



CEMENT & BUILDING MATERIALS REVIEW

Published by: Arab Union for Cement and Building Materials No. 89 September 2022



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

ALGERIA

GICA obtains certificate of conformity with European standards for cement products

Groupe des Ciments d'Algérie (GICA) has obtained a certificate of conformity with European standards (CE) for three types of cement. The certification should allow the company to export more products to Europe. It applies to its GICA Moudhad and GICA Béton products. The move follows similar certification of products with the Association Française de Normalisation (AFNOR) from the company's Aïn El Kebira plant in July 2021. At the same time the Minister of Industry said it was helping the group with its export strategy.

In 2021 GICA exported 2.25Mt of cement to countries including the Ivory Coast, Gambia, Ghana, Mauritania, Senegal, Cameroon, Benin, Guinea, Brazil, Peru, the Dominican Republic, Haiti and a number of European countries.

Global Cement

EGYPT

Misr Cement Qena's Qena cement plant commences automated cement production

Misr Cement Qena commenced automated cement production at its Qena cement plant in early July 2022. The automation systems also cover plant maintenance processes. Misr Cement Qena awarded a technical management contract for the plant to Arab Swiss Engineering Company in June 2021.

Misr Cement Qena said "This step came in line with the company's growth strategy to reduce operating costs and maximise asset utilisation in order to meet current challenges."

Global Cement

Korra Energi awarded contract to build waste heat recovery unit at Suez Cement's Helwan plant

Korra Energi has been awarded a contract to build a 20MW waste heat recovery (WHR) unit at Suez Cement's Helwan plant. The WHR unit will serve both of the plant's two production lines. Korra Energi is an Egypt-based engineering company and a subsidiary of conglomerate Korra.

Global Cement

**NEW PUBLICATION
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Cement Plant Environmental Handbook

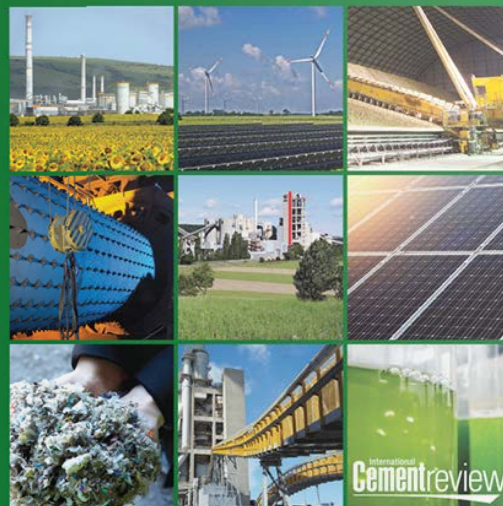
Third Edition

The third edition of the Cement Plant Environmental Handbook, published by International Cement Review, is the essential new reference work for cement plant owners and operators seeking to follow best practice cement manufacturing while adhering to the highest environmental standards.

Over 40 authoritative articles offering state-of-the-art technical know-how across all the main areas of the cement manufacturing process, with a focus on energy and resource efficiency, pollution control and carbon emissions reduction. Chapters include:

- Environmental context and the challenge of decarbonisation
- Quarry operations and ecosystems management
- Improving energy efficiency
- Process optimisation and the digital plant
- Alternative fuels technologies and case studies
- Emissions monitoring and abatement
- High efficiency grinding systems
- Clinker reduction and the production of low CO₂ cements
- The state-of-the-art cement plants
- Towards Net Zero: cement plants of the future

Cement Plant Environmental Handbook THIRD EDITION



Contributors to this handbook include Holcim, CTP Austria, Cementos Argos, GIZ-Geocycle, KHD, Carbon8 Systems, w&p Zement, Sintef, WL Gore, Köppern, Cementir, JSW Cement, EPFL, Dalmia Bharat, Optimotive, GCCA, Cementir, and many more...

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Arab News

Building Material Industries Company appoints ASEC for Asyut cement plant operations and maintenance management

Arab Swiss Engineering Company (ASEC) has won a contract to manage operations and maintenance at Building Material Industries Company (BMIC)'s Asyut cement plant. ASEC previously held responsibility for the plant's technical management between 2011 and 2019.

Global Cement

Suez Cement obtains environmental product declaration for cement products

Suez Cement says it is the first grey cement company in Egypt and Africa to obtain an environmental product declaration (EPD) certificate in accordance with international ISO standard. Four certificates have been issued for cement products manufactured at the company's Helwan, Kattameya and Suez integrated plants. These are: CEMII BP 42.5N; CEMIIIA 42.5N; CEMII AL 42.5N; and Masonry 12.5X.

Global Cement

QATAR

Qatar National Cement Company and Gulf Organisation for Research & Development sign deal on low-carbon building materials

The Qatar National Cement Company (QNCC) and Gulf Organisation for Research & Development (GORD) have signed a memorandum of understanding (MOU) to collaborate on the research and development of low-carbon building products. The organisations will also lead capacity building and knowledge sharing exercises to encourage the industry-wide transition to low-carbon solutions and green building practices.

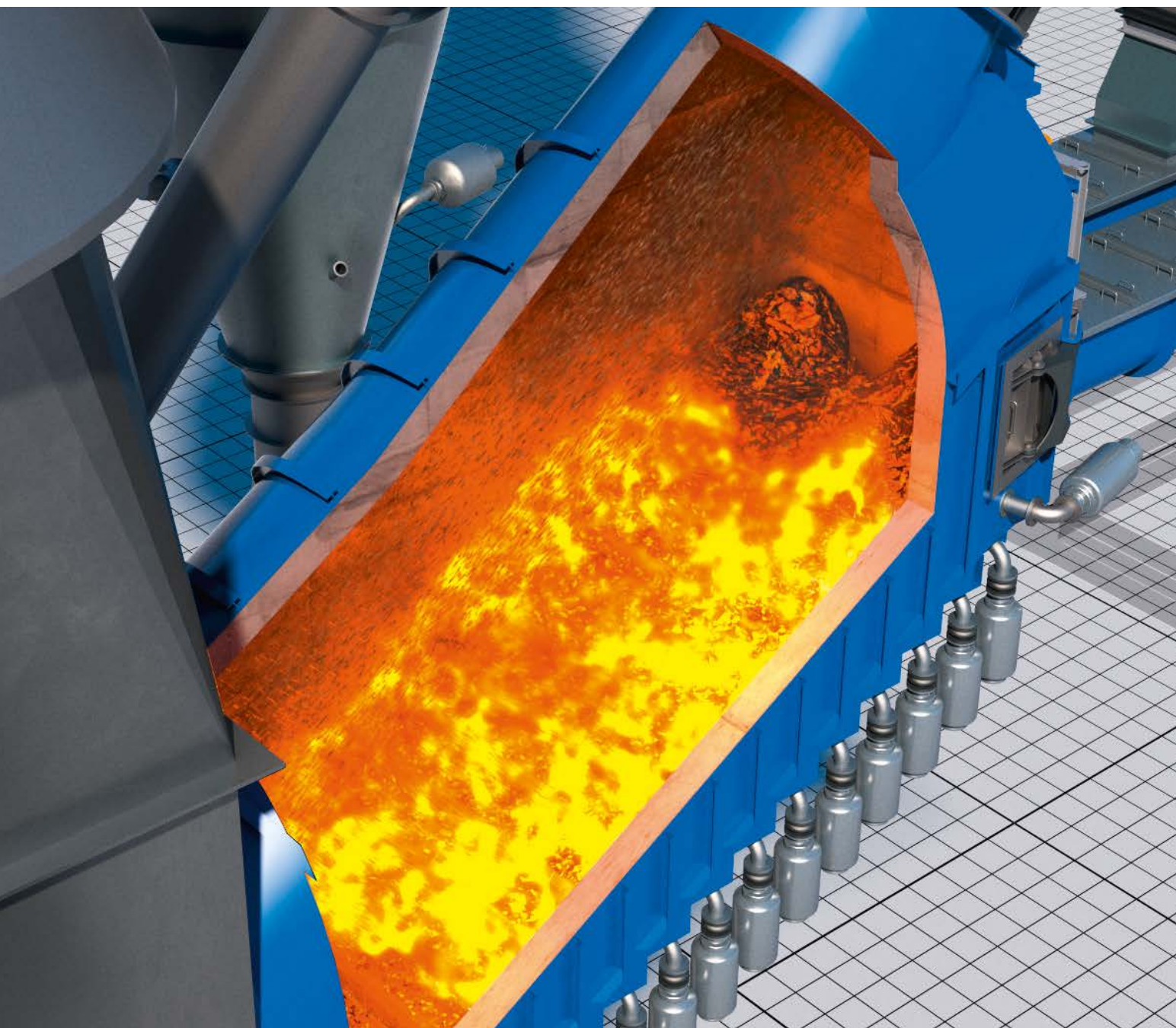
Global Cement

UAE

Lafarge Emirates Cement to install waste heat recovery plant at Fujairah cement plant

Lafarge Emirates Cement plans to install an organic Rankine cycle (ORC) waste heat recovery (WHR) plant at its Fujairah Cement Plant. The facility is part of the bank's planned US\$300bn-worth of green finance funding up to 2030.

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FLSmidth announces completion of TK Mining acquisition – creating a leading global mining technology and service provider

FLSmidth today announced that all conditions and requirements for the acquisition of thyssenkrupp's Mining business (TK Mining) have been met (refer Company Announcement No. 7-2021). In accordance with the sale and purchase agreement, final closing of the transaction will take place on the last business day of the month. Accordingly, the transaction will close on 31 August 2022.

All regulatory clearances have been obtained without imposition of any competition related remedies.

TK Mining is a leading full-line supplier of solutions for mining systems, material handling, mineral processing and services. The combination of FLSmidth and TK Mining will create a leading global mining technology and service provider with operations from pit-to-plant with a strong focus on productivity and sustainability.

FLSmidth Group CEO Mikko Keto commented: "Today's announcement marks a significant milestone in the history of FLSmidth. We are very excited to soon welcome our ~2,000 new colleagues and TK Mining's customers to FLSmidth. The completion of the acquisition contributes to FLSmidth's strategic growth ambitions within Mining. Our combined company will offer customers a stronger, complementary value proposition, while creating significant aftermarket opportunities, driving value creation through compelling synergies and further strengthening our sustainability and digitalisation agenda".

Further impact of the transaction, including updated financial guidance for 2022, will be communicated no later than in connection with the release of FLSmidth's financial results for the first nine months of 2022 on 8 November 2022.

About FLSmidth

FLSmidth provides sustainable productivity to the global mining and cement industries. We deliver market-leading engineering, equipment and service solutions that enable our customers to improve performance, drive down costs and reduce environmental impact. Our operations span the globe and we are close to ~10,100 employees, present in more than 60 countries. In 2021, FLSmidth generated revenue of DKK 17.6 billion.

MissionZero is our sustainability ambition towards zero emissions in mining and cement by 2030. FLSmidth works within fully validated Science-Based Targets, our commitment to keep global warming below 1.5°C and to becoming carbon neutral in our own operations by 2030. www.flsmidth.com

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KILN OPERATIONS OPTIMISATION

Kiln operators have one of the most important jobs on a cement plant and one where their actions can have a real-time impact on the profit and loss of the plant. They affect the kiln output, fuel and power consumption, clinker quality, plant emissions and the life of the refractory. But cement plant owners rarely invest in training, development and coaching of their operators to improve profits – JAMCEM can provide these services with its systems and kiln master burner services

PADS ASSESSMENTS

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OPERATING COACHING

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**INDEPENDENT CONSULTANTS FOR THE
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Mondi invests in new research and development centre at Mondi Steinfeld



- ***New €5 million R&D centre at Mondi Steinfeld, Germany, to meet customers' growing demand for sustainable packaging solutions***
- ***Facility to strengthen customer collaboration, insight and knowledge transfer***
- ***When completed, will include pilot lines for both plastic- and paper-based solutions as well as an analytical laboratory and a customer experience centre***

20 September 2022 – Mondi, a global leader in packaging and paper, is investing around €5 million in a new research and development (R&D) facility at Mondi Steinfeld, in Germany. This investment will support customers by helping them to develop solutions that achieve their sustainability goals.

Construction of the facility has commenced, and when completed, will include pilot lines for both plastic- and paper-based solutions, from coating, film extrusion and printing to filling lines for multiple products. The centre will also have an analytical laboratory as well as a

floor dedicated to a customer experience centre, which will provide an open environment to meet and collaborate with customers at an early stage in the development of new innovations.

The R&D centre will bring together experts with extensive knowledge of different materials and packaging types. Extrusion coating, aqueous coating and silicisation will be available, as well as various printing machines. Filling lines for different materials, including both horizontal and vertical filling, forming and sealing equipment will allow customers to conduct trials without interrupting their own running production. The facility also enables Mondi to work with its customers to develop pilot-scale solutions on site and to accelerate the process from idea to a scaled solution.

Elisabeth Schwaiger, Head of R&D and IP Flexible Packaging at Mondi, says, "This R&D centre demonstrates our hands-on approach to developing sustainable packaging solutions at Mondi. We look forward to working with our

customers, combining their knowledge with ours to meet their sustainable packaging goals. The investment helps to contribute to our own Mondi Action Plan 2030 sustainability goals, specifically our target to make 100% of our products reusable, recyclable or compostable by 2025."

The research and development centre will open its doors at the end of 2023 and will complement Mondi's other research and development centres such as the recycling and food safety laboratories in Frantschach, Austria.

About Mondi

Mondi is a global leader in packaging and paper, contributing to a better world by making innovative solutions that are sustainable by design. Our business is integrated across the value chain – from managing forests and producing pulp, paper and films, to developing and manufacturing sustainable consumer and industrial packaging solutions using paper where possible, plastic when useful.

Sustainability is at the centre of our strategy, with our ambitious commitments to 2030 focused on circular driven solutions, created by empowered people, taking action on climate.

In 2021, Mondi had revenues of €7.0 billion and underlying EBITDA of €1.2 billion from continuing operations, and employed 21,000 people worldwide. Mondi has a premium listing on the London Stock Exchange (MNDI), where the Group is a FTSE100 constituent, and also has a secondary listing on the JSE Limited (MNP).

www.mondigroup.com

Contact:

Judith Wronn

Head of Communication, Mondi Flexible Packaging

Tel: +49 151 1771 4692

Email:

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2022

THE ROAD TO GREEN CONSTRUCTION



Eng. Amr A. Nader
CEO, A³&Co.®



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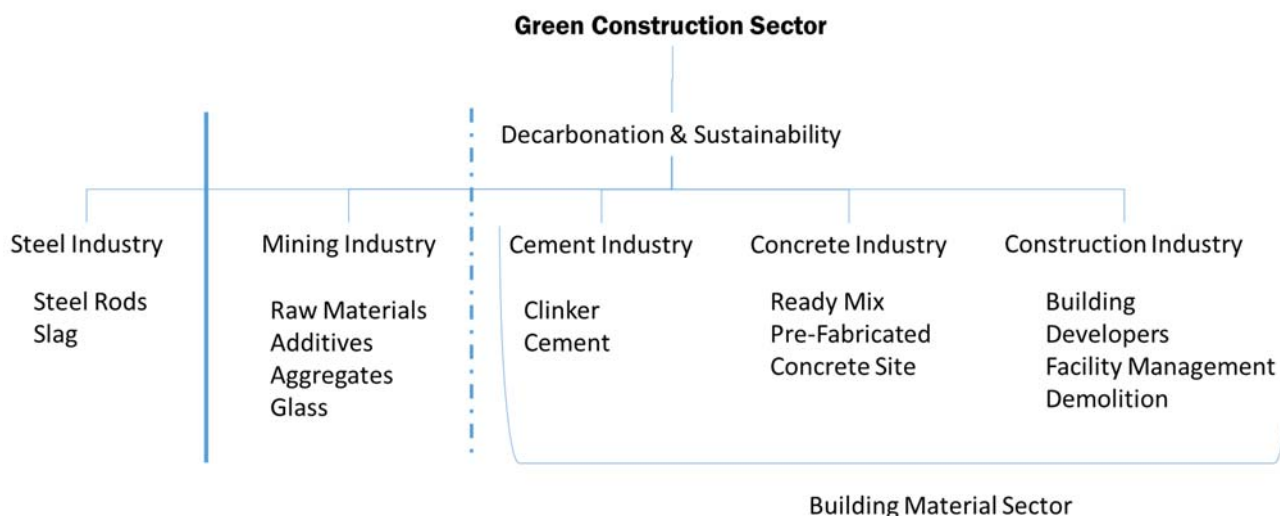
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The Road to Green Construction

Introduction:

Green Construction is an Integral Decarbonization Process of all the inputs and processes in the building value chain.

That said, defining the value chain from GHG emissions scopes 1, 2 & 3 is simply the integration of the following processes:



Cement Industry is an integral and impactful part of the value chain with Cement and Concrete representing more than 60% of the full GHG value.

Clinker, Cement, Concrete and Construction are the skeleton of the value chain where clinkerisation process holds approximately 78% of the embodied CO₂ of the building as built.

The decarbonisation of Clinker, Cement and partially concrete can be achieved in the context of “Reduce Carbon and Reduce Cost”

Specifically, 47% of the decarbonisation of the cement industry is doable in 3 to 5 years with total investments well below 50 M USD over the 5 years period and with payback period less than 10 years as well as a total cost reduction up to 10 dollars based on country specifics.

In the course of the paper, we will showcase A³&Co.[®] roadmap done under the umbrella of World Cement Association “WCA”

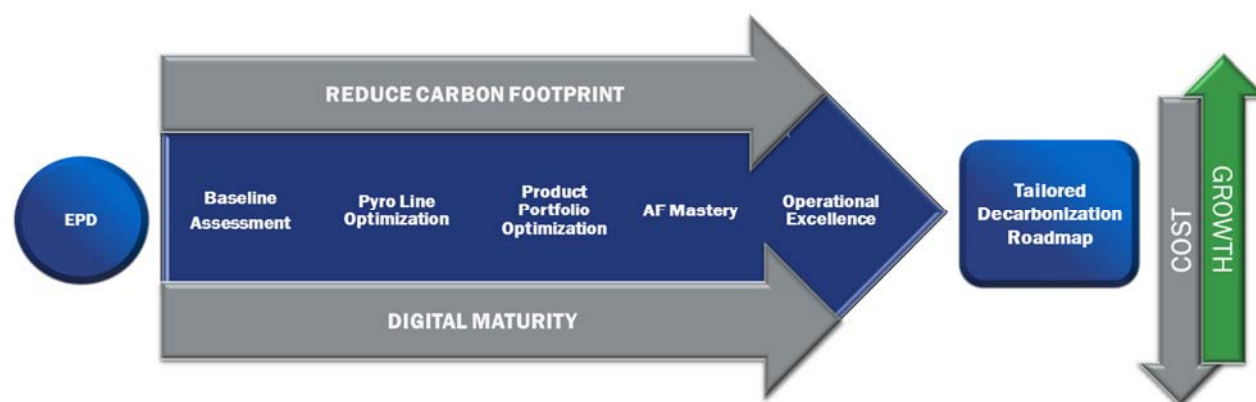


A³&Co.[®] Roadmap:

The roadmap logic is built inline with the UNCCC climate strategy, i.e. achieve the 1.5° pathway targets before 2030 and the Net Zero targets before 2050.

The building blocks of our roadmap are construction the target “Reducing Carbon while Reducing Cost” to ensure a business competitive edge in a market that is already under pressure from excessive supply resulting in lower prices as well as increasing energy costs resulting in shrinking profits.

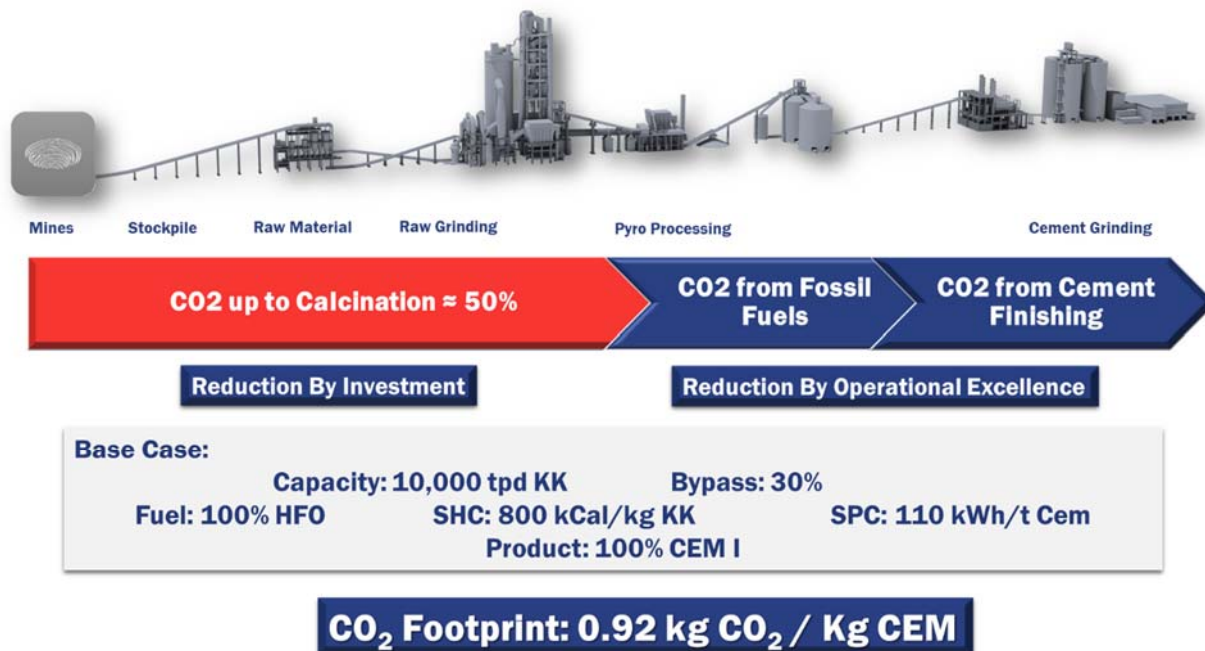
A³&Co.[®] Roadmap Technical approach:



