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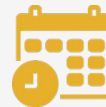
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AUCBM's *Quarterly Cement and Building Materials Review (CBMR)*

EDITORIAL SCHEDULE FOR 2025

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Deadlines for receiving articles, press releases, or advert materials for 2025 issues are as follows:

March issue: **10th March 2025**

June issue: **29th May 2025**

September (Bonus) issue: **24th September 2025**

December issue: **8th December 2025**



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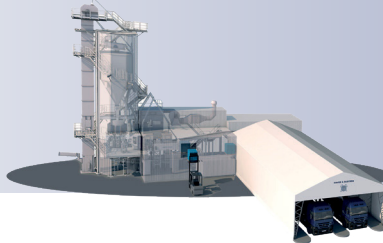
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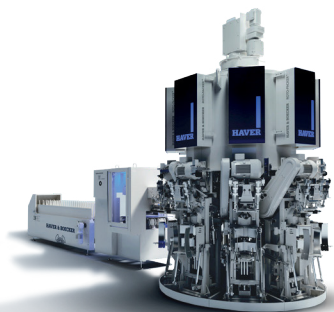
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Lower costs, increased capacities: Recommissioned road-mobile unloaders deliver on all counts

Headquartered in Muscat, Oman, Pioneer Cement LLC, is among the leading suppliers of construction materials in the region. With dynamic business operations located in Oman, the United Arab Emirates (UAE), Kuwait, Turkey, and Tajikistan, its responsiveness to the changing market demands of the cement industry is key.

Noticing the need for greater capacity, but also flexibility, efficiency, and environment-friendly dry bulk handling, Pioneer Cement required a new cement ship unloading solution. This came in the form of a pair of previously-owned Siwertell road-mobile ship unloaders, one 5 000 S and one 10 000 S.

Strategic unloading lowers costs

The road-mobile units offer the company a unique combination of asset agility and market-leading through-ship efficiency, and are capable of deploying within an hour of arriving at the quayside. They move between the ports of Suwaiq, Sultan Qaboos, and Sur in Oman, directly discharging cement to bulk trucks. The longest distance covered is around 350km, between the ports of Suwaiq and Sur.

“Siwertell technology provides several operational advantages for Pioneer Cement,” explains Saeed Taghdisi, Technical Manager, Pioneer Cement. “One of the key benefits lies in its ability to significantly reduce the logistics costs associated with cement unloading.

“With the Siwertell road-mobile unloaders, we have the flexibility to seamlessly relocate them between different ports, optimizing our operations to accommodate varying vessel sizes and the proximity of our customers to these ports. This flexibility allows us to strategically select the most efficient port for delivering cement to specific customers, ultimately leading to a reduction in the product’s final price,” Taghdisi notes.

“The acquisition of the Siwertell ship unloaders aimed to transform the transfer of cement from cement carrier vessels to general cargo ships,” he adds. “Cement carriers have transportation capacity limitations and incur high costs. Thanks to the utilization of these road-mobile unloaders, bulk cement can now be transported with increased capacity and at lower costs.”

Good fit for cruise ports

Regulations at regional, national and international levels rightly seek to ensure more environment-friendly dry bulk transfers, while port-specific requirements for clean and quiet procedures can place direct pressure on operators to improve their environmental performance.

A Siwertell ship unloader is totally enclosed, offering spillage-free dry bulk cargo handling, with virtually no dust creation. They are also quiet, making them ideal for operations in close proximity to residential, business and leisure areas, while their high efficiency makes them market leaders in terms of energy consumption per ton of material handled.

The road-mobile systems are an excellent fit for Pioneer Cement’s port locations. Taghdisi notes the particular benefits of this technology for one specific location. “Sultan Qaboos Port, situated in the Muttrah district near the center of Muscat, is primarily a passenger port with frequent cruise ship traffic. This poses a unique challenge for dry bulk handling activities, which we were able to address seamlessly.”

Positive early feedback

“I am excited to share more about our operational success,” continues Taghdisi. “With the Siwertell 10 000 S road-mobile unloader, the efficiency and smooth operation of this equipment has been truly remarkable. We have successfully utilized it to unload cement vessels at the Sultan Qaboos Port.”

Pioneer Cement’s process is tailored to the size of the vessels it receives. “For smaller vessels, we utilize the 5 000 S unloader, which efficiently handles the unloading process, and the larger unloader solely handles larger vessels,” he adds.



“We find that the optimal unloading performance of the 5 000 S unloader is when it unloads cement from vessels weighing less than 5,000 tons. Its smaller size makes maneuvering during the unloading process much more convenient,” Taghdisi explains.

“Our cement transportation system is intricately tied to the price of cement in export ports and destinations. To enhance our market presence, we are actively studying the development of new ports in Oman, such as Sohar and Duqm, where high deadweight tonnage (DWT) vessels can unload cement efficiently. In these ports, we anticipate the need for unloaders with higher capacities, such as the 15 000 S, to handle the increased volume effectively.

“Furthermore, we are exploring new opportunities in several other ports in the UAE and Qatar, and foresee potential expansion into African markets in the near future. By leveraging these strategic acquisitions and expansions, we aim to fortify our position in the region and capitalize on emerging opportunities for growth,” highlights Taghdisi.

Running like new

Road-mobile unloaders offer flexibility and efficiency, and along with small footprints, low quayside weights and quality builds, meaning that they retain their value and are prized on the second-hand market.

Pioneer Cement could see this opportunity and made the decision to purchase and recommission the previously-owned units, turning to expert original equipment manufacturer (OEM) input from Bruks Siwertell to ensure that they were operating at peak efficiency.

“When the road-mobile unloaders were initially inspected, I saw that there were some wear parts in need of replacement, as well as a number of other improvements required for long-term operational performance,” says Jonas Hansen, Senior Surveyor, Bruks Siwertell.

For example, one of the systems had been running without the counter-rotating inlet feeder for some months. This is not recommended, as this component optimizes the draw of material into the conveyor for faster, more efficient dry bulk unloading.

“On the 10 000 S, we also found hardened cement inside the inlet and encasing part of the screw conveyor,” says Hansen. “This is not unexpected for a cement unloader operated over a long interval without maintenance. Fortunately, the crew and I were able to remove the inlet and clean the cement off, restoring it to working order on site without having to order a replacement. We recommend that the bottom bearing is changed for this operation every 300 hours and we actually pushed through about 15kg of grease to clean the top bearing of the inlet.”

Pioneer Cement values proactive equipment service. It is embarking on a regular, thorough maintenance regime to keep the ship unloaders performing well and understands how good service impacts performance. “Thanks to the well-designed Siwertell ship unloader and Pioneer Cement’s rigorous maintenance program, we have achieved a commendable level of efficiency in cement unloading, with minimal dust emissions,” says Taghdisi.

“Additionally, we have invested in new technology from Bruks Siwertell, enabling us to use augmented reality (AR) glasses for maintenance tasks under the supervision of Siwertell experts at its service center. This ensures the quality of our maintenance work,” he highlights.

Resilient, reliable design

Siwertell ship unloaders are renowned for their market-leading longevity, reliability, low maintenance costs, and replaceable wear parts.

“The robust and heavy-duty design of Siwertell unloaders plays a crucial role in minimizing maintenance costs,” says Taghdisi. “This durability ensures that the unloading systems operate efficiently over an extended period, thereby reducing the need for frequent repairs and maintenance, which can otherwise incur substantial expenses.

“In summary, Siwertell technology not only streamlines our logistical operations, but also contributes to cost savings through its resilient design, ultimately enhancing our competitiveness in the market,” he concludes.



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Siwertell road-mobile ship unloader ensures efficient cement handling in Libyan port

Bruks Siwertell will soon deliver a next-generation Siwertell 10 000 S road-mobile ship unloader to Belgium company, SST BELGË NV. It will provide flexible, environment-friendly cement handling at the port of Benghazi, Libya, boosting the efficiency of regional supply chains.

“The operator recognized our proven dry bulk handling technology and the unmatched advantages that Siwertell road-mobile ship unloaders offer,” notes Jürgen Ojeda, Sales Director Mobile Unloaders, Bruks Siwertell. “They out-compete all other equivalent dry bulk handling technology on performance, including through-ship capacity and environmental protection, reliability, and operational costs.

“The next-generation 10 000 S model was selected after a comprehensive evaluation of several potential suppliers. Key factors influencing the company’s decision included our commitment to short delivery times, ability to offer a market-leading mechanical unloading system, and competitive pricing.

“Furthermore, they offer strategic value, both enhancing port efficiency and enabling an operator to respond to future changes,” Ojeda continues. “The agility of Siwertell road-mobile unloaders means that they can be deployed at multiple ports, operate with minimal infrastructure, and move away from the jetty when not required. Originally designed for handling cement, their success in this sector continues to grow.”

The unloader’s installation at the port of Benghazi will play a critical role in boosting regional trade. The port is part of the emerging Julyana Freezone, which was established in 2023 to streamline logistics and supply chain services. Benghazi serves as a major transit hub for landlocked countries like Chad and Niger, facilitating the movement of goods from ship to shore and onward by train to inland dry ports.

The 10 000 S road-mobile ship unloader will offer a continuous rated cement handling capacity of 300t/h and can efficiently discharge vessels of up to 10,000 dwt. The system features totally enclosed conveying lines and dust filters, minimizing dust emissions and ensuring the industry’s highest environmental protection standards. It also has a double-bellows discharge arrangement with an automatic shifting function, ensuring fast, efficient material transfers directly to waiting trucks.

The unloader is ready for handover, and the delivery includes a two-day comprehensive training program, comprising a theoretical overview of the unloader and all its systems, operating manual, and maintenance and service recommendations, along with practical operator handling.

For more information, please contact

Jürgen Ojeda, Sales Director Mobile Unloaders
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Misr International Ceramic Co., Sanitaryware plant: “Royal Style” Egypt chooses SACMI-Riedhammer

New shuttle kiln mod. HWS 15/500/40-G recently installed at Misr, equipped with Pulse Firing burners, automatic systems and high-performance kiln linings. An investment to modernize the sanitaryware plant at its production site in the industrial zone of Qesna.

Misr International Ceramic Co., Egypt chooses SACMI technology to launch its plan to modernize the technology and plant systems of the sanitaryware production line based in Tanta, where a new SACMI-Riedhammer HWS 15/500/40-G PF shuttle kiln has just been installed and started up.



Equipped with 10 cars, the new HWS kiln is conceived for a production output of 780 pieces/cycle and is suitable for first firing or re-firing. The burners (42 in total, of which 31 are at the bottom and 11 in the kiln roof) are designed with the exclusive SACMI-Riedhammer Pulse Firing technology for optimization of the firing curves and guaranteed consumption levels for 1.550 Kcal per Kg of fired product (in the case of first firing applications), 1.480 Kcal per Kg (with re-firing).

Piece handling is fully automatic, thanks to chain conveyors, both inside the kiln and for car loading and unloading operations. The vertical automatic door eliminates the need for manual work during loading/unloading and guarantees the best seal, as do the internal linings which are made of cordierite, like the roof, while the walls are made of high-performance fibre blocks.

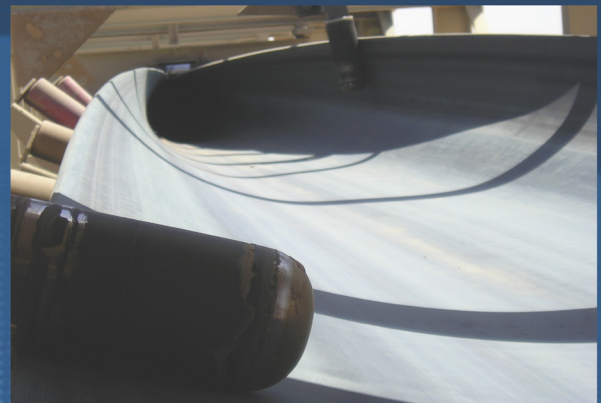
With this first stage of the investment, made with SACMI, Misr's objective is to increase the quality standards of the product in order to boost its position on the Egyptian market in the sanitaryware sector alongside its tiles business, which has been operating since 1980.



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Enhancing Cement Milling Efficiency: The Role of Grinding Aids

Shehab. M. Al-Aryan, ASEC Technical Center

Abstract

Grinding aids have an immense impact on the production and cost of cement manufacturing. They impact the quality, power consumption, and handling both in the cement plant and in the final users' hands (Strohman 2004). This paper explores the impact of grinding aids on the performance of cement mills, focusing on their chemical mechanisms, economic benefits, and environmental implications. Special emphasis is placed on sustainable alternatives and their role in optimizing cement production.

