



CEMENT & BUILDING MATERIALS REVIEW

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- *The Magazine editorial staff welcome the contribution of experts to enrich the contents of the magazine .*
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Contents

CONTENTS

Foreword
Arab News
International News
New Products and Media

Articles:

- **WIKOV: A Gearbox Solution Supplier**
By: Lukas Steiner, Wikov Industry, Czech Republic
- **Are Powder Storage Silos Disasters Waiting to Happen?**
By: HYCONTROL LTD, United Kingdom
- **A 'Sound Solution' to the Problems of Particulate Build up and Material Flow Problems within the Cement Industry**
By: PRIMASONICS International Ltd./ United Kingdom
- **Fresh technology adds new life to aging plants**
By: Robert Krist, FLSmidthPfister GmbH / Germany
- **A New Type of Magnesia Based Castable for the Cement Industry**
By: V. Wagner and P. Malkmus, CALDERYS, Neuwied / Germany
- **Vertical Mills**
By: Iraqi Cement State Company / Iraq (in Arabic)

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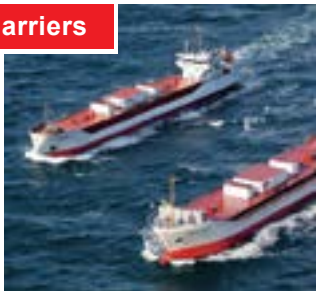
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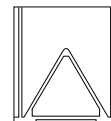
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ARAB CEMENT NEWS

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SAUDI ARABIA

Cement Market in Saudi Arabia 2015 Review, Research, Industry Analysis, Trends and Forecast 2019

Cement Market in Saudi Arabia 2015 to grow at a CAGR of 5.14% by 2019

For a rapidly growing country like Saudi Arabia, huge investments in infrastructure by the government is boosting the demand for cement. Cement Market in Saudi Arabia to grow at a CAGR of 5.14% over the period 2014-2019.

Saudi Arabia, the largest economy in the Middle East, is focusing on diversifying the economy to non-oil sectors.

Therefore, the government is emphasizing on investment in various construction projects, mainly power and transportation.

The government's aggressive plans to construct "Economic Cities" in the country is expected to give a further boost to the Cement market in Saudi Arabia, which is currently on a growth path.

Source: www.digitaljournal.com

UAE

Cement Market in the UAE 2015 - 2019

Post the economic downturn of 2008 - 2009 and property bubble burst in 2008, the cement market in the UAE is showing a positive rebound.

The UAE is the second largest economy in the GCC and is one of the leading cement producers in the region.

As of 2014, the country had a total cement production capacity of 40.7 million tons. The country is currently producing double of its cement demand. Over 50% of the cement produced in the UAE is exported to the neighboring countries such as Oman, Egypt, and other African countries.

However, Technavio believes that in the coming years the cement export share will decline to meet the growing demand in the country.

The growth of the cement market in the UAE is being primarily led by the surge in construction investment because of the revival of economy indicated by macroeconomic factors such as increased consumer confidence and growing employment rate.

The government will invest \$700 billion over the next 15 years toward the infrastructure development in the country.

Ahead of Dubai EXPO 2020 and UAE National Vision 2021, major investment will be directed toward transport and power infrastructure. Some of the major upcoming construction projects in the country are Hassyan coal-fired power plant and expansion of Doha metro line.

Technavio's analysts forecast the cement market in the UAE to grow at a CAGR of 7.56% over the period 2014 - 2019.

Source: <http://www.prnewswire.com>

ENVIRONMENT

EGYPT

Ministry to assess environmental impact of coal use in cement companies

Environment Minister of Egypt has agreed to assess the environmental impact of 7 out of 19 cement companies that have conducted studies to use coal as an alternative source of energy.

The minister said that the approved studies included ways of reducing greenhouse gases, as the ministry requested.

HE also stated that the ministry is also working on the climate change issue, which will be discussed at the Paris summit later this year, as well as the annual slash and burn method used in the rice industry.

Source: <http://www.egyptindependent.com>

Keeping belt conveyors perfectly clean

Flexco precleaners and secondary cleaners for conveyor systems provide superior performance and require little maintenance.

Operators of conveyor systems in coal mines, underground mines, steel mills and wood-processing mills need to keep their belts as clean as possible. That's because carryback can be a significant cost factor. The best results are usually achieved with a combination of precleaners and secondary cleaners. Flexco Europe GmbH offers easy-to-mount, low-maintenance cleaners for standard and heavy-duty applications. Users can put together their own systems to meet their individual needs.

The materials, such as salt, hard rock, iron ore, cement or sand, that are transported by conveyor belts from the excavation point to a plant or port facility can be very diverse, and their properties can differ as well. They can be moist, sticky, dry, acidic or abrasive. Environmental temperatures, which can be extreme underground, are another problem. In all these conditions, belt conveyors must be cleaned in an efficient manner. This task is handled by precleaners, which are mounted on the pulley and by secondary cleaners, which are usually located just past where the belt leaves the head pulley.

Flexco's precleaners have blades made of polyurethane which glide smoothly over mechanical splices without damaging the belt. The spring tensioning system allows the blades to avoid obstructions. Operators can perform all maintenance work without difficulty. Blade retensioning and replacement are easy to carry out. On request, Flexco can also provide blades with high resistance to heat and chemicals. Blades are available for all standard belt widths. Flexco offers precleaners to meet the requirements of various applications, including low heights and temperatures up to 163°C. For mining they are available in standard-duty, medium-duty and heavy-duty versions. The MMP heavy-duty precleaner, for example, is made of stainless steel and comes with dual tensioners. All PU blades have a faceted profile design that renews the blade edge as it wears, ensuring constant cleaning performance over the blade's entire lifetime.

The HV precleaner is designed for the high temperatures encountered in underground mining. Its carbide tips

deliver superior cleaning performance with vulcanized belts. Precleaners can be used at belt speeds of 2.5 to 7 m/sec.

Secondary cleaners increase the cleaning efficiency to more than 90 percent by removing fine material as well. They are equipped with wear-resistant carbide blades and are available for all standard belt widths. The blades have C-tips for mechanical fastener applications or V-tips for vulcanized belts. Patented cushions maintain optimal belt contact. Designs are available for low installation heights, standard-duty to heavy-duty applications, and special cases such as cupped belts and belts with worn centres.

The poles are designed to resist the powerful twisting forces caused by continuous belt motion. Together with Flexco, operators of conveyor systems can analyse their needs and select the solution that is best for them.



Belt cleaners keep material from sticking to the belt after it leaves the transfer point.

Picture credits: Flexco Europe GmbH

About the Company

Flexible Steel Lacing Company (FLEXCO), headquartered in Downers Grove, Illinois in the USA, is the leading international specialist for mechanical conveyor belt fastener systems, belt cleaners, belt positioners, impact beds and pulley lagging for light- and heavy-duty applications. With the company's innovative solutions, endusers can substantially reduce downtime and increase productivity. FLEXCO Europe GmbH is the German subsidiary of FLEXCO, and is headquartered in Rosenfeld, where the company currently has 60 employees. For more information, see: www.flexco.com.

Gebr. Pfeiffer wins another order for vertical roller mill for Iraqi market

The Chinese General Contractor Sinoma (Suzhou) Construction Co. Ltd., Kunshan, places an order with Gebr. Pfeiffer SE for the supply of an MPS 5000 B which will be installed at Saman cement works. The mill featuring an installed drive power of 4000 kW will be grinding ≥ 500 t/h of cement raw material to a product fineness of $\leq 10\%$ residue on 80 μm .

With this order, Gebr. Pfeiffer SE will supply the 6th mill of this type to Iraq via the Chinese General Contractor. This reflects the high level of customer satisfaction and the confidence placed in the Pfeiffer grinding technology.

The mill is slated for delivery in 2016.

Italian ceramic industry reports record tile exports in 2014

In the year to 31 December 2014 there were 223 manufacturers of ceramic tiles, sanitaryware, tableware and refractory materials operating in Italy with 25,598 employees and a total turnover of 5.687 billion euros, 75% of which was generated by exports.

The tile sector continued to account for the majority of turnover at 4.91 billion euros, while the other three segments generated a combined turnover of 773 million euros.

In 2014 the Italian tile industry consisted of 150 companies (6 fewer than in 2013) with 19,430 employees (1,107 fewer than in 2013) and a total output of 381.7 million sq.m (5% up on 2013).

Like the previous year, the sector's sales exceeded production, allowing it to take a further step towards the gradual rebalancing of warehouse stock. Total sales amounted to 394.6 million sq.m (+1.3%). While the domestic market experienced a further downturn to 80.8 million sq.m (6.6% down on 2013), the export markets continued to recover reaching 313.7 million sq.m (+3.6%).

Growth in value terms was even higher. As Chairman Vittorio Borelli pointed out, this was due to the

industry's ability to further raise its average selling price, which now stands at 12.45 €/sq.m (2.6% up on 2013). Export turnover rose by 6.2% to 4.11 billion euros, with an average price of 13.1 €/sq.m (2.5% up on 2013). This result more than compensated for the further fall in turnover in the domestic market (804 million euros, -6.1%), allowing the sector to close the year with a total turnover of 4.91 billion euros (+4%).

The sector's export share reached a record figure of 83.6% in value and 79.5% in volume.

The increase in average selling price is a direct result of companies' efforts in the field of product innovation, which enables them to offer products with ever greater added value (today this means primarily large and very large sizes). It is no coincidence that 2014 set another record in terms of technological investments, which at 286.2 million euros absorbed almost 6% of the sector's total turnover. This was a 27% increase on 2013 and the highest value since 2008. The trend is continuing this year with investments estimated at 250 million euros.

Source: CeramicWorldWeb Newsletter
www.ceramicworldweb.it

THE NEW COPE DRIVE IS ON THE MARKET

The increasing performance requirements of cement producers led to rethink the further developments in drive technology for vertical roller mills. Particularly for larger mill outputs, LOESCHE favours a drive system with multiple motors and gearboxes with milling force decoupling.

In order to meet these demands, LOESCHE will use for future projects with high and medium grinding capacity the COPE gearbox developed in cooperation with Renk, which offers a redundancy of up to 8 motors at the motor end. Only 4 models of the COPE gearbox, equipped with 6 to 8 motors, allow for a classification in a range of capacities from 3 up to 14 MW and thus an application within up to 17 different mill types.

For a constant output speed the COPE drive does not require any variable speed drive for the maintenance-free drive motors and moreover can be operated with a reduced number of motors. This new type of drive concept allows for an operation with for example 7, 6 or simply 4 of the 8 existing motors. Even in operation with only 7 motors, 100% mill output can be attained by activating the design reserves installed. The compact design of COPE gearbox is also of advantage as it does not require any additional modification of the mill foundation.

As this drive train can be put into operation with the common gearbox dimensions, this system can as well be considered for any retrofit at existing Loesche Mills.

For more info contact us:
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Hansaallee 243
D-40549 Düsseldorf
Email: marketing@loesche.de

LOESCHE 



With Sasil and Sacmi Team waste is turned into raw materials

Excellent results achieved in the recycling of glass industry waste

A successful experiment conducted by Sasil SpA, based in Brusnengo (Biella, Italy), in association with Sacmi Team, has led to the publication of an article in Glass Worldwide, the leading, most-read magazine on the glass industry and all its related technology.

This Biella-based company – which produces feldspathic and silica sands for the glass and ceramic industry – has, in fact, successfully completed experimentation of an innovative, self-developed process aimed at recovering waste from glass fibre manufacturing firms. It is a project in which Sasil has been joined by Sacmi Team, the division that, since 2007, has brought together all the Sacmi Group's best machine design and development skills for the technical ceramic industry.

