

refractories

Hot Topics

WORLD FORUM

Manufacturing & Performance of High-Temperature Materials

NEWSLETTER 1/2013



Fig. 1 Charging system made from SIGRABOND® Performance for heat treatment of truck transmission gears (source: SGL Carbon)

see page 2

2nd China International Refractory Production and Application Conference

May 15–17, 2013
Sheraton Wuxi Binhu Hotel, Wuxi, China
www.refractorychina.cn

Organizers

- China Iron and Steel Association (CISA)
- The Association of China Refractories Industry (ACRI)
- Metallurgical Council of China Council for the Promotion of International Trade (MCC-CPIIT)

Fig. 2 Chinese refractory conference

see page 3

US Demand for Refractories to Reach USD 2,6 Billion in 2016

US demand for refractories is projected to grow 3,3 % per year to USD 2,6 billion in 2016. Output of steel in the US will grow following a period of decline, driving demand for refractories. Gains will also come as nonresidential fixed investment spending returns to strong growth through 2016, prompting a resurgence in the manufacture of goods such as ceramics and glass. These and other trends are presented in „Refractories“, a new study from *The Freedonia Group, Inc.*, a Cleveland based industry market research firm.

In 2011, sales of refractories to iron and steel manufacturers totaled USD 990 million, making up 45 % of all refractory sales. Following a decline in steel output caused by the most recent recession, steel manufacturing in the US – and associated refractory demand – will rise through 2016. A shift in consumption toward higherpriced, advanced refractories will bolster sales value. However, the development of longer lasting, more durable refractories will limit demand going forward. Most materials manufacturing industries have reduced their per-production-unit consumption of refractories by using these newer, more durable products and improved processes. The fastest gains of any market in dollar terms will be posted by nonmetallic minerals. This market includes ceramics, glass, and cement producers. Output from these industries will rebound as the US economy continues to grow, fueling related refractory demand. Further growth will come from nonmanufacturing markets for refractories –

Item	[million USD]			[%] Annual Growth	
	2006	2011	2016	2006 – 2011	2011 – 2016
Total Refractory Demand	2236	2230	2625	- 0,1	3,3
Bricks & Shapes	1286	1300	1520	0,2	3,2
Monolithics	590	507	596	- 3,0	3,3
Other Forms	360	423	509	3,3	3,8

see page 2

Congress Highlights in May 2013

World Congress Aluminium 2000

Milan/IT, 14–18 May 2013

Further details available at:

www.interall.it

DGG Annual Meeting

Bremen/DE, 27–29 May 2013

Further details available at:

www.hvg-dgg.de

such as waste-to-energy plants, traditional power plants, and commercial ovens – although these are all fairly small markets. The largest sales volume increases will be in the engineering contractors market, which will rise more than 50 000 t between 2011 and 2016, recovering from declines posted during the 2006–2011 period.

In value terms, market gains for refractories will be led by monolithic refractories and specialized shapes. The performance of monolithic refractories

has improved greatly, boosting sales of these forms. Technological advancements have also made specialty shapes more cost effective and efficient, bolstering demand for those products. Buyers are increasingly choosing more expensive high grade refractories, which are formulated to perform well under specific operating conditions. As a result, demand for nonclay refractories in tons will outstrip that for clay refractories due to the better performance offered by nonclay types. However, sales of clay

refractories will shift toward higher grades, spurring value gains such that demand for clay types (in dollar terms) will rise at a faster pace than sales of non-clay refractories.

Refractories (published 12/2012, 242 pages) is available for USD 4900 from:

The Freedonia Group, Inc.

E-mail: pr@freedoniagroup.com.

www.freedoniagroup.com.