Keywords

Grinding aids, cement mill, energy efficiency, clinker grinding, sustainability, cost-effectiveness

1. Introduction

Cement production is a cornerstone of the construction industry, contributing significantly to infrastructure development worldwide. However, the cement manufacturing process is highly energy-intensive; out of 110 to 130 kWh/ton of electrical power consumed in making cement, between 30 and 50 kWh/ton are consumed by the finish milling operation. This is the largest single consumption point of electric power in the process of converting raw materials to finished cement (Strohman 2004). The grinding of clinker, combined with gypsum and other additives, is a critical step to achieve the desired fineness and other properties of cement.

Despite technological advancements, the efficiency of cement grinding remains a key challenge due to issues such as particle agglomeration and suboptimal mill performance. These inefficiencies not only increase operational costs but also contribute to significant greenhouse gas emissions, particularly CO₂, which is released during energy production.

To address these challenges, grinding aids have emerged as an essential tool in modern cement milling. Grinding aids are sometimes used in clinker grinding, to decrease the energy required to achieve a given fineness of grinding or throughput. They appear to act mainly by decreasing agglomeration (Taylor 1990).

This paper investigates the role of grinding aids in cement milling, with a focus on their chemical mechanisms, economic benefits, and potential for fostering sustainability in the cement industry. Additionally, the paper explores recent innovations in eco-friendly grinding aids, highlighting their contribution to energy efficiency and environmental impact reduction.

2. Mechanism of Grinding Aids

Grinding aids are materials which facilitate grinding in mills, by eliminating ball coating or by dispersing the ground material. When grinding cement, the additive must also have been shown not to be harmful to the finished cement (Duda 1975).

Mechanism of grinding aids depend on its type, such as:

- Surface active agents tend to saturate the free valence and inhibit the pack-set (as ligno-sulphonates, polyoils, amines, and organic acids).
- Polar compounds (water, ammonia) are known to have some action on such bonds through their polar moment
- HEA2 (alkanolamine), DDA (Dodecylamine) and other products cause a definite reduction of pack-set but do not prevent agglomeration or lump-formation problems that are caused by Alkalis (K₂SO₄) or Moisture (Paxton and Denizeau 2010).

3. Impact on Cement Properties

3.1 Physical Properties

Grinding aids improve cement fineness by enhancing the separation of particles, leading to a more uniform particle size distribution. This results in a higher Blaine fineness and better packing density, both critical factors for cement performance.

3.2 Chemical Properties

Grinding aids influence the hydration process of cement. They can accelerate hydration by promoting the dissolution of C₃S (tricalcium silicate), enhancing early strength development. However, excessive use may lead to undesirable side effects such as reduced long-term strength due to alterations in the microstructure; in addition, the heat of hydration may increase depending on the type of grinding aid.

4. Sustainability Considerations

Energy efficiency and environmental sustainability are pivotal in the modern cement industry. Grinding aids contribute to sustainability by:

1. **Reducing Energy Demand:** By lowering energy consumption during milling, grinding aids help reduce the carbon footprint associated with electricity generation.
2. **Lowering Emissions:** Enhanced grinding efficiency leads to lower overall CO₂ emissions per ton of cement produced.
3. **Promoting Circular Economy:** Research into bio-based grinding aids, such as those derived from industrial by-products (e.g., glycerol from biodiesel production), presents an opportunity to recycle waste streams into valuable additives.

A comparative analysis of conventional and eco-friendly grinding aids can provide insights into achieving both cost-effectiveness and environmental goals.

5. Economic Benefits

The adoption of grinding aids offers substantial economic advantages:

- **Increased Mill Throughput:** By improving particle dispersion and reducing energy losses, grinding aids enable higher production rates without additional capital investment.
- **Cost Savings:** Lower energy requirements translate directly into reduced operating costs, especially in regions with high electricity prices compared to the low cost of grinding aids.
- **Improved Product Quality:** Grinding aids enhance cement performance, such as strength development, leading to a higher market value for the product.

6. Challenges and Future Perspectives

Despite their benefits, grinding aids face challenges, including:

- **Material Compatibility:** Some grinding aids may react with cement constituents, affecting final properties.
- **Cost of Sustainable Alternatives:** Eco-friendly grinding aids may be more expensive, limiting their adoption in cost-sensitive markets.
- **Regulatory Hurdles:** Environmental and chemical safety regulations may restrict the use of certain additives.

Future research should focus on:

- Developing multifunctional grinding aids that enhance both mechanical and chemical properties.
- Scaling up bio-based grinding aid production to reduce costs.
- Exploring machine learning and AI to optimize dosing strategies for grinding aids in real-time.

7. Conclusion

Grinding aids play a vital role in enhancing the efficiency and sustainability of cement milling. By reducing energy consumption, increasing throughput, and improving cement quality, they offer both economic and environmental benefits. Sustainable alternatives, although still under development, represent a promising avenue for reducing the carbon footprint of the cement industry. As the sector moves towards net-zero goals, the adoption of advanced grinding aids will be critical for aligning productivity with sustainability.

References

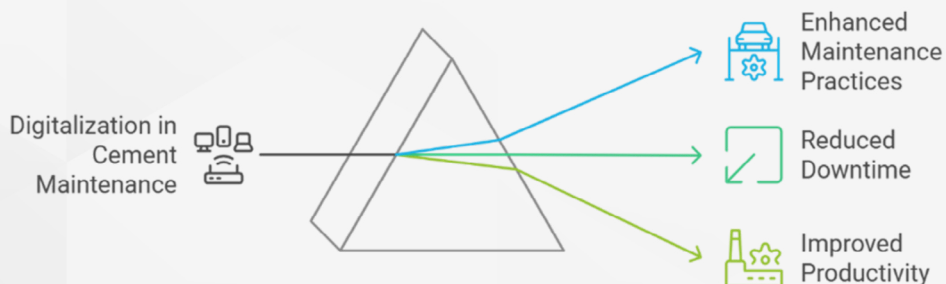
- Duda, Walter H. 1975. Cement Data Book. Berlin: Bauverlag GMBH.
- Paxton, Colin , and Jacques Denizeau. 2010. CEMENT PROCESS ENGINEERING Vade-Mecum. Paris: Lafarge SA.
- Strohman, Nile R. 2004. "Finish Milling and Grinding." In Innovations in Portland Cement Manufacturing, by Javed I. Bhatti, F.MacGregor Miller and Steven H. and Kosmatka, 512. USA: Portland Cement Association.
- Taylor, Harold F.W. 1990. Cement Chemistry. London: ACADEMIC PRESS.

Maintenance Efficiency and Digitalization in The Cement Industry

Dr. Haitham Eldalil, CEO & Co-Founder of Skymaint

The cement industry is a cornerstone of global infrastructure, and its operational efficiency is crucial for sustainable development. This document explores the intersection of maintenance efficiency and digitalization within the cement sector, highlighting how technological advancements can enhance maintenance practices, reduce downtime, and improve overall productivity. By leveraging digital tools and data analytics, cement manufacturers can optimize their maintenance strategies, leading to significant cost savings and improved operational reliability.

Unveiling the Impact of Digitalization in Cement Maintenance

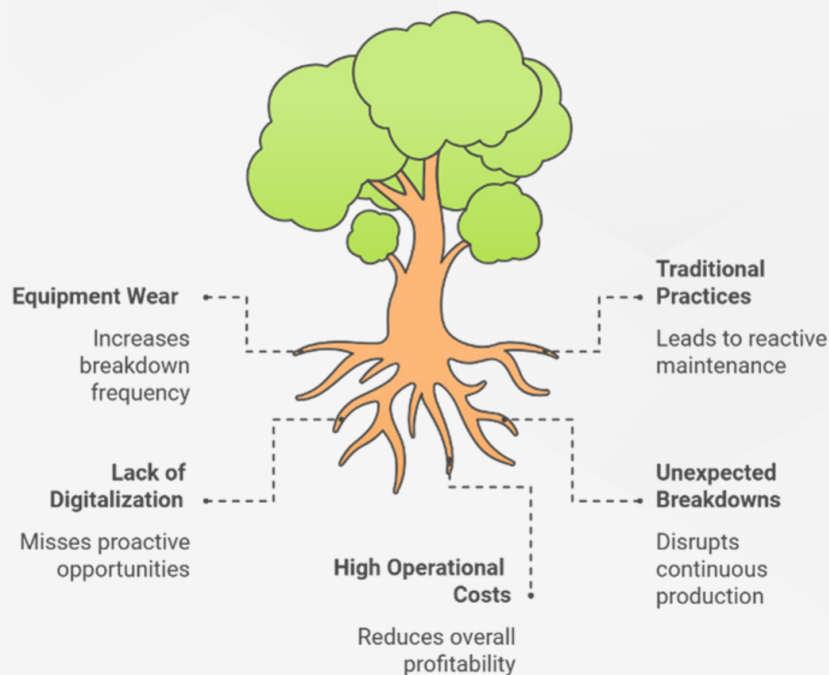


Introduction

The cement industry is confronted with a variety of obstacles, such as the necessity for continuous production, equipment wear and tear, and unforeseen failures. Additionally, the cement industry's substantial carbon footprint places more pressure on the implementation of maintenance practices that could contribute to a sustainable environment. Furthermore,

traditional maintenance procedures frequently induce inefficiencies, which in turn results in diminished output and elevated operational expenses. Nevertheless, the onset of digitalisation presents novel opportunities to revolutionise maintenance methodologies, thereby enhancing their data-driven and proactive nature.

Inefficient Maintenance in Cement Industry



Importance of Maintenance Efficiency

The term “maintenance efficiency” refers to the process of conducting maintenance and repair activities in a secure manner, at the optimal cost, and within the appropriate time frame. There are numerous reasons why maintenance efficiency is essential in the cement industry:

1. **Cost Reduction:** Effective maintenance strategies can significantly lower operational costs by minimizing unplanned downtime and extending equipment lifespan.
2. **Productivity Improvement:** Well-maintained equipment operates at optimal levels, ensuring consistent production rates and quality.
3. **Safety Enhancement:** Regular maintenance reduces the risk of equipment failure, thereby enhancing workplace safety for employees.
4. **Sustainability Goals:** Efficient maintenance practices contribute to reduced energy consumption and lower emissions, aligning with global sustainability initiatives.



Digitalization in the Cement Industry

Maintenance digitization refers to the integration of digital technologies, such as the Internet of Things (IoT), artificial intelligence (AI), and data analytics, into traditional maintenance practices. This paradigm shift allows for real-time monitoring of equipment and processes, enabling predictive maintenance strategies that anticipate potential failures before they occur. By utilizing sensors and IoT devices, cement manufacturers can collect data on machinery performance, vibration patterns, temperature fluctuations, and other critical parameters. This data-driven approach significantly reduces unplanned downtimes and extends the lifespan of equipment, thereby enhancing overall productivity. Moreover, the adoption of digital twin technology enables the creation of virtual replicas of physical assets. These digital twins provide insights into the operational behaviour of cement production machinery, facilitating simulations that inform maintenance schedules and interventions. Consequently, manufacturers can optimize their maintenance operations, allocating resources more efficiently and reducing the likelihood of operational disruptions.

In brief, in the cement industry, digitalization can take several forms:

- 1. IoT and Sensor Technologies:** Internet of Things (IoT) devices can monitor equipment performance in real-time, providing valuable data on operational conditions and potential issues.
- 2. Predictive Maintenance:** By analysing data collected from sensors, predictive maintenance models can forecast equipment failures before they occur, allowing for timely interventions.
- 3. Data Analytics:** Advanced analytics tools can process large volumes of data to identify patterns and trends, helping maintenance teams make informed decisions.
- 4. Digital Twins:** Creating digital replicas of physical assets allows for simulation and analysis, enabling better planning and optimization of maintenance activities.

Digital Technologies Enhancing Maintenance Efficiency

Digital Twins

Digital replicas for simulation and analysis

Data Analytics

Tools identifying patterns in data

IoT and Sensor Technologies

Devices monitoring equipment in real-time

Predictive Maintenance

Models forecasting equipment failures

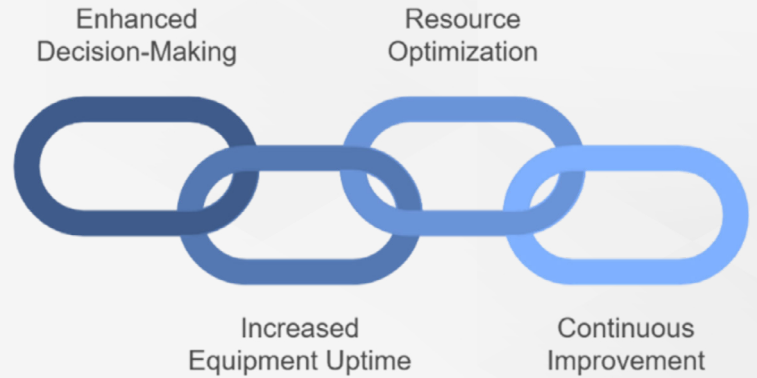


Benefits of Digitalization for Maintenance Efficiency

The integration of digital technologies into maintenance practices offers several benefits:

1. **Enhanced Decision-Making:** Access to real-time data enables maintenance teams to make informed decisions quickly, reducing response times to equipment issues.
2. **Increased Equipment Uptime:** Predictive maintenance reduces the likelihood of unexpected breakdowns, leading to higher equipment availability.
3. **Resource Optimization:** Digital tools help in optimizing resource allocation, ensuring that maintenance personnel and materials are used efficiently.
4. **Continuous Improvement:** Data-driven insights facilitate ongoing improvements in maintenance processes, fostering a culture of continuous enhancement.

