

# refractories

Hot Topics

# WORLD FORUM

Manufacturing & Performance of High-Temperature Materials

NEWSLETTER 3/2014

## IMPORTANT DATES

11.09.2014 - 13.09.2014

Ankiros / Annofer / Turckast 2014

Istanbul / TR

[www.ankiros.com](http://www.ankiros.com)

21.09.2014 - 24.09.2014

12<sup>th</sup> ESG Conference

Parma / IT

[www.icglass.org/](http://www.icglass.org/)

24.09.2014 - 25.09.2014

57<sup>th</sup> International Colloquium

of Refractories 2014

Aachen / DE

[www.feuerfest-kolloquium.de](http://www.feuerfest-kolloquium.de)

24.09.2014 - 26.09.2014

FundiExpo 2014

Monterrey / MX

[www.fundiexpo2014.com](http://www.fundiexpo2014.com)

30.09.2014 - 02.10.2014

POWTECH + TechnoPharm

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[www.powtech.de](http://www.powtech.de)

07.10.2014 - 09.10.2014

ALUMINIUM 2014

Düsseldorf / DE

[www.aluminium-messe.com](http://www.aluminium-messe.com)

21.10.2014 - 24.10.2014

glasstec

Düsseldorf / DE

[www.glasstec.de](http://www.glasstec.de)

28.10.2014 - 31.10.2014

ALAFAR

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## A Review of the Global Container Glass Industry 2014

Although there are a multitude of packing materials available today to the manufacturers of a huge range of diverse products, glass is still the material of choice for many and the reasons are usually "quite clear to see". Glass offers the benefits of being strong, secure, hygienic, convenient, relatively low cost, transparent and each individual item is capable of being recycled very many times.

It is claimed that up to 95 % of the glass bottles sold in Switzerland each year are recycled to provide cullet for remelting into new containers which not only helps the environment enormously but also reduces the subsequent energy usage and production costs substantially. Germany and Sweden are almost as diligent in recycling over 90 % while Spain and the GB average around 50 %

while countries such as Greece and Romania have a long way to go in catching up with the European average of 57 % managing only about 10 % recycling. With a 2,5 % energy saving possible for every 10 % of cullet recycled however there are very big financial incentives for every manufacturer in every country to improve their performance and the European target is currently more than 70 %.

*see page 2*

## ALUMINIUM 2014: Debut for the Recycling Pavilion

"Urban Mining" is gaining in importance in the aluminium industry. The recycling ratios in application industries such as automotive or construction have meanwhile reached about 95 %, and more than 60 % in packaging. The potential and the technical possibilities of recycling will be presented at the ALUMINIUM World Fair in Düsseldorf from 07.–09.10.2014, which will highlight this topic at a special "Recycling Pavilion".

Aluminium recycling not only secures the supply of raw materials, but above all minimises emissions and saves energy. Recovery of secondary aluminium uses only 5 % of the energy required for the production of primary aluminium. The high degree of recyclability of aluminium is due to its purity and low melting point (660 °C). The recovery cycle can be repeated an unlimited number of times without loss of quality.

