

refractories

WORLD FORUM

Hot Topics

Manufacturing & Performance of High-Temperature Materials

NEWSLETTER 4/2013

IMPORTANT DATES

14.01.2014 - 16.01.2014
EUROGUSS 2014, Nuremberg / DE
www.euroguss.de

15.01.2014 - 18.01.2014
IREFCON 2014:
10th India International Refractories
Congress, Kolkata / IN
www.irmaindia.org

01.04.2014 - 03.04.2014
Industrial Minerals International Congress
and Exhibition 2014, Vancouver / CA
www.metalbulletin.com

25.03.2014 - 27.03.2014
St. Louis Section/RCD
50th Annual Symposium, St. Louis / US
www.ceramics.org

01.04.2014 - 03.04.2014
Aluminium Brazil 2014
Sao Paulo / BR
www.aluminium-brazil.com

04.04.2014 - 06.04.2014
Aluminium China 2014
Shanghai / CN
www.aluminiumchina.com



Strategic Implementation Plan for the European Innovation Partnership on Raw Materials Launched

Euromines welcomed end of September 2013 the adoption of the Strategic Implementation Plan (SIP) for the European Innovation Partnership (EIP) on Raw Materials first launched by the European Commission on 12th February 2013. The SIP addresses all actions deemed necessary to achieve the objectives and targets of the EIP, including research and development along the value chain, raw materials knowledge, exchange of best practices, revision of selected legislation, licensing steps, standardisation, and policy dialogues. In particular the extractive sector welcomes the acknowledgement of the importance of raw materials for the growth and competitiveness of the European economy and society.

Streaming access to regional raw materials

It is important that EU Member States recognize that National Minerals Policies in different countries are not always clear and effective enough and that permitting procedures for mining can be lengthy and sometimes lack transparency.

Euromines members are therefore ready and willing to be involved in legislative processes aimed at simplifying and streamlining sustainable access to domestic raw materials. In particular effort is needed to reduce permitting times and increase the legislative reliability of investments in the extractive sector.

Raw material strategy to foster the socio-economic growth of Europe's Regions

Access to land is another key challenge for the extractive industry, where competing land uses may sterilise deposits for future use. *Euromines* highlights the fact that Europe has its own natural resources with both world-class deposits and major unexplored potential. Today mines occupy less than 1 % of Europe's land surface on a temporary basis. Until today Europe has not invested sufficiently in mineral exploration, which is a key factor for both developing and maintaining a healthy

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Seasons Greetings

Looking back on a very interesting year in 2013 with important fairs and international congresses (e. g. *Refractory Conference Moscow/RU*; *ACerS St. Louis Meeting/US*; *UNITECR/CA*; *Colloquium on Refractories Aachen/DE*). I should like on behalf of the team of refractories WORLD FORUM to thank our business partners for the trustful and constructive collaboration and fruitful discussions.

We wish our worldwide readership, who is celebrating Christmas, a peaceful time, and for everybody calm to reflect as the year draws to its close and a good start in a doubtlessly eventful new year.

Yours
Karin Scharrer

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industry. The sustainable exploitation of a large number of valuable raw materials deposits in Europe can increase Europe's supply of mineral resources, help to ease imports from third countries usually applying lower environmental, corporate and social standards, foster the socio-economic growth of Europe's Regions as well as provide raw materials that are crucial for the competitiveness of several industry sectors and the development of green technologies.

The extractive sector has been very supportive of the work conducted so far and welcomes the long term aim of the European Commission to tap the full potential of primary and secondary materials and to boost the innovation capacity of the EU raw materials sector. It will thus become a strong sustainable pillar of the EU economy with increasing benefits for

society. Increase in population and in living standards will continue to drive the growing demand for raw materials. Resource efficiency measures such as optimisation of reuse and recycling as well as extending product lifespans will still not close the material supply deficit until circa 2050.

Research and innovation actions to secure regional resources for the European future

In a medium term by 2020 the EIP proposes through its SIP a number of concrete research and innovation actions targeting the beginning of the raw materials value chain and integrating with downstream industries in order to start the process of transformation of the EU raw materials sector. Euromines members are ready to contribute to the European industrial renaissance that is crucially important for the European future.

