

# Kañch



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Quarterly Journal of The All India Glass Manufacturers' Federation

**Bi-lingual**

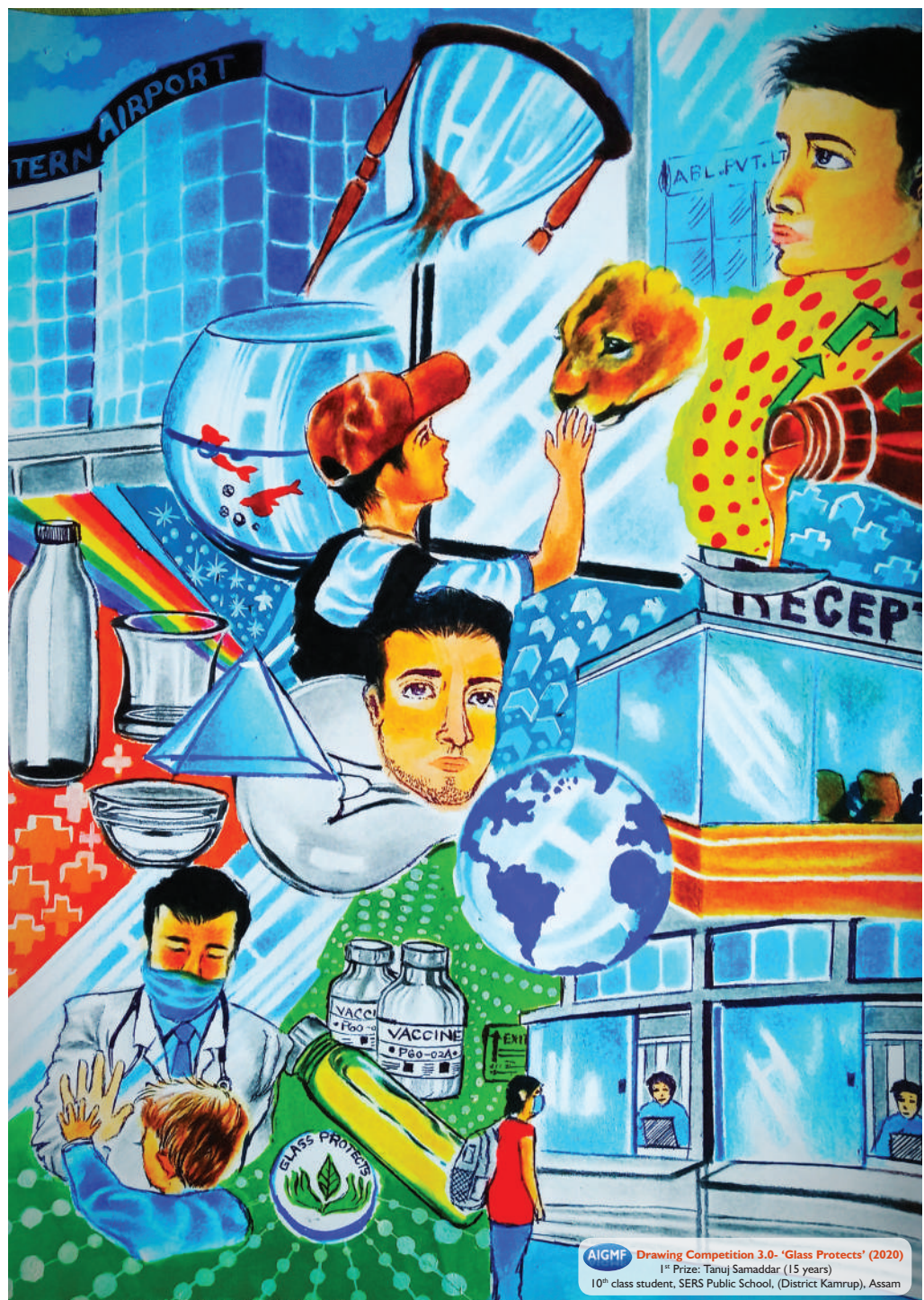
## Special Feature

- Apex Industry Body launches Children's vision on 'Glass Protects'
- 3<sup>rd</sup> AIGMF Glass Awards
- Glass News
- 'Glass Protects'... says School Children
- Delivering a Holistic Approach to Supply Chain Management
- Glass-Ceramics - A Challenging Material
- Virtual Conference on Glass Problems
- CO<sub>2</sub> Neutral Glass Production - A Route to Reduce CO<sub>2</sub> Emissions
- MSME Schemes and its Role in Industry
- Function through Technology

## Upcoming Events

(via Video- Conference)

- World Soda Ash Conference (Oct 19-22)
- Virtual Conference on Glass Problems (Oct 26-30)
- Executive Committee Meeting (Oct 31)



AIGMF Drawing Competition 3.0- 'Glass Protects' (2020)  
1<sup>st</sup> Prize: Tanuj Samaddar (15 years)  
10<sup>th</sup> class student, SERS Public School, (District Kamrup), Assam

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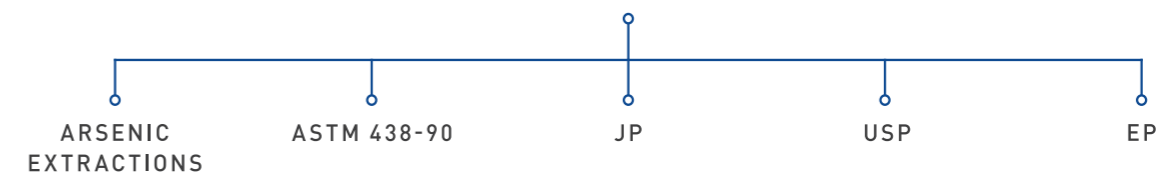


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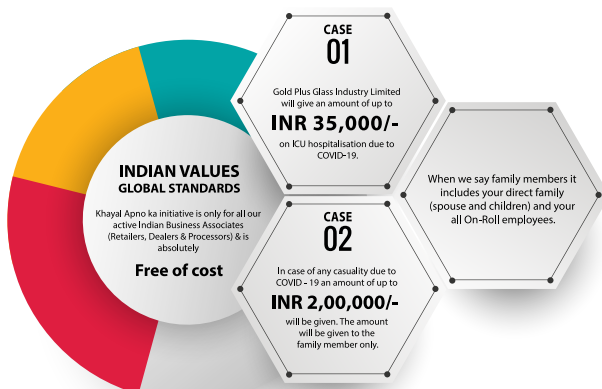
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Quarterly Journal of Glass Industry, published and printed by Vinit Kapur on behalf of The All India Glass Manufacturers' Federation from 812, New Delhi House, 27 Barakhamba Road, New Delhi - 110001 and printed at New United Process, A-26, Ph-II, Naraina Indl. Area, New Delhi-110028

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**Editor** MOHAN LALVANI

Complimentary copy for Members / Government Departments / NGO's and those connected with Glass Industry

**Others:** Price (excluding bank charges):

**Indian Companies :** ₹ 125 per copy

Annual Subscription ₹ 450

**Foreign Companies :** US\$ 25 per copy

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Quarterly Journal of **THE ALL INDIA GLASS MANUFACTURERS' FEDERATION**

Vol. 8 | No. 2 | July-September 2020

## Contents

From President's Desk	5
Advertise in Kanch	6
Apex Industry Body launches Children's vision on 'Glass Protects'	7
3 <sup>rd</sup> AIGMF Glass Awards	10
Glass News	12
'Glass Protects' ... says School Children	23
Delivering a Holistic Approach to Supply Chain Management	28
Membership of the Federation	29
Glass-Ceramics - A Challenging Material	33
Virtual Conference on Glass Problems	37
CO <sub>2</sub> Neutral Glass Production – A Route to Reduce CO <sub>2</sub> Emissions	42
MSME Schemes and its Role in Industry	46
List of Advertisers	48
Function through Technology	50
in Kanch Werben	52



# A STRATEGY AS TRANSPARENT AS GLASS

## **HEDGE FROM ADVERSE FLUCTUATIONS IN ENERGY PRICES**

For glass manufacturing units, energy costs account for approximately 30% of its manufacturing costs and is dependent on natural gas combustion to heat furnaces and melt raw materials to form glass. Any fluctuation in natural gas prices affects glass manufacturing adversely. This significant financial risk can be tackled through hedging thus ensuring smooth running of glass manufacturing business. Energy derivatives act as a tool to provide a cushion from such inevitable risk.



**MCX INVESTOR PROTECTION FUND**

## From President's Desk

In the 2<sup>nd</sup> quarter, the Executive Committee met twice over the Video-conference on July 31 and Sept 15 to discuss industry issues including the pandemic situation. Other online meetings were held with the Ministry of Commerce and Trade Chambers on issues of Controlling low quality imports from China, Support for Glass Industry (under HS Code-Chapter 70) in the context of outbreak of COVID-19, Anti-Dumping Duty cases on Soda- Ash, etc.

To commemorate International Youth Day, AIGMF invited online entries from children between 7-16 years to participate in the 'Drawing Competition 3.0' on the theme 'Glass Protects'. A jury of former Presidents, Mr. Sanjay Somany, Mr. Sanjay Ganjoo & Mr. S C Bansal picked the top 3 drawings out of 3,000 entries received from schools across India.

On Sept 15, Chief Guest Prof. Alicia Durán (Research Professor CSIC-Spanish National Research Council) and President of International Commission on Glass, Madrid, SPAIN unveiled a touring exhibition on 'Glass Protects' at the Annual General Meeting of the AIGMF. The roadshow will travel to other cities showcasing the vital role of Glass, being the only 100% recyclable packaging and building material. A digitized version of the exhibits may be viewed at: [www.aimf.com](http://www.aimf.com)

Dr. K Muraleedharan, Director, Council of Scientific & Industrial Research - Central Glass & Ceramic Research Institute (CSIR-CGCRI), Kolkata felicitated the winning students. As a token of appreciation, the first 200 entrants to the drawing competition were presented with a glass water bottle showcasing the Swachh Bharat Abhiyaan (Clean India Campaign) Logo (courtesy of HNG & Ind. Ltd).

Former Presidents; Mr. Sanjay Somany and Mr. Mukul Somany gave the prestigious annual 'CK Somany Award for Innovation and Technology' to Dr. Mukul Chandra Paul, Sr. Principal Scientist, CGCRI, Kolkata. The 'Balkrishna Gupta Award for Exports' was bestowed to M/s La Opala RG Ltd., by the Former President, Mr. Pradeep Gupta.

The Instilling of Quality, Safety & Environmental consciousness in the minds of the next generation is a mantle the Glass Industry carries faithfully. I am grateful for the unprecedented participation and efforts of the students and congratulate them all heartily. The worthy recognition of Dr. Mukul Chandra Paul and La Opala RG Ltd., for their tremendous contribution in the fields of Innovation & Technology and Exports respectively, is a matter of great pride for the Industry.

New Office Bearers as well as Executive Committee Members for the year 2020-21 were elected at the 1<sup>st</sup> ever Annual General Body Meeting held virtually on Sept 15. I take the opportunity to welcome members of the new team and express gratitude and appreciation to the outgoing President, Mr. Raj Kumar Mittal for his relentless support. The newly elected Executive Committee is keen to work on new avenues to promote glass packaging which is 100% sustainable and is evident from its huge worldwide demand for glass vials related to Covid-19 vaccination. At the same time Industry is fully geared to provide green packaging which is in Sync with the Prime Minister's vision for a better and safe environment.

The next Executive Committee Meeting is slated to be held Online on Oct 31 @ 1100 hrs (Saturday). We look forward to welcoming one and all in which we plan to launch an online 2021 calendar on 'Glass Protects' and to discuss industry issues and other projects ■



A handwritten signature in blue ink that reads "Sanjay Somany".

President AIGMF

and Vice - President, HNG & Inds. Ltd.



## October - December 2020 - Issue

will carry detailed coverage of the AIGMF Executive Committee Meetings, glasstec VIRTUAL, World Soda Ash Conference, Conference on Glass Problems, Technical Articles, Glass News, other supported Events and more.

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# Apex Industry Body launches Children's vision on 'Glass Protects'

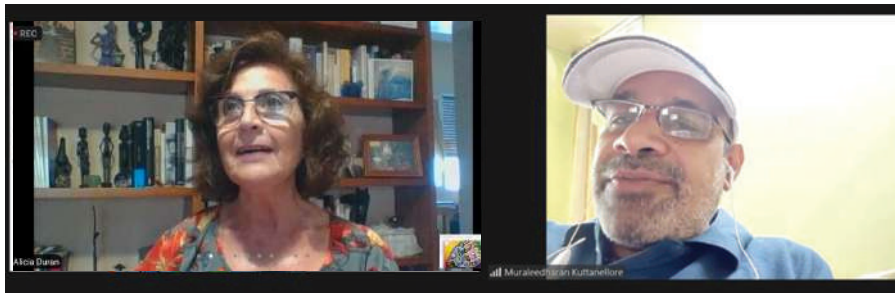
## School children and outstanding Members honoured

(September 15, Virtual Event)

Chief Guest Prof. Alicia Durán (Research Professor CSIC-Spanish National Research Council) and President of International Commission on Glass, Madrid, SPAIN unveiled a touring exhibition on 'Glass Protects' at the Annual General Meeting of the AIGMF held online amidst Pandemic conditions.

The Touring Exhibition is the collection of select drawings and paintings by school children. To commemorate International Youth Day, The All India Glass Manufacturers' Federation (AIGMF) invited online entries from children between 7-16 years to participate in the 'Drawing Competition 3.0' on the theme 'Glass Protects'.

Former Presidents, Mr. Sanjay Somany, Mr. Sanjay Ganjoo and Mr. S C Bansal were jury members who



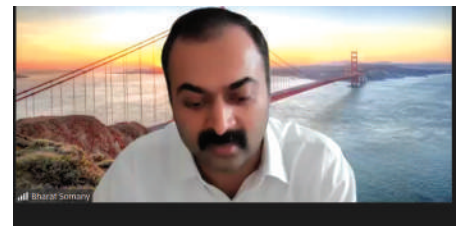
judged top 3 drawings out of 3,000 entries received from schools across India.

**Dr. K Muraleedharan, Director, CSIR-Central Glass & Ceramic Research Institute (CSIR-CGCRI), Kolkata** felicitated the winning students.

1<sup>st</sup> Prize (Rs. 15,000) was given to **Tanuj Samaddar** aged 15 years, 10<sup>th</sup> class student of **SERS Public School (District Kamrup), Assam;**

2<sup>nd</sup> Prize (Rs. 10,000) was given to **Priyal Singh** aged 13 years, 8<sup>th</sup> class student of **Global City International School, Bangalore;**

3<sup>rd</sup> Prize (Rs. 5,000) was given to **S. Christy Laura** aged 14 years, 9<sup>th</sup> class student of **Sri Akilandeswari Vidyalaya, (Trichy) Tamil Nadu.**

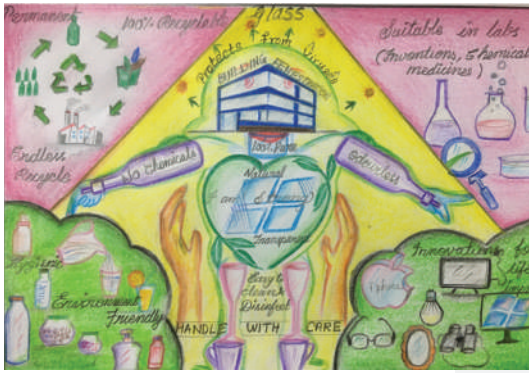


A digitized version of the exhibits may be viewed at: [www.aigmf.com](http://www.aigmf.com)



The road show will travel to other cities showcasing the vital role of Glass, being the only 100% recyclable building and packaging material.

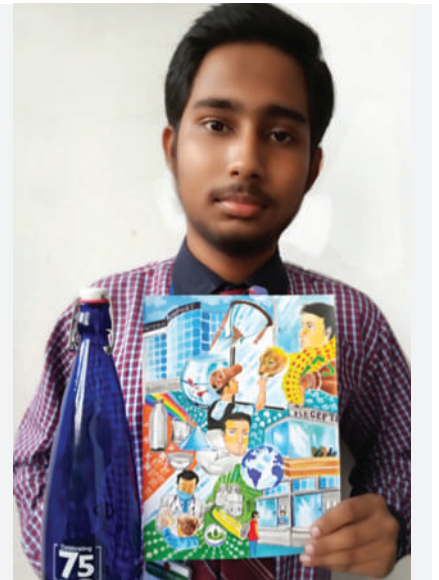




1<sup>st</sup> winner Tanuj Samaddar says, "Through my painting I have reflected the Utility of glasses in our day to day life. Glasses are used in constructing marvellous structures, Airports, Offices and also used in our houses. They are used in the reception centres etc. Glass packaging also helps protect the environment. Glass is 100% recyclable."

"I have also drawn Glass utensils of our daily use like Glass bottles, Glass bowls, and glasses for drinking water and for various other purposes. Glass doesn't chemically react with its contents. Glass keeps the contents healthy and safe.