Digitalization in Maintenance

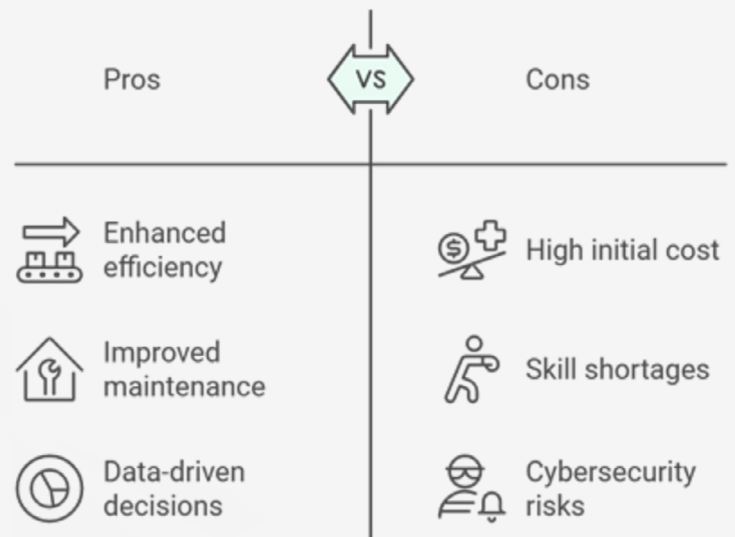


Challenges and Considerations

While digitalization presents numerous advantages, the cement industry must also navigate several challenges:

1. **Initial Investment:** Implementing digital technologies requires significant upfront investment, which may be a barrier for some companies.
2. **Skill Gaps:** The transition to digital maintenance practices necessitates a workforce skilled in data analysis and technology management.
3. **Data Security:** As digitalization increases, so does the risk of cyber threats, necessitating robust security measures to protect sensitive data.

Digitalization in Cement Industry



Conclusion

The integration of maintenance efficiency and digitalization in the cement industry represents a transformative opportunity for manufacturers. By embracing digital technologies, companies can enhance their maintenance practices, leading to improved operational efficiency, reduced costs, and a stronger commitment to sustainability. As the industry continues to evolve, those who prioritize digitalization in their maintenance strategies will be better pos



Partial Substitution of Clinker with Calcined Clays: A Pathway to Eco-Friendly Cement.

Jihen Zoghalmi khabouchi, Ayser Ben Saad, & Moufida Ben M'Barek-Jemai

Department of Geology, Faculté des Sciences de Bizerte

Research Work of the Laboratory of Geodynamics, Geonumerics, and Geomaterials (L3G)

Abstract

Cement production is a major concern in global pollution due to the significant carbon dioxide (CO₂) emissions it generates. The manufacturing process, particularly the clinkerization stage, where limestone and marl are heated to high temperatures (1450°C) to produce clinker, releases large amounts of CO₂ due to the decarbonization of limestone. Considering the climate emergency, the cement industry must find solutions to reduce its carbon footprint.

Among the most promising strategies, the partial substitution of clinker with alternative materials stands out. Calcined clays present an interesting opportunity to reduce CO₂ emissions while maintaining the mechanical performance of cement. When heated, these clays acquire remarkable cementitious properties, allowing for a portion of the clinker to be replaced without compromising the quality of the final product.

Our research is aligned with this approach by exploring the use of local clays from the Sejenane region (northern Tunisia) as a partial substitute for clinker produced by "Ciments de Bizerte". These clays were incorporated into cement production at substitution rates ranging from 10% to 30%, compared to cement without Calcined clays. The results are encouraging after only two days of hydration, the cement enriched with calcined clay exhibits mechanical strengths superior to those of traditional Portland cement. This finding is particularly significant for clays rich in kaolinite, which offer both an economic and ecological alternative.

Keywords:

Carbon dioxide emissions, Clinker substitution, Calcined clays, Eco-friendly cement, Mechanical performance, Sustainable materials

Introduction:

Cement production releases particulate emissions into the atmosphere due to the combustion of fuels, handling of raw materials, and processes such as grinding and storing cement. The manufacture of one ton of cement generates approximately one ton of CO₂, with around 50% of these emissions arising from the calcination process and the other half from fuel combustion.

Efforts to reduce emissions in the cement industry have primarily concentrated on improving energy efficiency and, more recently, on carbon capture, storage, and utilization technologies. These technologies enable producers to capture carbon at the point of emission and either transport it for use or store it underground (Andrew, 2018). If these technologies reach full maturity, they could significantly aid the cement industry in meeting long-term carbon emission reduction targets.

The process of cement manufacturing is highly polluting, generating over 2.5 billion tons of CO₂ annually, which accounts for more than 7% of global greenhouse gas emissions. As demand for cement continues to rise, it underscores the urgent need to decarbonize this sector (Bessa et al., 2019). One of the most effective strategies to minimize CO₂ emissions associated with cement production is the use of calcined clay as an additive. This approach can reduce CO₂ emissions linked to cement manufacturing by up to 30% compared to ordinary Portland cement. It also leads to lower energy consumption and, consequently, reduced costs.

In northern Tunisia, sedimentary clays comprise two-thirds of the available outcrops, highlighting the importance of identifying and utilizing these materials, particularly in the cement industry. This study focuses on the valorization and integration of calcined clay in cement manufacturing with the goals of conserving energy and reducing CO₂ emissions while ensuring the production of high-quality cement for concrete. Specifically, it assesses the feasibility of using calcined clay as an additive to decrease the clinker content in cement, thereby lowering CO₂ emissions associated with concrete production. The resulting product is known as Limestone Calcined Clay Cement (LC3). In LC3 systems, the clinker content is reduced to 50%, incorporating 30% calcined clay and 5% gypsum. Industrial trials conducted in India and Cuba have demonstrated that LC3 cements can replace conventional Portland cement without any adaptations while maintaining excellent performance (Avet & Scrivener, 2018).

Geological Framework

“Les Ciments de Bizerte” extracts raw materials from a quarry located 1.5 km from the main road GP11, which connects Bizerte to Menzel Bourguiba. It is situated 3.5 km west of the city of Bizerte. Access to the quarry is primarily provided by a secondary paved road that is 1.5 km long. The geographical situation of the quarry, along with its proximity to the factory and the Bizerte region, is better illustrated through a satellite photo (Fig. 1).

Our study area not only presents a clear location and geographical delineation but also displays distinctive tectonic geological structures. The quarries of the Bizerte cement factory are part of the northeastern section of the Tunisian Tell Atlas and are located at the northeastern end of the salt dome area (Biely et al., 1971). This area is bordered to the west by the Mogods and Hédil mountains and to the south by Mateur and Kechabta (Solignac, 1927).

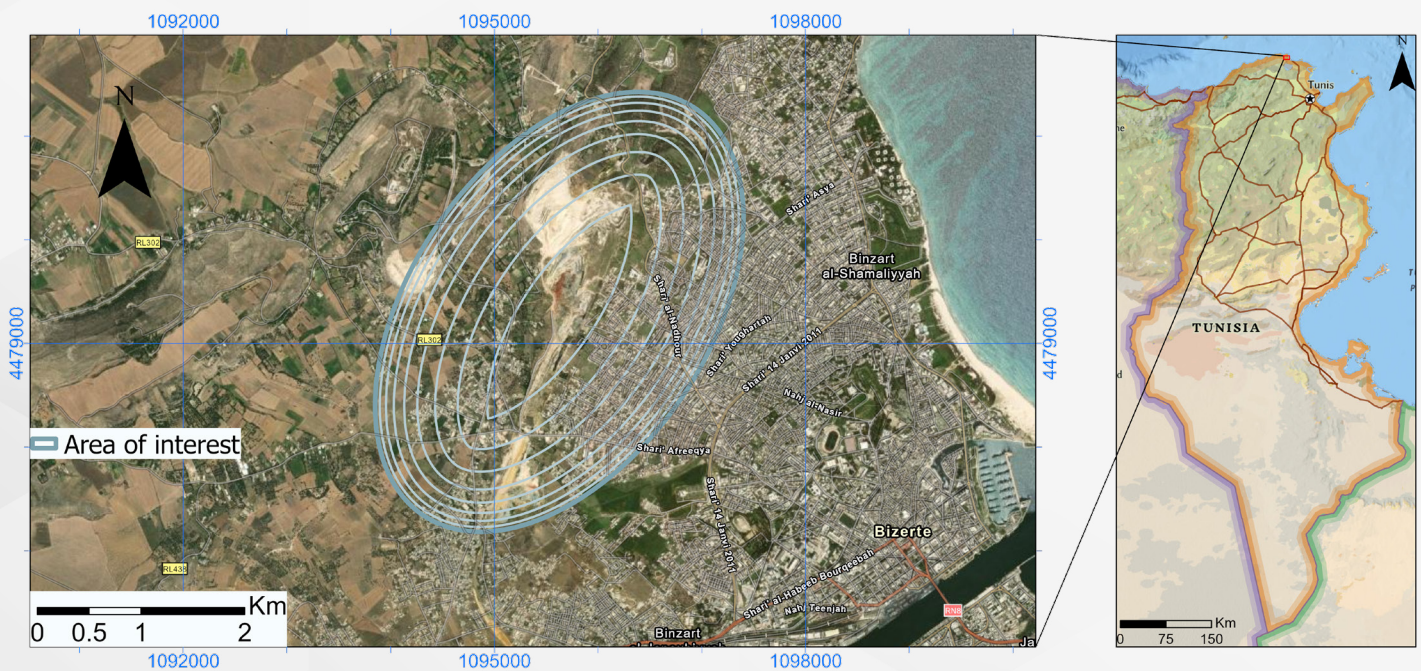


Fig.1: Geographic situation of the quarry

“Les Ciments de Bizerte” extracts marl and limestone from two quarries known as Messyougha East and Jebel Ain Berda, which are 2.69 km apart. The Ain Berda quarry, situated at the northernmost point of the extraction area, lies to the west of the access road and extracts lower Eocene limestones with a slope of approximately 30° towards the west (Fig. 2). The Messyougha East quarry, located to the south of the extraction area and east of the access road, extracts upper Eocene gray marls at the top of the limestone bar, with a slope of around 60° towards the east (Fig. 2).

“Les Ciments de Bizerte” also extracts Paleocene and middle to upper Eocene marls from the Messyougha quarry (Mezza, 2016). To reduce CO_2 emissions from cement production, limestone and marl are extracted from the Ain Berda and Messyougha quarries while incorporating calcined clay from the Sejenane region into the cement manufacturing process. The Sejenane region, from which our clay samples are sourced, is in the extreme northwest of Tunisia, between Cap Serrat and Garat Ichkeul. This area is characterized by NE-SW oriented reliefs (Atouani S, 2008).



Fig. 2: Satellite image of the Messyougha marl quarry

The Sejenane region is bordered to the north by the Teskraya-Sejenane road, to the south by the Oued Sejenane, to the east by Jebel Kalaat Aajout and Kalaat Aalia, and to the west by Ragoubet Ettir and Kef Er Rai. The terrain is accessible via the paved roads connecting Sejenane to Bizerte, Mateur to Bizerte, and Mateur to Sejenane (Fig. 3) (Rouvier, 1977).

