CEMENT & BUILDING MATERIALS REVIEW

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Le Centre International de Conférences de la Palmeraie,
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11 - 13th November 2014

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ARAB UNION FOR CEMENT AND BUILDING MATERIALS

Cement and Building Materials Review

Arab Album | International News | New Products | Technical Articles | Diary Dates

Editor-in-Chief Eng. Ahmad AL-Rousan

CONTRIBUTIONS

- *The Magazine editorial staff welcome the contribution of experts to enrich the contents of the magazine .*
- *Articles are not to be returned to authors .*
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Email: aucbm@scs-net.org / aucbm1977@gmail.com
Website : www.aucbm.org

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CORRESPONDENCE

Correspondence are to be addressed to the Editor-in-chief at the following address:

Syria, Damascus - P. O. Box 9015

Tel : (+963 11) 611 5412 - 6118598

Fax : (+963 11) 612 1731

Email: aucbm@scs-net.org / aucbm1977@gmail.com

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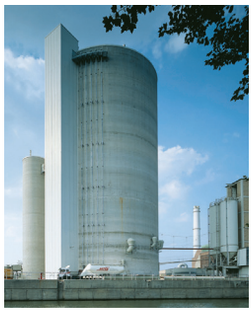
EXAMPLE MALMÖ/SWEDEN: The worlds largest multicompartment silo, with a capacity of 30.000 t, diameter of 26 m, height of 90 m, built for Cementa AB HeidelbergCement Group,commissioned in 2011 after only 18 months, without any delay or accident.



MULTICOMPARTMENT SILOS FROM IBAU HAMBURG: The base of the silo floor is formed by the central cone which has proven its worth over many years in ring silos. The compartment divisions result in clear external diameters of 14 to 27 m.

IBAU Multicompartment silos with central cone

Intensive development during the last few decades in the field of silo technology has produced pneumatic emptying systems which provided reliable storage of the powdered bulk materials. Changes in the production of binders and fillers, e.g. by grinding the mixing components separately or utilizing waste materials, fly ash, etc. have had an effect on silo technology, the preparation of the bulk materials and ultimately the dispatch technology. The concentration of storage and dispatch for a greatly increased number of bulk materials, interground additives and mixed products has eventually led to the concept of a multicompartment, high-capacity silo system with integral mixing and dispatch systems.

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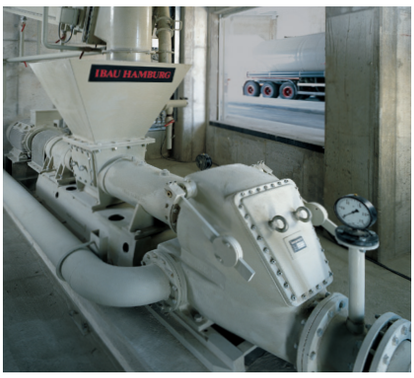
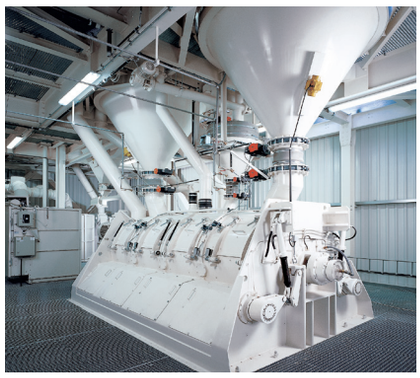


Material transport via IBAU Pump



The IBAU Batch-type mixer

Bulk loading with IBAU Simplex loader

ARAB ALBUM
ARAB ALBUM

NEW PROJECTS AND EXPANSIONS

KUWAIT

Kuwait Cement starts production at new clinker line
Cement capacity increased to 16,000 tons per day.

Source: CemWeek.com

ARAB CEMENT COMPANIES' NEWS

ARAB CEMENT COMPANIES' NEWS

EGYPT

Sinai Cement 1Q2014 net profit
Sinai Cement (SCEM) reported financial results posting a net profit LE 35.9 m in 1Q2014.

Noting that, it posted net profits LE 24.8 m according to the consolidated financial results in the same period in the previous year.

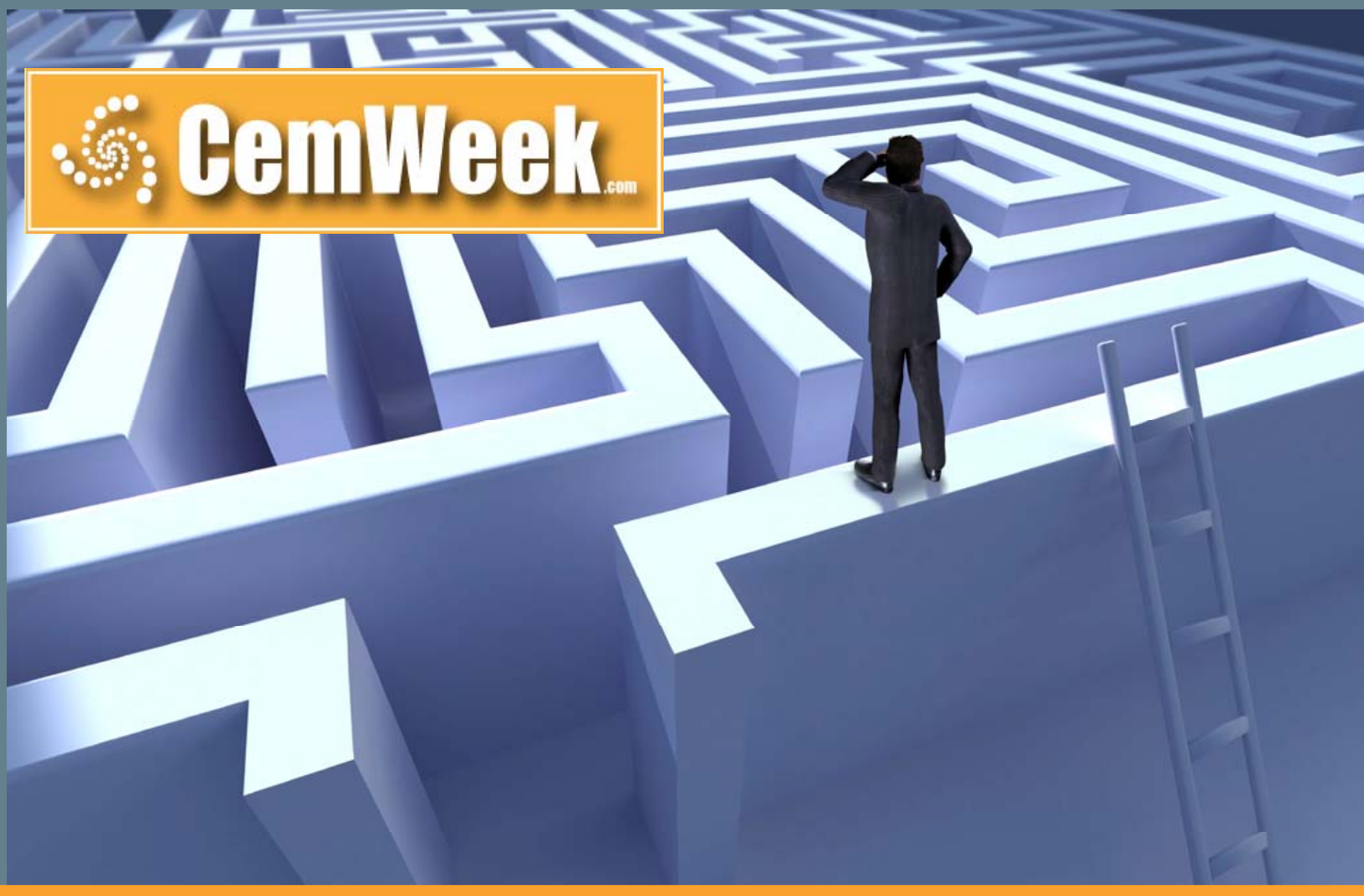
Source: arabfinance.com

OMAN

Oman Cement net profit slumps on lower output
Oman Cement Co posted a 46.7% decline in net profit for the first quarter of 2014 on lower production following the shutdown of one of its kilns for capacity upgrade.

The company's net profit declined to RO3.7mn for the 1Q2014, as against RO6.9mn during the corresponding period of the previous year.

Oman Cement has embarked upon a capacity upgrade



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project for one of its kilns (K-1), and the unit, on commencement of operations, is expected to increase output by 2,700 metric tonnes (MT) per day.

The company's sales dropped 17% to 521,667 MT of cement during 1Q2014, as against the sale of 628,553 MT during the corresponding period of 2013.

Oman Cement said it has also finalised arrangements with a leading bank in Oman to finance its project for the installation of a new cement mill of 150TPH capacity and the creation of supportive infrastructure of cement silos.

Source: UAECEMENT.com

Raysut Cement posts flat Q1 profit
Raysut Cement, Oman's largest cement firm by market value, reported a flat first-quarter profit.

The company made a profit of OMR8.23 million ($21.4 million) in the three months to March 31, up from OMR8.17 million in the year-earlier period.

The company's first-quarter revenue was OMR24.82 million, down from OMR25.22 million a year ago.

Source: gulfbusiness.com

SAUDI ARABIA

Saudi Arabian cement companies see drop in income
Southern Cement and Saudi Cement both reported a decrease in net income for the first quarter of 2014.

Southern Cement witnessed an 18% decrease in net income y-o-y to $58.9mn (SR221mn). Gross profit dropped by 15.3% y-o-y to SR240mn, while operating profit stood at $60mn (SR225mn), down by 17.5% year on year.

In summary, Southern Cement reported a weak set of 1Q2014 results, with all profit lines declining 15 - 18% y-o-y.

On the other hand, Saudi Cement reported a 16.5% y-o-y drop in net income as a result of lower volumes. The company saw a decrease in sales, which resulted in an increase in the company's clinker inventory to reach a four-year high level of 2.6mn tons in March 2014. This is the highest inventory level in the sector and is around four times the inventory levels a year ago.

Source: UAECEMENT.com

Al Jouf Cement completes import deal
Clinker supply deal with Jordanian company has been finalized.

Source: CemWeek.com

UNITED ARAB EMIRATES

RAK White Cement Q1 profit declines
Ras Al Khaimah Company for White Cement and Construction Materials PSC posted interim financial statements for 1Q2014 which reflected AED 13.8 million profit, a 35% decline compared with AED 21.23 million a year earlier.

Company›s revenues for the first quarter declined AED 96 million, compared to AED 112.5 million in year-earlier period.

Source: Mubasher Info

Abu Dhabi's Arkan Building Q1 2014 Revenue Rises
Arkan Building Materials Company PJSC, also known as ARKAN, stated that its revenue increased by 38% in the first quarter of 2014 to AED 129.3 million (USD 35.2 million) compared with the same period of 2013.

The company's net profit increased by 38.2% in the first quarter of 2014 to AED 13.3 million compared with the same period of 2013.

Source: Cedar rose

Union Cement Q1 profit jumps 220%
Union Cement Co posted interim financial statements for Q1 - 14 which reflected AED 18.2 million profit, a 220% leap compared with AED 5.7 million a year earlier.
Company's revenues for the first quarter declined to AED 138.5 million, compared to AED 161.7 million in year-earlier period.

UAE: RAK Cement reports lower Q1 earnings
Numbers down more than a quarter.

Source: CemWeek.com

Fujairah Cement registers higher profits
UAE based company reported higher sales, revenues for the first quarter

Source: CemWeek.com

Umm Al Qaiwain profit up more than a quarter in Q1
Profits for UAE based company surged on the back of higher sales for the period

Source: CemWeek.com

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ARAB ALBUM

CEMENT MARKETS

CEMENT MARKETS

ALGERIA

GICA says cement imports will start in May

Government plans to increase production to stop imports. It is worth mentioning that cement prices increased in Algeria due to 5 million tons deficit.

Value of Algeria construction imports down in 1Q2014

Value down even as volumes picked up.

Source: CemWeek.com

Lafarge increased investments in Algeria

24 billion dinars spent in the last six years to improve operations.

Source: CemWeek.com

EGYPT

Prices of white cement picked up in Egypt

Prices of white cement outpace those for gray cement by around 500 pounds.

Source: CemWeek.com

JORDAN

Jordan cement consumption steady in 1Q2014

Demand broadly in line with last year›s number.

Source: CemWeek.com

MOROCCO

Moroccan cement sales fall 3.1% in April

After declining in 2013, Cement sales in Morocco took a further dip in April, declining by 3.1% YoY, according to the Ministry of Economy and Finance.

For 2014, the cement industry expects another challenging year. Holcim Maroc forecasts a 4% decline, in addition to the 6.3% market contraction experienced in 2013.

Source: UAECEMENT.com

SAUDI ARABIA

Saudi prepares for possible cement shortage

Major construction projects in the pipeline to take demand higher

Source: CemWeek.com

Saudi cement firms hint of over production

Higher production, decline in demand seen hurting industry

Source: CemWeek.com

TUNISIA

Tunisia revises guidelines for cement investments

Part of the adjustment covers plants that will be built till 2017

Source: CemWeek.com

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ENVIRONMENT

EGYPT

Egypt backs switch to coal
Government says move is final, irreversible; it will also impose carbon tax on coal use to mitigate pollution.

Source: CemWeek.com

Ten plants stall on low gas supplies
Plants in Suez account for the bulk of Egyptian cement production

Source: CemWeek.com

South Valley studies coal option
Cement maker says it needs to invest EGP 140 mm for coal switch.

Source: CemWeek.com

Higher investment income boosts Gulf Cement profit
Large profit increase noted for the cement maker during the first quarter of the year

Source: CemWeek.com

INTERNATIONAL CEMENT CONFERENCE

Cemtech

PRODUCTION EXPERTISE - MANAGEMENT SKILLS

TURKEY 2014

ISTANBUL

Cement markets and production advances

28 September – 1 October 2014
Conrad Hotel
Istanbul, Turkey

28 September – 1 October 2014, Istanbul, Turkey

The leading event for the international cement industry returns to Istanbul for the 23rd Cemtech Europe Conference and Exhibition over 28 September - 1 October 2014.

This three-day meeting, expected to attract some 300 senior cement specialists, will be hosted at the prestigious five-star Conrad Hotel – one of the city's most exclusive venues.

Turkey remains home to one of the most dynamic cement industries worldwide, ranked fifth in terms of production output. With an installed cement capacity of 110Mta in 2013, the industry is also one of the largest exporters in the world, routinely exporting volumes of around 10Mta to over 70 countries. New projects continue to be established, while cement producers have also turned their attention towards environmental improvements, alternative fuels and energy optimisation.

How to create an efficient, sustainable and profitable industry? This is the common challenge faced by industries the world over and which will be addressed throughout the conference. Delegates will hear industry reports from across the region and engage with topical production-related themes. In addition, they will also be able to participate in field visits to local cement plants, technical workshops, as well as visit the adjoining international equipment exhibition.

Cemtech meetings offer participants the ideal forum to review key industry trends and new technologies in addition to peerless networking opportunities. Taking place in the heart of Istanbul, delegates will be able to enjoy Cemtech's unrivalled hospitality in one of the world's most historic cities. We look forward to welcoming you to Turkey in September!

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LOESCHE convinced Saudi Arabian company with the advantages of the LM 56.4 vertical mill

Similar mill type LM 56.4 installed in Hofuf,Saudi Arabia

Once again LOESCHE convinced with the advantages of its vertical roller mill technology. United Cement Industrial Company (UCIC) decided for a LM 56.4 raw mill for its cement plant in Al-Sadiya, 150 KM south of Jeddah, Saudi Arabia.

Jeddah - Tianjin Cement Industry Design and Research Institute Co., Ltd. Tianjin, China a company of Sinoma International signed the contract with LOESCHE for the delivery of a vertical roller mill type LM 56.4 to the cement plant of United Cement Industrial Company in Saudi Arabia.

LOESCHE's order includes the design engineering and supply of a LM 56.4 raw mill. The Loesche mill will grind cement raw material at a product rate of 420 t/h with a fineneness of 12% R 90 µm / 2% R 200 µm. Furthermore LOESCHE will deliver the gearbox which will have a capacity of 3,600 kW.
The very hot ambient conditions in the Kingdom of Saudi Arabia causes very dry raw materials. Therefore a grinding bed sprinkler system will be also installed on the raw mill for condition of the grinding bed.
The key advantages of the LOESCHE mills are the very low specific energy demand of the milling system, the unique modular design concept which saves time and money during maintenance. This also convinced UCIC to trust in the LOESCHE technologies.

Delivery for the key parts of the LM 56.4 is sheduled FOB in August 2014. The commercial production of cement is expected in the 2nd half of 2015.

Notes
United Cement Industrial Company "UCIC" is a new Saudi Closed Joint Stock company established in 2013. UCIC has been granted license to quarry limestone (raw) in cement production; UCIC is a green field project with expected production capacity of 6000 tons per day for Ordinary Portland Cement (OPC), Sulphate Resisting Cement (SRC) & Pozzalanic Cement (PC).

About LOESCHE
Since 1906 worldwide market leader in the business of designing, manufacturing and servicing grinding roller mills. We supply grinding and drying technology for the cement, iron & steel, energy and minerals industries. As technological leader we continually develop new ideas and individual concepts for grinding technology and processing methods.

Contact :
LOESCHE GmbH
Jennifer Holtschulte
Hansaallee 243
D-40549 Düsseldorf, Germany
Tel.: +49.211.53 53 - 715
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December 2–3, Moscow, Expocentre

CemEnergy-2014

III GLOBAL CONFERENCE

REDUCING ENERGY CONSUMPTION AND CO_2 EMISSIONS IN THE CEMENT INDUSTRY OF FAST DEVELOPING ECONOMIES

Maria van der Hoeven, Executive Director of International Energy Agency:
The IEA will take part in the Conference "CemEnergy", organized by the International Analytical Review "ALITinform: Cement. Concrete. Dry Mixtures". It will present highlights of its most recent analysis "Energy Technology Perspectives 2014".

CONFERENCE GOAL:

To consider a complex of preventive measures aimed at reduction of energy consumption and volume of CO_2 emissions in the cement industry of fast developing economies, and to attract attention of the State Government bodies to these issues.

MAIN QUESTIONS:

- Is there a potential for substantial excess of production over consumption of cement?
- What measures should be taken to reduce the risks of destabilization of the cement market by the cement community?
- How to get more investments and profits by reducing emissions and improving energy efficiency?

KEY SPEAKERS:

Philippe Fonta,
Managing Director, Cement Sustainability Initiative (CSI) and Energy Efficiency in Buildings (EEB) USA

Sui Tongbo,
Vice President of China Sinoma International Engineering Co. Ltd. China

Zbigniew Giergiczny,
Professor, Silesian University of Technology, Gliwice, Poland

José Otavio Carvalho,
President, National Sindicat of Cement Industry, Brazil

Angel Palomo,
Professor, Instituto de Ciencias de la Construcción Eduardo Torroja, Spain

Ms. Araceli Fernandez Pales,
Energy Technology Analyst IEA, Directorate of Sustainable Energy Policy and Technology, France

Jürgen Oecknick
Holcim Group Services Ltd Europe, Zürich, Switzerland

Eduard Bolshakov
President Group of Companies «ALIT», Russia

Egmont Ottermann,
Group Energy Manager, PPC Ltd, South Africa

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Mondi launches the Touch Bag with embossed logo

Vienna, May 13, 2014 – Under the slogan "Take your brand in your hand" Mondi launches the Touch Bag - an industrial paper bag with an embossed element such as a logo or another visual. The embossed element not only draws attention to the brand; it also gives the packaging an emotional touch and presents an obstacle to product counterfeiters.

"We are excited to offer this new feature to our customers," says Thomas Ott, Chief Operational Officer Mondi Industrial Bags. "Fillers can now further reinforce their brand on the packaging, and not only convey it in print but also through an emotional touch," he adds.

How does it work?

Embossing is a technique for creating a raised pattern on material such as paper, metal or wood. To produce the Touch Bag, sack kraft paper is run between a backing roll and an embossing drum with a pattern defined by the customer. The high pressure applied by the drums creates the raised element, which has a unique look and feel that customers are sure to find memorable.

Increased brand visibility

By combining the visual appeal of print with the tactile experience of embossing, the Touch Bag ensures that the customer brand lingers in the end customers' minds. Customers can give their brand the importance it deserves with the Touch Bag.

Emotional touch

Branding works well when it works on the emotions. The Touch Bag's embossing uses the power of the haptic to create positive associations with a customer brand.

Standing out from the competition

In today's markets, there is strong competition in all fields. In order to be successful, fillers have to focus on their own customers' benefits and differentiate themselves from other suppliers by offering a service that is not only exclusive, but sought after by a specific group of consumers. Packaging can underline this differentiation very strongly. The Touch Bag works with the customer brand and reinforces its image. A company that is proud of its brand shows it in every way possible – for example by letting it stand out on the packaging.

Product safety

Product piracy is a growing challenge in many markets. Counterfeiters who hijack a valuable brand create risks for unwary customers and jeopardise the integrity of the brand. "Consumers are led to believe that they buy a high-quality product, but in reality they risk being harmed by the inferior quality of a counterfeited product. The more sophisticated the packaging of each product, the more difficult it will be to fake" states Thomas Ott. The methods used to produce the Touch Bag are sophisticated, making it significantly more difficult for counterfeiters to gain the upper hand.