I have also focused on the importance of glasses in the field of education, e.g.: I have drawn a prism made of Glass to express its importance in various science experiments involving the dispersion of light. Glass vials are going to play a very important role to get better access to COVID-19 vaccine. And remembering the current situation, I have also drawn a heart touching picture of a little boy bidding adieu to his father who is a doctor, both of them are separated by a Glass partition only to prevent getting infected. Indeed, glasses do protect. Syrups kept in glass containers remain safe. Glasses are 100% recyclable. A man envisioning a world made of glass (showing that glasses are going to replace plastics and are going to contribute to Nature's wellness) has taken the Central stage in my painting. Glasses protect the environment, glasses protect us, glasses



1<sup>st</sup> winner Tanuj Samaddar protect foodstuffs, medicines, edible liquid items and what not." So after all these I have realised that: 'GLASS PROTECTS'.

2<sup>nd</sup> winner Priyal Singh says, "Through my drawing I have tried to depict the use of glass in the various stages of life. It protects us from viruses and it is hygienic, hence, items made of glass are a part of our day to day life. From a milk bottle of a baby to the windshield of a car we use glass in different forms. Jam, ketchup, pickle, etc., come in glass bottles, equipment used in laboratory, cosmetics like perfumes and nail polishes, screen of laptops, mobile, CFLs etc., are all made of glass. It is fully inert and recyclable, hence it is safe for our nature, Environment and us".



2<sup>nd</sup> winner Priyal Singh

3<sup>rd</sup> winner S. Christy Laura says “One of the simple yet significant discovery which plays a huge role in today’s world is inevitable a ‘Glass’.

Glass has its own uniqueness which makes it a useful end product. When glass is coated with lens it serves as a spectacle for people when their eyes become weak.

With spectacles the power required for the weak is compensated, also glass act as a protector and a house for fishes and other aquatic pet animals from its prey. Glass is an excellent material for keeping the volatile substances in it due to its inert nature.

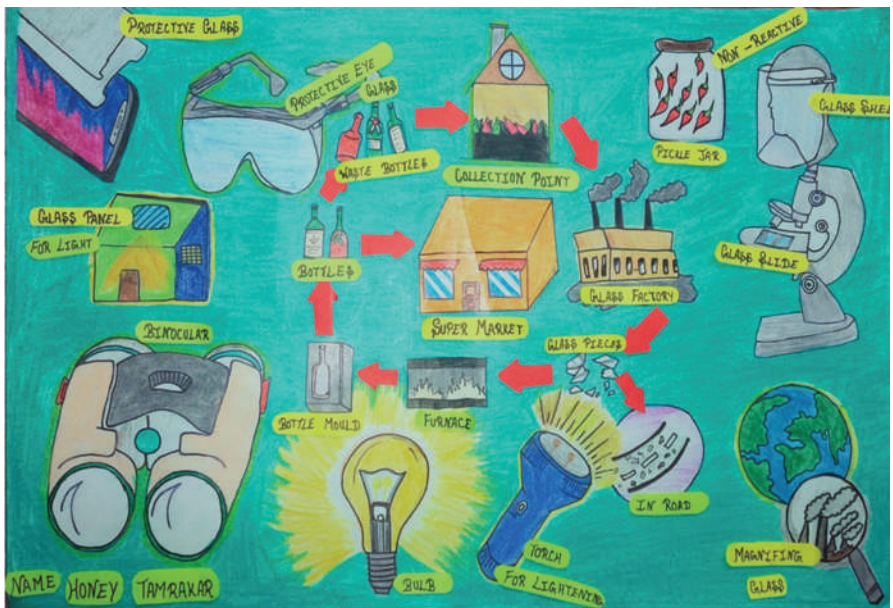


3<sup>rd</sup> winner S. Christy Laura

From using it as a shield in car from dust and other pollution to using it as a poetic metaphor glass occupies its position in all form.

As a token of appreciation, the first 200 drawing competition entrants were gifted a glass water bottle with the Swachh Bharat Abhiyaan (Clean India Campaign) Logo (manufactured by Hindustan National Glass & Industries Ltd.) ■

Select photos of the event can be downloaded from : <http://www.aigmf.com/past-events.php>



## 3<sup>rd</sup> AIGMF Glass Awards

Former Presidents; Mr. Sanjay Somany and Mr. Mukul Somany gave the prestigious annual 'CK Somany Award for Innovation and Technology' to Dr. Mukul Chandra Paul, Sr. Principal Scientist, Central Glass & Ceramic Research Institute, Kolkata. 'Balkrishna Gupta Award for Exports' was given to M/s La Opala RG Ltd., by the Former President, Mr. Pradeep Gupta.

**Dr. Mukul Chandra Paul** is a senior OSA member along with IEEE and life member of Materials Research Society of India (MRSI) and Indian Ceramic Society (ICS). He holds 7 U.S. patents, 4 Indian patents and published 7 book chapters, edited two books on 'Fiber Laser' and authored over 300 SCI papers in peer-reviewed journals and Conferences. Dr. Paul has received many awards, including BOYSCAST Fellowship from DST, IEEE Photonic Distinguished Lecture Award by Multimedia University, Malaysia, CSIR Technology Award, CSIR Technology Award for Innovation, Senior Visiting Scientist award by National Taiwan University of Technology (NTUT), Taiwan etc.

**La Opala RG Ltd.**, introduced Opal Glass technology in India in the year 1988. Since then, it has continuously captured the lifestyle market, and today it is one of the most popular tableware

brands of India. In its endeavor to service the consumers, they have not only captured the Indian Market but have a supply chain to over 40 countries around the globe."

The Jury for Glass awards comprised of Dr. K. Annapurna, Senior Principal Scientist, Glass Division, Central Glass & Ceramic Research Institute (CSIR-CGCRI), Kolkata; Mr. Dave Fordham, Publisher, Glass Worldwide, London (UK); Mr. Sanjay Somany, Chairman & Managing Director – HNG & Industries Ltd.; Mr. M.K. Bansal, Shri Sitaram Glass Works, Firozabad (UP) and Mr. Vinit Kapur, Secretary AIGMF.

Newly elected AIGMF President, Mr. Bharat Somany said, "The Instilling of Quality, Safety & Environmental consciousness in the minds of the next generation is a mantle the Glass Industry carries faithfully. I am grateful for the unprecedented participation and efforts of the students and congratulate them all heartily. The worthy recognition of Dr. Mukul Chandra Paul and La Opala RG Ltd., for their tremendous contribution in the fields of Technology Innovation and Exports respectively, is a matter of great pride for the Industry".

Dr. K. Annapurna, Sr. Principal Scientist, CGCRI said, "The laudable contributions in technology and innovation by Dr. Mukul Chandra Paul

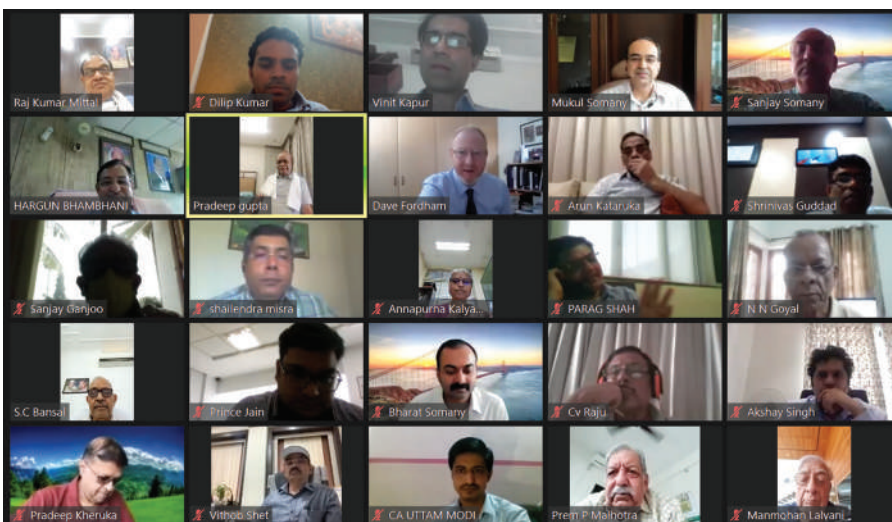


Dr. Mukul Chandra Paul, CGCRI



Mr. Ajit JhunJhunwala, La Opala is simply impressive indeed to confer prestigious C K Somany Award. Similarly, La Opala RG Ltd., with its well accepted brand name not only nationally but also globally which is evident from its exports was a suitable choice for the esteemed Balakrishna Gupta Award. Congratulations to both Dr. Mukul Chandra Paul and La Opala RG Ltd., for this accomplishment."

"Congratulations to Dr. Mukul Chandra Paul and La Opala RG Ltd., on their respective AIGMF awards. Dr. Mukul Chandra Paul's tremendous achievements in the field of technology were clearly evident to the judging panel and he is a more than worthy winner of the prestigious 2020 CK Somany Award. With a brand that is appreciated globally, it is also very fitting for La Opala to receive official recognition of their exceptional international trade with this year's Balkrishna Gupta Award for Exports." said Mr. Dave Fordham, Publisher of Glass Worldwide, the preferred journal of AIGMF in association with Kanch (quarterly journal of the AIGMF) ■



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# GLASS News

## NEW OFFICE BEARERS ELECTED AT THE 1<sup>ST</sup> EVER VIRTUAL-AGM OF THE AIGMF

Following were elected as Office Bearers of the AIGMF for the Year 2020–21 at the 1<sup>st</sup> ever Annual General Body Meeting held virtually on Sept 15 under Pandemic conditions:

**President** - Mr. Bharat Somany, HNG & Ind. Ltd., Bahadurgarh

**Sr. Vice President**- Mr. Sanjay Agarwal, Kwality Glass Works, Firozabad

**Vice President**- Mr. Rajesh Khosla, AGI glaspac, Hyderabad

**Hon. General Secretary** – Mr. Hargun C. Bhambani, Sunrise Glass Ind. Pvt. Ltd., Gujarat

**Hon. Treasurer** – Mr. Mukesh Kumar Bansal, Sri Sitaram Glass Works, Firozabad

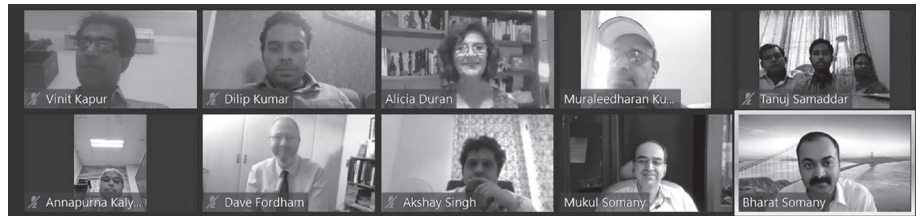
**On the recommendations of Zonal Associations following were nominated as Members of the Executive Committee for the year 2020-21:**

### Eastern India Glass Manufacturers' Association (EIGMA)

1. Mr. Vinay Saran - HNG & Inds. Ltd., Kolkata

### Northern India Glass Manufacturers' Association (NIGMA)

1. Mr. Gopal Ganatra - Asahi India Glass Ltd., Gurgaon (Haryana)
2. Mr. Shailendra Kumar Misra - HNG & Inds. Ltd., Bahadurgarh



### South India Glass Manufacturers' Association (SIGMA)

1. Mr. Sardar Akshay Singh - SGD Pharma Ltd., Hyderabad

### U.P. Glass Manufacturers' Syndicate (UPGMS)

1. Mr. Manish Bansal - G.M. Glass Works No. 2, Firozabad
2. Mr. Sanjay Mittal - Farukhi Glass Industries, Firozabad
3. Mr. Anurag Mittal - Geeta Glass Works, Firozabad
4. Mr. Anurag Gupta - Om Glass Works (P) Ltd., Firozabad
5. Mr. Nitesh Goyal - Goyal Glassware (P) Ltd., Firozabad
6. Mr. Devansh Gupta - Tigersons Glass Inds. (P) Ltd., Firozabad

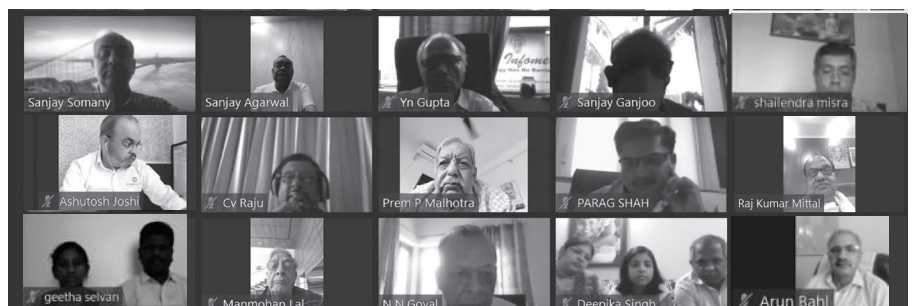
### Western India Glass Manufacturers' Association (WIGMA)

1. Mr. G.K. Sarda - Empire Ind. Ltd., Vitrum Glass, Mumbai
2. Mr. Ashok Jain - Borosil Ltd., Mumbai

3. Mr. Hemal Thakor - Piramal Glass (P) Ltd., Mumbai
4. Mr. Purvish Mayuresh Shah - Gopal Glass Works Ltd., Ahmedabad

**The following are co-opted members of the Executive Committee for the year 2020-21:**

1. Mr. Sanjay Somany - HNG & Ind. Ltd., Bahadurgarh
2. Mr. Pradeep Kumar Gupta - Om Glass Works Pvt. Ltd. Firozabad
3. Mr. P K Kheruka - Borosil Ltd., Mumbai
4. Mr. Mukul Somany - HNG & Ind. Ltd., Kolkata
5. Mr. SC Bansal - Adarsh Kanch Udyog, Firozabad
6. Mr. S K Jhunjhunwala - La Opala RG Ltd., Kolkata
7. Mr. Sanjay Ganjoo - Asahi India Glass Ltd., Mumbai
8. Mr. Raj Kumar Mittal - Mittal Group of Glass Industries, Firozabad



## PREM MALHOTRA APPOINTED AS SPECIAL CORRESPONDENT KANCH

Mr. Prem Malhotra of Glacera Engineers was appointed as Special Correspondent for Kanch and Glass News in the Honorary position. His role was commendable especially for his contributions to the stories related to glasstec, glasspex, China Glass, IGBC and most recent virtual meetings of the AIGMF held during Pandemic.



Mr. Malhotra holds an experience of over 45 years in the glass manufacturing. His company Glacera Engineers is one of the leading consultants to the glass industry in India.

*Glacera Engineers specializes in turnkey projects for glass plants producing a wide range of glass products such as bottles, tumblers, bulbs, tubes, crystal ware, sheet glass, refills, laboratory ware, etc. The company is always keeping abreast with the latest in glass technology and continuously strives towards improving the efficiency and eco-friendliness of glass plants.*

## AIGMF MEMBER INFORMATION

Pandemic has seen a heavy traffic of stakeholders logging onto AIGMF's website with regard to Member information, publications i.e. Indian Glass Directory, Kanch, Glass News and online library of Glass Worldwide articles in association with Kanch.

Secretariat is trying to keep Members information up-to-date, which is always in great demand. All Members are requested to check their company details at <https://aimf.com/members.php> and revert with updates (if any).

Also, to receive regular notifications, Members may register important mobile #'s for the official WhatsApp Group at [info@aimf.com](mailto:info@aimf.com)

## KK SHARMA JOINS AS ADVISOR FOR EMERGE GLASS

After attaining superannuation from HNG, Mr. KK Sharma has joined M/s Emerge Glass Pvt. Ltd., as their Advisor.

Possessing two Masters Degrees and trained at OI USA, Mr. Sharma is a true Glass professional, having 40+ years' working experience in India, Gulf, European countries, Australia, New Zealand and South Africa.



Having a long association with HNG, Mr. Sharma has been privileged to work in all the Plants of the Group.

An immediate Past-President of the Northern India Glass Manufacturers' Association (NIGMA), Mr. Sharma continues to serve as Member Editorial Board of Kanch since 2012.

## PAWAN KUMAR SHUKLA TAKES CHARGE AS THE NEW MD FOR SCHOTT INDIA

SCHOTT AG, has announced Mr. Pawan Kumar Shukla as the new Managing Director for SCHOTT



Glass India. Mr. Shukla brings over 25 years in the glass, lighting, pipes and electronics industry and comes with a strong background in techno-commercials. Prior to this role, he was the President Operations at Surya Roshni Ltd., an Indian multinational manufacturer for specialty glass tubing and lighting.

An alumnus of the prestigious Indian Institute of Technology, Kanpur, in ceramic engineering as well as material science and metallurgy, Mr. Shukla has also worked with Corning JV in the CRT Division as a manufacturing head for twelve years. Commenting on his new role, he said, "India is a frontrunner of the global pharma industry and primary pharma packaging is one of the most vital components in the entire production chain. I am proud to be associated with SCHOTT, being one of the oldest and most trusted manufacturers of tubular glass worldwide. While the domestic market is our key focus, our India plant also caters to the Asian market, thereby contributing to the pharmaceutical industry and the Indian government's vision of becoming a global pharmaceutical hub."

At the Jambusar facility, Mr. Shukla's main aim would be to achieve the full potential of his team by empowering them with responsibility, trust and acknowledgement. Further talking about the company's overall commitment to support the Indian



pharma industry, he added, “SCHOTT also takes awareness of the Indian Health Ministry’s initiative to provide affordable and accessible healthcare to its citizens. Moreover, this year has brought many challenges due to the Coronavirus pandemic. But we are proud to be a contributor in a sector, where everyone has stepped up to fight the novel virus. We remain committed in our support to the country’s pharmaceutical value chains, by providing high-quality glass products for pharma packaging while ensuring the highest global safety standards.”

