



CEMENT & BUILDING MATERIALS REVIEW

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THE TECHNICAL JOURNAL FOR THE CEMENT INDUSTRY



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

EDITORIAL SCHEDULE FOR 2021

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Deadlines for receiving articles, press releases, or advert materials for 2021 issues are as follows:

June issue: **28th May 2021**

September issue: **31st August 2021**

December issue: **3rd December 2021**

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ALGERIA

Société des Ciments de Hamma Bouziane and Société des ciments de Ain El Kebira plan 50,000t West African cement export operation

Groupe des Ciments d'Algérie (GICA) subsidiaries Société des Ciments de Hamma Bouziane (SCHB) and Société des Ciments de Ain El Kebira (SCAEK) are planning to export 50,000t of cement to West Africa. SCHB will supply 35,000t of the cement, and SCAEK will supply the remainder. SCHB produced 0.8Mt of cement in 2020.

Global Cement

EGYPT

ASEC and Qatrana Cement Extend O&M Contract

ASEC, the regional leader in cement engineering, operation and maintenance solutions, and the Jordanian cement producer, Qatrana Cement Company, announced the extension of the O&M contract for an additional 3 years.

The collaboration started back in 2010 where partners have entered into an O&M agreement and ASEC was entrusted with the full responsibility of the operation and maintenance of Qatrana Cement plant from raw material crushing up to cement dispatch. The plant comprises of one production line with annual production capacity of 1.5 Mtpy and it is located in Qatrana, Jordan.

"This contract marks a milestone in our cooperation with Qatrana Cement Company and is proof of the exceptional and long-standing relationship with our clients," said Mr. Ashraf El-Kahky, ASEC CEO and Managing Director. "ASEC with its distinctive set of resources and experience combined with QCC support represent the unique blend for achieving success and operational excellence," he added.

Suez Cement sells stake in Kuwait's Hilal Cement

Suez Cement sold its stake in Hilal Cement, the Kuwaiti cement maker, for a value of KWD 3 million or KWD 0.057 per share. Earlier, the board of directors of Suez Cement approved a decision to offer its 51% stake in Hilal Cement for sale.

Mubasher

Suez Cement delisting approved

On 29th December 2020, the listing committee of the Egyptian Exchange has announced and approved elective and discretionary delisting of Suez Cement Group.

The Suez Cement Company was established in 1977 as the largest grey cement producer in Egypt.

Presently, it has two production lines. These production lines use the dry method production process for manufacturing cement. The cement plant and two quarries cover an area of 3,095,000 m².

The company mainly focuses on the domestic market and exports a specific segment of its products to Arab, African and European countries.

CW Group

Cementos La Unión loses Arabian Cement Company arbitration case against Egyptian government

The US-based International Centre for Settlement of Investment Disputes (ICSID) has ruled in favour of the Egyptian government in a compensation case raised by Spain-based Cementos La Unión concerning its Arabian Cement Company (ACC) subsidiary. The Company sought US\$286m in compensation, due to the Egyptian government's decision to retroactively impose new activity and electricity licences shortly after ACC built a new integrated cement plant in Suez Governorate. Cementos La Unión argued that the additional licences breached a bilateral agreement between Spain and Egypt covering investments that were already in place.

The company said that it will continue to pursue its claim, which is also progressing in Egypt.

Global Cement

Lafarge Egypt and LMS Construction allied to form consortium for concrete supply

Lafarge Egypt, part of LafargeHolcim, signed a consortium agreement with LMS Construction, to manage the supply & delivery of half a million m³ of ready-mix concrete.

The agreement was active by early January 2021.

LEBANON**Lebanese government conducts u-turn on cement imports**

The Ministry of Industry has reversed a recent decision to allow cement imports into the country. Following a meeting with local cement producers, the Minister declared that allowing imports would decrease official selling prices rapidly. Local producers have reported low sales due to a strict coronavirus-related lockdown that started in January 2021. Cimenterie Nationale reportedly stopped production in early February 2021 due to a lack of raw materials.

Global Cement

LIBYA**Libyan Interior Ministry prioritises war-torn homeowners' cement orders**

Tripoli residents whose homes have been damaged during war will receive priority access to cement. The Libyan Interior Ministry has established a committee to coordinate between state-owned Ahlia Cement Company and citizens involved in reconstruction. The committee will update people who have ordered cement on their scheduled deliveries.

Global Cement

MOROCCO**Bab Sahara Company launches Guelmim cement plant project**

Bab Sahara Company is building a new cement plant in Guelmim, Guelmim-Oued Noun. The company is a joint venture between three private investors, including Tarfaya City Council Chair Abdelhay Hartoun. An environmental impact study for the project was started in late December 2020 by the Ministry of the Interior.

Global Cement

Morocco closes 2020 with a drop of 10 percent in cement sales

The figures are in line with expectations of producers.

CW Group

OMAN**Oman Consumer Protection Authority suspends production at cement facility**

The Consumer Protection Authority (CPA) has intervened to suspend operations at a cement producing facility in Al Dhahirah Governorate. The suspension results from repeated complaints to the CPA's consumer protection department about product quality. The operation is also suspended from selling its goods.

Global Cement

Raysut Cement holds ceremony for its new 9mw waste heat recovery system

Raysut Cement Company (RCC) held a groundbreaking ceremony triggering the start of the construction of its new 9MW Waste Heat Recovery system in its main plant in Salalah, Oman.

The development of 9MW waste heat recovery system, a strategic expansion for the company will complement the company's leadership in cement manufacturing because it will support the company's commitment for the reduction of carbon footprint by generating the power via utilising the waste hot gases from the existing plant, said the company.

Raysut Cement Company has engaged SINOMA Overseas Development Co., Ltd, China as an EPC contractor which has a long experience in this type of project.

The groundbreaking is a milestone for RCC. It will contribute significantly to the Company's ambitious targets such as reducing power consumption capacity by 25 per cent - 30 per cent, reduction in CO₂ emission and above all significant reduction in water consumption (reduction by more than 50 per cent of regular water consumption) resulting in direct environmental benefit and making the manufacturing process more energy efficient.

Times of Oman

Oman Cement Company upgrades digital control systems in its factory

ABB has supplied the cement producer Oman Cement Company SAOG (OCC) with new digital control systems to boost operational efficiency, increase availability, lower costs and drive sustainability.

The Muscat-based cement factory, with an annual cement production of 3.5 million tons, has installed the latest version of ABB Ability System 800xA, which integrates its three process lines into the single digital platform.

ABB has also replaced older controllers in their final lifecycle phase with AC800M models. ABB secured two separate contracts for the work with OCC.

CW Group

SAUDI ARABIA**Saudi cement sales grow 6% to 5.1m tons in January 2021**

The aggregate sales of 17 Saudi cement producers rose 6% to 5.1 million tons in January 2021, compared to 4.8 million tons in the same month last year, according to recent data issued by Yamama Cement Company.

As many as 12 cement producers reported higher sales, led by Arabian Cement Co. with a 50% rise year-on-year (YoY). It was followed by Najran Cement and Tabuk Cement with (+25% YoY each).

On the other hand, five other companies reported lower sales, led by Yamama Cement that saw a 21% YoY drop in sales.

Six companies exported 127,000 tons of cement in January. Saudi Cement Co. came on top with 61,000 tons of exports. It was followed by Yanbu Cement Co. with 32,000 tons, and Najran Cement with 19,000 tons.

Six companies exported clinker in January, led by Arabian Cement with nearly 257,000 tons. It was followed by Saudi Cement and Yanbu Cement with 179,000 tons, and 174,000 tons, respectively.

Clinker production increased by 5.7 percent to 4.5 million tons in the same month, compared to 4.2 million tons in January 2020.

Clinker inventories reached 35.7 million tons by the end of January, down 14.8 percent from 41.9 million tons in January 2020.

Arab News

Saudi Arabia cement sales forecast to grow by 4% to 52.8Mt in 2021

NCB Capital has predicted a growth in Saudi cement sales of 4% year-on-year to 52.8Mt in 2021. The investment and analyst division of National Commercial Bank described the sector's outlook as 'positive,' due to on-going housing programmes and the Public Investment Fund's 2021 – 2025 strategy, as well as a pick-up in infrastructure projects.

Global Cement

City Cement to incorporate waste and recycling subsidiary

The board of Saudi's City Cement Company has agreed to incorporate a new waste, environmental and recycling subsidiary LLC with registered offices in Riyadh.

The company announced in a statement that its board of directors had approved the LLC company, which will fully be owned by City Cement and incorporated with \$133,000 capital.

The decision comes in line with the company's strategy, and any further developments in this regard will be announced in due course.

Najran receives licence for transportation subsidiary

The Ministry of Transport has granted Najran Cement a licence to launch its own limited liability transportation company. The company is in the process of obtaining

the final licence for the launch.

Global Cement

Umm AlQura Cement renews O&M Agreement with Wärtsilä

Wärtsilä announced that it has signed a 5-year Operation and Maintenance (O&M) agreement with Umm AlQura Cement Co. This will be the third agreement term for the customer's captive power plant installation. The initial 3-year long-term agreement was signed in 2015, and thereafter renewed once. Following the continued efficient and reliable performance of the power plant, this latest contract was renewed for 5 years in November 2020.

The 47 MW plant is located in Taif City in Western Saudi Arabia. It operates with 5 Wärtsilä 32TS engines, a two-stage turbocharged version of the standard Wärtsilä 32 engine series, which features low fuel and lube oil consumption. Since the plant supplies the power needed to operate the cement production facility, reliability and availability are essential. This twice renewed O&M agreement provides clear evidence that these essentials are being met. Wärtsilä Expertise Centre in Dubai provides versatile and extensive support for the site team in ensuring uninterrupted power generation for the cement production facility. This support comprises 24/7 remote guidance and technical support with Augmented Reality video streaming.

Yanbu Cement starts modernisation project on production line

Yanbu Cement has started a two months modernisation project on Line 4 at its integrated Yanbu plant. The company said that dispatches would not be affected by the stoppage due to sufficient clinker stocks. Line 5, which represents 60% of the company's total capacity at the plant, will continue production at full capacity.

The cement producer reported that its sales fell by 4% year-on-year to US\$251m in 2020 from US\$260m in 2019. Its net profit after zakat and tax grew by 9% to US\$74.9m from US\$68.7m.

Global Cement

Saudi Readymix becomes certified American Concrete Institute course provider

Saudi Readymix has received its certification from the American Concrete Institute (ACI) to provide ACI certified courses. The courses form a minimum qualification for concrete industry workers.

The concrete producer will start accepting candidates for its courses in March 2021. It will offer ACI trainings courses in concrete field testing and concrete strength testing.

Global Cement

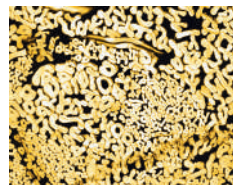
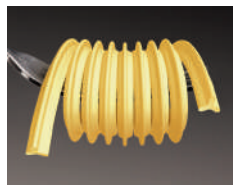
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SUDAN

Cement producers in Sudan claim anti-industry policies adopted by the government

Multiple taxes are weighting on cement manufacturing in the country, producers say.

[CW Group](#)

SYRIA

Hama Cement sells over 1Mt of cement in 2020

The General Company for Cement and Building Materials in Hama central province (Hama Cement) recorded cement sales in excess of 1Mt in 2020. Clinker sales were 0.7Mt; the total value of sales was US\$96m.

The year included the beginning of concrete paving slab production at the company's plant.

The company said that 2021's tasks consisted of improving the technical specifications of the product and producing new cement types, modernising equipment, developing workers' skills and diversifying investments.

[Global Cement](#)

TUNISIA

Study shows heavy metals equally present in CEM-I and CEM-II cement

Carthage University, Ciments de Bizerte, the Tunisian Ministry of Higher Education and Scientific Research and the University of Algarve faculty of science and technology have concluded a study into the heavy metal content of CEM-I and CEM-II cement. The study found that both types of cement contain traces of arsenic, barium, boron, cadmium, chromium, copper, manganese, nickel, lead, strontium and zinc in equal measure.

Carthage University said, "Heavy metals in cement can originate from a variety of processes in production, including their initial presence in raw materials and fuel, incorporation into kiln refractory brick, metal erosion from the raw material grinding process and in additives such as gypsum, as well as cement kiln dust."

[Global Cement](#)

UAE

Emirates Global Aluminium, Geocycle UAE renew partnership

Emirates Global Aluminium (EGA) and Geocycle

UAE, part of LafargeHolcim, announced they have signed an agreement to extend their 10-year partnership in creating value from industrial waste in the UAE.

EGA has worked with LafargeHolcim since 2010 to find productive uses in the UAE for spent pot lining, the used inner lining of reduction cells, which is one of the aluminium industry's most significant waste streams.

The two companies jointly developed a technique for pre-processing and then using spent pot lining as an alternative feedstock in local cement manufacturing. Since 2010, EGA has supplied GeocycleUAE with over 160,000 tonnes of spent pot lining, requiring almost 3,000 truck trips between the two company's facilities.

Over the next two years, EGA will supply a further 40,000 tons of spent pot lining, both to Geocycle UAE & directly as pre-processed material to LafargeHolcim's cement plant in Fujairah.

WORLD

Bill Gates shines spotlight on carbon-emitting cement and need for something new

Microsoft co-founder Bill Gates has written a new book titled "How to Avoid a Climate Disaster," and in it he argues that we need to get serious about changing the way we produce cement if we're going to tackle climate change. Gates says that cement is responsible for 6% of carbon emissions globally.

Sriramya Nair, an assistant professor of civil and environmental engineering, is working to develop new alternatives to cement that decrease emissions, yet meet construction demands. Nair says that demand for construction material will increase in the coming decades and that researchers are exploring cement alternatives derived from waste material such as corn ash or rice husk ash.

"In 2020, 4.37 billion tons of Portland cement was produced worldwide and production of one ton of Portland cement generates an average of 0.9 tons of CO₂, resulting in approximately 5-7% of the global CO₂ emissions. Cement production plants are finding ways to curb CO₂ emissions, but to reach net zero, more needs to be done," says Sriramya.

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- **Data services:** statistical and data research tools offering industry practitioners a wealth of cement supply and demand data



FLSmidth announces the sale of its Möller pneumatic conveying systems business to REEL

On 29 December, 2020, FLSmidth entered into a definitive agreement to sell its Germany-based Möller business to French conglomerate REEL. REEL is an industrial group specialising in complex handling and lifting systems with annual sales of €400m.

Möller, also known as FLSmidth Hamburg GmbH, is a specialist in design, supply, installation and service of pneumatic conveying systems. The company caters to the power and aluminium industries. All of Möller's 60 employees will join the REEL family.

Möller, founded in 1934, was acquired by FLSmidth in 1996 with the intention of enhancing FLSmidth's business in the power sector which is no longer a sector of focus for FLSmidth.

FLSmidth delivers sustainable productivity to the global mining and cement industries. We deliver market-leading engineering, equipment and service solutions to our customers enabling them to improve performance, drive down costs and reduce environmental impact. With MissionZero, our 2030 ambition is to enable zero emission and zero waste (water, energy) in cement production and mining. Our operations span the globe and our 11,000 employees are present in more than 60 countries. In 2019, FLSmidth generated revenue of DKK 20.6 billion.

www.flsmidth.com

FLSmidth announces the sale of fabric filter technology to Simatek and the signing of a cooperation agreement with Simatek

On 22 December, 2020, FLSmidth has entered into an agreement to sell fabric filter technology, a non-core business of FLSmidth's advanced filter technology ("AFT"), to Simatek A/S ("Simatek"), a Denmark-based manufacturer of industrial filters.

The transaction has substantial benefits for both parties: (i) FLSmidth will retain its core AFT operations, which continue to be key in the delivery of FLSmidth's MissionZero strategy; while (ii) the acquisition will allow Simatek to gain scale, widen its product portfolio and enhance its filter technology.

As part of this transaction, FLSmidth and Simatek have entered into a cooperation agreement. Under this agreement, Simatek will supply FLSmidth with fabric filters. In turn, FLSmidth will become a supplier of filter bags and filter cages to Simatek.

The cooperation agreement will enable FLSmidth to enhance its MissionZero strategy by reaching more clients with core products that focus on reducing particle emissions.

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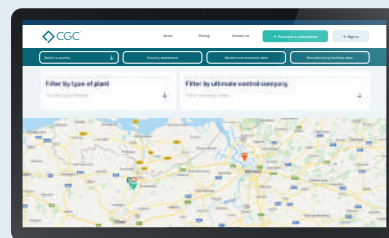
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Fosbel acquires Wahl Refractory Solutions, LLC.

Wahl Refractory Solutions, Fremont, Ohio, will now conduct business under the name Wahl Refractory Solutions, a Fosbel Company.

Wahl Refractory has been a respected manufacturer and supplier to the steel, aluminum, cement, and thermo-processing industries since 1921. A recognized leader in technology for monolithic and precast refractories, Wahl manufactures tailored, custom refractory solutions. As the innovator in the use of steel fibers in refractories, Wahl pioneered SIFCA® (Slurry Infiltrated Fiber Castable) and has been at the forefront in design, formulation, and manufacture solutions to our customers' toughest applications.

Fosbel's mission in providing industry specific

services, engineered refractory solutions and advanced installation methods will continue with exceptional service to our markets by leveraging our outstanding employees to implement these strategies. The integration of Fosbel and Wahl Refractory secures a future of continued growth through strengthened products and services to a broader customer base.

By making a commitment to ensure Wahl's continuing business under the Fosbel umbrella, capital investments are being made at Wahl's manufacturing plant. Fosbel will utilize Wahl's manufacturing and production capabilities that will result in shortened supply chains and increased inventory capacities. This will result in improved products and services for Wahl and Fosbel customers.

Both companies have unceasingly provided excellent customer service and new innovations to their respective markets by delivering consistent quality with repeatable performance; and this tradition will continue.

TÇMB will walk into the future as TÜRKÇİMENTO with its new identity and logotype:

WE ARE THE FOUNDATION OF THIS COUNTRY AND WE WILL PREVAIL IN ITS FUTURE

Unifying non-governmental organization of the cement industry, the Turkish Cement Manufacturers' Association will continue to work under the name of TÜRKÇİMENTO. Its new logo and future vision were shared with the public at an online meeting

Dr. Tamer Saka, Chairman of the Board of Directors, stated that "Cement sector is one of the leading sectors in the development maneuver of Turkey. Therefore we, as TURKCİMENTO, say that "we are the foundation of this country and we will prevail in its future".

The Turkish Cement Manufacturers Association (TÇMB) will continue to work with the TÜRKÇİMENTO brand, representing a total of 66 plants and also being an international representative of the Turkish cement industry. Promoting the change of

its identity and logo at the launching meeting held on December 18th 2020, the Association shared its vision of the future with the public as TÜRKÇİMENTO. The Chairman of the Board of Directors, Dr. Tamer Saka, made the following remarks on the change of brand, the strategic goals of the organization and its vision for the future:

"We've come together to present our new identity and logo that symbolizes it. Emphasizing the importance of perceptions, investment and Turkish products in this week, as cement industry we are protecting our

national values and taking them into the future. We've witnessed enormous changes in the managerial, social and economic areas for a while, like all the countries of the world. In this environment of transformation and uncertainty, which is even more complicated with the pandemic in which institutions like us have a great responsibility to direct the future. The most important aim of our association is to carry our sector, which is the most important player of the Turkish economy, forward with the experiences of our institution. We will achieve this as the sector with social sensitivity and which generates added value, maintains corporate confidence, invests in human and pioneers in digitalization, technology and innovation."

NEW VISION, NEW LOGO

Stating the tremendous excitement they feel for this journey with the aim of Association's making more contribution to the economic and social development of Turkey, Dr. Tamer Saka continued as follows:

"We are embarking on a new vision journey to bring our industry to the forefront with its pioneering, socially sensitive, sustainable and innovative activities and practices, and to raise awareness among stakeholders of all our activities as a pioneer for more and better. Considering that new vision requires new logo, we also changed our identity. Cement is important to humanity because of its benefits and the economy generated by its activities.

It has never lost its importance in the establishment of civilizations in the past and in the construction of the future. Without cement, you cannot build schools, hospitals or bridges. Cement is one of the leading sectors in the development maneuver initiated by Mustafa Kemal Atatürk after the War of Independence. The first cement factory of our country was established 108 years ago. After the proclamation of the Republic of Turkey, Ankara Cement Company was the first plant of our republican period, was established in 1928 with the vision of "complete independence can only be achieved through economic independence" as our great leader Mustafa Kemal Atatürk expressed. Therefore, as TÜRKÇİMENTO we say that "We are the foundation of this country and we will prevail in its future".

Dr. Tamer Saka also clarified the main initiatives to be undertaken with a new vision as follows;

"First of all, we are planning a position paper on the city vision. In this document, we're going to clarify how cities should be in 2050. It will be created with the contribution of participants from different segments, which we consider from different perspectives such as urban planning and socio-economics, and will be

a document for our future. The Architecture Awards project will be launched next year. We strive to reward professional architects and university students alike. We are planning to introduce new CSR and digitalization initiatives."

Reminding that they have launched a civil initiative on earthquake, Dr. Tamer Saka stated that: "Our cement and concrete quality is at world standards. In particular, with the impact of the earthquake regulations that came into force after the 1999 earthquake, we do not see a fundamental problem in the residential built after that date. The main problem is the housing stock of 6 million houses. We need to transform them quickly. The Marmara earthquake, in particular, is a national security issue. It's meant to be looked at like this, not just an earthquake. Here is the center of the economy. There are many factors to be affected beyond economic activities. We have put forward a civil initiative in this regard and implemented it. We came together with 22 NGOs and started to prepare an earthquake action plan. We will share this in the earthquake week on March 5, 2021."

About TÜRKÇİMENTO

TÜRKÇİMENTO is a non-governmental organization established in 1957 with the Association status. It represents a total of 66 facilities in Turkey including 50 integrated facilities and 16 grinding facilities. TÜRKÇİMENTO is the Non-Governmental Organization representative of the cement sector, which produces the most important material in the development and structuring of the country. A member of the European Cement Association (CEMBUREAU) since 1972 as the international representative of the Turkish cement sector, TÜRKÇİMENTO successfully undertakes a number of responsibilities from research and development services to training, international collaboration, certification, sectorial data collection, collaboration with the universities, non-governmental organizations and other institutions.

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ABK Group acquires Ceramiche Gardenia Orchidea

The acquisition establishes ABK Group as one of the top players in the luxury segment of the ceramic industry. The Group expect to reach a total turnover of €150 million in 2020

ABK Group, one of the top players in the world ceramic tile industry specialising in the production of high-performance large slabs, is continuing its process of expansion. Despite the difficult period for the global economy, ABK Group S.p.A. has completed the acquisition of the 100% share capital of Ceramiche Gardenia Orchidea S.p.A., a historic company that owns the Gardenia Orchidea and Versace Ceramics brands and posted a turnover of more than €38 million in FY 2019.

ABK Group has seen exponential growth since it was founded in 1992

and reported a turnover of more than €110 million in FY 2019. Combining cutting-edge design with state-of-the-art technological innovation, the company has two production facilities, one of which is a revolutionary slab production plant located in Solignano Nuovo (MO).

Founded in 1961, Gardenia Orchidea Group has played an important role in bringing the style and quality of Italian ceramics to over 100 countries worldwide. Along with its own Gardenia Orchidea brand name, since 1997 the company has also been distributing the exclusive Versace Ceramics Collection, an extensive product range that combines ceramic tiles with a collection of prestigious bathroom furnishings with the unmistakable style of the Versace fashion house.

“The Ceramiche Gardenia Orchidea Group brands are positioned in the same high-end segment of the market as our historic ABK, Flaviker and Ariana brands and the new ABK Stone and Materia brands devoted to large porcelain slabs in 12 mm, 20 mm and 30 mm thicknesses,” explains Roberto Fabbri, Chairman of ABK Group SpA. “This acquisition establishes us as one of the top players in the luxury segment of the ceramic industry and is part of a broader development strategy that includes investments in technology and innovation aimed at strengthening our leadership in the sector. The success of this growth strategy will be demonstrated by the Group’s total turnover, which we expect to reach €150 million in 2020.”

ABK Group acquires 49% stake in Arbe Stolanic



ABK Group is stepping up the pace of its international expansion in the furniture sector and will begin selling the innovative “invisible” Cooking Surface Prime hob integrated with ABKSTONE and Materia slabs in international markets.

ABK Group, one of Italy’s leading producers of large, high-performance ceramic slabs, has acquired a 49% stake in Arbe Stolanic, a company based in Valencia (Spain) specialising in the production of kitchen and bathroom countertops. Arbe Stolanic holds several patents for the use of the innovative Cooking Surface Prime induction cooking system in combination with ABKSTONE and Materia slabs. This successful

concept earned the Spanish company an award for best innovation in the sector at the SADECC 2019 kitchen festival in Paris.

