, R&D centres, and the private sector.

Addressing the International Congress on Glass organised by CSIR-Central Glass and Ceramic Research Institute, the Union Minister of State for Science and Technology and Earth Sciences stressed the growing importance of the recycling industry alongside manufacturing for sustainability.



The event brought together eminent figures from the global glass community. The Congress included several plenary talks, industry presentations, and round table discussions devoted to the theme of the congress, focusing on the contribution of glass in creating a Green World.





Prof. Bikramjit Basu, Director of CSIR-CGCRI, emphasized multiple aims of the Congress significantly benefitting the Indian glass community, encompassing faculty, researchers, students, and industry professionals; Cultivate fruitful collaborations with institutions and Universities globally, focusing on cutting-edge research, development, and futuristic applications.



In conjunction with the main Congress, the 3rd ICG-CGCRI Tutorial on Glass was conducted from Jan 17- 19, 2025, facilitating knowledge exchange and skill enhancement.

The Glass Congress, a triennial event organized by the International Commission on Glass (ICG), serves as a pivotal platform for the global





Dr. K Annapurna, Chief Scientist CSIR-CGCRI and Member Editorial Board of KANCH formally handed over the AIGMF's C K Somany Award for Excellence 2024 to Dr. Manoj Choudhary at the ICG 2025 Meet at Kolkata where he also delivered the 1st C K Somany Memorial Lecture as part of the overall ICG proceedings. The prestigious annual award was originally conferred to Dr. Manoj Choudhary, Former President of the International Commission on Glass at the Hybrid Annual General Meeting of the AIGMF held on Sept 30, 2024. Dr. Choudhary is a fellow of the American Ceramic Society and the Society of Glass Technology and an Academician of the World Academy of Ceramics. His close and friendly association with India is certainly a boost for the Indian Glass Industry to benefit the most in forms of latest technology knowhow, expertise; and in the fields of research, innovation, etc.



glass community to exchange ideas, knowledge, and experiences.

Hosted by member countries, this prestigious event aims to address critical challenges and explore promising opportunities within the field of glass technology; Provide invaluable benefits to India's glass community, including faculty,

researchers, students, and industry professionals; Foster collaborations with renowned institutions and universities worldwide, focusing on cutting-edge research, development, and futuristic applications.

The conference featured 12 symposia covering a diverse range of topics within glass science and technology.



Archives



Dr. K Annapurna (right) of CGCRI receiving C K Somany Award for Excellence 2024 from the Former President AIGMF Mr. Sanjay Somany (left) on behalf of Dr. Manoj Choudhary which will be presented to Dr. Choudhary at the ICG 2025 meet in Jan at Kolkata



A major highlight of the event was a mega exposition showcasing innovative products and technologies from leading glass companies, research institutions and professional societies worldwide. Approximately 15 exhibitors participated.

The Congress hosted over 500 delegates, including 150 international participants from 20 countries. The distinguished attendees included



eminent researchers, academicians, industry leaders, young faculty members, and students. The event featured 11 Plenary Speakers, 22 Keynote Speakers, and 94 Invited Speakers, who contributed through insightful presentations and discussions. Furthermore, there were around 140 poster presentations and 111 contributory presentations.

Glass is widely regarded as a transformative material, contributing to approximately 11 of the 17 Sustainable Development Goals (SDGs) set by the United Nations. Recognizing its critical role in human progress, the United Nations General Assembly declared 2022 as the International Year of Glass,



marking the first time in UN history that a material has been honoured in this way. Glass's potential to address pressing global issues, including climate change, highlights its importance in sustainable development.



A large degree of success of the ICG 2025 Kolkata could be ascribed to an incredible number of conference sponsorships received. Each sponsor was thanked for the same. The Conference Banquet January 20 aboard cruise boat the Ganges Queen was sponsored by Türkiye Sisecam. *The fundraising Chair, Prof. Arun Varshneya thanked Dr. Ilkay*





Sokmen of Sisecam for this generous sponsorship and sang a song to her from the 1951 movie "Aawara" marking the birth centennial of late Mr. Raj Kapoor (an Indian actor, film director and producer, who worked in Hindi cinema).

Conference dinner on January 21st evening was sponsored by AGC. Dr. Akio Koike of AGC USA congratulated Prof. Arun & Mrs. Darshana Varshneya on their 51st wedding anniversary. The Bengali classical cultural program in the memory of Ustad Zakir Hussain, a highlight, January 21st featuring Pandit Kaushal Das, Pandit Samar Saha, and Mr. Vishal Krishna was sponsored by Saxon Glass Technologies, Alfred NY.

Lunches (all 5) were sponsored by Saint-Gobain, Borosil Renewables, Horn Glass Industries, Furnotherm, and Gold Plus Glass Industry Ltd.

Sponsors of other events were: Hindalco, Asahi India Glass Ltd, Corning India, Hindustan Platinum, Nippon Electric Glass (NEG), Planet Ceramica Pvt. Ltd., Schott India, AGI Greenpac, Glass Power Group, Anton Paar, LabIndia Instruments Pvt. Ltd., SD Logistics Pvt. Ltd., Tempsens Instruments Pvt. Ltd., ThermoFisher Scientific, Glass Service Company (Czech Republic), F-I-C UK Ltd.,

Refsol Marketing Pvt. Ltd., the American Ceramic Society, and the Society of Glass Technology.

The support of Dr. Bikramjit Basu, the CGCRI Director, Mr. Sitendu Mandal, the Congress President, Dr. K Annapurna, the Program Chair, and Dr. Atiar Rahaman Molla, Organising Secretary was commendable in the overall success of the Congress.



AIGMF was allocated a stall that provided an ideal platform to interact with stakeholders, students, research scholars, glass technologists and participants from various glass



related institutions and companies. The students in particular were welcomed with open arms and were even gifted calendar glass bottles and literature on the glass industry news and developments. They were even invited to share ideas on glass promotion by also participating in the annual Youth contests organised by the AIGMF, which offer cash prizes as a direct motivation seeking Youth

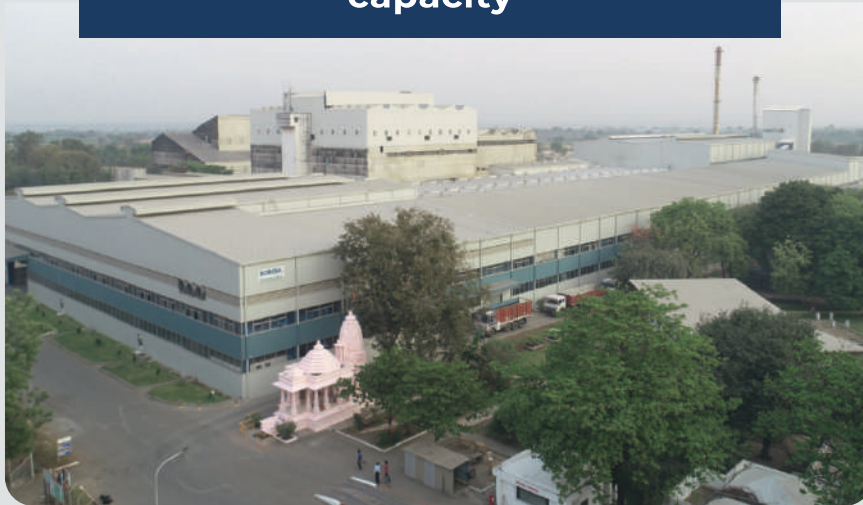


participation. Several student groups requested for arranging special talks at their institutes which would be planned in future in tie up with the International Commission on Glass and The All India Glass Manufacturers' Federation ■