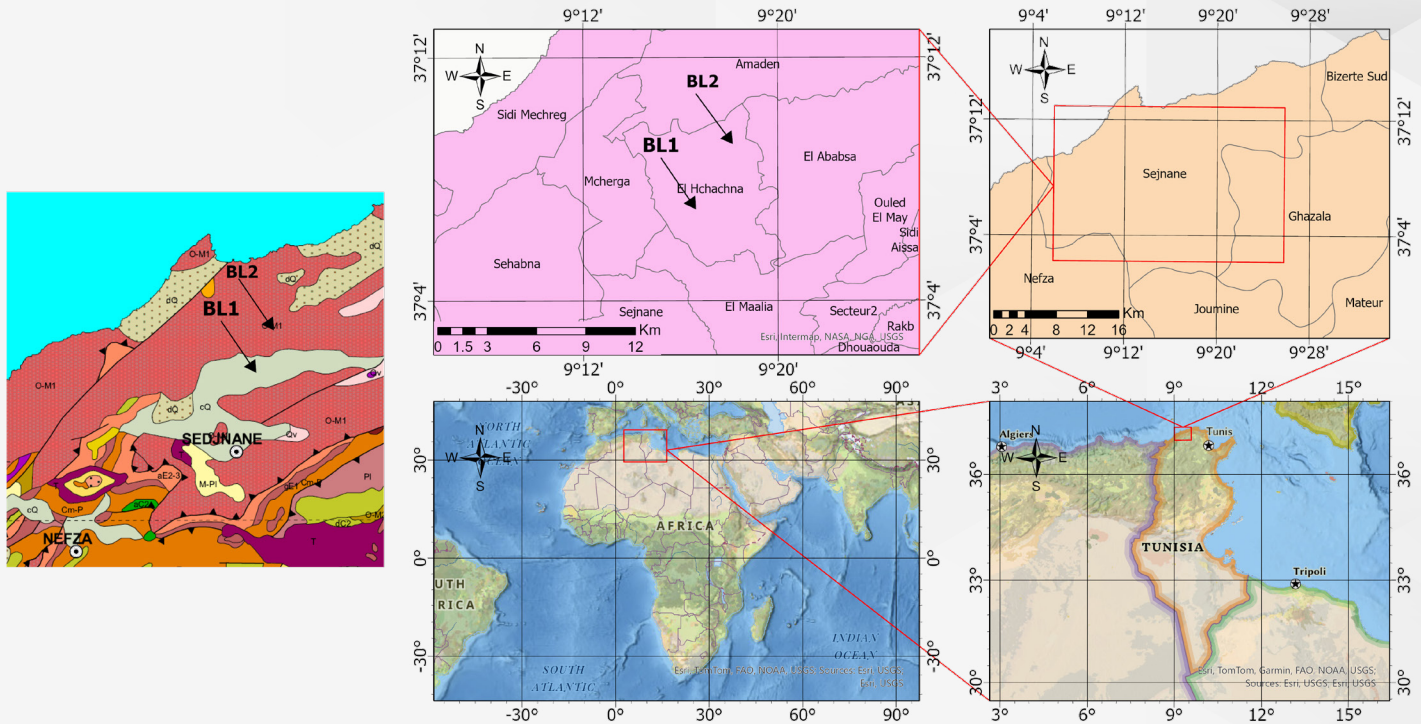


Fig. 3: Location of the study area on the Sejenane map (BL1: Berda_1 and BL2: Berda_2).

Geologically, the Sejenane region falls within the Numidian flysch zone (Rouvier, 1985). In Tunisia, the Numidian formation extends 20 to 50 km inland from the Mogods and Kroumirie reliefs, stretching from Ras El Korane in the northeast to Ghardimaou in the southwest. On the Oued Sejenane sheet, the Numidian series, dating from the Oligo-Miocene period, is represented by clayey-sandy sediments extending from a boundary marked by Bir el Hallouf, Jebel Msala, and Kef en Nsour to the sea.

Materials and Methods:

This study details the results of mineralogical, geochemical, and granulometric analyses, as well as the determination of Calcimetry, and the integration of calcined clay with clinker for cement manufacturing. Two clay samples from the Sejenane region, specifically from “El Blaket,” were collected for laboratory analysis.

X-ray diffraction (XRD) data were acquired using a diffractometer equipped with a radiation source. The analysis of clay fractions was performed on thin sections prepared for each sample, which were oriented normally, glycolated, and heated to 520°C. The clay fraction was separated through centrifugation, following methods outlined by Brown (1982).

Geochemical analysis of major elements in oxide form (SiO_2 , Al_2O_3 , Fe_2O_3 , MgO , CaO , Na_2O , K_2O , and SO_3) was conducted on the total rock, with quantification achieved using X-ray fluorescence spectrometry. This technique allows for the analysis of up to 84 elements from the periodic table across various sample types and forms. Its advantages include rapid analysis, relatively simple sample preparation, high stability and precision, as well as a wide dynamic range.

The loss on ignition at 1050°C was measured as a percentage of the total rock. Microgranulometry was performed on the fraction smaller than 63 μm using a “5100 D” laser SediGraph. The percentage of CaCO_3 was determined using a Bernard Calcimeter. Semi-industrial tests were carried out in the laboratories of “Les Ciments de Bizerte”. The steps involved in the various treatments are illustrated in Figure 4.

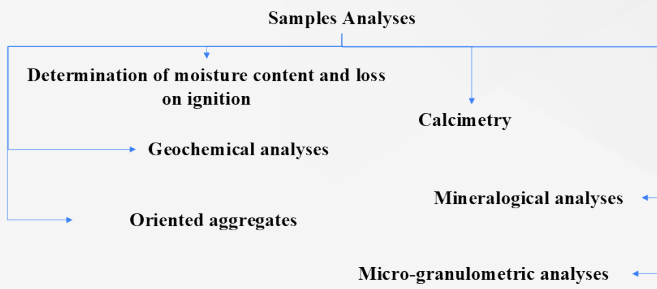


Fig. 4: Clay analysis Methodology flowchart.

Results and Discussion

This section presents the analysis of the clays collected from the Sejenane region, focusing on their potential use after calcination for cement manufacturing. The goal is to evaluate how different percentages of calcined clay affect mechanical strength and overall cement quality.

Mineralogical Composition of the Clays:

X-ray diffraction analysis was conducted on the two clay samples to identify the types of clay minerals they contain and their respective percentages. The analyses indicate that both samples have a nearly homogeneous mineralogical composition, as confirmed by several X-ray diffractograms. The study of X-ray spectra reveals the presence of two primary clay minerals: kaolinite and Illite. Additionally, quartz is the main associated mineral, with calcite appearing only occasionally. The mineralogical analysis of the clay samples from the Blaket region shows a dominance of kaolinite, comprising between 70% and 90% of the fraction smaller than 2 μm , along with low levels of Illite (see Table 1). Both clay samples are notably enriched in quartz, with a maximum calcite content of 7%.

Results of the Geochemical Analysis of the Two Clay Samples:

The clays are characterized by low calcium oxide (CaO) content, which does not exceed 4%. In contrast, the silica content is relatively high, ranging from 56.69% to 60.94%. The percentage of alumina (Al_2O_3) varies between 20.80% and 21.74%. The iron oxide (Fe_2O_3) content ranges from 6.80% to 7.39%, while magnesium oxide (MgO) is found in the range of 1.52% to 1.67%. The potassium oxide (K_2O) content varies from 0.75% to 0.92%. In terms of sodium oxide (Na_2O) and sulfur trioxide (SO_3), the percentages are very low, not exceeding 0.50% for gray clay (see Table 1).

Results of the Micro-Granulometric Analysis:

Granulometric analyses are increasingly conducted using automatic measurement devices (Delaune et al., 1991). The micro-granulometric analysis of our samples was performed using a Laser Sedi Graph, which determines particle size in liquid dispersions based on Stokes' law. The results are presented as cumulative distributions expressed in equivalent spherical diameters. The semi-logarithmic cumulative granulometric curves for both samples are similar, exhibiting the same shape. Each curve shows an inflection point that corresponds to the transition from clay (see Figures 5 A & B). Both curves display a hyperbolic granulometric profile, with 50% of particles smaller than 4 μm , indicating that these sediments were formed in a relatively calm environment (Rouvier, 1977).

Minerals	Clays minerals		Non-Clays minerals	
	Kaolinite	Illite	Calcite	Quartz
Grey Clays (BL1)	97.5%	2.5%	7%	64%
Brown Clays (BL2)	74%	26%	5.68%	67.69%

Table 1: Percentages of clay minerals and associated minerals in grey and Brown clays

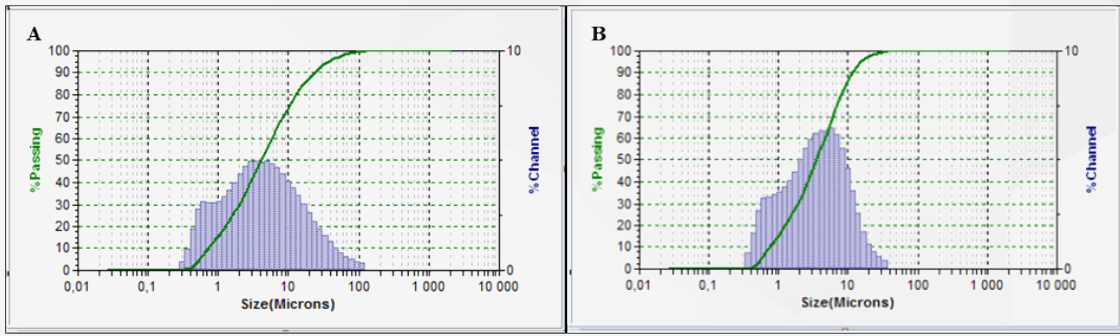


Figure 5: Granulometric distribution curves for BL1(A) and BL2 (B) clay

Moisture content:

The measurement of the moisture content (Fig. 6) involves determining the mass of water removed by drying a wet material until a constant mass is achieved at a temperature of $105 \pm 5^\circ\text{C}$ for 24 hours. According to the humidity determination test, the brown clay has a significantly higher moisture content (16.2%) compared to the gray clay (8.67%).

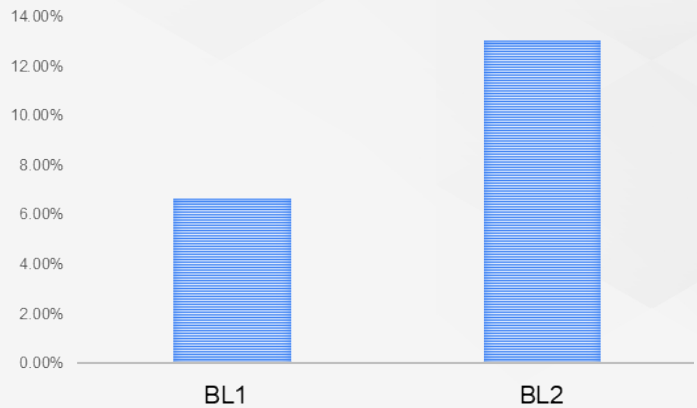


Figure 7: Histogram of percentage loss on ignition for the two clay samples.

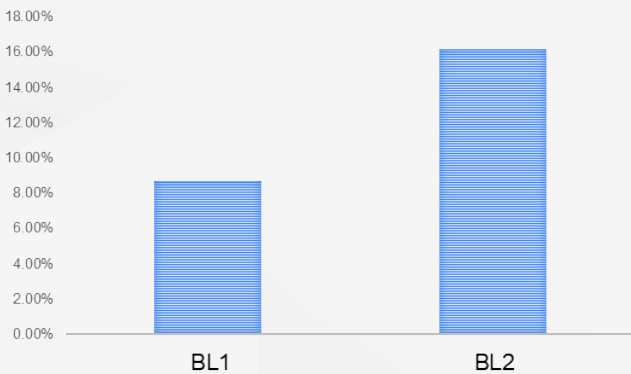


Figure 6: Moisture content histogram for two clay samples BL1 & BL2.

Results of the Loss on Ignition Determination:

The determination of the loss on ignition for the Sejenane clay shows a significantly higher percentage of loss on ignition for brown clay (13%) than for gray clay (6%). This increase is attributed to the higher percentage of carbonates present in brown clay (Fig. 7).

Results of the Calcimetry:

It is observed that the CaCO_3 content for the samples analyzed is very low (Fig. 8). These results are closely related to the determination of the loss on ignition. This type of analysis was performed on both clay samples.

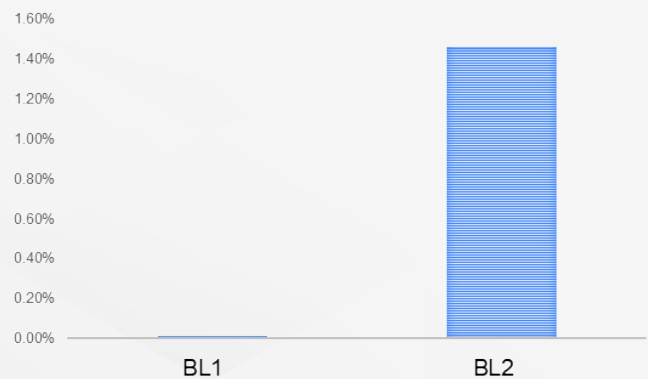


Figure 8: Histogram of CaCO_3 percentage variation in clays (BL1 & BL2).

The results of the mineralogical analysis show that these clays are composed of a mixture of kaolinite and quartz in significant proportions. From the geochemical analysis, we noted that the predominant constituents are silica and aluminum. Indeed, the $\text{SiO}_2/\text{Al}_2\text{O}_3$ ratio close to 3 is a characteristic indicator of free quartz. The enrichment of these clays in free silica is likely attributed to the detrital input from Numidian sandstones (Ben M'barek-Jemaï, 2001). We chose to use gray clay because it contains the highest kaolinite content at 97.5%. Therefore, we decided to use the gray clay as an additive in the cement after calcining it at 750°C for two hours.