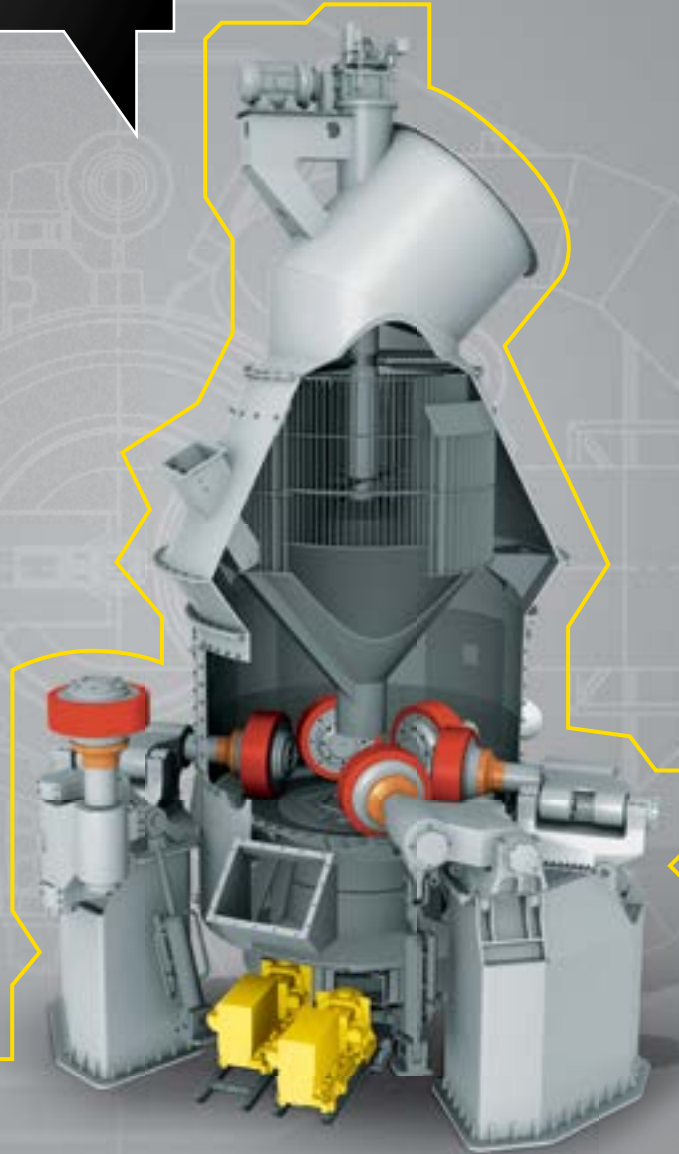
More specifically, the specialists of Sacmi Forni and Riedhammer, coordinated by Sacmi Imola, have designed a neutralization kiln that heat-treats such waste to give a product that is fully re-utilisable as a raw material (something that was, until now, unattainable owing to the materials' characteristics). This important achievement – presented by Sasil with a report by Dr. Piero Ercole at the recent EHEDG congress (Parma, October 2014) - subsequently attracted the attention of the prestigious Glass Worldwide magazine; the results of the pilot project were published in the March/April 2015 issue.

For more information, please contact
Mr Cristian Cassani - Group PR & Communication
Email: Cristian.Cassani@sacmi.it



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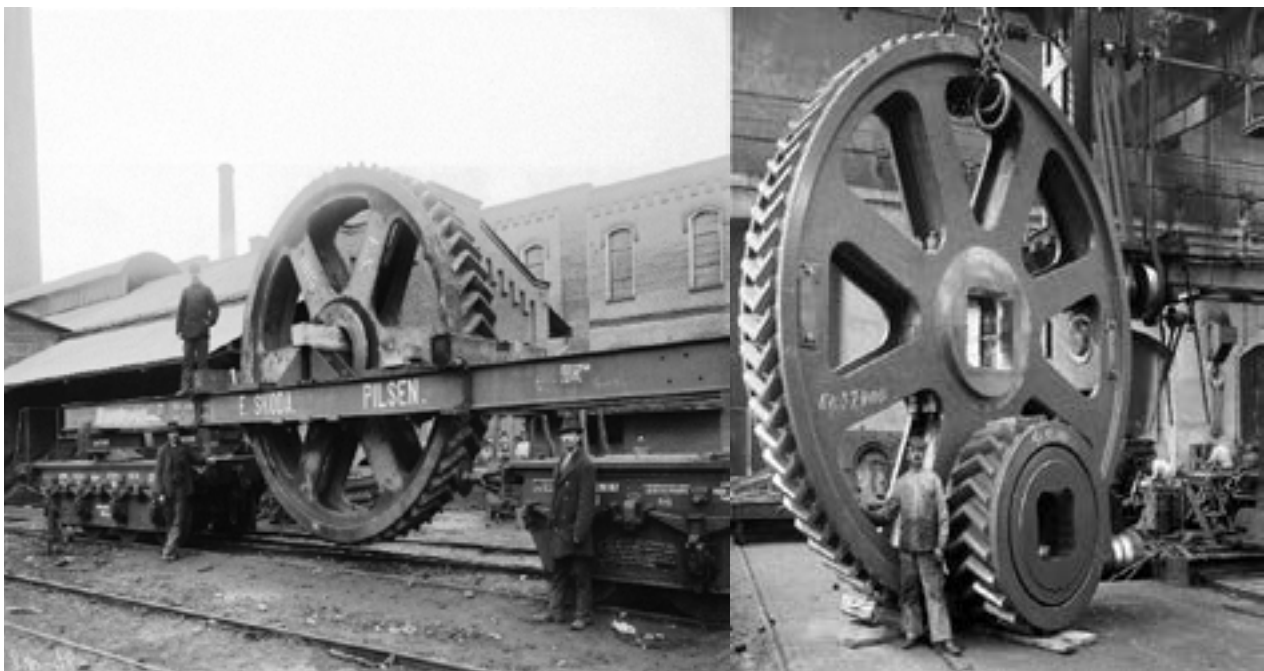
Pfeiffer. Progress is our tradition.

Lukas Steiner, Wikov Industry

Wikov

A gearbox solution supplier

Mechanical gearboxes and gears have been manufactured by Wikov Gear in Pilsen, Czech Republic for almost 100 years. The brand Wikov is the successor to the globally-recognized Škoda brand, which has a rich installation base counting thousands of gearboxes operating all around the world. The manufacturing plant Wikov Gear is a part of Wikov group, dynamically growing gearbox manufacturer oriented to latest production technologies and innovations. Wikov Gear's history is bound to the demanding oil and gas and power-generation sectors but most importantly the cement sector, to which it provides equipment and services for horizontal ball mills, vertical roller mills and belt conveyors, among other parts. Wikov is a guarantee of true European quality.



Jumbo size gears manufactured in Pilsen factory in the beginning of the 20th century

Wikov Gear is not focused on design and manufacture of new gearboxes only but the company can offer 1:1 replacements for old gearboxes of other brands utilizing its engineering force and field experience. Its aftermarket department portfolio covers general repairs, diagnostics, overhauls, upgrades and modernization of Škoda and Wikov gearboxes or even gearboxes of other brands. Recent installation of a modernized Renk gearbox for a vertical ball mill at Bursa Cimento qualifies Wikov among top quality suppliers in the field of gears aftermarket services. Onsite vibration measurement performed by Wikov factory service after 500 operation hours brought excellent results. The vibration parameter showed maximum values of 0,9 mm/s whereas the tolerance is over 5 times higher. Alike onsite parameters prove perfect condition of the gearbox and represent guarantee of stable production. Aftermarket services provided by Wikov are supported by strong engineering team whose role is to provide customers with upgrades with added value. In practice, the added value means modification of existing gearbox to latest technical standards while implementing technologies and design innovations which have positive impact on extended lifetime, reduced maintenance costs and higher performance of the gearbox. The installation of upgraded gearbox for the vertical mill at Bursa was complemented by installation of an overhauled and upgraded Flender gearbox.



Renk gearbox before and after a total upgrade and modernization at Wikov Gear facility

Bursa Cimento is one of approximately twenty cement operations in Turkey using gearboxes made by Wikov Gear in last few years. The majority of existing Wikov installations in Turkey are represented by cost saving design of the side drive gearbox solution for horizontal ball mills. The side drive gearboxes by Wikov distinguish by a revolutionary separated lubrication system. This feature is the key argument to upgrade existing conventional drives with Wikov gearbox. The design of the side drive gearbox utilizing labyrinth system protects the drive components of the gearbox such as gears and bearings from dust and dirt pollution thus extending the gearbox life and oil exchange intervals resulting in reduced maintenance costs. The outside lubrication pipe system allows for fast and easy maintenance work without need to dismantle the whole gearbox.

Largest horizontal ball mill drive ever built in Wikov Gear was built in 2014. This 120t drive for Spassk-Cement consists of two Side Drive gearboxes, each with nominal power of 2000 kW.



Functional testing of the horizontal ball mill drive after assembly in the production hall in Pilsen

Maintenance in cement plants

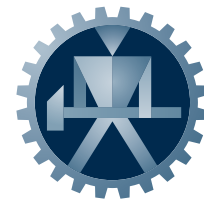
All gearboxes can be fitted with WiGuard, a remote condition monitoring system providing information about performance of the gearbox during its operation remotely. This feature gathers data about vibrations, temperature, speed, pressure, oil quality and other parameters related to the gearbox operation accessible via web interface for on-line analysis. It brings manufacturer's service closer to its users. Apart of its diagnostic capability it serves as a safety tool when sending warning and error messages. The service can be done in an early stage of arising malfunction and save costs for later replacement or extensive repairs. The WiGuard system provides valuable information to the cement plant management about time when and how was the mill operated. It is a control tool helping to monitor the efficiency of cement production.



A screen-shot from WiGuard, which allows Wikov's engineers to see a raft of key parameters remotely.



GEARBOX SOLUTIONS FOR VERTICAL ROLLER MILLS



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The Essence of Engineering

A 'Sound Solution' to the Problems of Particulate Build up and Material Flow Problems within the Cement Industry

What are Audiosonic Acoustic Cleaners?

They are pneumatically operated horns that produce low frequency – high energy sound waves. These sound waves are produced when compressed air enters the Wave Generator and forces the only moving part, a titanium diaphragm, to flex. Acoustic cleaners are employed wherever ash, dust, powders or granular materials are processed, generated, stored or transported.

What is Sound?

Sound may be described as the passage of very rapid pressure fluctuations through a medium by means of a vibrating force. Our ear does not actually hear sound, it is a pressure sensitive mechanism that detects very rapid pressure fluctuations and it is in fact these very rapid pressure fluctuations which cause dry material to debond from both adjoining particles and from any structure.

Perhaps it is with the Audiosonic sphere of acoustics, which arouses most human interest through music, occurrence of echoes, construction of amphitheatres etc. Modern acoustics have found a new and exciting use within the Audiosonic wave zone in the form of Acoustic Cleaners (also know as Sonic Horns), which operate generally within the 60 Hz - 420 Hz frequency range.

Acoustic cleaners employ high-energy - low frequency sound waves to eliminate particulate build-up and facilitate maximum material flow.

HOW DO THEY WORK?

Acoustic cleaners are extremely simple in their operation, requiring only normal plant compressed air for their initial energy source. Compressed air enters the Wave Generator and forces the only moving part, the ultra high-grade titanium diaphragm to oscillate very rapidly within its specially designed housing. These rapid oscillations create the base tone and the different bell sections convert, amplify and distribute this base tone into a range of selected key fundamental frequencies.

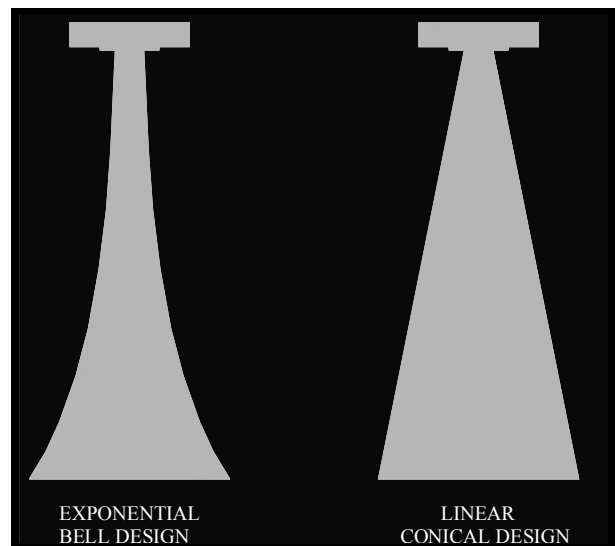
Let's now look at the design of the Wave Generator (the vibrating source) and the Bell Section (the transmission medium).