The partnership will bring advantages in longer term. The idea is to develop:

- new exemplary cost-effective, environmentally sound and safe technological solutions for securing supply of raw materials,
- knowledge and skills in the EU to attract investment by industry bringing new jobs and growth to the EU economy.

The EIP on raw materials will promote both technological and non-technological innovation along the entire value chain of raw materials (i.e. exploration, extraction, processing, refining, re-use, recycling, substitution) involving stakeholders for relevant upstream and downstream sectors.

European companies lead the world in modern mining and technology and can deploy those strengths worldwide. www.euromines.org

Germany

Refratechnik Group Takes over Burton

The *Refratechnik Group* in Ismaning/DE, a leading manufacturer of ceramic refractory products, has acquired the facilities of *Burton GmbH & Co. KG* in Melle/DE, and will continue business operations under the name *Refratechnik Ceramics GmbH*.

The jobs of the employees in the Melle location will be saved. As a result of this strategic takeover, *Refratechnik Ceramics* will become a market leader and global supplier of refractory products for industrial furnaces in the ceramics industry. In this field, the product range covers wall, roof and car systems as well as furniture for tunnel kilns. *Burton Kiln Furniture* in Hungary, which was also taken over by *Refratechnik Ceramics*, primarily produces cast refractory materials.

Consequently, *Refratechnik Ceramics* is the world's only supplier of a complete range of ceramic systems for furnaces. The Industrial Division manufactures and sells high-performance products for applications in waste incineration plants, coal-fired power plants, primary aluminium industry, non-ferrous metallurgy and the glass and steel industries. While the field of industrial furnaces for the ceramics industry represents an expansion of *Refratechnik's* activities, *Burton's* industrial customer base and product portfolio is a contribution to *Refratechnik's* consistent expansion of existing business operations, in particular in the fields of primary aluminium and waste incineration. In these areas, *Refratechnik* is now a full-service supplier offering complex refractory systems from a single source. Founded in 1950, the *Refratechnik Group* has more than 1200 employees worldwide, making it the largest family-owned company in the refractory business. It is also one of the most dynamic medium-sized companies in Germany. With its

companies *Refratechnik Cement GmbH* in Göttingen/DE, and *Refratechnik Asia Ltd.* in Hong Kong/CN, the *Refratechnik Group* is the global market leader for high-grade refractory linings for furnaces in the cement industry, and a reliable partner in the lime industry. With *Refratechnik Steel GmbH* in Düsseldorf/DE, the Group is successful internationally in the metal-producing and metal-processing industries. Magnesite ore is mined and processed by *Baymag Inc.* in Calgary/CA – a wholly-owned subsidiary of *Refratechnik Holding GmbH*.

With the acquisition of *Burton*, the *Refratechnik Group* now has 18 sites in four continents. Nine of these are state-of-the-art production facilities for burnt, shaped, and unshaped refractory products. Two other sites are in the raw materials business.

China

Mayerton: Divestment of Production Facility in China as Part of Strategy

Mayerton Holdings Ltd., a leading refractory engineering solutions provider and a high quality castable and refractories brick manufacturer, has signed a definitive agreement for the sale of its 100 % equity interest in *Dalian Mayerton Refractories Co. Ltd. (DMR)* to *Magnesita Refratarios S.A./BR*

DMR is a refractory brick manufacturing facility in Dalian/CN (Liaoning Province). The divestment of *DMR* will support *Mayerton's* strategy to optimise capacity at its remaining production facilities and focus resources on performance and service/support in addition to product diversification. The divestment does not impact *Liaoning Mayerton Refractories Co. Ltd.* where it retains sufficient capacity to manufacture in excess of its current volume of refractory bricks.

Germany / India

Distribution Agreement between KRAHN and CUMI

KRAHN CHEMIE/DE will be distributing SiC fine powders of *Carborundum Universal Limited (CUMI)/IN* in Europe.