The invisible induction cooking system is installed directly underneath the 20 mm thick slabs without the need for further machining operations, thereby optimising the kitchen space and transforming the entire countertop into a workspace while allowing for unlimited functionality and creativity. The latest version, Cooking 3.0, is also capable of cooking more quickly than conventional systems and optimises energy consumption.

ABK Group sees the acquisition of a stake in the Valencia-based company and a presence on the board of directors as a key strategy for accelerating its international expansion in the furniture sector. ABK Group’s CEO Alessandro Fabbri commented: “Arbe Stolanic is the ideal partner for guaranteeing the market a technologically unique, versatile and durable product which I am sure will become an essential part of today’s and tomorrow’s kitchens.”

The system will be sold by Arbe Stolanic under the new brand name Cooking Surface Prime in Spain, Portugal and France and distributed exclusively by AbkStone and Materia in the rest of the world.

Italcer Group acquires 100% stake in Cedir

Italcer Group, a leading player in the Italian ceramic design and high-end bathroom furnishings sector, has acquired 100% of the capital of Cedir, a historic ceramic tile producer founded back in 1968 in Castel Bolognese in the province of Ravenna. Formed over a period of 3 years through a series of mergers, Italcer is now Italy's sixth largest ceramic group and produces high-quality products for interior and exterior use through a variety of top brands and historic companies (Devon&Devon, La Fabbrica Ceramiche Ceramiche, AVA, Elios Ceramica, Ceramica Rondine and Bottega).

Italcer's acquisition of Cedir, which has a production capacity of 3 million sqm/year of porcelain tiles and 60

employees, fits in perfectly with the group's long-term strategic goals. It is committed to retaining both the facility and the workforce.

Amongst its international development projects, the Group intends to build a new Industry 4.0 plant for large slab production in Tennessee, USA. In recent years, Italcer has invested more than 25 million euros in Industry 4.0 technologies and expects to make further annual investments of 10 million euros over the next three years. The group recently launched Advance, its new line of anti-viral, anti-pollutant and anti-bacterial porcelain products with properties certified by tests conducted in the Tile Council of North America (TCNA) research laboratories.

Monalisa partners with SACMI to produce the world's largest ceramic slab

News of the ambitious project - developed and launched in record time - announced on 27th January. The customer, a leading Chinese brand, selected SACMI to supply a new large slab line equipped with the Continua+ 2180

Monalisa, an industry's leading Chinese brand and a key player on the large ceramic slab market for over 10 years, has produced a record-breaking slab thanks to SACMI's latest ceramic slab manufacturing technology.

The official announcement came on 27th January 2021. It was issued by the firm's headquarters in Xiqiao, in the Guangdong district, after the first slab (measuring a stunning 1.8 x 6.1 m, a world record) rolled off the SACMI Continua+ line that had started up only a few days earlier.

The new line features the PCR 2180, the latest model in the SACMI Continua+ family, the global standard-setter for the manufacture of ceramic slabs and their sub-sizes. This new solution provides a comprehensive set of advantages as it is designed to provide the customer with optimal versatility when it comes to managing size and thickness. A key feature on this new model is the increased width of the compactor belt; this allows for the production of slabs as wide as 1800 mm, of variable length and thickness (the latter ranging from 3 to 20 mm).

The most productive compactor ever (up to 21,500 m²/day), the PCR 2180 also stands out on account of automated settings and extreme user-friendliness, as demonstrated by the record-breaking installation and start-up times; in fact, the first maxi-slab was produced only a few days after the first test runs.

Automatic settings and integration with the TPV cutting unit mean maximum manufacturing versatility, allowing the customer to create products of high added value with through-the-body effects: all thanks to a line that also features, downstream from the compactor, the innovative SACMI MDX system for real-time slab density and thickness control. Result: maximum quality, maximum process repeatability.

This latest high-performance stoneware slab plant is part of the key Monalisa 2020 project, an ambitious investment plan that aims to strengthen the customer's role as one of China's innovation trailblazers. Indeed, the customer couldn't be more satisfied with the Continua+, "a technology that revolutionizes the pressing concept to provide unprecedented customization opportunities". So, not just a slab of record size, then, but one that, thanks to SACMI, "incorporates technology, consistency and aesthetics".

Close support from SACMI Nanhai, the hub for all SACMI assistance services before during and after the sale throughout China, played a key role in completing this order. A global technology and service partner, SACMI supports customers through both local branches and via technical-technological assistance provided in synergy with the parent company: for Monalisa, that support proved to be priceless, as effective teamwork with SACMI's technicians ensured they were able to complete the investment on time.

UMS Group acquires Alteo

UMS, leader in extraction, transport and mining logistics in West Africa, announced the takeover of Alteo, the French producer of specialty aluminas.

UMS, leader in extraction, transport and mining logistics in West Africa, announced on January 8th the takeover of Alteo, the French producer of specialty aluminas. The acquisition will enable Alteo to strengthen its financial position, to consider further expansion and to ensure a world leading position over the long term.

UMS is an experienced, sound and socially responsible

industrial group. The industrial project linked to the takeover of Alteo will enable to develop a best-in-class company, to increase its production capacity of high value-added products, to develop its customer portfolio and to strengthen its R&D capabilities.

Strengthened by 125 years' experience in the alumina industry, Alteo supplies more than 1,000 different plants worldwide, including the major world ceramic and refractory manufacturers.

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CLOSING THE LOOP – SUSTAINABLE CEMENT MANUFACTURING BY EFFICIENT UTILIZATION OF ALTERNATIVE FUELS

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Abstract

The substitution of classical fossil fuels, such as coal or gas, by alternative energy sources has become a major aspect of modern cement manufacturing. Since the European cement plants reach already a substitution rate of 80-90%, there is still a lot of potential in other parts of the world for a further increase of alternative fuel (AF) utilisation. This paper provides insights and a case study towards a sustainable strategy for the provision of thermal energy. Thus, typical plant setups and processing stages are explained and introduced based on a recent realised project at PHOENIX Cement, Germany.

Interduction

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. 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. Also Phoenix Cement in Beckum, Germany follows a quite ambitious schedule for their AF utilisation and while the plant was also pioneering with the very early adoption of residue derived fuels (RDF) within their main burner combustion, the increase of the substitution rate for the pre-calcination process is a next milestone towards a green future of modern cement manufacturing.

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. The actual installation at Phoenix Zementwerke Krogbeumker GmbH & Co.KG is based on the company's well-established MultiFUEL concept for the efficient utilisation of alternative fuels with an industry-leading CAPEX and OPEX efficiency.

This article provides a general overview of some best practice approaches and conceptual definitions regarding the design, implementation and operation of feeding, dosing and storage lines for alternative fuels (AFs). For the implementation of AF installations, DI MATTEO developed over the past years a specific concept, which is introduced in section 2. In the subsequent sections 3 to 5 the different elements of the overall AF installation are introduced and described in detail. Finally section 6 concludes the whole article.

Seven Stage Concept (SSC) for the handling of alternative fuels

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.

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 |

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 (SSC) for plants for the handling, dosing and storage of alternative fuels (AFs).

This concept, as depicted in **Figure 1**, 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 [1]:

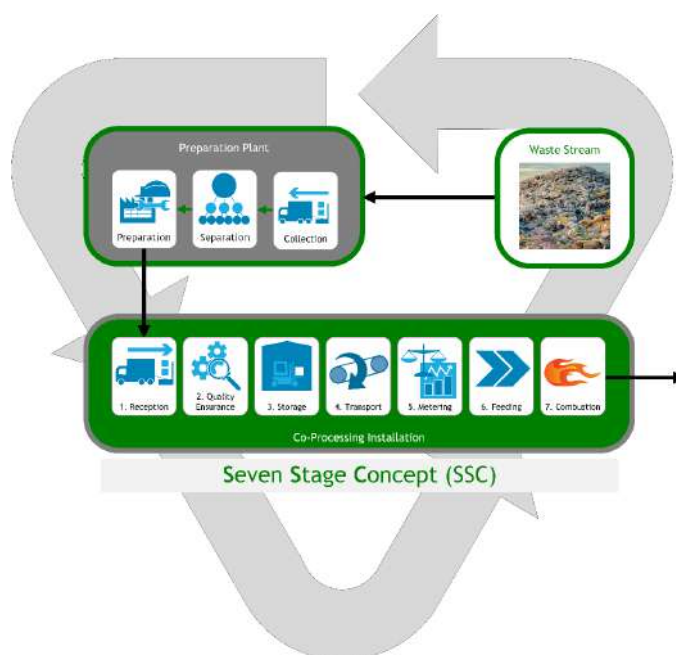


Figure 1- Seven Stage Concept (SSC) for the systematic classification of AF handling plants

1.Reception

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

2.Quality Insurance

machinery for the preparation of the received material prior to the combustion process, such as screening, magnetic separation, 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, 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 gravimetric dosing of AFs for a precise control of the combustion process.

6.Feeding to the kiln process

e.g. the mechanical or pneumatic feeding of kiln inlets or calciners (e. g. by screw feeders, injectomizers, pneumatic pipelines etc.).

7. Combustion

Successful and efficient combustion of the AF. It is essential to realize that the successful substitution of higher rates of fossil fuels by AF requires the right combination and implementation of the previous process steps [1].

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. The actual realisation of the project at PHOENIX Cement, Germany is visualised in **Figure 2**.

Reception, Storage and AF Logistics

The AF supply chain to the cement plant in Beckum is mainly organised by local processing plants, where the lion's share of material stems from industrial waste and is processed from residues made of wood, paper, textiles and plastics, defining a typical RDF-classified fuel. In comparison to the fuel used for main burner feeding, the material pre-processed for the calciner combustion is usually coarser and can appear in fractions of 2D particles up to 100x100mm and contains also a quite significant amount of 3D particles. Typical bulk densities vary between 0.1 and 0.3 t/m³, where the humidity content can reach up to 25%. As

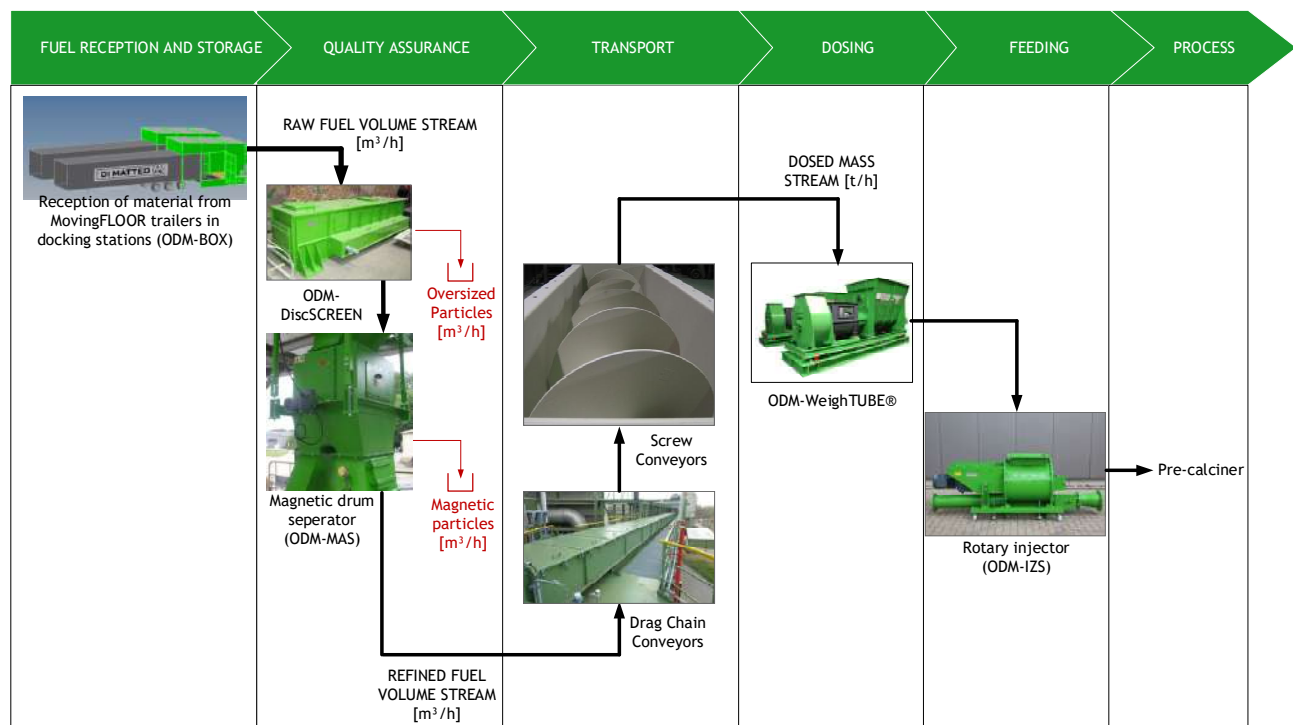


Figure 2- Feeding concept at Phoenix Cement

usual for all kinds of AFs, all these properties are volatile and can vary enormously over time (see also [2]). Therefore it was one of the major design criteria for all machineries to be able to deal with a wide range of fuels and their associated properties.

The secondary fuel is delivered by walkingfloor trucks to the plant and it was decided that the trailers itself shall be used as the intermediate storages, where each delivery contains roughly 100-130m³ of fuel, depending on the compaction factor within the trailer. Such a concept is a very efficient way to guarantee a continuous material supply in case the logistic supply chain can be sustained also over weekends. Therefore two ODM-BOX DockingSTATIONS are used in order to realise a spillage free reception of the material, as shown in **Figure 3**. Here the trailer's walkingfloor systems are operated by a dedicated stationary Hydraulic Power Unit (HPU) independently from their tractor. Furthermore it is possible to feed either material from one of the DockingSTATIONS separately or from both trailers simultaneously. The latter option shall be potentially used for the blending of material in case different material qualities and specifications

are available on the local AF market. Thus, the flexibility of the new installation in terms of fuel quality and supply can be increased even further. In total an intermediate storage of approx. 50t of material is always available for the feeding. In general the MultiFUEL-concept allows the extension for up to 12 docking stations. This depend on the available space and preference only.

Each box is equipped with an ODM-ScrewDOS[®] screw bottom, where each system consists of five screws with field-installed variable speed drives in order to reduce cabling efforts. By controlling the

speed of the screws, the volumetric infeed to the installation can be adjusted based on the current massflow setpoint. The material is afterwards transported with an inclination of app. 45° to a preparation and dosing tower by means of the famous ODM-TKF drag chain conveyor **Figure 4**. For a maintenance free operation, Di Matteo uses within their drag chain conveyors specifically forged chains with a dedicated material composition in order to sustain the often corrosive environment caused by the typical chemical fuel properties. The same applies for the specific wear resistant abrasion liners.



Figure 4 – ODM-ScrewDOS[®] screw bottoms and ODM-TKF drag chain conveyor



Figure 3 – ODM-DockingSTATIONS for material reception

Material Preparation

In surveys about reason for downtimes of AF feeding installations, most of the typical answers will be related to impurities of the material stream. However, even if it is quite well known for every experienced process technician that typical AF streams will be never completely free from foreign particles, there are numerous examples where this fact is completely ignored during the design phase of AF feeding lines, which leads to scenarios where the availability of those installations suffer enormously from downtimes due to blockages (e.g. oversized parts in pneumatic feeding lines) and even machine damage (e.g. caused by metallic parts). Not to mention the various possible process problems related to the infeed of undesired pieces of materials into the combustion process. Therefore it was decided to include in the new feeding line associated counter measures in order to get rid of possible impurities remaining within the processed fuel.

Screening by ODM-DiscSCREEN

A disc separator (ODM-DiscSCREEN) is used to avoid any oversized particles within the main material stream and to protect the machines further along in the process. To separate out oversized sediment material, the entire material flow is guided over the rotating sorting screens. During the conveying process, fine materials fall between the sorting screens or sorting rollers. The oversized sediment is transported further along and then ejected. The disc shape, construction materials, spacing, and layout, as well as the size of the sorting area are tailored to the bulk materials and the specific sorting job. The gaps between discs can also be refined to accommodate other materials. **Figure 5** shows the machine within the Phoenix installation and typical rejects from a disc sorter.



(a)

Magnetic separation

Besides the impurities which are mainly distinguished from the main material stream due to its size, also non-ferrous and ferrous metallic parts are causing problems within the AF feeding. These particles cannot be separated by typical screens or sifters, due to the fact that their size or weight can be quite small. Therefore DI MATTEO typically implements within their feeding lines magnetic separators (ODM-MAS). The compact and modular design of the drum magnetic separator makes it possible for it to be easily integrated into already existing equipment. With the appropriate construction materials, the magnetic separator is especially low-wear and needs little maintenance. **Figure 6** provides an overview of the machine and the related typical rejects. The working principle is based on a magnetic drum rotating within the material stream. Non-ferrous particles are just conveyed to the main outlet chute, while ferrous particles stick to the magnetic drum and can be separated from the material stream. Here the machine was installed in the chute between the drag chain conveyor and the ODM-DiscSCREEN. All rejects are collected within distinctive containers, which are emptied periodically and the weights of the rejects can be deducted from the AF material price.

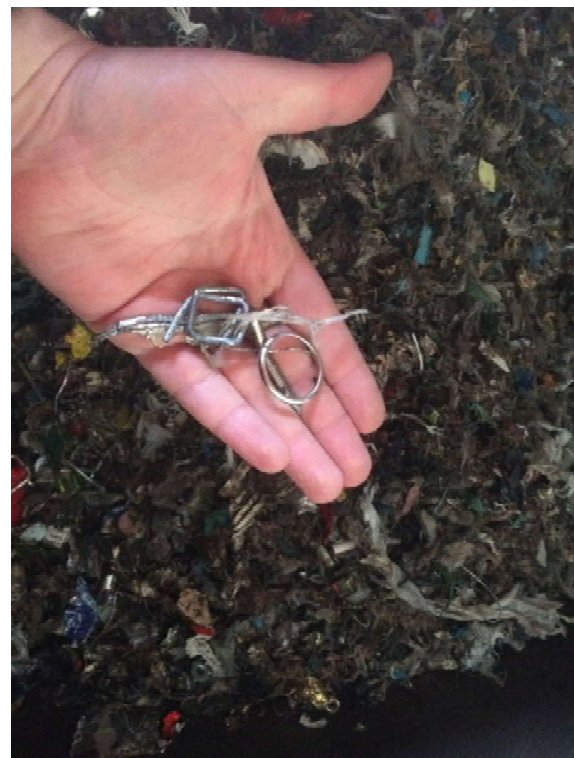
Dosing and Process Feeding

After possible impurities are removed from the main material stream, the fuel is collected within the intermediate hopper of the ODM-WeighTUBE® gravimetric dosing system. After the positive commissioning of one of the first ODM-WeighTUBE® dosing systems for the main burner feeding in the same plant, where it replaced a classical dosing belt weigh feeder, in 2010, the plant decides to utilise the same machine also for the calciner feeding. Due to the actual



(b)

Figure 5 - ODM-DiscSCREEN disc separator – (a): machine; (b): typical rejects



(a) (b)
Figure 6 - ODM-MAS magnetic separator – (a): machine; (b): typical rejects

design of the system based on a dosing screw, it can also be used for more coarse AF material without any limitations and the feeding capacity was defined in this case to be 12t/h in maximum. Di Matteo already realised capacities up to 30t/h and therefore the dosing system used in the Phoenix plant can be defined as a medium size dosing unit.

The award-winning design and the innovative ODM-GravitAS control system guarantee a very precise gravimetric dosing with a maximum deviation of +/- 1% from the massflow setpoint. More information about the ODM-WeighTUBE[®] dosing device can be found in [3] and [4].

The WeighTUBE[®] see Figure 7 consists of a tubular screw conveyor, which is continuously discharging material from an intermediate buffer. The material is conveyed to the tube section, which is placed on a set of load cells and decoupled from the main frame of the machine by flexible connections. Therefore it is possible to measure the actual material weight within the tube (tube weight) m_{tube} [kg]. Furthermore, the actual conveying speed of the screw v_{screw} [m/s] is continuously acquired. Both physical values are processed in order to calculate the actual mass flow M_{act} [kg/h]. By taken into consideration the desired mass flow (setpoint) it is possible to determine the actual deviation e [kg/h], which is fed to the continuous dosing controller (CDC), which calculates the necessary adaption of the screw speed in order to

minimize the deviation under all circumstances and at any given time. All software elements are implemented within the ODM-GravitAS control system, which was developed by DI MATTEO as a unified platform for



Figure 7- ODM-WeighTUBE[®] gravimetric dosing system incl. ODM-GravitAS control system

all weighing and dosing applications, as shown in the following figure.

Furthermore, the ODM-GravitAS control system implements an automatic calibration routine, which provides the possibility to estimate properties of the dosed bulk material and automatically adapt the controller parameters in such a way that the dosing

accuracy remains stable over time. The actual process operation is not influenced by the execution of the automatic calibration routine, so that the available machine time can be increased.

During the automatic calibration routine the intermediate buffer hopper of the ODM-WeighTUBE is filled to a certain maximum in a first stage of operation. Within the second phase the buffer hopper is emptied by normal dosing operation (and parallel stopped feed of material to the buffer) up to a predefined minimum buffer weight. From the resulting difference in mass (Δm) and the corresponding expired time (Δt), the actual control parameters of the continuous dosing controller are automatically adapted. To avoid possible undesired influences, all controller parameters are checked for plausibility based on a probabilistic analysis of former calibration cycles, before they become active in the system. The whole control algorithm is visualised in **Figure 8**.

In the past, the ODM-WeighTUBE® was compared against the performance of classical belt weigh feeders and it was found that the dosing precision was much better and the overall stability of the system could be increased. So if it is again considered, that important properties of the AF material varies, the high accuracy of the dosing with the ODM-WeighTUBE® (max. deviation +/- 1%) leads to a much more stable

process behaviour. The following figure shows a comparison between the typical massflows (left hand side) of a classical belt weight feeder and an ODM-WeighTUBE® for a biomass AF feed. As it can be seen, the fluctuations within the massflows are much higher for the classical dosing belt, while the ODM-WeighTUBE® massflow shows a higher stability and less deviation. As a consequence the actual feed of thermal energy per time unit (right hand side) is also much more stable for the ODM-WeighTUBE® in direct comparison to the belt weigh feeder. Therefore, the process control becomes much easier and even if there is a high variation within the energetic content of the material, the accurate gravimetric dosing is very important in order to guarantee a full control of the associated combustion parameters.

