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

15. TÇMB International Technical Seminar & Exhibition

8-11 October 2019

Kaya Palazzo Golf Resort, Belek, Antalya/ Turkey

15. TÇMB International Technical Seminar & Exhibition

15th TÇMB International Technical Seminar and Exhibition will be held in Kaya Palazzo Golf Resort Belek, Antalya, Turkey between 8th and 11th October, 2019.

The program is open for both national and international attendees from cement industry, service and technology providers. The event is important for the manufacturers to follow up the recent developments and creates an opportunity for the participants to consider the new investments while having a chance to benchmark their business for every two years.

14th TÇMB International Technical Seminar and Exhibition held in 2017 was found very successfull by global cement industry with the participation of more than 576 participants, also 131 foreign and national companies from cement and related industries.

Event the details will be announced in the further months.

For Pre-Registration:
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Arab News

ALGERIA

GICA aims to export up to 1.5Mt of cement in 2018

Groupe des Ciments d'Algérie's (GICA) aims to export 1 - 1.5Mt of cement in 2018. The Group has signed a deal to export 30,000t via its SODISMAC subsidiary. GICA is also in discussion with foreign partners to export other products such as limestone and gypsum. The cement group handles its exports via the ports of Arzew and Djendjen.

GICA and CNAN Nord, a subsidiary of GATMA, have also signed a contract for the shipment of clinker to West Africa.

In 2017, the Group recorded cement production of nearly 14Mt compared with 12.6Mt in 2016. It exported 45,000t of cement in May 2018 under a contract with a total volume of 200,000t.

Global Cement

GICA begins testing waste as fuel

The Group announced that its subsidiary, Mitidja Cement, has initiated a pilot project on burning used oils and sewage sludge as fuel in the cement production process.

Daily Cement

LafargeHolcim Algeria makes first export of clinker

LafargeHolcim Algeria has exported 40,000t of clinker from the port of Oran. This is the company's first export of clinker, following exports of cement carried out earlier in the year. The subsidiary of LafargeHolcim operates two cement plants in the country and it holds stakes in two others.

Global Cement

Second production line built at STG's Adrar cement plant

China Triumph International Engineering (CTIE) is set to start procuring equipment for a US$211m production line at STG Engineering and Real Estate Development's plant at Adrar. The line will be the second production line at the site and it will have a production capacity of 4200t/day of marine cement. CTIE is the engineering, procurement and construction contractor for the project and its subsidiary Beijing Triumph International Engineering will manage the engineering design work.

Global Cement

ASEC looking to leave Zahana

Egypt's Qalaa Holdings has announced that its subsidiary ASEC Cement is looking to exit from Algeria-based Zahana Cement Factory. ASEC holds around a 35% stake in the Algerian facility and has so far invested US$62m in the plant, taking its capacity to 0.75Mt/yr. A new 1.6Mt/yr production line is currently being constructed at the plant, with commissioning expected in early 2020.

Global Cement

EGYPT

Egypt considers ban on raw materials exports

The Egyptian government is considering a ban on exports of raw materials in order to incentivize the export of value-added products.

Among the materials that could be target by that measure are: sand, granite, crude oil, light fuel oil, raw gold, gold powder, copper wires, white cheese, some fresh fruits and vegetables, urea fertilizer, wool men

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CemWeek

El-Arish Beni Suef complex inaugurated

The El-Arish Beni Suef complex covers five square kilometers and boasts three cement factories with a total annual capacity of 13 million tons, accounting for 20% of total cement produced

The Beni Suef cement plant has six production lines and is owned by El Arish Cement Co, which also has another two production lines in North Sinai. El Arish is owned by the National Service Projects Organisation (NSPO), which in turn is owned by the military.

CemWeek

El Nahda cement plant replaces fossil fuel with biomass

As part of its goal to reduce greenhouse gas emissions, El Nadha cement plant – located in the Egyptian governorate of Qena – replaced part of the coal used to power the plant with sugar-based biomass.

The plant is using organic pellets of sugar by-products, taking advantage of the large sugar industry that exists in Egypt. For now, around 100,000 tons of the fuel will be used every year, with plans to eventually reach 150,000 tons.

By replacing fossil fuels, the team responsible for the project hopes to reduce carbon dioxide emissions by 35%, while slashing fuel costs by 20% and coal consumption by 50,000 tpa.

CemWeek

Helwan Cement to sell white cement plant to Emmar Industries

Helwan Cement has agreed to sell its white cement plant in Minya Governorate to Emmar Industries. The transaction is planned to take place following the de-merger of the white cement unit from the rest of the company. The subsidiary of HeidelbergCement and Suez Cement said that the sale was part of its plan to restructure the business and improve its financial position.

Global Cement

Egyptian government shuts down National Cement Company

The Ministry of Public Business Sector has shut down the National Cement Company due to mounting losses. Minister of Public Business said that the plant's losses had reached Euro43m in the last year. Its creditors include the Gas Company and the Egyptian Electricity Company.

The company's registration with the local stock exchange was closed in August 2018. The government is now intending to sell its stocks in the Suez Cement Company and Al-Nahda Company. The company's assets will then be sold.

The cement producer reported mounting losses in recent years due to higher production costs. Reportedly, the cost of producing one ton of cement was 60% higher than the average comparable cost of its competitors.

Global Cement

MOROCCO

APC elects new president

The General Assembly of the Professional Association of Cement Makers (Association Professionnelle des Cimentiers – APC) has recently elected Tarafa Marouane, Chairman of the Board of Directors of LafargeHolcim as new President of the APC.

Daily Cement

Moroccan cement consumption rebounds

Cement consumption in Morocco was higher in July 2018 than for any July since 2012 at 1.3Mt, a 0.1Mt (7.8%) year-on-year increase.

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The upturn has been expected by cement companies, which now hope to finish the year level or even slightly up on 2017, if conditions remain favourable.

According to data provided by the Professional Association of Cement Manufacturers (PCA), 10 out of 12 regions saw consumption increase in July 2018. Increases range from 0.33% for Oriental to 40.55% for Guelmim-Oued Noun.

Casablanca-Settat still has the lion's share of Moroccan cement consumption. The region was able to absorb 282,680t, an increase of 3.8% year-on-year. This zone was followed by Marrakech-Safi, which its volumes sold rise by nearly 21% compared to July 2017, thus accumulating 180,131t.

Daily Cement

OMAN

Suhar Cement back on track after delays

Suhar Cement, the Sultanate's third cement plant after Oman Cement and Raysut Cement, will come into operation later in 2018, helping add to domestic production capacity and reduce the nation's dependence on imports.

The new facility, featuring a cement-grinding unit with a capacity of around 240t/hr, is being developed by a partnership between Sohar Cement (70% of the equity) and UAE-based Fujairah Cement Company (30%). Construction work on the plant is nearing completion at a site located within Phase 7 of Suhar Industrial Estate, one of several industrial parks administered by the Public Establishment for Industrial Estates (PEIE) around Oman.

Significantly, the new Suhar Cement plant, along with other cement plant projects planned in the Special Economic Zone (SEZ) at Duqm, will go a long way in ramping up Oman's domestic cement production by 2021. Oman is projected to be self-sufficient in meeting its domestic cement requirements. At present, Oman is dependent on imports for just over half of its cement demand.

Global Cement

Four New Cement Plants to Come up in Oman

The Special Economic Zone (SEZ) of Duqm has been tipped to host a string of new cement plants which, along with a sizable investment planned in Sohar, is set to ramp up Oman's cement production capacity exponentially according to 2017 Annual Report published by Support & Follow-Up (ISFU) Unit.

In all, 4 large-scale cement mills are envisioned for implementation in Duqm SEZ. When operational, they will offer around 5Mt of new cement capacity in the SEZ alone by 2021.

Notable is Al Taj Cement, which is investing in a 2 million Mta cement plant with backing from Iraq based Al Yamama Engineering Co. Commercial operations are slated by the Q4 of 2020.

Also in the works is a new white cement plant. The Ministry of Commerce & Industry is currently studying the feasibility of establishing a 900Mtpd white cement plant in Duqm.

Oman-based Al Anwar Holding SAOG and Hormozgan Cement of Iran plans to establish a 1 Mta cement-grinding unit in Duqm. Land for the project has already been allocated, with commissioning targeted by early 2020.

Rounding off the list of new cement investments in Duqm is 1.75 Mta Al Wusta Cement, a JV of Oman Cement and Raysut Cement.
Oman Observer

SAUDI ARABIA

Tabuk Cement, Hail Cement increase output to supply Neom City

Since the start of the year, Tabuk Cement and Hail

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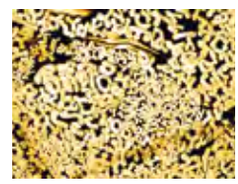

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EVONIK
POWER TO CREATE

Cement – both operating in the northern region of Saudi Arabia – have been scaling up their output in order to supply cement to the Neom City project.

The output of the two companies has already increased by 20% and 55% respectively, in contrast with a general decrease in the other 15 cement producers in the country.

Neom City is a project, valued at USD 500 billion. The high-tech city will cover an area of 26,500 square kilometers, and is part of the Vision 2030, a program designed to diversify and transform the Saudi economy.

CemWeek

Sika commissions new factory

Sika has expanded its presence in Saudi Arabia by opening a new production plant for concrete admixtures.

Up to now, Sika supplied its customers in the Riyadh as well as on the east coast with concrete admixtures from the plant in Rabigh, which is located 1,500 and 1,100 kilometers away from Dammam and Riyadh respectively. The new production facility in Dammam will thus greatly reduce transport distances. It is also ideally positioned to potentially supply customers in neighboring markets around the Arabian Gulf.

Daily Cement

SUDAN

Sudanese government to support cement exports

Minister of Industry says that government is keen to remove all obstacles facing the cement industry including a block on exports. The country's cement production capacity exceeds its domestic consumption.

Global Cement

Fuel and power shortages hit cement production in Sudan

Fuel shortages and power cuts have reduced cement production by half. The Atbara Cement Plant reduced its production to 60,000t/month from 120,000t/month. Production fell to 20,000t/month from 60,000t/month at Alsalam Cement, to 32,000t/month from 80,000t/month at El Takamol Cement, to 50,000t/month from 120,000t/month at North Cement and to 30,000t/month from 70,000t/month at Berber Cement. Parts of the country experienced fuel shortages in 2017 and this has continued in 2018, leading to problems for various industries.

Global Cement

UAE

JSW Cement to invest US$150m in UAE

India's JSW Cement plans to invest around US$150m in a new integrated 1Mt/yr plant in Fujairah. The project will also include a captive power plant. The company expects to commission the new plant by December 2019. The project is part of the group's target to reach a production capacity of 20Mt/yr by 2020.

Global Cement

Lafarge Emirates orders burner from FLSmidth

Lafarge Emirates has ordered a Jetflex Plus burner for its Fujairah cement plant from FLSmidth. The company expects a 'significant' change in its fuel mix cost as well as a more sustainable kiln operation.

FLSmidth says that the Jetflex Plus burner is the first to be installed in the LafargeHolcim Group and that the company was selected for procurement and supervision of the installation of it. The burner product has rotatable jet air nozzles allowing for optimal adjustment of the flame as well as the low NOx emissions for various fuel types and operating conditions.

The relationship between the companies dates back to 2007 when FLSmidth built the 7500t/day Fujairah plant for Orascom.

Global Cement: 20/08

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CHRISTIAN PFEIFFER

New bucket elevator increases plant capacity in Oman

These days growing demand for cement in the Middle East ensures increase in orders and not just for plant manufacturers. Also, the equipment suppliers are required by numerous expansion and modernization measures of the plant operators. A current example of such a capacity expansion is the increase of rotary kiln capacity in a cement plant in Oman, which necessarily resulted in the installation of a more efficient bucket elevator for loading.

With the technical improvement of the rotary kiln at the Oman Cement Company (OCC) over recent years, the inadequate performance of the existing bucket elevator was initially recognized in 2016. The only economic solution was the installation of a new bucket elevator, which was already a challenge at the beginning of the construction as a result of the inadequate documentation of the Chinese plant manufacturer and the limited space in and around the preheater tower. Due to the positive experiences with the German supplier KoWey from Kamp-Lintfort, with whom the plant operator has already successfully completed 14 projects so far, the OCC once again decided to opt for a bucket elevator from this company belonging to the Heko Group.

However, the engineering of the project planning proved to be extremely difficult. Several local appointments were needed to determine the exact dimensions of the building, the existing steel structure and, consequently, the available free space for the larger bucket elevator. Fault tolerance in the calculations was minimal as the system was in a round-the-clock operation and part of the direct production chain. Even though production should continue during installation, any construction error caused in advance by inaccurate measurement or incorrect calculation could have led to unplanned, cost-intensive plant shutdowns. But the installation worked out error-free. The new bucket elevator was integrated into the material flow using air slides, while the old system, which until then had been driven overloaded, was uncoupled. Following a demanding survey and design phase, the new bucket elevator was delivered within a few weeks, installed by the local contractor and successfully commissioned under supervision by KoWey.

The new system is a KCT50 / 710-320 central chain bucket elevator with a center distance of 74.5 m and an engine output of 110 kW, conveying 250 t/h of raw meal. As part of this contract KoWey also supervised the engineering of the new plant components and the supply of all incoming and outgoing air slides with control elements, connected chutes, the maintenance platform on the base with a small staircase, the horizontal support braces and the assembly platform on the elevator head with hoist beam and large winch to ground floor.

With this order Heko Group and its subsidiaries once again underline their market position as reliable suppliers to the global cement industry, who are able to carry out the most difficult modernizations and plant upgrades on a wide base of experience and know-how in this area.

For further information on the companies and products mentioned please visit:
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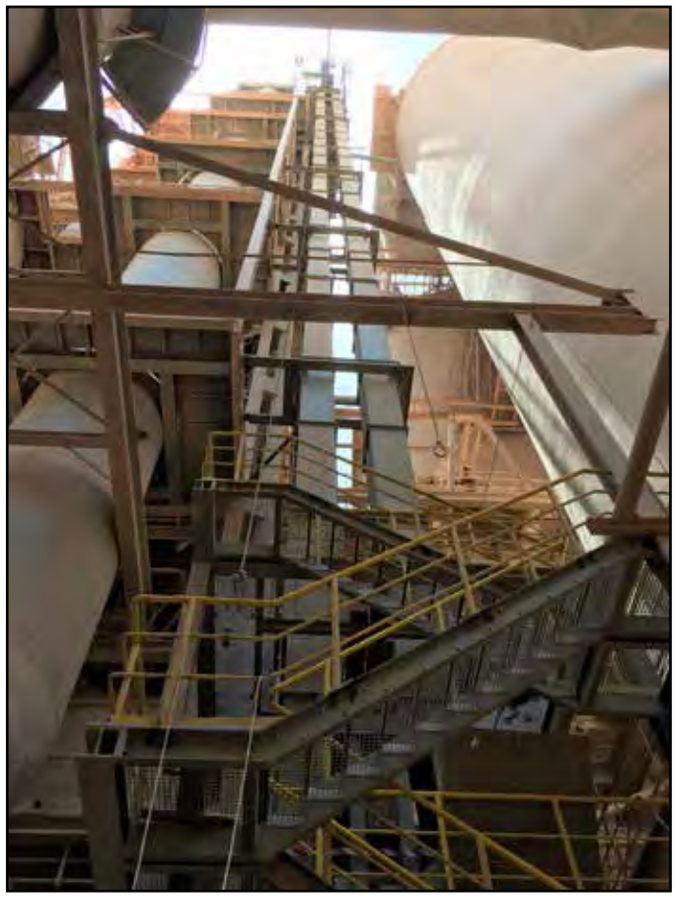

Fig.1: The new bucket elevator had to be designed custom-fit to the low space conditions of the preheater tower.

Fig. 2: Installation and commissioning of the new bucket elevator took hardly more than 4 weeks.

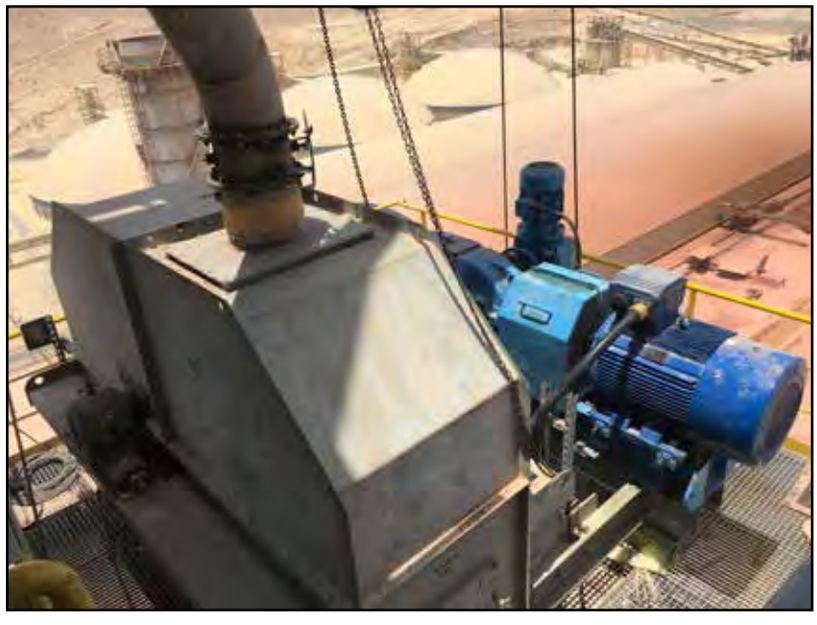

Fig. 3: Desert conditions require everything from the engines of the bucket elevator.

Fig. 4: The Heko central chain is extremely powerful, offering a breaking load of 1450 kN.

Mondi Group completes the acquisition of NPP in Egypt

Further to the announcement made on 30 April 2018, Mondi confirms that all conditions have been satisfied and it has completed the acquisition of National Company for Paper Products and Import & Export S.A.E ("NPP"), for a total consideration of EGP510 million (€24 million) on a debt and cash free-basis.

NPP operates an industrial bags plant in Giza near Cairo (Egypt), serving regional customers. The business will be integrated into Mondi's Fibre Packaging Business Unit, which is a leading producer of industrial bags with four plants in the Middle East.

Commenting on the acquisition, Erik Bouts, CEO Fibre Packaging, Mondi Group, said: "We are excited to have completed this acquisition, which complements our existing network in the growing Middle East region and allows us to grow our business and better serve our customers."

About Mondi

Mondi is a global leader in packaging and paper, delighting its customers and consumers with innovative and sustainable packaging and paper solutions. Mondi is fully integrated across the packaging and paper value chain - from managing forests and producing pulp, paper and plastic films, to developing and manufacturing effective industrial and consumer packaging solutions. Sustainability is embedded in everything Mondi does. In 2017, Mondi had revenues of €7.10 billion and underlying EBITDA of €1.44 billion.

Contact

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Senior Manager – External Communication
Tel: +44 193 282 6323

In March 2018, Claudius Peters commissioned a silo project comprising rail car unloading and bulk cargo ship loading system for the BEGA Stevedoring Company, in the Port of Klaipėda, Lithuania.

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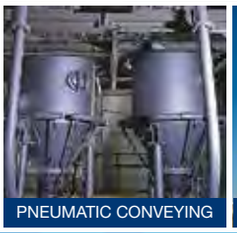
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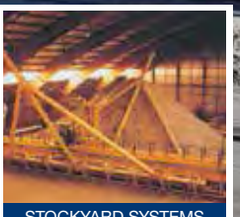
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Schenck Process acquires Raymond Bartlett Snow from the Arvos Group

Schenck Process is pleased to announce signing of definitive agreements this week on the acquisition of Raymond Bartlett Snow (RBS), a leader in the design, manufacturing and construction of size reduction, classification and thermal processing equipment

With a company history of 130 years, RBS has successfully established thousands of references globally and set the standard in size reduction with a strong reputation for the high quality and performance of its equipment and services.

Raymond Bartlett Snow operates locations in the USA, India and Brazil, all of which will become part of the Schenck Process Group.

About Schenck Process

Schenck Process is the global technology and market leader in applied measuring technology. We make processes work in all areas of industry throughout the world. For us that means improving our customer processes in terms of reliability, efficiency, and accuracy. Combining outstanding equipment and extensive process knowledge, we develop and manufacture innovative solutions for weighing, feeding, conveying, screening, automation, and air filtration applications. We focus on the needs of our customers and support them through the whole lifecycle of a product.

For more information, visit **schenckprocess.com**

W&H joins CEFLEX – promoting circular economy as a common goal

The European initiative CEFLEX aims to improve the contribution of flexible packaging to the circular economy. The aim is to find better system design solutions by 2025 through cooperation between the many players along the entire value chain. In May this year, German machine builder Windmöller & Hölscher joined CEFLEX.

CEFLEX is a collaboration project carried out by European companies that represent the entire flexible packaging value chain. The initiative looks at the entire life cycle of flexible packaging from production, consumption and collection to waste management and secondary raw materials. An important goal is to develop guidelines for flexible packaging that are recognised throughout Europe by 2020. Other working groups deal with new technologies, infrastructure and business models as well as end markets for recycled material.

Transforming flexible packaging into a closed material system will represent a major challenge for the flexible packaging industry in the future, explains W&H CEO Dr. Jürgen Vutz. “CEFLEX is an important step towards combining expertise in this area and working together to find circular economy solutions for flexible packaging. As the world market leader for machines for manufacturing flexible packaging, we can make an important contribution to the technological advancement, in particular,” states Vutz when explaining the involvement of W&H in the collaborative initiative.

In addition to Windmöller & Hölscher, more than 70 other companies and organizations are involved in the CEFLEX project – these range from raw material suppliers to packaging processers and brand owners. These stakeholders all hold important positions in the flexible packaging value chain.

About Windmöller & Hölscher:
Windmöller & Hölscher, a family owned company, is world leader for machinery and systems for the manufacturing and converting of flexible packaging.

The product portfolio includes high-performance machines for film extrusion, printing and converting. As a global company W&H offers its clients everything from a single source: from expert consultation and engineering to the delivery of high quality machines and complete packaging production lines. Approximately 2,950 employees create optimal solutions for the individual production tasks of flexible packaging producers – bringing the corporate philosophy "Passion for innovation" to life.

Machines by Windmöller & Hölscher are in use in over 130 countries and by more than 5,000 customers. In 2017 the Windmöller & Hölscher Group with its headquarters in Lengerich, Germany reached sales of approximately 835 Mio. EUR.

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About CEFLEX:
CEFLEX is a collaboration initiative of a European consortium of diverse companies and organizations that represent the entire flexible packaging value chain.

The mission of the project is to further enhance the capabilities of flexible packaging in the circular economy by improving the system design solutions through mutual cooperation. The following companies are involved in the project: The Alliance for Beverage Cartons and Environment, Amcor, Applied Materials, Attero, APK AG, Barilla Group, BASF, Borealis, Robert Bosch – Packaging Technology, Brückner Machinenbau, cfp flexible packaging, Citeo, Constantia Flexibles, Dow Europe, DSD, DSM, DuPont, EcoBlue, ecolean, Erema Group, EXPRA, FFP Packaging Solutions, Flexible Packaging Europe, Gerosa Cellografica, Gualapack Group, Haribo, Henkel, Hill's Pet Nutrition, Huhtamaki, Hydro Aluminium Rolled Products, Immer Group, Ineos, Japan Pulp and Paper, Jindal Films Europe, KIDV, Krehalon, Kuraray, M&S, Mondi Consumer Packaging, mtm plastics (A Member Of Borealis Group), Nestlé, PepsiCo, pladis, PlasticsEurope, Plastotecnica, Polypouch, Porta Pouch, Royal Canin SAS, The Procter and Gamble Company, Polifilm, Pyral, RKW, Sappi Packaging and Specialty Papers, Schur Flexibles, Sealed Air, Siegwerk, SIT Group, Südpack, Suez, Tomra Sorting, Tönsmeier Wertstoffe, Toppan Printing, Toray Films Europe, Unilever, Windmöller & Hölscher, Wipak.

VORTEX ANNOUNCES ACQUISITION OF KASA FAB

Vortex is pleased to announce the acquisition of Kasa Fab, a leading custom metal fabrication and manufacturing company. Located at 304 East Avenue B in Salina, Kansas, Kasa Fab was a division of Kasa Companies, which includes Kasa Controls & Automation, IntelliFinishing, and Kasa Anlagen.

"This acquisition allows Vortex to expand upon our fabrication capabilities, including lasers, robotic welders, blasting booths, and liquid and powder paint systems, among others," explained Travis Young, executive vice president at Vortex. "Over the past few years, Vortex has rapidly grown its carbon steel fabrication, which is not always compatible with stainless and aluminum processes. By having two manufacturing sites, we will better serve Vortex's current customer base, as well as our new customers brought over from Kasa Fab."

"We are happy to be welcoming their employee group into the Vortex family," commented Jeff Thompson, president & CEO at Vortex. "Both companies have very similar cultures and core competencies. Plus, we are always looking for great people who share our values to join our team."

With this acquisition, Vortex will operate more than 250,000 square feet of manufacturing space and employ more than 400 employees in Salina, Kansas. In the transition of ownership, Kasa Fab will operate under the Vortex brand name. Other Kasa Companies were not included in the sale. The acquisition was made effective on September 1, 2018.

About Vortex:
For more than 40 years, Vortex has provided slide gates, diverter valves and loading solutions specifically designed for the handling of dry bulk solids in gravity, vacuum, dilute or dense phase applications. Vortex products are engineered for quality, dependability, durability, and ease of maintenance, making them proven material handling solutions for issues in process efficiency. Through the expertise of Vortex engineers, valves can be completely customized for individual applications or special installations.

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Coesia acquires majority stake in System's ceramics business

On 31 July, Coesia and System entered into an agreement for the acquisition by Coesia of 60% of the ceramic business of System S.p.A., to be subsequently incorporated into a new company named System Ceramics. Franco Stefani will maintain a 40% stake in the new company and will stay on as Chairman of the Board. The closing of the transaction is expected to occur by the end of the year.

System SpA is headquartered in Fiorano Modenese and has manufacturing facilities in Italy and China and an international network of approximately twenty subsidiaries.

Coesia, whose sole shareholder is Bolognese entrepreneur Isabella Seràgnoli, is a multinational group of companies that operates in the industrial solution and packaging sector. From its headquarters in Bologna it controls 99 business units (including 60 production plants) in 32.

The head offices and factories of System Ceramics will remain in Fiorano Modenese, where major expansion and construction work is in progress at the System Group's headquarters.

Under the terms of the agreement, System and Coesia have agreed on reciprocal purchase and sale options for the remaining 40% of the capital, to be exercised in the future during agreed time periods.

System Group operates in the ceramic, electronics and intralogistics sectors and has operations in 25 countries with 36 subsidiaries and a total of 2,300 employees. Along with System SpA, the group includes the Italian companies Laminam, Modula, Tosilab, System Sicurezza, Premium Care and Studio 1.

Source: CeramicWorldWeb Newsletter

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Sacmi focuses on the environment and acquires 100% ownership of Eurofilter

As of today the company - already the world's leading provider of environmental services to the ceramic industry and other sectors - is fully owned by Sacmi, opening up prospects for further consolidation and penetration of new markets and businesses

Sacmi has acquired 100% ownership of Eurofilter, the leading provider of environmental services to the ceramic industry and other sectors. The decision was made official on 1st August. It aims to see the company (20% of which has been owned by Sacmi since 2015), already a market leader with over 2,500 installed systems, achieve further growth. The operation will also see Eurofilter play a key role in Group development plans as its solutions and services are applicable to multiple businesses and are set to play a pivotal 'green' role that mirrors the growing importance of the environmental aspects of smart production 4.0.

"This decision", observes the President of Sacmi Imola, Paolo Mongardi, "stemmed from the need to invest in a company, already an industry leader, to generate further growth and make the most of a wealth of know-how by implementing projects of potential interest to all Group businesses. Moreover, this takeover comes at a time of ever-stricter regulations (Italy already has advanced environmental protection laws) and a growing awareness that sustainability and other 'green' issues are the keystones to implementation of Industry 4.0".

Founded in 1968 as a service company inside the budding Sassuolo ceramic district, Eurofilter (which now employs 60 people) has steadily grown to become the district's main environmental service provider. Its products range from dust extraction systems to waste/process water treatment solutions, from fume capture/treatment to heat retrieval. "When it comes to environmental matters, our district pays the utmost attention to regulations and environment-related awareness", explains the General Manager of the Sacmi Group, Claudio Marani. "One of today's greatest challenges is transferring this approach to all world markets, both those where the implementation of environmental services is something new and

those similar to our own where regulations and the current situation in the ceramic industry is decidedly underdeveloped compared to that in our own companies".

"What's more", continues Claudio Marani, "being a 100% Sacmi-controlled company will let us plan investment in new business areas where the Group is already present, from beverage to metal powder, from closures to packaging. All manufacturing processes have plant engineers whose task is to ensure process quality and workplace health and safety. Being able to offer a comprehensive, integrated range also as regards environmental services provides added value for Sacmi, as we're aware that the capacity to reduce pollutants and supply clean conveying systems is set to play an ever-greater role both in Italy and abroad".

After boom years as a 'local company', Eurofilter's subsequent international experience with major players in the Italian ceramic industry (with installations from the USA to Mexico, from Asia to South America) proved to be a key development driver. Now, by drawing on the full potential of the Sacmi Global Network, that expertise and experience will be put to even better use. As regards the quality of the services in the portfolio, the goal isn't just alignment with regulations, it's also - and above all, re-use: "Industry still sees environmental regulations as a burden, yet ", observes the President of Sacmi Imola, Paolo Mongardi, "there comes, in all industries and on all markets, a point at which firms realise that compliance is actually a vital investment, one that enhances quality of work, process efficiency and, ultimately competitiveness".

Just think of the classic filters installed in presses and spray dryers, or systems for purifying and fully recycling the waters used in glazing and lapping. These are key areas in which Eurofilter (which already accounts for over 50% of all market production value) is perfectly placed to penetrate multiple target sectors and achieve further growth, in parallel with improvements in quality and an expansion of the range of services provided.

"Operating within the Sacmi Global Network as a 100% Sacmi-controlled company will allow Eurofilter to approach the market from a position of strength, win over customers worldwide and ensure it is ready to respond to changes - which can be brusque - in regulations and environmental awareness", concludes Claudio Marani. From an environmental standpoint, then, the Italian ceramic industry offers an exemplary model: to grasp all the opportunities at global level, we're going to need players who are prepared, motivated and adequately structured.

An integrated approach to alternative fuel use in cement making

By: Eng. Taís Mazza, LOESCHE GMBH, Germany

1 Introduction

The world is facing a growing challenge with handling the ever-increasing tonnages of waste materials being produced, while at the same time environmental pressures are driving the push to reduce fossil fuel use in industrial processes. Cement production is no exception in this respect.

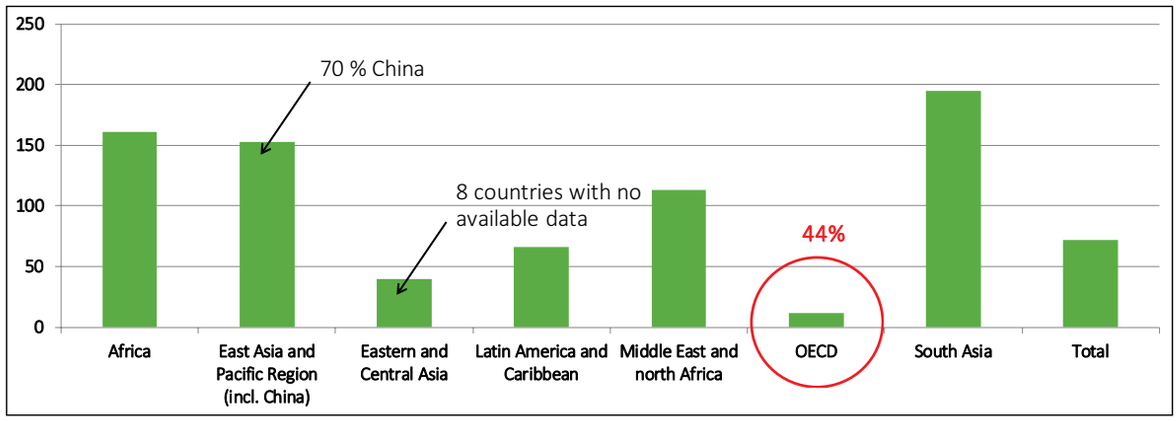
And while the traditional approach was to regard waste as unwanted, fit only for burying and leaving for future generations to attend to, there is now a much greater appreciation of the value of waste as an energy source in its own right. In every sense, this is a win-win situation, with less physical material to be stockpiled and greater substitution for fossil fuels helping to cut cement production energy costs and CO_2 emissions at the same time.

Building on its 111-year history in designing and supplying specialist mills for grinding coal, raw materials and clinker, Loesche GmbH has brought together the technologies needed to optimise the production and firing of waste fuel in calciners and kilns. With the group including two companies that specialise in waste milling, pyrotechnology and process optimisation, Loesche can now offer a completely integrated package that incorporates all aspects of waste-derived fuel utilisation in cement production.

2 The challenge of waste

Throughout the world, waste generation is on the increase. This is obviously a result of population growth in general, but other factors come into play as well – such as increasing urbanisation within the developing world. Using data from the World Bank, Figure 1 illustrates the variation in growth rates on a regional basis for the period from 2005 to 2025. During these 20 years, urban waste generation in Southern Asia will have nearly doubled; Africa and the Eastern Asia-Pacific region will not be far behind. And while the World Bank predicts urban waste growth in the OECD countries to be only around 10%, it has

1%-increase in total urban waste generation from 2005 – 2025 by region



World Bank Report – Urban Development Series – Knowledge Papers – Chapter 3

to be remembered that this economic group actually produces 44% of the world's total.

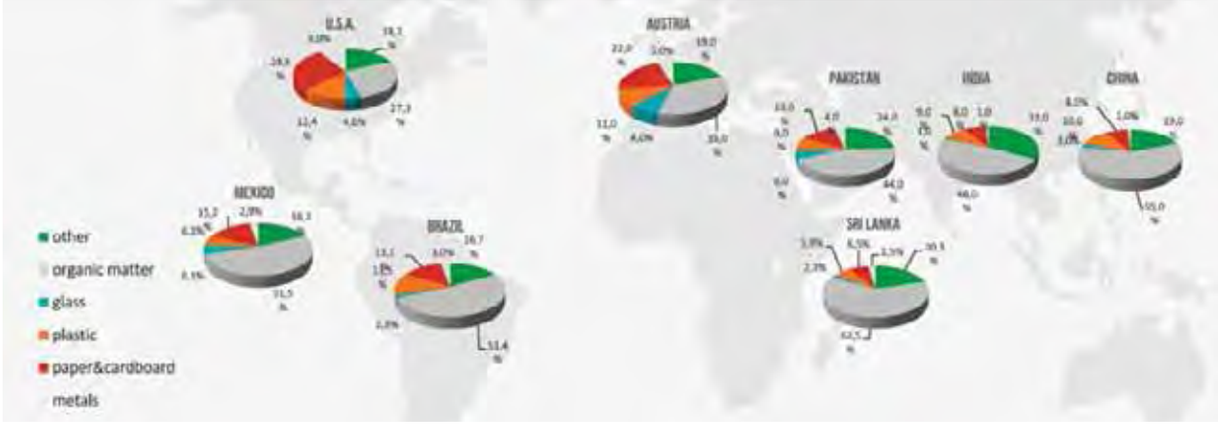
There is also considerable diversity in terms of the composition of the urban waste being produced. As Figure 2 shows, in China organic matter makes up nearly 60% of the total amount; paper, cardboard and plastics – key fuel components of the waste – less than 20%. By contrast, less than 30% of the urban waste generated in the USA is organic, while these potential fuel constituents comprise over 40%.