Mr. Patrick Markschlaeger, Executive Vice-President, SCHOTT AG, Business Unit Tubing noted, “SCHOTT’s Jambusar plant is one of our most advanced tubing plants worldwide. The quality of glass produced here is at par with any other production site, including Germany.” “We are pleased that the manufacturing site is under the capable leadership of Mr. Shukla, who is an industry stalwart himself. He brings with him decades of technical and managerial expertise in the glass manufacturing space. We look forward to seeing SCHOTT India achieve even higher standards and success under his guidance”, he said.

Presently, SCHOTT is delivering its highly specialised Fiolax® glass tubes to leading pharma packaging players in India and abroad for preparing primary packaging products such as vials, syringes, etc. Supporting the world’s fight against COVID-19 with vials capable of holding up to 2 billion vaccination doses, the German leader has reached agreements and started supplying to leading pharmaceutical companies including key players in India.

Given the exponential rise in demand for quality glass for pharma packaging, SCHOTT had inaugurated a new tank facility in its Jambusar plant, following an investment of €21

million in 2018. Even before the Coronavirus pandemic, the company had forecasted a rapid growth trend, and had thus committed additional investments of €26 million for yet another tank facility last year. With a combined investment of €47 million and two new plants, SCHOTT’s India plant is well on track to double its production capacity, enabling supply of its Fiolax® glass tubing for both domestic and export demands.

### GERMAN PLANT UPGRADE FEATURES ADVANCED HEYE PRODUCTION TECHNOLOGIES

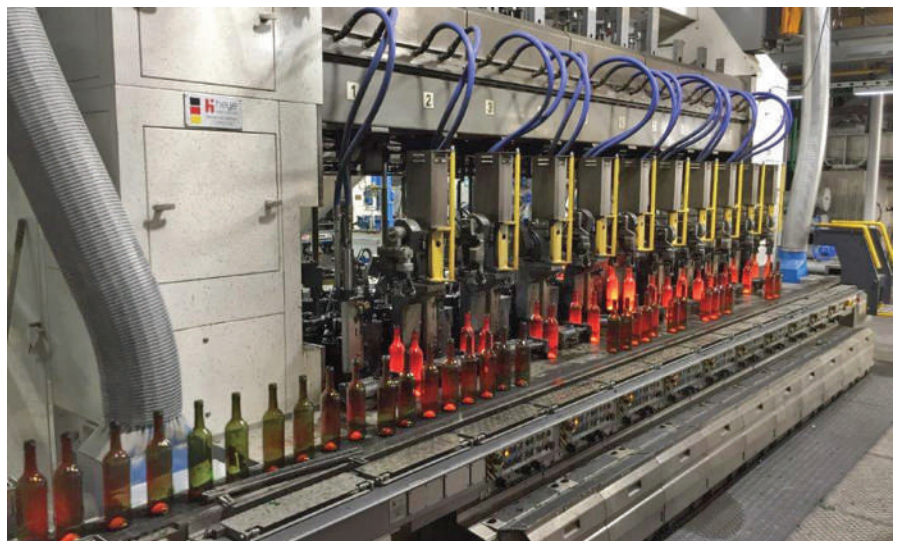
Ardagh Group’s Germersheim glass production facility in south west Germany has been the subject of a substantial investment in recent months. One of the facility’s two melting furnaces has been completely rebuilt and as part of associated production shop investment projects, some of the glass container industry’s most advanced manufacturing technologies have been purchased. This includes specialist production machinery from Heye International GmbH, one of the facility’s longstanding partners.

Germersheim is one of eight plants operated by Ardagh in Germany, located near Speyer, where some 280 people are employed.

An intensive 150 day repair schedule was undertaken to make production more efficient and environmentally-friendly, preparing the Germersheim glassworks for continued successful operation in the future. As well as renewing the green furnace, the batch plant has been upgraded and new NNPB production equipment has been installed. An annealing Lehr has been replaced, as well as the basement cullet return system, while existing supply facilities for compressed air, gas, water and electricity have been either rebuilt or overhauled.

The rebuilt regenerative melting furnace serves four production lines, two of which have been equipped with the latest SpeedLine IS machines from Heye International. This equipment features the safe, user-friendly, easy-to-clean, flexible and fast Multilevel security concept. It is designed to comply with HACCP standards and employs a modular design for simplified maintenance and service. The use of standardised components reduces the number of spare parts required, while existing machine mechanisms are also reusable.

One of the new IS machines is a 12-section 6 1/4in double gob installation, while the second is a 10-section 5in double gob SpeedLine. The production shop’s other two lines



feature existing Heye IS machines. The feeders for these lines have been modernised with the latest Heye front plates and spout casings.

Commenting on the successful completion of this project, Mr. Stefan Döring, Technical Service Manager for the Germersheim facility, expressed his team's positive response to the working relationship established with Heye International engineers. "There was a very good co-operation with respect to pre-works engineering, FAT organisation, machine installation and commissioning" he confirmed.

### **SCHOTT AG DELIVERS PHARMA VIALS TO PACKAGE 2 BILLION DOSES OF COVID-19 VACCINES; INDIAN JV SCHOTT KAISHA LEADS THE SUPPLY OF VIALS FROM INDIA**

German glass manufacturing giant SCHOTT AG is supporting the world's fight against COVID-19 with vials capable of holding up to 2 billion vaccination doses. The pharma glass and packaging specialist has reached agreements with leading pharmaceutical companies, including key players in India. The global agreements became effective in the month of July and first vials are already being delivered to companies in Asia, North America and Europe.

In India, SCHOTT's 50-50 joint venture, SCHOTT KAISHA is supplying vials for COVID-19 vaccines to Serum Institute (India) and several other players. The joint venture operates four manufacturing facilities in the country located in Jambusar and Umarsadi in Gujarat, Daman, and Baddi in Himachal Pradesh. In addition, the company produces the pharmaceutical glass tubing for the packaging itself at its global sites including one in Jambusar in Gujarat.

The specialty glass pioneer is ideally positioned to meet the challenging

demand situation since it had started an investment program into its pharma business of 1 billion USD in 2019 already. In India, this includes a three-digit million-euro number for new Borosilicate glass melting tanks, and for its packaging operations an entirely new production site as well as new modules and lines.

All of SCHOTT's 20 production sites for pharma glass and packaging are validated by regulatory bodies and pharma companies. This means that additional capacities can be used immediately without further regulatory efforts. Even before the expansions, SCHOTT already produced more than 11 billion pharma containers globally for life-saving drugs per annum, of which a nine-digit figure is manufactured locally in India.

"SCHOTT KAISHA has been known to scale up extremely fast in order to meet customer demands over the past decade, which is also evident from its two new facilities in Umarsadi and Baddi. Thanks to our strong supply chain and support from SCHOTT's global sites, we are in a very strong position to meet our customer's current and anticipated requirements. We are confident that we can quickly expand our production capabilities further, in case demand arises", shared Mr. Rishad Dadachanji, Director, SCHOTT KAISHA.

More importantly, all major pharma companies and many other players in the market have been processing the company's vials on their fill and finish lines for many years. "Hence, no time-consuming adaptations of fill and finish equipment will slow down vaccine distribution. As time is a luxury the industry doesn't have at the moment, it is common sense to rely on tried-and-true packaging solutions," said Mr. Dadachanji.

### **SUPPORTING PHARMACEUTICAL GLASSMAKERS TO MAXIMISE PRODUCTIVITY**

The race is on around the world to produce adequate quantities of glass vials for a potential coronavirus vaccine, making high quality packaging available as soon as the vaccine has been perfected. To accommodate the vast levels of demand involved, it is anticipated that global production of pharmaceutical vials needs to be ramped up by 5-10% within two years.

IRIS Inspection machines is supporting glassmakers in their drive for additional productivity, working closely with such customers as Bormioli Pharma, Gerresheimer Group and SGD Pharma at their various manufacturing locations throughout



Europe, the Americas, India and China. Few industrial sectors have such stringent quality requirements as the pharmaceutical industry and to meet these exacting specifications, companies are increasingly utilizing intelligent inspection solutions.

The specialist inspection technologies developed in France by IRIS Inspection machines provide essential solutions for the identification of dimensional, finish and low contrast surface defects. These technologies have been perfected in close consultation with the world's leading pharmaceutical glassware manufacturers.

Evolution DIM NEO non-contact inspection equipment is designed to perform a series of critical dimensional inspection tasks, for example, measuring height, minimum and maximum diameter, roundness and barrelling. Among the defects identified are tiny body deformations, non-round sidewalls, diameter deformations and other minor geometric defects in the body, bulged or sunken sidewalls, as well as ware with an out-of-specification height.

Improved verticality inspection is provided with 3D, the Evolution DIM machine calculating the verticality of each container to measure the body or finish shifting via precise, 360° verticality detection. Verticality defects detected with this solution include lean articles, offset finish and bent neck.

A dedicated module provides a series of accurate finish measurements, identifying minimum and maximum external finish diameter, finish height and flatness, plus the height of the finish ring. The deformation defects encountered include bulged finishes and unfilled ware.

The Evolution DIM NEO equipment features a compact design, with up to three body cameras, up to two finish cameras and a dedicated light source.

Also available from IRIS Inspection machines is the Evolution 5 NEO

finish inspection module. This solution has been developed to identify such sealing surface defects as a shipped finish, LOF or an unfilled finish.

Another of the company's developments is the EVO Ultimate NEO machine for the identification of transparent surface defects, including surface blisters and small laps.

Governments and drug companies worldwide are placing huge orders worth hundreds of millions of dollars and encouraging the makers of glass vials and syringes to add manufacturing capacity. Although this initiative requires immediate preparation, the glass industry is confident that it is a surmountable challenge. IRIS Inspection machines and its innovative ware inspection technologies are available to support the world's specialist pharmaceutical glassmakers to meet these challenges.

### **VISY ACQUIRES GLASS MANUFACTURER OWENS ILLINOIS**

Australian recycling giant Visy has entered into an agreement to acquire the Australian and New Zealand glass manufacturing business of Owens Illinois (O-I).

The deal, worth almost \$1 billion, is one of the biggest manufacturing acquisitions by an Australian-owned business in Australian business history.

Visy would employ 7200 people in manufacturing jobs post acquisition.

Visy Executive Chairman Mr. Anthony Pratt said, "*manufacturing has never been more important to Australia's future.*"

"*Importantly we will bring Visy's sustainability culture to O-I, aiming to increase recycled content of glass bottles from 1/3 to 2/3,*" he said.

O-I is the largest manufacturer of glass bottles and containers in Australia-

New Zealand with factories in Sydney, Melbourne, Brisbane, Adelaide and Auckland.

Visy, which is owned by Mr. Anthony Pratt and his two sisters is one of the world's largest privately owned recycling and packaging companies.

The addition of glass manufacturing to Visy's portfolio is in line with the company's long-term strategy of creating local manufacturing job opportunities and supporting local communities.

### **INDIAN RESEARCHERS DEMYSTIFY PROCESS OF TRANSFORMATION OF GLASS INTO CRYSTAL**

A team of Indian researchers has demystified devitrification, which is the transformation of glass into a crystal, and visualised the process for the first time in experiments, the Indian Institute of Science said. Glass is amorphous in nature, its atomic structure does not involve the repetitive arrangement seen in crystalline materials, the Bengaluru-based IISc noted in a statement. But occasionally, it undergoes a process called devitrification, which is the transformation of glass into a crystal often an unwanted process in industries.

The dynamics of devitrification remain poorly understood because the process can be extremely slow, spanning decades or more, according to IISc.

Now, a team of researchers led by Mr. Rajesh Ganapathy, Associate Professor at the Jawaharlal Nehru Centre for Advanced Scientific Research, in collaboration with Mr. Ajay Sood, DST Year of Science Chair and Professor at the IISc, and their Ph.D. student Ms. Divya Ganapathi (IISc) has visualised devitrification for the first time in experiments, it said.

The results of this study have been published in 'Nature Physics'. The trick was to work with a glass made of colloidal particles.

*Since each colloidal particle can be thought of as a substitute for a single atom but being ten thousand times bigger than the atom, its dynamics can be watched in real-time with an optical microscope,* said Ms. Divya Ganapathi.

*"Also, to hasten the process we tweaked the interaction between particles so that it is soft and rearrangements in the glass occurred frequently,"* she said.

In order to make glass, Ms. Ganapathi and the team jammed the colloids together to reach high densities.

The researchers observed different regions of the glass following two routes to crystallisation: an avalanche-mediated route involving rapid rearrangements in the structure, and a smooth growth route with rearrangements happening gradually over time.

To gain insights into these findings, the researchers then used machine learning methods to determine if there was some subtle structural feature hidden in the glass that 'apriori' decides which regions would later crystallise and through what route.

Despite the glass being disordered, the machine learning model was able to identify a structural feature called 'softness' that had earlier been found to decide which particles in the glass rearrange and which do not, the statement said.

The researchers then found that regions in the glass which had particle clusters with large 'softness' values were the ones that crystallised and that 'softness' was also sensitive to the crystallisation route.

Perhaps the most striking finding emerging from the study was that the authors fed their machine learning model pictures of a colloidal glass

and the model accurately predicted the regions that crystallised days in advance, IISc said.

*"This paves the way for a powerful technique to identify and tune 'softness well in advance and avoid devitrification,"* said Mr. Ajay Sood.

Understanding devitrification is 'crucial' in areas like the pharmaceutical industry, which strives to produce stable amorphous drugs as they dissolve faster in the body than their crystalline counterparts, the IISc said.

Even liquid nuclear waste is vitrified as a solid in a glass matrix to safely dispose it off to deep underground and prevent hazardous materials from leaking into the environment.

The authors believe that this study is a significant step forward in understanding the connection between the underlying structure and stability of the glass.

*"It is really cool that a machine learning algorithm can predict where the glass is going to crystallise and where it is going to stay glassy. This could be the initial step for designing more stable glasses like the gorilla glass on mobile phones, which is ubiquitous in modern technology,"* says Mr. Rajesh Ganapathy.

The ability to manipulate structural parameters could usher in new ways to realise technologically significant

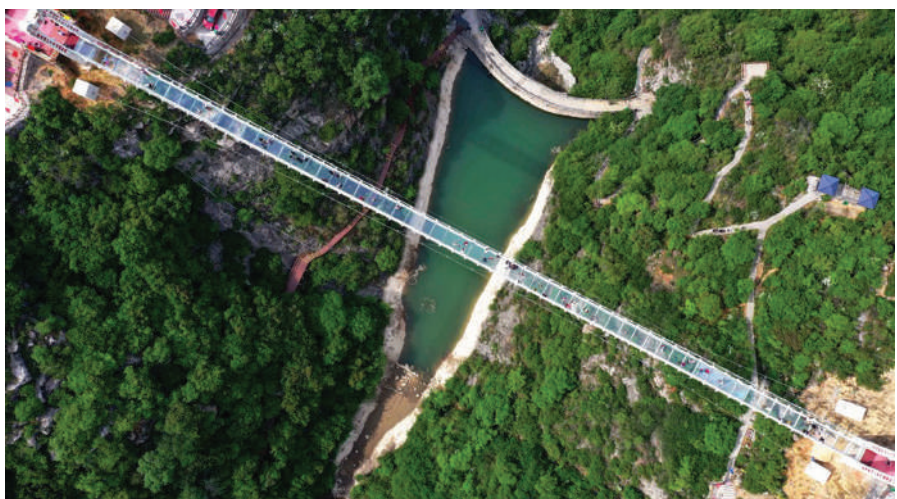
long-lived glassy states, the statement added.

### CHINA UNVEILS RECORD-BREAKING FULL GLASS BRIDGE IN HUANGCHUAN

A stunning new bridge, made entirely out of glass, has been opened for public in China. The glimmering piece of architecture was unveiled in Huangchuan Three Gorges Scenic area, Lianzhou. Although Chinese state media reported that there were about 2000 glass bridges across the country, this one has broken the Guinness world record for being the longest.

As per a Chinese news media outlet, the ambitious structure, built over Lianjiang river, could hold 500 people at once. In addition, to normal foot traffic, this full glass bridge could also serve as a platform for adventure sports such as bungee jumping and zip lines. In addendum, it could even be used as a ramp for fashion events.

The opening of the bridge took place on July 18 in the presence of Guinness world record representatives who awarded it the status of being the world's longest glass bridge at 526.14 mts. As per Chinese state media, the structure, which has four observation decks at the middle, is made entirely out of laminated glass which is 4.5 cm thick and said to be



99.15% transparent, eventually giving a full-fledged view of valley and river passing underneath.

As per the China News Service, the bridge took three years to build and cost nearly 300 million CNY to the authorities. The bridge which was fully completed by January this year has been credited 'AAAA' or '4A' rating, which is the second-highest grade assigned by China's Ministry of Culture and Tourism. This new bridge has smashed the record that was held by the Hongya Valley glass bridge in Hubei Province in Central China which is 488 mts. (1600 ft.) long.

### **EMERGE GLASS ALL SET FOR CONTAINER GLASS MANUFACTURING**

In a statement issued by Emerge Glass Pvt. Ltd., the company said that since its inception in 2013, Emerge Glass has ensured to manufacture the highest standards of complete glass solutions and constantly strived to match industry practices.