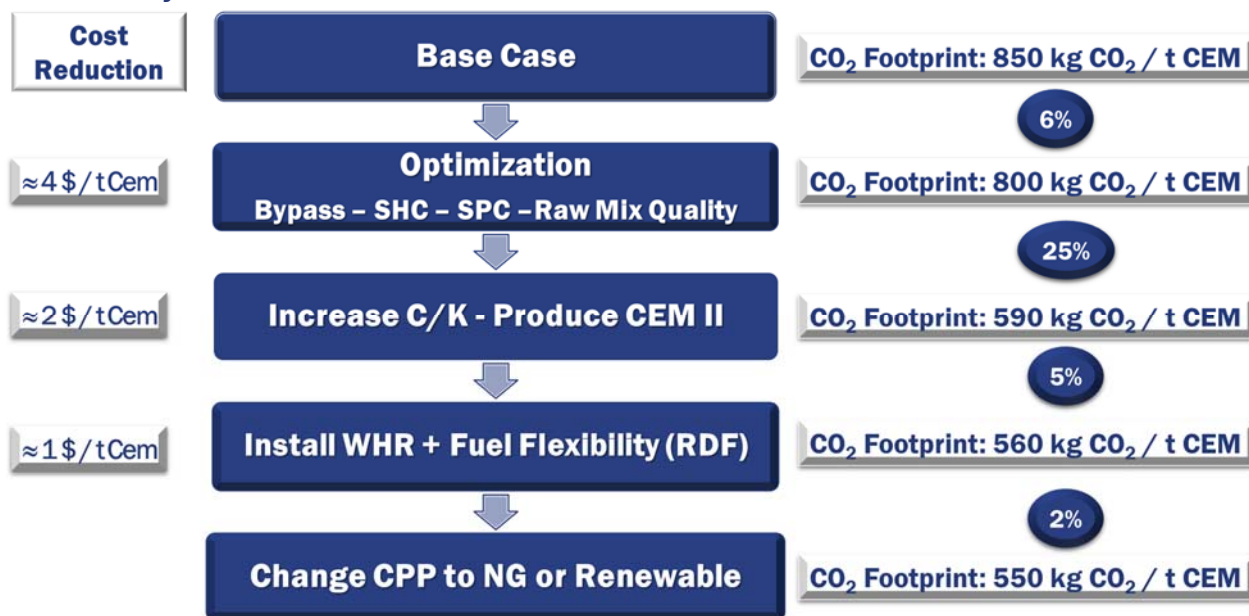
A³&Co.[®] Step by Step Approach

- Develop Baseline using Environmental Product Declaration approach coupled with A³&Co.[®] CO₂ Calculation tool
- Baseline line Assessment to develop Operational Excellence Strategy to Optimise Pyro-Line, Product Portfolio and Alternative Fuels Mastery which is best done in a full transformational approach covering the plant horizontally from quarry to dispatch and the business vertically covering Commercial, Financial, Human Capital, IT and Operational aspects.
- That is Followed by a tailored decarbonisation roadmap built on:
 - Operational Excellence
 - Product Portfolio Development (Clinker Replacement and SCMs utilisation)
 - Energy Management (WHR and Alternative Fuels Utilisation)
 - Cement Innovation either by belite clinker production or calcined clay or a mix of both in addition to using Renewable Energy.
 After 2030:
 - Utilisation of 2nd Generation Oxyfuel
 - Implementation of Carbon Capture, Utilisation and Storage (CCUS) technologies
 - Finally, the possibility of replacing conventional and alternative fuels by hydrogen

The Base Case:

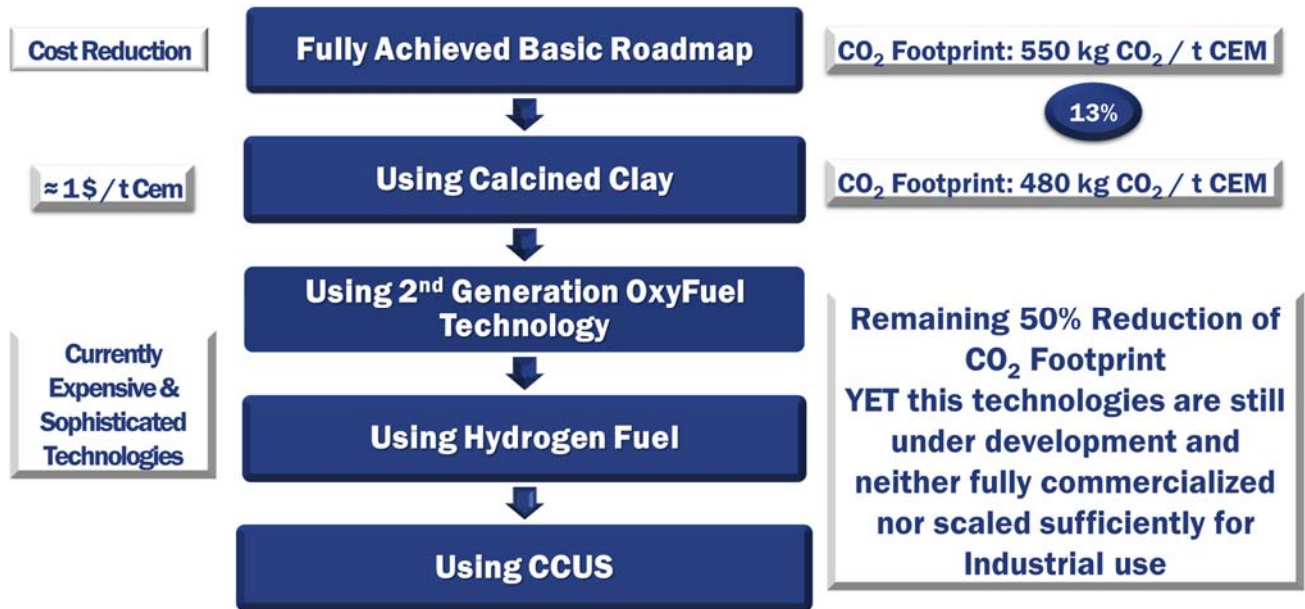


Phase 1 - By 2030:



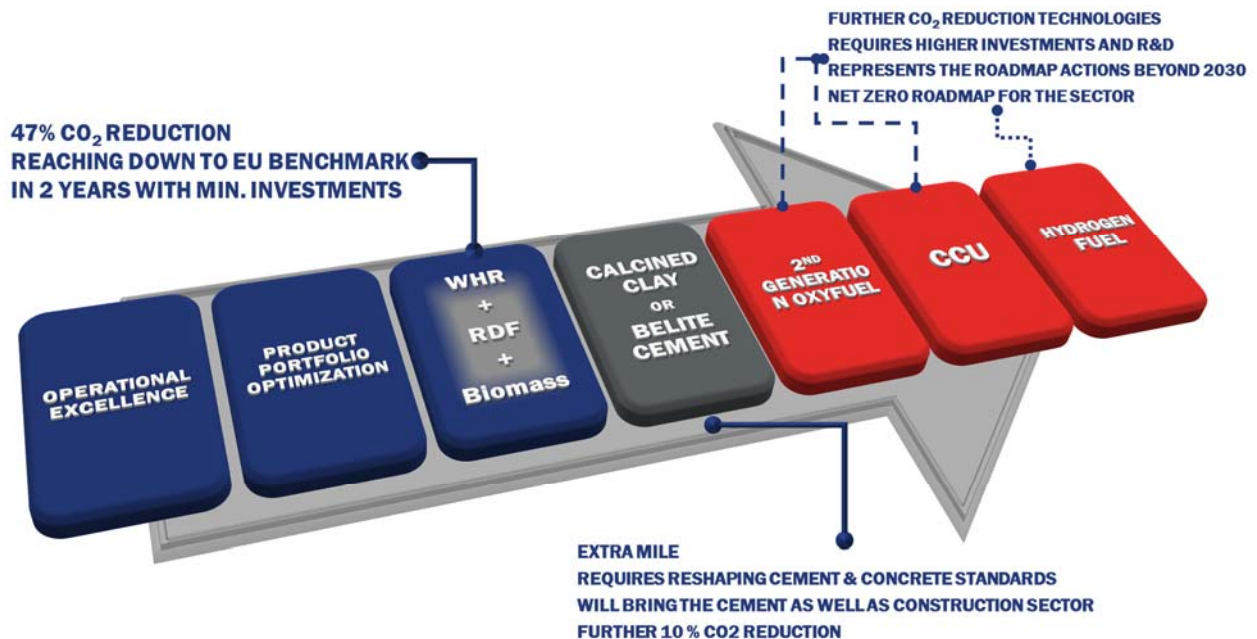
- Minimum of 38% reduction
- Total investment of 15 M USD
- Total Cost Reduction of 7 USD/t
- Payback period < 10 Years.

Phase 2 - By 2050:



- Reaching Net Zero
- Total investment of > 100 M USD

Conclusion - A³&Co.[®] Roadmap in Details:



VERTICAL DRYING OF ALTERNATIVE FUELS AND SIMULTANEOUS SIFTING OF IMPURITIES

By: Dr. Dominik Aufderheide, Dr.-Ing. Luigi Di Matteo[#]
[#]DI MATTEO Group, Germany

Abstract

Many alternative fuels (AF) are derived from waste streams and therefore are prone to changing material properties. Especially a high variation of the humidity leads often to challenging process situations, since the variation of the water content causes automatically a non-constant energy influx to the combustion process. One possibility to compensate for those problems is the integration of modern fuel flash dryers into the AF handling line. This article provides an overview of the functional principle of those machines and summarises typical characteristics of the operation of dryers, which need to be considered for the plant operator.

Keywords: Alternative fuels, drying, calorific value, combustion

1. Introduction

The high energy demand of the cement manufacturing process initiated the wish to substitute classical fossil fuels for the clinkering process by more cost effective and sustainable alternatives already decades ago. Besides the obvious economic advantages of such an approach, it can be also considered to be without any alternative when it comes to an evaluation of the ecological aspects of modern cement production. Especially in times, where typical stakeholders of the cement plants are more sensitive regarding the protection of the environment and sustainable manufacturing strategies, it is important that the implementation strategies for alternative fuels (AFs) are chosen wisely. In this context it need to be understand by all involved parties from the very beginning of a project, that typical material streams for AF differ immensely from those for other raw materials and fuels. Most substitute fuels are nowadays derived from industrial and/or municipal waste streams (e.g. residue derived fuels – RDF), biomass (e.g. rice straw, corn plants, etc.) or tires (e.g. in shredded or fluffy form), where one of the major challenges for the utilisation of AF starts even before the material even arrive in the cement plant (see [1]). The establishment of a proper logistic chain requires often the involvement of more than a single exclusive preparation plant as a supply partner, which has certain advantages if it comes to guarantee a continuous material stream, but the more fuel sources are used, the instability of the quality and properties of the AF increases. Even if smart contracting and purchasing can compensate some of the problems, it is important to consider that the typical AF material properties are volatile and that those inconsistencies will lead to challenging situations during the utilisation of those fuels. This article will provide in section 2 a short case study on how the moisture content of AF might affect the combustion process by taking into consideration the typical dosing scheme utilised in modern AF feeding plants. Section 3 introduces flash drying techniques as an efficient methodology to dry out surface moisture of fuel particles within a few seconds and homogenize the characteristics of each fuel and therefore helps to increase the process stability. Finally, section 4 concludes the article with an overview of typical advantages accompanied by the integration of flash dryers into AF handling concepts.

2. Humidity and its importance for the combustion process

As already pointed out, the volatile character of typical bulk material characteristics of almost all alternative fuels which are derived from waste, are leading to challenging process conditions. As one example, it is possible to identify the humidity content of AFs and how the amount of water within the fuel streams affects the combustion process. However, it is possible to maintain the correct temperature profile of Kiln by controlling the feeding system and the fuel homogeneity with alternative fuels with a uniform heating value and moisture content. In order to highlight the importance of this aspect, a short case study shall be defined, where the actual AF material stream is directly dosed to the combustion process (e.g. the rotary kiln main flame or the pre-calciner). As it can be seen, there is a direct relation between the water content of the AF and the resulting energy content. Thus, it can be concluded that, the higher the moisture content of a fuel will be, the lower is its calorific value. Usually the

influence of the moisture can be modelled for each composition by using an adaption factor, which can be used to calculate the increase or decrease in energy content based on a reference moisture (e.g. 15%) and is represented by a simple adaption coefficient. The following figure provides an example for such an adaption curve as gathered for a reference material.

If it is now assumed, that the moisture of an alternative fuel varies between 5 and 20%, the actual energy content per mass varies also according to the adaption factor as shown in Figure 1 from 113% to 90% of its reference energy content gathered at a humidity level of 15%. Of course, this would only describe the change in energy content caused by the humidity variations; in reality, the deviation could be much higher, due to the influence of general inconsistencies within the general composition of the AF.

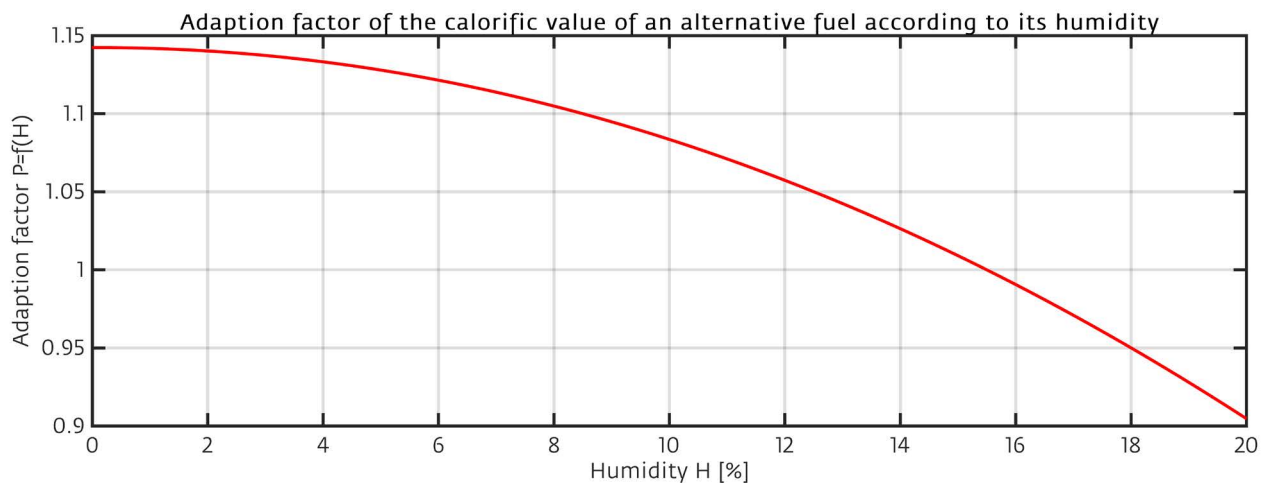


Figure 1: Adaption factor for the calorific value of an alternative fuel according to its humidity

However, most AF handling systems using gravimetric dosing systems, where the actual amount of material transported to the burning process is metered in terms of mass per time unit (e.g. t/h). Usually gravimetric dosing systems, such as the ODM-WeighTUBE [3] are able to dose the material with an accuracy of +/-1% from the massflow setpoint. Therefore for a typical case, where 15t/h are transported to the combustion process the variation over time in the actual energy content of the infeed fuel are varying quite enormously. The following figure provides an overview of data captured from a typical scenario, where a humidity variation leads to a certain variation of the energy transported to the combustion process.

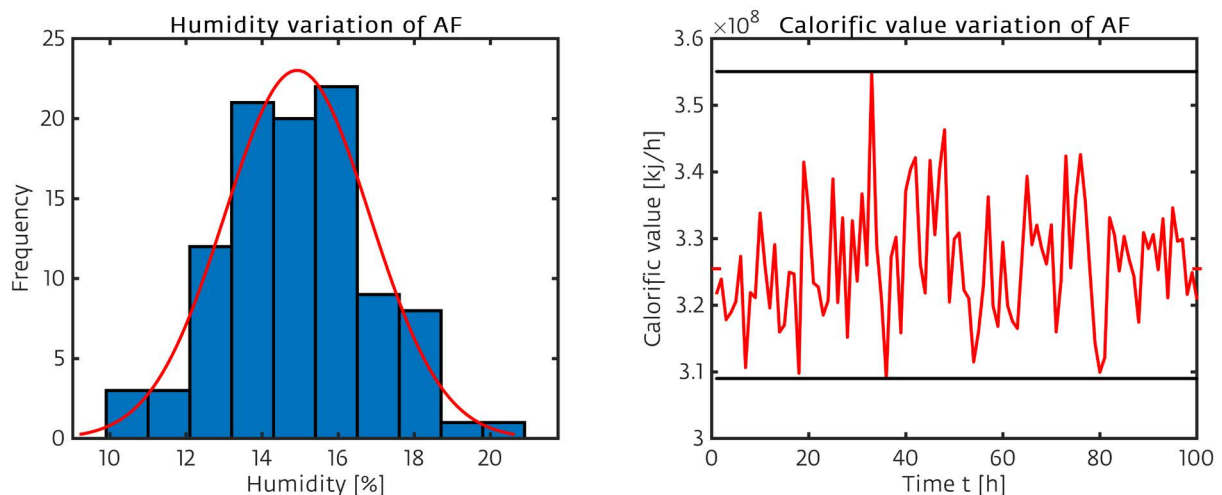


Figure 2: Case study for an alternative fuel with varying characteristics. Left: Histogram and derived Gaussian distribution of the humidity variation of an AF; Right: Resulting variation within the calorific value of the AF

There it can be concluded, that a further control of the moisture content of the material instream would lead to a much more heterogeneous energy infeed to the process and therefore a more stable process.

3. Pneumatic drying with a modern flash dryer

Drying is a separation process that converts a wet solid, semisolid, or liquid feedstock into a solid product by evaporation of the liquid into a vapour phase with the application of heat. Essential features of the drying process are phase change and production of a solid. Pneumatic or flash dryers may be classified as gas–solid transport systems that are characterized by continuous convective heat and mass transfer processes. Hot air produced by indirect heating or direct firing is the most

common drying medium in these systems. In direct flash dryers, the gas stream transports the solid particles through the system, and makes direct contact with the material to be dried. This gas stream (drying medium) also supplies the heat required for drying and carries away the evaporated moisture. Superheated steam can also be used as drying medium yielding sometimes to higher efficiencies and often to higher product quality (see also [3]). The large surface area for heat and mass transfer and the high convective heat and mass transfer coefficients, which take place at these units, result in high drying rates and as a result, high drying capacity. The size of particulates to be dried is usually in the range of 10–500 μm . One of the features of these types of dryers is the relatively short contact time between the hot air and the particulate materials (0.5–10 s) at the drying section. Because of this, the material temperature stays always low in the drying process.

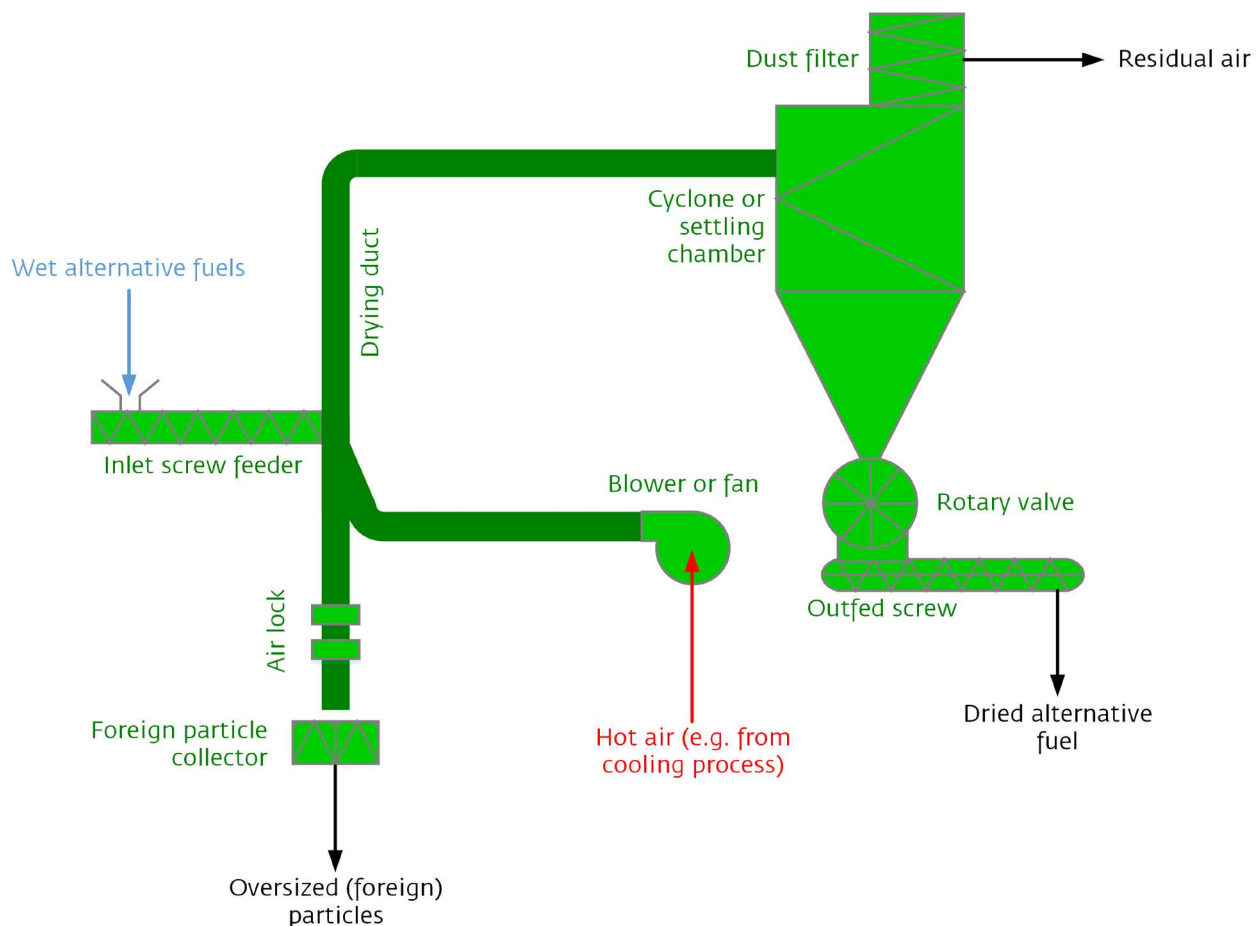


Figure 3: Typical setup of an ODM-FlashDRYER - (Image courtesy: DI MATTEO Group)

Figure 3 shows a simple pneumatic flash drying system in which particulate solids are dried during transport in a hot gas stream (usually air or combustion gases). The simple flash drying system includes seven major components: the hot air fan or blower, the wet material inlet screw feeder, the drying duct, the cyclone or settling chamber, exhaust dust filter, a rotary valve and an outfeed screw feeder. The wet particles are fed into the hot gas stream sometimes with special mixing devices. The stream flows up the drying tube. The gas velocity must be greater than the free fall velocity of the largest particle to be dried. The gas velocity in relation to the particle velocity is high. At the end of the drying process a dust separation arrangement is installed. It must comply with the regulations for pollution control. For this purpose cyclone dust separators, specially designed settling chambers, fabric filters, electrostatic precipitators, wet scrubbers, and fabric filters are used. In order to generate an air lock between the subsequent outfeed conveyors (e.g. outfeed screw conveyors) and the cyclone or settling chamber, there is usually an additional rotary airlock installed.

One of the major characteristic of flash dryers is the fact that the thermal contact between the conveying air and the solids as mentioned above is usually very short and therefore flash dryers are most suitable for removal of external moisture (surface moisture) and are less suitable for removal of internal moisture. If this considered for AF, it shall be noted, that the majority of the humidity within those material streams can be associated to volatile surface moisture. Therefore, the concept of flash drying perfectly fits to the actual properties of alternative fuels. Furthermore, high rates of evaporation in flash dryers are leading to low temperatures of the dried material. This is an indication that flash dryers are particularly useful for drying fuels, since the danger of an undesired ignition of the fuel during the drying process is very unlikely due to the low temperature profile. In addition it shall be noted that flash dryers are simple in construction and have low capital cost and they are almost trouble free, since there are almost no sophisticated machine parts with moving parts involved. The following figure provides an insight into the drying process, where Figure 4 – (a) shows the typical drying curve. This curve shows the drying rate over the possible drying time. As it can be seen from this curve, the most efficient drying period will be up to point B within the graph, where the dry out per time will be almost constant. This is exactly the period utilised in a flash dryer. Afterwards the drying efficiency gradually decreases drastically. This can be explained that the efficiency depends actually on the water content within the fuel, as it can be seen in Figure 4 – (b).

