

# refractories

## WORLD FORUM

Hot Topics

Manufacturing & Performance of High-Temperature Materials

### IMPORTANT DATES

07.09.2015 - 09.09.2015

Aluminium India

Mumbai / IN

Aluminium India

[www.aluminium-india](http://www.aluminium-india)

08.09.2015 - 10.09.2015

2<sup>nd</sup> Common European Seminar on Refractories – Key Technology and its Applications

Höhr-Grenzhausen / DE

[www.ecref.eu](http://www.ecref.eu)

15.09.2015 - 18.09.2015

UNITECR 2015

14<sup>th</sup> Biennial Congress combined with the 58<sup>th</sup> Int. Colloquium on Refractories

Vienna / AT

[www.unitecr2015.org](http://www.unitecr2015.org)

08.10.2015 - 10.10.2015

ALUEXPO 2015

Istanbul / TR

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

19.10.2015 - 19.10.2015

Ceramic Minerals and Markets Forum 2015

Munich / DE

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

16.11.2015 - 19.11.2015

Iran Metafo

12<sup>th</sup> International Exhibition of Metallurgy

Tehran / IR

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



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

NEWSLETTER 3/2015

## UNITECR 2015 – Panel Debate: “Refractories – Engineered Products or Commodities?”

The steel industry is the main consumer of refractories and also an important driver for innovations in refractories. Therefore the approach of steel companies to refractories is essential for the business with their refractory suppliers. Although refractories only account for 1–2% of cost in steel making, they are often considered as major cost driver, where savings must be achieved in order to improve the economic situation of steel companies. This is supporting an approach to refractories as commodities with a few standardised specifications in order to leverage negotiation power. On the other hand, refractories are essential components of the metal producing process and their functionality and performance is essential for achieving the desired steel quality. Refractories are often customized for the requirements of a specific customer and new developments are triggered by such specific requirements. These are typical features of engineered products with more complex specification and lower potential for easy exchange with other products.

*see page 2*

## ceramitec 2015 – Iran Day

Oct. 21<sup>st</sup>; 3:15-4:45 pm, at ceramitec FORUM in Hall B1

Moderation: *Karin Scharrer*, Editor-in-chief, ceramic forum international+refractories WORLD FORUM

• Opening Speech by *Khalil Khalili Amiri*, General Consul of Iran

• *Prof. Golestani Fard*, President of Iranian Ceramic Society:

***Present situation of the ceramic industry in Iran***

• ***Industrial and financial experience in trade with Iran*** (expert statements)

*Klaus Friedrich*, foreign trade expert and Iran specialist, VDMA – German Engineering Association

*Sven-Boris Brunner*, Managing Director Millitzer & Münch Deutschland GmbH

*Volker Fitz*, Maschinenfabrik Gustav Eirich GmbH & Co. KG, Sales Director Middle East and Asia

• *M. Reza Bahraman*, Vice President of Teheran Chamber of Commerce Industries,

***Mines and agriculture on current industrial development in Iran***

• Best practice statements from German ceramic raw material, ceramic component and equipment suppliers industry

**ceramitec** is international key trade show for the entire ceramics industry, from classic ceramics and raw materials through powder metallurgy, refractories and technical ceramics. It will be held from **20 to 23 October 2015** on the exhibitions grounds of **Messe München**. [www.ceramitec.de](http://www.ceramitec.de)

PRESSES FOR REFRACTORIES

LAEIS

In the UNITECR panel discussion (Thursday, Sept. 17<sup>th</sup>, 2015, 5.15 pm 6.45 at the Hofburg Congress Centre/Festsaal), experienced stake holders from both sides of the business will discuss if and where refractories are commodities or engineered products and what it means for the refractory business, including the innovation process.

Moderators:

- Dr. Andus Buhr, Almatis GmbH, Global Technical Director Refractories
- Dipl.-Ing. Jens Pischke, Salzgitter AG Stahl und Technologie, Process Technology

Panellists refractories manufacturers:

- Prof. Dr. Helge Jansen – Refratechnik Steel, Managing Director
- Dr Patrick Tassot – Refratechnik Steel, Head of Technical Marketing
- Dipl.-Ing. Christian Artner – RHI VP Sales West Europe

Panellists enduser/steel industry:

- Steve Resler – Arcelor Mittal USA, Purchasing Refractories North America
- Dipl.-Ing. Leandro Schöttler – Deutsche Edelstahlwerke GmbH Siegen, Process
- Dipl.-Ing. Rinus Siebring – TATA Steel NL, Ceramics Research Center, Refractories Steel
- Wolfgang Eder – voestalpine Stahl Linz, Purchasing
- Mark Welbourn, Siemens / Primetals Technologies Ltd. UK, Procurement

Discussion Points:

- In which areas are refractories engineered products and where are they just treated as commodities?
- Organisation structure in companies (purchasing – R&D – production, probably incl. installation companies) both refractories and steel (resp. end users) - who has the full picture, or does anybody have the full picture?
- What role plays the size of a company in this regard? Can larger scale companies overcome the

disadvantage of missing general overview by organisational measures?