The material is afterwards pneumatically conveyed to the calciner, where the transition to the pneumatic feeding line is realised by the famous ODM-IZS® rotary injector, as shown in **Figure 9**. It shall be mentioned, that typical blow-through rotary vane gates, which are normally employed for adding solids into a conveyed air stream, have a significant air leak rate thanks to the air overpressure within the lower section of the rotary valve gates. As the secondary fuel, with a bulk density of 0.1 to 0.3 t/m³, is very light, a clogging of material within the feeding chute can be the result of this vagabonding air, leading to a pulsating

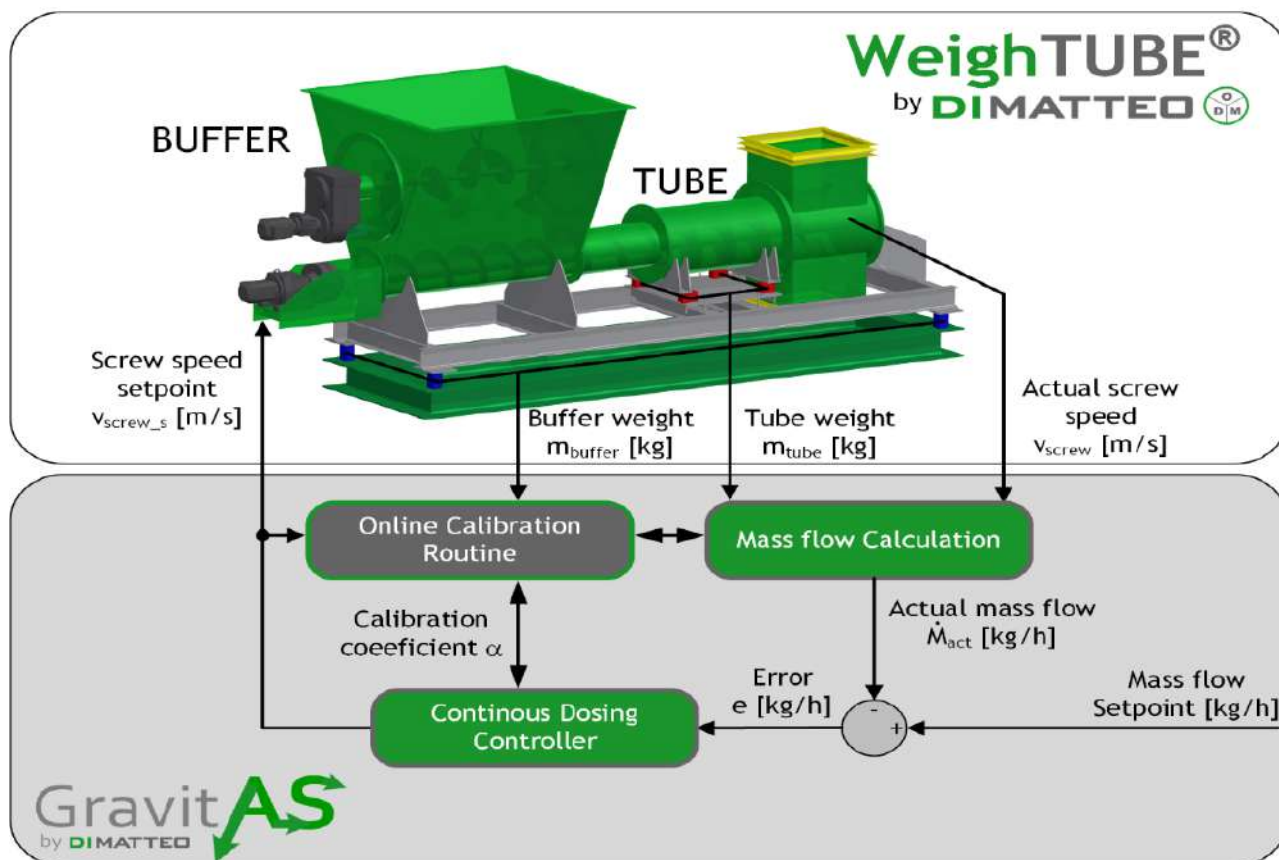


Figure 8 - ODM-IZS® rotary injector for pneumatic feeding

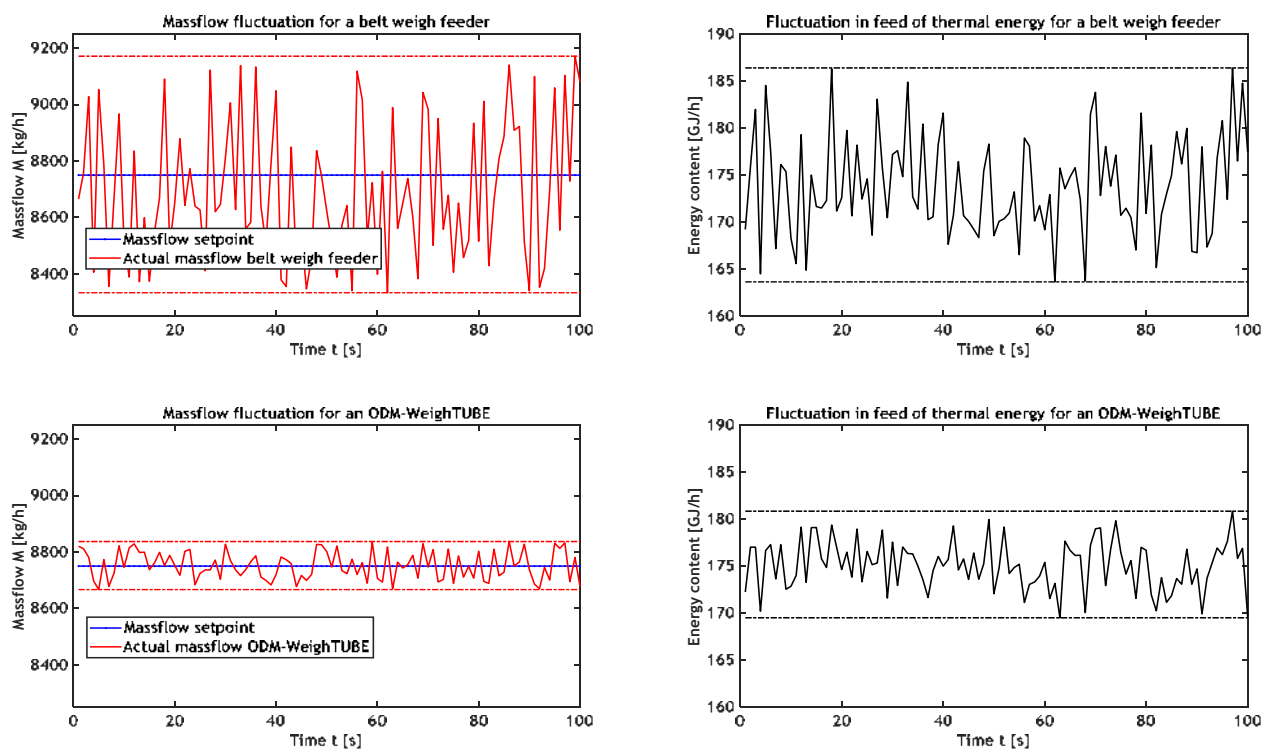


Figure 9 - Comparison between a classic belt weight feeder (top) and an ODM-WeighTUBE for the massflow deviation (left) and the associated fluctuations within the feed if thermal energy (right)

or total interruption of the metered fuel stream. In the specifically designed ODM-IZS[®] from DI Matteo a special injector jet (ODM-VarioJET) is fitted at the inlet of the conveyed air stream into the blow-through rotary vane gate (see also [5]).

This can be used to adjust the air stream during operation in a way to reduce the static pressure within the blow-through chamber significantly and therefore compensate for possible air leakages. The following figure shows the installed machine within the installation at the Phoenix cement plant.

Conclusion

The new installation at the Phoenix Zementwerke Krogbeumker GmbH & Co.KG was successfully commissioned in 2019 and is in operation since then, serving the combustion process with AF and achieving the required process performance and contributing to the overall ambitious AF strategy of the Phoenix cement plant.

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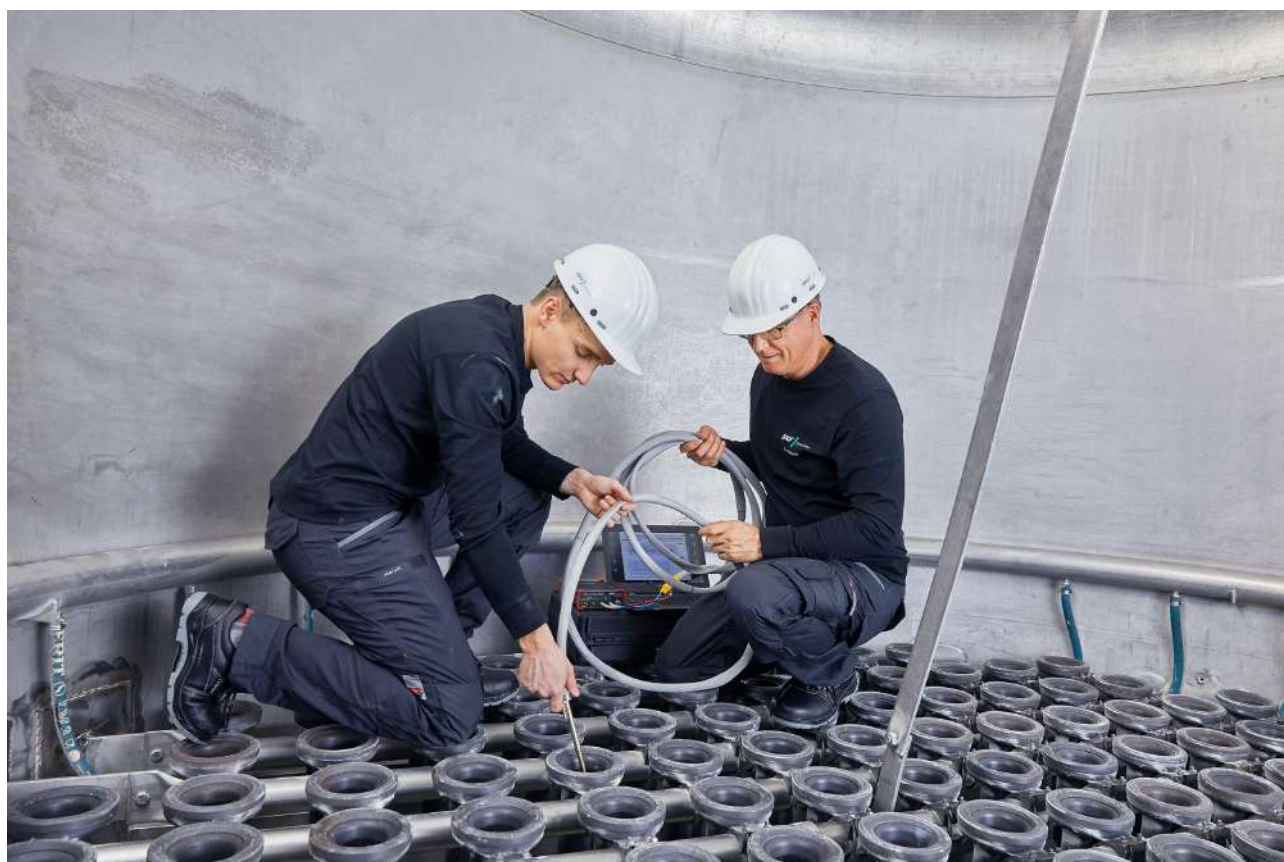
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Energetic optimization of pulse jet cleaned filter systems

By: Ernst Rohner, Director Global Process & Application Technology, BWF Envirotec

In cement production, in most cases, pulse jet cleaned filter systems with textile filter elements serve to dedust product and exhaust gas flows. In recent years, these filter systems have largely displaced less effective processes, such as cyclones or electrostatic precipitators, and dominate the market. Equipped with filter bags, made of high-quality polymer or glass fibers, pulse jet cleaned filter systems master almost every challenge when it comes to the effective dedusting of exhaust gas flows.

The following article deals with the possibilities of analyzing and increasing the performance of these filter systems. For this purpose, a suitable measuring method is presented, possible measuring tasks are defined, and possible solutions are discussed on a bag filter system that operates.

The variety of bag filter systems operating on the market is enormous, but their tasks can be summarized in a few recurring parameters. Compliance with current legislation regarding gaseous and dust emissions that may be released into the environment is imperative. Business management aspects and current climate policy require the lowest possible use of energy. In-house operational limits, such as fan power, only allow one mode of operation within those. A long service life of the filter bags and a low maintenance effort are also desirable to reduce the maintenance costs.

However, the parameters just listed are related and interact with each other. If, for example, the filter elements are frequently cleaned, the differential pressure and the energy costs decrease directly, but at the same time the emission of dust-like particles increases, and the service life of the filter bags decreases.

Measuring probe system according to the Prandtl tube principle

In order to find the optimal operating point of an existing filter system, numerous time-consuming test series are

therefore common, which can also disrupt the regular production process. The goal is an independent measurement method, which does not interfere with the control system, but nevertheless illustrates and documents changes in the behavior of the filter system quantitatively and in real time.



Figure 1: Measuring probe

For this purpose, BWF Envirotec developed measuring probes based on the principle of the Prandtl tube (Figure 1). The measuring probe is positioned at any height in the filter bag to be analyzed. When the fan is in operation, the exhaust gas flows through the filter bag from the outside in and rises upwards towards the clean gas chamber. The probe positioned in the bag center is flowed around. The probe tip has a hole that receives the so-called "stagnation pressure". The exhaust gas flows past further lateral bores without stagnation. Therefore, there is only static pressure here. The Bernoulli equation defines the relationship between the two measured pressures:

$$p \text{ (stagnation)} = p \text{ (static)} + p \text{ (dynamic)}.$$

If the exhaust gas density is known, the flow velocity v in the filter bag can be calculated directly from the dynamic pressure:

$$p \text{ (dynamic)} = \frac{1}{2} * \rho * v^2 \quad \text{and} \quad v = \sqrt{(2 * p \text{ (dynamic)} / \rho)}$$

Static and dynamic pressure and the flow velocity calculated from this serve as a guide for possible optimization tasks.

Determination of the measured values on the filter bag

The measuring process works independently. All that is required is a 230-volt connection and a cable passage from the clean gas chamber to the environment. The measuring probes are heat-resistant and can therefore be used up to temperatures of 220 ° C.

For the measurement, the corresponding chambers must be opened, the blow tubes temporarily removed, and the probes positioned in the filter bags at the desired height. The blow tubes are then reassembled, and the chambers closed. The measurement is now ready. Simultaneous measurements with 4 probes within one chamber are possible. Depending on the scope of measurement, 2-3 days (plus arrival) are required. With the measurement method just described, the following parameters that are relevant for optimization can be determined quickly and without great effort:

- The pressure surge in the filter bags reached during cleaning, depending on the position along the blow tube
- Distribution of the maximum pressure surge over the height of a filter bag
- The amount of pressure surge in the filter bag depending on the tank pressure
- Influence of the valve opening time on the maximum pressure surge
- Influence of the cycle duration on the differential pressure
- Influence of the cleaning sequence on the differential pressure
- Influence of the blow hole on the pressure build-up in the filter bag
- Effect of blow tube nozzles and venturi on the pressure build-up
- Influence of different filter media on the differential pressure.

Only some of the many measurement tasks listed above can be discussed.

Case study from a cement plant

A common example is, that the operator of a cement plant complained of a high differential pressure or insufficient gas flow through the filter system because the fan power was reached. Both parties agreed on a measurement campaign to investigate the causes of this

BWF Envirotec installed 4 measuring probes on a blow tube that was initially selected as desired. Probes 1 and 2 were installed at different heights in the filter bag (FS17) at the end of the blow tube. The probes 3 and 4 were installed in the second filter bag as seen from the pressure tank.

Figure 2 shows the measured pressure build-up during pulse jet cleaning as a function of the measurement duration. Since the measurement is carried out during operation, a negative pressure of -1000 Pa is applied to both filter bags 2 and 17 on the clean gas side compared to the raw gas side.

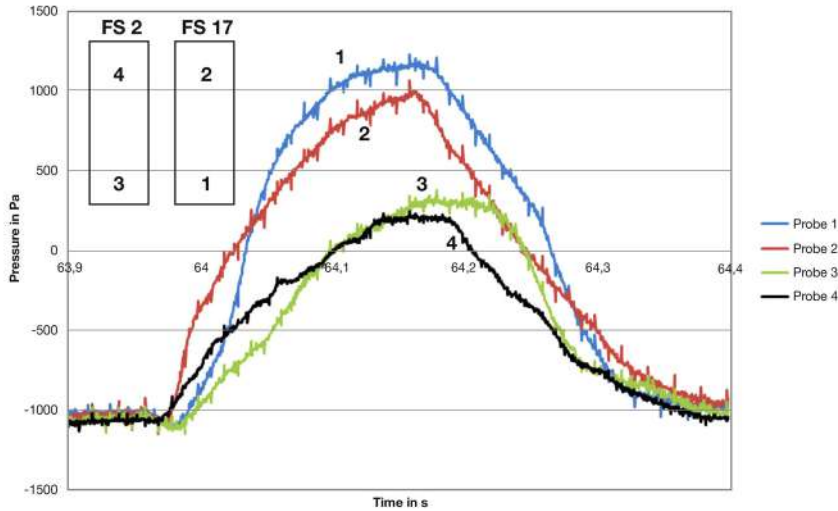


Fig.2: Pressure build-up during cleaning of filter bags 2 and 17

As can be clearly seen, the pressure build-up within a filter bag hardly differs. The probe at the top indicates the start of pressure build-up earlier than the bottom one, as the cleaning air takes a few milliseconds to flow down. In the maximum pressure level, probes 1 and 2 (or 3 and 4) differ only slightly. This means that the pressure build-up takes place relatively evenly along the height within a filter bag.

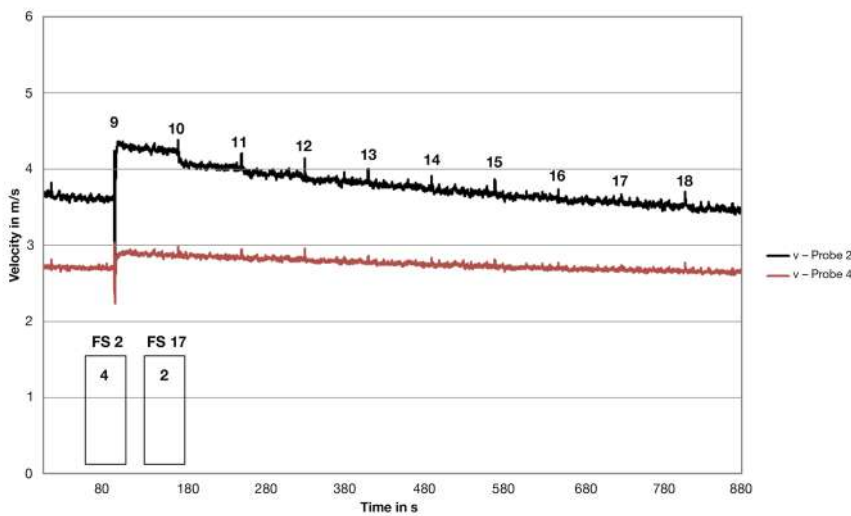


Fig.3: Flow velocity in filter bags 2 and 17 during two cleaning pulses

As soon as the valve of the pressure tank opens, compressed air flows through the blow pipe into the filter bags underneath. This fills the filter bag, compensates for the negative pressure, and builds up positive pressure inside the filter bag. Only then will the filter bag inflate and can throw off the dust cake that has been filtered on. If the pressure build-up is insufficient, the filter cake is not cleaned off and the filter bag offers the same resistance to the gas stream flowing through as before the cleaning.

However, there are clear differences in the position of the filter bag in relation to the blow tube. The filter bag 17 installed at the end of the blow tube reaches a maximum overpressure of 1000 Pa compared to the raw gas side. Experience has shown that this is usually sufficient for an effective cleaning of the filtered filter cake. This does not seem to be the case with filter bag 2. The zero line is just crossed, so insufficient cleaning can be assumed. Examination of further blow tubes and filter bag positions proved that all filter bags in the front positions suffered from the same symptom.

Figure 3 impressively illustrates the possible effects of pulse jet cleaning. After filter bag 17 (black line) has been cleaned, the resistance to the gas flowing through decreases because the dust cake has been removed. This is expressed by a spontaneous increase in the flow velocity in the filter bag from approx. 3.6 m / s to approx. 4.3 m / s in direction to the clean gas chamber. This confirms the effective cleaning of filter bag 17, which is already assumed due to the high pressure build-up described before.

Filter bag 2 (red line) shows only a slight increase in flow velocity, which confirms the suspicion that the filter bag is not cleaned properly. The overall significantly lower flow velocity let assume that the filter bags positioned at the front contribute to the filtration process to a far lesser extent.

Further detailed analysis of the flow velocity in filter bag 17 (black line) shows a further abnormality. As already mentioned, immediately after cleaning (with a time axis of 80 seconds) the flow velocity suddenly increased to approx. 4.3 m / sec, followed by a continuous decrease (caused by the increase in filter cake) until time axis 180 sec an unexpected abrupt decrease of approx. 0.2 m / sec occurs. This takes place at the same time as the cleaning of the adjacent blow tube 10, so that it can be assumed that cleaned-off dust is re-entrained to the previously pulsed bag row 9. Experience shows that the finer and more free-flowing the filter dust, the more this occurs.

When cleaning more distant blow tubes, the effect of the re-entrainment subsides and is no longer noticeable four rows further (time axis approx. 400 sec).

Without re-entrainment effects, the flow rate in filter bag 17 would decrease significantly more slowly. This would keep the higher gas throughput much longer and would lead to a slower dp increase.

This can be achieved by changing the cleaning sequence from successive (row by row) to staggered (skipping 3 rows).

Minor design changes to the blowpipe and an adapted cleaning sequence could reduce the differential pressure or increase the gas throughput through this filter system.

The final example is the optimization of the total costs of a filter system based on the cleaning cycle time. BWF Envirotec defines cleaning cycle time as the time until one and the same bag row is cleaned again.

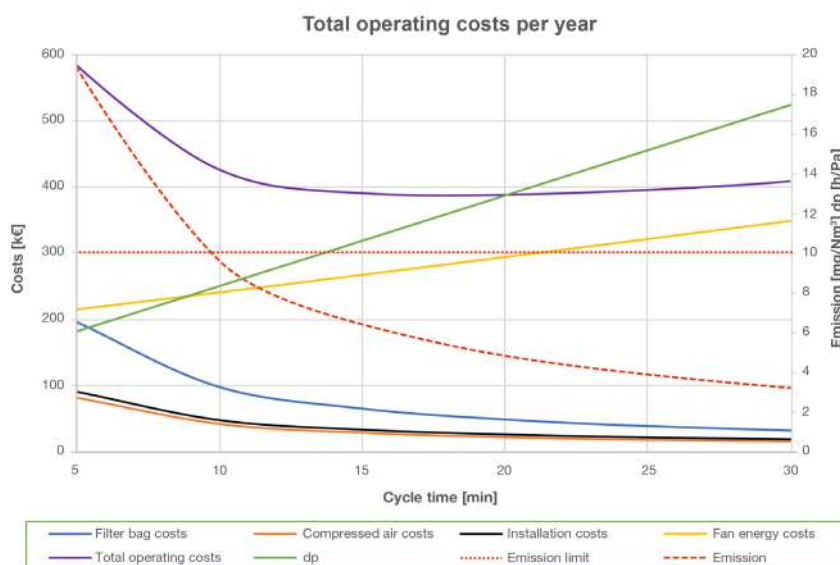


Figure 4: Total operating costs per year

Figure 4 displays the individual and total costs depending on the selected cycle duration on the left axis. The right axis shows emission and differential pressure, which could possibly have a limiting influence on the choice of the optimal cycle duration.

A shortening of the cycle duration, i.e. frequent cleaning of a filter bag affects the differential pressure in a positive way, this and with it the energy costs of the fan decrease accordingly. A drastic increase in dust emissions caused by the numerous emission peaks that

occur with every pulse jet cleaning speaks against this mode of operation. In this example, the statutory regulation of 10 mg/Nm³ dust emission is exceeded for a cycle duration of less than 10 minutes, so that an operational limit is reached here.

An increase in the cycle duration, on the other hand, has a positive effect due to a sharp decrease in dust emissions, which is preferable for reasons of environmental protection. At the same time, the cost of compressed air is reduced because cleaning is less frequent.

Filter bag procurement and assembly costs are also lowered with a longer cycle time, since fewer pulses cause less mechanical wear and aging on the installed filter bags and these have a longer service life.

This contrasts with the increasing energy costs for the fan and reaching the performance limit. In the example shown, the lowest total costs would occur with a cycle time of approx. 20 minutes, a differential pressure of 1300-1400 Pa and a dust emission of approx. 5 mg / Nm³. If, on the other hand, the fan's performance limit had been reached at 1200 Pa, the cycle time would have to be set to 15 minutes instead.

In this or a similar way, BWF Envirotec can individually optimize an existing filter system for its most economic, but also feasible manipulated variables and at the same time achieve the lowest possible total costs.

Summary

Existing filter systems often do not work in their energetic optimum. This increases the overall costs and harms the environment. The BWF Envirotec service team offers a solution in the form of filter system optimization with specially developed measuring probes. These can be used in practically every pulse jet cleaned filter system with vertically installed filter bags. The measurement does not interfere with the control of the filter system but does provide meaningful data in real time. The optimal operating point and the lowest total costs can be determined immediately from the received data. With large filter systems, such as a cement kiln filter, the costs of the measurement campaign are amortized within a few weeks. A measurement campaign can ideally be carried out as part of other services provided by the BWF Envirotec service team, such as filter bag assembly, filter house maintenance and leakage tests.

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Renewable energy, water solutions and the building materials industry

By: Hamdy Hafez, ACCA®, MBA, Dip., Financial & Reporting Manager, HeidelbergCement

Introduction

Is it time to overweight the renewable energy in building materials industry? What is the relationship between the building materials producers, the renewable energy installations, and the water solutions providers? Will the global decarbonization regulations pushing to move toward greener power? If so, is it cost effective option worth the transition efforts? And what's the best source of finance? To answer these questions and more, we need to get closer to these mentioned industries, to understand the relationship between them. Again, let's meet the family members.

Top largest building material producers:

China is the world's leading country in building materials production (especially cement industry). The world's largest cement producers are CNBM China National Building Material Co. also, Anhui Conch from China. Another 3 largest cement global producers are LafargeHolcim (Switzerland), are HeidelbergCement (Germany), and CEMEX (Mexico). And for other building material producers Saint Gobain (France), Knauf Gips KG (Germany), ArcelorMittal (Luxembourg).