Select photos of the event are available at <https://aigmf.com/past-events.php>



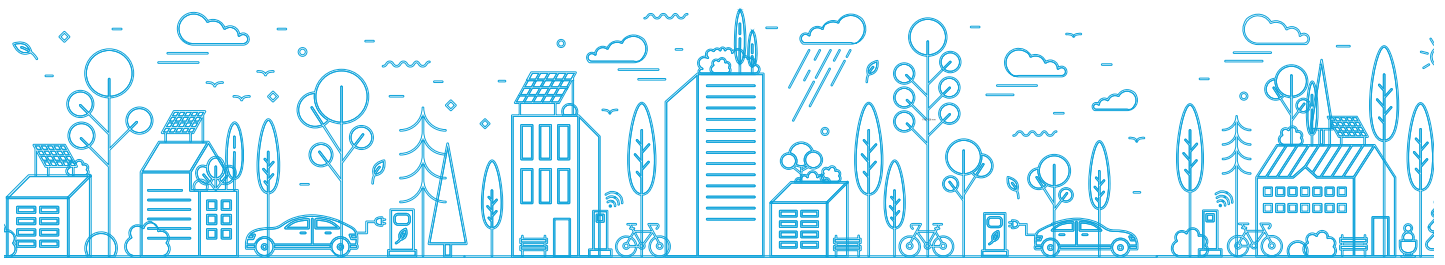
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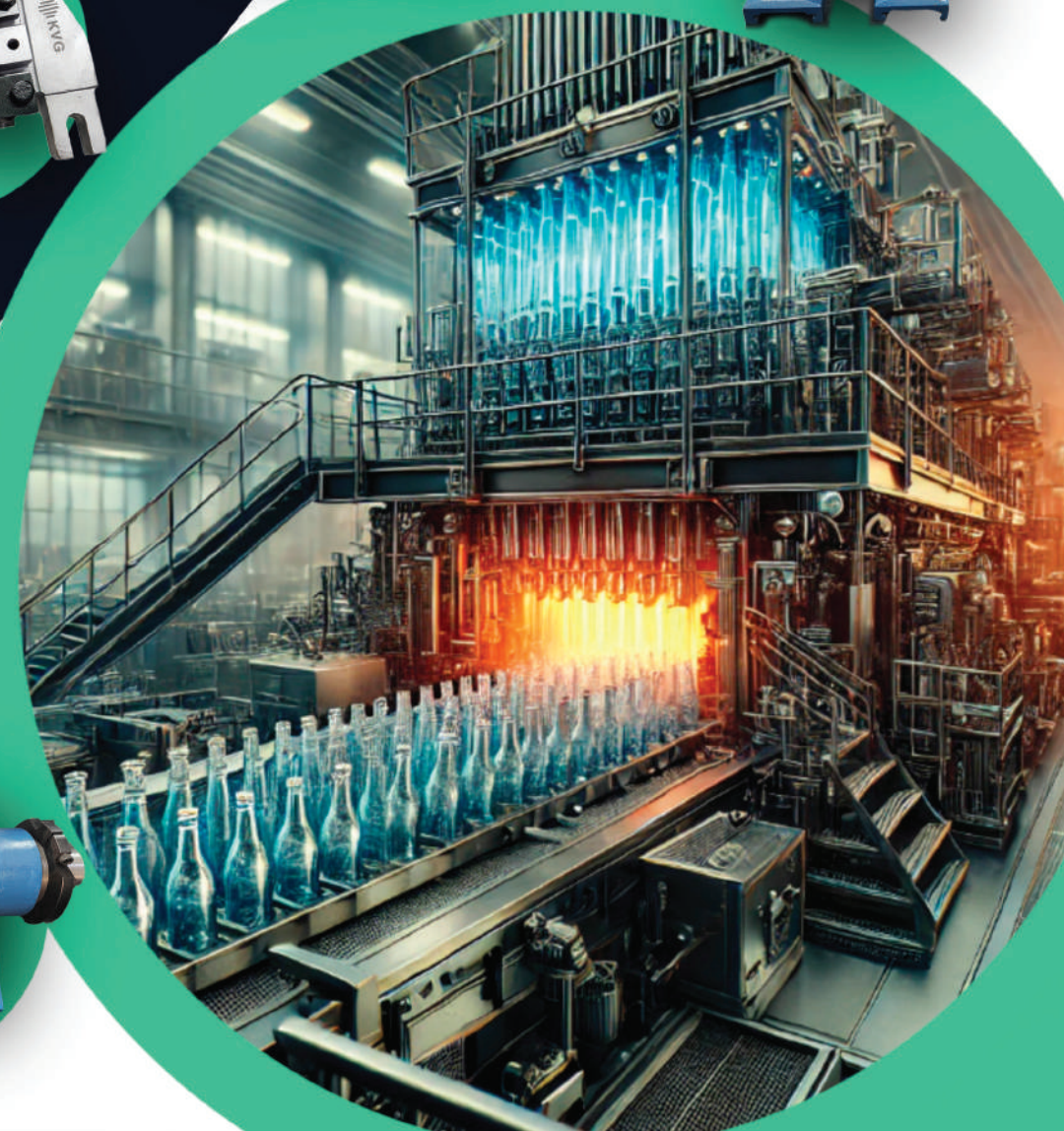
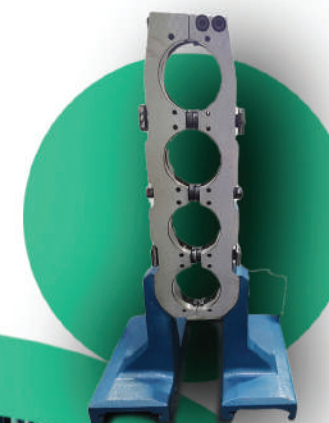
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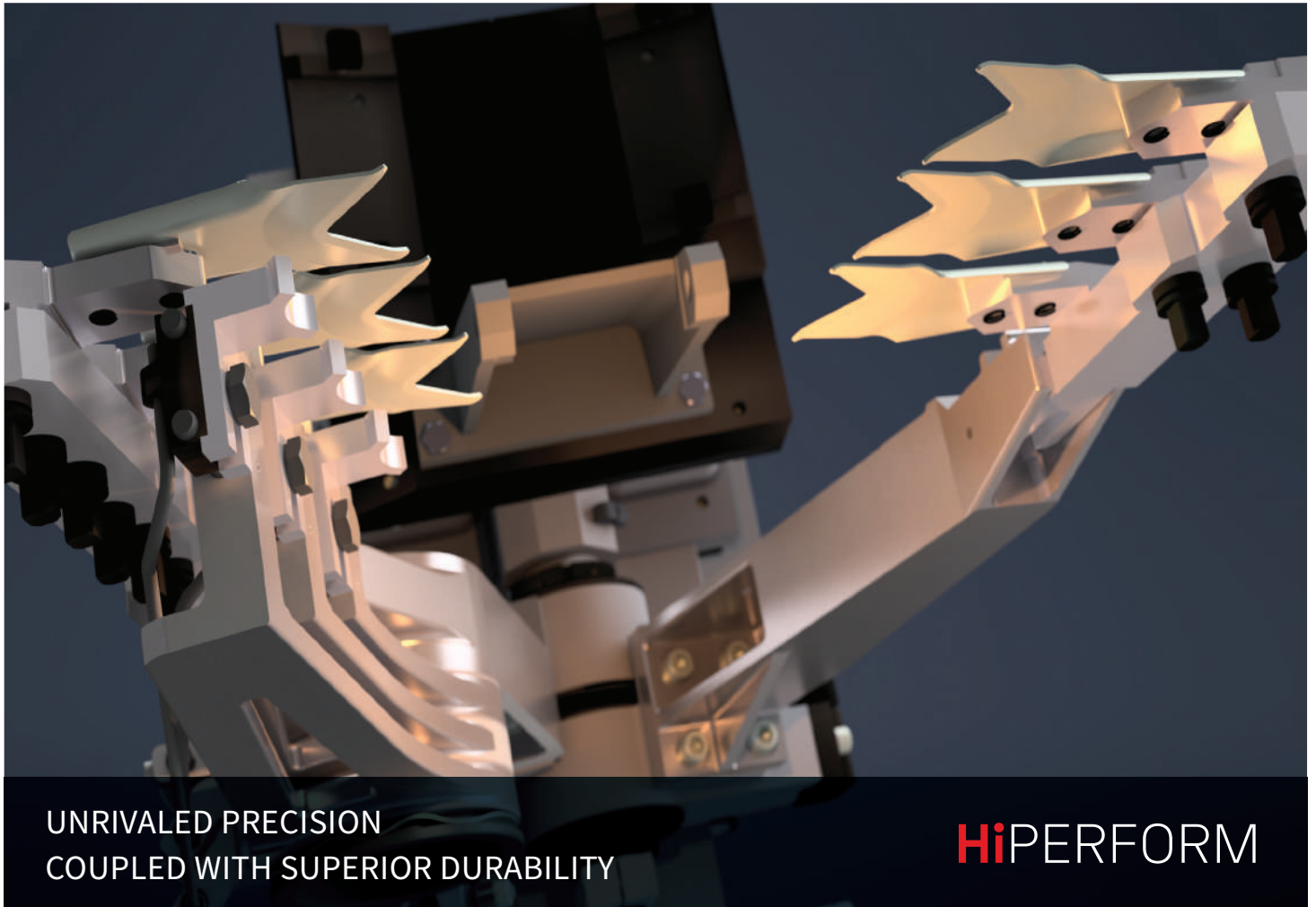


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WE ARE GLASS PEOPLE

Cullet Processing & Usage

Ashoka Rao Manikala

FORMER PRESIDENT (OPERATIONS) PGP GLASS AND AGI GREENPAC
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For General Public, “Cullet” is typically an unfamiliar word but in Glass Industry, it is used commonly on daily basis. It is believed that the first use of this word started in the year 1817, perhaps from French word *Cueillette*, meaning act of Gathering (Latin word *Collecta*).

Cullet refers to crushed or broken glass that is used in the production of new glass products. It is typically composed of glass that has been rejected or discarded, often due to damage or breakage, and is generally of the same composition as the mineral mixture used in glassmaking. The inclusion of cullet in the glass batch is beneficial because it melts early in the furnace, helping to bring the mineral particles together and accelerating the reactions necessary for glass formation.

Cullet has been an integral part of glassmaking for many years due to its role in improving the efficiency of the melting process. The use of cullet in glass production is also a form of recycling, as it involves reusing waste glass to create new glass products. This practice helps reduce the need for raw materials and can lower energy consumption in the glassmaking process. The use of recycled glass (cullet) in the manufacturing process

has major advantages. Cullet reduces the consumption of natural raw materials such as sand or synthetic materials such as sodium carbonate. By replacing raw materials, it reduces CO₂ emissions on two levels: by lowering the energy required for melting and by decreasing the use of raw materials whose melting emits carbon dioxide.

Today, cullet is the main raw material for glassmakers. Its incorporation rate in the furnaces has increased considerably in recent years. This rate could technically reach up to 95% for certain colors. Today it is mainly the availability of cullet that limits this integration. There are many difficulties in collection of Cullet due to various reasons. Collection of Cullet requires lot of effort and dedication.

Despite the benefits, recycling glass and using cullet can be challenging. One of the main difficulties is separating glass from other waste materials and sorting it by color,

as different colors of glass must be processed separately to maintain the quality of the final product. Nevertheless, cullet remains a crucial component in glass manufacturing, with usage rates varying significantly by country, ranging from 35 to 95 percent in new glass production. Following image shows the typical cullet received from market.

CULLET PREPARATION

Within the intricate realm of glass production, the process of preparing cullet for use in Glass manufacturing takes centre stage as a critical phase that weaves together sustainability, quality, and innovation. This crucial step acts as the gateway to transforming discarded glass into useful cullet to form new glass products, championing both environmental consciousness and manufacturing excellence.

Collecting and Preparing Cullet:

The journey of cullet begins with the



Cullet for Recycling

The cullet received from market contains caps, labels, mud and impurities along with different colored glasses. This cullet can be used after proper processing & sorting. The process includes crushing, washing, sorting as explained in this article. It is difficult to do the sorting manually and hence many Glass manufacturers use automatic cullet sorting systems to have a good quality of cullet.

collection of recycled glass, often sourced from used glass bottles and the remnants of previous glass production. This raw material, once collected, undergoes a meticulous preparation process. Initially, the collected glass is sorted, ensuring that it meets the specific criteria required for the desired glass product. The sorted glass then undergoes rigorous cleaning to eliminate any impurities or foreign substances that could compromise the integrity of the final glass product. This thorough cleaning process not only guarantees the quality of the glass but also aligns with sustainability goals by maximizing the usability of recycled materials.

The importance of Sorting and Cleaning: The sorting and cleaning of cullet play an important role in ensuring that the resulting glass maintains the highest standards of quality. The precision of this process directly impacts the properties of the glass, from its transparency and color consistency to its durability. By meticulously sorting the cullet, manufacturers can select pieces that match the specific requirements of their intended glass product, enhancing uniformity and performance. Moreover, the intensive cleaning of cullet eliminates contaminants, creating a clean canvas for the glass-making process. This focus on quality not only satisfies customer expectations but also upholds the industry's commitment to sustainable practices, as higher-quality cullet optimizes resource usage.