- Optimisation of sub-processes or units (Cost center approach) vs. optimisation of value chains
- Magnitude of potential savings in purchasing vs. magnitude of cost savings or increases depending on refractory performance / reliability
- Long product life cycle of refractory products, long periods for introducing new products – supporting the impression of refractories being commodities? Frequency of fine tuning refractories based on specific customer requirements.
- Co-development with suppliers – how long is business secured afterwards? Is intense co-operation rewarded in the business?
- How important is the supplier – customer relationship in the refractory business?
- Is service of the supplier adding substantial value for the customer? If yes, which kind of service?
- How is the service taken into account during negotiations – only possible through pro-rata contracts? <http://www.unitecr2015.org>

Belgium

### CEMBUREAU Welcomes new President and Vice President

In June 2015 - Daniel Gauthier, CEO Western Europe-Africa and Member of the Managing Board of HeidelbergCement, has been elected as President of CEMBUREAU for a two-year term at the Association's General Assembly held in Oslo/NO after having completed his mandate of Vice-President over the last two years. He takes over from Peter Hoddinott, Executive Vice President Performance and Member of the Executive Committee at Lafarge. In addition, Gonçalo Salazar Leite (CEO Secil) has been elected as Vice President of CEMBUREAU for a two-year term.

Upon his election, Daniel Gauthier outlined his priorities in his role as President, stating that "the industry must now build upon the accomplishments of "The Concrete Initiative", which was launched one year ago. "Concrete is essential to Europe's future providing the buildings and infrastructure which society needs, as well as growth and jobs. The circular economy, competitiveness and climate change will also remain at the forefront of CEMBUREAU's activities."

India

### Nalco to Invest INR 55 400 Million in 1 Mt Alumina Refinery

The board of National Aluminium Company (Nalco) has approved a significant capacity expansion plan to set up a 1 Mt alumina refinery at Damanjodi,

Koraput, Odisha at a proposed investment of INR 55 400 million.

Nalco already has a captive bauxite deposit at Potangi in the state, which will be utilized in this project. This is the first major expansion in the state run aluminium company in step with the Modi government's Make in India campaign. With a view to boost the ancillary and downstream industries, Nalco is also committed to supply 50 000 t of aluminium metal to Angul Aluminium Park which has been formed as a joint venture between Nalco and Industrial Development Corporation of Odisha. Apart from investing in its mainstay metals business, the company is also stepping up its fledgling presence in the renewable energy sector.

Turkey/The Netherlands

### OYAK has Signed a Share Purchase Agreement to Take over ALMATIS

ALMATIS' products are used in a wide variety of industries including iron and steel, cement, ceramic, polishing, automotive, construction and electronics sectors.

With more than 100 years of alumina expertise, ALMATIS is a group of companies which has its headquarters in the Netherlands, 4 factories and a refinery in the USA, factories in Germany, the Netherlands, Japan, China, and India, sales offices in Brazil, the USA, Germany, India, Japan, and China, and is by far the world leader in its field, employing 1 140 workers. Its expected that all legal issues can be settled until first week of September 2015.

By acquiring Akdeniz Kimya in 2012 and Austria based Chemson in 2013, OYAK achieved world leadership in the stabilizer sector, and by adding the premium alumina sector, it has now reached the position of world leader in both fields. Premium alumina and stabilizer groups provide a turnover of USD 1,1 billion with over 2 000 workers.

Austria

### RHI: Results of the Second Quarter 2015 – Outlook Adjusted

In the second quarter of 2015, the RHI Group increased its revenue by 12,7% compared with the first quarter of 2015 to EUR 477,9 million. This is in particular due to significantly higher revenue in the Steel Division in Europe and North America as well as in the environment, energy, chemicals, glass and nonferrous metals business units.