Mr. Sumit Gupta, Managing Director said *"Emerge Glass has achieved many milestones along the way. We take pride as the only entity to produce Imm thin flat glass in the country. What's more, we are also the only manufacturer in India with the capability to simultaneously produce three different thicknesses of Clear Flat Glass, lending us an upper hand in market competition. Further these wonders in glass are applied across micro slides, automobile rear view mirrors, wall clocks, picture frames and many more."*

*"Powered by innovative capability and engineering expertise, our customized glass solutions are done as per customer's necessity. Pioneering Ultra-thin Glass production in India, we have created value and superior benchmarks not only for the competition but also for ourselves."*

*"We have recently ventured into the premium glass-packaging segment by manufacturing container glass in three categories- Liquor, Beer, and Food grade, with Liquor being our largest category of production. From design to production, ornamentation of premium glass containers to customized designs, we are emerging as a significant solution provider in glass manufacturing not only in India, rather across the globe. No wonder, our glass containers adorn shelves around the world. We have procured 4 brand new advanced IS machines from Emhart Group Company, and soon would be producing 210 tons of high-quality container glass per day."*

Emerge Glass is backed by a strong and meticulous parent group company network of 150 dealers/distributors and 15 sales offices across India which is managed by 1,000 skilled professionals. Emerge has state-of-the-art manufacturing facility in Rajasthan that spans across 80,000 sqm, including 35,000 sqm built-up area and 20,000 sqm green area. It's glass solutions are exported to Dubai, Sri Lanka, Brazil, Netherlands, Nepal, Bangladesh and Turkey. Emerge's expansion in container segment is in addition to their existing line of products i.e. Flat Glass, Mirror and Frosted Glass.

Mr. Gupta, an MBA, began a glorious journey with Aluminium Composite Panels which was followed by acclaimed projects and foray into WPC, Silicone Sealant, clear flat Glass etc. By successfully instituting a world-class manufacturing unit in Dubai for non-combustible Metal



Mr. Sumit Gupta, Managing Director

Composite Panel, he set a precedent for the industry. Leading from the front, he has led momentum to the brand as one of the leading manufacturers of Façade and Glass solutions.

*"Being in sync with PM's visionary and bold initiative towards plastic ban and adoption of container glass, we have aligned closely with the Government of India's 'Make in India' and 'Atmanirbhar Bharat Abhiyan' (self-reliant India), aiming to completely replace imports",* said Mr. Gupta.

### **4<sup>th</sup> GLASSPRO INDIA & 7<sup>th</sup> GLASSPEX INDIA TO BE HELD ON SEPT 23-25, 2021 IN MUMBAI**

The forthcoming editions of glasspro India, the country's leading glass products and technology exhibition jointly organized by Messe Düsseldorf India and Glass Bulletin, and glasspex India, the nation's leading exhibition in glass production and processes organized by Messe Düsseldorf India, will be held from September 23-25, 2021 at Hall 4, BCEC, Mumbai.

Both events are powered by glasstec, Düsseldorf, Germany – the world's leading exhibition on glass.

glasspro INDIA 2021 will continue to showcase the latest trends and

innovations in the field of flat / processed glass products and innovations; and feature the largest display of the latest glass processing solutions, tools, auxiliary products and services.

As an additional feature, glasspro India will bring along fenestration pro INDIA, a show designed to cater to the door, window and the façade segments and unite architects, fabricators, developers, policymakers, façade consultants, engineers, and stakeholders from the Indian industry and beyond.

Synergistically, this show will drive discussions on the design trends which can be harmonized with energy efficient building technologies, bringing the widest fraternity under one roof.

The door, window and façade industry in India is emerging rapidly and the need for sustainability, comfort and aesthetics continues to drive innovation in the construction sector. This industry has given up its traditional structure and expedited to modernism. This new taste and necessity caused the manufacturers to change their production platform to manufacture new and updated products.

On the other hand, glasspex INDIA 2021 will continue to showcase the widest range of glass production technologies, glass processing and finishing, hollow glass products and applications, glass packaging technologies, automation, measurement and control engineering, tools, auxiliary equipment and fittings and many more.

Announcing the new dates for the exhibitions, Mr. Thomas Schlitt, Managing Director, Messe Düsseldorf India, said, "Health and safety of our exhibitors, sponsors and visitors has

been the biggest priority for us during past few months and it continues to be so. However, we are hopeful that the world as well as businesses will soon take a hopeful turn. As we regret the inconveniences occurred due to our plan to postpone this year's show, we are very excited to meet you in September, 2021 with even more enthusiasm and expectations."

"We have also realized that tough times give us initial challenges but present to us a great deal of opportunities. Keeping that in mind, I am sure that we can expect an array of even more advanced products, technologies and solutions. We will also be delighted to offer a potent platform for the industry stakeholders to meet, greet, share ideas and do fruitful businesses together," he said.

The last edition of the events was a huge success. There was a marked increase in the number of exhibitors, visitors and international participants compared to the year before that.

The number of exhibiting companies stood at 195. Given the growth in popularity and clientele, the exhibitions are certainly going to script yet another success next year.

The show is supported by The All India Glass Manufacturers Federation, Builders Association of India, Ludhiana Glass Dealers Association, Noida Glass and Dealers Association, The Madras Glass & Plywood Merchant Association and Rajkot Glass Merchant Association.

### **CORNING'S LATEST SMARTPHONE GLASS CAN SURVIVE A 6-FOOT DROP**

Corning, the American technology company that specializes in specialty glass, ceramics, and related materials, has announced the next-generation

of protective glass for smartphones - Gorilla Glass Victus.

The company describes it as the "toughest glass" ever to be created for a gadget, one that can easily survive a drop from six feet of height.

Phones can tumble anytime but Victus, which is the seventh generation of Corning's protective glass, is well equipped to deal with it.

The company says it can survive a 6.5-foot drop, something that the tallest among us would surely appreciate.

To recall, the previous two versions of Gorilla Glass offered drop protection from just 5.25 feet and 3.9 feet of height, respectively.

Along with drop resistance, which has been the focus of Corning in the last few years, the new Victus glass also brings enhanced scratch resistance.

Specifically, the company claims that its new glass offers twice the resistance of Gorilla Glass 6 and four times the resistance of a competing product, making a much stronger offering to bear marks left by keys and coins.

While the new glass will protect devices, it must be noted that it doesn't make them unbreakable.

Victus just reduces the risk of a screen getting damaged after a fall. If you throw/scratch it intentionally, it will certainly break.

Gorilla Glass Scientist Mr. Jaymin Amin says, "metal/dirt particles can also stick on keys/coins and damage this glass, but the chances are fairly less."

A Samsung phone is expected to use the glass in the next few months, followed by other OEMs, with perhaps even Apple, jumping on the bandwagon.

The glass will understandably come at a premium price tag to the manufacturers.

## PASSING AWAY OF HELMUT SORG

On 16<sup>th</sup> July, Mr. Helmut Sorg, the long-serving Managing Partner of Beteiligungen SORG GmbH, died unexpectedly at the age of 80. Mr. Sorg, a member of the fourth generation of the family, was still at the helm of the family business, working together with his son Mr. Alexander and his brother Mr. Karl-Heinz.



After graduating from high school, Mr. Sorg went to the renowned technical university at Aachen to study industrial furnace and heating technology. His passion for and commitment to glass furnace technology was already evident in his early years. Mr. Sorg spent most of his school and semester holidays working in the family business. He graduated from Aachen at the age of 24 and began working full-time for Nikolaus SORG in 1964.

From the start, Mr. Sorg's intent was the opening of the world market for plant engineering. He knew that the key to success lay with the application of the most modern technology, the main focus of his life as a dedicated engineer.

In 1978 he initiated the creation of a single technical department within the Company and assumed responsibility for, amongst other things, all technological and development matters. This move formed the basis for the subsequent and lasting success of SORG as one of the leading suppliers to the glass industry worldwide.

Initially he focussed on the end-fired regenerative furnace and pushed for the development of

increasingly larger furnaces of this type. At the same time, he was able to find customers who were ready to accept the accompanying technical challenges. This led to the industry-wide replacement of antiquated cross-fired furnaces by the modern end-fired technology.

Mr. Sorg's drive resulted in the successful sale of these modern furnaces in Europe. He won many new customers in the core markets of Germany, Austria, Switzerland, Italy, France, Spain, and Portugal. Furthermore, he opened markets outside Europe, for example on the American and African continents.

At the beginning of the 1980s he formed a company destined to produce tableware, the American Stemware Corp. in PA. USA. Greensville, PA. USA.

One reason for this step was to demonstrate the suitability of the VSM all-electric furnace for the production of highest quality lead crystal glass. He was also responsible for the development of the LoNOx Melter, designed to give a significant reduction in NOx emissions.

Towards the end of the 1990s, Mr. Sorg gained the contract from an important customer to build the largest oxy-fuel melter in Europe. His business acumen was evident in the development of the batch plant sector. At his instigation the company took over EME in Erkelenz in 1987. Under his management this company has become a renowned supplier to the glass industry.

Mr. Sorg initiated SORG's successful entry into the flat glass sector through a co-operation which led to the acquisition of ghs GmbH, a specialist consultant to the float industry. The Company's competence in the float industry is demonstrated by the excellent results achieved.

In recent years, Mr. Sorg focussed on the development of forward-looking, low emission melting concepts. In 2012 the first batch preheater was commissioned as part of the new "Batch3" concept. Under his aegis the Company has developed an innovative, heavily electrically heated, horizontal furnace, now being

introduced into the market under the name "CLEAN MELTER".

Mr. Helmut Sorg's successes were the result of his purposefulness, his vision and his competence. However, of equal importance were his amenable personal qualities that allowed him to establish excellent social contact with many customers. He was highly respected by the staff of the SORG Group companies, who valued his straightforwardness, fairness and generosity.

## SAD DEMISE OF JAYANTILAL J SHAH

Mr. Jayantilal J Shah, Chairman of Gopal Glass Works Ltd., left for heavenly abode on Oct 9 at the age of 90.



'Jentikaka' as a nickname was a pioneer in nourishing Gopal Glass from a low key start and took the company to new heights with his great visionary.

A renowned philanthropist, Mr. Shah had served in the areas of women empowerment, education and medical support for the poor. He also supported several schools, hostels and hospitals.

*Started by Mr. Jayantilal J Shah and Late Mr. Dhirajlal Sheth, Gopal Glass Works Ltd. is one of the leading players in the Figured / patterned and wired glass industry for over 40 years. It began with a production capacity of mere 50 tons per day and today it boasts of a state-of-the-art manufacturing facility spread over 30 acres with a production capacity of 350 tons per day with 4 units. Equipped with world-class technology from Germany, Gopal Glass is known for its cardinal points of innovation in design and manufacturing excellence.*

## क्रिकेट में प्रदीप गुप्ता ने बढ़ाया मान

फिरोज़ाबाद शहर के प्रमुख कांच उद्यमी प्रदीप गुप्ता ने क्रिकेट जगत में सुहाग नगरी का बड़ा मान बढ़ाया। उ.प्र. क्रिकेट एसोसिएशन के उपाध्यक्ष एवं फिरोज़ाबाद डिस्ट्रिक्ट एसोसिएशन के पूर्व अध्यक्ष श्री प्रदीप कुमार गुप्ता को एसोसिएशन की 26 सितंबर 2020 को कानपुर में आयोजित वार्षिक आम बैठक में सर्व सम्मति से सत्र 2020-21 के लिये कार्यवाहक अध्यक्ष चुना गया है।

आप इससे पूर्व सन् 2018 में एसोसिएशन के तीन उपाध्यक्षों में से एक उपाध्यक्ष चुने गये थे। इससे पूर्व आप सन् 2015 से उ.प्र. क्रिकेट एसोसिएशन के कार्यकारिणी समिति के सदस्य भी रहे। सन् 2015 में उन्हें यूपीसीए द्वारा संचालित गौर हरी सिंघानिया क्रिकेट एकेडमी का चेयरमैन बनाया गया था।

श्री मोहनकिशोर गुप्ता-अध्यक्ष, जिला क्रिकेट एसोसिएशन, फिरोज़ाबाद द्वारा आयोजित एक विशेष बैठक में उनके निर्वाचन पर हर्ष व्यक्त किया गया और इसे फिरोज़ाबाद जनपद का सम्मान बताया गया।

जिला क्रिकेट एसोसिएशन से अपना सफर शुरू करने वाले प्रदीप गुप्ता का क्रिकेट के प्रति प्रेम शुरू से रहा। जिला एसोसिएशन

का अध्यक्ष बनने के बाद उन्होंने फिरोज़ाबाद ऑल इंडिया क्रिकेट टूर्नामेंट की शुरूआत कराई। कई साल तक चले इस टूर्नामेंट में भारतीय टीम के क्रिकेटर मदन लाल, चेतन चौहान, रमन लांबा, मनोज प्रभाकर, अजय जडेजा जैसे खिलाड़ी खेलने आए। 25 साल तक जिला क्रिकेट एसोसिएशन के अध्यक्ष रहने के बाद प्रदीप गुप्ता यूपीसीए के सदस्य बने। उनकी इस उपलब्धि पर जिला क्रिकेट एसोसिएशन



Mr. Pradeep Gupta, Former President AIGMF

“श्री प्रदीप गुप्ता हमारी संस्था के संरक्षक एवं वरिष्ठ सदस्य हैं। उनके उ.प्र. क्रिकेट एसोसिएशन का कार्यवाहक अध्यक्ष चुने जाने पर संस्था के पदाधिकारी एवं समस्त सदस्य हर्ष व्यक्त करते हैं। उन्होंने फिरोज़ाबाद का गौरव बढ़ाया है।” - राजकुमार मित्तल, अध्यक्ष, यू.पी.जी.एम्.एस. एवं पूर्व प्रेजिडेंट दी ऑल इंडिया ग्लास मैनुफैक्चरर्स फेडरेशन।

अध्यक्ष मोहन किशोर गुप्ता, केशव लहरी, विजय अग्रवाल, विजय गोयल, शिवकांत शर्मा, नीलमणि चुतुर्वेदी, बीसीसीआई लेवल एं कोच विकास पालीवाल सहित अन्य लोगों ने बधाई दी।

प्रतिभाओं को निखारने के लिए अपना बनाया स्टेडियम, जिला क्रिकेट एसोसिएशन अध्यक्ष रहते हुए स्थानीय खेल प्रतिभाओं को निखारने

के लिए उन्होंने अपनी निजी जमीन पर ओम ग्लास क्रिकेट स्टेडियम बनाया। इस स्टेडियम में खेलने वाले खिलाड़ी प्रदेश स्तर पर खेल चुके हैं। शहर के जावेद अनवर देश की अंडर 19 टीम के सदस्य रहे।

आपको बता दें श्री प्रदीप गुप्ता सन् 2001-03 तक दी ऑल इंडिया ग्लास मैनुफैक्चरर्स फेडरेशन के प्रेजिडेंट रह चुके हैं।

## फिरोज़ाबाद उद्यमियों ने किया वृक्षारोपण

ग्लास मैनुफैक्चर एण्ड एस्पॉर्ट एसो. के अध्यक्ष एवं ए.आई.जी.एम.एफ. कोषाध्यक्ष श्री मुकेश कुमार बंसल (टोनी) जी के निर्देशन में पिछले 10 वर्षों से लगातार वृक्षारोपण का कार्य कराया जा रहा है तथा वर्ष 2019 तक इनके

द्वारा 2 लाख से अधिक वृक्षों का वृक्षारोपण कराया जा चुका है।

वर्ष 2020 में भी इनके द्वारा (जुलाई से 15 सितंबर तक) लगभग 72000 वृक्षों जैसे कि सहजन, मलेशिया, सागोन, अमरूद, गूलर, टीक, पीपल, कनेर, नीम, अंजीर इत्यादि वृक्षों का वृक्षारोपण कराया जा चुका है।



देश के यशस्वी प्रधानमंत्री श्री नरेन्द्र मोदी जी के 70 वे जन्मदिन के उपलक्ष्य में सेवा सप्ताह के अन्तर्गत फिरोज़ाबाद जनपद में 1800 वृक्षों का वृक्षारोपण किया गया है। इस वृक्षारोपण कार्यक्रम में सदर विधायक श्री मनीष असीजा जी, ग्लास मैनुफैक्चर एण्ड एस्पॉर्ट एसो. के पदाधिकारीगण (गगन सचदेवा (कोषाध्यक्ष), राजेन्द्र गुप्ता (वरिष्ठ उपाध्यक्ष), सरवर हुसैन (सचिव), मुवीन अहमद (उपसचिव), विपिन अग्रवाल (संयुक्त सचिव), विनीत जैन, शरद चन्द्रा, राजीव दीक्षित (उपाध्यक्ष), शैलेश बंसल, शरद गुप्ता, नमन बंसल, अर्चित अग्रवाल, श्रेय बंसल इत्यादि लोग इस अवसर पर मौजूद थे।

एक्सपोर्ट प्रमोशन काउन्सिल फॉर हैन्डीक्रॉफ्ट के (ईपीसीएच) के महानिदेशक श्री राकेश कुमार जी के निर्देशन में भी 10 हजार पौधों के वृक्षारोपण का कार्य चल रहा है। उन्होंने ग्लास मैनुफैक्चर एण्ड एस्पॉर्ट एसो. के पदाधिकारीगणों द्वारा कराये गये वृक्षारोपण कार्य की भूरि-भूरि प्रशंसा की।

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





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### Liquor Bottles



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Bottle Range:-  
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Bottle Range:-  
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### Bottles & Food Jars



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\* The product images shown are for illustration purposes only and may not be an exact representation of the product.