Top largest renewable energy

China also, is the world's leading country in electricity production from renewable energy sources. Another leading producing country are USA, Germany, Spain & Russia. The global largest producers are; Iberdrola (Spain) is the Europe's biggest producer of wind power, and the 2nd wind power asset owners in the globe (Chinese is the top asset owner). Vestas Wind Systems (Denmark), the global leading designing, manufacture, install, and service wind turbines across the globe. Siemens Gamesa Renewable Energy (Spain) the 2nd global leading provider of the world's best offshore and onshore wind turbines and services.

Regarding the largest solar parks; Bhadla Solar Park is the largest solar park in 2020 (India - capacity of 2,245 MW). Benban Solar Park is one of largest solar power plant in the world (Egypt – 1,650 MW). Tengger Desert Solar Park, (China – 1,547MW), Sweihan Photovoltaic Independent Power Project, (UAE – 1,177MW). ENGIE (Renewables & Environment - France) is a global benchmark group in low carbon

energy and services. By the way, ENGIE will supplying CEMEX with 100% renewable electricity.

Renewable energy & building materials – best practice experiences

Building materials industry in general is the largest energy consumer. Cement is the third-largest energy consumer in the industry sector and second-largest share of CO₂ emissions. Italcementi was a pioneer & leader in using the renewable energy in the building materials industry. And in 2001 was the establishment of Italgas S.p.A., Italcementi's spinoff for energy activities. on July 2013 Mr. Nabil Francis (CEO of Zuari Cement – Italcementi) inaugurated its solar power project, a bold initiative towards energy sustainability in line with the Italcementi Group energy policy.

On July 2012 Aditya Birla Group has installed a 100.3-kW solar power system at its Rajashree cement plant (India), and on July 2019 Aditya Birla Renewables (part of the diversified business) announced to complete 75 Mw solar plants in Odisha by June 2020. HeidelbergCement AG also built a CSP solar plant in Morocco in 3 phases began in 2013 and reached completion in 2016. Another Indian cement company that installed solar power was Ultratech cement and Emami cement. Also, there're companies have taken serious steps toward greener power, for instance (based on RE resources);

Solar power energy

According to the World Energy Outlook 2020, published by the International Energy Agency's IEA's "Solar becomes the new king of electricity". Solar still the lowest cost and most efficient source for power generation (as RE source) in the building material industry. Here-below some promising experiences;

- Orient Cement that entered into a shareholder's agreement with AMPSolar Systems and AMPTechnology to establishing a 13.5MW solar power plant in Maharashtra, where Orient Cement operates an integrated cement plant.
- Cementos Cosmos that partnered with France-based EDF energy to establish a 6.2MW solar power plant (will provide 15% of the electrical

- power requirements at the cement plant).
- HeidelbergCement deployed a 739-kW floating array on a quarry lake (Bavaria region - 700,000 kWh per year) the solar power plant installs by Isigener (Spanish company)
- LafargeHolcim opened a 10MW solar power plant at its Hagerstown, Maryland cement plant in partnership with Greenbacker Renewable Energy Company.

Arabian Cement Co. (Egypt) installs a solar photovoltaic system for its cement plant by SolarisEgypt.

Wind power

- Mombasa Cement (Kenya) that completed construction of a 36MW wind farm consisting of 12 3MW turbines in Vipingo
- Lafarge-Holcim (Argentina) YPF Luz to supply of wind power to Holcim cement plants (35% of the company's energy requirements) - 142GWh from a 30MW installed base.
- Lafarge-Holcim, GE Renewable Energy and COBOD, partner to co-develop wind turbines with optimized 3D printed concrete bases, reaching record heights up to 200 meters.
- Cemex to convert Gádor cement plant site for renewables, waste recycling and concrete and wind power generation. Also, ENGIE (France) has been providing electricity to over 150 CEMEX UK sites for over 10 years, also supplying gas to 33 of these sites. In December 2018, ENGIE & CMEX announcing that; all the electricity supplied to these sites will be from 100% renewable energy sources including wind energy.
- Saint-Gobain North America will receive renewable energy certificates (RECs) (VPPAs for 250 MW of wind power in Illinois, with Blooming Grove Wind Farm).

RE Alternative use

- Biomass-fired this power technology has been deployed in practice in the Ethiopian cement sector. A comprehensive guide was jointly developed by UNDP and UNEP Risoe Centre, the subject was "BIOMASS ENERGY FOR CEMENT PRODUCTION: OPPORTUNITIES IN ETHIOPIA". the guide link on the references at the end of this article.

- Waste Heat Recovery System WHRS Power generation from waste heat in cement plants is possible as well as reducing the amount of CO₂, all these can be by the application of WHRS. Also, can provide low-temperature heating or generate up to 30 % of overall plant electricity needs.

- Geothermal that considers the magic solution (On-site energy production). The Pacific Northwest National Laboratory has announced in May 2019 after test research that "A self-healing cement developed can outperform conventional concrete, offering a potentially pollution-preventing technology for the growing geothermal industry". The tests confirmed that the self-healing cement is a significant alternative to conventional cement because it is flexible and autonomously heals cracks. For further technical details, a specialized development report was produced by IFC, in cooperation with other institutions specialized in cement technology "IMPROVING THERMAL AND ELECTRIC ENERGY EFFICIENCY AT CEMENT PLANTS: INTERNATIONAL BEST PRACTICE". It's a very important report can be used as best practices.

- Hydropower: In June 2018, Cementos Bicentenario (BSA) has signed a deal with Engie (Renewables & Environment Co. France) to supply its grinding plant with renewable energy (solar and hydroelectric). The contract, equivalent to 35GWh.

- Steel producers can support indirectly the move to clean energy generation by offering high-performance steels, advanced metallic coatings, and structural solutions for PV and solar thermal installations (as done by ArcelorMittal in installing largest sunroof in Belgium by Eneco). Also, for the Wind power: most of wind turbines' components are made from steel, ArcelorMittal and global steel producers can supply of specialist steels to the wind energy industry.

Power generation and water solutions

Two important facts represent a critical challenge; Cement is the second largest consumable in the world behind water. And low carbon doesn't necessarily mean low water.

According to the IAE's "Some low-carbon technologies, such as wind and solar PV require very little water, others, such as biofuels, concentrating solar power (CSP), carbon capture, utilization and storage or nuclear power are relatively water-intensive."

Nowadays, the water solutions companies became a new market entrant of the renewable energy. They can offer new solutions that ensure providing the exact equipment & chemical solutions needed for power generation, also solutions help to master the water cycle, cooling systems & blowdown and make power generation more powerful (increase resource recovery and asset protection).

The major players in this market are (for example but not limited to); Xylem (US), Veolia (France), SUEZ (France), Ecolab (India), and Evoqua Water Technologies (US).

They can offer water management solutions for; Hydropower, District heating, Geothermal Power, Concentrated Solar Power, Coal fired & Gas fired Power. The following are example solutions;

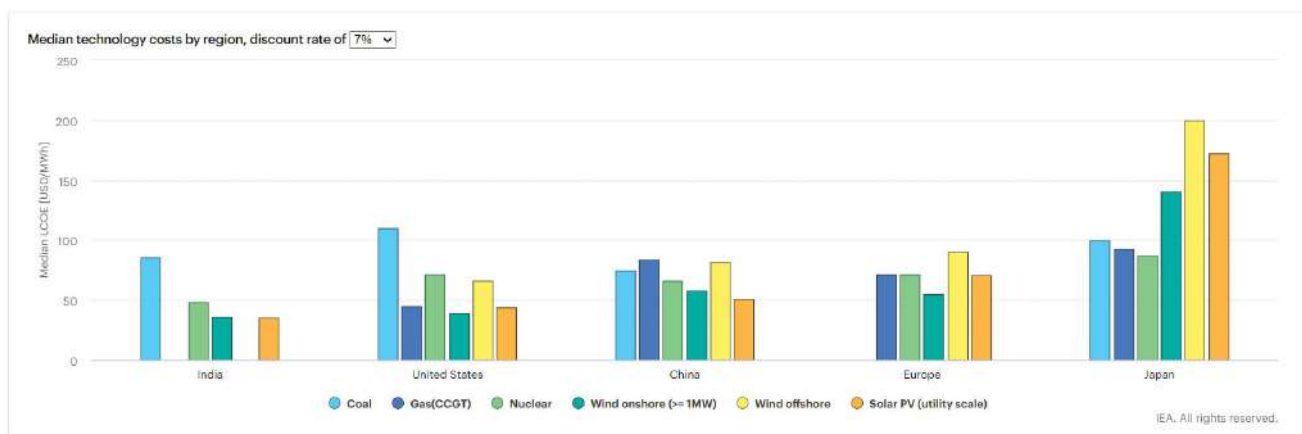
- Xylem (US) leads the way in the field of electrical and mechanical engineering with expertise in building control and monitoring systems for solar charged remote power units. Also, Generating green electricity through hydro power (Hydroelectric). Xylem's heat exchangers and pumps with variable speed controllers help operate the Geothermal systems. Also, another indicator proves the concerning about the RE market, Xylem have tried to hire professional senior-executives with previous experiences in the RE market. One of those executives was Mr. Frank Ackland

future generations.” Frederic Hisbergues (SUEZ Global Power Market Director).

- Ecolab (India) NALCO water (an Ecolab company) offers reliable solutions helping meet power generation objectives. One example is the Chemical Cleaning Program to increase Electric Power (generation per unit) in Geothermal Plants.
- Veolia Water Technologies (France) deploys solutions to make wastewater treatment a source of renewable energy, provide management of the entire water cycle from process water supply and distribution to wastewater treatment, supplying process water to boilers (with preheating possible). Further details will be in separate article soon ““ Water solutions & renewable energy””.

Is it cost effective option worth the transition efforts?

In general, after the transition to RE, there will be no increase in product cost above the current cost for cement. The renewables are having the lowest expected levelized generation costs, but to be more competitive, it needs to take into consideration the company region, technology used, also the national and local conditions. In addition, the share of a technology in the total production of an electricity system makes a difference to its value, load factor and average costs. (Projected Costs of Generating Electricity 2020 - report by IEA).



(Xylem MD - Middle East & Turkey) who was former managing director GE Energy, Alstom Grid and Eaton. So, he has a massive experience in the power & RE (that can support Xylem entering the RE market).

- SUEZ (France) proposes water and waste treatment solutions dedicated to electricity producers. One of the company visions is “We work alongside our customers daily to meet the growing energy demands of the present, without compromising

Also, to answer this question I’ll try to briefly mention some important points;

- The best RE resource: The solar power is the lowest cost comparing to the other RE sources, and the most suitable source for the building material industry is CSP-Concentrated Solar (Solar Thermal) and/or Power Solar PV.
- Carbon pricing: Day by day mounting carbon taxes, force cement plants to find cheapest solution to

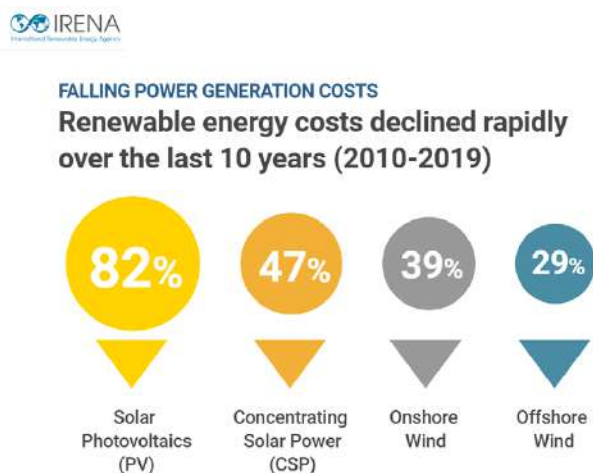
deal with their CO₂ emissions. The reduction of carbon emissions CO₂ will have financial effects of a cap and tax system. Day by day there's need for fair carbon pricing, especially after the removal of subsidies combined with an initially low but rising carbon pricing. As explained by Nachtigall (OECD Environment Working Papers No. 147 - year 2019) "A first step to introducing carbon pricing is to reduce energy subsidies over time".

- Waste management, and decommissioning costs: The old wind turbine blades can be used in cement production, by adding wind turbine blades (made of fiberglass) to replace raw materials for cement manufacturing (reducing the amount of coal, sand and minerals). A best practice of this use was announced in a deal agreement that was signed by GE Renewable Energy and Veolia North America (VNA).
- Energy mix efficiency: Transition to an energy mix dominated by low-carbon is more efficient and less polluting than coal or fossil. This efficiency will support extra savings on the energy bills. recent publication by IRENA International Renewable Energy Agency on June 2020, confirm that "" Replacing the costliest coal capacity with renewables would also reduce annual carbon dioxide (CO₂) emissions by around 1.8 gigatonnes, or 5% of last year's global total. By 2021, up to 1 200 gigawatts of existing coal-fired capacity would cost more to operate than new utility-scale solar PV would cost to install.
- Waste Heat Recovery (WHR) can reduce the operating costs and improve EBITDA margins of cement factories by about 10 to 15 percent (research by IFC & Institute for industrial productively).
- Overload / Underload conditions as a result of the unstable weather (blazing/peak sun, stormy winds), may lead to additional system costs, but this can be solved if managed effectively (contract conditions with the solar or wind developer).
- Sunk cost: The relation between a high/medium levelized cost and marginal cost and their final effect of total cost, also should be.
- The transition stage: if the transition to renewable energy itself been managed effectively, no doubt the RE will be also an effective cost option, as it'll help cutting the amount of fossil fuels used in the building materials production (cut the expensive fuel bill), that can potentially reduce the cost of CO₂ capture and utilization. Finally, you should select the best source of finance (reducing finance

cost), and contracting with trusted experienced RE companies, that can lead the transition process effectively.

- Cost management approach We should consider managing the cost not just reducing it, for instance installation costs cannot be managed in isolation of the other factors (Thermal Energy Efficiency, Changing the fuel mix, Electric Energy Efficiency, Clinker Substitution, Alternative Raw Materials) finally the application of combined RE Renewable Energy cycle (use more than RE resources).

All above-mentioned & more could make Renewables a Cost-effective Investment. Also, a recent publication by IRENA International Renewable Energy Agency on June 2020, confirm that "" Continuing cost declines confirm the need for renewable power as a low-cost climate and decarbonisation solution, aligning short-term economic needs with medium- and long-term sustainable development goals." The chart below shows the falling power generation costs, especially solar and wind power technologies.



Financing the transition to greener power

Renewable energy can be financed using a variety of financial instruments, that can be funding by public and/or private investment. The transition can be financed by different financial entities based on their size and level of risk;

- Sources of finance (conventional) can be private sources (Conventional debt and/or equity finance), also can be public finance (Grants, concessional finance, tax-exempt debt finance, commercial or soft loans, etc.)
- Islamic finance could limit the extent of leverage associated with financing, the Green Sukuk (Islamic bonds) consider the best instrument (among others) to provide funding for renewable energy and environmental projects. The building materials

companies can issue Islamic sukuk to finance the transition to RE, also the RE installations itself can issue Sukuk (for instance; Tadau Energy that sold the world's very first green sukuk in July 2017). one of Islamic finance major player is ISDB The Islamic Development Bank, that support providing finance for the energy sector (as said by ISDB president Dr Bandar Hajjar: IsDB Group is Highly Interested in Clean energy).

- EBRD European Bank for Reconstruction and Development is one of the main finance solutions, that can support the uptake of renewable energy projects and helps to reduce carbon emissions (practical experience was in the Egyptian cement industry). One of EBRD areas of activity is making energy efficiency investments in energy-intensive industrial processes such as steel manufacturing, aluminum smelting, cement and glass production. for instance; one of EBRD Green Transition Portfolio was, the first alternative fuel project in the cement industry in Egypt, also the construction of the first large-scale windfarm in Kazakhstan. Also, EBRD has signed almost €36 billion in green investments (over 2,000 green projects).
- IFC, a member of the World Bank Group is partnering with cement companies to support financing the cement industry's decarbonization, it has invested more than \$3 billion in cement projects over the last 15 years across more than 25 countries (It extended a loan of \$120 million in 2016 to Mexico's CEMEX). IFC also uses innovative tools such as green bonds, green loans and blended finance to marshal decarbonization investments. IFC is also a leading mobilizer of third-party resources for its projects.
- APICORP is a multinational development financial institution, that can help provide nuanced and efficient financing options to the Arab energy industry. Also, APICORP can invest directly in the cement & building material industry (for instance; in Dec 2016 APICORP has acquired a 30 percent stake in Bahrain's Falcon Cement Company (FCC), the Gulf state's largest cement maker)

Other major finance actors for the RE are (but not limited to); World Bank, Asian Development Bank, HSBC, EIB and Japan Bank for Int'l Cooperation (further details will be in separate article – Best source of financing the transition to greener power).

Global committed companies to net zero emissions – initiators

The global decarbonization regulations committing the

building materials industry (in particular) to achieve net zero emissions no later than 2050. One of these regulations are the program publications by the (IIGCC) in participant with the Climate Action 100+. For instance, recent press release by IIGCC has recognized the steps HeidelbergCement (in particular) has taken in already having commitment to meeting key aspects of the investor expectations outlined. Other committers are; CRH, Lafarge and Saint-Gobain who have been encouraged to follow suit, given the significant role they play as European-based multinationals, with investors making clear the need for the companies to set net zero emission targets, as HeidelbergCement already has.

Here-below are quoted common visions & strategy adopted by these companies, which prove their commitment to zero carbon & to greener power policy.

HeidelbergCement AG

“We are investing in improving the energy efficiency of our production facilities, using alternative raw materials and fuels, and replacing CO₂-intensive clinker in our cement with raw and waste materials that have a significantly-lower carbon footprint,” said by Chairman of the Managing Board, Dr Dominik von Achten.

Saint-Gobain

“We know how much decarbonization of the construction sector is key to curb the effects of climate change.....5 years after the Paris Agreement, it is clear that more still needs to be done, and much faster! The pace of progress in improving the energy efficiency of buildings is slowing down. Let's make sure we don't content ourselves with ambitions, but take action!” Pierre-André de Chalendar - Chairman & CEO, Saint-Gobain.

LafargeHolcim

Jan Jenisch, CEO: “I believe in building a world that works for people and the planet. That's why we are reinventing how the world builds today to make it greener with low-carbon and circular solutions.”

Conclusion

It's time for extreme collaboration, between all the building materials actors, the renewable energy installations, and the water solutions providers, across the entire value chain and across the government's aid, to support accelerating the transition towards green power & decarbonization. also, it's time to find the best source of financing this transition and to build an effective cost model to manage the transition.

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Lindner's Polaris 2800 Fuels One of Europe's Largest Cement Plants in Cyprus

The picturesque south coast of the holiday island of Cyprus in August 2020: 40 °C in the shade and COVID-19 – tourists who would otherwise be enjoying the sea breeze at the height of summer are conspicuously absent and the only full car park is that of the rental cars at the airport. But instead of letting pandemic lethargy set in, Enerco – Energy Recovery Ltd, associated company of Vassiliko Cement Works, commissioned a Lindner shredder from the Polaris series to shred high-calorific refuse derived fuels (RDF).



The treatment of local waste streams more than doubled with Lindner's Polaris 2800



Output: RDF with a particle size of approximately 50 mm to be used for energy recovery in the calciner

Vassiliko Cement Works is among the biggest industrial players in the island state and operates one of the largest and most advanced cement plants in Europe near Mari, between Limassol and Larnaca. To ensure the amount of energy needed to produce approximately 6,000 metric tons of clinker per day, the company relies on resource-saving alternative fuels from its associated company Enerco. 'We are delighted to report that since we commissioned Lindner's new Polaris 2800, it's been possible to increase our waste treatment capacity for the production of alternative fuels suitable for Vassiliko's calciner. We succeeded in more than doubling the quantities of local waste streams treated – without delay despite the ongoing difficulties,' George Amerikanos, General Manager at Enerco, is pleased to say.

The new shredder, complemented by associated Lindner system components, produces on-site fuel with a particle size of approximately 50 mm out of end-of-life tyres, mixed and bulky waste as well as waste wood. This waste is regionally collected.

After 950 operating hours, Amerikanos takes stock: 'We mostly process very tough materials. To do this, we need machines that can handle heavy loads and consistently deliver the required fuel quality long term. It's for this very reason that we found the Polaris, with its powerful drives and robust construction, so impressive. Now, after the first few months in operation, we see that the performance exceeded our expectations. The average throughput increased by an extra 30% to what we had asked for.'

Lindner, Spittal an der Drau/Austria (www.lindner.com): The Lindner family business has been offering innovative, tried-and-tested shredding solutions for decades. From planning, development, design and production to service, everything comes from a single source. At its production facilities in Spittal/Drau and Feistritz/Drau in Austria, Lindner manufactures machines and system components that are exported to almost one hundred countries. In addition to stationary and mobile shredders for waste processing, the portfolio also includes complete systems for plastics recycling, SRF and waste wood processing. The shredders can be used among other things for municipal solid waste, commercial and industrial waste, waste wood, plastics, packaging material, paper and light scrap.

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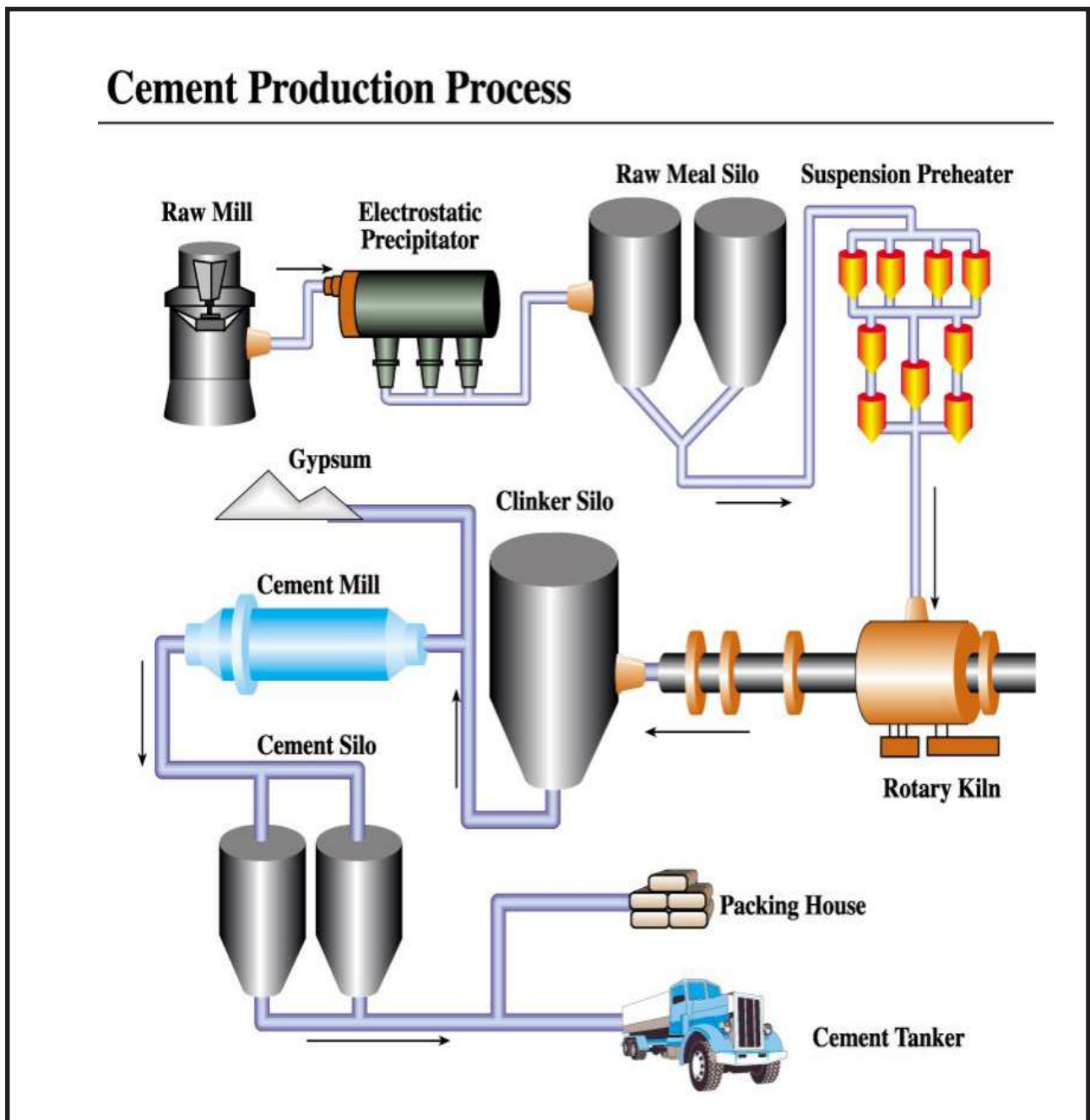
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Grinding Aids for Cement

By: Eng. Faiza Abou Zeid, General Manager
Aqua Trust for Water Treatment Co.