Great Britain

Cookson Demerged Performance Materials Division

Cookson Group plc (Cookson) proposed to demerge its Performance Materials Division, such that Cookson would then consist principally of the Engineered Ceramics Division, to be renamed *Vesuvius plc* (Vesuvius). These proposals were approved by the Court Meeting and General Meeting of Cookson shareholders on 26 November 2012 and the demerger was expected to become effective on 19 December 2012. Vesuvius will outline its position as a global leader in metal flow engineering, developing, manufacturing and marketing mission critical advanced ceramic consumable products and systems to demanding applications, primarily in the global steel and foundry industries. Since the demerger announcement additional measures have been actioned, most notably the permanent closures of a Solar Crucible™ production facility in Poland and two small Steel-related facilities in China and Germany. These recent initiatives will increase the restructuring charge for 2012 from the GBP 35 million noted in the demerger announcement to around GBP 60 million, of which around three-quarters is non-cash related. Vesuvius will comprise the former Engineered Ceramics and Precious Metals Processing Divisions of Cookson. The Engineered Ceramics Division is a global leader in metal flow engineering, developing, manufacturing and marketing mission critical advanced ceramic consumable products and systems to demanding applications, primarily in the global steel and foundry industries and in industries that require refractory materials for high temperature, abrasion resistant and corrosion resistant applications such as the aluminium, cement, glass and solar industries. The Precious Metals Processing Division supplies fabricated precious metals (primarily gold, silver, platinum and palladium) to the jewellery industry in Europe and has significant precious metals recycling operations. Vesuvius will be organised into three business segments: Steel, comprising the Engineered Ceramics Division's Steel Flow Control and Advanced Refractories businesses; Foundry, comprising the Engineered Ceramics Division's Foundry Technologies and Fused Silica businesses; and Precious Metals Processing.

USA

US Launches Anti-dumping Probe on China's Silica Bricks

The *United States Department of Commerce* launched an anti-dumping investigation on China's silica bricks products. Silica bricks are a type of refractory brick used to line the roofs of smelting-coke ovens and hot-blast stoves. In 2011, China's exports of silica bricks to the US were worth USD 43,2 million. According to the US Department of Commerce, the investigation resulted from a complaint from *Utah Refractories Corp*, which on behalf of the American industry of silica bricks and shapes claimed that silica bricks imported from China have hurt related industries in the US. The US company claimed that the dumping range of Chinese-made silica bricks is between 118,47 % and 290,12 %.

Norway

Jordi Hernández Appointed as New European Sales Manager, Refractories, in Elkem Silicon Materials

Elkem Silicon Materials, the Norwegian-based global supplier of microsilica and silicon products for the refractories industry, has appointed *Jordi Hernández* as new European Refractories and Ceramic Sales Manager.

Jordi has a chemistry degree, and brings with him a wealth of experience, having worked in a prestigious trading company *IMCD* (formerly *Warwick Benbasat*), and was responsible for the sales and promotion of different raw materials for the refractories, abrasive, friction and ceramic industries. Within Elkem Silicon Materials he will be in charge of the southern European refractories and ceramics markets, as well as GB markets. He will report to *José-Ramón Luna*, who will focus on global marketing.

Germany

SGL Group Launches Innovative Carbon Fiber Reinforced Graphite Material

SGL Group/DE – The Carbon Company – has developed a new type of carbon fiber reinforced graphite material designed for industrial heat treatment applications. The product is carbon fiber reinforced carbon (CFRC), a high-strength composite comprising

a graphite matrix and reinforcing fibers made of carbon. This material, which is marketed under the trade name SIGRABOND® Performance, has special properties compared to other CFRC materials on the market. For example, it is 20 % stiffer and can be processed to create intricate structures, with the material being ideal for technically demanding high-temperature applications.

Carbon fiber reinforced graphite materials are ideal for use in high-temperature processes requiring lightweight and temperature resistant materials such as the heat treatment of steel components for the automotive and aerospace industry or the coating of silicon wafers in the photovoltaic industry. A current application example from the automotive industry is the fully automatic heat treatment of transmission components on "charging fixtures".