The Wave Generator

The Wave Generator usually contains a titanium diaphragm and when 'clamped' within the wave generator body and normal plant compressed air, applied for a few seconds at periodic intervals, produces a "base tone". This "base tone" is then amplified by the bell section and transmitted to a particular fundamental frequency in relation to the bell section design and length.

The Bell Section

The shape of the bell section is also a very important design fact as the sound transmission and radiation from the bell section of changing cross-section is greatly influenced by the manner in which the sections change plus the physical length of the bell section itself. The exponential bell shape on the left has been proven to out perform the simpler, linear conical bell shape, shown on the right.



Therefore for a given length and end area the advantage of the exponential shape (above left) over a conical shape (above right) is that the exponential bell section will always transmit greater acoustic power at all frequencies above the critical value.

At very short wave lengths (high frequency - say 420 Hz) interference occurs and the sound distribution becomes "beam like" so that only points which lie in the region of a line coaxial with the centreline of the bell section will experience high power effective cleaning. This is

why we employ such models to aid material flow at the discharge point of silos and hoppers.

At large wavelengths (low frequency say 60 or 75 Hz) the sound will be transmitted in the form of a spherical wave and points equidistant from the exit of the bell section will experience similar sound energy levels. This is why we employ such models to prevent material blockage in large vessels (silos and power plants etc).

Advantages of Acoustic Cleaners

Acoustic cleaners prevent the build up and blockages from occurring in the first place by constantly "de-bonding" the material from the vessel or structure surface. Secondly, unlike air cannons, which are uni-directional, sound waves travel at an exceptionally fast speed (344 metres per second at normal temperature and pressure) in a 360° radius. Furthermore they bounce off all surfaces and rebound back onto other surfaces. Installation and operation of acoustic cleaners are easy and virtually maintenance free.

Air cannons/blasters seek to affect a very localised cure for a blockage problem, which has already occurred. In many cases the air cannon simply "blows" a localised hole through the blockage, necessitating the installation of many air cannons within the general problem area. It is generally true to say that it is very rare to find a single air cannon in effective operation. This is totally the opposite with acoustic cleaners but then they approach the problem with a totally different philosophy. Sound waves travel at 344 m/second and at a 360° angle, therefore they prevent the build-up from occurring in the first place.

Some of Primasonics most challenging but successful applications were within silos which contained dry materials such as cement. Primasonics have solved cement storage silo problems in over 40 countries worldwide. The two main problem areas within hoppers and silos are:-

- Ratholing – where the material builds up on the sidewalls causing severely reduced “funnel flow”, which also restricts the silo being used to its full storage capacity.
- Bridging – where the material bridges over the outlet area either severely restricting flow or stopping it completely.

Irrespective as to whether the cement bulk storage facility is under 500 kg or over 30,000 kg capacity Primasonics® Acoustic Cleaners have eliminated both of these problems. Typical examples range from small 20 tonne capacity internal pre-packing hoppers right up to 30,000 tonne capacity cement silos. Where the problem is ratholing with the material building up on the sidewalls, a low frequency, larger Primasonics®

Acoustic Cleaner is mounted on top of each silo to dislodge and thereafter, eliminate the build up. These units can be located at any position on top of the silo, as sound waves travel at over 344 metres per second and in a 360° radius. Generally speaking they are mounted on top of an existing inspection hatch, thus installation is simple and inexpensive.

Moving on to silo and hopper discharge, in such applications one of the smaller Primasonics® Acoustic Cleaners with higher frequencies is employed. The higher the frequency the shorter the wavelength and so all the acoustic power created by the Wave Generator is concentrated over a much shorter range – say between 1 and 5 m. Therefore a higher frequency Primasonics® Acoustic Cleaner mounted just above the discharge will prevent material bridging and ensure even material flow at maximum rates.

It is now well established that Acoustic Cleaners which can now provide non-intrusive, affordable technologies will: -

- maximise plant and process efficiency
- improve material flow
- prevent cross-contamination
- eliminate hazardous and costly manual cleaning regimes
- reduce plant shutdown due to material blockages
- increase energy efficiency
- increase plant life

A periodic "sounding" is all that is required to achieve these goals! Typically 5 - 10 seconds every 10 - 60 minutes.



Prima Range of Acoustic



Cleaners PAS 75 S acoustic cleaner installed on a 8000 tonne cement silo in Haiti

www.primasonics.com
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A NEW TYPE OF MAGNESIA BASED CASTABLE FOR THE CEMENT INDUSTRY

V. Wagner *, P. Malkmus
CALDERYS, Neuwied, Germany

SUMMARY

Magnesia spinel bricks are the main choice for the most demanding part of a clinker production line. However, based on kiln shell deformations or geometrical constraints such materials couldn't be used for solving refractory lifetime problems.

A new type of magnesia based castables has been developed to target such problem areas such as e.g.

- Tire sections
- Burner lances
- Kiln hood

These new materials are showing equivalent physical and chemical properties to respective bricks; but they can be installed in any area wherever required as they can be cast easily into any geometrical form. There is no need for cutting bricks to put them into the correct shape. Areas where bricks cannot be used like e.g. burner lances, can now be lined with a suitable material whenever high quality standard solutions are not working.

Now there is the chance to make use of the advantages provided by magnesia spinel bricks in those sections where only monolithic materials can be applied.

INTRODUCTION

Over the past few decades a standard refractory lining in the cement industry has been the result of an "evolutionary" process. Fireclay and alumina based refractories, partially with the addition of silicon carbide, dominate the lining of the preheater tower, inlet chamber, kiln hood and cooler of a modern clinker production unit. Extremely high temperatures in combination with an excessive chemical load and a significant mechanical stress are the reason for the predominant presence of basic refractories in the cement rotary kiln; especially in the entire burning zone. These basic refractories are mainly magnesia

bricks with special additions to improve important properties like thermal shock and corrosion resistance (1).

LIMITATION OF BRICKS

These magnesia based materials are applied – without exception – as shaped products. The perfect cylindrical rotary kiln allows a quick and easy installation with bricks.

In case of geometrical restrictions, if the installation becomes complicated or if a high installation speed is required castables or gunning mixes are used instead. Even the cones of rotary kilns are mainly protected by a monolithic lining as special brick shapes were needed (either pressed or cut on site).

New cement rotary kilns have a nicely shaped nose ring; so a lining based on bricks can be applied with no problems. But after a short period of time this nose ring often shows severe deformations which does not allow the easy installation of such shaped products

MATERIAL CHOICE & REFRACTORY LIFETIME

Basic refractories – in this case magnesia spinel bricks - are chosen for the hottest section of cement rotary kilns for several reasons. They are

- resistant against high temperatures,
- resistant against mechanical stress and
- resistant against attack by liquid clinker phases.

Even in times of an increased usage of alternative fuels these solutions are still without alternative.

But there are applications where problems arise: What about applications like the burner lance tip, the nose ring and the kiln hood? Under many different conditions the existing alumina based monolithic solutions perfectly fit into the lifetime cycle of a

cement rotary kiln lining. Last but not least they are the optimum solution in terms of installation. But in some kilns these areas are exposed to excessive temperatures. As these areas are located at the end of the burning zone, liquid clinker phases can easily attack the refractory lining. The combination of these two factors results in a poor performance of the refractory lining of e.g. burner lance tip or nose ring.

There are cases where all possible traditional monolithic solutions have been tried to reach a satisfactory lifetime of the burner tip but have never exceeded a maximum of two or three months lifetime.

The nose ring lining can also fail under such conditions. Whereas under normal conditions standard monolithic materials show a satisfactory performance providing a lifetime of more than one year the lining may fail under these severe conditions after very few months of operation.

Finally these deformations result in a limit on the lifetime of the lining.

A NEW TYPE OF CASTABLE

Keeping all those points in mind the idea came up to develop a castable providing at least the same beneficial properties as magnesia based bricks (2) combined with the ease of installation of a castable. Analysing the existing solutions the predominant materials used are magnesia spinel bricks. The excellent behaviour of such materials under difficult conditions is well-known (1).

The basis of our development was an existing monolithic material based on pure magnesia. In a first step we identified the spinel respectively zirconia addition both in terms of amount and grain sizing. Finally we ended up with two different new solutions (table I):

	CALDE™ MAG BCHC 8004		CALDE™ MAG BCNV 8004
Al₂O₃ [%]	9	ZrO₂ [%]	3,3
MgO [%]	86	MgO [%]	86
BD [g/cm³]	2.98	BD [g/cm³]	2.93
CCS [N/mm²]	70	CCS [N/mm²]	90
Open Porosity [%]	14	Open Porosity [%]	15

Table I: Newly developed magnesia spinel/zirconia castables

Further problematic regions are the tire sections in the upper and lower transition zones. In case of a kiln operation with an unstable or poor coating the kiln shell can get red because of the enormous heat inside the kiln and the thermal conductivity of magnesia based bricks. The outside temperature can be so high that the steel shell is getting weak and soft.

Consequently many cement rotary kilns show severe shell deformation in these tire sections. The installation of bricks is getting more and more difficult as these deformations have to be levelled by using monolithic or bricks have to be cut to fit into this part of the kiln.

FIRST FIELD TRIAL

As a first field trial the tip of a burner lance has been chosen. A customer had severe problems with any standard material and was willing to test the new magnesia spinel castable:

- The burner tip has been sent to our Neuwied plant (Germany)
- The tip has been casted and pre-fired
- After this treatment the tip has been stored for two months in our plant as it was not needed on site immediately

- Then the tip has been transported to the customer site where it has been stored again for a few weeks
- Finally the tip has been installed

After three months of operation the tip has been taken out of operation.

The overall appearance of the used tip lining was good (picture 1).

Picture 1: Burner tip lined with CALDE™ MAG BCHC 8004 after 3 months of operation



In principle, the new material has done its job as it was neither attacked by clinker phases nor showing any other signs of corrosion or cracks. Even though further tests are necessary this example already shows the existence of a potential new solution for burner pipe linings.

A PARTIAL MONOLITHIC LINING IN THE UPPER TRANSITION ZONE

Another cement plant had severe problems with the brick lining in the upper transition zone of their kiln (capacity 5,000 tons per day). No brick type could achieve a lifetime longer than three months. One of the major problems was the extreme shell deformation in this kiln section. The customer agreed to a monolithic solution. Over a length of 2.6 m we have installed our castable with a maximum field length of 950 mm directly over the tire (picture 2):

Picture 2: Tire section in the upper transition with a monolithic lining



This monolithic solution resulted in a lifetime of ten months. In this specific case we haven't installed one of the two mentioned materials but a not yet optimised version coming from an earlier stage of development. But obviously even this material was providing the required properties in terms of

- Mechanical strength
- Resistance against corrosion
- Resistance against high temperatures

Furthermore it has solved the problems caused by geometrical constraints. There is no need for the customer anymore to stop the kiln every third month.

These examples demonstrate the potential these new, magnesia-spinel castables have to provide solutions in the cement industry. Contact your local Calderys Refractory Solutions provider for assistance with your cement plant problems.

- (1) Refractory materials in rotary kilns for the cement Industry, Ropczyce S.A, 2004.
- (2) Thermal cycling resistant MgO based monolithic linings; C. Dromain, P. Malkmus and J. Soudier; UNITCR 2013.

About Calderys

Calderys' mission is to help you meet your ever increasing production and productivity targets, whilst protecting the safety of your people and the integrity of your equipment. Our focus is to deliver safe, reliable and high performing refractory solutions customized to your needs. Our international production and sales facilities allow us to develop and deliver customized solutions based on monolithic and ready shape monolithic refractory materials worldwide in a fast, efficient, and safe manner.