The operating result, at EUR 34,1 million in the second quarter of 2015, is at the level of the preceding quarter. The market environment of the Steel Division is characterized by an aggressive export strategy of Chinese steel producers as a result of a weak domestic market and high excess capacities. This led to high pressure on steel prices and consequently the profitability of manufacturers and further on the supply industries. In combination with negative product mix effects in the linings business, this resulted in a weaker contribution to earnings by the Steel Division compared with the first quarter of 2015. In contrast, the Industrial Division significantly increased its operating EBIT due to the deli-

very of projects. While the operating EBIT of the first quarter of 2015 still included slightly positive currency translation effects from intra-group transactions and the measurement of balance sheet items, the second quarter of 2015 was negatively influenced. The operating EBIT margin of the RHI Group declined from 8,1 % in the first quarter of 2015 to 7,1 % in the second quarter.

In the first half of 2015, the RHI Group's revenue was up 7,5 % on the comparative period of 2014 and amounted to EUR 902 million. The Steel Division's revenue rose by 7,3 % primarily because of positive currency translation effects and a strong business development in India. The 11,2 % increase in revenue in the Industrial Division compared with the weak first half of 2014 is primarily attributable to higher project deliveries in the glass and environment, energy, chemicals business units.

The operating EBIT amounted to EUR 68,6 million in the first half of the year. This corresponds to a decline by 4,5 % compared with the operating EBIT of 71,8 million in the first half of 2014. This development is primarily attributable to the Raw Materials Division's low contribution to earnings resulting from weaker capacity utilization at the raw material plants as well as falling raw material prices. While the Industrial Division benefited from a better utilization of fixed costs as a result of higher revenue, a better margin situation in the glass business unit and several major repairs in the nonferrous metals business unit, the operating EBIT of the Steel Division declined in the second quarter of 2015 due to a weaker margin development in Europe and in the Middle East, as well as to negative product mix effects. The operating EBIT margin fell from 8,6 % in the first half of 2014 to 7,6 % in the first half of 2015. EBIT of the first half of 2015 included no extraordinary effects and thus corresponded to the operating EBIT.

The economic framework conditions do not indicate a significant recovery in the main customer markets for the second half of 2015. Weak domestic demand in China leads to expectations that export activities for Chinese steel will continue to increase, which causes an additional burden on the steel customers outside of China. Important industrial metals such as aluminum, copper, nickel and tin reached new five-year lows in July 2015. RHI expects a currency-driven increase in revenue of more than 3% for the year 2015. In this environment and provided that the exchange rates remain stable, the operating EBIT margin will amount to roughly 8 %, contrary to previous expectations of roughly 9 %.

United States

#### **US Refractories Demand to Exceed USD 3 Billion in 2019**

Demand for refractories in the US is forecast to increase 3,3 % per year through 2019 to USD 3,1

billion. This will represent a deceleration from robust 2009-2014 gains, as iron and steel production in the US slows. Sales will also be limited by moderating output in a number of other durable goods manufacturing industries, many of which utilize refractories to at least some extent. Furthermore, a shift in demand toward better performing refractories, while providing an initial boost to sales due to their premium prices, will cause market growth to slow in the long run as replacement cycles are lengthened. On the positive side, continued increases in the price of raw refractory materials will support value gains. Additionally, the nonmetallic minerals industry segment, which is expected to record the fastest market advances, utilizes some of the highest cost refractories, boosting overall dollar growth. These and other trends are presented in Refractories, a new study from The Freedonia Group, Inc., a Cleveland-based industry market research firm.

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

Worldwide

#### **Crude Steel Production for the 65 Countries Reporting to worldsteel**

World crude steel production in the first six months of 2015 was 813 Mt, a decrease of -2,0 % compared to the same period of 2014. The Middle East showed an increase of 2,9 % whereas both North America and C.I.S. reported negative growth of -6,9 % in the first half of 2015. Crude steel production in Asia declined by -1,5 % while it increased by 0,5 % in the EU 28. South American production remained the same in the first six months of 2015 compared to the same period of 2014.

China's crude steel production for June 2015 was 69, Mt, a -0,8 % decrease compared to June 2014. Japan produced 8,6 Mt of crude steel in June 2015, a decrease of -6,2% compared to June 2014. India's production was 7,4 Mt, up by 0,8 % on June 2014. South Korea produced 5,9 Mt of crude steel, down by -3,6% compared to June 2014.

In the EU, Germany produced 3,8 Mt of crude steel in June 2015, an increase of 5,8 % compared to June 2014. Italy produced 1,9 Mt of crude steel, down by -11,4 % on June 2014. France's crude steel production was 1,4 Mt, a decrease of -1,3 % compared to June 2014. Spain produced 1,3 Mt of crude steel, a -3,3 % decrease year on year.