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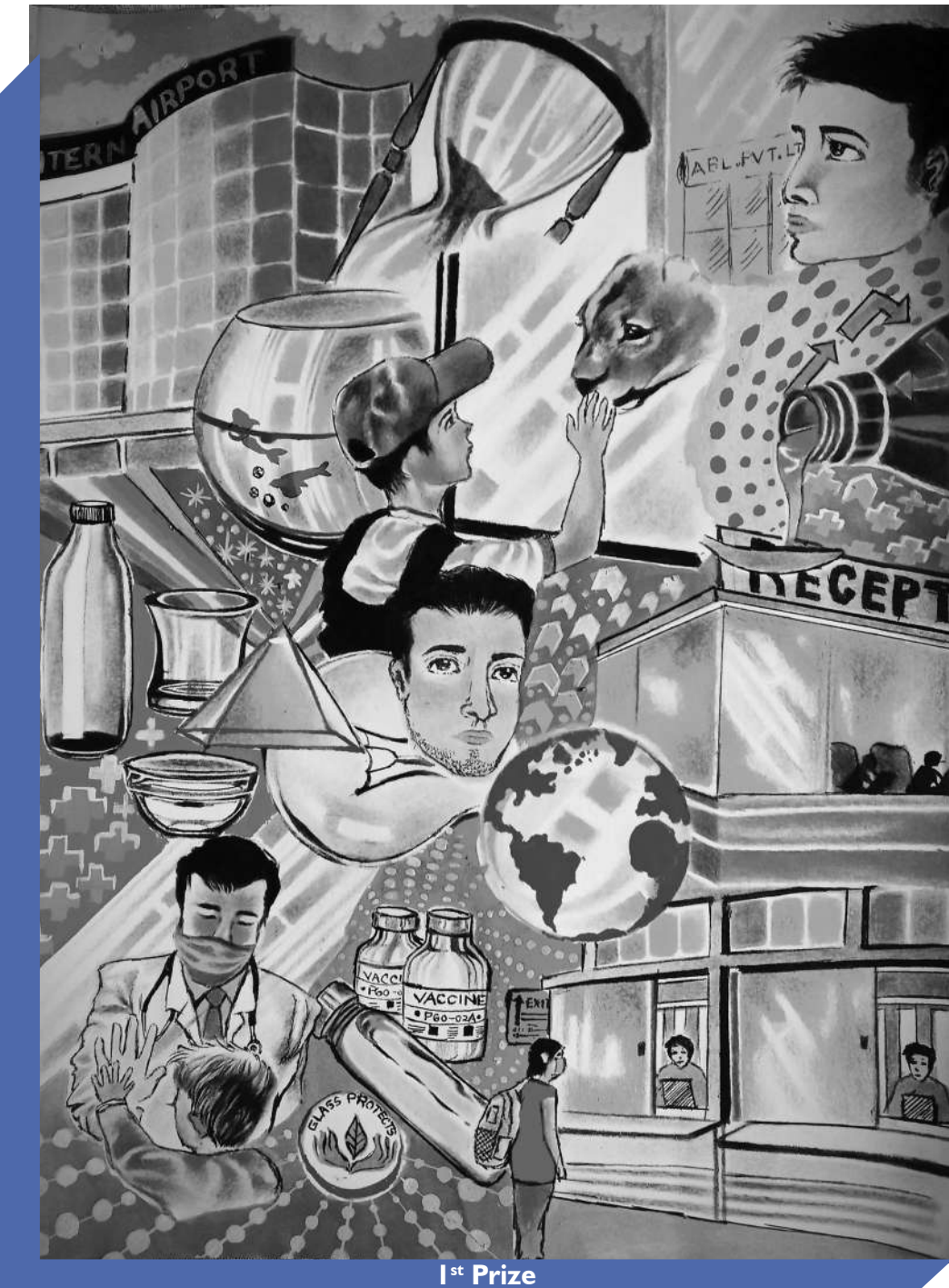
# 'Glass Protects'... says School Children

To commemorate International Youth Day on August 12, 2020, The All India Glass Manufacturers' Federation (AIGMF) invited online entries from children between 7-16 years to participate in the 'Drawing Competition 3.0' on the theme 'Glass Protects'.

Former Presidents, Mr. Sanjay Somany, Mr. Sanjay Ganjoo and Mr. S C Bansal were jury members who judged top 3 drawings out of 3,000 entries received from schools across India.

Formal award ceremony was held parallel to the virtual Annual General Meeting of the AIGMF on Sept 15, where an online exhibition of select drawings / paintings was also unveiled that would form a part of a touring exhibition on the theme 'Glass Protects'.

Mr. Sanjay Somany (Chairman & Managing Director- HNG & Inds. Ltd.) said, "as the National Apex Body



1<sup>st</sup> Prize

of the Glass Industry, the AIGMF undertakes socially responsible steps as a voluntary service to society, thereby bringing increased awareness of Glass being a safe and 100% recyclable packaging and building material".

Mr. Sanjay Ganjoo (Chief Operating Officer- Asahi India Glass Ltd.) said, "under these challenging circumstances The All India Glass Manufacturers' Federation takes responsibility to work on





# 2 MM

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### Recent Awards & Accolades:

- Letter from Hon. Prime Minister Narendra Modi for successfully completing trials of 2mm Fully tempered Solar Glass.
- FT 1000 High-Growth Companies Asia-Pacific 2018.
- 15th FGI Awards for Excellence
- CII BE STAR Recognition Emerging Leader - Excellence in Operations Management
- Capexil Special Export Award

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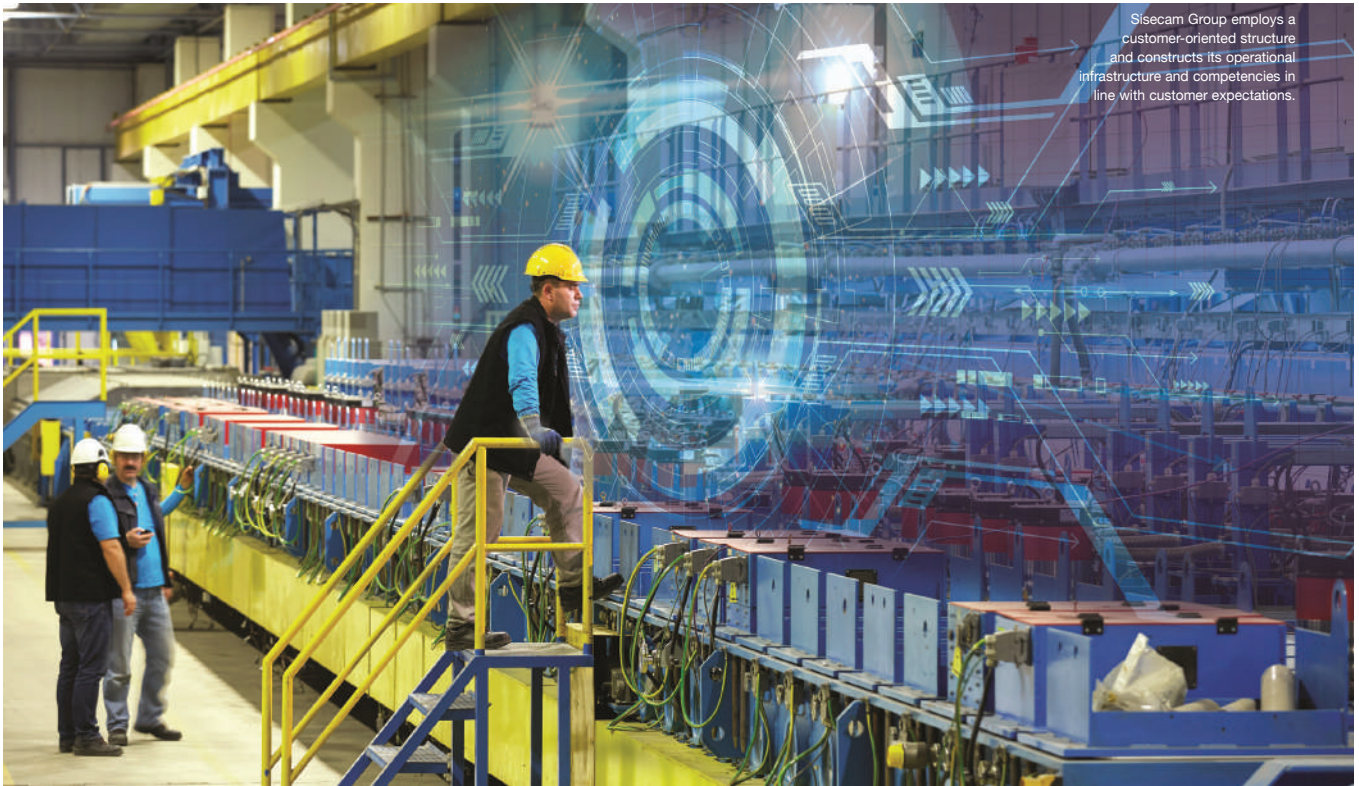
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Sisecam Group employs a customer-oriented structure and constructs its operational infrastructure and competencies in line with customer expectations.

## Delivering a holistic approach to supply chain management

With 20,000 suppliers globally, more than 10,000 of whom are active, Sisecam Group is one of the most influential buyers in the international glass industry. Dr Selma Oner, Chief Procurement Officer, discusses her team's strategic role in the co-ordination of procurement functions, as well as the group's development of an integrated supply chain. John Wallis reported in *Glass Worldwide*, preferred international journal of AIGMF.




As Chief Procurement Officer, Dr Selma Oner is responsible for co-ordinating all procurement functions at Sisecam Group.

Sisecam Group is widely acknowledged as a global leader in flat glass, household glassware, glass packaging and glassfibre, as well as soda ash and chrome

compounds. Production is undertaken by a workforce of 22,000 people in 14 different countries, with sales conducted in more than 150 national markets. In terms of production ▶



In total, nearly 300 people make up Sisecam's procurement team.

Originally published in Glass Worldwide, preferred international journal of 





The supply chain function plays an important role in the process of forming company strategies.

capacity, the group ranks among the top three for household glassware, the top five for flat glass and glass packaging, the top six in synthetic soda ash production and is the world's leading producer of chromium chemicals.

As Chief Procurement Officer at Sisecam Group, Dr Selma Oner is responsible for co-ordinating all procurement functions, liaising with Corporate Management and providing approvals for strategic decisions. She also supports internal collaboration, knowledge sharing, compliance with best practices and established category management processes. These

initiatives ensure a strategic view of the procurement function that anticipates demand, understands the supply markets, develops and implements the best sourcing strategies to maximise value-for-money, while ensuring programme delivery within time and quality boundaries. They also serve the Sisecam Group's strategic aspirations to become one of the top three global manufacturers in its core business lines.

Dr Oner graduated from the Department of Industrial Engineering at Istanbul Technical University in 1995, before receiving her Master's degree and PhD from the Department of Industrial Engineering at Bogazici University. She completed the General Management programme at Harvard Business School in 2014, having started her professional career as a Research Assistant at Bogazici University. Ms Oner joined Sisecam Group in 1997 as a Logistics Engineer at Pasabahce Cam San ve Tic AS and later served in various management positions within the same organisation, before becoming Supply Chain Director at Trakya Cam AS. In 2017, she was appointed Group Procurement Co-ordinator at Turkiye Sise ve Cam Fabrikalari and was confirmed as Chief Procurement Officer for Sisecam Group in 2018.

In fulfilling this role, Dr Oner has developed substantial expertise in the building of effective sourcing strategies, based on the dynamic analysis of data and involving all business stakeholders. Extensive experience has been realised in the use of detailed market analysis to create scenarios regarding potential market development. In addition, she enjoys her responsibilities as an effective coach, leading teams through complex negotiation processes and overcoming the challenges posed by the current transformation era.

In terms of internal relationship management, Dr Oner assists others with the management of internal customer issues and expectations, while also exhibiting expertise in generating and analysing business cases and routinely showing a high level of value delivery and strategic awareness in financial and ▶

## Membership of the Federation

Members of the Federation are classified into two categories; manufacturers of primary glass articles are enrolled as **Ordinary Members** of the Federation and suppliers to glass industry viz., suppliers of machinery, raw materials, consultants and others connected with glass industry are enrolled as **Affiliate Members**.

**Foreign Companies** supplying machinery etc., to glass industry are also enrolled as **Affiliate Members**.

Membership forms can be downloaded from [www.aimf.com/membership.php](http://www.aimf.com/membership.php)

Members of the Federation are enrolled on the recommendation of Zonal Associations viz.:

- Eastern India Glass Manufacturers' Association (EIGMA)
- Northern India Glass Manufacturers' Association (NIGMA)
- South India Glass Manufacturers' Association (SIGMA)
- Uttar Pradesh Glass Manufacturers' Syndicate (UPGMS)
- Western India Glass Manufacturers' Association (WIGMA)



### ADMISSION FEE / ANNUAL SUBSCRIPTION

#### Ordinary Members:

- Admission fee ₹ 5,000/-
- Annual subscription: Single Unit: ₹ 27,500 + GST as applicable
- More than one Unit: ₹ 1,10,000 + GST as applicable
- Applicants for enrollment for a period of five years may pay a consolidated amount of ₹ 1,25,000 for a single Unit and ₹ 5,00,000 for more than one Unit + GST as applicable

#### Affiliate Members:

- Admission fee ₹ 5,000/-
- Annual subscription: ₹ 11,000 + GST as applicable
- Applicants for enrollment for a period of five years may pay a consolidated amount of ₹ 49,500 (including admission fee) + GST as applicable

#### Affiliate Members from countries other than India:

- Admission fee US \$ 200
- Annual subscription: US \$ 440 + GST as applicable
- Applicants for enrollment for a period of five years may pay a consolidated amount of US \$ 1,650 (including admission fee) + GST as applicable ■





Sisecam's procurement transformation focuses on optimisation and transparency throughout the value chain.

commercial areas, while displaying the ability to focus others on wider financial implications.

**Supply chain management strategy**

"In order to successfully implement our company's strategies, investments and growth plans and to continue our success story, we need to be strong and competent in all levels of our global supply chain, extending from our suppliers to customers" Dr Oner confirms. "Accordingly, the supply chain function plays an important role in the process of forming company strategies, which perceives the whole picture, manages decisions with an

analytical approach and creates operational strategies aligned with corporate strategies."

Sisecam Group employs a customer-oriented structure and constructs its operational infrastructure and competencies in line with customer expectations. In this respect, the success of supply chain functions is important for the group in order to ensure accurate service levels in a stable and cost-efficient manner to establish and continuously develop a supply chain that can adapt to internal and external variables. Via the central restructuring of the procurement function within the past three years, important steps have been taken to reveal a holistic approach to the supply chain, providing significant cost advantages and effective risk management.

The group has been adopting digital transformation, not only in terms of digitising its production lines and facilities but also increasing the digital capabilities of the business units such as supply chain, finance and human resources. A holistic approach to this journey is a key focus, with Sisecam aiming to integrate business processes with innovative technologies.

According to Selma Oner, the 'Roots and Wings' digital transformation project is proceeding within the different Sisecam Group companies and its central functions. "The aim of this project is to empower the infrastructure in order to hasten digital transformation and enhance business processes" she explains. "Moreover, a complementary master data transformation project involves every business function within digital transformation. In addition, interpreting data in business processes by advanced analytics applications is to be an important focus and will lead to enhanced operational excellence."

When considering that the Sisecam global supply chain involves more than 40 production plants in 13 countries and over 10,000 active suppliers, it is suggested that digitalisation is key to the effective management ▶

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30 Kanch | Vol. 8 | No. 2 | July-September 2020

of these operations. In particular, it will help to follow plant performances efficiently to take action and to maximise total profitability. "The ability to generate a price on a much wider basis lets us reduce our costs by nearly 6% every year" says Dr Oner. "When you have a bigger demand, it is easier to reach bigger suppliers and the prices decrease."

Accordingly, Sisecam carries out comprehensive digital transformation programmes in many functions, while processes are designed and modernised in accordance with today's business expectations and dynamics. In this way, it is aimed to integrate the systems in the supply chain to monitor all operations digitally, to establish decision processes on a high rate of data analysis and to increase decision-making agility to the highest level. In particular, different projects are carried out in order to support decision support processes with optimisation solutions. In addition, the Sisecam Academy organises comprehensive training programmes in order to raise awareness of digital transformation, to inform employees and to gain different perspectives.

"Suppliers are expected to be aligned with these priorities" Selma Oner confirms. "We are increasingly expecting our suppliers to strengthen their planning competencies, effectively manage the variables in the market and their operations, maintain a high level of co-ordination with Sisecam and adopt a performance-oriented business approach."



The Sisecam global supply chain involves more than 40 production plants in 13 countries and over 10,000 active suppliers.

### Dedicated procurement team

In total, nearly 300 people make up Sisecam's procurement team. Most are located in Turkey, Europe and Russia, focusing on operational excellence and sustainability, as well as supplier and risk management through digitalisation and the global procurement infrastructure.