Based on the classical flash drying principle as explained before, it is furthermore possible to include a classical air sifting technique into the very same machine: As it can be seen in Figure 3, at the lower end of the drying duct,

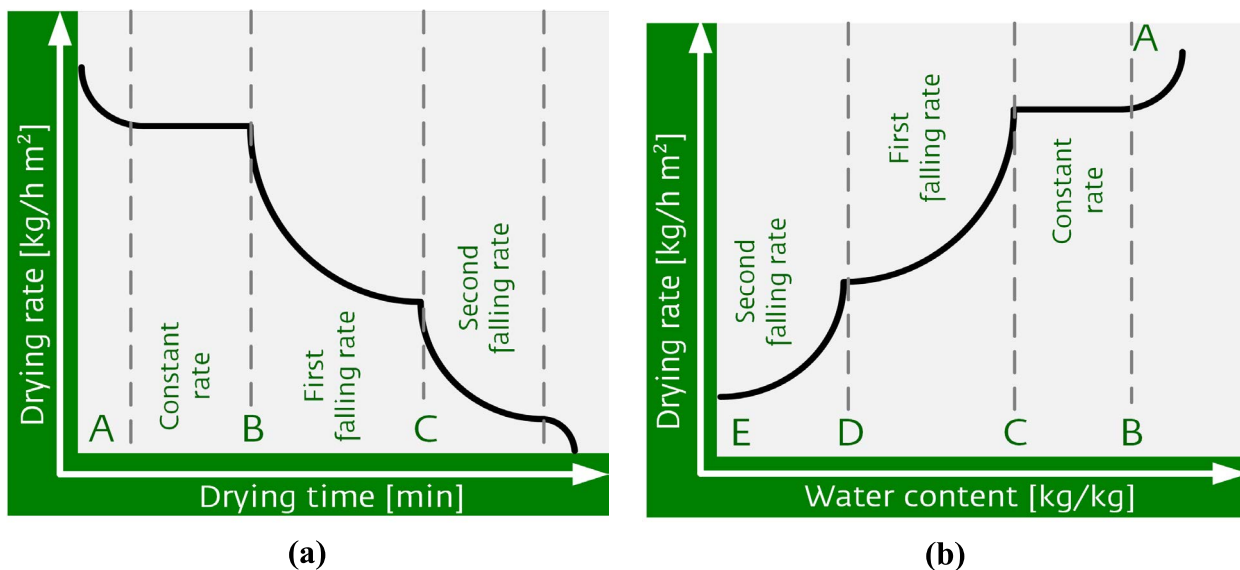


Figure 4: Typical drying curves: (a) – Drying rate over drying time; (b) Drying rate as a function of the fuels water content - (Image courtesy: DI MATTEO Group)



Figure 5: Typical heavy particles sorted out during the drying process by the included air sifting element; (a) – Case with basically metallic parts, hard plastics; (b) – Case with mainly mineral fractions, such as stones - (Image courtesy: DI MATTEO Group)

there is an additional air lock installed. This is typically build from two air-tight sliding gates, which are operated in a way, that the upper slider opens periodically and releases foreign and heavy particles which are accumulating at the lower end of the riser duct due to the inability to transport to heavy particles pneumatically within the air stream. When the first slide gate was opened it will be closed again and the lower slide gate releases those undesired particles to a waste container. This end of the machine can be interpreted as an air sifting device, which comes practically for free as an integral part of the flash drying principle. The following figure shows typical particles, which are sorted out during the drying process by this sifting element.

This additional function of a flash dryer is often a very important aspect of its operation, when the actual combustion process is considered. For this, the following figure shall illustrate the influence of such undesired particles on the combustion process. The particle in green colour represents a high quality AF particle with a relative small surface area and a general 2D morphology mainly based on plastic foil. The particle ignites fast and the combustion process is limited to the flame, while bigger particles with a bigger surface area and especially those with a 3D morphology (e.g. hard plastic pieces) would ignite much slower and would not completely burn within the flame. Particles with a larger ignition delay and higher particle-velocities burn later (low quality AF particle – red trajectory in Figure 6) as well as their heat release is also required for optimal conditions in the cement kiln [4]. These particles could only be tolerated to a small degree (see also [5]).

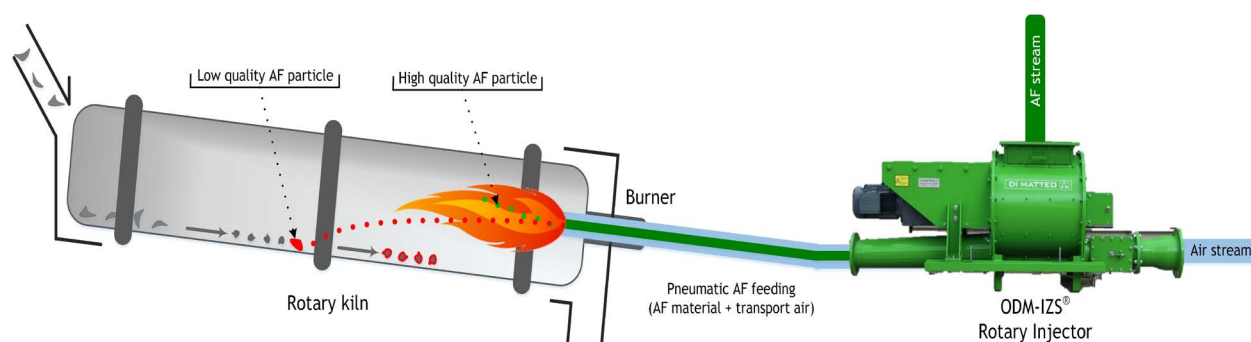


Figure 6: Trajectories of alternative fuel particles during co-combustion in a rotary kiln (Image courtesy: DI MATTEO Group)

4. Conclusion

The integration of a flash dryer into a handling line for alternative fuels has many advantages for the operator, since on the one hand the overall increase in the calorific value leads to a more efficient utilisation of the fuel itself. Furthermore, the homogenisation of the infeed fuel moisture helps also to stabilise the clinkering process and to generally provide an opportunity to increase the substitution rate even further. As it was also mentioned, the principle of the pneumatic drying includes also an air sifting element, which can be used to classify undesired foreign particles from the fuel stream.

The DI MATTEO Group in Germany developed based on the general principle of pneumatic drying their modular ODM-FlashDRYER. The overall system design is strictly modular and contains all necessary elements for a possible inclusion in new projects. Here DI MATTEO serves as the designer and fabricator of all necessary elements, as shown in Figure 3. Furthermore, the successful integration of a flash drying stage into existing feeding lines is possible. The following figure shows an example of an installed ODM-FlashDRYER for alternative fuels in a cement plant.

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Figure 7: ODM-FlashDRYER (Image courtesy: DI MATTEO Group)

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BEUMER Group supplies individual single-source solutions with regard to the handling of alternative fuels:

Firing manufacture economically

By: BEUMER Group, Germany

Cement manufacturers face strict environmental regulations with alternative fuels. This way, they fire calciners and main burners in an efficient and sustainable manner. BEUMER Group develops single-source solutions in order to convey, store and feed the differently composed materials. Among other things, the overall systems are made up of specially developed individual components.

Cement is the most commonly used building material worldwide, and is continuously growing. However, manufacturers have to comply with ever stricter environmental regulations in order to get air pollution under control. Depending on the processes used, the emissions from producing cement are at 0.6 to 0.99 t of CO₂ per ton of cement. The CO₂ emissions from this sector are estimated to account for seven to eight percent of the overall global carbon dioxide emissions. An approach to sustainably reduce greenhouse gas emissions and production costs is to increase the use of alternative fuels.

Fluid materials like waste oil or solvents but also solids for example are used instead of coal and gas. The majority is here composed of municipal and industrial waste, such as plastic, paper, composite material or textile mixes as well as wood pellets. The use of entire or shredded waste tyres is also welcome. The calorific value of the rubber from waste tyres is comparable to that from hard coal, and the iron from the reinforcement can be incorporated mineralogically into the cement. This minimises the addition of ferrous corrective substances. Alternative fuels are available in large quantities and at low costs and can be disposed of completely in a safe high-temperature process in the rotary kilns at the cement plants. Thus, these materials do not have to be landfilled or otherwise disposed of.

As different materials have different calorific values, the complete household waste cannot simply be fed into the combustion process in the kiln. Especially in

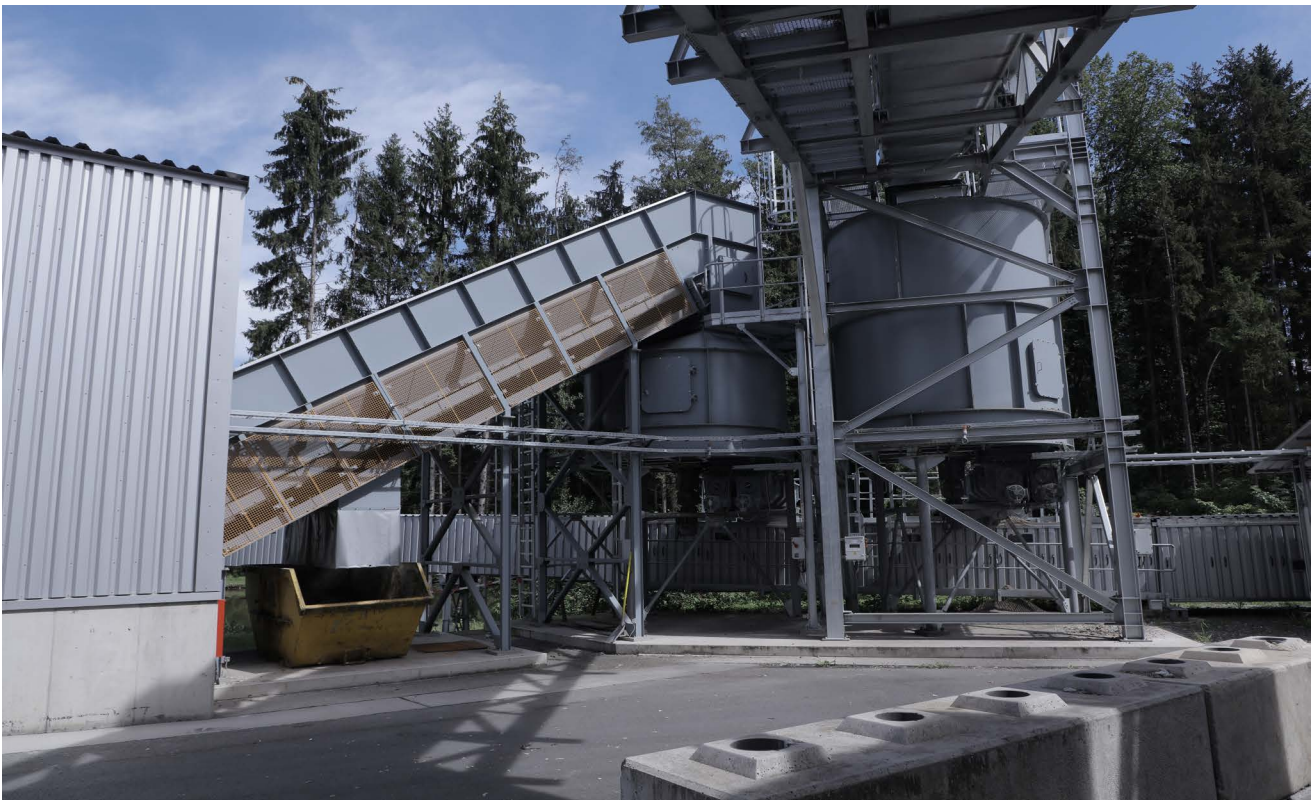
countries where waste separation is not developed like in Europe, the challenge is huge. How the alternative fuels are composed and how they are used often also depends on their availability in a determined region and, in particular, on the economic aspects. In addition, the materials have to fulfil determined quality requirements. Some operators for example only use processed waste with a defined minimum calorific value and low heavy metal content. At this regard, the alternative fuel often may only have a determined particle size and a determined density. The moisture content is also important.

From the receiving to the feeding process

As a system provider, BEUMER Group develops tailor-made solutions for the entire material flow chain from unloading the delivery vehicle to storing, weighing, conveying and control feeding of solid alternative fuels. BEUMER Group also provides fully automated systems that can control feed, singulate and convey large and heavy tyres to the inlet of the rotary kiln. BEUMER Group supports the cement manufacturers with its intralogistic solutions in modernising their plants in sustainable and cost-efficient ways. "Our know-how and tailor-made systems permit us to optimise our customers' processes," says Jan Tuma, Chief Sales Officer (CSO), BEUMER Group, Czech Republic. The user receives everything from one source, thus having a unique contact. In addition to a comprehensive range of reliable systems for handling with alternative fuels, the specialists also focus on planning logistics and customised conveying and storage solutions, including crane halls and steel structures.

Clear unique feature

"The material flow chain is implemented with the single components of our BG OptiSeries," says Jan Tuma. "We have developed these different systems in our company - a clear unique feature on the market". The systems are designed to meet the requirements for functionality and performance in daily operation.



Picture 1: The BG OptiFeed is a screw conveyor with load cells. This allows the material to be fed continuously.

The material prepared for combustion in the kiln is usually supplied in moving-floor trailers. The hydraulically controlled moving floor moves the load outwards on the conveying system. "All conveying systems supplied and the accompanying equipment are intertwined

like toothed gears to ensure steady fuel feeding," explains Jan Tuma. "At this regard, we can install our unloading station BG OptiBulk at our customers". This system is suitable for inhomogeneous material that is difficult to handle. Such materials have a low bulk den-



Picture 2: The BG OptiBulk unloading station is equipped with a special housing, which protects the environment from dust escape and the material from environmental stress.

sity, a high moisture and a large grain size. In addition, this system is suitable for explosive substances. In addition to tippers and moving-floor trailers, which are sometimes in use, trucks can also be unloaded quickly and easily. The system consists of a chain belt conveyor and lateral steel walls.

A further possibility to empty trucks and moving-floor trailers is given by the BG OptiDock. This station is also suitable for inhomogeneous material like alternative fuels or biomass. The BG OptiDock is composed of a receiving box and a screw floor. It guides the raw materials and the alternative fuels coming from the moving-floor trailer and the truck on a feeding system. The receiving box is equipped with a rubber gasket and, if necessary, with a hydraulic pump in case that the vehicle is not available. It permits to unload the semi-trailer continuously.

The material falls from the unloading station into the BG OptiFeed screw weigh feeder with a connected buffer bin. This screw conveyor with weighing cells is suitable for completely different materials – that means, ideal for the continuous feeding of alternative fuels or raw materials," says Jan Tuma. Since the screw conveyors are positioned on the weighing cells, it can always be seen how much material is extracted. The regulation ratio is max. 1:10 and the maximum feeding accuracy between one and two percent," explains Jan Tuma. In addition, the completely closed screw weigh feeder is protected against dust.

BEUMER Group also offers a BG OptiFeed Duo. This solution has been designed for the continuous feeding of bulk material to two separated feeding points in one

process, for example when the preheater tower has two inlets. The material is then stored in a buffer bin and taken off by two single screw conveyors or one double screw conveyor.

Conveying technology in tubular shape or U-shape

In order to transport the alternative fuels to the calciner and to the main burner, BEUMER experts, depending on the application, evaluate different variants of mechanical conveying systems, which for example include the Pipe Conveyors. "This conveying technology is not only eco-friendly and requires low maintenance", describes Jan Tuma. "Its enclosed type of construction also protects the environment safely from material falling down and emissions. Another advantage is the elimination of dust development on the running line". Due to its ability to navigate curves, considerably



Picture 4: Pipe Conveyor: The enclosed system ensures an environmentally safe, dust-free and low-energy transport of the alternative fuels.



Picture 3: The double discharge screw conveyor of the BG OptiLock construction series: The airlock principle protects the material against the infiltrated air entering from outside.

fewer transfer towers are required compared to other belt conveyors and the system can be customised to the individual routings. "If necessary, we can further equip the conveyor," says Jan Tuma, "for example with a scraper conveyor in order to minimise clean-up, or with a dedusting filter".

A further efficient possibility is the U-shape conveyor. It can be simply integrated and is also suitable for long distances and rough terrain as well as horizontal and vertical curves. Just like in the Pipe Conveyor, the material conveyed is protected against external influences such as wind, rain or snow and the environment against possible material loss. This conveying solution is suitable for coarse but also for very fine material.

"At the feeding point, the U-shape conveyor is open like conventional troughed belt conveyors," explains Jan



Picture 5: Inside of a U-shape conveyor



Picture 5: Inside of a U-shape conveyor

Tuma. "A special idler configuration brings the belt in a U-shape". This way the material conveyed reaches the discharge station. An idler configuration similar to that for the shaping is used for opening the belt.

Reduces infiltrated air to the calciner

Conveying elements lead the material to the discharge screw conveyors of the BG OptiLock construction series. The airlock of this system solution protects the pyroprocess from the infiltrated air, i.e. the air that additionally and uncontrollably enters from the outside with the fuel. Also the BG OptiLock is equipped with load cells and transfers the bulk material continuously to a screw conveyor, which feeds the calciner. The speed of the discharge screw conveyor is controlled so that the shown weight of the entire system and the real material volume in the container is constant. "As the material can catch fire, all systems are carried out according to the ATEX directives," says Jan Tuma.

As a single-source provider, BEUMER Group has substantial competence in handling with alternative fuels and is able to support the owners of cement plants efficiently - all within a short period of time. All components are complementary and ensure the continuous and economical feeding with alternative fuels.

BEUMER Group is an international leader in the manufacture of intralogistics systems for conveying, loading, palletising, packaging, sortation, and distribution. With 4,500 employees worldwide, BEUMER Group has annual sales of about EUR 960 million. BEUMER Group and its group companies and sales agencies provide their customers with high-quality system solutions and an extensive customer support network around the globe and across a wide range of industries, including bulk materials and piece goods, food/non-food, construction, mail order, post, and airport baggage handling.

For more information visit: www.beumer.com.

Conditions for an economical production and use of alternative fuels

By: Dr. Hubert Baier, WhiteLabel-TandemProjects e.U., Germany

Abstract

Basically, the entire pre- and co-processing needs to be worked out carefully before alternative fuels can be used. It begins with the technical assessment of the pyroprocess in the cement plant, as well as the assessment of the waste sources and its composition from which the alternative fuel shall be obtained and the number of impurities to be disposed of in a safe manner.

Part of the preparatory work is also the pe-engineering, the forecast of qualities and its assurance under the operational conditions. It is strongly discouraged to be persuaded to buy a system without these preliminary works. The individual requirements for each pyroprocess of cement production and the thermal potential in the waste composition determine the technical and financial expenditure for the conditioning plant and thus the profitability of such a project.

The economic viability of such a project is largely determined by the enforcement of legal requirements and a sound disposal fee on a proper calculation basis. It has to be noted that the contract periods are not determined by the purchaser of the alternative fuels (i.e. the cement plant), but by the reliable access to the waste, including its disposal fees. A cement plant is not interested in being supplied with poor AF qualities over long contract periods, but it is much more interested in a quality-oriented bonus-/malus system on which regular settlements can be made. The terms of these purchase agreements must be negotiated individually.

It is shown how such terms depend on the level of the disposal fee and at what point the purchase of fuels will switch to a sufficient gate fee to the cement work. Finally, it is shown how a contractual basis for supply and billing can be created.

Keywords

#economical basis #cement production #kiln #pre-processing #waste derived fuels #HCF #RDF #SRF #co-processing #pre-combustion #calciner #main burner #quality assurance #CO₂ #settlement #disposal fee #gate fee

1. Initial situation

As one of the most energy-intensive industries, the cement industry contributes approx. 6% to global CO₂ emissions. This is on one hand due to the CO₂ containing limestone in the raw material, which accounts for approx. 90% of the entire mass flow, and on the other hand to the use of fossil fuels, which account for approx. 10% of the intake to the rotary kiln.

These fuels are used to decarbonize the raw meal and to form the minerals of the semi-product clinker. This burnt clinker shall be ground into a standardized cement using electricity and by additional gypsum, fly ash, slag or other aggregates. Subsequently, packaged and shipped [9] to the ready-mix plant to produce concrete for the final customer.

The concrete is installed in the structure using electricity and remains there for several decades, during which CO₂ re-carbonates by the binders' surface, and until the structure will be demolished.

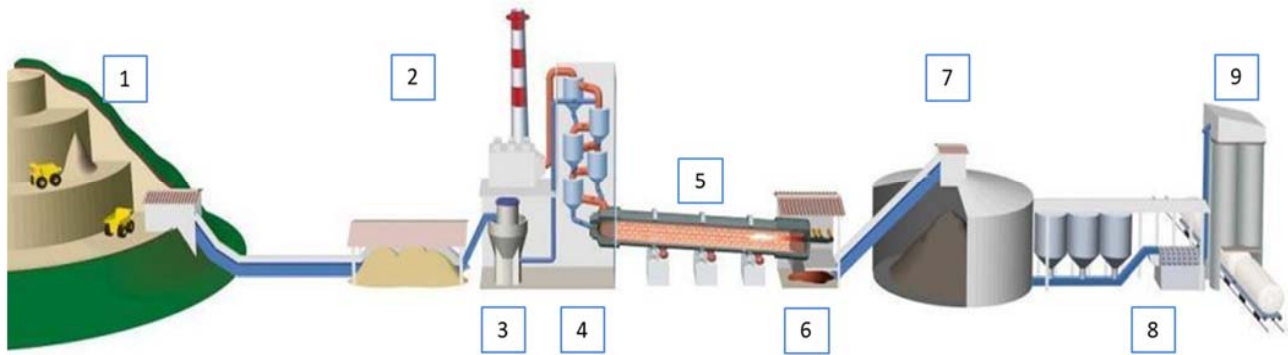
To minimize CO₂ emissions down this chain, the cement industry has committed itself to reducing approximately 38% of its total emissions by 2050. The measures identified are based on the important pillars of

- Operation of highly efficient and energy-saving equipment,
- Substitution of raw material with CO₂-free raw materials, and
- Co-processing, i.e. the use of waste-derived alternative fuels.

Co-processing is the generic term for the material and thermal use of suitable and pre-processed wastes, which are converted and quality-assured to alternative fuels and raw materials (AFR).

Starting from the quarry [1], calcareous sludges, e.g. from the de-carbonization of process water in power plants, siliceous forms of foundry sand or aluminum-containing sludges from clay, these mineral wastes can be used as raw material substitutes.

This fine ground raw meal [2, 3] is fed to the calciner [4] at the entrance of the calciner [4], and is falling against the hot exhaust gas into the rotating kiln [5] at approx. 1000°C. Then the iron- and aluminum-containing components react to form a melt and provide calcium and silicon with the necessary matrix to form clinker minerals at a flame temperature of ~2.000°C.