Cement Reaction with Water

- Portland cement when mixed with water undergoes the process of Setting & Hardening.
- The initial stiffening or setting of OPC pastes appears to be the result of the rapid hydration taking place on the surface of the cement particles.
- This rapid initial setting is controlled by the presence of calcium sulfate (Gypsum) and for this reason a small proportion of gypsum is interground with cement clinker to control the rate of initial setting.

The Cement Chemistry

- Cement is hydraulic material which develops strength when it reacts with water.
- It is inorganic material which consists of oxides of (Calcium , Silicon , Iron , Aluminum).
- Phases in Hydrated Cement:
- C_3S (Alite)
- C_2S (Belite)
- C_3A
- C_4AF
- Where
- (C:CaO) (S: SiO_2) (A: Al_2O_3) (F: Fe_2O_3)

Following are the principal reaction is the formation of single calcium silicate hydrate (C-S-H) from the various anhydrous calcium silicates present in the cement particles.

Cement Reaction with Water

- $C_3S + 3H \rightarrow C-S-H_2 + C-H$ Rigid Gel.
- $C_2S + 2H \rightarrow C-S-H + C-H$ Rigid Gel.
- C_3A, C_4AF have less hydraulic properties but useful for liquid formation in kiln.

Types of Cement

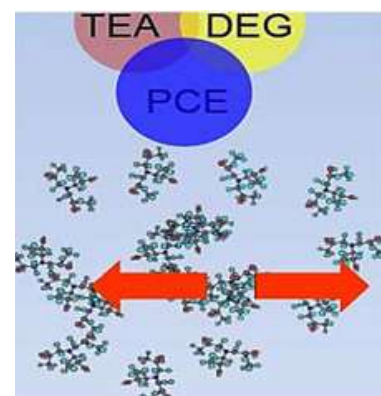
- OPC - Ordinary Portland cement
 - 95% Clinker + 5% Gypsum MPa = 10 Bar.
 - 32MPa, 42.5MPa, 52.5MPa.
 - 32.5 grade: develop strength up to 330kg/cm² after 28days.
- PPC (Pozzolana Portland Cement)
 - Pozzolana cement is produced from OPC + Silicious material.

What are Grinding Aids?

- Grinding mill grinds the hard clinker into fine cement powder.
- Additives used to improve the grinding efficiency of grinding mill, is called Grinding Aids.
- Improvement in grinding efficiency leads to reduction in electricity consumption.

Why Grinding Aids should be used?

- Grinding of clinker is affected by cleavage, micro cracks of the defects present in its crystal structure.
- Applied shear stress on clinker breaks the ionic bonds and highly reactive positive and negative charges are produced.
- High surface energy on clinker surface will take place.
- Formation of electrostatic charges on surface cause agglomeration of cement particles.
- Decrease in surface area and increase in electricity consumption.
- High surface energy causing "Pack set".
- Grinding Aids neutralize the electrostatic charges and inhibits the packset of cement.



Factors affecting ball mills Use of Grinding Aids:

- Amine, glycol & increasingly polycarboxylate polymer (PCE) based

grinding aids can improve grinding efficiency at low dosage rate of 0.02 -0.05% by neutralizing the electrical charges formed on the surfaces & cracks of particles to reduce agglomeration and coating formation on media & liners.

- At higher dosage (> 0.2% by weight), early strength may be affected.
- **Output may increase by 5 -10% for normal OPC, or more for finer cement.**

Commonly Used Chemicals for Grinding Aids

- Amine based Grinding Aids
 - o Monoethanolamine (MEA).
 - o Diethanolamine (DEA).
 - o Triethanolamine (TEA).
 - o Trisopropanolamine (TIPA).
- Alcohol based Grinding Aids
 - o Ethylene glycol (EG).
 - o Diethylene glycol (DEG).
- Ether based Grinding Aids
 - o Poly Carboxylate Ether (PCE).

Effect of Grinding Aids on Cement Composition

- Effect on C_3S , C_2S , C_3A & C_3A +gypsum.
- C_3A hydrates to hydrogarnet (C_3AH_6) before it transforms to ettringite in absence of TEA.
- TEA accelerates the hydration of CA.
- TEA accelerates the formation of ettringite and as it increase, conversion from ettringite to monosulphate is at fast rate.
- Extends the induction period of C_3S may be due to formation of surface complex on the hydrating C_3S .
- TEA also increases the induction period of C_2S like C_3S but the difference is the slow rate of reaction with C_2S .
- Peak due to the C_3S formation is extended with the addition of TEA which indicates the hydration of C_3S is retarded by TEA.
- So TEA accelerates the aluminate phase hydration and retards the hydration of silicate phase.

Effect of Grinding Aids on Mechanical Properties

GA affects the following mechanical properties of cement:

- Setting time.
- Surface area - Blaine
- Compressive strength.
- Mortar workability and fluidability.
- Prevent pack set and Lumps Formation.

Setting time

- It is not found out whether TEA is a retarder or an accelerator.
- TEA acts as retarder at low dosage (up to 0.05 %) but accelerates the hydration at higher dosage.
- High dosage TEA can be used as an accelerator in place of $CaCl_2$ to eliminate chloride attack.
- MEA and low dosage DEA does not cause much alteration in setting time.
- TIPA increases both initial and final setting time of cement due to its diffusion into pores and cracks of clinker particles.
- Grinding energy of the mill affects the performance of grinding aids.
- At higher grinding energy the effectiveness of grinding aids to increase surface area of cement.
- **Compressive Strength**
- TIPA increase 7 days and 28 days compressive strength of cement.
- Optimum dosage is 0.01-0.02 % for the enhancement of strength by TIPA.

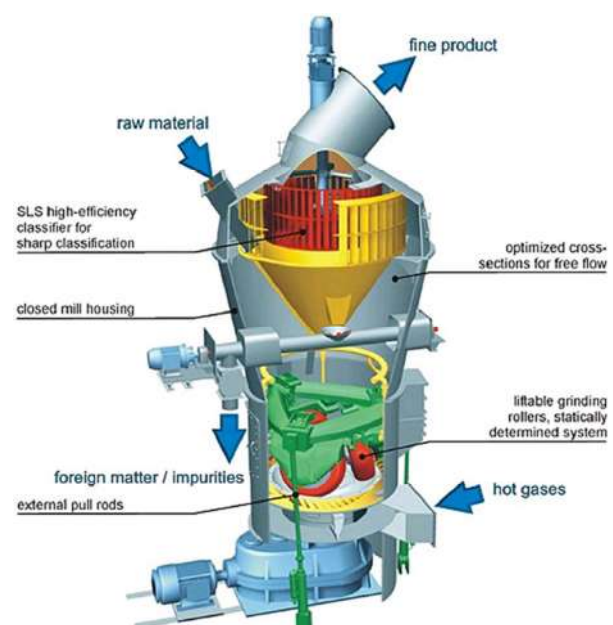
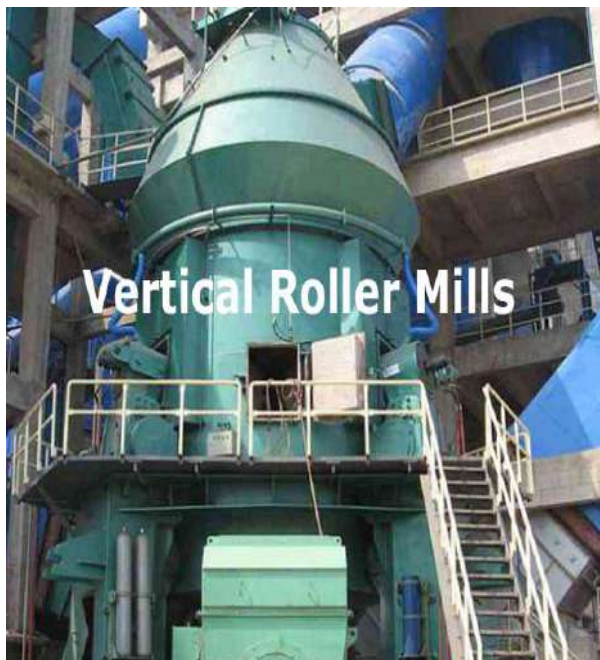
- If dosage > optimum dosage it can increase the strength further very little but it is not economical.
- Higher dosage of TIPA can cause air entrainment in cement. This air entrainment can be as high as 2% compared to the cement without any additives.
- Therefore TIPA is used with air entraining agent at higher dosage.

Explanations for the decrease in lateral strength due to TEA:

- Rapid early hydration may create a dense zone of hydration product around the grains and retard subsequent hydration. In the oxidizing and alkaline burning condition in the kilns, lead to Cr₆ formation by oxidation.
- Formation of hydration product with higher density may promote a more porous structure.
- Cement that has set in a few minutes has obviously not been thoroughly mixed, and consequently there will be a non-uniform distribution of hydration products with in the structure that will prevent the development of full strength.
- Rapid formation of ettringite may alter the initial matrix and disturb subsequent bonding characteristics.
- Combinations of grinding aids can be used to improve grinding aids of cement at all ages.
- When TIPA is added individually it does not make significant difference in strength at 28 days.
- 1 day strength of mixture of TEA and TIPA fall between neat TIPA and neat TEA.
- Combination of TIPA and TEA used in the proportion 3:1 or 1:3 respectively significantly increase the compressive strength at ranges.

Conclusion

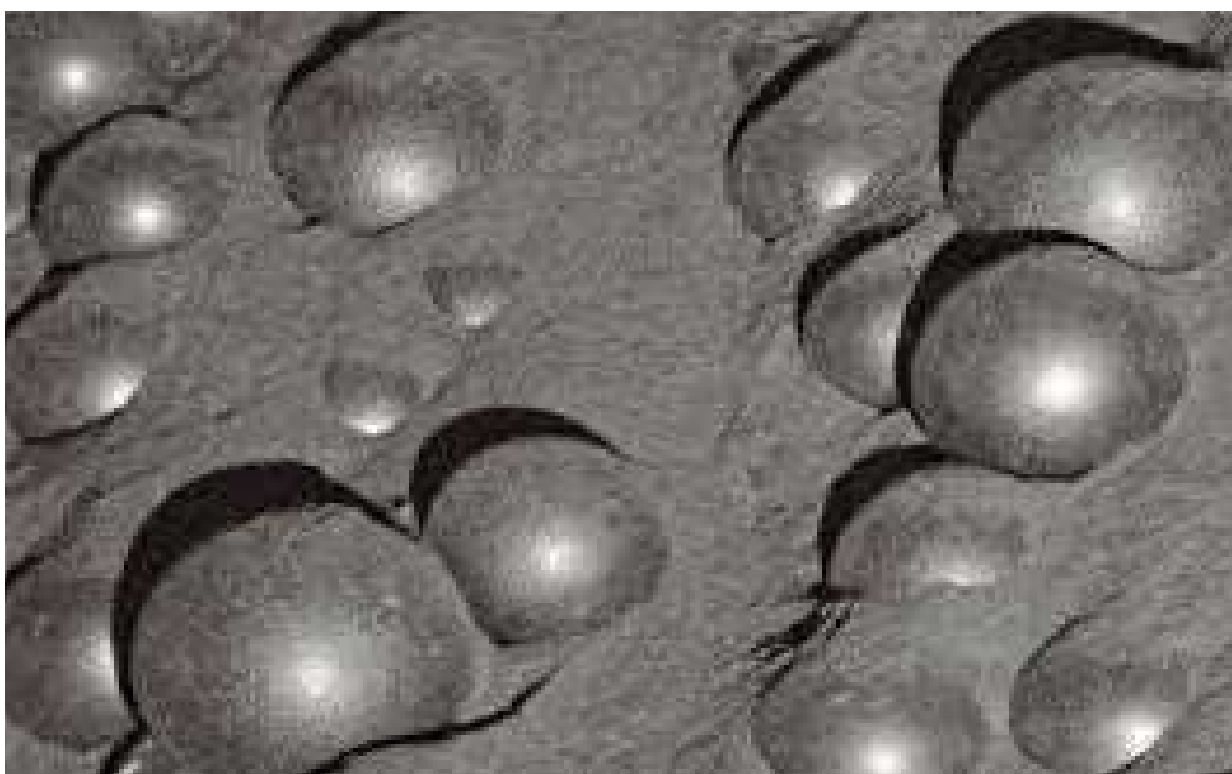
- Grinding aids are used to improve grinding efficiency of the clinker particles and to minimize the power consumption.
- Grinding aid also improve some physical and mechanical properties of cement, concrete.



Vertical roller mills for cement grinding use of grinding aids keep the rollers clean and increase mill production.



Ball mill grinding without grinding aids leading to coating on the balls and decreasing milling efficiency.



Ball mill cement grinding with grinding aids prevents ball coating.

AQUATRUST-CGA

Grinding Aid Actions

AQUA TRUST - CGA is aqueous organic compounds that mostly active in the mill through adsorption on the particle surfaces

It generates a very thin monomolecular film around the particles which soften some electrovalence bonds as well as neutralize electrostatic charges on the particle edges

Electrovalence's of its organic group component act on the calcium (Ca^{++}) and oxygen (O^-) bond. Ion formed by **AQUA TRUST - CGA**, ($\text{OH}-(\text{CH}_2)_n$) neutralize all electrostatic charges on the clinker and cement particles which eliminate coating and provide higher fluidity of the ground materials

Mechanism of agglomeration

Cement particles agglomerate between each other's due to static charges



Re-agglomeration continues



Re-agglomeration continues during grinding process



Grinding Aid

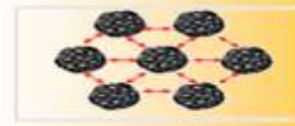
Re-agglomeration continues during grinding process



Re-agglomeration continues



AQUATRUST - CGA Neutralized particles reduce agglomeration between cement particles



Benefits

- Increased **Mill Output and** reduced **production cost** per unit of cement
- Improved cement **flowability** / Reduced **Pack Set**
- Improved Mill **Equipment Performance**
- Increase early and long-term compressive strengths of produced better quality cement.
- Reduced **agglomeration**.

Dosage:

0.05%-0.07% gram of AQUATRUST-CGA should be accurately proportioned through calibrated dosing system suitable for cement mill and output required, AQUATRUST - CGA must be added just ahead the grinding machine.

Field trial to estimate the exact dosing of AQUATRUST-CGA is recommended.

Packaging:

AQUATRUST-CGA is supplied in cubical container of 1000 Liter or 200Liter and 60 liter drums .



The drums and containers are returnable to AQUATRUST after using the

Handling and Storage:

Wear safety goggles and gloves.

Store in a shaded warehouse.

Shelf life minimum 12 months in tightly closed original containers.

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**WORLD
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Control emissions and keep efficient the upstream equipment? Save money and save time with CTP maintenance service

By Matteo Colombo

Baghouse is a critical equipment in a plant as it ensures both compliance with stricter and stricter emission regulations in terms of outlet dust and pollutants, and the maximum efficiency of your upstream equipment.

But what if your existing baghouse was designed 5 or more years ago, for a different emission regulations and most probably different plant production needs or utilized fuel? Or, how ensure that your existing APC system still operate within the threshold inlet parameters and it is not suffering of premature wear? How avoid to increase the total cost of ownership?

And what if, comparing to the first commissioning, the new and just replaced filter bags in your process baghouse and which consist in one of the most expensive recurring wear part, start lasting less and less time ...and how to identify the reason? New purchased material quality? Existing supporting metal cages conditions or wrong bag-to-cage fitment? Maybe a not correct/proper installation method? Different equipment inlet conditions taking bags to be just the victims? Wrong filter media selected for the application?

All what above will inevitably lead to following main conditions:

- higher maintenance manpower costs;
- higher spare parts costs;
- higher compressed air and energy consumption costs.

CTP Team, thanks to its leading position as OEM company for decades combined with its strongly service oriented setup, is able to carry out on any baghouse brand/design a comprehensive and deep technical analysis:

- **inlet parameters analysis: evaluate if inlet conditions of your equipment are still suitable for the adopted filter media / cleaning system / available cloth area;**

Every main process baghouse, to ensure a smooth and cost-effective operation, is designed to grant the right amount of cloth area (m²) comparing to the gas volume (Am³/h) it is supposed to handle together with the expected inlet gas chemical composition. The inlet flow-cloth area ratio is a key aspect

to ensure installed filter bags will not suffer of premature damages caused by surface abrasion, caused by higher gas velocity (air-to-cloth-ratio), turbulence inside the filter, increased pulse cleaning frequency/pressure with consequent mechanical stress.

The analysis of gas composition is essential to ensure the adopted filtering media is still suitable for the process. All above evaluations can be easily and quickly carried out by CTP Team experts.

- **analysis of the already installed materials: prevent any damage to the new replaced parts due to a poor quality or bad conditions of the existing ones;**

Sometime all the focus is paid on the new purchased parts. But a key role is played also by the existing components.

Filter cages in one good example. The cages quality, shape and design

- high-time-consumption for the procurement, technical and maintenance team;
- lot of different involved suppliers to be coordinated (e.g. bag manufacturers, cage manufacturers, external manpower, equipment OEM etc..)
- unplanned shutdowns;



Figure1: The “cleaning efficiency” is a key parameter strictly connected to the level of emissions requested by our client. This parameter optimizes the bags arrangement* together with the type of filter media and the choice between of high or low compressed air pressure for cleaning system

play a key role for the new filter bags which will be installed in. Number of vertical wires shall be correct depending on the process and kind of bags which they will have to host. A proper coating shall be ensured to avoid rust/oxidation events.

A poor supporting cage quality or design will lead to a poor filter bags operating performances and lifetime.

Same worth for cleaning valves. The efficiency of the cleaning system must be always ensured in order to avoid bags to be cleaned differently or not properly. A routine check to the membrane/piston valves shall be carried out and in case of any strange “noise” coming from the filter during the cleaning should be immediately investigated further.

- enhance your system performances: choose the best available CTP Team technologies (e.g. low-pressure sonic wave cleaning, online remote monitoring, increase filtration area)

Thanks to the constant work of CTP Team R&D combined with the years of experience of CTP Team



Figure 3: Enhance your APC performances using CTP online remote monitoring

in several applications, CTP Team can integrate its latest dedusting technologies and baghouse control system on any existing equipment restoring its performances , with minor changes and lowering the total cost of ownership (e.g. compressed air consumption, fan energy consumption, key components replacement frequency/lifetime etc.)

So, if instead of looking for the possible cause of your equipment failure you want to focus immediately in finding a solution, let CTP step in your plant and take care of your equipment with its highly skilled technical experts . You will get in one point contact the whole support you need to maintain your equipment and ensure it operational.

About CTP

CTP is an engineering and manufacturing Company with 50 years of experience in the fields of environmental systems and Heat recovery. Since 1970, CTP has designed and installed Air Pollution Control (APC) systems applying best available techniques to meet the strictest emission regulations. Through its own staff and organization, CTP can supply turnkey solutions complete of mechanical and electrical scope. In addition, APC systems are directly designed in the HQ in Italy and manufactured in our workshop by CTN group, our mother company. www.ctp.mi.it



Figure 2: CTP provides detailed inspections and tests on used bags to identify the causes of early-deterioration of the filter media

Dry Grinding by Recycling Dust and Improving the Environment

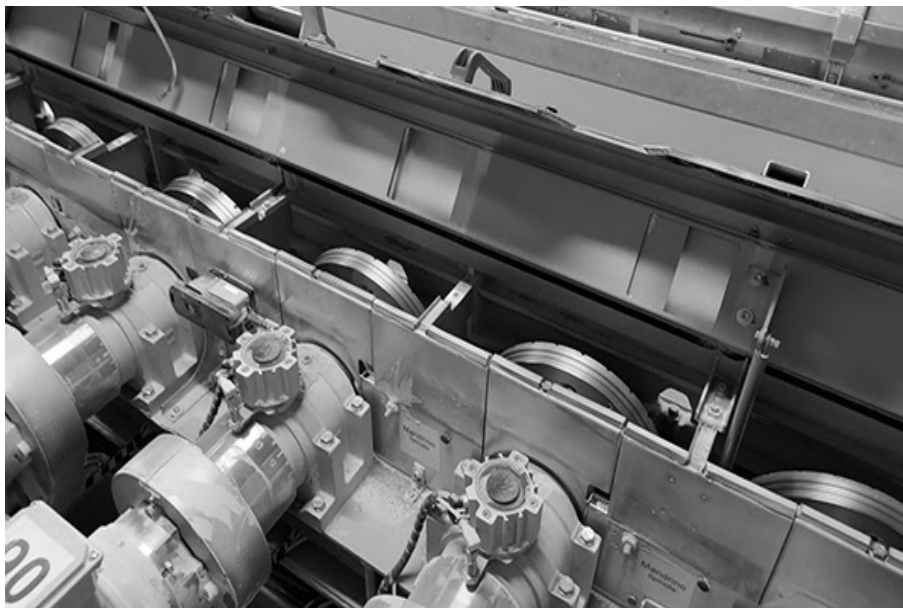


In a difficult historical period like the one we are living in, it becomes even more important to find optimal technical solutions in terms of cost savings and improvement of the surrounding environment.

Diatex has been developing a line of products for over 10 years, called ECO-Friendly, aimed at reducing heavy metal pollution.

An ECO-friendly product is made completely without cobalt, copper, nickel and molybdenum and designed with the aim of improving the work environment, without sacrificing its quality and productivity.

In addition to the “workplace quality” factor, DRY LINE wheels are already widely recognized by the major tile manufacturers in the world for being able to adapt to the needs of duration, quality and grinding speed during the dry process.



The ECO + DRY series guarantees the same working parameters as traditional DRY wheels with a further advantage for the ceramic industries that recover the powders from the grinding and / or cutting line as these powders are fully recyclable being free from metals such as cobalt and copper that create defects in the tiles.

Guarantees of the ECO + DRY line

- Excellent squaring quality
- Cost per square meter of the product same if not lower than the standard product (not eco friendly)
- Possibility of powders recycling
- Removal capacity up to 20 mm. each side
- Wheels MADE IN ITALY

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New cost-competitive, large-scale filter press can recycle up to 95% of water for mine sites

The new AFP2525 Automatic Filter Press from FLSmidth allows miners to recycle and reuse a significant amount of water in their operations. As a result, the high-efficiency, large-capacity, dewatering equipment both reduces the need for fresh water intake and cuts costs for the mine site.

Today's mines operate with many ecological and social responsibilities – to minimise water and energy consumption, protect the local environment, and keep surrounding communities safe. All of these efforts can create a huge economic impact, so cost-effective solutions are imperative.

To help miners achieve this, we have launched the AFP2525 Automatic Filter Press that delivers high availability and efficiency, with the lowest cost possible – in fact, the lowest cost per ton in its class. The AFP2525 is also durable and long-lasting due to a maintenance-friendly, robust design so it is built to last for the life of the mine and beyond.

“We are delighted to launch this large-scale, cost-competitive filter press to the mining industry. With a combination of fast and safe maintenance, lower costs and a minimised environmental footprint, the AFP2525 immediately becomes the leading solution in its area. It meets growing customer demand for fast and efficient water recovery and illustrates our determination to meet our MissionZero ambition and help mining move towards zero water waste by 2030,” comments Mikko Keto, Mining President at FLSmidth.

As ore grades decline, greater challenges are experienced with water management to keep up with desired production rates. This creates more water and tailings to manage. Some of the major environmental risks in mining are associated with tailings – high water use (in areas of water scarcity), contamination of ground water and tailings dam failures.

By employing a filter press to remove the water from tailings waste, the AFP eliminates the need for wet tailings dams, while the reuse of process water minimises environmental risks associated with mining, cuts complexity and helps miners attain a social license to operate.

Why does the AFP2525 provide a step change in this area? Firstly, the technology has been rethought so the filter is easy to maintain, which means costly downtime is minimised. Secondly, the filter is very efficient and operates at high capacity – i.e., it maximises water recovery and is suitable for large-scale mines. Additionally, fast filtration rates and short mechanical times minimise the filter cycle time; this combination of speed and reliability result in the lowest cost per ton in the industry. With the AFP2525 Automatic Filter Press, miners can expect an average of 93% availability and up to 95% recovery of process water.

The AFP2525 Automatic Filter Press is a key solution in FLSmidth's MissionZero ambition to enable mines to eliminate water waste and emissions by 2030.

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FLSmidth provides sustainable productivity to the global mining and cement industries. We deliver market-leading engineering, equipment and service solutions that enable our customers to improve performance, drive down costs and reduce environmental impact. Our operations span the globe and we are close to 10,700 employees, present in more than 60 countries. In 2020, FLSmidth generated revenue of DKK 16.4 billion. MissionZero is our sustainability ambition towards zero emissions in mining and cement by 2030.

www.flsmidth.com/MissionZero

Reproducible Analysis of Particle Shape and Size in less than 5 minutes

Amazingly good value particle analyser with software that's fun to use

The **FRITSCH ANALYSETTE 28** ImageSizer for dry and wet measurement is the ideal Particle Sizer for all applications that require accurate and reproducible measuring results for both particle shape and size.



