



CEMENT & BUILDING MATERIALS REVIEW

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Cement and 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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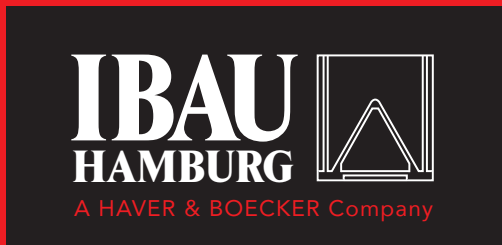
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ARAB ALBUM

ALGERIA

Algeria records uptake in cement consumption

The consumption rises in the first six months of 2016

Cemweek

CILAS Biskra cement plant starts production

The CILAS Biskra cement plant started production in mid-July 2016, 11 days before the scheduled start of operations. The 2.7Mt/yr plant is a joint venture between Lafarge Algeria and Souakri Group. The project had an investment of Euro 270m and it took 21 months to build.

Chinese company Hangzhou HOTA M&E Company Ltd. has successfully bid for all the bucket elevators and chain conveyors of two 6000-tonne-per-day lines at Biskra Cement plant.

Global Cement News

GICA starts construction works at cement plant in Sigus (Oum El Bouaghi)

Industrial Public Group of Cements of Algeria (GICA) started construction works at its new cement plant in Sigus (Oum El Bouaghi).

Daily Cement

EGYPT

Egyptian cabinet approves cement licenses

Around eight cement companies receive permit to setup cement plants.

Cemweek

Pharos publishes Egypt cement sector report

Securities brokerage firm Pharos Holding has published its report on the Egypt cement sector, entitled "The Oversupply Apocalypse". According to the report, current players are unable to access regional markets with exports, due to the buildup of excess supply in the region, in addition to low commodity prices, sluggish economic conditions, and political instability in key export markets.

Arabian Cement to build US\$9m petcoke mill

Arabian Cement plans to build a US\$9m petcoke mill for its cement plant. It is preparing all the necessary legal and financial requirements for the project. The new mill will help the cement plant reduce its operating costs.

Global Cement News



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Heidelberg acquires Suez Cement Group

HeidelbergCement completed the acquisition of a 45% stake in Suez Cement Group, including the shares owned by Italcementi.

IRAQ

Iraq reports good supply of cement across its provinces

The country imposed limitations on imports earlier this year

Muthana Governorate invests in cement capacity expansion
The governorate will increase the production capacity by 2020.
Cemweek

MOROCCO

Moroccan cement makers import waste for fuel

Waste importation from Italy has generated some controversy in Morocco
Cemweek

OMAN

Oman Cement to start joint-venture with Raysut Cement

Oman Cement has registered a new joint-venture company with Raysut Cement to operate in the Duqm Special

Economic Zone Authority. The new Company is named Al Wusta Cement Company and it will set up a new cement plant following a feasibility report.

Global Cement News

Raysut Cement upgrades Salalah gas supply station

Raysut Cement has commissioned and completed a gas pressure reduction unit at its plant in Salalah. The upgrade will enable the plant to increase its production capacity to 140,000t/yr from 130,000t/yr. This is expected to increase the profitability of the company. The cost of the project was estimated at US\$5.45m when it was first announced in December 2015.

Global Cement News

PALESTINE

Palestinians talk about cement plant

A cement plant is seen as a step into self-sufficiency

SAUDI ARABIA

Arabian Cement renews mining concession for its plant in Rabigh

Arabian Cement announced it has renewed the mining concession granted to the company for the exploitation of limestone, gypsum and all other necessary materials for the manufacturing of cement-based materials at its plant in Rabigh.

Southern Province Cement starts trial at second Bishah plant line

Southern Province Cement has commenced trial operation at the second production line of its Bishah cement plant. The trial operation will continue until the plant reaches a contractual design capacity of 5000t/day of clinker. Once the trial is complete the plant's production capacity from its three lines will reach 33,000t/day of clinker.

Global Cement News

Tabuk Cement postpones opening of second clinker line

Tabuk Cement Company announced it



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- liner plates for cyclone heat exchangers and
- some other castings which are used in cement production process



has postponed commercial operation of its second clinker line for the second quarter of 2017.
Intercem markets

Umm Al Qura Cement to start production at new line

New production line is supposed to begin operation in the third quarter 2016.

Wärtsilä supplies 161MW Flexicycle power plant to Yamama Cement

Wärtsilä has signed a contract to supply a 161MW Flexicycle (combined cycle) power plant to Yamama Cement.
Daily cement

SUDAN

Sudan records increase in investment in cement sector

Investments will help boost infrastructure development in the region.

Sudan cement market witnesses decline in prices

The cement market is struggling with economic recession
Cemweek

SYRIA

Hama Cement may boost production capacity

The company may invest in a new cement plant.



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UAE

Fujairah Cement Industries to establish new company Sohar Cement Co. in Oman

Oman: Fujairah Cement Industries announced it will establish a new company in the Sultanate, entitled Sohar Cement Co.

Daily Cement: 248/

Arkan Building Materials aims to enter new markets and boost exports

Arkan Building Materials said it has registered a solid growth this year and is now aiming to increase exports to 20% of the group's total revenues over the next 3 years.

Daily cement



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Höganäs Bjuf inaugurates the world's most modern plant for monolithic products

On 01st of September 2016, Höganäs Bjuf inaugurated the world's most modern plant for the production of monolithic products in Bjuv, Sweden. The facility, with a total capacity of 30,000 tonnes per year, will be used for production of a new generation monolithic products for customers in e.g. the cement, steel and aluminium industries in 70 countries around the world.

In 2015, Höganäs Bjuf took the strategic decision to develop a new generation of monolithic products with even better properties than those available on the market today. To ensure quality and safe deliveries, Höganäs Bjuf also decided to build the world's most modern plant for the production of monolithic products in Bjuv, Sweden. The plant, which represents an investment of about 40 MSEK was inaugurated on 01st of September 2016.

The new factory has a floor area of approximately 1,000 m² and is designed to produce 30,000 tonnes of monolithic products per year. High degree of automation and the latest mixing technology ensure high and consistent product quality. The factory is completely dust-free and designed with sustainability in mind.

The new Höganäs range of monolithic products has significantly better characteristics than current products on the market. A unique bonding technology makes it possible to both mix and dry them significantly faster than conventional monolithics, saving time and money for the customers. Four product families, plus the well-known Borgestad range, meet all relevant market requirements. An app for smartphones gives customers access to product data and installation instructions in a few clicks.

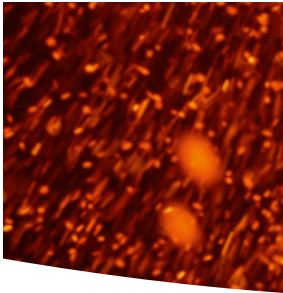
Höganäs Bjuf has been manufacturing refractory products for almost 200 years thereby gaining a technology leader position in the market. In recent years, the company has intensified and enhanced research and development by recruiting international expertise and building up one of Europe's most modern laboratories for refractory products.

Along with the new factory and product range, these extensive investments are fully in line with the company's commitment to offer customers a total solution, which in addition to a broad product range includes design, engineering, logistics, supervision and installation.

For more information contact Egil Friestad, phone **+46 705 746622** or at egil.friestad@hoganasbjuf.se

Höganäs Bjuf is part of Borgestad Industries, a leading global supplier of refractory solutions and products to customers in more than 70 countries. Operations are conducted through eight renowned brands: Höganäs Bjuf, Borgestad Fabrikker, J.H. Björklund, T Knutsson, GL Contracting, AG Port, Macon and Mektec.

Borgestad Industries has a turnover of about 700 MSEK and is part of Borgestad ASA listed on Oslo Stock Exchange. Borgestad Industries operational headquarters are located in Bjuv, Sweden.



When only the best is good enough

Are you looking for the best monolithic products? Try the new generation monolithics from Höganäs Bjuf. A unique bonding method makes them both significantly faster to mix and dry than traditional monolithic products, saving time and money. With four product families, plus the well-known monolithics from Borgestad, we cover all your needs.

But to manufacture the best monolithics you need to do right from the very start. That is why we recently inaugurated the world's most modern plant for monolithic products in Bjuv, Sweden.

This initiative shows our ambition to offer our customers a total solution, which in addition to a broad product range includes design, engineering, logistics, supervision and installation.

For more information, visit www.hoganasbjuf.com



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Vortex Offers Loading Spouts for Cement Industry

Vortex Global Ltd's loading spouts are used for loading dry/bulk solid materials into open and/or enclosed vessels like trucks, railcars and barges. The 4-cable lifting design provides maximum stability when compared to the standard 2- or 3-cable systems.

"We are so confident that our loading spout's design will increase the lifespan of the lifting cables," says Vice President Jon Jasinski, "that Vortex offers a 10-year cable warranty on both standard systems and high volume systems. Our cables will seldom need replacing saving our customers money and time."

The warranty covers any Vortex loading spout cable that breaks due to friction from the pulley. The 3-piece CNC machined pulley features chamfered edges and precision cable grooves to significantly reduce cable wear and back lashing as the loading spout extends and retracts. Because the cables do not fray, cable failure is nearly eliminated and so is costly downtime for repairs.

Vortex can also custom engineer loading spout systems to meet any loadout application requirements, including corrosive or hazardous materials, long distances, and extreme temperatures.

For more information, visit <http://www.vortexglobal.com/loading-solutions/>.

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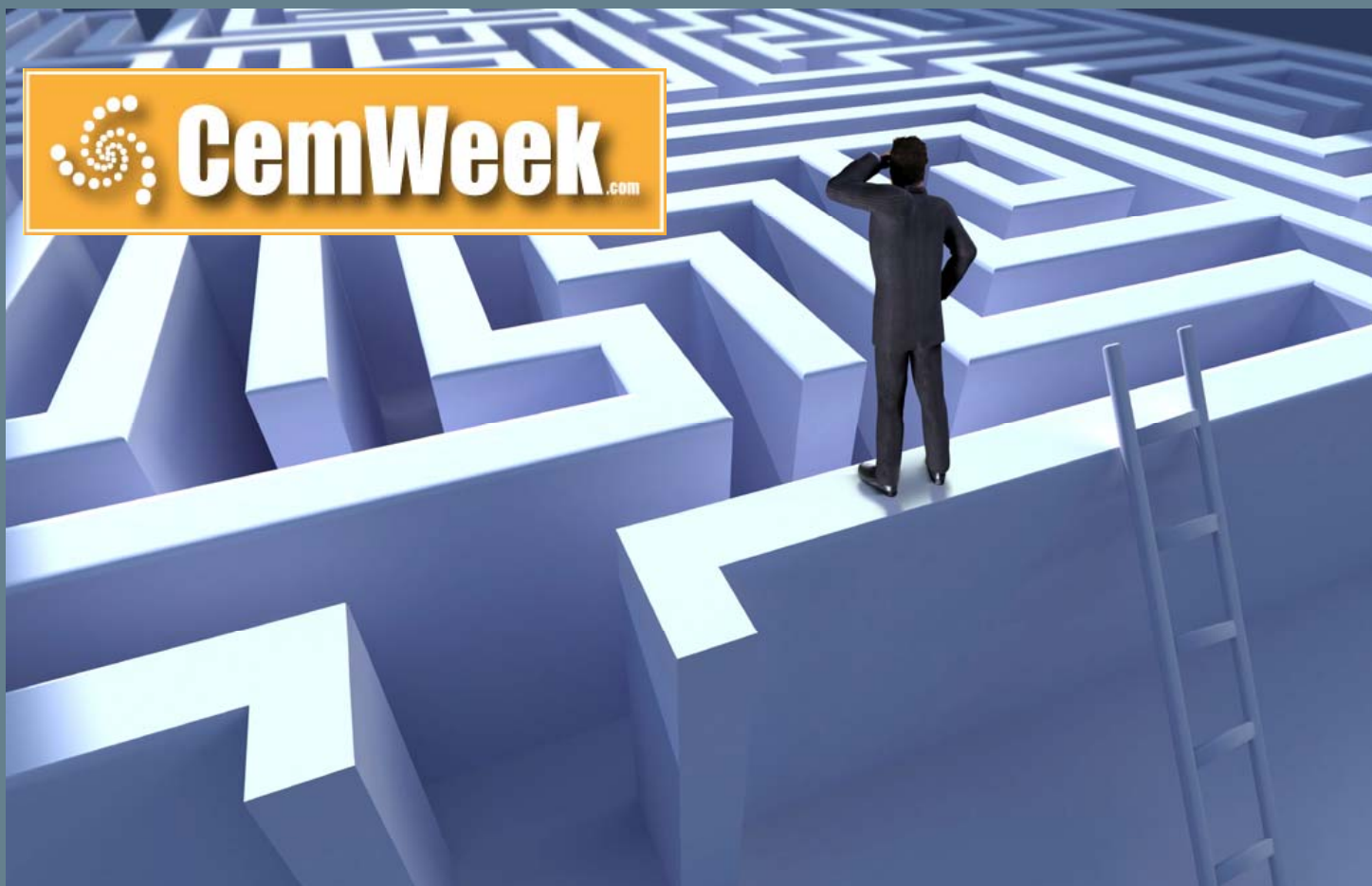
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Large slab polishing-brushing: Iride chooses Sacmi-Nuova Sima

Latest supply demonstrates that the Sacmi Group has completed and expanded its range of solutions for large fired slab finishing, ensuring flexibility, high automation and total quality control



Sacmi's range of ceramic slab/tile polishing and diamond-tipped brushing solutions continues to grow, as the latest order supplied by Nuova Sima (the Sacmi Group's specialist provider of automated machining, inspection, handling and end-of-line solutions) to Iride (a pivotal long-standing ceramic machining player in the Sassuolo district that provides services to the industry's biggest brands) clearly demonstrates.

Delivered at the start of the year and already running at full capacity, this complete line for the polishing/brushing of fired slabs includes solutions that complement the already tried-and-tested line of Sacmi-Nuova Sima unfired product cutting solutions. This new highly automated line features an automatic handling system that picks the tiles and feeds the polishing-brushing machine. The extremely innovative integrated machining centre is made up of two units, each equipped with 15 floating heads, a solution that allows effective, flexible management of widely differing products, including slabs as large as 1600x3200.

This solution – which works in concert with unfired product cutting systems already integrated into Sacmi's CONTINUA+ large decorated ceramic slab manufacturing line – is extremely efficient and competitive as it can control, via the two machining units, complex polishing and brushing tasks on every type of commercially available surface and size. Downstream

from the polisher-brusher lies another essential part of the order, the cutting line, which allows users to obtain the various sub-multiples starting from an already-treated surface (i.e. one ready for subsequent finishing, packaging and palletization).

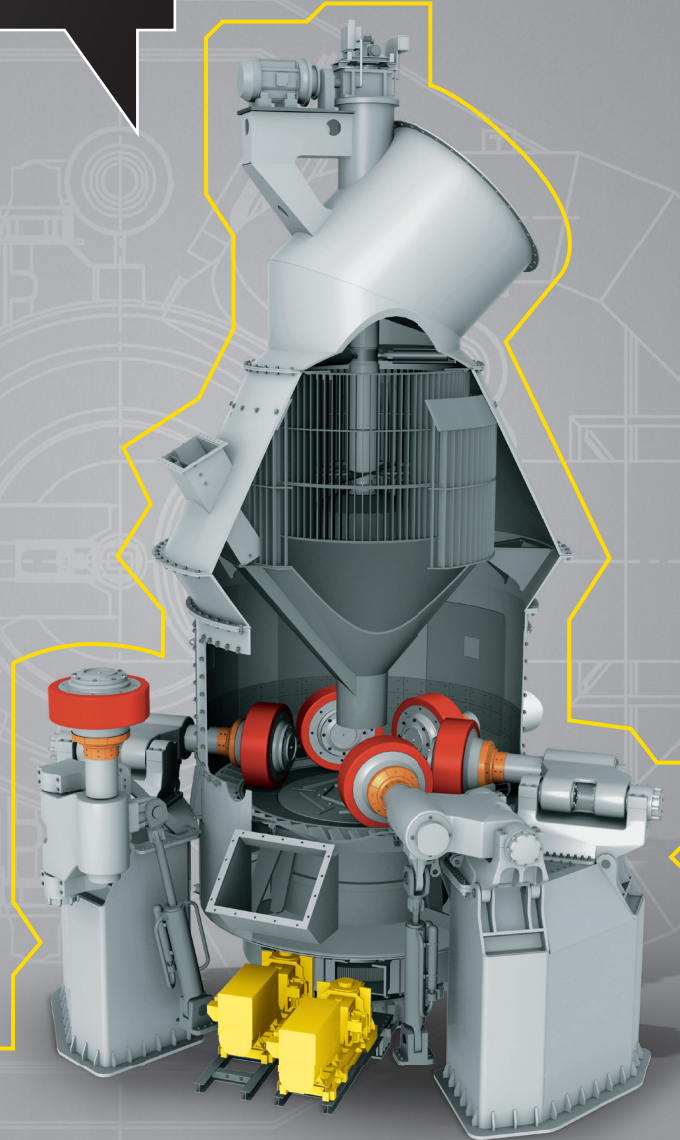
A further essential element of the order supplied to Iride regards, in fact, final slab treatment: this solution, in addition to removing residual vitrified material, occludes the microporosity that can form on ceramic surfaces. Indeed, the latter often gives rise to the well-known problem of surface cleanability over time. With the Sacmi-Nuova Sima machine, instead, slabs offer excellent long-term cleanability, a key factor in laying and a significant source of added value, especially where tiles/slabs are used in high-traffic areas such as shops, airports and crowded public spaces.

Together with the polishing-brushing, cutting and finishing line, Nuova Sima also supplied – via the specialised Surface Inspection brand – six automatic inspection systems for checking size and colour: an effective solution that ensures products meet the required surface, size and colour specifications. Yet another distinctive feature, which together with high levels of line automation, ensures Iride can count on fully automatic total quality control, making it one of the very few outsourcers in the district capable of offering such advanced services.