Germany

#### **IntrinSiC® Large-Size 3D-Printed Ceramic Components**

A unique innovation was presented by Schunk Ingenieurkeramik at THERMPROCESS 2015 in Dusseldorf/DE. With IntrinSiC®, Schunk has developed a new process where components can be produced from reaction bonded silicon carbide through 3D printing, which wasn't possible in the past. It ena-

bles the trouble-free creation of complex undercuts and hollow spaces for uniform (monolithic) and large-sized constructional elements using ceramics. Thanks to its extreme dimensional stability, IntrinSiC® is especially attractive to manufacturers of components, which have to exhibit especially high rigidity and strength. The ceramic material, which is nearly as hard as diamonds, yet relatively lightweight, hardly expands at all when exposed to high temperatures and exhibits extreme dimensional stability (unlike other materials such as steel). Using traditional production processes like casting, pressing and pultrusion, individual shaping in top-notch quality wasn't possible. IntrinSiC® gives customers from a wide variety of industries completely new options in the area of industrial precision and measuring technology.

The process begins by mixing powdered silicon carbide with a binding agent. Using CAD structural data, a 3D printer then models the desired component layer by layer. Sizes of 1,5 m × 0,7 m × 0,7 m are possible here. Following special pretreatment, burning and finishing, the product is ready. The process is much faster and the amount of material used is less in comparison to conventional technology.

China

#### **ISR'2016**

The Seventh International Symposium on Refractories (ISR'2016), organized by The Chinese Society for Metals, The Chinese Ceramic Society and Sino-steel Luoyang Institute of Refractories Research Co., Ltd. (Sinosteel LIRR) will be held in Xi'an, China on Sept. 20-22, 2016.

The International Symposium on Refractories (ISR) is a serial international conference and is held every 4 to 5 years in China, the 1<sup>st</sup> (1988) in Hangzhou,

#### IMPRINT

Publishing House  
Göller Verlag GmbH  
Aschmattstraße 8  
D-76532 Baden-Baden

Editorial Department  
Karin Scharrer (Editor-in-Chief)  
Phone: +49 (0) 7221-502-241  
E-mail: [k.scharrer@goeller-verlag.de](mailto:k.scharrer@goeller-verlag.de)

Advertising Department  
Corinna Zepter (Advertising Manager)  
Phone: +49 (0) 7221-502-237  
E-mail: [c.zepter@goeller-verlag.de](mailto:c.zepter@goeller-verlag.de)

[www.refractories-worldforum.com](http://www.refractories-worldforum.com)

Reprinting etc.

Any type of copying – photocopies, microfiches etc. – or storage in data retrieval systems and any translation, even in part, can only be done with the written permission of the publishing house.

the 2<sup>nd</sup> (1992) in Beijing, the 3<sup>rd</sup> (1998) in Beijing, the 4<sup>th</sup> (2003) in Dalian, the 5<sup>th</sup> (2007) in Beijing and the 6<sup>th</sup> (2012) in Zhengzhou. The Seventh International Symposium on Refractories (ISR'2016) will be an excellent venue for the academia, researchers and engineers all around the world to exchange state-of-the-art development, results and information on issues related to refractories.

Austria

#### FIRE Short Courses During UNITECR 2015

On Tuesday, Sept. 15, 2015 (8.00 a.m. - 5.00 p.m.) two FIRE Short Courses are offered (regular rate: EUR 550). They can be booked with the conderence registration ( <http://www.unitecr2015.org/Participant-Registration.528.0.html>).

#### *Dispersion and Packing of Ceramics Particles for Advanced Refractory Castables*

**Instructors:** Ana Paula Luz, Mariana A. Braulio and Victor C. Pandolfelli from Federal University of São Carlos/BR

The refractory industry has been using dispersion and packing principles successfully for many decades, although most of the time empirically. Therefore, the producers and end-users may not need motivation on the subject, though we all need its science. The main objective of the course is to provide the fundamentals in order to help processing and microstructure design of refractory castables.

**Morning:** Rheological concepts, viscosity and shear effects, double layer and DLVO fundamentals, zeta potential, electrostatic and electrosteric dispersion, dispersant role, structure and selection, multi-component dispersion, stability maps, dispersing complex systems:  $Al_2O_3-SiC-C-SiO_2$  and wet shotcrete concept application.

**Afternoon:** The fundamentals and main particle packing models used in the design of castable compositions, as well as the aspects that affect packing density will be discussed. Moreover, the role of a suitable particle size distribution in castables processing (mixing and drying), rheology, thermo-mechanical properties and application technique (vibratable and self-flow castables) will be highlighted in order to provide some insights for the development of advanced refractories.

**Learning Outcomes:** The fundamentals and examples presented will show that processing and engineering microstructures are mainly related to the understanding and application of the first principles, which will help to solve production and end-users problems, and to design new products.