The traditional approach has been to collect waste, process (condition) it and dispose of it. The conditioning step can, in the right conditions, lead to a proportion of the waste stream being reused. The challenge here is to improve the quality of the usable material so that more can be done with a greater proportion of the total, resulting in less being sent to landfill or other disposal.

Turning waste into energy is one clear option, but the efficiency of the conversion depends to a great extent on the technological approach used. Figure 3 illustrates the differences in conversion efficiency when using alternative fuels – such as municipal and industrial waste – for energy generation. Data from the German Association for Secondary Raw Materials and Waste Management show that burning this type of waste in a conventional incinerator achieves around 35% energy conversion efficiency. By contrast, using waste material to fire cement production nearly doubles the efficiency; more energy is won and, of course, the specific emissions from production are reduced.

This fact has not been lost on cement producers, particularly those in countries where the infrastructure is in place to handle, separate and prepare waste materials for use as fuels. Thus, for example, alternative fuels account for over 60% of the process energy

2 Overview waste composition: diversity of the urban waste being produced



input in Germany's cement production. In Austria, the proportion is even higher, at over 70%, with selected industrial and commercial waste comprising by far the largest component within the alternative fuel mix.

3 What's the cost?

Not only is using waste as an alternative fuel in cement production more energy-efficient, but it is also mostly cheaper to implement. In order to compare the costs and revenues of a recent waste-to-energy project in Latin America with waste utilization as fuel in cement plants, a standard plant with an approximate clinker production of 4000 t/d was considered. The necessary amount of waste to achieve 90% total substitution rate and the incurring costs as well as primary fuel savings (coal-based) were calculated. In a second step, the waste-to-fuel alternative was scaled-up to equal the amount of waste utilized in the new waste-to-energy plant. Naturally, such a comparison does not claim to represent all possible configurations of either waste-to-energy plants or AF utilization in cement plants, however the results are quite exciting! The total capex for utilization in cement plants would only amount to 30-40%, whereas the revenue (electricity sales versus coal savings) would be in the range of 75-85% when compared to a waste-to-energy plant! Hence it is clear that both constructing new, and adapting existing cement plants to burn alternative waste-derived fuels can offer significant economic benefits for both capital and operating costs. So what is actually involved in achieving higher levels of fuel substitution, and what are the implications in terms of the technology needed?

For thermal substitution rates (TSR) of 9% or less on an existing cement plant, little is required apart from work on the fuel conditioning unit, which may need to be installed as new, or expanded in capacity where alternative fuels are already being used. Thus the capex commitment is likely to be limited. Once the initial reluctance of working with waste is overcome, the direction is clear.

To increase the TSR to the next threshold at up to 25% of the fuel energy input, not only must the fuel-conditioning plant be upgraded, but more milling capacity will also be needed. Where the commitment to alternative fuel use really requires the highest investment comes with the next milestone, taking the TSR from 25% to 60%.

3 The differences in conversion efficiency when using alternative fuels

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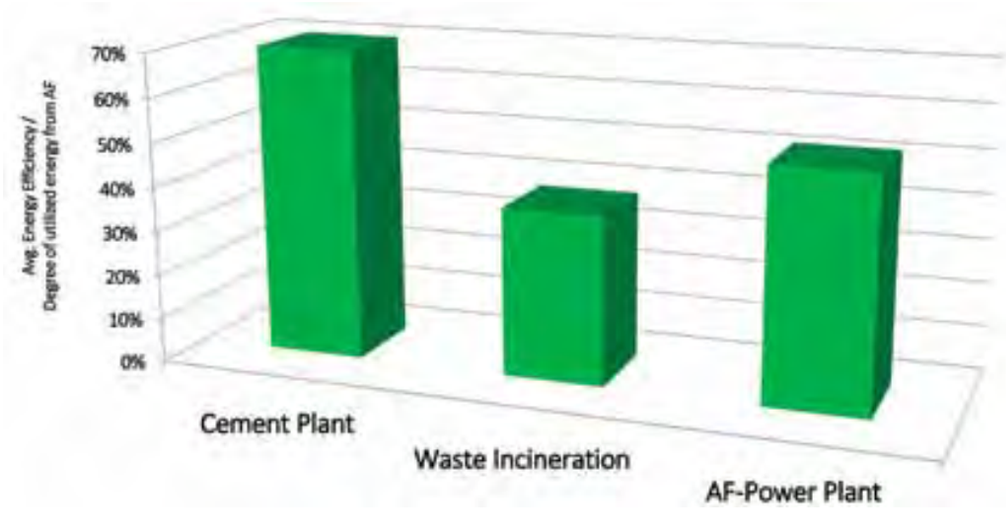
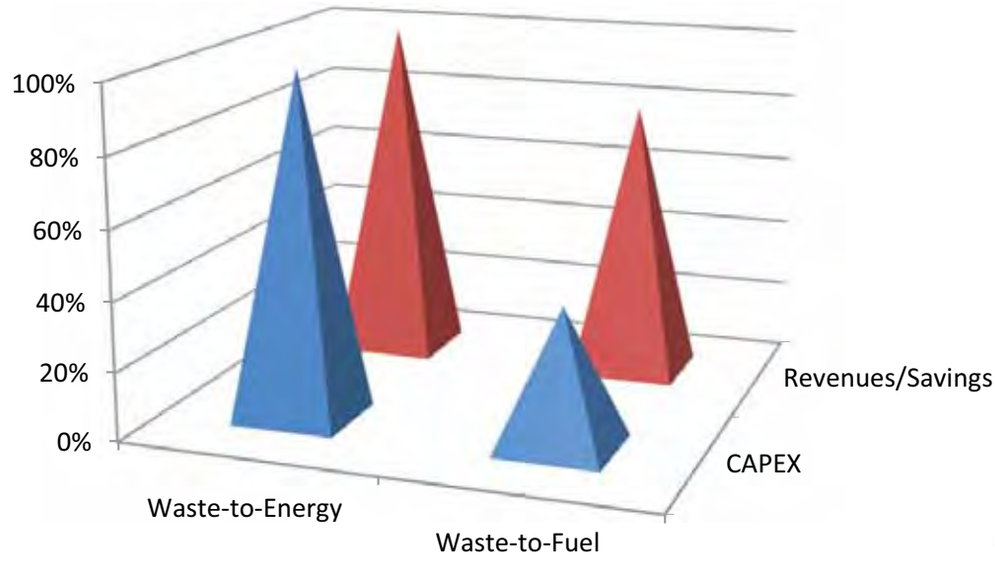


Bundesverband Sekundärrohstoffe und Entsorgung e.V., 2016

4 Comparison between waste disposal in a waste-to-energy plant and waste-derived fuel usage in cement plants



In this case, major modifications are usually needed to the plant infrastructure, with modifications to the calciner section and the installation of a chlorine bypass system. Further upgrading to the fuel conditioning and milling capacities will also have to be undertaken.

After that, reaching higher TSR levels builds on the investment already incurred, through measures that are essentially complementary to those already put in place. Higher-capacity fuel preparation systems are again needed, as well as modifications to the main kiln burners to allow them to efficiently handle higher proportions of alternative fuels.

This analysis clearly shows that profitability increases with increasing TSR – and the most significant savings are achieved with the highest alternative fuel inputs, as Figure 5 shows.

4 Understanding the requirements

By bringing together the expertise of its group member companies in the fields of grinding, pyroprocess technology, plant optimisation, energy systems and

5 Main technical milestones on the way to the highest substitution rates in cement plants

T.S.R.	< 9 %	9 – 25 %	25 – 60 %	60 – 90 %
Initial or extension of cond. plant	√	√	√	√
Cl by-pass	-	-	√	-
Pre-calciner modification	-	-	√	-
Additional Rocket Mills	-	√	√	√
Modifications in main burner	-	-	-	√

Loesche

cement plant equipment design and operation, Loesche is in a unique position when it comes to helping cement producers gain the benefits of using greater amounts of waste-derived fuels. This expertise was widened in 2012 when both aixergee, which specialises in cement plant optimisation and CFD simulations, and the Austrian company A TEC (including Greco Combustion Systems from Brazil) became part of the Loesche group. So now, not only can Loesche supply equipment, but it can also design and undertake all of the modifications that may be needed in order to increase alternative fuel use in cement plants.

Looking at some of these capabilities in more detail, A TEC's expertise lies in the cement kiln pyroprocess. Since the mid-1990s, the company has been focusing on the use of alternative fuels in cement production, and can now supply complete alternative fuel systems for nearly any kind of solid and liquid waste materials, including materials handling, preparation, and storage and feeding into the kiln. In parallel, it undertakes any modifications that may be needed to the pyroprocess for firing alternative fuels, such as to preheaters, calciners and ancillary equipment.

Another of A TEC's strengths is illustrated by its Rocket Mill technology, designed to produce high-quality waste-derived fuels with special characteristics that allow very high substitution rates. A key benefit is that Rocket Mills can be integrated within a cement plant, allowing producers to manage their own fuel supplies efficiently and with confidence about the output quality, without having to rely on outside suppliers who may not be able to meet the stringent quality parameters needed to achieve high TSRs.

The technology within the Rocket Mill enables pre-sorted, shredded household and commercial waste with a bulk density of 100-300 kg/m^3 to be ground to a size of 15 mm, with 50% < 5 mm, in one pass. The preparation process not only provides size reduction but also increases the specific surface area of the waste material, giving better ignition and combustion properties – key factors when striving to achieve high TSRs.

Of particular importance where the raw waste has a high moisture content, the physical process within the Rocket Mill provides a drying effect, such that feed at 25% moisture can be transformed into fuel containing 15% moisture or less.

Of course, investment in equipment is just one aspect of achieving a successful transition to using larger amounts of alternative fuels in a cement plant. Bringing expertise in process optimisation to the Loesche group, aixergee can evaluate how a plant functions, identify any limitations and seek their root causes. Having done so, it can then provide appropriate solutions in order to optimise the plant's operation.

Plant optimisation is not, however, just confined to the situation where a cement producer wants to alter the composition of its fuel mix. Indeed, cost pressures and changing feed and product parameters mean that optimisation is often a continuing requirement,

6 The A TEC Rocket Mill for processing alternative fuels

Loesche

with equipment operation modifications needed on a regular basis. The challenge is that the process inside a calciner or a kiln is different from what it looks like from the outside: hence the need for process modelling of parameters such as the gas- and meal flows, the combustion process, emissions and the clinker quality before actual system modifications are put into effect.

In the case of increased use of waste-derived fuels, aixergee can use CFD and other techniques to model the kiln or calciner behaviour of different waste particles, offering a better understanding of how they flow, interact and burn. The output from these studies can then be used to develop optimisation process flowsheets.

5 Alternative fuel use in cement production

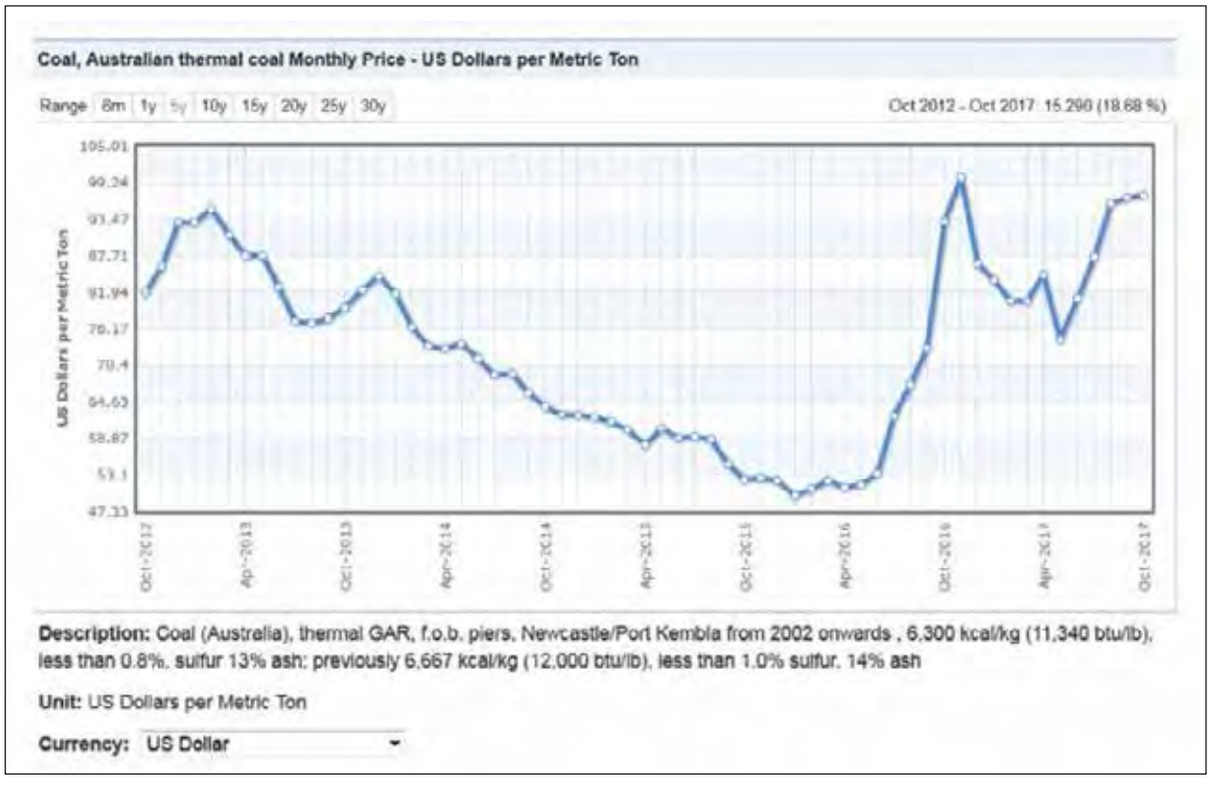
As a general rule, increasing the proportion of alternative fuels – such as those derived from post-consumer and commercial waste – will be an attractive approach for cement producers keen to cut their energy costs. Nonetheless, at the same time it is important to ensure that the plants remain stable in operation, despite potential variations in the fuel composition, and that the quality of the clinker product continues to meet specification. In addition, any system in which large amounts of alternative fuel is burnt must retain low maintenance requirements, since increased service costs would obviously eat into the energy cost savings achieved.

In view of this, it is essential that high-quality waste-derived fuel is used in any system that increases the TSR in cement plants. And this is where the A TEC Rocket Mill brings significant advantages, not only in terms of the way in which it dries and prepares the waste material, but also through its ability to segregate and discharge inorganic matter that has the potential for forming increased amounts of ash during combustion, while at the same time increasing the calorific value of the waste-derived fuel.

Using a high-quality fuel obviously has a positive impact on the pyroprocess as a whole, with better fuel burn-out in the kiln resulting from the improved physical fuel properties. In addition, practical experience has proved that the use of well-prepared, high-quality fuel leads to the production of high-quality clinker, with less iron-rich brown clinker and reduced sulphur circulation. Finally, plant operation remains stable because the fuel is more homogeneous in terms of its chemical and physical properties.

While the Rocket Mill process reduces the moisture content of the waste, even drier fuel can be produced by adding a drier-separator unit to the fuel-preparation circuit, or by flushing waste gas through the Rocket Mill. Fuel produced in this way assists in achieving fast burn-out and helps to maximise the TSR.

7 5-year trend in coal prices – Australian coal



http://www.indexmundi.com/commodities/?commodity=coal-australian&months=60 (access on Nov. 29th, 2017)

8 Focusing on waste as a valuable resource

Thus TSRs of over 90% are now being achieved using A TEC's combustion and post-combustion chamber designs in calciners, with the post-combustion chamber in particular ensuring that full burn-out is achieved even when using high feed rates of alternative fuels. Importantly, kiln stability is also maintained.

6 Loesche's approach to alternative fuel use

The world has a waste problem. Data from the Waste Atlas show that some 1900 Mt/y of Municipal Solid Waste (MSW) are being produced worldwide, of which only 70% is collected. Of this 70%, 19% is recycled or recovered and 11% – less than 150 Mt/y – is used as fuel in energy-recovery facilities. Clearly there is an opportunity to divert a much greater proportion of the waste that is now landfilled to energy production with, as has been noted above, the cement industry providing a cost-effective alternative to the traditional type of power station for waste combustion.

Returning to Figure 3, it is important to understand that the efficiency comparison shown here – favouring the use of waste as a fuel in cement production – is based only on the chemical energy contained in the fuel. The study from which the illustration has been derived also concluded that the use of high-quality conditioned waste in cement plants has environmental benefits as well, in that any ash produced during combustion is incorporated into the clinker, so requires no further handling or long-term disposal.

The integrated approach that Loesche can offer the world's cement producers brings together the company's strengths in all of the areas needed to make the increased use of waste-derived fuels a success, both technically and economically. The rationale for doing this is strong: Loesche operates within very energy-intensive industries, which are now under pressure to decrease operating costs. Properly selected waste contains usable energy, most of which is currently "going to waste", so exploiting this resource helps to improve the sustainability of cement production.

Today, more and more countries are taking action to establish sustainable waste management systems. Political and environmental pressures to find a solution are increasing, as more attention is given to public health and safety issues, and to the question of land allocation for waste disposal, particularly around large urban centres.

In addition, primary energy prices have risen by around 80% in the last 18 months, providing cement producers with a major incentive to start or to significantly increase their total substitution rates.

Loesche's focus on waste as a valuable resource brings together the company's expertise in equipment, process optimisation and – most importantly – its long-term understanding of the cement and power industries' operational requirements. This experience allows the company to provide the best possible solutions for its customers, and by knowing what the end-user needs, it can do this with waste conditioning plants as well as for their grinding needs.

Perhaps the biggest challenge is that waste is one of the most heterogeneous streams available in the world – there is no typical composition. By understanding this, Loesche believes that its integrated approach to providing appropriate solutions to individual cement plants' requirements offers a clear way forward.

7 Keynote

As can be seen in Figure 7, the tendency towards increasing coal prices is quite clear, so now is the time to invest in higher substitution rates and profit from the significant savings in primary energy costs!

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Reliable feeding of alternative fuels

CASE: Grupo Cementos Molins
talks about using alternative fuels in cement making

RELIABLE FEEDING OF ALTERNATIVE FUELS

Author: Juan José Riesgo, Pfister® Regional Sales Manager, FLSmidth

Intro

You need a steady kiln temperature to create consistently high quality cement. That means a regular, controlled inflow of fuels. Dosing has always been a fine art, but as cement manufacturers increasingly opt for alternative fuels (AF) over gas or coal, fuel dosing has become even more complex. The wide range of available AF and the variations even within a fuel type mean that the technology and processes must be flexible in scope but precise in performance.

PFISTER® rotor weighfeeders are capable of handling all kinds of AF with great precision, ensuring the control and stability your pyroprocess needs. Here, Grupo Cementos Molins shares their experience with dosing alternative fuels.

Customer declaration

"Altogether we have a very good performance of the Pfister rotor weighfeeders for alternative fuels, which delivered sustainable productivity to our business and cuts cost." Juan Godoy, Project Manager Grupo Cemento Molins and Gonzalo López, Engineering Manager, Grupo Cementos Molins

Overview of alternative fuels dosing at Cementos Molins / Barcelona:

Cementos Molins is an experienced player in the cement industry with a reputation for sustainability. Their plant in Sant Vicenç dels Horts near Barcelona, Spain, currently operates a single kiln with precalciner. The plant is in operation 24/7 all year round, with the exception of a ~3 week kiln shutdown for maintenance.

Overview of alternative fuels dosing at Cementos Molins / Barcelona:			
Location	**Location**	**Fuels**	**Dosing capacity**
Main burner	**2 rotor weighfeeders Pfister TRW-D 4.14 with a 3 m³ prehopper**	**granulated DSS and biomass**	**laid out for 7 t/h**
Precalciner	**1 rotor weighfeeder Pfister TRW-S 4.20 with a 10 m³ prehopper**	**granulated RDF and biomass**	**laid out for 2 - 15 t/h**

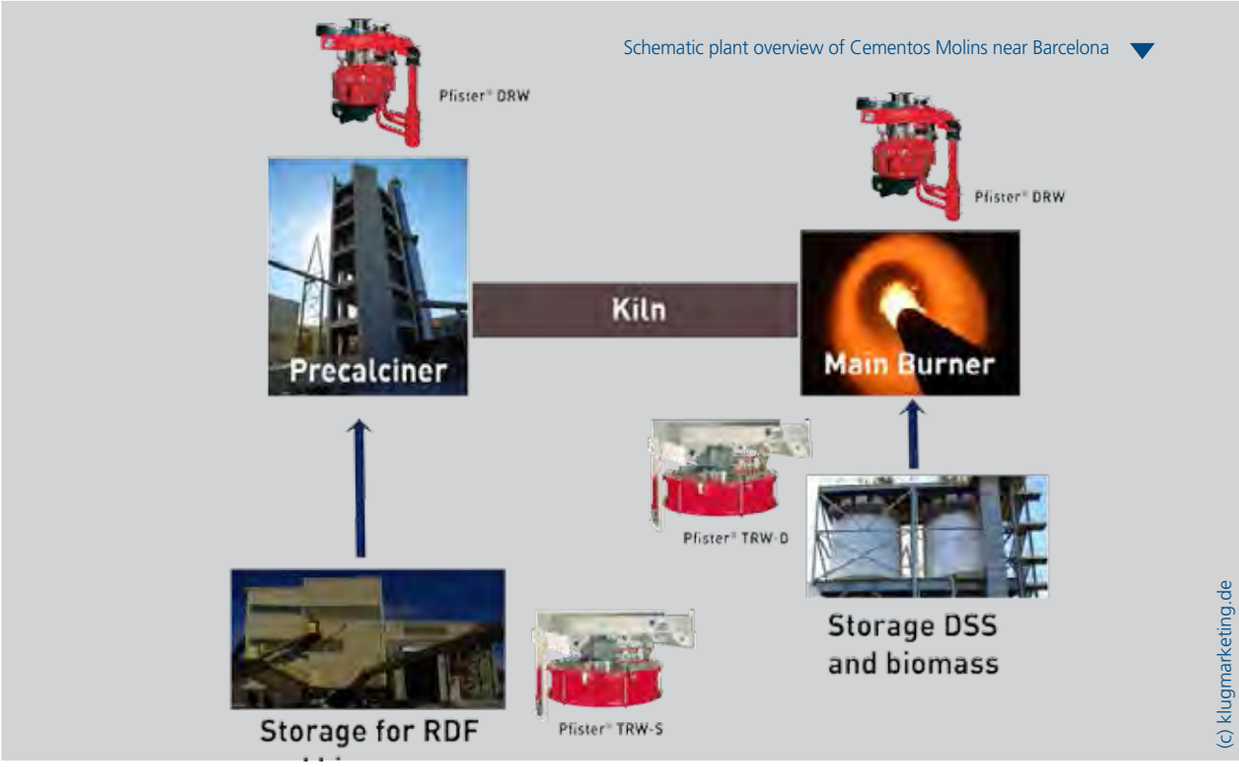
The plant is burning about 40% AF in the main burner and precalciner. As is usually the case, the plant's AF mix is largely dictated by what is locally available. At present, Cementos Molins is burning a mix of dried sewage sludge (DSS) and biomass in the main burner and refuse-derived fuel (RDF), tyre chips and biomass in the precalciner. With such a diverse mix of fuels, they needed a partner who could guarantee a consistently reliable dosing solution.

»Altogether we have a very good performance of the Pfister rotor weighfeeders for alternative fuels which delivered sustainable productivity to our business and cuts cost."
Juan Godoy, Project Manager Grupo Cementro Molins (left) and Gonzalo López, Engineering Manager, Grupo Cementos Molins

"We had good experience with Pfister® rotor weighfeeders in previous installations", states Cementos Molins' Project Manager Julián Godoy, "so we had every confidence in the Pfister solution for alternative fuels." Reliable technology to handle a variety of fuels.

The Pfister TRW-S rotor weighfeeder and the explosion-proof version, Pfister TRW-S, are well known dosing solutions with hundreds of references worldwide. Material is extracted from a pre-hopper and transported in rotor chambers from the inlet to the outlet. The rotor body is mounted on bearings that form a weighing axis. This axis is eccentric to the rotor shaft and goes through the middle of the inlet and outlet. The third point is suspended at a load cell that weighs the content in the rotor wheel gravimetrically before material discharge. The rotor speed is controlled inverse to the measured force. Material is discharged at the outlet with a highly accurate mass stream.

"The challenge in dosing alternative fuels is their wide variety in materials, moisture content, forms and sizes", explains Juan José Riesgo who contributed his AF expertise to the dosing project at Cementos Molins. "AF certainly are more demanding to handle than, for example, petcoke. They can be sticky; they can be of odd sizes; they show all these material differences. These aspects can all be solved, but we have to have a very close look at finding the optimal solution."



The Pfister TRW-S and TRW-D rotor weighfeeders use advanced technology to handle all types of AF. Between 2011 and 2014 three AF installations were realized at Cementos Molins. The first comprised an AF installation for the main burner: a TRW-D with a dosing capacity of 7 t/h. The second was a Pfister TRW-S installation for AF to the precalciner with a maximum feed rate of 15 t/h. The third Pfister rotor weighfeeder TRW-D for AF was installed in 2014. This was another dosing system to feed the main burner. An increase in the feed rate at the precalciner is also in the planning stages. "We'll use an existing Pfister rotor weighfeeder at the main burner installation to feed the precalciner. We'll modify only the feeding shoe to increase the output at 7", explains Gonzalo Lopez, Head of Engineering Department at Cementos Molins.

Troubleshooting and bottlenecks

AF can be highly abrasive. Without the proper equipment, you risk spending all the money gained by switching fuels on expensive maintenance programs. Cementos Molins has addressed this issue from the outset by installing anti-wear pipes at the curves and about 500 – 700 mm after. The TRW-D and TRW-S products are designed for reliability, whatever the fuel type. They require no cleaning and are easy to maintain since they have minimal moving parts.

Another issue with AF is the variability in properties. For example, different treatment plants produce different quality DSS and Cementos Molins' DSS supply is a case in point. The different batches of granulated DSS have a moisture content ranging from 10 – 15%. The whole of the AF process must be able to handle this variability to guarantee consistent high quality clinker production.

This flexibility proved useful to Cementos Molins when one of its sources of DSS closed down, creating a shortfall in supply. A change in the fuel mix was not an issue for the rotor weighfeeders.

A choice for the future

"We are a modern, future-oriented company", says Gonzalo Lopez. "We know that in in the medium term replacing primary fuels by AF is saving us money, as well as bringing environmental benefits. This is why we are planning to increase the amount of alternative fuels in our production process even further."

"Altogether we are delighted with the performance of the Pfister rotor weighfeeders for alternative fuels, which deliver sustainable productivity to our business and cut costs."

Red rotor weighfeeder Pfister TRW-D with the white pre-hopper above dosing DSS and biomass to the main burner at Cementos Molins

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Grupo Cementos Molins. Grupo Cementos Molins

The activity of Cementos Molins Group focuses on manufacturing, distributing and selling cement, concrete, mortars, aggregates and prefabricated concrete. Molins operates plants in Spain, Argentina, Uruguay, Mexico, Bolivia, Colombia, Bangladesh, India and Tunisia. With an annual output of 1,300,000 tons of clinker the plant near Barcelona/Spain is one of the group's largest. cemolins.es

Rotor weighfeeder Pfister TRW-S dosing RDF and biomass to the calciner at Cementos Molins

TOWARDS A BEST-PRACTICE APPROACH FOR CO-PROCESSING OF ALTERNATIVE FUELS WITHIN THE CEMENT INDUSTRY

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Abstract

The combustion of alternative fuels within co-processing schemes is an established framework for increasing the sustainability of cement manufacturing all around the globe. Since the introduction of non-conventional fuels derived from waste streams as a substitution for classical fossil fuels, it was a long-lasting goal to reach a substitution rate of nearly 100% in order to guarantee long-term economic and technological competiveness in a globalised market. However, even if this goal is almost reached in some parts of Europe, there is still a big potential on a worldwide scale. Therefore clear systematic frameworks and best practice approaches for the co-processing of alternative fuels need to be developed in order to minimise investment risks and guarantee an optimal operational reliability of new installations. This article provides some insights about proper project planning and corresponding strategic directions for AF projects and introduces a systematic concept for the selection of adequate machinery.

1. Introduction

Today the daily work within the cement industry, both in headquarters and plant offices, is mainly determined by economic drivers, such as needs for increasing the production efficiency and capacity by a parallel reduction of costs for maintenance personnel and shorter return-on-investment (ROI) periods. These trends are the logical consequences of the actual act of global consolidation and market shake-outs within the whole industry, but especially in Europe after the financial crisis and the subsequent recession all over the south of Europe.

In this context the optimisation of energy resources and raw material supply are important factors, which are already considered by most plants. Thus the increased substitution of conventional fossil fuels by alternative energy resources is an ongoing process during the last decades and the utilisation of energy-from-waste concepts will speed up even more on a worldwide scale during the next years.

However, even if the co-processing of waste streams in the thermal combustion of the cement manufacturing chain is common sense and everyday practice in many cement plants of the world, the experiences and best-practices developed especially in Europe during the last two decades did not led to the parallel establishment of a taxonomy of corresponding machinery or guidelines for their adequate usage.

As a supplier of turn-key solutions for the co-processing of waste streams in all energy-intensive industries (Cement, Lime stone, steel, etc.), DI MATTEO developed a wide range of plant concepts and corresponding machines for almost all kinds of alternative fuels and possible application fields.

This article provides a general overview of some best practice approaches and conceptional definitions regarding the design, implementation and operation of feeding, dosing and storage lines for alternative fuels (AFs).

In order to define a clear basis for the development of co-processing lines in cement plants, it is always important to define a clear set of aims and goals prior to the actual implementation. For this, section 2 provides an overview of general strategic directions and associated targets for the co-processing of AFs. Besides the general strategic project definition, it is important to select early in the process the correct machines and plant setups. For this DI MATTEO developed a systematic framework, as introduced in section 3. However, the correct setup of machines can only be determined if the properties of the fuel is known and defined up to a certain accuracy. Therefore section 4 provides an overview of important characteristics of alternative fuels and how they can be determined. As an example for the selection of machines, section 5 examines different mechanical conveying systems and compares different types of transport systems. Finally section 6 concludes the whole article.

2. General Strategic Direction of Co-Processing and Target Definitions

As it was already mentioned in section 1, actual developments on the cement market led to an increased need of economic optimisation of the cement production processes. Especially since cement prices and the general demand of building materials are still not on the pre-crisis level and will possibly never again reach those heights, even very productive plants need to develop a clear strategy to maintain their economically vibrant status in the future. However, besides the economic drivers of co-processing, it is important to consider also all other aspects with a sufficient and reasonable depth.

Here one of the main aspects is the fulfilment of requirements defined by the waste hierarchy as introduced within the waste framework directive of the European Union (directive 2008/98/EC). Even if the directive is only binding for EU member states, the hierarchy was recently also adapted and introduced by other countries around the globe. Therefore each cement producer shall respect the specific priority order defined in the hierarchy, as shown in Figure 1. Here it is clearly defined that all kinds of measures in order to avoid or minimise waste streams have a higher priority than all other possibilities of post-treatment. However, the recovery of material or energy resources from waste is also defined as a desirable goal, if a complete avoidance of waste is not achievable. In this context it is very important to consider, that the co-processing of waste has been officially recognised by the European Commission as a resource efficient best practice under its flagship initiative for a resource-efficient Europe under the Europe 2020 strategy (see [1]). Thus, co-processing within the cement industry provides the optimum strategy for recovering energy and material from waste and guarantees therefore a long-term applicability of the corresponding framework.

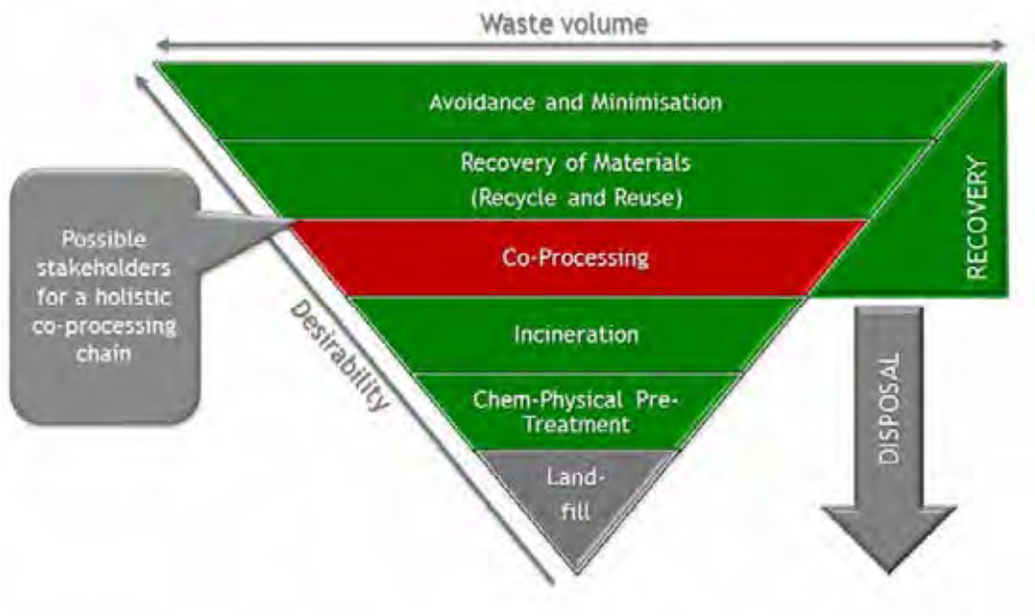

Figure 1- Definition of a Waste Hierarchy (adapted from [2] and [3])

It is worthy to note, that the success of each co-processing scheme deepens highly on a good relation with all possible stakeholders from the private and especially the public sector (municipalities, local governments, etc.), since it is necessary to verify always the complete material chain for a successful implementation. In most cases the underlying waste management schemes, e.g. waste collection, pre-treatment, etc. are run by a combination of private investors and public legislation organisations, which need to be reliable partners for long-term success.

However, economical and legal requirements are just two of the most important points, which need to be considered for a holistic design of co-processing installations. Table 1 provides a sound overview of the main aspects and principles for each co-processing project, where economic, socio-cultural, technological and legal aspects are differentiated.

Of course DI MATTEO is specialised in the consulting of cement manufacturers from the beginning of a project up to the successful operation of AF installations and provides expertise in all fields. However, within this article, the technological strategic directions shall be discussed in more detail, in order to come up with a bunch of best-practice approaches. In this context DI MATTEO developed a framework for the systematic classification of co-processing plants, which shall be introduced within the next chapter.

3. Seven Stage Concept (SCC) for the handling of alternative fuels

This ongoing development of machines and concepts within the field of co-processing of waste streams was accompanied and driven by the introduction of the DI MATTEO Seven Stage Concept (SCC) for plants for the handling, dosing and storage of alternative fuels (AFs). This concept, as depicted in Figure 2, summarises the thermal utilisation of AFs, e.g. within a cement plant, as a setup of machines from seven different stages, as described in detail in [4]:

Table 1 - Strategic directions of co-processing projects

Strategic directions of co-processing projects			
Economic aspects	**Consider future developments of fuel prices**	**Consider the logistic side of AF supply**	**Pre-processing is essential part of AF usage**
Socio-cultural aspects	**Respect the waste hierarchy**	**Active involvement in waste management schemes**	**Stay in connection with all stakeholders**
Technological aspects	**Consider special bulk material properties of AFs**	**Avoid additional emissions or decreasing product quality**	**Choose the correct machines and adequate setups**
Legal aspects	**Guarantee compliance with recent laws and regulations**	**Collect relevant health, safety and environmental data**	**Develop proper training and information policies**

1. *Reception*

   e.g. plants for the reception of AFs from trailers, such as docking stations or from dumper trucks etc.