Challenges and considerations in handling Cullet: While the benefits of using cullet in glass production are undeniable, this practice does come with unique challenges. One significant challenge revolves around the removal of contaminants from the collected glass. These contaminants can range from non-glass materials to residues from previous contents

in glass bottles. Effectively identifying and eliminating these contaminants requires sophisticated technology and meticulous attention to detail. Additionally, ensuring the consistency of cullet quality can be a consideration. Variations in cullet characteristics, such as size and composition, can impact the final glass product. Addressing these challenges involves a combination of advanced sorting and cleaning techniques, as well as a commitment to continuous improvement. As we delve into the intricacies of cullet preparation, it becomes evident that this process is a cornerstone of sustainable glass manufacturing. It is a testament to the industry's dedication to innovation and eco-conscious practices. By meticulously collecting, sorting, and cleaning cullet, manufacturers not only enhance the quality of their glass products but also contribute to the preservation of natural resources and the reduction of waste. It is a harmonious blend of craftsmanship and environmental responsibility, paving the way for a brighter, greener, and more resource-efficient future. Hence Cullet Processing is an important activity in Glass Manufacturing and understanding it well, will help Industries to get Good Quality of their Glass Products, save Energy & reduce Natural Raw Materials usage.

Recycling is gaining very high importance now a days. What was already the norm in advanced countries a long time ago, is now on the agenda in all countries around the world. However, there are still big differences in the quality of the collection systems. In some countries the raw material glass is collected and sorted according to color; sometimes, however, it is collected completely mixed. The proportion of foreign substances (metals, ceramics, waste in general, etc.) also differs from country to country.

STAGES IN CULLET PROCESSING:

1. Receiving & Storage of Cullet
2. Cullet Sorting
3. Processed Cullet Storage
4. Processed Cullet Usage

1. Receiving & Storage of Cullet:

It is a very important activity in Container Glass Manufacturing facility. Proper inspection of Cullet while receiving & storage in designated locations according to type, grade, size, source etc., will largely help to process the cullet for final use. If all the incoming cullet is stored together, then sorting load will be extremely high & maintaining quality of Glass will be a Herculean task.

Cullet is classified into two categories based on source namely Internal and External Cullet. These two categories should be processed and stored separately. Based on Glass properties, external cullet can be classified as Flint, Amber, Green, Mixed, Sheet Glass etc., and they have to be again stored separately before & after processing for better control of Glass Quality. One dedicated staff may be given full responsibility of Cullet receiving, processing & storage as it is an important activity. With good sorting quality, cullet up to 95% can be used in Batch for Glass melting.

Inspection of cullet while receiving & unloading is extremely important. While unloading the external cullet, check the quality at different stages of unloading as there are every chance of contamination at different areas of truck (Top, middle, bottom or at front & Backside of truck). Any suspected quality of cullet (Especially for Metals, Stones, Ceramics, Porcelain, Micro Oven Glasses) should be stored separately and then sorted properly to avoid such contaminants going to Glass Furnace. Regular training

& advise to Vendors to supply Cullet as per the specification will largely reduce the load on Sorting process.

2. Cullet Sorting

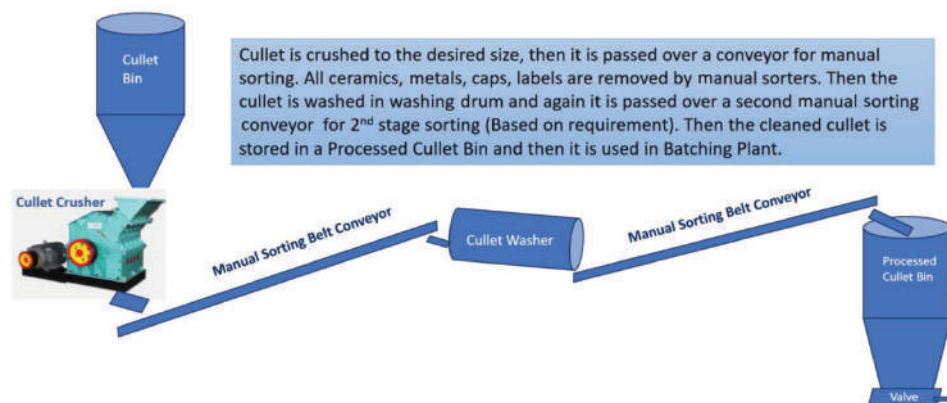
Earlier cullet sorting used to be a laborious & tedious process but, thanks to innovative technologies, which is helping Glass Industries to sort the cullet with High Quality & speed. Manual sorting is exceedingly difficult and slow process. As the Glass industries are expanding and increasing their capacities, manual sorting of cullet is becoming difficult and hence they are moving to automatic Cullet sorting.

a) Manual Sorting: The Following Flow Chart shows general Manual sorting system adopted.

In manual sorting, controlling the sorting quality is difficult due to various constraints with labour, speed of sorting, thickness of Cullet on belt conveyor etc. Along the conveyor, powerful Magnets can be installed to remove ferrous material and Eddy current separator can be independently installed to remove non-ferrous items like Aluminium caps. Sorters need to be positioned along the manual sorting belt conveyors and there are chances of some accidents if adequate safety precautions are not taken. All the conveyors should have emergency pull chord system to immediately stop the Belt conveyor in case of emergency and the sorters should have good seating & walking arrangements along the belt conveyors to avoid any accidents (to avoid fall).

b) Automatic Cullet Sorting System:

As the Glass Quality requirement is becoming stringent day by day,



cullet sorting quality should also be extremely high because it has direct bearing on Melted Glass. It can be achieved only by Auto Cullet sorting system. Auto cullet sorting system consists of Screening the Cullet for coarse and fines, crushing bigger size Cullet, drying of Cullet, Organic matter removal, Metal separation, Color and CSP sorting (Sorting Flint, Amber and green separately) as shown in the Process Map. There are many reputed suppliers of Cullet sorting system like M/s BINDER+CO AG Austria, M/s REDWAVE Austria, M/s Zippe GmbH Germany etc., who can design & supply plants as per plant requirement.

Necessity of Sorting / Processing of Cullet:

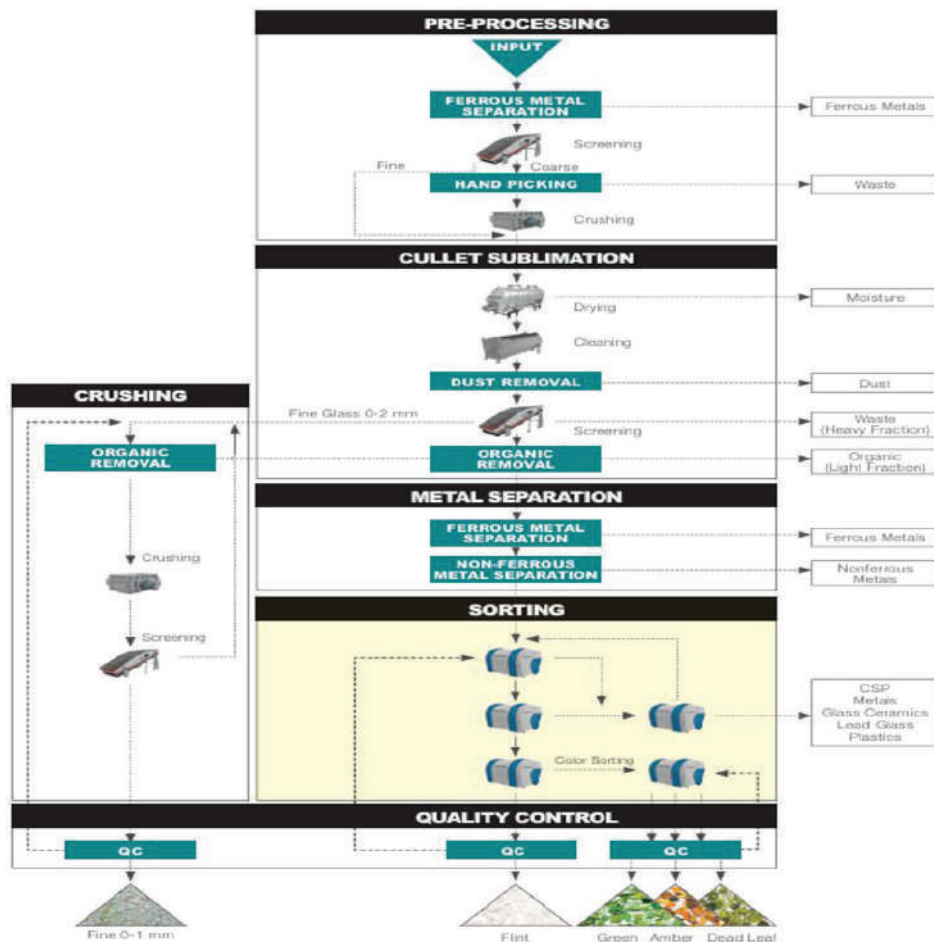
Cullet is sorted and processed for following reasons.

1. Cullet is one of the Major ingredients for producing Glass. Without cullet (Minimum of 10%), glass melting will be exceedingly difficult, and it will lead to many melting problems. Cullet acts as a catalyst for melting. Hence minimum amount of cullet in Batch is necessary for Melting Glass.
2. Proper sizing of Cullet for use in Batch is very important. It is recommended to use 6mm to 15mm size of cullet for satisfactory results in terms of

melting, energy saving and Glass quality.

3. Un-sorted or poorly sorted cullet may lead to many problems. Following are few of them:
 - a. Damage to Furnace & Furnace equipments:
 - If there are lot of contaminants like Ferrous materials & Aluminium Caps, the same can settle at the bottom of the Melter and create downward drilling of bottom tiles. This will make the refractory to corrode quickly and glass can leak from melter bottom.
 - The Ferrous and Non-ferrous metals can form a metal layer at the bottom of the melter and as the time passes, it can have a metal layer of many millimetres of thickness. If there are Bottom boosting electrodes, then it can create sparking of electrodes and electrodes may be damaged very quickly making the electrodes ineffective or lead to glass leak from electrode areas at the bottom. This kind of leakage will be very difficult to control and there can be a major accident due to Glass leakage.
 - Due to metal contaminants present in Cullet, the furnace life will be seriously impacted due to rapid corrosion of melter bottom tiles.

Process Map of Container Glass Cullet Auto Sorting



weighing and feeding units for better control of Glass quality. Also, for different types of cullet (Flint, Amber, Green), separate silos / Bins are to be used. As the cullet is highly abrasive material, storage Bins / Silos to be designed by experts to minimise wear & tear and avoid contamination of cullet from storage Silos.

During Transport of Cullet from Processing to Storage and then storage to Melting, enough powerful magnets to be fixed on Belt Conveyors and Cullet Chutes to remove any left-over Ferrous contaminants.