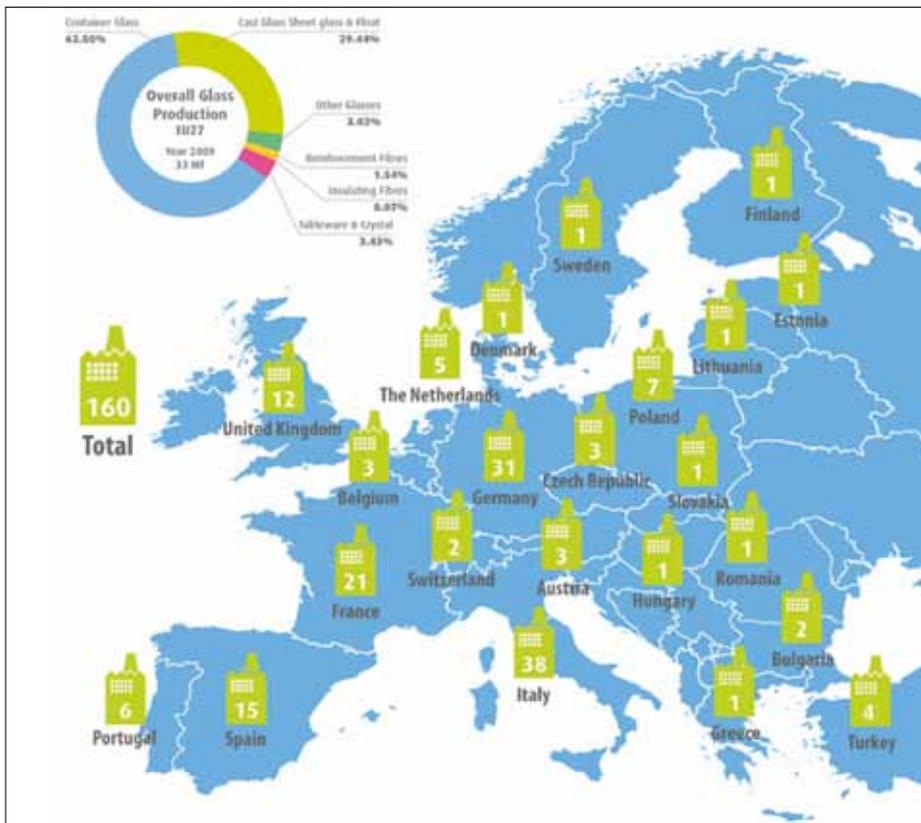
At ALUMINIUM 2014, the world's largest trade event of the aluminium industry, aluminium producers and converters meet with suppliers of technologies and equipment for production, further processing and finishing. More than 950 exhibitors and 20 000 visitors are expected at ALUMINIUM 2014.

Further information on: [www.aluminium-messe.com](http://www.aluminium-messe.com)



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**Fig. 1 European glass production EU 27**

(Source: FEVE)

Glass is not only readily available as bottles and jars but also in many other formats such as table wear which can be very practical to glasses and vases which can also be extremely decorative and in a wide range of colours. Container glass is mainly clear with 60 % of the market and with amber and green making up the remaining 40 % in virtually equal amounts.

The origins of the glass industry may be traced back to about 6000 years ago. Archaeologists have found traces of small stones covered in coloured glazes to make decorative beads but it is said that the first evidence of glass containers may only date from about 3500 years ago. These early articles appear to have been made from molten glass poured over a sand core but it was only about 2000 years ago that the technique of glass

blowing seems to have been developed somewhere within the Roman empire and it was they who eventually introduced it into much of Europe and also the middle east. These hand-made items in both clear and coloured glasses were all slightly unique and very expensive and the Venetians in particular are credited with spreading the manufacture of container and decorative glass throughout Europe.

The first evidence of commercial glass making in GB for example is thought to be in north east England near Sunderland in the 7<sup>th</sup> century while in Germany the industry seemed to centre around the Cologne area perhaps also resulting from its former Roman influences.

Container glass production took an enormous leap forward in the early 20<sup>th</sup> century in the United

States benefitting from massive developments in mechanisation as instanced by the advances made by *Michael Owens* in Illinois and *Henry Ingle* in Connecticut

A typical modern container glass furnace might be designed to produce about 600 t/d but a few of these are being pushed to maintain production levels of up to 800 t/d. Such a furnace could cost anything between EUR 10 – 20 million and have life of up to 10 years during which they can produce up to 12 containers per second or about 3500 million units during its operating lifetime. Such a furnace operating continuously at over 1600 °C is heavily insulated and the energy usage would be in the region of 4 GJ/t of glass produced, with a refractories consumption of around 5 kg/t of glass produced on average depending on the type of glass.

Today Europe has maintained its early lead and is the biggest production area in the world for most types of glass. The European glass industry currently produces more than 20 Mt of glass packaging each year employing about 46 000 people working in 160 plants throughout the EU but these figures also include Switzerland and Turkey. The largest producer of container glass in Europe is Italy with about 38 Mt, while Germany manufactures almost 31 Mt, France 21 Mt, Spain 15 Mt and GB 12 Mt. Of the other countries, the Netherlands and Portugal produce about 5 Mt each while most of the other countries have national production levels in the region of 1 Mt each per annum. In Germany there are at least 10 significant glass container producers. These companies serve to illustrate the enormous range of sizes and the diverse capabilities of companies in the modern container glass industry throughout Europe and beyond in most industrialised countries in the world at large.

*(The full version of the paper will be published in refractories WOLRDFORUM 6 [4]; publication date: 01.10.2014).*

Worldwide

### Management Change at ThyssenKrupp

*Walter Medeiros* took over as Chief Executive Officer (CEO) of *ThyssenKrupp Companhia Siderúrgica do Atlântico* (CSA) on 1 June 2014.