2. *Preparation*

   machinery for the preparation of the received material prior to the combustion process, such as screening (ODM-DiscSCREEN), magnetic separation (ODM-MAS), deagglomeration, drying etc.

3. *Storage*

   silo and bunker systems for the intermediate storage of AFs within the plant and their corresponding discharge systems, such as screw dischargers (ODM-ScrewDOS®), moving floors (ODM-MovingFLOOR), etc.

4. *Transport*

   all types of conveyors for the transport of AFs in the plant, such as screw conveyors, drag chain conveyors, pipe conveyors, bucket elevators etc.

5. *Metering*

   metering devices for the gravimetrical dosing of AFs for a precise control of the combustion process (e.g. the ODM-WeighTUBE® tubular weighing system, ODM-GraviSCALE belt weighers, etc.).

6. *Feeding to the kiln process*

   e.g. the mechanical feeding of kiln inlets or calciners (e. g. by screw feeders, injectomizers etc.) or pneumatic feeding of main burners by injector rotary valves (ODM-IZS®) and the corresponding pneumatic transport lines.

7. *Combustion*

Successful and efficient combustion of the AF. It is essential to realize that the successful substitution of higher rates of fossile fuels by AF requires the right combination and implementation of the previous process steps [5].

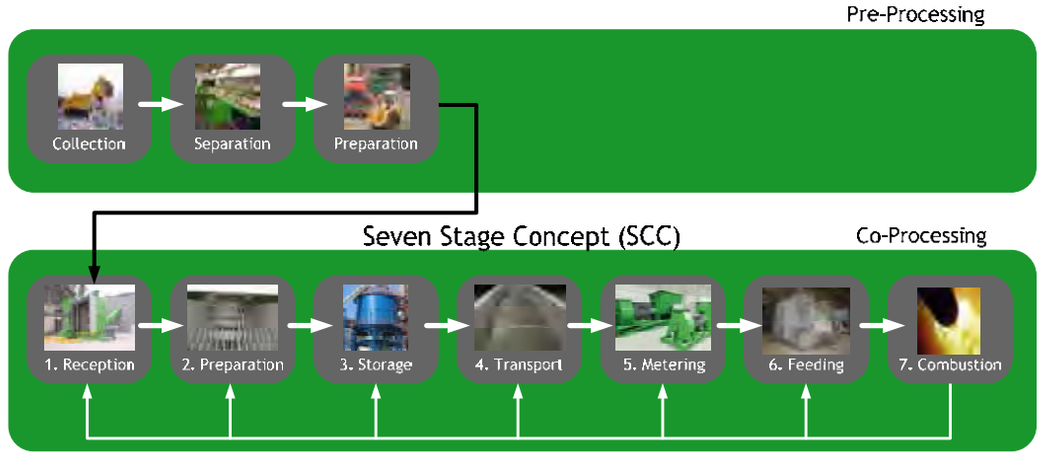

Figure 2- Seven Stage Concept (SCC) for the systematic classification of AF handling plants

This concept has proven its applicability in a wide range of application fields in numerous installations of DI MATTEO all over the world and was already adapted by many cement producers as a cornerstone for the definition of co-processing projects.

One major aspect of the utilisation of that scheme is the prior characterisation of the exact physical properties of the range of alternative fuels which should be feed to the combustion process, as described within the next section.

4. Characterisation of AFs

As an integral part of the implementation of a co-processing scheme the available waste streams and corresponding AFs after a pre-processing stage needs to be evaluated according their (i). thermal, (ii). chemical and (iii.) physical characteristics. No matter where the AFs are used within the cement plant, either for main burner feeding or within the calcinator, it is essential for a reliable operation, that the materials fulfil a pre-defined set of requirements. In Figure 3 a typical set of requirements, as defined by [6], from the different characteristic classes are defined exemplarily.

For practical applications it is sometimes quite difficult to determine the exact specifications, since specific properties vary immensely over time and therefore tasks as sampling and a proper sample treatment become more and more important.

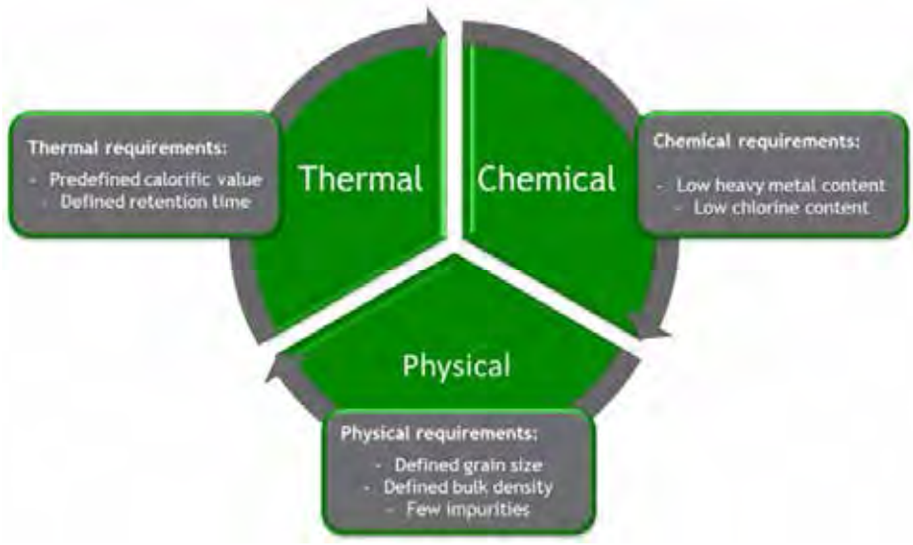

Figure 3- Requirements of AFs for co-processing

DI MATTEO developed over the last decades a quite comprehensive set of tools and methodologies for the characterisation of the bulk material properties in order to provide the best possible setup of machines for the set of processed waste streams as intended to feed by a new installation. As an example especially the physical properties shall be briefly introduced here, where the following table provides an overview of typical bulk material properties of solid alternative fuels (here: biomass and refuse-derived fuels (RDF)).

It shall be mentioned that many of the characteristic values vary immensely over time and for different fuel suppliers. In Europe especially the moisture content within the solid fuel is often causing problems, especially if the corresponding storage and transport systems are not adequately chosen. Here the influence of time-consolidation and compactibility of the material are often underestimated (see [7]).

However, all physical fuel properties are important for the actual structure of an installation, either for pre- or co-processing, and the corresponding selection of machines according to the DI MATTEO Seven-Stage Concept (SCC). In this context it is also important to develop a clear understanding of the taxonomy of machines within a certain category of the SCC. The following section provides an overview for mechanical conveying systems (transport) as an example for a systematic categorisation.

Table 2 – Typical physical properties of solid alternative fuels

Typical datas		Comparison	Europe		Middle East	
		Coal	Biomass	RDF	Biomass	RDF
Bulk density ρ	kg/m³	500 - 800	270 - 590	80 - 230	70 - 180	80 – 220
Moisture content	%	< 15	< 35	2	< 10	< 20
Particle size (2D)	mm	< 1	< 200	< 50	< 100	< 50
Compressibility index	-	1,0 – 1,2	1,2 – 3,0	2,5 – 4,0	5,0 – 8,0	3,0 – 5,5
Flow properties	-	free flowing …	bad flowing, fibrous, affinity for arching, time consolidating			
Explosion and fire requirements	-	yes	to be evaluated individually, in general to be considered			

5. Classification and Comparison of Mechanical Conveying Systems

Each mechanical conveying system is associated with a specific set of physical entities, which can be used in order to create a generalised model for the description of a generic continuous conveying system, as shown in Figure 4.

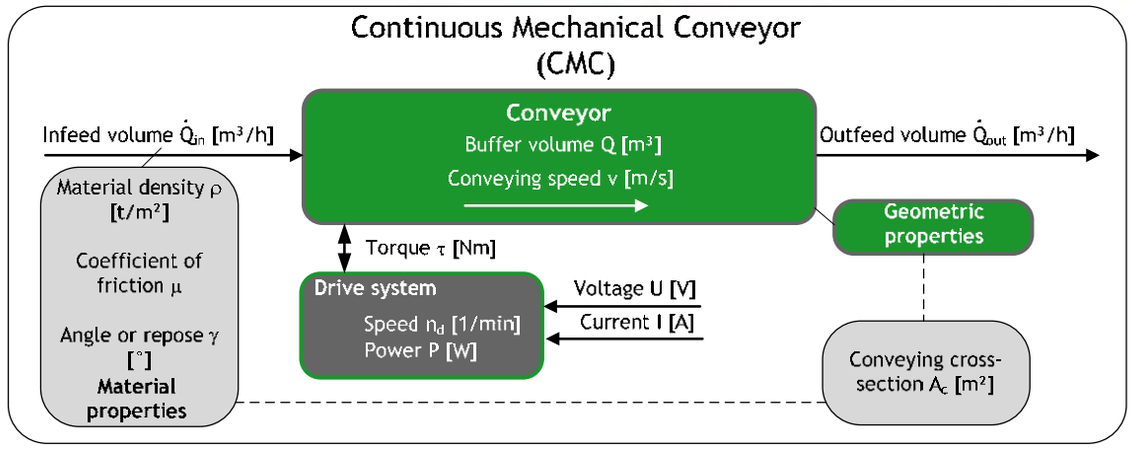

Figure 4- Generic continuous mechanical conveyor model

Here a conveyor is defined as a generic machine, which is fed with a certain infeed volume $\dot{Q}_{in}$ [m³/h] of a certain bulk material. The bulk material is defined by a set of characteristic values, such as the bulk density ρ [t/m³], a coefficient of friction during conveying μ, etc. The conveyor itself delivers a certain outfeed volume $\dot{Q}_{out}$ [m³/h], which is usually defined to be a function of the conveying speed of the conveyor v [m/s] and the characteristic conveying cross-section A_c [m²]. The later needs to be determined by the geometric properties of the conveyor (e.g. width of conveying surface) and the material characteristics (e.g. angle of repose γ [°]). By taking into consideration the in- and outfeed to the machine over time, there is a certain buffer volume of material Q [m³] inside the machine at the time t [s]:

$$Q = \int_0^t [\dot{Q}_{in} - \dot{Q}_{out}]dt + Q_{(t=0)} \quad \textbf{(1)}$$

An integral part of the conveyor model is the associated electrical drive system, which is mostly an interpretation of an electrical motor. The motor is associated with a certain speed n_d [1/min] and a specific mechanical power P [kW], which leads to a available torque τ [Nm] to drive the conveyor:

$$\tau = \frac{60 \cdot P}{2 \cdot \pi \cdot n_d} \quad \textbf{(2)}$$

However, the drive system is in most cases an electrical system, so e.g. for a standard three-phase AC motor the corresponding entities to calculate the mechanical energy P would be the current I [A], the voltage U [V] and the phase angle ϕ [rad] (or the corresponding power factor $\cos(\phi)$):

$$P = P_{el} - P_{lost} = \sqrt{3} \cdot U \cdot I \cdot \cos(\phi) - P_{lost} \quad \textbf{(3)}$$

Thus, the proper handling of the associated electrical motors is also an important aspect during the selection and design of a complete conveying line. Here [8] provides a more detailed introduction into different drive concepts.

During the last decades enormous efforts have been made, to standardize all available conveying products offered by the industry, which can be considered as a helpful step for engineers and project managers to select the correct conveying principle for their specific applications. Here especially the Association of

German Engineers VDI (Verein Deutscher Ingenieure) and the Conveyor Equipment Manufacturers Association (CEMA) in America developed comprehensive guidelines for the classification of different conveying principles and their design and main elements. For instance, the German Standards Institute DIN proposes in their DIN 15201 standard [9] a general taxonomy and terminology for continuous mechanical handling equipment. Figure 5 shows an example for a classification framework of Continuous Mechanical Conveyors (CMCs) from the DI MATTEO portfolio based on that standard. It should be noted in this context, that there is also a classification of each subcategory available, which further defines the exact nature of the specific machine. Thus, e.g. alone for chain conveyors it is possible to distinguish between drag chain conveyors (ODM-TKF), apron conveyors (ODM-FZF), surface feeders (ODM-GFK), etc.

The DI MATTEO Group developed since its establishment in 1961 an immense portfolio of different CMCs for each and every possible application field and all kinds of possible bulk materials. Naturally each concept has its own advantages and drawbacks and therefore, even today, it is not reasonable from a design point of view to follow a one-system-fits-all approach. Especially, against the background of an increased demand for energy efficiency and the ability to handle also problematic bulk materials (e.g. in the field of alternative fuels [10]), it is important to choose the optimal conveying technique for a certain utilisation carefully.

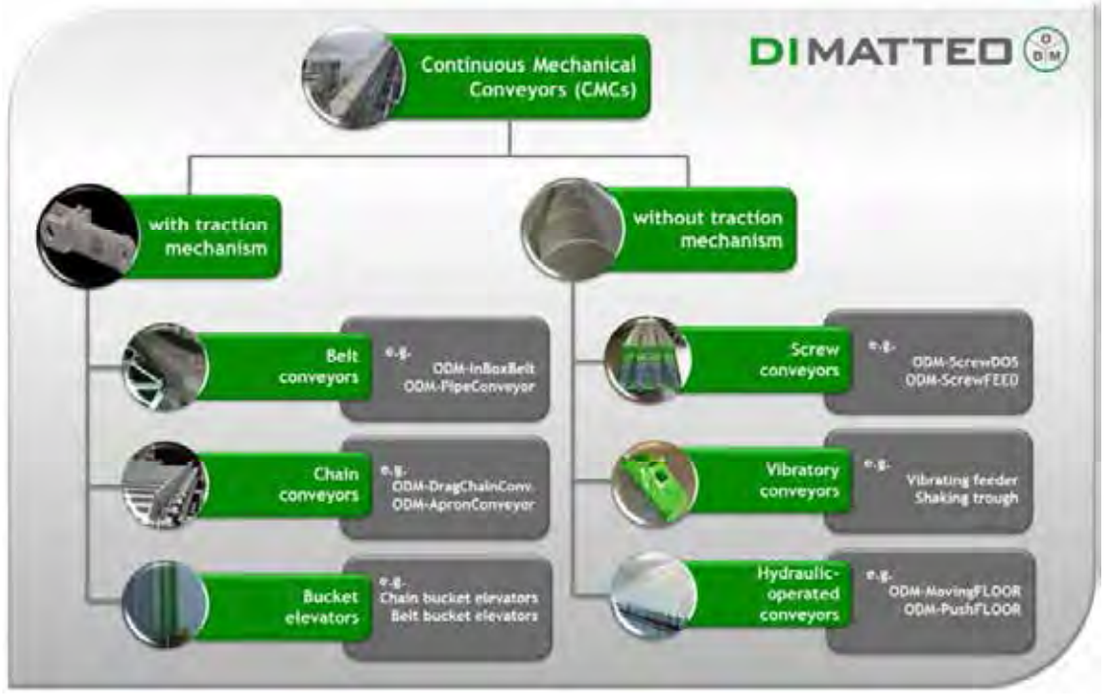

Figure 5- Classification of different continuous mechanical conveying systems

In order to give a clear guideline which conveying system or method is a preferable solution within different application scenarios, a set of evaluation criteria was defined. Thus it is possible to define a comparison matrix, where each conveying principle is assessed against the different criteria. It needs to be stated that the matrix is just a first indication and DI MATTEO offers a comprehensive consulting strategy for new

projects. Furthermore the DI MATTEO test centre in Beckum provides also the possibility to test most available conveying principles for all kinds of bulk materials.

Table 3 – Comparison matrix for different conveying systems

	Energy demand	Curve mobility	Ability for elevation	Dust formation	Capacity	Multiple outlets
Belt conveyors	+	−	=	− −	+ +	−
ODM-InBoxBelt	+	−	=	+	+ +	−
ODM-PipeConveyor	+	+ +	+	+	+	−
ODM-HoverBELT	+ +	−	+	+	+	−
Drag Chain Conveyor	−	−	+	+ +	+	+ +
Apron Conveyors	=	−	=	+	+	−
Bucket elevator	+	−	+ +	+	+	−
Screw conveyor	−	−	+	+ +	+	+
MovingFLOOR	+	−	−	=	+	−
Vibrating conveyor	+	+	=	+	−	+

It should be noted, that the matrix shown in Table 3 is only an indication of the status-quo. DI MATTEO continuously develops extensions and/or improvements for conventional systems in order to compensate typical problems of a specific conveyor category and to increase the amount of possible applications.

Figure 6- ODM-InBoxBelt solution

One example for such a development is the ODM-InBoxBelt, which combines the advantages of a classical belt conveyor, such as a low energy demand, high capacities, etc., with the typical characteristics of a complete closed conveyor (e.g. drag chain conveyor) in order to provide a solution based on a belt conveyor, which is also dust-tight and able to protect the conveyed materials from the environmental influences. By this, DI MATTEO is able to utilise belt conveyors also for light materials, such as residue-derived fuels (RDF), over long distance in outside conditions without the possible occurrence of material spillages (see Figure 6).

Another alternative for such an application field, especially for sophisticated conveying routes including a lot of curves and inclination changes, would be the usage of an ODM-RGF pipe conveyor, as shown in Figure 7. Here the complete conveying principle guarantees a fully enclosed material transport by nature and therefore any undesired spillage of material can be avoided.

Figure 7- ODM-RGF pipe conveyor (left: fully pre-assembled pipe belt modules; right: example for completely enclosed conveying of AFs with a pipe conveyor)

For more straight conveying routes the ODM-HoverBELT is an innovative product, where the belt is actually guided by an air cushion instead of classical rollers. Thus, there are no maintenance points along the conveyor and therefore it is possible to avoid the additional costs for catwalks. Furthermore, the usage of the air cushion instead of rollers lowers the actual power demand of the main motor, which can be considered as an important step towards the energy efficiency of the overall installation.

Since DI MATTEO developed similar taxonomies for other stages (reception, preparation, storage (see [7]), dosing (see [11]), etc.) in order to guarantee that the client gets the best possible system based on sound technologies completely designed, fabricated and implemented by DI MATTEO. Thus, each concept is tailor-made for the specific application and the corresponding fuel characteristics.

6. Conclusion

Even if the co-processing of alternative fuels is already successfully introduced within the industry for more than three decades, systematic and analytical approaches for a successful utilisation are not well established. In this context it needs to be mentioned, that typical mistakes and misconceptions can be found in almost

each and every project phase, due to missing knowledge and experience with the usage of AFs. Due to the fact, that DI MATTEO was one of the pioneers in terms of feeding and handling of problematic fuels, a sound basis for almost each application scenario and specific bulk material was already developed and can be adapted easily for new projects. In this context it is always important that projects are executed with a holistic view, beginning from a clear vision about the requirements, over a clear specification of the properties of the available waste streams, to a systematic selection and implementation of adequate machineries. Since DI MATTEO is not only a consultant within this section, but a supplier of complete turn-key installations, each project can be accompanied from the very first design of an initial concept up to the maintenance of a fully operational installation.

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Energy Management Told us The world is not ending tomorrow

By: Eng. Osama Aly Ahmed, Egypt

Abstract:

How much is the cement industry involved in air pollution?

Cement industry is innocent from Global warming phenomena as 42 per cent of greenhouse gas emissions associated with the creation of cement is recouped from the atmosphere once the concrete is in situ. This is good news, if true, but work is still needed to reduce the carbon footprint of cement in order to prevent disastrous global warming, and the opportunity exists to turn cement from climate change villain to climate change hero by making it carbon negative – that is, absorbing more carbon dioxide from the atmosphere than was used to produce it.

Introduction:

Here, cement efficiency specialist Osama Aly Ahmed describes a case-study in which an Egyptian cement plant was able to monitor and improve its overall energy efficiency using a number of measures.

To assess the potential to save energy, one needs to produce an energy budget to get a feel for the existing situation. Key factors in producing such a budget include:

A. Management commitment: The managing director must approve such an energy policy. There must be clear communication between management and the team that is using data to monitor and improve performance. Communication is also key within the team. Findings and reports should be published in common areas of the plant and the head office should be informed of progress.

B. Planning: Commitments to energy policy must be translated into objectives, targets and action plans.

C. Roles and responsibility: Roles must be identified for all persons that have a direct influence on significant energy use. They must be documented.

D. Scope: A scope must be outlined. What is and is not

included? This may include looking only at power consumption, thermal energy or a combination of the two.

E. Boundaries: Where does the 'plant' begin and end? This must be clearly defined. Will the admin-istration buildings also be included or just the main plant equipment? Will the quarry be included or not?

F. Legal: The project must comply with legal requirements. This is often done on a monthly basis according to applicable local legal and other requirements related to energy use and efficiency.

Outline Steps

The main aims of energy analysis and budget include identifying and documenting all of the significant energy uses within the defined boundaries, obtaining a baseline of energy performance, identifying indicators to use in measuring progress against the baseline, setting energy objectives and targets and, finally, establishing an energy action plan. The energy management system must be evaluated at least once a year and what are the improvements made based on the results of the evaluation. In more detail this will include:

1. Recording main electricity bills and sub-meter data;

2. Analysing past, present and future energy use;

3. Identifying and quantifying significant energy users (SEU);
4. Identifying drivers affecting SEU levels;

5. Developing baselines and performance indicators for each SEU;
6. Review operational control for all SEUs

7. Technical energy audits

8. Identifying opportunities for improved performance, review and decide action plans.

Useful questions include: How much energy was used in the 12 months ending last month? How much did it cost? How much was used during the previous year? How much will be used in the next 12 months? How does this compare to the target? Why are there deviations? Is the plant using too much energy? If so, how much should it be using?

A Cement Plant in Egypt

Using each of the eight points above in turn, we shall now look at an Egyptian case study. This cement plant is one of the most modern cement plants in Egypt; it produces around 5500t/day of clinker. It uses heavy fuel oil as its thermal energy source, having one vertical raw mill and one vertical cement mill. It uses bucket elevators to take raw meal to the preheater and all of the silos.

It was decided that the plant would focus on electricity use and the use of heavy fuel oil and that the boundaries would include the production line (raw mill, preheater, kiln, cement mill, plus utilities) and all the buildings within, including the plant fence. The quarry was not included.

1. Table 1 shows the plant energy consumption for 2013 to 2016 inclusive. Energy management began in June 2016.

2. Figures 1 & 2 show data relating to energy use in 2015, the baseline year. It can be seen that consumption is resulting in rising costs that do not hit the required budget for both electrical use and heavy fuel oil use.

3. The SEUs are shown in Figure 3. The scope in saving energy is related to a three axis target of increasing running time, decreasing stoppage time and keeping maintenance to scheduled periods only.

4. Looking at just the vertical cement mill (See Table 2), it is possible to calculate the energy intensity index (EII) by comparing the baseline data with new monthly data. This should be less than 1, indicating improvement on the baseline. Table 2 and Figure 4 show that this has already been achieved. The difference between the actual and expected consumption values should be negative and the cumulative summation of the difference should be on an infinite downward trend. The trend of specific energy consumption can be seen in Figure 5.

It is important not to lose sight of customer satisfaction throughout an efficiency drive. The average properties for cement produced during each month of 2016 is shown in Table 3. It shows that the average surface area according to Blaine was 3424cm^2/g. There is significant potential to increase the amount of energy

saved by reducing the separator rotor speed, while remaining within the customers' requirements. Continued monitoring of the coarse portion that is recycled from the separator is recommended so that the separator speed can be kept as low as possible without allowing the coarse fraction through the separator.5 & 6. Each of the SEUs has operating parameters that affect their energy use. As for the cement mill rotor speed (above), each needs to be identified, quantified, recorded and communicated, monitored and controlled through identified measuring points. This will achieve accurate monitoring and identification of opportunities.

7. The recommendations of audits should be included in the opportunities list, see below.

8. The opportunities list is a list of all known opportunities to improve energy performance, including those that may be rejected. It must be assigned to a designated staff member, along with a target completion date, enabling an action plan for each upcoming period. The opportunities list unlocks new horizons for sustainable development based on business sense by examining the potential for retrofit solutions, renewables and alternative energy sources. A selection of projects has been identified and is shown in Table 4.

The table below indicates plant data for energy consumption through 4 years

ER1

Year	Production	Electrical Consumption kWh	S.P Power Cons. Kwh/ ton	Thermal Consumption kWh	S.P thermal cons. Kwh/t	S.P. heat Cons Kcal /Kg
2013	1,523,185	131,376,400	86.251	1,530,907,499	1,005	
2014	1,200,450	126,719,700	105.56	1,198,732,500	998.5	
2015	1,702,324	142,389,400	83.644	1,708,479,463	1003.6	815
2016	1,869,555	155,784,699	83.327	1,676,069,123	896.5	799

Table 1: Summary of energy use at Egyptian cement plant, 2013 - 2016.

From above table we have started our energy management system since June 2016, and we were surprised by huge amounts of information without any comment as long as it is within limits
The world Best Available

Technology (BAT) = 2.92 GJ/t

The national BAT value = 3.53 (The most efficient plant of the analyzed companies in Egypt)

Our case study BAT value = 3.52 GJ /t

The above table indicates that no improvement took place electric consumption, at 0.3%.
But for heat energy there is big improvement, at around 12%

Now our thoughts are considering it as a race to bottom (more and more saving)

ER2:

All graphs shown below are for 2015, and they indicate an increase in annual consumption vs cost and budget either in electric or heavy oil so plans must be established to allocate these problems.

For Electric energy

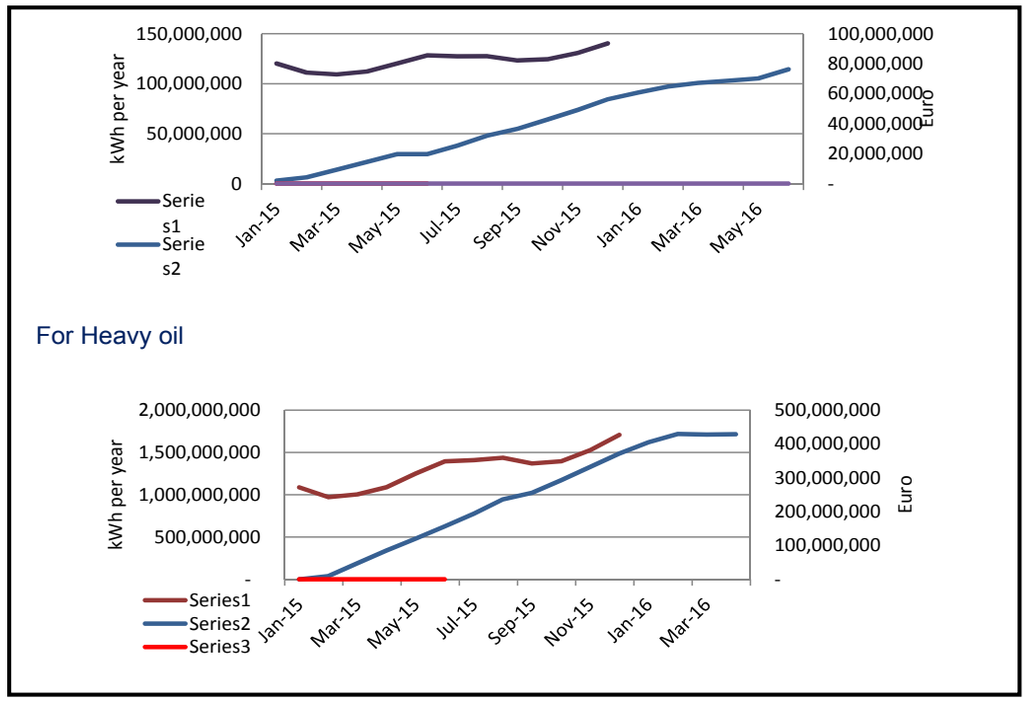


Figure 1: for electrical energy.

For Heavy oil

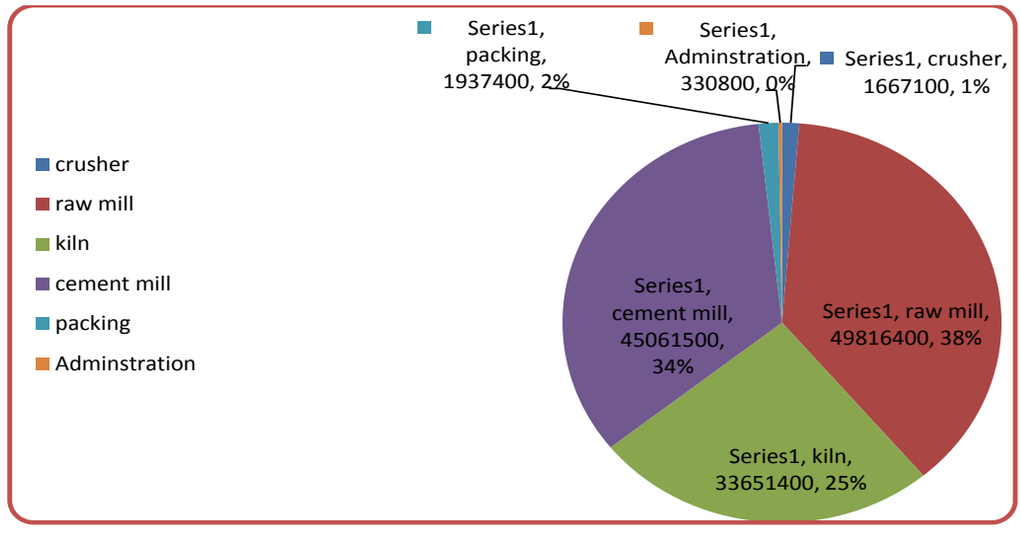
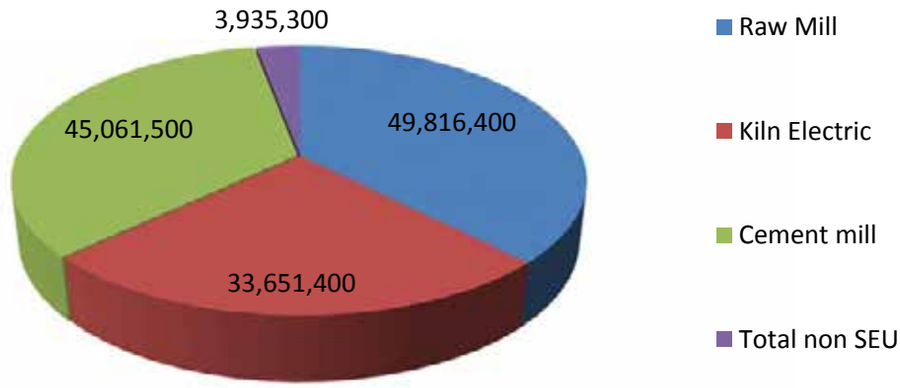


Figure 2: for thermal energy.

Pie chart 2015 Thermal and electrical energy balance



Total SEU	128,529,300	97%
Total non SEU	3,935,300	3%
Total consumption	132,464,600	100%

Figure 3: Energy used by SEUs and non SEU activities at the Egyptian cement plant in 2015.

Significant Energy Usage SEU:

ID	Name of SEU	What are the main drivers?	Is the SEU metered? Auto/ Manual	kWh p.a.	% of Overall Usage
1	Raw Mill	Mill Production	Auto	**49,816,400**	38%
2	Kiln Electric	Kiln Production	Auto	**33,651,400**	25%
3	Cement mill	Mill Production	Auto	**45,061,500**	34%
3	Total non SEU	-	Auto	3,935,300	3%

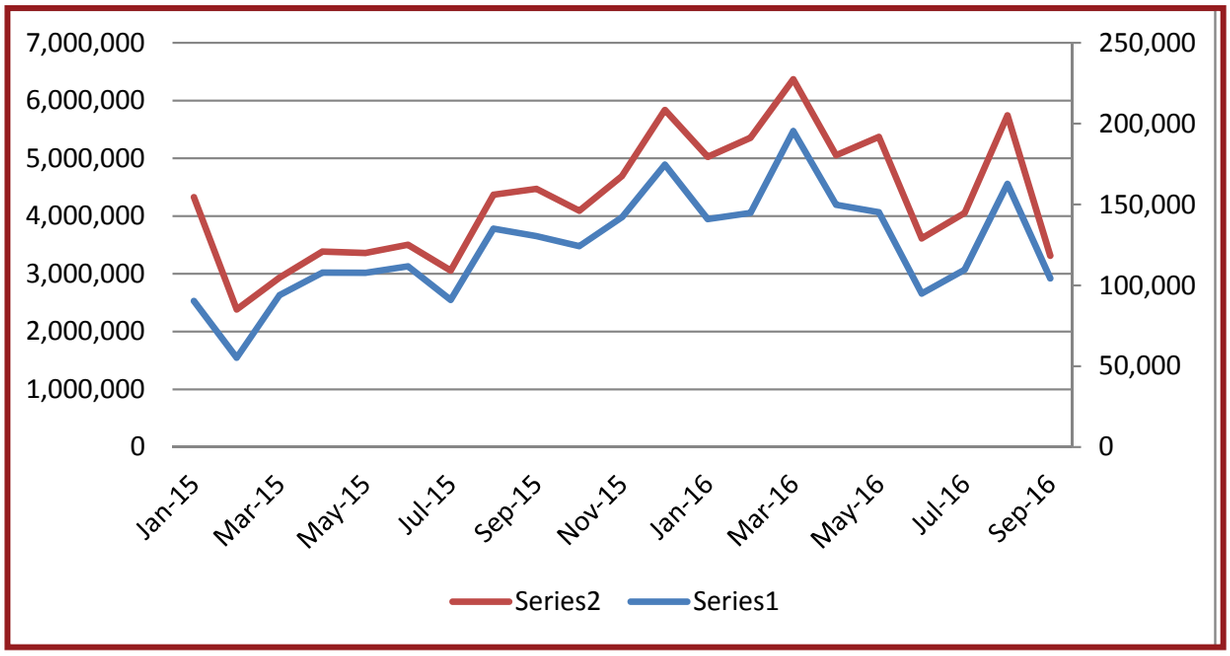
Our scope in saving energy is related to 3 axis increasing running time, decreasing stoppage time and keeping maintenance stoppage in scheduled periods.