4. Processed Cullet Usage:

During the Batching, cullet is generally not Mixed in Mixer as cullet is highly abrasive and can damage the mixer blades quickly. Hence cullet is spread over the Batch uniformly by proper cullet feeding System. During conveying and feeding of cullet powerful hanging magnets may be used to catch the Ferrous contaminants present in cullet. It is recommended to daily collect the cullet sample from cullet feeding system and check the quality for sorting & contamination. Accordingly corrective actions to be taken in sorting. There are systems to pre-heat cullet using Furnace waste heat to save energy. M/s Zippe GmbH Germany and few others can design and supply these systems. However

b) Poor Glass Quality:

- If Cullet is not sorted properly & has lot of impurities, the Glass color can vary frequently resulting in customer complaints. This is extremely critical for cosmetic Glass production.
- Final Glass may have lot of stones, Glass knots and forming defects. This can lead to higher rejections, lower production efficiency and increased customer complaints.
- Frequent yellow lines in Glass because of reaction of glass with contaminants (Ferrous and Non-Ferrous metals).
- Bubbles, seeds may increase suddenly due to reaction of contaminants with Glass.

c) Increased Melting Energy:

- Increase in Iron level in Glass will lower the heat transfer rate in melter and Forehearths. Hence Melting Energy or SFC (Specific Fuel Consumption) for melting and Forehearth Energy consumption will increase.
- More bubbles and seeds in Glass due to high contaminants in cullet may necessitate increase of melter temperature which will lead to increase in energy consumption.

3. Processed Cullet storage:

It is very important that the processed cullet is stored properly in Batching Plant. It is recommended to have separate Cullet Bins / Silos for internal and external Cullet with independent

in India, this system is not installed due to low return on Investment.

Advantages of using Cullet:

When it comes to the ecological footprint of glass manufacturing, the adoption of cullet serves as a game-changer, yielding an impressive array of environmental benefits that outshine the conventional reliance on virgin raw materials. Let us embark on a journey through the eco-conscious realm of cullet, unearthing its profound contributions to reducing raw material extraction, conserving energy, and mitigating carbon emissions.

Reduction in raw material

extraction: One of the most glaring advantages of incorporating cullet into the glass-making process is the substantial reduction in the need for primary raw materials such as sand, soda ash, and limestone. These materials are traditionally mined, a process that extracts a significant toll on the environment. By substituting a portion of these virgin materials with recycled glass, we are diminishing the pressure on fragile ecosystems, preserving pristine sand dunes, and minimizing the ecological disturbances caused by mining operations. This reduction in raw material extraction is a triumph for the environment, as it directly curbs habitat disruption and soil degradation while easing the strain on natural resources.

Energy savings during the melting

process: The allure of cullet extends beyond material conservation, delving into the realm of energy efficiency. When recycled glass is introduced into the melting furnace, its lower melting point imparts a profound energy-saving effect. The furnace does not need to reach the same temperatures as it would when processing solely

virgin materials, resulting in reduced energy consumption. This translates into fewer fossil fuels burned, fewer emissions spewed into the atmosphere, and a tangible step towards a greener future. It is a virtuous cycle where every shard of cullet becomes a catalyst for energy conservation, aligning industry practices with sustainable aspirations. It is established in Glass industry that every 10% increase in Cullet usage will result into 3% reduction in specific fuel consumption. Also, by increasing the Cullet usage, Glass draw can be increased by 2 to 3% for every 10% increase in Cullet.

Decreased carbon emissions due to reduced energy consumption:

The connection between energy use and carbon emissions is a fundamental pillar of environmental responsibility. As the energy demands decrease, so do the carbon emissions. By leveraging cullet in glass manufacturing, we are ushering in a paradigm where reduced energy requirements equate to a significant reduction in carbon footprints. The virtuous synergy of cullet's lower melting point and the resultant energy savings culminate in a measurable decrease in greenhouse gas emissions. This not only contributes to cleaner air but also aligns with international efforts to combat climate change, positioning cullet as a frontline ally in the battle for a sustainable planet. It is estimated that every ton of glass cullet saves about 300 kg of CO₂, thanks to reduced fuel consumption and the absence of carbonate raw

material decomposition in the purified material.

CONCLUSION:

When we evaluate the overall environmental impact, it becomes evident that cullet holds a considerable advantage over the exclusive use of virgin raw materials. The traditional approach entails resource-intensive extraction, energy-intensive processing, and significant emissions, creating a domino effect of environmental strain. In contrast, cullet-based production drastically reduces the demand for these raw materials, lessens the energy burden, and minimizes emissions, painting a more ecologically friendly picture. The juxtaposition is clear: cullet is not just a sustainable alternative; it is a beacon of responsible manufacturing that charts a course towards a circular, eco-conscious future. In the grand tapestry of sustainable practices, the adoption of cullet in glass manufacturing stands as a shining example of innovation, conservation, and environmental stewardship. It is a beacon of hope, showcasing that practical solutions exist to address the ecological challenges we face. As we continue to steer the glass industry towards a more sustainable path, let us keep in mind the transformative potential of cullet, a small yet powerful agent of change that leaves a lasting positive impact on our planet. We should rigorously focus on ways to increase the Cullet collection, improve sorting and use it maximum extent for melting ■

Use Cullet For:

25-30%

ENERGY SAVED
DURING
MANUFACTURING

25-50%

REDUCTION IN
CARBON
EMISSIONS

1.2KG

RAW MATERIAL SAVED
FOR EVERY KILO OF GLASS
MADE FROM CULLET

95%

OF ALL RAW MATERIALS
CAN BE SUBSTITUTED BY
CULLET

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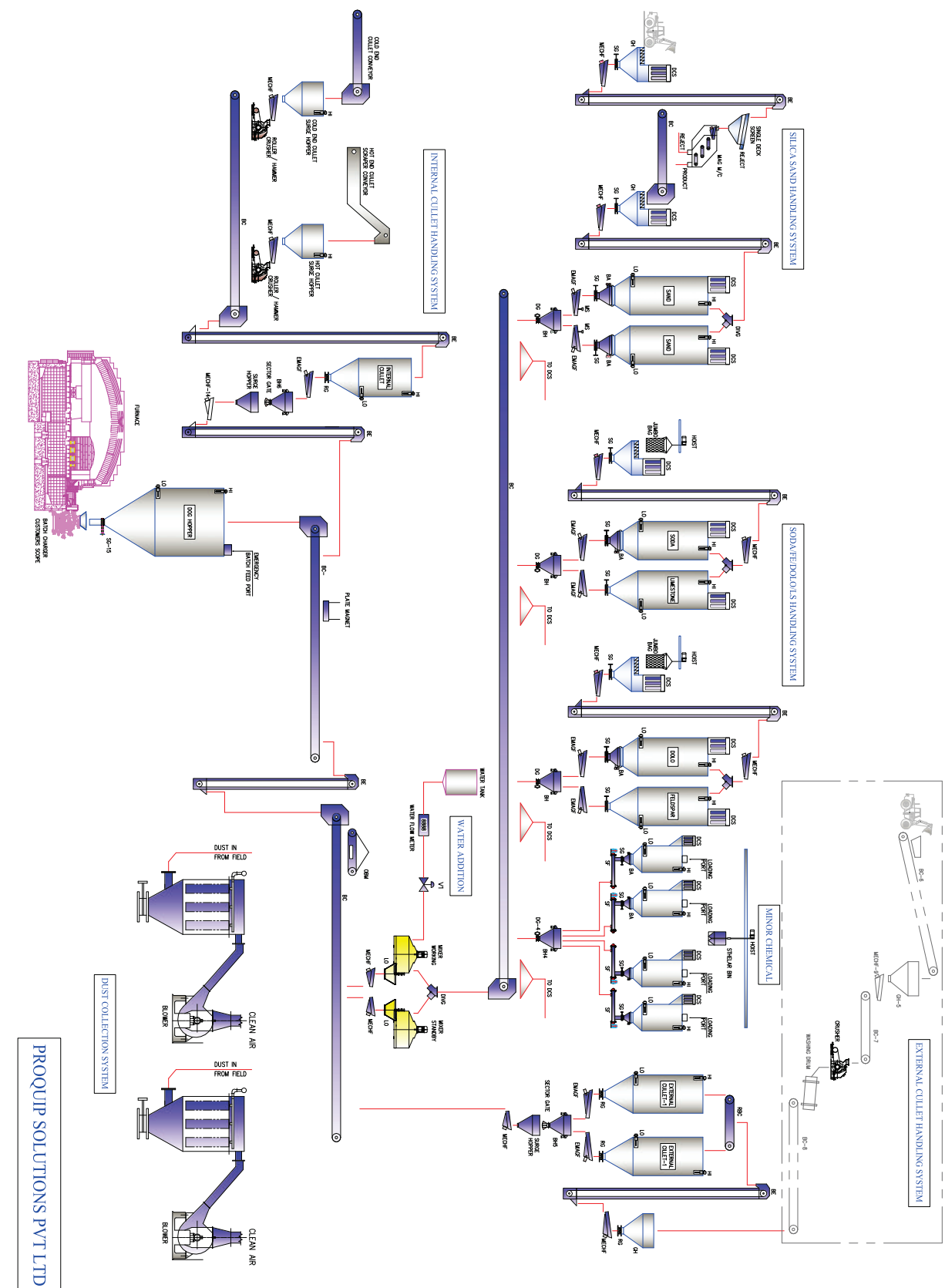
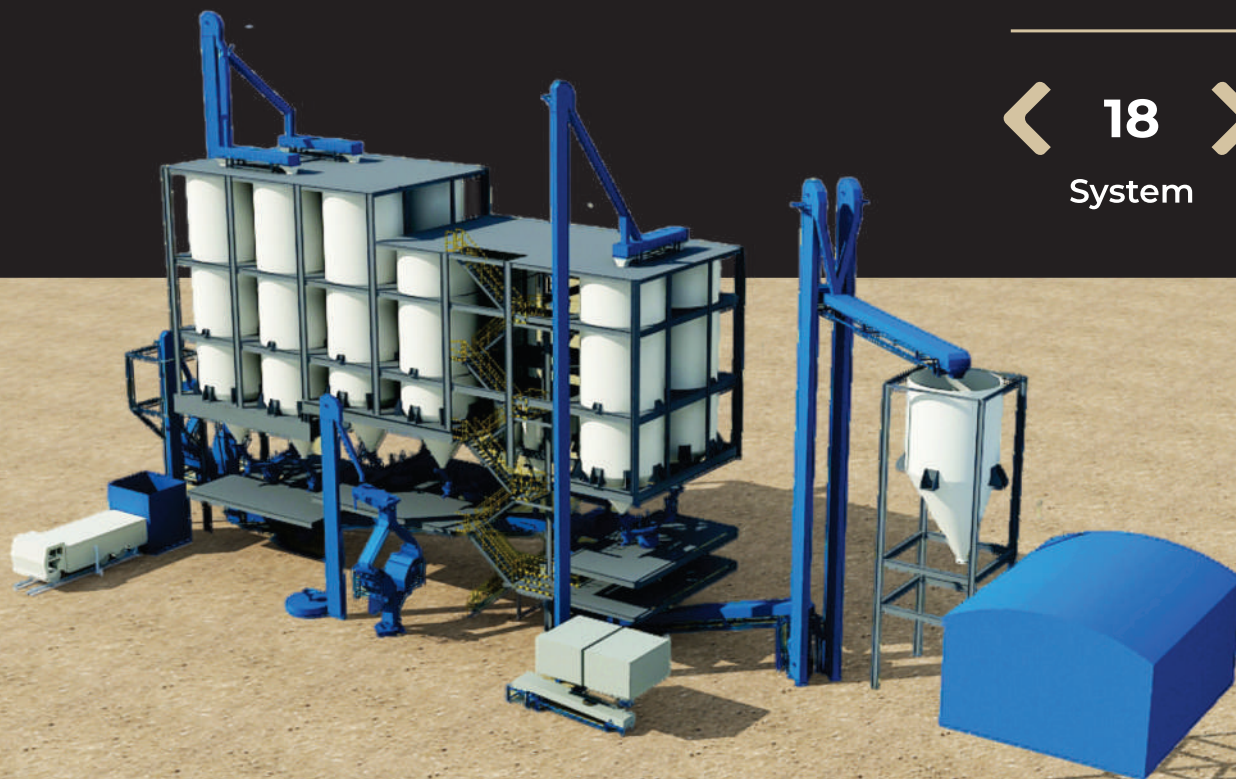