About Mondi Industrial Bags

Mondi Industrial Bags, a business segment of Mondi's Europe & International Division, is the leading international producer of industrial paper bags1, selling around 4 billion bags per year. Thanks to its broad range of bag specifications, Mondi Industrial Bags serves major industries including cement and building materials, chemicals, food, feed and seed. The business segment operates a dense sales and service network, the specialised filling equipment department Natro Tech, as well as its Bag Application Centre, where researchers develop and test innovative packaging solutions.

About Mondi

Mondi is an international packaging and paper Group, employing around 24,000 people in production facilities across 30 countries. In 2013, Mondi had revenues of €6.5 billion and a ROCE of 15.3%. The Group's key operations are located in central Europe, Russia, the Americas and South Africa. The Mondi Group is fully integrated across the packaging and paper value chain - from the management of its own forests and the production of pulp and paper (packaging paper and uncoated fine paper), to the conversion of packaging paper into corrugated packaging, industrial bags, extrusion coatings and release liner. Mondi is also a supplier of innovative consumer packaging solutions, advanced films and hygiene products components. Mondi has a dual listed company structure, with a primary listing on the JSE Limited for Mondi Limited under the ticker code MND and a premium listing on the London Stock Exchange for Mondi plc, under the ticker code MNDI. The Group's performance, and the responsible approach it takes to good business practice, has been recognised by its inclusion in the FTSE4Good Global, European and UK Index Series (since 2008) and the JSE's Socially Responsible Investment (SRI) Index since 2007.

Contact

Christina Fadler, Marketing Communications Manager

1 Based on sales volume. Source: Eurosac, Freedonia World Industrial Bags 2011 study prepared for Mondi and management estimates.

Tel.: +43 1 790 13 - 4917, Fax: +43 1 790 13 964,
Email: christina.fadler@mondigroup.com
Mondi Industrial Bags GmbH, Marxergasse 4A, A-1030 Vienna
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The winners are selected for the INDUSTRIEPREIS 2014 and the FRITSCH Disk Mill PULVERISETTE 13 *premium line* now features the seal of quality *Best of 2014*

For the ninth time the Huber publishing house for Neue Medien GmbH (New Media) selects outstanding companies from the industry for the INDUSTRIEPREIS (industry award) within the time period of the HANNOVER MESSE. And the winners are chosen: the FRITSCH Disk Mill PULVERISETTE 13 *premium line* belongs in the category "Research and Development" to the best solutions of the INDUSTRIEPREIS 2014.

FRITSCH Disk Mill PULVERISETTE 13 *premium line* convinces

Disk Mill *premium line*

From altogether 14 award categories, the independent renowned well-known specialized jury consisting of professors, scientists, industry representatives, experts and journalists, selected the innovations. And the FRITSCH Disk Mill PULVERISETTE 13 *premium line* for sample preparation and efficient fine grinding down to 50 µm, convinced the jury.

The *premium model* of the FRITSCH Disk Mill series is perfect for efficient fine grinding of hard-brittle to medium-hard solids: Even safer due to the automatic locking of the collecting vessel and grinding chamber, even easier to operate due to the convenient motor-driven grinding gap adjustment with digital gap display. A well-designed display shows all of the parameters. Ideal for medium particle sizes in the areas of mining and metallurgy, ceramics industry, rocks and soils, glass industry, soil research.

The grinding principle of the Disk Mill PULVERISETTE 13 *premium line*

Well-conceived Clean Design: The grinding chamber can be completely opened for simplest cleaning

In the Disk Mill, the material to be ground is comminuted by pressure and shearing action between two counteracting grinding disks with coarse interlocking teeth. The ground material automatically falls down through the pre-set grinding gap into the collection drawer. The desired final fineness can be defined reproducibly by simply adjusting the digital setting of the gap width.

Convincing Features of the FRITSCH Disk Mill at a glance

- Easy, motor-driven grinding gap adjustment with digital gap display
- Automatic locking of the grinding chamber
- Easy operation and cleaning with Clean Design
- High throughput of up to 150 kg/h with extra powerful motor
- Fine grinding down to 0.05 mm
- Large, removable funnel – for especially easy cleaning and optimal material feeding
- Dust-free grinding due to the connection of a dust exhaust system – directly controlled via the instrument

About the INDUSTRIEPREIS

Since 2006 the Huber publishing house for Neue Medien GmbH annually awards the INDUSTRIEPREIS to the best and most progressive companies from Germany, Austria and Switzerland. Any sized companies can apply for the popular award, which due to its large and high-calibre jury enjoys an excellent reputation.

The jury evaluates the submissions in regards to their technological, economical, ecological or usefulness for society. Rainer Kölmel, initiator of the INDUSTRIEPREIS explained "The INDUSTRIEPREIS supports companies which meet challenges like for example shortage of commodities, sustainability, globalization and mobility with especially clever and useful products and strategies. The large number of submissions of progressive products this year illustrates that the innovative powers of local companies remain strong".

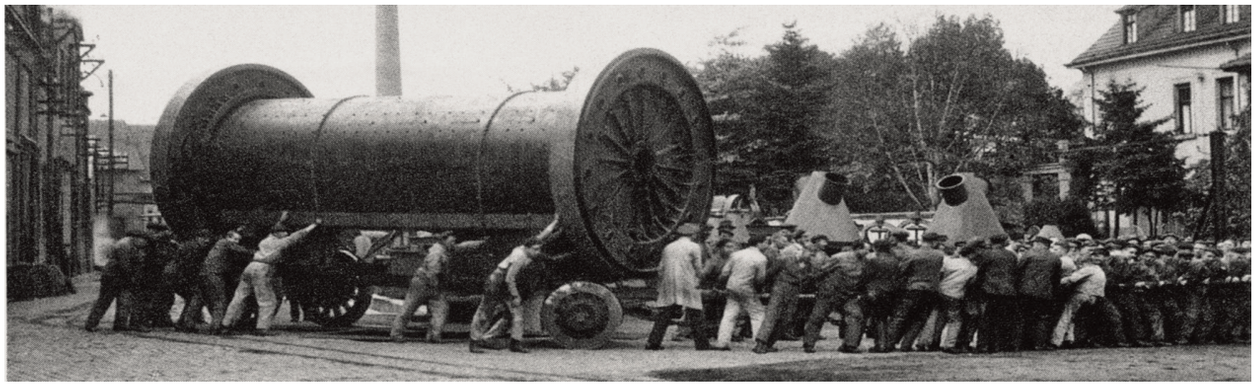
Contact: FRITSCH GmbH • Milling and Sizing
Andrea Köhler
Industriestrasse 8 • 55743 Idar-Oberstein • Germany
Phone 0049 67 84 70 146 • Fax 0049 67 84 70 11
E-Mail: koehler@fritsch.de • Internet: www.fritsch.de

GEBR. PFEIFFER

Gebr. Pfeiffer was founded in 1864 as a small machine factory in Kaiserslautern, Germany. Today, it is a globally active company with subsidiaries in India, in the United States and China and has about 500 employees worldwide.

In the founding years steam engines, mills for food production and malting equipment were the main products of the company, but its focus very soon turned to machines and plants for the basic materials industry as we learn from an exhibition catalogue "Machines for Hard Comminution" published in the year 1892 (Figure 1).

Gebr. Pfeiffer has always strived to supply its customers with particularly efficient and reliable machines. In retrospect, it is not surprising that you find superlatives again and again like "the first mill", "the largest mill", "the best workmanship", "the longest durability" (Figure 2).



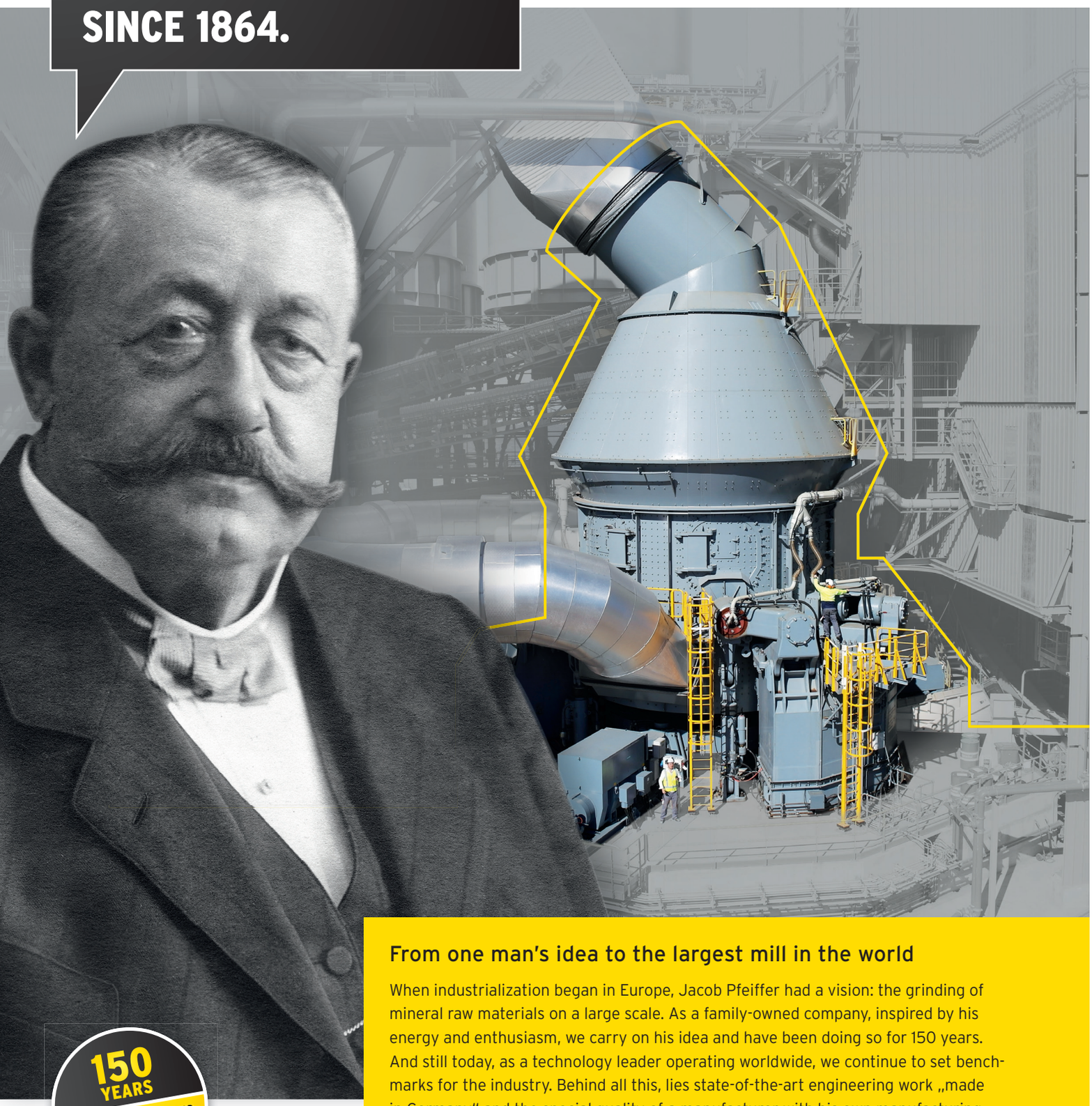
True to his motto that "Resting is Rusting" the company founder Jacob Pfeiffer motivated his employees time and time again to perform to their very best. The first air separators for the cement industry (1890) were manufactured during his active business life. Before the beginning of the 1st World War in 1914 Gebr. Pfeiffer employed 500 people in Kaiserslautern and exported 75 % of its machines.

The two World Wars (1914 - 1918 and 1939 - 1945) saw Gebr. Pfeiffer, which was an international and export-oriented company, suffer serious setbacks in its entrepreneurial development: Sales markets were no longer accessible, production plants were destroyed by war and disassembled after war as reparations. Yet, after each setback, Gebr. Pfeiffer recovered quickly and today in the 150th year of its company history Gebr. Pfeiffer demonstrates its technological leadership through the by far largest cement mill in the world, an MVR 6700 C-6 with an 11,500 kW MultiDrive®, currently under erection in Barroso, Minas Gerais, for Holcim Brazil.

Gebr. Pfeiffer sold its first own vertical mill in 1956, which has become a success story under the name of MPS mill. It was a significant contributing factor to the company's current success and the mill has been sold several thousand times over the years by Gebr. Pfeiffer and its licensees. The MPS mill was also the world's first vertical mill for cement grinding that was installed in Germany in 1979 (Figure 3).

PFEIFFER.
SETTING BENCHMARKS.
SINCE 1864.

GEBR. PFEIFFER
Progress is our tradition



150 YEARS
GERMAN ENGINEERING
SINCE 1864

From one man's idea to the largest mill in the world

When industrialization began in Europe, Jacob Pfeiffer had a vision: the grinding of mineral raw materials on a large scale. As a family-owned company, inspired by his energy and enthusiasm, we carry on his idea and have been doing so for 150 years. And still today, as a technology leader operating worldwide, we continue to set benchmarks for the industry. Behind all this, lies state-of-the-art engineering work „made in Germany" and the special quality of a manufacturer with his own manufacturing facilities guaranteeing highest durability and reliability. Jacob Pfeiffer would be proud.

www.gpse.de

1864 Jacob and Karl Pfeiffer founded the Pfeiffer machine factory and foundry

1890 The first air separator in the cement industry

1894 The first cement grinding operation in a Pfeiffer mill

1925 The largest cement mill in the world

1956 The first MPS mills for raw material and coal grinding

1979 The first vertical mill for cement grinding

1994 Launch of MPS B series with improved performance

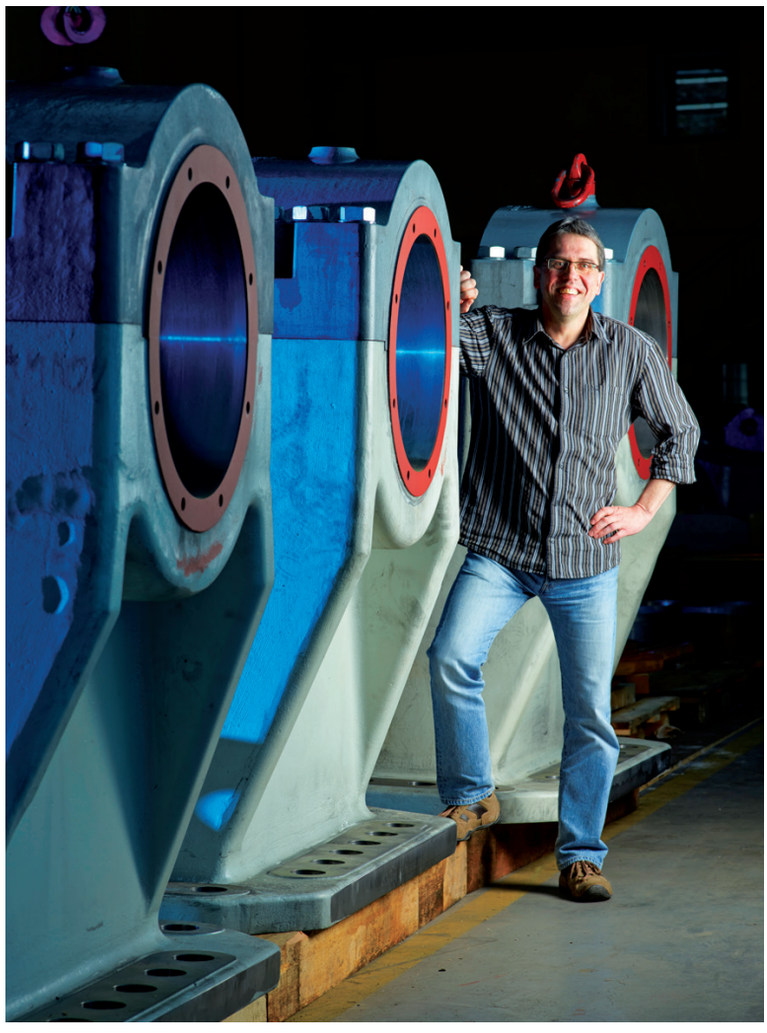
2006 The first MVR mill for cement grinding

2007 The first vertical mill with MultiDrive®

2014 The world's largest vertical mill for cement, under erection

Today, in terms of reliability and cost efficiency, the MPS mill is worldwide considered the best solution for small and medium capacities in the field of raw material, coal and cement grinding. For large and extra large capacities, starting with an installed power of 5,000 kW, the MPS mill got a big sister, the MVR mill, which was put on line for the first time in 2008. Today, MVR mills for raw material and cement grinding are operating to the entire satisfaction of Gebr. Pfeiffer's customers in Europe, Asia and Australia (Figure 4) and more MVR mills will go onstream shortly in North and South America and other countries in Asia.

In addition to the technically excellent product range Gebr. Pfeiffer's endeavour is always to render the very best services around the mill to its customers. This starts with the planning and construction of complete grinding plants, reaching from training programmes and plant optimisations through to repairs, modernisations and upgrades. Moreover, the portfolio includes the supply of spare parts which for mill components can be made available 40, 50 or even 60 years after their delivery thanks to Gebr. Pfeiffer's own and flexible workshops in Kaiserslautern.



Apart from continuously working on innovations to the benefit of the customers, true to its company's motto "Progress is our tradition", another success factor of Gebr. Pfeiffer has been continuity – free from management fads – of staff and management. Many staff members of Gebr. Pfeiffer celebrate their 25th, 40th or even 50th anniversary with the company (Figure 5) – staff fluctuations are not an issue for us – and over the 150 years of the company's history the average employment period of the executive board members is 18 years.

The customers, however, who decide over and over again in favour of Gebr. Pfeiffer's machines and plants, sharing their positive experience with other customers, are the most important factor for Gebr. Pfeiffer's success. On May 8th and 9th, 2014, Gebr. Pfeiffer celebrated the company's 150th anniversary with these faithful customers and thereby did not only look back on past achievements but also made plans for the future true to the company founder's motto "Resting is Rusting".

FLSmidth Ventomatic consolidates its presence in the minerals and chemical industries

FLSmidth Ventomatic SpA (Ventomatic), one of the world's leading suppliers of complete plants and single machinery for high accuracy and high capacity storage, packaging and dis-patching of products for the cement and building material industry, strengthens its position in the minerals and chemical industries through the consolidation of the partnerships with two Italian companies, Imeco® and Italmeccanica, both with long-standing experience in the packaging of powdery and granulated products.

Thanks to these two strong business partnerships, Ventomatic is now in the position to design, manufacture and supply fully proven and efficient bagging solutions specifically designed for the dosing and weighing of products such as ready mix, dry mortars, building materials, in-dustrial minerals, fertilizers, chemicals and granulated plastics (collectively referred as miner-als and industrials) into any type of bags (valve bags, open mouth or FFS).

The existing proven technology portfolio now includes the high accuracy "net weigh" weigher for bagging & bulk-loading applications, fully automatic VENTOPACK™ open mouth bag-ging line for pre-formed bags sizing from 10 up to 50 kg, VENTOTUBE™ Form, Fill and Seal (FFS) technology and bag closing systems.

VENTOPACK™ and VENTOTUBE™ bagging systems seamlessly integrate with Vento-matic already proven technologies such as automatic loaders (among others CARICAMAT®), palletizers (POLIMAT® EVO family), making Ventomatic the one source provider for packing and dispatching solutions to achieve both a high level of flexibility and consistently high pro-duction rates.

The historical experience of FLSmidth Ventomatic in packing and dispatching of powder and granulated material, the increased product range and the continuous support of FLSmidth Ventomatic R&D and Service, provides the opportunity for solution to market demands play-ing an important role as supplier for minerals and industrials worldwide.

RAK Ceramics and Sacmi: new sizes of tile with CONTINUA PLUS

Expected to start producing very soon, the new Continua Plus line will allow the manufacture of large technical and glazed porcelain tiles

Rak Ceramics, one of the world's leading multinational ceramics manufacturer based in Ras Al Khaimah, United Arab Emirates, has commissioned Sacmi to renew its large tile production line.

Founded in 1989 with the support of the royal family of the Emirate of Ras Al Khaimah, Rak Ceramics chose to make its initial investments with Sacmi. It was the start of a breath-taking period of expansion. By 2010 - 11 the company achieved staggering success, becoming the "world's biggest tile manufacturer", with a total output of 117 million square metres/year, including also the production in numerous overseas plants beyond the UAE, like Bangladesh, India, China, Sudan and Iran. Sanitaryware and tableware manufacturing facilities were also established.

Rak began manufacturing large tiles back in 2001, when Sacmi supplied (for the very first time outside the Sassuolo district) the technology needed to make tiles as big as 1200x1800 and up to 2 cm thick, a result then achieved with traditional pressing methods and a high-tonnage PH7200 press. Now, the large slab market is - thanks to the forward-thinking guidance of Abdallah Massaad, CEO of Rak Ceramics – once again the focus of a series of investment projects aimed at boosting efficiency and renewing the product range.

An all-new CONTINUA PLUS line for the manufacture of technical and glazed porcelain tiles is currently being shipped: this will produce tiles as big as 1500x3000 with different thicknesses.

CONTINUA PLUS is the evolution of the now consolidated Continua, a technology developed and patented by the Sacmi Group to manufacture large slabs. While, on the Continua line, an initial on-conveyor pre-compaction phase is followed by final pressing with a high-tonnage press, the Continua Plus line, thanks to a "super-compactor" able to press ceramic powders at a pressure of 450 kg/cm2, continuously feeds a bed of spray-dried powder and "instantly" transforms it into a firing-ready ceramic material. This ensures significant advantages in terms of both the reduction-rationalisation of its installation-production costs and the outstanding flexibility and scope of output.