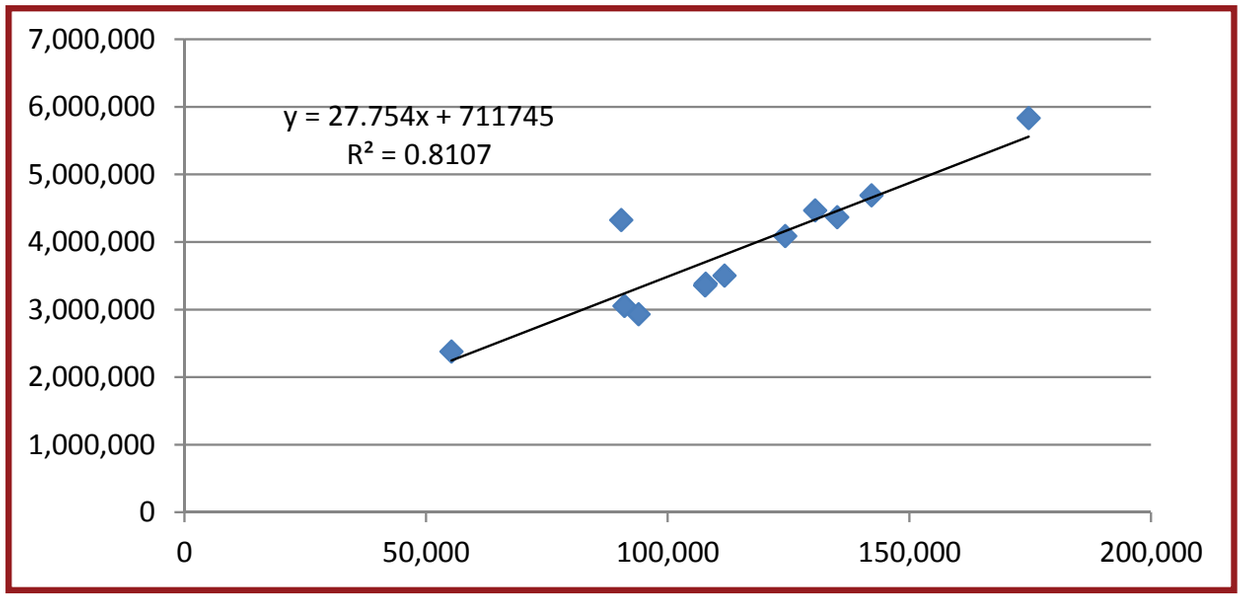
ER4, 5: for all SEU Raw mill, Kiln (electric – heat), Cement Mill

Cement mill

								Base Year (2015)	
Date	Driver Production (ton)	Electrical Con Energy (kWh)	Expected demand (kWh)	Energy Intensity Index (EII)	Difference (excess) (kWh)	CUSUM (kWh)	SEC (kWh/ton)	2015 AVE. SEC (kWh/ton)	
Jan-15	90,361	4,328,100					47.89788		
Feb-15	55,245	2,382,100					43.11883		
Mar-15	93,956	2,932,600					31.21248		
Apr-15	107,838	3,383,700					31.37762		
May-15	107,712	3,359,400					31.18873		
Jun-15	111,728	3,504,400					31.3656	34.64464	
Jul-15	91,027	3,056,800					33.58125		
Aug-15	135,040	4,369,800					32.3593		
Sep-15	130,471	4,470,900					34.26739		
Oct-15	124,274	4,092,000					32.92724		
Nov-15	142,131	4,694,200					33.02739		
Dec-15	174,665	5,835,900					33.41196		
Jan-16	141,032	5,024,300	4,625,957	1.0861	398,343	398,343	35.62525	34.64464	
Feb-16	144,812	5,355,600	4,730,868	1.1321	624,732	1,023,075	36.98312	34.64464	
Mar-16	195,483	6,370,300	6,137,188	1.038	233,112	1,256,187	32.58753	34.64464	
Apr-16	149,884	5,053,700	4,871,626	1.0374	182,074	1,438,261	33.71749	34.64464	
May-16	145,243	5,372,400	4,742,830	1.1327	629,570	2,067,831	36.98905	34.64464	
Jun-16	94,910	3,614,100	3,345,884	1.0802	268,216	2,336,047	38.07923	34.64464	
Jul-16	109,702	4,053,000	3,756,429	1.079	296,571	2,632,618	36.94546	34.64464	
Aug-16	162,763	5,746,200	5,229,081	1.0989	517,119	3,149,737	35.30409	34.64464	
Sep-16	104,353	3,314,300	3,607,966	0.9186	-293,666	2,856,072	31.76047	34.64464	
Oct-16	194,794	5,750,700	6,118,072	0.94	-367,372	2,488,700	29.52196	34.64464	
Nov-16	152,019	4,779,100	6,467,718	0.8869	-731,718	1,756,982	45.491	34.64464	
Dec-16	207,392	5,736,000	4,930,890	0.9692	-151,790	1,605,192	27.65777	34.64464	

Table 3: Key data and efficiency data for the Egyptian cement plant's cement mill in 2015, 2016.





To compute
Expected demand = production * (base load + specific energy efficiency)
It is better for SEU that R^2 to be more than 0.7
If R^2 less than 0.5 it means that SEU is to be Non SEU

Base Year is in blue starting in cell

A14 B33

Slope	27.754074
Base load (intercept)	711744.751
R2	0.81073053

Energy intensity index

Energy intensity is better to be less than 1 and it is already achieved

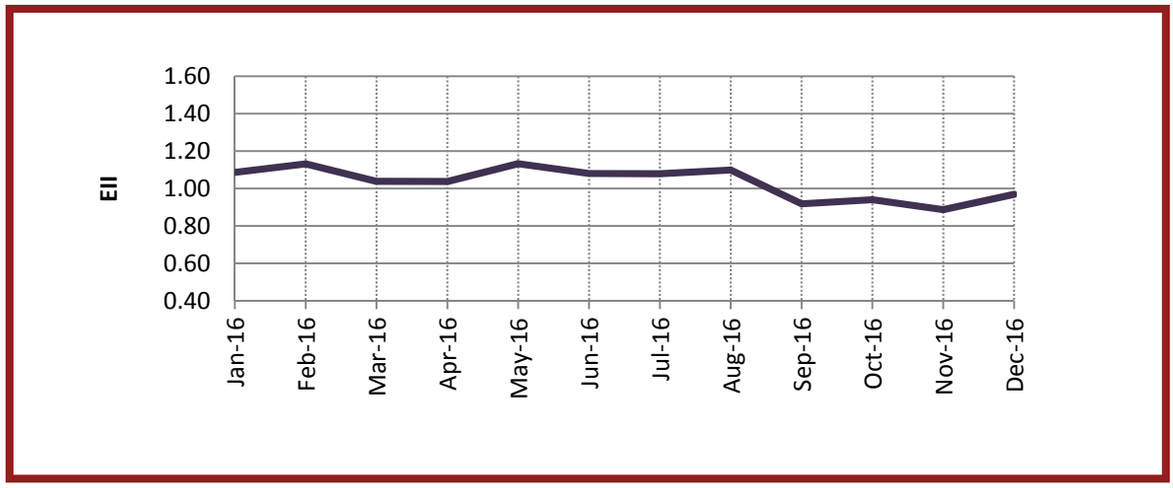
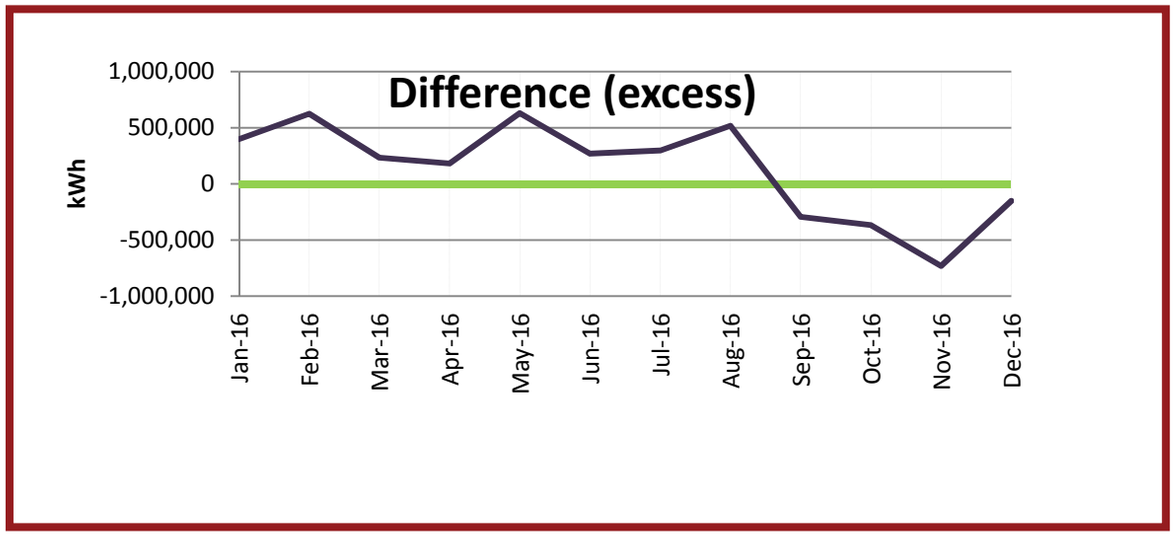


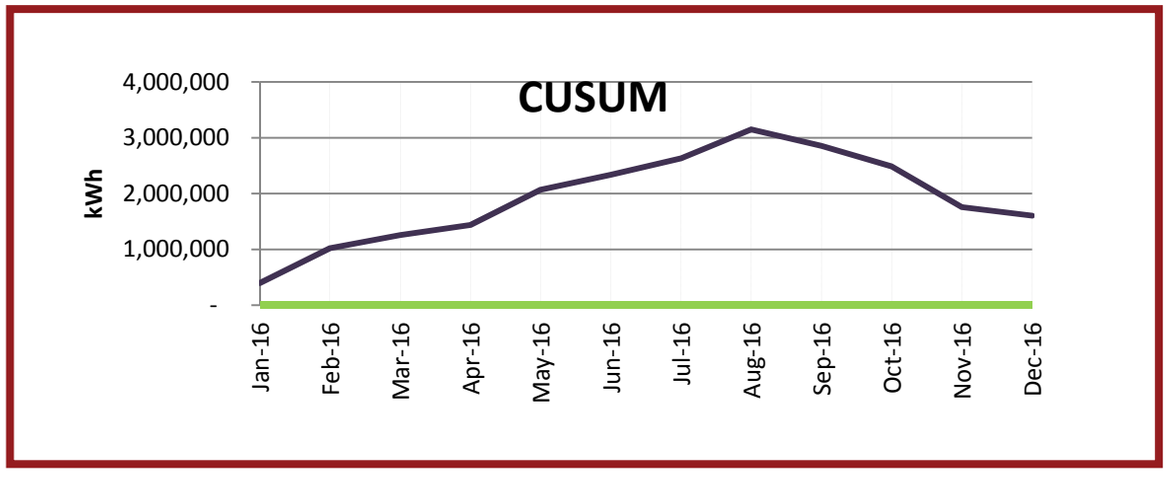
Figure 4: Energy-intensity index (EII) throughout 2016.

Difference between actual and expected

As shown, that difference must be negative.



CUSUM: Cumulative summation
It is a race for bottom and shall be continued to bottom for infinity.



Specific Energy Consumption

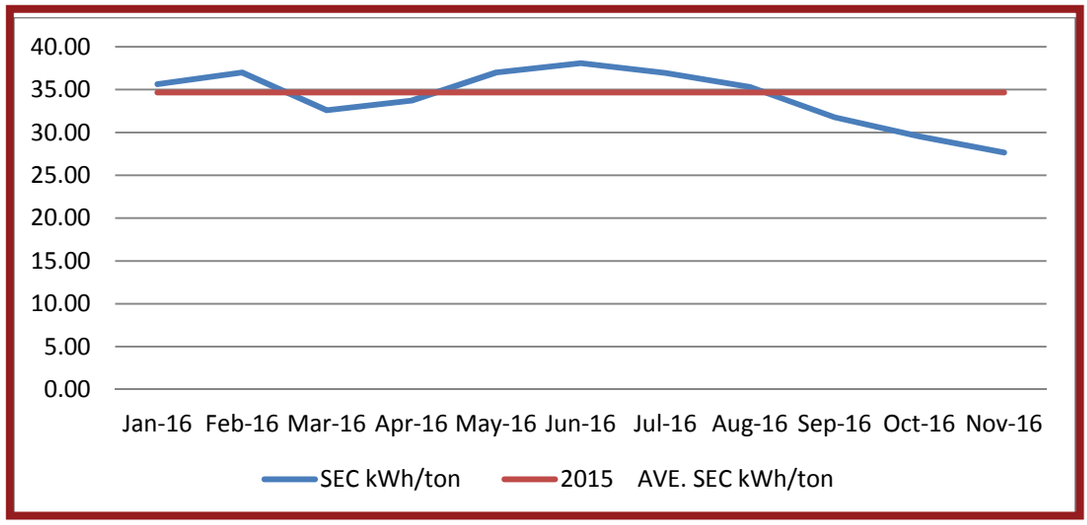


Figure 5: Monthly specific energy consumption in 2016, showing 2015 average.

2015
2016

Review of cement quality according to customer satisfaction

Sample ID	Date	Strength (N/mm^2)		Setting Time		BLAINE
		2 Day	28 Day	Initial (min)	Final (hr:min)	
1	Jan	18.39	53.15	229	4:36	3725
2	Feb	20.01	50.19	199	4:33	3747
3	March	20.25	52.54	216	4:32	3690
4	April	20.22	51.00	230	4:38	3545
5	May	21.10	52.47	247	5:30	3351
6	June	18.54	51.74	245	5:28	3285
7	July	17.65	52.59	237	5:26	3290
8	August	18.26	52.31	221	5:20	3291
9	Sep	19.40	53.68	230	4:53	3299
10	Oct	19.90	53.11	228	4:56	3274
11	Nov	20.51	53.27	220	4:35	3290
12	Dec	19.30		228	4:51	3298

Average value for Blaine is 3424 and there is a big potential to increase production and save more energy through reducing separator rotor speed, taking into consideration the strength of cement produced. We should keep monitoring coarse portions, which are recycled from separator with a view to become at its minimum in order to avoid more energy consumption through decreasing separator speed to minimum, in order to make sure that most of fine product is not recycled in closed loop inside the mill.

Table 5: Opportunities identified by the Egyptian cement plant, along with costs, payback time and priority level.
1 Egyptian Pound (EGP) = US$0.056 or Euro0.053 as at 9 February 2017.

Project Description	SEU	Saving	Capital Cost	Operation Cost	Payback	Ex. Duration	Risk
		EGP	EGP	EGP	month	month	Eval.
By paas reduction	Kiln	10 M	0	0	immediate	3	2
compressed air leakage	All	1 M	0	0	immediate	3	1
operation optimization	Kiln	1 M	0	0	immediate	3	2
Quality optimization	Kiln , Cement mill	1 M	0	0	immediate	3	3
Heat recovery	Kiln	15 M	75 M	Not estimated	60	9	5

Training

Throughout the implementation of energy management practices, it is important that all staff be aware of the programme and its main targets. To help, it is advisable to keep both soft and hard copies of all energy manuals, bills, policies and audits. Management reviews, meetings, maintenance records, process and maintenance procedures should be used in designing and conducting reviews of all projects, from the very small to the very large.

Conclusion

The implementation of energy management systems in cement plants is both easy and cost effective, given strong commitment from management and the availability of adequate technical resources. In the case of the Egyptian cement plant, zero or low cost measures have proven to be a strong tool in convincing all company staff of the potential benefits that can be achieved if a commitment to continuous improvement becomes an integrated part of the company's culture and day-to-day behavior.

In general, management should provide all necessary resources and required information to enable the company to achieve its energy objectives and targets. The system should help the plant management to commit to:
Reduction of the energy intensity on continual basis
Encouraging continues identification of opportunities to improve energy performance throughout the organization
Developing a framework to set and follow up energy objectives and targets

Using energy efficiency and energy performance concepts in the design of new modifications and replacement of process systems

Compliance with applicable legal and other requirements to which organization subscribes, related to its energy use and efficiency

Ensuring and support purchase energy-efficient products and services.
All of the pervious steps shall be regularly reviewed, and updated as necessary.

We would be glad to introduce our consultation services for cement training courses, in addition to Establishing Energy management System to your plant

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KGD Bogiflex benefits (CMD)

By: CMD Gears, France

The running behaviour of the kiln significantly impacts on the running conditions of the pinion and girth gear. With this as a starting point CMD of France developed its Bogiflex KGD kiln drive. In this article, the company explains its benefits to users.

The performance of a cement plant heavily relies on the performance of the kiln and the stability of its running behaviour. The kiln drive system is usually not considered as a key component for enhancing performance of the kiln, but rather is only looked at in case of failure. By introducing the Bogiflex KGD (Kiln Gear Drive), CMD's aim is to make the drive system an integral part of kiln performance by enhancing its reliability and performance.

Conventional kiln drive systems

In the vast majority of plants, kiln drive systems include a girth gear and a pinion. This basic concept has existed for more than a century and has not seen any form of drastic reinvention since.

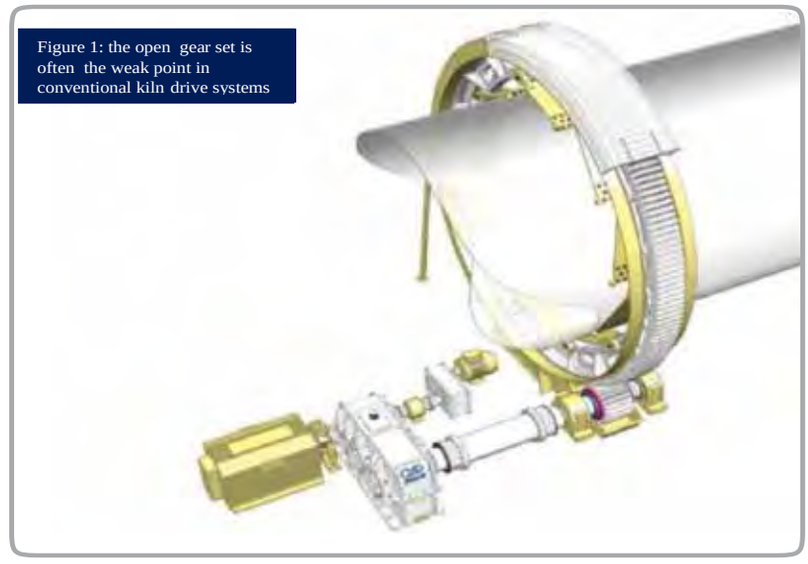

Figure 1: the open gear set is often the weak point in conventional kiln drive systems

Today's conventional kiln drives (see Figure 1) therefore include:

- 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 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). It takes effort and care to obtain consistently good meshing between the pinion teeth and the girth gear teeth. Indeed, these meshing conditions depend on the position, deformation and movement of the girth gear.

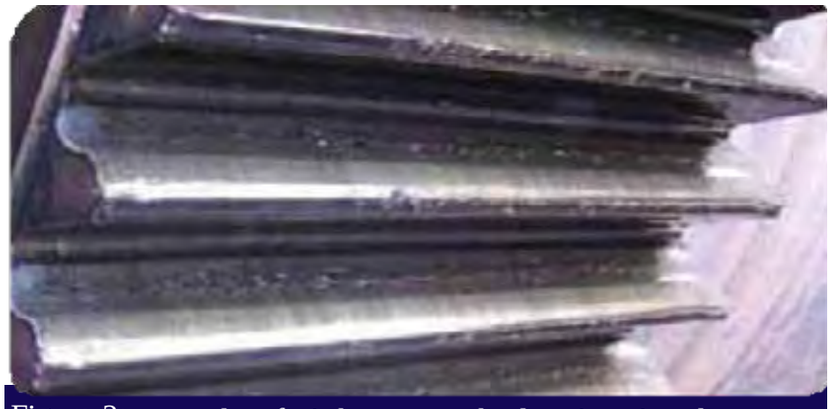

Figure 2: example of girth gear teeth deterioration due to incorrect meshing conditions

Kiln running behaviour– the idea behind the Bogiflex KGD

Kiln running behaviour greatly impacts the running conditions of the pinion and girth gear.

Deformation of the kiln shell is prone to modify the girth gear geometry, in the following ways:

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

The way kilns are run (for example, the increased use of alternative fuels), can impose higher kiln shell temperature and can even amplify the above-listed issues.

By introducing the Bogiflex KGD (Kiln Gear Drive), CMD's aim is to make the drive system an integral part of kiln performance by enhancing its reliability and performance.

The open gear set meshing conditions are therefore modified, which can lead to pinion and gear damage by imposing higher contact stress than what the gears are designed and manufactured for. The following phenomena can therefore occur: pitting, scratching, flaking, high teeth wear. This also means an increase in girth gear. vibrations, and in extreme cases, seizure or failure.

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

Bogiflex KGD mounted on kiln

The Bogiflex KGD concept

This led CMD to develop a completely new solution, to solve the listed issues.

The solution was actually already in CMD's toolbox. The Bogiflex basic concept had been created in the 1960s 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 freedom, self-aligns automatically to the driven gear wheel.

A few years ago, the decision was taken to develop a modern version of the Bogiflex for kilns. A fruitful partnership began with the Holcim Group that resulted in the creation and application of this new type of kiln drive system.

The Bogiflex KGD is a drive system which floats on and is self-aligned 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 To ensures that pinion-girth gear meshing conditions are always constant.

The CMD Bogiflex KGD components include:

- Girth gear, mounted on the kiln via tangential blades. It is 100 per cent manufactured by CMD and sister company Ferry Capitain, and can be made either of cast steel or cast iron
- Bogiflex itself, meshing with the girth

Recent developments in gear, and supported by the reaction arm

- Cardan shaft
- Primary gearbox
- Auxiliary drive
- Lubrication units
- Girth gear cover.

The girth gear and Bogiflex 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.

Three standard sizes of Bogiflex KGD units exist so far which cover most existing kiln sizes (see Table 1). CMD can deliver the entire system.

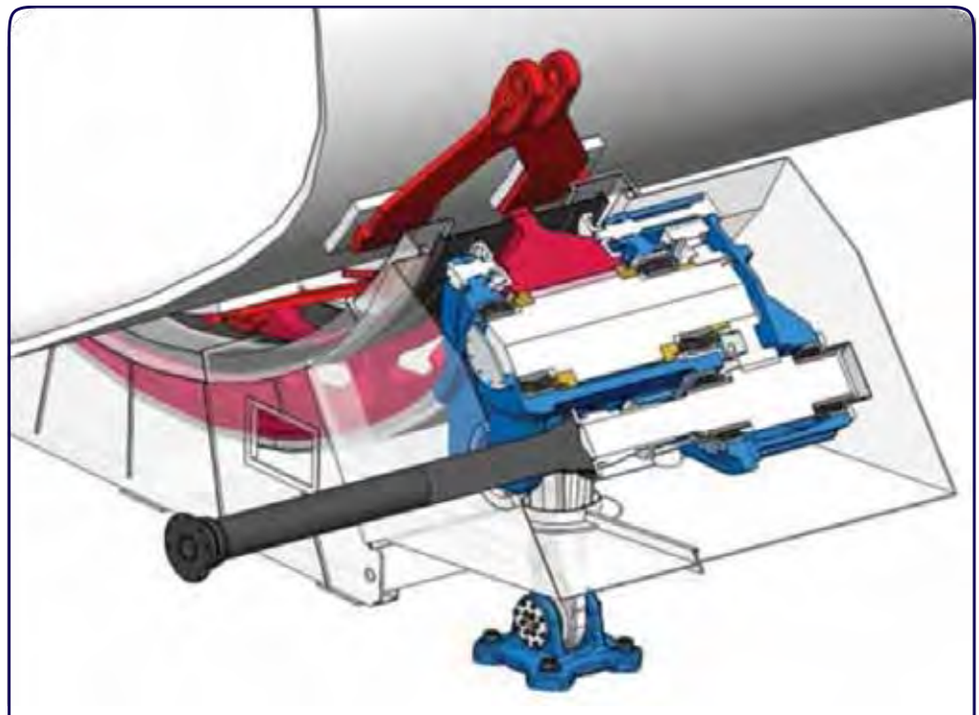

Figure 4: Bogiflex KGD cross-section view

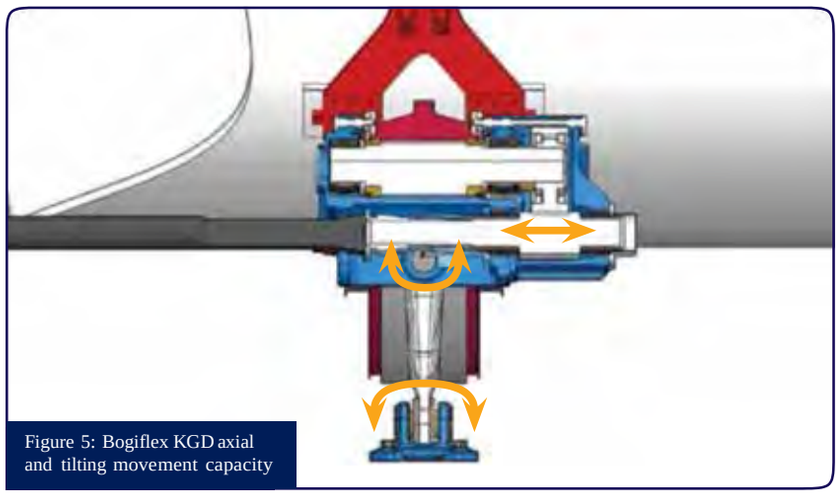

Figure 5: Bogiflex KGD axial and tilting movement capacity

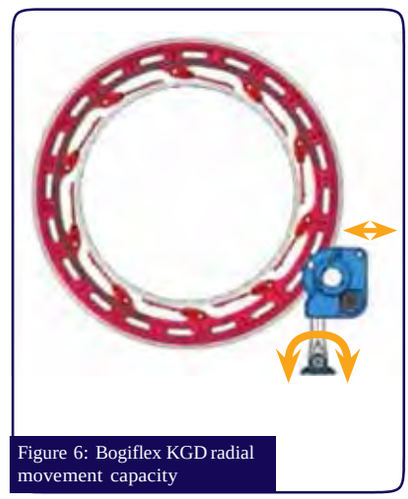

Figure 6: Bogiflex KGD radial movement capacity

Table 1: Bogiflex KGD range

KGD size	*Kiln shell f(m)*	*Max driven torque at the shell(Nm)*
KGD20	>4.6	1,000,000
KGD26	4.6-5.2	2,300,000
KGD32	> 5.2	>4,000,000

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

Figure 7: example of Bogiflex KGD26 in operation

Figure 8: example of Bogiflex KGD20 during installation

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 versus the girth gear, and therefore constant centre distance and alignment.

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

The Bogiflex's freedom of movement is enabled 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.

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

Bogiflex benefits

Some of the obvious benefits brought by the Bogiflex concept are:

- constant position of pinionto to the girth gear and, therefore, constant meshing conditions and excellent load repartition on the pinion and 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 alignmentrequired.

The globalisation and standardisation of the concept also bring other advantages:

- safety of the integrated oilcirculation systems
- integrated monitoring system (for vibration, temperatures, optional monitoring of torque available)
- standardised 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 as demonstrated by the net present value (NPV) calculation carried out by Holcim.

Proven in the field

A total of eight units have been ordered so far, and five units are already operating in various plants across the world. They have proven to perform as they were designed and have resulted in very smooth kiln drive running.

Conclusion

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

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trol Company Rexroth Bosch Group

WHY USE HYDRAULIC DIRECT DRIVE SYSTEMS IN THE CEMENT INDUSTRY?

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

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

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

Redundancy and
reliability Hägglunds hydraulic direct drive systems have proven invulnerable to harsh environments and varying production with their unique ability to handle a starting torque of 3-4 times the running torque – without overdimensioning of the drive system. When multiple hydraulic motors are used, they provide a high level of redundancy and perfect load-sharing. Moreover, since the motors are connected hydraulically and share the load equally, they minimize wear.

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

Unbeatable flexibility

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

"Flexible speed control not only lets you increase production, but also results in better quality, since you can experiment to find the optimal feed-speed ratio," says Per Åström, Industry Sector Manager, Mining and Material Handling & Cement, at Bosch Rexroth. "No matter how much or how little you feed in, you always end up with great-quality raw material for cement. In this way, future capacity increases or reductions can be achieved more efficiently and with greater flexibility."

Less installed power

Bosch Rexroth offers a flexible drive system concept for kilns and drums that allows less power to be installed while achieving a more compact system with the same flexibility as before. This concept takes advantage of the possibility to use tandem Hägglunds motors, connecting two motors to each shaft. It also

creates an adaptive system, where drive parameters can be changed during operation to maintain the 'sweet spot' and make the production more efficient. This is achieved through the built-in control system in the Hägglunds drive unit, which supplies the hydraulic motors with the necessary hydraulic power. The drive unit can be located anywhere convenient and communicates with the DCS via any interface.

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

Low lifecycle cost

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

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Block Model Based Cement Quarry Optimization

By: Pawel Kawalec, PhD[1] and Cornelis Bockemühl, PhD[2]

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Introduction

Do you face problems with buildups in the preheater tower? Or thick coating in the kiln? Ring formations? Elevated emissions? Customer complaints? All of that may come from insufficient quality management in the quarry. This is well-known in cement plants, and quarries are being blamed for it.

I used to know a plant manager, who force the quarry manager to sign a commitment to always deliver according to some specified quality constraints. He was very proud of his solution – addressing the problem at the source – but there was a catch: The quarry manager had no means whatsoever to deliver on his commitment!

So, what were the options of a quarry manager? He would go only for those layers where the grade and contamination were not an issue, avoiding certain geological units altogether and remove them to the waste dump. If all this did not help, the plant needed to use expensive correctives for adjusting the kiln feed. All that is fine if you have infinite land reserves and a "friendly" geological setup, but for all others it will end up in an early termination of cement production altogether – because the quarries are exhausted.

In this article we are going to explain some other options and show you how to optimize and schedule your cement quarries for more reliable quality control, lower wasting and correctives consumption and an extended lifetime.

First, we need to take a closer look at the entire raw material quality management process. It includes exploration, analytics and planning, and yes, you will not get it for free: You need to invest in, but at the end you will see a benefit that exceeds these expenses by far!

The impact of raw materials on the cement production process

Raw materials extraction is an essential part of the cement production and contributes significantly to cost and quality of the final product. This is true in two ways.

First of all, a permanent supply of adequate amounts of raw materials is a precondition of operating a cement plant at all. So, this is the first challenge for mines planning and operation: ensure this steady supply following the mining state of art, dealing with weather, natural phenomenon's, environment, biodiversity, communities, OH&S and many more, for the longest possible period of time.

On top of this, qualities do also matter. Plant design is based on average parameters and operation will be optimal if these parameters are always met. But natural raw materials are variable, and if this goes directly into production it will affect cost:

- High electrical energy consumption for homogenizing the raw material.
- High and unstable consumption of expensive corrective materials (e.g. bauxite, high grade limestone etc.).
- High wear of the vertical roller mill if no attention is paid to quartz, often even as flint.
- Higher fuel costs and refractories consumption due to fluctuations in the thermal process.
- Little use of cheaper alternative fuels and raw materials which bring their own variability from other industries, so their usage is extremely risky without proper raw mix control.
- Need to use "cleaner", more expensive fuels, like natural gas, to comply with emission limits.

Often cement raw material supply is only understood in terms of limestone, but even the highest-grade limestone has no value without a second component – clay, shale etc. What counts is thus not only limestone, but the constant delivery of the right mix of primary and second component. In many cases the "lower-grade" limestone is already much closer to the needs of cement production than the very pure "good" material.

Most of the time, additional corrective materials such as high grade ("sweetener") limestone, bauxite, iron ore, sand or others are required as well. But even in small amounts they add considerably to the production cost, so this should be minimized, and suitable inexpensive alternatives need to be permanently evaluated. In the best case these can be found even in the own quarries – if all the materials have been properly explored and analyzed! It happens too often that exploration only

looks at the limestone or second component, considering everything else as "waste", so opportunities are missed. In some of my projects I showed that overburden could replace or reduce the use of costly external materials.

Minor elements and oxides (chlorine, magnesium, sulfur, organic carbon etc.) need to be monitored as well because they can either badly affect the process and product quality or lead to emissions above the allowed limits. Controlling them in the quarry is often the only option to do something about them: While main parameters such as silica and alumina ratio can easily be handled with correctives, this is not true for too high amounts of detrimental minor compounds.

Finally, also physical parameters do matter. Depending on geological and climatic conditions, raw materials can be dry or humid and sticky, hard or soft etc. Knowing these parameters in advance is crucial for the plant design – also for the second component: number and type of crushers, bins, weigh feeders, conveyors, preblending piles etc. Plant design issues should of course be known before the plant is built.

At the kiln outlet the results of all previous efforts become evident – with nothing to be done if the results are negative: off-spec clinker cannot be sold, and marginal qualities lead to reputation damage and cost market share.

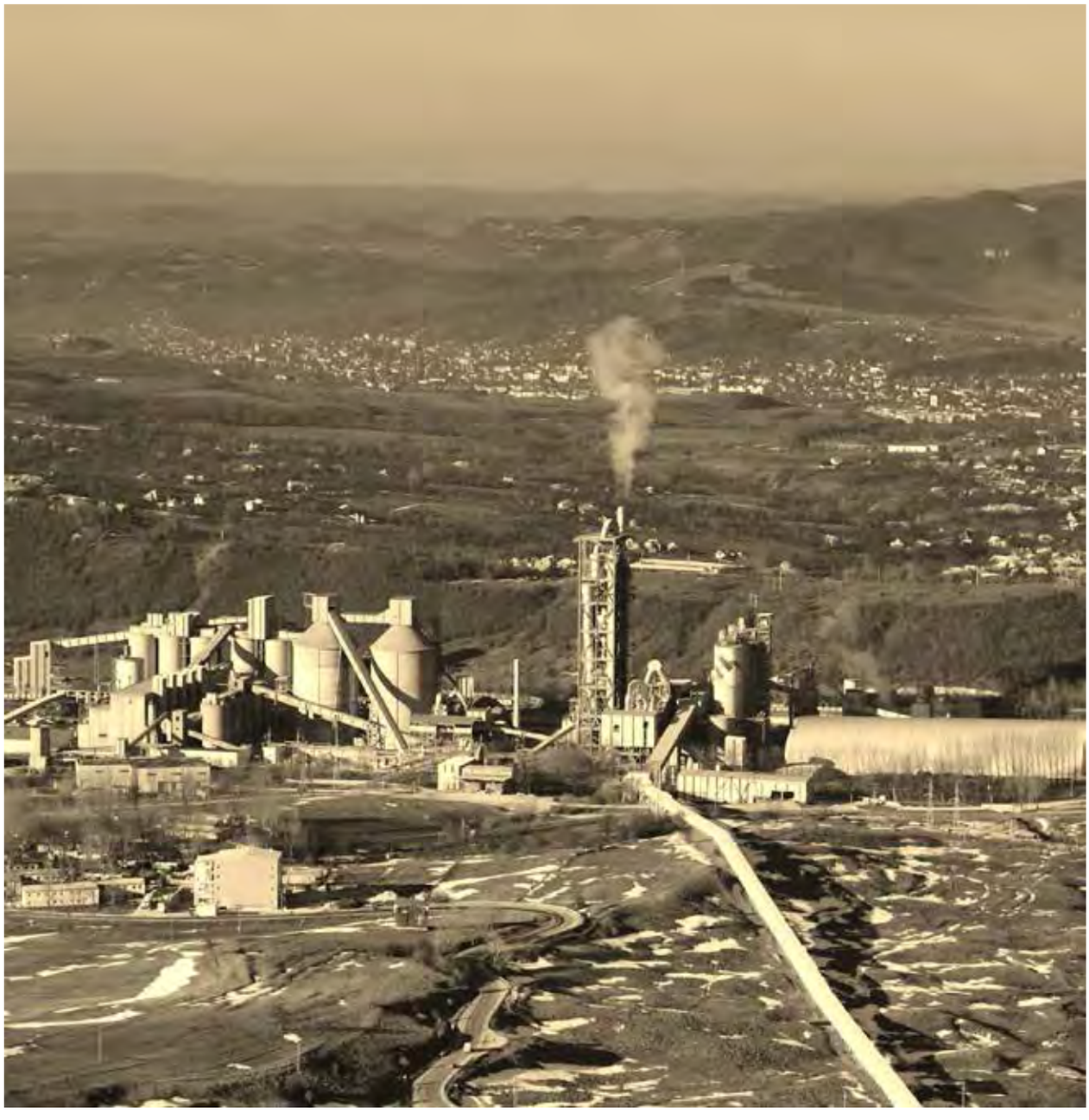

Figure 1 In this article we are looking at the cement plant from the quarry perspective.