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New multi-fuel kiln burner launched at Rohoznik - FLSmidth's new JETFLEX® burner has helped improve plant operation and alternative fuels usage at the Rohoznik Cement Plant

By: Mads Nielsen and Carsten Damslund Jensen, FLSmidth

* This article is based on an article first published in World Cement

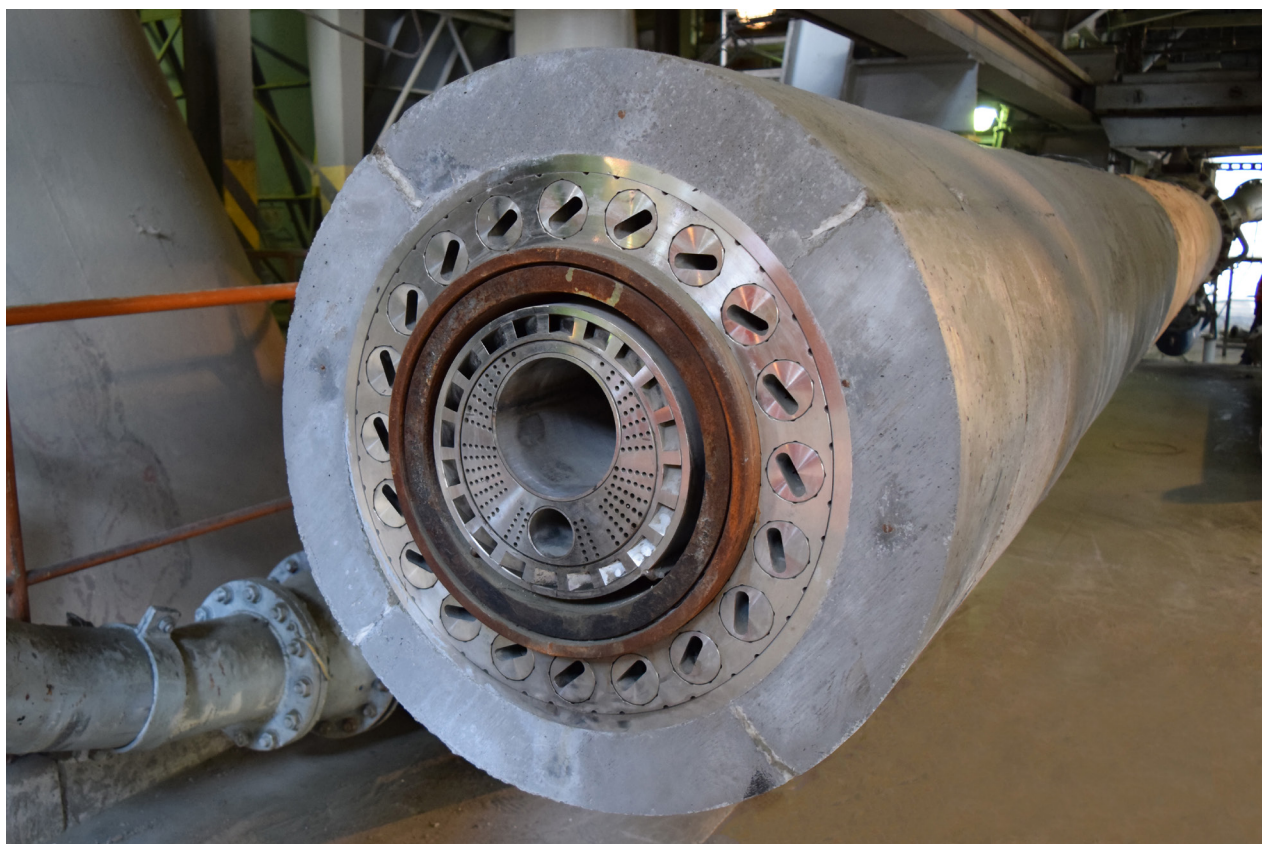


Figure 1 JETFLEX® burner

FLSmidth is introducing the next generation of kiln burner, the JETFLEX® burner, meeting the demands for high fuel flexibility, reliable and stable operation and outstanding heat efficiency. At CRH's Rohoznik Cement Plant in Slovakia, the first FLSmidth JETFLEX kiln burner has now been in operation since beginning of February 2016. The numerous features built into the prototype design for optimising reliability, availability and fuel substitution have been tested with solid and convincing results. Rohoznik's goal with the new burner was to improve alternative fuels substitution rate, clinker quality and energy efficiency .

The JETFLEX burner is the result of an extensive development programme conducted at FLSmidth's research facility, Dania. The development programme included physical comparison tests of more than 10 different burner designs. They were put through a series of cold tests, including velocity and gas mixing profiles. Based on these findings, the JETFLEX burner design was determined and then developed into an industrial design. During the development programme, a number of leading cement producers were invited to participate in the

testing, including a team from Rohoznik. Impressed with what they observed, an agreement was reached between FLSmidth and Rohoznik to install the prototype burner on Rohoznik's 3500 tpd clinker line, re-using a large part of the existing burner parts.

Following the line of burner innovation

The JETFLEX burner succeeds FLSmidth's DUOFLEX® burner, which has successfully served the market for many years. The JETFLEX burner design builds on the DUOFLEX burner's key design attributes of low NOx emissions, ease of operation and long kiln lining lifetime.

Flame optimisation and improved thermal efficiency

The JETFLEX burner features two main technological innovations: a new type of flat primary air jet nozzle and a shared adjustable centre fuel channel.

Flat primary jet air nozzles

The new jet nozzle design gives the JETFLEX burner the ability to optimise the flame shape and combustion according to the type and quality of fuel. Outstanding combustion efficiency is achieved by the primary air jet configuration, which efficiently mixes fuel with hot secondary air.

Enabling increased retention time

In order to enhance solid alternative fuel substitution, the centre fuel channel can be designed to be adjustable in length, allowing the fuel to expand and decelerate to gain retention time and increase fuel surface exposure, which improves fuel conversion and combustion.

This, combined with fast mixing with hot secondary air ensures early ignition and maximum fuel burnout, while also reducing or eliminating fuel particles combusting in the clinker bed. The effect is supported by physical and CFD simulations, which show that the ignition distance from the burner front is significantly reduced.

The improved burn out contributes to better clinker quality and the highest degree of alternative fuel substitution.

Elimination of the annular coal duct

The combined effectiveness of the jet air nozzle design and the swirler has made it possible to eliminate the traditional pulverized fuel annular channel. Usually the annular channel is exposed to wear due to changes in flow direction and internal wear on the burner parts.

The solid fuels introduced through the JETFLEX burner are transported in a straight, uninterrupted pipe design, which fuels can pass through without disturbance, reducing wear and maintenance.

Furthermore, the solid fuel channels can be designed as a shared fuel channel for simultaneous burning of multiple solid fuels, such as coal, petcoke and solid alternative fuels. This improves heat economy by minimising the cold airflow arising from the fuel transport. The JETFLEX burner design allows for a traditional annular channel if specifically requested. At Rohoznik, in addition to installing the JETFLEX burner, a new coal transport system was installed, including a pipe and blower with reduced flow, reducing the transport air amount by 2000 m³/h by utilising the shared fuel pipe.

Based on the findings through the development programme and the industrial test at Rohoznik, FLSmidth has released two versions of the JETFLEX burner: a version with fixed jet air nozzles and a PLUS version with rotatable jet air nozzles. The fixed nozzle design is targeted towards traditional fuels such as oil, gas, pulverized solid fuels and high and medium alternative fuel grades. The PLUS version targets, in addition to the above, lower alternative fuel grades, due to the maximum flame forming possibilities offered by the design.

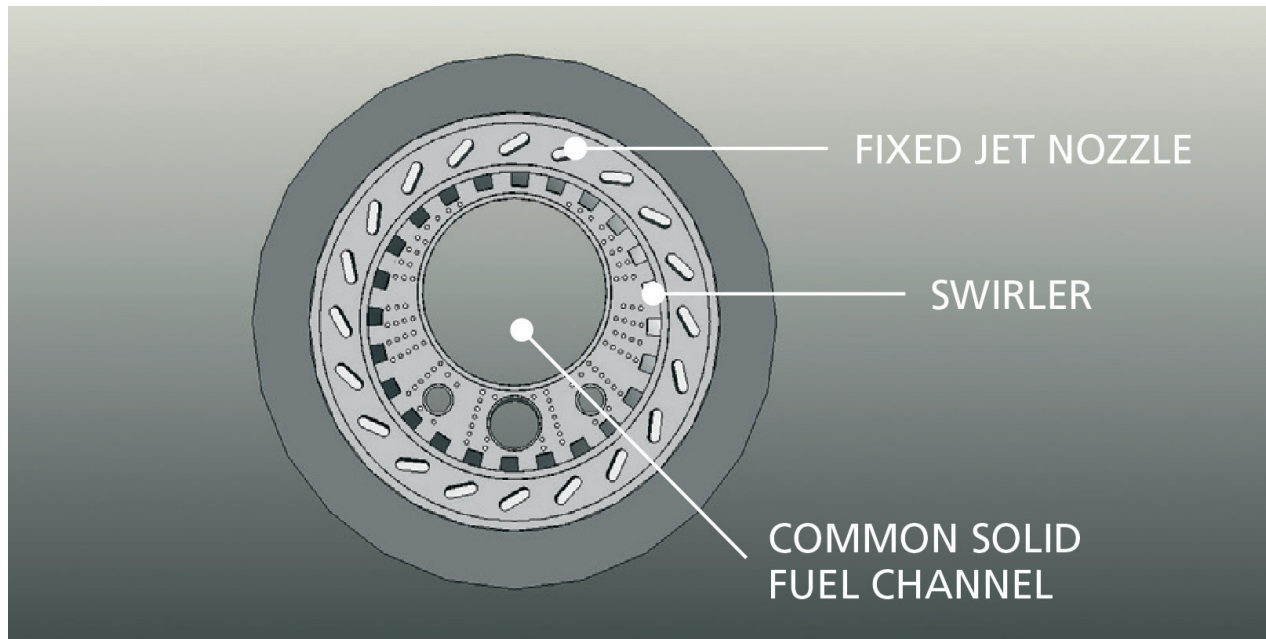


Figure 2: JETFLEX® burner

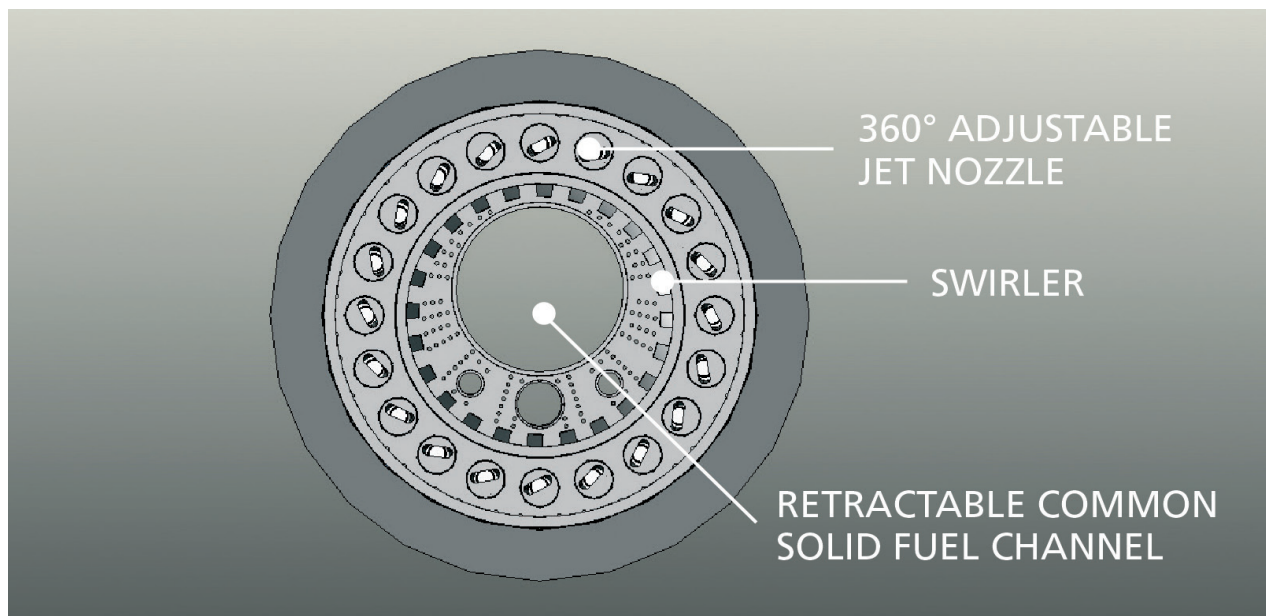


Figure 3: JETFLEX PLUS® burner

Successful cooperation and start-up

The development project at Rohoznik was managed by Mads Nielsen from FLSmidth R&D and Przemek Bochen, Production Manager at Rohoznik. Thanks to the good collaboration between them and their teams, the project has been highly successful.

Before the installation of the JETFLEX burner, a series of baseline tests were performed on the installed multichannel burner in order to obtain performance data. One test included a special high-temperature flame camera. The camera provides video footage of the flame and helps to understand flame and fuel behaviour inside the flame.

The footage in figure 4 (1 and 2) was taken in visual spectrum and infrared, where the cold AF fuel appears black on the display. As can be seen above, the solid AF fuel was poorly suspended and dropped out of the flame into

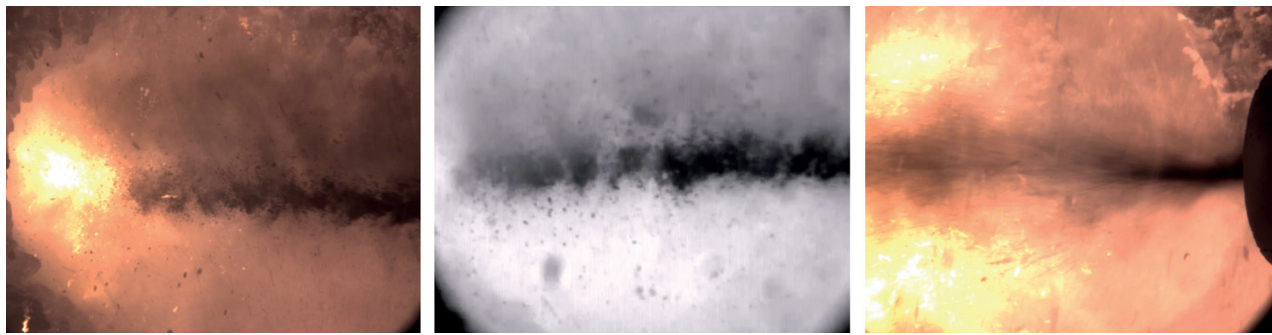


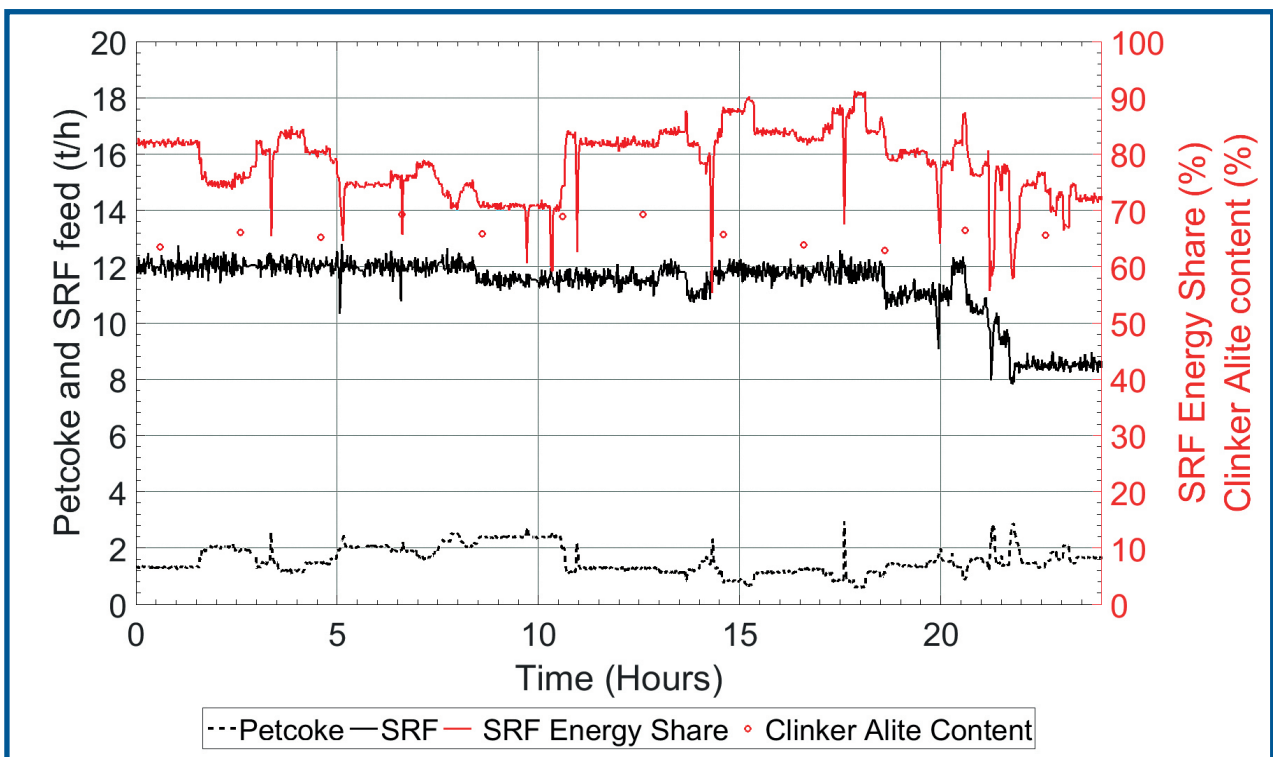
Figure 4: Flame footage of the old burner (1 and 2) and the JETFLEX® burner [3]. Footage 1 and 3 is taken in visual spectrum and no. 2 is taken in infrared spectrum. Cold un-ignited fuel appears black. The JETFLEX burner footage (3) illustrates how well the JETFLEX burner mixes and suspends the fuel in the flame centre.

the charge.