And maximum flexibility is just what this line, developed by the Sacmi Group's engineering department in close collaboration with the RAK Group, aims to provide: a line capable of being incorporated in the existing plant without compromising the already impressive output capacity.

The order includes the powder loading unit with dry DDD digital machines, full-body APC filling devices and the accessories needed to make double filling and multi-layer effects, also with micronized powders; this will enable RAK CERAMICS to implement extensive expansion of its production range and dry graphic effects. The pressing section includes the PCR1600 PLUS super-compactor; able to compact a ceramic slab of unlimited length and a maximum unfired width of 1600 mm, this is followed by a new single-layer drier with a 3500 mm wide inlet to dry very large slabs. Completing the line is a COLORA HD 1808 digital decorator, the latest in the range by Intesa, the Sacmi Group Company dedicated to developing digital decoration. Able to print on tiles as large as 1800 mm using 8-colour inks, this printer will - in close collaboration with prestigious graphic design studios and leading colour producers - be used to make slabs of outstanding aesthetic value.

Thanks to co-development of the project together with RAK's technicians, it will be possible to exploit the full potential of the line both in its traditional CONTINUA configuration (i.e. with repressing) and in the CONTINUA PLUS one (i.e. with dynamic compaction only). A project, then, that is highly innovative, a real technical challenge and a clear demonstration of the ever-more strategic role the Sacmi Group plays as a quality-focussed technological partner.

Riedhammer celebrates its 90th anniversary

The history and 'secrets' behind the success of this German company, part of the Sacmi Group since 2003 and a world-leading designer and manufacturer of industrial kilns

The world leader in the design and manufacture of industrial kilns for advance ceramics, sanitaryware, tableware and industrial carbon products, Riedhammer is now celebrating 90 years of success. This German company joined the Sacmi Group in 2003, a milestone event in its history that has seen it achieve ten years of outstanding results and become the top firm in the global firing industry.

Sacmi has played a major role in piloting the company through the economic crisis, explain Peter Riedhammer, third-generation member of the company's founding family and manager from 1975 to 2006, and his successor Matthias Uhl. By supporting Riedhammer's pioneering skills, and through ground-breaking plant engineering, process and product solutions, Sacmi ensured continuation of the success enjoyed in the Eighties and Nineties when the German company was a world leader in several different sectors.

Fast firing technology, roller kilns and ferrite processing are just some of the fields in which Riedhammer has made a decisive contribution, not to mention carbon baking technology for the production of materials requiring the highest quality/technology standards (e.g. anodes, electrodes and other amorphous materials). These projects alone, explain the two company managers, have helped boost sales by 1020- million Euros over the last three-year period.

Riedhammer became a supplier of kilns to the ceramic sanitaryware industry in the 90s, enjoying a level of success that soon made this area its main business. The company enjoys outstanding competitiveness across the entire technical ceramic sector as almost the entire production cycle remains internal and customers can count on the best technology the market has to offer. Moreover, within the context of profound worldwide change, with the transformation from a manufacturing to a consumer economy, Sacmi's contribution has proved to be vital, allowing Riedhammer to maintain high levels of investment in design and R&D while enacting a corporate reorganisation plan in the early Nineties, begun with the 'Riedhammer 75' programme.

The ensuing development has been momentous, with Riedhammer now the jewel in the Sacmi Group crown also in terms of manufacturing internationalisation, with facilities in, to name but a few, China, Brazil and central Asia. In short, Riedhammer is the perfect blend of German reliability and Italian creativity, providing top-of-the-range solutions that always combine quality, attentiveness to costs, high productivity, low consumption and limited emissions.

NEW DEVELOPMENTS WITH SACMI'S CONTINUA+

Following the latest innovations to Continua pressing technology for the manufacture of smooth and relief-patterned ceramic slabs (for which patents have recently been deposited), Dr. Romano Minozzi, founder of the Iris/Ariostea/GranitiFiandre Group, has confirmed a further plant investment with the Sacmi Group.

CONTINUA+, the latest evolution of the already-successful Continua line, is the new Sacmi-developed roller-compaction technology for the manufacture of very large tiles that allows aesthetic effects to be varied naturally, thus leaving plenty of space for creativity.

It can be used to manufacture ceramic porcelain slabs and tiles within an extensive size and thickness range, personalised both on the surface and in-body, at productivity levels higher than those attainable with traditional products.

CONTINUA+ is a highly flexible technology and a clear demonstration of SACMI's ongoing commitment to innovation and development.

Brigl & Bergmeister acquires Uetersen paper mill from Stora-Enso

On 8 May, 2014, Brigl & Bergmeister signed the purchase agreement to acquire 100% shares of the paper mill Uetersen from Stora-Enso Group.

With a capacity of 240,000 tons per year, the paper mill, (formerly known as Feldmühle Papierfabrik), manufactures one side coated specialty papers (labels and flexible packaging) as well as high quality ‘’two side coated’’ graphical paper and board on 2 paper machines.

The acquisition results in creation of a leading global supplier of specialty papers with an extensive product portfolio.

The synergies which can be achieved as a result of this merger will also ensure that Uetersen in Schleswig-Holstein will remain an attractive employer in the region.

In 2011, B&B with its paper mills in Niklasdorf (Austria) and Vevče (Slovenia) was purchased by the Roxcel paper trading group as their first move into the paper production. Meanwhile, the group has acquired the waste to energy company ‘’ENAGES’’ in 2012, to ensure the secure and environmentally sustainable energy for the paper mill in Niklasdorf. Further investments have been completed in 2013 and also still ongoing in 2014 to improve quality and capacity in both mills. Today, the annual capacity of Niklasdorf is 78,000 tons, and that of Vevče is 120,000 tons of specialty papers. Among the company›s customers are printers and convertors mainly supplying the beverage and food industry with high-grade label and packaging papers.

The transaction has yet to be approved by the competent competition authorities.

For more information, please visit www.birgl-bergmeister.com

Global Cement: Events 2014-2015

www.GlobalCement.com

3rd global landfill mining

17-18 November 2014, London, UK

The 3rd Global Landfill Mining Conference and Exhibition will look at opportunities for landfill mining around the world, including technical hurdles, best practice and global case studies. Cement industry attendees are typically looking to mine local landfills for alternative fuels. Networking opportunities at the event are superb and the adjacent exhibition allows operators to source the most cost-effective equipment and advice for landfill mining and monetisation

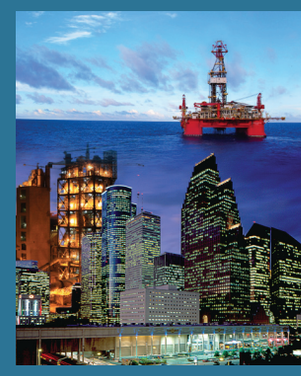
10th global slag

8-9 December 2014, Aachen, Germany

The 10th Global Slag Conference will take place in Aachen, heart of the 'slag universe'. Slag producers and users are expected to attend from throughout Europe and from the rest of the world: Slag products have the potential to be profitable for both the iron and steel industry and also for the cement, concrete and construction products industries. If your business is in slag, then you should attend!

2nd global well cem

22-23 January 2015, Houston, Texas



After the huge success of the first event, Global Cement is pleased to present the second conference dedicated to the production and optimisation of well cements. Bringing together producers and users in 'oil city,' the Global Well Cem conference and exhibition will again be focused on making contacts, on networking, on technical information exchange and on business. If well cement is your business, make it your business to be at Well Cem!

9th global cemfuels

FUELS FOR CEMENT AND LIME

16-17 February 2015, Dubai, UAE

Dubai offers a well-located venue for the 9th annual Global CemFuels conference, close to the huge cement markets of the Middle East, Africa and Asia. The event will showcase the state-of-the-art in handling, processing and firing all types of conventional and alternative fuels for cement (and lime) production. If your business is in fuels and alternative fuels for the cement and lime industry, you must attend this event !

3rd global cement India

17-18 March 2015, Mumbai, India

Global Cement India Conference and Exhibition has been called the 'Rolls Royce' of cement-related events in India: Five-star facilities, a world-class speaker programme, excellent networking and business opportunities and Global Cement's usual meticulous organisation combine to create a world-beating event for the cement industry in India. If you have an interest in the Indian cement industry, don't miss it!

Our conferences: Aachen, Ankara, Bangkok, Barcelona, Berlin, Brussels, Cancun, Chicago, Copenhagen, Dresden, Dubai, Düsseldorf, Geneva, Hanoi, Helsinki, Houston, Istanbul, Jeddah, Krakow, Kuala Lumpur, Las Vegas, London, Miami, Moscow, Mumbai, Munich, Paris, Prague, Puerto Rico, Riga, Rio de Janeiro, Riyadh, San Francisco, Shanghai, Strasbourg, Sydney, Tehran, Toronto, Vienna and Washington DC!

On the de-aeration of cement in storage

By: Lyn Bates. Ajax Equipment Ltd.

Abstract,

This article sets out the criteria relating to the efficient de-aeration of fine powders, such as cement, in bulk storage situations. Based on the diffusion characteristics and flow properties of a particulate bed and the flow regimes generated in different flow channel geometries, the fundamental requirements can be established for securing efficient de-aeration of fine powders that are loaded into a bulk storage system in a fluidised condition. Various techniques are discussed for accelerating the rate of de-aerating powders in a fluid condition and providing bulk 'state control' for the rapid securement and the sustainment of an bulk density and flow condition that is appropriate for the prevailing process circumstances.

Introduction

All particulate solids vary in bulk density according to how the constituent particles nest within the bulk array. Coarse granular materials tend to settle quickly to a stable condition with a network of particle contacts forming load paths that support the weight of the mass. The low porosity of the bed allows void gas that is displaced by a reducing bulk volume as the mass settles, to percolate rapidly through the bed and attain ambient pressure. Hard materials of this type then resist further compaction by superimposed vertical loads, as these forces merely increase the particle-to-particle contact pressure on the existing loads paths that were developed by gravity. However, modest transverse forces on the bed of material will more effectively cause coarse particles to reorient and settle to a denser condition. A mass of fine particles are less permeable. Excess air in the voids as material in a dilated condition settles to occupy a lower volume is difficult to escape and so increases in pressure and supports part of the weight of the mass. The presence of void gas at pressure inhibits the development of shear strength, such that the bulk material can behave in a fluid condition until it has de-aerated sufficiently for the bulk to develop a resistance to deformation. As the gas in the decreasing void space percolates to ambient, the pressure decreases and there is a corresponding reduction in the bulk porosity, resulting in an exponential reduction in the rate at which the gas escapes from the voids. It can therefore take a long time for the powder to attain a stable condition with the void gas at ambient pressure. The process of de-aeration is extended in warm or hot conditions, as the viscosity of gasses increase at elevated temperatures and they are therefore slower to diffuse through a particulate bed. An increase in bulk density is accompanied by a gain is shear strength, which can continue to the extent that cohesive forces develop that strongly oppose flow. Flow of a well-settled fine powder is also inhibited by the low porosity of the bulk resisting the entry of ambient gas into the expanding voids, causing a pressure differential to act on the material that presses the particles together. For this reason, it is good practice to prevent total settlement of very fine powders that are subsequently required to flow freely.

A consequence is that fine powders offer many operating problems in storage and handling, ranging from 'flushing' uncontrollably when dilated, to proving difficult to initiate flow and then 'arching' and 'piping' when flow occurs from a settled condition. Performance features can also be adversely affected. Density variations incur packing problems when dispensing by volume a product that is sold by weight. Sacks, tubs and bulk transport vehicles can have difficulty holding the required amount during filling, but become only partially filled later. Sacks can

be unstable for stitching and flexible IBC's be unsafe for stacking. Road loading problems have arisen from front axle loads increased excessively when bulk tankers filled with fluidised product braked suddenly and ships have also sunk due to fluidised cargo shifting in heavy seas and de-stabilising the vessel. Transit on belt conveyors can be jeopardised when excessively dilated at transfer points or moving up an incline, leading to 'roll-back; or spillage. Apart from immediate process difficulties caused by fluidity, the material may also not be in an optimum condition for other subsequent operations.

The situation can be addressed by accommodating the fluid state of the powder by appropriate containment, inhibiting its dilatation by the design of the flow route or by arranging for the escape of excess entrained excess air to bring the powder more quickly to a desirable condition. Flow routes should be considered in entirety, as there no point in securing a desired density if this is upset by subsequent free-fall or high agitation. In large scale operations a fluid state may be unavoidable, or even convenient. Large silos are often emptied by way of air slides, but at a late stage in the operation, as with packing in sacks of filling bulk tankers, it is normally convenient for cement to be in a dense, but stable flow condition.

Operating conditions

A common means of handling cement is by pneumatic conveying, or by other transport means that terminate in free-fall into a bulk storage container, resulting in a powder initially coming to rest in a well-dilated, fluid condition. Whether it then settles to a stable flow condition depends upon many factors, including: -

- The in-feed rate and the geometry of the bed, particularly the depth of the stored material.
- Whether the receiving vessel is discharging at the same time as filling, or how long it settles before discharge takes place.
- The flow pattern that is generated when discharge does occur.

As both the filling and discharging may be variable and intermittent, it is not practical to analyse all possible cases. The worst condition should therefore be considered, where filling and discharging is concurrent and an equilibrium state exists in the system exhibiting a minimum residence time. Any delay is discharging then produces more favourable de-aeration conditions, subject to the earlier reservations expressed about settling to a poor flow condition. Clearly, low contents in the hopper would leave little time for de-aeration so only a full hopper condition will be considered.

Many large cement storage hoppers have very shallow conical bases and are discharged by an assembly of air slides to avoid flow problems. These invariably generate a 'funnel flow' pattern of discharge and deliver an aerated product. Packing into sacks and other plant activities are often undertaken from smaller buffer storage units that are discharged by mechanical equipment where there is a greater need and more opportunity to de-aerate the powder. The flow regime generated in the stored product at this stage is of major importance. A 'funnel flow' pattern will form a narrow cross section of flow channel from the stored surface to the container outlet at a comparatively high downward velocity relative to that of excess gas rising to escape through the bed, such that the potential for de-aeration is highly limited and, for practical purposes, usually negligible. Even if the contents are allowed to statically settle to a stable condition and the orifice size is greater than the 'critical arching span', there are serious hazards with funnel flow because the collapse of material above the outlet is inhibited by the capacity for air to penetrate the mass and satisfy the demand of the expanding voids. At best, the material re-dilates to a loose condition to discharge. This process can also result in the exposed surface breaking away progressively to form a slowly increasing arch until it eventually attains an unstable span and suddenly collapses, either resulting in a rapidly developing 'flush' of the stored contents, or that re-fills the vacant space to the outlet with settled material that re-commences the progressive arch growth. This latter cyclic process of a slowly increasing discharge to a maximum, which sudden reverts to the starting condition, is termed 'slurping'. Another hazard is that the arch continues to collapse up to the stored surface level, to leave a stable 'rathole' so that no further flow takes place or, worse still, the rathole collapses and results on the 'flushing' of the total stored contents. A 'funnel flow' offers a minimum residence time for de-aeration to take place,

A mass flow pattern is therefore essential for effective de-aeration. However, mass flow of a fluid media cannot develop in a converging flow channel, as the internal resistance to shear is less than its frictional resistance on the container walls, so it will deform internally before slipping on the walls. Hence material occupying the converging region of a bulk storage facility must have settled enough to develop internal strength in order to to mass flow and avoid the development of 'short-circuit' flow paths that allow fluidised material to pass through to the container outlet.

Further, and importantly, the level of material in the container behaving in mass flow must extend sufficiently into the parallel region of the vessel body to develop 'bed flow', that is the coherent drawdown of material at uniform velocity over the total cross section of the flow path. The reason this is essential is that flow moves fastest in a vertical path above the exit of a converging channel and the hydrostatic pressure of a fluid media will preferentially displace the minimum principle stress exerted by a more settled bulk product, to progressively penetrate the bed of a flow regime with differing flow velocities across its cross section. Once the continuity of the flow path to an unconfined outlet is filled with fluidised material, all the loose stored content will 'flush' uncontrollably and the rest is likely to follow.

Addressing the situation

The escape of excess air from a fine powder in a fluid state of aeration depends on: -

- The differential pressure between the gas in the voids and local ambient,
- The mean porosity of the bed,
- The length of the escape path,
- The viscosity of the void gas, usually air.
- Any differential between the rising velocity of escaping gas and the downward flow of the discharging powder
- Time.

As the bed settles the void pressure decreases and the bed becomes less permeable, so the rate of air escape decreases exponentially and the process theoretically is never complete. However, for practical purposes, the three main bulk conditions of interest are: -

1 When the shear strength of the bulk increases above the wall friction value on a local contact surface, as at this stage mass flow can take place in a suitable form of hopper geometry.

2 When the compaction strength of the bulk material will exceed the separating pressure of the compacted void gas, as at this stage the powder can be compressed without subsequent 'flaking' or 'exploding' of the compact when the compacting stress is removed; typically as with pill formation.

3 When the bulk density and/or flow condition of the product are suitable for the subsequent requirements; as with filling containers by volume that sell by weight and filling containers to a suitable stable volume.

The first condition is key to efficient de-aeration is storage hoppers, as powder in a totally fluid condition will develop a narrow flow path from the surface of stored contents to the outlet that offers a minimal residence time for de-aeration and a maximum counter-flow rate of powder that detracts from the rate at which the excess air is rising through the mass to escape. The flow rate does not have to be high to carry the rising gas down with the powder such that no de-aeration occurs. This feature indicates that for optimum operation: -

- A mass flow hopper should be used to develop total movement of the stored contents and give a 'first-in, first-out' flow pattern in order to maximise the residence time for the powder to de-aerate.

- The level of fluidised material in the flow path must offer adequate time for de-aeration to stabilise the material to a mass flow condition before leaving the section of the hopper that generates even draw-down.

A feeder can considerably reduce the flow velocity by increasing the cross section of the flow channel and, thereby reduce the counter-flow differential to escaping gas. It will also provide a larger cross section for the passage of escaping gas and increase the residence time by virtue of holding a larger volume in a given height. The extraction profile must be as even as possible to avoid local flow paths moving much faster than the average velocity. These condition demand carefully designed equipment and strict operational control to secure reliable and consistently satisfactory results. One advantage is that a 'V' shaped hopper with walls at 60 degrees to the horizontal has similar mass flow potential to a cone with walls inclined at 70 degrees so, comparing a cone with a 'V' hopper, each 2,000 mm across with outlets 250 mm wide, with the outlet of the 'V'hopper fitted with a feeder 1,500 mm long, illustrates the 'V' hopper benefits. The cone will have a depth of 2,404 mm whereas the 'V' hopper will diverge to the width of 2,000 mm in a height of 1,515 mm. The ends can then diverge from 1,500 mm long to 2,000 mm long in a height of 453, allowing a square parallel section 556 mm high to bring it to the same overall height of the cone. The respective holding capacities and flow areas are shown below.

	Conical Hopper	'V' Hopper	Multiple
Volume	**2.87 M^3**	**6.295 M^3**	**2.193**
Outlet area	**491 cm^2**	**3750 cm^2**	**7.637**
Max. Flow area	**3.142 M^3**	**4.0 M^3**	**1.273**

Flow in a converging channel develops a velocity contour across the flow channel. The ratio of velocity at the centre to that at the periphery is greater in a cone than a "V' hopper because the area that the outlet draws from increases parabolicly in radial flow, but linearly in plane flow. Even if the extraction is not completely uniform along the length of the feeder, bulk material approaches the outlet many times faster in the conical hopper, so is much more likely to carry down any rising air than in the 'V' shaped hopper, where it will also reside more than twice as long in the flow channel. A storage container with a circular body section can be transformed to a slot outlet by a rectangular to circular transition section or chisel-shaped connection to secure the reduced flow velocity benefits. It is no mean task to provide completely uniform draw-down over a long feeder slot, but the benefits of a mass flow 'V' hopper with well-designed feeder are clearly shown.

Hopper inserts may be incorporated to accelerating de-aeration in storage. These work by providing 'short circuit' or preferential routes for the escape of air from lower regions of stored beds. Various types are illustrated elsewhere. (1).These may be supplemented by compaction by way of screws or roller press, provided the bulk is sufficiently de-aerated to lose fluidity and the pressure of the gas pressure developed in the voids is inadequate to separate the compacted particles. The use of injected air to replace that being lost when the bulk is in an easy flow condition prevents the material settling to a difficult flow state. The amount required must be continuously supplied at a controlled volume, but is relatively small so does not significantly influence the de-aeration rate, particularly if combined with a accelerated de-aeration technique. Such a combination can be used to bring a fluidised material more quickly to a stable flow state, as indicated in the reference.

Whereas improvements can usually be made to an existing system, there are limits to what can be achieved in given circumstances, as dictated by the powder and operating conditions.

Reference

Bates. L. 'De-aeration of dilated powders in storage', ICBSH. Newcastle, NSW. 2013.

Managing chloride in raw materials

By: Dr. Michael Clark and geologist Fabio Coletta [Whitehopleman (UK)]

Introduction

All cement technologists will be aware of the cycles of volatile alkali chlorides and sulphates that circulate in a cement kiln and the operational problems that those cycles can cause by restricting or choking the flow of material through the kiln. For that reason chloride is one of the most important contaminants in cement raw materials and it requires an accurate evaluation during the investigation of raw material deposits for cement manufacture.