Deposit investigation and block modeling

Quality management at the source is the key to handling all the issues described above, and it starts with exploration, modeling and planning. And for all these steps, all the materials that exist in the foreseen deposit area should immediately be included – even if at first they do not look like being useful: It was already pointed out that in some cases this impression may be wrong.

The initial exploration steps will be geological desk studies and field work, followed by core drilling and sometimes supplemented with production rig drilling. Drilling is the most expensive part of the exploration process, so it is important to prepare it well by collecting all available geological information in advance and plan the drilling campaign accordingly. Geophysics can also help to complement the geological information.

The resulting database of georeferenced chemical analyses, together with other information, will go into a geological model that represents in 3D the geological units and tectonic structure. Then a block model can finally be calculated (see figure 2). The block model attributes are calculated from the sample database and the geological model using geostatistical methods.

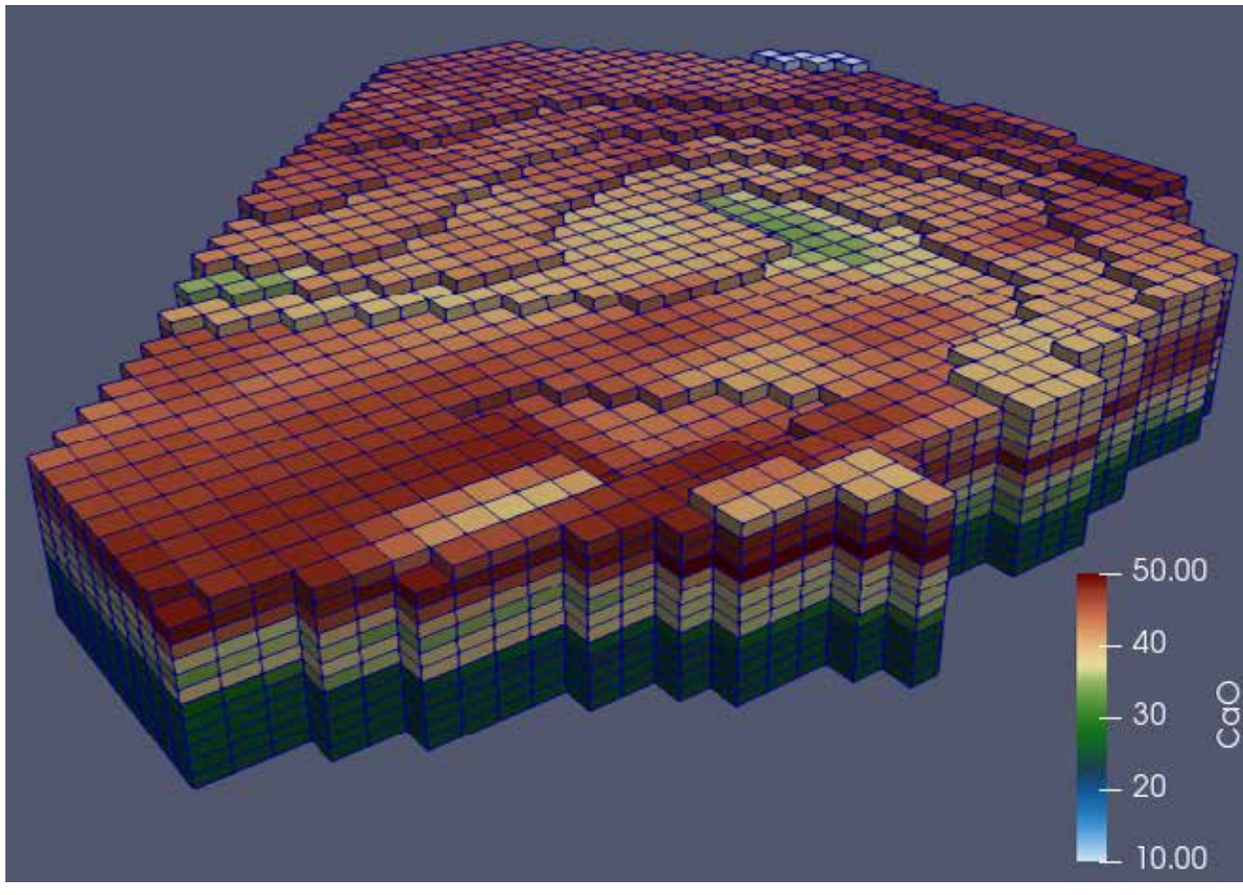

Figure 2 In a block model the deposit rock volume is divided into rectangular blocks. Qualities and other parameters are assigned to every block and can be visualized with colors.

A block model approximates the reality in terms of qualities. The reliability of the model depends on input data, methods used and not the least on the skills and experience of the modeling expert. Doing all this properly costs of course money but saving here in the wrong place costs much more! Figure 3 illustrates schematically the cost structure of the entire exploration and modeling campaign and shows that in order to save cost:

- spend enough effort for a good planning of the drilling campaign (desk study and field geology), to minimize the number of required drillings, and
- spend money for a high quality, certified laboratory for sample analysis, and invest in the generation of good geological and block models – because otherwise even the most expensive drilling campaign will only deliver unreliable information.

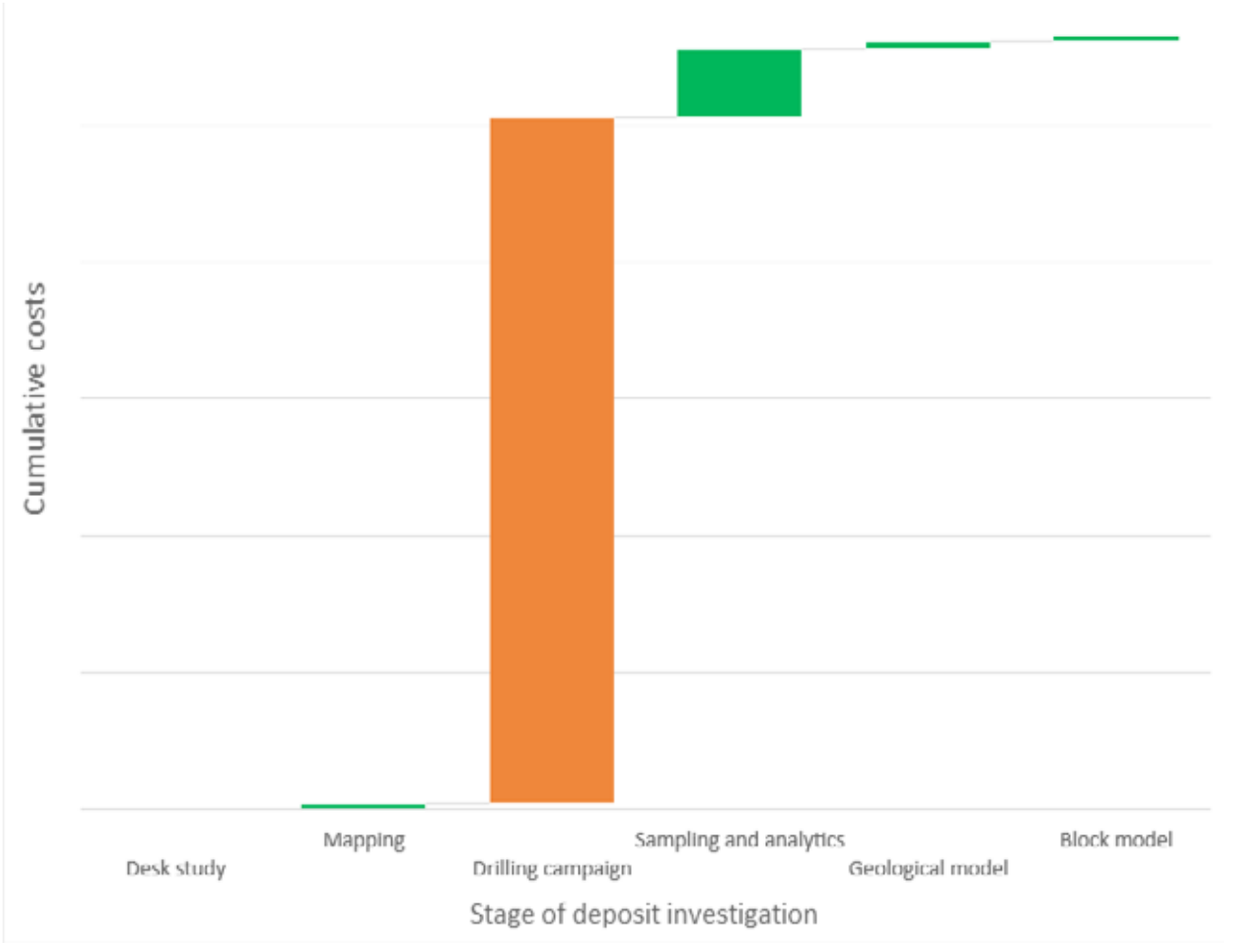

Figure 3 Cost structure of an exploration campaign: By far the most expensive step is the drilling campaign, but the reliability of the result equally depends on the quality of every single step: the chain is as weak as the weakest link.

The block model is now the base for numerical optimization and scheduling of the quarry production based on quality constraints.

Again, there is a cost related reasoning that easily justifies the efforts done for planning and more selective mining in the quarry according to the plans. The important question is: What is the cost of handling quality deviations at the different stages of the process between quarry and market (see figure 4)? The answer is clearly: the later the deviations occur the higher the cost for correction or mitigation – up to the loss of production that results from off-spec clinker.

Figure 4 Cost for correction or mitigation of quality deviations at different stages of cement production between quarry and market

Planning software – a historical background

In the 1960-ies first attempts were made to define algorithms and use computers for optimized planning in the mining industry, based on block models. The metal miners were forerunners, and until now their needs are dominating the market of planning tools – see figure 5.

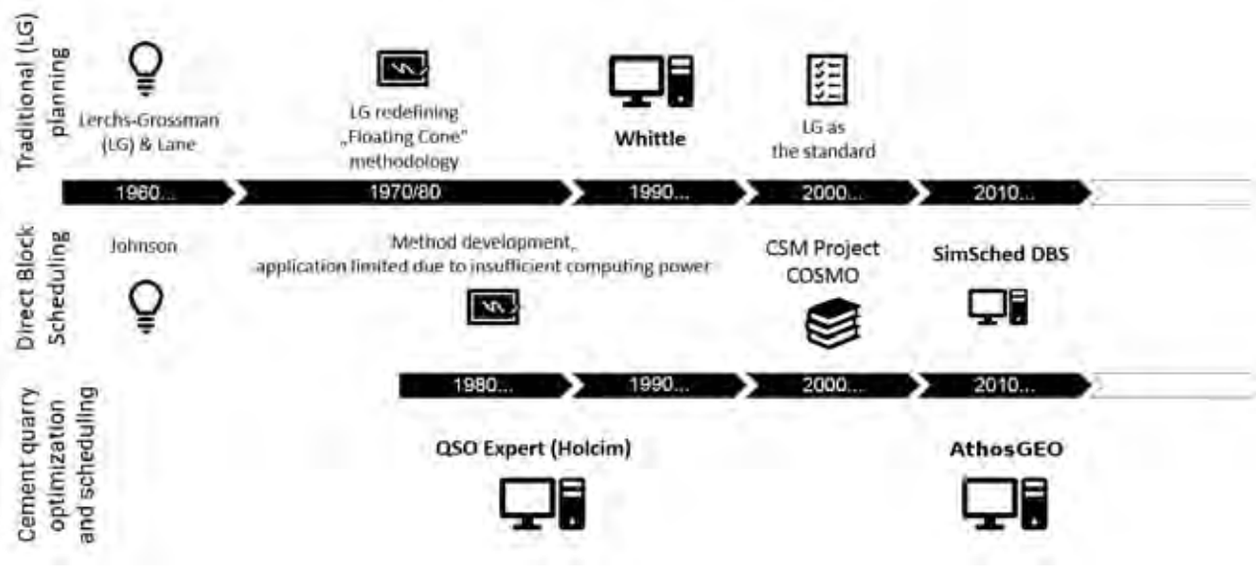

Figure 5 Development of computerized mines planning concepts. The methods going back to Lerchs-Grossman (LH), like the Whittle software, are nowadays dominating the resources and reserves estimation in metal and other major mining industries. Direct Block Scheduling (DBS) methods are solving the same optimization problems in a stricter way, but they require computing power (like 64-bit hardware) that is only recently available. However, mining for cement faces different challenges and the market of available software is much more restricted.

Mining for cement raw materials must solve different optimization problems from different starting points. Since these mines tend to be much smaller, the market of available software is much more limited. The differences can best be summarized with the following table:

	Ore mines	**Cement raw materials**
Value of a block	depends on the "ore grade", like %Cu, Fe etc. and market situation	cannot be defined because it depends on mixing opportunities with other blocks and materials
Cost of a block	for mining, handling and processing	dto.
Cutoff grade	below which the cost for handling and processing exceeds the value, so the "ore" becomes "waste"	does not exist
Main optimization target	net present value (NPV), i.e. the discounted benefit (value minus cost) of all blocks together. Discounted means that a benefit has the more value the sooner it can be realized	maximum quarry lifetime, thus maximizing the clinker and cement production of the plant, always providing constant raw mix quality, to generate the highest possible return from the investment in the plant

A first software that was independent of all the ore mining tools but specialized for cement raw material mining was developed at Holderbank (later Holcim, now LafargeHolcim) in the 1980-ies: QSO Expert (Quarry Scheduling and Optimization). Initially it was sold also to externals, but since the end of the 90-ies it is restricted to plants within the group. QSO can optimize multiple deposits, handle many different constraints for each one of them and include external corrective materials.

This is where the new AthosGEO software is supposed to step in. It's going to be a brand-new software, ready for production only within a few months. Still it is based on many years of experience of working with QSO and its concepts in many different geological, economic and legal environments throughout the world. Like SimSched DBS it also uses the opportunity of more advanced computer hardware, namely 64-bit technology, to address a problem that could not be handled by QSO yet: the simultaneous production of several products, like raw mix and a high-grade filler limestone.

AthosGEO in nutshell

AthosGEO supports the specific needs of cement producers at three different levels:

1. Know the characteristics of your deposit. Visualize qualities inside the deposit (block model) in 3D, display charts and tables (see figure 7).

[3]For more information, see https://cobo.bockemuehl.ch.

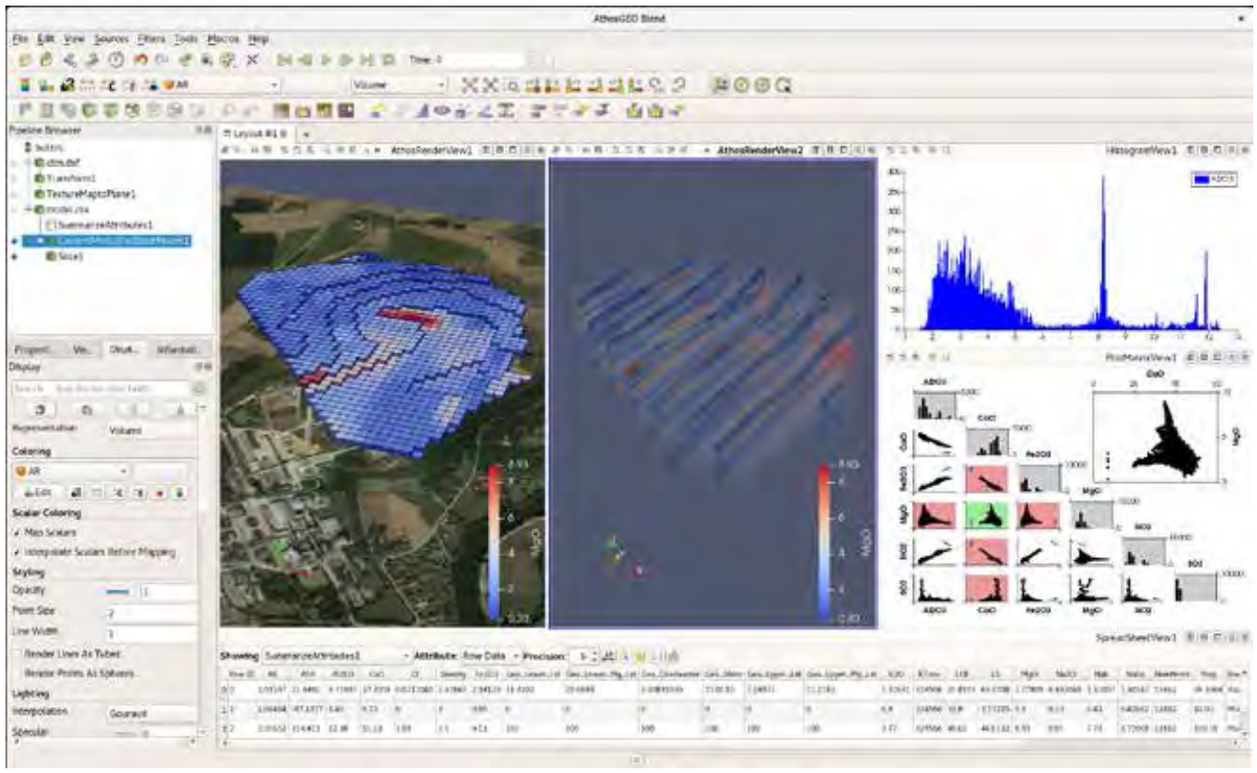

Figure 6 This screenshot illustrates many ways how AthosGEO supports a better understanding the characteristics of a quarry.

2. Understand the maximum raw mix potential. A linear optimization module calculates the maximum of raw mix that a deposit can produce, depending on quality and many other constraints, including the use of external corrective materials
3. Step by step mining simulation. In a semi-automatic, interactive process the user finds an optimum feasible schedule for the short, medium or long term.

The software will exist in two variants:

- AthosGEO View is for the visualization and assessment of the deposit – the first "level" as explained above. This variant will be offered as Open Source, like the visualization software on which it is built (ParaView). With the option to also visualize planning results it is the right tool for the customers of a planning expert.
- AthosGEO Blend is for the planning experts, doing the optimized planning and scheduling by proper blending of materials .

Summary

In this article we looked at the entire cement production process, but always from the raw materials and quarry perspective. Once you understand how relatively little efforts in the quarry can generate much higher benefits further down the line you will no longer hesitate to invest in proper deposit exploration and quarry planning. Figure 7 summarizes once more some of these positive effects.

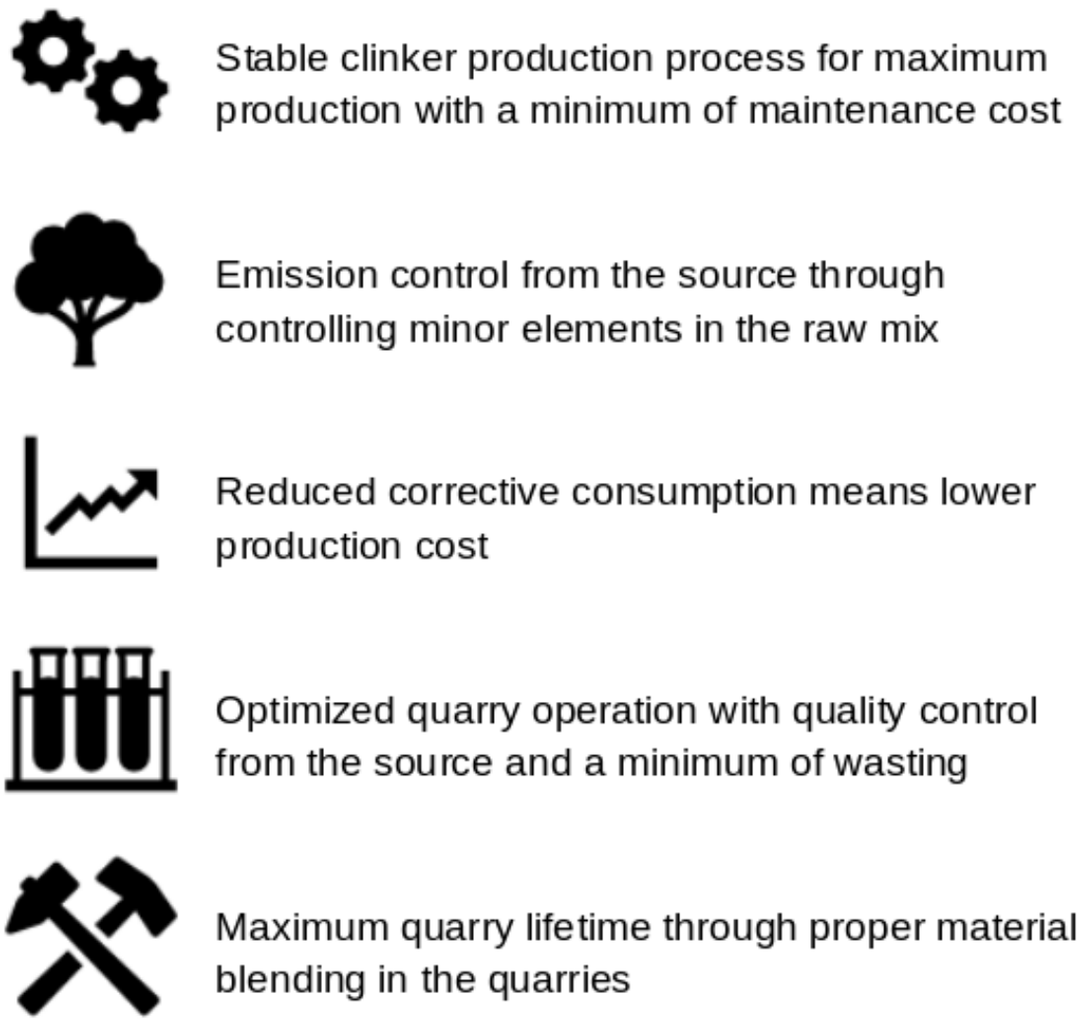

Figure 7 benefits of block model-based scheduling

The new AthosGEO can support your efforts in that direction, but the key to make it happen is not a software, but it's always you and your team! Using the block model for a deeper understanding of the characteristics of your deposit and its potentials is already a first benefit because it means a major change in mindset: miners will stop mining rocks and start mining quality instead. Which may finally trigger a new and better way of working together between plant and quarries – far beyond blaming each other for shortcomings.

The immediate financial benefit depends on the situation. During our careers in Holcim the top saving estimated amounted to 4 Mio. US$, and in a short time over 1 Mio US$ has been achieved. Which is a rather quick payback for the planning efforts (the major drilling campaign was not included) – and is only one of the positive aspects! The gain in quarry lifetime, often less emphasized by the managers because mostly not affecting short term benefits, should not be underestimated: end of quarry lifetime is often also the end of plant production if additional resources cannot be obtained (land, permits etc.).

Finally, do not forget the relative benefit for your surrounding and environment – by reducing emissions and consuming less of the valuable non-renewable natural resources (rocks).

[3]For more information, see https://cobo.bockemuehl.ch.

Powering Saudi Arabia's Construction Boom

Ashraf Al Natsheh, Senior Sales Director for Power Plants at Saudi Arabia MAN Diesel & Turbo – now MAN Energy Solutions – talks to the Arab Union for Cement and Materials magazine about the challenges facing the Kingdom of Saudi Arabia as it transforms its economy and builds infrastructure.

How is Saudi Arabia's construction landscape evolving?

Six major economic cities are currently being developed across the Kingdom at a cost of more than US$60 billion. They already require massive energy resources and the new projects will drive up electricity demand to an estimated 67,000 MW of installed capacity by 2020. Exponential growth in capacity and grid auxiliary services is needed to support the needs for reliable energy of the multi-billion-dollar projects materializing across the country.

Growth will be facilitated by the development of industrial cities and free trade zones, as well as an increasing emphasis on improving the business and investment climate both for local and foreign investors and the use of joint ventures.

Extensive industrial development across Saudi Arabia is set to increase the Kingdom's total power production capacity to more than 120 GW by 2030. Furthermore, the drive for low-carbon power, such as nuclear and solar capacity, is sparking a transformation across the region.

Developments that have already begun in Saudi Arabia, Iraq and the UAE are expected to continue through to 2030, making the decade 2020-2030 good years for the construction sector.

What specific challenges does Saudi Arabia face in realising its development ambitions?

Almost half of Saudi Arabia's population is under 25 years of age but unemployment in that demographic stands at 12%. Furthermore, increased oil exports from Russia and the United States could see Saudi Arabia lose its dominant market share.

Vigorous construction activity - particularly around the regions of Mecca and Medina – has also fuelled raw material shortages and inflation in essential construction materials, such as cement.

However, Saudi Arabia is likely to continue with further measures for developing its industrial sectors at a moderate pace, mainly through further leveraging its natural advantages of cheap energy, plentiful capital, and a prime geographic location between Asia and Europe.

While oil remains the backbone of the Saudi economy, the government considers the country's real wealth to lie in the ambition of its human resources and the potential of the younger generation.

The strategic vision of Saudi Arabia is organized into three main pillars: a vibrant society, a thriving economy and an ambitious nation.

How will the Vision 2030 program influence Saudi Arabia's infrastructure development?

The Kingdom's ambitious reform program, called Vision 2030, aims to diversify the economy, increase energy prices and improve energy efficiency. Without such a transformation, the Kingdom will remain vulnerable to swings in international energy markets.

The industrial sector is the largest and fastest growing source of energy demand in the Kingdom, comprising around 54% of total final energy consumption. It is here that some of the biggest gains from energy efficiency can be made, for example in the petrochemical sector. Energy efficiency benchmarking is currently being carried out for around 180 plants in Saudi Arabia's most significant energy-consuming industrial sectors - petrochemicals, cement and steel.

Aspirational goals have been negotiated for 2019 and overall these are expected to achieve a reduction of around 9% in total energy consumption compared with a 2011 baseline.

Under the terms of the Paris Accord on Climate Change, Saudi Arabia also plans to avoid 130 million tonnes of CO_2 equivalents per year by 2030. Diversification, energy efficiency and renewable energy will contribute significantly to achieving this target.

Infrastructure is the backbone of the Saudi economic strategy, what does that mean for national energy sector development?

A cornerstone of the transformation of the Saudi economy is developing and improving infrastructure. Last year the country began construction of new industrial cities with a clear focus on rapidly expanding the country's industrial infrastructure.

The Saudi infrastructure boom has helped to fuel an increased demand for concrete, construction chemicals and other building materials. In addition to new fossil fuel and renewable energy projects, the country is also seriously considering its first nuclear power plant. Education and health care also figure prominently in the Saudi infrastructure development program as key corollaries of the Kingdom's drive to diversify its economy, enhance competitiveness and address the rapid increase in population.

Two additional drivers behind the ambitious Saudi infrastructure development program are the recent increase in oil revenue and the global recession. Saudi Arabia has accelerated its spending on infrastructure development projects to take advantage of lower costs of steel and other building materials and significantly higher oil revenues.

The convergence of these factors, coupled with the overall diversification and modernization efforts,

presents very real opportunities for a range of investors and businesses, for example, the recent 40 MW power plant installation at the Arabian Cement Company (ACC).

How do MAN Energy Solutions support Saudi Arabian cement and construction industries?

Transferring 250 years of advanced engineering experience to our MEA partners and creating solutions for sustainable prosperity, the first MAN engine arrived in Saudi Arabia in the 1950s destined for the Saudi Cement company. To date more than 600 MW has been installed for the Kingdom's cement sector alone.

Key partners in the industry include the Yanbu Cement Company which has had more than 175 MW of MAN equipment installed since 1978. The United Cement Company has more than 50 MW already in operation and Yamama Cement now has more than 40 MW of MAN equipment under commission, with many more phases planned over the coming years.

To date, more than 1.4 GW of MAN equipment has been installed nationwide and about 26 skilled engineers are based at our offices in Jeddah and Riyadh. This is in addition to around 40 qualified O&M service staff in Saudi Arabia alone.

Reflecting the diverse industries and applications for our equipment in Saudi Arabia, the wider MEA region and elsewhere, the transition of the energy world to decarbonisation, and the various energy solutions in our portfolio - we have recently changed our name from MAN Diesel & Turbo to MAN Energy Solutions.

How are the latest energy technologies improving the economics of Saudi Arabian industry?

With the challenging ambient conditions, many Saudi Arabian industrial and commercial interests are looking for power units which can deliver 18-23 MW at site conditions of 50°C.

For example, our 18V48/60TS engines are installed at Arabian Cement sites and are able to support the variable loads required by the cement industry.

Our newest platform, the 45/60, has an output of more than 25 MW and does not require derating even at extreme temperatures. Irrespective of site conditions, cement customers also require the highest efficiencies. In combination with batteries and PV elements the dynamics, efficiency and CO_2 reduction of engine power plants can be increased even further.

Energy grids with a growing percentage of renewable energy systems require energy storage and stabilizing elements to balance the volatile energy production from photovoltaic power plants, for example.

With its energy storage and hybrid power systems, MAN provides solutions needed for the new energy world.

Furthermore, the flexibility required by industrial concerns like cement producers is well suited to MAN solutions. For example, Saudi Arabia is currently extending its gas transmission network. With the completion of the program still at least four or five years away, industries are able to run their plant on heavy fuel oil (HFO) before swit ching to gas as supplies become available.

The sheer volume and range of infrastructure projects under development or planned in Saudi Arabia alone would be enough to make it one of the most interesting markets anywhere. However, when coupled with WTO accession, modernization, plans for further privatisation and a committed drive to economic diversification, Saudi Arabia presents a real and immediate opportunity for flexible and efficient energy equipment.

Biography: Ashraf Al Natsheh

Responsible for building customer relationships within the middle east region Al Natsheh supports the MAN project execution teams right up to customer handover.

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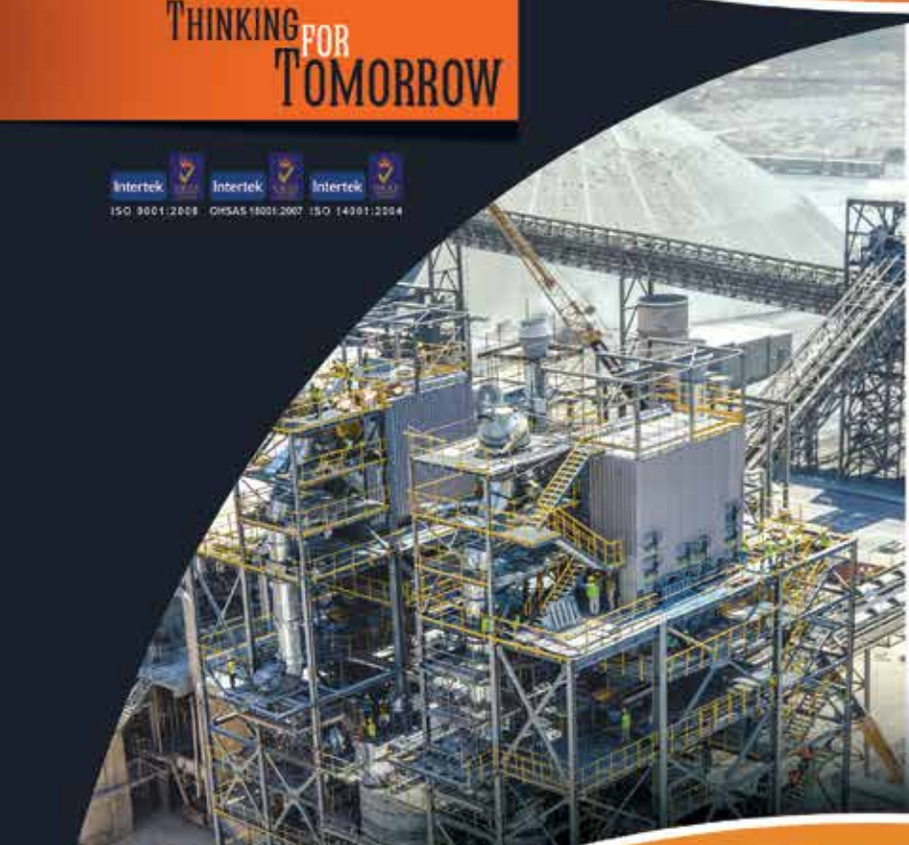

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INTERMAINT Group

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Brief

International Company for Construction and Special Maintenance (INTERMAINT) was established in 2003 by the best referenced expertise of 18 years Working with Japanese ideology which proved a great success in the Egyptian market.

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

Intermaint/Alfran partnership was formed to add alfran Total Refractory Solution's history of success in the total refractory systems all over the world to our different services inside Egypt.

Fabrication

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

Erection

- Our way to success is short time and high quality performance.
- for new or existing project we can do : -
- Installation of Electromechanical Equipments and Piping as a total services.
- Installation of insulation works.
- Refractory services.

Maintenance

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

VEZ 3200 from Vecoplan: Single-shaft pre-shredder with high throughput capacity

The VEZ 3200 is suitable for the manufacture of refuse-derived fuels from production and sorting waste, packaging material and the high-calorific fraction of domestic and commercial waste.

Compact. Robust. Powerful and extraordinarily efficient. With the VEZ 3200 (Vecoplan refuse-derived fuel shredder), the environmental technology company has developed a powerful single-shaft pre-shredder with high throughput capacity. It is ideally suited for the manufacture of refuse-derived fuels from production and sorting waste, packaging material and the high-calorific fraction of domestic and commercial waste for use as an energy source in cement works and power stations.

The VEZ 3200 is equipped with the latest Vecoplan technology and combines 50 years of experience in shredding technology with the latest know-how in its machine housing. The VEZ 3200 was designed on the basis of the successful VEZ 2500 TV with the objective of developing an even more robust, more powerful and more economic component. All areas which are subject to particularly high forces and loadings in the shredding process have been specifically reinforced.

Along with this reinforcement and the more compact external dimensions, a lower loading edge has been incorporated to simplify feeding of the machine by wheel loaders and stacker trucks. This enables the customer to dispense with additional conveyor equipment for feeding the machine. The provision of input material – in particular larger bales – is no problem thanks to the increased internal volume of the VEZ 3200. Bales with an edge length of 1,200 mm can be fed directly to this powerhouse. With infinitely adjustable pusher speed, the improved curved pusher, which is matched to the wide variety of input material, ensures optimum shredding, even with heavy or very light input materials. A further new feature of the machine is that, thanks to the enclosed design, none of the hazard points on the outside of the machine are accessible, and sensors and all pipes for the different media are protected against severe contamination, falling input material and other external mechanical effects.

The Vecoplan refuse-derived fuel shredder can be set up in different ways: as a pre-shredder for producing sortable and conveyable material for the manufacture of refuse-derived fuel from production waste for the production of particle sizes <250 mm, and as a single-stage shredder for producing particle sizes of up to <50 mm. The high-performance cutter is distinguished by the production of a uniform particle structure, maximum throughput capacity and reduced heat development for energy-saving shredding.

The rotor cutters consist of hardened individual knives which can be used up to 4 times and can be quickly replaced thanks to the V-shaped centring seat. This also minimises wear and operating costs.

35-tonne powerhouse with solid steel rotor

The counter knives consist of several individual segments which can be used up to 4 times and can be individually adjusted from the outside. This guarantees an optimum cutting gap, thus reducing the heat developed and the energy required during the shredding process to a minimum. The flanged shaft ends enable the rotor to be changed quickly without removing bearings and drive, thus reducing maintenance costs and increasing availability.

The VEZ 3200 is fitted with the HiTorc® drive unit. This revolutionary gearless drive with speed-controllable high-torque motor is virtually maintenance-free and generates little noise. Equipped with the latest frequency converter technology, starting currents, efficiency and torque are all optimised.

Current peaks can be adjusted and limited, thus achieving significantly lower electricity costs compared with conventional drives. The very high torque, which is available over the whole speed range, enables trouble-free starting under load, and reversing in the case of overload is highly dynamic.