Cement Testing

Three mixtures were prepared using limestone from the Bizerte cement quarries, with additions of 10%, 20%, and 30% limestone. Additionally, three mixtures were created by replacing the limestone with calcined gray clay at the same percentages of 10%, 20%, and 30%. Semi-industrial tests for cement manufacturing were conducted to evaluate the suitability of gray clay (BL1) from the Sejenane region for cement production and to identify any defects.

Mechanical tests were performed on both the mixtures with limestone and those with calcined gray clay to allow for comparison between the two. We determined the physicochemical parameters and conducted physical tests on the cement with calcined clay additions at the 10%, 20%, and 30% levels. The manufacturing and characterization efforts focused on cement types CEM I, CEM II, CEM IV, and CEM V. This approach ensures that the samples:

- Are representative and serve as a reference for identifying and classifying cements with varying percentages of calcined clay.
- Meet the requirements of the adopted standards for this type of cement production.

Cement with calcined clay additions is suitable for large-scale construction due to its high strength. The results from semi-industrial tests indicate that clays from Sejenane can be utilized as alternative materials, enhancing the production of high-quality cement. The mechanical performance of these formulations is acceptable for the intended applications. For instance, a mortar formulation containing 3% gypsum and 97% clinker achieved a compressive strength of 50 MPa in 28 days. In contrast, a formulation with 10% calcined clay, 3% gypsum, and 87% clinker exhibited even greater mechanical performance, reaching 57 MPa.

These findings highlight the economic and environmental benefits of replacing clinker with calcined clay. The addition of 10% calcined clay yielded a strength superior to that of Type I cement, allowing us to reduce the clinker quantity, which leads to energy and cost savings while also lowering CO_2 emissions. For the mixtures with 20% and 30% calcined clay, we observed improved strength compared to Type II cement. Reducing the amount of clinker not only resulted in further energy and cost savings but also further reduced CO_2 emissions.

The goal of incorporating clay is to minimize the reliance on limestone, which is in high demand across various sectors. The benefits of this addition to cement arise mainly from two effects: physical and chemical. Physically, they can modify the cement hydration process; chemically, their pozzolanic characteristics enable them to react in cementitious environments and form new hydrated products. These two effects work together to enhance the final performance of the hardened materials.

Conclusion

It is noted that cement with the addition of calcined clay achieve excellent properties, both mechanical and durability-wise. The most suitable clays are not pure kaolin, but clays containing at least 40% kaolinite (Shvarzman et al., 2003). Similar strengths to the reference system of Type I cement are obtained after 28 days for cements containing 10% calcined clay addition, and like Type II cement when adding between 20% and 30% of calcined clay. This excellent strength may be applicable on an industrial scale while meeting standards.

By using cement with calcined clay additions, in addition to the previously described property benefits, CO₂ emissions are reduced by approximately 30% compared to the reference cement (Scrivener et al., 2018). From an economic perspective, they present a very important factor in the production of Type I cement (CEM I) and Type II cement (CEM II), as the clinker consumption decreases based on the addition rate used.

References

- Andrew, R. M. (2018). Global CO₂ emissions from cement production. *Earth System Science Data*, 10(1), 195–217.
- Atouani S. (2008). Étude minéralogique et géochimique des argiles numidiennes (Oligo-Miocène) de la région de Sejenane (nord-ouest de la Tunisie) : essais de valorisations.
- Avet, F., & Scrivener, K. (2018). Investigation of the calcined kaolinite content on the hydration of Limestone Calcined Clay Cement (LC3). *Cement and Concrete Research*, 107, 124–135.
- Ben M'barek-Jemaï, M. (2001). Les argiles du crétacé et du paléocène du Nord-Est de la Tunisie : caractérisation et essais d'application industrielles. Université El Manar, Faculté des Sciences de Tunis.
- Bessa, B. T., Sanjad, T. A. B. C., & Gester, C. de S. L. M. (2019). Cleaning procedures applied to the conservation of terrazzo tiles from the early twentieth century. *Ambiente Construído*, 20, 313–324.
- Biely, A., Lajmi, T., & Rouvier, H. (1971). Les unités allochtones du Pays de Bizerte (Tunisie septentrionale). *Comptes Rendus Académie Sciences France*, 273, 2052–2055.
- Brown, G. (1982). Crystal structures of clay minerals and their X-ray identification (Vol. 5). The Mineralogical Society of Great Britain and Ireland.
- Delaune, M., Reiffsteck, M., & Feller, C. (1991). L'analyse granulométrique de sols et sédiments à l'aide du microgranulomètre « Sedigraph 5000 ET » Comparaison avec la méthode « pipette Robinson ». *Cah. ORSTOM, Sér. Pédol.*, 26(2), 183–189.
- Mezza, S. (2016). Suivi et optimisation de l'exploitation de la carrière de calcaire de la société Les Ciments de Bizerte à partir de l'analyse des cuttings. Mémoire du Master Professionnel en Géorressources et Applications. Université de carthage, Faculté des Sciences de Bize.
- Rouvier, H. (1977). Géologie de l'extrême-nord tunisien: tectoniques et paléogéographies superposées à l'extrémité orientale de la chaîne nord-maghrébine. These Sci. Univ. Paris VI.
- Rouvier, H. (1985). Géologie de l'Extrême-Nord Tunisien: tectoniques et paléogéographies superposées à l'extrémité orientale de la chaîne Nord-Maghrébine. Ed. du Service géologique de Tunisie.
- Scrivener, K. L., John, V. M., & Gartner, E. M. (2018). Eco-efficient cements: Potential economically viable solutions for a low-CO₂ cement-based materials industry. *Cement and Concrete Research*, 114, 2–26.
- Shvarzman, A., Kovler, K., Grader, G. S., & Shter, G. E. (2003). The effect of dehydroxylation/ amorphization degree on pozzolanic activity of kaolinite. *Cement and Concrete Research*, 33(3), 405–416.
- Solignac, M. (1927). Etude géologique de la Tunisie septentrionale. Imprimerie J. Bablier & Cie.

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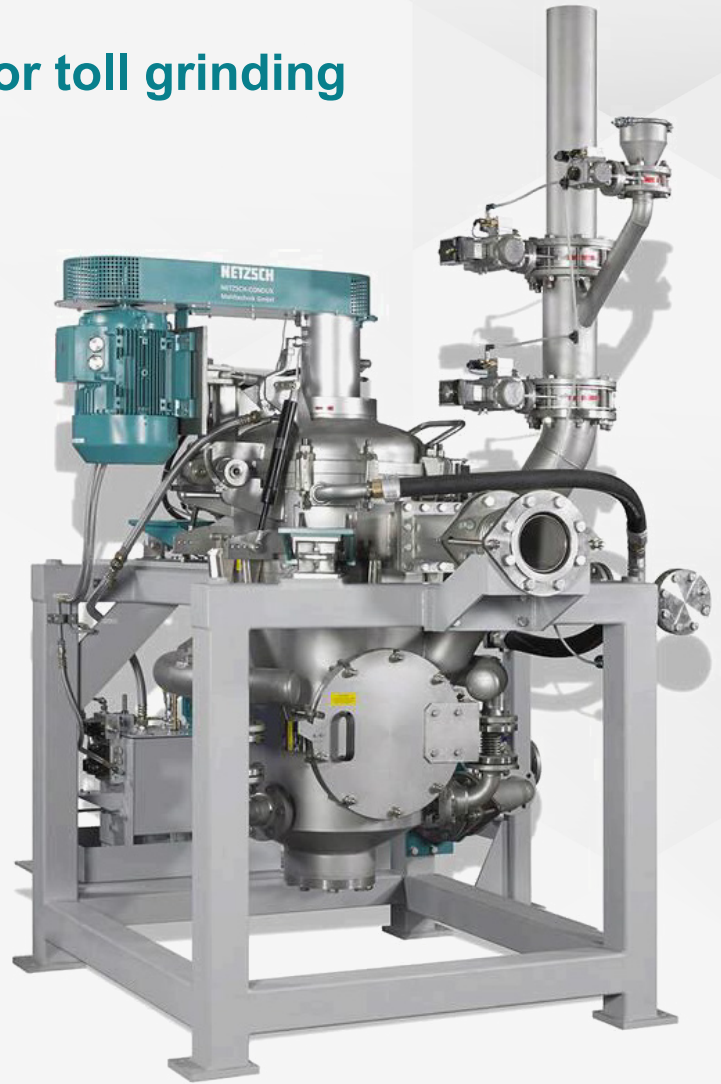
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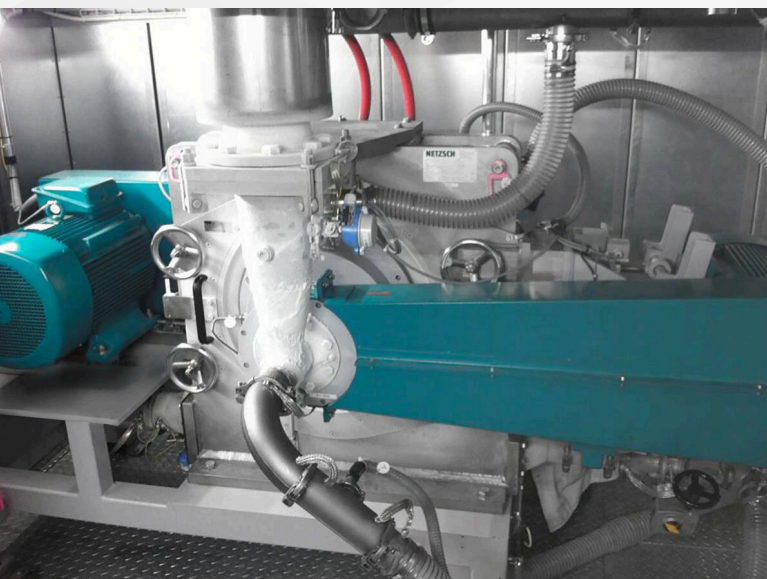
at which the modulus of elasticity of a material increases abruptly, can be optimally utilized. To achieve the desired comminution results, a variety of grinding tools can be used in addition to counter-rotating pin disks in the machine.

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Solution-oriented: side-mounted radar sensor for continuous level measurement on fly ash hoppers

In a coal power plant in South Carolina, continuous level measurement for fly ash hoppers was required. This specific challenge was effectively addressed by installing a side-mounted guided radar sensor with a 90° elbow shaft. In the energy sector, where environmental protection and safety are of high importance, UWT has once again demonstrated its ability to shine with thoughtful solutions and technical expertise.

The challenge:

Promoting environmental safety through precise level measurement. Fly ash is a byproduct of coal combustion and is an environmental hazard. Coal-fired power plants are obliged to collect this material for disposal or reuse. Precise level measurement is of the utmost importance in this context in order to avoid overfilling, which can lead to safety risks, high cleaning costs and possible fines.

Proven methods, innovative approach

In such situations, free-radiating sensors such as the NivoRadar® 3000 or NivoRadar® 4000 are usually used. However, the special process hoppers in the South Carolina plant presented an unusual spatial challenge, as there was not

enough free space at the top for conventional device mounting. This problem required an innovative approach that went beyond conventional vertical mounting techniques

The UWT solution:

NivoGuide® 3000 overcomes spatial challenges with pragmatic, side-mounted radar technology. UWT Level Control LLC, the US subsidiary of UWT, offers the NivoGuide® 3100 with guided wave radar technology as an answer to this problem. This case illustrates the importance of special solutions and UWT's ability to provide innovative solutions. In contrast to the usual vertical arrangement of radar sensors, where a cable or rod is guided vertically through the container, UWT presented a clever method for this application. By integrating a 90° bent probe extension, it was possible to guide the radar pulse from a horizontally mounted head unit into the container. This flexible solution specifically took into account the limited space at the top of the conical container by enabling the side mounting of the NivoGuide 3100® on the outer wall of the silo. In this way, the spatial restrictions were cleverly circumvented without compromising the accuracy or reliability of the operation.



In the cone-shaped single-chamber silo, there is a process pressure of up to 0.8 bar (11.6 psi). There are no vibrations or electrostatic charges, but there is a dusty atmosphere. The prevailing DK values of 2.0 - 3.0 hardly influence the NivoGuide® radar sensor used with low-frequency microwave pulses in any way, which guarantees a reliable measurement result.

Continuous level measurement

NivoGuide® radar sensors are used for continuous level measurement in liquid and bulk solids applications. The measuring range of up to 75m (246ft) and its high sensitivity from a DK value of 1.5 make them versatile usable in silos, tanks and pipes. The guided wave radar does not contain any moving parts inside the process vessel. The microwaves are emitted at low frequencies, so that even with high dust intensity, no spurious reflection is generated. As a result, the energy content of the microwave can be used exclusively for determining the specific filling level within the storage processes. It is protected against thawing explosions and precisely measures $\pm 2\text{mm}$ even under difficult process conditions. UWT has implemented two series, the NivoGuide® NG 3000 series, which

is specially tailored to the needs of solids, and the NivoGuide® NG 8000 for applications in liquids, pastes, foam, slurries, oils as well as for interface measurement. The device versions are each equipped with outriggers that can be individually adapted to the application with rod and cable extensions.