Whitehopleman has written numerous articles and conducted investigations into the cycles of chlorides and other volatile species in the cement kiln and also provided advisory expert systems for their management within the process. However, the management of chlorides within the process is not the topic of this article. In this article we will discuss the management and control of the chlorine inputs to the process from the raw materials. Moreover this article examines how the understanding of the geological origin of the chlorine contaminating compounds allows such raw materials management efforts to be successful.

Chlorine sources in raw materials

The principal cement raw materials (limestone, clays and sand) contribute to the raw mix chlorine content in various forms and quantities. Other chlorine sources are represented by silicates which compose some clay substitutes, raw meal additives like ashes (fly or bottom) generated by other industrial process combustion, slag from smelting ore process, clays from lubricating oil refining, sewage sludge from purifier activity. Furthermore chlorine comes from fuels utilized in the burning phase and alternative fuels derived from the waste management.

All the chlorine inputs to the cement manufacturing process have to be considered to arrive at a chlorine balance. However, this article focuses on chlorine in the primary cement raw materials such as limestone, clay and sand.

Chlorine from sedimentary rocks

The most common chlorine compounds, largely diffused in limestone and clays, are chlorides such as halite (NaCl) and subordinately sylivite (KCl) which is more soluble. Sodium chloride or rock salt (NaCl) is present in vast quantities in the seawater where it is the main mineral constituent, with an average content of 3.5%.

Salt deposits form principally for the chemical precipitation of salt dissolved in seawater. As soon as the sun evaporates the seawater, it transforms the solution into an hypersaline brine. Evaporitic chlorides are deposited after the brine has precipitated the Ca and Mg carbonates and during or after the Ca sulphates. The salt crystals start to precipitate in the brine pool and accumulate on its floor stacking one atop the other. The process is similar to that one visible in modern saltworks.

Evaporites precipitate also as intrasediment crystal growths and replacements or as cements in pre-existing evaporite and non-evaporite hosts. The subsurface salt deposition depends on the capillary evaporation inside capillary fringe, whose thickness derives from the grain size of the hosting sediment or the percolation of dense cooling brines from the subaqueous water body.

Normally the subaqueous salts form in saltern, which are seawater portions remaining isolated from the sea, and in the continental perennial lakes located in endorheic basins, which retain water and haven't any outflow to other external water bodies. The greater part of the subsurface evaporites form in saline mudflats and pans called sabkha (Fig. 1), according to the Arabian word to indicate this kind of environment typical of the Persian Gulf coast.

Fig. 1: Sabkha dry and soft mudflats example in Western Africa

Sabkha is a typically dry and subaerial environment for most of the time; only rarely being covered by marine water. The major supplier of the ions to the salts growing is represented by the deeply circulated resurging continental groundwater. Continental pans as salt lakes (Fig. 2), are frequently associated with lacustrine sabkha, representing the transitional environment between saline mudflats and dry mudflats.

Fig. 2:example of salt continental lake

The existence of large salt deposits mined all over the world testifies that the process is still very active but modern salt lakes and sabkha deposits are definitively not comparable in size with the ancient ones.

The alternation of limestone/dolomite layers with gypsum and chloride levels is very rare even if the contiguous depositional environment indicates that the formation of salt intercalations inside a carbonatic sequence is possible. This absence is explained by the halokinesis theory. Allochthonous salt bodies rise into their overburden often losing connection to the primary salt bed. The rich chlorides fluids associated with diapirs rise through the overlying rocks (Fig. 3) and precipitate halite crystals in the hosting rock pores. Thus the hosting limestone presents chloride contamination even if the related stratigraphical sequence doesn't indicate any presence of salt layer.

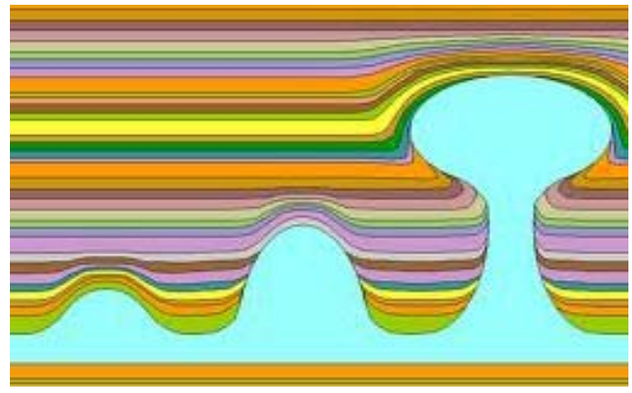


Fig. 3: Diapirism mechanism for rising salt bodies

The saline fluid penetration depends on the rock mass permeability which is related to pores connection in loose sediments and to fracturing in diagenized rock. Therefore the chlorine content in the contaminated limestone shows frequently variations which are quantitatively unpredictable before a direct exploration.

A slightly different origin is the chlorine pollution in the clays which form in the same deposition environment of the evaporite salt. Salt layers and nodules form in the clay sequence but, more frequently, salt deposits inside clays are subjected to diapirism rise (Fig. 4). Clays located in coastal environments like the sabkha are subject to subsurface salt formation because of the capillary fringe fluctuation.

Fig. 4: Evaporites and clay sequence with convoluted layers for diapirism

Another cement raw material affected by chlorine compounds contamination is gypsum ($CaSO_4 \cdot 2H_2O$). Gypsum is a typical evaporitic deposit and often it coexists with rock salt. Present evaporitic minerals and rocks form throughout the world, in both hemispheres among two dry tropical climatic belts located between 15 - 35° of latitude from the Equator. The most important sources of present evaporite deposits in the boreal hemisphere are corresponding to the coast of the Persian Gulf, Gujarat and Pakistan, the Red Sea

and the Nile Delta, Mauritania and Baja California. In the austral hemisphere the most representative evaporite deposits are the Atacama desert, the Bolivian highlands, the coast of south Madagascar, Namibia and the western Australian.

The areas of the boreal hemisphere where these mineral formations are important include the Middle East and North Africa where the member companies of the AUCBM operate their cement factories. It is therefore not surprising that the limestone and clay deposits, on which those AUCBM cement factories are reliant, are often affected by chlorine contamination.

Chlorine from igneous and metamorphic rocks

In addition to evaporites, chlorine is the principal constituent of some silicate minerals found commonly in igneous rocks, sometimes utilized as substitutes for the clays in cement production. The most diffused are sodalite, eudialyte and scapolite group. The alkali-rich magmatic rocks are enriched in chlorine, while the silica undersaturated rocks are enriched to an even greater degree.

Little information is available for chlorine in metamorphic rocks. Chlorine is fairly low in schists and it is generally higher in rocks rich in micas and amphiboles. The low chlorine content is probably due to the high sensibility of chlorine to pressure and temperature.

Chlorine tolerance in the clinker production (semi-dry to dry process)

The content of chlorine both in the raw materials and fuels must be kept to a minimum. Experience indicates that the total chlorine content in the raw meal, before the calcination process, must be less than 200ppm to avoid formation of kiln buildups and pre-heater deposits without a bypass. The critical chlorine content in each raw materials depends on the raw mix proportioning simulations. If the extreme case of a basic raw mix composed of pure limestone, pure clay, iron and sand is considered as reference to illustrate the maximum chlorine evaluation. The raw materials have the following chemical characteristics:

- very pure limestone => CaO ≈ 54%;
- clay => SiO_2 ≈ 60%, Al_2O_3 ≈ 16% , Fe_2O_3 ≈ 7%, SR ≈ 2.2, AR ≈ 2.4;
- iron => Fe_2O_3 ≈ 56%;
- pure sand => SiO_2 ≈ 96%

The clinker targets for the standard cement are LSF = 95, SR = 2.50 and AR = 1.5

The resulting raw meal design indicates the correct proportion contains about 78% of limestone, 18% of clay, 1.6% of iron and 2.4% of sand.

According to this raw mix, if the clay is not polluted by chlorine, the maximum chlorine allowable in the limestone is 260ppm. Otherwise, if the limestone is not polluted by chlorine, the clay tolerates about 1100ppm of chlorine because of its relatively small quantities in the designed raw meal. If both materials contain chlorine, they must not exceed 210ppm each.

Chlorine is a minor constituent so it doesn't drive the raw meal proportioning but it depends on it. Anyway the lower is the percentage of each material in the raw mix, the higher is its chlorine content in comparison to the extreme case previously exposed.

Chlorine management approaches

Managing the chlorine contamination in the raw materials and adjusting the cement manufacturing process to operate with those chlorine contaminated raw materials are therefore fundamental challenges that AUCBM member companies have to address.

The management of chlorine encompasses direct and indirect methods: direct methods are based on the geochemical reduction of chlorine content in the raw materials; indirect methods are based on the technological intervention to bypass part of the kiln gases. The aim of both solutions is the reduction of chlorine impact to kiln gases cycle to the 200ppm threshold.

Direct method for chlorine reduction

The principal direct method of reducing chlorine contamination involves raw material washing with water. This technique is regularly deployed in the preparation of chloride free aggregates for concrete production. In fact marine dredged aggregates are washed with fresh water to remove the chloride contained in the seawater from which the aggregates are drained. In surface mining, the washing operation occurs on salt contaminated raw materials extracted from the quarry before or after the primary crusher (Fig. 5).

Fig. 5: Raw material washing nozzles equipment

For most AUCBM member companies washing raw materials to remove or reduce chloride contamination is not a viable option. Often insufficient fresh water is available for such washing operations. Even if the fresh water were available the problems of increased moisture content of the raw materials and disposal of the washings would be major challenges.

Another direct method for the chlorine reduction depends on the management of contaminated raw materials which regards raw material excavation and blending management all along the production chain. This approach is reliant on a deep geological and geochemical deposit knowledge and it develops in different phases.

The first stage includes a precise and detailed study of the raw material deposit with a particular focus on the core drilling operations and the consequent sampling to reach a realistic geochemical reconstruction of the whole ore body. A typical drilling error depends on the leaching of soluble compounds such as chlorides that leads to a chlorine content underestimation. An error that occurs during the sampling regards the incorrect riffling and screening of the raw material that replaces some original sample components.

Reliable boreholes samples and their respective chemical analyses, if performed on a sufficiently detailed grid, enable the fulfilment of a proper quarry block model which provides the basis for the preparation of a long term mining plan. Once the chlorine distribution of the deposit is clear, the mining plan must establish different dig points inside the quarry, some with very low content of chlorine and some with medium content if available. All different materials must be blended to reduce the chlorine content below the critical threshold according to the raw mix proportioning. This approach optimizes the usable raw material reserves and extends the quarry life. This method also avoids the production of large amounts of sterile, dumped material with attendant environmental issues.

The excavation of the quarry must strictly follow the proposed mining plan improving the deposit knowledge with a systematic and punctual examination of the blasted rock throughout blasthole cuttings analysis. This approach requires continuous monitoring of chlorine content of the excavated deposit. Commonly plant laboratories are not equipped to handle this workload. Chemical analysis field equipment is a possible solution. Nowadays the market offers several light equipment to perform on-site analyses. The best solution consists of the preparation of a 4WD truck with all sampling and analysing equipment mounted to check the drilled and blasted material as soon as it is excavated. This data must be crosschecked with the data from the geochemical block model and utilized to update that model. This procedure, of course, requires well trained and skilled people.

A positive benefit of the deployment of this methodology is the opportunity to minimise, or even eliminate, the need for a kiln gas bypass. The thermal energy savings delivered by such minimisation, or elimination of the need for a kiln gas bypass can more than pay for the additional staff and equipment required for a such a raw materials management approach.

Indirect method to chlorine reduction

The indirect method mostly used to reduce chlorine is represented by the bypass construction to catch kiln gases flux. This technological method works both alone and together with the direct approach solutions, considering that the lower is the chlorine content of the raw materials, the smaller will be the bypass utilization and the consequent energy loss. Again, bypasses operation is not the matter of this article.

However as rule of thumb, the best bypass guarantees maximum chlorine removal with minimum heat loss. The thermal loss, expressed as increment of the specific energy consumption, consists of 6000 - 12000 J/kg per each 1% of removed kiln inlet gas. By managing the inputs of chlorine to the process in the raw materials the losses incurred through the bypass can be minimised.

The case of the Egyptian cement plants illustrates the bypass use concerns. Many Egyptian raw materials for cement production have chlorine concentrations that range between 500 - 1000ppm. After raw materials selection and blend, the feeding raw meals have usually a chlorine content of about 700ppm which correspond to the bypass rate use of about 2 - 3%, meaning a system thermal loss of about 20000 - 30000J/kg. In Egypt, the typical bypass rates for chlorine are of up to 15% with an increase of specific consumption up

to about 150000J/kg. Few Egyptian plants presents a raw meal chlorine content of about 1600ppm that request an extraction of about 30 - 40% of kiln gases corresponding to a thermal loss of about 300000-500000J/kg. This represents a huge energy loss that raises considerably the cost of cement production

The problem of kiln dust management

Another negative aspect of the bypass use is the production of large quantities of cement kiln dust (CKD), rich in alkalies, chlorides and sulphates that may have a tremendous environmental impact. Conceptually, the ideal strategy for any cement plant operator would be based on the CKD recycling by sending them back to the process. Although plants recycle some portion of the gross CKD, the gradual accumulation of alkalies, sulphates and chlorides produces dust which is not suitable for any further uses than being dumped in waste disposal.

The primary issue of CKD production regards the availably of dump sites where discharge the dust excess. These waste disposals have both environmental impact (Fig. 6) and slope stability problems (Fig. 7) that require a careful evaluation before, during and after their direct utilization.

Fig. 6: CKD disposal polluting the air

Fig. 7: CKD dumps slope stability issue

CKD consists primarily of $CaCO_3$ and SiO_2 which is similar to the cement kiln raw feed, but the amount of alkalies, chlorides and sulphates is usually higher in the dust. Rarely metal contaminants, such as arsenic, barium, chromium, nickel and vanadium in CKD, have concentrations over the acceptable limits set by different countries environmental regulation. The use of alternative fuels, derived from waste management, makes CKD more rich of contaminants and less recyclable.

Many of the CKD are unstable or highly soluble at the earth surface conditions when they get in contact with water. Chlorides are totally soluble and very mobile compounds which are toxic to aquatic life and impact vegetation and wildlife. The human tolerability for chlorides in the drinking water is about 0.25g/l. Furthermore chloride contaminated waters become corrosive for metal and plastic too.

Depending on the concentration of free lime (CaO), CKD can be highly cementitious material; this aspect leads to many CKD applications such as soil stabilization, waste treatment, soil amendment as fertilizers and in chemical processing to recover alkali salts based on its high potassium contents, mine backfilling, glass making, coagulant in waste water treatments, absorptive agent for oil spillages etc. Sometimes CKD is agglomerated or palletized to produce an artificial aggregate for special applications.

Only small quantities of chlorine rich powder can be reused in the cement process as kiln feed or blended with finished cement products. The major factor limiting the direct recycling of dust to the cement manufacturing process is its alkali level. Similarly, chlorine reacts with alkalies to form alkali chlorides, which can also result in structurally-defective concrete. The maximum chlorine content accepted for cement is about 500 - 1000ppm to avoid problem in the concrete. Sulphur, in the form of sulphate reduce the structural quality of concrete as well. Several studies found that cements containing only CKD had reduced workability, setting times, strength and concrete durability.

The amount of dust that is recyclable to the kiln increases operating a leaching process of the alkali salts with water.

Conclusions

In conclusion Whitehopleman believes that effective management and control of the chlorine inputs to the cement manufacturing process can make a major contribution to reducing cement production costs. The reduction of chlorine compounds in the raw material is preferable to bypassing large volumes of kiln exit gas. Gas extraction represents both a significant energy loss and an intense growth of the cement manufacturing cost. Furthermore bypass operation produces a lot of dust which is ften difficult to reuse.

Such management and control of the chlorine contributions to the process in the raw materials must be based on the accurate geological and geochemical knowledge of the raw material deposit combined with day-to-day sampling and testing of the material available for loading at different dig points of the quarries.
These are the services which Whitehopleman provides and advocates that cement companies in the AUCBM region should adopt.

References

Adaska W. S., Taubert D. H.(2008) - Beneficial uses of cement kiln dust. IEEE/PCA 50th Cement Industry Technical Conf., Miami, FL, May 19,22-2008

Bhatty J. I. (1995) - Role of Minor elements in Cement Manufacture and Use. Research and Development Bulletin. Portland Cement Association

Bouchard M., Milliard A., Rivard S. (2013) - The Study of Chlorine Analysis by XRF Using Sample. Preparation by Borate Fusion for Cement Industry Related

Materials. Corporation Scientifique Claisse Brehler B., Fuge R.(1974) - Handbook of Geochemistry. Springer-Verlag

Corazza F., Gandini P. (2004) - Manual of the Cement Chemistry Course. CTG Italcementi Group

Deolalkar S.P. (2009) - Handbook for designing cement plant. BS Publications Forgey J. (1994) - Recirculation of metals in cement kilns. Erathech-Environmental Limited

Jøns E., Hundebøl S., Clausen K (2008) - New reasons for installing a chloride by-pass. Interaction between chloride and sulphur. FLSmidth.

Labahn O. (1983) - Cement engineers› handbook (4th ed). Bauverlag

Moore C. H. (1989) - Carbonate Diagenesis and Porosity (2nd ed.). In Developments in Sedimentology, 46.Eelsevier Science b.v.

Naik T. R., Canpolat F. , Chun Y. (2003) - Uses of CKD other than for flue gas desulfurization. CBU Report for Holcim (US)

Rajabzadeh.M.A., Askarizadeh.V. (2010) - Quality evaluation of cement raw materials from Lar region, south Iran. In: The 1 st International Applied

Geological Congress, Department of Geology, Islamic Azad University - Mashad Branch, Iran, 2628-April 2010

Siddique R. (2008) - Waste Materials and By-Products in Concrete. Springer-Verlag

Taylor H.F.W. (1990) - Cement chemistry (2nd ed.). Thomas Telford Publishing

VV. AA. (2006) - Cement Kilns firing Hazardous. The Basel Technical Guidelines

VV. AA. (2009) - Chlorine Bypass System by Taiheiyo Cement in raw materials and fuels. Claim :

T 04323.3.05 - 09/. Taiheiyo Cement Corporation

VV. AA. (2011) - New value of cement industry in resource recycling society. Perspectives on sustainable development from Asia. Taiheiyo Cement Corporation

VV. AA. (2010) - Reference Document on Best Available Techniques in the Cement, Lime and Magnesium Oxide Manufacturing Industries. European Commission

Warren J. K. (2006) - Evaporites :Sediments, Resources and Hydrocarbons. Springer-Verlag

Vortex Blastair® more blasting power for less cost!

By: Staminair, Philippines

With today's need to lower cost of fuels, Cement plants are increasing the usage of alternate fuels. Petcoke, Industrial and domestic waste, agricultural by-products are coming into the mix with effect of creating concretion and clogging that are becoming one of the main obstacles to optimization of cement kiln operation.

A cement kiln preheater has several areas where concretions can occur. Hence, we are talking about areas where gases velocity decreases, where hot and colder temperatures encounter raw meal or where restricted dimensions of preheater sections changes raw material flow speed. The most critical areas of build up being, but not limited to, are inlet heart, smoke chamber, riser duct, cyclones cone / meal feed pipes and grate cooler.

Concretions and blockages, even recognized as an everyday concern by cement plants, are somehow a hidden cost affecting operations and kiln performance in terms of Clinker quality; Clinker overall production; Refractory lining life; Fuel consumption and Safety of operation.

What solutions are available?

Basically, cement plants have 2 possible options. Curing or Preventing method?

Curing can eliminate concretions while kiln is still in operation (if measures are taken at early build up stage) but will affect overall kiln performance.
Most common practices are hammering and poking, usage of CO_2 cartridges, High pressure water jetting….etc …But are all labor extensive….and on top of it….DANGEROUS for the operators, RISKY for the

refractory brick-work, and UNPRACTICAL in terms of calorific energy consumption (when hatches are opened, ambient cool air is introduced).
Prevention with air cannon. it is the most suitable solution for build up problems, as it is more energy and cost efficient device currently available. Vortex Blastair® are able to remove safely and automatically concretions occurring in areas where temperatures are high and not really suitable for human working environment.

Thus, build up can be regulated and destroyed before affecting overall cement process while offering safety for the operators. And, plant reliability is improved!

Based on this assessment and the field experience of its members, Staminair knew that available solutions where not fully satisfying users. Reliability of Air Canons systems was low, difficult and expensive to maintain. About 15 years Staminair then decided to come with its own and innovative design to answer the concerns of end users:

- A simplified and sturdy design able to cope with the most severe operating conditions;
- A metal to metal construction design making the Vortex Blastair® extremely reliable;
- Easy maintenance through an accessible external T shape valve;
- A cost effective solution by limiting the number of spare parts and a double sided piston doubling its usage life.
- Standardized installation on safety devises as control valves and heat shields.

A fast return on investment:

Considering the cost of un-scheduled shutdown the price to equip a cement line with air canons is negligible. It is a common practice for a modern kiln to quantify each hour of stoppage at an approximate of 4000 USD. Knowing that the cost of a set of 30 cannons will be less than 100,000 USD it means a payback in 1 day of avoided stoppage! Besides, a cement plant does not require installing air cannons everywhere at the same time. It can be a gradual investment done per identified "build up zoning" (like Kiln inlet; smoke chamber; Riser duct; Cyclones; Cooler.. etc). Thus, costing is no more an issue….. And improved performance in the equipped "zoning" can justify further investment at a proper time as Return On Investment can be achieved more rapidly and in a safely manner.