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Towards Sustainable Glass Manufacturing -Initiatives in Carbon Neutrality

Yoshio Iwatsubo

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1. INITIATIVES OF ENERGY CONSERVATION AND CO₂ REDUCTION

Today, the glass industry is facing a critical challenge of sustainable glass manufacturing. Particularly, the glass melting process, which consumes a large amount of energy, requires efforts in energy conservation and carbon reduction.

Nippon Electric Glass Co., Ltd. (NEG) upholds the value of 'coexistence with nature' and believes that 'the world's most efficient manufacturing leads to the world's most environmentally friendly manufacturing.' Based on this philosophy, we have been working on energy conservation and CO₂ emission reduction through improvements in quality and productivity.

This chapter explains our efforts to improve production efficiency and reduce energy consumption and CO₂ emissions, focusing on the transition to low-carbon fuels, the switch to oxygen combustion, and the introduction of electric melting.

Transition to Low-Carbon Fuels

Since the 1950s, when NEG started operating large Siemens furnaces, we have primarily used heavy oil as fuel for the glass melting process. In the 2000s, aiming to reduce CO₂ emissions, we actively promoted the transition to low-carbon fuels. We first switched from heavy oil to LPG (main component: C₄H₁₀), and then to natural gas (main component: CH₄), eliminating the use of heavy oil by 2010. This transition reduced our

CO₂ emission factor to 3/4.

The transition from heavy oil to natural gas is a means to reduce CO₂ emissions by 1/4 without significantly altering the process. This fuel transition also reduces the maintenance required for heavy oil combustion equipment.

Oxygen Combustion

Air contains only about 20% oxygen, with the remaining 80% being nitrogen, which does not contribute to combustion. When air is used as the combustion, a large amount of high-temperature exhaust gas carries away thermal energy. Typical regenerative furnaces have regenerators to recover the thermal energy from this exhaust gas. To achieve high heat recovery efficiency, the heat capacity of the regenerators must be sufficiently large, requiring significant initial investment and generating substantial

refractory waste disposal costs at the end of the furnace's life. Additionally, during operation, maintenance costs arise to remove blockages in the regenerators, and changes in the blockage status of checker bricks in the chamber can make it difficult to maintain stable operating conditions. These issues can be resolved with oxygen combustion.

Oxygen combustion was first introduced to glass melting furnaces by Corning Inc., in the United States in 1982. Subsequently, its benefits in energy conservation, glass quality improvement, equipment cost reduction, and dust suppression were confirmed, leading to its rapid adoption in the U.S. glass industry around 1992. In 1993, NEG introduced the first oxygen combustion furnace in Japan, and by 2024, 96% of our combustion-type (include hybrid-type) furnaces have switched to oxygen combustion.

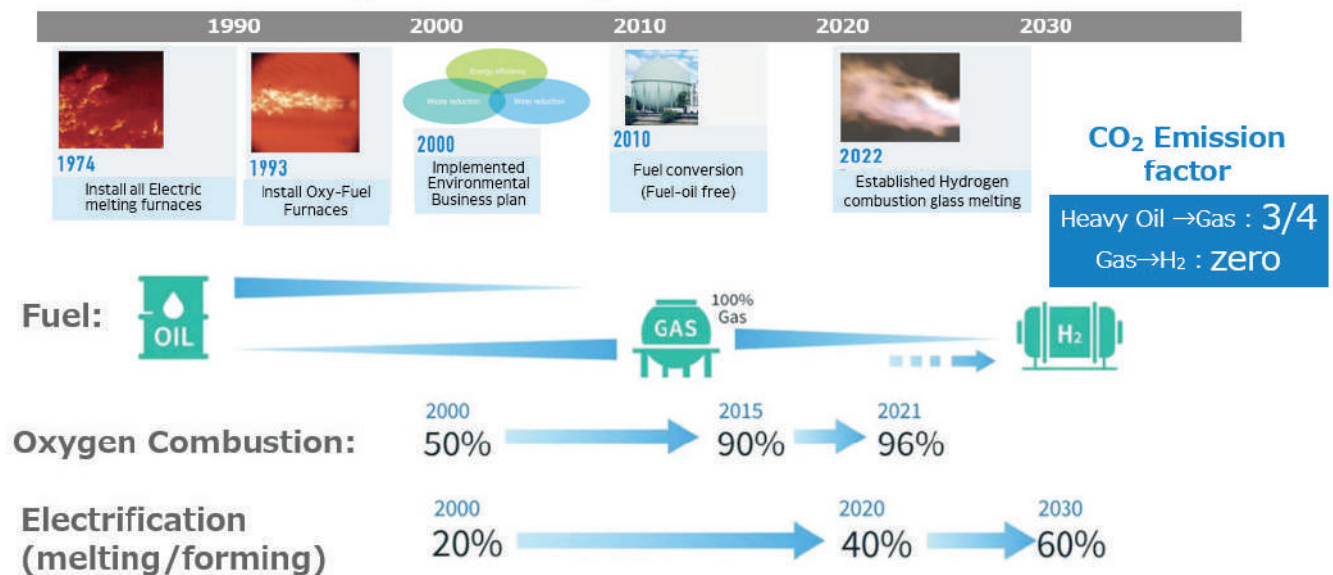


Ms. Yuki Uno, Sales Manager, Nippon Electric Glass (NEG) Co., Ltd, making a technical presentation on 'Towards a Sustainable Glass Manufacturing' at the AIGMF's International Women's Day celebration at Kaziranga (ASSAM) on March 8, 2025

NEG's approach to Carbon Neutrality



Focus on Melting and Forming



The advantages of oxygen combustion are as follows:

- Significant reduction in exhaust gas volume
- Improved energy efficiency
- Reduction of NO_x emissions
- Reduced initial equipment investment and refractory waste in the end of life
- Eliminate maintenance costs and instability of the regenerators
- Stable operation and improved production efficiency

Electric Melting

In the glass industry, the technology

of using electricity to heat glass, due to its high energy efficiency, has been widely used for a long time. By using electric melting as e-boosting, glass temperature at the bottom of the furnace can be efficiently heated, dramatically improving the productivity of the furnace.

In 1962, NEG adopted a hybrid melting furnace that incorporated electric melting into a heavy oil combustion furnace for the first time. With the cooperation of Owens-Illinois Inc., in the United States, we enhanced this technology and introduced it to number of melting furnaces. In the 2000s, we changed

the design of the melting furnaces to increase the electric ratio of hybrid melting furnaces and actively promoted the transition to all-electric melting furnaces, further improving energy efficiency. The proportion of electricity in our total energy consumption increased from 20% in 2000 to 46% in 2023. To achieve these initiatives, we have developed electric melting equipment with high reliability for long life.

2. TOWARDS CARBON NEUTRALITY

To achieve carbon neutrality, it is necessary to have melting technology that does not generate CO₂. This chapter explains our efforts in all-electric melting and carbon-free fuel technology.

All-Electric Melting

In 1967, NEG first developed all-electric melting furnace and expanded it to special glasses such as lead glass. Subsequently, we expanded to glass fibers and established full-scale production technology using all-electric melting furnaces in 1972. Currently, we are switching our glass melting furnaces to all-electric melting



Members of NEG Team with other AIGMF Members at the Executive Committee Meeting of the AIGMF at Kaziranga (ASSAM) on March 8, 2025

furnaces, focusing on high-quality glass products, and further enhancing their performance.

All-electric melting furnaces do not use combustion for heating in the melter, and most of the molten glass surface is covered with the batch. Because of the insulating effect of the batch, the heat of the molten glass heated by direct electric heating is retained within the glass, reducing heat loss from the surface of the molten glass and the superstructure of the furnace. Additionally, the heat loss by exhaust gas is reduced, significantly improving energy efficiency, allowing the same amount of glass to be melted with about half the energy of a combustion melting furnace. In the future, we aim to achieve carbon neutrality by converting the electricity used to renewable energy.

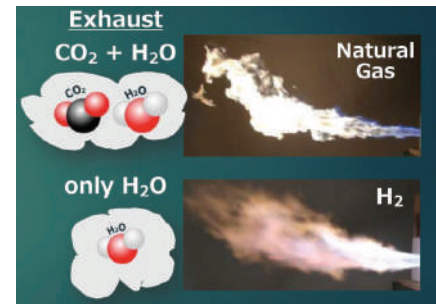
In addition to improving energy efficiency, all-electric melting does not generate any pollution and NO_x from combustion, and the carryover from raw materials and evaporation from the surface of the molten glass are minimized. The low exhaust gas temperature and exceedingly small

exhaust gas volume reduce the investment of exhaust gas treatment equipment. All-electric melting become more important technology to achieve high energy efficiency and low environmental emission for glass manufacturing.

However, in the case of all-electric melting, which relies almost entirely on heat transfer from the molten glass to heat the batch, the heat transfer rate to the batch is lower than that of hybrid melting furnaces, which are heated from both the upper combustion and the molten glass. Therefore, it needs consideration to improve heat transfer rate to the batch to achieve high furnace pull rates in all-electric melting furnaces.