The virtually maintenance free HiTorc® synchronous motor with 155 kW replaces maintenance-intensive drive elements such as belt drives, fluid couplings, slipping clutches and/or gearboxes. Particularly in the energy-intensive preparation of RDF, when using the HiTorc® drive, operators very soon notice the energy saving of up to 60% compared with conventional drives.

Photo 1: With the VEZ 3200, Vecoplan has developed a powerful single-shaft pre-shredder with high throughput capacity.

Vecoplan® AG is a leading manufacturer of machines and systems for the resources and recycling industry for shredding, conveying and reprocessing wood, biomass, plastics, paper and other recyclable materials such as domestic and industrial waste. Vecoplan® develops and manufactures the systems and components, and sells them worldwide in the wood reprocessing and waste processing industries. It currently has around 380 employees at its locations in Germany, the USA, Great Britain and Spain.

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Photo 2: With infinitely adjustable pusher speed, the improved curved pusher ensures optimum shredding, even with heavy or very light input materials.

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WHITE NIGHTS

A MEETING NOT TO BE MISSED!

Measure true power consumption with the new VPInstruments 3 Phase Power Meter!

VPInstruments, manufacturer of leading flow metering equipment for easy insight into energy flows, introduces the highly accurate 3 Phase Power Meter. This newest addition to the portfolio measures true power, as it measures the voltage and current of all three phases. It provides power, voltage, current, cos(phi) and many more electrical parameters. All of these are communicated via the RS485 (Modbus RTU) interface. VPInstruments 3 Phase Power Meter is the recommended power meter for permanent measurements.

Versatile and complete

The 3 Phase Power Meter comes in different voltage ranges to fit your specific measurement applications. Models are available for single- and three phase configurations. The 0.333 VAC CT inputs enable connection to universal current transformers. Or just rely on VPInstruments Current Transformers to complete the power measurement solution.

Applications:

- Power consumption of compressors
- General purpose power measurement
- Electricity sub metering
- Pumps, Ventilators, and many more.

Specifications:

- Measures up to three phases
- +/- 0.5% accuracy
- RS485 (Modbus RTU) output
- Delta or Wye types available
- For permanent installation

Monitor compressor performance and efficiency

In most production plants, the compressed air system consumes between 10 and 25 percent of all electricity. Monitoring the efficiency of your compressed air equipment is key to realizing energy savings. By combining the 3 Phase Power Meter with a VPFlowScope DP flow meter, which has been installed at the discharge of the compressor, you can monitor the performance and efficiency of the compressor. Monitoring compressor performance continuously enables you to see changes in efficiency which may be due to clogged inlet filters, cooling problems, malfunctioning drains and other maintenance issues.

The expansion of the product portfolio with this great power meter, shows VPInstruments' insight in providing the complete monitoring solution for compressed air and industrial gases.

About VPInstruments

VPInstruments offers industrial customers easy insight into energy flows. We believe that industrial energy monitoring should be easy and effortless, to enable insight, savings and optimization. VPInstruments products are recommended by leading energy professionals worldwide and offer the most complete measurement solution for compressed air flow, gas flow and electric energy consumption. Our monitoring software VPVision can be used for all utilities, and enables you to see where, when and how much you can save. Our products can be found all over the world. We serve all industrial markets, for example; automotive, glass manufacturing, metal processing, food and beverage and consumer goods. We can also help your industry. Let us open your eyes and start saving energy.

For more information, contact:

VPInstruments
Joyce van Eijk - joyce.van.eijk@vpinstruments.com
Buitenwatersloot 335, 2614 GS Delft
Tel. +31 (0)15 213 1580
Internet: www.vpinstruments.com

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BEDESCHI product range covers a wide variety of equipment for Heavy Clay Industry, Bulk Materials Handling, Marine Logistics and Mining.

BEDESCHI services range from feasibility studies and basic engineering to complete green field, turn key installations. All design activities are performed in house in BEDESCHI technical centers in Italy and United States, while all manufacturing is carried out in the Company state-of-art workshop in Italy.

BEDESCHI has followed this way of operation for more than 100 years, resulting in complete quality control and the highest product reliability.

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BULK HANDLING · CRUSHING · MARINE · CONTAINER LOGISTICS · GAS CLEANING · BRICKS

Schenck Process releases the world's highest capacity weighbeam

Direct weighing technology – for accurate weighing results with minimum effort.

Schenck Process, the global market leader in measuring and process technology solutions, is proud to announce the latest generation of its SENSiQ® WB weighbeam technology.

For more than 30 years Schenck Process weighbeams, now all branded SENSiQ® WB, have been the standard for tough weighing tasks, especially in the heavy duty and harsh environment of steel production.

The latest release from Schenck Process is the world's highest capacity loadcell with a nominal capacity of 600 metric tonnes for installation by simple bolting into the given steel structure. This makes it ideal for hopper scales with a total weight of up to 2,500 tonnes as well as for hoppers in train loading systems.

Furthermore, the latest SENSiQ® WB development is characterized by the following improved technical features:

- expanded operating temperature range between -40° C and 180° C
- high accuracy, which has always been a key benefit of the SENSiQ® loadcell generation, has been further improved to an error of +0.07% across the entire load range
- all loadcells of the SENSiQ® WB fulfil IP68 requirements according to ANSI/IEC 60529.

Schenck Process customers love the simple and cost-effective installation of these SENSiQ® WB weighbeams. They connect directly inside the given structure without moving parts and transmit all disturbance forces and moments with minimal measuring value interference. Plus, SENSiQ® WB weighbeams function entirely maintenance-free in the harshest conditions, offering high long-term stability and high reproducibility.

Typical applications are ladle turret, ladle transfer car, scrap basket, roller table and tundish car scales as well as silo and hopper weighers.

The full SENSiQ® WB range now includes 11,5 t, 15 t, 25 t, 40 t, 50 t, 100 t, 150 t, 200 t and 600 t rated capacity types.

About Schenck Process

Schenck Process is the global technology and market leader in applied measuring technology. We make processes work in all areas of industry throughout the world. For us that means improving our customer processes in terms of reliability, efficiency, and accuracy. Combining outstanding equipment and extensive process knowledge, we develop and manufacture innovative solutions for weighing, feeding, conveying, screening, automation, and air filtration applications. We focus on the needs of our customers and support them through the whole lifecycle of a product. For more information, visit schenckprocess.com

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Flow Weigher DC3 – Compact weighing system for recording of quantities and flow rate of grain

The company FRIEDRICH electronic developed the new weighing system Flow Weigher DC3. It is applied to continuously measure flow capacity and total weight of flowable bulk.

The Flow Weigher DC3 is the successor model for the long-standing model type Vertical Pipe Weigher DCG. Several advantages and developments have been implemented, which are introduced below.

By an optimized product conveyance inside the weighing unit, the bulk is lead into the sensing pipe more accurately and carefully. The system has a wider tolerance against different product types, so the effort to calibrate is reduced. Weighing results and reproducibility with varying product specifications are improved.

Furthermore the suspension of the deflection plate has a new design, which strongly stabilizes the zero point behavior. It increases the robustness against exterior influences. Additionally the device was constructed maintenance-friendly, e.g. exchange of load cell is substantially simplified.

Another advantage of the new construction is the enhanced grade purity. The product flows unresistedly out of the housing, avoiding any product residues.

Due to its low installation height, the system can easily be integrated under narrow spatial conditions. The installation is simple, since the connections can be assembled with regular clamping rings. Standard feed is with 45° inclination, but it can also be implemented under 0° alignment using special feed deflectors. Through this arrangement, system can be installed in vertical conveying pipes.

In case of abrasive bulk or high throughput rates, product conveying parts can easily be equipped with low-wear protection sheets, which stretch life cycle time.

The new DC3 weighing system is also integrated in the Automatic Dampening System NC8, providing highly reliable measuring results to calculate water dosing amounts.

All common cereals, animal feed, granules, pellets, but also bruised grains and various grinded products can be applied for weighing. The system is also suited for the application with seeds and can optionally be supplied in stainless steel qualities (AISI 304 / AISI 316).

In summary, the Flow Weigher DC3 – being considered as successor model to the Vertical Pipe Weigher – comes with many improvements which derive from practical field experiences of recent years. These improvements enhance the system to provide practicable, accurate, reliable, robust and easy-to-handle services. The Flow Weigher DC3 marks an important milestone for the weighing equipment of the company FRIEDRICH electronic and comes as an essential element of product modernization in the company portfolio. Further innovations will follow in the near future.

For further information please visit our website **www.friedrich-electronic.com.**

Fig.: The new DC3 weighing system is the improved successor model of the renowned Vertical Pipe Weigher, which was also developed by FRIEDRICH electronic.

Global Cement Events 2019

For details, please visit each event's web site.

4th global cempower

22-23 January 2019,
London, UK
cempower.com

The 4th Global CemPower Conference and Exhibition will take place in London once again, and will cover waste heat recovery, captive power generation (including solar and wind, and energy storage), grinding optimisation and electrical energy efficiency. ***If you want to reduce your cement plant's electrical energy bills, or can help companies in the cement industry to save electrical energy, then you should attend!***

13th global cemfuels

20-21 February 2019,
Amsterdam, Netherlands
cemfuels.com

The popular Global CemFuels Conference and Exhibition will visit Amsterdam for the first time in 2019 and is expected to attract one of its largest-ever audiences from around the world. The event will showcase the state-of-the-art in handling, processing and firing all types of conventional and alternative fuels for cement (and lime) production. ***If you produce or use fuels and alternative fuels in the cement and lime industry, then you should attend!***

2nd global cemtrans

14-15 March 2019,
Brussels, Belgium
cem-trans.com

The 2nd Global CemTrans Conference and Exhibition on trade, freight, markets, flyash and GBFS, cement and clinker transport and logistics will take place in Brussels in March 2019. The event - which follows on from the previous CemTrader and CemTrans conferences - will see producers, shippers, traders and buyers from around the world in attendance. ***If you are involved in the trade and transport of raw materials, clinker or cement, then you should attend!***

14th global slag

3-4 April 2019,
Aachen, Germany
globalslag.com

The 14th Global Slag Conference and Exhibition will take place in Aachen, in the heart of Europe's iron-, steel- and slag-producing areas. Slag producers and users are expected to attend from throughout Europe and from the rest of the world: Slag products have the potential to be profitable for both the iron and steel industry and also for the cement, concrete and construction products industries. ***If your business is in slag, then you should attend!***

2nd global futurecem

22-23 May 2019,
Brussels, Belgium
futurecem.com

The 2nd Global FutureCem Conference and Exhibition will take place in May 2019, looking at how the global cement and concrete industry can adapt to a high-carbon-price, low- or no-carbon future. In addition to equipping delegates with the latest information, news and developments, the networking opportunities will once again be excellent. ***If you want to reduce your company's CO_2 footprint (and its future CO_2 bill), then you should attend!***

The new high-tech standard for Variable Speed Rotor Mills!

Efficient pre- and fine grinding in one instrument with impact or cutting rotor!

Variable Speed Rotor Mill
PULVERISETTE 14 *premium line*

The FRITSCH **Variable Speed Rotor Mill PULVERISETTE 14 *premium line*** offers impact, shearing and cutting comminution in one instrument – with a higher performance, better cooling and significantly quieter than comparable instruments. Its powerful motor is ideal for the particularly fast comminution of soft to medium-hard, brittle as well as fibrous materials and temperature-sensitive samples with an extremely fast sample throughput of up to 15 litres and more per hour, depending on the material and parameter settings.

Overview of the features:

- Powerful grinding with 22,000 rpm for particularly fast sample throughput
- Max. feed size < 15 mm, sample throughput of up to 15 l/h and more
- AutoLOCK grinding chamber for particularly safe work
- Final fineness down to d_{50} < 40 µm, sieve rings 0.08 – 6 mm
- Particularly good cooling of the grinding material
- Pleasantly quiet operation
- Very easy to clean due to Clean Design

Especially powerful

A high-speed motor with ceramic bearings ensures a particularly high impact and rotor speed with an extra powerful 22,000 rpm.

Your advantage: finer results in shorter times.

Significantly better cooling

The new PULVERISETTE 14 *premium line* cools your sample during grinding significantly better than comparable instruments.

Your advantage: melting or sticking of the grinding material is greatly reduced, even with temperature-sensitive samples.

AutoLOCK grinding chamber
enables incredibly safe operation

Incredibly safe operation

The new AutoLOCK grinding chamber facilitates automatic opening and closing with clamping and crushing protection. The additional Intelligence-Safety-Control-

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You need to know what is happening in the global cement industry. Right now. Your competitive advantage demands it.

CemWeek must be your information and market intelligence source. *CemWeek.com – knowledge delivered.*

CemWeek's online news and knowledge platform for the global cement industry identifies and researches key industry events and uncover hard-to-find news from around the world. CemWeek regularly speaks to cement sector experts to provide a continuous flow of insights and analysis.

- **Daily news:** The cement industry's leading news service, offering detailed and insightful articles put together by our global team of writers covering more markets and more news than any other industry source.
- **Proprietary intelligence:** Interviews with cement industry thought-leaders and experts, including CEOs, executives, analysts and consultants through the *CemExec* feature series.
- **Market research:** High-quality research reports, including detailed market studies, competitive assessments, cement trade flows, and export opportunity assessments, among many others. Custom research available upon request.
- **Data services:** Statistical and data research tools offering industry practitioners a wealth of cement supply and demand data.

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System only allows the instrument to start if the grinding set is fully and correctly inserted.

Fast, residue-free cleaning

The well-conceived Clean Design covers all the areas, which make the cleaning of your mill as easy as possible: All the surfaces are designed to be extremely dirt-resistant and easy to clean. And all the parts that need regular cleaning can be removed with a single motion without tools. Even the lid of the instrument can be easily removed for cleaning.

Well-conceived Clean Design for especially easy cleaning

Two instruments in one

Turn your Variable Speed Rotor Mill PULVERISETTE 14 *premium line* into a Cutting Mill with just a few simple motions for fast, efficient pre-grinding of fibrous materials and plastics – in an optimised mode with up to 10,000 rpm. Absolutely multifunctional with the choice of grinding with an impact or cutting rotor!

The special features of the **FRITSCH Variable Speed Rotor Mill PULVERISETTE 14 *premium line*** and how it works – please have a look: **www.youtube.com/embed/Rn3nWGQD9mM?rel=0**

Up-dated information on the FRITSCH Rotor Mills for efficient sample .preparation at www.fritsch-international.com/rotor-mills

contact: FRITSCH GmbH • Milling and Sizing

Selina Krieger
Industriestrasse 8 • 55743 Idar-Oberstein • Germany
Phone +49 67 84 70 155 • Fax 0 67 84 70 11
E-Mail: krieger@fritsch.de • Internet: www.fritsch.de

The Sacmi ATM: 50 years old and going strong

Half a century of honourable service for the ATM35 installed at Marazzi.
And nowadays spray dryers are more than mere machines; they're plants within the plant that ensure flexibility, low consumption, reliability and 'smart factory' capability.

The Sacmi ATM? First built way back in '68. Now, in 2018, the ATM35 machine installed at the Marazzi factory in Fiorano Modenese is celebrating its fiftieth anniversary of honourable service and is still going strong!

Up until the 1990s, Sacmi developed a vast range of spray driers using proprietary designs (from the centrifugal distributor to the ring-mounted nozzle array), machines renowned for their reliability. Today, thanks to in-depth innovation that focuses on flexibility, low consumption, reliability and process simulation, Sacmi is projecting that reliability into the smart manufacturing era.

This revolution is rooted in the first few years of the 21st century, when the advent of new calculation tools allowed engineers to exploit the full potential of process simulation and design less energy-hungry machines of outstanding reliability and compactness. Now, because they can be integrated with slip injection, combustion and cogeneration/energy recovery systems, spray-drying units are seen more and more as a "plant within the plant".

Research into in-tower particle speeds and temperature distribution, optimisation of air flows and greater flexibility throughout the process (the Sacmi ATM can work continuously or be used to produce small lots, with multiple stoppages in a single day having no impact on machine lifespan) have all generated advantages, as has the ability to use different combustion and slip injection systems. These are just some of the "revolutions" that, by maintaining the Sacmi tradition of reliability – as the still perfectly-working machine at Marazzi clearly demonstrates – will secure the future success of the ATM, over 1,400 of which have been sold worldwide.

Modern ATMs are also characterised by ever-greater integration with energy retrieval/electricity generation systems, cutting-edge exhaust air dust removal devices and new slip injection systems: just some of the systems that allow a drastic reduction in spray dryer running costs. Further developments are in the pipeline; these typically focus on micro-simulation of the interaction between slip spray and hot air (the goal being to make the process even more efficient) and the possibility (as standard throughout the Sacmi range) of interfacing with plant supervisors according to 4.0 logic.

SIEMENS

Siship BlueDrive: Scalable electric drive for reduced emissions

- Scalable uniform-topology power supply and drive solutions
- Customized configuration based on practically tested, standardized components such as Sinamics
- High level of resilience, availability and service friendliness
- Up to zero emissions depending on drive configuration

Siemens is expanding its portfolio of green ship propulsion systems by adding a new member to the Siship BlueDrive Family: Siship BlueDrive Eco. Besides by integrating battery systems produced in-house, the company is now able to offer a scalable and flexible solution to cover every propulsion requirement, with different power graduations for small to medium-sized propulsion systems from 5 kilowatts (kW) in auxiliary mode up to 5.5 megawatts (MW) for the main drive – from Siship BlueDrive Eco through to Siship BlueDrive PlusC. The solutions can be configured to individual customer specifications and are based on practically tested standardized components such as Sinamics converters. With its Siship BlueDrive, Siemens provides an efficient, environmentally friendly propulsion solution providing a high level of reliability, availability and service friendliness, with emissions down as low as zero depending on the drive configuration.

The Siship BlueDrive topology is based on DC technology and offers a wide range of benefits such as continuously reliable operation, a leaner design due to fewer components, an extended life cycle and fuel savings.

The regulations and requirements surrounding green propulsion systems for use on inland and coastal waterway transportation are growing ever more stringent, forcing the shipbuilding industry to rethink its approach. While new drive solutions are required to produce only minimal emissions, they also have to be economical for the operating companies. With its Siship BlueDrive, Siemens provides an integrated solution to address the whole range of drive requirements from 5 kW to 5.5 MW, produced in compliance with the technical regulations governing the maritime industry and certified by the major marine classification societies such as DNV GL. The solutions offered by the Siship BlueDrive Family are designed to be used in ship types which can be diesel-electric, hybrid or fully electrically powered such as ferries, yachts, cruise liners and work boats or research vessels.

Tested and proven in practice

Siemens has already equipped countless ships with power supply and drive solutions based on DC technology such as the Siship BlueDrive Family. Successfully completed projects include the passenger ship MS Diamant in Switzerland, the HADAG harbor ferry in Hamburg, and the Ampere, the world's first fully electric ferry in Norway. Siemens will be exhibiting its integrated uniform-topology solutions for the (partial) electrification of ships at this year's SMM, the international lead fair serving the maritime industry. As well as presenting the new functional features of Siship BlueDrive, the company will also be unveiling its own internally produced battery system at the show.

For further information on Siship, please see
www.siemens.com/siship

For further information on Siemens at SMM 2018, please see
www.siemens.com/press/smm18

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Siemens AG (Berlin and Munich) is a global technology powerhouse that has stood for engineering excellence, innovation, quality, reliability and internationality for 170 years. The company is active around the globe, focusing on the areas of electrification, automation and digitalization. One of the world's largest producers of energy-efficient, resource-saving technologies, Siemens is a leading supplier of efficient power generation and power transmission solutions and a pioneer in infrastructure solutions as well as automation, drive and software solutions for industry. With its publicly listed subsidiary Siemens Healthineers AG, the company is also a leading provider of medical imaging equipment – such as computed tomography and magnetic resonance imaging systems – and a leader in laboratory diagnostics as well as clinical IT. In fiscal 2017, which ended on September 30, 2017, Siemens generated revenue of €83.0 billion and net income of €6.2 billion. At the end of September 2017, the company had around 377,000 employees worldwide. Further information is available on the Internet at www.siemens.com.

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

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

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

Cement and its Applications, Journal
22 A Zvenigorodskaja Str. No 438
St. Petersburg, 191119, Russia

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SIEMENS

A utility grade Power-over-Ethernet supporting switch to handle growing amounts of data

- High bandwidth to handle growing amounts of data
- Ideal for applications with the need for PoE++ in harsh environments
- Support for Ruggedcom CLP for easier in-field setup

Siemens is expanding its Ruggedcom portfolio with a new Ethernet 19 inch rack switch with Power-over-Ethernet support. Its high port density with up to 24 Power-over-Ethernet ports helps significantly reduce capital expenses by reducing the number of network devices needed. The RST2228P offers Power-over-Ethernet, precision timing and network communication on a single network, helping to reduce maintenance costs related to timing or power solutions that require dedicated wiring. The CLP interface port allows for easy replacement of devices in the field using the Ruggedcom CLP removable media to automatically apply the failed device's configuration to a replacement unit in the unlikely event of a failure. The device is rugged rated and features an operating temperature from -40 to +85 degrees Celsius, as well as electromagnetic interference (EMI) immunity. The product can be used in the harsh environments of Electric Power, Transportation and Oil & Gas industries and is ideal to handle ever growing amounts of data.

The Ruggedcom RST2228P is a rugged Layer 2 rack switch with 4 integrated 1/10 Gbit/s uplinks and up to 24 field modular 10/100/1000 Mbit/s interfaces supporting IEEE 1588 Transparent Clock and Power-over-Ethernet according to IEEE 802.3bt (draft). The Ruggedcom RST2228P comes with Power-over-Ethernet support for up to 24 devices with a combined power of 500 Watts with a maximum of 60 Watts per port. The product can be ordered pre-configured with modules installed, but also allows for quick in field setup and modifications with the separately orderable media modules: Ruggedcom RMM2973-4RJ45, RMM2973-4FC, RMM297304POE, RMM297304PFC, RMM2972-4SFP and RMM2942-4LD2 – to enable simplified migration from copper to fiber optic networks (one of the major challenges of digitalization). Further savings can be found by purchasing only the necessary modules for the RST2228P to meet the immediate need.

Siemens is expanding its Ruggedcom portfolio with a new Ethernet 19 inch rack switch with Power-over-Ethernet support. Its high port density with up to 24 Power-over-Ethernet ports helps significantly reduce capital expenses by reducing the number of network devices needed.

For further information, refer to www.siemens.com/rst2228p

DIARY DATES

CEMENT

MixBuild 2018
20th International Conference
"Modern Technologies of Drymix Mortars in Construction – MixBuild"
Date : 28 - 30 November 2018
Venue: Moscow, Russia
Email: events@alitinform.ru
For more information, please visit:
www.dry-mix.ru/eng

5th International Conference
"Precast Housing: Production. Design. Construction"
Date : 28 - 30 November 2018
Venue: Moscow, Russia
Email: events@alitinform.ru
For more information, please visit:
www.con-tech.ru/eng

Loesche Technical Seminar
Date : 04 December 2018
Venue: Duesseldorf, Germany
Email: trainingcenter@loesche.de
For more information, please visit:
www.loesche.com

INTERCEM Shipping Forum
Date : 21 - 22 January 2019
Venue: Rome, Italy
For more information, please visit:
www.intercem.com

4th Global Cempower
Date : 22 - 23 January 2019
Venue: London, UK
For more information, please visit:
www.cempower.com

Argus Middle East Petroleum Coke
Date : 23 - 24 January 2019
Venue: Abu Dhabi, UAE
Email: me.events@argusmedia.com

Cemtech Middle East & Africa 2019
Date: 18 - 20 February 2019
Venue: Dubai, UAE
Tel.: +44 1306 740 363
Fax: +44 1306 740 660
Email: info@cemtech.com
www.Cemtech.com/MEA2019

13th Global CemFuels
Date : 20 - 21 February 2019
Venue: Amsterdam, Netherlands
For more information, please visit:
www.cemfuels.com

INTERCEM Dubai
Date : 4 - 6 March 2019
Venue: Dubai, UAE
For more information, please visit:
www.intercem.com

2nd Global Cemtrans
Date : 14 - 15 March 2019
Venue: Brussels, Belgium
For more information, please visit:
www.cem-trans.com

14th Global Slag
Date : 3 - 4 April 2019
Venue: Aachen, Germany
For more information, please visit:
www.globalslag.com

BusinessCem Moscow 2019
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THE CEMENT INDUSTRY & THE MARKET
Date : 15 - 17 April 2019
Venue: Moscow, Russia
For more information, please contact:
Tel. +7 495 9774968
Fax: +7 495 977 4495
Email: valev@businesscem.msk.ru
http://businesscem.ru

2nd Global FutureCem
Date : 22 - 23 May 2019
Venue: Brussels, Belgium
For more information, please visit:
www.futurecem.com

White Nights: V International Cement Business Conference
Date : 29 - 31 May 2019
Venue: Grand Hotel Europe, St. Petersburg, Russia
For more information please visit:
www.white-nights.info

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

15th TÇMB International Technical Seminar & Exhibition
Date : 08 - 11 October 2019
Venue: Kaya Plazzo Golf Resort, Belek, Antalya, Turkey
For more information, please contact Turkish Cement Manufactures' Association
Email: tekniks@tcma.org.tr

GENERAL

15th Arab International Mineral Resources Conference
Date : 26 - 28 November 2018
Venue: Cairo, Egypt
For more information, please contact:
Mineral Resources Direction - Arab Industrial Development and Mining Organization
Tel: +212 537274500
Fax: +212 537772188
Email: oadim.mining@gmail.com
www.aidmo.org

Argus LPG and Petrochemical Feedstocks 2018
Date : 27 - 28 November 2018
Venue: Shanghai, China
Tel : + 65 6496 9926
Email: asiaconferences@argusmedia.com

Bauma China 2018
Date : 27 - 30 November 2018
Venue: Shanghai, China
For more information, please visit:
www.bauma-china.com

PropTech Conference
Date : 28 - 29 November 2018
Venue: Kuala Lumpur, Malaysia
For more information, please contact:
Trueventus
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Maintenance Analytics
Projecting greater asset performance with forefront analytics
Date : 28 - 29 November 2018
Venue: Kuala Lumpur, Malaysia
For more information, please contact:
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Email: stevej@strategictruconferences.com / johnk@trueventus.com

2018 European Base Oils and Lubricants Interactive Summit
Date : 28 - 29 November 2018
Venue: Florence, Italy
For more information, please contact:
Mr. Bo Gordon
Tel: +44 0203 141 0635
Email: bgordon@acieu.net

9th BUILDINT 2018 Tanzania Trade Show International Building & Construction Exhibition
Date : 01 - 03 December 2018
Venue: Dar Es Salaam, Tanzania
Email: Melanie@tradetalk.info
For more information please visit:
www.buildinttanzania.com

Benchmarking and Performance Indicators
Date : 09 - 13 December 2018
Venue: Sharm el-Sheikh, Egypt
Tel: 00201125514402 / 00201125514401
Email: info@oktechn.com
www.oktechn.com

Fundamentals Supply Chain Management
Date : 15 - 19 December 2018
Venue: Istanbul, Turkey
Tel: 00201125514402 / 00201125514401
Email: info@oktechn.com
www.oktechn.com

Talent Development Goals Focused Training Management
Date : 16 - 20 December 2018
Venue: Sharm el-Sheikh, Egypt
Tel: 00201125514402
00201125514401
Email: info@oktechn.com
www.oktechn.com

SETIT'18
Date : 18 - 20 December 2018
Venue: Genoa, Italy and Hammamet, Tunisia
Pr. Med Salim BOUHLEL
Head of the Research Unit: SETIT (Sfax University)
GSM: (+216) 20 20 00 05
Email: conferences@setit.rnu.tn
http://www.setit.rnu.tn

15th Edition SteelFab 2019
Date : 14 - 17 January 2019
Venue: Expo Center Sharjah, UAE
E-mail: info@expo-centre.ae
For more information please visit: **www.steelfabme.com**

7th Edition of the Future of Polyolefins
Date : 16 - 17 January 2019
Venue: Antwerp, Belgium
For more information please Contact:
Mr. Mohammad Ahsan:
Tel: +44 0203 141 0606
Email: mahsan@acieu.co.uk
http:// www.wplgroup.com/aci/event/co2-us/

Hydrogen & Fuel Cells Energy Summit 2019
Date : 06 - 07 February 2019
Venue: Madrid, Spain
For more information please Contact:
Mr. Adam Kowalewski
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ACI's 4th Biomass Trade Summit Europe 2019
Date : 17 - 16 January 2019
Venue: Rotterdam, The Netherlands
Email: contact@a7-group.com
For more information, please contact:
Mr. Rohan Baryah
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Invest & Trade in Ukraine '19
Date : 07 - 13 March 2019
Venue: Transatlantic Tour, Ukraine
Email: contact@a7-group.com
For more information, please visit:
www.a7conf.com

3rd European Fuels Markets & Refining Strategy Conference
Date : 27 - 28 March 2019
Venue: Frankfurt, Germany
For more information please Contact:
Mr. Adam Kowalewski
Tel: +48 616 467047
Email: adam@acieu.net

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

26th International Mining Congress and Exhibition (IMCET 2019)
Date : 16 - 19 April 2019
Venue: Granada Luxury Hotel Belek/ Antalya, Turkey
For more information, please visit:
www.imcet.org.tr

Ukrainian Infrastructure Forum '19
Date : 16 - 18 April 2019
Venue: Kyiv, Ukraine
For more information, please visit:
www.a7conf.com

Next Gen: Quality Assurance and Material Testing
Date : 28 - 29 August 2019
Venue: Bangkok, Thailand
Tel: +603-2775 0067
Email: stevej@strategictruconferences.com

المناصير

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- لا تلتزم المجلة برد الموضوعات إلى أصحابها .
- الآراء الموجودة بالمجلة لاتعبر بالضرورة عن رأي الاتحاد أو المجلة وإنما عن الرأي الخاص بكاتبها ولا يتحمل الاتحاد أية مسؤولية قانونية تجاه ذلك .

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المحتويات

المراسلات

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شركة المناصير لصناعة الإسمنت

مقدمة :

- حازت الشركة بحمد الله على جائزة الملك عبد الله الثاني للتميز على مستوى قطاع الشركات الصناعية الكبرى للفترة 2016 – 2017 التي تمت مؤخراً .
- يأتي هذا ترجمةً لرسالة مجموعة المناصير والتي تبنتها كل شركات المجموعة على رأسها الحديثة للإسمنت والتعدين وهي « نبني أجيال المستقبل » .
- يمكننا القول بأن جائزة الملك عبد الله الثاني للتميز – القطاع الخاص من اكثر الجوائز عراقةً على المستوى المؤسسي ، حيث تنفذ من قبل مركز عبدالله الثاني للتميز وتقام كل عامين ، تتقدم من خلالها الشركات والمؤسسات للتنافس بناءً على نموذج عمل مؤسسي تحكمه معايير التميز من خلال زيارات تقييم ميدانية لفريق المقيمين من قبل المركز .
- الهدف من الجائزة هو حث المؤسسات الوطنية بشقيها في القطاع العام أو الخاص على السعي نحو التميز من خلال التطوير المستمر ومقارنة أدائها وأنشطتها بمعايير عالمية تساعدها على تحديد نقاط القوة وفرص التحسين مما يساعد على الرقي في أدائها والوصول للمستوى المطلوب .

المفاهيم التي تتبناها الجائزة :

- بناء مستقبل مستدام من خلال منهجيات عمل وخطط عملية ومتابعة الأداء بهدف التحسين .
- الشراكة مع الجهات المختلفة من موردين وقطاع حكومي وعملاء وموظفين ... وغيرهم .
- تنمية القدرة المؤسسية على كافة المستويات الفنية والتقنية والموارد البشرية .
- تحفيز الإبداع والابتكار والريادة .
- القيادة بالأهداف من خلال توجهات مرسومة واضحة للجميع .
- الاستثمار في قدرات العاملين وتمكينهم بالعمل .
- بناء علاقة تشاركية مع المجتمع الذي نعيش فيه .

الأسباب التي دفعتنا للمشاركة :

- السعي نحو التميز والتطوير المستمر، حيث أننا نؤمن بضرورة توفير مستوى مميز من الخدمات والمنتجات في القطاعات التي نعمل بها تحقيقاً لرؤية وتوجهات المجموعة .
- كان من أسباب المشاركة هو تقييم أي نقف من حيث التميز ... ومعرفة موقعنا الحالي في سعينا نحو التميز حتى نتمكن من معرفة ما علينا فعله للمضي وإتمام المسيرة ، فإذا قارنا أداءنا بمعايير الجائزة ستكون لنا خارطة طريق واضحة نحو التحسين وهذا كان أحد أهداف السعي نحو الجائزة .
- السعي للجائزة كان أيضاً هدف لدينا ليمكننا من تعزيز تنافسنا في قطاع صناعة الاسمنت والتعدين حيث أصبحنا الشركة الوحيدة الحاصلة على الجائزة مما يجعلنا السباقين والرواد في هذا القطاع على مستوى التميز المؤسسي .

الفوائد التي لمسناها من المشاركة :

- نشر ثقافة التميز والأداء الموجه بالأهداف والحرص على تحقيق النتائج المرجوة .
- رفع المعنويات للموظفين وشعورهم بالفخر كونهم من ساهموا بتحقيق هذا الإنجاز .
- تعزيز العمل المؤسسي بدل من أن تكون اجتهادات فردية بحيث أصبح العمل مبني على نظام عمل متكامل من خلال إجراءات ومنهجيات عمل جديدة تساهم في التطوير المستمر .
- تعزيز المكانة التنافسية في قطاع الصناعات الكبيرة وإظهار شركتنا بالصورة التي تليق بمستواها الذي تستحقه أمام العملاء والمنافسين .
- التواصل بشكل أقرب وفعال مع العملاء والمجتمع .
- التقدير والدعم من القطاع العام حيث يكون هنالك تسهيل للإجراءات والمعاملات بحكم الحصول على الجائزة في كل من مؤسسة المواصفات والمقاييس ، دائرة الجمارك ، المؤسسة الأردنية لتطوير المشاريع ، دائرة العطاءات ودائرة اللوازم العامة ، والملكية الأردنية .

أخبار صناعة الإسمنت

الإمارات العربية المتحدة:

550 مليوناً لإنشاء مصنع إسمنت جديد في الفجيرة

تم افتتاح وإطلاق إشارة البدء في إنشاء وتنفيذ مشروع مصنع «جي. إس.دبليو» لإنتاج الكلنكر في منطقة حبحب ، والذي تقيمه مجموعة «جي.إس.دبليو» للإسمنت ، المتخصصة في إنتاج الإسمنت الصديق للبيئة في الهند .

ويستهدف المشروع بناء وحدة طحن الكلنكر في الفجيرة ، ومصنع للطاقة المقيدة لتوفير احتياجات ومتطلبات الوحدة من الطاقة بقيمة استثمارية تقارب 150 مليون دولار .

وسيتم تنفيذ المشروع على 3 مراحل بتكلفة 150 مليون دولار، حيث ينتج في مرحلته الأولى 6 ملايين طن سنوياً من الحجر الجيري ، فيما سترتفع الإنتاجية في مرحلته الثانية إلى 12 مليون طن في السنة ، لتصل إلى 20 مليون طن سنوياً من الحجر الجيري في مرحلته الثالثة ، وستبدأ إنتاجية المصنع في أعقاب الانتهاء من المرحلة الأولى للأعمال الإنشائية في ديسمبر / كانون الأول 2019 .

عقد بين لافارج الإمارات وشركة FLSmidth لتوريد حراق

وقعت لافارج الإمارات عقداً مع شركة FLSmidth لتوريد حراق Jetflex Plus لمصنع إسمنت الفجيرة التابع لها . وتتوقع الشركة حدوث تغيير كبير في تكلفة مزيج الوقود بالإضافة إلى عملية أكثر استدامة للأفران .