SIGRABOND® Performance was developed by SGL Group. Thanks to its new type of structure based on unidirectional rather than conventional woven carbon fiber fabrics, the product offers dramatically improved performance and can be optimized to meet individual customer requirements. With this product, SGL Group offers a solution that enables its customers to create material saving structures.

www.sglcarbon.de

Iran

Iran's Steel Ingot Output Rises 8,3 %

Iran produced 11,2 Mt of steel ingots during the first nine months of the current Iranian calendar year (March 20–December 20), showing 8,3 % rise year on year, the *Mehr News Agency* reported. The volume of manufactured steel products exceeded 1,3 Mt during the 9-month period, according to the report. Iran exported over USD 390 million worth of steel products in the first eight months of the current Iranian calendar year, showing 12 % rise compared to the same period in the previous year, *ISNA* reported. Exports of steel ingots, however, fell by 79 % in value and 82 % in weight year on year. Industry, Mine, and Trade Minister *Mehdi Ghazanfari* has said Iran will become one of the world's main steel exporters by March 2016. He added that despite global economic sanctions, the country's steel output increased by 5 Mt during the past two years, reaching 17 Mt.

Austria

RHI Expects Positive Contributions to Earnings

RHI expects positive contribution to earnings from starting up fusing lines in Norway as of the second quarter and confirms guidance for 2013. In the course of the start-up of the newly established fusion plant in Norway in late November, a technical defect occurred while material was fed in, which caused a crucible to spill over and consequently required the entire melting operations to be shut down. As it is taking longer than expected to repair the damage, start-up costs will be higher. Moreover, the positive contribution to earnings due to increased vertical integration cannot be realized in the first quarter. The EBIT margin in the first quarter of 2013 will therefore be slightly below the figure of the comparable period of 2012. Nevertheless, the Management Board of RHI is confident that the guidance of 2013, which was issued as part of the publication of the third quarterly report and provides for revenues at a similar level as in 2012 as well as a further improvement in the EBIT margin, will be met. The re-commissioning of the melting operation will start again in February. Full-load operation, with an annual production of roughly 80 000 t of sea-water-based fused magnesia, is expected for March; this will effectively make RHI self-sufficient in fused magnesia outside of China.

Russia

Magnezit Group Obtained Patents of the Russian Federation

Magnezit Group obtained patents of Russian Federation for the invention method of repair of pipe of vacuum steel degasser and for the utility model water cooled roofs of electric arc steel-making furnaces, as well as a patent of Ukraine for the utility model tundish for continuous casting of steel. The method of repair of pipe of vacuum steel degasser consists in applying of refractory mass onto the repair piece, placing onto it of the hot vacuum degasser with the pipe. For this purpose first a repair piece is produced by way of casting of concrete into the mould, which has an inner cylindrical hole equal to the diameter of the pipe hole in its initial state and the outer diameter by 5–25 mm less than diameter of the worn out lining of the pipe. The invention allows increasing service life of the pipe lining and strength of its inner surface after repair. Method of vacuum degasser pipe repair was tested at the arc-furnace melting shop No. 2 of the JSC Chelyabinsk Metallurgical Integrated Works. Water cooled roof of the furnace has a water cooled panel, created by concentric rows of water cooled pipes, and a central refractory plate. According to the utility model the slanted part of the water cooled panel is made with a bending and is divided into two parts – the outer one and the inner one – in such a way,

that the angle of slope of the walls of the inner part of water cooled panel is 60–90°, and thanks to this the central refractory plate is distanced from the level of metal by 300–400 mm. Tightening refractory rings are put onto the central refractory plate. Such a model was tested for the first time during lining of an electric arc furnace with capacity of 110 t at the arc-furnace melting shop No. 2 of the JSC Chelyabinsk Metallurgical Integrated Works. The State Service of Intellectual Property of Ukraine (*Ukrpatent*) issued to Magnezit Group a patent for the utility model Tundish for Continuous Casting of Steel. Earlier this development of the company was protected by the patent of RF No. 114627 (issued on April 2012). Specialists of the Technical Department of Magnezit Group upgraded a construction of tundish for continuous casting of steel and developed the most optimal variant of positioning of its separate components. There are several rows of overflow channels in the tundish for continuous casting of steel and there are dams in the collecting and casting areas. In the body of the dams there are gas conducting channel with independent supply of blowing gas. Dams consist of the main body and blowing zone, located in the upper part of the dam and made of porous refractory material. When steel is cast through the suggested tundish, impurities are removed by way of creating a continuous curtain of gas, supplied through the blowing zone of dams. Thanks to this the purity of cast metal is improved, vortex formation and drawing of non-metal impurities into nozzle of the tundish is excluded. Quality of metal is improved. As at 1 January 2013 Magnezit Group is holder of 31 patents for inventions, 8 patents for utility models and 2 trademarks. Another 12 applications for inventions are at the stage of expertise: 7 of them at Rospatent, 2 – at Ukrainian patent service, 2 – at Eurasian Patent Office and 1 application – in China.