Successful performance

After being installed during the Rohoznik plant’s winter shutdown, the JETFLEX burner was started up on 8 February 2016. The JETFLEX prototype installed at Rohoznik is designed for 100 percent coal/petcoke firing, natural gas for heating up and a high percentage of waste fuels – up to 100 percent depending on fuel quality. According to the plant operators, it proved easy to start and gave them excellent flame control from the very beginning. Changes to burner settings can be observed immediately. The operators also found they were able to transition smoothly from gas to petcoke and then to alternative fuels firing.

The Rohoznik plant has been highly successful in its use of alternative fuels, such as Solid Recovered Fuel (SRF) and others. Consequently, the alternative fuel substitution is one of the key performance parameters, together with capacity, clinker quality and energy efficiency. The operators and the project team spent the first months of operation testing and optimising the burner and kiln performance, improving the overall performance on all accounts.



Graph 1: Alternative fuels substitution and clinker quality

Improvements in burner performance have been recorded using the special camera and other operational data. The footage (figure 4) shows how well the JETFLEX burner is able to mix and suspend the fuel in the flame centre with a strongly reduced tendency for the fuel to drop into the kiln charge.

The graph above indicates the JETFLEX burner fuel flows, the petcoke substitution (measured as energy share), and the clinker Alite (C3S) content over a 24-hour period. A substitution of approximately 80 percent was achieved with a 1420- MJ/kg SRF (Solid Recovered Fuel) at 1024- percent moisture, while maintaining good clinker strength. At 20 and 22 hours, the SRF dosing unit experienced a blocking tendency forcing a reduced SRF flow from approximately 12 tph to 8.5 tph. The average kiln inlet NOx emission was recorded well below 700 mg/Nm³ at 10% O₂ during the same period.



Figure 5: Burner tip in excellent condition after 3 months operation

Inspection after first run

The JETFLEX burner was in operation for 106 days without any issues until a planned two-day plant shutdown, which was ample time for a thorough inspection of the burner. The front of the burner appeared in excellent condition and the rotatable air nozzles were all in good condition and could easily be rotated. Following the inspection, the burner is now back in operation.

A bright future

Production Manager Przemek Bochen at Rohoznik says: "We faced an increasing need to bring alternative fuels into our production, and we saw a good opportunity to do this with a new burner. We have been pleased with the performance of the JETFLEX burner."

Mads Nielsen also confirms that FLSmidth is highly satisfied with the burner's performance at Rohoznik:

"The performance to date shows that the JETFLEX burner is very good burner. The main focus at the plant has been on performance, reliability and simplifications – goals that have all been achieved."

The JETFLEX burner is ready to serve the market for any kiln fuel of today and tomorrow.



Unitherm burners in Egypt (M.A.S.-system) with PNEUMO DEFLECTOR

Since the last couple of years Unitherm delivered plenty of burners for cement factories in Egypt. As natural gas has become hardly available in Egypt, no other way than to switch to coal, petcoke and solid alternative fuels was a feasible measure to gain independence from standard fuel resources like oil and gas.

All new burners were delivered as multi fuel burners with the main topic on fuel substitution by firing solid alternative fuels with our PNEUMO DEFLECTOR-system. Our clients are CEMEX Assiut, TITAN Beni Suef and Alexandria Portland Cement. These plants are in operation with our kiln and calciner burners since 2013, 2014 and 2015.

In 2015 GEBRÜDER PFEIFFER ordered kiln and calciner burners for the 5000 tpd ASEC kiln line in Al-Minya for conversion to coal and kiln line upgrading. For the same purpose we delivered our burners to CHRISTIAN PFEIFFER for 2 INTERCEMENT kiln lines in Amreyah.

In 2016 ITALCIMENTI ordered 2 multi fuel burners for SUEZ CEMENT to start also with solid alternative fuel in their plant. The above projects are in the final stage now and commissioning in progress. Next year we will inform you about these installations.

Below please find a brief project description of our installations for CEMEX and TITAN and in the last paragraph a description of our PNEUMO DEFLECTOR-system.

Cemex – Assiut Kiln line I, II, and III

Main target was the change of the main-burners to fire petcoke and solid alternative fuels.

Two M.A.S. kiln burners with 97 MW each and one burner with 105 MW firing capacity for petcoke, HFO and solid alternative fuels.

All burners for Cemex Assiut are equipped with a divisible burner jacket tube for easy maintenance. The divisible jacket pipe is a unique Unitherm design to change only the front part of the burner jacket pipe (when worn) and replace it by a readily prepared new one. An internal mechanism makes this work very easy and ensures reliable locking and unlocking.

The primary air fans from the old installations as well as the HFO fuel supply could remain in use. The carriages however were supplied from Austria.



Titan – Beni Suef line II

For line II we installed a new main burner to fire 100% petcoke and dried sewage sludge with the possibility to fire later also an additional alternative fuel. The M.A.S. Kiln burner has a firing capacity of 62 MW. The entire gas and HFO system remained as existing, the primary air fan with all hoses and the trolley as well.



The UNICAL calciner burner, installed in a Fives Fcb Low-Nox pre-calciner, is able to burn petcoke with 5% oil substitution (100% with super fine ground coal).

This top fired UNICAL burner, with a firing capacity of 116 MW can be also used to burn natural gas and solid alternative fuel like in use on the main burner.



We replaced the gas fired auxilliary burner at the tertiary air pipe firing now HFO. There a new oil valve train and an air fan providing higher pressure for oil operation was necessary. For the raw meal system a new hot gas generator including the HFO oil feeding system were installed.

Later we were assigned to convert our calciner burner for 100% waste oil operation (116 MW) on the pre-calciner. Different oils ranging from low to high viscosity including HFO should be able to be fired with one waste oil firing system.



The tank suction heater remained as it was installed for the former used HFO-system.

Unitherm installed a pump and pre-heater unit with frequency controlled oil pumps. At the calciner burner platform a waste oil valve train was installed. For the different oils as well as for the HFO we use our UNIGRESS DDM-XL air atomizer waste oil lances. This lances can be operated with an oil viscosity of about 50 cSt providing main fuel quality atomising.



To provide the proper heating temperature the viscosity was metered at the valve train and converted to an input signal for the thermal oil operated waste oil pre-heater unit. Depending from the oil used, the oil temperature ranges from ambient temperature up to 70°C

This UNICAL calciner burner now can be used for natural gas, petcoke, solid alternative fuel (DDS), HFO and a big variety of waste oils.

With these burners highest flexibility is granted.

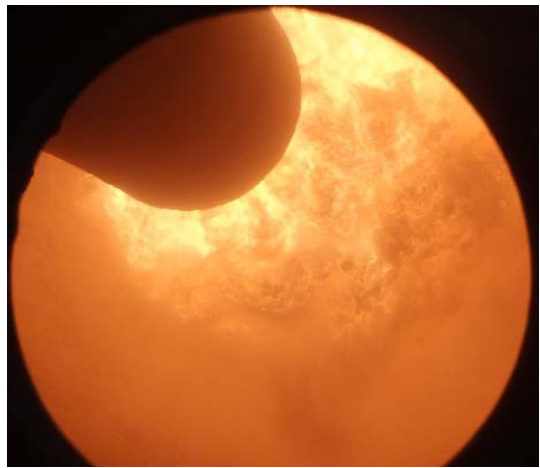
Titan – Beni Suef line I

In line I we installed a new kiln burner for the same fuels and with the same performance as on kiln line II.

The old primary air fan was also replaced as it was primarily used for natural gas and oil operation. The air pressure was too little for proper operation necessary for petcoke and for solid alternative fuels.

The oil and gas system remained, but the burner trolley was too weak. We provided engineering drawings for local fabrication.

Four UNICAL calciner burners for petcoke and fuel oil operation with a firing capacity of 32,5 MW per burner were installed in the old 2-string calciner originally supplied by Kobe Steel.



TITAN - Alexandria Portland Cement

Also at this plant the main target was to switch from gas and oil to petcoke and in addition to fire waste fuels. Due to the limited space availability in the plant the petcoke has simply been delivered in big bags.

The existing Gas and Oil operated kiln burner has been changed to an M.A.S. burner firing petcoke, HFO or diesel, natural gas and two types of secondary waste fuel (DDS and RDF). The firing capacity is 76 MW. Carriage, primary air fan and gas valve train remained. A new UNIGRESS ZL fuel oil lance replaced the existing lance which had a very big diameter, wasting too much space inside the burner. With minor adaptations the fuel oil valve train remained in use.

Four coal and oil operated UNICAL calciner burners with a firing performance of 32,5 MW each, were installed on the FLS ILC.

The natural gas calciner firing remained untouched.

For all installations we additionally provided erection supervision and commissioning service.

PNEUMO DEFLECTOR-system

All these UNITHERM M.A.S. kiln burners were equipped with our PNEUMO DEFLECTOR-system to provide the highest performance of solid alternative fuel intake.

The PNEUMO DEFLECTOR-system is patented and only available in combination with a UNITHERM M.A.S. burner.



Requirements for firing Solid Alternative Fuels

Prior of using alternative fuels many of parameters must be considered. Particularly at first time use of alternative fuels in a cement factory the expectations are too high in regard of the achievable substitution rate. Changed process conditions often must be expected as alternative fuels have sometimes chemical fuel compositions not matching process conditions. An increased oxygen content (about 3 - 5%) at kiln inlet should be available in addition.

A very important concern is the preparation of the waste fuel. The particle size and material moisture are the most important parameters, as they are directly responsible for the residence time. The permanent availability of such a fuel in constant quality is also of high importance.

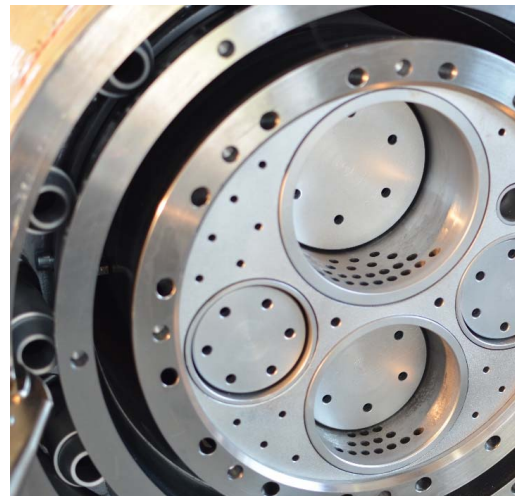
Most of the plants taking profit of a very high substitution rate (80%-100%) have long time experience in using waste fuels in general and increased their rate over years. For a first time installation a substitution rate of about 30% of the thermal burner capacity should however be attainable. (Basic recommendation - the burner however can be designed for all future tasks.)

Description of the PNEUMO DEFLECTOR-system

The uniform flow of particles (solid alternative fuel flow) in a therefore designated waste fuel pipe located in the burner is normally “straight”. This is achieved without any action, using conveying air only.

This flow however can also be “deflected”, up to a 10° deflection of the entire waste fuel flow.

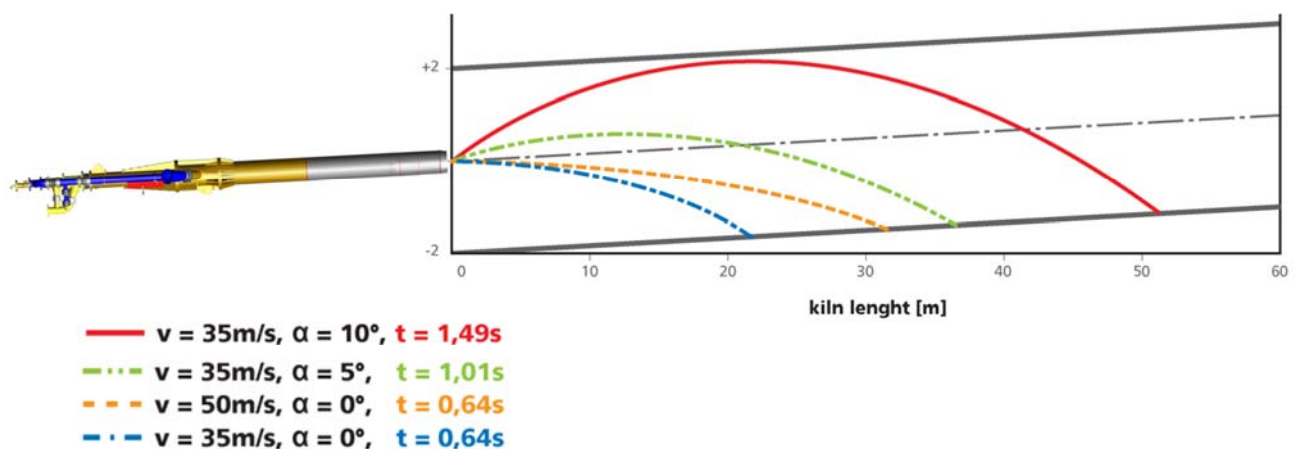
This is done by means of a nozzle situated at the waste fuel pipe exit. This nozzle is equipped with bores located on the nozzle bottom side. This bores have well-chosen diameters, drilled under a well-chosen angle. The energy for the deflection is provided by the primary air pressure which is adjustable.



In this way we control the deflecting angle from 0° up to 10°, in dependence of the desired firing requirements.

The particles will follow a trajectory through the main flame up to the oxygen rich zone of the kiln (along the main flame) and further back into the main flame again. In this way the residence time is increased.

Please consider the relation between velocity, deflecting angle and residence time in above illustration. With a higher injection velocity only the throwing range can be increased.



The only effective way to increase the resistance time is to change the injection angle.



WHY USE HYDRAULIC DIRECT DRIVE SYSTEMS IN THE CEMENT INDUSTRY?

In a cement plant, the gigantic rotating kiln is the heart of production and has to work 24 / 7. This makes it a perfect application for hydraulic direct drive systems, which offer unbeatable reliability, exceptional uptime, high starting torque and great flexibility. Not only do they withstand vibrations, they also make it possible to start up the kiln without any overdimensioning of the drive system.

The number of hydraulic direct drive systems is steadily increasing, especially in applications such as kilns, crushers, feeders, mills and roll presses. Wherever variable speed, power sharing or high starting torque is required, and wherever shock loads occur frequently, hydraulic direct drives should be the first choice.

A Hägglunds hydraulic direct drive system from Bosch Rexroth allows a large kiln to be driven at variable speed, adapting rpm to the current production, while still offering the capacity to start up from standstill. It also balances the driving forces, thus eliminating the transfer of vibrations to the machine. The compact, low-weight Hägglunds motors are mounted directly on the drive shaft without gearboxes, foundations, special frames or



complex attachments, which saves space, installation time and cost.

Redundancy and reliability
Hägglunds hydraulic direct drive systems have proven invulnerable to harsh environments and varying production with their unique ability

to handle a starting torque of 3 - 4 times the running torque – without overdimensioning of the drive system. When multiple hydraulic motors are used, they provide a high level of redundancy and perfect load-sharing. Moreover, since the motors are connected hydraulically

and share the load equally, they minimize wear. A hydraulic direct drive system is used both for the main drive and for the auxiliary drive during maintenance and emergency stops. Unscheduled shutdowns are not acceptable for cement plants, not only because the kiln is the key to production, but also because a stop can easily deform or break the kiln due to the extreme heat that arises inside during standstill.

Unbeatable flexibility

With a hydraulic direct drive system, a kiln can be dimensioned for all operating conditions and kept in continuous operation. The rotation speed can easily be adjusted as required – ranging from zero up to maximum speed with the same high degree of reliability.

“Flexible speed control not only lets you increase production, but also results in better quality, since you can experiment to find the optimal feed-speed ratio,” says Per Åström, Industry Sector Manager, Mining

and Material Handling & Cement, at Bosch Rexroth. “No matter how much or how little you feed in, you always end up with great-quality raw material for cement. In this way, future capacity increases or reductions can be achieved more efficiently and with greater flexibility.”