Every year, approximately 70 product development projects are realised for alternative materials and supply. During those projects, Procurement Category Managers and Supplier Development Specialists work closely to identify possible development areas with suppliers that give a competitive edge in the market with advanced technological products. Site visits to strategic suppliers are undertaken during this product development phase.

A series of important criteria is employed when selecting individual suppliers of plant, equipment and materials for Sisecam projects. "As well as the bidding price, suppliers are evaluated according to their operational performance, financial stability, geopolitical risks, continuity risks, ethical compliance and a strategic 'edge', such as dependency of companies to suppliers or customers" Dr Oner explains. "We are planning to invest in a Supplier Suggestion system, through which we expect to receive improvement and innovation projects led by suppliers to help Sisecam maintain a competitive advantage."

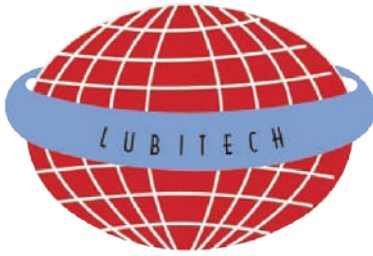
Sisecam's procurement transformation was initiated three years ago, focusing on optimisation and transparency throughout the value chain. "One of the group's competitive advantages is its ability to operate an integrated supply chain" Selma Oner concludes.

"Even though we are a glass producing company, we also operate upstream of our supply chain, producing chemicals and industrial raw materials. This shows that we are very strong in vertical integration throughout the entire supply chain." ●

**Further information:**  
Sisecam Group, Istanbul, Turkey  
web: [www.sisecam.com](http://www.sisecam.com)



The group has been adopting digital transformation, not only in terms of digitising its production lines and facilities but also increasing the digital capabilities of the business units such as supply chain, finance and human resources.



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# Glass-Ceramics - A Challenging Material

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## Abstract

Glass is an amorphous material, but crystallization can be induced within the same glass composition or, with certain special additions with the known composition to force crystallization. If the crystal content is appreciable, then it is roughly called glass-ceramics. These glass-ceramics have a variety of applications in diverse fields of activity. Here, some discussions are being made about some of these activities in the field of glass-ceramics.

## INTRODUCTION

It is known that glass structure has silica tetrahedra in silicate glasses, boron triangles in borate glasses, etc., but these polyhedra are distributed randomly lacking a long range order in 3-dimensions. So, they are treated as 'amorphous', but with proper chemical and thermal treatments, the glasses can be transformed into a mixture of amorphous and crystalline parts. This is like a composite matrix. If the crystallinity or crystal content is about 30% or higher, they are termed as "Glass-Ceramics". Glass-ceramics are an important class of materials which have a variety of applications in various shapes and sizes. Machinable glass-ceramic materials exist in order to make different shapes [1,2].

A simple definition can be given as: Glass-ceramics are fine-grained polycrystalline materials formed when glasses of suitable compositions are heat treated and thus undergo controlled crystallisation to the (lower energy) crystalline state. It must be emphasised here that only specific glass compositions are suitable precursors for glass-ceramics due to the fact that some glasses are too stable and difficult to crystallise, like borate glasses, whereas others result in undesirable microstructures by crystallizing too readily in an uncontrollable manner. In

addition, it must also be accentuated that in order for a suitable product to be attained, the heat-treatment is critical for the process and a range of generic heat treatment procedures are used which are meticulously developed and modified for a specific glass composition [3-6].

In the manufacture of glass and ceramics, there is a slight difference. A glass kiln will have heating from the top, whereas a ceramic kiln will have heating elements on the sides. Glass is known to be non-crystalline. Ceramics may be crystalline or partly crystalline. Ceramic products are made from the mixture of different crystalline compounds with or without water by giving shapes via different processing techniques, then dried and finally fired to impart necessary strength. However, glass is prepared by mixing dry raw crystalline materials first, then melted to reach a molten state (with an appropriate viscosity) while cooling gives rise to different shapes of the product. In ceramic products, there is hardly any secondary process except glazing for decoration, but the glasses can be subjected to secondary heat-treatment for ceramization or crystallization to make glass-ceramics [3,4].

In Corning Glass Works (USA), glass-ceramics was discovered many years

ago merely by an accident. A piece of glass was kept for long hours by mistake, and when the small furnace was open, and the piece fell on the floor - it did not break. Actually, when molten glass passes through transformation temperature ( $T_g$ ), existing structure (random) freezes into a glass structure. If the same glass piece is reheated over  $T_g$ , it can be ceramized, as the structure gets enough time to relax, i.e. longer atomic relaxation time. In the absence of any nucleant or nucleating agents within the glass, first of all the glass piece has to be nucleated, then on a second stage of reheating, the glass has to be crystallized to make glass-ceramics. Without nucleation, there cannot be any crystallization. Sometimes, some nucleating agents like  $TiO_2$  have to be added to the original glass. This is a simple description of making glass-ceramic products.

## SOME PROPERTIES -->

Glass-ceramic materials share many properties with both glasses and ceramics. Glass-ceramics have an amorphous phase and one or more crystalline phases and are produced by a so-called "controlled crystallization" in contrast to a spontaneous crystallization, which is usually not wanted in glass manufacturing.

Glass-ceramics have the fabrication advantage of glass, as well as special properties of ceramics.

Glass-ceramics usually have between 30% and 90% crystallinity, and yield an array of materials with a range of interesting properties. Some of these properties are [3]:

- a) zero porosity
- b) high strength
- c) toughness
- d) translucency or opacity
- e) pigmentation
- f) opalescence
- g) low or even negative thermal expansion
- h) high temperature stability
- i) fluorescence
- j) machinability
- k) ferromagnetism
- l) resorbability / high chemical durability
- m) bio-compatibility
- n) biological activity
- o) ion conductivity
- p) super conductivity
- q) isolation capabilities
- r) low dielectric constant and loss
- s) high resistivity and break-down voltage

These properties can be tailored by controlling the base-glass composition and by controlled heat treatment/crystallization of base glass. In manufacturing, glass-ceramics are valued for having the strength of ceramic but the hermetic sealing properties of glass. Glass-ceramics are mostly produced in two steps: First, a glass is formed by a glass-manufacturing process. The glass is cooled down and is then reheated in a second step. In this heat treatment the glass partly crystallizes. In most cases nucleation agents are added to the base composition of the glass-ceramic. These nucleation agents aid and control the crystallization process. As there is usually no pressing and sintering, glass-ceramics have, unlike

sintered ceramics like alumina or zirconia, no pores.

A wide variety of glass-ceramic systems exists, e.g., the  $\text{Li}_2\text{O} \times \text{Al}_2\text{O}_3 \times n\text{SiO}_2$  system (LAS system), the  $\text{MgO} \times \text{Al}_2\text{O}_3 \times n\text{SiO}_2$  system (MAS system), the  $\text{ZnO} \times \text{Al}_2\text{O}_3 \times n\text{SiO}_2$  system (ZAS system). Las is by far the most well-known in the field of glass-ceramics.

### SOME APPLICATIONS

Some applications of glass-ceramics include: Radomes—made from Corning 9606 ( $2\text{MgO} \cdot 2\text{Al}_2\text{O}_3$ , cordierite system). There are also Cookware, Bakeware and Cooktops – made from Corning 9608 ( $\beta$ -spodumene system). There is a huge ‘consumer market’ for these products.

Glass-ceramic is mechanically very strong material and can sustain repeated and quick temperature changes up to 800–1000 °C. At the same time, it has a very low heat conduction coefficient that can be made nearly transparent (i.e. a loss of 15–20% in a typical Cooktop) for radiation in the infrared wavelengths. Presently, there are two major types of electrical Stoves with Cooktops made of glass-ceramic:

- A glass-ceramic Stove uses electrical heating coils or infrared halogen lamps as the heating elements. The surface of the glass-ceramic Cooktop above the burner heats up, but the adjacent surface remains cool because of the low heat conduction coefficient of the material.
- An Induction Stove heats a metal pot's bottom directly through an EM induction.

Some well-known brands of glass-ceramics are: 1) Ceran (Cooktop), 2) Eurokera (Cooktop), 3) Stoves and Fireplaces, 4) Zerodur (Telescope mirrors), or 5) Macor. The famous German manufacturer SCHOTT

introduced Zerodur in 1968. Ceran followed in 1971. NEG of Japan is another worldwide manufacturer of glass ceramics, whose related products in this area include Firelite and Neoceram fire-rated glass. The same class of material is also used in Corningware dishes, which can be taken from the freezer directly to the oven with no risk of thermal shock. This only speeds up the cooking process.

In an interesting project [7], heat-treatment of an  $\text{MgO-CaO-SiO}_2\text{-P}_2\text{O}_5$  glass gave a glass ceramic containing crystalline apatite ( $\text{Ca}_{10}(\text{PO}_4)_6\text{F}_2$ ) and  $\beta$ -wollastonite ( $\text{CaO} \cdot \text{SiO}_2$ ) in an  $\text{MgO-CaO-SiO}_2$  glassy matrix. It showed bioactivity and a fairly high mechanical strength that decreased only slowly, even under load-bearing conditions in the body. It is used clinically as (1) Artificial Vertebrae, (2) Iliac bones, etc. The bioactivity of this glass ceramic was attributed to apatite formation on its surface in the body. Dissolution of calcium and silicate ions from the glass-ceramic was considered to play an important role in forming the surface apatite layer. It was shown that some new kinds of bioactive materials can be developed from  $\text{CaO-SiO}_2$ -based glasses.

Ceramics, metals and organic polymers coated with bone-like apatite were obtained when such materials were placed in the vicinity of a  $\text{CaO-SiO}_2$ -based glass in a simulated body fluid. A bioactive bone cement which was hardened within 4 min and bonded to living bone, forming an apatite, was obtained by mixing a  $\text{CaO-SiO}_2$ -based glass powder with a neutral ammonium phosphate solution. Its compressive strength reached 80 MPa comparable to that of poly (methyl methacrylate) within 3 days.

A bioactive and ferromagnetic glass ceramic containing crystalline



Fig. 1: Dental Porcelain (Glass-ceramics can be also made of such quality)



Fig. 2: Corningware casserole dish and other cookware pieces, with the 'Cornflower' pattern decoration

magnetite ( $\text{Fe}_3\text{O}_4$ ) in a matrix of  $\text{CaO-SiO}_2$ -based glassy and crystalline phases was obtained by a heat treatment of a  $\text{Fe}_2\text{O}_3\text{-CaO.SiO}_2\text{-B}_2\text{O}_3\text{-P}_2\text{O}_5$  glass. This glass-ceramic was shown to be useful as "thermo-seeds" for hyperthermia treatment of cancer. The crystallization was also investigated within a 'basalt glass'

matrix involving even 5 nm magnetite particles giving rise to (possibly) a **first study** on nano-materials - by various novel techniques, such as Mossbauer Spectroscopy, Small Angle Neutron Scattering, etc. [8]. Some of the interesting glass-ceramics products are shown in Fig. 1 and Fig. 2 respectively.

### CONCLUSIONS

In this brief exposure on glass-ceramics that should have been otherwise a grand compilation of interesting facts about this wonder material is given here in this article. Next article in the future issue of Kanch will highlight its use in the field of biology that is of great human concern. Here, some properties of importance are also mentioned along with some of the applications involving various systems in which crystallization can be induced within a given glass matrix.

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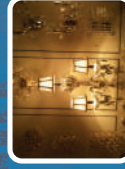
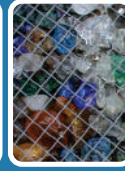
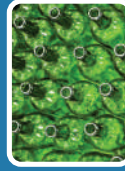
- Selection of site
- Plant layout
- Furnace design, selection of refractory & steel structure
- Furnace building, commissioning & maintenance
- Selection & commissioning of combustion system, instrumentation & allied equipment
- Selection of raw material
- Designing of fully automatic batch house and cullet handling system.
- Selection, installation and commissioning of production machinery and annealing lehrs
- Installation and commissioning of quality control equipment and packing machinery

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# Virtual Conference on Glass Problems

**Mr. Bob Lipetz, Conference Director, provides this preview of the Virtual Conference on Glass Problems for KANCH. Information and registration at <https://glassproblemsconference.org>**

**(October 26-30, 2020)**

The good news for the Indian glass manufacturing industry is that the 81<sup>st</sup> Conference on Glass Problems, which had been scheduled to take place on October 26-29 in Columbus (Ohio) USA, has been replaced with a virtual conference. The Virtual Conference on Glass Problems (VGPC) will take place online on October 26-30. Being accessible via the internet will allow participants from the Indian glass manufacturing industry access to the world's leading technical experts addressing current problems in glass manufacturing. The VGPC will also provide an exhibiting platform for solutions providers to communicate with the industry.

Larry McCloskey-Glass Engineering Consultant to Anchor Hocking, provides this insight, "The GPC conference has the cross section of information and vendor interaction, coupled with the technical papers, that may provide the only practical/technical experience many plant level or young engineers have opportunity to experience, during the year."

The Virtual Conference on Glass



**will participate as one of the Supporting Associations**

Problems is organised by the Glass Manufacturing Industry Council (GMIC), which is the American trade association bridging all segments of glass manufacturing and Alfred University, the USA's leading glass research institution. It is endorsed by the American Ceramic Society. Glass Worldwide is the official journal.

An industry advisory board oversees the programme, which is composed of invited papers and submitted abstracts, with the proceedings manuscripts distributed to attendees and also published by John Wiley & Sons. Preference is given to lectures providing practical, take-home information. Some of the highlights of the programme are: **Marty Curran, Innovation Officer, Corning**

**Incorporated** – *Glass Industry Today: Challenges & Opportunities*; **John Mauro, Professor, Pennsylvania State University** – *Machine Learning and Glass Formation*; **Frank O'Brien-Bernini, VP and Chief Sustainability Officer Owens Corning** – *Sustainability – Creating Enterprise Value*; **Daniel Swiler, Glass Scientist, O-I, Inc.** – *Surface Viscosity and the Melting of Glass*; and **Lance Lemings, Senior Director Operations, Gallo Glass Company** – *Hot Bottom Repair on a 10-Year-Old Furnace*.

The technical programme, which had traditionally been two days, now expands to three days, October 26-28.



The 82<sup>nd</sup> Conference on Glass Problems will take place on 1-4 November 2021 at the Greater Columbus Convention Center and the Hilton Columbus Downtown in Columbus, Ohio, USA



Two excellent technical short courses are offered virtually on October 23; **‘Fundamentals of Batch and Furnace Operations’** taught by C. Philip Ross and **‘Introduction to Redox and Sulfur Chemistry’** taught by Corinne Claireaux, Glass Scientist and Oscar Verheijen, Senior Consultant at CelSian Glass & Solar B. V.

An additional special opportunity is the GMIC organised virtual symposium entitled ‘The Future of Glass Manufacturing. The world’s top experts examine the technologies and trends that shape the future of glass manufacturing. The symposium will have three sessions, *Digital Transformation*, *Resources*, and *Furnace Design*. To allow for sufficient time to cover the topic in depth, the symposium has been extended to two days, October 29-30.

**EXHIBITORS**

The Virtual Conference on Glass Problems will allow delegates to visit an online exhibition of leading suppliers of glassmaking plant, equipment and services. In addition, delegates can communicate directly with exhibitors and exhibitors will be providing additional satellite education events.

To be presented as a virtual conference, the conference programme at the time of going to press includes:

**SHORT COURSES**

**Fundamentals of Batch and Furnace Operations**

Friday: October 23, 2020  
10:00 am to 4:00 pm

Instructor: **C. Philip Ross**, President | Glass Industry Consulting International (GICI).

The course is an introduction to the principles of commercial glass production employed in Batch & Furnace operations by US Glass producers. Raw Materials, Glass Technology & Properties, Melting Furnaces, and Environmental Issues will all be touched upon. Suggested attendees could be vendors or newer individuals to glass manufacturing seeking an introduction to the issues faced in glass production.

**Introduction to Redox and Sulfur Chemistry**

Friday: October 23, 2020  
10:00 am to 2:00 pm

Instructor: **Corinne Claireaux**, Glass Scientist and Oscar Verheijen, Senior Consultant | CelSian Glass & Solar B.V.

The short course provides a general description of the redox concept and the relevant sulfur chemistry for soda-lime-silicate glasses.