How to make Vortex Blastair installation successful?

At Staminair, we believe in a permanent exchange information with the end users. They are running the plant, and as such, are mostly qualified to identify concretions related problems and are fully aware of pending build up related issues. Information and location of previous severe build ups are vital inputs.

At the same time, detailed drawings indicating potential concretions will help determine the number, size and positioning of the Vortex Blastair and if specific blowing nozzles shapes are necessary.
Sites actual pictures can also be valuable. Once agreed upon with customer, detailed installation drawings, which Staminair Corporation called «Posiblast" can be prepared.

Second step is a proper pneumatic piping layout (pipes sizing and access path) will help to minimize air consumption and maximize the Vortex Blastair performance. Depending on the number of Vortex Blastair air cannons required, an air pressure «buffer tank» (1 to 2 m3) can be installed between the Vortex Blastair network and plant existing

air compressor, thus alleviating air delivery from compressors, which have to be planned to deliver enough compressed air in pressure and in volume.
At the same time, location of control panels that programs blasting sequences can be decided. Then cable runways and electrical conducts delivering electrical supply to the Vortex Blastair pilot valves can be properly laid out.

Finally, during the installation of Vortex Blastair®, control a proper angles positioning of piping to insure that no material will flow back into the cannon and that blasting effect will target precisely clogging areas.

Air cannons as a universal application:

Our operational principal proves successful. End users often contact us for not only for new installation but upgrading their installed systems. This option allows keeping the installed network and tanks by replacing only the sensitive part that is the blasting head and solenoid valves. Our latest interventions in Algeria (Ciments de Tebessa) and Turkey (NUH cements) cement, the largest cement plant in Europe, was for the replacements of obsolete air cannons.

At first, Staminair was called to conduct a feasibility study with two objectives in mind:

1/ To recommend optimum types and positioning of new air cannons to fight expected build ups.
2/ To replace the existing network of obsolete air cannons.

After acceptation, the old network was reshaped by replacing blasting heads with Vortex Blastair® T-shape blasting head mounted on existing tanks. Since Vortex Blastair® blasting heads are directly compatible with most pressure vessel brands, it allows a complete renewal of the active parts of the cannons while saving on equipment purchase.
To complete the system Staminair has extended the air cannon networks with strategically placed Vortex Blastair® V6100HT.

Feedback after installation was the satisfaction of customer that noticed an immediate improvement of blasting performances and no reported new clogging incurred.

Vortex Blastair® specificity

Vortex Blastair® is using a specific patented design allowing the triggering device to be equipped with a Reversible piston (for double service life) and avoiding wear by the addition of a replaceable metal cylinder sleeve; this reduces tremendously its maintenance cost.
Safety of the users: by the addition of a heat shield preventing hot material to fire back to personal on duty during maintenance.
Vortex Blastair® are engineered in Europe but manufactured in Asia for cost efficiency.
As of today the Vortex Blastair® has been recognized and is referenced by all the main players of Cement and steel industry and is making his way into other specialized application in mining, power plants and food processing.

Just a few numbers to give the measure of the success: More than 120 production plants in 22 different countries are now trusting Vortex Blastair® to optimize their production… And the network of its agents is growing every day.

For more information on how we can help or service your company›s unique requirements, please contact us at: inquiry@staminair.com ; service@staminair.com

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Wear Protection Solutions

By: Joachim May, Kalenborn, Germany

Introduction

As with other areas of technology, wear protection technology is subject to change. Formerly, materials were requested that could significantly extend the duty cycle of different plant components due to their hardness and other properties. The current demand is for upgraded standards and materials of improved quality. Additionally, in the past, customers were prepared to procure various materials from different suppliers. Today, purchasers prefer the complete array of materials to come from a single source. Another demand is the continuous improvement and simplification of application technologies. Plant operators request complete system solutions for various purposes.

Sintered zirconium corundum

KALCOR-S sintered zirconium corundum, developed by Kalenborn, is a unique substance (Figure 1). Aluminum oxide and zirconium oxide raw materials are cast in cold state to slabs, shapes and cylinders and then sintered. This allows the production of elements that easily match a variety of system components.

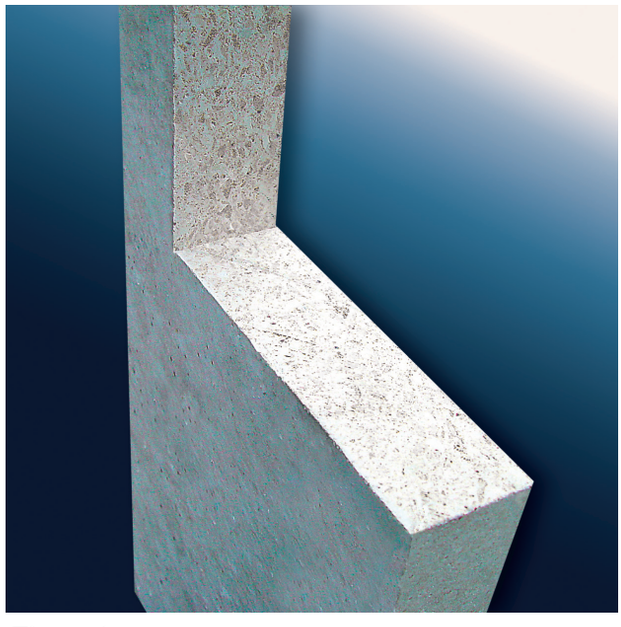


Figure 1
The structure of KALCOR-S sintered zirconium corundum is predominantly homogeneous, dense and free of voids.

KALCOR-S is based on the same raw material as the time-tested zirconium corundum, which is produced by a fusing process. Cold casting and sintering optimise the material advantages. This results in significantly greater shape flexibility. On top of that, voids typical of fusion casting are avoided. KALCOR-S features a predominantly homogeneous, dense structure, free of voids. The systematic use of the nanotechnology attains material characteristics that, in actual practice, correspond to hardness 9 by the Mohs scale. KALCOR-S is advantageous in cases of intense abrasion as well as high temperatures and thermal shocks. The maximum application temperature is 1250 °C.

Hard compound highlighted by flexible use

Contrary to monolithic ceramic lining, hard compounds offer considerably improved flexibility of use. KALCRET hard compound is an example of materials that are improved and optimised to obtain enhanced hardness and impact resistance and to advance application technology. Micro and nanotechnologies are now used systematically as progress is made in its development. KALCRET hard compound covers a comprehensive range of materials that can be used equally by trowelling, casting and spraying. Prefabricated slabs and system components are also offered. The spraying of KALCRET-S (Figure 2) fulfils modern requirements stipulated for wear protection

Figure 2
KALCRET-S sprayed on compound enables large surfaces to be covered in minimum of time. The compound can be sprayed on horizontally, vertically and overhead without any problems.

For example, it is quick setting, and consistently shorter installation periods are allowed for new systems and repairs, making it essential to mount wear protection linings within a minimum of time. In response to these requirements, Kalenborn developed the spray-on KALCRET-S hard compound, which allows application over large surfaces within a minimum amount of time, at rates of more than 5 m2/hour. This rate is achieved for a layer thickness of 25 mm. Spraying may be done horizontally and vertically, even overhead working and the lining of complicated surfaces are feasible without difficulties. KALCRET hard compounds can be reliably, safely and efficiently installed at various system dimensions. This is also true of the compound to be trowelled. KALCRET-X allows vertical and overhead applications without any problems.

Epoxy bonded hard compound

Another addition to the Kalenborn product range is KALPOXY epoxy bonded hard compound. While the KALCRET range includes cement-bonded materials, the bonding matrix of KALPOXY is a two-component epoxy resin system. KALPOXY was developed for use in the basic industry. Rather than make a multitude of materials available for any conceivable application, the plan was to offer a single material that adapts to the specific circumstances, e.g. the ambient temperatures in cement works, and is therefore more universally applicable. Whereas KALCRET lends itself especially well to lining large surfaces, KALPOXY features high abrasion resistance combined with easy workability and is used for repairs and cases of emergency. KALPOXY hard compound is corundum based. The selective use of mineral hard materials, in combination with the epoxy resin matrix that withstands high stress, allows a variable layer structure. This ensures reliable and easy protection of locations that are exposed to particular stress. KALPOXY cures within short periods at ambient temperatures of 20 °C. The maximum application temperature is 80 °C.

The two-component system is offered in measured packages to warrant easy handling. It can also be worked cost efficiently at a site using simple tools. After manual mixing, the material is applied at the required thickness with the aid of a trowel. The surface is smoothed if necessary. The use of anchor systems, e.g. in the form of wire mesh, is not necessary. The material can be applied equally well horizontally and vertically. In addition, it can be reliably worked overhead (Figure 3) without requiring any type of reinforcement e.g. a wire mesh. KALPOXY firmly sticks to the surface – no detachment has been observed in practice.

Figure 3

KALPOXY is also successfully used for overhead working. Peeling off has not been observed in practice.

Wear protection

Flexible pipe bends

Kalenborn has developed numerous wear protection systems. These include, for example, flexible pipe bends, hard material rubber compounds and wear-monitoring systems. KALFLEX flexible pipe bends (Figure 4) are abrasion-resistant segments that fit into each other and are capable of moving in relation to each other.

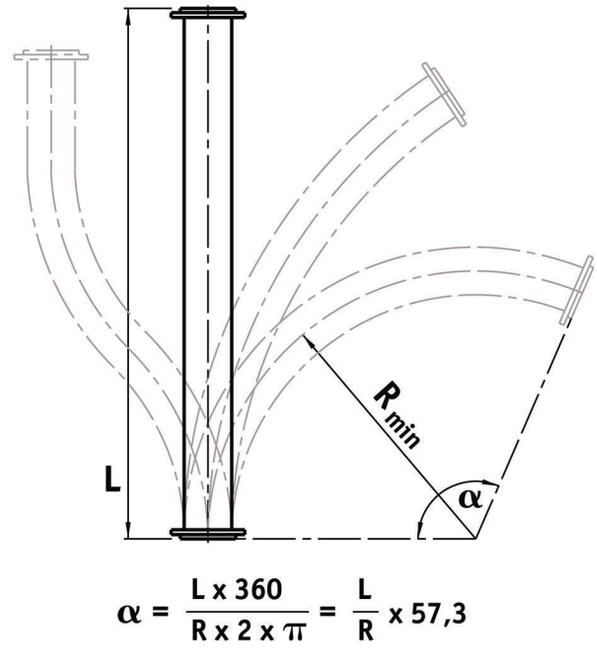


Figure 4
KALFLEX allows flexible joining of two fixed points if a rigid connection involves the risk of a pipe fracture and, consequently, undesired interruption of plant operation.

This results in variable radii and angle positions of the pipe components. The segments are enclosed in a rubber jacket containing a fabric insert, producing the necessary stability and tightness. Nominal diameters from 20 to 150 mm cover the complete range that is used, in particular, for pneumatic conveying systems. The wear-resistant segments are mostly made of KALMETALL-C hard casting. In case of maximum requirements concerning sliding wear, the segments may be produced of KALOCER high alumina ceramics. The advantages of KALFLEX result from its flexible adaptability to pipe systems. It is highly wear resistant, easy to install and suggests itself for preventive storage. KALFLEX pipe bends are also used for pipe branchings, expansion joints and flexible joining of two fixed points if a rigid connection involves the risk of a pipe fracture. Undesired interruption of plant operation is avoided. The system allows all popular flange and coupling connections, which ensures rapid and easy installation in existing plants.

Composite construction of hard material and rubber

KERAFLEX (Figure 5) is a hard compound, like KALOCER high alumina ceramics or KALMETALL-W hard overlay welding vulcanised into rubber mats. It covers a composite system of solutions, such as a composite construction of KALOCER high alumina ceramics, rubber and steel, a composite construction of high alumina ceramics and rubber, a composite construction of hard overlay welded plates, rubber and steel and a simple composite construction of rubber and steel.

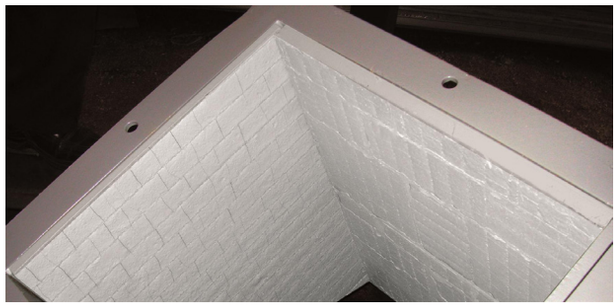


Figure 5
KERAFLEX lining of a bunker that is exposed to high sliding and impact wear. Moreover, the system allows significant noise reduction.

The use of KALMETALL-W hard overlay welded plates is attributable to the excellent impact resistance of the system as a whole. It comprises overlay welded steel systems made up of a tough basic body and hard overlay welding. The base metal provides the strength of the system. The hard overlay welding is the wear layer. It consists of a C-Cr-Fe system with primary chromium carbides. KERAFLEX-WRM is the system that has been combined with KALMETALL-W through vulcanisation into a functional component in a single operation.

The size of a KALMETALL-W slabs is normally 200 x 200 mm. Other slab sizes can be used as well. Generally, KERAFLEX elements are manufactured at standard sizes from 100 x 100 mm up to 500 x 500 mm. KERAFLEX elements are offered at thicknesses from 25 to 100 mm with the varying thickness of hard compound and/or rubber being the decisive aspect. The elements are mechanically connected to the subsurface by means of bolts in a time-tested attachment system. The maximum application temperature is 80 °C.

The benefits of using KERAFLEX are:

- Impact resistant elements
- Hard and wear-resistant surface.
- Impact resistant due to the rubber layer matched to the specific application.
- Optimal system vulcanisation.
- Simple and reliable mechanical fastening or gluing.
- Easy replacement of the elements.
- Optimal adaptation to special requirements with a variety of sizes, thicknesses and design.
- Sound insulation.

KERAFLEX achieves significant results with respect to sound insulation. The “Montan” University of Leoben in Austria has carried out sound tests with the systems set against standard steel plates. The comparison showed that, when using the material, the sound level could on an average be reduced by 10 dB. This corresponds to a reduction of the subjective noise perception by factor 2. In other words, the use of this product reduces volume to half the normal value.

Protection of a vertical roller mill

The vertical roller mill includes several zones that are subject to varying requirements, e.g. areas subject to sliding wear, due to varying conveying velocities. Wear in other zones is attributable to additional impact and varying temperatures, especially when it is grinding/drying equipment. Furthermore, there are grinding tools located in the grinding zone. A cement plant in Europe decided to install a vertical roller mill. A precondition for which was that it would meet guaranteed outputs. Based on the above principles, Kalenborn developed a wear protection system together with the plant operator and the mill suppliers.

KALOCER high alumina ceramic slabs (Figure 6), covering a total of 280 m2, have been installed in the upper part of the separator housing. These slabs are particularly wear resistant; they withstand not only the

anticipated high pneumatic conveying velocities, but also the high density of the material flow. Due to the expected vibrations within the separator area, the slabs have been mechanically fixed with hole and welded bolts.

Figure 6
KALOCER high alumina ceramic lining in the separator zone of a vertical roller mill.

KALMETALL-W 100 hard overlay welded plates (Figure 7) have been used in the lower and upper part of the separator and the outer zone of the rejects return cone. The lined surface measures 55
m2. The critical issue in this zone is to ensure reliable wear protection despite intense impact wear. The lining plates used feature a 6 mm steel plate as strength carrier and 4 mm thick hard overlay welding. The plates are fixed to the base structure by means of plug welds. The discharge bend of the mill is protected by trowelled

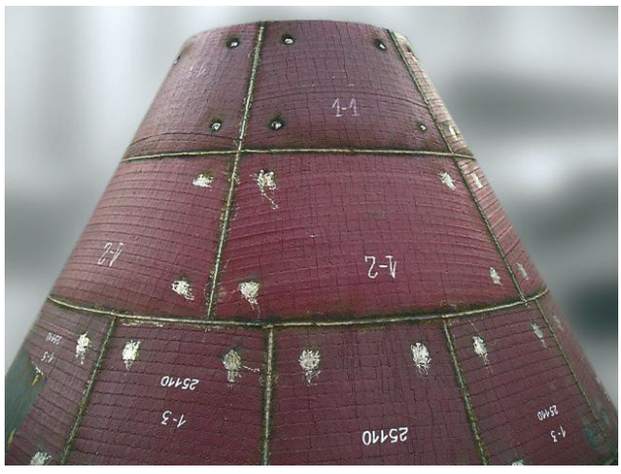


Figure 7
KALMETALL-W 100 hard overlay welded plates protect the vertical mill zones that are exposed to sliding and impact wear.

KALCRET-BNX hard compound (Figure 8). The lined

Figure 8
KALCRET-BNX hard compound installed in the discharge bend of the vertical cement mill.

Slide promoting linings enhance the production flow

Bunkers, chutes, troughs or similar equipment used for the storage and transportation of fine grained bulk materials often suffer problems of flow (Figure 9). The sliding properties of typical wall materials, such as concrete or steel, are in most cases inadequate to ensure mass flow for the utilization of the complete storage volume. Depending on the bulk material being handled, sticking and/or material accumulations will develop.
Clogging, reduced storage volumes or plant interruptions may occur which require costly flow promoting efforts. In actual practice, these flow promoting efforts reach from manual tapping to expensive air blast guns and mechanical discharge machines. Even newly built installations can have these problems which cannot be avoided by structural measures, such as steeper sliding surfaces. The situation is even more complicated for plants that are already in operation.

Significant improvements can be achieved by selective measures to reduce wall friction and to avoid adhesion, i.e. by the use of slide promoting linings. Kalenborn uses different materials for that purpose and offers the most suitable lining and fastening techniques (Figure 10 & 11).

The future

Technology is subject to rapid development and this is also true of wear protection. The solutions offered for extending duty cycles and minimising operational failures and maintenance expenses have undergone significant changes - a trend that is set to continue. Plant users and manufacturers of machines and components are tackling new challenges and the suppliers of wear protection products are determined to meet these requirements.

Figure 9, 10 & Figure 11 Bunker for fine coal: The slide promoting lining ensures the material flow without sticking and clogging.

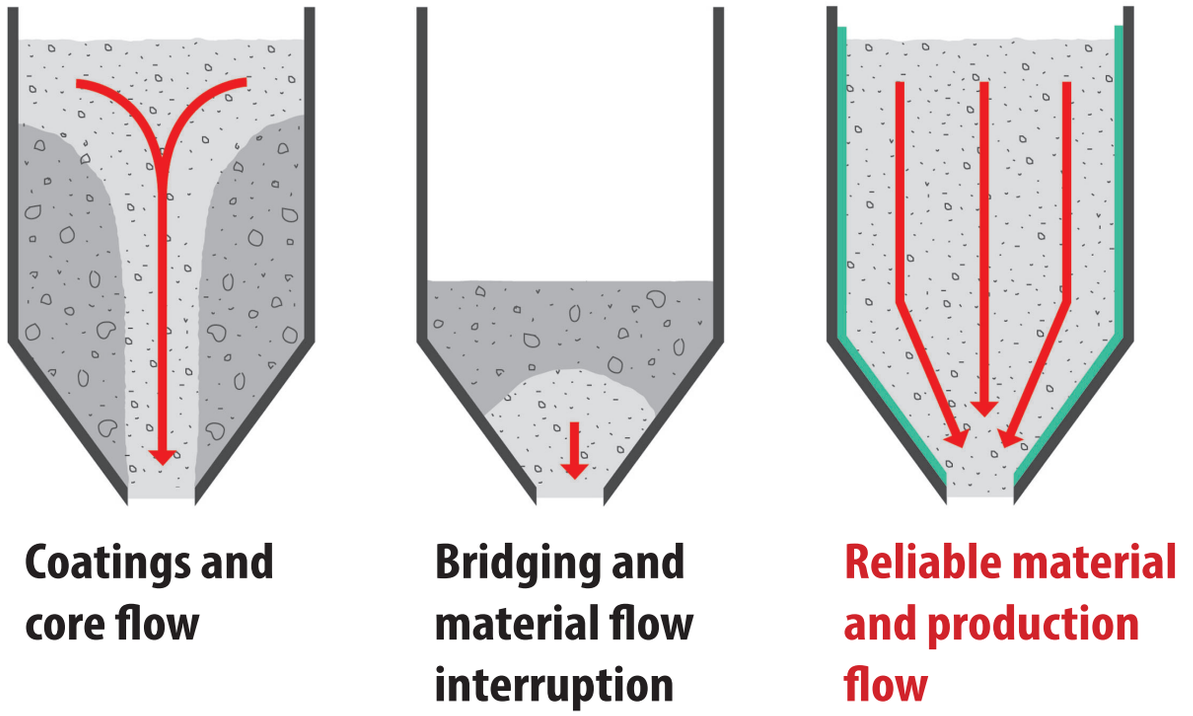


Figure 9

Figure 10

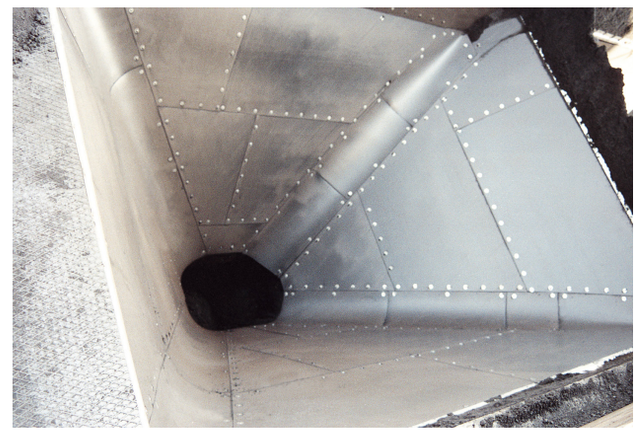


Figure 11

Contact:
Joachim May, Kalenborn, Germany
joachim.may@kalenborn.com

RUSSIAN CEMENT MARKET: CURRENT STATE AND DEVELOPMENT PERSPECTIVES

Bolshakov, E.L., Cand. Eng. Sc., Chairman of the Committee on cement, concrete, dry mixtures of the Russian Union of Builders, President of "ALIT" Group of Companies

Introduction

Modern Russian cement industry currently includes 58 cement plants with a total combined capacity of more than 95 mln t. The largest cement companies in the Russian market are "EUROCEMENT group" holding, market share of which is more than 30 %, Holding Company "Sibirskiy cement" (11.0 %), "Novoroscement" (more than 8.0 %).
Russian cement industry is a dynamic field. After the crisis, since 2009, a steady increase in the production of cement can be observed (Fig. 1).

