



# The Shining Inferno

## A Symposium on Glass Raw Materials



### Speaker Biographies & Abstracts

Thursday October 20, 2011

9:00 a.m. to 4:00 p.m.



#### Opening Remarks – Objectives, Logistics, and Acknowledgments

*Christopher Hoyle, Vice President - Technical Director, Toledo Engineering Co., Inc.*

#### About the Chair

Chris Hoyle is a graduate of Nottingham University in the UK where he received a bachelor's degree with honors in Chemical Engineering. Chris is a Chartered Energy Engineer, member of the Energy Institute and Society of Glass Technology.

Chris has been in the glass industry since 1980, joining TECO in 2000 as Assistant Technical Director (2000-2004), Technical Director (2004-2011) and Vice President – Technical Director (2011-Present). He is responsible for the design and specification of glass melting furnaces and the development and implementation of new technology. He is actively involved in the application of mathematical and computational fluid dynamics methods to improve furnace design and operations analysis for process optimization. Chris' experience includes all types of glass furnaces and conditioning systems.

Prior to joining TECO, Chris was Contracts Manager at KTG Systems, Inc., Engineering Manager at Frazier-Simplex, Inc., and Chief Systems Engineer at King, Taudevin & Gregson, Ltd. in the UK. Before joining the glass industry, Chris worked for GR-Stein Refractories, Ltd. as a Fuel Engineer

#### Program 1 Regulations Affecting Raw Materials Selection

**NOX, SOX, Mercury, Chlorine, Cullet, Cap and Trade, Reducing Agents, Selenium, etc.**

**Regulations Affecting Raw Material Selection** – As emission and safety regulations tighten, they may clash with a glassmaker's traditional route to producing cost-effective and high-quality glass. Alternate routes need to be defined.

*C. Phillip Ross, Glass Industry Consultant*

#### Abstract

This presentation will generally review current environmental issues which are affecting certain raw materials for use in glass manufacturing. Examples of raw material substitutions for both exposure to employees as well as furnace emissions will be discussed. There will also be examples of the melting furnace's operational variables which influence the levels of regulated emissions.



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### About the Speaker

C. Phillip Ross is a glass industry consultant with 28 years experience in Container and Tableware Manufacturing, Glass Industry Line and Staff Engineering and has held many positions in glass melting. Past employment includes Vice President of Batch & Furnace Engineering Kerr Glass. In 1992 he formed Glass Industry Consulting. He holds a BS in Ceramic Engineering, University of Illinois 1965. Professional Societies; Fellow American Ceramic Society, Past President Ceramic Manufacturing Council, Member National Institute of Ceramic Engineers, Glass Program Chairman Pacific Regional Meetings (4 conferences), Member Society of Glass Technology, Chairman Glass Packaging Institute's Glass Firing Task Group (1981-1992), Member Glass Problems Advisory Board (1984 – 2009) 14 papers presented.

### Program 2 Different Routes to the Same Glass

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#### **Saving Energy/Carbon Footprint by Using Different Raw Materials to Reach Your Present Composition**

**Calumite Slag – Time to Look Again** – A review of how calumite slag is used worldwide and across glass sectors, with a focus on uses in the U.S. Calumite can be used in the management of furnace emissions for quality improvements, increased furnace output, and reduction of greenhouse emissions.

*Mark A. Abraham, General Manager, Calumite Company, LLC*

#### **Abstract**

Calumite slag has been used successfully all around the world due to its unique glass making properties, this paper reviews the materials available around the globe, then focuses on renewed interest in increasing the use of Calumite slag due to its ability when properly utilized to reduce emissions of both Sox and Greenhouse gasses. Recent developments in Iron making have also made the increased use of Calumite slag a viable proposition for current users to reduce further their CO2 emissions.