- | | | |
|-------------------------|-----------------------------------|----------------------------------|
| 1 quarry (raw material) | 4 calciner (decarbonization) | 7 clinker silo |
| 2 raw meal blending | 5 rotary kiln (clinker formation) | 8 admixtures and cement grinding |
| 3 raw meal grinding | 6 clinker cooler | 9 dispatch |

After the clinker minerals have been formed, the clinker granules are abruptly cooled down [6] and stored in silos [7]. To obtain cement, the clinker will be ground with gypsum, e.g. from flue gas desulfurization, as well as fly ashes from power plants, blast furnace slag or similar, to produce standardized cement on the mill [8].

The highest production costs are nearly 30 % and are fuel costs, so cost-efficient alternatives have always been sought, and with them the waste management industry and its ability to provide cost-efficient alternative fuels.

In Europe, the use of waste-derived alternative fuels started in the 1970th with used oil, and is today subject to a huge range of waste sources and the corresponding directives. From a legal point of view, co-processing in a clinker burning process is strongly focused towards the restrictive requirements of air pollution control. A basic requirement for a reasonable use is therefore the maintenance of a temperature of at least 850°C for more than 2 seconds. In accordance to these requirements, in general there are several entrance points available to feed the kiln process best.

Most often, the calciner is used for feeding the low-grade RDF, which is simply prepared and of poor quality. However, setting up this feed point nevertheless requires a sound preparatory work to evaluate the bottlenecks and possibilities in the entire process and respectively in the calciner in terms of e.g. temperature profile, oxygen supply, mixing, residence time and its burnout behavior or with the view to pre-processing to the particle size. The investment is enormous and the construction as well as the preliminary work should therefore be well prepared.

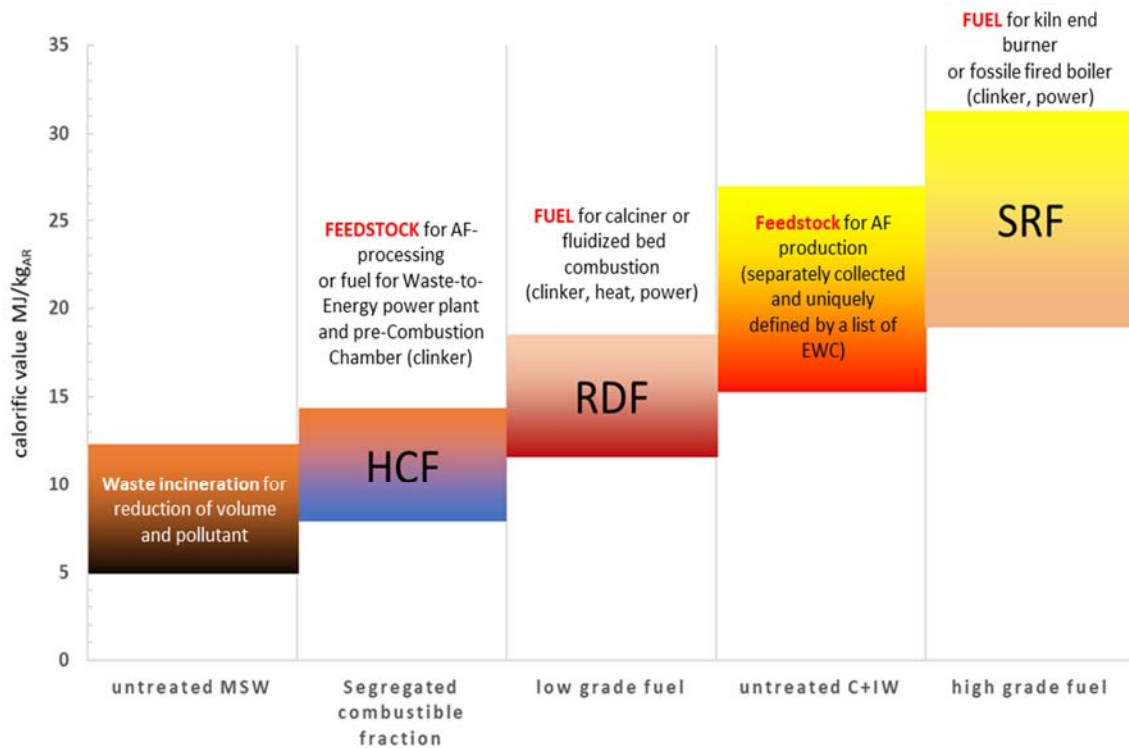
High-grade SRF is easier to feed via a satellite burner or sinter zone burner at the end of the kiln. However, this requires a higher degree of pre-treatment and a calorific value similar to lignite and does not tolerate 3D particles, which even affects the clinker quality by reductive burning conditions.

In the latest years precombustion chambers are designed to be fed with a so-called high calorific fraction (HCF) in a grainsize of roughly 300 mm. These materials are difficult to process or to burn, such as windmill blades, sticky tar, resin or coarse wooden biomass.

2. Definitions

Many different definitions, fancy names or careless statements cause confusion or even lead to public and political rejection. Therefore, it is essential to use the right terms in the right context.

This implies not simply referring to waste, but dubbing them as waste-derived or better as alternative fuel. This has nothing to do with concealment, but is due to the fact that enormous investments are made beforehand to convert waste into a specified and quality assured fuel that has to meet the requirements of a thermal production process. If this attitude is not in place from the beginning, the use of waste becomes a kind of waste disposal and the pyro-process will not accept alternative fuels after a certain thermal substitution rate (TSR).



With regard to the envisaged valorization process several qualities shall be derived from waste. For the process of clinker burning and production of electricity there are several terms and specifications:

HCF – High Calorific Fraction, which is the combustible fraction with a higher calorific value than untreated MSW. After sorting out materials for recycling and segregating unsuitable impurities and water containing organics, the grain size is <300 mm and its cv will range up to 15 MJ/kg.

It is the feedstock for a Waste-to-Energy plant (WtE) to produce process stream and electrical power. Or it will directly be used in a so-called pre-combustion chamber, which is linked to the calciner at the rotary kiln or shall further be blend and processed to

RDF – Residue Derived Fuel. This low-grade fuel, RDF suits best directly for the calciner to decarbonize the lime containing raw meal at a long retention time (>5s). It's mainly processed on the second step out of HCF, and in a grain size between 60-120mm, and a cv ~13-19 MJ/kg.

SRF – Solid Recovered Fuel can simply be processed from purely collected industrial and commercial waste or -with a little more effort of cleaning and blending- from RDF. It is free of 3D-particles and is processed to get shortest retention time in the burner flame. Due to its proportions of waste-derived compounds its cv can range similar to lignite (22±2 MJ/kg) or much higher.

3. Minimum requirements

Definitions and other issues are one part of the entire process that needs to be worked out carefully before alternative fuels can be used.

It begins with the basic technical determination of the pyroprocess in the cement plant, as well as the determination of the waste composition from which the alternative fuel is obtained and the number of impurities to be disposed of in a safe manner. Part of the preparatory work is also the knowledge of the mechanics and its physics behind, the quality assurance up to the right feeding or operational issues. It is strongly discouraged to be persuaded to buy a system without these sound preliminary works.

The individual requirements for the pyroprocess of cement production and the thermal potential in the waste composition determine the expenditure for the conditioning plant and thus the profitability of such a project. Profitability is determined by several factors, which will be discussed in more detail below.

4. Economical frame

The decarbonization of limestone to produce cement clinker and the CO₂-allowances are the two cost drivers and the main reasons for using alternative fuels and raw materials. Depending on the technology the clinker burning process varies from ~6 kJ/kg_{clinker} (wet process) to ~3 kJ/kg_{clinker} (dry process).

Since the first oil price „shock“ in 1979 the cement industry started to seek for cheaper energy, and switched from oil to lignite, which also marks the specification of properly conditioned waste derived AFs, today. The largest benefit of AF is by saving primary energy costs, which are accounting around 26% of the manufacturing costs. In addition to modernizing the plant equipment by using highly efficient technologies (e.g. cooler), the use of CO₂-neutral fuels offers a quick option to save costs, as well. Consequently dry and preprocessed wood, paper, natural rubber, textiles etc. are most of interest with regard to its neutrality, but its generated fuels must match mandatorily the energy demand of the thermal process.

With regard to financing the entire waste management in many countries the authorities levy the disposal fee by a certain percentage of consumption of e.g. water, gas or estate taxes and transfer the responsibility inclusive the budget to private companies. Although this financial budget is partly insufficient to cover all costs, the risk of corruption vulnerability is high due to the lack of legal enforcement and strict control.

E.g. in Europe, the disposal service is awarded by tender to obligatory state certified companies, which are politically controlled and on the basis of the legal regulations. The waste disposal fee shall follow the polluter-pays-principle, which has at least two main functions: first, to cover all the costs of a reliable and legally compliant waste disposal, and second, to encourage people to reduce their amount of waste they produce by saving their own money.

In the case waste cannot be avoided all subjects of collection, transport, stuff management, sorting, conditioning, recycling until quality monitoring, thermal use, waste incineration or sanitary landfilling are subsumed in this disposal fee.

In order to obtain reliable figures, the current situation is reviewed every five years as part of a waste management plan. This includes determining of the number of inhabitants, the amount of waste per capita or the composition of the waste.

So, the waste producer is the responsible owner and has to cover all the costs. The fees are directly linked to each individual collection and bin, which means you pay depending on the legal requirements and annual needs.

In the following, different scenarios are used to show which economic opportunities and possibilities exist to lead a project to success. The general conditions shall be assumed as follows:

On the side of the waste management industry:

- ✓ a mechanical-biological treatment plant (MBT) is designed for an annual capacity of 180,000 t of municipal solid waste (MSW),
- ✓ composting is not taken into account for the first,
- ✓ the depreciation period for the plant is 20 years for the building, 7 years for fixed installations and 3 years for movable equipment.

On the side of the exploiting cement plant are exemplarily taken into account:

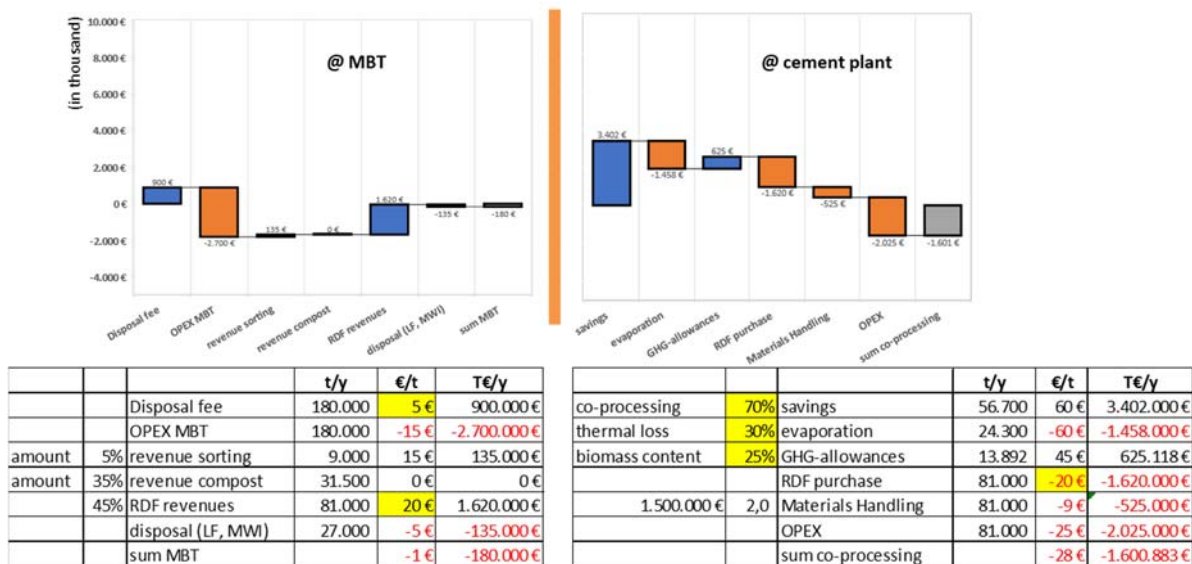
- ✓ Savings of primary energy,
- ✓ Savings of CO₂-certificates related to the non-fossil portion of biomass,

- ✓ Thermal loss due to water input,
- ✓ AF-gate fee or purchase price,
- ✓ New investments for AF handling,
- ✓ Additional operating expenditures e.g. due to laboratory, NO_x-reduction, kiln lining, energy loss due to moisture, operation of bypass etc.

All costs are calculated as per ton.

In the first case, which is the current starting situation in most cases, the polluter-pays-principle does not apply, i.e. the disposal fee remains at its known low level. A simple MBT technology is installed which will produce a low-grade fuel (RDF) with a high moisture content and a low level of calorific value, but a high content of biomass.

In order to establish a reliable waste management system, the cement plant is willing to subsidize the system by purchasing RDF, even though its quality is at the lowest tolerable level.



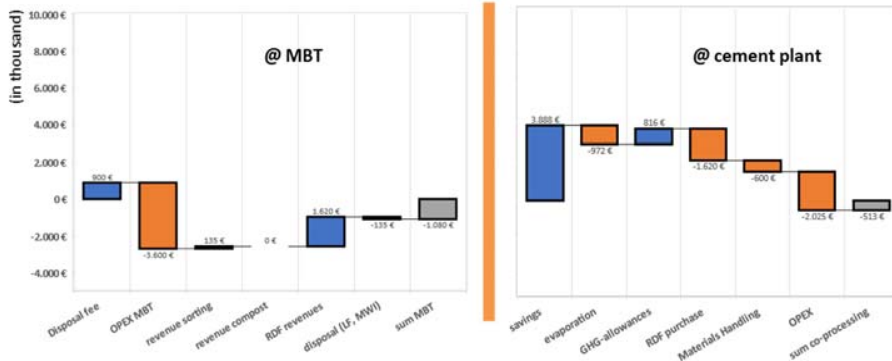
By a quick review of the calculations, this project to producing alternative fuels in a simple MBT will fail, even despite financial support from the cement plant.

The damage caused by the introduction of moisture into the thermal process by the poorly treated RDF and the initial costs cannot be compensated by the savings in avoidance of fossil fuel and its reduction in GHG allowances. The financial loss is about 9 times higher on the plant side than on the conditioner side.

At this point, it must be clearly stated that the economic viability of such a project depends essentially on the enforcement of the legal framework and the certainty of the disposal fees, which must cover all the costs of a reliable and integrated waste management system that includes collection, sorting and conditioning up to the long-term operation of a sanitary landfill.

Under the existing contractual conditions and further subsidization by the cement plant, the MBT will be upgraded to produce more suitable RDF for the calciner.

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		t/y	€/t	T€/y
	Disposal fee	180.000	5 €	900.000 €
	OPEX MBT	180.000	-20 €	-3.600.000 €
amount	5% revenue sorting	9.000	15 €	135.000 €
amount	35% revenue compost	31.500	0 €	0 €
	45% RDF revenues	81.000	20 €	1.620.000 €
	disposal (LF, MWI)	27.000	-5 €	-135.000 €
	sum MBT		-6 €	-1.080.000 €

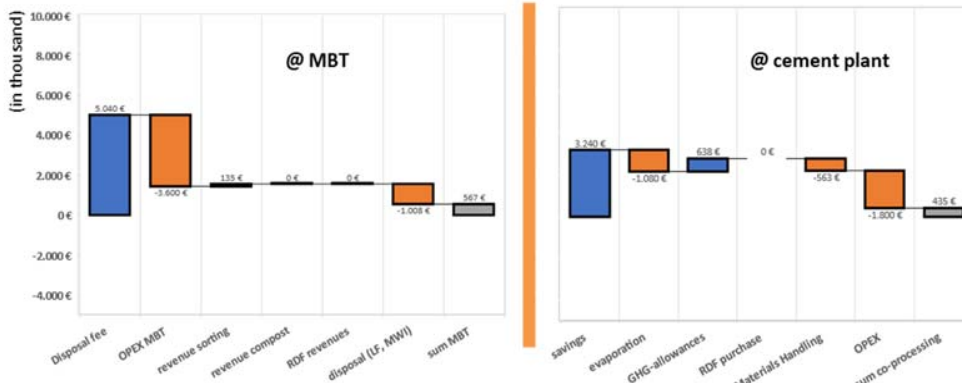
		t/y	€/t	T€/y		
	co-processing	80%	savings	64.800	60 €	3.888.000 €
	thermal loss	20%	evaporation	16.200	-60 €	-972.000 €
	biomass content	28%	GHG-allowances	18.144	45 €	816.480 €
			RDF purchase	81.000	-20 €	-1.620.000 €
1.500.000 €	2,0	Materials Handling	81.000	-9 €	-600.000 €	
		OPEX	81.000	-25 €	-2.025.000 €	
		sum co-processing		-8 €	-512.520 €	

On one hand, upgrading the MBT will generate a better RDF quality with a higher biomass content and a lesser introduction of moisture, and consequently a higher thermal substitution rate at the cement plant. Its losses will be halved, but will still remain negative.

On the other hand, the costs in the MBT will rise up to six times than before reconstruction and will bring it to its knees.

This means that the disposal fees have to be raised - significantly!

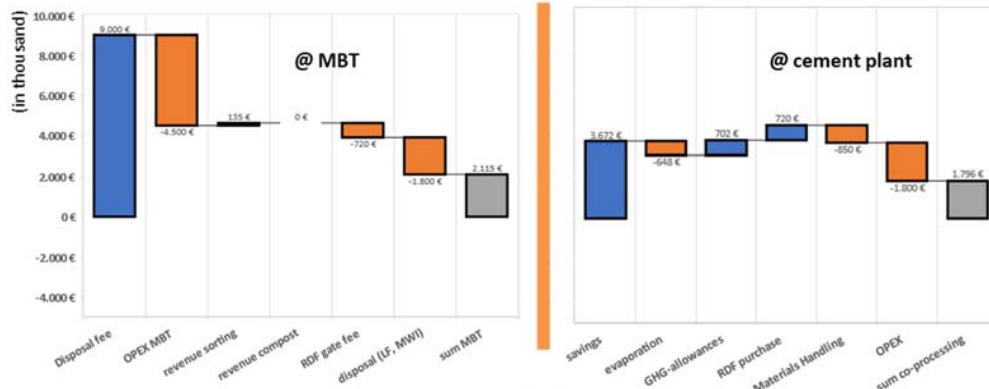
In addition, in this theoretical example, the cement plant shall waive a gate fee and on subsidizing the costs of the MBT in order to bring the calculation into a balance for both sides.



		t/y	€/t	T€/y
	Disposal fee	180.000	28 €	5.040.000 €
	OPEX MBT	180.000	-20 €	-3.600.000 €
amount	5% revenue sorting	9.000	15 €	135.000 €
amount	35% revenue compost	31.500	0 €	0 €
	40% RDF revenues	72.000	0 €	0 €
	disposal (LF, MWI)	36.000	-28 €	-1.008.000 €
	sum MBT		3 €	567.000 €

		t/y	€/t	T€/y		
	co-processing	75%	savings	54.000	60 €	3.240.000 €
	thermal loss	25%	evaporation	18.000	-60 €	-1.080.000 €
	biomass content	26%	GHG-allowances	14.175	45 €	637.875 €
			RDF purchase	72.000	0 €	0 €
1.500.000 €	2,0	Materials Handling	72.000	-10 €	-562.500 €	
		OPEX	72.000	-25 €	-1.800.000 €	
		sum co-processing		8 €	435.375 €	

Nevertheless, the resulting financial cushion will be too tight for both partners to cover even the smallest expenses such as additional repairs or such investments for a sufficient equipped laboratory or the operation of a sanitary landfill. Finally, an MBT is a splitting plant, from which several streams are leaving to recycling, compost and customized alternative fuels. But, also non-recycables and impurities have to be disposed of in a safe manner on a sanitary landfill or even incinerator. These investments have to be covered by the polluter-pays-principle, as well.



		t/y	€/t	T€/y
	Disposal fee	180.000	50 €	9.000.000 €
	OPEX MBT	180.000	-25 €	-4.500.000 €
amount	5% revenue sorting	9.000	15 €	135.000 €
amount	35% revenue compost	31.500	0 €	0 €
	40% RDF gate fee	72.000	-10 €	-720.000 €
	disposal (LF, MW)	36.000	-50 €	-1.800.000 €
	sum MBT		12 €	2.115.000 €

			t/y	€/t	T€/y
	co-processing	85%	61.200	60 €	3.672.000 €
	thermal loss	15%	10.800	-60 €	-648.000 €
	biomass content	26%	15.606	45 €	702.270 €
			72.000	10 €	720.000 €
	3.000.000 €	3,0	72.000	-14 €	-850.000 €
			72.000	-25 €	-1.800.000 €
				29 €	1.796.270 €

In this last example, the polluter-pays-principle is valid, and the appropriate disposal fee will cover all the investment into a suitable technology to produce RDF with a suitable quality. The cement plant will extend its reception and storage facility to guaranty a continuous supply and will get a gate fee to compensate its higher investments such as SCR- or SNCR-technology to reduce NO_x-emissions.

Finally, an additional WtE-plant to produce power may complete this system to ensure a public and private cooperation for an integrative, safe and reliable waste management.

5. How to draw up a supply contract

As already mentioned, the contract periods are not determined by the cement plant, but by the reliable access to the waste, including its disposal fees. A cement plant is not interested in being supplied with poor AF qualities over a long contract period, but rather in qualities and on demand.

Later, when the MBT is in operation and the cement plant is continuously supplied, these qualities must meet the agreed specification of the clinker production process and will also be the basis for its frequent billing. The terms of these purchase contracts are usually negotiated individually and monitored by regular inspections at the reception on the cement plant side. Incidentally, this billing model can be extended or shortened as desired according to the agreed bonus/malus system.

This also shows very clearly that it is always worthwhile to assess the composition and properties of the intended input waste in detail in advance and to design the processing plant accordingly, which has a huge impact on the investment, in order to produce customized RDF qualities for the calciner or SRF for the main burner.

Quality assurance according to defined standards will provide the required parameters for cross-checking. For this purpose, the statistical median and the 80th percentile have proven to be useful by means which both sides can bill in a certain rhythm.

The following shows when several parameters have been agreed upon, which are analyzed regularly during the delivery period. Finally, these are set in advance as the settlement basis and tolerance, so that a settlement is based on these results or their deviation.

In the following example, four typical parameters (calorific value, and the content of chlorine, moisture and biomass) are identified by this individual cement plant. This billing basis can be extended or shortened as desired for individual supply contracts.

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		calorific value (inferior)	
		<16 MJ/kg	16 MJ/kg
		>16 MJ/Kg	
Correction factor	per t per MJ/kg	-2,00 \$	0,00 \$
Correction factor			1,00 \$
		chlorine content	
		< 0,9%	> 0,9%
Concentration		0,90%	0,00 \$
Correction factor	per t per 0,1%	3,00 \$	-3,00 \$
		moisture content	
		< 20%	> 20%
Concentration		20%	0,00 \$
Correction factor	per t per %	1,50 \$	-1,50 \$
		biomass content	
		<30%	>30%
Concentration		30%	5,00 \$
Correction factor	per t per %	-2,00 \$	2,00 \$
Settlement basis per ton (delivery contract):			10,00 \$
Example 1:		Median value/ month	in accordance to committed norms
	calorific value MJ/kg	17,32	2,64 \$/t
	chlorine	1,14%	-7,20 \$/t
	moisture	30,0%	-15,00 \$/t
	biomass content	31,8%	8,60 \$/t
Purchase price for plant:			-10,96 \$/t
Example 2:		Median value/ month	
	calorific value MJ/kg	22,00	12,00 \$/t
	chlorine	0,50%	12,00 \$/t
	moisture	12,0%	12,00 \$/t
	biomass content	15,0%	-25,00 \$/t
Purchase price for plant:			11,00 \$/t

Here **Example 1** shows the consequences if the promised specification is not met. However, **Example 2** also shows how much profit can be made if the system is designed and operated, properly.