CUMI is part of the USD 2 billion conglomerate *Murugappa Group*, one of India's leading corporations, and is among the world's largest silicon carbide producers. *CUMI* produces SiC crude and grains in India and Russia using the Acheson process. Its product range comprises black and green SiC, which it offers in a wide array of grain sizes. SiC is particularly used in the production of high-stress components such as slide rings, slide bearings, rolls, pumps and nozzles. *KRAHN CHEMIE* also delivers *CUMI's* standard micro-powders with sizes according to international standards such as FEPA and JIS. *KRAHN* also supplies the advanced ceramics industry with zirconium and aluminum oxide, aluminum nitride and titanium dioxide powders.

Murugappa Group is one of India's largest family promoted, professionally managed corporates with over 28 000 employees. The Electro Minerals Division (EMD) of *CUMI* is primarily in the business of manufacturing silicon carbide and alumina oxide grains for the abrasive, refractory, ceramics, wafer slicing and Diesel particle filter industry.

KRAHN CHEMIE belongs to the *OTTO KRAHN Group* and looks back on a 100-year history. The company specializes in the sales, distribution, and marketing of chemical raw materials and speciality chemicals. The Group achieves with 140 employees a turnover of about EUR 60 million and supplies following industries: paint and coatings, construction chemicals, adhesives and sealants, technical ceramics, plastics, rubber, and lubricants.

Czech Republic

2014: Conference on Refractories and HITHERM in Prague

The *Czech Silicate Society* prepares two international conferences, 18th Conference on Refractories and HITHERM Prague 2014 which will be organized in parallel sessions on 13–14 May 2014.

The Refractories Conference will concentrate on shaped and unshaped refractories, new materials and applications, insulation materials, corrosion of refractory linings as well as environmental challenges. HITHERM will focus on: high temperature processes, heating systems, furnaces and burner technologies, energy efficiency and heat recovery in silicate technologies, materials for high temperature technologies as well as control and measuring equipment. Conference languages are English, Czech/Slovak; simultaneous translation will be provided in the Refractory Conference. HITHERM sessions will be only in English. Deadlines are: submission of abstracts: 31 January 2014; manuscripts of papers (only in English) 30 March 2014. For further information, contact sis@csvts.cz and follow www.silikaweb.cz

Worldwide

New Elected Officers by World Steel Association

The Board of Directors of the *World Steel Association (worldsteel)* has elected at its 47th Annual Conference new officers for 2013/2014. They are: Chairman *Joon-Yang Chung* (Chairman and CEO, *POSCO*), Vice Chairmen *Alexey Mordashov* (CEO, *Severstal JSC*) and *Wolfgang Eder* (Chairman and CEO, *voestalpine AG*) and Treasurer *Eiji Hayashida*, (President and CEO, *JFE Steel Corporation*). The Board of Directors also elected the 2013/2014 Executive Committee and welcomed a range of companies as new members of the association.

Korea

Blast Furnace with 6000 m³ Internal Capacity

Blast Furnace No. 1 *POSCO's* Gwangyang Steelworks in South Jeolla Province has been reborn as the largest blast furnace in the world.

POSCO expanded the internal capacity of Blast Furnace No. 1 from 3800 to 6000 m³ by mobilizing all different innovative engineering methods through the project. It is the world's largest in scale that exceeds Chinese Shagang Group's Blast Furnace No. 1 (5800 m³), which was previously the biggest. There are 21 large scale blast furnaces with a capacity of over 5000 m³ each worldwide. With the upgrading project, the annual steel production at Gwangyang Blast Furnace No. 1 increased from 3,28 to 5,65 Mt/a. This is a volume enough to produce 5,65 million passenger cars yearly. Gwangyang Blast Furnace No. 1 has transformed

into a blast furnace facility armed with eco-friendly functions, which not only preemptively prevents generation of steam but also enhances the energy recovery ratio and saves electricity consumption. Amid concern over excessive production due to a slump in the steel industry in recent months, *POSCO* plans to use molten iron generated at Gwangyang Blast Furnace No. 1 to produce high added-value products and replace scrap iron.