#### **About the Speaker**

Mark is a Chemistry graduate from the University of Birmingham and an MBA from Sheffield Hallam University, has spent all of his working life in the Glass and Minerals Industry. He was technical manager of Rockware glass UK before moving to Calumite Ltd where he was responsible for the UK and Czech operation. Mark designed and started the Czech operation shortly after the opening up of Eastern Europe which has proved to be one of the most successful operations in the world. After leaving Calumite he worked for both Rexam Glass and Beatson Clark in the UK before taking a role in the mineral Industry. He finally came home in 2008 after being invited to manage The Calumite Co., LLC based in Burns Harbor Indiana. He now lives in NW Indiana is married with 2 teenage sons both now football not soccer players!

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**Alkaline Earths for Glass Manufacturing – You Have Choices** – A range of alkaline earth products can supply the CaO/MgO component of your glass. These products have widely differing physical and chemical properties that can help optimize your glass operation. Burned lime and dolomite offer potential benefits in both transportation and your carbon footprint.

*John Elliott, Sales Manager, Lhoist North America*

### **Abstract**

Overview and comparison of Carbonates and Oxides of Calcium and Magnesium as a earth alkalis in the manufacture of glass using

- Mining, production, and processing
- Chemistry
- Applications
- Decrepitation
- Physical sizing and handling characteristics
- Logistics
- Safety

### **About the Speaker**

John Elliott is the Sales Manager Market Specialist-Glass for Lhoist North America operating units Franklin Industrial Minerals and Chemical Lime Company. He received his BA in 1973 from University of South Carolina, and has worked in the Lime and Limestone Industry since 1980.

**Glass Batch Activation for Better Melting Properties** – The batch mixer can do more than just achieve homogeneity. Sequenced mixing facilitates early reactions and reduces dissolution times. Pelletization brings traditional benefits at reduced costs. Tests show great potential.

*Dan Britton, North American Sales Manager, Eirich Machines, Inc.*

### **Abstract**

Eirich's preparation technology is used for batch or continuous processes. High costs of raw material and energy enable fast return on investment for high quality batching equipment.

### **About the Speaker**

Dan Britton has been with Eirich Machines for more than one year and brings 18 years of material processing and material handing expertise to the company along with several equipment patents. Dan also has experience with multiple mixing technologies. Dan has a bachelor's degree in Mechanical Engineering Technology from the Milwaukee School of Engineering. Previously Dan served as a Regional Sales Manager at a material handling company.



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**New Freedom in Raw Materials for High-Intensity Melters** – We hear “A melter is not a mixer”. But this is not the case for these melters with high shear and high-speed flows. The kinetics of melting and reaching homogeneity are much different. Our paradigms about raw materials can be challenged.

*David Rue, Manager, Industrial Combustion Processes, Gas Technology Institute*

### **Abstract**

Conventional melters place tight constraints on raw materials. But melters with high shear and high-speed flows provide interesting new freedoms in raw materials. It is worth considering the many ways existing ideas on raw materials processing and handling can be challenged while considering the consequences and potential benefits of those choices.

### **About the Speaker**

David Rue holds B.S. (Notre Dame) and M.Ch.E. (IIT) degrees in chemical engineering and is a Research Manager in the End Use Solutions group at the Gas Technology Institute. His group focuses on the development of energy efficient combustion systems, technologies for heat recovery and management, and processes for emissions reductions. He has 30 years of R&D experience with current emphasis on the development of submerged combustion melting and industrial oxygen-gas combustion technologies.

### **Program 3 Logistics**

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#### **Transportation and Handling of Raw Materials**

**Logistics Issues** – There are many factors involved in the cost and reliability of having your raw materials in your silos when you need them and free from contamination. We will look at these factors and how they may change in the near future. Some will just be happening to us, and others we can influence.

*Wayne Johnson, Manager Global Carrier Relations, Owens Corning*

### **Abstract**

Logistic issues are a major factor in transportation related statistics. There are many key metrics to watch including modal choices and shipper relationships, and regulations affecting transportation.

### **About the Speaker**

Wayne is a native of Illinois where he was raised on a farm near Pittsfield. After graduating from Pittsfield High Wayne joined the U.S. Navy served for 4 years where he was promoted to an E-5 Radioman prior to receiving his honorable discharge. He received his BA from Iowa Wesleyan College with majors in Business, Transportation and Accounting.