And, this also shows very clearly that it is always worthwhile to assess the waste composition and its properties precisely beforehand and to design the processing plant to this, i.e. to invest in order to produce tailor-made qualities and to ensure their quality and continuous supply.

The entire system only works in a sustainable manner and for the benefit of the society if both sides are aware of the context and consequences.

More detailed contract templates can be found on <https://wltp.eu/activities/> and in the appendix of the WLTP [Directional Compass: Alternative Fuels Handbook for Project Managers](#)

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With FCB Horomill[®], grind your cement without a drop of water

By: Loïc POTTIER, Area Sales Manager, Fives FCB, France

FCB Horomill[®] has been introduced to the cement world for the first time in 1993.

It was at that time making a decisive breakthrough in the grinding technology and processing, in achieving smooth integral cement grinding at the lowest energy consumption – compared to the roller presses, which were then considered as a solution to reduce grinding energy requirement – and operating at lower pressures, as well as with lower mechanical stresses.

Nearly seventy FCB Horomill[®] have been sold up to now, for cement grinding as well as for raw meal or slag grinding. Whatever the application, the same type of machine is used, thus proving the high flexibility of this technology.

FCB Horomill[®] is nowadays operated worldwide by most of the major cement manufacturers:

- By Buzzi Unicem, which has actively participated in the development of the mill, owning 20 machines, and whose prototype FCB Horomill[®] 2200 is still producing cement in the Trino plant, Italy. The group now operates FCB Horomill[®] technology in the Cementos Moctezuma plants (Mexico) and in Maryneal, Texas (USA).
- Holcim Brasil SA has purchased and installed one FCB Horomill[®] 4400, the biggest size ever built, for the Barroso plant in Brazil, with a production capacity of 420 tph raw meal and owns four other mills

in Mexico and Costa Rica.

- Cemex, Vicat and CRH are using FCB Horomill[®] for cement production in Panama, Turkey and the Philippines

Regional players also benefit from FCB Horomill[®] advantages. These include Ciments Quebec (Canada), Cooperativa Cruz Azul (Mexico),

Jingye and Rizhao Jingua (China), Vinaconex and Vinaicon (Vietnam) and Oyak (Turkey).

Low energy consumption and stable high quality product

Without again presenting and developing all the basic principles of FCB Horomill[®], let us just highlight, in addition to the bed compression grinding technology that makes de



Picture 1: FCB Horomill[®] - Hermosillo, Mexico

facto FCB Horomill® efficient, the other advantages linked to its specific process and innovative design that even enhance its benefits for the end users:

- With a small quantity of material circulating in the circuit (there are about 10 tons of material for a FCB Horomill® 3800 standard workshop) rapid and frequent changes of type of products are possible within very short period (5 minutes) and without need of a purge bin to deal with intermediate production grades.
- Thanks to the material centrifugation onto the rotating shell and the material flow control plate, combined to a large grinding contact area, the FCB Horomill® is a stable machine that enables achieving fine cement grinding without the need of any water spraying nor mill mechanical adjustments between two campaigns.
- FCB Horomill® is not air swept, only dedusted, and the ventilation is only needed for the selection circuit. The gas circuit is then 100% devoted to the classifier operation, and, as the case may be, to drying. This leads consequently to a huge energy saving in electrical consumption for the fan compared to plant using vertical roller mill.

Thus, the energy consumed by the grinding workshop is low, and high cement quality can be produced in optimized conditions at any time. FCB Horomill® leads to large energy savings, more important with harder to grind materials, such as slag cement or pure slag. It is true not only compared to the classical ball mill technology, with 30 to 50% saving for the whole plant, but also compared to vertical mills, with 15 to 30% savings since the

ventilation circuit is sized only for classification, and not for the material transport. In addition, it has been measured that strength developments and values are similar to those obtained with ball mill cement, with a lower specific surface area. It also applies for both mortar and concrete and for any cement type.

Various cement types meeting all quality targets are produced very steadily thanks to FCB Horomill® process stability and FCB TSV™ Classifier proven efficiency. Some plants process different types of products with the same FCB Horomill®, taking advantage of its flexibility and versatility, with 3 to 4 daily changes of the recipe, depending on production and sales needs (Karsdorf, Germany). And as it is the case for the standard daily operation, along with the modifications

of the cement compositions, every adjustment of process parameters, and the selection of the cement silo can even be fully automated.

The stability of FCB Horomill® combined to the very efficient FCB TSV™ Classifier is also a major advantage for the production of even finer cements, in line with the increasing of cement-to-clinker factor that enables CO₂ emission cuts, still without water injection needs. In trials carried out in the Fives FCB testing station and adequate classifying conditions, high fineness has been reached with CEM I at more than 7000 cm²/g.

Easy management of moist materials

As FCB Horomill® is not air-swept, the drying function is ensured in the separator gas loop. For moderate moisture content, drying is



Picture 2: FCB Horomill® - Teresa, The Philippines

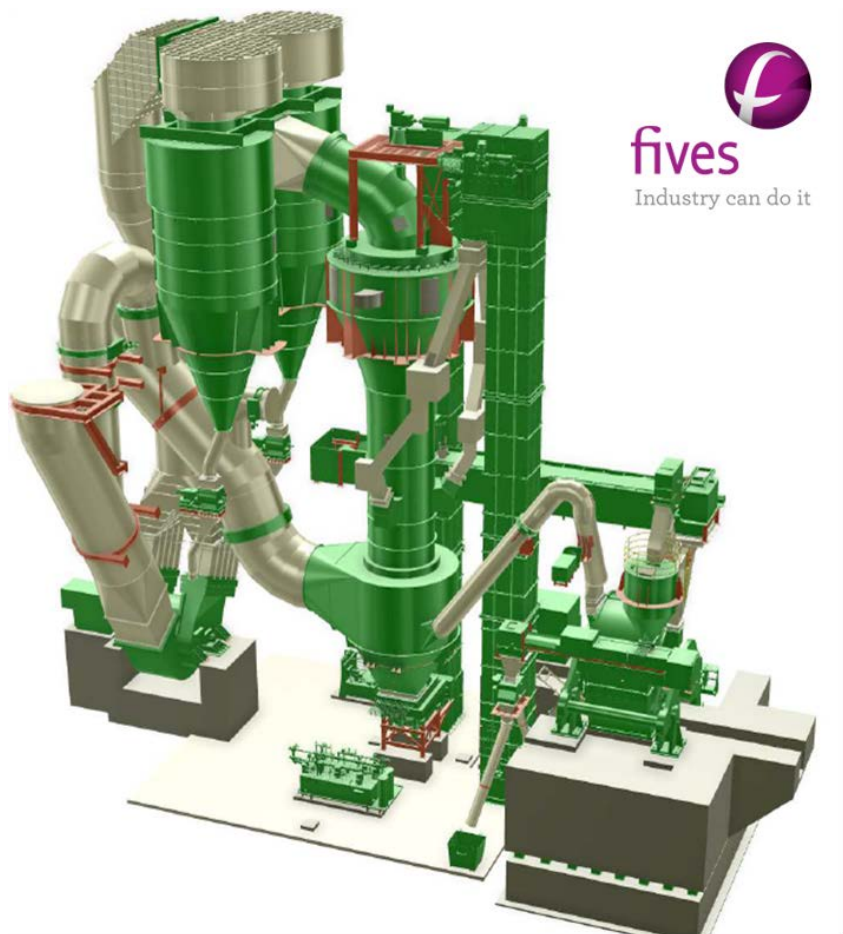
achieved in the separator, while for higher moisture content drying is achieved in the flash dryer located beneath the FCB TSV™ Classifier. Since dried and hot, the classifier rejects, constituting the external material circulation, together with the flash dryer tailings, when mixing with the mill feed significantly reduce the moisture inside the mill itself. The drying arrangement design and equipment of the grinding plant is selected by Fives FCB according to the type of material to be dried, its grain size and its moisture content.

It is important to mention here that FCB Horomill® so gets rid of two major inconveniences: high venting speed and material moisture (efficient drying and no water spraying) that ascertain the lowest operating wear rate (typically from 0.3 to 1.0 grams/ton). The drying is done by feeding the moist material into the riser.

This moist material can be either some wet fine additives component used in cement or coarser ones, as well as raw meal mix:

- Blast furnace slag in the Karsdorf plant, Germany, up to 100% of pure slag feeding at 10% moisture.
- Pozzolana in the Tepetzingo plant, Mexico, representing 15% of the composition up to 24% moisture in wet season
- Pozzolana in the Teresa plant (The Philippines), representing 29% of the composition up to 25% moisture in wet season
- Raw mix in Tepetzingo plant, 9% moisture.

So, moisture feed up to 10% has been successfully practiced in industrial plants. Trials realized at



Picture 3: FCB Flash dryer

representative test rig scale in the Fives FCB testing station indicated that it would be possible to reach 20% moisture without difficulty.

Operation stability and 4.0

The operation is fully automatic, without intervention of the CCR operator after having pushed the start button: for each recipe, the operation parameters are set in the PLC, enabling even start, stop and recipe change sequences on a 'one-button-push' mode. Thus, automatic changes of the cement composition, adjustment of the plant parameters and selection of target silo have even been successfully implemented in some plants allowing overnight and week-end operation without supervision (Trino, Italy).

Moreover, remote monitoring for the milling plant is now available. It covers both process and mechanical dashboard overview, offering

the opportunity to FCB Horomill® owners to benefit from the worldwide experience and deep expertise of the dedicated service team from the distance. Such remote monitoring and remote control help not only to detect any deviation on the proper operations and initiate adequate action, but allow for finding the best operation setting for an optimum eco-steering of the grinding plant.

A reliable machine

The design of FCB Horomill® was a challenge for process aspects as well as for mechanical solutions, even if the basics were adapted from proven technologies. To date, many improvements have been brought making the technique mature and giving FCB Horomill® a high level of reliability: 97% reliability factor is a common value for the FCB Horomill® on a yearly basis survey.



Picture 4: FCB Horomill® remote monitoring dashboard

FCB Horomill® is the latest innovation in comminution technology, with a different design allowing compact installation footprint with flexible, automatic, reliable and stable production.

With nearly 70 machines in operation for cement, slag, raw materials and minerals, the HOROMILL® has demonstrated the expected energy efficiency and versatility. On top, it is the ideal answer to tomorrow's sustainability challenges, including CO₂ emission re-

duction, leveraging on C/K ratio increase, eco-steering, and water savings.

For any additional information, please contact Mr. Loïc POTTIER (Area Manager Africa) or Mr. Richard FEGHALI (Area Manager Middle-East)

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Picture 5: FCB Horomill® - Thai Nguyen, Vietnam

Application of Large Bolted Steel Silo in Cement Industry

By: Wen Peng, Henan SRON Silo Engineering Co., Ltd., China

1 Background of the project

The body of large steel silo is cylindrical, the top and bottom of the silo are spherical and the base is a round table barrel type. It has advantages of large reserves (single silo capacity is 10,000-100,000 tons), low investment (steel silo can not only save about 50% of building materials, but also save land use area), safety and reliability (with good vacuum tightness performance, it can store materials for a long time and keep their performance indicators unchanged), energy saving and environmental protection (the dust collection system is adopted in the process of feeding and discharging, which will not cause pollution to the surrounding environment) etc., so its application in the cement industry is gradually popularized.

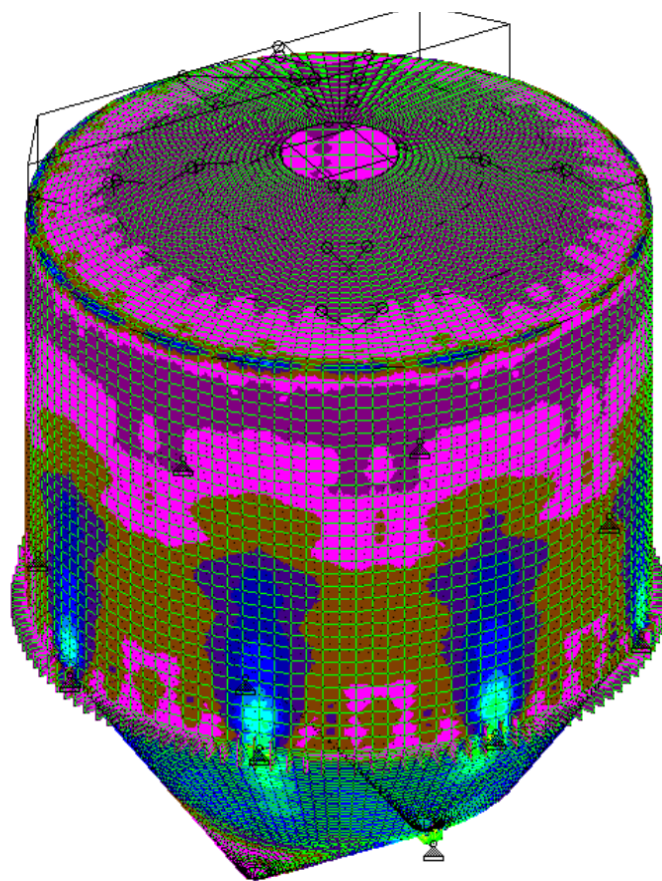
However, the traditional large-scale steel silo is installed by on-site welding, and the amount of construction welding is large. For countries and regions that lack professional welding construction technology, equipment and personnel, the construction period is long, the construction quality is difficult to control, and the construction cost remains high. This is an obstacle for the promotion of welded steel silos. Therefore, how to ensure the rapid installation and forming of the steel silo at the construction site has become the primary issue for the promotion of large-scale steel silo in various industries.

The completion of our company's research on the assembly technology of large-scale bolted steel silos will completely solve the problem faced in the process of popularizing the application of steel silos in the cement industry. The bolted steel silo can not only greatly save labor, shorten the construction period and realize rapid installation and construction, but also facilitate quality control and improve the safety of steel silo body while greatly improving the power efficiency. At the same time, the large bolted silo greatly reduces the construction cost and can achieve great economic benefits.

2 Technical characteristics of large-scale bolted steel silo

2.1 Structural Safety Guarantee of Steel Silo

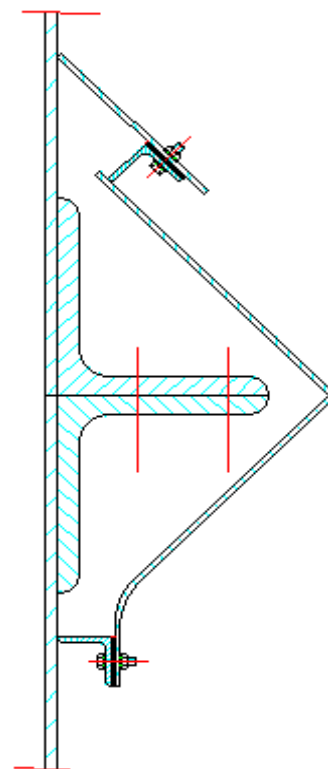
Through market research, fully absorbing the advantages of similar products at home and abroad, adopting comparison of the overall entity analysis and local entity analysis, and using ANSYS and STAAD structural calculation software for simulation analysis to calculate and optimize design. SRON Silo Engineering Co., Ltd. takes the 50,000t cement steel silo as an example to calculate and verify the specifications, so that the structural safety



Stress distribution diagram of steel silo



Silo wall plates connection points



technology of silo roof sealing

- 1) The top plate connecting flange is welded on the top plate of the silo, and the flanges on every two silo top plates are connected by bolts.
- 2) The sealing cover and the sealing support are assembled with bolts, and the sealing rubber blanket is between the sealing support and the sealing cover to form the external sealing method of the silo top plates.

of the steel silo can be fully guaranteed.

2.2 Proprietary of Assembly Design

The roof and wall of SRON's large-scale bolted steel silo are all connected by bolts with patented technology. The on-site construction is simple, which greatly reduces the use of professional and technical worker and greatly shortens the construction period while reducing

labor cost.

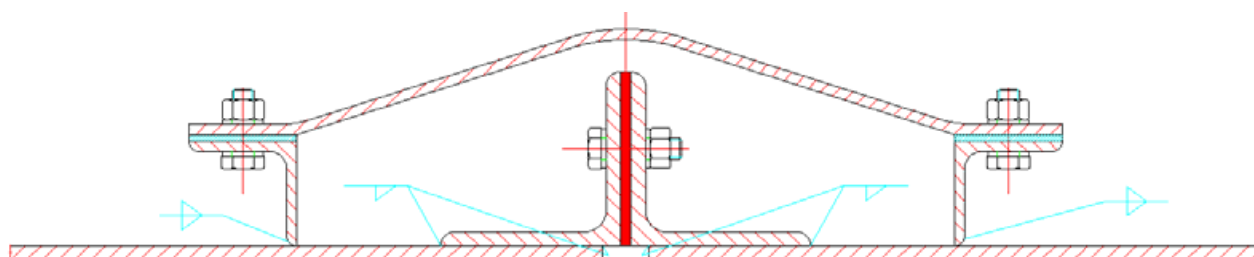
2.3 Proprietary of the whole silo sealing design

The sealing of bolted steel silo has always been the main factor restricting its promotion. SRON's bolted silo adopts its patented sealing technology, which effectively solves the sealing problem of bolted steel silo.

2.3.1 Introduction of patented

2.3.2 Introduction of patented technology of the silo wall plate annular sealing

The silo wall plate sealing cover is connected with the upper supporting plate through the connecting



Sectional view of silo roof connection seal

angle steel, the sealing rubber blanket is placed between the connecting angle steels, the lower part of the sealing cover and the lower supporting angle steel are connected by bolts, and the sealing rubber blanket is placed between the sealing cover and the lower supporting angle steel.

2.4 Safety Guarantee Measures for Transportation

In order to facilitate transportation, the silo body and silo roof of SRON's bolted steel silo are decomposed in the design stage, and formed pieces in the processing plant. The connection nodes after forming pieces mainly include vertical splicing nodes and horizontal splicing nodes. Each segmented steel silo is surrounded by assembly connection nodes, which can at least form and achieve equal strength after assembly.

The packaging of SRON's goods meets the requirements of science, economy, firmness, beauty and marketability. For multiple loading, unloading and handling needs during the long-distance ocean and land transportation, and



preventing goods from mechanical damage, corrosion, mold growth, reduction of equipment technical performance and loss during transportation and storage, the packaging of each product has a product mark, a packaging storage and transportation indication mark and a shipping mark.



3 Benefits that the project can produce

3.1 Economic benefits of the project

With the improvement of environmental protection requirements in various countries in the world, more and more steel silos will be used in cement industry projects in the future. The completion of this project will not only greatly save labor, shorten the construction period, realize rapid installation and construction, but also facilitate quality control and improve the safety of steel silo body while greatly improving the power efficiency. In engineering projects, there is high probability that customers adopt bolted steel silos, the number of signing system general contracting contracts every year will not be less, and the total annual contract value should be around 100-300 million.

3.2 Social benefits of the project

Steel silos are very common in electric power, coal, chemical, port cement and other industries. The demand for this system in domestic and foreign projects is very large. The application of large-scale bolted steel silo will definitely replace the current welded steel silo system. Its market prospect is very broad, and it will achieve good economic and social benefits.

CMD Gears, introduces the KGD, its solution dedicated to kiln drive, and the advantages brought to the cement manufacturer.

By: CMD Gears, France

The performance of a cement plant heavily relies on the performance of the kiln, and the stability of its running behaviour. One of the main challenge being: maintaining the capacity to rotate the kiln in difficult circumstances of global and local shell deformation. Often driven with a conventional and not suitable solution of girth gear and pinion, maintenance of the kiln becomes a continuous concern of the maintenance team and management. By introducing the Bogiflex® KGD, CMD is aiming at making the drive system a reliable part of the kiln performance, by enhancing its reliability and cost performance.

Conventional kiln drive systems

In the vast majority of the plants, the kiln drive systems include a girth gear and a pinion. This basic concept has been existing for more than a century and has not drastically been reinvented since.

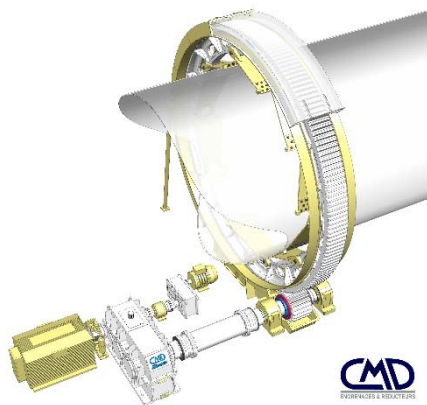


Fig 1 - Conventional kiln drive system

Conventional kiln drives of today (see fig 1) therefore includes:

- A girth gear, mounted onto the kiln via an elastic assembly system
- A pinion meshing with the girth gear. This pinion usually has wider teeth than the girth gear in order to cope with the axial movement of the kiln
- A gearbox driving the pinion through a gear coupling.

The weak point in this drive system is usually the open gear set (pinion and girth gear). Indeed, the girth gear following the kiln movement and deformation, while the pinion is fixed to the ground, proper meshing

between the pinion teeth and the girth gear teeth can't be achieved.

Kiln running behaviour – the idea behind the Bogiflex® KGD

The kiln running behaviour greatly impacts on the running conditions of pinion and girth gear. Indeed deformation of the kiln shell is prone to modify the girth gear geometry, in the following ways :



Fig 2 – Thermal readings of running kiln

- A kiln shell thermal or mechanical crank will impact on center distance between the pinion and girth gear and will lead to wobbling
- A kiln shell eccentricity will impact on the geometry of the girth gear (axial and radial runout) and will affect center distance and / or alignment between the pinion and girth gear
- Deformation and movements of the kiln shell will negatively affect the working conditions of the pinion and girth gear

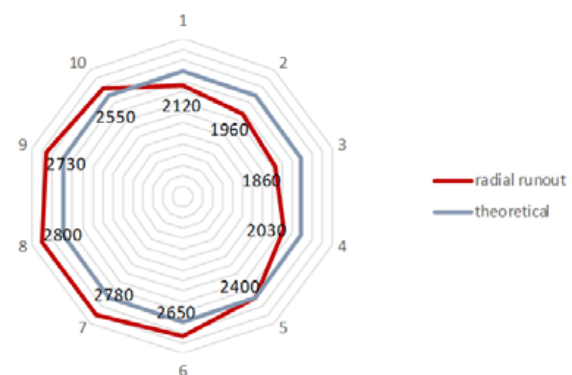


Fig 3 – Radial Runout readings



Fig 4 – Axial Runout readings (1/100mm)

Recent developments in the way kilns are run, like the use of recycling fuels, can impose higher kiln shell temperature and can even amplify the above listed issues.

Return of experience records show that approximatively 10% of installed new kilns face a forced stoppage within 1st year of operation and 50% of them over 12 years operation.