China

2nd China International Refractory Production and Application Conference

The 2nd China International Refractory Production and Application Conference, jointly organized by China Iron and Steel Association, The Association of China Refractories Industry, Metallurgical Council of CCPIT and Metallurgical Center for International Exchange and Cooperation, will be held on 15–17 May 2013 at Sheraton Wuxi Binhu Hotel, Wuxi, Jiangsu/CN China.

In recent years, China's refractory industry has made significant progress in product quality and technological innovation in addition to the rapid growth of production, satisfying the insatiable demand of the high temperature industries.

Main topics will cover:

- China and the global steel industry development

- Current situation, innovation and sustainable development of the Chinese refractory industry
- World refractories market: demand and supply analysis
- Refractories international trade and trade frictions
- Refractory raw materials supply and demand and used refractory materials recycling
- Refractories basic research trends
- Unshaped refractories technology development trends
- Nanotechnology and high performance refractories
- Refractories for the steel industry
- Refractories demand for non-ferrous metals, building materials and electric power industries, etc.

The conference aims to connect refractory manufacturers with their consumers and suppliers, promote refractory production and application technology advancement, and strengthen international cooperation.

www.refractorychina.cn

Germany

Seminar Refractories: Theory and Application

A technical seminar on refractories is scheduled on 17–20 April 2013 at the Institute of Mineral Engineering (*Gesteinshüttenkunde/GHI*) of RWTH Aachen University, Germany.

This intensive seminar covers the refractory industry from the raw material to the industrial application. The speakers are experienced refractory experts: Prof. A. Eschner, Prof. J. Pötschke, Dipl.-Ing. R. Krebs and Dipl.-Ing. J. Mendheim. The seminar is focused on engineers and employers of the refractory industry, the refractory applying and supplying industry, furnace construction, plant engineering and procurement. The seminar is licensed as a postgraduate professional education. www.feuerfest.info

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Europe

Glassman Europe 2013: Conference Speakers Announced

The first speakers have been announced for the *Glassman Europe 2013 Conference* taking place alongside the exhibition in Warsaw/PL during 7–8 May 2013. The Glassman Europe 2013 Conference will discuss market trends and analysis, technology developments, case studies and innovation. Conference topics include: Energy Efficiency, Reducing Emissions and Manufacturing Methods. The Conference will be held in conjunction with the Glassman Europe 2013 Exhibition and will provide a platform for the hollow and container glass manufacturing industries to meet in an intimate, relaxed environment and do business with decision makers involved in all aspects of design, process and production of hollow and container glass. Leading suppliers of equipment, technology and services used in the manufacture of all types of hollow and container glass including containers, giftware, industrial, medical, packaging, pharmaceutical, scientific, surgical, tableware, technical glass and many more are participating.

www.glassmanevents.com/europe

Great Britain

Magma Ceramics & Catalysts Plans Vietnamese Venture

Following a successful period of growth during 2012, *Magma Ceramics & Catalysts/GB* announced the acquisition and imminent development of an additional manufacturing facility in Vietnam, which will support the ceramics division of the business.