For over 35 years Wayne has worked in the field of Logistics as a shipper, carrier and educator. He has over 32 years in management responsibility with Fortune 100 companies in the United



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States and Mexico. Wayne worked with the sixth largest LTL and TL carrier in Philadelphia for 5 years. He has 8 years of teaching experience in the field of transportation and accounting.

Wayne is the Chairman of the National Industrial Transportation League (NITL) Highway Committee and also serves on its Board of Directors and an active member of the Rail Committee. He is on the Board of Governors of the Southwest Association of Railroad Shippers (SWARS), he was on the Executive Board and Treasurer for Americans for Safe & Efficient Transportation (ASET) and a member of Saving Our Service Association (SOS). In 2010 Wayne received the McCullough/ NITL Executive of the Year Award. Wayne is presently the Manager of Global Carrier Relations for Owens Corning headquartered in Toledo, OH and he presently resides in Toledo with his wife Lorraine of 42 years.

### **Program 4 Cleaning Up Our Act**

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#### **Opportunities for Upgrading Our Raw Materials for Specialty Products**

**Factors in US Sand Supply** – Both glassmakers and raw material suppliers need profitability and sustainability. Are there changes that would be good for both? We will examine the sand market and how glass fits into it. Some specifications are critical; some may offer flexibility.

*Greg Bedford, Technical Sales Manager, Unimin Corporation*

#### **Abstract**

Many factors can affect the supply and quality of sand that is supplied to the U.S. glass industry. This presentation will focus on the following four questions, and how each affects sand that is supplied to the glass industry.

- How has hydraulic fracturing in the oil and gas industry affected the cost and supply of high quality glass sand to the glass industry?
- How practical is it for sand suppliers to upgrade their supplies in terms of iron oxide content?
- What problems make it impractical to supply wet sand to the glass industry?
- Are there specifications which place restrictions on the supplier that prevent him from getting optimum use of his material in the ground, without particularly helping the glassmaker?

#### **About the Speaker**

Greg Bedford obtained a B.S. degree in Chemistry from Austin Peay State University in 2000. Currently he serves as Glass Chemist and Technical Sales Manager for Glass and Fiberglass Industries for Unimin Corporation. Employed with Unimin for 10 years and currently operates the Glass Lab at their Brentwood, TN facility.

**Benefits of Glass Cullet and Factors Affecting Supply** – Increasing cullet in batch reduces energy consumption and emissions. Manufacturers require a reliable supply of clean and



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affordable cullet, but various factors impact supply and price including multiple glass recycling stakeholders and raw material pricing.

*Joe Cattaneo, Packaging and Recycling Communications Consultant*

### **Abstract**

Glass is 100% and endlessly recyclable, and the environmental and economic benefits of using recycled glass in the manufacture of new glass containers include reductions in energy use, raw materials, and CO2 emissions. But glass manufacturers are up against a myriad of obstacles to increasing cullet supply. A primary challenge is the impact of recycling collection practices on the industry's ability to meet the demand for high-quality recycled glass required for closed-loop recycling. At curbside, recycling glass through single stream collection can yield low-quality cullet. Recycled glass is further contaminated when it is processed at the Materials Recovery Facility (MRF). In the commercial stream, more incentives and systems need to be in place to recover and collect glass bottles at high-volume sources, such as bars, restaurants, and hotels. Finally, proposed legislation, such as container deposits, landfill bans, and Extended Producer Responsibility (EPR), present both opportunities and concerns.

### **About the Speaker**

Joe Cattaneo retired as President of the Glass Packaging Institute (GPI) in March 2011. He served in that position for ten years and prior to that, as Executive Vice President since 1992.

GPI is the trade association representing the North American glass container industry. GPI member companies manufacture glass containers for beer, food, beverages, wine, liquor, fragrance and cosmetics. GPI also has associate members that represent a broad range of suppliers. Through GPI, glass container manufacturers advocate industry standards and recycling, promote sound environmental policies and educate students and packaging professionals of the benefits of glass.