In comparison, Bogiflex® KGD is operating now for more than 10 years without any forced stoppage.

In recent years, self-aligning pinions were introduced in order to improve the pinion / gear meshing. However, this type of pinion only deals with the tilting of the girth gear. It does not deal with its movement or runout, and therefore only partially improves the situation.

The Bogiflex® KGD concept

This led CMD into developing a completely new solution, which would solve the listed issues.

The solution was actually already in CMD's toolbox: The Bogiflex® basic concept had been created in the 1960's and was already used in many steel or sugar industry applications.

The Bogiflex® is a floating and self-aligning gearbox. Self-alignment capability is allowed by the fact that the gearbox output pinion, thanks to some degree of liberty, self-aligns automatically to the driven gear wheel.

In the start of 2000's, the decision was taken to develop a modern version of the Bogiflex® for kilns. A fruitful partnership started together with the Holcim group, which ended in the creation and application of this new breed of kiln drive system.

The Bogiflex® KGD (for Kiln Gear Drive) is a drive system which is floating on, and self-aligning to, the kiln girth gear. It follows the movement of the girth gear, and therefore kiln shell, in every direction; it compensates for any kiln deformation or movement and ensures that meshing conditions between the

CMD BOGIFLEX® KGD (Kiln Gear Drive)

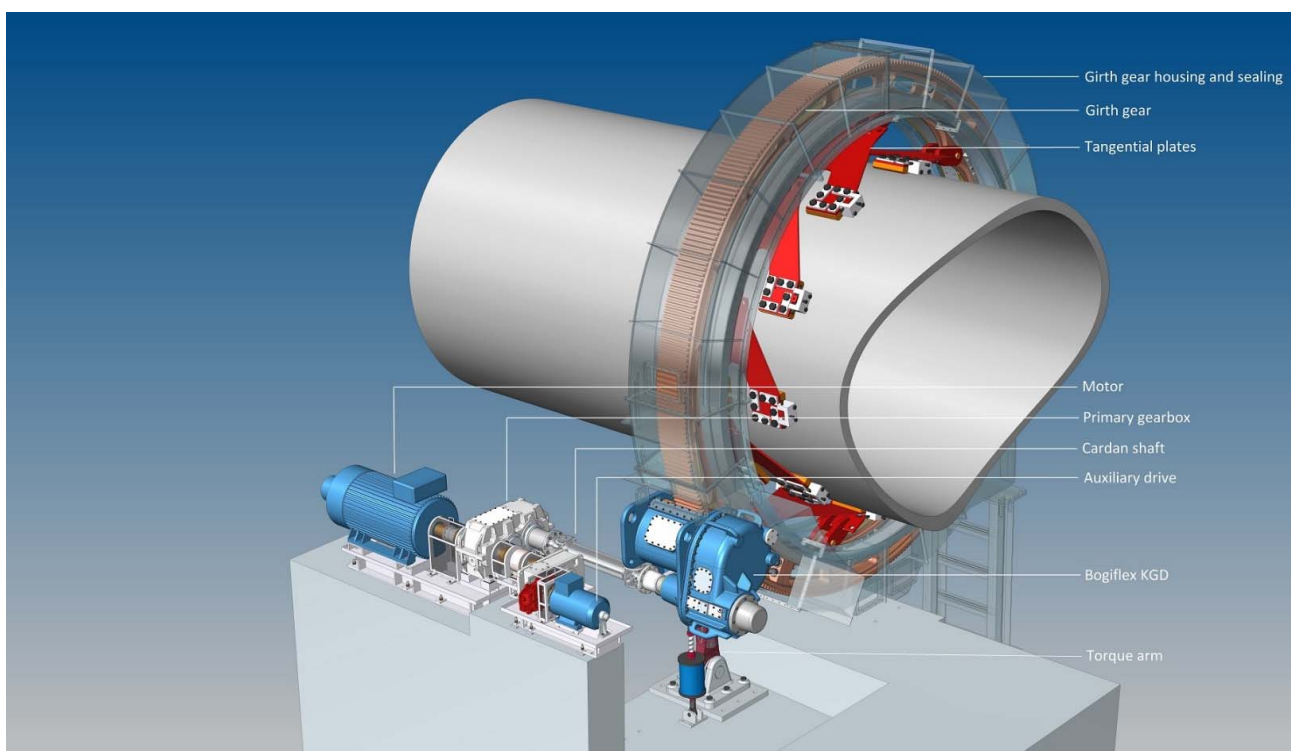


Fig 5 – Bogiflex® KGD mounted on kiln

pinion and girth gear are always constant.

The CMD Bogiflex® KGD (Kiln Gear Drive) includes the following components:

- The girth gear, mounted on the kiln via tangential blades. It is 100% manufactured by CMD and its sister company Ferry Capitain, and can be made either of cast steel or cast iron.
- The Bogiflex® itself, meshing with the girth gear, and supported by the reaction arm
- The cardan shaft
- The primary gearbox
- The auxiliary drive
- The lubrication units
- The girth gear cover

The whole above package being delivered by CMD.

The girth gear and Bogiflex® themselves were designed to be standard components and therefore allow commonality of spare parts between several plants.

The tuning of the drive reduction ratio is obtained by adjusting the specification of the primary gearbox

3 standard sizes of Bogiflex® KGD units exist so far, covering most of the existing kiln sizes, reaching to the biggest lines above 10000TPD :

KGD size	Kiln shell diameter (m)	Clinker capacity (Tons per day)
KGD20	Up to 4.6	2000 to 4000 TPD
KGD26	4.6 to 5.2	4000 to 8000 TPD
KGD32	More than 5.2	8000 to 13000 TPD

Table 1 – Bogiflex® KGD range

How does the Bogiflex® KGD work?

The Bogiflex® itself includes the main pinion, meshing with the girth gear. Two pinion rollers are mounted on the pinion shaft, at each side of the pinion, and roll onto two girth gear external tracks (These tracks are cast in, at each side of the girth gear teeth). Thanks to the “pushing effect” (the angle formed between the meshing forces and the reaction arm position actually pushes the pinion towards the girth gear), the pinion rollers are permanently in contact with the girth gear tracks. This maintains a constant position of the pinion vs the girth gear, and therefore constant center distance and alignment.

Another set of rollers, mounted in the Bogiflex® casing, roll onto two girth gear internal tracks. They are only useful to maintain the Bogiflex® in position when the kiln is stopped or rolling backwards.

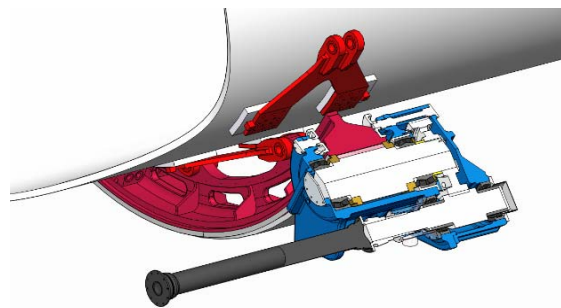


Fig 6 – Bogiflex® KGD cross section view

The freedom of movement of the Bogiflex® is allowed by the possibility of axial movement of the input pinion inside the Bogiflex®, and by the fact that the Bogiflex® is linked to the foundations via an articulated reaction arm.

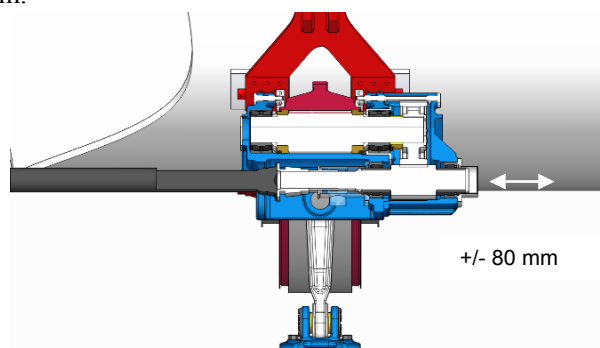


Fig 7 – Bogiflex® KGD axial and tilting movement capacity

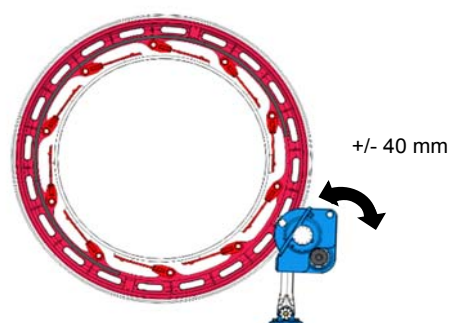


Fig 8 – Bogiflex® KGD radial movement capacity

Low viscosity and High viscosity oil circulation systems are supplied with the Bogiflex®. Thanks to their integrated monitoring, they ensure the safety of the drive.

Bogiflex® optimizing the TCO (Total Cost of Ownership) :

Some of the advantages brought by the Bogiflex® concept are obvious:

- Constant position of the pinion to the girth gear, and therefore constant meshing conditions and excellent load repartition on the pinion and gear teeth
- A direct consequence is the increase of pinion and girth gear life
- Reduction of shutdown risk thanks to stable working conditions
- No more pinion alignment required

The globalization and standardization of the concept also bring other advantages:

- Safety of the integrated oil circulation systems
- Integrated monitoring system (for vibration, temperatures, optional monitoring of torque available)
- Standardized spare parts, which can be shared between several plants
- Reduced foundations requirement (the Bogiflex® itself is only supported by a reaction arm), which allows its use for new kilns as well as for the replacement of existing drives.

These technical advantages make the Bogiflex® KGD solution a cost effective system as well. Net present value (NPV) calculation carried out by Holcim did show this.

Field approved technology

A total of 14 units were ordered so far, 6 for existing kilns (increase of capacity and/or kiln shell behaviour) and 8 for new projects, in various areas of the world. These units are behaving as designed, and the kilns are now driven in a reliable and resilient way.



Fig 9 –Kiln upgrade with Bogiflex® KGD26



Fig 10 – example of Bogiflex® KGD20 during installation

Conclusion

The Bogiflex® is an innovative, reliable and cost effective solution for the kiln drive applications. Its versatility allows it to be used on either new kilns or existing kiln drives replacements.

CMD is at the disposal of all engineering companies and cement makers to adapt this solution to their kilns.

Please contact wesam.manal@cmdgears.com for further information

Video: <http://bit.do/eMvJ5>

Advanced technology for the new kiln line at Qizilqum Sement

By: Alevtina Weimer, IKN GmbH, Germany

A new cement production line has been recently put into operation in Navoi, Uzbekistan. It will increase the clinker production of the existing cement plant JSC “Qizilqum Sement” by 5.500 t/d.

The construction of the new kiln line was executed as an EPC-project whereby IKN assumed the responsibility as main equipment supplier. IKN’s scope includes process integration and equipment design

technology and a Dynamic Linear Drive (DLD). The pyro line is designed for burning natural gas as well as coal.

Key pyro line components

Preheater

The six stage LUCY (Low Under pressure CYclones) type preheater rises 150 m above the ground level. The single-string preheater consists of 5 system cyclones, a twin cyclone top-stage for high separation efficiency and a state-of-the-art inline calciner.

The high efficiency system cyclones with 270° inlet spiral have a diameter of 9,2m clear shell which results in one of the largest single string towers in the area.

Calciner

The inline calciner is installed between cyclones C5 and C6. The preheated raw meal enters the calcining channel just above the location where the burner pipes and tertiary air ducts are attached. This ensures an efficient mixing of meal and fuel with the oxygen-rich tertiary air.

The state-of-the-art inline calciner includes meal and gas staging to provide ideal conditions to ignite



The project

Qizilqum Sement, owner of the cement plant with three kiln lines each with a capacity of 3.000 t/d, decided to increase efficiency and production capacity of the plant. Internal studies concluded that the best way to do this was to install a new pyro line with a capacity of 5.500 t/d using latest technology.

for the pyro line as well as supply of the core parts for preheater, kiln and cooler including ID fan, kiln drive and burners.

The final solution for the kiln line includes a 6-stage LUCY type preheater with inline calciner, a Ø5,0 x72 m rotary kiln and a Pendulum Cooler® with CoandaWing®

Capacity	5.500 t/d
Preheater	six-stage, single string type LUCY with inline calciner
Calciner burners	4 burners for 100% NG or 100% coal
Kiln	Ø5,0 x72 m
Kiln burner	Combined burner for 100% NG or 100% coal
Spec. heat consumption	705 kcal/kg cli.
Cooler	Single stage with Twin Dynamic Linear Drive (DLD)
Cooler clinker discharge temperature	65°C above ambient
Crusher	IKN Roll Crusher with four rolls

different fuels like natural gas and any kind of coal. Together with the new design of IKN's swirl head this ensures good mixing of gas streams to reach full fuel burn out at a low oxygen level.

Rotary kiln

For the production of 5.500 t/d a 72m long and 5.0m diameter rotary kiln with a 3,5% inclination, supported by three piers was selected. On the piers three pairs of radial

rollers are seated in slide bearings with water-cooled spherical support. The bearing design ensures reliable operation and easy alignment on site. They are equipped with an oil and water distribution system for lubrication and cooling. Thermocouples are monitoring bushings, thrust ring and oil. Adjustment provisions on the frame enable final horizontal alignment of radial rollers even during operation.

To ensure trouble-free operation by regular axial movement, a kiln thrust unit (KTU) is installed at pier I. In intervals of five to eight hours, the single hydraulic roller is pushing the kiln upwards and allows it to travel downwards to its initial position by gravity.

The kiln is sealed against the kiln inlet chamber and the kiln hood by lamella type seals with dust hoppers. The lamellas are designed to



compensate for kiln run out and ovality.

Clinker Cooler

Having a big impact on heat efficiency and availability of the kiln line, the Pendulum Cooler is the key to a highly efficient and stable production process.

For this project IKN supplied a single stage cooler with 130m² aerated surface driven by the latest grate drive type – Dynamic Linear Drive (DLD). The DLD is located underneath the Clinker Inlet Distribution System (KIDS®) outside of the cooler housing which guarantees easy access at all times. The drive operates without any hydraulic components and greatly reduces the amount of installation or maintenance work.



The mobile frame is suspended by the IKN Linear Pendulum Support (LPS). These completely wear- and lubrication-free supports are integrated into the lower housing.

The cooler is equipped with an IKN Roll Crusher with 4 rolls located at the end of the cooler.

Leaving the kiln, the clinker falls onto the KIDS4.0 which generates a clinker bed of uniform resistance for optimal passage of air to ensure stable, high temperatures of sec-

ondary and tertiary air. The result is high heat efficiency and smooth cooler performance.

The new KIDS4.0 is based on the concept of more than 650 installations worldwide. One of the new features is a variable slope between 10° to 15° to adjust the KIDS to the prevailing clinker conditions.

After the inlet, the clinker is transported by linear strokes of movable rows of the pendulum section. The entire grate is uniformly aerated in-

cluding the transport system. Due to the precision of the grate alignment and the minimal gaps between moving and fixed parts of the grate, the amount of clinker falling into the under-grate compartments is minimal. For comfort and safety, a Tube Dust Extractor (TDE) is installed for the extraction of any clinker dust to the clinker discharge. Typically, the tube extractor is operated once a day for less than an hour.

Installation and start-up

After the signing of the contract in late 2020, and successful equipment delivery after only 9 months, installation on site began. First assembly works took place in the middle of the COVID-19 pandemic, but thanks to very careful supply chain management, these were overcome. Hot commissioning took place in the third quarter of 2022.

Conclusion

It was an ambitious project and a successful partnership for Qizilqum Sement and IKN. After the start-up, the new six-stage preheater at Qizilqum Sement is a new landmark in Uzbekistan.



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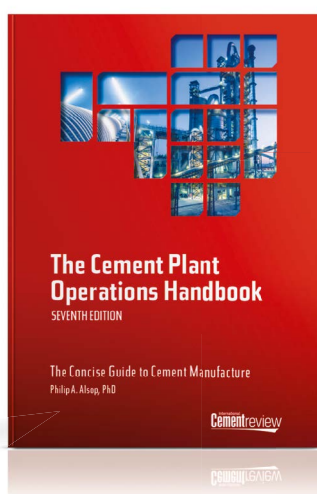
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Vibrating Cup Mill
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The FRITSCH Vibrating Cup Mill PULVERISSETTE 9 offers many practical advantages in all areas in which hard, brittle and fibrous material must be ground extremely quick down to analytical fineness. It is indispensable for fast sample preparation, for example in spectroscopy preparation, ore and geology laboratories, mining and metallurgy, ceramics industry, agriculture and environment, infrared and X-ray fluorescence analysis.

The PULVERISSETTE 9 is very powerful, especially quiet, simple to operate, quick to clean and has a well-conceived drive concept and the grinding set is safe and easy to tension.

For perfect, loss-free grinding results in extremely short grinding time!

Your advantages with the Vibrating Cup Mill PULVERISSETTE 9

- ▶ High power with well-conceived drive concept
- ▶ Extra-fast grinding with up to 1500 rpm
- ▶ Grinding sets in 5 different materials and 3 different sizes from 50 ml to 250 ml volume are available – for each application the suitable one
- ▶ Especially safe hood locking
- ▶ Complete soundproof lining

Easy working

No similar mill offers a more convenient operation: The working position is ergonomically optimised; the ease of cleaning is without match. The grinding sets are especially light and are equipped with heat insulated handles, and do not have to be placed directly on the vibrating plate in the centre of the mill.



Especially ergonomic handling

The grinding set is simply placed on the guide rail, an anti-rotation lock enables easy movement to the final position and the safety switch checks the firm position.

This protects your back and saves energy and time. The grinding set is tensioned in seconds using a well-thought out one-hand lever.

Simply clever!

Especially well-arranged and intelligent

The setting of the grinding time precisely the second, the pause periods and rotational speed as well as the programming and storage of grinding cycles is done via the self-explanatory multilingual menu navigation on the LCD display. A special detector automatically recognizes when you use a grinding set made of agate and reduces the rotational speed independently.

Test the FRITSCH Vibrating Cup Mill PULVERISSETTE 9

Send us your most difficult samples – we will conduct an individual sample grinding. Compare it yourself!

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ЦЕМЕНТ

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

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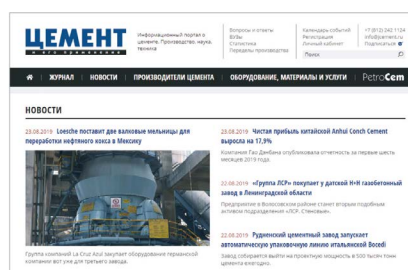
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Both are designed with just one laser and a number of patented features for maximum durability with minimum maintenance. Installation is easy via plug and play, thorough cleaning without tools with just few

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Overview of the main features:

- Two different measuring ranges - perfectly equipped for all measuring tasks
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- Especially quick rinsing – four times faster than usual

- Wear-free and low-maintenance - one professional maintenance per year is sufficient
- Highly accurate measuring results – that exceed ISO 13320

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- Module Ultrasonic box

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NETZSCH LABPILOT: NEW HIGHLY FLEXIBLE GRINDING/CLASSIFYING SYSTEM

NETZSCH LabPilot is particularly suitable for product development, for flexible use in the laboratory and for production of smaller sample quantities.

Brief description

NETZSCH LabPilot is particularly suitable for flexible use in the laboratory and for production of smaller sample quantities. The compact system consists of an operating module with dosing, cyclone, filter, blower and electrical control as well as two positions for fine grinding and classifying, which allow the operation of different machine types. If required, the CFS 5 HD-S high-performance fine classifier can be installed at the second position after the mill to ensure even greater fineness. In addition, it is possible to operate both machine modules alternately – giving the operator even more flexibility.

Grinding and classifying are important process steps in the industrial production of various products concerning the food and luxury food sector as well as in chemical, pharmaceutical and general bulk materials industries. This applies not only on a production scale, but also on a laboratory scale, for the development of new products and the search for new properties, as well as for increasing efficiency and reducing production costs. A wide field, that is becoming increasingly complex and demanding as technical development progresses. Nevertheless, modern laboratories should always be capable of handling different process steps and requirements in an efficient and repeatable way.

Today's laboratory plants usually concentrate on individual machines and their respective tasks. For example, in grinding with subsequent particle separation, the test product must be ground first, then collected and transported to a second machine where the classification process takes place. This is often a dust- and labour-intensive process that can easily lead to product contamination and even product loss. In addition to the space required for several machines, the explosion risks at various points, for example, must also be taken into account.

The situation becomes even more problematic when the particle fineness in comminution tasks is to be var-

ied over such a wide range that the standard impact milling technology does not provide enough energy for the desired finenesses or even a controlled maximum particle size cannot be achieved – which is, however, required for many applications. The requirement for a narrow particle size distribution in turn means that a certain proportion of coarse or fine product has to be separated after grinding. If this is in the range below 100 μm , only air classification can be used here.

Especially for such tasks, NETZSCH has taken the well-known LabCompact system as a basis and constructed the new LabPilot system on it. In addition to a facelift, which brought not only optical changes, but also further advantages in terms of user-friendliness, cleaning and maintenance, LabPilot has been expanded to include additional grinding technologies. Now, in addition to the jet and classifier mills available so far, the fine impact mill Condux® and the dry agitator bead mill SpheRho® can also be used. This expands the possibilities for comminution in laboratories to include many more areas of application.

For example, the Condux® fine impact mill can be used to process a wide variety of products up to a Mohs hardness of 3 - 3.5. Depending on the product properties and comminution task, the laboratory mill is equipped with different grinding tools (pin discs, blast rotor, wing beater) and stators. It thus flexibly covers a wide range of applications and is the ideal solution for initial feasibility studies and the production of small production quantities.

Due to its operating mode and stress characteristics, the dry agitator bead mill SpheRho® achieves very high finenesses, combined with high throughput rates at low specific energy consumption. The main field of application is real comminution of various raw materials with typical product finenesses d_{50} in the range of 2 μm to 70 μm . The continuously operating dry agitator bead mill can be used both in individual passages without classifier and in a grinding/classifying circuit.

In addition to the systems mentioned, various other mills, such as jet and classifier mills as well as fine and ultra-fine classifiers, can be used with the NETZSCH LabPilot with only one installation by means of short adjustments and coordinated with the respective process gas quantity. With appropriate laboratory machines, the proven technology can also be used for the development of new products or for the production of small quantities on a laboratory scale. NETZSCH LabPilot offers maximum flexibility through the possible use of different mill types with subsequent classification stage in a closed system, including throughput mode. This avoids product losses, offers considerable facilitation/time savings and enables quick tests with different products.

Easy accessibility and simple cleaning as well as the compact design make NETZSCH LabPilot an indispensable system in any particle technology laboratory environment.