Are Powder Storage Silos Disasters Waiting to Happen?

The latest silo protection technology provides much more than a safety system to prevent over-filling and over-pressurisation.

By: : HYCONTROL LTD, United Kingdom

INTRODUCTION

Level measurement specialists Hycontrol have been designing specialist silo protection systems for over 20 years and have extensive experience of the potential problems that exist on sites, especially in the cement, quarrying, bitumen, food, plastics and waste water industry sectors. According to Hycontrol's MD Nigel Allen, many powder storage silos are disasters waiting to happen, putting lives at risk and posing serious threats to the environment.

“Our findings are worrying to say the least and the photos taken by our installation engineers speak for themselves,” says Mr. Allen. “Companies just don't seem to understand the consequences of poorly maintained protection systems. It's quite frightening that operators accept pressure blow outs via the pressure relief valve (PRV), erroneously thinking that 'It's OK - the PRV is doing its job'. This couldn't be further from the truth - PRVs are there as a last resort.”

“If the silo protection system is working correctly and is fitted with an automatic shut-off feature to prevent over-filling, the PRV should never be used. If a PRV blows then there's an inherent problem with the system or the filling protocol and corrective action must be taken.”

“Material in and around a PRV is a tell-tale sign that there's something wrong and a catastrophic blow-out is waiting to happen,” he continues. “The material blown out from the silos will almost certainly solidify over time and this will, at best, prevent the PRV from working correctly and, at worst, completely clog it up. Unfortunately many maintenance engineers just don't realise the potential dangers that lurk beneath. They often think that simply cleaning off the material on and around the PRV is good enough. They don't realise



that if the PRV doesn't lift next time an 'event' occurs, the over-pressure could easily rupture the silo or eject the filter housing from the top. On an ATEX-rated silo the over-pressure could be sufficient to simulate an explosion and open the protective blast panels, resulting in costly loss of product and silo contents being left open to the elements.”

With regard to filter housings, Hycontrol engineers have witnessed another worrying practice at a number of sites where companies fit chains to prevent the housing being blown off the top of the silo, almost accepting blow-outs as an inevitability.

WHAT CAUSES OVER-PRESSURISATION PROBLEMS?

Silo protection systems are designed to prevent the damaging and potentially dangerous consequences of silo over-filling or over-pressurisation when powdered material is being transferred pneumatically from road tankers to silos. Unfortunately, perched out on the top of silos, such protection systems are all too often 'out of sight, out of mind' – until a major problem occurs!

Problems during the filling process usually arise through an inherent problem with the silo protection system or with the air filtration system on top of the silo. Problems can also occur through tanker driver/operator error. Delivery tankers are pressure-tested vessels typically capable of withstanding up to 2 bar (29 psi) pressure. Storage silos, on the other hand, are only designed to withstand the weight of material stored in them and can rupture at pressures as low as 12-psi above atmospheric pressure.



The possible consequences of over-filling or over-pressurisation include:

- Serious or fatal injury to workers and the public
- Catastrophic silo damage
- Loss of material and production plus
- Harmful environmental pollution
- Damage to company reputation

A key issue with many silo protection systems is that without adequate ground level testing capabilities, operators don't know if they will work when needed. Working at height restrictions limit silo top inspections and maintenance, especially in adverse weather conditions. However, the main problem is: what can engineers actually do when they are at the top of the silo? How do you physically test a relief valve or pressure transmitter unless you remove them?

Even if the protection system does do its intended job and prevents a major incident, companies rarely investigate the root cause of the problem so that remedial work can be carried out to prevent the situation re-occurring. Important near-miss events such as PRV (Pressure Relief Valve) lifts, high level events and high pressure events are routinely not recorded and often conveniently dismissed. Hycontrol have clear evidence that in practice there are more near-misses than realised and that the situation is a ticking time bomb.

Filter housings on top of silos are designed to vent the silo during filling, whilst preventing dust escaping into the atmosphere. Normally these are fitted with some form of self-cleaning system to keep filters clear, typically mechanical shakers or reverse jet systems. Although filter manufacturers give recommended check routines and filter replacement schedules, in practice it would appear these guidelines are regularly ignored. Faulty operation can be caused by a range of issues, including blockages and the fitting of unsuitable or wrongly-sized filters. Most powders form hard compounds when mixed with water from the atmosphere, further exacerbating the problems at the top of the silo.

EFFECTIVE SILO PROTECTION

The MPA (Mineral Products Association) publishes comprehensive guidelines for silo protection systems in quarries and cement works, but there are little or no such recommendations for powder silos used in a broader range of industries including food and beverage, chemical, water treatment and plastics. However the primary principles are the same for protecting any pneumatically-filled silo.

The Mineral Products Association is the trade body for the UK's aggregates, cement and concrete industries. In other parts of the world no comprehensive guidelines have yet been published.

Even with guidelines in place, the benchmark for the effectiveness of any silo safety protection system can only relate to the last time all the components were fully tested.



Silo Protection

OPTIMUM SOLUTION

The only effective solution is to take an integrated approach to silo protection design whereby the PRV, pressure sensor and high level alarm can be tested at ground level, prior to each fill. Only when all these safety devices have passed the checks should the safety interlock allow the silo inlet valve to open and the delivery to commence.



As an added benefit, an effective protection system can serve as a powerful predictive maintenance diagnostic tool by recording critical near-miss events that occur during the filling process. This information allows managers to carry out effective predictive maintenance by means of a logical step-by-step root cause analysis (RCA) process to understand why the problems are arising. For example, high pressure and PRV lift events may be due to filter problems, prompting questions



such as:

- Are the filters the correct size?
- Is the filter cleaning regime fully operational?
- Have the filter bags/cartridges been changed as per manufacturers' recommendations?

In parallel the logs will also indicate if the tanker drivers are routinely over-pressurising during the fill process.

CONCLUSION

In summary, the optimised silo protection system should incorporate:

- Pressure sensor, high alarm level sensor and PRV testing (essential)
- Simple one-button press to test all components
- Silo filling auto shut-off control
- Pneumatic cleaning of pressure sensor
- Recording of the number of events on incidents of over-pressure (time /date stamp)
- Recording of the number of events of PRV lift and opening (time /date stamp)
- Recording of the number of events of high level probe activation (time /date stamp)
- Filter ON / OFF output option to check filter status
- Filter air supply monitoring alarm option

There is strong empirical evidence that many silos are disasters waiting to happen. The practical reality is that powder storage silos can split or rupture at pressures as low as 1 or 2 psi above atmospheric pressure. Malfunctioning filter housings can and have been ejected at similar pressures.

Simply relying on cursory visual inspections of silo protection equipment is woefully inadequate. Therefore it is imperative that any installed safety system must be capable of providing reliable protection that can be easily verified by testing critical components before each and every delivery – without having to climb to the top of the silo. This approach will provide total silo safety; protecting assets, the environment and most importantly site personnel and the public.



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CEMTEC

Cement & Mining Technology

Fresh technology adds new life to aging plants

Five examples of how Pfister rotor weighfeeders got production on the hop

**By: Robert Krist, Head of Sales
FLSmidth Pfister GmbH / Germany**

Cement plants are the heavy-duty workhorses of production industry. Sturdy built and willing to perform for a long time. But even the most durable workhorses need a new set of shoes every once in a while to keep up with the new studs. Great new horseshoes for cement plants are state-of-the-art weighfeeders, stepping production up a notch, making sure that enterprises investing in smart technology stay that important extra step ahead of the competition.

Let's stay with the workhorse-picture for a little longer: it is important what and how you feed that horse of yours. Too much, and it will roll on the floor with a colic. Too little, and the performance will be poor. If you want to feed your cement plant workhorse well, the way to go is with reliable, custom-fit dosing systems. The German company FLSmidth Pfister is specialized on engineering, designing, assembling and installing of continuous gravimetric weighing and dosing equipment for the cement making process. They are the original inventor of the red, round rotor weighfeeders, well-known in the industry. FLSmidth Pfister not only delivers to newly built cement plants. Often times the German specialist are asked for help if systems in existing plants don't perform well any more.

In thousands of implementations Pfister rotor weighfeeders have proven to master any setup and material in the cement industry. Specialized solutions are available for raw mill and coal mill feeding, for pulverized fuel feeding, finish mill and kiln feeding as well as blending. Machinery designed for bulk material pre-loading and for the cost-saving use of alternative fuels help companies in reaching early and increasing ROI over the complete value chain.

The first patented rotor weighfeeder was invented by Pfister in 1984 to feed pulverized fuels for the cement burning process. In more than 2800 installations worldwide, that dosing device from the original maker proved its continuously upgraded features in a wide variety of production environments. It pleases customers with optimum handling and low-maintenance performance.

The principle behind perfect dosing and feeding is



identical for all Pfister rotor weighfeeders. Material is extracted out of a silo and transported in rotor chambers from the inlet to the outlet. The rotor is mounted on bearings forming a weighing axis, which is eccentric to the rotor shaft. Gravimetrically, the material in the rotor wheel is precisely weighed to the kilogram. The measured gravimetric force provides information on the bold mass in the rotor weighfeeder before material discharges in a highly accurate mass stream.

Patented prospective control ProsCon uses the set feed rate and measured bulk mass to calculate the angular speed of the rotor. Less material in the rotor results in a higher angular speed, more material in a lower speed. ProsCon rotor weighfeeders accurately compensate variations in rotor loading and material density. Extremely accurate short- and long-term feed rates, which can be altered without loss of precision in no time, are the result of smart design and engineering know-how. While other feeders only react on requirements, ProsCon pro-actively regulates feeding in a realtime answer to measured deviations. Perfectly attuned pre-feeding devices complete the smart package.

Since runtime matters when it comes to achieving best possible return of investment, reliability and long service life of key production interfaces are of utmost importance. Experience taught FLSmidth Pfister engineers that a simple design with a minimal number of functional parts and high quality materials fulfill those expectations best. But even the best technique falters, when the staff has problems operating the equipment. That is why Pfister systems are as simple in handling

as they are strong in performance. Flexible, reliable communication to the local plant control system and easily accessible parts and drives make Pfister devices easy to operate and maintain in any environment.

Another top feature of Pfister rotor weighfeeders is their flexibility. Which means: those shiny new horseshoes fit any hoof, no matter how old it is and how soon it needs an overhaul. FLSmidth Pfister engineers together with the plant management first analyse the situation on site, they advise in the selection of the Pfister rotor weighfeeder that best meets the customers requirements and they adjust the selected product to individual needs. Materials, accompanying machinery and required dosage vary from plant to plant. The quality and flexibility of Pfister products allows solutions for various set-ups. And this is but one of the reasons why Pfister dosing systems come into play when machinery replacements are required:

In a brandnew cement plant in Turkey the main and calciner burner is fed with coaldust. In selecting their equipment, the Turkish operators first looked at the price tag and a cheaper non-Pfister dosing system was chosen for the first installation. That soon proved to be a bad decision: On plant acceptance day reality hit: the dosing system wasn't up to par and could not deliver the requested performance. The original setup consisted of four dosing systems each in two plants, two of them as back-up machines. Without having the chance to get any wear and tear on them, they were replaced with only three Pfister rotor weighfeeders in each plant (one each rotor weighfeeder Pfister DRW 4.10 for the hot gas generators with a dosing capacity of 5 t/h max. and two each rotor weighfeeder Pfister DRW 4.12, one for the main, one for the calciner burner with a capacity of 15 t/h max.). Backup-systems became superfluous due to the high reliability and low maintenance of Pfister systems. As often in life, the higher-quality solution proved to be the smarter choice after all. **SEE PICTURES TURKEY 1**

2) Example 1 Turkey old:

Formerly: This dosing system which was first installed in a new cement plant did not



3) Example 1-turkey-new

Replacement: Rotor weighfeeders Pfister DRW now feed to the hot gas generators and the main and calciner burner. Backup-systems are not necessary.