ANALYSETTE 28 ImageSizer for dry measurement of powders and solids

The optical method of dynamic image analysis delivers results for particle sizes from 20 µm to 20 mm with a multitude of shape parameters and evaluation options.

Your advantage: excellent flexibility for different measurement tasks. Even agglomerating samples can be processed easily by using the optional wet dispersion unit.

The Top Advantages of the ANALYSETTE 28 ImageSizer

- Ideal for powders and bulk solids as well as for suspensions and emulsions
- Costs 50 % less than comparable competitor products for most applications
- State-of-the-art software that's fun to use – including single image analysis of individual particles upon a mouse click
- Fast evaluation at high image resolution – up to 75 images per second in microscopy quality

For fast single image viewing, each individual particle can be opened directly from the FRITSCH Cloud with a mouse click. The really important information for you about the morphology will be shown by the position of the data point in the Cloud. Without time-consuming

search, you can immediately analyse and evaluate individual selected particles using all available size and shape parameters.

Even if you conduct many and frequent sieve analyses, this particle size analyser is still the perfect, time-saving alternative without weighing, assembling of a sieve stack and time-consuming cleaning. And the follow-up costs are significantly reduced because calibrating and purchasing



ANALYSETTE 28 ImageSizer with wet dispersion unit for wet measurements from 20 µm to 2.8 mm in suspensions and emulsions

new sieves are no longer necessary.

The special features of the Particle Sizer ANALYSETTE 28 ImageSizer and how it works – please have a look:

www.youtube.com/embed/3ttOHBurRnO?rel=0

Up-dated information on FRITSCH particle sizing technology – from Static Light Scattering to Dynamic Image Analysis at www.fritsch-international.com/particle-sizing.

For more information, please contact: FRITSCH GmbH • Milling and Sizing

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• Internet: www.fritsch.de

Exhaust Gas Cleaning System (EGCS) – Scrubber Corrosion

Exhaust Gas Cleaning Systems (EGCS) – more commonly known as “scrubbers” – are currently being installed on thousands of vessels worldwide in order to comply with the IMO 2020 Sulphur Cap. And as a recent innovation within the maritime industry, they have not been without some early issues, including EGCS corrosion. The wash water from scrubbers, now containing pollutants it has filtered, is acidic and therefore highly corrosive. The effects of the



acidic nature of the corrosive scrubber wash water on the integrity of the ship is further aggravated by the high temperatures of exhaust gases. It is now firmly established that the structural integrity of the scrubber and associated pipework (e.g. SO_x scrubber discharge water line) need to be regularly checked for signs of corrosion.

Ultrasonic thickness gauging is a simple, inexpensive and reliable method to engage proactively with a schedule of preventative maintenance on scrubbers. Already, many companies around the world are choosing to use Cygnus thickness gauges on their vessels as part of routine scrubber structural integrity checks. Areas of particular interest and concern for vessels are the scrubber discharge outlet and the overboard pipe.

Cygnus Instruments was born in to the marine industry; our first gauges were designed 40 years ago specifically for hull inspection work. As a result, our MK5 units are all purpose-designed for a tough life on board a ship: they are waterproof (IP67), drop proof and shock proof (US MIL STD 810G standard). Readings taken can be logged and uploaded to simple software in order to be referred to later; thus wall thinning and corrosion can be easily monitored over time and any issues can be caught and addressed early.

In addition, Cygnus range of gauges all read through coatings of up to 20mm thick – which means there is no need to remove any of the important (and expensive) protective coatings or epoxy that safeguard against external scrubber corrosion. And, for heavily corroded metals where there is a thin or no coating left, Cygnus PLUS gauges incorporating Echo-Echo and Single-Echo measuring modes coupled with the Measurement Stability Indicator (MSI™) can give the quick and reliable readings you need.

To find out more information, visit:

www.cygnus-instruments.com

Alternatively, call us on **+44 (0) 1305 265533** or

email: **sales@cygnus-instruments.com**

Flender presents the new double-cardanic N-Eupex DK and increases the performance of the N-Eupex series

- **Extension of the N-Eupex modular principle by a double-cardanic coupling variant**
- **New split hub shortens assembly and disassembly time**
- **Performance increase by an average of 30 percent and increased bore capacity for all types of the N-Eupex series**

Flender introduces a new type in the N-Eupex coupling series, while increasing the performance and bore capacity of the entire series. The new double-cardanic N-Eupex DK connects the shaft ends of the drive and driven machine via two elastomer joints instead of only one joint, as is the case with the other types. The introduction of the second elastomer joint increases the damping properties of the coupling and results in a lower torsional stiffness. This reduces vibrations, and the adjacent machine components are less stressed. In addition, the possible radial offset is increased more than fourfold. The restoring forces are thus reduced by more than half depending on size, offset and installation dimension. The encapsulation of the elastomers ensures a constructive catch protection of the intermediate sleeve.

The N-Eupex DK adds a double-cardanic variant to the already existing short and long construction types. It is universally applicable, but it is particularly suitable for pump applications. With the introduction of the double-cardanic design, the selection of N-Eupex couplings can be adjusted even more specifically to the respective application.

At the same time, Flender achieved to increase the performance of the entire N-Eupex series by approximately 30 percent, and the bore capacity by up to 25 percent. The increased power density was achieved through extensive testing and material optimization. As a result, users benefit from higher torque, increased rotation speed and a change in size. The same performance can now be achieved with a smaller size.

With the so-called G-hub, the N-Eupex DK also receives a new, split hub design. The two half shells of the hub are bolted together. When the clamping screws are tightened, the half-shells center themselves over the

feather key and position themselves correctly relative to each other. The feather key connection is therefore free of play. In addition, the service friendliness is increased. The coupled driving and driven machines do not have to be moved during assembly or disassembly of the coupling. This halves the time required compared to conventional hub design.

The N-Eupex DK is available in ten sizes for torques from 48 Nm to 2,300 Nm. The bore capacity of the hubs is suitable for shaft ends with diameters between 20 and 150 mm. The permissible speed for small diameters is 5,500 rpm, for large diameters 3,000 rpm. The N-Eupex DK can be used at ambient temperatures from -30 degrees Celsius to +80 degrees Celsius. It is ATEX certified and therefore suitable for use in potentially explosive atmospheres.

The new double-cardanic N-Eupex DK coupling.



Flender is carrying out a performance increase and enlargement of the bore capacity for the entire N-Eupex series.

Flender headquartered in Bocholt, Germany, is a leading global supplier for mechanical and electrical drive systems and has the reputation for highest performance, innovation, quality, and reliability of mechanical and electrical components for more than 120 years. Flender offers a broad variety of gear units, couplings and generators and associated services, with a focus on key industries such as wind power,

cement, mining, oil & gas, power generation, water and wastewater, marine, conveyor and crane technology. Flender products and services combine the latest technology with extremely high quality and have been reliably providing the optimal transmission of power for decades. Flender has around 8,500 employees globally. Further information is available on the Internet at www.flender.com.



NEW VPFlowScope In-line 3/8 inch: Measure low flows up to 50 l/min

VPInstruments, manufacturer and worldwide supplier of measurement and monitoring equipment for compressed air and gas, is proud to introduce the innovative VPFlowScope In-line 3/8 inch for smaller diameters. Obtain all the data you need to optimize your oxygen and/or compressed air consumption.

With the pioneering smaller diameters, the VPFlowScope In-line 3/8 inch is the perfect solution to measure low flows of compressed air and oxygen at the point of use. The VPFlowScope In-line 3/8 inch can measure flow, total flow, and temperature simultaneously. Its Modbus and analog outputs enable you to interface with VPVision or other energy monitoring systems.

Installation is very simple, and its size is compact. Moreover, the VPFlowScope In-line 3/8 inch features 2-line TFT display with real-time information and configuration keys, which enhance user visual insight at first blush. Actual measurement data empowers you to optimize your air and gas system, reduce consumption, and allocate costs.

About VPInstruments

VPInstruments offers industrial customers worldwide easy insight into energy flows. We believe that industrial energy monitoring should be easy and effortless, to enable insight, savings and optimization.



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For more information, contact:

VPInstruments

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Tel. +31 (0)15 213 1580

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THE SYSTEM FOR SUCKING UP AND CAPTURING DUST, VIRUSES AND BACTERIA

PULL'n'CATCH® is a new air suction and filtering system, part of GreenBlow® line, capable of eliminating dust and processing residues.

Thanks to the use of HEPA filters and Predictive Maintenance systems that signal the need to replace the filters, limit the spread and inhalation of potentially carcinogenic substances such as PM2.5, PM10, Free crystalline silica and favoring the elimination of bacteria and viruses (including Covid-19).

The GreenBlow® line is now complete as it provides in one package: air blowing, suction and filtering suitable for different sectors (ceramic, glass, marble, stone, etc ...) and can be integrated into existing systems.

PULL'n'CATCH® - MAIN SYSTEM FEATURES:

MODULARITY

The system allows stand-alone installation, i.e. Ex novo, of all components or you can retrofit existing systems (GreenBlow fan + Air knife) by purchasing only the missing parts. It can be independent or connected to the centralized aspiration system already present in the company.

REDUCED COSTS

The PULL'n'CATCH® system is also economically very competitive considering above all the energy savings due to the use of high efficiency IE3 and IE4 small size motors with a maximum consumption of 2.2kw (for each blower).

SMALL FOOTPRINT

The space occupied on the line is very small (about 800mm) and does not require plants dedicated.

LIMITED NOISE

The whole system is designed to contain noise as much as possible, managing to avoid the obligation to use PPE even in the immediate vicinity.

Many digital presentation initiatives are planned in the coming weeks, follow the GreenBlow website to find out all updates.

Contact us:

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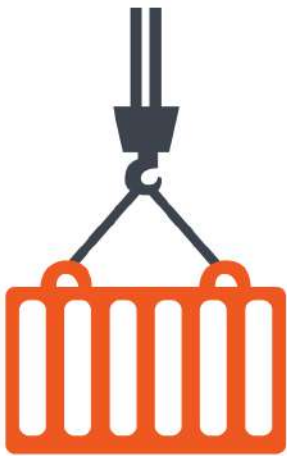
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ITA Ceramiche looks to the future with SACMI automation

New kiln - larger and more productive than its predecessor - and laser-guided vehicles connecting the glazing and sorting lines installed. This Fiorano Modenese-based firm, which is currently launching a renewed "I.TILES born in Maranello" brand, has now completed, with SACMI, the first step in an ambitious investment focusing on quality and manufacturing efficiency. ITA Ceramiche looks to the future with SACMI by completing an

ambitious project that aims to implement total process automation. This latest order centers on a new SACMI kiln, a high-performance model equipped with the latest heat recovery systems that has an output capacity of over 10,000 m²/day.

This is nothing less than a revolution for ITA Ceramiche, as it includes all the handling systems upstream and downstream from the kiln. In fact, all pieces leaving the glazing department for the new kiln are

handled on SACMI-supplied LGVs (laser-guided vehicles). Moreover, automated storage means the customer can use the full output capacity of the kiln (117 meters long, with an effective width of 2,950 mm).

Kiln loading-unloading is also automated. Automatic racking machines deposit the pieces onto further LGVs that take them to the sorting and grinding lines, configured to handle 16,000 m²/day. The two new lines - each equipped with 7 stackers - were designed by SACMI to respond to the production needs of the customer, who makes, alongside the traditional 320x320 mm tile, a broad mix that includes 170x620, 220x900, 200x1200, 300x600, 600x600, 600x1200, 450x450, 200x400, 200x200 and, lastly, the 900x900, which will go into production by May 2021.

"This investment in SACMI technology", observes the President of ITA Ceramiche, Andrea Spagni, "allows us to pursue a twofold objective: to boost product quality even further and increase the versatility and flexibility of the 6 press-glazing lines. This, in turn, will let us create new products to intercept customers in high-end, high-added-value market segments".

Production is expected to increase by 5,000 m² per day, bringing overall capacity to 24,000 square meters. "In 2022 we'll move on to phase two of the project. This will involve a complete renewal of the handling systems that serve the other two kilns, with the older of the two being replaced altogether to take output to over 29,000 m²/day".



SACMI 12-bar DHD, the versatile “multi-resolution” machine

This latest proposal broadens and completes SACMI’s wet decoration machine range, adapting it to product and market developments. Its strongpoint: independent management of inks and materials, with upstream software control of the different print resolutions

Diversified products, small lots and, above all, the need to respond to changing production and market requirements in an efficient, versatile matter. Hence the new 12-bar DHD, SACMI’s latest digital wet decoration machine which extends and completes the SACMI Deep Digital range.

In its ideal configuration (8+4), the machine allows fully independent control (also from a mechanical viewpoint) of the bar set dedicated to color (ink) and the head set that deposits effects (glazes and materials).

The first reason for this is the different frequency with which the two sets are used. When inapplicable to the product/graphics, the "materials set" can, in fact, be mechanically raised above the printing area and protected via the automatic spitting system. This keeps the nozzles perfectly clean, ensuring they’re ready for operation at maximum efficiency. And that’s not all. The SACMI

12-bar DHD is designed to allow upstream management of different "native" resolutions of different commercially available heads. This makes it possible to select the most suitable head for the desired application. SACMI-patented FLS (Frequency Linearization Screening) software divides up the layers in the upstream graphics project in a way that matches the specific resolution and control electronics of the different head types.

The main plus-point of this SACMI solution is that it lets customers respond to different decoration and digital printing needs via a single platform, all at maximum efficiency. SACMI extends this “native” multi-resolution management to other dry and wet digital decoration solutions, in particular the SACMI DDG, to combine deposits of dry/wet materials and effects.

From a customer perspective, note also that the investment can be made gradually and still provide the best results in relation to production needs. For example, customers can purchase an initial DHD smart configuration with 8 bars in total (two of which are dedicated to material deposits). Then, over time, they can install new bars in keeping with market demand and changes in the product portfolio.

Daily contact between SACMI and leading ink and glaze manufacturers provides further added value and guarantees for customers, who can count on the best available technology in terms of the formulation and physical-chemical behavior of the materials. For example, note the increasingly widespread use, particularly with effects, of water-based compounds. These have less impact on the environment but are difficult to manage efficiently unless dedicated purge & spitting systems are used to ensure lasting reliability and repeatability.

From a product viewpoint, the 12-bar DHD comes in different size-related versions. Moreover, it can handle not just a complete color range but the deposit of various non-pigmented fluid types (sheens with iridescent, glossy, matt, white effects, etc.) to give tiles a wide range of chromatic and material-like effects. Lastly, digitally synchronizing DHD with other SACMI Deep Digital solutions allows a fully 4.0 approach to ceramic decoration, resulting in continuous technological development to maximize versatility, customization, cost optimization and return on investment.



Algerian cement production capacity to increase to over 46 million tons by 2025 amidst oversupply scenario

Despite the current oversupply scenario befalling the Algerian cement industry, the sector is expected to see a further increase of capacity at a CAGR of 1.8 percent by 2025, exceeding 46 million tons, reveals CW Research's 2020 update of the Algeria Cement Market Report.

Cement demand in the country is estimated in 2020 at less than half the capacity, an unhelpful combination arising not only out of the slowdown in construction activities as consequence of the lockdown measures adopted to contain the pandemic but also because of the reduction in government investment due to the decline in global crude oil prices.

However, several infrastructure projects are scheduled to be implemented by the Algerian government over the next five years with total investment exceeding USD 13 billion, revealing prospects for sustained growth in demand, especially boosted by oil and gas sector investments.

The government is focused on taking advantage of not only the existing over capacity as well as the export infrastructure in place in many of the cement plants. Cement exports, including clinker, are expected to reach more than 6 million tons in 2025, as the government and cement producers make efforts to boost the trade and increase exports to Europe, the United States as well as existing trading partners in across Africa.

"The ability of the Algerian government to finance these ambitious but necessary infrastructure projects is contingent upon a global economic recovery driving up the demand as well as the price for crude oil. The cost competitiveness of Algerian cement production will determine its ability to compete in a price sensitive trading market", observes Prashant Singh, CW Group's Associate Director.

An industry that grows in an economy dominated by hydrocarbons

The Algerian economy largely relies on oil, with the non-oil sector representing less than half of total GDP. The Algerian cement sector is an important constituent of the construction sector, and has been gaining

momentum over the past few years as the government focuses on spending to spur infrastructure projects.

Currently, there are twenty-five integrated cement plants in the country, operated by six cement companies, largely dominated by Groupe Industriel des Ciments d'Algérie (GICA) and LafargeHolcim, which account for over 50 percent and 28 percent of share in capacity, respectively.

With the current oversupply and with cement makers focusing on exports, ex-works prices which have declined by 12 percent in 2019, compared to the previous year, are expected to remain stable this year.

For more information, placing an order, or interview inquiries, please contact Mihnea Manea, Media and Market Services Executive, CW Group, by phone at +40 723 281 704, or e-mail at mm@cwgrp.com.

About the Report

The Algeria Cement Market Report provides qualitative and in-depth market assessment and forecast of the country's cement industry, including cement volume trends in detail, trade flows, cement demand and production (historical and a five-year outlook), per capita consumption, and the competitive landscape. The report also comprises key players profiles, cement production facility details, including past and announced brownfield production increases and greenfield projects. Find out more about the report here.

About CW Group

The Greenwich (Conn.), USA headquartered CW Group is a leading advisory, research and business intelligence boutique with a global presence and a multi-industry orientation. CW Group is particularly recognized for its sector expertise in heavy-side building materials (cement), light-side building materials, traditional and renewable power & energy, petrochemicals, metals & mining, industrial minerals, industrial manufacturing, bulk cargo & shipping, among others. We have a strong functional capability, grounded in our methodical and quantitative philosophy, including due diligence, sourcing intelligence, feasibility studies and commodity forecasting. www.cwgrp.com

Global Demand for Ground Granulated Blast Furnace Slag to Reach 269mt by 2025F

Global consumption of Ground Granulated Blast Furnace Slag (GGBFS) is expected to grow between 2020E and 2025F to reach almost 269 million tons, as demand for alternatives to lower emissions and energy use during the manufacturing of Portland clinker cement is predicted to increase, according to CW Research's 2020 update of the Global Ground Granulated Blast-furnace Slag Market Report and Forecast.

China remained by far the largest consumer of slag in 2020E, but its share is expected to decline from 62 percent in 2020E to 55 percent by the end of 2025F, as the country reduces its steel production intensity gradually.

"China's overall slag consumption profile will start to see a shift from GGFBS to steel slag over the medium term. But Asia's robust demand growth over the forecast period is expected to make up a significant percentage of the short fall in global demand due to China's reduced exposure", assesses Prashant Singh, CW Group's Associate Director.

Consumption to increase at a slower pace over the next five years

Globally, GGBFS demand is projected to slowly increase over the five-year period at a CAGR of 0.1 percent, following a growth of almost 2 percent between 2015 and 2020E. Over the forecast period, Asia's demand is expected to rise to more than 61 million tons by 2025F.

The global market size for GGBFS is expected to decline at a CAGR of 3.5 percent by 2025F, primarily driven by the expected decline in China's market valuation, which is predicted to shrink to USD 2.5 billion in 2025F.

Global GGBFS production forecast to expand by 2025F

Global production of GGBFS is projected to grow over the next five years, to reach 280 million tons, with China's production declining to about 153 million tons by the end of the period.

China's output is estimated to decline at a CAGR of 2 percent from 2020E to 2025F as steel production is also set to decline over the said period. On the other hand, in Asia ex-China, the second largest producer of GGBFS, is expected to grow to growth at a robust CAGR of almost 5 percent for the period.

Japan to remain the largest GGBFS producer in Asia ex-China region

Despite stronger growth in India, Japan will continue to remain the region's largest producer of GGBFS over the forecast period, reaching almost 22 million tons, and also the largest exporter of the product.

However, Japan's GGBFS consumption is expected to decline to around 15 million tons by 2025F, and India is expected to displace it as second largest consumer, as its GGBFS consumption is forecast to increase to 16 million tons in 2025F.

The 2020 update of the Global Ground Granulated Blast-furnace Slag Market Report and Forecast provides an in-depth analysis of the global blast furnace slag market. The report presents the latest data on the market size (volume and value) sourced through both primary and secondary research. Historic and five-year forecast data showcased include figures on consumption, domestic production, exports and imports, price dynamics, as well as qualitative information on trends in the industry. The market intelligence provided in the report is divided into regional demand, as well as by end user, providing a strategic perspective on the evolution and outlook for the industry.

DIARY DATES
DIARY DATES

CEMENT

Digitalisation and cement plant Optimisation (Part 1)

Date : 07th April 2021

Digitalisation and cement plant Optimisation (Part 2)

Date : 14th April 2021

Venue: Your device

For more information, please contact:

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Fax: +7 812 712-3683

Email: info@jccement.ru

Website: www.petrocem.ru / www.jccement.ru

Virtual American Cement Conference

Date : 27th April 2021

Venue: Your device

For more information, please contact:

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convenor

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Fax: +44 1372 743838

Email: info@propubs.com

Website: www.AmericanCement.com

2nd Virtual Global CemTrans Conference and Exhibition 2021

Date : 13 April 2021

Venue: Your device

For more information, please contact:

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convenor

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: info@propubs.com

Website: www.Cem-Trans.com

5th Mortar Convention

Date : 27 - 29 April 2021

Venue: Your device

Email: info@drymix.info

Website: www.drymix.info

CBI – Cement Business & Industry Africa 2021

Date : 15 - 16 April 2021

Venue: Johannesburg, South Africa

For more information, please contact:

Mr. Ali Assad, Business Development Executive

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Email: aga@gmiforum.com

2nd Virtual Global CemProcess Seminar and Exhibition 2021

Date : 11th May 2021

Venue: Your device

For more information, please contact:

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convenor

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Fax: +44 1372 743838

Email: info@propubs.com

DIGITALCEM

Date : 20 - 21 April 2021

Venue: Your device

Tel.: +90 444 50 57 / 1125

Fax: + 90 (312) 265 09 06-05

Email: zeyneph@turkcimento.org.tr

Website: www.turkcimento.org.tr

Virtual Global CemEnergy 2

Date : 18th May 2021

Venue: Your device

For more information, please contact:

Dr. Robert McCaffrey, Global Boards Conference
convenor

Tel.: +44 1372 743837

Fax: +44 1372 743838

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11th International PetroCem Conference

Date : 25 - 27 April 2021

Venue: Astoria Hotel, St. Petersburg, Russia

63rd Virtual IEEE-IAS/PCA Cement Industry Technical Conference

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EVENTS 2021

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Virtual Global CemTrans 2

Cement and clinker transport and logistics

13 April 2021

Free registration:
www.Cem-Trans.com

Virtual American Cement

Market trends and technology in the Americas

27 April 2021

Free registration:
www.AmericanCement.com

Virtual Global CemProcess

Process control in cement

11 May 2021

Free registration:
www.CemProcess.com

Virtual Global CemEnergy 2

Conventional fuels for cement and lime

18 May 2021

Free registration:
www.Cement-Energy.com

Virtual Global Slag 3

Slag optimisation and use in cement

15 June 2021

Free registration:
www.GlobalSlag.com

Virtual Middle Eastern Cement 2

Market trends and technology in the Middle East - Kindly co-organised by the AUCBM

6 July 2021

Free registration:
www.MiddleEasternCement.com

Virtual African Cement

Market trends and technology in Africa

7 September 2021

Free registration:
www.AfricanCement.com

Virtual Global Concrete 2

Market trends and future concrete

14 September 2021

Free registration:
www.Global-Concrete.com

15th Global CemFuels Conference

22-23 September 2021,
Lisbon, Portugal
www.CemFuels.com

Virtual Global CemQC 2

Quality control for clinker and cement

5 October 2021

Free registration:
www.CemQC.com

Virtual Global CemProducer 4

Cement plant maintenance

9 November 2021

Free registration:
www.CemProducer.com

Virtual Global CemPower

Electrical production and efficiency

23 November 2021

Free registration:
www.CemPower.com

Virtual European Cement

Market trends and technology in Europe

7 December 2021

Free registration:
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Event Enquiries

Exhibition and sponsorship:
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Organizer



China Building Materials Federation



China Cement Association



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Contact:

Ms. Dido

Tel: 86-10-88082338

E-mail: liuyan@ccpitbm.org / lime@ccpitbm.org

Date : 24 - 28 May 2021

Venue: your device

For more information, please visit:

<http://cementconference.org>

Lignofuels 2021

Date : 26 - 27 May 2021

Venue: Helsinki, Finland

For more information, please contact:

Mr. Dimitri Pavlyk

Tel.: +44 2031410610

Email: dpavlyk@acievents.eu

Asia's transition to a low-carbon future

Date : 21- 24 June 2021

Venue: Your device

For more information, please contact:

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- Cemtech Conferences & Exhibitions

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3rd Virtual Global Slag Seminar

Date : 15th June 2021

Venue: Your device

For more information, please contact:

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Fax: +44 1372 743838

Email: info@propubs.com

Website: www.globalslag.com

Virtual Middle Eastern Cement 2

Date : 06th July 2021

Venue: Your device

For more information, please contact:

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convenor

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: info@propubs.com / rob@propubs.com

Website: www.MiddleEasternCement.com

3rd Conference of Cement Industry & Technology in Syria & the Region 2021

Date : 26 - 28 July 2021

Venue: Cham Palace, Damascus, Syria

For more information, please contact:

Mobile/WhatsApp: +963969019984

E-mail: info@cementtechco.net

Website: www.cementtechco.net

Virtual African Cement Conference

Date : 07th September 2021

Venue: Your device

For more information, please contact:

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convenor

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: info@propubs.com

Website: www.AfricanCement.com

3rd International Conference on Concrete Sustainability

**Concrete – Challenge for Sustainable and Resilient
Built Environment**

Date : 08 - 10 September 2021

Venue: Faculty of Civil Engineering, Czech Technical
University in Prague, Czech Republic

For more information, please contact:

Czech Concrete Society

Email: fibiccs20@cvut.cz

Website: www.fibiccs.org

Middle East Concrete 2021

Date : 12 - 15 September 2021

Venue: Dubai World Trade Centre (DWTC), Dubai,
United Arab Emirates

For more information, please visit:

<https://www.middleeastconcrete.com/>

8th International Drymix Mortar Conference idmmc8

Date : 13th September 2021: 09:00 - 17:00hrs

Venue: Ofenwerk, Nürnberg, Germany

Email: info@drymix.info

Website: www.drymix.info

15th Global CemFuels Conference and Exhibition on alternative fuels for the cement and lime industry

Date : 22 - 23 September 2021

Venue: Lisbon, Portugal

For more information, please contact:

Dr. Robert McCaffrey, Global Boards Conference
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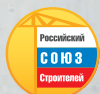
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DIARY DATES

CW EMENA Cement & Fuel Summit

Date : 22 - 23 September 2021

Venue: Madrid, Spain

Email: inquiries@cwgrp.com

Website: www.cwgrp.com

Virtual Global CementQC Seminar 2

Date : 5th October 2021

Venue: Your device

For more information, please contact:

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Fax: +44 1372 743838

Email: info@propubs.com

Website: www.CementQC.com

International Lime and Calcium Industry Expo

Date : 26 - 28 October 2021

Venue: Handan, China

For more information, please contact:

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Email: liuyan@ccpitbm.org

Virtual Global CemProducer 4: Refractories, wear, lubrication & cement plant maintenance

Date : 09th November 2021

Venue: Your device

For more information, please contact:

Dr. Robert McCaffrey, Global Boards Conference
convenor

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: info@propubs.com

Website: <http://www.cemproducer.com>

Global Cement Electrical Power Conference and Exhibition

(virtual Global CemPower Seminar)

Date : 23rd November 2021

Venue: Your device

For more information, please contact:

Dr. Robert McCaffrey, Global Boards Conference
convenor

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: info@propubs.com

European Cement – Virtual

Date : 7th December 2021

Venue: Your device

For more information, please contact:

Dr. Robert McCaffrey, Global Boards Conference
convenor

Tel.: +44 1372 743837

Fax: +44 1372 743838

Email: info@propubs.com

Website: www.EuropeanCement.com

Alternative Fuels & Raw Materials (AFARM) Americas 2021

Date : 8 - 9 December 2021

Venue: Cancun, Mexico

For more information, please contact:

Mr. Ali Assad, Business Development Executive

Mobile: +40 754 023 330

Email: aga@gmiforum.com

Ms. Magda Kwapisiewicz, Conference Producer

Mobile: +351 939 114 543

Email: mk@gmiforum.com

www.gmiforum.com

7th Alternative Fuels Symposium

Date : 2022

Venue: Germany

Tel.: +49 0 203 34 65 16 0

Fax: +49 0 203 34 65 16 50

Email: workshop@lechtenberg-partner.de

Website: www.lechtenberg-partner.de

TRAINING

Virtual Online Course “Process Technology of Cement Production”

Module 1 (Grinding Technology and Raw Material Preparation)

Date : 20 - 23 April 2021

Module 2 (Clinker Production and Material Technology)

Date : 26 - 29 April 2021

For more information, please visit:

<https://www.vdz-online.de>

Virtual Online Course “Firing Alternative Fuels: Opportunities, impacts on process, optimisation and limitations” (Training course 1)

Date : 17 - 20 May 2021

For more information, please visit:

<https://www.vdz-online.de>

Evolving the well-established

Training Programme 2021

Online Courses

Process Technology of
Cement Production
20 - 29 April 2021

Firing Alternative Fuels: Opportunities,
impacts on process, optimisation and
limitations
17 - 20 May 2021 and 25 - 28 October 2021

Crash Course for Young Engineers
14 - 18 June 2021

In-class Training

Plant Maintenance and Refractories
6 - 10 September 2021

Basic Course Process Control
8 - 11 November 2021

Process Technology of Cement Production
29 November - 10 December 2021

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vdz



More information and registration:
www.vdz-online.de/en/training
training@vdz-online.de

Follow us on **LinkedIn**

VDZ
Toulouser Allee 71
40476 Duesseldorf
Germany

DIARY DATES

Virtual Online Training “Crash Course for Young Engineers”

Date : 14 - 18 June 2021

For more information, please visit:

<https://www.vdz-online.de>

In-class Training “Plant Maintenance and Refractories Course”

Date : 6 - 10 September 2021

For more information, please contact:

Ms. Julia Volchkova

Tel: +49-211-45 78-402

Email: training@vdz-online.de

Website: <https://www.vdz-online.de>

In-class Training “Basic Course Process Control”

Date : 8 - 11 November 2021

For more information, please contact:

Ms. Julia Volchkova

Tel: +49-211-45 78-402

Email: training@vdz-online.de

Website: <https://www.vdz-online.de>

In-class Training “Process Technology of Cement Production”

Module 1 (Grinding Technology and Raw Material Preparation)

Date : 29 November - 3 December 2021

Module 2 (Clinker Production and Material Technology)

Date : 6 - 10 December 2021

For more information, please visit :

<https://www.vdz-online.de>

CERAMIC

Coverings 2021 - The global tile & stone experience

Date : 07 - 09 July 2021

Venue: The North Hall of the Orange County Convention Center, Orlando, Florida, USA

For more information, please visit:

www.coverings.com

CERSAIE 2021

The healthiness of ceramics for rethinking home design and architecture

Date : 27 September - 01 October 2021

Venue: Bologna Exhibition Centre, Italy

For more information, please visit:

www.cersaie.it/en/

27th Tecnargilla 2021

Date : 27 September - 1 October 2021

Venue: Rimini Expo Centre, Italy

Tel: +39 0541 744111

Fax: +39 0541 744200

Email: segreteria@tecnargilla.it

CEVISAMA – International Ceramics & Bathroom Experience

Date : 07 - 11 February 2022

Venue: Valencia Fair, Spain

For more information, please visit:

<https://cevisama.feriavalencia.com>

GENERAL

1st Construction Technology Forum

Date : 06 - 07 April 2021

Venue: Intercontinental Riyadh, KSA

For more information, please visit:

www.ctf-ksa.com

Greece – North Africa E Business Gathering

Date : 07th April 2021

Venue: Your device

Email: chamber@arabgreekchamber.gr

For more information, please visit:

www.arahellenicchamber.gr

Hannover Fair

Date : 12 - 16 April 2021

Venue: Your device

For more information, please visit:

<https://www.hannovermesse.de/en/>

Global Gypsum Live

Date : 20th April 2021

Venue: Your device / Free Registration

For more information, please contact:

Dr. Robert McCaffrey, Global Boards Conference convenor

Tel: +44 (0) 1372 743837

Fax: +44 (0) 1372 743838

Email: info@propubs.com

Website: www.globalgypsum.com

10th Annual European Algae Industry Summit

Date : 21 - 22 April 2021

Venue: Reykjavik, Iceland

For more information, please contact:

ACI (Europe)

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

Each course is complete with full documentation, course notes, etc.

No additional material is required other than a computer with an internet connection.

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

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

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

<https://Training.CemNet.com>

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

Email: Training@CemNet.com

Training Schedule 2021

■ **Alternative Fuels for Firing Cement Kilns** (3-week online training)

18 January 2021 05 April 2021
05 July 2021 04 October 2021

■ **Cement Manufacturing Technology** (6-week online training)

18 January 2021 05 April 2021
05 July 2021 04 October 2021

■ **Cement Kiln Process Chemistry** (6-week online training)

18 January 2021 05 April 2021
05 July 2021 04 October 2021

■ **Cement Kiln Refractories** (6-week online training)

19 April 2021 12 July 2021

■ **Grinding and Milling Systems** (6-week online training)

25 January 2021 19 April 2021
02 August 2021 11 October 2021

■ **Cement Factory Maintenance** (6-week online training)

11 January 2021 12 April 2021
12 July 2021 11 October 2021

■ **Cement Factory Quality Control** (6-week online training)

25 January 2021 12 April 2021
02 August 2021 01 November 2021

■ **Cement Kiln Pyroprocessing** (6-week online training)

25 January 2021 12 April 2021
12 July 2021 11 October 2021

■ **White Cement Manufacturing Technology** (6-week online training)

22 February 2021 06 September 2021

■ **Selecting & Using Raw Materials for Cement Manufacture**

(instant access course, starts anytime)

To register for a course, visit:

<https://Training.CemNet.com>

DIARY DATES

Mr. Dimitri Pavly
Tel.: +44 203 141 0610
Email: dpavlyk@acievents.eu

International Powder & Bulk Solids

Date : 27 - 29 April 2021
Venue: Your device
For more information, please visit:
<https://powderandbulkshow.com/>

Gasification 2021 - 9th Annual Gasification Summit

Date : 05 - 06 May 2021
Venue: Lyon, France
For more information, please contact:
Mr. Mohammad Ahsan
Tel.: +44 203 141 0606
Email: mahsan@acieu.net

3rd Annual Digital Marketing and Customer Experience – Virtual Conference

Date : 19 - 20 May 2021
Venue: Your device
Tel.: +603 2775 0067
Email: sama@internationalbusinesscongress.com

Digital CFO Summit – Virtual Conference

Date : 19 - 20 May 2021
Venue: Your device
For more information, please contact:
Mr. Phil Slater
Email: phils@globalprgramrunner.com

Chief Data Scientist

Date : 19 - 20 May 2021
Venue: Your device
For more information, please contact:
Mr. Sam Ward
Tel.: +603 2775 0067
Email: samw@runbestevents.com

13th ERBIL BUILDING

Date : 19 - 22 May 2021
Venue: Erbil, Iraq
For more information, please contact:
Mr. Tarek Alamer, International Sales Manager
Pyramids Group Fair Inc.
Tel.: +90 216 575 28 28 ext. 223
Mob: +90 507 064 78 23
E-mail: tarek.alamer@pyramidsfair.com

SOLIDS Dortmund 2021

Date : 16 - 17 June 2021

Venue: Dortmund, Germany
For more information, please visit:
www.easyfairs.com

4th European Environmental Port Conference

Date : 16 - 17 June 2021
Venue: Rotterdam, The Netherlands
For more information, please contact:
Cheryl Williams
Tel.: +44 203 141 0605
Email: cwilliams@acieu.co.uk

Marketing Algorithm Summit

Date : 28 - 29 June 2021
Venue: Singapore (Virtual Summit)
For more information, please contact:
John Karras
Tel.: +603 2775 0067
Email: johnk@trueventus.com

Data Analytics in Construction Summit – Virtual Conference

Date : 07- 08 July 2021
For more information, please contact:
John Karras
Tel.: +603 2775 0067
Email: johnk@trueventus.com

9th Annual Modular & Prefabrication Construction – Virtual Conference

Date : 07- 08 July 2021
For more information, please contact:
Mr. John Karras
Tel.: +603 2775 0067
Email: johnk@trueventus.com

2nd Annual BIM Summit – Virtual Conference

Date : 07- 08 July 2021
For more information, please contact:
Mr. John Karras
Tel.: +603 2775 0067
Email: johnk@trueventus.com

2nd Annual Digital Predictive Maintenance Summit – Virtual Conference

Date : 18 - 19 August 2021
For more information, please contact:
Mr. John Karras
Tel.: +603 2775 0067
Email: johnk@trueventus.com

The Big 5 Solar

Date : 12 - 15 September 2021

ЦЕМЕНТ

и его применение

CEMENT AND ITS APPLICATIONS

INDUSTRIAL JOURNAL

SINCE 1901

News

Markets analysis

Science,
technology,
production

Solid partners

Effective
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The journal for producers and consumers of cement and other binders, as well as for construction companies and equipment producers

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» is the only initiator and organizer of international cement conferences PetroCem. PetroCem 2018 which was held on April, 2018 in Saint-Petersburg, Russia – gathered more than 520 participants from 36 countries and representing more than 320 companies.

Jcement.ru web-based information portal on cement. Production, technologies, science. Always up-to-date news and data on cement producers, technologies, equipment suppliers and key-players. Journal, interviews, statistics, events, Q&A and other relevant materials.

Cement and its Applications, Journal
22 A Zvenigorodskaja Str. No 438
St. Petersburg, 191119, Russia
Tel. +7 (812) 242-11-24
E-mail: info@jcement.ru
Web: www.jcement.ru
www.petrocem.ru



DIARY DATES

Venue: Dubai World Trade Centre, Dubai, UAE

For more event please visit:

www.thebig5solar.ae

The Big 5 Heavy

Date : 12 - 15 September 2021

Venue: Dubai World Trade Centre, Dubai, UAE

For more event please visit:

www.thebig5heavy.com

Breakwaters 2021

Date : 13 - 16 September 2021

Venue: Portsmouth, UK

Email: breakwaters@ice.org.uk

European Coatings Show

Date : 14 - 16 September 2021

Venue: Nürnberg, Germany

Email: info@drymix.info

Website: www.drymix.info

RWM

Date : 22 - 23 September 2021

Venue: NEC Birmingham, UK

For more information, please visit:

www.rwmexhibition.com

9th European Bulk Liquid Storage Summit

Date : 29 - 30 September 2021

Venue: Cartagena, Spain

For more information, please contact:

Cheryl Williams

Tel.: +44 203 141 0605

Email: cwilliams@acieu.net

Egypt Projects

Date : 30 September - 02 October 2021

Venue: Egypt International Exhibition Center - EIEC, Cairo Governorate, Egypt

For more information, please contact:

Mr. Amr Hassan

Tel.: +20226774263

Fax: +20226774252

Mobile: +201009069609

Email: amr@arabiangerman.com

Website: www.Egypt-projects.com

MHEA Bulkex 2021

Date : 12 - 13 October 2021

Venue: Chesford Grange - Warwickshire, UK

For more information, please visit:

<https://mhea.co.uk/bulkex21/>

BATIMATEC Expo

Salon International du Bâtiment des Matériaux de Construction et des Travaux Publics

Date : 07 - 11 November 2021

Venue: Palais des Exposition Pins Martimes, Algiers, Algeria

For more information, please visit:

www.batimatecexpo.com

2021 European Base Oils & Lubricants Summit

Date : 17 - 18 November 2021

Venue: Amsterdam, The Netherlands

For more information, please contact:

Mr. Mohammad Ahsan

Tel.: +44 203 141 0606

Email: mahsan@acieu.net

Website: www.acieu.net

17th Edition SteelFab 2202

Machinery, Technology, Equipment

Date : 10 - 13 January 2022

Venue: Expo Center Sharjah, UAE

For more information, please contact:

Tel.: +971 6 5770000

Email: steel@expo-centre.ae

Website: www.steelfabme.com

Powtech 2022

Date : 26 - 28 April 2022

Venue: Nürnberg, Germany

For more information, please visit:

<https://www.powtech.de/en>

Hillhead 2022

Date : 21 - 23 June 2022

Venue: Hillhead Quarry, Buxton, Derbyshire, UK

For more information, please visit:

www.hillhead.com

interpack Düsseldorf

Date : 04 - 10 May 2023

Venue: Düsseldorf Trade Fair Centre, Germany

For more information, please visit:

www.interpack.com



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عالم الإسمنت ومواد البناء

تصدر عن : الاتحاد العربي للإسمنت ومواد البناء العدد 83 مارس / آذار 2021

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



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عالم الإسمنت ومواد البناء

مؤتمرات ومعارض

منتجات جديدة

موضوعات تقنية

أخبار عالمية

الملف العربي

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

المساهمات

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

● الآراء الموجودة بالمجلة لا تعبر بالضرورة عن رأي الاتحاد أو المجلة وإنما عن الرأي الخاص ب كاتبها ولا يتحمل الاتحاد أية مسؤولية قانونية تجاه ذلك .

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الشركات والمؤسسات ●

الجامعات ومراكز البحوث ●

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

Website : www.aucbm.net

المكتويات

أخبار عربية
أخبار عالمية
منتجات جديدة

الموضوعات:

- توفير الطاقة
إعداد: م. رئيس مهندسين صباح أحمد محمود / الشركة العامة للإسمنت العراقية – جمهورية العراق
- مدى تأثير عدد من العوامل المختارة على استقلال مراجع الحسابات في المملكة العربية السعودية
إعداد: وجدان علي الكاف/ كلية الاقتصاد والإدارة ، جامعة الملك عبد العزيز – المملكة العربية السعودية
- تصنيع الإسمنت المستدام بالاستخدام الفعال للوقود البديل
إعداد: Prof. Dr. Dominik Aufderheide
Di Matteo Förderanlagen GmbH & Co. KG – ألمانيا
- التحسين الفعال لأنظمة الفلتر النفاث النبضي
إعداد: Ernst Rohner / BWF Envirotec – تركيا
- الطاقة المتجددة وحلول للمياه وصناعة مواد البناء
إعداد: حمدي حافظ / HeidelbergCement – جمهورية مصر العربية
- Polaris 2800 يزود أحد أكبر مصانع الإسمنت في قبرص بالوقود
إعداد: Lindner-Recyclingtech GmbH – النمسا
- مساعدات طحن الإسمنت
إعداد: م. فائزة أبو زيد / شركة أكواتراست لمعالجة المياه – جمهورية مصر العربية
- مؤتمرات ومعارض

المراسلات

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

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

Website : www.aucbm.net



مجلة عالم الإسمنت ومواد البناء

جدول موضوعات المجلة لعام 2021

| المناسبات | الموضوعات | العدد |
|-----------|---|-----------------------|
| | * الإسمنت ذو النسبة المنخفضة من الكربون * الخرسانة * التحليل بتألق الأشعة السينية (XRF) وبحيود الأشعة السينية (XRD) * كيمياء الإسمنت * مضافات الإسمنت * انسداد الصوامع وتنظيفها * النقاط التي تؤخذ بعين الاعتبار عند تصميم الصوامع * منظومات التحريك * تكنولوجيا الوزن * تقنيات وأنظمة الاعتيان (أخذ العينات) * دراسات حالة | يونيو/حزيران 2021 |
| | * التعبئة والتغليف والتسليم * معدات التحميل والتفريغ من السفن * تكنولوجيا التغذية * تخزين ومناولة المواد السائبة * تخزين الوقود * أنظمة النقل والرافعات الدولية * الصحة والسلامة المهنية * إعداد الفحم وإشعاله * دراسات حالة | سبتمبر/أيلول 2021 |
| | * أنظمة التشحيم * الصيانة في مصانع الإسمنت * تقنيات الإصلاح واللحام * إدارة قطع الغيار * الطواحين العمودية * الكسارات * المبردات * تكنولوجيا الحرقانات * الحرارية وفحص الحرارية * دراسات حالة | ديسمبر/كانون أول 2021 |

آخر موعد لاستلام المقالات أو النصوص الصحفية أو الإعلانات لأعداد عام 2021 هو على النحو التالي :

1. عدد يونيو / حزيران : 28 مايو / أيار 2021
2. عدد سبتمبر / أيلول : 31 أغسطس / آب 2021
3. عدد ديسمبر / كانون أول : 3 ديسمبر / كانون أول 2021

الإعلانات

(بالدولار الأمريكي)

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

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

WWW.AUCBM.NET إعلان على موقع الاتحاد

- 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)

أخبار عربية

20.7 % خلال عام 2020 لتصل إلى نحو 51.08 مليون طن، مقارنة بنحو 42.32 مليون طن في 2019 ، واصلت صعودها في يناير / كانون الثاني الماضي وزاد إجمالي المبيعات بنحو 5.6 % على أساس سنوي ، وانخفضت صادرات شركات الإسمنت العاملة في المملكة على أساس سنوي خلال شهر يناير / كانون الثاني الماضي 44.3 %، وسجلت 127 ألف طن مقابل 228 ألف طن في الشهر المماثل من عام 2020.

ورفعت شركات الإسمنت إنتاجها بنسبة 5.55 % خلال شهر يناير / كانون الثاني من عام 2021 على أساس سنوي ، ووصل إلى 5.15 مليون طن ، مقارنة مع 4.88 مليون طن في الشهر المماثل من 2020 ، وجاءت إسمنت الجنوب في المقدمة على مستوى الإنتاج بواقع 714 ألف طن ، وكان إنتاج إسمنت الشمالية الأقل بواقع 119 ألف طن .

كما ارتفعت مبيعات الإسمنت - التسليمات المحلية والصادرات - إلى 5.08 مليون طن خلال هذا الشهر ، مقابل 4.81 مليون طن في يناير 2020 ، وزادت التسليمات المحلية للشركات إلى 4.95 مليون طن ، مقابل 4.58 مليون طن في الشهر ذاته من العام الماضي .

| سوق شركات الإسمنت في العام 2020 مقارنة بالعام 2019 | | | |
|--|----------|-------|-------|
| البيان | الوحدة | 2020 | 2019 |
| المبيعات | مليون طن | 51.08 | 42.32 |
| الإنتاج | مليون طن | 53.42 | 44.32 |
| المخزون | مليون طن | 1.26 | 1.18 |
| الصادرات | مليون طن | 2.126 | 1.938 |

المصدر: www.alwatan.com.sa

توقعات إيجابية لشركات الإسمنت السعودية في 2021

قالت شركة الأهلي كابيتال للأبحاث إنه من المتوقع أن تسهم برامج الإسكان الجارية بالمملكة العربية السعودية في دعم قطاع الإسمنت إضافة إلى الارتقاء في مشاريع ضخمة واستراتيجية لصندوق الاستثمارات العامة 2021-2025 .

وأضافت شركة الأبحاث إنها لا تزال تحافظ على نظرتها الإيجابية لقطاع الإسمنت السعودي ، متوقعة أن ترتفع مبيعات الإسمنت المحلية بنسبة 3.5 % على أساس سنوي في عام 2021 لتصل إلى 52.8 مليون طن ، عقب نمو قوي بنسبة 20.7 % على أساس سنوي في عام 2020 عند مستويات 51.1 مليون طن .

وأكدت الأهلي كابيتال أن الطلب من قطاع الإسكان لا يزال قوياً مع وصول قيمة القروض العقارية الجديدة إلى مستوى قياسي بلغ 32.8 مليار ريال في يناير/ كانون الثاني 2021 ، مرجحة أن يتسارع العمل في مشاريع المملكة في عام 2021 حيث تم منح العديد من العقود مؤخراً .

الإمارات العربية المتحدة

"الإمارات للألمنيوم" تمدد شراكتها مع "جيوسايل لافارج هولسيم" 10 سنوات

أعلنت شركة "الإمارات العالمية للألمنيوم" عن توقيع اتفاقية لتمديد شراكتها لمدة 10 سنوات إضافية مع شركة "جيوسايل لافارج هولسيم" التابعة لشركة لافارج هولسيم ، وذلك لخلق قيمة من النفايات الصناعية في دولة الإمارات .

ومنذ عام 2010 ، تعمل شركة الإمارات العالمية للألمنيوم مع شركة لافارج هولسيم لإيجاد استخدامات اقتصادية لبطانة الخلايا المستهلكة وهي مواد ناجمة عن عملية صهر الألمنيوم والتي تعد واحدة من أهم النفايات في صناعة الألمنيوم . وتعاونت الشركتان معاً لتطوير تقنية للمعالجة المسبقة واستخدام بطانة الخلايا المستهلكة كمادة وسيطة بديلة في صناعة الإسمنت المحلي . وقد أسست لافارج هولسيم شركتها الفرعية "جيوسايل الإمارات" للتركيز على المعالجة المسبقة لبطانة الخلايا المستهلكة والمواد الأخرى .