A success story:

Increasing safety and ensuring environmental compliance. Today, the power plant in South Carolina can proudly look back on 12 process hoppers equipped with this customized solution, symbolizing a significant step towards operational efficiency and environmental safety. This endeavor underscores UWT's commitment to developing versatile, high-performance level measurement technologies tailored to the unique needs of various industries worldwide. UWT Level Control LLC's success at the coal power plant epitomizes the company's core principles - Technology, Performance and Partnership. This solution demonstrates UWT's ability to innovate and adapt its technologies to customer-specific requirements. The use case presented here offers a convincing answer to the challenges posed by limited installation space.

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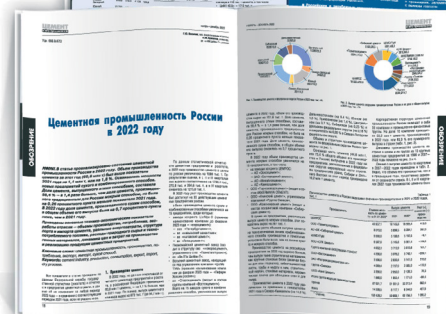
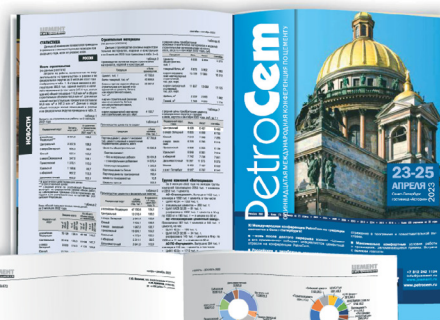
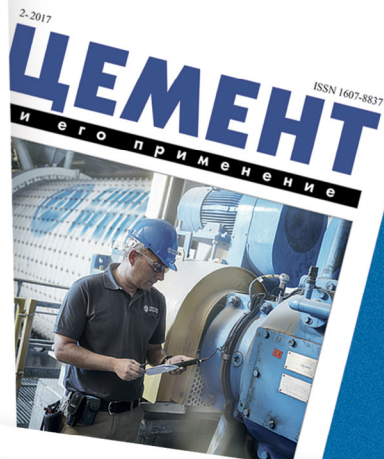
PETROCEM Ltd

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Production of thermally conductive silicone rubbers

An important component of accumulators in the automotive industry

When manufacturing rechargeable batteries for the automotive industry, efficient temperature management is essential. It serves to efficiently dissipate the heat from the electronic components, e.g. the batteries or the line electronics. This extends the service life of the components and improves their performance at the same time. Without effective temperature management, the components would overheat and be damaged, which is why the use of thermally conductive silicone rubbers is a very important part of battery technology.

Previously, the customer Wacker produced these rubbers in a batch process, but throughput was limited. This was to be modernised and a continuous process was developed which improved the overall throughput. The decision was made in favour of HOSOKAWA Solids Solutions from Schwabmünchen, which offers complete systems for solids handling. Their dosing system was integrated into the continuous production process, thereby increasing throughput. "It was important for the customer to take over a fully developed and trouble-free

system," says Tobias Meixner, Teamlead Sales & Marketing at HOSOKAWA Solids Solutions, who supervised the project from start to finish.

Big bags filled with aluminium hydroxide, aluminium oxide and zinc oxide are emptied using six solids big bag dischargers. The products are then transported through 12 pneumatic conveyor lines. The "Solids Vacu-Fill" dense phase vacuum conveying process is an advantage here, as it only requires a low headroom at the feed point. This conveying method also offers a versatile and cost-effective solution for short conveying distances without the risk of blockages. After transport, the batches are dosed into 2 rotary pan weighers.

The Nauta® mixer Hosokawa Micron B.V. is used to mix the individual components. The homogenised products are then conveyed segregation-free by two dense phase vacuum conveyors and finally the powder mixture is dosed into two batch buffer containers using the on-site integrated loss-in-weight feeder (with a dosing accuracy of ± 50 g) and transported away for further processing.

bulksolids-portal

The conference will be attended by representatives of domestic and foreign industry associations, CEOs of companies specializing in the production and sale of cement and modern binding materials, top managers, leading scientists and technical experts.

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2025**

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1

Speeches and reports by leading industry experts, providing valuable insights and fostering collaborative discussions.

2

Exhibition of cement industry companies, offering opportunities to explore the latest innovations and strengthening business relations.

3

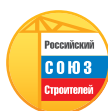
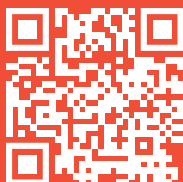
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New extraction solution for combustible and carcinogenic laser dusts

ULT is introducing the LAS 260 H/Ex, a new solution for removing critical dust during various laser processes. The explosion-proof device was developed for extracting and filtering dry, combustible, and health-endangering airborne pollutants.

ULT is introducing the LAS 260 H/Ex, a new solution for removing critical dust during various laser processes. The explosion-proof device was developed for extracting and filtering dry, combustible, and health-endangering pollutants (dust and fumes) that can arise during laser processing of plastics and metals.

As an ATEX-compliant system designed to be free of ignition sources, the LAS 260 H/Ex is suitable for installation and operation within a zone 22 and enables the safe separation of combustible dust. Even the finest particles are separated to 99.995% in a two-stage filter system including a HEPA H-14 filter and safety filter stage.

The safety filter with integrated activated carbon filling ensures the safe operation of the device and removes gases that are hazardous to health and unpleasant odors. Due to the high level of cleaning, the filtered clean gas can be fed back into the work area even when carcinogenic, mutagenic, or toxic dust is separated (recirculation mode).

In addition to the redundant filter system, the LAS 260 H/Ex provides further user benefits such as high flexibility through mobile utilization, extremely quiet operation, and low energy consumption. All electrical components are suitable for UL and CE compliant use. In addition, the device can be used worldwide with a voltage range of 110-240 V.



bulksolids-portal

To ensure compliance with the minimum volume flow of >20 m/s, an automatic monitoring system is integrated, which issues a warning signal if the flow falls below this limit.

A collection element (hose, pipe, extraction arm) with DN50 can be connected to the extraction and filter system. In addition, an M12 interface is available for system integration or connection for automated operation.

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JSW Cement aims full capacity utilization



New extraction solution for flammable gases and vapours

With the ACD 400.1 Ex extraction and filter system, ULT presents a new solution for removing atmospheres with flammable components.

The system, equipped with an explosion-proof fan in accordance with ATEX Ex II 2G T3, was developed for the extraction and filtration of dry, flammable and non-flammable gases and vapours in concentrations of up to 20% of the lower explosion limit.

It is a modular, two-stage storage filter unit consisting of an M5 dust pre-filter and two adsorption filter modules (activated carbon). To prevent the ignition of flammable gases and vapours in the filter, the activated carbon filter elements and downstream components - such as the ATEX-compliant fan and the ATEX-compliant motor - are earthed and designed without ignition sources.

In addition to its properties as an Ex device, the 'ACD 400.1 Ex' offers further user benefits such as extremely quiet operation, low energy consumption and high flexibility with regard to changing workstations or emission types. The filter cassettes are electrically conductive with a potential equalisation connection and also offer a high safety standard for users when changing filters. A T3 blower is installed in the device, which is why gases of temperature classes T1-T3 can be extracted safely.

The extraction system can be equipped with various collection elements (extraction arms, hoses, pipes) of different sizes and types.



bulksolids-portal

Due to the high degree of gas separation, the filtered clean gas can be fed back into the work area via the recirculation mode integrated as standard. For applications with carcinogenic, mutagenic or reprotoxic gases, the devices can be equipped with an exhaust air connection for exhaust air operation.

An extensive range of accessories is available for the 'ACD 400.1 Ex' unit, which has been specially developed for applications with flammable gases.



Bverso by Vetriceramici: More is less

Bverso is a new system developed by Vetriceramici to produce complex three-dimensional ceramic surfaces, through the application of a single type of grit, BGRITS.

Bverso is a new patent-pending system developed by Vetriceramici to produce complex three-dimensional ceramic surfaces, through the application of a single type of grit, BGRITS. With Bverso, simplicity makes the difference: the system stands out for its ease of implementation and requires no new installations or dedicated production lines – all you need to do is integrate a latest-generation digital machine. This approach puts Bverso within the reach of all manufacturers, both large and small, that want to innovate without revolutionising their infrastructure.

High performance for amazing results: the real strength of Bverso lies in its ability to modify the texture of vitreous materials and create combinations of matt, waxy, white and gloss effects on the same surface. The resulting three-dimensional surfaces are not only aesthetically superior, but also extremely strong and ready for finishing treatments, like lapping and deep polishing. Bverso, thanks to the use of special FIXERS with a strong adhesive power, revolutionizes traditional methods by increasing technical-aesthetic performance.

Outstanding graphic details: the secret of Bverso's perfect definition is the inversion of the textural application. This process incorporates digital textural applications within a vitreous body, thus protecting them while at the same time enhancing their graphic definition. The result is an eye-catching ceramic surface that pushes

back the boundaries of traditional aesthetics.

Increased competitiveness: Bverso is described as a “compendium” application, because it makes use of materials and technologies that complement traditional systems. This integration enables you to create unique products that are recognisable and highly competitive on the market.

Aesthetics and innovation: it is on the aesthetic front that Bverso really excels. The precision of the detail and the versatility of a single grit (BGRITS) makes it possible to achieve a wide range of final effects, by simply varying, mixing and overlapping the FIXERS. This level of customisation is unrivalled and marks a quantum leap from traditional methods.

The Bverso system uses the following materials:

- **B-FIX:** Textural fixers, available in both solvent-based and water-based versions, for different surface textures, such as:
 - Snow for white textures;
 - Matt Velvet for soft waxy textures;
 - Satin Stone for textures such as “stone”
 - Shine for shiny transparent textures.
- **B-GRITS:** New generation of specially designed grits with a special particle size cut.

Designed around sustainability: as well as being innovative, Bverso makes it possible to use water-based materials.



System Ceramics launches Infinity DRY

With the new digital grit and powder application system, System Ceramics raises the level of digital decoration.

Infinity DRY is the new digital grit and powder application system with which System Ceramics (Coesia Group) accelerates the evolution of ceramic decoration. This new solution sums up the synergy between the excellence of digital printing expressed by Creadigit Infinity and the use of dry powders in the digital bars. The result is the possibility to reach new decoration performances for porcelain surfaces, taking the product to an increasingly realistic and three-dimensional level.

The core of Infinity DRY is its selective functioning, which makes it possible to deposit grits and powders in selected points on specific areas. After the digital printer has applied the layer of glue on the tile surface, the new digital grit and powder discharge system releases the decorating material and, subsequently, sucks the small amount of powder in excess, leaving the design perfectly clean and defined.

The evolution of Infinity DRY is based on the know-how developed with heads for powder-based printing, derived from the application of dry material already successfully managed by

System Ceramics' Genesis technology. This technical background ensures that the system can manage a vast range of materials with different volumes with high standards of quality and precision, creating numerous versions of digital designs. It also allows to overcome the limitations of current digital printers which, for this type of material application, require powders with predefined characteristics and offer a limited range of applications. The machine, in fact, not only decorates full fields but also enables selective designs and sequentially applies different grits using separate bars, catering to the most sophisticated decorative needs and aiming for maximum flexibility.

By integrating digital bars with those for grits in a single module, System Ceramics presents an innovative solution, which permits the application of dry material in a single step, guaranteeing maximum precision and reducing material waste and recirculation impurities to a minimum. This is a sustainable upgrade compared to traditional processes, in which excess powders are sucked up and need to be processed in order to be reused, often resulting in a loss of purity. With the Infinity DRY system, the synergy between the decorating digital bars and those for grits make it possible to limit waste, optimizing the use of the powders.

20-21 January 2025

2th INTERCEM Shipping Forum 2025

SANA Malhoa Hotel, Lisbon, Portugal

➔

05-06 February 2025

5th Global FutureCem Conference and Exhibition on cement industry decarbonisation

Crowne Plaza Florya, Istanbul, Türkiye

For more information, please contact:
Dr. Robert McCaffrey
 Tel.: +44 1372 743837
 Fax: +44 1372 743838

➔

09-12

Cemtech Middle East & Africa 2025

Decarbonising Cement | Sustainable Solutions Across All Continents

Sofitel Dubai The Obelisk, UAE

➔

20-21

Green Cement & Concrete Innovation Europe 2025

Denham Grove Hotel, Uxbridge, UK

➔

23-25 February 2025

INTERCEM Dubai 2025

Jumeirah Emirates Towers, Dubai, UAE

For more information, please contact:
Ms. Lola Carragher, Commercial Sales Manager

➔

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- Support Roller Design Review
- Training on Kiln Maintenance & Repairs

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- Kiln Support Roller Shaft / Thrust roller Shaft
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- Chair pad Lubrication Bar
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PRODUCTION EXPERTISE - MANAGEMENT SKILLS

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2025



DECARBONISING THE CEMENT INDUSTRY

Decarbonisation as a catalyst for growth

Conference • Exhibition • Networking • Plant Tour

Sofitel Dubai The Obelisk, UAE

9-12 February 2025

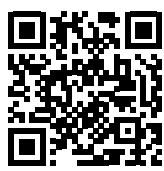
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PRODUCTION EXPERTISE - MANAGEMENT SKILLS

— MEA —
2025

Cemtech Middle East & Africa 2025, the region's leading cement industry conference and exhibition, will take place in Dubai, UAE, on 9-12 February 2025.