On the other end of the Mediterranean Sea, at a cement plant in Portugal, raw meal dosing by impact flow meter was the problem. The raw meal flow to the preheater was lacking in precision, the unsteady feeding became a production impediment. A rotor weighfeeder Pfister FRW 4.18 replacing the impact flow meter at a capacity of up to 300 t/h solved the problem quick and easy. The new installation was set up parallel to normal production and went live during a very short, regularly planned maintenance interval. The new system now guarantees reliable material dosing and it stabilized the kiln process considerably. **SEE PICTURES Portugal**

4) Example 2- Portugal

At a cement plant in Portugal an impact flow meter was replaced by a rotor weighfeeder Pfister FRW 4.18 with a capacity of up to 300 t/h which doses raw meal to the preheater



REPLACEMENTS

Back in Turkey and to a cement plant with four airlift systems. Their pulsating coal feeding to the main and calciner burners lacked in precision. Fuel dosage was unstable, deviations to the burner unacceptable. Kiln output and with it clinker output was unsatisfactory. Since the customer had Pfister systems already successfully performing in other parts of the plant, the decision for another quality-replacement made by FLSmidth Pfister was a quick one. Not the cost factor, but the implementation of a considerably better, technically sophisticated system played the main role in that selection. Plus the fact that FLSmidth Pfister was able to carry out the replacement in very short time. Today, four rotor weighfeeders Pfister DRW 4.10 meet all performance parameters. Calibration can be performed online for perfect feeding and fuel control at all times. Up to 10 tons of coal are fed, the kilns are supplied with a stable flow of fuel and the clinker output meets production requirements. **SEE PICTURES TURKEY 2**

5) Example 3 - Turkey old

Former installation: These airlift systems at a cement plant in Turkey were lacking dosing precision in feeding coal to the main and calciner burners



6) Example 3_Turkey new

Replacement: Four rotor weighfeeders Pfister DRW were installed instead of the airlift systems in very short time. The fuel dosage to the kiln is now stable and clinker output to the satisfaction of the client



At a cement plant in France, heat was the problem. Temperatures of 180 degrees celsius with peaks up to 230 degrees celsius are reached in the finish mill process. The belt weighfeeder used for the feeding of hot white cement clinker needed belt replacement several times a year. A costly and time consuming effort with repeating production stillstands.

Pfister specialists had a solution ready: rotor weighfeeder Pfister TRW 4.14 comes without rollers and belts. Delicate sensors and the drive are temperature-sheltered and placed outside of the machinery. Only the steel rotor wheel is in contact with the hot material. Constant mill feeding with minimal maintenance requirements is now the new daily works at the plant in France. Maintenance intervals stretch over several years.

Granted, the purchase price of a Pfister rotor weighfeeder compared to a belt-driven weighfeeder is higher. However, plant owners have realized that low-maintenance, trouble-free mill operations are practically invaluable and the higher investment repays over a very short operation period.

SEE PICTURES France

7) Example 4_France old

Old installation: High application temperatures at a cement plant in France destroyed the belt of the employed belt weighfeeders too often making plant stops costly



8) Example 4_France new replacement: Rotor weighfeeder Pfister TRW replaced the former belt weighfeeder fulfilling the mill feeding now. Rotor weighfeeder Pfister TRW 4.14 comes without rollers and belts and is able to handle the occurring temperatures of up to 230 degrees Celsius



In the Middle East, the same problem occurred: another belt weighfeeder interfered with the kiln feeding process in Iran. Permanent material flushing through the open beltfeeder caused irregular feeding and consequently an overall disturbance of the kiln process. Dust emissions and material spillage were another annoying characteristic of the old system. The feedrate of up to 250 t/h was too low. Rotor weighfeeder Pfister FRW 4.18 with its completely encapsulated system solved the problem. The replacement was put in place and was ready to run in a record time of eight days. The switch took place during a planned kiln stop. Now stable material processing at a feed rate of up to 350 tons per hour ensures stable and reliable operations at the Middle East plant. Many other plants in Iran followed that example.

SEE PICTURES Iran

9) Example Iran old

Former installation: A belt weighfeeder interfered with the kiln feeding process in Iran. Permanent material flushing through the open beltfeeder caused irregular feeding and dust emission



10) Example Iran_new

Replacement: Rotor weighfeeder Pfister FRW 4.18 with its completely encapsulated system prevents material spillage and feeds the kiln with considerably higher reliability and an increased feed rate of 350 t/h.



These are only five examples of the many success stories written with Pfister state-of-the-art equipment for the cement industry. High startup investments require constant and long-lasting output of high-quality products to meet investors' expectations for turnout. Pfister system specialists assist in the technical layout planning for newly designed plants, but also integrate efficient replacements into existing production facilities. No matter whether all new or renewed, Pfister dosing and weighing equipment is the way to prolong the productive life of any cement plant, with any possible technical setup, anywhere in the world.

New AUMUND Belt Bucket Elevator for the Vertical Transport of Coarse Grained Bulk Material

During the last 60 years, AUMUND delivered more than 5,500 bucket elevators worldwide to all those industries where the vertical transport of bulk material is of importance. These are especially the cement-, limestone-, fertilizer-, steel- and mining industries. AUMUND constructed for those industries belt and chain bucket elevators. The belt bucket elevator is configured for a grainage of ten millimeters and a performance of 2,000 t/h. The growing presence in the fields of mining & minerals led to the development of a Coarse Grain Bucket Elevator (BWG-GK type). It is able to transport coarse grained material (up to 80 millimeters) with a performance of 1,200 m³/h.



Fig. 1: AUMUND Bucket Elevator Belt for the BWG-GK (graphic @AUMUND) Coarse Grain Bucket Elevator (BWG-GK, photo AUMUND)

Fig. 2: Conversion of a Chain Bucket Elevator into an AUMUND

In developing the new BWG-GK type, AUMUND banked on proven components of the existing types of bucket elevators: in doing so AUMUND focusses on standardized drive units. To protect the belt from damage by the conveyed material, AUMUND took a new path.

With the tight, overlapping configuration of the buckets, the belt will be completely covered by the buckets. Thus, coarse material cannot be jammed between the backs of the buckets anymore. Simultaneously the outer edges of the belt will be protected. Even in case of a stoppage with filled buckets, no coarse material will be thrown behind the backsides of the buckets. The safe attachment of the buckets, under consideration of the bucket conditions during scooping as well, is guaranteed by the design of

the AUMUND Steel Cords with transversally running steel belt reinforcements. They provide a high pull out resistance and a reliable fixation.

The plate screws developed for mounting the buckets differ significantly from conventional DIN plate screws and are constructed for longer belt endurance and a higher load. Therefore, further parts to increase the tension force at the bucket attachment are not necessary. The belt runs without any problem or wear on the drive drum. Only little dead weight has to be transported. Beyond that, the belt of a bucket elevator has to guarantee a high tensile strength, little elongation and good directional stability. This will be achieved by a specialized production process and a high transverse rigidity.

The carcass design of the AUMUND Bucket Elevator Belts combined with the AUMUND Bucket Attachment System guarantee a long lasting service life. The belt of the bucket elevator has been optimally designed for its attachments like buckets, profiled rubber edges and endless splices. Tightly packed cords made of high-tensile steel serve as tension members.

On front- and backside of the tension member, transversal steel belt reinforcements strengthen the belt. Contrary to reinforcements with textile mesh, the advantage of the transversal steel belt reinforcements lies with higher adhesion values between rubber and tension members. That ensures a durable connection of the particular belt layers even at higher temperatures.

Newly developed rubber compounds based on ethylene-propylene-diene-monomer (EPDM) make the use of AUMUND Belt Bucket Elevators in ranges of operation with a material temperature of up to 150°C possible. Endurance tests during daily industrial routine have indicated that EPDM belts are more durable against aging than textile belts.

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HYBRID^{PRO}: combining the best of both worlds

Mondi makes further progress in the evolution of industrial paper bags by launching a bag that offers uncompromising weather protection and significantly extends the shelf life of its contents. The HYBRID^{PRO} is a technically demanding combination of paper and plastic, and is suitable for many industries and applications, particularly construction materials.

Conventional industrial bags made of paper tend to be vulnerable to rain and moisture. When exposed to direct rain on an unprotected pallet, a standard paper bag absorbs water and may weaken as a result. Handling may then become awkward, and the shelf life of the contents may be affected. In some cases, a switch to plastic bags is the answer. But this may not be the optimum approach, as the cost of investing in form-fill-seal (FFS) machinery tends to be high. Mondi, ever conscious of its customers' needs, has come up with a hybrid solution to the dilemma: the HYBRID^{PRO} bag, offering the advantages of a plastic bag, yet fillable on conventional paper bag filling systems.

With the HYBRID^{PRO}, paper combined with plastic really can provide the best of both worlds: uncompromising weather protection thanks to the bag's outer PE barrier layer, allowing genuine outdoor storage for lengthy periods and extended storage stability, without the need to invest in expensive FFS filling systems.

The next generation of water-repellent paper bags from Mondi

The HYBRID^{PRO} bag, which will be marketed under the slogan 'Made of PaPEr – combining the best of both worlds', represents a whole new concept in industrial bag design. Like a hybrid drive in a car, the HYBRID^{PRO} is an excellent combination of the available options: the inner ply is made of 120 g/m² Mondi Advantage ONE sack kraft paper; the outer ply is a 40 µm-thick layer of high-density polyethylene (HDPE). The innovative step here is that the HDPE forms a protective layer on the outside of the paper. Other bags also use a combination of paper and plastic, but not in this way. This is a considerable technical achievement that brings a new dimension to industrial bag design.

The HYBRID^{PRO} belongs to Mondi's next generation

of water-repellent bags, developed as part of the company's focus on exciting new solutions achieved through ongoing R&D. The bag – for which a patent is pending – is yet another successful outcome of Mondi's strategic emphasis on collaboration with customers during the product development process.

The benefits

With the HYBRID^{PRO}, building materials such as gypsum and cement enjoy excellent protection against direct rain during shipping or on site. The HYBRID^{PRO} also provides excellent protection against gradual moisture ingress during outdoor storage, thanks to the 40 µm thickness of the unperforated HDPE film. This means shelf life is longer than with standard paper bags. For example, according to building materials producer Knauf, who collaborated in developing the HYBRID^{PRO}, gypsum packaged in the HYBRID^{PRO} enjoys an eight-month shelf life when stored outdoors with no further protective layer – twice as long as if packaged in a standard paper bag.

This impressive performance outdoors makes the bag very user-friendly and has benefits when it comes to streamlining the supply chain of fillers and end-consumers: with longer shelf life, order sizes can be larger, for potential reductions in shipping costs.

Since the bag can be filled on conventional paper bag filling systems, investment in FFS systems, which tend to be expensive, is not required.

Compelling additional benefits

The bag's outer ply – which forms the barrier against rain, moisture and dust – is made of plastic film, giving it an attractive, modern appearance, an important factor in many markets. The HDPE film can be printed in up to eight colours, including on the bottom patches, for a glossy, premium look, and the paper ply is available in a bleached or an unbleached version.

The HYBRID^{PRO} allows high-speed filling, with de-aeration twice as fast as with a standard three-ply bag (35 m³/h versus 18 m³/h tested on Mega Gurley equipment at Mondi's R&D centre BAC in Austria).

Workplaces, such as construction sites, are cleaner with the HYBRID^{PRO}, as less of the contents adhere to the outer layer – a benefit sure to appeal to end users.

The HYBRID^{PRO} is an eco-friendly solution: the total



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grammage of material used is less than with standard three-ply designs used for the same purpose.

Last but not least, the plastic and paper components are easy to separate, for optimum recyclability.

Applications

The HYBRID^{PRO} is a high-quality packaging solution conceived for high-quality contents. It is particularly suitable for building materials, including gypsum and cement, as well as many other moisture-sensitive products. The bag is suitable for filling contents at temperatures of up to 90 °C.

The HYBRID^{PRO} was developed alongside Mondi's showerproof paper SPLASHBAG (launched beginning of 2015) as part of Mondi's next generation of water-repellent bags, in keeping with Mondi's strategic orientation to ongoing innovation.