Less installed power

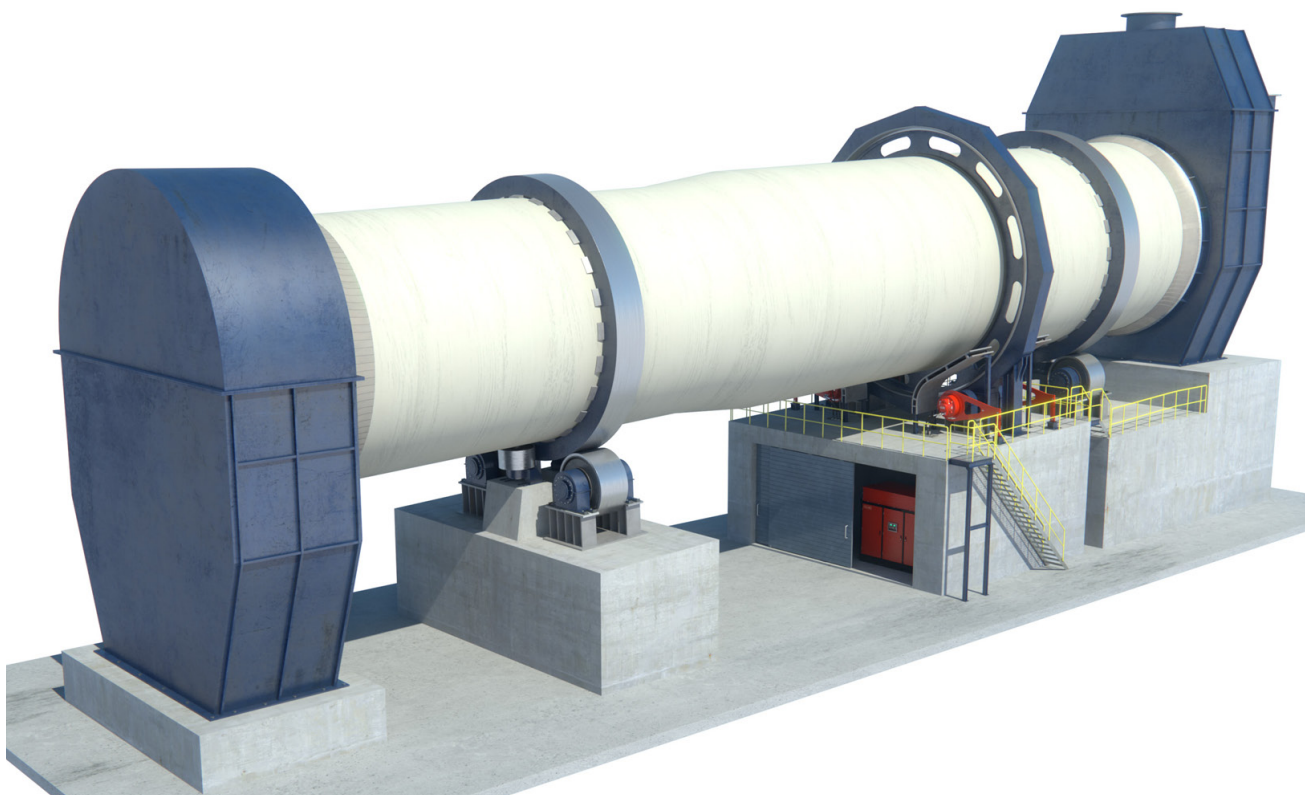
Bosch Rexroth offers a flexible drive system concept for kilns and drums that allows less power to be installed while achieving a more compact system with the same flexibility as before. This concept takes advantage of the possibility to use tandem Hägglunds motors, connecting two motors to each shaft. It also creates an adaptive system, where drive parameters can be changed during operation to maintain the ‘sweet spot’ and make the production more efficient. This is achieved through the built-in control system in the Hägglunds drive unit, which supplies the hydraulic motors with the necessary hydraulic power. The

drive unit can be located anywhere convenient and communicates with the DCS via any interface.

“With this solution our customers can achieve higher productivity, flexibility and reliability, adapted to the actual production need,” says Åström.

Low lifecycle cost

Hägglunds hydraulic direct drive systems from Bosch Rexroth offer an excellent solution for reliable and uninterrupted production, which is exactly what is demanded for tough applications like kiln drives. Complete retrofit kits for upgrading existing kilns are available and can easily be installed during a scheduled maintenance stop. “I have customers who installed our drive systems five or ten years ago and haven’t had a single unscheduled shutdown since. All in all, we offer a lower lifecycle cost, thanks to higher productivity coupled with less maintenance and downtime,” concludes Åström.



FRITZ & MACZIOL secures Supply Chain Management with the Electronic Proof of Delivery (ePOD) Solution for VAS®

FRITZ & MACZIOL, the provider of the VAS® IT logistic solution, which is used in more than 200 industrial plants worldwide, has successfully implemented a new module for its customers in Southeast Asia, which secures the final step of delivery in the supply chain. FRITZ & MACZIOL is a part of axians, the global ICT brand of Vinci Energies.

The need to be in full control of shipments that are leaving a cement plant, was the reason for LafargeHolcim to add another important feature to their logistics dispatch solution VAS® in several plants in Southeast Asia. VAS® is supporting the online pre-registration of trucks (iDISPO), the parking management, the call to entry, the complete entry process including registration and truck weighing, the loading and exit process of the trucks – including the exit weighing – as well as automated delivery document print-out within a plant's truck dispatch process.

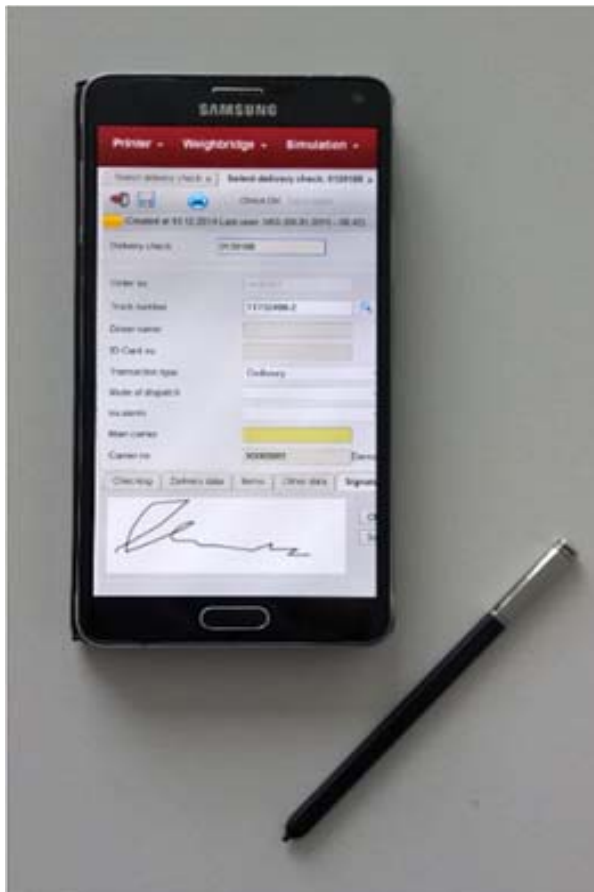


Image: Mobile signature with the ePOD (Electronic Proof of Delivery) module, which leads to a smooth supply chain in production and logistics. (Image: FRITZ & MACZIOL)

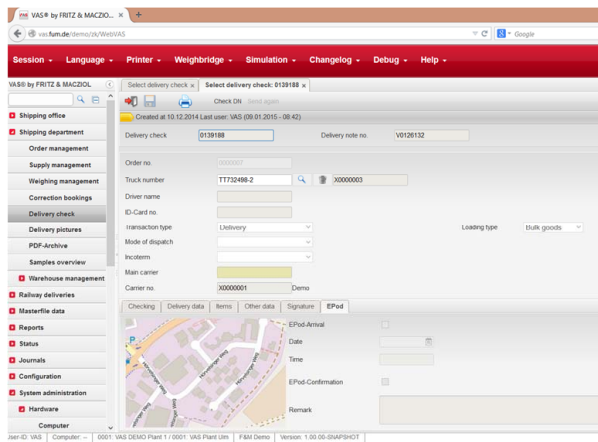
In order to monitor the delivery status, the current position of the shipment as well as the final delivery, LafargeHolcim decided to expand the range of its IT logistics solution VAS® by adding the module Electronic Proof of Delivery (ePOD). This module gives authorized plant personnel full control of shipments, even after the trucks have left the plant. Using a standard web browser, they can access VAS® and are able to review the shipment details at any time from any place. The module is compatible with smartphones and other mobile devices via HTML5, enabling the truck driver to request a delivery signature on the screen of his mobile device, which is then saved in the VAS® database and allocated to the shipment in question. By including GPS data, it is also possible to determine the geographical location of the shipment.

The ePOD module gives businesses full control of their shipments at any time and helps them increase their overall security within the supply chain management process. Mr. Claus Jordan, Director of Business Development of IAS Germany, highlights the importance

of the new module for the market: „In order to meet the high security needs of our customers, the ePOD module was created specifically for our customers. These new features enable companies to make their logistics processes more flexible and efficient.”

The VAS® solution will be presented at the following conferences:

21st Arab Intern Cement Conference & Exhibition
 Abu Dhabi, UAE
 16.-18. November 2016
 Booth Numbers H-N + H-N1



Screenshot of the VAS® browser of FRITZ & MACZIOL with GPS truck positioning (Image: FRITZ & MACZIOL)

About VAS®

VAS® – the process-orientated software solution for the raw materials industry - forms the entire process chain from delivery via dispatch and loading, right up to departure. As the link between ERP systems and technical systems, VAS® represents the key function and the 'adjusting screw' for efficient process sequences. In addition, VAS® supports reporting functions and supplies real-time information to further systems, for example for Production, Sales or Controlling. All external technical systems such as the weighing, silo or metering technology are completely integrated into the VAS® logistics system processes. VAS® is currently used in more than 200 plants worldwide within the raw materials industry.

FRITZ & MACZIOL, member of the axians ICT network

The FRITZ & MACZIOL GmbH (F&M) with its headquarters in Ulm, Germany is an independent IT systems house which offers a complete portfolio of consultancy, services, software and hardware. Top-partners of the company are Cisco, EMC, HPE, IBM, Microsoft, SAP as well as further industry leading manufacturers. Besides the traditional IT business

also further strategic IT fields like cloud, mobility, business analytics and Industry 4.0 belong to the core competences of the company. Since October 2014 F&M belongs to the French Construction and Industry conglomerate of Vinci. Under the umbrella of the brand Axians, Vinci Energies connects all ICT (Information & Communication Technology) activities worldwide. www.fum-vas.de

About Axians

Axians supports its customers – enterprise, public sector, carriers and service providers — from IT & Infrastructure services to digital transformation. Axians provides a comprehensive portfolio of solutions: software solutions, cloud-based and managed IT services, data systems and data centres, enterprise networks and collaborative solutions, telecommunications infrastructures. Axians is a brand of Vinci Energies. www.axians.com
 2015: €1.7 billion revenue // 8,000 employees // 200 business units // 15 countries

About Vinci Energies

In a world undergoing constant change, Vinci Energies focuses on connections, performance, energy efficiency and data to fast-track the rollout of new technologies and support two major changes: the digital transformation and the energy transition. With their strong regional roots and agile organisational structure, Vinci Energies' business units boost the reliability, safety and efficiency of energy, transport and communication infrastructure, factories and buildings.
 2015: €10 billion revenue // 65,400 employees // 1,600 business units // 51 countries
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Further Information:

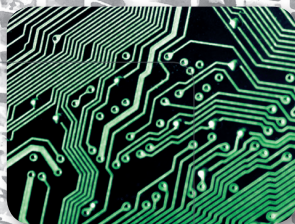
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Case Study:

Dual-process Dosing with German Pfister® Rotor Weighfeeders

J.K Cement Works produces white as well as grey cement in one and the same production line

It was a one of its kind project when J.K Cement Works started production at their new green field plant in Fujairah by the end of 2014: The plant is not only one of the few plants worldwide which produces white cement. On top, this plant also produces grey cement in one and the same production line. It is able to switch the necessary fuels for the clinker process - petcoke and coal dust - in next to no time. One reason for this smooth switchover: The fuels which fire the kiln and calciner are dosed by pneumatical rotor weighfeeders from German FLSmidth Pfister. Those devices are engineered for flawless handling of different pulverised fuels.

In the modern construction industry, both grey and white cement find their own application. While grey cement is cheaper and is used as general purpose cement for concrete etc., white cement is rather used for decorative and aesthetic purposes. Though both types consist of basically the same ingredients, the quality of the raw materials has to be considerably higher in production of white cement.

The heart of each cement manufacturing process is the clinkerisation. Therefore, at “J.K Fujairah Cement” the fuel is prepared in the fuel tower. At “J.K Fujairah Cement” petcoke with a calorific value of approx. 8.150 kcal/kg mixed with 7 % sulphur is dosed and fired for the production of white cement. Coal dust with a calorific value of approx. 6.200 kcal/kg and 15 % flyash is rather used for the production of “grey clinker”, explains Rajesh Khanna, Head-Technical & Operations of J.K Cement. Only two pneumatic rotor weighfeeders Pfister® DRW 4.10 are needed for both fuels and manufacturing processes which are also located in the fuel tower. One of these is feeding into the kiln, the other one into the calciner. This flexibility in fuel dosing of these German-engineered rotor weighfeeders is just one of the reasons the choice of the plant operators fell on this brand.

For grey clinker manufacturing the rotor weighfeeder Pfister® DRW dosing coal dust is laid out for dosing a capacity of 8 tph into the kiln and 11 tph into the precalciner burner. For the production of white clinker the same machines dosing petcoke are able for dosing 8 tph into the kiln respectively 8 tph into the precalciner.

Dosing challenges with petcoke

As compared to coal dust, petcoke is by far more difficult in its handling. Petcoke possesses a higher rate of humidity and has to be ground much finer than coal dust. Both factors contribute to its difficult flow characteristics: Petcoke does not flow easily and thus tends to clog the pre-hoppers. Here, the special engineering of the Pfister® pre-hoppers shows its full advantage: For J. K Cement Works those pre-hoppers were equipped with special agitators. “These stirrer-like agitators improve the material flow by keeping the fuel in motion, mixing it with air and thus providing for better flowability”, explains Hassan Jradi, project manager at FLSmidth Pfister.

What exactly is the trick which enables these German rotor weighfeeders to dose these and other pulverised

fuels like coaldust, lignite, petcoke or oil shale with widely varying characteristics with great stability and constancy? The trick is actually a combination of the following technical features:

Firstly, the rotor weighfeeder is engineered with an inside rotor with chambers: After the material is extracted out of the silo into the rotor weighfeeder, it is weighed and dosed while being transported to the rotor's outlet. The number and size of the chambers inside the rotor are designed and arranged in a proven way to hold a large quantity of bulk material at the same time. The rotor body is suspended on two bearings forming the eccentric weighing axis and one load cell. The weighing axis is positioned eccentric to the rotor shaft, and goes through the middle of rotor inlet and outlet. The load cell mounted at the third suspension point weighs the content in the rotor wheel gravimetrically before being discharged.

Dosing into continuous process requires a predictable, reliable material flow that can be adjusted precisely in order to achieve a stable production. By the weighing electronics the rotor speed is controlled inversely to the measured force: Depending from the set point, the higher the force, the slower-going the rotor, the lower the force, the faster turning the rotor. The prospective control algorithm ProsCon® ensures a precise dosing by anticipating the variation in flow rate caused by material density and flowability. This is enabled by measuring the material weight a long time before dosing at the measuring point. Taking into account the set point and dynamic motion characteristics of the feeder, the necessary speed at the dosing point is calculated and adjusted at the prospective point before dosing. This result is a constant and stable feeding over short and long term”, explain Hassan Jradi. The follow-up pneumatic transport of the petcoke and coal dust to the burner is an essential part of the feeding system. The rotor weighfeeder Pfister® DRW is directly connected to a blower. Clean transport air is blown through the feeder and transports the fuel to the burner.

Secondly, the speed of the rotor itself is an important factor: While other feeders swirl at a rate of several hundreds and more rounds per minute, wearing out bearings, housing and consuming loads of energy, the rotor of Pfister® rotor weighfeeders turns with only 4 - 10 round per minute. Combined with its well-designed and integrated low pressure pneumatic transport, the rotor is able to convey the required amount of pulverized material into the burning area keeping wear and energy consumption at a minimum.

“Here at J.K Fujairah Cement we switch from production of white cement to grey cement and back according to market demand”, says Rajesh Khanna. So it was of major priority to find a dosing system which is able to handle the different fuels without technical adjustments. In the case of the rotor weighfeeders Pfister® DRW the systems are able to handle a variety of pulverized fuels. Their prospective control ProsCon® performs online calibration according to the set data and actual load. So the system literally “adapts” itself to the specific bulk good inside. “The overall capacity of our dual process plant is at 1,750 tonnes per day (tpd) for White Cement and 2,800 tonnes per day (tpd) Grey cement respectively”, adds Rajesh Khanna.

About J.K Cement

As a subsidiary of J.K Cement Ltd. J.K Cement Works was set up as a green field white cement manufacturing plant in Fujairah, United Arab Emirates. The company has commenced its commercial production from September, 2014 and is now supplying white clinker and white cement to more than 20 countries across the globe.

The uniqueness of the Fujairah plant: The plant is being used to produce grey as well as white cement. With its special production equipment and technical layout the plant was especially designed to switch from one product to another depending on market demand. This "Composite Dual Process Cement Plant" is one of the first of its kind in the world. J.K Cement Works (Fujairah) This capacity expansion has made J.K Cement Ltd the second largest White Cement producer in the World.



1. Mr. Rajesh Khanna, Head-Technical & Operations
J.K Cement



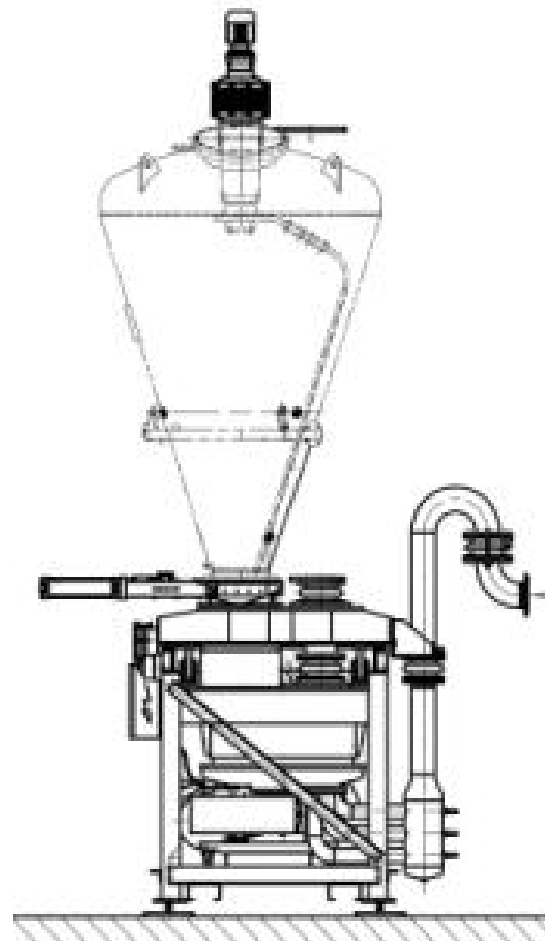
4. Two rotor weighfeeder Pfister® DRW are dosing petcoke and coal dust to the kiln and calciner for production of White Cement and Grey Cement.