**Audience:** Engineers, scientists, students, technicians and managers who are interested in understanding the fundamentals and how they can be applied to processing and designing ceramic microstructures are encouraged to attend. There are no prerequisites for the course; however, a modest technical background in ceramics and materials sci-

ence at an undergraduate level would be helpful. The course is intended for a broad spectrum of people willing to learn the basics and their possible application to refractories and technical ceramics.

#### *Fundamentals on Corrosion Behavior of Refractories*

**Instructors:** Christos Aneziris, Technical University Freiberg, Germany, Jacques Poirier, University of Orleans, France

One main focus is the iron and steel industry, but other high temperature processes are discussed. The course will cover:

**Morning:** Fundamental mechanisms of corrosion and the solutions to limit the thermochemical degradations, Wetting, infiltration, Corrosion by liquid species (metal, slag, molten salts), Corrosion by gaseous species (oxygen, alkalis, chlorides, sulfur compounds).

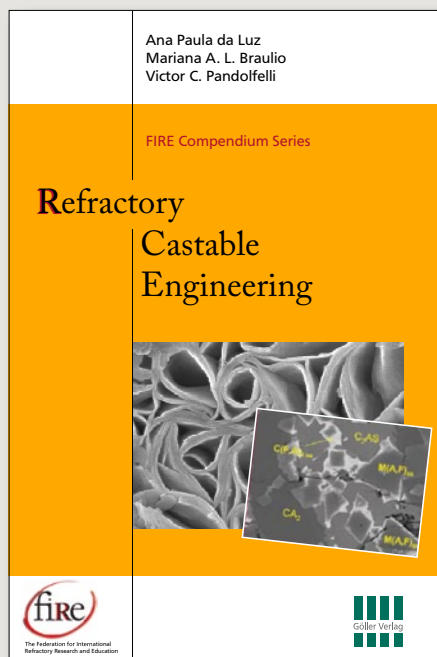
**Afternoon:** Impact of refractories corrosion on industrial processes, including steel making, cement industry, waste incineration and energy.

**Audience:** Engineers, scientists, students (Masters or PhD), technicians and managers who are interested in the refractory manufacturing or refractory consuming industry are encouraged to attend.

<http://www.unitecr2015.org>

### AVAILABLE NOW!!!

752 pages; price: USD 135,00 plus postage



Further information:  
Göller Verlag GmbH, Petra Blank  
Phone: +49 (0) 7221-502-210  
E-mail: [p.blank@goeller-verlag.de](mailto:p.blank@goeller-verlag.de)

Details and order form also on:  
[www.refractories-worldforum.com](http://www.refractories-worldforum.com)

# refractories WORLDFORUM

Manufacturing & Performance of High-Temperature Materials

## preview of issue 4/2015 (extract)

### Company Profiles / Interviews

Nuova Cives/IT, TERNA MAG/GR,  
German Kiln Technology/DE

### Reports

- Research Activities at CSIR-CGCI with Emphasis on Refractory Development
- 16<sup>th</sup> ECerS Conference in Toledo/ES
- Review GIFA-METEC-THERMPROCES-NEW-CAST 2015
- 5<sup>th</sup> Refractories & Maintenance Conference and Exhibition in Istanbul/TR
- Preview ceramitec 2015

### Economy & Markets

- Global Casting Industry 2020: Trends and Challenges (IKB Deutsche Industriebank/DE)
- Refractories for the Incineration Industry (Part 1)

### Technology Trends

- Investigation of the Main Factors Susceptible to Influence the Modulus of Rupture Testing Results of Refractory Materials (BCRC/BE)
- New Perspectives for Investigating the Softening Behavior of Refractory Products at High Temperature (FGF/DE)
- Calcium Hexaluminate: Synthesis and Fractal Analysis of Microstructural Images (CSIR/IN)
- Difference of Sintered and Fused Aggregates in Various Refractory Applications (Almatis/DE)
- Improvement of Refractory Castables with an Innovative Calcium Aluminate Binder System (Calucem/DE)
- New Perspectives for Investigating the Softening Behaviour of Refractory Products at High Temperature (FG-Feuerfest/DE)

### Special Circulation at:

- ceramitec 2015 Munich/DE, 20 –23 Oct. 2015

**Advertising Deadline: 02.09.2015**

Please contact:

**Corinna Zepter**, Advertising Manager  
Phone: +49 (0) 7221-502-237  
E-mail: [c.zepter@goeller-verlag.de](mailto:c.zepter@goeller-verlag.de)

Further media information on volume **7** (2015) and volume **8** (2016) at:

[www.refractories-worldforum.com](http://www.refractories-worldforum.com)