The brand-new HYBRID^{PRO} will be presented to the public during upcoming packaging trade shows in Europe and internationally. The first trade show at which visitors will be able to explore the new bag is FachPack in Nuremberg, Germany. Mondi will be exhibiting from 29 September to 1 October in Hall 7, Booth 254.

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 5 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.

We are Mondi: IN TOUCH EVERY DAY.

Mondi is an international packaging and paper Group, employing around 25,000 people across more than 30

countries. Our key operations are located in central Europe, Russia, North America and South Africa. We offer over 100 packaging and paper products, customised into more than 100,000 different solutions for customers and end consumers. In 2014, Mondi had revenues of €6.4 billion and a return on capital employed of 17.2%.

The Mondi Group is fully integrated across the packaging and paper value chain - from managing forests and producing pulp, paper and compound plastics, to developing effective and innovative industrial and consumer packaging solutions. Our innovative technologies and products can be found in a variety of applications including hygiene components, stand-up pouches, super-strong cement bags, clever retail boxes and office paper. Our key customers are in industries such as automotive; building and construction; chemicals; food and beverage; home and personal care; medical and pharmaceutical; packaging and paper converting; pet care; and office and professional printing.

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.

For us, sustainable development makes good business sense. We don't just talk about sustainability; we make it part of the way we work every day. We have been included in the FTSE4Good Index Series since 2008 and the JSE's Socially Responsible Investment (SRI) Index since 2007.

Contact

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More about Mondri's industrial bags:



Mondri industrial bags are ideally suited for the high-speed filling of cement and powdered building materials. The bags are optimised for automated and precise application on the filling spout and offer optional features such as moisture barriers or sealable valves for increased product protection. Contact us at mena.bags@mondigroup.com

Mondri new water-repellent industrial bags

Mondri Industrial Bags introduced two new and innovative water-repellent bags – including the world premiere of the HYBRIDPRO. Mondri also presented the rain-resistant SPLASHBAG, launched only at the beginning of this year. Eye-catching displays will further show the huge Protector Bags and how much they can package for a variety of industries.

Mondri Industrial Bag's innovation of the year, It represents the next generation of water-repellent bags for the building materials industry. HYBRIDPRO combines the best of both worlds: it offers all the protective advantages of a plastic bag, yet is fillable on conventional paper bag filling systems.

Mondri's SPLASHBAG has been proven to resist rain for up to two hours and to withstand humidity better than standard paper bags.

Protector Bags are very large bags designed for packaging bulky items. So far they have mainly been used by the automobile industry. Protector Bags are suitable for many other industries and applications, too.

More information about Mondri at FachPack 2015 is available at www.mondigroup.com/fachpack

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CONiQ detects machine faults before they become a failure

Schenck Process Condition Monitoring System maximizes vibrating machine uptime

Inspection and maintenance account for up to a third of the indirect costs in production plants. Condition monitoring systems enable companies to realign their maintenance strategies around fault detection and prevention and save money. CONiQ from Schenck Process offers distinct advantages as a CM system specially designed for vibrating machines, with unique six-dimensional vibration measurement. With CONiQ, Schenck process consolidates its position as a provider of intelligent Industry 4.0 applications.

Proactively avoid interruptions to production

In heavy industries such as mining or steel manufacturing, machines are confronted with unparalleled harsh conditions,” says Jan Schäfer, Product Manager, Schenck Process R&D. “Short maintenance intervals, unplanned machine breakdowns and the damage that can result are the attendant consequences. Companies that until now have relied on corrective maintenance need to change their thinking in a competitive environment, in which downtime has become more expensive than ever.”

Particularly in the mining industry, plants are often in remote locations where there are no service personnel within easy reach. Thus there is a growing demand for the strategic deployment of proactive condition monitoring and diagnostic systems.

CONiQ: specially designed for vibrating equipment

The CONiQ condition monitoring system for vibrating machines is based on the principle of predictive maintenance. Damage and wear are detected and components can be repaired or replaced before they lead to more serious damage or stoppages. Significant cracks or defects of the screen body are also detected.

CONiQ continuously monitors the vibration of machines and components as well as oil temperature. These metrics are automatically analyzed compared with preconfigured initial and limit values, and interpreted for possible root causes.

With the prevention of a single plant standstill, CONiQ will immediately recover the investment costs. The system can be bundled into new vibrating machinery or retrofitted to a machine that is already in operation.

As well as preventing breakdowns and optimizing the machine’s energy efficiency, this approach offers other significant advantages compared with maintenance

strategies that involve pre-planned interventions: the service life of components is maximized and the time demands on maintenance personnel are reduced. Unforeseen downtime for maintenance can be avoided, and maintenance work planned more effectively. Moreover, operators can gain machine-specific experience and know-how.

CONiQ also offers a couple of unique advantages over other CM machines that are designed for vibrating equipment. It measures screen movement with a six-dimensional inertial sensor: three-dimensional linear acceleration, and three-dimensional rotatory velocity. Six-dimensional measurement is essential. If you measure less than six dimensions, it is possible that you will fail to detect a fault.

Additionally, CONiQ measures mechanical vibration at both sides of the exciter with piezoelectric accelerometers. This detects any possible damage to bearings and gears that could emit vibrations causing further damage to the exciter.

Uniquely, CONiQ offers the option of wireless or non-wireless data communication for these sensors to the Floor Unit, which carries out continuous analysis of the measurements. “This combines flexibility of deployment with security and synchronicity. A wireless-only approach is not always ideal in environments where there is a lot of external interference that can affect the signal,” says Schäfer.

Schenck Process in the modern production

Following the release of LOGiQ middleware for automating the planning and loading of bulk materials and cargo, Schenck Process has delivered another intelligent building block for the emerging Industry 4.0.* With CONiQ, the company has further demonstrated its power of innovation focused on the demands of modern industrial production.

Product description

CONiQ comprises three elements: Measurement, Analysis and Interpretation.

Measurement: First, machine movement (to monitor load, springs, intermediate shaft etc.) is measured with six-dimensional microelectromechanical (MEMS) sensors. Second, mechanical vibration is measured with piezoelectric accelerometers to monitor bearings, gears etc. The separation of these two tasks (mechanical vibration and machine movement) enables more accurate



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CONiQ

condition monitoring for more effective detection of actual or potential faults. Third, CONiQ monitors oil temperature using Pt100 sensors.

Analysis: Values are constantly analyzed during operation on a Floor Unit with display by comparing them with initial and reference values. If a value is exceeded, this triggers an alarm. The raw measurements as well as the analysis results are stored to evaluate historical data.

Interpretation: The Floor Unit also supports automatic interpretation of the analysis, giving operators better insight into the possible root causes of any emerging problems, and prompts appropriate actions. Furthermore, the data can be transmitted via Ethernet, field bus, digital or analogue outputs to an existing process control system. Alternatively, Schenck Process provides a proprietary

PC software program enabling central evaluation of data values. This program includes a comprehensive range of expert tools for the analysis and interpretation of metrics. In this way long-term prognoses can be extrapolated, making potential risks identifiable at the earliest opportunity.

*

Four out of ten companies are already applying Industry 4.0 applications, according to the Bitkom Study published in April 2015, a growing trend confirmed by other studies, for example by Fraunhofer IPA. Predictive maintenance applications are among the most widespread, with 27 percent of industrial companies already depending on them, according to Bitkom.

New, innovative complete Sacmi plant supplied in Algeria

Sobris- part of the BMSD Group – puts its trust in Sacmi

SACMI and COSMEC have just successfully completed the start-up of the first part of a new plant being supplied to SOBRIS - BMSD (Algeria), renowned brick manufacturer and enterprising industrial Group operating in the brick industry and several other sectors.

This first part regards the dual-line fired product unloading section; this can simultaneously and independently unload two kiln cars sent from both the new plant and the existing one.

SACMI, thanks to effective technical teamwork with the BMSD Group, is currently completing the smooth integration of the all-new plant while partially modifying the old production line - but without affecting existing production programmes and, above all, without any plant downtimes or production loss.

The complete plant is as follows:

- Complete wide-outlet cutting line, one of the biggest to be installed in Algeria;
- Innovative green piece programming and loading system on drying carriers;
- High output carrier-type rapid dryer, with hot-galvanised carriers that can be loaded 3 pieces

deep;

- Dual-line stacker for high output rates;
- New kiln car handling system serving both the new plant and the existing one;
- Tunnel kiln, with innovative “made in Sacmi” combustion system: anti-acid refractory material, innovative heat recovery system and special insulation to ensure low consumption and maximum recovery efficiency;
- Dual fired material unloading system, able to unload two kiln cars at a time, simultaneously and independently.

This excellent result stems from the customer’s involvement in all technical aspects and close teamwork with the customer at every stage of the project, not to mention the outstanding skill and experience provided by SACMI and COSMEC; moreover, this collaboration has laid the foundations for what we are certain will be the equally satisfying completion of the subsequent stages of the project.

For more information, please contact

Mr Cristian Cassani - Group PR & Communication

Email: Cristian.Cassani@sacmi.it



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Rak Ceramics continues to invest in Sacmi high pressure casting solutions

Two new casting machines and a Riedhammer HWS kiln installed at the plant in Bangladesh

Rak Ceramics, one of the world's largest manufacturers of ceramic tiles and sanitaryware with a distribution network that spans 160 countries worldwide, has added two new casting machines and a state-of-the-art kiln to its Bangladesh plant.

The Sacmi-developed high pressure casting technology, which is now used extensively within the industry, includes two battery-type casting machines for two-part moulds and a new Riedhammer HWS kiln, which has an output capacity of 706.5 pieces per cycle.

RAK Ceramics Bangladesh plant is one of the most modern and highly automated facilities in the region. The Dhaka site is also fitted with glazing robots supplied by Sacmi and thanks to this new investment will benefit from increased output capacity, in the region of 200,000 pieces per year.

Key features of the Sacmi-supplied casting line include excellent finished product quality, user-

friendliness and optimisation of space. Designed to carry out both firing and re-firing, the Riedhammer kiln is characterised by high quality output, reduced energy consumption and lower emissions.

RAK Ceramics, which has a global annual production capacity of over 4.6 million units in sanitaryware alone, has always had a strong focus on environmental and economical sustainability and their ongoing partnership with Sacmi solutions providing high-efficiency and low-consumption technology clearly demonstrate this.

Abdallah Massaad, CEO of RAK Ceramics said, "We are very pleased to have installed this new technology in our RAK Bangladesh plant. We continue to invest heavily in research, development and the latest technologies to ensure that we remain at the cutting edge of ceramics' production. We have a strong partnership with Sacmi and a long-term commitment to maintain our status as an industry leader."

With Sacmi, 70% output boost for Saudi firm Al Fanar

The company looks to the future and renews its confidence in Sacmi technological solutions

A major manufacturing company based in the Saudi capital of Riyadh, the Al Fanar Group recently completed a significant investment in Sacmi-supplied technological and plant engineering solutions, leading to a production increase of no less than 70% if compared to the beginning of 2014.

This order included a pre-crushing and raw material handling system, downstream from which there are two continuous MTC 088 mills and two ATM 110 spray dryers. At the heart of the line there are four PH 3020 presses with an inter-column clearance of 2,250 mm (these join the three already installed by Sacmi) and four 14.12-metre horizontal ECP dryers which

join the two existing ECP units.

Completing the picture is the firing department with three kilns (with an effective inlet width of 3150 mm) designed to manage porcelain tiles too. Together, these provide a total firing length of 327.6 metres.

A long-standing partner of Sacmi - which, in 2011, provided the Saudi company with a production line that tripled the existing output - Al Fanar has, with this latest investment decision, moved closer to its goal of becoming a major player in the Saudi ceramic industry and has opened up new market prospects involving the entire Middle East.

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AutoSampler for the automation of measurement series

AutoSampler

Ideal for easy automation of measurement series: The practical AutoSampler provides automatic sample feeding as a simple attachment for the wet dispersion unit of the ANALYSETTE 22.