2. In this fuel tower both rotor weighfeeders Pfister® DRW are located and the fuels are dosed and pneumatically sent to the kiln and calciner



3. J.K Cement Works in Fujairah



5. Calibration pre-hopper of rotor weighfeeder Pfister® DRW with stirrer to keep the petcoke flowable

ЦЕМЕНТ

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The Russian-language periodical professional publication devoted to the production of cement and other binders, concretes, dry mixes and their applications, as well as to research and design.

A conspicuous place in the journal materials is given to the problems of plant development, capital movement, economic problems facing the cement industries of Russia and other countries.

The journal comes out once in two months and includes news, analytical materials and detailed abstracts of all the articles in English.

Cement and its Applications, Journal
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BEDESCHI EXPERIENCE WITH THE COAL LIFE CYCLE: FROM QUARRY TO CEMENT PLANT

By: Marco Bertorelle – Sales Manager Bedeschi Spa

Coal, used as fuel in the industrial processes, is always more a strategic resource also for the Middle East and North Africa countries' economies.

Bedeschi presentation is focused on the coal life cycle, from mine to ports, until the final use as fuel for cement plants mills.

Coal Industry

The coal delivered from mines that reports to the **Coal Preparation Plant (CPP)**, is called **Run-of-mine (ROM)** coal. This is the raw material for the a.m. CPP, that's a facility to wash coal of soil and rock, preparing it for transport to market.

ROM consists of coal, rocks, middling minerals and contaminations. Contaminations are usually introduced by the mining process and may include machine parts, used consumables and parts of ground engaging tools.

ROM coal can have a large variability of moisture and maximum particle size.

Therefore, coal needs to be stored at various stages of the preparation process, and conveyed around the CPP facilities. **Coal handling** is part of the larger field of bulk material handling, and is a complex and vital part of the CPP.

Crushing: an important aspect to consider is the grain size of coal that is not always able to satisfy the granulometry's features required to use it as fuel inside the mills. Often a crushing treatment became necessary.

This crushing process could be done during the pre-stacking phase, may be directly at the mine, processing the ROM coal, with heavy-duty crushers or during post-stacking phase, using smaller crusher able to correctly feed the mills.

The selection of a primary crushing system rather than a secondary type depends on the type of material, hardness, humidity and abrasiveness.

Very hard coal and low moisture requires an impact machine, a gyratory crushers or a jaw crusher. However, when dealing with a high degree of moisture and sticky material, a double roller crusher sizer is required, as this is the only type of machine that can deal with sticky material, thanks to its rotors geometric configuration and cleaning scrapers that prevent clogging.



The use of a double roller crusher to size coal can have particular benefits in terms of reducing fines compared with impact or jaw crushers. This is important when preparing coal for vertical mills, as these work at best efficiency when fed with materials containing a low percentage of fines. Double roller crushers can be installed either at the mine to crush the ROM coal before the preparation and the transportation or at its destination, as a sizer.



Key characteristics of the double roller crusher include:

- The generation of a low quantity of fines and high quantity of grain material during the crushing process; the grain size that is produced depend on:
 - o The gap between the two rollers, that's easily adjustable according to proces requirements, even after it has been installed;
 - o The size, thickness, shape and number of teeth.
- The ability to work with moist and sticky material, such as soil-polluted lignite with low calorific value;
- The ability to run with low-power electric motors, resulting in low energy consumption thanks to their low revolution speed (1.5 – 3.0 m/sec). Many applications and tests confirm an average power consumption of 0.2 – 0.4 kWh/ton of coal and lignite. As revolution speed is also proportional to the wear rate, this low speed also reduces the rate of ware.

The selection of a fixed, semi-mobile or mobile crushing unit is based on the position of the crushing unit, on the lay out of the plant and whether its positioning will be the same or it will change during its life-time. There can be therefore different configuration: cement hopper, lined with steel sheets; steel hopper of various dimensions; fixed crushing units, assembled on skids; surface feeding units, which allow the reduction of the hopper volume.



Coal Receiving Operation: therefore, we are introducing the second main arguments on the coal handling that is the Coal Receiving Operation.

The coal coming from mines could be carried by:

- Trucks
- Trains
- Ships

As first option, using **trucks**, coal can be collected into hoppers.

The best feeder to the crusher is a hopper and an apron

or a surface feeder, continuously feeding the crusher. The hopper must be of a suitable size for the flow of material discharged by the trucks and it advisable to grant a buffer suitable to contain one or two trucks of material. With modern dump trucks, it is useful to have a hopper of 100 – 150 cubic meter. The hopper shape must be suitable for the correct material down flow, especially in the case of moisture sticky material and of material that may freeze: the wrong sizing or shape can adversely affect the flow of the material and cause stoppage.

As second option, receiving coal by **trains**, it's needed to install railcars receiving equipment and railcars unloading system as a rotary railcar dumper or wagon tippler.

This mechanism is used for unloading certain railroad cars such as hoppers car, gondolas or lorries. It holds the rail car to a section of track and rotates the track and car together to dump out the coal. Used with gondola cars, it is making open hopper cars obsolete. Because hopper cars require sloped chutes in order to direct the contents to the bottom dump doors (hatches) for unloading, gondola cars allow cars to be shorter, thus lowering their center of gravity, while carrying the same gross rail load.

Alternatives to the rotary dump cars are bottom dump cars with bottom doors, and back end hoes which unload gondola cars. The former has the disadvantage that any imperfection in the seals of the doors allows material to spill onto the track.

As third alternative, in case of coal **shipping**, there are two different possibilities.

There is often the need to transport raw materials and combustible solid material from one continent to another by use of the sea. The ships that do that are becoming bigger, so the modern port has to be equipped with all kinds of machines like shiploaders, shipunloaders, cranes, conveyors, etc. to be able to complete the vessel's loading/unloading process in the minimum time.

The increasing ship sizes has influenced Bedeschi production in two different ways:

- In new ports that are designed to accommodate for larger ships, Bedeschi has created machines with a higher capacity able to fulfill the new loading and unloading needs.

In this case, for import unloading operation, different type of unloading equipment can be utilized (grab shipunloader, continuous shipunloader,...), as for example movable hopper on rails, loaded by mobile harbor cranes (single jib or double jib) or continuous ship unloader;



Instead for export loading operation, mobile shiploader on rails or movable shiploader on wheels.



During transhipping operation the shuttle vessel (in this case barges) carrying coal remains anchored near the ship that has to be loaded and the Bedeschi slewing and luffing shiploader load the OGV. The transhipper is equipped with a Bedeschi conveyor system and slewing and luffing shiploader with a design capacity of 2,500 tph which amounts to a daily rate in excess of 40,000 tons of coal, and an annual capacity exceeding 9.5 million of tons.



- In the existing ports, which are not able to accommodate for larger ships, the loading and unloading process must be done outside of the port. For this reason, Bedeschi created a new set of transhippers for offshore loading (in case of export) or unloading (in case of import) of dry bulk cargo, mainly coal as in the case of Princesse Chloe where the most efficient floating terminal ever built is in operation in East Kalimantan, Indonesia.



Considering the fact that port's infrastructures which consists of the land and space necessary for operations is expensive, Bedeschi is able to help the client by providing compact, functional, and ecofriendly machines that are able to adapt to a smaller space but are still able to create the high stocking volume requested by the client.

Belt conveyors, overland, pipe (ONT & MID WEST CONVEYOR)

Stockpiles provide surge capacity to various parts of the CPP.

Once coal has been reduced to the appropriate size, a storage area is required.

The main criteria when deciding on the type of storage

are: the moisture of material and therefore its stickiness; and pre-blending requirements.

ROM coal is delivered with large variations in production rate of tones per hour (tph). A ROM stockpile is used to allow the wash plant to be fed coal at lower, constant rate.

A simple stockpile is formed by machinery dumping coal into a pile, either from dump trucks, pushed into heaps with bulldozers or from conveyor booms. More controlled stockpiles are formed using stackers to form piles along the length of a conveyor, and reclaimers to retrieve the coal when required for product loading, etc.



Taller and wider stockpiles reduce the land area required to store a set tonnage of coal. Larger coal stockpiles have a reduced rate of heat loss, leading to a higher risk of spontaneous combustion. Regarding the storage, it is necessary to consider the space available and the volumes of the material to be treat. Also the pre-homogenization is fundamental during the reclaiming phase. Indeed, if the coal is not uniform it is necessary a frontal type reclaimer using a bridge type reclaimer as for example PAL T model.



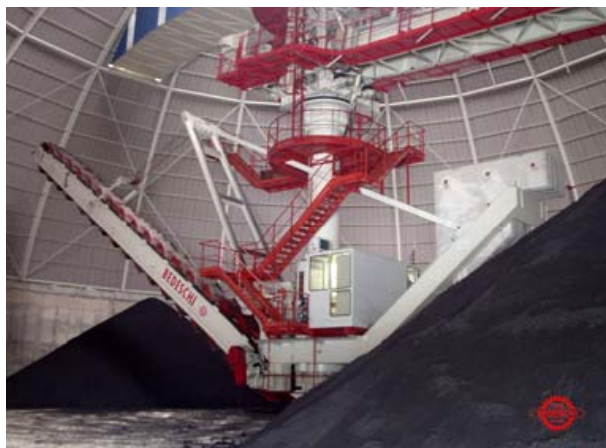
The selection is mainly oriented towards longitudinal or circular storage: both type of machines are very similar

since they both have traditional stacker (rotating or running) and a frontal rake reclaimer.

SELECTION CRITERIA:

- Available space: circular storage needs at least 30% less space than longitudinal storage, so the shad can be much smaller;
- Pre-blending and throughput constancy: longitudinal storage is highly discontinuous in the cones at the beginning and ending of pile.
- Possibility of future expansion: longitudinal storage can possibly be extended in the future, while circular storage cannot.
- Idle time during pile exchange: once circular storage has performed the first pile, it goes on with a continuous working process, which is technically endless, followed by the reclaimer.

A separate mention is for the Circular storage being the combination of a rotating stacker and a frontal rake reclaimer or a lateral cantilever or portal reclaimer.



Otherwise, if the coal is uniform, using a lateral reclaiming system like portal or semi-portal reclaimer could be enough (example case study Crowder and Posco).



Stacker is performed with a traditional lateral stacker or with a tripper. The reclaimer can be selected among

a lateral cantilever boom reclaimer, a portal or a semi portal one. The process is absolutely equivalent; the different choice is due only to the plant design reasons and to the costs of the civil work.

With a boom length bigger than 2530-mt it is more economical to use a portal reclaimer.



A very long cantilever boom requires a very heavy counterweight with relevant overall dimensions and suitably elevated loading on the foundations.

Thanks to the experience in coal handling in the cement plants where it is not necessary to store and reclaim big volume of material, Bedeschi is able to support with its great know how end users operating in different industrial sectors where the volumes are wide, like steel or power plants.



Bedeschi is able to minimize environmental problems due to dust emission by stocking material in an enclosed warehouse. In addition, all of the machines have dust filters created by the Bedeschi affiliate company CTP, therefore Bedeschi Group may propose totally dust free environmental friendly solutions.

Bag filters have to be reliable and low energy consumption equipment in order to satisfy the most different market needs.

Electrostatic precipitator is a particulate collection equipment that removes particles from a flowing flue



gas using the force of an induced electrostatic charge. SWAP (Sonic Wave Acceleration Pulse) is a unique bag cleaning technology at low pressure, designed to remove dust from bags up to 10mt length.

Cyclones vertical or horizontal sparks arrestor and multi-cyclones are equipment mainly used for applications with high dust concentrations or for sparks separation or in case pre-filtration, upstream the filter is needed.

To optimize their raw material handling operations, cement plants must choose the correct type of equipment in every part of the raw material process. Efficiency and sustainability are key components of Bedeschi's design vision, developed during the past 100 years, to bring products to market that deliver on customer's expectations.



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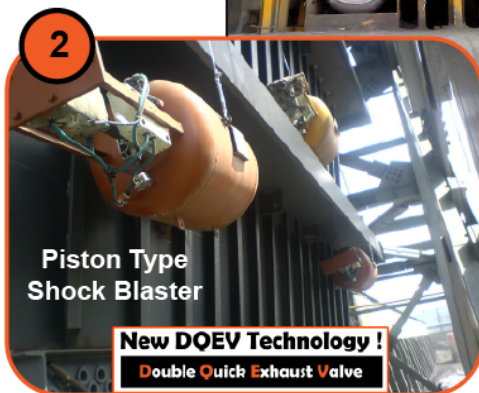
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SK Automatic Big Bag Filling Station With Lifting System



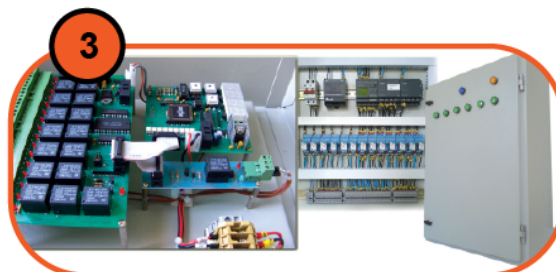
SK Cement Packer



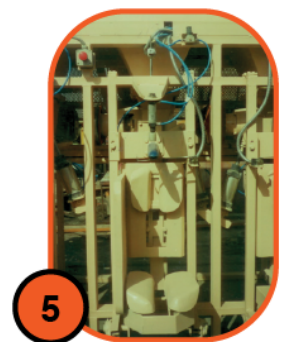
Piston Type Shock Blaster

New DOEV Technology!
Double Quick Exhaust Valve

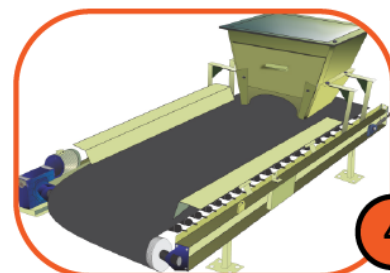
SK Shock Blaster



SK Bag Filter Jet Pulse Controller



SK Weigh Feeder & Belt Scale



4

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AUMUND Solutions in the Modern Cement Industry

By: Christian Spättmann, Sales Director Cement / EMEA, AUMUND Fördertechnik GmbH

Bucket Elevators

The continuous and reliable transport of the raw meal to the cement kiln and the cement clinker from the kiln cooler to the silo and onward from the silo to the mill is fundamental to the efficiency of cement production in every plant regardless of size or production capacity.



Raw Meal Belt-Bucket Elevator type BWG

Illustrated above this single AUMUND type BWG vertical belt-bucket elevator raises the raw meal from blending silos below to the pre-heater tower where the material is pre-calcined before being passed into the rotary kiln for final calcination and formation of the cement clinker. For larger plants, these elevators are installed with a single vertical lift in excess of 150 metres.

Like all other AUMUND products the type BWG vertical belt-bucket elevator has been subjected to continuous detailed development over the years and now represents the state of the art in this field of application. Unique to the AUMUND system the type BWG elevator uses a single or double rope strand cross stabilised steel cord conveyor belt with close pitch cords to maximise the belt strength with a reduced belt thickness allowing selection of smaller pulley diameters to minimise gearing size.

In addition compact close pitch buckets are employed to reduce the fixing stress and, combined with the special fixing design and close cord pitch, bucket detachment in service is virtually eliminated. To accommodate the high puncture strength of the cross stabilised close pitch steel cord belts AUMUND have developed a special punching machine allowing the belts to be easily and reliably prepared before shipment.



Automated Belt Punch, AUMUND, Germany

As illustrated previously AUMUND are famous for the extensive range of clinker transport and storage systems particularly for reliable and continuous handling of hot materials.

Pan Conveyors

AUMUND offer a range of clinker transport designs all based on a common set of conveyor chains and supporting wheels but with various pan arrangements depending upon the installed angle.



AUMUND Pan Conveyor (type KZB) handling hot material

Handling very hot material, the standard AUMUND type KZB design without internal baffles is suitable for working angle to 30 degrees. For steep inclines to 40 degrees the KZB-Q design with baffles provides a simple and effective solution and for even steeper angles the type BZB “Bucket-Conveyor” is available.



Clinker Export – Transport and Silo

Invariably the pan conveyors are usually installed in enclosed galleries for weather protection and environmental pollution control. AUMUND offer a complete service from a full package including the conveyors, gantries, transfer towers and cladding or a simple engineering only package where key components are supplied but the client is free to arrange local fabrication for the heavy structures.



AUMUND type KZB – Pan Conveyor

Illustrated above the classical KZB pan design with overlapping base plate and joggled side plates designed to ensure the material is effectively contained whilst allowing the conveyor strand to articulate around the terminal sprockets with minimum leakage. The unique side plate design ensures material does not become trapped between the adjacent pans causing premature wear.

For the steep angle BZB “Bucket-Conveyor” design the material is conveyed in fabricated buckets with overlapping front and back plates to prevent spillage, as illustrated below.

Both, the KZB and BZB conveyors share the same range of conveyor chains and supporting rollers



AUMUND type BZB – Bucket Conveyor

both of which have seen recent upgrades to obtain enhanced performance and reliability. Cast iron rollers are machined with a single flange designed to run on standard rail sections and include two ball bearings and a multi-pass labyrinth seal to prevent material ingress for maximum life.

AUMUND has a wide range of conveyor chains formed in precision laser cut fine grain steels with an extended range and increased rupture strength allowing longer single flight conveyors. Often the traditional intermediate transfer tower may be completely eliminated and the clinker transferred direct from cooler to silo if the plant geometry permits...

Where vertical elevation is required then for handling hot materials such as cement clinker and other raw materials or additions the central chain bucket elevator type BWZ is the favoured solution in any critical application.