OCTOBER 26–30, 2020 [glassproblemsconference.org](http://glassproblemsconference.org)

Organized by: **GMIC** Glass Manufacturing Industry Council  
Official Journal: **glass WORLDWIDE**

**Virtual Conference on Glass Problems**  
*where the glass manufacturing industry meets*

**Monday: October 26, 2020**

**TECHNICAL PLENARY**

**Session Moderator: Bob Lipetz, MBA**  
Conference Director, Glass Manufacturing Industry Council

10:00 am — 10:15 am	<b>Bob Lipetz, MBA</b> , Conference Director, Glass Manufacturing Industry Council – <i>Introduction</i>
10:15 am — 10:40 am	<b>Erik Muijsenberg</b> , Vice President, Glass Service, Inc.– <i>Industry 4.0 and Beyond</i>
10:40 am — 10:45 am	<b>Q&amp;A</b>
10:45 am — 10:50 am	<b>BREAK</b>
10:50 am — 11:15 am	<b>Daniel Swiler</b> , Glass Scientist, O-I, Inc. – <i>Surface Viscosity and the Melting of Glass</i>
11:15 am — 11:20 am	<b>Q&amp;A</b>
11:20 am — 11:25 am	<b>BREAK</b>
11:25 am — 11:50 am	<b>Lance Lemings</b> , Senior Director Operations, Gallo Glass Company – <i>Hot Bottom Repair on a 10-Year Old Furnace</i>

11:50 am — 11:55 am  
11:55 am — 12:55 pm

**Q&A**  
**BREAK**

**Session Moderator:** **S. K. Sundaram, PhD**  
Program Director, Alfred University

12:55 pm — 01:50 pm **John Mauro**, Professor, Pennsylvania State University—*Machine Learning and Glass Formation*  
01:50 pm — 01:55 pm **Q&A**  
01:55 pm — 02:00 pm **BREAK**  
02:00 pm — 02:25 pm **Marty Curran**, Innovation Officer, Corning Incorporated – *Glass Industry Today: Challenges & Opportunities*  
02:25 pm — 02:30 pm **Q&A**  
02:30 pm — 02:35 pm **BREAK**  
02:35 pm — 03:00 pm **Frank O’Brien-Bernini**, VP and Chief Sustainability Officer Owens Corning –*Sustainability – Creating Enterprise Value*  
03:00 pm — 03:05 pm **Q&A**  
03:05 pm **SESSION ENDS**

**Tuesday: October 27, 2020**

### **TECHNICAL SESSION – CONSTRUCTION / REPAIR**

**Session Moderator:** **Larry McCloskey**  
Consultant, Anchor Hocking

10:00 am — 10:25 am **Neil Simpson**, Independent Consultant to Ametek Land—*Supporting Hot and Cold Furnace Repairs*  
10:25 am — 10:30 am **Q&A**  
10:30 am — 10:35 am **BREAK**  
10:35 am — 11:00 am **Christopher Hetro**, Glass Service Leader, Borton-Lawson— *Infrastructure and Process Considerations when Increasing the Size of Your Furnace*  
11:00 am — 11:05 am **Q&A**  
11:05 am — 11:10 am **BREAK**  
11:10 am — 11:35 am **Jalil Abraham Kuri**, Furnace Design, Construction and Maintenance, Libbey, Inc. – *Experienced Analysis in Furnace Construction Recurrent Projects*  
11:35 am — 11:40 am **Q&A**  
11:40 am — 12:40 pm **BREAK**

### **TECHNICAL SESSION – MELTING**

**Session Moderator:** **Chris Tournour**  
Senior Glass Process Engineer, Corning Incorporated

12:40 pm — 01:05 pm **Stephane Schaller**, SEFPRO Refractory Solution Engineer, SEFPRO— *Improved Glass Homogeneity and Higher Sustainability through Textured Expendable Tubes in Container Glass Furnace*  
01:05 pm — 01:10 pm **Q&A**  
01:10 pm — 01:15 pm **BREAK**  
01:15 pm — 01:40 pm **Phil Tucker**, Principal Materials Engineer, Johns Manville | **Donn Sederstrom**, Senior Research Engineer, Johns Manville—*Extending Campaign Life in an All-Electric Melter Using High Levels of Commercial Bottle Cutlet*  
01:40 pm — 01:45 pm **Q&A**  
01:45 pm — 01:50 pm **BREAK**  
01:50 pm — 02:15 pm **Stanley Rutkowski, III**, Senior Applications Engineer, RoMan Manufacturing— *New Power System Technology for More Electrically Efficient Melting, Booting and Forming Processes*  
02:15 pm — 02:20 pm **Q&A**

02:20 pm — 02:25 pm	BREAK
02:25 pm — 02:50 pm	<b>Cheng- Hung Hung</b> , Senior Research Associate, Vitro Architectural Glass— <i>Combustion in Regenerative Air-Fuel Glass Furnaces</i>
02:50 pm — 02:55 pm	<b>Q&amp;A</b>
02:55 pm	SESSION ENDS

**Wednesday: October 28, 2020****TECHNICAL SESSION – QUALITY CONTROLS & SENSORS**

**Session Moderator:** **Kenneth Bratton**  
Manager, Research & Development, Bucher Emhart Glass

10:00 am — 10:15 am	<b>Andries Habraken</b> , Glass Melting Expert, CelSian— <i>Glass Melt Quality Optimization by Mathematical Modeling of Redox and Bubbles in the Glass Melt</i>
10:15 am — 10:30 am	<b>Q&amp;A</b>
10:30 am — 10:35 am	BREAK
10:35 am — 11:00 am	<b>Scott Cooper</b> , Global Glass & Materials Science Leader, O-I – Glass, <i>The Detection and Root Causes of Cord in Glass</i>
11:00 am — 11:05 am	<b>Q&amp;A</b>
11:05 am — 11:35 am	<b>Joseph La Plante</b> , Business Unit Glass Market Manager, ISRA Vision— <i>Float Glass Flatness Process Consequences and How to Improve Control</i>
11:35 am — 11:40 am	<b>Q&amp;A</b>
11:40 am — 12:40 pm	BREAK
12:40 pm — 01:05 pm	<b>Tod Canty, Jr.</b> Engineer, JM Canty – <i>Dynamic Imaging as a Tool to Increase Yield and Reduce Production Costs</i>
01:05 pm — 01:10 pm	<b>Q&amp;A</b>
01:10 pm — 01:15 pm	BREAK

**TECHNICAL SESSION – ENVIRONMENTAL AND SUSTAINABILITY**

**Session Moderator:** **Adam Polcyn, PhD**  
Associate Director, Glass Science and Technology  
Manager, Vacuum Coatings R&D, Vitro Architectural Glass

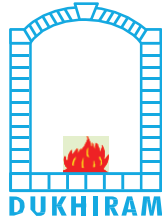
01:15 pm — 01:40 pm	<b>Shrikar Chakravarti</b> , Associate Director, Technology Commercialization – Glass, Praxair, Inc.— <i>Waste Heat Recovery in Oxy-Fuel Glass Furnaces – A Path to Sustainability and Lower CO<sub>2</sub> Emissions</i>
01:40 pm — 01:45 pm	<b>Q&amp;A</b>
01:45 pm — 01:50 pm	BREAK
01:50 pm — 02:15 pm	<b>Scott DeFife</b> , President, Glass Packaging Institute— <i>Glass Recycling – A Regional Approach to Dedicated Glass Collection</i>
02:15 pm — 02:20 pm	<b>Q&amp;A</b>
02:20 pm — 02:25 pm	BREAK
02:25 pm — 02:50 pm	<b>Ravindra Aglave</b> , Director, Energy & Process, Siemens Digital Industries Software— <i>Multiphysics Simulation to Solve Energy and Pollution Challenges in the Glass Industry</i>
02:50 pm — 02:55 pm	<b>Q&amp;A</b>
02:55 pm	SESSION ENDS

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# CO<sub>2</sub> neutral glass production - a route to reduce CO<sub>2</sub> emissions



Originally published in *Glass Worldwide*, preferred international journal of AIGMF, Dipl.-Ing Bernhard Fleischmann summarises the glass relevant results of the SynErgie project and describes an idea that unfolds from numerous discussions about CO<sub>2</sub> emissions and reduction. The idea of a closed CO<sub>2</sub> loop is drafted that still uses fuels, however renewable fuels, to melt glass. The concept allows compensating the fluctuations of renewable electric power regarding availability, with the possibilities to store electric energy when disposable as synthetic fuel.



The advancing climate change forces energy-intensive industries to think about, as well as to develop, methods and production processes that minimise CO<sub>2</sub> emissions. Immediate action and first steps help to decrease the emissions due to increased efficiency of the process steps, decreased losses, improved heat recovery and usage of optimised cross-sectional technologies. To

reach the ambitious aims of 2050 with CO<sub>2</sub> neutral production and process, new concepts have to be found. As there are only 30 years to reach the aim, ie two- to three-fold furnace lifetime, the developments have to be initiated today and serious thoughts should be given to ideas that seem to be funny or strange on first sight.

## The challenge of renewable energy sources

Renewable energy sources like photovoltaic or solar and wind energy vary and fluctuate in availability and amount due to night and day, as well as changes in weather and seasons. The Federal Ministry of Education and Research in Germany therefore started the Kopernikus programme in 2016 to re-engineer industrial production to renewable fluctuating energy sources within the SynErgie project. The following conclusions result from the dialogue of the Huettentechnische Vereinigung der Deutschen Glasindustrie eV (HVG) with the glass industry within the SynErgie project<sup>(1-3)</sup>.

The glass production process is a continuous one even in two-fold aspects. First of all, the operation time of glass melting furnaces is more than 10 years except for some particular glasses and all-electric melters, even up to 20 years for soda lime silica glasses. This means that after lighting the furnace, a continuous energy supply is required 24 hours a day, seven days a week and 52 weeks a year for the total operation time of more than 10 years, without disruption. In the glass industry, the definition of operation time or furnace lifetime implies that there is no break to change the refractory lining in contrast to other sectors, where furnace lifetime of decades includes the yearly change of refractory lining. If there is a break of one hour or more in power supply and the glass melt is frozen, maybe only in parts of the installation,

the furnace and feeder are destroyed or damaged and no longer deliver best quality glass products.

Secondly, when the batch enters the furnace to produce a distinct product, the velocity of the production chain (melting - forming - annealing) cannot be altered to adapt to the fluctuating electric energy supply as product quality and geometry, respectively, would change. The drawing speed of the float ribbon affects the thickness of the sheet. If the speed of a container glass forming machine is varied, the cooling of the glass within the mould changes and the mechanical properties of the product as well as the thickness distribution of the container are influenced. The annealing process that minimises the residual stress in the product after forming will not give satisfactory results if the velocity of the production process varies. Again,

the quality of the glass product will be unsatisfactory. The continuous glass production process requires a constant and assured power supply, therefore, ie enough power without interruption.

The main questions regarding renewable electric power are how to use the electric power in times of excess and how to bridge times with lack of electricity or with high prices for electricity? And is all-electric melting the solution or could other concepts serve with alternative answers?

## Electric boosting and flexibility

Even though no basic flexibility in glass production is visible, one tool for small flexibility potential could be found: Electric boosting<sup>(1)</sup>. Electric boosting is partly used already for tasks within the scope of demand side management, so that practical experience is available

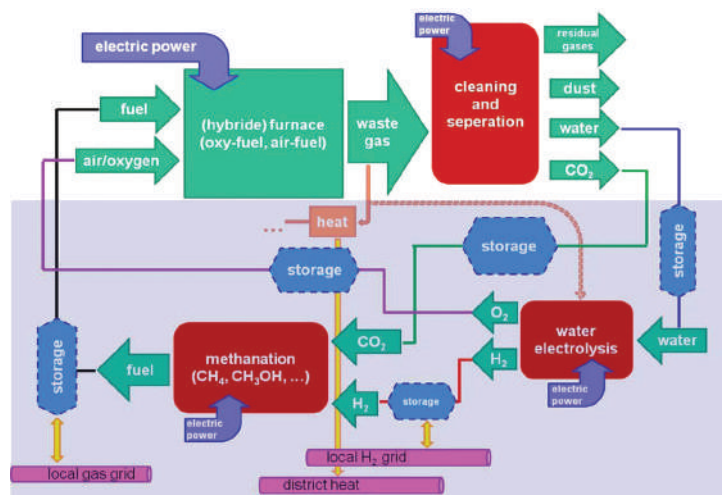


Figure 1: CO<sub>2</sub> neutral glass production with renewable fuel and a closed CO<sub>2</sub> loop.



This article is based on a paper presented at the GlassTrend sessions during the 25th International Congress on Glass (ICG2019) in Boston, USA in June 2019. [www.glasstrend.nl](http://www.glasstrend.nl)

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about technological restrictions. The usage of electrical boosting in Europe in most cases is required and used due to technological reasons and not for economic ones. Electric boosting increases furnace output and/or allows melting of coloured glasses in furnaces with a higher glass level. This technological need is the reason that electric boosting cannot just be switched on or off when flexibility is needed but it can replace up to one third of the actually used electric power.

In Germany, about 75 MW are installed with electric boosting in the glass container industry. Few additional furnaces use electric boosting in flat glass production or other glass sectors. In total, about 100 MW for electric boosting are installed in the German glass industry. But not all furnaces use electric boosting all the time and the power transferred in most cases is less than the installed power. Statistically, one or two furnaces are shut down for a major repair. Therefore, 80% maximum of the installed power is really in use. With a maximum flexibility of one third, the maximum technologically usable flexibility is about 27 MW. If one assumes that the flexibility can be provided for use once per working shift for 20 minutes without influence on glass quality, the maximum amount of flexible energy per year is about 9 GWh/a.

This flexibility of the electric power is strongly coupled to the flexibility of the fuel used for melting. Varying the electric power supply has to be compensated by adapting fuel consumption within minutes to keep the total energy supply constant.

### Common results of energy-intensive industry

Similar investigations in other industry sectors with high energy consumption have shown some principal findings that are valid for all sectors<sup>(1)</sup>:

- The very first: Switching to all-electric does not (automatically) mean more flexibility. Having a closer look at all-electric melters, the continuous need for electric power to melt glass is still present to get a high quality glass product and to achieve a long furnace lifetime. The inflexibility of the glass forming process is still valid too.
- Thinking about hybrid devices or furnaces: The flexibility of one energy source (electric power)

also entails flexibility of the second energy source (gaseous or liquid or solid fuels) to compensate the temporary lack and abundance, respectively, of electric power.


- Higher flexibility in most cases is contradictory to optimum energy and thermal efficiency. Since industrial thermal processes are optimised regarding energy demand or costs up to now, the efficiency will worsen if high flexibility is the crucial factor.
- The potential for flexibility is intimately connected to the ability of storing (semi-finished) products and energy within the process (chain) and varies from site to site and depends on the technology used.
- And more generally: Top priority is to satisfy the delivery commitments of customers and a subordinated priority is flexibility in the use of electric power.

- Furthermore, production and process stability, ie product quality, is superior to flexibility too.


### CO<sub>2</sub> neutral production

Since flexibility is not very high in glass production and the efficiency of the glass melting process in Western Europe is at a high stage, alternative actions and breaking new ground are necessary to minimise CO<sub>2</sub> emissions.

CO<sub>2</sub> emissions during glass production originate from two sources. Energy-related emissions are the first part and the CO<sub>2</sub> emissions of batch components are the second part. Both sources should be



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neutralised to contribute for climate correction. Figure 1 presents a concept for CO<sub>2</sub> neutral glass production that tries to integrate all aspects.

The starting point is the glass melting device. Gaseous, liquid or solid fuels are used for combustion with any oxidant (air, oxygen or mixtures) in combination with more or less electric boosting, maybe as a hybrid furnace, to melt and fine the glass. The flue gases from combustion, as well as the CO<sub>2</sub> emissions from the batch materials are collected and withdrawn in a flue gas channel.

First of the basic steps for a closed CO<sub>2</sub> circuit loop is the cleaning device that separates the CO<sub>2</sub> of the flue gases from other gaseous components and solid particles. Whether this is a combination of a cooling trap and a baghouse filter or other technologies has to be resolved. The specific requirements and characteristics of flue gases originating from a glass melting furnace have to be considered when thinking about the closed CO<sub>2</sub> loop.

As a second step, hydrogen has to be generated before the renewable fuel can be produced in a third step. It has to be identified which of the technologies, under development could be the best solution for each step. Now the CO<sub>2</sub> loop in principle is closed and the CO<sub>2</sub>, incorporated in the renewable fuel, can be used to melt glass again.

To get flexibility of the CO<sub>2</sub> loop regarding the availability of electric power and to ensure constant availability of the renewable fuel, different storage facilities are needed. If hydrogen is produced with water electrolysis, storage is necessary that may gather the water that may come from the cooling trap. Storage for CO<sub>2</sub> after separation as well as storage for hydrogen after electrolysis or other technologies are necessary to be less contingent or less controlled by the availability of electric power. If electrolysis is used to generate hydrogen, the side product oxygen should be stored to be used as an oxidant in combustion. Last but not least, renewable fuel has to be stored to bridge the times when no electric power is available or too expensive to produce renewable fuel.

The exhaust heat of the waste gas of the furnace can be used within process steps that need higher temperatures, or can be fed to a local district heating grid. Both hydrogen and the fuel may be fed into local or public grids if available in excess. If the storages are empty, these local grids could be the standby solution for both gases.

Electric power is needed for all

steps as the primary renewable, CO<sub>2</sub> neutral energy source. The glass melting furnace uses electric power for electric boosting or for hybrid operation modus. The separation of CO<sub>2</sub> as well as the hydrogen production and the fuel synthesis will use electric power, preferred in times of cheap electricity and times of excess electricity. To bridge the other times, mass storages are necessary before and behind the three main process steps.

The whole production of renewable fuels may be outsourced to a service provider if the glass producer wants to concentrate on glass production or if several nearby industry production sites are connected to one big production unit of renewable fuels.

The mission now is to look for the technologies for every process step that are the most efficient, with the smallest investment and lowest maintenance cost, that are the most flexible (operating grade from 0% to 100% if possible) and that have technical maturity. Besides that, the special features due to glass production have to be incorporated (gaseous trace components of the waste gas, dust, high temperatures etc).