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- Automatic assignment of the position and measuring result by means the software
- All function sequences, such as the dispersion and measurement duration, can be specified for each position separately and can be saved a SOP standard list
- Practical Home button for automatically returning to position 1



Up to 26 samples can be measured automatically

How it works: The FRITSCH AutoSampler can simply be placed on top of the wet dispersion unit and is immediately ready for use. And after use, removing it is just as easy – simply lift it off. For fast, smooth work processes.

For most samples wet dispersion represents the ideal method for perfect dispersion. Therefore the samples are feed into a closed liquid circulation system. An integrated and freely programmable ultrasonic emitter ensures fast and extremely efficient degradation of the agglomerates – precisely adapted to each sample. Due to the integrated water connection, the wet dispersion unit can be automatically cleaned and refilled with new, clean liquid after each measurement. And is quickly ready again for the next measurement.

Choose according to your needs!

The **AutoSampler** can be combined with both models of the FRITSCH Laser Particle Sizers ANALYSETTE 22.

Either the **ANALYSETTE 22 MicroTec plus** – the perfect all-round-laser with a measuring range of 0.08 – 2000 μm for all typical measurement tasks; or the **ANALYSETTE 22 NanoTec plus**, the highend instrument for measurements down to the nano range – for maximum precision and sensitivity for the smallest particles through the measurement of the backward scattering in a third laser beam.

For more information, please contact:

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World Ceramic Tile Production passes the 12 billion sq.m mark

Ceramic World Review anticipates the key figures of the third edition of the publication "World production and consumption of ceramic tiles" produced by the Acimac Research Department and due to be released in November.

- In 2014 world tile production reached 12,409 million sq.m, 3.6% up on 2013 and world tile consumption reached 12,095 million sq.m (up 4.2%).
- The Import and export growth showed a slowdown, with an increase by just 1% to 2,683 million sq.m: Chinese exports decrease, while EU exports increase.

"World production and consumption of ceramic tiles" produced by the Acimac Research Department: the study provides detailed analysis of the ten-year trends up to 2014 in industry, market, per capita consumption and export flows in large geographic regions and in the 76 largest tile producer, consumer, exporter and importer countries.

In 2014 world tile production and consumption continued to expand, although more slowly than in previous years. World tile production reached 12,409 million sq.m, 3.6% up on the 11,973 million sq.m of 2013. Growth was reported in almost all areas of the planet and in 8 of the 10 leading producer countries.

World tile consumption reached 12,095 million sq.m (up 4.2% on the 11,604 million sq.m of 2013).

The slowdown in import and export growth was even more evident. World exports increased by just 32 million sq.m, +1.05% from 2,655 million to 2,683 million sq.m, a much slower rate of growth than the average annual growth rate of 9.4% in the period 2009 - 2013. The biggest increase in both percentage and absolute terms was in the European Union, which exported 819 million sq.m (up 3.9% on 2013) thanks to the continued recovery of Spain (339 million sq.m, up 6.6%) and Italy (314 million sq.m, up 3.6%). The EU's share of total exports rose to 30.5%

Main responsible for the slower growth were the exports falls in non-EU Europe (-3.2%), North America (-2.9%) and Africa (-16.7%), and, above all (due to the biggest export volumes), the first real slowdown in Asian exports, which remained virtually stable at 1,488 million sq.m (+0.6%), 55.4% of the world total. This was mainly due to China's exports, which experienced the first real downturn, dropping to 1,110 million sq.m (down 3.3% on 2013).

For more information, please contact:

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- Siemens increases type diversity of the Sitrans family
- New Sitrans P410 and innovated Sitrans P DS III in the Advanced pressure transmitter segment of Siemens
- The portfolio is rounded off by Sitrans P310 in the Basic segment and Sitrans P500 in the Premium segment

Siemens is extending the Sitrans P family of its pressure transmitter portfolio. By adding the newly developed Sitrans P310 and P410 to the Basic and Advanced segments and the proven Sitrans P500 in the Premium segment, Siemens is now able to offer the right device class to address every conceivable measurement requirement. The proven Sitrans P DS III has also been technically innovated. The new developments deliver even more accurate measurement results across the whole pressure transmitter range.

The Sitrans family provides a high-precision product portfolio to cover any conceivable measurement need with its comprehensive range of device classes, from the Basic model, the P310, through the Advanced Sitrans P410 to the proven Premium Sitrans P500. The P310 pressure transmitter offers a measurement accuracy of 0.075 percent, making it ideal for applications in fields such as water supply and disposal.

With its extreme measurement accuracy of 0.04 percent, when used in combination with an orifice meter the Sitrans P410 is ideally suited for applications such as the flow measurements required when filling and emptying gas tanks. The same applies to pressure measurements for process gases or fluids in low and high pressure applications up to 700 bar. The Sitrans P500 rounds off the Sitrans P family in the Premium segment with standard measurement ranges from 50 mbar to 32 bar. In terms of performance, precision, long-term stability and diagnostic scope, the differential pressure transmitter is capable of coping with the most stringent demands. With a response time of 88 ms and an ability to operate in temperatures of -49°C to +125°C (-56.2 °F to 257 °F), the Sitrans P500 is ideally suited for the ultra-precise measurement of differential pressure, filling level and flow rate.

Still available is the tried and tested Sitrans P DS III. This product from the Advanced segment has been innovated to feature premium sensor technology, bringing about an improvement in both basic accuracy and temperature range, as well as optimizing measurement deviation to 0.065 percent with a turndown of 1:1 to 5:1. This allows plant efficiency to be further increased when performing processes such as level measurement, as the new technology enables better utilization of shutoff limits for tank filling levels. These improvements and the wider relative pressure range, which has been extended with a 250 mbar cell, make this the highest performing transmitter for flue gas measurements in power stations and incineration plants.

All of the transmitter series are simple to operate using just three push buttons, and offer a long-term stability of 0.125 percent over a period of five years, allowing calibration cycles to be extended and maintenance work reduced with all the associated cost savings. They are also certified to SIL 23/ and dispose the commonly required Ex zone certifications.

The Sitrans P family, comprising Sitrans P310, P410, P DS III and P500, offer users just the right pressure transmitter for every measurement need. Sensor technology taken from the Premium segment has now been used to enhance the precision of the Advanced products.



More information about transmitters is available at:
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Flat Panels and Panel PCs with all-round protection for harsh industrial environments

- 19-inch widescreen operator panels with complete IP65 protection
- Crystal-clear, scratchproof, 100% glass front for use at the machine level
- Industrial anti-glare surface featuring high image resolution and brightness
- PCT technology for intuitive single and multi-touch or gesture-based operation

19-inch widescreen Flat Panels and Panel PCs with all-round IP65 protection are the latest addition to the Siemens glass-front portfolio. Fitted with a rugged aluminum enclosure, the new devices are designed especially for use at the machine level in harsh industrial environments and can be mounted either from the top or the bottom on a stand or supporting arm system.

Simatic IFP1900 PRO Flat Panels and Simatic IPC477D PRO Panel PCs have crystal-clear, scratchproof, 100% glass fronts that are highly resistant to chemicals. Highlights include a special industrial anti-glare surface, excellent legibility even at large viewing angles thanks to the high image resolution and brightness, and the automatic detection of inadvertent touching or operation, for example, caused by catching the screen with the ball of the hand or the build-up of dirt on the panel surface. Projected-capacitive touch technology (PCT) enables single and multitouch or gesture-based operation, even when wearing thin protective gloves, and images can be panned, zoomed, or hidden components shown both intuitively and quickly.

19-inch widescreen Flat Panels and Panel PCs with all-round IP65 protection are the latest addition to the Siemens glass-front portfolio. Fitted with a rugged aluminum enclosure, the new devices are designed especially for use at the machine level in harsh industrial environments.



For further information, please see www.siemens.com/ip65-hmi-devices

Siemens AG (Berlin and Munich) is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for more than 165 years. The company is active in more than 200 countries, focusing on the areas of electrification, automation and digitalization. One of the world's largest producers of energy-efficient, resource-saving technologies, Siemens is No. 1 in offshore wind turbine construction, a leading supplier of combined cycle turbines for power generation, a major provider of power transmission solutions and a pioneer in infrastructure solutions as well as automation, drive and software solutions for industry. The company is also a leading provider of medical imaging equipment – such as computed tomography and magnetic resonance imaging systems – and a leader in laboratory diagnostics as well as clinical IT. In fiscal 2014, which ended on September 30, 2014, Siemens generated revenue from continuing operations of €71.9 billion and net income of €5.5 billion. At the end of September 2014, the company had around 343,000 employees worldwide on a continuing basis. Further information is available on the Internet at www.siemens.com.

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- castings for jaw crushers, roll crushers and bowl mill crushers,
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- infeed and discharge diaphragm segments as well as lining plates for ball mills
- cooling and side plates for clinker coolers,
- liner plates for cyclone heat exchangers



Fluke® Process Instruments Introduces Endurance™ Series High-temperature Ratio Pyrometers

Fluke® Process Instruments has introduced the Endurance™ Series of high-temperature ratio pyrometers. These rugged and flexible instruments enable continuous visual process monitoring and are designed to meet the demands of harsh industrial environments, including primary and secondary metals manufacturing, carbon processing and silicon production.

The Endurance Series pyrometers provide a robust solution for manufacturers seeking to improve product quality and uniformity, reduce reject rates, maximize throughput, and minimize energy costs. They offer superior optical resolution (up to 150:1) for viewing critical process operations, as well as innovative tools to help make better sense of production data. Multiple lens, sighting and focus options are available for different mounting distance and sighting needs. For example, on-board camera video sighting via Ethernet ensures the sensor is always sighted properly for remote and control room viewing. On-board laser sighting can be used to verify process alignment for local viewing when the sensor is located in a hard-to-reach area. On-board light-emitting diode (LED) sighting makes it easy to view the actual spot size projected on the target. The SpotScan™ line scanning accessory enables measurement over a larger target object versus a single spot.

Plants installing the Endurance Series pyrometers can lower their maintenance costs with "set it and forget it" reliability. The units feature robust, galvanically-isolated inputs/outputs, as well as an IP65 (NEMA4) rated stainless steel housing able to withstand ambient temperatures up to 65°C (149°F) or up to 315°C (600°F) using cooling accessories. A dirty lens alarm helps avoid unneeded periodic lens cleaning checks.

The Endurance Series pyrometers are also exceptionally versatile and easy to install. Their broad temperature range covers an entire process with fewer units. The sensors operate with either Power over Ethernet (PoE) or DC power, and interface to various bus systems (Ethernet, Profinet and RS-485). An intuitive rear-panel user interface simplifies navigation. PC-based Endurance setup and monitoring software simplifies configuration and deployment, and a built-in web server enables archiving of historical data for traceability and process troubleshooting.

All Endurance Series pyrometers are offered with a best-in-class four-year warranty.

About Fluke Process Instruments

Fluke Process Instruments designs, manufactures, and markets a complete line of infrared (IR) temperature measurement and profiling solutions for industrial, maintenance, and quality control applications. Distributed worldwide under the Raytek®, Ircon® and Datapaq® brands, our products reflect the combined experience of over 125 years in manufacturing the world's finest temperature measurement tools and devices. For more information, visit www.flukeprocessinstruments.com.