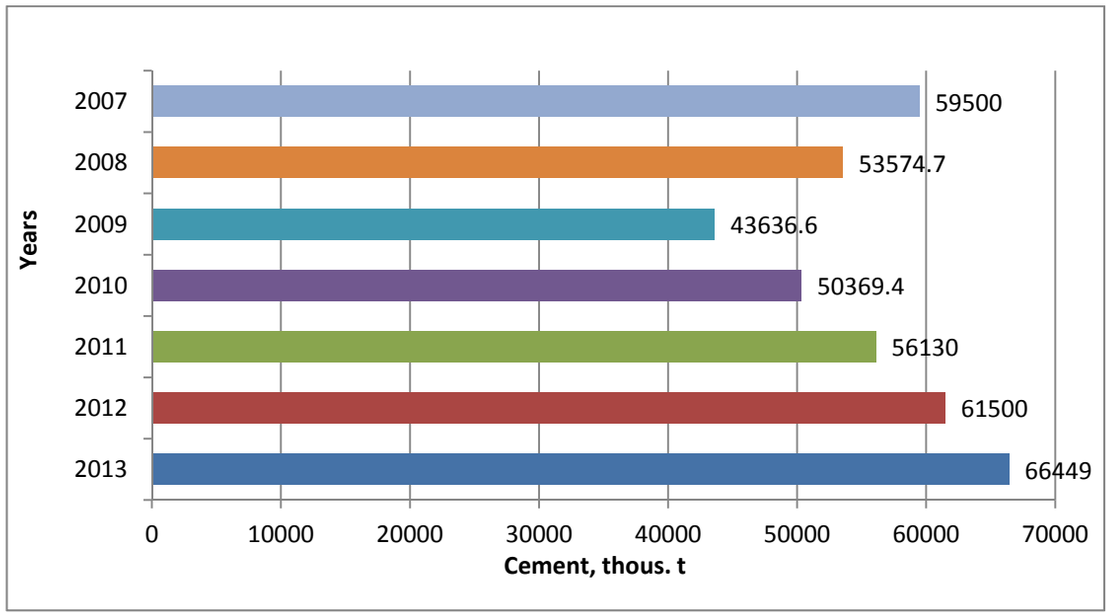


Fig. 1. Russian Cement industry in 2007–2013 (Source: Rosstat RF)

During 2012 61.5 mln t of cement was produced, that is 10.5 % higher than in the previous year. This is the maximum figure in the history of the cement industry in the Russian Federation since 1992. Thus consumption of cement increased more significantly up to 65.2 mln t, i.e. for 13.2 % more than in 2011. Besides it should be noted that cement production and consumption level is lower than that of the Soviet period. For example, 83.1 mln t of cement was produced in Russia in 1990.

In 2013 cement consumption and production has also run up to 69.7 and 66.4 mln t. Though there was an essential slowdown in growth rates if compared to 2012: consumption fell from 13.2 to 8% and production from 10.5 to 7.4%.

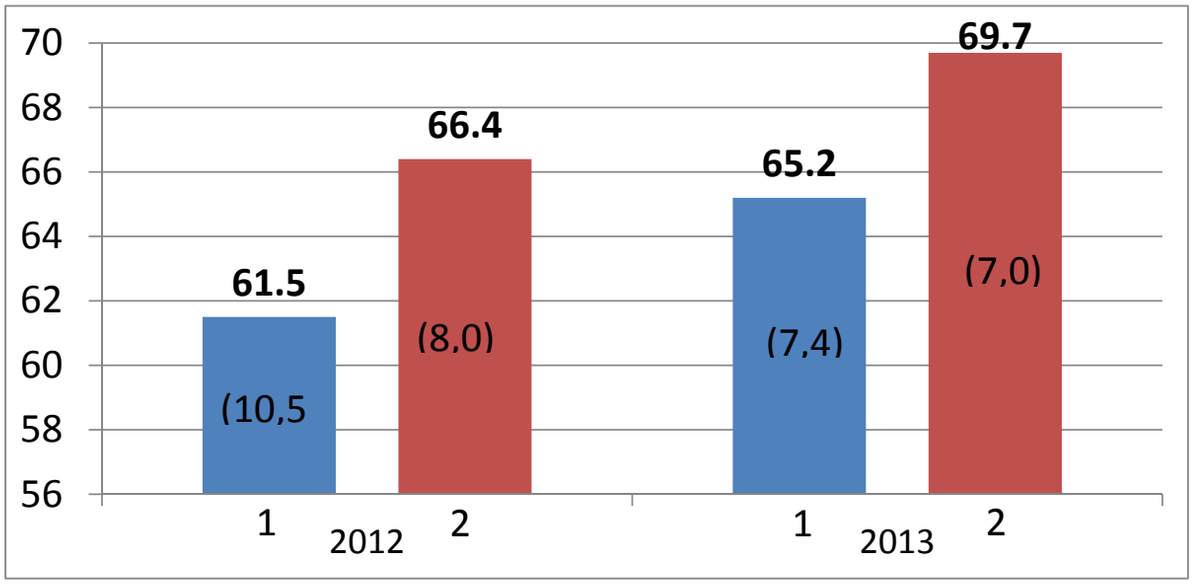


Fig. 2. Production and consumption of cement in Russia (mln t)
(production index (%) compared to the previous year)

Modernization

The important major trend in the cement industry is the active building of new energy-efficient production lines of dry cement production method. Over the past six years, which were not easy for the industry, ten production lines with total capacity of 23 mln t were put into operation (Table 1). Looking ahead to 2025, more than 21 projects with a total capacity of over 37 mln t can be realized in the Russian Federation.

Table 1. Cement plant construction projects in the Russian Federation in 2008–2013

Region	Investor	New production capacities, mln tons
Orenburg Region	South Ural Mining Company	2,5 (1,3 + 1,2)
Leningrad Region	LSR	1,9
Tula Region	HeidelbergCement	1,8
Sverdlovsk Region	Dyckerhoff	1,3
Republic of Mordovia	Vita-Line	3.2 (0.8 — semi-dry)
Republic of Bashkortostan	HeidelbergCement	1.3
Moscow Region	Holcim	2,0
Ryazan Region	BaselCement	1.7
Krasnodar Region	Gazmetalproject	2.3
Voronezh Region	Eurocement group	2.4
Penza Region	AsiaCement	1.3
Volgograd Region	RGR	1.3
Total amount		23,0

For today there are 30 % of all capacities operate on the dry production method in Russian cement industry, that means that this indicator has grown almost twice compared to 1992, and by 2025 this percentage can grow by more than 50 %.

Among the conditions stimulating the active building of new cement production lines the following can be outlined:

- Meeting the growing demand in cement for the construction industry. Housing construction in Russia in 2012 has increased by 5.5 % to 69.4 mln t. Projects for the FIFA World Cup, large transport projects, etc are implemented.
- The steady increase in the cost of energy in Russia. The large number of obsolete and outdated wet process cement plants (about 70 % of the total capacity) dramatically increases the power consumption of cement industry in Russia, which can result, in the medium term, to a sharp decrease in competitiveness of the cement companies and their exclusion from the market.

The introduction of new modern cement production capacities in 2008–2013 has led to a sharp increase of internal competition in the cement market of the European part of Russia.

Customs Union

The important factors that will influence the state of the Russian cement market are the integration processes in the framework of the Customs Union of Russia, Belarus and Kazakhstan. Abolition of the internal customs duties will allow the producers of these countries to sell cement freely, thereby creating the additional competition to Russian producers and vice versa. For 2013 imports of Belarusian cement has increased by 20% and reached 1.2 mln t.
In this case in Belarus and Kazakhstan major construction projects of new energy-efficient production lines are developing. So in Belarus three new production lines of dry process, with total capacity 5.4 mln t, added to the existing in 2012–2013 capacities of 4.8 mln t, which would lead to a significant surplus of cement in the market of Belarus (over 5 mln t) (Table 2).

Table 2. Belorussian cement plant capacities increase
Company Name Capacity , mln t (production method)

Company Name	Capacity , mln t (production method)		
	Existing	New	Total
JSC “Belorussian cement plant”	1,15 (dry)	1,8 (dry)	2.95
JSC “Krasnoselskstrojmaterialy”	1,93 (wet)	1,8 (dry)	3.73
JSC “Krichevtsementshifer”	1,71 (wet)	1,8 (dry)	3.51
Total	4,79	5,4	10.19
Maximum cement consumption in Belarus in 2010, mln t			4.7
Surplus, mln t			5.5

There is the same situation in Kazakhstan. Another 5.3 mln t capacity could be added to the existing 10.2 mln t capacity by 2015, with a maximum consumption of cement in Kazakhstan of 7.3 mln t, thus the surplus capacity could reach 8.2 mln t.

It can be expected that by 2015, imports of cement from the Customs Union countries, taking into account the capacity reductions, the growth of the domestic consumption consumption and imports to other countries, could increase from 1 mln t in 2012 to 4–5 mln t in 2015–2017, that is up to 7.7 % of the consumption of cement in 2012 in Russia. In addition, imports of Russian cement to Kazakhstan, which in 2012 amounted to 767 thous. t, will stop.

Table 3. Kazakh cement plant capacities increase
(Source: Heidelberg Cement in Kazakhstan)

Cement plants	Capacity, mln t	Maximum cement consumption in 2012 , mln t	Surplus, mln t
Existing	10.2	7.3	8.2
Developing by 2015	5.3		
Total	15.5		

Thus, we can say that the Russian market has turned into an integrated market of the Customs Union countries. The influence of the cement manufacturers from Belarus and Kazakhstan to the Russian cement market, and vice versa, will grow.

Import

In 2012 the cement market of the Russian Federation had a new trend — a sharp increase in the share of imported cement from foreign countries. So for 2012, 4.5 mln t of cement was imported to Russia, that means that the imports increased by almost 80 %. The main supplier-countries of cement to Russia was Turkey 1,874 t (doubled), Belarus 981 thous. t (2.5 times increase) and the Baltics 545 t (20 % growth). In 2013 the cement market of the Russian Federation remained at the same level and amounted to 5.1 mln t.

This situation has already been observed in 2007–2008, but then it was due to a sharp increase in cement consumption in Russia and an acute shortage of capacities to meet it, which led to an increase of the cement cost in the market, which reached at peak times $200.

Current situation is absolutely different. The country has enough capacities to meet the demands of building industry.

The main conditions for cement import growth are:

- The creation of Customs Union;
- Russia›s accession to the WTO;
- Additional cement supply on the world's market due to global crisis;
- Relatively high cement cost in Russia (Fig. 2).

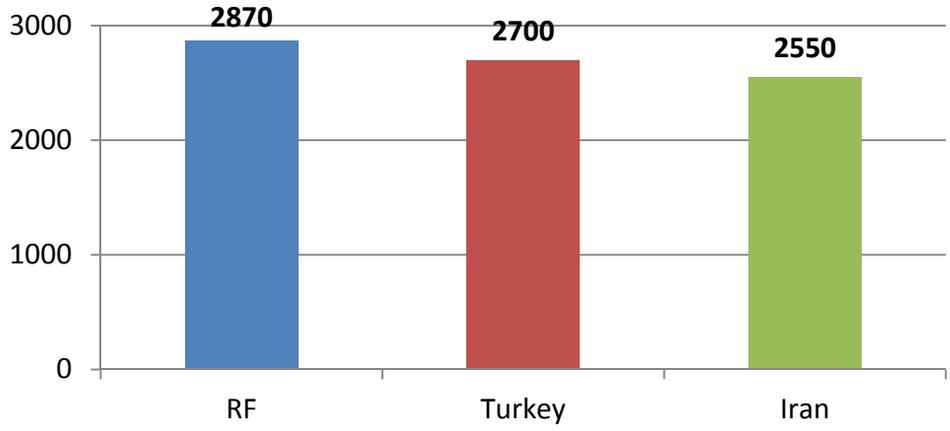


Fig. 3. Cost of cement (Russian market in 2012).

There are various reasons of the high cement production cost can be outlined:

- Cement companies that have modernized production are forced to repay the loans add high investment share to the cost of cement. During the repayment period, these enterprises will have a high degree of competitiveness in the domestic market and the international market;

- Cement companies utilizing the worn out production lines of wet method have high production cost for the high energy consumption; further their competitiveness will decline;

- A low level of using alternative fuels and raw materials, utilization of which allows to reduce the natural fuel costs;

- The lack of developed outsourcing system which allows to optimize the labor cost;
  Thus the Russian market became open. So any value fluctuations towards the increase will be accompanied by the additional offers of foreign cement. Due to the Russia's accession to WTO the ability to use the protecting measure is limited.

The problem with the cement import to Russia can exacerbate in medium- and long term perspective. It is connected with the surplus of cement on the Chinese market. Currently China produces 2.4 bln t of cement (Fig. 4), which is 1.8 t per capita.

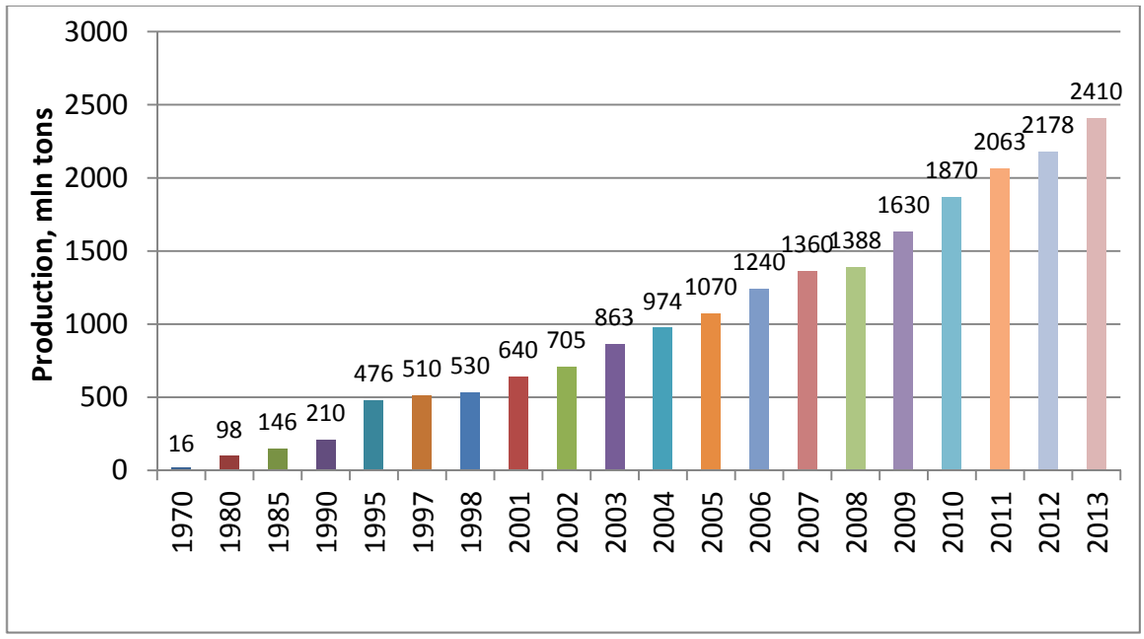


Fig. 4. Chinese cement production level [2]

The experience of the world leading countries shows that the cement consumption in China will decline steadily (Fig. 5).

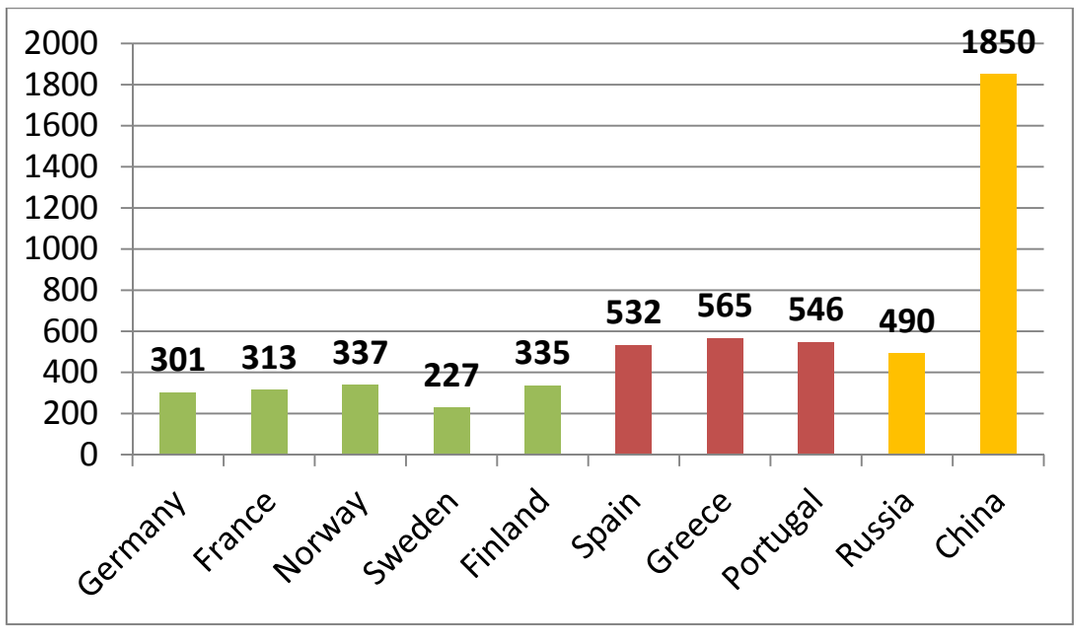


Fig. 5. Cement consumption per capita in EU in 2010; in Russia and China in 2013.
(Source: CemBUREAU)

In future China can become the world's biggest exporter. Taking into account relatively low cement cost in China, only $ 50 (Fig. 6), we can assume that it can lead to the serious changes on national markets, including the Russian market.

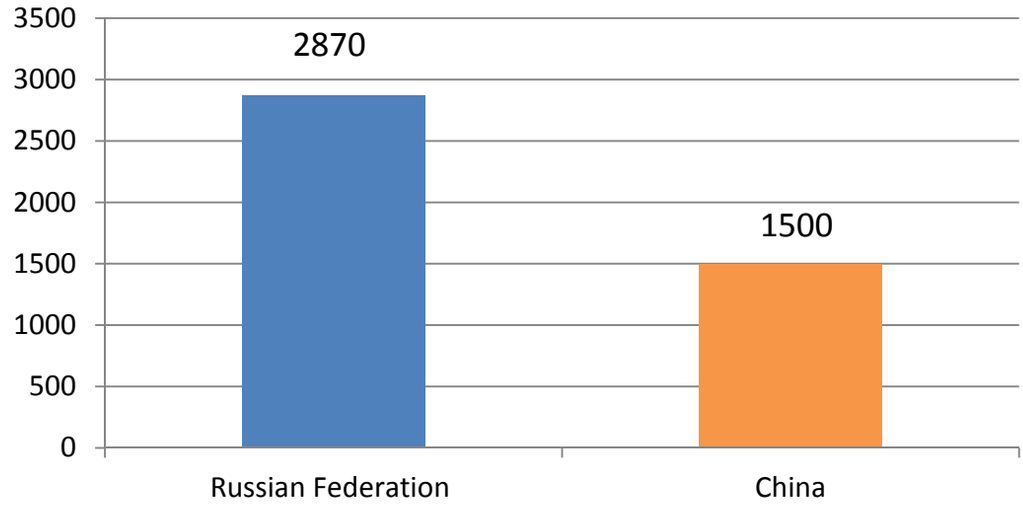


Fig. 6. Cement cost in Russia and in China

Forecast

The forecast for 2014 of cement production in Russia is likely to be negative — at best a small growth can take place 3–5%. Among the reasons of the negative forecast general decrease in economic indicators of Russian economy should be outlined above all.
In 2014 import of cement will remain at the same level due to a sharp fall of ruble.
The highest growth rate is forecast from Belarus and Iran. Those countries have a great demand in foreign currency that is the reason why they will increase the supply level by all means, including damping.
In the medium term, there will be a gradual increase in the production of cement in Russia on average of 10 % per year if the world economy remains stable.

Most analysts predict increase in the volume of cement production in Russia by 2025 to 100 mln t (Table 4), which will require to increase the production capacity by 30–40 mln t.