As the global cement sector continues to transform at pace, Cemtech offers all cement industry stakeholders a vibrant forum in which to explore the key topics facing cement producers. From market dynamics and trends in global cement and clinker trade to cement manufacturing technology and operational efficiency, this conference will ensure delegates are informed with the most up-to-date industry insights.

As national decarbonisation initiatives continue to strengthen, this major driving force will be examined from the perspective of Middle East and Africa cement industry, where priorities favour practical, low-cost approaches that make use of existing, proven technologies and processes, ahead of more expensive and unproven carbon capture solutions.

The agenda will also focus on how decarbonisation and the shift to low carbon manufacturing can be a catalyst for growth, stimulating innovation and product development, as well as accelerating the adoption of best practice technologies.

Cemtech MEA2025 is organised by International Cement Review with the kind support of the AUCBM and in association with knowledge partner, A3&Co.

“Decarbonisation can be a catalyst for growth, driving product development and innovation.”

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*Cemtech Group discounted rates are available to registered delegates on a first-come, first-served basis.

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**Delegate fee includes all conference documentation, meals, receptions and Gala Dinner. Field trip is included but subject to availability.



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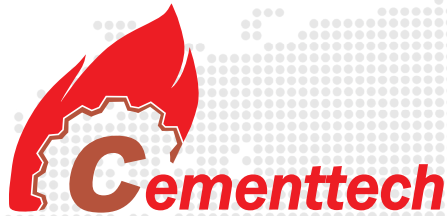
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Further details can be found on the website where you can book online, explore discount offers and view the latest programme.

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May 15-17, 2025



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Cement Manufacturing Technology
Cement Kiln Process Chemistry

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14 April 2025	14 April 2025
14 July 2025	14 July 2025
20 October 2025	06 October 2025

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20 October 2025

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03 February 2025
13 October 2025

Fly Ash Cements

6-Week Online Trainings

28 April 2025
14 July 2025

Cement Kiln Refractories

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28 April 2025
13 October 2025

White Cement Manufacturing

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27 January 2025
14 April 2025
07 July 2025
13 October 2025

Cement Kiln Pyroprocessing
Cement Factory Maintenance

Ceramic

18-22 April 2025

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 **Foshan Tanzhou International Convention and Exhibition Center, China**

For more information, please contact:
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18-21 June 2025


CERAMICS CHINA 2025
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13-17


14-16

January 2025

BAU Munich 2025

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 **Munich, Germany**

 **King Abdulaziz International Conference Center, Riyadh, Saudi Arabia**




15-18

24-27

February 2025

14th Big 5 Construct Saudi 2025


 **Riyadh Front Exhibition & Conference Center, located at ROSHN Front, Saudi Arabia**



25-27

March 2025

European Coatings Show 2025

 **Nürnberg, Germany**



7-10

April 2025

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 **Antalya, Türkiye**

For more information, please contact:

Prof. Dr. Ümit Özer,
Chairperson of
FRAGBLAST 14



Mehmet MAKAR
(Technical Secretary)



Dr. Abdulkadir
KARADOĞAN
(General Secretary)




08-09

20-23

May 2025

VI. International Drilling Congress and Exhibition of Türkiye
(Drilling Türkiye 2025)

 **Ankara, Türkiye**

For more information, please contact:
TMMOB Chamber of Mining Engineers
İlker Ertem, Congress Chairman



15th Iraq international building, construction and machinery exhibition

 **Erbil International Fairground, Iraq**

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23-25

October 2025

MERSEM 2025

12th International Marble and Natural Stone Congress

 **Afyon Kocatepe University's Atatürk Congress Center, Afyonkarahisar, Türkiye**



11-14

November 2025

IMCET 2025

29th International Mining Congress and Exhibition of Türkiye

 **Antalya, Türkiye**



For more information, please contact:
Dr. Nejat Tamzok, Congress Chairman

04-08

May 2026

IFAT Munich 2026

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 **Munich, Germany**





مجلة عالم الإسمنت ومواد البناء

جدول موضوعات المجلة لعام 2025

المناسبات	الموضوعات	العدد
	<ul style="list-style-type: none"> * تصنيع الإسمنت الأبيض * الإسمنت المخروط * الإسمنت متعدد المكونات * إسمنت الخبث * إنتاج الإسمنت الأخضر * خلائط الإسمنت * مضافات الإسمنت * مكونات الإسمنت * كيمياء الإسمنت * الإسمنت الخالي من الكربون * إنتاج الكلنكر منخفض الكربون * المواد الخام لمضافات الإسمنت * إدارة الإمدادات * إنتاج الإسمنت بطاقة منخفضة * توكيد الجودة ومراقبة العمليات في مصانع الإسمنت * توفير تكلفة إنتاج الإسمنت 	<p>مارس/آذار 2025</p> <p>(العدد رقم 99)</p>
	<ul style="list-style-type: none"> * المعالجة الحرارية * الحكم في العمليات والتحسين نحو الأمثل * هندسة عمليات الإسمنت * أفران الإسمنت * معالجة النفايات الخطرة ومراحل ما قبل معالجتها * معالجة غازات المداخن * التحول الرقمي * الرقمنة في صناعة الإسمنت * الحراقات وعمليات الحرق * تطوير المشاريع * التحديث والأتمتة * تحليل الغازات * الاختبار والتحليل * معدات المختبرات 	<p>يونيو/حزيران 2025</p> <p>(العدد رقم 100)</p>
<p>المؤتمر والمعرض العربي الدولي الثامن والعشرون لصناعة الإسمنت ومواد البناء</p> <p>دبي الإمارات العربية المتحدة</p> <p>نوفمبر/تشرين الثاني 2025</p>	<ul style="list-style-type: none"> * التعبئة والتغليف * أنظمة التحميل / التفريغ والتخزين * حلول النقل * تكنولوجيا التغذية * سيور الرافعات الدلوية * مناولة المواد في مصانع الإسمنت والمحاجر والمحطات والموانئ * القباب والصوامع والنقل * الحماية من التآكل * التروس والمحركات والتزييت * أنظمة الحماية من الحريق * إجراءات الصيانة 	<p>سبتمبر/أيلول 2025</p> <p>(العدد رقم 101)</p>

	* الحراريات * تأهيل المحاجر * تنظيف الصوامع * المرشحات وإزالة الغبار	
	* المبردات * المراوح * مدافع الهواء * الصحة والسلامة المهنية * تكنولوجيا الطحن * الطواحين العمودية * زيادة إنتاج مطحنة الإسمنت * التكسير * مساعدات الطحن والطحن * استعادة الحرارة المفقودة * التصوير الحراري * إعادة التدوير الحراري * طرق معالجة واستخدام غبار الممر الجانبي * الحماية من الانفجار في صوامع تخزين الوقود البديل * أنظمة مناولة الوقود البديل * إنتاج واستخدام الوقود الصلب المستعاد	ديسمبر/كانون الأول 2025 (العدد رقم 102)

آخر موعد لاستلام المقالات أو النصوص الصحفية أو الإعلانات لأعداد عام 2025:

1. عدد مارس / آذار : 10 مارس / آذار 2025
2. عدد يونيو / حزيران : 29 مايو / أيار 2025
3. عدد سبتمبر / أيلول (عدد خاص) : 24 سبتمبر / أيلول 2025
4. عدد ديسمبر / كانون الأول : 8 ديسمبر / كانون الأول 2025

الإعلانات

(بالدولار الأمريكي)

الإعلان في عدد واحد	الإعلان في عددين	الإعلان في ثلاثة أعداد	الإعلان في أربعة أعداد	
1,250	*	*	*	غلاف خارجي ملون
750	950	1,250	1,350	صفحة داخلية ملونة (A4)
450	550	650	750	نصف صفحة داخلية ملونة (A5)
300	350	400	450	ربع صفحة داخلية ملونة (210*75 مم)

أبعاد الإعلان على الغلاف الخارجي: ارتفاع 20 سم وعرض 20 سم

الدقة : 300dpi

نوع الملف: PSD أو EPS أو PDF

إعلان على موقع الاتحاد www.aucbm.net

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



المملكة العربية السعودية

9% زيادة في مبيعات الإسمنت لارتفاع الطلب

سجلت المبيعات المحلية لشركات الإسمنت السعودية، خلال النصف الثاني من 2024، ارتفاعاً نسبته 9%، مقارنة بنفس الفترة من العام 2023؛ لتسجل نحو 26.6 مليون طن في النصف الثاني من 2024، مقابل 24.5 مليون طن لنفس الفترة من العام 2023، وذلك في ظل ارتفاع الطلب.

وكشفت بيانات سوق الإسمنت السعودي عن عودة المؤشرات الإيجابية للسوق بصورة كبيرة في شهر ديسمبر / كانون الأول الماضي، بارتفاع 16.4% للمبيعات المحلية، و15.5% للإنتاج، و17% للصادرات.

وتظهر البيانات الصادرة عن شركة إسمنت اليمامة، أن النصف الثاني من العام 2024 شهد تحسناً ملحوظاً في الطلب المحلي على الإسمنت، إذ ظلت المبيعات والإنتاج إيجابية خلال الـ 6 أشهر، بدعم من تعافي الطلب المحلي مع التقدم الكبير في إنجاز المشروعات الكبرى التي تبنيتها رؤية المملكة 2030، إضافة إلى المشروعات العقارية المتنوعة.

وتظهر البيانات أن المبيعات المحلية للشركات الـ 17 العاملة في السوق سجلت نحو 49.2 مليون طن في العام 2024، مقابل نحو 47.2 مليون طن في العام 2023 بارتفاع 4%.

وعلى صعيد الإنتاج، تشير البيانات إلى ارتفاع الإنتاج إلى نحو 51 مليون طن في العام 2024، مقارنة بنحو 49.2 مليون طن في العام 2023 بارتفاع 3.6%.

أما الصادرات (إسمنت وكلنكر) فتظهر البيانات استمرار انخفاضها للعام الثاني على التوالي؛ لتسجل نحو 6.5 ملايين طن في العام 2024، مقابل نحو 8.6 ملايين طن في العام 2023.

ورغم زيادة المبيعات المحلية، إلا أن رصيد المخزونات من الكلنكر لدى شركات الإسمنت سجل ارتفاعاً نسبته 14%، عند نحو 45.4 مليون طن نهاية العام 2024، مقابل نحو 40 مليون طن نهاية العام 2023.

al-madina.com

إسمنت الجوف توقع اتفاقية مع انجي الفرنسية لبناء محطة توليد الكهرباء بالطاقة الشمسية

أعلنت شركة إسمنت الجوف توقيع اتفاقية بناء محطة توليد الكهرباء بالطاقة الشمسية وتشغيلها لمدة 25 سنة مع شركة انجي الفرنسية في موقع الشركة بمدينة طريف بطاقة توليد تقدر بـ 22 ميغاوات.

وتوقعت أن تساهم محطة الطاقة الشمسية حين اكتمالها بحوالي 25% من احتياجات الشركة من الطاقة الكهربائية.

وأشارت الشركة إلى أن العقد سيكون له أثر إيجابي على البيئة وذلك بخفض الانبعاثات الكربونية بواقع 1.5 مليون طن مما يدعم توجهات الدولة للمحافظة على البيئة في قطاع الإسمنت والمعروف بكثافة استهلاك الطاقة.

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إسمنت الجوف تعلن اعتماد منتج الإسمنت الأخضر بمشاريع نيوم

أعلنت شركة إسمنت الجوف عن اعتماد منتجها الجديد منتج الإسمنت الأخضر بمشاريع نيوم، وذلك من خلال القيام ببحوث تطويرية متعددة بالشراكة مع شركة أساس المهيلب وهي شركة متخصصة في إنتاج الخرسانة الجاهزة عالية الجودة.