He replaces *Jorge Luiz Ribeiro de Oliveira*, who is seeking a new challenge outside the Group following the successful technical ramp-up of the Brazilian steel mill. With the mill in Rio de Janeiro state operating reliably and production having been ramped up, the focus now turns to further efficiency improvements and stronger penetration of the

American slab markets. *Walter Medeiros* joined the Group in 1988 and is an expert on the South and North American markets. He has been a member of the management team of *ThyssenKrupp Metalúrgica Campo Limpo* in Sao Paulo since 2004. In his last position, he was Chief Operating Officer (COO) of the entire Forged & Machined Components business unit at ThyssenKrupp. *Andreas Goss* became Chief Executive Officer of the Steel Europe business area and the Steel Americas business area effective 1 June 2014. *Andreas Goss*, who took on the role of Chief Financial Officer (CFO) on the board of the

Steel Europe business area and the board of the Steel Americas business area effective 1 October 2012, will continue to perform these duties alongside his role as CEO. *Gerd Krasshöfer* is taking well-earned retirement at the end of the current fiscal year. *Dr Klaus Keysberg*, a member of the Materials Services business area board since 2011, is to take on the role of CFO effective 1 October 2014. *Hans-Josef Hoss* has been appointed to the business area board effective 1 July 2014; after a three-month settling-in period he will succeed *Dr Klaus Keysberg* as COO.

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Egypt

### CPC Buys Egypt's Sphinx Glass

*Construction Products Holding Company (CPC)* has acquired 100 % shares of Egypt's *Sphinx Glass* company for USD 190 million, with the aim to increase its revenues to EGP 451 million this year from EGP 393 million registered in 2013.

Sphinx Glass has a paid-up capital of USD 80 million. Sphinx Glass plans to establish an integrated industrial system in Egypt to meet the growing demand for float glass in local and export markets, through benefiting from the advantages of the advanced Egyptian glass industry, as well as the availability of high-quality raw materials and skilled labor. The Egyptian market is expecting a large construction boom under the new government's directives for building millions of residential units for low-and middle-income people, this is in addition to the major projects to be implemented by Arab and foreign capitals to offer more job opportunities for the Egyptians, which would create great demand for float glass, and here lies the importance of Sphinx glass factory, which will enable us to meet a large part of this demand, and also export to neighboring countries.

Sphinx Glass uses the latest glass industry technologies, have a strong administration and the appropriate infrastructure to establish a second production line to increase its production capacity, as well as to develop its exports to the nearby markets. Sphinx Glass has a new factory with a production capacity of 600 t. The plant was built by an Italian company on an area of 220 000 m<sup>2</sup> in Sadat City, north of Cairo. Since its opening in March 2010, the factory becomes a major resource for many projects in Egypt and export markets. This plant uses PPG Industries' know-how, which specialized in providing advanced technical solutions for float glass industry.

Germany

### TRIMET Acquires Aluminum Smelter in Voerde

*Trimet Aluminium SE* has acquired *Voerde Aluminium GmbH* and all 280 of its employees.

The company, which is currently in bankruptcy proceedings, manufactures primary aluminum and carbon anodes used in electrolysis for metal extraction. Trimet will continue to run the aluminum smelter and anode factory at its location on the Lower Rhine and will take over the full staff. "We are pleased that we can continue to run Voerde Aluminium GmbH as a viable long-term production site and secure existing jobs," said *Heinz-Peter Schlüter*, owner and Supervisory Board Chairman of Trimet Aluminium SE. The acquisition was contingent upon an EU-compliant asset relief scheme for the energy-intensive industry under the Renewable Energy Sources Act. This has removed any existing

legal uncertainty and created planning security. With the Voerde location, the materials specialist has expanded its production capacity for primary aluminum, continuing the positive growth demonstrated over the past few years. The medium-sized family enterprise operates production facilities at eight locations which manufacture, cast and recycle aluminum. In December 2013, Trimet acquired two production plants in France.

Germany

### Processes for Continuous Chemical Tempering of Glass

For advanced refining systems for the production of alkali-free special glass with daily yields of significantly over ten tons, a continuous process for pre-tempering glass and an IR-based advanced conditioning technology has been developed. These are just some of the innovations that the German glass melting plant and machinery manufacturer *JSJ Jodeit* will be showcasing at the leading industry event *glasstec*, held in Düsseldorf from 21 to 24 October.