Table 4. Cement consumption by 2020–2025 forecast

Source	Consumption, mln t
The development strategy of construction materials industry of the Russian Federation up to 2020 (an innovative version)	97,7
International Analytical Review “ALITinform: Cement. Concrete. Dry Mixtures”	95,0
Higher Polytechnic School (France)	100

In the medium and long-term perspective there will be a gradual replacement of wet-method plants to dry ones, which will require the construction of additional capacities of approximately 30 mln t.

Conclusions:

Russian cement industry is actively developing: increasing production and consumption of cement; large-scale modernization of the production takes place; the producers have the necessary reserve capacity to meet the demands of the building industry.

Russian cement market in connection with the creation of the Customs Union and Russia's accession to the WTO has become open, which enhances the competitive environment in the market.
It is predicted that by 2020, Russia will build new production lines for the production of cement (dry method) in total volume of 30–40 mln t to meet the growing demand of building industry for cement. In the long-term prospect it is necessary to build additional capacity of approximately 30 mln t of lines to replace wet method with dry methods.

References:

1. Sui Tongbo. Industrial waste byproducts contributing to cement sustainability in China, ALITinform: Cement. Concrete. Dry mixtures, 2012. No. 6 (27). P. 6–15.

2. Trofimov, I. B. Structure of the cement market of the Republic of Belarus. Economic and mathematical methods for forecasting and annual planning for cement demand of the national construction complex, ALITinform: Cement. Concrete. Dry mixtures, 2012. No.2 (24). P. 12–21.

Reduction of investment costs is opportunity for economical civil design?

By: Martin Wuerth, Managing Director Wuerth Consulting Engineers

Global Cement Company leaders are talking about reduction of investment cost per tonne of new cement capacity and streamlining of the procurement process.

It looks like some of the global cement leaders have realized, that they pay too much for the civil part of a cement plant. What are the reasons for that and how can it be changed, this is an interesting and simple question but the answers are not so simple.

One of the main reasons for too high civil cost is that innovative & economic design will not be preferred. Simple and easy civil solutions are common in the cement industry and cost the owner additional 10 to 20 % of the required civil costs of a new plant.

If you want to reduce the investment costs you first must throw overboard the put safety on safety mentality of your engineers and peer reviewers. Stop people which hiding behind the standards & codes. You do not need engineers who know when the over next issue about the standard is issued. You need engineers & peer reviewers who understand how civil structures works in detail!
Of course every design has to be comprehended, but this does not mean it has to be comprehended from every inexperienced engineer! So we can only propose to choose your civil designer and peer reviewer very carefully.

Attached we describe two examples of economic design not accepted by the checking engineer who costs the owner more than 20 % of the required civil costs:

Example 1: Interaction of pile and flat foundation

A building should be founded on bad soil conditions. A good, thick layer of heavy compacted gravel is 5 m below the surface. This layer is covered by a soft layer of clay. The soil report gives E-Module for the gravel layer with 50 - 70 MN/m2 and 5 – 10 MN/m2 for the clay layer.

The interaction calculation of pile and flat foundation shows, that only 50 % of the building load has to be taken from the piles, the other part of the load is taken by the soft soil.

How is that possible?

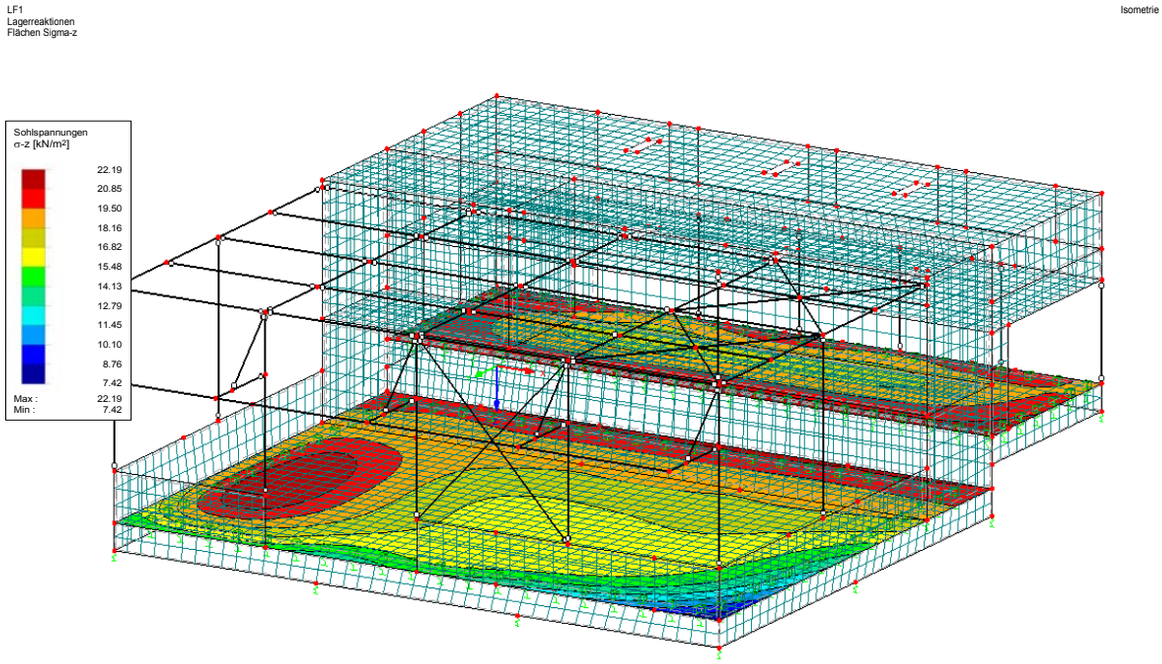
The foot print of the building is quite large. A large area multiplied with a very low soil pressure give still a force which had not be founded on piles. In our example we have a maximum soil pressure of 22 KN/m2 what brings in the end a 50 % reduction of the number of piles.

How can we be sure that we do not overload the piles?

Consider in the spring calculation for the piles the higher E-module from the soil report and for the slab consider the lower E-Module. So model the piles a bit harder and the soil below the slab a bit softer as it is in reality.

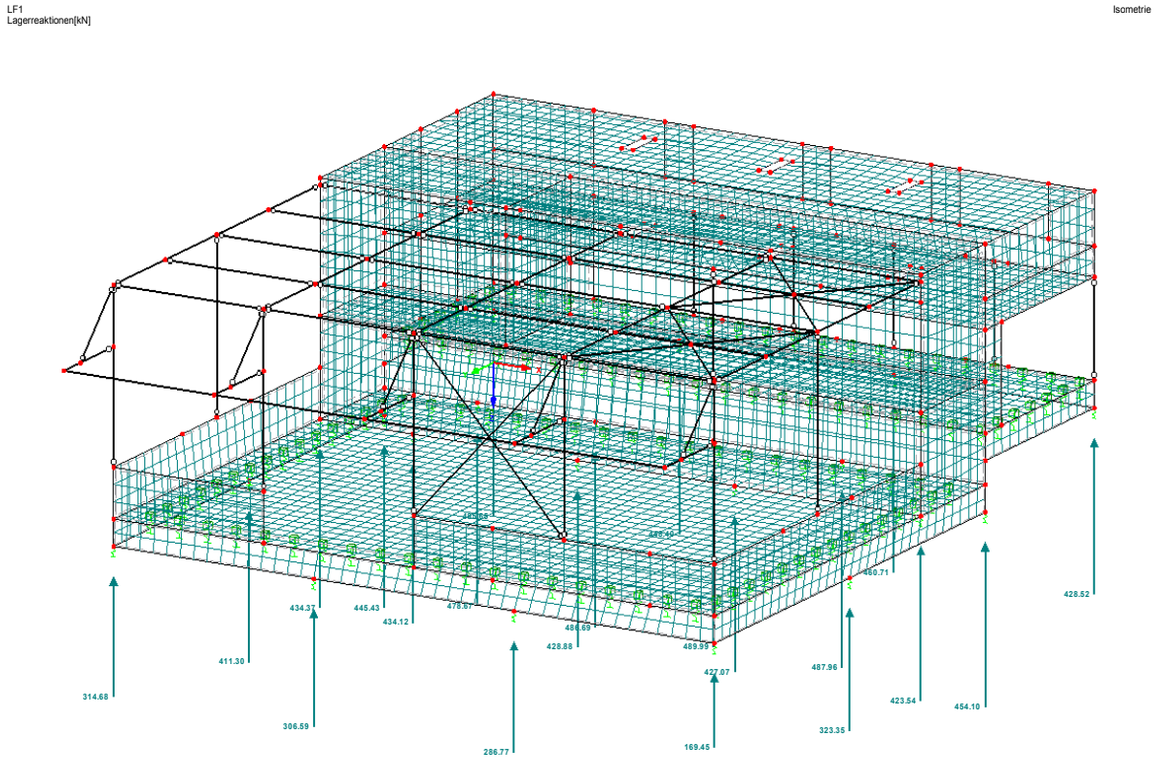
Why has checking engineer not accepted solution?

Pile must carry the whole building loads was the statement of the checking engineer. Settlement calculation is too difficult and too rough.
Physics: To carry a load, every pile must settle ($\sigma = E \times \varepsilon$) and this settlement generates also soil pressure under the floor slab. The discussion between the engineer and the peer reviewers must be focused on the relation between this mechanism and not if this mechanism can be considered. If he does not understand the relation between it he is not qualified for such a job and generate too high building costs for the investor.



Flächen Max Sigma-z: 22.19, Min Sigma-z: 7.42 [kN/m²]

Soil pressure under the floor slab



Pile forces

Example 2: Buckling resistance of bulk steel silos

One day, a turnkey contractor which had won a tender for supply and erection of a large coal silo made of steel contacted us and ask for support.
In his tender document was written, that the buckling resistance has to be designed according to an American standard for steel tanks filled up with liquids.

The contractor realized very soon, that it is not economic to design a bulk silo according a tank code for liquids. The savings of steel weight with a proper bulk silo design according EC standard was approximately 30 % of the steel weight.

Based on a simple test with cans, we tried to explain the consultant what the differences of liquids and bulk materials are regarding the buckling resistance of a steel shell. Because of the internal friction of the bulk material the internal pressure of a silo can be considered for the buckling resistance calculation (according EC 3: 19936-1-strength and stability of shell structures)

In this test we have three cans. One of them we do not open, the two other's we open and enjoy first the drinks. One of the empty can we filled up with sand and the other one we filled up with water.

1.) water can 2.) sand can 3.) closed can 1.) water can 2.) sand can 3.) closed can

After this preparation we put on each can a load of 100 kg. What happens?
The closed can under CO_2 gas pressure does not move a millimeter (right). The water filled can buckled on the whole wall height (left) and the sand can only buckled a little at the top end (middle).
Physics: internal friction of bulk material increases the buckling resistance of walls.

Why has consultant not accepted solution?
We still do not know exactly, why the consultant has not allowed using the right code for the right application he just argumented that the safety factor with a liquid design is larger than according a bulk design.
The owner was also very interested in this way, but the consultant didn't support this design.
One reason could be that the consultant did not want loose his face, because the tender documents were not made professional in this particular point.

2 x 20'000 m3 sugar silo designed according EC 3: 1993- 1- 6

Conclusion

Some of the global cement leaders are talking about reduction of investment costs for new cement plants; this is not utopic and can be achieved.

One of the main reasons for too high civil cost is that innovative & economic design have a hard time because simple and easy can be understand from more consultants than sophisticated solutions.

If you want to reduce the investment costs you first must throw overboard the put safety on safety mentality of your engineers and peer reviewers.

One key to the success is that the civil engineers and peer reviewers must be forced to economic solutions. Of course the designers gets paid lump sum and after they got the contract they are not interested anymore in the total costs for the investor, they are focused on their tasks & risks. Keep it simple and easy, that is the target of most designers.

Solution competition instead of fee competition between the engineering teams, this is one effective possibility to reach lower civil work costs for the clients.

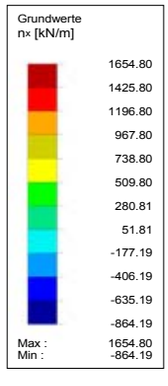
A second key to the success is not mixing engineer and peer reviewer teams. Let the designer choose the peer reviewer and the way around. Designer and checker have to speak the same language and the same kind of thinking otherwise the put safety on safety mentality cannot be repressed like in our described examples.
You need only one peer reviewer who can comprehend the design of your detail engineer. After that the quality check is full field and the safety is quarantined.

The collaboration between designer and peer reviewer is generally underestimated. Since neither has an interest to declare the other a smart design, it is important that both parties get the job done as a team.

To reduce civil costs, it is important to conserve resources as possible and meet their properties targeted manner. This often takes courage and assertiveness.

Positive example for economic design and good collaboration between designer and peer reviewer:

Elevated storage water tank for water treatment plant in Iraq supplied by a specialized company with smart product design and sophisticated erection method.



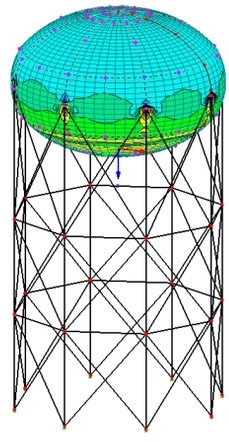


ABB improves functionality of EPCCs cement production lines in Saudi Arabia

Successful process control system upgrade to the latest operating features at Eastern Province Cement Company (EPCC) in Al Khursaniya, Saudi Arabia

ABB, the leading power and automation technology group, recently completed an extensive upgrade of the Extended Automation System 800xA to the latest standards at EPCCs three cement production lines in Saudi Arabia.

Outdated hardware and software could impact the plants reliability and availability. To avoid unexpected shutdowns and improve the functionality of the cement production lines, EPCC decided to modernize the process control system. The evolution with the latest operating features will help EPCC produce at the highest level of efficiency and quality to meet various international standards.

ABB has completed the final upgrade on site in a record time during the planned maintenance shutdown of the plant, said Mohammad Arif Khan, Electrical and Instrumentation Manager at EPCC. The excellent team work between EPCC and ABB engineers made it possible to meet this challenge.

The scope of supply included the evolution of Extended Automation System 800xA licences, state-of-the-art computer, laboratory and raw meal proportioning system hardware, as well as project management, engineering and site services including training.

The modernization follows a previous process control system upgrade of the production lines number one and two in 2003, as well as equipment deliveries for the extension of the plant with line number 3 in 2005.

ABBs process automation solutions will allow EPCC to achieve optimal operational conditions, said Albert Braun, ABBs Market Segment Manager for Cement. Our well established relationship with the customer combined with ABBs long-term experience with the cement production process were major factors for winning this order.

The contract was booked in June 2013. Commissioning was completed in December 2013.

EPCC cement plant located in Al Khursaniya, Saudi Arabia.

The Eastern Province Cement production facility is located in Al Khursaniya, in the Eastern part of Saudi Arabia about 165 kilometers north of Dammam where the company is headquartered. The plant started commercial production in 1985 with an annual production of 2.2 million tons of clinker and 860 thousand tons of cement. Today, annual capacity reaches 3.5 million tons of clinker and 3.7 million tons of cement.

ABB (www.abb.com) is a leader in power and automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs about 150,000 people.

For help with any technical terms in this release, please go to: **www.abb.com/glossary**

From the cement works to the user

PetroCem 2014: As a single-source provider, BEUMER Group presents innovative conveying, loading, filling, palletising and packaging technologies

The BEUMER Group supplies innovative solutions from a single source. The specialist›s program includes belt apron conveyors that, for example, guarantee fast and economic conveying of cement clinker. These conveyors are based on field-proven belts as used in our bucket elevators. Another major topic at the trade fair booth will be the high-capacity belt bucket elevators type HD, which transport coarse, highly abrasive bulk goods with grain sizes up to 120 millimetres.

In order to load bulk materials quickly and without dust, BEUMER offers bulk loading heads. These are designed according to the double-wall system: The material inlet and the dedusting unit are separated from each other. In order to balance out any minor positional deviations of the vehicle, the bulk loading head can be moved laterally during placement. Stationary bulk loading heads are often no longer sufficient for large loading capacities as, for example, in the cement industry. It should be possible to move the bulk loading head to each filler neck of the vehicle. For this purpose, BEUMER has developed mobile loaders that adapt to the length of the vehicles. If open vehicles are to be loaded without dust, various telescoping loading systems are available.

To be able to load bagged bulk materials onto trucks in a fully-automated, and above all economical process, BEUMER offers its customers the BEUMER autopac loading and palletising system. The machine simultaneously loads and palletises bagged goods directly on trucks without using pallets. Loading bags with this system is particularly efficient because significant manpower would otherwise be required. This is particularly true in emerging market nations, where the transshipment of bagged bulk goods is increasing and labour costs are climbing. For loading rail cars and vessels, BEUMER offers telescoping bag loading machines in mobile or swivelling designs.

The new, innovative BEUMER fillpac sees the system supplier continue to pursue its ambitious goal of offering its customers solutions that are sustainable in every respect. The system can be flexibly integrated with existing packaging lines and is equipped with a weighing unit admitted for calibration. The weighing electronics ensure that the BEUMER fillpac always achieves precise degrees of filling and special software supports permanent communication between the balance and the filling spout. Users can thus optimise their packaging lines because there is no longer any need to remove bags with an incorrect weight from the process.

To be able to stack the filled bags on pallets of different sizes in a flexible, precise, stable and even more efficient way, BEUMER has completely revised the BEUMER paletpac high capacity layer palletiser. The user now benefits from improved accessibility, shorter assembly period, higher flexibility and, as a result, from lower costs. Depending on the product requirements, the BEUMER paletpac can be equipped with the newly-developed twin-belt turning device allowing bags to be turned more conservatively and using less force. This removes the need for tooling times in case of product changes, so the maintenance costs are lower and the stacking pattern is even more precise. These are only a few of the benefits compared with legacy turning devices. The experts in Customer Support can easily retrofit this solution on existing palletisers. The geometric precision and the stability of the palletised stacks allow for easy storage and ensure reliable integration in downstream packaging systems.

On top of this, BEUMER has developed and designed from scratch a new machine from the BEUMER stretch hood model range. Our specialists analysed various components and optimised them in terms of function, arrangement and ergonomics. This includes an improved menu system on the machine control, an optimised, ergonomically designed workplace for the operator and material-friendly transporting of the film in the machine thanks to an innovative film transport system. At the same time, the intralogistics specialist guarantees higher system output and improved machine availability for the operator, who also benefits from the lower system height and the far smaller footprint.

The intralogistics specialist has equipped all BEUMER palletising and packaging systems with the BEUMER Group Human Machine Interface (HMI), a newly-developed operator panel with an optimised user interface and optimised navigation. This easily understandable and intuitive interaction concept helps to define efficient working sequences and because the operator can control the machine safely, independently of prior skills, training and capabilities, this also saves time and money.

The BEUMER Group is also presenting its Customer Support.
Customer Support ensures high availability for all of a user's systems. Our competent experts are deployed globally, taking care of proper maintenance and

repairs, delivering spare parts and conducting customer training.
5,663 characters (incl. spaces)

BEUMER Group is an international manufacturing leader in intralogistics in the fields of conveying, loading, palletising, packaging, sortation and distribution technology. Together with Crisplant a/s and Enexco Teknologies India Limited, the BEUMER Group employed some 3,700 people in 2013, taking orders with a value of some 770 million EUR. With its subsidiaries and sales agencies, BEUMER Group is present in many industries worldwide.

For further information visit www.beumergroup.com.

Captions:

Fig. 1: BEUMER has optimised the BEUMER fillpac R rotary filling machine, equipping it with additional features.

Fig. 2: The BEUMER paletpac forms exact, stable and thus space-saving bag stacks.

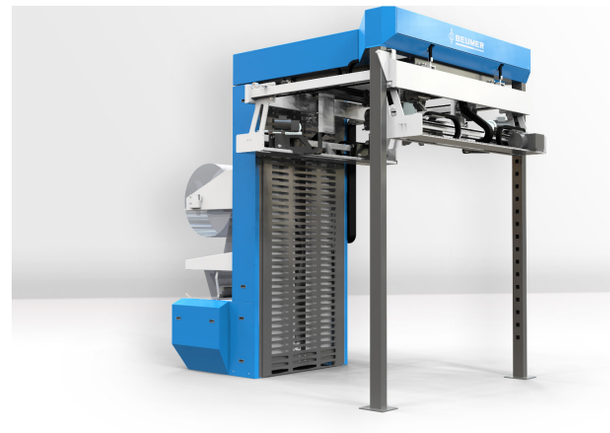


Fig. 3: At PetroCem, BEUMER is presenting a new machine from the BEUMER stretch hood model range.

Fig. 4: The BEUMER robotpac series palletises and depalletises a wide range of packages using specially developed gripping systems.

Photos: BEUMER Group GmbH & Co. KG

CONTINUA PLUS®

Cutting-edge technology for the manufacture of large tiles

The ceramic tile manufacturing process is, today, a highly evolved one, allowing for the production of high quality materials at outstanding levels of output efficiency.

The reliability of pressing and firing technologies has, moreover, allowed a constant, steady increase in tile size in order to obtain ever-better products of the highest added value. Floor tiles of the 60x60 and 80x80 cm size are now standard, as are slabs with dimensions of up to a 2 metres.

It is in this context that Sacmi has, over the last few years, introduced highly innovative Continua technology, which executes on-conveyor powder pre-compaction prior to final pressing in order to ensure the easy shaping of large, complex products without penalising productivity.