Before joining GPI, Mr. Cattaneo was Vice President and Partner at Gunder & Associates, a Columbus, Ohio-based advertising and public relations firm. His advertising experience also includes account supervisor positions at Fahlgren & Swink, Inc. and Howard Swink Advertising. While at all three agencies, Mr. Cattaneo directed GPI's industry union promotion program.

Prior to his career in advertising and public relations, Mr. Cattaneo worked eleven years in various management positions for the American Red Cross in Missouri, Illinois, Wisconsin and Ohio.

Mr. Cattaneo has an A.B. in Political Science and M.A. in Urban Affairs from Saint Louis University. He also served in the United States Army as an artillery officer. He has a married daughter living in Washington, DC area and a son in New York City.

### **Using Selective Batching to Dramatically Reduce Batch Free Time in**

**Commercial Glass Compositions** – Liquids from low-temperature eutectics can drain away from the sand during melting of a normal glass batch, delaying final silica dissolution, increasing retention time, and energy costs. This is avoided by choosing partial combinations of



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the raw materials and segregating them during initial melting phases. Various combinations of agglomeration, particle size, and melting schedules can optimize the results. Selective Batching introduces raw materials into the melter in a manner that controls the raw material reactions within the batch during melting.

*William M. Carty, CSL Materials, LLC*

### **Abstract**

Selective Batching introduces raw materials into the melter in a manner that controls the raw material reactions within the batch during melting. It is proposed that by controlling raw material reactions, and specifically thwarting reactions that create low viscosity melts, large scale segregation within the reacting batch is reduced or eliminated, dramatically reducing batch free time. Since the idea was introduced, roughly 30 glass compositions have been evaluated that fall into four general categories: float glass, container glass, reinforcement fiber glass (E-glass), and borosilicate flat panel display glass. In all cases the batch free time was substantially reduced and in some cases by approximately 90% (from eight hours to 45 minutes in crucible melts). Over the past eight years we have refined the basic concept, established general rules, and have investigated various granulation technologies necessary to implement selective batching efficiently.

### **About the Speaker**

William Carty has a B.S. and M.S. in Ceramic Engineering from University of Missouri-Rolla and a PhD in Materials Science and Engineering from the University of Washington (Seattle). John F. McMahon Professor and Chair of Ceramic Engineering at Alfred University. Have been a Professor at Alfred University since 1993. Formed CSL Materials, LLC with Chris Sinton and Hyojin Lee in 2006. His expertise is in ceramic processing for, and microstructure evolution in, traditional and advanced ceramic materials.

**Wrap Up** – Summary review, take home lessons learned

*Douglas Davis, PhD, Senior Glass Technologist, Toledo Engineering Co., Inc.*

### **About the Chair**

Doug Davis graduated from the NYS College of Ceramics in Alfred in 1964, and later, with a PhD in Ceramic Science.

He has worked at Norton Company and after grad school at PPG Industries, dealing with raw materials and chemicals used by the glass industry. He took a position with FMC Corporation, having the opportunity to film and evaluate many melter operations, getting a strong appreciation for the importance of convective flows.

He later worked with Manville Corporation, in raw material and melting process development. Moving to Toledo Engineering, he was soon immersed in the vitrification of hazardous and radioactive wastes.



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In recent years, as Sr. Glass Technologist for TECO, he has had a chance to put his oar in many glass projects. In addition to glass technology and modeling projects, he has been working to open a window from TECO to the glass world.

**Symposium Evaluation** – Please return the enclosed Symposium Evaluation to Donna Banks at the end of the session

**Symposium Proceedings** – Presentations will be available for download November 1, 2011 on the GMIC Website: <http://www.gmic.org/pubs.html>

**GMIC** – Facilitating, organizing and promoting the interests and economic growth, and sustainability of the glass industry through education and cooperation in the areas of technology, productivity, innovation and the environment.

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