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For more information, please contact:

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Website: <https://www.gmiforum.com>

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European Time (Berlin, Paris, Rome)

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For more information, please contact:

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For more information, please contact:

Turkish Cement Manufacturers' Association

Email: info@turkcimento.org.tr /

tekniks@turkcimento.org.tr

Website: www.turkcimento.org.tr

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XXIV International Construction Forum | Cement Concrete - Dry Mixtures

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Website: intercem.us20.list-manage.com

2nd Virtual European Cement Conference - Market trends and technology in Europe

Date : 06th December 2022 at 10:00 - 17:00 Central European Time (Berlin, Paris, Rome)
Venue: Your device
Free registration link:
<https://register.gotowebinar.com/register/5470726077176679695>
For more information, please contact:
Dr. Robert McCaffrey
Tel.: +44 1372 743837
Fax: +44 1372 743838
Email: rob@propubs.com
<https://www.globalcement.com/conferences/more/european-cement/virtual>

17th NCB International Conference on Cement, Concrete and Building Materials

"Moving towards Net Zero Carbon Emissions"

Date : 06 - 09 December 2022
Venue: Manekshaw Centre, New Delhi, India
For more information, please visit:
<https://www.ncbindia.com/17seminar.php>

Cemtech Live Webinar: The Digital Plant

Date : 07th December 2022

Venue: Your device
For more information, please visit:
www.CemNet.com

3rd Virtual Global Ash Seminar - 2022

Date : 13th December 2022 at 11:00 AM - 15:00 Central European Time (Berlin, Paris, Rome)
Venue: Your device
Free registration link:
<https://register.gotowebinar.com/register/5120266641427681292>
For more information, please contact:
Dr. Robert McCaffrey
Tel.: +44 1372 743837
Fax: +44 1372 743838
Email: rob@propubs.com
<https://www.globalcement.com/conferences/ash/virtual>

3rd Virtual Asian Cement - Market trends and technology in Asia

Date : 17th January 2023 at 11:00 AM - 15:00 Central European Time (Berlin, Paris, Rome)
Venue: Your device
Free registration link:
<https://register.gotowebinar.com/register/5120266641427681292>
For more information, please contact:
Dr. Robert McCaffrey
Tel.: +44 1372 743837
Fax: +44 1372 743838
Email: rob@propubs.com
<https://www.globalcement.com/conferences/more/asiacementlime/virtual>

5th Virtual Global Concrete - Global concrete business

Date : 24th January 2023 at 11:00 AM - 15:00 Central European Time (Berlin, Paris, Rome)
Venue: Your device
Free registration link:
<https://register.gotowebinar.com/register/5120266641427681292>
For more information, please contact:
Dr. Robert McCaffrey
Tel.: +44 1372 743837
Fax: +44 1372 743838
Email: rob@propubs.com
Website: www.Global-Concrete.com

Drymix Mortars in the Middle East (MEDMA Annual Conference)

Date : 06th February 2023
Venue: Dubai, UAE
Email: info@drymix.info
Website: www.drymix.info

XXIV INTERNATIONAL CONSTRUCTION FORUM

CEMENT • CONCRETE DRY MIXTURES

NOVEMBER 29- DECEMBER 1, 2022. EXPOCENTRE, MOSCOW.



XXIV INTERNATIONAL CONSTRUCTION EXHIBITION
«Cement. Concrete. Dry mixtures»

More than **6000**
exhibition visitors

BlockRead

International Conference
«Precast Housing: Production, Design,
Construction»

450 members
of the business
program

MixBuild

International Scientific and Technical
Conference «Modern Technologies of Dry
Mixtures in Construction»

150 exhibits

80 reports

18 countries



organizers

venue



info@alitinform.ru // www.infocem.info // +7 812 335 09 92



3rd Virtual American Cement - Market trends and technology in the Americas

Date : 7th February 2023 at 11:00 AM - 15:00 Central European Time (Berlin, Paris, Rome)

Venue: Your device

For more information, please contact:

Dr. Robert McCaffrey

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: rob@propubs.com

Website: <https://www.globalcement.com/conferences/more/american-cement/virtual>

2nd Global GypSupply Conference

Date : 22 - 23 February 2023

Venue: Brussels, Belgium

For more information, please contact:

Dr. Robert McCaffrey

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: rob@propubs.com

Website: <https://www.globalgypsum.com/conferences/global-gypsupply/introduction>

1st Global CemProducer Conference & Exhibition on cement trade & technology

Date : 14 - 15 March 2023

Venue: Munich, Germany

For more information, please contact:

Dr. Robert McCaffrey

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: rob@propubs.com

Website: <https://www.globalcement.com/conferences/cemproducer/introduction>

CBI – Cement Business and Industry Brazil and LatAm & Alternative Fuels and Raw Materials 2023

Date : 15 - 16 March 2023

Venue: São Paulo, Brazil

For more information, please contact:

Email: sales@gmiforum.com / mk@gmiforum.com

Website: <https://www.gmiforum.com>

9th international Drymix Mortar Conference idm-mc9

Date : 27th March 2023

Venue: Nürnberg, Germany

Email: info@drymix.info

Website: www.drymix.info

65th IEEE-IAS/PCA Cement Industry Technical Conference

Date : 23 - 27 April 2023

Venue: Dallas-Hilton Anatole, Dallas, USA

For more information, please visit:

<https://cementconference.org/>

2nd Virtual Global CemCCUS - Carbon capture, use and storage for cement and lime

Date : 9 May 2023 at 10:00 - 16:00 CET (Central European Time, Berlin, Paris, Rome)

Venue: Your device

For more information, please contact:

Dr. Robert McCaffrey

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: rob@propubs.com

<https://www.globalcement.com/conferences/more/cement-ccus/virtual>

5th Global CemBoards Conference and Exhibition

Date : 18 - 19 May 2023

Venue: Hotel Pullman Brussels, Belgium

For more information, please contact:

Dr. Robert McCaffrey

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: rob@propubs.com

<https://www.propubs.com/industries/global-cem-boards/conferences/introduction>

15th Global Slag Conference

Date : 07 - 08 June 2023

Venue: Düsseldorf, Germany

For more information, please contact:

Dr. Robert McCaffrey

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: rob@propubs.com

<https://www.globalslag.com/conferences/global-slag/introduction>

7th American Drymix Mortar Conference - adm-mc7

Date : 08th June 2023

Venue: Richmond, Virginia, USA

Email: info@drymix.info

Website: www.drymix.info

Second Interdisciplinary Symposium on 3D Printing of Mortars ScalingUp 3D

Date : 09th June 2023

Venue: Richmond, Virginia, USA

Email: info@drymix.info

Website: www.drymix.info

66th IEEE-IAS/PCA Cement Industry Technical Conference

Date : 05 - 09 May 2024

Venue: Gaylord Rockies, Denver, USA

For more information, please visit:

<https://cementconference.org/>

Virtual (*free*) and
in-person events
in 2022-23 from:



Details and registration

Virtual Global Concrete 4
Global concrete business
11 October 2022

Virtual Global Concrete 5
Global concrete business
24 January 2023

Virtual Global CemProducer 6
Cement production optimisation
18 October 2022

Virtual American Cement 3
Market trends and technology in the Americas
7 February 2023

**20th Global Gypsum/
15th Insulation Conference**
**2-3 November 2022, Estoril/
Lisbon, Portugal**

**2nd Global GypSupply
Conference**
**22-23 February 2023,
Brussels, Belgium**

**3rd Global FutureCem
Conference**
16-17 November 2022, Brussels

**1st Global CemProducer
Conference**
14-15 March 2023, Munich, Germany

Virtual Global CemPower 2
Electrical generation and efficiency
29 November 2022

Virtual Global CemCCUS 2
Carbon capture, use and storage for cement and lime
9 May 2023

Virtual European Cement 2
Market trends and technology in Europe
6 December 2022

5th Global CemBoards Conference
18-19 May 2023, Brussels, Belgium

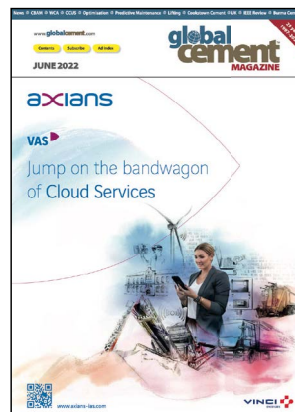
Virtual Global Ash 3
Ash for cement and concrete
13 December 2022

15th Global Slag Conference
7-8 June 2023, Düsseldorf, Germany

Virtual Asian Cement 3
Market trends and technology in Asia
17 January 2023

www.GlobalCement.com

Check website for
latest details



TRAINING

Crash Course Process Control

Pneumatic Conveying of Bulk Solids

Date : 08 - 09 November 2022

Venue: University of Greenwich Medway campus in Kent, England

For more information, please visit:

www.gre.ac.uk

Pneumatic Conveying System

Design (Advanced Course)

Date : 22 - 23 November 2022

Venue: University of Greenwich Medway campus in Kent, England

For more information, please visit:

www.gre.ac.uk

Rotary Valves: Design, Selection and Operational Issues

Date : 24th November 2022

Venue: University of Greenwich Medway campus in Kent, England

For more information, please visit:

www.gre.ac.uk

Commissioning and Troubleshooting Pneumatic Conveying Systems

Date : 06 - 07 December 2022

Venue: University of Greenwich Medway campus in Kent, England

For more information, please visit:

www.gre.ac.uk



M/s. Allan Smith Engineering Pvt. Ltd. is a name of repute in the Rotary Kiln Industry. We offer specialized maintenance services includes KILN Audit, grinding (Kiln Tire, Ball Mill Slide Ring, gear teeth, etc.), Assistance in Kiln and components, erections & commissioning, and kiln and component design review for upgradation. We are a professionally managed company to emerge as principal name in the field.

Our engineering services are designed and implemented at par with international standards and continuous upgradation in methodology with the knowledge centre based in Europe. Many times, we had received acclamation from overseas clients. Our ethical business practice and professional attitude have earned the trust of clients with reputed businesses.



ALLAN SMITH ENGINEERING PVT. LTD.

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Landline Number: +91 22 4962 2220/1
Mobile Number: +91 98675 89351 / + 91 90046 76484 (+91 900 IN SMITH)
Email: admin@smithengg.in, ase@eurokiln.com | Web.: www.smithengg.in

OUR SERVICES:

- Kiln Audit
- Hot Kiln Alignment
- Repair & Maintenance
- Kiln Tyre & Roller Grinding
- Thrust Roller & Thrust Face Grinding
- Kiln Erection
- Kiln Diagnostic Maintenance
- Kiln & Component Design
- Analysis of Residual life
- Support Roller design review

SUPPLY:

- Kiln Shell
- Duplex Graphite Seal (Inlet & Outlet)
- Girth Gear Spring Plate
- Tyre & Support Rollers
- Chairpad Lubrication Bar
- Isostatic Graphite Block
- Design & Supply of Full floating Chair pad

CERAMIC

ASEAN Ceramics 2022

Date : 30 November -02 December 2022

Venue : Bangkok - IMPACT Exhibition Center, Thailand

For more information, please contact:

Email: aseanceceramics@mmiasia.com.sg

Website: <https://aseanceceramics.com>

Indian Ceramics Asia

Date : 15 - 17 February 2023

Venue: Helipad Exhibition Centre, Gandhinagar, India

For more information, please visit:

<https://www.indian-ceramics.com>



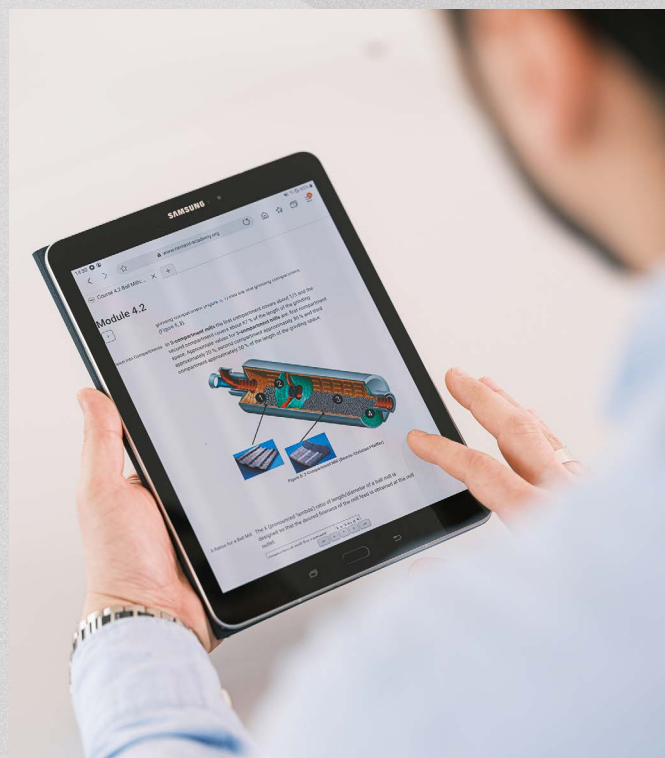
Evolving the well-established

vdz

Become a cement expert with VDZ's online learning platform

Some advantages at a glance:

- **37 well-structured online courses covering the latest knowledge on cement production:**
Raw material preparation, burning technology, alternative fuels, grinding technology, emissions abatement and much more
- **Videos and high-quality animations for better understanding of complex processes**
- **Learn at your own pace, anytime and anywhere**
- **Cost-efficient and time saving**
- **Learning success control tools**
- **Available for both individuals and cement companies**



For further information,
please visit our website:
<https://vdz.info/vdzoc>



Are you interested?

Feel free to contact us:
VDZ, Germany
Dirk Viehweg
+49-211-45 78-417
dirk.viehweg@vdz-online.de

DIARY DATES DIARY DATES

GENERAL

BAUMA 2022

Date : 24 - 30 October 2022
Venue: Munich, Germany
For more information, please visit:
<https://bauma.de/en>

EuroBLECH 2022, the 26th International Sheet Metal Working Technology Exhibition

Date : 25 - 28 October 2022
Venue: Hannover, Germany
For more information, please visit:
<https://www.euroblech.com/>

5th International Drilling Congress and Exhibition of Turkey

Date : 27 - 28 October 2022
Venue: Izmir, Turkey
For more information, please contact:
TMMOB MADEN MÜHENDİSLERİ ODASI
Tel: +90 312 425 10 80
Email: maden@maden.imdlv.net
www.drilling.org.tr

Modular Construction in Data Centers

Date : 23 - 24 November 2022
Venue: Hotel Fort Canning, Singapore
For more information, please contact:
John Karras
Tel.: +603 2775 0067
Email: johnk@trueventus.com

Modular, Prefab and Construction Tech Senate

Date : 23 - 24 November 2022
Venue: Mercure Hotel Amsterdam City, Netherlands
For more information, please contact:
John Karras
Tel.: +603 2775 0067
Email: johnk@trueventus.com

VALVE WORLD EXPO

Date : 29 November – 01 December 2022
Venue: Düsseldorf, Germany
For more information, please visit:
www.valveworldexpo.com

Construction Technology Festival

Date : 14 - 15 December 2022
Venue: Movenpick Hotel & Residences Riyadh, KSA
For more information, please visit:
www.ctf-ksa.com

18th Edition SteelFab 2023 Machinery, Technology, Equipment

Date : 09 - 12 January 2023
Venue: Sharjah, UAE
For more information, please contact:
Tel.: +971 6 5770000
Email: steel@expo-centre.ae
Website: www.steelfabme.com

5th International Underground Excavations Symposium

UYAK2023 Istanbul
Date : 09 - 11 March 2023
Venue: Istanbul, Turkey
Tel: +90 312 4251080
Email: uyak@uyak.org.tr
For more information, please visit:
<https://www.uyak.org.tr/en/>

Moving Towards Net Zero Construction

Date : 15 - 16 March 2023
Venue: Hotel Fort Canning, Singapore
For more information, please contact:
John Karras
Tel.: +603 2775 0067
Email: johnk@trueventus.com

European Coatings Show

Date : 28 - 30 March 2023
Venue: Nürnberg, Germany
For more information, please visit:
<https://www.european-coatings-show.com/>

interpack Düsseldorf

Date : 04 - 10 May 2023
Venue: Düsseldorf Trade Fair Centre, Germany
For more information, please visit:
www.interpack.com



e-Learning

PROVIDING ONLINE TRAINING TO THE CEMENT INDUSTRY

Training Schedule **2023**

3-WEEK ONLINE TRAINING

Alternative Fuels for Firing Cement Kilns

16 January 2023 · 03 April 2023
03 July 2023 · 02 October 2023

6-WEEK ONLINE TRAINING

Cement Kiln Process Chemistry

16 January 2023 · 03 April 2023
03 July 2023 · 02 October 2023

6-WEEK ONLINE TRAINING

Cement Factory Maintenance

09 January 2023 · 10 April 2023
10 July 2023 · 09 October 2023

6-WEEK ONLINE TRAINING

Grinding and Milling Systems

23 January 2023 · 17 April 2023
31 July 2023 · 09 October 2023

6-WEEK ONLINE TRAINING

Cement Kiln Refractories

17 April 2023 · 10 July 2023

6-WEEK ONLINE TRAINING

Cement Manufacturing Technology

16 January 2023 · 03 April 2023
03 July 2023 · 02 October 2023

6-WEEK ONLINE TRAINING

Decarbonising Cement Manufacture

23 January 2023 · 10 April 2023
10 July 2023 · 09 October 2023

6-WEEK ONLINE TRAINING

Cement Kiln Pyroprocessing

23 January 2023 · 10 April 2023
10 July 2023 · 09 October 2023

6-WEEK ONLINE TRAINING

Cement Factory Quality Control

23 January 2023 · 10 April 2023
31 July 2023 · 30 October 2023

6-WEEK ONLINE TRAINING

White Cement Manufacturing Technology

20 February 2023 · 04 September 2023

All courses are run and managed via the CemNet Training website, with tutors providing full support to students throughout.

Each course is complete with full documentation, course notes, etc. No additional material is required other than a computer with an internet connection.

Courses may be taken at work or at home and at times that suit each individual student.

Successful students are awarded a Certificate of Merit from CemNet Training as evidence of their diligence and competency.

Further details on costings, course content, technical levels and course suitability are available via:

www.CemNet.com

Note: all listed courses can be tailored as part of an exclusive corporate technical training programme, delivered either as tutor-led classroom-based or online. Please email for a quote.

Email: Training@CemNet.com

To register for a course, visit:

www.CemNet.com





عالم الإسمنت ومواد البناء

تصدر عن : الائتاد العربى للإسمنت ومواد البناء العدد 89 سبتمبر / أيلول 2022

- أخبار عربية
- أخبار عالمية
- مقالات تقنية
- منتجات جديدة
- مؤتمرات ومعارض



عالم الإسمنت ومواد البناء

مؤتمرات ومعارض

منتجات جديدة

موضوعات تقنية

أخبار عالمية

الملف العربي

رئيس التحرير الأمين العام / المهندس أحمد محمود الروسان
مدير التحرير سها منير كنعان

المساهمات

● ترحب هيئة تحرير المجلة بمساهمة السادة المهتمين والمتخصصين بهدف إثراء المادة التحريرية .

● الآراء الموجودة بالمجلة لاتعبر بالضرورة عن رأي الاتحاد أو المجلة وإنما عن الرأي الخاص بكتابها ولا يتحمل الاتحاد أية مسؤولية قانونية تجاه ذلك .

توجه كافة طلبات الإعلان بإسم رئيس التحرير

الإعلان

الاشتراكات السنوية

150 دولار أمريكي

65 دولار أمريكي

الشركات والمؤسسات ●

الجامعات ومراكز البحوث ●

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

Website : www.aucbm.net

المكتويات

أخبار عربية
أخبار عالمية
منتجات جديدة

الموضوعات:

- الطريق نحو البناء الأخضر
إعداد: A3&Co. – الإمارات العربية المتحدة
 - التجفيف العمودي للوقود البديل تزامناً مع غربة
الشواوب
إعداد: Dr.-Ing. و Dr. Dominik Aufderheide
– Luigi Di Matteo ، DI MATTEO Group
ألمانيا
 - مجموعة **Beumer** توفر حلولاً فردية أحادية المصدر
لمناولة الوقود البديل
إعداد: Beumer Group – ألمانيا
 - شروط الإنتاج والاستخدام الاقتصادي للوقود البديل
إعداد: Dr. Hubert Baier ، WhiteLabel-
TandemProjects e.U – ألمانيا
 - مع منتج **FCB Horomill** يمكن طحن الإسمنت
دون قطرة ماء
إعداد: D Loïc POTTIER ، Fives FCB
فرنسا
 - استخدام الصومعة الضخمة من الفولاذ المسحوب في
صناعة الإسمنت
إعداد: Wen Peng ، Henan SRON Silo
Engineering Co., Ltd – الصين
 - مزايا نظام إدارة الفرن **KGD BOGIFLEX** من
شركة **CMD**
إعداد: CMD Gears – فرنسا
 - التكنولوجيا المتقدمة لخط الفرن الجديد في مصنع
قيزلقم
إعداد: Alevtina Weimer ، IKN GmbH
ألمانيا
 - تقديم عن شركة **Toni Technik**
إعداد: Toni Technik Toni Technik
Baustoffprüfsysteme GmbH – ألمانيا
- مؤتمرات ومعارض

المراسلات

توجه كافة المراسلات بإسم رئيس التحرير / الاتحاد العربي للأسمنت ومواد البناء
الجمهورية العربية السورية - دمشق - ص . ب 9015
هاتف : 611 85 98 - 611 54 12 (11 963 +)
فاكس : 612 17 31 (11 963 +)

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

Website : www.aucbm.net



مجلة عالم الإسمنت ومواد البناء

جدول موضوعات المجلة عدد ديسمبر / كانون الأول 2022	
* تصنيع الإسمنت الأبيض	* الإسمنت الخالي من الكربون
* الإسمنت المخلوط	* إنتاج الكلنكر منخفض الكربون
* الإسمنت متعدد المكونات	* المواد الخام لمضافات الإسمنت
* إسمنت الخبث	* إدارة الإمدادات
* إنتاج الإسمنت الأخضر	* إنتاج الإسمنت بطاقة منخفضة
* خلانط الإسمنت	* توكيد الجودة ومراقبة العمليات في مصانع الإسمنت
* مضافات الإسمنت	* توفير تكلفة إنتاج الإسمنت
* مكونات الإسمنت	* كيمياء الإسمنت

آخر موعد لاستلام المقالات أو النصوص الصحفية أو الإعلانات لعدد ديسمبر / كانون أول: ٥ ديسمبر / كانون أول ٢٠٢٢

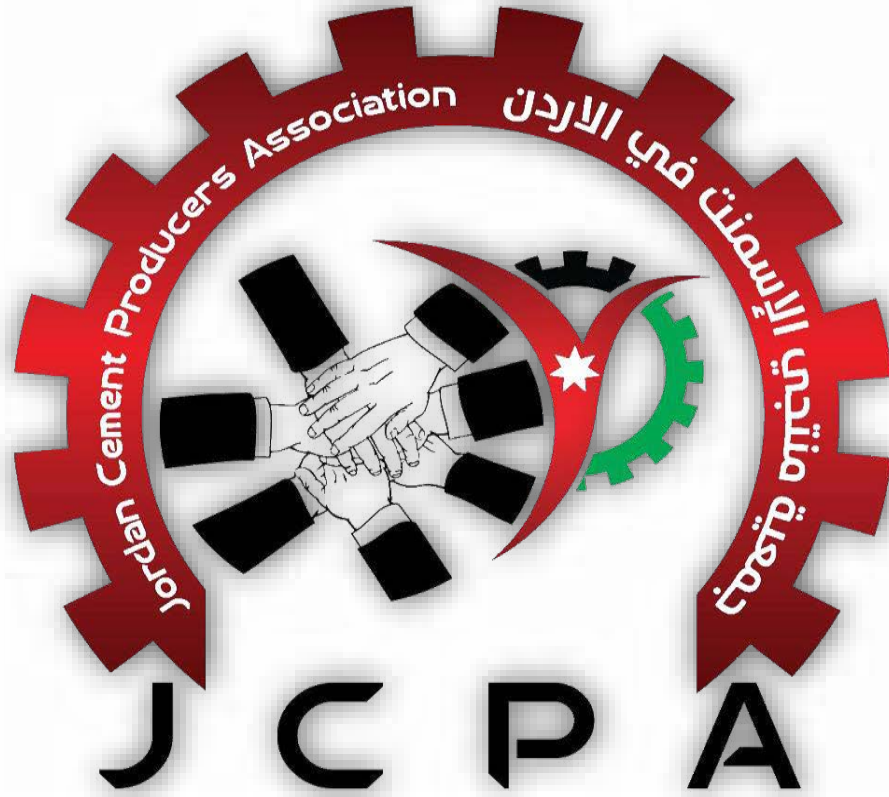
الإعلانات لعام كامل (بالدولار الأمريكي)