وذكرت FLSmidth أن حراق Jetflex Plus هو الأول الذي يتم تركيبه لمجموعة LafargeHolcim وأنه قد تم اختيارها لشراء المعدات والإشراف على تركيبها . وتعود العلاقة بين الشركتين إلى عام 2007 عندما قامت FLSmidth ببناء مصنع إسمنت الفجيرة بطاقة 7500 طن في اليوم لصالح شركة أوراسكوم .

المصدر : *Global Cement*

الجزائر:

تصدير 30 ألف طن من الإسمنت الرمادي قريباً

عقد المجمع الصناعي للإسمنت (GICA) اتفاقية مع شريك أجنبي لتصدير 30 ألف طن من الإسمنت من خلال شركة SODISMAC التابعة له . كما يجري المجمع مناقشات مع الشركاء الأجانب لتصدير منتجات أخرى مثل الحجر الجيري والجبس ، وسيتم تصدير هذه الكميات من ميناء أرزيو وجن جن .

وكان مجمع GICA قد قام في مايو / أيار الماضي بتصدير 45 ألف طن من الكلنكر ، بموجب عقد إجمالي قدره 200,000 طن . وفي عام 2017 ، سجلت مجموعة GICA إنتاج إسمنت قياسي بلغ نحو 14 مليون طن مقارنة بـ 12.6 مليون طن سنة 2016 . وبفضل مصانع الإسمنت الإثني عشر، حقق مجمع GICA سجله الثالث على التوالي ، متجاوزاً توقعاته لعام 2017 التي تتوقع إنتاج 13.2 مليون طن من الإسمنت .

وتنتج الجزائر حالياً أكثر من 25 مليون طن من الإسمنت سنوياً وتخطط لتصل إلى 40 مليون طن سنوياً بحلول عام 2020 . ومع عمليات التصدير هذه ، تحولت الجزائر من مستورد كبير للإسمنت إلى بلد .

المصدر : *www.ennaharonline.com*

المجمع الصناعي لإسمنت الجزائر: طريقة جديدة لمعالجة النفايات الصناعية

أدرجت شركة إسمنت المتيجة ، فرع المجمع الصناعي لإسمنت الجزائر (جيكا) ، طريقة جديدة لمعالجة نفايات مصنع الإسمنت ، وبالتالي ستتمكن شركة إسمنت المتيجة من إنتاج إسمنت ذي جودة ، و ذلك باستعمال نفايات صناعية من خلال الحفاظ على البيئة .

وأوضح المدير العام للشركة أن المشروع يتضمن إتلاف المواد القابلة للاشتعال السائلة (الزيوت المستعملة) والصلبة (طين التطهير) . ويتمثل المشروع في إدراج نفايات صناعية تحول إلى مواد بديلة قابلة للاشتعال عن طريق الحرق المشترك في فرن مصنع الإسمنت .

لافارج الجزائر تجري أول عملية تصدير لمادة الكلنكر

قام مجمع لافارج هولسيم الجزائر بتصدير 40 ألف طن من مادة الكلنكر من ميناء وهران . وحسب بيان للمجمع فإن العملية تعتبر الأولى لتصدير الكلنكر وهذا بعد عمليات تصدير الإسمنت الرمادي بداية السنة .

المصدر : *www.ennaharonline.com*

مصنع إسمنت بتيمقطن في الصحراء الجزائرية

تم إنجاز مصنع إسمنت بتيمقطن (دائرة أولف ولاية أدرار) في الصحراء التي تبعد 1400 كم عن جزائر العاصمة ، ويعتبر أكبر مشروع متكامل لإنتاج الإسمنت في الصحراء ، والذي يعتبر ثمرة الشراكة الصينية ـ الجزائرية ، تم انجازه من قبل الشركة الصينية للبناء China Triumph International Engineering (CTIE)

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ونحن يمكننا منع ذلك.

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وشاركت جزئياً في أعمال إدارته . وقد اجتاز مصنع الإسمنت التقييم بنجاح في أكتوبر / تشرين الأول هذا العام ، ليدخل حالياً مرحلة الانتاج الكاملة .

وينتج المصنع حوالي 4,200 طن من الكلنكر في اليوم ، ومن المتوقع أن تصل الطاقة الإنتاجية الى 1.5 مليون طن أو أكثر سنوياً ، ما يساعد على ملئ الكثير من الثغرات في سوق مواد البناء الجزائرية ، كما سيشبع أيضاً أسواق الإسمنت في مالي والنيجر وغيرها من البلدان الأخرى . وكانت الجزائر تعتمد على الواردات الأوروبية بالنسبة للإسمنت آبار النفط ، لكن الوضع قد تغير بعد دخول الشركات الصينية ، حيث يصل الإنتاج السنوي لمصنع الإسمنت بتيمقطن الى 300 ألف طن من إسمنت آبار النفط ، والذي سوف يساعد الجزائر لأول مرة على الاكتفاء الذاتي من حيث إنتاج هذا النوع من الإسمنت .

المصدر : *arabic.people.com.cn*

القلعة تعتزم تقليص استثماراتها بالجزائر والتخارج من مصنع زهانة للإسمنت

قالت القلعة للاستشارات المالية إن أسيك للإسمنت التابعة لها قد بدأت جولة من المفاوضات للتخارج من مصنع زهانة للإسمنت بالجزائر . وأوضحت الشركة أن أسيك تمتلك نحو 35 % من أسهم مصنع زهانة .

وكانت أسيك قد استثمرت 62 مليون دولار في إسمنت زهانة ، وقامت برفع كفاءة المصنع لينتج 750 ألف طن . وأشارت الشركة إلى أنه يجري إنشاء خط إنتاج جديد للمصنع بطاقة قدرها 1.6 مليون طن سنوياً ، متوقعة بدء إنتاجه في بداية 2020 .

وتبلغ مساهمة القلعة في شركة أسيك للإسمنت نحو 1.86 %. . وفي مايو / أيار 2017 ، أعلنت شركة القلعة عن إتمام بيع 100 % من أسهم شركة أسيك الجزائر للإسمنت لمستثمر جزائري في صفقة بقيمة 60 مليون دولار .

المصدر : *www.amwalalghad.com*

المملكة العربية السعودية:

شركتان سعوديتان للإسمنت تزيدان إنتاجهما من أجل «نيوم»

كشف موقع بلومبرج أن اثنين من كبار مصنعي الإسمنت في السعودية قد توسعا في إنتاجهما للاستفادة من الولادة المستقبلية لمشروع «نيوم»، الذي يبلغ تكلفته 500 مليار دولار. وقال الموقع إن شركتي إسمنت «تبوك» و»حائل» قد زادتا من إنتاجهما كل شهر تقريباً خلال هذا العام ، في حين أن معظم أقرانهم من الشركات الـ 15 الأخرى كانوا أقل إنتاجاً . وقد ارتفع ناتج الشركتين خلال الأشهر الستة المنتهية في يونيو/ حزيران ، بنسبة 20 % و55 % على التوالي ، مقارنة بالفترة ذاتها من العام الماضي ، فيما تعد الزيادة في الإنتاج للشركتين أسرع عدة مرات من نظيرتهما الأكبر «إسمنت السعودية ».

المصدر : *www.ajel.sa*

سيكا السويسرية توسّع نشاطها في السعودية بمصنع جديد بالدمام

تعتزم شركة «سيكا» السويسرية المتخصصة في مجال مواد البناء توسيع أنشطتها في المملكة ، وذلك من خلال زيادة طاقتها الإنتاجية وتحسين خدماتها اللوجستية من خلال فتح مصنع جديد لإنتاج الخرسانة . ويقع المصنع الجديد في مدينة الدمام ، وسيسمح لشركة سيكا بزيادة طاقتها الإنتاجية وتحسين خدماتها اللوجستية وبالتالي هيكل التكلفة .

وتقوم سيكا في الوقت الحالي بتزويد عملائها في العاصمة الرياض وكذلك على الساحل الشرقي بالخلطات الخرسانية من مصنع رابغ ، الذي يقع على التوالي على مسافة 1500 و1100 كيلومتر من الدمام والرياض . غير أن مصنع الدمام الجديد سيحد من مسافات النقل كما أنّه سيتمتع بموقع مثالي لإمداد العملاء من الأسواق القريبة في الخليج العربي .

المصدر : *www.ajel.sa*

جمهورية السودان

وزير الصناعة يؤكد معالجة معوقات صناعة الاسمنت

أكدت وزارة الصناعة السودانية حرصها على إزالة المعوقات التي تواجه صناعة الإسمنت بالبلاد والتي تحول دون تصدير هذه السلعة وغيرها من السلع الصناعية الأخرى والتي يمتلك السودان فيها طاقات إنتاجية عالية وميزات تنافسية إلى أسواق دول الجوار الأفريقي .

وكان وزير الصناعة قد قام بزيارة ميدانية إلى ولاية نهر النيل ووقف ميدانياً على صناعة الإسمنت وحجم الاستثمارات المستثمرة في هذه الصناعة ، وعقد لقاءات مع مديري المصانع والتي تم الاتفاق فيها على إقامة مركز تدريب صناعة الإسمنت بعطبرة، يستهدف تدريب الشباب على صناعة الاسمنت والصناعات المصاحبة لها .

المصدر : *alsudanalyoum.com*

نقص الوقود والطاقة يؤثر سلباً على إنتاج الإسمنت في السودان

أدى نقص الوقود وانقطاع التيار الكهربائي إلى خفض إنتاج الإسمنت إلى النصف في السودان . حيث خفض مصنع إسمنت عطبرة إنتاجه إلى 60 ألف طن من 120 ألف طن في الشهر . وتراجع إنتاج مصنع إسمنت السلام من 60 ألف إلى 20 ألف طن في الشهر ، أما مصنع إسمنت التكامل فقد خفض إنتاجه من 80 ألف طن إلى 32 ألف طن في الشهر . وتراجع إنتاج شركة إسمنت الشمال من 120 ألف طن إلى 50 ألف طن في الشهر . وانخفض إنتاج مصنع إسمنت بربر من 70 ألف

طن إلى 30 ألف طن في الشهر .
وقد شهدت أجزاء من البلاد نقصاً في الوقود في عام 2017 واستمر هذا الأمر في عام 2018 ، مما أدى إلى مشاكل في مختلف الصناعات .

المصدر : *Global Cement*

سلطنة عُمان

خمسة مشاريع جديدة للإسمنت تستهدف زيادة الإنتاج

أعلنت شركة إسمنت عمان أن العمل جار في دراسة الجدوى التفصيلية لمشروع شركة الوسطى للإسمنت ، وهو مشروع مشترك بين شركة إسمنت عمان وشركة ريسوت للإسمنت . كما أعلنت شركة ريسوت من جانبها أن محطة الإنتاج في الدقم ستعمل على تسهيل الإمداد المتواصل للإسمنت مما يساهم في تنمية وتطوير المنطقة .

وتستهدف المبادرات الحكومية الخاصة بالصناعات التحويلية زيادة الإنتاج المحلي من الإسمنت بما يصل إلى 5 مشاريع جديدة للإسمنت ، وارتفع استهلاك الإسمنت في السلطنة من 2.7 مليون طن في عام 2006 إلى 9 ملايين طن في عام 2015 ، مما يشير إلى وجود حاجة ماسة لتحسين الطاقة الإنتاجية لخفض الاعتماد على واردات الإسمنت .

وتشير الإحصائيات إلى أن 99 % من واردات السلطنة من الإسمنت تأتي من دولة الإمارات العربية المتحدة ، ويمثل ذلك 56 % من الاستهلاك الفعلي للإسمنت في السلطنة ، وأما الـ 44 % المتبقية فيتم إنتاجها عن طريق شركات محلية عمانية ، كشركة إسمنت عمان بنسبة 23 % ، وشركتي ريسوت والمدينة بنسبة 21 % .

وأوضحت شركة إسمنت عمان أن العمل يمضي بشكل جيد في مشروع تطوير معدات التحكم في التلوث الخاصة بخط الإنتاج الثاني ومن المتوقع أن ينهي العمل في الفرن قريباً ، كما تم في مارس / آذار الماضي تبديل فرازات طاحونتي الإسمنت رقم 1 ورقم 2 بأحدث جيل في هذا المجال . وفي إطار توسعات أخرى تستهدف زيادة الطاقة على التعبئة والتحميل ، قامت الشركة بتوقع عقد لتركيب روتوبيكر وآلة تحميل في الشاحنات ، ومن المنتظر اكتمال المشروع نهاية العام الجاري . كما أشارت شركة ريسوت للإسمنت إلى عدة توسعات مستقبلية لها .

وتقترح مبادرات مشروع «تنفيذ» العماني ثلاثة مشاريع فرعية أولها مصنعان جديدان للإسمنت إذ ثمة إمكانية لبناء مصنعي إسمنت في المنطقة الاقتصادية بالدقم لتغطية الحاجة المحلية وتقليص الاستيراد من الخارج بسعة إنتاجية تصل إلى 3 ملايين طن سنوياً لكل مصنع على حدة ، مع إمكانية تشغيل المصنعين باستخدام الفحم لتوليد طاقة مقدارها 80 ميجاواط ، وبيع الطاقة الإضافية لمشاريع أخرى . وثاني المشاريع هي مصنع للإسمنت الأبيض في المنطقة الاقتصادية بالدقم ، بطاقة إنتاجية تبلغ 300 ألف طن سنوياً ، على أن يتم زيادة الإنتاج في مرحلة قادمة من خلال بناء خط إنتاجي ثانٍ مطابق ، ينتج 600 ألف طن في السنة .

كما تم اقتراح منشأتين للطحن إحداهما في الدقم والأخرى في صحار وذلك لعدم وجود مصانع إسمنت في صحار . ويتوقع أن تصل سعة إنتاج كل وحدة إلى مليون طن سنوياً ، ويتطلب إمداد كل وحدة على حدة بطاقة تقدر بنحو 8 ميغاواط سنوياً، مع استيراد مادة الكلنكر .

ويهدف مشروع مصنع التاج للإسمنت إلى إنشاء مصنع إسمنت في المنطقة الاقتصادية الخاصة بالدقم لتغطية الطلب المحلي وخفض الواردات بسعة إنتاج تبلغ حوالي 2 مليون طن في السنة . من المتوقع أن يبدأ تشغيل المصنع في الربع الرابع من عام 2020 . وتقوم شركة اليمامة الهندسية العراقية بإنشاء المصنع الذي سوف يعرف باسم شركة التاج للإسمنت .

أمّا مشروع مصنع أسمنت الأنوار هرمز، فيهدف إلى إنشاء وحدة لطحن الإسمنت بقدرة تبلغ حوالي مليون طن سنوياً في المنطقة الاقتصادية الخاصة بالدقم لتغطية الطلب المحلي والحد من الواردات ، من المتوقع أن يبدأ تشغيل المصنع في الربع الأول من عام 2020 . وتقوم شركة الأنوار القابضة ش.م.ع.ع بتأسيس المصنع كمشروع استثماري مشترك مع شركة إسمنت هرمزجان الإيرانية ، حيث ستمتلك شركة الأنوار القابضة نسبة 40 % وتمتلك شركة إسمنت هرمزجان نسبة 60 % ، وتم توقيع عقد الانتفاع بالأراضي مع هيئة المنطقة الاقتصادية الخاصة في الدقم في يونيو 2017 .

ويهدف مشروع مصنع إسمنت صحار إلى إنشاء وحدة لطحن الإسمنت بطاقة تصل إلى حوالي 240 طناً في الساعة في منطقة صحار الصناعية التابعة للمؤسسة العامة للمناطق الصناعية بهدف تغطية الطلب المحلي وخفض الواردات . ومن المتوقع أن يبدأ تشغيل المصنع بحلول الربع الأول من عام 2018 . وتقوم شركة صحار للإسمنت بإنشاء المصنع ، حيث تمتلك 70 % من حصص المصنع ، بينما يمتلك شركاء من دولة الإمارات «إسمنت الفجيرة» نسبة 30 % المتبقية .

المصدر : *www.omandaily.om*

جمهورية مصر العربية:

«الصناعة»: لن نسمح بتصدير المواد الخام قبل تصنيعها

أعلنت وزارة التجارة والصناعة أن الحكومة تسعى خلال المرحلة الحالية لزيادة القيمة المضافة للمنتج المصري وعدم السماح بتصدير

المواد الخام إلا بعد مرورها بمراحل تصنيعية، بهدف زيادة القيمة المضافة .

ومن بين المواد التي يمكن استهدافها الرمل والغرانيت والنفط الخام وزيت الوقود الخفيف والذهب الخام ومسحوق الذهب والأسلاك النحاسية والجبن الأبيض وبعض الفواكه والخضروات الطازجة وأسمدة اليوريا والملابس الصوفية والعطور وبذور البطاطس والبصل وبعض مكونات الأثاث .

المصدر : *www.almasryalyoum.com*

مجمع بني سويف الجديد يضم 5 مصانع لإنتاج الرخام و2 للجرانيت

تم افتتاح المرحلة الثانية والرابعة لمصنع العريش للإسمنت ، ومن المقرر أن يتم افتتاح مصنع إسمنت بني سويف ، وهو أحد أكبر مصانع الإسمنت على مستوى العالم ويقع على الطريق الصحراوي الشرقي .

ويتكون مصنع إسمنت بني سويف من ستة خطوط إنتاج ويعود لشركة إسمنت العريش ، ويعود له خطا إنتاج آخران في شمال سيناء . ومصنع إسمنت العريش مملوك لمنظمة مشاريع الخدمات الوطنية والتي بدورها مملوكة من قبل الجيش .

المصدر : *www.vetogate.com*

مصنع إسمنت النهضة يستبدل الوقود الأحفوري بوقود الكتلة الحيوية

قام مصنع إسمنت النهضة الواقع في محافظة قنا ، كجزء من هدفه للحد من انبعاثات الغازات المسببة للاحتباس الحراري ، باستبدال جزء من وقود الفحم المستخدم لتشغيل المحطة بالكتلة الحيوية القائمة على السكر .

ويستخدم المصنع كريات عضوية من المنتجات الثانوية للسكر، مستفيداً من صناعة السكر الموجودة في مصر . وسيتم في الوقت الراهن استخدام نحو 100 ألف طن من الوقود كل عام على أن ترتفع إلى 150,000 مستقبلاً .

ومن خلال استبدال الوقود الأحفوري ، يأمل الفريق المسؤول عن المشروع خفض انبعاثات ثاني أكسيد الكربون بنسبة 35 %، مع خفض تكاليف الوقود بنسبة 20 % واستهلاك الفحم بمقدار 50 ألف طن سنوياً .

المصدر : *CemWeek*

إسمنت حلوان توقع عقد بيع مصنع الإسمنت الأبيض بالمنيا

قالت شركة السويس للإسمنت إن شركتها التابعة إسمنت حلوان - نسبة المساهمة 99.55 % - قد وقعت عقداً مع شركة إعمار للصناعات لبيع مصنع حلوان للإسمنت الأبيض في محافظة المنيا ، على أن يتم البيع بعد الانتهاء من فصل المصنع عن الشركة ، وذلك طبقاً لاستراتيجية الشركة الشاملة لتعزيز وضعها المالي وإعادة الهيكلة .

وكانت القوائم المالية المجمعة لشركة السويس للإسمنت ، قد كشفت عن تحول الشركة من الخسارة إلى الربحية وزيادة مبيعاتها المجمعة خلال النصف الأول من العام الحالي .

المصدر : *www.youm7.com*

«قطاع الأعمال» تتجه لبيع أصول «القومية للاسمنت» بعد تصفية الشركة

تتجه وزارة قطاع الأعمال العام إلى بيع أصول الشركة القومية للإسمنت ، لسداد المديونيات، بعد إغلاق الشركة ، حيث أن المؤشرات النهائية لدراسة وضع الشركة القومية للإسمنت تفيد بصعوبة عودة تشغيلها مرة أخرى والاتجاه لتصفيتها .

وترى الوزارة أن إغلاق شركة القومية للإسمنت أصبح «ضروريا» لأن المصنع يخسر بطريقة كبيرة ولا سبيل لتحديثه ومحاولة إحيائه مرة أخرى ، حيث بلغت خسائر المصنع السنوية 900 مليون جنيه ، وإذا قدمت الدولة دعماً لإعادة تطوير المصنع يحتاج ذلك إلى 4 مليارات جنيه ، وبعد دفع تلك المبالغ ستقل خسارة المصنع في العام الواحد إلى 500 مليون جنيه . وأرجعت الوزارة هذه الخسائر إلى النشاط الرئيسي من العملية الإنتاجية، «إذ تزيد تكلفة إنتاج طن الإسمنت في الشركة بنسبة تتجاوز 60 % عن متوسط تكلفته في الشركات المنافسة».
ولا يزال العمل في أفران الشركة متوقفًا حتى الآن، وتستخدم الشركة مخزونها من الكلنكر، في إنتاج الإسمنت.

المصدر : *www.masrawy.com*

المملكة المغربية

رئيس جديد للجمعية المهنية لمصنعي الإسمنت

انتخبت الجمعية المهنية لمصنعي الإسمنت السيد طرفا مروان ، رئيس مجلس إدارة لافارج هولسيم المغرب رئيساً جديداً للجمعية .

سوق الإسمنت يستعيد عافيته

استرجع سوق الإسمنت عافيته في يوليو / تموز الماضي . وقد ارتفع الاستهلاك في هذا الشهر بنسبة 7.84 % مقارنة بالفترة ذاتها من سنة 2017 ، حيث مكن هذا التحسن من تقليص الهوة إلى ناقص 1.26 % في يوليو / تموز مقابل ناقص 2.88 % خلال نهاية يونيو / حزيران . وترجع هذه الزيادة في الطلب بشكل رئيسي إلى انتعاش عمليات البناء الذاتية ، لا سيما بعد توافد أفراد الجالية المغربية المقيمين بالخارج على البلاد ، إضافة إلى تزايد المباني في العالم القروي .

المصدر : *haspresse.com*

نشاطات عربية

المؤتمر العربي الدولي الخامس عشر للثروة المعدنية:

المكان: القاهرة / جمهورية مصر العربية

التاريخ: 26 - 28 نوفمبر/ تشرين الثاني 2018

الجهة المنظمة: المنظمة العربية للتنمية الصناعية والتعدين

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الموقع الإلكتروني: www.aidmo.org

الملتقى العربي الأول للعلاقات العامة

المكان: القاهرة / جمهورية مصر العربية

التاريخ: 17 - 19 ديسمبر/ كانون الأول 2018

الجهة المنظمة: المنظمة العربية للتنمية الإدارية - جامعة الدول العربية

لمزيد من المعلومات يرجى التواصل مع السيد شريف أكرم

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الموقع الإلكتروني: www.arado.org

المؤتمر العربي السابع: التطوير الإداري في المؤسسات الحكومية (سـياسات مجتمع المعرفة)

المكان: القاهرة / جمهورية مصر العربية

التاريخ: 23 - 27 ديسمبر/ كانون الأول 2018

الجهة المنظمة: الدار العربية للتنمية الإدارية بالتعاون مع الاتحاد الدولي لمؤسسات التنمية البشرية

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المؤتمر العربي التاسع: تكنولوجيا الموارد البشرية - رؤية 2030

المكان: القاهرة / جمهورية مصر العربية

التاريخ: 30 ديسمبر/ كانون الأول 2018 - 2 يناير / كانون الثاني 2019

الجهة المنظمة: الاتحاد العربي لتنمية الموارد البشرية - إدارة المؤتمرات

لمزيد من المعلومات يرجى التواصل مع أ/ ميرفت شاهين

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دورات تدريبية عربية

مهارات المدير المعتمد

المكان: كوالالمبور، ماليزيا / القاهرة، جمهورية مصر العربية

التاريخ: 25 - 29 نوفمبر / تشرين الثاني 2018

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تنمية مهارات إعداد وصياغة المراسلات والتقارير

المكان: القاهرة، جمهورية مصر العربية

التاريخ: 25 - 29 نوفمبر / تشرين الثاني 2018

لمزيد من المعلومات يمكنكم التواصل مع: أ. ريهان سالم: مدير التدريب

الدار العربية للتنمية الإدارية

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التمكين وقيادة المواقف الصعبة والأزمات

المكان: كوالالمبور، ماليزيا / القاهرة، جمهورية مصر العربية

التاريخ: 2 - 11 ديسمبر / كانون الأول 2018

الجهة المنظمة: الاتحاد العربي لتنمية الموارد البشرية

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استراتيجيات تطوير الأعمال

المكان: بيروت، لبنان / القاهرة، جمهورية مصر العربية

التاريخ: 9 - 13 ديسمبر / كانون الأول 2018

الجهة المنظمة: الاتحاد العربي لتنمية الموارد البشرية

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تنمية مهارات العاملين في السكرتارية وإدارة المكاتب

المكان: بيروت، لبنان / القاهرة، جمهورية مصر العربية

التاريخ: 9 - 13 ديسمبر / كانون الأول 2018

الجهة المنظمة: الاتحاد العربي لتنمية الموارد البشرية

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تكنولوجيا مراجعة وتقييم أداء العاملين في بيئة التشغيل الإلكترونية

المكان: بيروت، لبنان / القاهرة، جمهورية مصر العربية

التاريخ: 9 - 18 ديسمبر / كانون الأول 2018

الجهة المنظمة: الاتحاد العربي لتنمية الموارد البشرية

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الإدارة الدولية للمناقصات والمزايدات

المكان: القاهرة، جمهورية مصر العربية

التاريخ: 16 - 20 ديسمبر / كانون الأول 2018

الجهة المنظمة: أكاديمية العدالة للدراسات القانونية والاقتصادية

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المشتريات والحوكمة الإلكترونية

المكان: بيروت، لبنان / القاهرة، جمهورية مصر العربية

التاريخ: 16 - 20 ديسمبر / كانون الأول 2018

الجهة المنظمة: الاتحاد العربي لتنمية الموارد البشرية

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فاكس: 0020235830285 / 0020235866953 / 0020235849316

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الدور الحديث للقيادة في العلاقات العامة

المكان: بيروت، لبنان / القاهرة، جمهورية مصر العربية

التاريخ: 16 - 20 ديسمبر / كانون الأول 2018

الجهة المنظمة: الاتحاد العربي لتنمية الموارد البشرية

هاتف: 0020235866963 / 0020235860262 / 0020235860290

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التميز والإبداع في التطوير الإداري وتنمية الموارد البشرية

المكان: اسطنبول، تركيا / القاهرة، جمهورية مصر العربية

التاريخ: 23 - 27 ديسمبر / كانون الأول 2018

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تكنولوجيا الموارد البشرية

المكان: القاهرة، جمهورية مصر العربية

التاريخ: 30 ديسمبر / كانون الأول 2018 - 3 يناير / كانون الثاني 2019

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مهارات صياغة القرارات الإدارية

المكان: القاهرة، جمهورية مصر العربية

التاريخ: 24 - 28 مارس / آذار 2019

الجهة المنظمة: أكاديمية العدالة للدراسات القانونية والاقتصادية

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مع مواجهة العالم لتحديات جديدة في التعامل مع الأحجام المتزايدة من نفايات ما بعد الاستهلاك ، فإن ربط أنظمة تحضير النفايات والمواد الخام يوفر حلاً قابلاً للتطبيق – ومزايا اقتصادية كبيرة .

إعداد : Taís Mazza / مهندس عمليات أقدم ، Loesche GmbH / دوسلدورف – ألمانيا

نهج متكامل لاستخدام الوقود البديل في صناعة الإسمنت

1 المقدمة

يواجه العالم تحدياً متنامياً في التعامل مع الأطنان المتزايدة باستمرار من مواد النفايات التي يتم إنتاجها ، بينما تدفع الضغوط البيئية في الوقت ذاته نحو خفض استخدام الوقود الأحفوري في العمليات الصناعية . وبالطبع فإن إنتاج الإسمنت ليس استثناءً في هذا الصدد .

وبينما كان النهج التقليدي هو اعتبار النفايات غير مرغوب فيها ، لا يلائمها سوى الردم والترك للأجيال القادمة للاهتمام بها ، هناك الآن تقدير أكبر بكثير لقيمة النفايات كمصدر للطاقة بحد ذاتها . وهذا وضع مربح لجميع الأطراف ، بكل معنى الكلمة ، حيث ستنخفض كمية المواد المتراكمة ، فضلاً عن استبدال أكبر للوقود الأحفوري ، مما سيساعد على خفض تكاليف إنتاج الإسمنت وانبعاثات ثاني أكسيد الكربون في ذات الوقت .

وكشركة ذات تاريخ يعود إلى 111 عاماً في تصميم وتوريد مصانع متخصصة لطحن الفحم والمواد الخام والكلنكر ، قامت شركة Loesche GmbH بجمع وربط التقنيات اللازمة لتحسين إنتاج وحرق وقود النفايات في المكلسنات والأفران .

ويتبع لمجموعةLoesche شركتان متخصصتان في طحن النفايات والتقنيات الحرارية وتحسين العمليات ، مما جعلها قادرة الآن على تقديم حزمة متكاملة تماماً تشتمل على جميع جوانب استخدام الوقود المشتق من النفايات في إنتاج الإسمنت .

2 تحدي النفايات

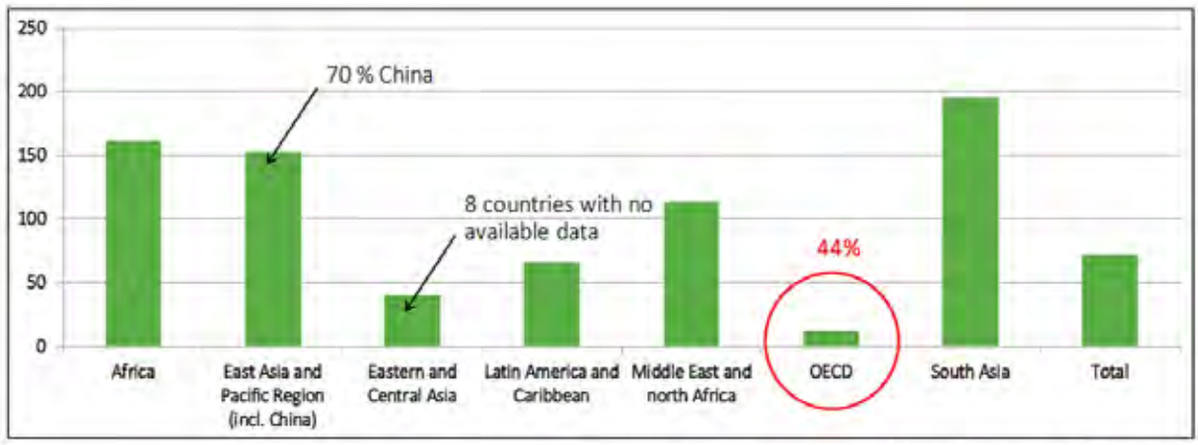
إن إنتاج النفايات يتزايد في جميع أنحاء العالم . ومن الواضح أن هذا

يأتي نتيجة للنمو السكاني بشكل عام ، ولكن هناك عوامل أخرى تلعب دوراً أيضاً – مثل زيادة التحضر في العالم النامي .

ويوضح الشكل 1 ، المستمد من بيانات من البنك الدولي ، التباين في معدلات النمو على أساس إقليمي للفترة من 2005 إلى 2025 . وخلال هذه السنوات العشرين ، سيتضاعف إنتاج النفايات الحضرية في جنوب آسيا تقريباً ، وكذلك الأمر بالنسبة لأفريقيا ومنطقة شرق آسيا والمحيط الهادئ .

وبينما يتوقع البنك الدولي أن يصل معدل نمو النفايات الحضرية في دول منظمة التعاون الاقتصادي والتنمية (OECD) إلى حوالي 10 % فقط ، ينبغي الإشارة إلى أن هذه المجموعة الاقتصادية تنتج فعلياً 44 % من الإجمالي العالمي .

1 النسبة المئوية للزيادة في إجمالي إنتاج النفايات الحضرية من عام 2005 إلى عام 2025 حسب المنطقة



World Bank Report – Urban Development Series – Knowledge Papers – Chapter 3

هناك أيضاً تنوع كبير من حيث تركيب النفايات الحضرية التي يتم إنتاجها . وكما يظهر الشكل 2 ، تشكل المادة العضوية في الصين ما يقرب من 60 % من إجمالي النفايات ، أما الورق والكرتون والبلاستيك ، وهي المكونات الرئيسية في الوقود المستمد من النفايات ، فتشكل أقل من 20 % . على النقيض من ذلك ، فإن أقل من 30 % من النفايات الحضرية الناتجة في الولايات المتحدة الأمريكية هي عضوية ، بينما تشكل مكونات الوقود المحتملة أكثر من 40 % .

وكان النهج المتعارف عليه هو جمع النفايات ، ومعالجتها (تكييفها) ثم التخلص منها . ويمكن أن تؤدي خطوة التكييف ، في الظروف المناسبة ، إلى إعادة استخدام جزء من تدفقات النفايات .

ويكمن التحدي هنا في تحسين جودة المواد الصالحة للاستخدام بحيث يمكن الاستفادة العظمى من نسبة أعلى من إجمالي النفايات ، مما يؤدي إلى تقليل الكمية المرسلة للردم أو للتخلص منها .

إن تحويل النفايات إلى طاقة هو أحد الخيارات الواضحة ، ولكن كفاءة التحويل تعتمد إلى حد كبير على المقاربة التكنولوجية المستخدمة . ويوضح الشكل 3 الاختلافات في كفاءة التحويل عند استخدام أنواع الوقود البديل – مثل النفايات البلدية والصناعية – لتوليد الطاقة .

وتظهر البيانات الصادرة عن « الجمعية الألمانية للمواد الخام الثانوية وإدارة النفايات » أن حرق هذا النوع من النفايات في محرقة تقليدية يحقق كفاءة نسبتها حوالي 35 % في التحويل إلى طاقة .

على النقيض من ذلك ، فإن استخدام النفايات في حرق الأفران لإنتاج الإسمنت يضاعف تقريباً من معدل الكفاءة ، كما يتم الحصول على المزيد من الطاقة ، ويتم ، بالطبع ، تقليل الانبعاثات المحددة من الإنتاج .

ولم تغب هذه الحقيقة عن منتجي الإسمنت ، لا سيما في البلدان التي توجد فيها بنية تحتية للتعامل مع مواد النفايات وفصلها وإعدادها لاستخدامها كوقود .

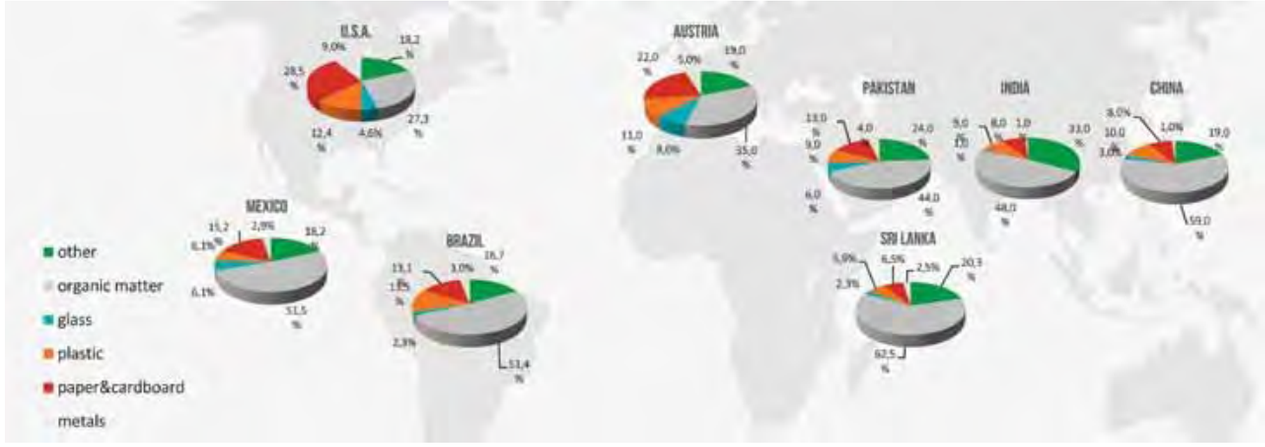
وعليه ، وعلى سبيل المثال ، تمثل أنواع الوقود البديل أكثر من 60 % من مدخلات الطاقة العملياتية في إنتاج الإسمنت في ألمانيا . أما في النمسا ، فكانت النسبة أعلى ، حيث بلغت أكثر من 70 % ، وتشكل النفايات الصناعية والتجارية المختارة بالمقابل أكبر مكوّن في مزيج الوقود البديل .