Suitable for handling materials up to 400 °C and with vertical lift height to over 70 metres these machines are extremely robust and reliable, proven in continuous duty applications running 24 / 7.

Available with either a single bucket strand and suitable for handling rates to 800 tonnes per hour or with a double strand to 1,600 tonnes per hour the range of options covers most applications including raw material intake to storage and mill recirculation.

The central chain system is based on a forged chain design with extended pins which carry loose bucket brackets mounted back to back and thus effectively retaining the bucket to the chain without a rigid bolted fixing. This loose bucket fixing is an AUMUND patent and eliminates transmission of vibration and thus stress cracking of the bucket mounting is almost eliminated with a corresponding increase in bucket life.

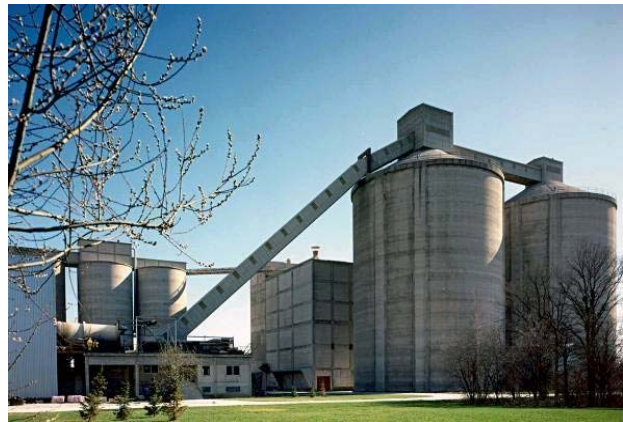
The forged chains have an integral labyrinth seal and the bolt and bush are pre-lubricated on assembly. The seal substantially prevents ingress of material to the chain bush/bolt interface and the pre-lubrication promotes the development of a high quality surface finish to the bearing areas in service reducing the wear rate and consequently extending the chain life. The equipment described herein covers the key areas in the transfer of material between the core processes in the cement plant and therefore critical to the plant performance and profitability. Clearly an unscheduled kiln stoppage is disastrous with the attendant loss of production and re-commissioning costs but it is exactly the same story if the raw meal elevator or the clinker transport fails since the kiln is stopped just the same...

With a new plant or plant extension the operator is free to choose the equipment best suited to the application but... for existing plants with life expired conveyors choices are more limited...

However, in these circumstances AUMUND have a solution that does not demand complete machine replacement and can be applied on short notice with absolute minimum downtime and disruption.

Retrofit & Conversion

With the AUMUND Retrofit & Conversion solution new chains, pans or buckets, drive wheels and shafts may be applied to existing structures upgrading the equipment to the legendary AUMUND standard of performance and reliability, for minimum investment. Not only is the Retrofit option cost and time efficient at the same point the equipment performance may be upgraded to increase the design handling rate.



Upgrade to BZB Bucket Conveyor

Heavy Duty Feeders

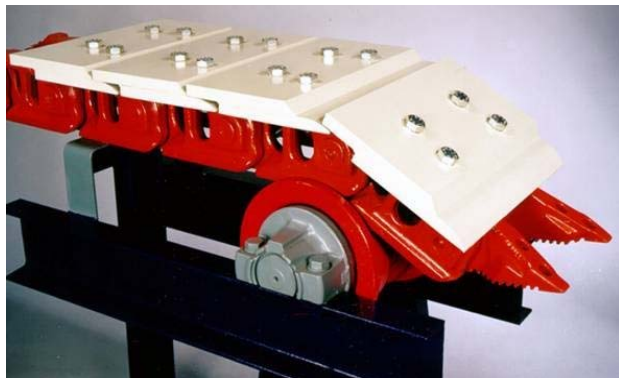
As an example the plant illustrated above at Heidelberg Ennigerloh / Germany an existing steel plate conveyor installed by another company was replaced with an AUMUND BZB Bucket-Conveyor within the same gallery and general operating envelope.



AUMUND type BPB-SF heavy duty feeders

Illustrated above the AUMUND BPB-SF heavy duty feeders receive as mined limestone direct from off-highway trucks providing a controlled feed rate to the primary crusher generally located at the quarry; one of the toughest jobs in the conveying process...

Feeders are really the unsung heroes of the cement plant often working away year after year with little attention handling the full range of process materials and fuels and in primary feed applications sustaining huge impact loads from boulders of several tons in weight falling up to 10 metres from the off highway type truck. In these ultra-high impact situations the plate feeder is really the only option, generally using tracked vehicle type chains up to 3,600 kN rating with track rollers at short pitch to support the load and absorb the impact from falling rocks.



AUMUND type BPB-SF Plate Feeder

Available with plate width to 3000 mm and plates to 80 mm thick these AUMUND type BPB-SF really are designed for arduous applications for long term reliability. Plates have milled edges for close fitting controlled overlap and cranked side boards to minimise risk of spillage.

The close pitch supporting rollers are the key to long and reliable operation providing proper support for the chains and apron plates and distributing the load through to the feeder chassis.



AUMUND Type BPB-SF Close Pitch Rollers



AUMUND Type BPB-SF during works assembly

Shown above the type BPB-SF feeder during proof assembly at the AUMUND works in Rheinberg / Germany where all machines of this type are tested before dismantling for shipment.

These feeders are installed under steel or concrete hoppers often of several hundred tons capacity and will take material from the largest dump trucks.



Off Highway Truck as Mined Minerals

Generally the apron feeder will discharge direct to the primary crusher inlet and must be speed controlled to allow critical optimisation of the crusher performance.

Hydraulic speed drives may be supplied with a remote power unit including variable flow axial piston type pump and motor combination providing adjustable speed control allowing fine-tuning of the feeder discharge rate.

As an alternative the modern design of electronic Inverter speed system provides excellent control using a simple direct coupled electric motor drive with combination of helical and planetary reduction gear as illustrated below.



Planetary and Helical Reduction Gear

Both hydraulic and electronic variable speed systems may be supplied with a digital interface allowing the speed to be set remotely. Generally the crusher drive will have a current monitoring system linked via the main plant PLC to the feeder drive to ensure the crusher is always operating at optimum efficiency.

Most primary crushers are very large installations weighing in at perhaps over 1,000 tons and requiring a substantial height differential between intake and discharge and as such are generally fixed at a central point within the quarry to minimise haulage distance.

Whilst off highway trucks have improved their fuel efficiency they remain very expensive both to buy and operate in today's high fuel cost environment. Nevertheless the flexibility offered by truck haulage, particularly over short distances, is very attractive and generally this is the only viable solution to move material from the working face to the primary crusher. However, the economics of conveyor haulage is also very attractive but there are limitations on the use of belt conveyors and obviously it is not practical to convey the as mined material direct from the face. Clearly combining the low operating cost of overland belt conveyors with the flexibility of short haul truck operations would be the ideal solution.

Samson® Material Feeder

AUMUND have solved this problem by combining a Samson® type Mobile Surface Feeder with a twin shaft Rotary Sizer. In this manner as mined material may be reduced to a size that may be efficiently handled by overland belts.



Samson® Mobile Feeder and Sizer

As illustrated above the Sizer is mounted directly over the field conveyor using a sub-chassis carried on rails allowing the Sizer to be easily moved along the conveyor to the closest point to the working face.



Mobile Feed Point to Field Conveyor

If the conveyor is laid down parallel to the bench along with the crusher rails carried on simple concrete or timber sleepers a considerable volume of material may be worked from a single conveyor location.

The mobility of the Samson® surface feeder is the key to this operation by providing a low level tipping point for the dump trucks and eliminating the traditional high level access ramp..



Samson® Feeder Limestone Intake

Whilst the Samson® will handle as mined material to a lump size of around 600 to even 800 mm there are

limitations in truck size and material type but within reasonable bounds this is an excellent solution.



Shale Sizer Installation – Irish Cement

In this unique installation for Irish Cement two twin rotor sizers reduce shale down to minus 50 mm for conveying to the plant bunkers. The shale is delivered by truck at high level with primary and secondary sizers to achieve the required reduction.

However, whilst rotary sizers are ideal for this material, when handling samples with a high proportion of fines the sizer is prone to flushing allowing the load to flow through the rotors at high speed creating a large peak in the output.

Normally this peak would be absorbed by a surge bin beneath the secondary crusher with another plate feeder to regulate the final output. However, this requires a significant increase in height differential to be made up with higher ramps or a deeper excavation neither of which were attractive solutions in this project.



Samson® Feed Rate Regulator

For Irish Cement the answer was to introduce a Samson® between the secondary crusher and the ongoing conveyor providing both a buffer storage capacity of around 50 tons and a regulated output rate to deliver

a controlled flow to the ongoing belt conveyor system eliminating overloading and consequent spillage.

By introducing a simple belt weigher on the following conveyor the input rate to the plant may be closely regulated by adjusting the conveying speed of the Samson® to achieve the required rate. The load within the Samson® is monitored by load cells and the output signal used to control the main intake plate feeder to ensure the system is not overloaded regardless of the material characteristics.

Within the Cement Plant there are many applications for feeders and the AUMUND Group have appropriate solutions for each and every section of the plant. For additions material and imported clinker again the Samson® is an attractive solution as illustrated below at the TDCIM grinding plant near Sines, Portugal. Being surface mounted this is an economical and flexible solution minimising foundation costs.



Samson® Imported Clinker Intake

And in addition the stationary Samson® may be combined with an integral sizer as shown at the Lafarge Asland, Villaluenga plant illustrated below.



Samson® Gypsum Additions Intake

In this application the twin rotor sizer is mounted to a fixed chassis directly at the Samson™ discharge to size down the Gypsum rock before conveying to storage.



Samson® with Integrated Sizer

In this manner the as-mined material requires only rough screening at the quarry with control of the crushing operation in the hands of the cement plant.



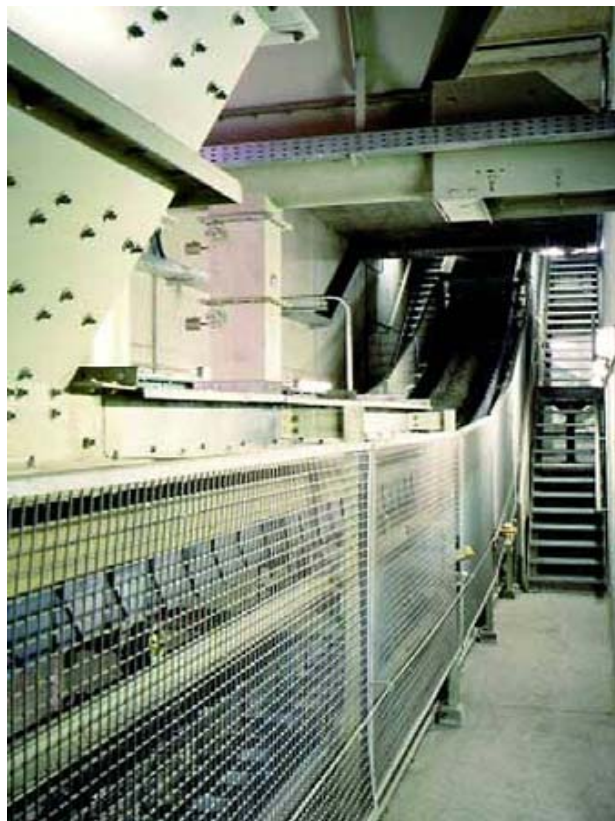
As-Mined Gypsum Rock Intake

As seen above the Gypsum is delivered in lump sizes to around 300 mm with some larger pieces to 500 mm...

Pan Conveyors

In addition to conventional conveying the construction of the KZB pan conveyor can be applied to feeders particularly for the extraction of materials such as clinker from long hoppers below railcar intake.

In this application clinker is extracted from the under rail hopper and inclined up for transfer to an AUMUND BWZ vertical bucket elevator for subsequent storage. Whilst the KZB design is ideal for handling dry materials such as clinker is it not the best solution for wet and sticky clays and marls which would adhere to the pans.



AUMUND Type KZB Under Rail Feeder/Conveyor

For these highly cohesive materials the type BPB arched plate design was developed with a smooth conveying surface which may be cleaned by suitable scrapers at the point of discharge.



AUMUND Type BPB Plate Feeder

Typically used for the extraction of raw materials and additions materials from blending silos the AUMUND BPB and BPB-S are proven and robust solutions.

In this case the silo outlet is formed into a rectangular slot taking the circular silo to the rectangular inlet of the feeder. As with the primary crusher feeders these silo discharge feeders are generally linked to an Inverter speed controller allow remote and automated



Silo with Rectangular Discharge

discharge rate integration to the plant process demands. Typically the feeder is supplied as a fully or at least partially pre-assembled package that may be simply connected to the prepared silo flanged outlet.



AUMUND Weigh Feeders at TXI Oro Grande

Illustrated above a project for TXI Oro Grande Cement where four silos provide storage for additives which must be metered at the required tonnages to blend into the main mill feed system. Similar equipment is also presently in operation at the St. Genevieve plant in Missouri by Holcim.



AUMUND Type DPB-B Plate Weigh Feeder

Both the Pan and Plate feeder designs may be supplied with integral weigh rails providing a mass measurement of output rate particularly for proportioning feeds and blends from multiple silos.

This state-of-the art, environmentally-responsible cement plant will produce approximately 4 million metric tons of cement per year to meet the demand of the internal US market. In addition to the weigh feeders AUMUND supplied clinker transports, vertical elevators, silo dischargers and chain conveyors for this most important project.

In addition to the intake of as mined raw material and the discharge of silos the AUMUND range of plate and pan feeders are equally suitable for forming an intermediate feed point for use with loading shovels discharging to existing overland or transfer belt conveyors.



Weigh Rail Load Cell Mounted

As illustrated above, an integral weigh rail supported on load cells carries the external pan or plate rollers allowing the material mass within the conveying element to be accurately measured dynamically. By computing the load on the weigh rail, the length of the rail and the speed of the conveyor the discharge rate from the silo can be accurately determined.



AUMUND BPB-S Plate Feeder for Shovel Loading

As illustrated above an AUMUND type BPB-S Apron Feeder receives clay from large shovels incorporating a buffer hopper and a controlled discharge rate using a rotary picker to regulate the discharge.

For the fine control of silo discharge rates cohesive materials such as wet clays are a real problem since the material tends to move as a block and shear off

at the feeder discharge in large slugs creating peaks and troughs in the instantaneous output rate with the potential of bridging and blockage in the transfer chutes plus likely spillage from the ongoing belt conveyors.

Obviously the problem of highly cohesive materials is also very important in the design and construction of larger silos.

This is particularly true of materials such as F.G.D. Gypsum (synthetic Gypsum) as a replacement for natural Gypsum but any fine and potentially wet material can be a real problem to extract reliably from large diameter storage silos.

In this situation the conventional cone or slot shaped silo outlet may not give reliable flow and with the risk of bridging and blockage or “Ratholing” causing an effective reduction of the silo usable working capacity.



CBR Ghent Silo Storage System

A typical silo storage facility is illustrated above at the CBR cement plant in Ghent, part of the Heidelberg Cement group. In this installation the silos are fitted with the LOUISE BEW-K extractor system as illustrated below.

The design is shown in more detail in the following close-up view...

The LOUISE BEW-K is based in principle on the LOUISE CENTREX® concept comprising a number of logarithmically shaped arms mounted to a rotating carrier which itself is mounted to a slewing ring allowing the carrier to rotate beneath the silo using a hydraulically operated circular rack system with twin actuators. In this manner the rotating arms excavate material from an undercut around the silo periphery working their way continuously around the silo circumference ensuring the contents are evenly discharged without risk of bridging or blockage.



Silo with type LOUISE BEW-K Extractor



Type LOUISE BEW-K Silo Extractor

Since the material is recovered from the outside of the silo reliable mass flow is ensured and the contents are discharged on the basis of first in first out always. In addition to the Samson® plus the Plate and Pan feeders described herein where the material load is effectively carried on rollers there is also the chain scraper conveyor type feeder known as the AUMUND PKF armoured chain conveyor and the AUMUND TKF drag chain conveyor.

The type PKF is generally used for handling difficult material beneath truck dump hoppers or more often

under rail intake hoppers and has particular advantages in this situation. The PKF is very compact and fully sealed eliminating any risk of spillage or dust escape.

Since these feeders are generally installed in deep pits housekeeping issues are important since clearing away spillage is difficult, expensive and time consuming.



Underground Hopper with AUMUND PKF Feeder

Illustrated above a typical PKF installation under a intake hopper providing a controlled discharge rate to an ongoing conveyor system.



AUMUND Armoured Chain Feeder Type PKF

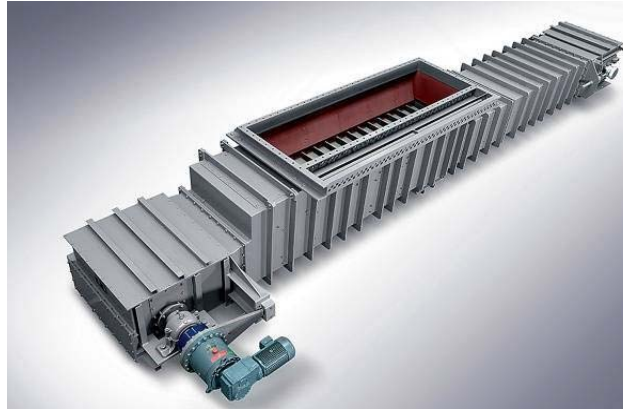
With its low construction height the Armoured Chain Conveyor is primarily used for hopper discharge of crushed limestone or sticky raw materials such as chalk, gypsum, marl, clay or coal. Illustrated above during assembly and including a rotary picker at the discharge.

Available with a conveying width of up to 2,600 mm the PKF can handle up to 1,800 tonnes per hour depending upon the material type.