Carbon-Free Fuels

We are also developing glasses melting technology using carbon-free fuels such as a hydrogen for glass products where the transition to all-electric melting is difficult and for hybrid melting furnaces that require high flow rates, we are also developing

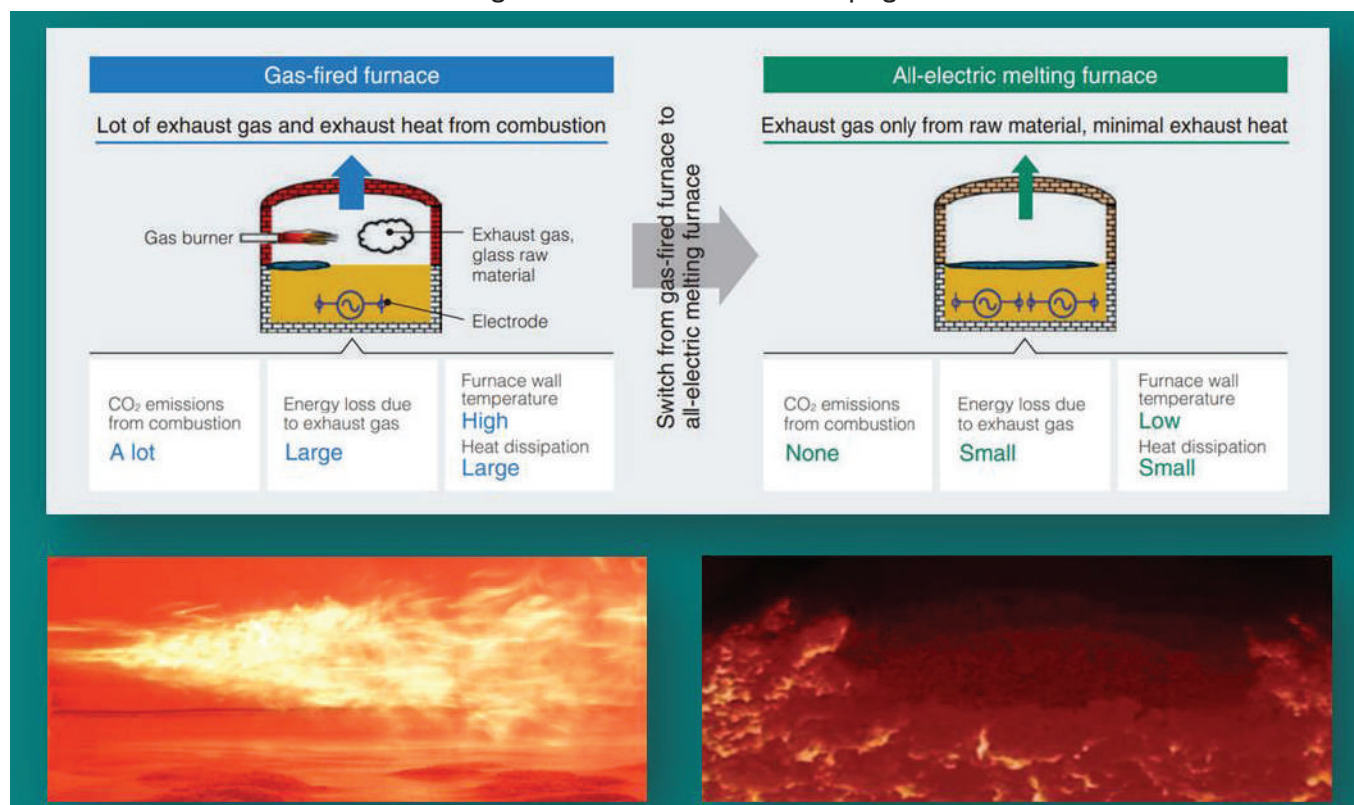


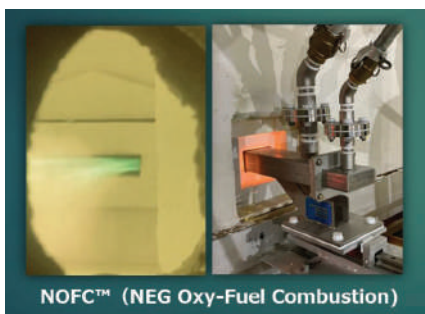
glass melting technology using carbon-free fuels such as hydrogen. In 2022, we successfully conducted the world's first demonstration experiment of glass melting using 100% hydrogen fuel with a hydrogen-oxygen burner jointly developed with Taiyo Nippon Sanso Corporation.

3. PROMOTING CARBON NEUTRALITY THROUGH GLASS ENGINEERING

In October 2024, NEG launched a glass engineering business to promote carbon neutrality in the global glass industry using the glass melting technology we have cultivated over the years.

Our available furnace technologies are as follows:

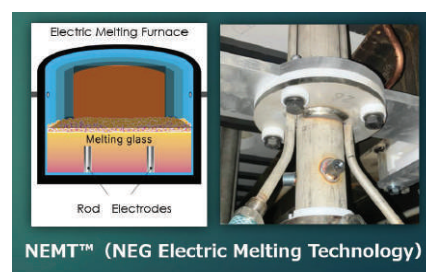




- **NEG Oxygen Combustion Technology NOFC™:** Suitable for small to large capacities with excellent maintenance characteristics. Provides solutions for improving production efficiency through partial oxygen combustion introduction to existing furnaces and reducing

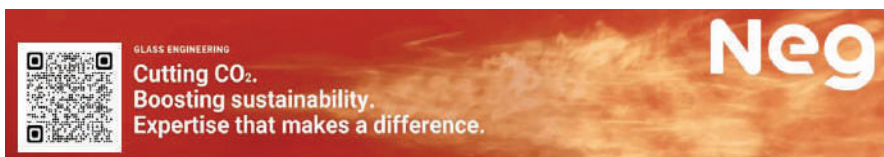
total life cycle costs of furnaces through full oxygen combustion.

- **NEG Furnace Control System NFCS™:** Provides centralized control necessary for the operation of melting furnaces, offering safe and reliable furnace control systems tailored to each melting furnace.
- **NEG Electric Melting NEMT™:** Significantly improves furnace efficiency and ensures stable operation through electric boosting of glass melting furnaces. Provides high-strength NEMT™ electrode holders designed for long life of glass melting furnaces.



- **Melting Furnace Equipment:** Offers furnace equipment such as in-furnace monitors, batch feeders, and glass levelers developed from years of glass melting experience. Also provides consulting services and computer modeling of glass melting furnaces.

Nippon Electric Glass (NEG) strive to build a brighter future for the world by uncovering the unlimited possibilities of glass for more advanced creative manufacturing ■



Welcomes its New Members

Company	Products / Services
RELIANCE INDUSTRIES LIMITED Mr. Pawan Sharma Navagam Via Khodiyar Colony, I, P.O.- Navagam/Kana Chhikari, Navagam, Jamnagar Gujarat-361006 T: + 91 76957 49900 E: pawan28.sharma@ril.com	Solar glass manufacturing
RSPL LIMITED Mr. Mukesh Kumar Survey no. 471, Village Kuranga, Porbandar Highway, Dev Bhumi Dwarka, Devbhoomi Dwarka Gujarat- 361335 T: + 91 98882 22468 E: mukesh.kumar1@rsplgroup.com	Suppliers of soda ash for glass manufacturing
HEYE INTERNATIONAL GmbH Ms. Petra Heumann Lohplatz 1, 31683 Obernkirchen, GERMANY T: +49 5724 260, +49 173 2898704 E: marketing@hey-international.com	Heye International GmbH is one of the container glass industry's foremost suppliers of production and inspection technology, high performance equipment and production expertise. It's mechanical engineering has set industry standards for more than six decades, significantly contributing to customers' success. Heye's vision is to ensure highly cost-effective, sustainable and safe operation of glassworks worldwide and thus further strengthen the position of glass as the packaging material of the future.



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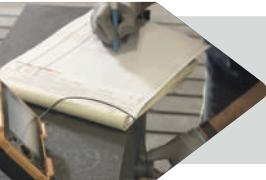


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► EME was awarded the contract to install a batch plant at the Glass Futures' Global Centre of Excellence in St Helens, UK.

Batch plant



Glass Futures 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 in 2025. 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>>

Originally Published in





► 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 later in 2025.

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 ft2 Glass Futures R&D facility.

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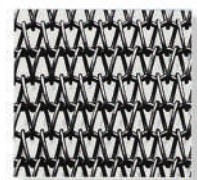
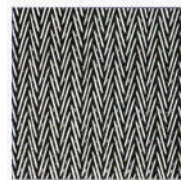
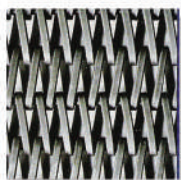
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Mr. M.D. Farooq, the founder of Umda Engineering, brings to the table more than 35 years of expertise in the manufacturing industry. Starting from humble beginnings, today more than 350 of Mr. Farooq's Lehr machines are successfully installed around the world.

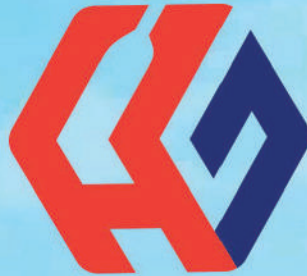
Mr. Farooq is best recognised as one of the co-founders of TNF Engineering, a company known across the industry as not only the leading manufacturers of Metallic Wire Conveyor and Lehr belts but also of Glass Plant Equipment. This mantle of superior performance and expertise has now been passed on to Umda Engineering.

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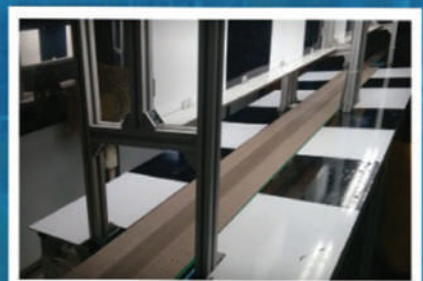
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Dual Motor Shears: Heye's Best-Selling Innovation in Glass Gob Cutting

Heye's top-selling product, the Dual Motor Shears, was a real showstopper at glasstec 2024.

With a solid reputation built over decades, these shears now come with enhancements designed to further boost performance and efficiency, making them an essential tool for glass manufacturers.

Heye Dual Motor Shears have established an exceptional reputation in the container glass market over decades, standing out as one of the top-selling products in Heye International's extensive product portfolio.

Renowned for their precision and reliability, the Heye Dual Motor Shears have set a benchmark in the container glass industry. The advanced design and engineering excellence not only enhance cutting efficiency but also ensure consistent gob loading, making Heye's shears a preferred choice among glassmakers worldwide.