Now, to achieve even larger sizes and greater productivity, Sacmi has taken things to the next level by developing CONTINUA PLUS®, a technology that, compared to traditional pressing, is nothing less than revolutionary.

The core of this new line consists of a "super-compactor" able to press ceramic powders at a pressure of 450 kg/cm^2.

The line loads the powders onto a metallic conveyor belt via a set of batching/mixing devices, which include dry digital decoration systems, subsequently forming a slab with a maximum width of 1800 mm (1600 mm post-firing) and unlimited length.

CONTINUA PLUS® undoubtedly represents an extraordinary technological leap forwards with respect to traditional pressing techniques: the ability to feed a bed of spray-dried powder continuously, "instantaneously" transforming it into a ceramic material ready for firing.

This technology offers multiple advantages in terms of simplicity, attainable product flexibility and also as regards the considerably lower installation and production costs.

For example, a CONTINUA PLUS® line does not require any foundation work as it is simply set down on the factory floor.

With regard to energy savings CONTINUA PLUS® has less than 50 kW of installed power, that is, a specific consumption of just 0.06 kWh/m^2, lower than that of any other pressing technology on the market.

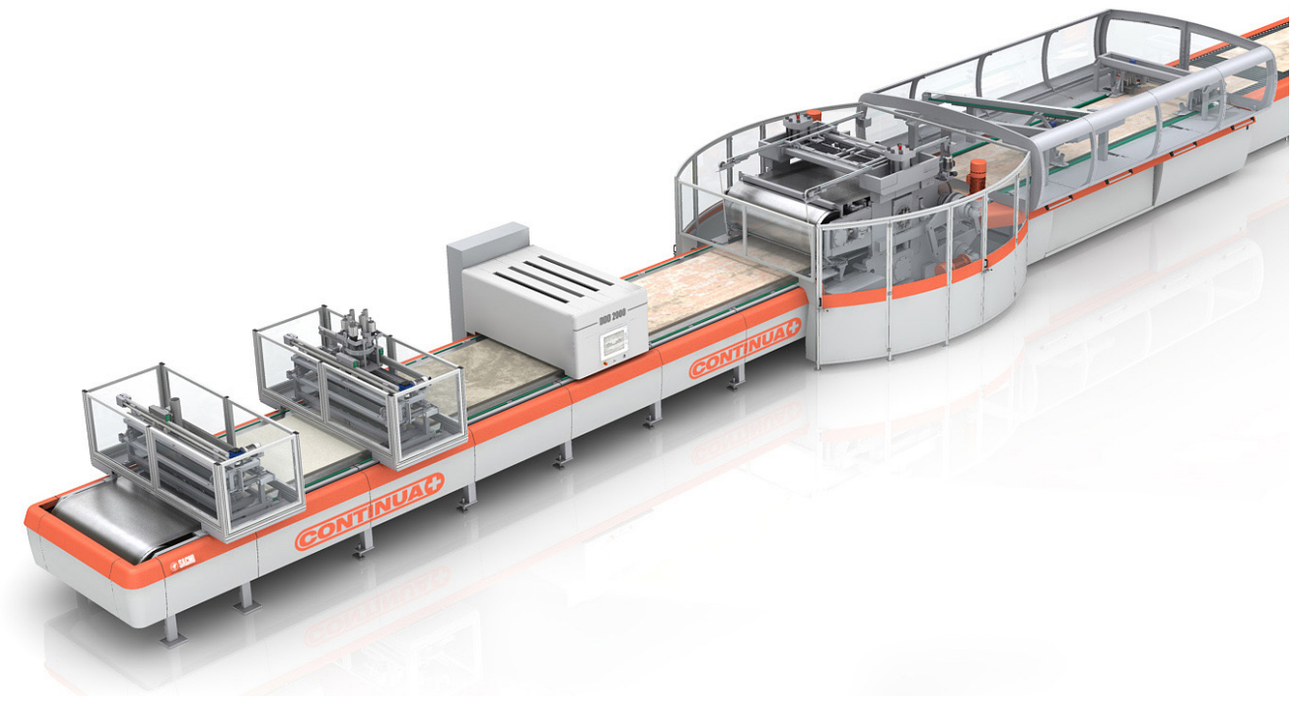
Absolute size flexibility is ensured by:

- a width (fired size) range of 1000 - 1600 mm, adjustable as desired with fast changeovers (20 minutes)
- length, adjustable as desired, with instantaneous changeover of the set cutting size (typical sizes: 1200, 2400, 3000, 3200 and 3600 mm)
- thickness is adjustable between 3 and 20 mm, with fast changeovers (30 minutes)
- further possibilities for the unfired cutting of sub-multiples up to a minimum size of 400 mm.

It should be pointed out that unfired slab lateral trim waste, which can easily be fed back into the grinding cycle, constitutes less than 3% of processed material thanks to rigid side containment and the resulting good compaction homogeneity.

Compaction of powders loaded onto the conveyor also offers considerable scope for the creation of products with outstanding aesthetics by way of numerous applicative combinations: loading of a base and/or economical powder, loading of a quality layer of coloured powders and/or spray-dried glazes, loading of a mix of powders, the creation of full-body products with through-veining, digital decoration with various (spray-dried, glaze, grain, flake and micronized) powder types, utilisation of conveyors with relief patterns and the blending of dry-type effects with digital ink-jet decoration before or after drying.

Lastly, the most important feature of CONTINUA PLUS® is, perhaps, its outstanding output rate: by using the maximum loading width of 1600 mm, a single line can produce up to 14,000 m^2/day!



For more information, please visit www.sacmi.com

Unconventional Resources Drive Growth of Well Stimulation Materials

World demand for well stimulation materials is projected to increase more than 12 percent per year to over 65 million metric tons in 2017, valued at $23 billion. Hydraulic fracturing and acidizing have both been used for decades to boost production, especially in aging or damaged oil and gas wells. In recent years the combination of multistage hydraulic fracturing with horizontal drilling technologies has enabled the development of resources previously considered technically or economically unfeasible. As Freedonia analyst Mike Richardson notes, "Development of these unconventional resources has been a driving force behind stellar growth in well stimulation materials demand over the past decade, mainly in the large North American market." These and other trends are presented in World Well Stimulation Materials, a new study from The Freedonia Group, Inc., a Cleveland-based industry market research firm.

Although oil and/or natural gas are produced in most countries, four countries -- the United States, Canada, China, and Russia -- account for a large majority of well stimulation materials demand. These countries not only drill the most wells (combining to account for more than 85 percent in 2012), but also have large, older oilfields in which stimulation technologies have been proven to increase output. Outside the four major markets, acidizing is often the preferred stimulation technique, particularly in carbonate formations.

Proppants will continue to account for the largest share of demand in volume terms, more than 80 percent in 2017. Uncoated sand accounts for the great majority of proppants used in the US and Canada. In these countries, ceramic proppants -- which generally offer stronger performance at higher cost -- are used mainly in wells with higher closure pressures and other challenging environments. In contrast, ceramic proppants are the leading proppant type in the Chinese and Russian markets. In these countries, well depths and pressure often favor the use of ceramic proppants. Moreover, these countries do not have sufficient supplies of sand with the necessary performance properties to be used in hydraulic fracturing. Trends in chemical consumption will be influenced by fluid formulation trends.

WORLD WELL STIMULATION MATERIALS DEMAND
(thousand metric tons)

				% Annual Growth	
Item	2007	2012	2017	2007- 2012	2012 - 2017
Well Stimulation Materials Demand	10840	36783	65220	27.7	12.1
United States	7582	28630	48240	30.4	11.0
Canada	1669	4162	8930	20.1	16.5
China	316	1373	2585	34.2	13.5
Russia	560	1074	2155	13.9	14.9
Other	713	1544	3310	16.7	16.5

World Well Stimulation Materials (published 12368 ,2013/ pages) is available for $6300 from The Freedonia Group, Inc. For further details or to arrange an interview with the analyst, please contact Corinne Gangloff by phone **440.684.9600** or **e-mail pr@freedoniagroup.com.** Information may also be obtained through **www.freedoniagroup.com.**

Global Sales of Mining Machinery to Reach $135 Billion

Global demand for mining machinery is forecast to expand 8.6 percent per year through 2017 to $135 billion despite some sales weakness in the short term. Freedonia Group analyst Matt Raskind states, "Gains will be spurred by voracious demand for mined materials in China, India, and other developing nations as industrial output increases." Rapid gains in mining equipment demand will occur in large developing markets such as Brazil, China, and India, with China being the largest purchaser. These and other trends are presented in World Mining Equipment, a new study from The Freedonia Group, Inc., a Cleveland-based industry market research firm.

While metals account for a smaller share of mine output than minerals and coal in volume terms, machinery used in metals mining represents the largest segment of the global market. This is due to the large amount of ore that typically must be removed per metric ton of primary metal product output. Demand for metals mining equipment will also rise at the most rapid pace through 2017, stimulated by steel and aluminum production. An expansion in construction spending and agricultural output as the global population continues to increase will boost consumption of construction aggregates and fertilizer minerals such as phosphate rock, as well as sales of related equipment.

Mr. Raskind forecasts, "The greatest sales growth through 2017 will occur in the large Asia/Pacific region, fueled by substantial investments in new mine production capacity in several nations." Strong gains will also be recorded in South America, as mining companies look to develop the region's sizable deposits of bauxite, copper, and iron ore. The dissipation of copper oversupply issues that existed in 2012 and 2013 will allow prices to recover and boost associated mining equipment demand in areas rich in copper, such as Chile and Peru. The Africa/Mideast region will post the next fastest advances, followed by Eastern and Western Europe, and North America. In developed areas, a recovery in construction spending and manufacturing output will boost demand for nearly all types of mined materials, although an increased emphasis on environmentally friendly sources of electricity will dampen thermal coal output.

WORLD MINING EQUIPMENT DEMAND
(million dollars)

				% Annual Growth	
Item	2007	2012	2017	2007 - 2012	2012 - 2017
Mining Equipment Demand	48050	89500	135000	13.2	8.6
North America	9830	13700	16950	6.9	4.3
Western Europe	6555	5575	7300	-3.2	5.5
Asia/Pacific	20000	54750	88600	22.3	10.1
Central & South America	3960	6645	10150	10.9	8.8
Eastern Europe	4000	4200	5480	1.0	5.5
Africa/Mideast	3705	4630	6520	4.6	7.1

World Mining Equipment (published 01/ 2014, 524 pages) is available for $6300 from The Freedonia Group, Inc. For further details or to arrange an interview with the analyst, please contact Corinne Gangloff by phone **440.684.9600** or **e-mail pr@freedoniagroup.com**. Information may also be obtained through **www.freedoniagroup.com.**

STANDARD INDUSTRIE International, a multi-national company with its headquarters in France has been specialising for 35 years in bulk handling.Air cannons, industrial vacuum machinery, systems for the optimisation of transport conveyors, and service operations: STANDARD INDUSTRIE International's objective is to provide tailor-made and personalised solutions for its customers.

EPCC (Eastern Province Cement Company), a large cement company, is the first customer in the Kingdom of Saudi Arabia to opt for the AIRCHOC® Wireless.

After several visits and technical studies carried out on site, by Rida AHIB (Middle East Sales Manager) and Jérémy DEFREYNE (AIRCHOC® Product Manager), air cannons with a capacity of 100 litres were fixed upon as the ideal solution to put an end to the frequent kiln stoppages, caused by excessive build-ups.
While the competition only offered a nominal exit diameter (DN) of 100mm, STANDARD INDUSTRIE International, designers of the widest range of air cannons on the market, offered a DN of 150mm. The objective: Increase the impact force and guarantee maximum performance, for identical air consumption.

Having proved itself for more than 4 years usage on the 5 continents, the Wireless version of the AIRCHOC® was also a determining factor in the decision taken by EPCC.In reality, it guarantees reductions in costs linked to the elimination of cables and cable supports, and also in terms of labour costs (setting-up, installation).Equally, reliability can be seen to have improved: in effect, risks of malfunctioning linked to cable damage (being burned, or cut, becoming disconnected….) are eliminated. Finally, maintenance is optimised, thanks to the centralisation of the bank of solenoid valves and to the identification of any faults in real time.

With spare parts guaranteed for 2 years and the presence of a local partner (Silicon Trading Company) to ensure follow-up for the customers in the Kingdom of Saudi Arabia, it is more than a solution to a problem that has been offered to EPCC, it is a full service!

Thus, in the next few months, 150 AIRCHOC® Wireless 100 L DN 150 will be installed on two production lines, from the cooler right through to the cyclones. Depending on the configuration of the installation, and the requirements of the cement company, one or two control boxes each driving 128 to 256 Wireless AIRCHOC®'s will be installed. This solution guarantees for EPCC the maintenance of their production capacity, absolutely essential when supplying the cement market. At the same time this will ensure improved profitability, thanks to the reduction in the number of kiln stoppages.

Delivered and installed at the biggest cement plants, but also in close to 60 other sectors of activity, the AIRCHOC® technology has proved its value. It has enabled STANDARD INDUSTRIE International to become leader in the Saudi market with the largest number of production lines equipped with AIRCHOC®.

DIARY DATES

CEMENT

INTERCEM Asia
Date : 22 - 24 September 2014
Venue: Sofitel Philippine Plaza Manila, The Philippines
For more information please visit:
www.intercem.com

LOESCHE Symposium 2014
Date : 25 - 26 September 2014
Venue: Hyatt Regency Hotel Düsseldorf, Germany
For more information please contact:
LOESCHE GmbH
Hansaallee 243,
40549 Düsseldorf, Germany
Tel.: +49 211 53 53 775
Fax: +49 211 53 535775
Email: Symposium2014@loesche.de

14th Global Gypsum Conference
Global wallboard and plaster production and trends
Date : 29 - 30 September 2014
Venue: Berlin, Germany
For more information please visit: **www.GlobalGypsum.com**

10th «CCC» Central European Congress on Concrete Engineering "CONCRETE OFFERS FOR THE PERIOD OF ECONOMIC RECOVERY"
Date : 01 - 02 October 2014
Venue: Liberec, Czech Republic
For more information please contact:
Congress secretariat:
10th CCC Congress LIBEREC 2014
Czech Concrete Society
Tel.: +420 222 316 173, +420 222 316 195
Fax: +420 222 311 261
Email: ccc2014@cbsbeton.eu
http:// www.cbsbeton.eu/ccc2014

16th Asia CemenTrade Summit
Date : 13 - 14 October 2014
Venue: Jakarta, Indonesia
For more information please contact:
Ms. Grace at grace@cmtsp.com.sg
Tel.: +65 6346 9147
http://www.cmtevents.com/register.

Global Insulation Conference and Exhibition
Global insulation production and trends
Date : 30 - 31 October 2014
Venue: Copenhagen, Denmark
For more information please visit:
www.Globalinsulation.com

BusinessCem Almaty 2014
Date : 20 - 22 October 2014
Venue: Almaty, Kazakhstan
For more information please contact:
Ms. Irina Valyukova, Deputy Director
BusinessCem
Tel.: +7 499 977 4495
Fax: +7 499 977 4968
Email: irina@businesscem.msk.ru
http://businesscem.ru

3rd Global Landfill Mining Conference & Exhibition
Global landfill mining for profit
Date : 17 - 18 November 2014
Venue: London, UK
For more information please visit:
www.landfill-mining-co.uk

"Cement. Concrete. Dry Mixtures 2014" Conference and Exhibition
Date : 02 - 04 December 2014
Venue: Expocentre, Moscow, Russia
For more information please contact:
Organizer: LLC «AlitInform»
Phone/Fax: +7 (812) 380- 65- 72, (495) 580- 54- 36
E-mail: mail@con-tech.ru
10th Global Slag Conference & Exhibition
Global slag production, applications and trends

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DIARY DATES

Date : 08 - 09 December 2014
Venue: Aachen, Germany
For more information please visit:
www.GlobalSlag.com

2nd Global Well Cem Conference & Exhibition
Global oil well cement production and well cementing
Date : 22 - 23 January 2015
Venue: Houston, Texas, USA
For more information please visit:
www.Well-Cem.com

9th Global CemFuels Conference & Exhibition
Fuels for cement and lime
Date : 16 – 17 February 2015
Venue: Dubai, UAE
For more information please visit:
www.CemFuels.com

2nd International Conference on Enhanced Usage of Alternate Fuels in Cement Plants
Date : 1920- February 2015
Venue: New Delhi, India
For more information please contact:
Cement Manufacturers› Association
CMA Tower, A-2E, Sector 24,
Noida 201301 (U.P.)
Tel: 0120- 2411955, 2411957,2411958
Fax: 0120- 2411956
Email: cmand@cmaindia.org

3rd Global Cement India Conference & Exhibition
Cement production technology and market trends in India
Date : 17 - 18 March 2015
Venue: Mumbai, India
For more information please visit:
www.Cement-India.com

Concrete 2015
Date : 30 August - 02 September 2015
Venue: Pullman Albert Park, Melbourne, Australia
For more information please visit:
www.concrete2015.com.au

13th TÇMB International Technical Seminar& Exhibition
Main theme: “Sustainable Environment & Energy”
Date : 07 - 10 October 2015
Venue: Titanic Deluxe Belek Hotel, Antalya, Turkey
For more information please click:
http://www.tcma.org.tr/ENG/index.php

CERAMIC

Tecnargilla
Date: 22 - 26 September 2014
Venue: Rimini, Italy
For more information please visit:
http://www.tecnargilla.it

MS&T14 – Materials Science & Technology Conference and Exhibition, combined with ACerS 116th Annual Meeting
Date: 12 - 16 October 2014
Venue: Pittsburgh, USA
For more information please visit:
http://ceramics.org/meetings/acers-meetings

GLASSTEC
Date: 21 - 24 October 2014
Venue: Dusseldorf, Germany
For more information please visit:
http://www.glasstec.de/

CERAMITEC 2015
Date: 20 - 23 October 2015
Venue: Munich, Germany
For more information please visit:
http://www.ceramitec.de

Nineteenth Arab International Cement Conference & Exhibition (AICCE19)

Le Centre International de Conférences de la Palmeraie,
Marrakech - Morocco

11 - 13th November 2014

For more information, please visit our website :
www.aucbm.org or contact us at
email: aicce19@gmail.com

AICCE19

GENERAL

3rd Process Engineering Expo and Conference – 2014
Date : 04 - 06 September 2014
Venue: HITEX Exhibition Center, Hyderabad, A P., India
For more information please visit:
http://www.processengineeringexpo.co.in

Minerals Metals Metallurgy & Materials
10th International Exhibition and Conference
Date : 04 - 07 September 2014
Venue: Pragati Maiden, New Delhi, India
For more information please contact:
International Trade and Exhibitions India Pvt. Ltd.
110611 ,1107-th Floor, Kailash Building,
Kasturba Gandhi Marg New Delhi - 110001 India
Tel.: +91- 11- 40828282
Fax: +91- 11- 40828283
Web: www.itei.in / www.ite-exhibitions.com

Fourth Central and South European Drymix Mortar Conference
Date : 11 September 2014
Venue: Istanbul, Turkey
For more information please visit: http:
//www.drymix.info/

IV International Conference Mediterranean Coal Markets 2014 (MED Coal Markets 2014)
Date : 15 - 16 September 2014
Venue: Ceylan Intercontinental Hotel, Istanbul, Turkey
For more information please contact:
Mr Tim Ransky, Project Manager
Business-Forum Ltd
Tel.: +380- 562- 313- 919
Email: T.Ranskiy@b-forum.ru
Website: www.b-forum.com

10th «CCC» Central European Congress on Concrete Engineering
Date : 01 - 02 October 2014
Venue: Liberec, Czech Republic
For more information please visit:
www.cbsbeton.eu.

German Conference on the Chemistry of Construction Materials
Date : 06 - 08 October 2014
Venue: Kassel, Germany
For more information please visit:
www.gdch.de

III Moscow International Forum for Innovative Development
"Open Innovations"
Date : 14 - 16 October 2014
Venue: Moscow, Russia
For more information please contact:
Julia Yudakova, International participants' coordinator
Tel.: +7(495) 6600668 ext. 4096
Fax: +7(495)6648399
Email: j.yudakova@forinnovations.org
www.forinnovations.org

Cairo Build
Date : 15 - 18 October 2014
Venue: Cairo, Egypt
For more information please contact:
To Exhibit:
E-mail: constructionshows@pyramidsfair.com
Tel: +90 216 575 28 28 ext. 228, 232
To Visit:
mahboobeh.ghaedi@pyramidsfair.comE-mail:
Tel: +90 216 575 28 28 ext. 113
www.cairobuildexpo.com

5th International Basrah Building and Construction
Date : 21 - 24 October 2014
Venue: Basrah, Iraq
For more information please contact:
Mr. Behnam Ghasemi, International sales Dep.
Tel.: +90 216 575 2828 Ext: 228
Fax: +90 216 575 1101
E-mail: behnam.ghasemi@pyramidsfair.com
Istanbul - Turkey
www.basrahbuilding.com

11th SteelFab 2015
The Middle East Tradeshow for the metal working, metal manufacturing and steel fabrication industry
Date : 26 - 29 January 2015
Venue: Expo Centre Sharjah, UAE
For more information please visit:
E-mail: info@expo-centre.ae
http://www.steelfabme.com/

MSE 2016 – Materials Science and Engineering
Date : 27 - 29 September 2016
Venue: Darmstadt, Germany
For more information please visit:
www.mse-congress.de

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