Russia

Magnezit Group Commissions Gas-cleaning Installation

Magnezit Group/RU commissioned at Satka production site (town Satka, Chelyabinsk region) gas-purifying equipment corresponding to the best world analogues. A twin unit with *Scheuch GmbH/AT* bag filter was installed at the workshop for firing magnesite powder behind the rotary kiln No. 4. Efficiency coefficient of such a filter amounts to 99,9 %. It is already the seventh dust-and-gas-cleaning system, installed at the workshops of *Magnezit Group* during several recent years. The total volume of investments allocated for implementation of the project amounted at the moment to about RUB 600 million. In the current year analogous equipment was installed and commissioned at the high-temperature shaft furnace of *Polysius AG/DE*, rotary kiln No. 1 at the workshop of magnesite powder No. 3. Now it is the turn of commissioning of high-performance gas-scrubbing system at the multi-hearth furnace, which is now under construction, as well as projecting the construction of gas-purifying units behind electric furnaces No. 1–4 at the workshop of magnesite powders No. 4 and behind the 2nd, 5th and 6th rotary kilns at the workshop of magnesite powders No. 3.

In 2013 *Magnezit Group* began to create a system for monitoring of dust emissions: each pipe behind thermal units – rotary kilns, shaft kilns and multi-hearth furnace – will be equipped with special dust counters – control sensors, data from which will be transmitted into a unified automated system and will be accessible to the specialists of the company as well as to the wide public.

Gas-cleaning units are powerful industrial installations with two-step system of air purification. They include a group of eight cyclones as well as a bag filter consisting of several hundred bags 5 m long made of high-tech high-temperature material. The units can treat up to 300 000 – 360 000 m³/h of gas. Dusty air goes through the chamber which consists of a system of bags, and is cleaned for 99,9 %. The layer of dust, accumulated on the bags, is regenerated with a stream of compressed air. The dust, consisting of finely dispersed caustic magnesite, falls into the bunker and then is transferred to special concrete vessels and from them – for treatment and production of bricks.

Worldwide

Magnesia Global Market

The new *Roskill* report "Magnesium Compounds and Chemicals: Global Industry & Markets 2013" analyses the likely effects of new capacities on global magnesia supply and demand, providing forecasts to 2018 for each region by main market. The Chinese magnesia market is on the cusp of maturity as government policies shape the future of the industry. Chinese magnesite and magnesia producers – by far the largest in the world – are under government orders to phase out old and inefficient production technologies, undertake mergers and acquisitions, and improve resource management. These changes are occurring against a backdrop of renewed magnesia investment in the rest of the world.

New projects and capacity expansions in countries such as Brazil (*Magnesita Refratários*), Norway (*RHI AG*), Russia (*Magnezit Group*) and Turkey (*RHI, Kümaş* and others) have been encouraged by tightening export supplies and higher prices from China, which also leads world magnesia trade. Companies in the rest of the world have outlined plans to develop 1,8 Mt/a of additional magnesia capacity between 2011 and 2015. As much as 500 000 t/a of this has already come online. Consumption of caustic calcined magnesia (CCM) is mainly driven by the industrial sector in its role in water, waste and flue gas treatment chemicals. High-value speciality CCM is expected to benefit from its use in hydrometallurgy, a metal extraction method that is gaining popularity in nickel/cobalt operations. Consumption of dead burned (DBM) and fused magnesia (FM), which constitutes more than 70 % of the total magnesia market, is almost exclusively in the production of refractories. Their consumption is dominated by iron and crude steel (73 %) and cement and lime (13 %).

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Roskill forecasts world crude steel output will grow by 3,5 %/a between 2012 and 2020, consequently driving demand for refractories and refractory magnesia. Integrated refractories producers are responsible for many of the magnesia capacity expansions that are underway or completed.

A key concern for these producers is stability of supply to meet forecast demand; for many consumers, this means independence from Chinese magnesia exports. Roskill forecasts the total magnesia market will grow by 3,2 %/a to 2018; the highest growth is expected to be in the CCM sector at 3,6 %/a while the lowest is forecast to be FM at 2,6 %/a. Refractories will continue to be the single largest consumer of magnesia. As additional magnesia capacity is installed in the rest of the world, export dependence on China is expected to decrease. (Source: *Roskill Information Services Ltd.*)