In addition to the PKF Armoured Chain Conveyor the type TKF Drag Chain Conveyors may also be used as feeders beneath silos and rail hoppers where the material specification permits.

Slag Intake – Holcim Romania

The TKF is a long standing AUMUND Group product with over 650 units installed worldwide handling raw materials, additions and fuels, both for feeding and transfer.



AUMUND Drag Chain Conveyor Type TKF



AUMUND Drag Chain Conveyor Type TKF

The TKF is also a fully enclosed design and as such spillage and dust generation are eliminated making this a clean solution ideal in confined spaces... Naturally cleanliness in operation is important in any situation and whilst the PKF and TKF designs have particular attributes in this respect it is not the only solution... There are many applications where the apron feeder is the only viable option but by definition the apron design has issues with cleanliness and material carry-back adhering to the apron plates is very difficult to completely eliminate.

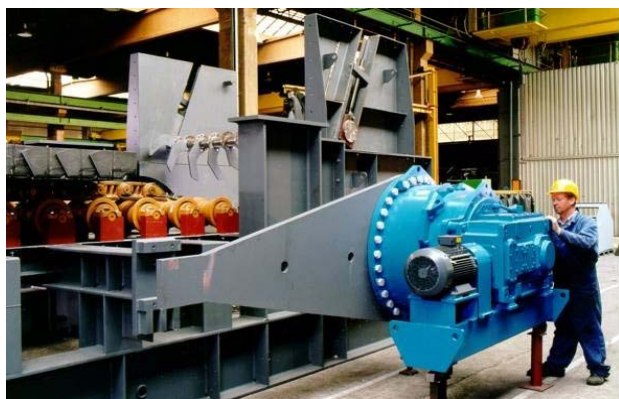
In this situation a spillage returns conveyor prevents any spilt material falling outside the confines of the conveyor system by collecting material falling from the pans on the return side; as illustrated on this weigh pan feeder shown below.



AUMUND Weigh Feeder with Spillage Returns

As referred previously in many of the applications described herein the rotary picker device is employed to loosen the bulk material as it passes over the discharge point of the feeder and thus smoothing the discharge rate.

This is a key feature for handling difficult materials without which the equipment would not function properly particularly when handling low volume rates.



Rotary Picker Installation of AUMUND BPB-SF

As illustrated with the feeder drive in the foreground the picker is located between the two side plates of the pan feeder discharge.



Rotary Picker with Paddle/Anvil Helix

The picker arms and paddles/anvils are simply mounted to a through shaft on bolted flanges and arranged in

a helix pattern to even out the anvil impacts thereby smoothing the discharge rate and reducing the drive torque demand.

In all applications feeders have to sustain heavy material static and impact loads and as such are exposed to far higher stresses compared to general transfer conveying within the cement plant process.

Not only are feeders expected to operate in these extreme conditions handling the regular materials used in the cement industry we now find a whole new raft of special alternative fuels and substitute raw materials with handling characteristics far away from our general experience.

AUMUND continue to develop the range of feeders and with the addition of the Samson® type from SAMSON Materials Handling (AUMUND Group) are now able to offer solutions suitable for these exotic fuels and raw materials.

Naturally all machines eventually require some attention and AUMUND offer a fully comprehensive after sales and refurbishment service.



AUMUND Plate Feeder Re-Build

As illustrated above an existing plate feeder is in the process of upgrading to the AUMUND BPB-SF specification with new conveyor chains and apron plates.

Generally most existing machines may be upgraded to the AUMUND specification by our experienced team of site engineers enabling the user to enjoy the legendary AUMUND reliability and service without the cost and downtime of a full feeder replacement. Experience is the key to reliability and performance and in this AUMUND have the products and the know-how to deliver the appropriate design for all applications.

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BEUMER Group develops smart maintenance system for customer support:

Looking at the world through smart glasses

Augmented reality offers interesting possibilities and potentials, e.g. for maintenance work on intralogistic systems: a head-mounted minicomputer could display all necessary information to the service employee. This would simplify their work, hands-free. The BEUMER Group development department places a high priority on this topic. With an app for smart maintenance on mobile end devices, our customer support technicians can quickly access all important data.

Companies must repair their machines and systems quickly to avoid costly downtimes. This is becoming a more difficult task as systems are becoming increasingly complex, requiring highly qualified service technicians. Even the most skilled technicians sometimes have to read through heavy manuals, open up drawings or struggle with outdated plans. This costs valuable time, and should be so much easier in the digital age. Tablets, smartphones and smartwatches have become indispensable in our private lives. Even smartglasses are increasingly finding their way into our lives. A tourist strolling through Paris, sits down at the Eiffel tower, puts on his glasses and gets all the information he wants, according to his location and true to scale: How tall is the building? What are the opening hours? How did these scene look like 100 years ago? "We take up this technological trend, to complement reality with digital information," says Dr. Andreas Werner, head of the research and development department with BEUMER Group. "This app for smart maintenance will help facilitate maintenance work on intralogistic systems for BEUMER Customer Support employees."

App facilitates maintenance

Through AutoID characteristics on the logistic element, e.g. a conveyor, and the smart maintenance app, information on this element can be displayed,

such as maintenance instructions or pin assignments. The service employee focuses on the object with his mobile device. The required data is displayed on the live image of the camera of the device. "The technician looks at the defective part and can immediately call up every related manuals or goods in stock," explains Dr. Andreas Werner. Every process step is displayed. In the event of very complex processes, he can call a colleague by using the smartglasses and solve the problem together via live stream. Measured values could be recorded at the same time and transferred to the back-end system in real time. Video recordings and photos can document whether an order was carried out correctly and in compliance with the safety regulations.

Smartglasses, tablet or mobile phone?

"When implementing these wearable computer systems into intralogistics, you have to consider aspects like information security, ergonomic user interfaces and suitable IT structures," explains Dr. Andreas Werner. The goal is to ensure a sustainable added value for companies and customers. But which mobile end device is the most efficient? The app can be used on smartphones and tablets for example. They offer the advantage of a high computing capacity. This allows you to process the large amount of data that is required for service tasks. Their interfaces are standardised and always have direct access to the Internet. Their



handling is intuitive and easy. One big advantage: these devices are accepted technologies at the workplace because they are already indispensable in our private lives. Smartwatches, however, have a low computing capacity, their interfaces are sometimes specific to the manufacturer and the user requires additional devices. Smartglasses are also very easy to use and their interfaces are standardised. Their availability however is still too low for industrial applications. As with smartwatches, the user requires additional devices. Smartglasses have many operating advantages, but they are still not developed enough to make an industrial use possible.

Smart maintenance at Singapore airport

"Tablets are already used at several airports that operate baggage handling systems from BEUMER Group," describes Dr. Andreas Werner. This includes Singapore Changi Airport. As one of the main hubs for Southeast Asia, this airport is known to be very progressive and passenger-friendly. The baggage handling system was developed and integrated by BEUMER Group. BEUMER Group is exclusively responsible for ensuring trouble-free operation, optimum maintenance and therefore the long-term coordination of the baggage handling systems. This is why 121 employees take care of customer support. They provide 24 / 7 operation at the baggage control rooms and necessary preventive maintenance to ensure continuous system availability and best performance.

"The maintenance personnel can use the tablets to connect to individual system control components to check for example statuses or carry out modifications," says Dr. Andreas Werner. BEUMER Group employees can scan barcodes from components and look into further data, such as maintenance protocols, using the integrated camera. Maintenance and repairs are carried out a lot faster, and system standstills are reduced. This ensures reliable operation and reduces costs.

Developers are currently carrying out an innovation study with the smartglasses at the airport. The

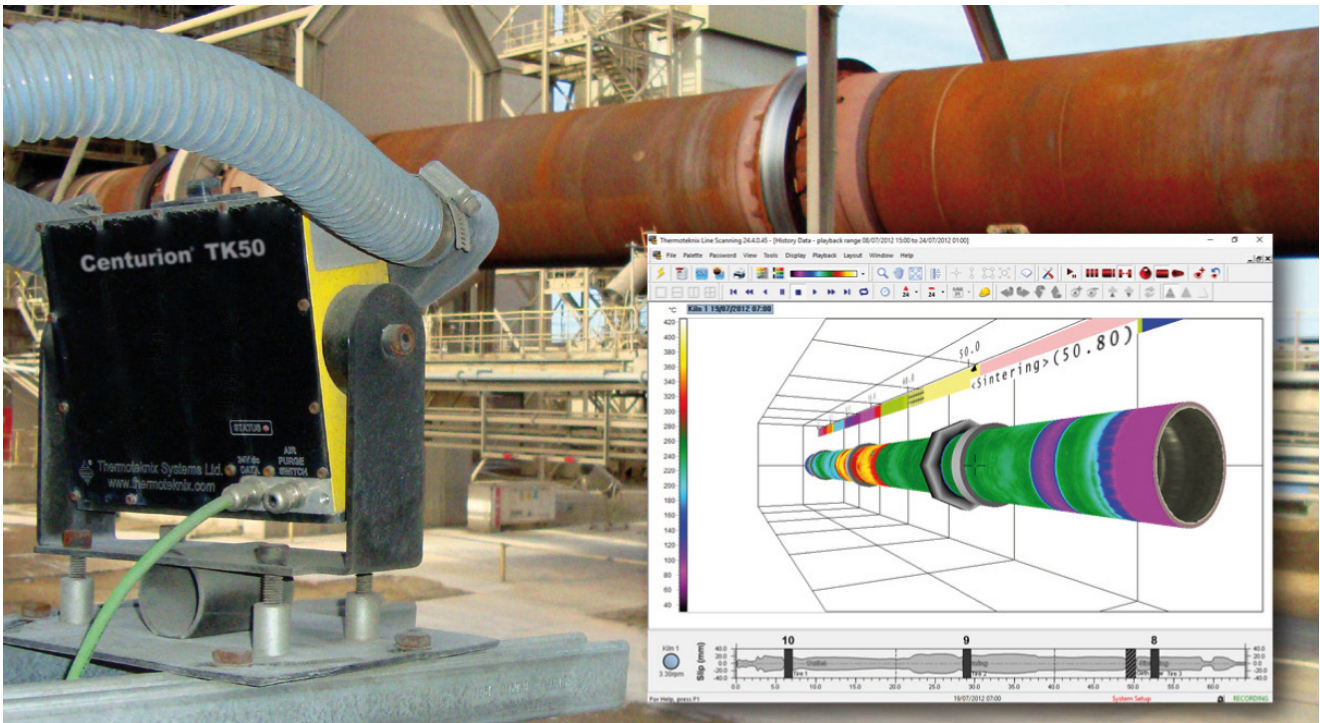
employees receive information on the system layout in 2D via their device, the error history, or device-specific information, and gets VoIP access to customer support. They can access operating and maintenance instructions easily and quickly. All of the information necessary for troubleshooting the system is available. The device can also be connected to the smartphone via Bluetooth.



Picture 1: BEUMER Group increases efficiency and safety of your baggage handling systems by using tablet computers.



Picture 2: The highly qualified personnel of the BEUMER Customer Support offers technical support and machine maintenance world-wide.



Thermoteknix recognised as key vendor in global kiln shell scanner market

British thermal imaging designer and manufacturer, Thermoteknix Systems Ltd has been identified as one of the key vendors in global kiln shell scanner market in the latest market report.

The Global Kiln Shell Scanner Market 20162020-report presents the key players in this market and gives a competitive analysis by end-user and geography.

“Thermoteknix has been consistently building its position in the industrial market since the Company was founded in 1982. Over the years we have achieved a leading position as a valued supplier of reliable, high performance, kiln shell temperature scanning and thermal imaging systems. Thermoteknix customers depend on our essential equipment for the smooth running of their kilns and processes. Long term reliability with first class customer service have been key to our success and their satisfaction.” said Dr. Richard Salisbury, Managing Director of Thermoteknix.

The Global Kiln Shell Scanner Market 20162020- was published by TechNavio, technology research and advisory company.

About Thermoteknix Systems Ltd:

Thermoteknix specialises in thermal imaging and night vision technologies for global sales in heavy

industrial, aerospace, security, R&D and defence markets. Thermoteknix products all share a heritage of technical superiority, successful operation in harsh conditions and long term support from an ISO 9001 certified company, committed to customer satisfaction. Thermoteknix is proud to be involved in many high profile projects including Formula 1 and Indycar motor racing, Aegis Defense program, award winning wildlife TV and has supplied the thermal imaging camera on NASA's successful LCROSS Mission which confirmed the presence of water on the moon... where the Thermoteknix' camera now permanently resides...

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"I was very glad to meet officials from the Russian cement and building materials industries and would look forward to having the opportunity of meeting all of you again in the near future. I reiterate my cordial congratulations for the grand success of the event. Thank you again for your continued support and looking forward for more cooperation with your highly esteemed organization."

Ahmad Al-Rousan, Secretary General, Arab Union for Cement and Building Materials (AUCBM) (Syria)



"I had a very interesting stay in St. Petersburg. Both Meeting and other programs were interesting and well organized. Also the big number of participants and their high positions in the companies or organisations were could be noticed. I got a picture what is happening in the cement market in Russia and also in other countries. The producer-user discussions were also interesting to hear. Thank you for acting as a host during my visit".

Pekka Pajakkala, Professor, Senior Advisor, Chairman and Partner, FORECON Oy (Finland)


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There is also a Video available on the Jaw Crusher PULVERISETTE 1 premium line which can be viewed at <http://www.youtube.com/embed/7lNr0KvrJag?rel=0>. Please also view the video of the Disk Mill PULVERISETTE 13 premium line at <http://www.youtube.com/embed/ZAD7WCZLIQU?rel=0>.

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Soft landing after a rough flight Flexco's EZIB impact beds are an effective means of preventing material loss

High-energy impacts in the loading zone are a frequent cause of material loss in conveyor systems used in coal mines, underground mines and gravel quarries. Flexco impact beds prevent this by slowing down the material that falls onto the conveyor. The EZIB systems are an efficient example. Users can easily modify and fit them thanks to the adjustable trough angle.

The product range is equipped with standard components, which makes it both effective and affordable. The impact strips made from tough ultra-high-molecular-weight polyethylene (PE-UHMW) absorb the impact force of the falling material, while the outer protective strip, which is likewise made of PE-UHMW, seals the loading zone. The system is suitable for light and medium-duty loads. Impact beds are also available in lengths of 600 and 1,200 mm. This solution enables users to significantly increase the life of their systems as they are subjected to considerably less load. Combined with Flexco sliding beds, they can be expanded to form complete loading zone systems. Service engineers can change the trough angle to get easy access to the strips and bolts, permitting quick, reliable maintenance.

EZIB impact beds are suitable for belt speeds of up to five metres per second and operating temperatures from -40° to +82° C.

Flexco provides solutions for light and medium-duty applications. To select the right impact bed, users must determine the weight of the largest material being conveyed and then multiply it by the drop height. This gives the approximate impact energy.

Users of conveyor systems can easily modify and fit the EZIB impact beds thanks to the adjustable trough angle.

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.



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PRODUCTION SITE

The Best of Both Worlds – SMARTREMOVAL has revolutionized filter hose changing

In the past the choice made by companies purchasing dust filter systems was in general limited by the type of plant they already had: Basically, if the height of the building made filter change possible a Top Removal System was chosen, as such systems always have a lower residual dust content compared to Side Removal Systems. However, if the building was too low, then a Side Removal System was always chosen, although these always meant longer stoppages for changing filter hoses and cleaning. This was seen as the lesser evil compared to the high costs required for modification work to the production facilities.

This dilemma inspired the design engineers at NETZSCH Trockenmahltechnik GmbH to look at the problem of filter hose changing from the customer's point of view. The resulting worldwide innovation, SMARTREMOVAL, was presented for the first time at this year's POWTECH in Nuremberg, Germany and aroused considerable interest in the branch. This new type of filter hose changing system combines the advantages of conventional Top- und Side Removal Systems in one product.

The main conceptual emphasis during the development of the SMARTREMOVAL was first and foremost on enabling an intuitive filter hose change without tools, which could be carried out easily and rapidly. In practice stoppages necessary for changing the filter hoses constitute a major cost factor, which can even be decisive for the profitability of individual campaigns with frequent product change.

A further focus was on reducing the residual dust content down to that of a Top Removal System. In the end, the designers of the SMARTREMOVAL were able to solve both tasks. The well thought out installation technology (patent pending) is constructed in such a way to exclude mounting errors and the mounting of the SMARTREMOVAL is up to 80% quicker than that of previous Side Removal systems. In addition to this its residual dust content is so low that it is comparable to that of conventional Top Removal systems.

In future users and plant builders of dust filter systems no longer only have the limited choice between two systems characterized by obvious weaknesses. On the contrary, now everybody can choose the new optimal solution when building, modifying or modernizing their plant regardless of the height of the building and

without having to tolerate high residual dust contents: NETZSCH SMARTREMOVAL.

www.netzsch-grinding.com



Fig. 1: SMARTREMOVAL was presented for the first time at POWTECH 2016 in Nuremberg, Germany.

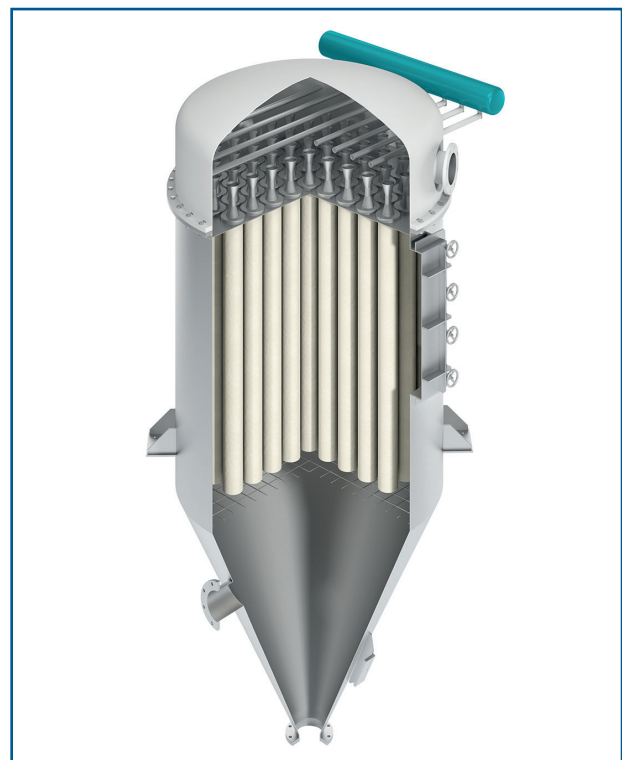


Fig. 2: SMARTREMOVAL as core component of a dust filter system.