الإعلان في عدد واحد	الإعلان في عدددين	الإعلان في ثلاثة أعداد	الإعلان في أربعة أعداد	
1,250	*	*	*	غلاف خارجي ملون (يمين أو يسار) A4
950	*	*	*	غلاف داخلي ملون (يمين أو يسار) A4
750	950	1,250	1,350	صفحة داخلية ملونة A4
450	550	650	750	نصف صفحة داخلية ملونة A4
300	350	400	450	ربع صفحة داخلية ملونة A4
300	350	400	450	صفحة أسود وأبيض

مع مسافة على الأطراف الأربعة A4 : أبعاد الإعلان
أبعاد الإعلان على الغلاف الخارجي : ارتفاع 20 سم وعرض 14 سم
300 dpi الدقة :
PDF أو EPS أو PSD : نوع الملف

إعلان على موقع الاتحاد WWW.AUCBM.NET

- عرض 200 بيكسل وارتفاع 75 بيكسل ، بقيمة 150 دولاراً أمريكياً في الشهر الواحد
- يرجى إرسال الصور مع اللينك المطلوب ربطه بها بدقة 300 dpi (dot per inch)



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تأسست عام 2015

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Fax: +962-65812567
Tel: +962-5850974





الجزائر

بعد المطابقة لمعايير المعهد الأمريكي لإنتاج الاسمنت البترولي: إسمنت "جيك" يحوز على شهادة المطابقة مع المعايير الأوروبية CE

حصل المجمع الصناعي لإسمنت الجزائر "جيك"، عبر الفرع التابع له "شركة الإسمنت لعين الكبيرة"، خلال شهر يوليو / تموز 2022، على شهادة المطابقة مع المعايير الأوروبية (CE) بخصوص الإثباتات لثلاثة أنواع من الإسمنت، مصادق عليها بالمطابقة من قبل الجمعية الفرنسية للتقييس (أفنور)، ويتعلق الأمر بكل من:

CEM I 42.5 N- LH /SR5 (جيك مضاف)

CEM II/A6L 42.5 N (جيك بيطون، عادي التصلد)

CEM II/A6L 42.5 R (جيك بيطون، سريع التصلد)

ويأتي هذا الاعتراف بعد عشرين شهراً من التدقيق الذي قامت به هيئة "أفنور" مع إدارات شركة الإسمنت لعين الكبيرة، وبالوصول على هذه العلامة سيكون بمقدور مجمع "جيك" تعزيز وجوده بقرارة أوروبا من خلال تصدير إنتاجه من الإسمنت، بعد تمكنه من قبل دخول الأسواق الإيطالية والإسبانية والبريطانية.

ويضاف هذا الاعتراف إلى شهادة المطابقة الخاصة بمعايير المعهد الأمريكي للبترون من أجل إنتاج إسمنت آبار النفط الذي يستخدم في قطاع المحروقات، والمحصل عليها شهر يوليو / تموز 2019 من ذات الهيئة التي تعتمد بالتصديق على جميع المواد والحلول الموجهة للصناعة النفطية العالمية، وهو ما سمح بتلبية الطلب الوطني المقدر بنحو 200 ألف طن سنوياً بعد أن كان يتم استيراده.

كما ساهم مجمع "جيك" بشكل كبير في تلبية الطلب الوطني على الإسمنت، قبل أن يتمكن من اقتحام الأسواق الخارجية ابتداءً من سنة 2018، حيث بلغت صادراته 2.247 مليون طن سنة 2021، باتجاه عدة دول من غرب أفريقيا مثل ساحل العاج، غامبيا، غانا، موريتانيا، السنغال، الكاميرون، بنين، غينيا، إضافة إلى أسواق أخرى بأمريكا اللاتينية وجزر الكاريبي مثل البرازيل، البيرو، جمهورية الدومنيكان، هايتي، فضلاً عن عدد من الدول الأوروبية.

العراق

الشركة العامة للسمنت العراقية تنجز تحويل الخط الثالث (الفرن) للعمل بمنظومة الغاز السائل بدلاً عن النفط الأسود في معمل سمنت الكوفة

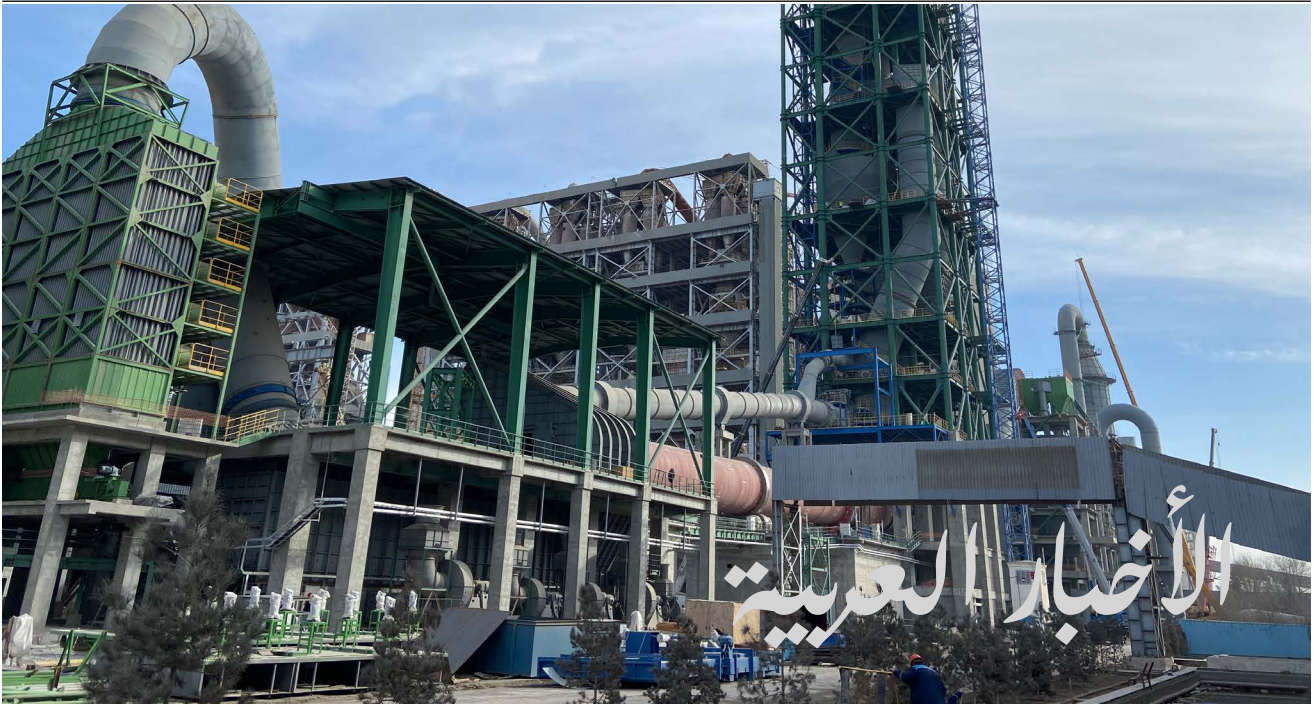
أعلنت الشركة العامة للسمنت العراقية إحدى شركات وزارة الصناعة والمعادن عن إكمال تحويل الخط الثالث (الفرن) للعمل بمنظومة الغاز السائل بدلاً عن النفط الأسود في معمل سمنت الكوفة.

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حيث أكملت كرادر معمل سمنت الكوفة الهندسية والفنية عملية تحويل منظومة الحرق من النفط الأسود إلى الغاز ، إذ تمكنت من إنجاز ما تم التخطيط له خلال عام واحد بتحويل منظومة حرق الخطين الأول والثاني (الفرن) للعمل بالغاز السائل وتحويل الخط الثالث في الفترة ذاتها . وسيسهم هذا الإنجاز في تحقيق نتائج اقتصادية جيدة وخفض كلف إنتاج السمنت ، إضافة إلى خفض مستوى الانبعاثات البيئية لاسيما غاز ثاني أكسيد الكربون CO_2 ، وتحسين نوعية مادة الكلنكر المنتجة عبر تقليل الكبريتات التي تنبعث من احتراق النفط الأسود ، فضلاً عن سهولة التحكم بالشعلة الغازية وخلق مناخ ملائم وبيئة مستدامة . ويعمل المصنع بالطريقة الرطبة التي تحتاج إلى كميات كبيرة من النفط الأسود تتجاوز ضعف الكمية في المعامل التي تعمل بالطريقة الجافة .

قطر

"قطر للإسمنت" توقع مذكرة تفاهم مع المنظمة الخليجية لتطوير مواد بناء مستدامة

وقعت شركة قطر الوطنية لصناعة الإسمنت والمنظمة الخليجية للبحث والتطوير /جورد/ ، مذكرة تفاهم للتعاون في مجالات البحث والتطوير لإنتاج مواد بناء خضراء أو منخفضة الانبعاثات الكربونية ، بما يعزز الجهود نحو إنشاء بيئة عمرانية مستدامة في قطر .

ويهدف توقيع مذكرة التفاهم مع المنظمة إلى تعزيز التعاون البحثي والعلمي في مجال إنتاج منتجات صديقة للبيئة ومنخفضة الكربون، وتحقيق التنمية المستدامة، وتأسيس نظام متكامل ومستدام في هذه الصناعة المهمة .

وتعتبر شركة قطر الوطنية لصناعة الإسمنت هي المنتج الرئيسي للإسمنت العادي والمقاوم والجير الحي والمطفاً والرمل المغسول في دولة قطر . أما المنظمة الخليجية للبحث والتطوير، فهي مؤسسة غير ربحية تسعى عبر أنشطتها المتنوعة إلى دعم تحول المجتمعات والبنية المؤسسية والبيئة العمرانية نحو الاستدامة ، وتعزيز الابتكار وتطوير القدرات لتمكين النمو المستدام منخفض الكربون للأجيال الحالية والمستقبلية .

مصر

"مصر للإسمنت" تبدأ تشغيل وصيانة مصنعها في قنا ذاتياً

أعلنت مجموعة مصر للإسمنت عن بدء تشغيل وصيانة مصنعها في قنا ذاتياً منذ بداية شهر يوليو / تموز الماضي ، بهدف خفض تكاليف التشغيل وتحقيق أقصى استفادة من الأصول . وذلك بعد انتهاء عقد الإدارة الفنية لمصنع الشركة بقنا والمسند إلى الشركة العربية السويسرية للهندسة "اسيك" منذ يوليو / تموز 2012 ، حيث وافق مجلس الإدارة على تشغيل وصيانة المصنع ذاتياً ، لتتولى المجموعة بذلك إدارة العمليات التشغيلية للمصانع المملوكة لها بالكامل .



غرفة صناعة عمان
AMMAN CHAMBER OF INDUSTRY

مؤسسة رائدة في خدمة الصناعة الوطنية

الرؤية

أن تكون الغرفة المحرك الرئيس والريادي في تحسين الصناعة الوطنية وتطويرها ورفع مستوى أداءها سعياً الى الوصول للاقتصاد الصناعي.

رسالة الغرفة

غرفة صناعة عمان تعمل منذ عام ١٩٦٢ على رعاية مصالحكم وتقديم الخدمات والبرامج لزيادة القدرة التنافسية للمنتجات الاردنية محلياً وعالمياً من خلال دعم السياسات وتعزيز الثقة بالمنتج الوطني وتطوير القدرات الفنية والتكنولوجية والإدارية والتسويقية والربط ما بين مؤسسات قطاع الاعمال وتوسيع نطاق الفرص أمام الأعضاء وتوفير خدمات ذات مستوى عالمي للأعضاء للوصول الى التنمية الاقتصادية المستدامة المبنية على الاقتصاد الصناعي.

غايات الغرفة

× المساهمة في تطوير الصناعة الاردنية في مختلف المجالات الفنية التكنولوجية والإدارية والتسويقية، ومعالجة المشاكل والمعوقات التي تواجه الصناعة بما يؤدي الى تطوير وتعزيز تنافسيتها.
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يذكر أن مجموعة مصر للإسمنت بدأت في تشغيل وصيانة مصنع المنيا ذاتياً في نوفمبر / تشرين الثاني من العام الماضي ، حيث نجح فريق الإدارة الفنية بالمصنع وإدارات المجموعة المعاونة في تشغيل المصنع بمستوى أداء متميز ، مما انعكس على إجمالي تكلفة التشغيل والقدرة على المنافسة وبالتالي ربحية الشركة .

وتتكون مجموعة مصر للإسمنت من شركة مصر للإسمنت قنا وشركة مصر للإسمنت المنيا وشركة مصر للإسمنت بيتون . تأسست شركة مصر للإسمنت قنا عام 1997 وتبلغ الطاقة الإنتاجية السنوية للشركة 2 مليون طن من الإسمنت بمختلف أنواعه .

وتتملك شركة مصر للإسمنت قنا حصة 60 % من رأس مال شركة مصر للإسمنت المنيا (إسمنت بورتلاند المنيا سابقاً) التي تقدر طاقتها الإنتاجية السنوية بـ 2.2 مليون طن من الإسمنت ، كما تمتلك شركة مصر للإسمنت قنا حصة حاکمة من رأس مال شركة مصر للإسمنت بيتون (أسيكو للخرسانة الجاهزة سابقاً) بنسبة 99.9 %، وذلك بطاقة إنتاج 500 ألف متر مكعب من الخرسانة الجاهزة من خلال 9 محطات للخرسانة .

"السويس للإسمنت" تصبح أول شركة في مصر وأفريقيا تحصل على شهادة "منتج صديق للبيئة"

أعلنت مجموعة شركات السويس للإسمنت ، إحدى شركات مجموعة هايدلبرج سيمنت ، أنها أصبحت أول مجموعة شركات لإنتاج الإسمنت الرمادي في مصر وأفريقيا تحصل على شهادة تصف المنتجات بـ "منتج صديق للبيئة" لأربع من منتجاتها رسمياً ووفقاً لمعايير الأيزو الدولية . وتعتبر هذه الشهادة اعترافاً رسمياً بالخصائص المحسنة لهذه المنتجات والتي تقلل من تأثيرها على البيئة.

وقد تم منح أربع شهادات لمنتجات إسمنت يتم إنتاجها في مصانع حلوان والقطامية والسويس . وتم منح شهادة "منتج صديق للبيئة" التي تتبع معايير الأيزو الدولية لمنتجات مجموعة السويس للإسمنت التالية :

CEMII BP 42.5N، و CEMIIIA 42.5N، و CEMII AL 42.5N، و Masonry 12.5X .

وتلعب المنتجات الحاصلة على الشهادة الرسمية دوراً كبيراً في الانتقال إلى بيئة بناء تحقق صافي انبعاثات صفري بحلول 2050 على أبعد تقدير ، ما يلبي طلب العملاء لمباني مستدامة ، وبنى تحتية ذات بصمة كربونية منخفضة دون التأثير على أداؤها.

عن شهادة "منتج صديق للبيئة" (EPD)

شهادة EPD هو إعلان بيئي للمنتج معتمد دولياً . يقدم EPD البيانات البيئية على مدار دورة حياة المنتجات وفقاً للمعايير الأيزو الدولية ISO 14025.

الشركة العربية السويسرية للهندسة (أسيك) تعود لتشغيل مصنع الإسمنت الخاص بشركة صناعات مواد البناء (BMIC)

تم توقيع عقد الإدارة الفنية بين شركة صناعات مواد البناء (BMIC) والشركة العربية السويسرية للهندسة (أسيك) حيث يستمر التعاون بين الشركتين لمدة عامين وذلك بعد الانتهاء من فترة الإعداد والتجهيز لتشغيل خط الإنتاج بكامل طاقته الإنتاجية .

وجدير بالذكر أن الشركة العربية السويسرية للهندسة (أسيك) قامت بإدارة المصنع منذ عام 2011 حتى عام 2019 .



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المكان: فندق هولندي ان ، القاهرة ، جمهورية مصر العربية

التاريخ: 10 - 12 أكتوبر / تشرين الأول 2022

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هاتف: 0020223807565 / 0020223583990 فاكس: 0020223803880

بريد إلكتروني: roc@aidsmo.org موقع إنترنت: www.aidsmo.org/roc

ورشة العمل العربية حول (الأساليب والتقنيات العلمية الحديثة للمعايرة الكهربائية والإلكترونية في المؤسسات والشركات الصناعية في العالم العربي)

المكان: القاهرة ، جمهورية مصر العربية أو عن طريق الانترنت

التاريخ: 17 - 19 أكتوبر / تشرين الأول 2022

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ورشة العمل العربية حول (كيفية إدارة وترشيد تكلفة التشغيل بالشركات والمؤسسات الصناعية من منظور التطبيق الفعال لمفاهيم الجودة الشاملة وعلاقتها بتكلفة الجودة - QualityCoasting)

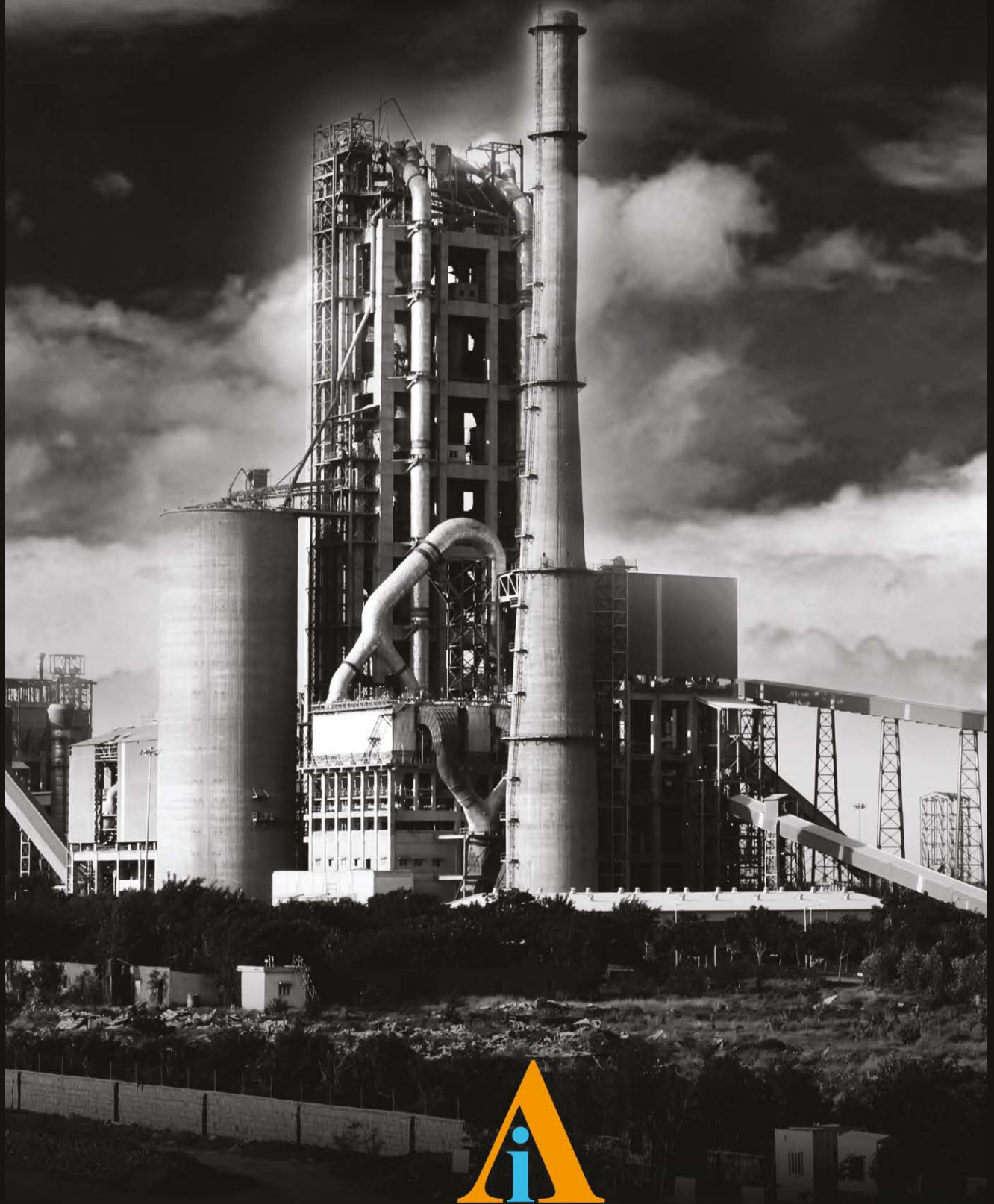
المكان: القاهرة ، جمهورية مصر العربية أو عن طريق الانترنت

التاريخ: 14 - 16 نوفمبر / تشرين الثاني 2022

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المكان: طنجة ، المملكة المغربية

التاريخ: 15 – 17 نوفمبر / تشرين الثاني 2022

الجهة المنظمة: المنظمة العربية للتنمية الصناعية والتقييس والتعدين

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ورشة العمل العربية حول (كيفية تطبيق نظام إدارة السلامة والصحة المهنية في المشروعات الصناعية في العالم العربي وفقاً لمتطلبات المواصفة القياسية الدولية 2018: ISO 45001)

المكان: القاهرة ، جمهورية مصر العربية أو عن طريق الإنترنت

التاريخ: 21 - 23 نوفمبر / تشرين الثاني 2022

الجهة المنظمة: المنظمة العربية للتنمية الصناعية والتقييس والتعدين

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التاريخ: 30 نوفمبر / تشرين الثاني – 02 ديسمبر / كانون الأول 2023

الجهة المنظمة: مجموعة "سيم تك"

جوال – واتس اب: 00963969019984

هاتف: 00963114476769

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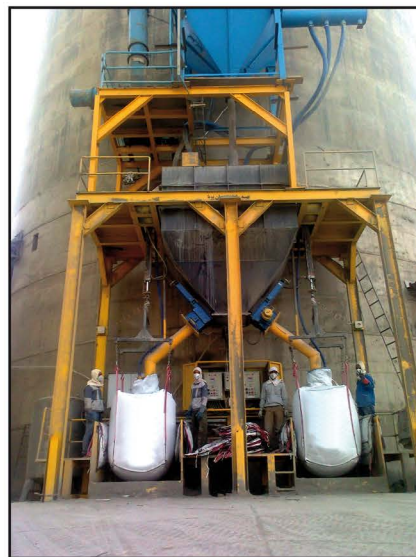
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