Magma's Vietnamese operation, *Magma Ceramics & Catalysts (Vietnam)*, is 100 % owned by the parent company, *Jemtec Limited/GB*. The business will operate under ISO 9001, ISO 14001 and OHSAS 18001 standards and will initially invest in refractory ceramic production to support the industries currently served by Magma Ceramics in GB, including glass, alloy and steel. Magma has secured a 6000 m² facility, ideally situated between Hanoi and North Vietnam's main international sea port, Haiphong, on a purpose built industrial estate which already serves a wide range of international manufacturers. Building modifications commenced in February, closely followed by the installation of equipment with commercial production expected to commence 2013. Magma Ceramics & Catalysts originally began trading from its GB base in February 2010, following the management buyout of the former *Dyson Group* businesses, *Dyson Precision Ceramics* and *Dytech*. The following 3 years have seen Magma go from strength to strength and enjoy continuing success. 2012 proved to be a particularly successful year with the acquisition of a new catalyst manufacturing plant in Brazil, which entered trial production in December 2012 and commenced

the manufacture of a range of catalyst products for customers operating in the petrochemical and natural gas markets earlier this month, and the development of a new building to facilitate an increase in manufacturing capacity at its head office in GB.

www.magmaceramics.com

Norway

MagMin 2013

MagMin 2013, the annual conference on magnesite, which will be held from 13–15 May 2013 in Oslo/NO. This highly regarded international conference is the most important event in the field of magnesite minerals. Industry experts will highlight the latest news and developments in the global market. The programme will include the following topics: Current and future resources, raw materials, China, new applications, the global marketplace, WTO and legal issues and more. Registration is now open at www.indmin.com/magmin13

New Editorial Board member of refractories WORLDFORUM: Zhou Ningsheng

Dr Zhou Ningsheng is since December 2012 member of the scientific editorial board of refractories WORLDFORUM. He is professor and director of *High Temperature Materials Institute, Henan University of Science and Technology/CN*, which he joined in 2004. Before that he had been with *Luoyang Institute of Refractories Research (LIRR)* since 1982 and been the vice director of LIRR in charge of R&D during 2000 and 2004. He received his B. Sc. from *Wuhan Science and Technology University/CN* in 1982, M. Sc. from LIRR in 1987 and Ph. D. from *University of Montreal/CA* in 2000. He was during 1991 and 1993 with R & D Department of *Dolomit Werke Wülfrath* in Germany as a visiting scholar dispatched by Chinese government. His research interest has been in monolithic refractories, centered around modern castables. As author and co-author, he has published more than 130 papers. He is a recipient of several awards granted by China's central government, provincial governments and *American Ceramic Society* for outstanding scientific achievements and publications. He is a standing director of *The Association of China Refractories Industry (ACRI)*, in charge of the International Cooperation Division.

We are pleased to welcome him as we consider the increasing research activities in China are of increasing importance for our readership. In the next two issues we will report on the 6th International Symposium on Refractories, which was jointly organized in Zhengzhou in October 2012 by the *Chinese Ceramic Society* and the *Chinese Society for Metals*. It was headlined „Refractories Serving Low Carbon Economy“.

refractories

WORLDFORUM

Manufacturing & Performance of High-Temperature Materials

preview of issue 2/2013 (extract)

Company Profiles/Interviews

Eirich/DE – PRE/EU – Elfusa/Curimbaba/BR – Skamol/DK – Brokk/US – Blastcrete/US – Lingl/DE

Reports

- Int. Symposium on Refractories Zengzhou/CN
- Refractories Forum Freiberg/DE

Technology

- Bonded Refractories for Extreme Conditions in the Top of Regenerators (RHI/AT)
- Dense Silica – Properties, Production and Perspectives (PD Refractories/CZ)
- Vacuum Casting Technology for Fused Cast AZS Blocks – a New Energy-saving and Environmentally Friendly Technology (Chiefway/CN)
- A Low-cost, Sustainable Source of Alumina for Thermal Insulation (RVA/FR)

Refereed Papers

- High-performance Nano-bonded Refractories for a Wide Temperature Range (UFSCAR/BR)
- New Insights into Corrosion Mechanisms of Dense Refractory Castables Containing a Novel Calcium Magnesium Aluminate Binder (Kerneos/BR)
- New Additive Packages for Self-flowing High-alumina and MgO-based Refractory Castables (Elkem Silicon Materials/NO)
- Why is MgO–C Refractory Material Applicable in Steel Metallurgy? (Pötschke/DE)

Economy & Markets

- European Aluminium Industry – Competitiveness and Challenges

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