Russia

### New Refractories for the Glass Industry

*Magnezit Group/RU* widened the range of refractory products with the new grades of bricks for the glass-making industry. At the Satka production site (Satka, Chelyabinsk region, Russian Federation) the company has manufactured the first pilot batch of bricks of MZ-84 grade for lining walls and regenerator checker of glass-melting furnaces.

Scientific studies of specialists of the *Center for Engineering Developments* were finished with the design of a new technology for production of four novel grades of refractories. The work for launching of one of this technologies – technology for production of bricks of MZ-84 grade — was started by the specialists of the workshop for production of magnesia bricks of *Kombinat Magnezit* (Satka, Chelyabinsk region, Russian Federation). The first pilot batches of refractories of MZ-84 grade were shipped to consumers.

The newly developed refractories are characterized by high strength rates, surpassing 100 N/mm<sup>2</sup>, and low open porosity of 10–14 %. These properties in combination with good thermophysical characteristics provide them with considerable advantages in service. In the course of development the refractories were tested for glass attack resistance at material science laboratory. During this testing the novel refractories were compared with batch bricks. This allowed to evaluate the ability of the new refractory to withstand destructive action of aggressive components during service.

Test results showed that novel products can compete not only with traditionally applied in glass-melting furnaces periclase bricks, but also with

expensive high-purity periclase- zirconia bricks. The thing is that composition of the refractories was developed mainly on the basis of clinker of the own production. It is manufactured in the shaft kiln design Maerz. It allowed to considerably reduce the share of expensive purchased materials in their composition and to improve the "price –quality" ratio during production of the novel bricks».

In the nearest plans of Magnezit Group there is an introduction of new grades of products for glass-melting industry into mass production and further scientific and research work in perspective directions.

Germany

### International Forum at ALUMINIUM 2014

The trade fair's new "International Forum" will put the spotlight on two of them: China and India. Held for the first time, the lecture forum in Hall 13 will serve as an information exchange for both German and international companies interested in expanding their activities abroad.

How do the Chinese and Indian markets function? What opportunities and risks await European companies when launching there? How best to prepare trade fair appearances abroad? Officials representing embassies, regional aluminium associations and corporations as well as tax professionals will provide answers to these and other questions. The lecture programme starts in the morning and concludes with an international reception in the afternoon. Trade fair visitors are welcome to attend the International Forum without prior registration. Admission is free; lectures are held in English. The International Forum is presented in collaboration with the *German-Chinese Business Association (DCW)* and *Prexma Limited*. Thanks to their ties with organisations such as the *China Aluminium Network*, *Asia-Pacific Management Consulting* and the *Ger-*

#### IMPRINT

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www.refractories-worldforum.com

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Germany

### Glass Industry Outlook 2018 – Growing Demand for Flat Glass to Foster Growth

The report titled "Germany Glass Industry Outlook 2018 – Growing Demand for Flat Glass to Foster Growth" provides a detailed analysis of the glass industry in Germany covering various aspects related to market size in terms of revenue and market segmentation on the basis of major types of glass such as flat glass, container glass, tableware glass, glass fiber, utility and special glass. The report also includes competitive analysis and profiles of all the major players operating in the industry. The future projections are also included in the report to provide an insight of future prospects for the Germany glass industry.

Complete report with TOC: [www.researchmoz.us/germany-glass-industry-outlook-2018-growing-demand-for-flat-glass-to-foster-growth-report.html](http://www.researchmoz.us/germany-glass-industry-outlook-2018-growing-demand-for-flat-glass-to-foster-growth-report.html)