Germany

SGL2015 Cost Savings Program

As part of the "SGL2015" cost savings program, *SGL Group – The Carbon Company* has initiated a comprehensive package of measures. This package comprises the global production network, the organizational structure as well as the Group's portfolio and is targeted to achieve cost savings totaling approximately EUR 150 million by the end of 2015, based on the actual costs for 2012. Savings of EUR 50 million will already be realised in 2013. There will be non-recurring expenses and extraordinary write-downs which will be recognized in accordance with IFRS in a timely manner, most of which should be accounted for with the 2013 annual financial results already. With the program SGL Group responds to the difficult market conditions, characterized especially by unsatisfactory price developments in graphite electrodes, a cyclical downturn in the graphite specialties business as well as ongoing losses in the business area carbon fibers and composites due to delays in the development and start-up phase. In particular, the global production network will be adjusted to the changed circumstances. This realignment is expected to improve capacity utilization and reduce fixed costs.

Austria

RHI: Problems in Norway Strain Earnings Situation

In the 3rd quarter of 2013, *RHI* revenues fell to EUR 427,4 million, down 4 % on the previous quarter. While the revenues of the Steel Division declined by 3,6 % because business in Europe was weaker than expected, the Industrial Division's revenues fell by 4,7 % especially due to the postponement of projects in the business unit glass. The operating re-

sult in the past quarter amounted to EUR 32,2 million and is burdened by technical problems in the newly constructed fusion plant in Norway totaling roughly EUR 12 million, and by negative currency effects. Although sales volume in the Steel Division dropped by 6,3 % in a weak economic environment in the first nine months of 2013 the decline in revenues was more moderate at 3,4 % due to the consistent implementation of a sales strategy focusing on profitability and an improved product mix. Revenues in the Industrial Division decreased by 8 % in the first nine months of 2013 because of weaker project business in the segment environment, energy, chemicals, and due to project postponements in the business unit glass. The decline in the operating result by 17,9 % to EUR 108,8 million is attributable to the technical problems which occurred during the start-up phase of the newly established fusion plant in Norway, lower capacity utilization at the production sites and negative exchange rate effects.

RHI expects the 4th quarter of 2013 to be the strongest quarter of the Industrial Division in terms of revenues, and revenues to increase slightly in the Steel Division in comparison with the 3rd quarter of 2013. The operating result is expected to be negatively affected by roughly EUR 10 million in the fourth quarter due to the technical problems in Norway, which are still unresolved. For the full year 2013, *RHI* expects revenues to be slightly below the level of the previous year.

Greece/Great Britain

New Refractory Fused Magnesia Product under the PyrMag Brand, Launched by Grecian Magnesite and UCM Magnesite

Grecian Magnesite S.A. and *UCM Magnesite*, the *IMERYS Fused Minerals* plant in Hull/GB, announced the production and joint marketing of a premium refractory electro-fused magnesia product, sold under the PyrMag brand name.

PyrMag is a high purity product (typical MgO 98,4 %) with low levels of impurities, in all size fractions. PyrMag exhibits enhanced physical properties such as exceptionally high bulk density (3,54 g/cm³), and a large mean periclase crystal size of 1300 µm. PyrMag's superior refractory properties makes it perfectly suitable for the production of high quality shaped or unshaped refractory products for use in the steelmaking, cement and non-ferrous metals industries (e. g. MgO-C bricks, special castables, etc.); including other high temperature applications requiring high performance, low iron, refractory raw materials.

PyrMag is manufactured in electric arc furnaces in the *IMERYS* facility in Great Britain, using as raw material, high purity cryptocrystalline caustic calcined magnesia from Grecian Magnesite's Turkish affiliate, *Akdeniz Mineral Kaynaklari AS (AMK)*.

refractories

WORLDFORUM

Manufacturing & Performance of High-Temperature Materials

preview of issue 1/2014 (extract)

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- Effect of Pyrolusite on the Densification Behaviour of Alumina-Kaolin System: Towards Sintered High Alumina Refractory Aggregate (CSIR-Central Glass & Ceramic Research Institute/IN)
- Reliable Grade Control and Purity Control of Geological Materials by EDXRF (Bruker/DE)
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- Insights on in Situ MgAl₂O₄ Formation Mechanism and Its Correlation with the Corrosion Resistance of Spinel-containing Refractory Castables (UFSCAR/BR)

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