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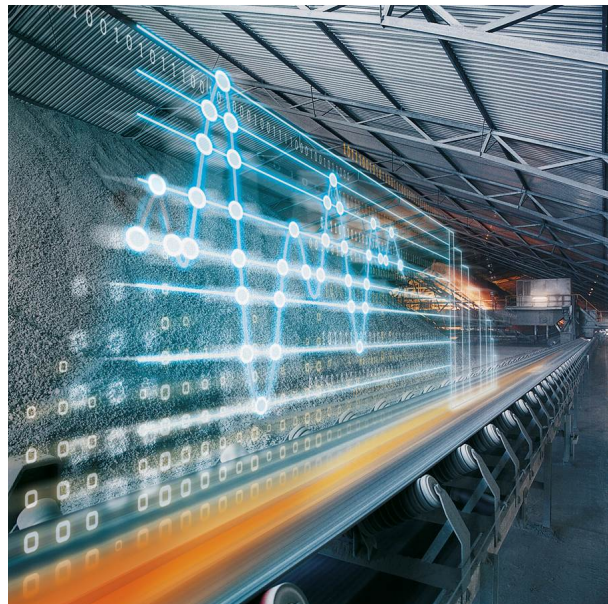
Entry of mechanics into the digital world

- Flender Gearlog depicts gear load data in digital form for the first time
- Software, hardware and special sensors
- Full transparency of operating data enables conclusions about operating reliability, availability and productivity

Siemens have unreiled its digital measurement technology for gears, Flender Gearlog, This new technology entails the capture of values relating to rotational speed, torque, temperature and in the future also vibration by special sensors. The system adds up these readings in parallel with machine capacity utilization. The measurement results are logged, saved and digitally depicted in compressed form. Operators are able to visualize the results at any time or read them out in the form of a dataset. The measurements enable conclusions to be drawn about the applied load and loading capacity of gears when used in specific applications. The full transparency of operating data means it can be used to identify possible sources of damage, capacity reserves and overloading in the measured gear. Flender Gearlog allows application-specific load collectives, which often vary for operational reasons, to be matched against the operational stability of individual gear components and also other elements of the drive train. In this way, customers can find an optimum standard gear - working machine match.

Flender Gearlog comprises a software solution linked to a hardware component and sensor equipment coordinated in line with the gear. Siemens also offers services such as installation and commissioning, secure access to all data, regular evaluation of data and status reports. Special algorithms are used to compress the time signals and depict wide-ranging information relating to operating data on a digital basis. If threshold values are exceeded, Flender Gearlog also records time signals, allowing any detected overloads, for instance, to be additionally analyzed. All the data necessary for this is already available locally, or in future also in the cloud. The measurements can be performed on all available Flender gears, both catalog and non-standard types, for instance for the mining, cement or oil and gas industry, for wind turbines and cranes. A pilot phase for the product of around one year with interested gear customers will start with Hannover Messe.

Flender Gearlog represents the very first entry of a mechanical component into the digital world of industry: This hardware component represents a bridge between gear and software. The digital depiction of gear load data permits an insight to be gained into operating reliability, availability and productivity in cooperation with Siemens experts.



Using special sensors, Flender Gearlog captures readings relating to rotational speed, torque, temperature and in the future also vibration, which are added up in parallel with machine capacity utilization. The measurement results are logged, saved and digitally depicted in compressed form. Operators are able to visualize the results at any time or read them out in the form of a dataset. The measurements enable conclusions to be drawn about the applied load and loading capacity of gears.

For further information on Flender Gearlog, please see www.siemens.com/flendergearlog

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14.

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Sub-themes

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Registration and Floor Plan

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Lean paperless manufacturing solution reduces engineering and operation effort

- **New version 6.1 of the Simatic IT eBR**
- **Manufacturing Operation Management solution for the life science industries**
- **Lean approach to paperless manufacturing**
- **Enhanced integration into Simatic PCS 7 and HMI systems**

Siemens is launching Version 6.1 of its Simatic IT eBR software, which is at the heart of its Manufacturing Operation Management for the life science industries. The new version of the software enables users to easily implement paperless manufacturing solutions by offering two main features: A new web-based MBR (Master Batch Record) module which facilitates the management of key process parameters, and native integration with the Siemens automation layer (Simatic PCS 7 process control system and HMI systems). The new version reduces the work involved in engineering and operation, helps users to enforce standardization and makes for a more transparent production process, so shortening the time-to-market.

production process, so shortening the time-to-market. Product quality and safety are the top priorities for the life science industries, especially in the pharmaceutical industry. At the same time, many companies need to cut costs and increase innovation. Siemens offers a paperless manufacturing solution for enhancing both efficiency and product quality, while at the same time bringing down risk and costs. Fully integrated communication is established between the automation level and manufacturing IT. This enables complete electronic recording and documentation of quality-related production data, while eliminating time-consuming manual procedures and paper-based batch reports. Simatic IT eBR 6.1 facilitates the implementation of the paperless manufacturing. With a new Master Batch Record module and a “Project Startup” package, it provides a list of out-of-the-box deliverables to speed up project execution time. In addition, it offers native integration with Siemens PCS 7 Batch and new access to electronic work instruction lists embedded in SCADA/HMI clients. By accelerating the design, execution, review and release of regulated production processes and electronic batch records (EBRs), Simatic IT eBR helps both enhance product quality and lower Simatic IT eBR 6.1 facilitates the implementation of the

paperless manufacturing. With a new Master Batch Record module and a “Project Startup” package, it provides a list of out-of-the-box deliverables to speed up project execution time. In addition, it offers native integration with Siemens PCS 7 Batch and new access to electronic work instruction lists embedded in SCADA/HMI clients. By accelerating the design, execution, review and release of regulated production processes and electronic batch records (EBRs), Simatic IT eBR helps both enhance product quality and lower production costs.



Simatic IT eBR 6.1 is based on the engine of the former XFP product developed by Elan Software Systems and acquired by Siemens in 2009. It combines 30 years of proven experience in the pharmaceutical industry and native integration with the rest of the Siemens portfolio for regulated and non-regulated industries. Siemens is launching Version 6.1 of its Simatic IT eBR software, which is at the heart of its Manufacturing Operation Management for the life science industries. The new version of the software enables users to easily implement paperless manufacturing solutions.

For further information please see www.siemens.com/pharma and www.siemens.com/simaticit/lifesciences

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INTERMAINT

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Heavy Industrial Plants Services

Brief

International Company for Construction and Special Maintenance (INTERMAINT) was established in 2003 by the best referenced expertise of 18 years

Working with Japanese ideology which proved a great success in the Egyptian market.

That's why we manage through different valuable clients and meet their needs.

Intermaint/Alfran partnership was formed to add **alfran** history of success

Total Refractory Solution's

in the total refractory systems all over the world to our different services inside Egypt.

INTERMAINT
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02

03

INTERMAINT
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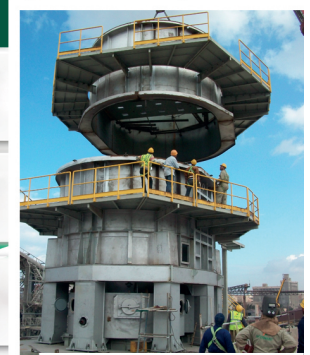
04

05

INTERMAINT
GmbH

INTERMAINT
ENERGY

06



Fabrication :

- Our Fabrication Experience Covers All The needs of Your Plant's Production Equipment.
- All Of Our Process Quality Controlled and quality assured
- We ensure the best quality in the shortest duration possible.
- Our Yearly Capacity Is About 7000 Tons Mixed, As Technological Steel Structure Plate Works And Built Up Sections , Spare Parts Etc.

Erection :

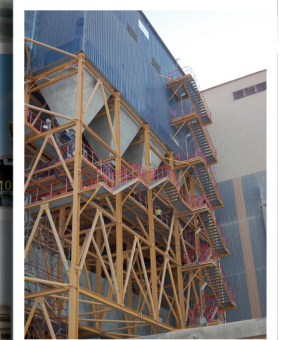
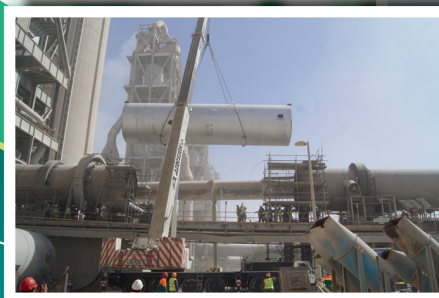
Our way to success is short time and high quality performance.

for new or existing project we can do :-

- Installation of Electromechanical Equipments and Piping as a total services.
- Installation of insulation works.
- Refractory services.

Maintenance :

- Quick intervention
- Planning of shutdowns
- Good preparation
- Very short time execution period



Contact Information

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Web site : www.intermaint.net

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ISO 9001:2008 OHSAS 18001:2007 ISO 14001:2004

THINKING FOR TOMORROW

DIARY DATES

CEMENT

23rd international conference CONCRETE DAYS
2016

Date : 30 November - 01 December 2016

Venue: Litomyšl, Czech Republic

Email: cbsbeton@cbsbeton.eu

For more information please visit: www.cbsbeton.eu

International Exhibition "Concrete plants. Equipment.
Formwork – ConTech"

Date : 30 November - 02 December 2016

Venue: Moscow, Russia

For more information please contact:

Email: info-pr@alitinform.ru

visit: <http://infocem.info/eng/>

CEMENT EXPO - 9th International Exhibition and
Seminar

Date : 08 - 09 December 2016

Venue: Mumbai, India

For more information please contact:

Ms. Vrushali Pawar, Asst. Conference Producer

Tel: +91 22 2419 3000

Mobile: +91 9619 197 636

Fax: +91 22 2417 5734

Email: vrushali.p@ASAPPinfoGLOBAL.com

www.ASAPPinfoGLOBAL.com

11th Global CemFuels Conference & Exhibition
Fuels for Cement and Lime

Date : 02 - 03 February 2017

Venue: Barcelona, Spain

For more information please contact:

Pro Global Media Ltd

Tel: +44 1372 743837

Fax: +44 1372 743838

Email: info@propubs.com

For more information please visit: www.cemfuels.com

Cement Business & Industry conference and
exhibition

Date : 15 - 16 February 2017

Venue: Sao Paulo, Brazil

For more information please contact:

Ms. Beatrice Ene, Client Development & Marketing
Director (International)

Tel: +1 203 987 5212

Email: be@gmiforum.com

www.gmiforum.com

Cemtech Middle East & Africa 2017

Date: 19 - 22 February 2017

Venue: Dubai, UAE

Tel.: +44 1306 740 363

Fax: +44 1306 740 660

Email: info@cemtech.com

www.Cemtech.com/MEA2017

2nd Global SynGyp Conference & Exhibition on wet
scrubbers and synthetic gypsum

Date : 30 - 31 March 2017

Venue: Lindner Congress Hotel, Düsseldorf, Germany

For more information please visit: [http://www.](http://www.globalgypsum.com/conferences/global-syngyp/introduction)

[globalgypsum.com/conferences/global-syngyp/
introduction](http://www.globalgypsum.com/conferences/global-syngyp/introduction)

1st Global CemProcess Conference and Exhibition
Process optimisation, de-bottlenecking, production
maximisation and troubleshooting

Date : 24 - 25 April 2017

Venue: London, UK

For more information please contact:

Pro Global Media Ltd

Tel: +44 1372 743837

Fax: +44 1372 743838

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

BusinessCem Moscow 2017

Date : 24 - 26 April 2017

Venue: Moscow, Russia

For more information please contact:

BusinessCem Media

Tel.: +7 499 977 4968

Fax: +7 499 977 4495

Email: valev@businesscem.msk.ru

[http:// www.businesscem.ru](http://www.businesscem.ru)

12th Global Slag Conference, Exhibition & Awards

Date : 18 - 19 May 2017

Venue: Düsseldorf, Germany

For more information please contact:

Pro Global Media Ltd

Tel: +44 1372 743837

Fax: +44 1372 743838

For more information please visit: www.globalslag.com

IV International Business Meeting

White Nights: Cement. Concrete. Dry Mixtures

Date : 29 - 31 May 2017
 Venue: Grand Hotel Europe, St. Petersburg, Russia
 For more information please visit:
www.white-nights.info

14th TÇMB International Technical Seminar & Exhibition
 Main theme: "Sustainable Environment & Energy"
 Date : 10 - 13 October 2017
 Venue: Kaya Palazzo Golf Resort, Belek, Antalya, Turkey

For more information please click:
<http://www.tcma.org.tr/ENG>

15th International Congress on the Chemistry of Cement (ICCC 2019)
 Date : 16 - 20 September 2019
 Venue: Prague, Czech Republic
 For more information please click:
<http://www.iccc2019.org>

CERAMIC

Cuba Glass 2016
 Date: 06 - 07 December 2016
 Venue: Havana, Cuba
 For more information please visit:
<http://glassonline.com/site/cubaglass>

Glass Technology India 2016
 Date: 09 - 11 December 2016
 Venue: Mumbai, India
Tel: +91 44 4295 9595
Fax: +91 44 2820 2728
For more information please visit:

reliability – quality – progress afp



(SEMI) TURNKEY GRINDING PLANTS
MILLS
ROTARY DRYERS
HOT GAS GENERATORS
SEPARATORS
ONLINE PARTICLE SIZE ANALYSERS



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 📧 info@cemtec.at • www.cemtec.at

CEMTEC
 Cement & Mining Technology

GENERAL

The 7th International Conference
Sciences of Electronics, Technologies of Information
and Telecommunications (SETIT 2016)
Date : 18 - 20 December 2016
Venue: Hammamet – Tunisia
For more information, please visit:
<http://www.setit.rnu.tn>

SteelFab 2017
The Middle East trade show for the metal working,
metal manufacturing and steel fabrication industry
Date : 16 - 19 January 2017
Venue: Expo Center Sharjah, UAE
E-mail: info@expo-centre.ae
For more information please visit:
www.steelfabme.com

Soil Mechanics for Property Development
Date : 18 - 19 January 2017
Venue: Kuala Lumpur, Malaysia
For more information please contact:
Trueventus
Casey Lee
Tel: +603 2775 0067 / Fax: +603 2775 0055
Email: caseyl@trueventus.com

IFAT Eurasia, Trade Fair for Environmental
Technologies
Date : 16 - 18 February 2017
Venue: Istanbul Expo Center (İFM), Hall 9 -10 -11-
Turkey
For more information please visit:
www.ifat-eurasia.com

Iran BuildEx - Iran International Exhibition of
Building & Construction Industry
Date : 25 - 28 February 2017
Venue: Tehran, Iran
For more information please contact:
Serhan PUL, International Sales Director
Email: serhan.pul@pyramidsfair.com
Tel: +90 216 575 28 28 Ext: 233

6th International Drymix Mortar Conference IDMMC
Six
Date : 03 - 04 April 2017
Venue: Nuremberg, Germany
For more information, please visit:
www.drymix.info

25th International Mining Congress and Exhibition of
Turkey
Date : 11 - 14 April 2017
Venue: Antalya, Turkey
Email: imcet.maden@maden.org.tr
For more information, please visit:
www.imcet.org.tr

Irexpo
Date : May 2017
Venue: Tabriz, Iran
Tel: +90 212 273 18 18
Email: info@irexpo.net / www.irexpo.net

IE expo 2017
Date : 04 - 06 May 2017
Venue: Shanghai New International Expo Centre,
China
For more information please visit:
www.ie-expo.com

NETZSCH Fine Powder Processing: "Energy
Efficiency and Process Optimization"
Date : 31 May - 01 Jun 2017
Venue: Hanau, Germany
For more information please visit:
www.netzsch-grinding.com

IFAT Africa 2017 Trade Fair for Water, Sewage,
Refuse and Recycling
Date : September 2017
Venue: Johannesburg, South Africa
For more information please visit:
www.ifat-africa.com

Bauma 2019
Date : 08 - 14 April 2019
Venue: Munich, Germany
For more information, please visit:
www.bauma.de

Cemtech MEA 2017

DUBAI, UAE

19-22 FEBRUARY 2017

Market insights &
production expertise

INTERNATIONAL CEMENT CONFERENCE

Cemtech

PRODUCTION EXPERTISE - MANAGEMENT SKILLS



Cemtech invites you to its 12th Middle East & Africa conference and exhibition, taking place at the Grand Hyatt Dubai (UAE) on 19-22 February 2017, offering:

- The chance to network with senior industry experts from over 35 nations
- Insights into the latest market trends, drivers for change, trade reports, regional forecasts and country profiles
- Stimulating technical programme, including case studies tackling key issues such as plant optimisation, alternative fuel systems and their implementation, and new plant construction
- The Cemtech exhibition, running parallel to the conference, providing a space for delegates to network and interact with a range of technology suppliers
- Extended technical programme: tour of local cement plant
- Exceptional hospitality, a hallmark of the Cemtech experience, including lunches, evening receptions and the renowned Gala Dinner.

Early bird offer: register by 17 January 2017 and save US\$375

Conference organised by

International
Cementreview

Supported by
the AUCBM



For more details, programme updates and registration, see:

www.Cemtech.com/MEA2017