TIME-TESTED RELIABILITY

The secret to the success of Heye's Dual Motor Shears lies in their design, which ensures high-speed and consistent cutting performance. The shear blades, which move on a circular arc, allow for practically wear- and backlash-free suspension of the shear arms, achieved through the use of tapered roller bearings. An outstanding characteristic of the shears is their nearly parallel cut: the centres of rotation of both shear arms are aligned on a common axis, ensuring that the motion of the shear blades is perpendicular to the centre line at the moment of the cut. The Dual Motor Shears also excel in achieving a minimum orifice distance, capable of cutting very close – within

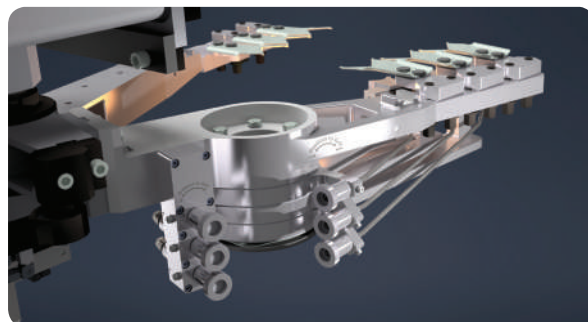
just 1/2" – to the orifice ring. Each shear arm is independently driven by a separate three-phase servo motor, with both motors completing one full revolution per cut. This eliminates the need for reverse rotation of the motor at the cutting point. A common control system ensures phase-locked synchronization of both shear arm movements. Additionally, the actuating joints of the moving parts are equipped with tapered roller bearings, which significantly reduce wear and backlash, contributing to the accuracy, overall durability, and reliability of the shears.

The solution is designed for a wide range of feeder types, spout casings of different sizes and various orifice centre distances and suitable for single to triple gob production.

SHOWSTOPPER AT GLASSTEC 2024: THE BEST GOT BETTER

At glasstec 2024, Heye showcased their Dual Motor Shears and unveiled exciting new design enhancements on their booth. The exhibit proved to be a real showstopper with visitors and loyal customers, already impressed by the product's established reputation. Since the event, Heye has experienced a surge of enquiries for the enhanced version of this product.

The key enhancement lies in the redesigned shear arms featuring an innovative gob guide. The shear arm, which accommodates the gob guide arms, has been revised with optimised rigidity. Additionally, the geometry of the gob guide arms has been improved. These enhancements minimise harmful vibrations and



significantly improve gob fall. Along with the optimised gob fall, this also leads to considerably improved durability of both the bearings and the gob guide arms. This new design with improved rigidity ensures enhanced precision, durability and lower material wear.

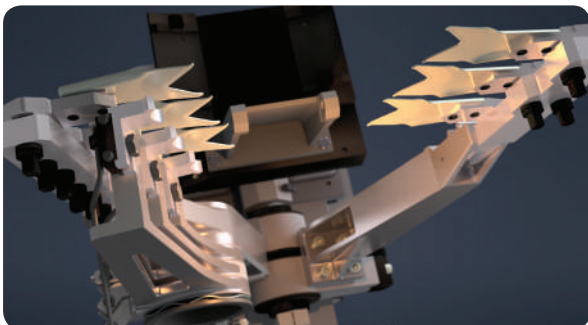
Retrofits possible: The approximately 800 Heye Dual Motor Shears currently in operation worldwide can also benefit from these new enhancements. By replacing the entire right shear arm along with the gob guides, the shears can easily be updated to the new version, thereby enhancing their precision and durability even further.

DESIGNED WITH THE USER IN MIND

The Dual Motor Shears are also designed with ease of maintenance in mind. Their modular design allows for quick and easy replacement of the shear blades, facilitating routine maintenance and reducing downtime.

The shears offer various mechanical adjustment possibilities to achieve clean and accurate gob cutting: Whether it is necessary to adjust the blade overlap, blade tension, or the height of the shears (and consequently their distance from the orifice ring), all these adjustments can be made using easily accessible handles and spindles.

The next adjustment possibility



relates to the gob guides. The handles for adjusting the gob guides are conveniently located on the right shear arm. The new design provides significantly improved accessibility to these handles. While this enhancement benefits the double gob version, it has an even greater impact on the triple gob version, where the middle handle was previously the most difficult to reach.

It is crucial to be able to carry out manual adjustments or perform necessary maintenance on the shears quickly and easily – especially in the tough operating environment where the Dual Motor Shears are installed.

The new enhanced design took account of all areas, which help Heye's customers to improve efficiency, focusing on ease of use for the personnel while also prioritizing the reduction of downtime.

Heye's Dual Motor Shears are not just a testament to engineering excellence; they are a forward-thinking solution, which addresses the evolving needs of the container glass industry. With their innovative features and a design focused on efficiency, these shears continue to set the standard for glass gob cutting, reinforcing Heye's position as the market leader.

ABOUT HEYE INTERNATIONAL:

Based at Obernkirchen, Germany, Heye International GmbH is one of the container glass industry's foremost suppliers of production and inspection technology, high performance

equipment and production expertise. Our mechanical engineering has set industry standards for more than six decades, significantly contributing to our customers' success.

Heye's vision is to ensure highly cost-effective, sustainable and safe operation of glassworks worldwide and thus further strengthen the position of glass as the packaging material of the future. We consider glass as the purest and most natural packaging on our planet. Our actions are driven by experience, courage and passion.

Thus, we make a positive impact on the environment and health, fostering a sustainable future. Today. Tomorrow. Together■

Further information:

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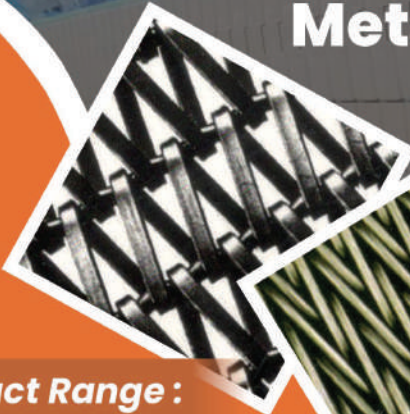
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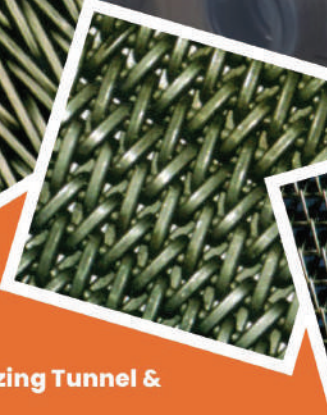
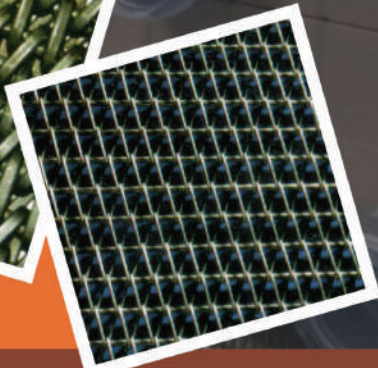
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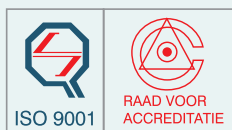
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▲ Glass Future's pilot facility in St Helens, UK.

Glass Futures' pilot facility nears completion

The pilot furnace at Glass Futures' UK research and development centre will become fully operational in early 2025. This article discusses how Siemens helped the organisation to reach this milestone.

The glass industry is facing a huge transformation. Further energy efficiency improvements and solutions to reduce the carbon footprint of the value chain are needed. These challenges are best tackled collaboratively, a belief shared by non-profit organisation Glass Futures.

With a 165,000ft² Global Centre of Excellence, complemented by its network throughout the supply chain, Glass Futures is available to the entire sector through its membership structure, as both an open platform for collaboration and a training and research partner.

The St Helens, UK-based Global Centre

of Excellence features a modern test furnace that will become fully operational later in 2025. As a founding member and technology partner, Siemens has supported Glass Futures from the outset.

Glass Futures

Glass Futures operates at a technology stage that is available to the entire glass sector and associated industries, supporting glass manufacturers, plant and technology suppliers, processors and finishers, as well as their customers.

Moreover, as a platform, Glass Futures brings together all industry players in a single network, enabling the sharing of

knowledge, new technologies, tools, and training opportunities.

Mr. Aston Fuller, General Manager at Glass Futures (**Pic 1**), says: "Glass Futures ensures that skilled workers can undergo targeted training. We also show interested new recruits how attractive the sector is as an employer."

Siemens has been a member of Glass Futures since the beginning. The company has provided support with consulting expertise and its network of contacts, and, in preparation for the centre's opening, support in the

Continued>>

Originally Published in





◀ Pic 1. Mr. Aston Fuller,
General Manager at Glass
Futures.

“Glass Futures ensures that skilled workers can undergo targeted training. We also show interested new recruits how attractive the sector is as an employer.”

form of technologies associated with digitalisation, automation, drives, communication and security.

The scope also includes building automation and security solutions, as well as software for low-voltage power distribution.

Collaboration

In addition to Siemens, fellow founder members of Glass Futures include Encirc, Guardian Glass and O-I.

The network of current membership features brands such as Diageo, Heineken and Pernod Ricard, as well as glassmakers including Arc, Ardagh Group, Bormioli Pharma, Corning Incorporated, Encirc, Guardian, Knauf, NSG Pilkington, O-I, Stoezle Glass Group, Velux and Verallia. Also included are technology suppliers, associations and those from academia.

Siemens and Glass Futures believe collaboration is essential for the glass industry to achieve its full potential, and in the coming months further stakeholders will be revealed.

Glass Futures' Centre of Excellence will advance projects in areas such as alternative fuels, robotics and automation, Industry 4.0 applications, and heat recovery.

Members can also use Glass Futures' network to share new technologies, tools and processes, thus driving forward the entire sector.

However, planners, system integrators, technology companies, and representatives from research, academia

and associations also belong to the glass ecosystem and benefit from it.

Members of Glass Futures also include the Universities of Cambridge, Leeds, Liverpool, and Sheffield.

Nearly 50 members have joined the collaboration to date, and can make use of the capabilities at the Centre of Excellence to develop new solutions through research and development.

Sustainability

The Glass Futures network particularly supports the industry in implementing global sustainability goals.

If the glass industry is to comply with EU environmental goals and the 1.5 °C target set in the Paris Agreement, while also ensuring that glass has a viable future, it must reduce emissions and its use of fossil fuels.

This means using more renewable energies, developing new materials and melting processes, and optimising processes all along the supply chain (Scopes 1, 2, and 3).

This approach requires substantial resources; the glass industry is energy-intensive and has traditionally used natural gas as its main energy source. At a glass packaging plant, the melting furnace accounts for well over half the total amount of energy used.