3 ماهي التكلفة؟

إن استخدام النفايات كوقود بديل في إنتاج الإسمنت ليس أكثر كفاءة في استخدام الطاقة فحسب ، بل هو على الأغلب أقل تكلفة في التنفيذ .

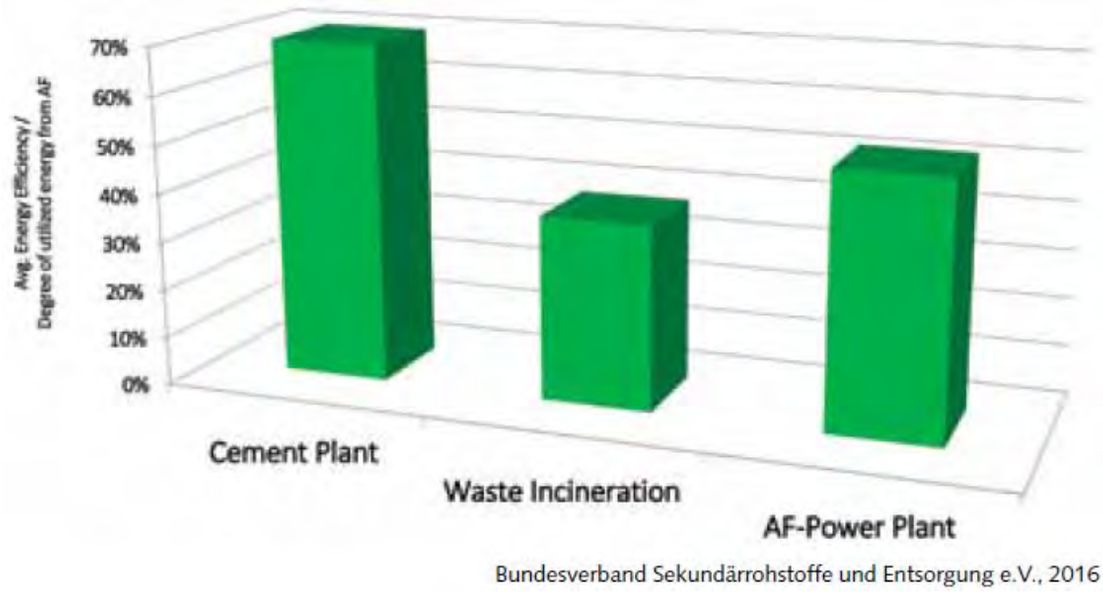
ولمقارنة تكاليف وعائدات مشروع حديث لتحويل النفايات إلى طاقة في أمريكا اللاتينية باستخدام النفايات كوقود في مصانع الإسمنت ، تم النظر في إنشاء مصنع قياسي بطاقة إنتاجية تبلغ نحو 4000 طن من الكلنكر في اليوم .

2 لمحة عامة عن تكوين النفايات : التنوع في النفايات الحضرية التي يتم إنتاجها



تم حساب الكمية الضرورية من النفايات لتحقيق معدل إبدال كامل نسبته 90 % وكذلك التكاليف المترتبة بالإضافة إلى الوفورات في الوقود الأساسي (القائم على الفحم) . وفي الخطوة الثانية ، تم توسيع نطاق خيار تحويل النفايات إلى الوقود ليساوي كمية النفايات المستخدمة في المحطة الجديدة لتحويل النفايات إلى طاقة.

3 الاختلافات في كفاءة التحويل عند استخدام أنواع الوقود البديل

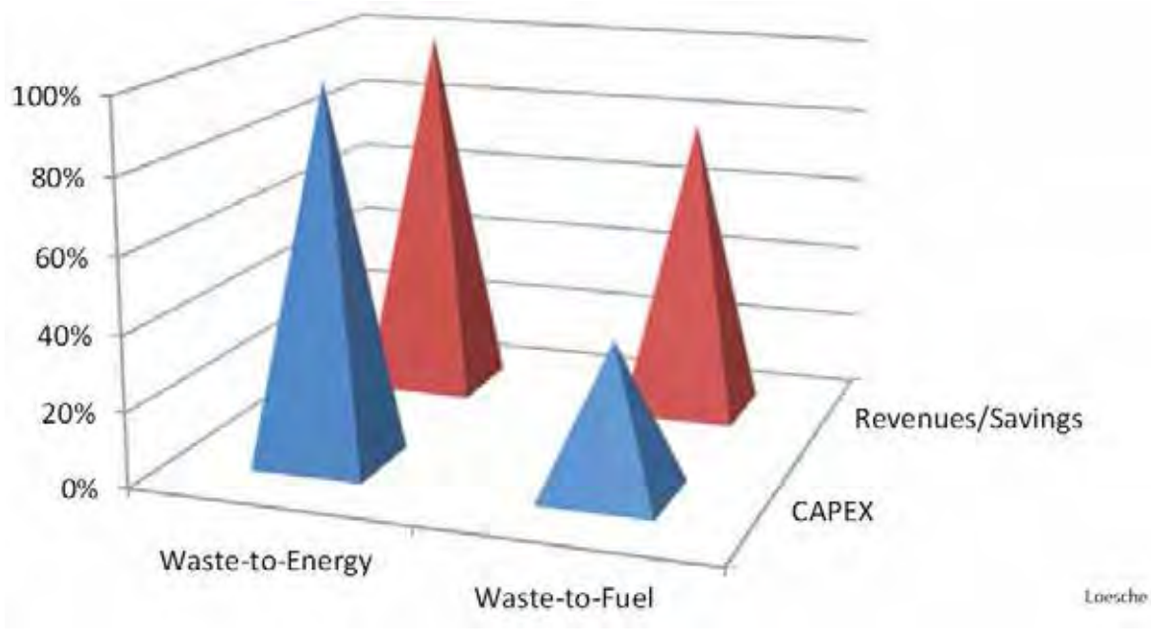


وبطبيعة الحال ، لا تدعي هذه المقارنة أنها تمثل جميع التشكيلات الممكنة لمحطات تحويل النفايات إلى طاقة أو استخدام الوقود البديل في مصانع الإسمنت ، ولكن النتائج مثيرة للغاية ! لن يتجاوز إجمالي النفقات الرأسمالية للاستخدام في مصانع الإسمنت نسبة 30 % - 40 % ، في حين أن الإيرادات (مبيعات الكهرباء مقابل وفورات الفحم) ستكون في حدود 75 % - 85 % مقارنة مع محطة تحويل النفايات إلى طاقة !

بالتالي ، من الواضح أن إنشاء مصانع إسمنت جديدة وتهيئة المصانع القائمة لإحراق الوقود البديل المشتق من النفايات ، على حد سواء ، يمكن أن يكون له فوائد اقتصادية كبيرة بالنسبة لتكاليف رأس المال والتشغيل.

إذن ما الذي يؤثر بالفعل في تحقيق مستويات أعلى من استبدال الوقود ، وما هي الآثار المترتبة فيما يتعلق بالتكنولوجيا المطلوبة ؟

4 مقارنة بين التخلص من النفايات في محطة تحويل النفايات إلى طاقة مع استخدام الوقود المشتق من النفايات في مصانع الإسمنت



وفيما يتعلق بمعدلات الإحلال الحراري (TSR) بنسبة 9 % أو أقل في مصنع إسمنت قائم ، لا يتطلب الأمر سوى القليل من الإجراءات ، باستثناء العمل في وحدة تكييف الوقود ، حيث يستلزم الأمر تركيب وحدة جديدة أو توسيع طاقة الوحدة القائمة حين يكون استخدام أنواع وقود بديل قد بدأ من قبل .

وبالتالي من المرجح أن تكون النفقات الرأسمالية المطلوبة محدودة . وبمجرد التغلب على العزوف المبدئي عن العمل بالنفايات ، فإن الاتجاه سيكون واضحاً .

ومن أجل زيادة معدلات الإحلال الحراري (TSR) إلى العتبة التالية عند 25 % من مُدخل طاقة الوقود ، لا ينبغي تطوير محطة تكييف الوقود فحسب ، بل ستكون هناك حاجة أيضاً إلى المزيد من طاقة الطحن .

وتأتي المرحلة التالية عندما يتطلب الالتزام باستخدام الوقود البديل بالفعل أعلى استثمار ممكن ، حيث يرتفع معدل الإحلال الحراري (TSR) من 25 % إلى 60 % .

في هذه الحالة ، عادة ما تكون هناك حاجة لتعديلات رئيسية للبنية التحتية للمصنع ، مع تعديلات لقسم المكلسن وتركيب نظام الممر الجانبي

للكلور . وسيتعين أيضاً إجراء مزيد من التحسينات على طاقات تكييف الهواء والطحن .

بعد ذلك ، سيعتمد الوصول إلى مستويات أعلى لمعدل الإحلال الحراري (TSR) على الاستثمار الذي تم تكبده بالفعل ، وذلك من خلال إجراءات مكمّلة أساساً لتلك التي تم وضعها من قبل .

هناك حاجة مرة أخرى إلى أنظمة إعداد وقود ذات طاقة أعلى ، بالإضافة إلى تعديلات على الحراقات الرئيسية للأفران للسماح لها بمعالجة نسب عالية من أنواع الوقود البديل .

يوضح هذا التحليل بوضوح أن الربحية تزداد بزيادة معدل الإحلال الحراري (TSR) ويتم تحقيق أعلى الوقورات باستخدام أعلى المدخلات من الوقود البديل ، كما يوضح الشكل 5 .

5 المعالم التقنية الرئيسية للوصل إلى أعلى معدلات إحلال في مصانع الإسمنت

T.S.R.	< 9 %	9 – 25 %	25 – 60 %	60 – 90 %
Initial or extension of cond. plant	√	√	√	√
CI by-pass	-	-	√	-
Pre-calciner modification	-	-	√	-
Additional Rocket Mills	-	√	√	√
Modifications in main burner	-	-	-	√

Loesche

4 فهم المتطلبات

من خلال الجمع بين خبرات الشركات الأعضاء في المجموعة في مجالات الطحن وتكنولوجيا المعالجة الحرارية وتحسين المصانع وأنظمة الطاقة وتصميم وتشغيل معدات مصانع الإسمنت ، تتمتع Loesche بمكانة فريدة فيما يتعلق بمساعدة منتجي الإسمنت على الاستفادة من فوائد استخدام كميات أكبر من الوقود المشتق من النفايات .

وقد اتسعت هذه الخبرة في عام 2012 عندما أصبحت كل من aixergee ، المتخصصة في محاكاة مصانع الإسمنت ومحاكاة ديناميكا الموائع الحسابية (CFD) ، والشركة النمساوية A TEC (بما في ذلك Greco Combustion Systems في البرازيل) جزءاً من مجموعة Loesche.

وعليه ، فإن مجموعة Loesche لا يمكنها توريد المعدات فحسب ، بل يمكنها أيضاً تصميم وتنفيذ جميع التعديلات التي قد تكون ضرورية من أجل زيادة استخدام الوقود البديل في مصانع الإسمنت .

وبالنظر إلى بعض هذه القدرات بمزيد من التفصيل ، نجد أن خبرة A TEC تكمن في المعالجة الحرارية لفرن الإسمنت .

ومنذ منتصف التسعينيات ، ركزت الشركة على استخدام أنواع الوقود البديل في إنتاج الإسمنت ، ويمكنها الآن توفير أنظمة وقود بديل كاملة لأي نوع من أنواع النفايات الصلبة والسائلة تقريباً ، بما في ذلك مناولة المواد وإعدادها وتخزينها ، والتغذية في الفرن .

وبالتوازي ، تقوم الشركة بإجراء أي تعديلات قد تلزم للمعالجة الحرارية من أجل حرق أنواع الوقود البديل ، مثل التعديلات على المسخنات المسبقة والمكلسنات والمعدات الإضافية .

وتتجلى إحدى نقاط قوة A TEC في تقنية Rocket Mill ، المصممة لإنتاج أنواع وقود عالية الجودة مشتقة من النفايات ذات خصائص خاصة تسمح بمعدلات إحلال عالية للغاية .

وتتمثل إحدى المزايا الرئيسية في إمكانية دمج تقنية Rocket Mills في مصنع للإسمنت ، هي أنها تتيح للمنتجين التحكم في إمدادات الوقود الخاصة بهم بكفاءة وثقة فيما يخص جودة المخرجات ، دون الحاجة إلى الاعتماد على موردين خارجيين قد لا يتمكنون من تلبية معايير الجودة الصارمة اللازمة لتحقيق مستويات عالية من معدل الإحلال الحراري (TSR) .

وتتيح التكنولوجيا داخل تقنيةRocket Mill طحن النفايات المنزلية والتجارية التي تم فرزها مسبقاً وتقطيعها والموزعة بكثافة 100-300 كجم / م 3 ، بأحجام تصل إلى 15 ملم ، وبنسبة 50 % < 5 مم ، في تمريرة واحدة .

ولا تؤمن عملية التحضير تقليل الحجم (الطحن) فحسب ، بل تزيد أيضاً من المساحة السطحية المحددة لمواد النفايات ، مما يوفر خصائص اشتعال واحتراق أفضل – وهي عوامل رئيسية عند السعي لتحقيق مستويات عالية من معدل الإحلال الحراري (TSR) .

وعندما تحتوي النفايات الخام على نسبة عالية من الرطوبة ، وهو أمر بغاية الأهمية ، فإن العملية الفيزيائية داخل Rocket Mill توفر وسيلة تجفيف ، بحيث يمكن تحويل الوجبة ذات نسبة رطوبة 25 % إلى وقود يحتوي على نسبة 15 % رطوبة أو أقل .

وبالطبع ، يعد الاستثمار في المعدات مجرد جانب واحد لتحقيق التحول الناجح إلى استخدام كميات أكبر من أنواع الوقود البديلة في مصنع الإسمنت .

ومع زيادة الخبرة في عملية التحسين ضمن مجموعة Loesche ، يمكن لشركة aixergee تقييم كيفية عمل المصنع وتحديد أي قيود والبحث عن أسبابها الجذرية . كما يمكنها ، بعد القيام بذلك ، أن توفر الحلول المناسبة من أجل تحسين تشغيل المصنع .

غير أن عملية تحسين المصانع نحو الأمثل لا تقتصر على الحالة التي يرغب فيها منتج الإسمنت في تغيير تركيبة مزيج الوقود الخاص به . فضغوط التكلفة وتغيير الوجبات ومعايير المنتج تعني أن التحسين هو في كثير من الأحيان متطلب مستمر ، مع ضرورة إجراء تعديلات على تشغيل المعدات بشكل منتظم .

ويتمثل التحدي في أن العملية داخل المكلسن أو الفرن تختلف عما تبدو عليه من الخارج : وبالتالي هناك حاجة إلى النمذجة العملياتية للمعايير مثل تدفق الغاز والوجبات وعملية الاحتراق والانبعاثات وجودة الكلنكر قبل أن يتم إدخال تعديلات النظام الفعلية موضع التنفيذ .

6 تقنية Rocket Mill من A TEC لتجهيز أنواع الوقود البديل

وفي حالة الاستخدام المتزايد للوقود المشتق من النفايات ، تستطيع شركة aixergee استخدام محاكاة ديناميكا الموائع الحسابية (CFD) وغيرها من التقنيات لنمذجة سلوك الأفران أو المكلسنات بالنسبة لجزيئات النفايات المختلفة ، مما يوفر فهماً أفضل لكيفية تدفقها وتفاعلها وحرقها . يمكن بعد ذلك استخدام مخرجات هذه الدراسات لتطوير مخططات عملية التحسين نحو الأمثل .

5 استخدام الوقود البديل في إنتاج الإسمنت

كقاعدة عامة ، ستصبح زيادة نسبة أنواع الوقود البديل – مثل تلك المشتقة من نفايات ما بعد الاستهلاك والنفايات التجارية – مقاربة جذابة لمنتجي الإسمنت الذين يحرصون على خفض تكاليف الطاقة لديهم .

ومع ذلك ، من المهم في الوقت ذاته التأكد من أن المصانع ستبقى مستقرة أثناء التشغيل ، على الرغم من الاختلافات المحتملة في تركيب الوقود ، وأن جودة منتج الكلنكر ستستمر في تلبية المواصفات .

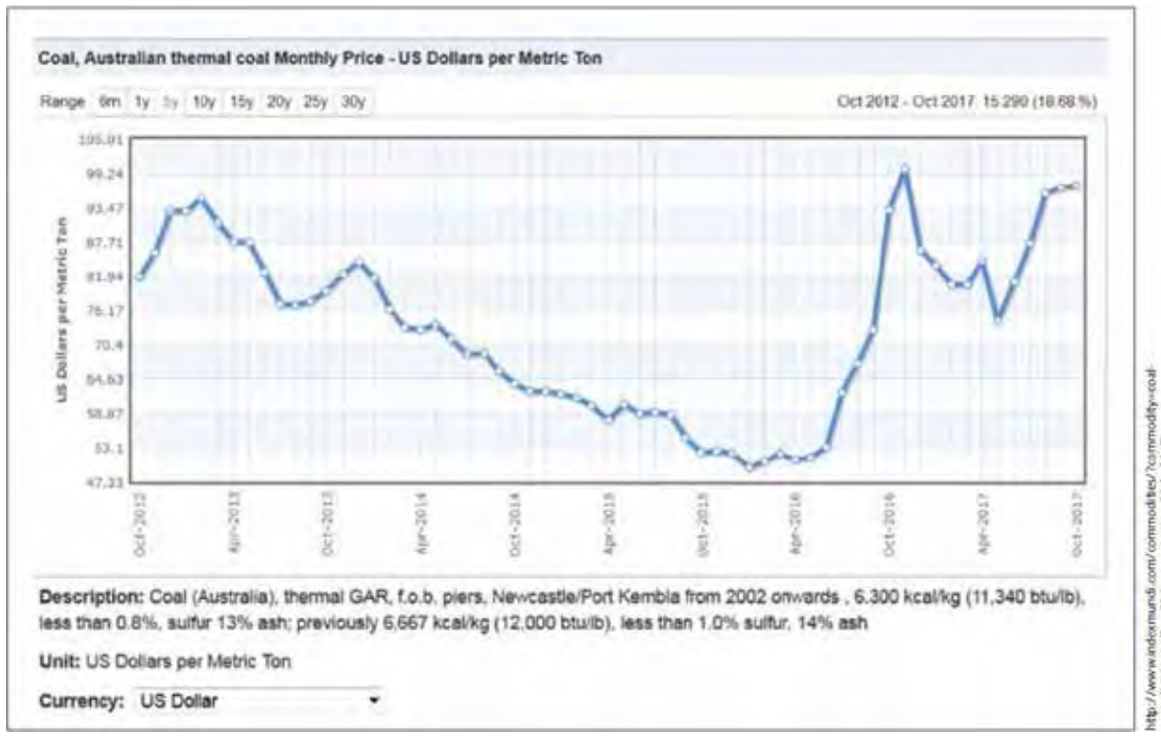
وبالإضافة إلى ذلك ، يجب أن يحافظ أي نظام تحرق فيه كميات كبيرة من الوقود البديل على متطلبات صيانة منخفضة ، لأن تكاليف الخدمة المتزايدة ستؤثر بوضوح في وفورات تكاليف الطاقة المحققة .

في ضوء ذلك ، من الضروري استخدام الوقود المشتق من النفايات عالي الجودة في أي نظام يعمل على زيادة معدلات الإحلال الحراري (TSR) في مصانع الإسمنت . وهنا تقدم تقنية Rocket Mill من A TEC مزايا هامة ، ليس فقط من حيث الطريقة التي تجفف بها مواد النفايات وتقوم بإعدادها ، بل من خلال قدرتها على فصل وتفريغ المواد غير العضوية التي قد تشكل كميات متزايدة من الرماد أثناء الاحتراق ، وتعمل ، في ذات الوقت ، على زيادة القيمة الحرارية للوقود المشتق من النفايات .

ومن الواضح أن استخدام وقود عالي الجودة له تأثير إيجابي على المعالجة الحرارية ككل ، مع حرق أفضل للوقود في الأفران نتيجة لخواص الوقود الفيزيائي المحسنة .

بالإضافة إلى ذلك ، أثبتت التجربة العملية أن استخدام وقود مُعد جيداً وعالي الجودة يؤدي إلى إنتاج كلنكر عالي الجودة ، مع نسبة أقل من الكلنكر البني الغني بالحديد وانخفاض في دوران الكبريت . وأخيراً ، تظل عملية التشغيل مستقرة بسبب تجانس الوقود الأكبر من حيث خواصه الكيميائية والفيزيائية .

7 التوجه خلال 5 سنوات في أسعار الفحم - الفحم الأسترالي



وفي حين تعمل تقنية Rocket Mill على تقليل محتوى الرطوبة في النفايات ، فإنه يمكن إنتاج وقود أكثر جفافاً بإضافة وحدة فاصل / مجفف إلى دارة إعداد الوقود ، أو عن طريق طرد الغاز الزائد من خلال تقنية Rocket Mill . ويساعد الوقود الذي يتم إنتاجه بهذه الطريقة في تحقيق حرق سريع ، كما يساعد على تحقيق أقصى نسبة من معدلات الإحلال الحراري (TSR) .

8 التركيز على النفايات كمورد ذي قيمة

وهكذا يتم الآن تحقيق معدلات إحلال حراري (TSR) تزيد عن 90 % مع استخدام تصاميم A TC لغرف الاحتراق وما بعد الاحتراق في المكلسنات ، علماً بأن غرفة ما بعد الاحتراق على وجه الخصوص تضمن تحقيق حرق كامل حتى عند استخدام معدلات عالية من الوقود البديل . والأهم من ذلك هو الحفاظ على استقرار الفرن .

6 نهج Loesche في استخدام الوقود البديل

إن العالم بأكمله لديه مشكلة النفايات . وتظهر البيانات من Waste Atlas أن حوالي 1900 طن في السنة من النفايات البلدية الصلبة(MSW) يتم إنتاجها في جميع أنحاء العالم ، ويتم جمع 70 % منها فقط .

ومن تلك الـ 70 % ، يتم إعادة تدوير أو استرداد 19 % ، ويتم استخدام 11 % – أي أقل من 150 مليون طن سنوياً ¬– كوقود في منشآت استرداد الطاقة . من الواضح أن هناك فرصة لتحويل نسبة أكبر بكثير من النفايات التي يتم ردمها الآن لإنتاج الطاقة ، كما هو مذكور أعلاه ، وتوفر صناعة الإسمنت بديلاً منخفض الكلفة للنوع التقليدي في محطات توليد الطاقة ، وذلك من خلال حرق النفايات .

وبالرجوع إلى الشكل 3 ، من المهم إدراك أن مقارنة الكفاءة المبينة هنا – والتي تفضل استخدام النفايات كوقود في إنتاج الإسمنت – تستند فقط إلى الطاقة الكيميائية الموجودة في الوقود .

وقد خلصت الدراسة التي تم الحصول عليها من الرسم التوضيحي إلى أن استخدام نفايات مكيفة عالية الجودة في مصانع الإسمنت له فوائد بيئية أيضاً ، حيث أن أي رماد ناتج أثناء الاحتراق يتم إدماجه في الكلنكر ، لذلك لا يتطلب الأمر المزيد من المعالجة أو التخلص على المدى البعيد .

ويجمع النهج المتكامل الذي يمكن أن تقدمه Loesche لمنتجي الإسمنت في العالم نقاط قوة المجموعة في جميع المجالات اللازمة لجعل الاستخدام المتزايد للوقود المشتق من النفايات ناجحاً من الناحيتين التقنية والاقتصادية .

والأساس المنطقي للقيام بذلك قوي : فمجموعة Loesche تعمل ضمن صناعات ذات استخدام كثيف للطاقة ، والتي تتعرض الآن لضغوطات خفض تكاليف التشغيل . وتحتوي النفايات المختارة بشكل صحيح على طاقة قابلة للاستخدام ، ومعظمها «يذهب إلى النفايات» حالياً ، لذلك فإن استغلال هذا المورد سيساعد على تحسين استدامة إنتاج الإسمنت .

واليوم ، يتخذ عدد متزايد من البلدان إجراءات لإنشاء نظم مستدامة لإدارة النفايات . فضلاً عن تعاظم الضغوط السياسية والبيئية لإيجاد الحلول ، مع إيلاء المزيد من الاهتمام لقضايا الصحة والسلامة العامة ، ومسألة تخصيص الأراضي للتخلص من النفايات ، ولا سيما حول المراكز الحضرية الكبيرة .

أضف إلى ذلك ، ارتفعت أسعار الطاقة الأولية بحوالي 80 % في الأشهر الثمانية عشرة الماضية ، مما يعطي منتجي الإسمنت حافزاً كبيراً للبدء في أو زيادة معدلات الاستبدال الإجمالية بشكل كبير .

إن تركيز Loesche على النفايات كمورد ذي قيمة يجمع بين خبرة المجموعة في المعدات وتحسين العمليات – والأهم من ذلك – فهمها على المدى الطويل لمتطلبات التشغيل في صناعات الإسمنت والطاقة . وتتيح هذه التجربة للمجموعة تقديم أفضل الحلول الممكنة لعملائها ، وستتمكن من تحقيق ذلك عن طريق معرفة ما يحتاجه المستخدم النهائي ، وذلك في محطات تكييف النفايات فضلاً عن احتياجاته من الطحن .

ربما يكون التحدي الأكبر هو أن النفايات تعد واحدة من أكثر التدفقات غير المتجانسة في العالم – فليس هناك تركيبة نموذجية . ومن خلال فهم ذلك ، تعتقد Loesche أن نهجها المتكامل لتوفير الحلول المناسبة لمتطلبات مصنعي الإسمنت سيقدم طريقة واضحة للأمام .

7 ملاحظات أساسية

يبين الشكل رقم 7 أن الاتجاه نحو زيادة أسعار الفحم واضح تماماً ، لذا فقد حان الوقت للاستثمار في معدلات إحلال أعلى والاستفادة من الوفورات الكبيرة في تكاليف الطاقة الأولية !

www.loesche.com

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الأفران الدوارة في معامل الاسمنت
أسئلة وأجوبة

إعداد / رئيس المهندسين الأقدم

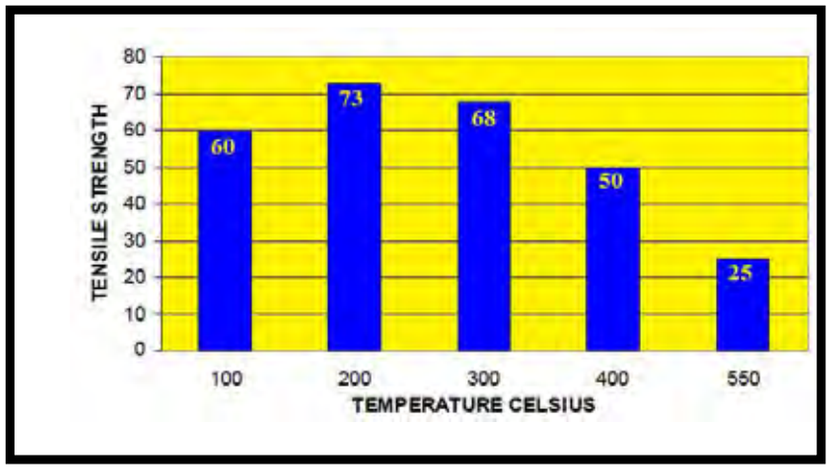
هزاع اسماعيل محمود – الشركة العامة للسمنت العراقية

س/ ماهي أعلى درجة حرارة مستمرة يبقى عندها جسم الفرن بدون ضرر

ج/ بالرغم من حقيقة أن أغلب أجسام الأفران تصنع من سبيكة صلب منخفض الكربون (low alloy carbon steel) إلا أن أعلى درجة حرارة لجسم الفرن الدوار في معامل الإسمنت ينصح بها تختلف باختلاف المعمل – البلد – المصنع ، وتعتمد على عمر جسم الفرن - المسافة بين تايرات الأفران - تركيب جسم الفرن . وهناك نقاط هامة يجب أن تؤخذ بعين الاعتبار قبل تحديد أعلى درجة حرارة مسموح بها لجسم الفرن منها:

1. عمر وحالة جسم الفرن : أجسام الأفران القديمة تكون قد تعرضت إلى الزحف لمدة طويلة وبهذا تكون أكثر عرضة لحصول التشققات في قشرتها أكثر من الأفران الأقل عمراً .
2. المسافة بين التايرات : كلما زادت المسافات بين التايرات الساندة للفرن تكون قشرة الفرن أقل تحملاً لارتفاع درجات الحرارة ومعرضة لحصول انحناء وقتي فيها .
3. تركيب جسم الفرن : أجسام الأفران تصنع من صفائح فولاذية مدرفلة (structural rolled steel plate) من نوع A-S-T-M A36 مثلا قوة الشد لهذا النوع من الصلب عند درجة حرارة الغرفة هي بحدود (50000 TO 80000 PSI)

الجدول رقم (1) يوضح أن قوة الشد لجسم الفرن تزداد عندما تنتقل الحرارة من حرارة الغرفة لتصل إلى 200°م يعقبها انخفاض حاد بقوة شد جسم الفرن بارتفاع الحرارة عن 200°م . عند درجة حرارة 430°م تنخفض قيمة الشد من 50000 psi الى 75000 psi أي انخفاض بمقدار 33 % وبعض الباحثين يخمن قيمة الانخفاض بمقدار 50 % عند نفس التحول بدرجات الحرارة .



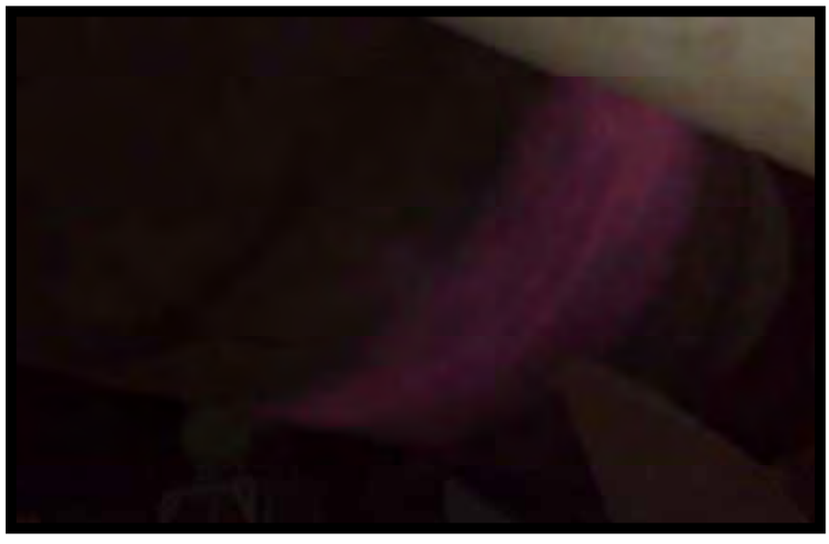
صورة رقم (1) (قوة الشد لجسم الفرن بتغيير درجات الحرارة)

* A.S.T.M الجمعية الامريكية لاختبار المواد

* par1 = 14.503psi

س/ ما هو الفرق بين البقعة الحارة والبقعة الحمراء لجسم الفرن ؟

ج/ البقعة الحارة هي منطقة محددة على جسم الفرن بدرجة حرارة مرتفعة غير طبيعية . يتم الكشف عنها بسرعة بواسطة الماسح الضوئي لجسم الفرن أو



صورة رقم (2) (بقعة حارة بدرجة حرارة 750°م)

بواسطة جهاز قياس الحرارة بالأشعة تحت الحمراء ، البقعة الحارة لا يمكن رؤيتها بالعين المجردة أثناء النهار ويمكن مشاهدتها بصعوبة عند الليل (صورة رقم 2) ، لذا واستناداً إلى طيف الإشعاع الضوئي (Visible Radiation Spectrum) للأجسام الحارة يجب أن تكون درجة حرارة جسم الفرن أقل من 550°م . وتختلف البقعة الحمراء (صورة رقم 3) عن البقعة الحارة من حيث أنها يمكن مشاهدتها خلال فترة النهار ، بينما البقعة الحارة تكون مؤشر إنذار ، البقعة الحمراء دائماً تحتاج إلى تصرف من قبل مشغل الفرن .

صورة رقم (3) (بقعة حمراء بدرجة حرارة 830°م)

س/ ماهي أعلى درجة حرارة للبقعة الحمراء لجسم الفرن التي تجبر مشغّل الفرن على إيقافه عن العمل ؟

ج / الإجابة القصيرة هي 550°م إذا كانت البقعة الحمراء مستمرة ومتواصلة .

هذه هي الإجابة الموجزة ولكن عند الحديث عن البقعة الحمراء ، أضرار قشرة جسم الفرن ، توقف الفرن لمدة طويلة ، خسارة مبالغ كبيرة ، هذا الجواب لا يمكن أن يكون مقبولاً . هناك عدد من العوامل يكون من الضروري تماماً أخذها بعين الاعتبار قبل اتخاذ قرار إيقاف الفرن :

1 - قرب البقعة الحمراء من الإطارات ومسننات تدوير الفرن يتطلب أخذ رد فعل فوري ، هذه البقع عادة وبثبات تجبر على البدء بخطوات إيقاف الفرن لتجنب تشوه جسم الفرن .

2 - امتداد البقعة الحمراء : كلما زاد الامتداد المحيطي للبقعة الحمراء أدى إلى تزايد خطورة التشوه في جسم الفرن أو حصول انهيار فيه ، وإذا كان هناك بقعة حمراء تغطي 10 % من محيط الفرن (صورة رقم 4) يجب إيقاف الفرن فوراً .

3 - حالات استقامة الفرن : عدم استقامة الأفران يؤدي إلى إجهادات موضعية على طول جسم الفرن ، إذا كانت البقعة الحمراء تجاور منطقة فيها مثلاً هذه الاجهادات المركزة ستؤدي إلى حصول استطالة أو التواء في جسم الفرن .

صورة رقم (4) (بقعة حمراء محيطية)

4 - فيما إذا كانت البقعة معرضة للجو أو تحت سقف : إذا كان جسم الفرن معرضاً مباشرة لأمطار غزيرة تضرب البقعة الحمراء سيؤدي ذلك إلى حصول تشققات في جسم الفرن نتيجة التبريد المفاجئ الحاصل بسبب مياه الأمطار ، ويؤدي في بعض الأحيان إلى تحطم الطابوق الناري القريب من هذه المنطقة .

5 - وجود شق في جسم الفرن في منطقة مجاورة للبقعة : في حالة وجود شق مجاور لمنطقة بقعة حارة يجب إيقاف الفرن عن العمل فوراً .

صورة رقم (3) (بقعة حمراء بدرجة حرارة 830°م)

صورة رقم (4) (بقعة حمراء محيطية)