About Fluke

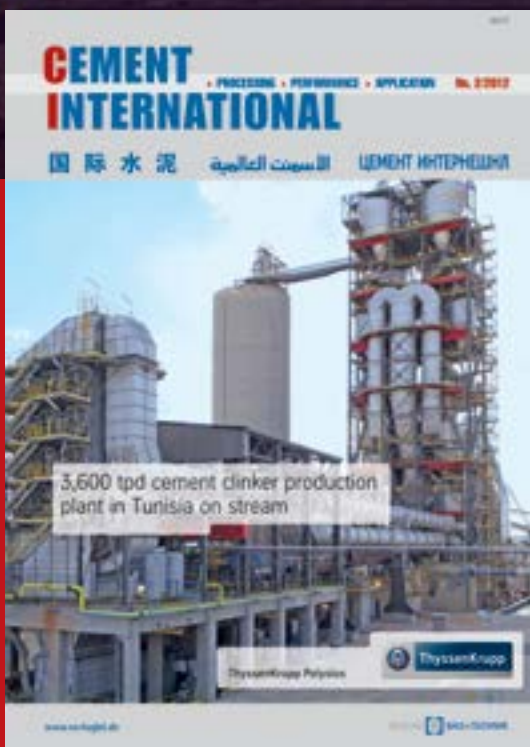
Founded in 1948, Fluke Corporation is the world leader in compact, professional electronic test tools. Fluke customers are technicians, engineers, electricians, and metrologists who install, troubleshoot and manage industrial, electrical and electronic equipment and calibration processes.

For more information, please contact:

[Jutta Schwelmjchwelm@fluke.de](mailto:Jutta.Schwelmjchwelm@fluke.de)



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The 13th International Central Asia Conference & Exhibition

Date : 23 - 25 November 2015

Venue: Tashkent, Uzbekistan

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 / valev@businesscem.msk.ru

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22nd international conference CONCRETE DAYS 2015

Date : 25 - 26 November 2015

Venue: Hall of The Castle in Litomysl, The Czech Republic

For more information please contact:

Conference Secretariat

Email: cbsbeton@cbsbeton.eu

<http://www.cbsbeton.eu/en/seminars/22st-concrete-days-2015-call-for-papers>

International Building Forum “Cement. Concrete. Dry Mixtures”

Date : 01 - 03 December 2015

Venue: Expocentre, Moscow, Russia

For more information please visit: <http://infocem.info/eng/>

14th NCB International Seminar

Date : 01 - 04 December 2015

Venue: New Delhi, India

For more information please visit: www.ncbindia.com/

Cemtech Americas 2015 Conference and Exhibition

Date: 7 - 10 December 2015

Venue: Ritz-Carlton Orlando, Grande Lakes, Florida, USA

Tel.: +44 1306 740 363

Fax: +44 1306 740 660

Email: info@cemtech.com

For more information please visit: www.Cemtech.com/Americas2015

The INTERCEM Fuels & Energy Forum

Date: 89- December 2015

Venue: Dubai, UAE

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www.Cemtech.com/MEA2016

CONTACT DETAILS

- www.Cemtech.com/MEA2016
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DIARY DATES

Tel: +44 208 669 5222

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www.intercem.com

INTERCEM Shipping Forum

Date : 25 - 26 January 2016

Venue: Corinthia Hotel Lisbon, Lisbon, Portugal

Tel: +44 208 669 5222

Email: info@intercom.co.uk

2nd Global Boards Conference & Exhibition

Date: 25 - 26 January 2016

Venue: London, UK

For more information please contact:

Dr Robert McCaffrey

rob@propubs.com

[http\\ www.Globalboards.com](http://www.Globalboards.com)

Advances in Cement and Concrete Technology in Africa 2016

Date: 27 - 29 January 2016

Venue: Johannesburg, South Africa

For more information please visit: <http://www.accta2016.bam.de/en>

Cemtech Middle East & Africa 2016

Date: 07 - 10 February 2016

Dubai, UAE

Tel.: +44 1306 740 363

Fax: +44 1306 740 660

Email: info@cemtech.com

<http://www.Cemtech.com/MEA2016>

10th Global CemFuels Conference & Exhibition

Alternative Fuels for Cement and Lime

Date : 22 - 23 February 2016

Venue: Prague, Czech Republic

For more information please contact:

Pro Global Media Ltd

Tel: +44 1372 743837

Fax: +44 1372 743838

For more information please visit: <http://www.cemfuels.com>

Global CemCoal

1st Global CemCoal Conference on coal for cement and lime

Date : 15 - 16 March 2016

Venue: London, UK

For more information please contact:

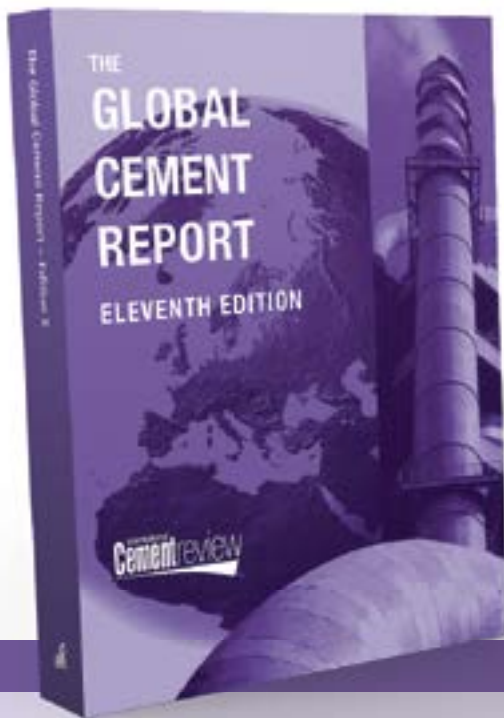
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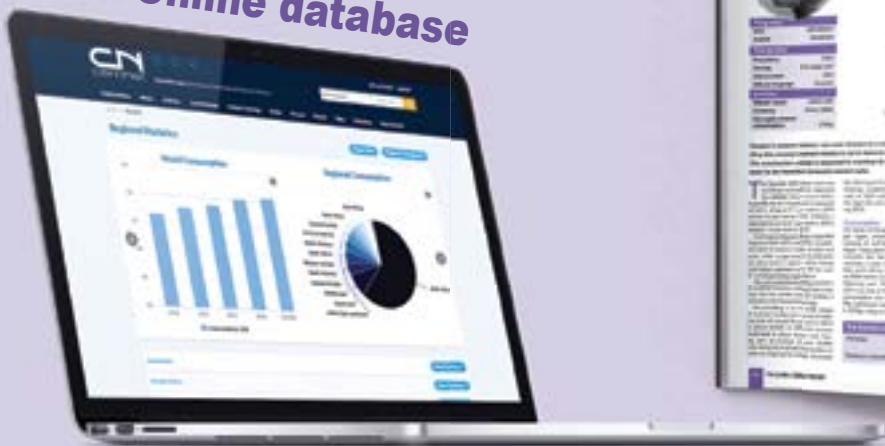
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3rd Global Cement EnviroCem Conference on Environmental Technology for Cement & Lime

Date : 10 - 11 May 2016

Venue: London, UK

For more information please contact:

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For more information please visit: <http://www.globalcement.com/conferences/envirocem/introduction>

11th Global Slag Conference, Exhibition & Awards 2015

Date : 24 - 25 May 2016

Venue: the Radisson Blu Edwardian, London, UK

For more information please contact:

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For more information please visit: www.GlobalSlag.com

Global CemProcess Conference and Exhibition

Process optimisation, de-bottlenecking, production maximisation and troubleshooting

Date : November 2016

Venue: London, UK

For more information please contact:

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Tel: +44 1372 743837

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For more information please visit: www.Global-CemProcess.com

IV International Business Meeting

White Nights: Cement. Concrete. Dry Mixtures

Date : May 2017

Venue: Grand Hotel Europe, St. Petersburg, Russia

For more information please visit: www.white-nights.info

CERAMIC

Tecnargilla 2016

Date: 26 - 30 September 2016

Venue: Rimini, Italy

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GENERAL

Yapex Building Exhibition

Date : 18 - 21 November 2015

Venue:AntalyaTurkey

For more information please contact:

Mr. Fatih ONKAR

Tel: +90 242 316 46 00

Fax: +90 242 316 46 01

Email: fatih@yapex.com

13th Edition of Green Building Congress 2015

Date : 19 - 21 November 2015

Venue:Mahatma Mandir, Gandhinagar, Gujarat, India

For more information please contact:

Shankar Kundu

Tel: +91 88861 88828

Email: Somya.shankar@cii.in

www.greenbuildingcongress.com

Improving Construction Site Productivity

Date : 22 - 23 November 2015

Venue:Dubai, UAE

For more information please contact:

Mr. John Karras

Tel: +603 2775 0001

Fax: +603 2775 0005

Email: johnk@trueventus.com

15th Industrialists' Conference

Date : 25 - 26 November 2015

Venue:State of Kuwait, Kuwait

For more information please visit:

www.incge.com/Default.aspx

Transit Oriented Development

Date : 25 - 26 November 2015

Venue:Singapore

For more information please contact:

Mr. John Karras

Tel: +603 2775 0001

Fax: +603 2775 0005

Email: johnk@trueventus.com

Façade and Lobby Design for Buildings

Date : 25 - 26 November 2015

Venue: Kuala Lumpur, Malaysia

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Tender & Bid for Procurement Professionals

Date : 25 - 26 November 2015

Venue: Manila, Philippines

For more information please contact:

Trueventus

Casey Lee

Tel: +603 2775 0067

Fax: +603 2775 0055

Email: caseyl@trueventus.com

Applied Reliability for Operating Plant

Date : 25 - 26 November 2015

Venue: Kuala Lumpur, Malaysia

For more information please contact:

Trueventus

Casey Lee

Tel: +603 2775 0067

Fax: +603 2775 0055

Email: caseyl@trueventus.com

Azerbaijan International Real Estate & Investment Exhibition

Date : 17 - 19 December 2015

Venue: Baku Expo Center, Baku, Azerbaijan

For more information, please visit: www.rec-expo.net

SteelFab 2016

The Middle East trade show for the metal working, metal manufacturing and steel fabrication industry

Date : 17 - 20 January 2016

Venue: Expo Center Sharjah, UAE

For more information please visit: www.steelfabme.com

E-mail: info@expo-centre.ae

GAZA Rebuild

4th International Exhibition for Construction Technologies and Building Materials 2016

Date : 18 - 21 February 2016

Venue: Amman, Jordan

Tel: +962 6 5169702

Fax: +962 6 5169703

Mobile: +962 79 5015547

Emai: info@interbuild.jo

For more information, please visit: www.interbuild.jo / www.arabuild.jo

ISNR Abu Dhabi

Date : 15 - 17 March 2016

Venue: Abu Dhabi, UAE

For more information please visit: www.isnrabudhabi.com

5th Annual Industrial Estates and Business Parks Conference

Date : 16 - 17 March 2016

Venue: Singapore

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6th ANTALYA CITY EXPO

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Date : 16 - 18 March 2016

Venue: Antalya, Turkey

For more information please contact:

Mr. Tarek ALAMER / Int'l Marketing Executive

Tel: +90 216 575 28 28 ext. 223

Email: tarek.alamer@pyramidsfair.com

Buildafro Tanzania 2016

International Building & Construction Trade Show

Date : 18 - 20 March 2016

Venue: Dar-Es-Salaam, Tanzania

For more information please contact:

"Intl Trade Exhibition" inquiry@mxmexpos.info

Hannover Messe 2016

Date : 25 - 29 April 2016

Venue: Hannover Exhibition Grounds, Hannover , Germany

For more information, please visit: www.hannovermesse.de/en/

10th Erbil International Building-Construction, Municipality Equipment, Machinery & Natural Stone Exhibition

Date : 12 - 15 May 2016

Venue: Erbil – Iraq

For more information please contact:

Mr. Tarek ALAMER / Int'l Marketing Executive

Tel: +90 216 575 28 28 ext. 223

Email: tarek.alamer@pyramidsfair.com

The First European and Mediterranean Structural Engineering and Construction Conference

Date : 24 - 29 May 2016

Venue: Istanbul, Turkey

For more information please contact:

ISEC Secretariat

email: euro.med.sec@gmail.com

https://www.isec-society.org/EURO_MED_SEC_01/

MSE 2016 – Materials Science and Engineering

Date : 27 - 29 September 2016

Venue: Darmstadt, Germany

For more information please visit: www.mse-congress.de

4th Latin American Drymix Mortar Conference

Date : 6 November 2016

Venue: Sao Paulo, Brazil

For more information, please contact:

Mr. Ferdinand Leopolder

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