وقالت الشركة في بيان لها إن منتج الأسمنت الأخضر يتميز بالخصائص التالية:

- الحد من انبعاثات ثاني أكسيد الكربون بنسبة 30% ولذلك يعتبر إسمنتاً صديقاً للبيئة.
- إن استخدام الإسمنت الأخضر في الخرسانة بديل متميز عن استخدام المكونات الإضافية المستوردة مثل خبث الأفرن (GGBS) والرماد المتطاير (Fly Ash) حيث يؤدي استخدامه إلى الحصول على منتجات خرسانية بجودة أعلى، وفق معايير متميزة ومنفردة عن باقي المنتجات.
- الإسمنت الأخضر بحرارة تفاعل منخفضة، مما ينعكس على الخرسانة ويجعلها مناسبة لأعمال الخرسانة الكبيرة الحجم.
- الإسمنت الأخضر يحسن ويرفع كفاءة الخرسانة بشكل كبير من ناحية المتانة والديمومة، ويخفض امتصاص الماء، ويخفض النفاذية ويصنف شديد الانخفاض من ناحية اختراق الكلوريدات للخرسانة.
- الإسمنت الأخضر مقاوم للأملاح الكبريتية والكلوريدية المتواجدة في التربة.
- إن قوة الضغط للإسمنت الأخضر تعادل الإسمنت العادي OPC وتزيد.
- الإسمنت الأخضر يساعد في عزل الحرارة ومقاوم للحريق.
- يساعد الإسمنت الأخضر على تقليل استخدام التلج في تبريد الخرسانة، وهو ما يساعد على خفض تكلفة الخرسانة بشكل كبير.

argaam.com

شركة إسمنت نجران ت دشّن تطبيق (واصل) الأول من نوعه على مستوى شركات الإسمنت السعودية

احتفلت شركة إسمنت نجران بتدشين تطبيق (واصل) حيث يعتبر التطبيق الأول من نوعه على مستوى شركات الإسمنت السعودية الذي يقدم خدمة إلكترونية متكاملة لبيع وتوصيل الإسمنت لعملاء الشركة من فئة الأعمال (الشركات والمؤسسات). ويهدف التطبيق إلى تمكين عملاء الشركة من الاستفادة من خدمة واصل وتسهيل عملية طلب وتوصيل واستلام الإسمنت، وضمان وصوله بكل سرعة واحترافية.

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سلطنة عُمان

ريسوت للإسمنت: تنفيذ برنامج مستدام لرفع كفاءة الإنتاج

تدرس شركة "ريسوت للإسمنت" إطلاق برنامج لإعادة تدوير مواد ثانوية صناعية واستخدامها كوقود "أخضر" في عمليات إنتاج الإسمنت وإنتاج الطاقة الكهربائية. ويستهدف هذا البرنامج الجديد تعزيز الجهود الحكومية لتقليل انبعاثات ثاني أكسيد الكربون ودعم خطة سلطنة عُمان لتحقيق الحياد الصفري بحلول عام 2050.

وعملت الشركة على تطوير تقنيات جديدة في عمليات الإنتاج في عدد من مصانعها في سلطنة عُمان والخارج لتتيح لها تدوير مواد ناتجة عن صناعات أخرى غير مرغوب بها واستخدامها كوقود في عمليات إنتاج الإسمنت وهو ما يساهم في تقليل انبعاثات ثاني أكسيد الكربون وتعزيز استخدام الموارد وتوفير طاقة نظيفة في عمليات الإنتاج.

كما تقوم إسمنت ريسوت باستخدام مواد ثانوية صناعية ناتجة عن عمليات الإنتاج من مختلف الصناعات وإعادة تدويرها والاستفادة منها في صناعة الإسمنت. وهذه المواد تنقسم لنوعين: النوع الأول هو مواد يمكن إعادة استخدامها كوقود بديل للغاز في مصانع الإسمنت، أما المواد الأخرى فيمكن استخدامها كمواد أولية تدخل كبديل جزئي للمواد الأولية في صناعة الإسمنت. وتشمل المواد التي قامت الشركة بإعادة تدويرها المواد الصناعية الناتجة عن مصهر الألمنيوم بصحر، والمواد الصناعية الناتجة عن أعمال صناعة الرخام والجرانيت، والمواد الناتجة عن حفر آبار النفط، بالإضافة إلى المواد الصناعية الناتجة عن مصفاة النفط بصحر.

وحول النتائج التي حققتها برنامج إعادة التدوير، ذكرت الشركة أن هناك مشروعاً كبيراً في مصنع "ريسوت للإسمنت" بصلالة لإعادة استخدام الهواء الساخن الخارج وإعادة استغلاله في إنتاج الطاقة الكهربائية، حيث تتيح هذه الطريقة للمصنع توليد حوالي 30% من الطاقة الكهربائية، ووفقاً لذلك سيتم خفض حوالي 50 ألف طن من غاز ثاني أكسيد الكربون سنوياً، وبذلك يصبح مصنع "ريسوت للإسمنت" بصلالة واحداً من المصانع الصديقة للبيئة من خلال قدراته على توفير طاقة نظيفة لإنتاج الإسمنت.

وقد أتاح برنامج إعادة تدوير مواد ثانوية أخرى ذات قيمة شبيهة بالحجر الجيري وخام السيليكا لشركة "ريسوت للإسمنت" أيضاً رفع كفاءة مصنعها بصلالة من خلال تقليل مادة الكلنكر في الإسمنت مع رفع كفاءة الإسمنت في الخرسانة، مما ساهم في تخفيض حوالي 18% من انبعاثات ثاني أكسيد الكربون عند مقارنته بالإسمنت العادي مع المحافظة على جودة عالية وكفاءة في الخرسانة حسب المواصفات والمقاييس الدولية.

وتطبيق واصل عبارة عن جزء من (نظام واصل الرقمي) الذي يتكون من عدة وحدات حيث بدأ العمل على تطويره في نهاية عام 2023 وتم إطلاق وحداته تدريجياً خلال عام 2024 وفقاً لأولوية الحاجة التشغيلية. وقد تم الانتهاء من تشغيل وربط جميع وحدات النظام بنجاح كما تم ربط النظام بأنظمة مساندة له مثل نظام تتبع المركبات ونظام إصدار وثائق النقل للبضائع الخاص بالهيئة العامة للنقل، ما كوّن بنية تحتية رقمية متكاملة سهلت عمليات التشغيل وتكامل الأعمال بين شركة إسمنت نجران وشركة النقل التابعة لها (شركة وصل الجنوب للنقل البري). كما مكّن من إدارة أسطول النقل بكفاءة عالية، وذلك من أجل تقديم خدمة أفضل للعميل. ويمثل (تطبيق واصل) حلقة الوصل بين عملاء شركة إسمنت نجران و(نظام واصل الرقمي) حيث يُمكن التطبيق العملاء من طلب الإسمنت بأنواعه ومتابعة الطلبات والوصول إلى بياناتهم على مدار الـ 24 ساعة خلال جميع أيام الأسبوع، كما يتيح جدولة الطلبات المستقبلية بما يتوافق مع احتياجاتهم ما يوفر تجربة عميل مميزة. وتأتي هذه الخطوة كجزء من سلسلة من المبادرات والمشاريع التي تستمر شركة إسمنت نجران في إطلاقها منذ تأسيسها لتحقيق الاستدامة في أعمالها والارتقاء بمستوى الخدمة المقدمة لعملائها.

تجدر الإشارة إلى أن الشركة كانت قد بادرت بالاستثمار في مجال النقل وذلك من خلال تأسيس شركة وصل الجنوب للنقل البري في عام 2020م، حيث كانت تتركز أعمالها في تقديم خدمة نقل المواد الداخلة في صناعة الإسمنت لصالح شركة إسمنت نجران ما ساهم في خفض التكاليف التشغيلية للشركة. ومن ثم توسعت شركة وصل للنقل في أعمالها وخدماتها وذلك بتقديم خدمة توصيل منتج الإسمنت لعملاء شركة إسمنت نجران من خلال أسطول من الشاحنات التي تعمل بأحدث التقنيات والتي تم ربطها بـ (نظام واصل الرقمي) ما يُمكن العميل من متابعة طلبه بشكل مباشر من خلال التطبيق من لحظة رفع الطلب حتى وصوله لموقع العميل وتوثيق عملية التوصيل والاستلام رقمياً بكل يسر وسهولة.

ويتوفر تطبيق (واصل) حالياً لأجهزة الهاتف التي تعمل بنظام الأندرويد ويمكن تحميله من خلال متجر (Google Play)، وسيتم خلال الفترة القادمة إطلاق نسخة (IOS) لمستخدمي أجهزته الأيفون.

موقع الشركة الإلكتروني

إسمنت اليمامة السعودية تؤسس شركة للاستثمار بصناعة المعادن

وقعت شركة إسمنت اليمامة مذكرة تفاهم غير ملزمة مع مجموعة العبيكان للاستثمار وشركة سلطان القابضة في تاريخ 25 ديسمبر 2024، لتأسيس شركة قابضة للاستثمار في مجال صناعة المعادن بالمملكة العربية السعودية، وتشمل إنتاج معادن (الليثيوم، غرافيت، السيليكا).



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الأمن من المخلفات بالمحافظات والقضاء على الممارسات العشوائية والتلوث البيئي والمخاطر الصحية الناجمة عن التعامل غير السليم مع منظومة المخلفات.

ويأتي تشغيل منظومة المعالجة وطرحها للقطاع الخاص لاستيعاب كافة المخلفات للحصول على قيمة اقتصادية منها سواء إنتاج وقود بديل وتوفيره لمصانع الإسمنت أو كسماد عضوي لاستصلاح الأراضي بجانب المفروقات الذي يتم إعادة تدويره في مصانع إعادة التدوير.

والمصنع، الذي أقيم على مساحة 10 أفدنة بتكلفة إجمالية بلغت 90 مليون جنيه، مزود بأحدث المعدات والتجهيزات اللازمة لعملية تدوير المخلفات، إلى جانب منشآت إدارية وخدمية متكاملة.

gomhuriaonline.com

كما ساهم البرنامج أيضاً في رفع كفاءة الإنتاج لمصنع إسمنت صحار وهو أحد المصانع المملوكة لمجموعة "ريسوت للإسمنت" من 2000 طن في اليوم إلى 5000 طن يومياً وتقليل استهلاك الكهرباء بحوالي 24%، مما ساهم في تقليل انبعاثات ثاني أكسيد الكربون، كما تم رفع كفاءة مصنع باونير لصناعة الإسمنت بدولة الإمارات العربية المتحدة التابع لمجموعة "ريسوت للإسمنت" من خلال تنفيذ مشروع استخدام الوقود البديل بنسبة تصل إلى 20%، خلال فترة تمتد من سنة إلى سنتين.

وهناك العديد من المبادرات الأخرى التي تدرس الشركة تنفيذها بالتعاون مع الجهات الحكومية المختصة مثل إعادة تدوير المخلفات المنزلية والبلدية واستخدامها كوقود بديل للغاز.

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جمهورية مصر العربية

مصنع تدوير المخلفات بتونا الجبل خطوة نحو

مستقبل بيئي مستدام

تم توقيع عقد إدارة وتشغيل مصنع تدوير المخلفات بتونا الجبل بمركز ملوي بمحافظة المنيا وذلك بين المحافظة وشركة إسمنت أسبوت سيمكس "Cemex".

وستعمل منشأة معالجة المخلفات غير الخطرة بتونا الجبل بمركز ملوي بمحافظة المنيا، بطاقة تصميمية 20 طن في الساعة بإجمالي 320 طن / يوم، يتم من خلالها استقبال المخلفات المتولدة عن مركز ومدينة ملوي ودير مواس، حيث سيتم معالجة المخلفات لإنتاج الوقود البديل والسماد العضوي والتخلص من المرفوضات في المدفن الصحي الذي يتم إنشاؤه حالياً. وستساعد تلك المشروعات على رفع كفاءة نقل والتخلص

مجموعة مصر للإسمنت تبرم اتفاقية شراء طاقة مع «سولاريز إيجيبت» لتنفيذ مشروع طاقة شمسية بقدرة 40 ميغاوات

أعلنت مجموعة مصر للإسمنت عن توقيع عقد شراكة مع شركة سولاريز إيجيبت لإنشاء مشروع طاقة شمسية كهروضوئية بقدرة إجمالية تصل إلى 40 ميغاوات، وفق نموذج منتج الطاقة المستقل IPP.

وبلغت التكلفة الإجمالية للمشروع ما يقارب 1.5 مليار جنيه، حيث ستعمل كل محطة من محطتي الطاقة الشمسية على توفير 48 مليون كيلوواط ساعة سنوياً من الطاقة الشمسية لكل من مصانع المجموعة بمحافظة المنيا وقنا، حيث يبلغ إجمالي إنتاج المحطتين حوالي 96 مليون كيلوواط ساعة سنوياً، مما يساهم في تقليل الاعتماد على مصادر الطاقة التقليدية، وخفض الانبعاثات الكربونية، وتعزيز الاستدامة التشغيلية للمجموعة.

نشاطات عربية



دورات تدريبية عربية

الأساليب والطرق الحديثة لعمليات الشراء الدولية

الاعتبارات القانونية والفنية التي تحكم صياغة العقود وتنفيذها

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