“The only way to increase sustainability is through greater energy efficiency, renewable energies, and new technical solutions. This means that we have to learn to use renewable energies more

efficiently while optimising processes,” says Mr. Fuller.

Glass Futures wants to play a leading role in helping the industry achieve its goal of becoming carbon neutral by 2050.

“That may sound like a long time, but climate change and regulations mean we have to move fast.

“At the same time, we can't neglect traditional goals such as plant availability, time to market, productivity, efficiency and product quality.”

Pilot plant

Glass Futures is commissioning a plant that will be driven by a single furnace and can manufacture both flat glass and container packaging.

Mr. Dave Fordham, Global Engagement Lead at Glass Futures, says: “Our melting furnace is industrial grade, with a daily capacity of 30 metric tons. It features exhaust-gas cleaning and heat recovery, and can be heated with natural gas, hydrogen, biofuels or electricity.

“We therefore offer optimal test conditions that companies can lease for research purposes to expand and rethink their manufacturing technologies.”

Companies cannot usually perform extensive tests in their own mass-production plants or those of their customers without bringing their entire production to a standstill, so this new facility has attracted much interest within the industry.

The project has also earned the support of major glass companies and the UK government. It is of interest not only to the glass industry, but also to industries such as ceramics, minerals, and steel manufacturing, which are similarly energy-intensive. There is good reason to hope that the insights gained by Glass Futures will be transferable.

Mr. Fordham continues: “We are also going to research and try out new raw materials for glassmaking that have a smaller carbon footprint, which has been identified by our members and the industry as a key area of interest to explore.”

Future-ready

With the help of Glass Futures, companies can, for example, develop prototypes and market-ready products much faster than in the past. This gain in speed is especially important during this period of transformation. Glass Futures also has small production capacities for manufacturing special glass, fiberglass,

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hollow glass and float glass.

"The needs-based provision of these capacities is ideal for companies that have specific requests," says Mr Fordham. "We need to think of the transformation as taking place within a large, coherent ecosystem because, ultimately, we all want to make glass a future-ready product. This requires high-quality, cost-effective, energy-efficient sustainable production."

Support

Siemens colleagues and consulting teams have provided support for Glass Futures since it was first conceived.

The Siemens experts combine glass and cross-industry expertise – from raw materials to the finished product – with capabilities that range from the field, automation, and process control levels to the company management level with its specific IT requirements.

Mr. S Haigh, Head of the Glass Sector – Siemens UK and Ireland (**Pic 2**), says: "With our IT/OT convergence expertise in particular, we can provide important ideas and inspiration.

"What's more, we have in-depth knowledge of lifecycle integration at both product and plant level."

In terms of technology, for example, Siemens supports Glass Futures with plant-wide integrated automation solutions that include planning and services, potentially throughout the entire lifecycle of the production plants.

This complete modular offering combines automation, drive, instrumentation, and energy technologies with information technology, digital planning, and services. The focus is on integrating all sub-plants and systems in one standardised automation structure with central data storage.

"The benefit of adopting an integrated automation platform is the ability to use the large amount of generated data to make quick, accurate and effective decisions, gaining a deeper understanding of the process in near real time," says Mr. Haigh.

At Glass Futures, the Simatic PCS neo process control system is used to collect knowledge during the operation of the furnace. This web-based process control system from Siemens incorporates advancements from areas such as the Internet of Things (IoT), digitalisation and modelling.

The control technology enables different people to work together on

the same project from any location – in other words, it offers multi-user engineering. Both the Simatic ET 200SP HA decentralised peripheral system and the flexible, user-friendly Simatic Compact Field Unit (CFU) are also used for the furnace.

Digitalisation therefore offers new communication options and network concepts all the way to field level – as well as a targeted and stable database.

Continuous emission monitoring systems (CEMS) from Siemens are utilised to measure and report upon the emissions from the process.

In addition, other Siemens technology is also used in the batch house. This includes Scalance – network components for industrial communication that form the basis of communication networks in manufacturing and process automation.

These components have been designed by Siemens specifically for use in industrial applications.

Siwarex and Sitrans are also integrated into the batch house. These two Siemens solutions incorporate weighing electronics and fill level technology to cover applications relating to weighing, flow, and fill level technology.

When it comes to glass forming, Glass Futures uses the Simatic WinCC process visualisation system that is integrated into the Totally Integrated Automation (TIA) Portal. Using this combination of Siemens solutions, visualisations for multiple applications can be created

quickly and efficiently.

Glass Futures puts its trust in Sinamics variable frequency drives from Siemens in many other areas, too, including exhaust-gas cleaning and the batch plant, for example. Simatic TIA, Simotics S-1FK7 servomotors, and Sinamics S120 variable frequency drives / drive systems are all important components of the glass forming systems.

WinCC and the Simatic IPC software tool are also used for these systems, along with Sitrans field units for measuring pressure, temperature, and flow, and Sipart positioners for pneumatic valves.

The future

"We are already looking forward to the near future, when everything will have fallen into place, the furnace will be operational, and the industry will be able to reap the benefits of new insights for years to come," says Mr. Fuller.

"Above all, however, we are looking forward to future collaboration with our partners – and we'd like to invite them all to make use of the broad framework and flexible basis that Glass Futures offers companies in the glass industry and related sectors." ■

Siemens, Erlangen, Germany

<https://www.siemens.com/global/en.html>

Glass Futures, St Helens, UK

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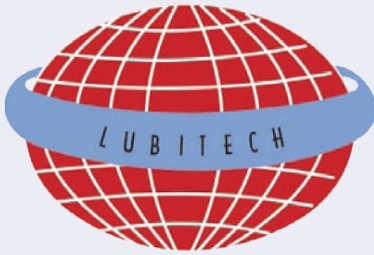


◀ Pic 2. Mr. Stephen Haigh, Head of the Glass Sector – Siemens UK and Ireland.

“With our IT/OT convergence expertise in particular, we can provide important ideas and inspiration. What's more, we have in-depth knowledge of lifecycle integration at both product and plant level.”

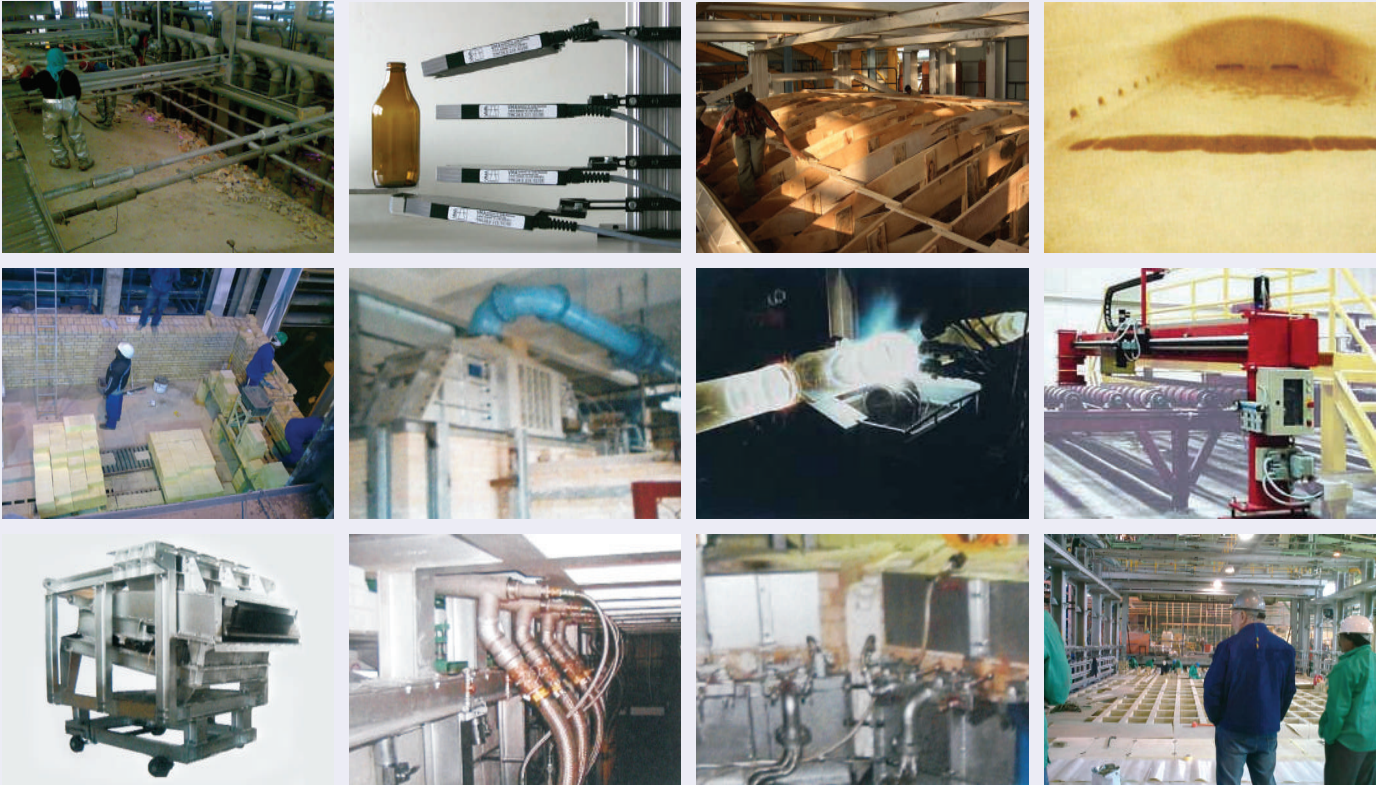
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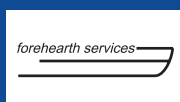


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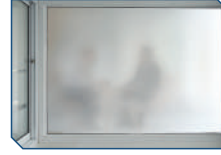
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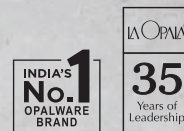
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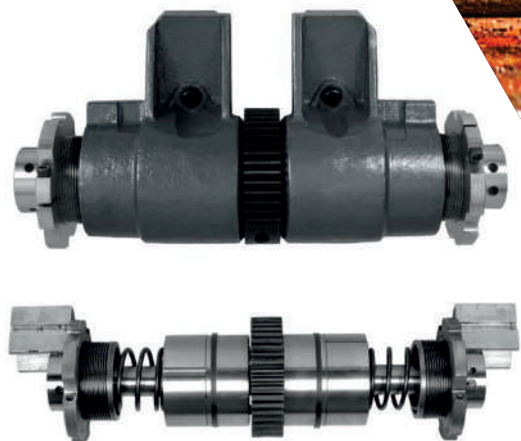
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