### Advantages

Several questions arise when reflecting on the concept. First and most prominent: Why not use the electric power directly to melt glass with an all-electric melter? The storage of electric power is still not really effective for high amounts of energy combined with longer times of discharging application. Mass storage of fuels is the more successful method (up to now) to provide energy in sufficient amount and over longer times.

Another benefit of the concept is the fact that a well known and proven device can be used for glass melting without changes in technology and modus operandi. Although all-electric melters are well known and proven, there are restrictions in maximum tonnage and size of the melter and in amount of cullet when cold top is installed. With some glass compositions and some coloured glasses, adaption of raw materials is necessary when melting glass with an all-electric melter.

A further advantage is that the glass producer is more or less independent from the supply of external fuel if the CO<sub>2</sub> loop works as predicted. The cost of fuel production may be higher than today but with future prices for electricity and CO<sub>2</sub> certificates, this will change and the economic view will perform better.

Furthermore, no CO<sub>2</sub> leaves the closed circuits, even process CO<sub>2</sub> from batch is captured and will compensate the principal losses of CO<sub>2</sub> when passing through the circuit. Aside from that, the costs of fuel production are more predictable and advantage can be taken of low price periods of electric power to keep down the costs for energy as far as possible.

In addition, if water electrolysis is used to provide the hydrogen, oxygen is produced as an acceptable byproduct that helps to increase the efficiency of combustion by mixing the oxygen with air or by applying oxy-fuel combustion.

As mentioned previously, there is no need for the glass producer to keep busy with the fuel production site, since the additional site could be outsourced or run by an external supplier.

### Conclusion

Synthetic fuels are one route to achieve CO<sub>2</sub> neutral glass production. Renewable electric power can be used to establish a closed CO<sub>2</sub> loop that shows less total efficiency than melting with an all-electric melter but does have other advantages. The fluctuations of electricity are homogenised by the storage of the synthetic fuel, which enables companies to bridge times with a lack of electric power or times with high prices for electricity. An efficient and well known technology can be used furthermore to melt glass and a certain degree of autonomy regarding renewable electric energy is achievable.

### Acknowledgement

The author thanks the Federal Ministry of Education and Research for financing the SynErgie project and the Projektraeger Jülich (PtJ) as the project executing organisation. Further thanks are extended to glass industry colleagues who discussed the results and made available their knowledge in interviews and questioning surveys. Last but not least, the author appreciated working with all research partners within the SynErgie project. ●

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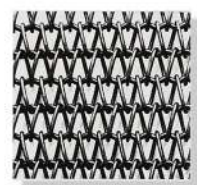
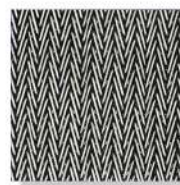
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# MSME SCHEMES AND ITS ROLE IN INDUSTRY

By: Uttam Modi  
 CHARTERED ACCOUNTANT  
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The Micro, Small and Medium Enterprises (MSME) sector has become a highly vibrant and dynamic sector of the Indian economy in the last five decades. MSMEs not only play an important role in providing large employment opportunities at lower capital costs than large industries, but also help in the industrialization of rural and backward areas, thereby reducing regional imbalances, higher national incomes and wealth. Equal distribution is assured. MSMEs complement large industries as ancillary units and the sector contributes greatly to the socio-economic development of the country.

The present ceilings on investment & Turnover for enterprises to be classified as micro, small and medium enterprises are as follows:

Revised MSME Classification			
Composite Criteria: Investment & Annual Turnover			
Classification	Micro	Small	Medium
Manufacturing & Service Industries	Investment < Rs 1 Cr. And Turnover < Rs 5 Cr.	Investment < Rs 10 Cr. And Turnover < Rs 50 Cr.	Investment < Rs 50 Cr. And Turnover < Rs 250 Cr.

## FEW MSME SCHEMES WHICH CAN BE BENEFICIAL TO GLASS INDUSTRIES:

### National Competitiveness and Manufacturing Lean Manufacturing Programme

The program aims to develop global



competitiveness among Indian MSMEs by improving their processes, designs, technology and market access. The program envisages substantial investment to expand the entire value chain of the MSME sector. All ten components of NMCP have already been commissioned and are likely to spur innovation and development in the MSME sector.

Under the Lean Manufacturing Program (LMP), MSMEs are being helped to reduce their manufacturing costs, through proper manufacturing

management, better space utilization, scientific inventory management, better process flow, shorter engineering time and so on. LMP improves the quality of products and reduces costs, which are necessary for competition in national and international markets.

### Promotion of Information & Communication Tools (ICT) in MSME Sector

Comprehensive activities planned under this component include identifying potential MSME manufacturing clusters for ICT interventions, setting up of e-readiness centres, developing web portals for clusters, skill development of MSME staff / employees, designing local software solutions for MSMEs. Doing this involves increasing their competitiveness, etc. and networking MSME clusters on national level portals to advance MSMEs in global markets.

### Technology Upgradation and Quality Certification Support to MSMEs

The major activities planned under this component include Capacity Building of MSME Clusters for Energy Efficiency/Clean Development Interventions, Implementation of Energy Efficient Technologies in MSME sector, setting up of Carbon Credit Aggregation centres and encouraging MSMEs to acquire

product certification licenses from National / International bodies.

### Tools (QTT)

The objective of the scheme is, to improve the quality of the products in the MSME sector and inculcate the quality consciousness in enterprises in this sector. The major activities are (i) Introduction of Appropriate Modules for Technical Institutions; (ii) Organizing Awareness Campaigns for MSEs; (iii) Organizing Competition-Watch (C-Watch); (iv) Implementation of Quality Management Standards and Quality Technology Tools in selected MSMEs; (v) Monitoring International Study Missions; and (vi) Impact Studies of application of QMS/ QTT.

### ISO 9000/14001/HACCP

#### Reimbursement Scheme

To enhance the competitive strength of the MSEs, the Government introduced a scheme to provide technological upgradation, quality improvement and better environment management by the MSEs. The scheme reimburses 75% of the fees, subject to a maximum of Rs. 75,000 for acquiring Quality Management System (QMS) ISO 9000/HACCP certification and/or Environment Management System (EMS) ISO 14001 certification by the MSEs. *The Scheme provides one-time reimbursement.*

### Marketing Assistance and Technology Upgradation Scheme for MSMEs

The objective of this component is to identify and encourage such clusters of MSMEs, which have quality production and export potential and assist them to achieve competitiveness in the national and international markets through technological Upgradation in packaging, skill upgradation /

development of modern marketing techniques, competition studies, participation in local exhibition/fairs, setting up of marketing hubs etc.

### Building Awareness on Intellectual Property Rights for the MSMEs

Financial Assistance (Reimbursement) for IPR	
Domestic Patent	Up to Rs 1,00,000
Foreign Patent	Up to Rs 5,00,000
Trade Mark	Up to Rs 10,000
Geographical Indication up to Rs 2,00,000	

### Public Procurement Policy

*Minimum 25% of the total annual purchase or services procured by Central Ministries/ Government Departments/PSUs/Authorities shall be from MSEs.*

- Out of 25% sub-target 4% from MSMEs owned by SC/ST entrepreneurs.
- Out of 25% sub-target 3% from MSMEs owned by women entrepreneurs.

Further 15% weightage in price preference also given to MSME entity. If MSEs quoting price within price band of Lower I (Other than MSE) + 15% shall be allowed to supply at Lower Price subject to lowering of price by MSEs to Lower.

### Protection against Delayed Payment Under MSMEs

The Objective of the scheme is to make available funds with MSME. Under the scheme Buyer is required to pay outstanding amount within 45 Days. Otherwise beyond 45 days MSME entity get legal right to receive interest at 3 times of normal bank rate.

### Prime Minister's Employment Generation Programme

PMEGP is a credit linked subsidy scheme of the Ministry, implemented through KVIC, DICs and State KVI

Boards with KVIC as the Nodal Agency at the national level for setting up new self-employment ventures/projects/ micro enterprises to generate employment opportunities in rural as well as urban areas of the

country. Encourage Entrepreneur through Credit Link subsidy Support up to 35%.

### Credit Guarantee Scheme for Micro and Small Enterprises

The objective of the scheme is to make available credit to SSI units, particularly tiny units, for loans up to Rs. 200 lakhs without collateral/ third party guarantees. The Scheme covers collateral free credit facility (term loan and / or working capital) extended by eligible lending institutions to new and existing micro and small enterprises up to Rs. 200 lakh per borrowing unit.

### Credit Linked Capital Subsidy Scheme (CLCSS)

- For both Old or New Enterprises (*Machinery for Technology upgradation*)
- Subsidy @ 15% of Institutional Credit for Technology upgradation up to Loan of Rs one crore.

### MSE Cluster Development Programme

To Support the substantially and growth of MSEs by addressing common issue such as Improvement of technology, Skill & Quality, Market Research, Upgradation, Set up common facility centres etc. Grant at 70% of the cost of project subject to maximum of Rs 20 crores.

### **E-Discounting Trade Receivable "TReDS"**

Electronic platform for facilitating the financial / discounting of trade receivable of MSMEs through multiple financiers. Amount will be credited in 3 Days only.

### **International Cooperation (IC) Scheme**

The scheme will include the following activities, including deputation of MSME business delegations to explore / upgrade new areas of technology in other areas, facilitation of joint ventures, market improvement of MSMEs products, foreign collaboration, participation by Indian MSMEs in international exhibitions, Trade fair included. And buyers and sellers meet abroad as well as in India, which has international participation.

IC Scheme provides financial assistance towards the airfare and space rent of entrepreneurs. State / Central Government Organisations, Industry / Enterprise Associations and Registered Societies / Trusts and Organisations

associated with the promotion and development of MSMEs are eligible to apply.

### **Survey, Studies and Policy Research**

The main objectives of the Scheme are (i) to regularly / periodically collect relevant and reliable data on various aspects and features of MSMEs, (ii) to study and analyse, on the basis of empirical data or otherwise, the constraints and challenges faced by MSMEs as well as the opportunities available to them in the context of liberalization and globalization of the economy, and (iii) to use the results of these surveys and analytical studies for policy research and designing appropriate strategies and measures of intervention by the Government. Several studies on the MSME sector and evaluation studies of various schemes implemented by the Ministry have been completed under this scheme.

### **Skill Mapping**

MSMEs have also compiled district wise skill development requirements

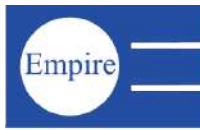
based on the district industrial profile of 658 districts. District-wise skill development needs have been created on the basis of industry clusters located in the respective districts. In addition, based on industry groups, the types of skills required to produce products and, subsequently, the need for training programs to be conducted to manipulate non-employed youth have been identified. The 29 column forms for skill mapping in each district based on industry groups have been developed to cover all possible information - including the name of technical institutes (ITIs, polytechnics and engineering colleges with facilities). The draft has been shared with the Ministry of Skill Development, National Skill Development Council and Industry Associations.

**There are many more general and specific schemes for industries, in this article the author just covered those few schemes from which the glass manufacturing industry can avail benefits.**

**About the Author:** Mr. Uttam Modi is a practicing Chartered Accountant from New Delhi and an Associate Member of The Institute of Chartered Accountants of India. He is a certified GST Practitioner, and a Commerce Graduate from Bikaner University. His expertise lies in Audits for various companies, indirect taxation matters, MSMEs and other routine compliances. He possesses experience in handling matters relating to Income Tax, Customs, TDS, MCA, Taxation and Business Consultancy services ■

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# Function through technology

Multi-functional glass has a fascinating range of uses, yet is challenging to produce. Modern architecture and some industrial sectors today are unimaginable without it. Coatings and textures allow the glass to fulfil multiple functions simultaneously but these demand additional steps in production. According to the following VDMA contribution originally published in *Glass Worldwide*, preferred international journal of AIGMF, the latest technologies are helping to shorten processes and increase productivity.

The core challenge in producing thermal insulation coatings is the size of the substrate to be processed, combined with the need to maximise the system service life and reduce maintenance times. Grenzbach Maschinenbau GmbH has now opened a coatings laboratory to develop solutions for the panes, which can be up to 3.4m in width. Coatings can be applied for high end products, from dielectrics such as silicon nitride and titanium dioxide to ultra-thin metal and blocker layers like silver and nickel chromium and even transparent conductive layers for use in the display and solar industries. Tests in this laboratory can answer a variety of questions, such as how to apply silver layers to thermal insulation glass while also extending the service life of the system.

In order to minimise shutdown and maintenance times, digital solutions

support the production process. The IIoT platform SERICY developed by Grenzbach controls all the processes of coaters and peripherals in production, the warehouse and shipping. The data collected can be used to derive continuous analyses and adaptations, which further optimise performance and thus economy. App-supported assistance systems help in this task.

The aim of all this is to offer almost fully automated PVD coating lines. The PVD process is a vacuum-supported procedure for layer removal. The sputter process has a significant effect on layer growth, with the involvement of excited atoms and molecules and/or ions generated in plasmas. This allows manufacturers to produce all coatings on large surfaces, from sun protection applications to high quality thermal insulation glasses (low-E layer systems).

Grenzbach recently installed a system for a North American manufacturer that produces more than 500km of flat glass worldwide every day, demonstrating the capability of this procedure. The glass is intended to ensure a pleasant temperature and high energy efficiency in buildings. The production line can coat more than 12 million m<sup>2</sup> of sheet glass with thermal insulation or sun protection coatings every year. The processing section of the coating system is

equipped with 11 process chambers and a range of coating stations, which apply various coating systems to the glass in a precisely defined order. Two of Grenzbach's three stackers work constantly to add new sheets of glass and remove them at the end of the production line. As the product is sensitive to touch both before and after coating, the stackers are arranged in such a way that they pick up the coated sheets from underneath.

The entire line covers 9300m<sup>2</sup>, or the size of 1.3 football pitches. Some 110m of the coating system is under a vacuum, while the section equipped with conveyor technology measures 450m in length.


## No autoclave required

Laminated glasses undergo a complex process. They generally consist of three layers: A glass layer at the top and bottom, enclosing a layer of PVB, SGP or EVA film, for example. An autoclave is used in the standard process but this is complex and cost-intensive. Robert Bürkle GmbH has developed inline flat lamination, an innovative multi-stage process that can be used for laminated glass or laminated safety glass, even switchable glass. Lamination is faster and is flexible in terms of glass structure. Moreover, set-up times are short when switching between different products.

The glasses enter the laminator in batches. As the batches are only formed on the feed belt, the process enables a high level of flexibility. A vacuum removes the air between the layers before lamination, which then begins with a vacuum flat press heated on both sides. Steel plates heated with thermal oil ensure symmetrical and homogeneous temperature input across the entire surface. Simple glasses such as tempered glass can be processed at a temperature of approximately 150°C. The effective



The latest technologies are helping to shorten processes and increase productivity (source: VDMA).

Originally published in *Glass Worldwide*, preferred international journal of 



area is 2600mm by 5000mm and the cycle time is less than 10 minutes. Lamination of particularly thick glasses can be completed in a second step, thereby reducing the cycle time. Another flat press then cools the laminated glasses and completes the process.

This procedure allows fast and even lamination without overpressure at the edges, which is a particular problem in membrane laminators. Cooling both sides simultaneously under pressure prevents internal tension and deformation. These flat presses are suitable for safety glass, decorative glass, solar modules and especially multi-functional glasses that are to be equipped with sensor technology or contain functional films.

**Bright and warm**

Windows and fully glazed tower facades today do a lot more than just letting light into the building. Numerous functional layers meet the requirements of modern working environments and personal preferences. Electrically conductive layers are in just as high demand as self-cleaning surfaces and thermal insulation. Glass that both lets light in and keeps heat inside the building demands a special metallic coating. Manz AG worked with Trumpf GmbH + Co KG to develop a laser process that makes this surface treatment more efficient for a French glass manufacturer.

The goal was to improve the thermal insulation properties of very large glass substrates, while also allowing the greatest possible quantity of light to permeate. Manz has many years of expertise in producing thin film solar modules. The company was therefore responsible for the conveyor line with consistent synchronisation, the high precision kinematic control of the laser optics including all sensor technology and inline measurement technology and the overall integration of all individual components to form a system ready for production. The glass manufacturer integrated this into its production flow, downstream of the inline coating system.

Eight line optics arranged next to each other make it possible to process the glass sheet running underneath at a width of 3.30m.

Twelve laser sources with 12kW of power each feed into the line optics, which Manz has constructed as a bridge across the width of the conveyor line. A continuous laser line across the entire width of the glass sheet requires precise control. The Gaussian width and edge characteristics at each end of the line must be ensured. Homogeneous energy input within the individual lines and the correct focus depth were further requirements for the quality of the products. With a width of less than 100 µm, the laser line only briefly heats a silver coating that is just a few micrometres thick on the glass substrate. The coating thus switches from an amorphous to a crystalline state, thereby enhancing the insulation effect and transparency of the material. The more constantly the glass substrate, which can weigh up to 750kg, is transported along the line and the more constantly the laser inputs the energy, the higher the quality of the coating.

In order to adapt the system to various products quickly, flexibly and based on the recipe, the line optics are mounted on very stiff, moveable fixtures to ensure the highest level of precision. Cooling units and radiation protection equipment provide the necessary safety. ●

**Further information:**  
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## Oktober - Dezember 2020

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