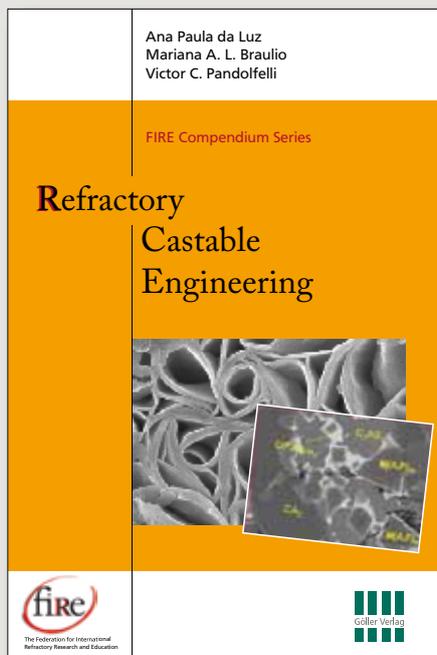
The Germany glass industry is a highly fragmented market with more than 400 domestic and international players in the market. The future of Germany glass industry is expected to be favorable as the use of glass as a specialized material in various industries has gained continuous momentum. Changing needs and advanced technology has opened doors for alternate usage of glass and not just for decorative and storage purpose. The improving economy of Germany and other European countries has led to increase in the demand for glass from various related industries. The revenue generated by the glass industry of Germany is projected to be USD 12,4 billion in 2014 which is expected to further increase to USD billion in 2015 witnessing a growth rate in percent. The CAGR from the years 2013 – 2018 is projected to be 4,3 %, recording total revenue of USD billion by 2018.

### FIRE Compendium Series

#### Volume 1: Refractory Castable Engineering

Authors: Ana Paula da Luz, Mariana A.L. Braulio and Victor C. Pandolfelli

The book addresses the fundamentals of refractory castable engineering with three distinct themes being presented in a sequence that not only considers the formulation concepts and properties but also the features and the optimization of different systems. Three chapters are dedicated to the fundamentals of formulation design linked to dispersion, particle size distribution and packing, and different binder additives. Subsequent chapters then address the installation and drying steps, as well as the effects associated with the main castable processing stages. The last four chapters move on to highlight



the properties and optimization of traditional and novel monolithic formulations containing magnesia, spinel or carbon and a treatise on the family of special castables. This perspective demonstrates the authors' objectives to illustrate the various and complex steps and fundamentals involved in the design, processing and applications of these products. Furthermore, by applying the presented fundamentals for the development and production of such materials, high-performance castables can be developed, aiming to extend the equipment working life and cope with aggressive operational conditions.

The authors were led by one of the world's experts in the field of monolithic refractories, Prof. Victor C. Pandolfelli, from Federal University of Sao Carlos in Brazil, who compiled with his co-authors Dr Ana Paula da Luz and Dr Mariana A. L. Braulio this ten chapter book dedicated to the engineering of modern refractory systems.

The book is unique as its content has been reviewed by fellow experts worldwide in the field of castables with Prof. Michel Rigaud acting as executive editor. It thus represents unrivalled peer reviewed content in terms of castable engineering compared to previous publications and provides the reader with a unifying holistic view of such complex subject.

**Price: 120,00 USD** (postage included)

**Publication date: 15 October 2014**

For orders received until 15 October 2014

Price: 108,00 USD (postage included)

#### Customer Service

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# refractories

## WORLDFORUM

Manufacturing & Performance of High-Temperature Materials

### preview of issue 4/2014 (extract)

#### Company Profiles / Interviews

- EKW/DE
- Skamol/DK
- Refratechnik Steel/DE
- ancorro/DE

#### Reports

- 18<sup>th</sup> Int. Conf. on Refractories + HITHERM 2014, Prague/CZ

#### Economy & Markets

- A Review of The Global Container Glass Industry 2014 (Jarvis/GB)
- Czech and Slovak Refractories in the Background of the Global Refractory Materials Industry

#### Technology Trends

- Interactions between Molten Aluminum and Various Refractory Materials (Steuler-KCH/DE)
- Investments in Industrial Tools to Improve Quality (Imerys Refractory Minerals/FR)
- The Value of Additives in Refractory Castables: Part 2 (Almatis/DE)
- Improvement of Methods of Fused Periclase Crystal Size Determination (Magnezit/RU)
- Microstructural Development in Calcium Hexaluminate with and without Fe<sub>2</sub>O<sub>3</sub> Doping at Different Forming Method (CISR/IN)

#### Special Circulation at:

- ALUMINIUM 2014, Düsseldorf/DE, 07 – 08 October 2014
- MST – ACerS 2014, Pittsburgh/US, 12 – 14 October 2014
- glasstec 2014, Düsseldorf/DE, 21 – 24 October 2014
- ALAFAR Santiago de Chile//CL, 28 – 31 October 2014

**Technical Reports Deadline: 07.08.2014**

**Advertising Deadline: 11.09.2014**

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Further media information on volume 6 (2014):

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