وقد زودت شركة الإمارات العالمية للألمنيوم شركة جيوسايل بأكثر من 160 ألف طن من البطانات المستهلكة منذ عام 2010 . ومن المقرر أن تقوم شركة الإمارات العالمية للألمنيوم بتوريد 40,000 طن إضافي من بطانات الخلايا المستهلكة على مدار العامين المقبلين سواء لشركة جيوسايل أو مباشرة كمواد معالجة مسبقاً لمصنع الإسمنت التابع لشركة لافارج هولسيم في الفجيرة . وفي العام الماضي، قامت شركة الإمارات العالمية للألمنيوم بتكليف منشأة خاصة بها لتكسير بطانة الخلايا المستهلكة في الطويلة .

www.alkhaleej.ae

الجزائر

إسمنت حامة بوزيان تستعد لتصدير 50 ألف طن نحو غرب أفريقيا

حققت شركة إسمنت حامة بوزيان بقسنطينة ، التابعة للمجمع الصناعي لإسمنت الجزائر (جيكا) ، خلال سنة ، إنتاجاً يفوق 825 ألف طن من مادة الإسمنت من أصل طاقة إنتاجية تقدر بـ 1 مليون طن . ويستعد مصنع إسمنت حامة بوزيان ، وبالتعاون مع شركة إسمنت عين الكبيرة ، بولاية سطيف ، لتنظيم عملية تصدير 50 ألف طن من مادة الإسمنت (35 ألف طن منها منتجة من طرف شركة إسمنت حامة بوزيان) نحو غرب أفريقيا .

www.ech-chaab.co

العربية السعودية

نمو مبيعات الإسمنت وتراجع الصادرات

في حين قفزت مبيعات شركات الإسمنت السعودية ، بنسبة

الشركة السعودية للخرسانة الجاهزة تحصل على اعتماد ACI كمرکز تدريبي معتمد
حصلت الشركة السعودية للخرسانة الجاهزة على اعتماد المعهد الأمريكي للخرسانة (ACI) كمرکز تدريبي معتمد .

وتشكل الدورات الحد الأدنى من المؤهلات للعاملين في صناعة الخرسانة . وستبدأ الشركة بقبول المرشحين لدوراتها التدريبية اعتباراً من مارس / آذار 2021 . وستقدم دورات تدريبية للمعهد الأمريكي للخرسانة في الاختبار الميداني للخرسانة واختبار مقاومة الخرسانة .

السودان

الرسوم تهدد صناعة الإسمنت المحلية

ذكر مصدر من صناعة الإسمنت في السودان أن معظم مصانع الإسمنت العاملة بالسودان متعثرة اقتصادياً وذلك مع ارتفاع الضرائب والرسوم المتعددة المفروضة على صناعة الإسمنت المحلية .

www.opensudan.net

سوريا

مبيعات "إسمنت حماة" خلال 2020

وصلت قيمة مبيعات "الشركة السورية لصنع الإسمنت ومواد البناء بحماة" خلال عام 2020 ، إلى نحو 49 مليار ليرة سورية ، ناتجة عن بيع مليون وخمسة وخمسين ألف طن من مادة الإسمنت ، حيث بلغ إنتاج الشركة مليوناً واحداً وخمسين ألف طن من مادة الإسمنت ، بينما وصلت كميات الكلنكر إلى سبعمائة وأربعة عشر ألف طن .

كما باعت وحدة إنتاج البلوك في الشركة خلال العام الماضي 660 ألف بلوكة للقطاعين العام والخاص وبمختلف المقاسات .

ولفت المدير العام للشركة إلى أن التوجهات الرئيسة للعمل خلال العام الجاري 2021 ستركز على تحسين المواصفات الفنية للمنتج وتحديث وتطوير الآلات وإنتاج أنواع جديدة من الإسمنت ، بالإضافة إلى زيادة الحصة السوقية للشركة وتنويع الاستثمارات وتنمية الموارد البشرية بما يؤدي إلى تطوير العمل نحو الأفضل .

www.abwmonline.com

سلطنة عُمان

ريسوت للإسمنت تضع حجر الأساس لتركيبة نظام إسترجاع الحرارة المهدرة بقدرة 9 ميجاوات

أقامت شركة ريسوت للإسمنت أكبر شركة مصنعة للإسمنت في سلطنة عُمان حفل وضع حجر الأساس لبدء إنشاء نظام جديد لإسترجاع الحرارة المهدرة بقدرة 9 ميجاوات في مصنعها الرئيسي في صلالة .

كما أكدت أنها تتوقع ارتفاع الأسعار عن المستويات المنخفضة الأخيرة حيث بلغ متوسط أسعار الإسمنت المحلي 174 ريال سعودي للطن في الربع الرابع 2020 ، بانخفاض 16.1 % و 8 % عن مستويات 2019 والربع الثالث وعام 2020 على التوالي .

وتتوقع أن هذا يرجع إلى حد كبير إلى المنافسة القوية (لا سيما في المنطقة الوسطى) ، مما يحد من قدرة القطاع على تمرير تأثير ارتفاع ضريبة القيمة المضافة ، مع تحسن الطلب في جميع أنحاء المملكة العربية السعودية في عام 2021 .

وقالت أنها تتوقع أن يبلغ متوسط الأسعار 183 ريال سعودي للطن مؤكدة أن ضعف سعر البيع لا يزال يمثل مخاطرة رئيسية .

sahla-store.com

إسمنت المدينة توافق على تأسيس شركة تابعة لمعالجة وإعادة تدوير المخلفات

أعلنت شركة إسمنت المدينة عن موافقة مجلس الإدارة على تأسيس شركة تابعة ذات مسؤولية محدودة مملوكة بنسبة 100 % ، برأسمال 500 ألف ريال .

وأوضحت الشركة أنها سوف تتخذ من مدينة الرياض مقراً لها ، ويتركز نشاطها في تقديم حلول وخدمات بيئية لمعالجة وإعادة تدوير المخلفات . وسيتم تأسيس الشركة بعد الحصول على الموافقات والترخيص اللازمة من الجهات ذات العلاقة .

وتأتي تلك الخطوة تماشياً مع استراتيجية الشركة ، وسيتم الإعلان عن أية تطورات بهذا الشأن في حينها .

www.mubasher.info

إسمنت نجران تنتهي من تأسيس شركة نقل ذات مسؤولية محدودة

أعلنت شركة إسمنت نجران عن انتهائها من تأسيس شركة نقل متخصصة ذات مسؤولية محدودة وإصدار الترخيص المبدئي لمزاولة النشاط الصادرة من هيئة النقل العام السعودية . وأضافت الشركة أن العمل جار على الإجراءات النهائية للحصول على الترخيص النهائي .

www.mubasher.info

إسمنت ينبع: إيقاف خط الإنتاج الرابع لغرض التحديث

أعلنت شركة إسمنت ينبع عن تنفيذ خطتها الاستراتيجية لتحديث الخط الرابع ، وعليه تم إيقاف هذا الخط ابتداءً من 15 فبراير / شباط 2021 ، وذلك لمدة 60 يوماً تقريباً .

وأكدت إسمنت ينبع ، أن المبيعات لن تتأثر بهذا التوقف نظراً لوجود مخزون استراتيجي كافٍ ، إضافة إلى استمرار عمل الخط الخامس بكامل طاقته الإنتاجية والذي يمثل 60 % من طاقة الشركة الإجمالية .

www.mubasher.info

بنحو 51 %، فيما يمتلك جاسم مرزوق بودي ، ومروان مرزوق بودي ومجموعتهما 43.76 % في "إسمنت الهلال". وحققت إسمنت الهلال خسائر العام الماضي بلغت 681.1 ألف دينار، مقابل خسائر عام 2018 البالغة 68.75 ألف دينار .
www.mubasher.info

إدارة السويس للإسمنت توافق على الشطب الاختياري لأسهمها من البورصة

أعلنت شركة السويس للإسمنت عن موافقة مجلس على شطب أسهم الشركة من البورصة شطباً اختيارياً ، وشراء جميع أسهم المعارضين على الشطب الاختياري والمتضررين منه بنفس سعر عرض الشراء الإجباري المقدم من شركة هايدلبرج سيمنت فرانس .

في سياق آخر، حققت الشركة صافي خسائر غير مجمع عن الفترة من 2020/01/01 إلى 2020/06/30، قدر بنحو 463,328,727 جنيه ، نظير صافي خسائر بلغ 590,501,525 جنيه ، خلال الفترة المقارنة من العام المالي السابق .

ولسويس للإسمنت هي شركة عامة مدرجة في البورصة المصرية منذ فبراير 1995، وهي تعمل في قطاع المواد مع التركيز على مواد البناء . يقع مقر شركة السويس للإسمنت في القاهرة / مصر ، وقد تم تأسيسها في أبريل 1979.

www.arabfinance.com

بعد 7 سنوات تحكيم دولي الحكم يصدر لصالح مصر على شركتين إسبانييتين

بعد 7 سنوات من إجراءات التقاضي، أصدر المركز الدولي لتسوية منازعات الاستثمار التابع للبنك الدولي، حكمه برفض دعوى التحكيم الدولي التي أقامتها شركتا "سيمنتوس لا يونيون" و"أريديوس جاتيفا" للحصول على تعويضات من الحكومة المصرية قُدرت بنحو 236 مليون دولار بما يعادل 4.3 مليار جنيه مصري .

كانت الشركتان الإسبانييتان تقدمتا بدعوى التحكيم من أجل الحصول على تعويضات، بزعم إخفاق السلطات المصرية في إمدادهما بالكميات الكافية من الغاز الطبيعي والكهرباء لمصنع الإسمنت التابع لهما ، والذي كان من المقرر افتتاحه في مصر.

وزعمتا أيضاً أن الحكومة المصرية طالبت شركة العربية للإسمنت، التي تمتلك فيها سيمنتوس حصة 60 % من الأسهم، بسداد رسوم باهظة للحصول على التراخيص اللازمة وأيضاً لتزويدها بالكهرباء. ويتضمن النزاع حول رسوم التراخيص - التي تعود لعام 2008 أيضاً - دعاوى قضائية لا تزال قائمة أمام المحاكم المصرية .

www.zatmasr.com

لافارج مصر تتحالف مع "إل إم إس" للإنشاءات

وقعت شركة لافارج مصر التابعة لمجموعة لافارج هولسيم العالمية اتفاقية تحالف مع شركة "إل إم إس للإنشاءات" لتوريد وصب نحو 500 ألف متر مكعب خرسانة ، لمشروع "One

ويعتبر مشروع نظام استرجاع الحرارة المهذرة بقدرة 9 ميغاوات هو توسع استراتيجي لشركة ريسوت للإسمنت ، ذلك لأنه سيساعد الشركة في الالتزام بالحد من انبعاثات الكربون ، حيث سيتم توليد الطاقة من خلال استرجاع الغازات الساخنة المنبعثة من المحطة الحالية في صلالة .

وسيساهم هذا المشروع بشكل كبير في تحقيق أهداف الشركة الطموحة مثل الحد من استهلاك الطاقة بنسبة 25 % - 30 %، وخفض انبعاثات غاز ثاني أكسيد الكربون ، فضلاً عن الانخفاض الكبير في الاستهلاك المنتظم للمياه بأكثر من 50 % ينتج عنه فائدة بيئية مباشرة ويجعل عملية التصنيع أكثر كفاءة في استخدام الطاقة .

www.raysutcement.om

لبنان

وزير الصناعة اللبناني: فتح باب استيراد الإسمنت لن يرفع

سعره

قال وزير الصناعة اللبناني إن قرار وزارته بفتح باب استيراد الإسمنت يفتح الباب لتخفيض سعره وليس العكس ، مؤكداً أن الهدف هو تخفيض الأسعار .

www.arabic.sputniknews.com

ليبيا

الداخلية تتابع عمل لجنة التنسيق بين «الأهلية للإسمنت» ومديريات الأمن بمناطق جنوب طرابلس

ناقش مسؤولون بوزارة الداخلية في حكومة الوفاق الوطني ومدير أمن النواحي الأربعة سير عمل لجنة التنسيق بين "الشركة الأهلية للإسمنت" ومديريات الأمن في مناطق جنوب طرابلس ، بحسب ما أعلنته الوزارة . ولجنة التنسيق بين الشركة الأهلية للإسمنت ومديريات الأمن بمناطق جنوب طرابلس تشكلت تنفيذاً لقرار المفوض بوزارة الداخلية في حكومة الوفاق الوطني بهدف تسهيل حصول المواطنين الذين تضررت منازلهم وممتلكاتهم جراء حرب طرابلس على الإسمنت .

www.alwasat.ly

مصر

انتهاء بيع حصة إسمنت السويس المصرية في "الهلال" الكويتية

أعلنت بورصة الكويت الانتهاء من الإجراءات المقررة لبيع 51.75 مليون سهم في شركة إسمنت الهلال . وكان مجلس إدارة شركة السويس للإسمنت قد وافق في مارس / آذار 2020 على بيع مساهمة الشركة في شركة إسمنت الهلال والبالغة 51 % لأي مشتري مهتم .

وتُعد شركة السويس للإسمنت أكبر مساهم في إسمنت الهلال

إمكانية الاستفادة من التكنولوجيا والابتكار في خفض انبعاثات الاحتباس الحراري إلى الصفر ، لاسيما لجهة التصنيع .

ويُمثل التصنيع حوالي ثلث انبعاثات غازات الاحتباس الحراري العالمية ، إذ ينتج عنه غازات دفيئة (تتواجد في الغلاف الجوي) أكثر من الطاقة أو النقل ، ولكنه لا يحظى باهتمام كبير من خبراء البيئة وصناع السياسات .

ويُعتبر إنتاج الإسمنت والصلب من أكبر العوامل المسببة للتلوث ، والتي تشكل بدورها حوالي نصف جميع انبعاثات ثاني أكسيد الكربون الصناعية في جميع أنحاء العالم ، وفقاً لمركز أبحاث معهد الموارد العالمية .

ويُقدّر أن انبعاثات الإسمنت يجب أن تنخفض بنسبة 85 % إلى 91 % على مستوى العالم ، وانبعاثات الصلب بنسبة 93 % إلى 100 % بحلول عام 2050 لتحقيق هدف اتفاقية باريس لعام 2015 المتمثل في الحفاظ على الاحترار (أي درجة الحرارة السطحية المتوسطة) "أقل بكثير من" درجتين مؤبنتين فوق مستويات ما قبل الصناعة . ولكن ، مع ارتفاع عدد سكان العالم واستمرار نمو المدن بسرعة ، من المتوقع أن تكون هناك حاجة إلى المزيد من الصلب والإسمنت .

ويذكر غيتس أنه لا توجد حالياً طريقة لصنع الفولاذ والإسمنت دون إطلاق انبعاثات الاحتباس الحراري ، إذ تتطلب صناعة الصلب والإسمنت كميات هائلة من الحرارة ، والتي يتم تحقيقها عن طريق حرق الوقود الأحفوري .

وهنا ، قال الخبير البيئي في جامعة كولومبيا ، جوليو فريدمان: "حرق الوقود الأحفوري لإنتاج الحرارة للعمليات الصناعية مسؤول عن حوالي 10 % من إجمالي انبعاثات غازات الاحتباس الحراري العالمية" . وأشار إلى أن "الحل الأنسب يكمن في التقنيات النظيفة مثل التقاط الكربون وتخزينه ، والتي تتضمن التقاط غازات الاحتباس الحراري وتخزينها على المدى الطويل تحت الأرض أو في أعماق المحيطات ، أو استخدامها لصنع منتجات أخرى" .

بدوره ، استثمر غيتس حوالي ملياري دولار لتطوير تقنيات نظيفة ، بما في ذلك احتجاز الكربون وتطوير وقود طيران أكثر مراعاة للبيئة . وكان غيتس قد اعتبر أن "التكنولوجيا يمكنها إزالة الكربون من الإسمنت والصلب" ، داعياً الحكومات إلى زيادة ميزانياتها للبحث والتطوير لإيجاد واختبار المزيد من الحلول .

www.alhurra.com

"Ninety"، وهو أحد أهم وأكبر المشروعات العقارية بالقاهرة الجديدة .

وتتملك لافارج مصر ، مصنعا في العين السخنة بمحافظة السويس ، وتتبع لمجموعة لافارج هولسيم العالمية ، وتعد شريكاً رئيسياً في صناعة مواد البناء بمصر . أما شركة "إل إم إس" للإنشاءات فقد تأسست ، كشركة مساهمة مصرية في عام 2019 وتعمل في تنفيذ مشروعات البناء الضخمة .

www.economyplusme.com

قناة السويس تعلن تصدير أول سفينة إسمنت من ميناء شرق بورسعيد إلى أمريكا

قال رئيس المنطقة الاقتصادية لقناة السويس إن ميناء العريش يعمل بوضعه الحالي على توفير التصدير لعدد من الدول ، كما سيجري تطوير الميناء خلال الفترة القليلة المقبلة لخدمة التصدير على مستوى العالم .

وقد تم تصدير أول سفينة من ميناء شرق بورسعيد ، وهي سفينة محملة ب 18 ألف طن من الإسمنت للولايات المتحدة الأمريكية . وأوضح أن هناك خطة طموحة لتصدير الإسمنت والملح للأسواق المختلفة حول العالم ، ومنها السوق الأمريكية .

www.elwatannews.com

المغرب

تراجع مبيعات الإسمنت بنسبة 10 % خلال عام 2020

سجلت مبيعات الإسمنت ، المؤشر الرئيسي لنشاط قطاع البناء والأشغال العمومية ، تراجعاً نسبته 10 % خلال عام 2020 ، بعد أن سجلت ناقص 25.1 % في نهاية شهر مايو / أيار ، وزائد 3.1 % قبل ذلك بعام .

وكانت مبيعات الإسمنت قد استؤنفت على إثر قرار الرفع التدريجي للحجر الصحي ، (زائد 33 % خلال شهر يونيو / حزيران ، وزائد 18.6 % خلال شهر أغسطس / آب ، وزائد 7.8 % شهر سبتمبر / أيلول و زائد 6.7 % خلال شهر نوفمبر / تشرين الثاني 2020) ولكن من دون احتواء الانخفاض الكبير الذي تم تسجيله خلال فترة الحجر الصحي (ناقص 44 % ، خلال الفترة ما بين مارس / آذار ومايو / أيار 2020) .

www.mamlakapress.com

العالم

بيل غيتس: يمكن تجنب كارثة مناخية عبر اعتماد "التصنيع الأخضر"

مع بدء العد التنازلي لمؤتمر الأمم المتحدة للمناخ في نوفمبر / تشرين الثاني 2021 ، أطلق مطور البرمجيات ومؤسس شركة "مايكروسوفت" الأميركية ، بيل غيتس ، كتابه الجديد بعنوان "كيفية تجنب حدوث كارثة مناخية" ، ويتناول فيه

توفير الطاقة

إعداد: م. رئيس مهندسين صباح أحمد محمود / الشركة العامة للسمنت العراقية – جمهورية العراق

توفير الطاقة : هي عملية تخفيض الطلب المستمر على مصادر الطاقة المحدودة للسماح لها بإعادة التكوّن مرة أخرى ، وذلك عن طريق استخدام مصادر طاقة بديلة تُخفّف ضغط الطلب عليها ، تُسمّى هذه العملية بالوقود الخامس ، الذي يُستعاض به عن الوقود الأحفوري والذي يشمل النفط السائل ، والغاز ، والفحم الصلب ، والكهرباء الناتجة من المصادر النووية أو المائية .

طرق توفير الطاقة :

طرق توفير الطاقة في المنزل:

- استخدام مصابيح التوفير: حيث إنّها توفر ما بين 25 % إلى 80 % من الطاقة الكهربائية ، وتدوم أكثر بمقدار يتراوح بين 3 إلى 25 مرة ، ولها أنواع مختلفة ، مثل: مصابيح الهالوجين المتوهجة ، والمصابيح الفلورية المدمجة "CFL" ، ومصابيح الصمام الثنائي الباعثة للضوء "LED" .
- استخدام ميزان الحرارة المبرمج : وهو جهاز تتم برمجته لإيقاف ، أو تخفيض ، أو رفع درجة الحرارة تلقائياً في الغرف الفارغة أو التي يكون فيها الأشخاص نائمون، دون الحاجة إلى التحكم بنظام التكييف أو التدفئة يدوياً مما يوفر الطاقة .
- شراء الأجهزة الموفرة للطاقة : وغالباً ما تكون هذه الأجهزة ذات تكلفة شراء أعلى ، إلا أن تكاليف تشغيلها أقل من الأجهزة التقليدية على المدى الطويل بنسبة تتراوح بين 9 % إلى 25 % .
- تقليل نفقات تدفئة المياه : وذلك عن طريق استخدام كميات أقل من الماء الساخن ، أو خفض الحرارة في سخان المياه، أو عزله ، أو استبداله بأخر يوفر الطاقة ، مع الانتباه إلى نوع الوقود الذي يشغل السخان ، واختيار نوع سخان يتناسب مع حاجات المستخدمين .
- تركيب نوافذ مخصصة : وذلك عن طريق استخدام نوافذ تمنع تسرب الحرارة في المناطق الباردة ، مثل: النوافذ المزدوجة ، أو النوافذ المملوءة بالغاز المطلية بطبقة "low-e" ، وغيرها من أنواع النوافذ المخصصة لمنع تسرب الحرارة ، وفي المناطق الدافئة يمكن طلاء النوافذ بطلاء خاص من نوع "low-e" الذي يعكس الضوء الساقط عليها من الشمس مما يساهم في المحافظة على برودة الجو داخل المنازل .

طرق توفير الطاقة في أماكن العمل:

- **الإتارة :** استخدام نظام الإتارة "Bi-level switching" الذي يتحكم بتشغيل أو إغلاق المصابيح في المكتب حسب الحاجة لها . وكذلك استخدام مستشعرات خاصة مركبة مع المصابيح ، وظيفتها استشعار الإضاءة الطبيعية المحيطة وبناءً على ذلك تُخفّف من الإضاءة أو تزيدها ، كما أنها تشغل المصابيح وتطفئها حسب دخول الأشخاص إلى الغرفة أو خروجهم منها .
- **التدفئة والتبريد :** تغيير فتر الهواء الخاص بأنظمة التدفئة والتبريد دورياً كل 3 أشهر ؛ لأن تراكم الأوساخ عليه يقلل من تدفق الهواء عبره مما يساهم في هدر الطاقة ، أما إذا كان الاستخدام متكرراً فيُنصح بتغييره كل شهر وكذلك استخدام ميزان الحرارة المبرمج لتنظيم الحرارة داخل المكتب تلقائياً ، فذلك يساهم في توفير حوالي 180 دولاراً سنوياً .

طرق توفير الطاقة في المركبات:

- شراء سيارة موفرة للطاقة مثل السيارات الكهربائية والهجينة ؛ لأنها تقلل التلوث وانبعثات غازات الدفيئة إضافة إلى كونها موفرة للطاقة .
- تقليل حمولة السيارة ، حيث إنّ تخفيض 45 كغم من حمولة السيارة يساهم في خفض استهلاك الوقود بنسبة 2 % .
- نفخ الإطارات بمقدار مناسب ، حيث يساهم ذلك في تقليل استهلاك الوقود بنسبة 3 % ، ويقلل من انبعثات ثاني أكسيد الكربون بمقدار 124 كغم سنوياً تقريباً .
- استخدام زيت المحرك المناسب لمحرك السيارة ، فذلك يقلل استهلاك الوقود بنسبة 1-2 % .
- الصيانة الدورية لقطع المركبة؛ كالمكابح والمحرك وغيرها لخفض استهلاك الوقود .
- استخدام محرك مكربن ، واستبدال مرشحات الهواء المغلقة لخفض استهلاك الوقود بمقدار 10 % .
- استخدام خيارات أخرى للنقل كوسائل النقل العام أو ركوب الدراجة .



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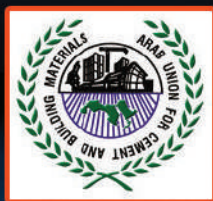
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مدى تأثير عدد من العوامل المختارة على استقلال مراجع الحسابات في المملكة العربية السعودية: دراسة ميدانية

The Extent to which a Number of Selected Factors Affect the Auditor's Independence in the Kingdom of Saudi Arabia: An Empirical Study

إعداد : وجدان علي الكاف

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Abstract: This research aims at uncovering the extent to which a number of selected factors affect the auditor's independence in the Kingdom of Saudi Arabia including, long lasting audit assignments, the provision of additional professional services to audit clients, and the reduction and undisclosed audit fees.

The significance of this research resides in the importance of providing bases upon which evaluating such factors could be undertaken in order to minimize their negative effects. In order to accomplish the aim of the research, a positive theory has been implemented, through reviewing previous research and searching for proper indicators that can be used in the conduct of the empirical study and examining the research hypotheses. The research data has been gathered by using questionnaire and analyzed through various proper statistical methods. The researcher - in conducting the

empirical study – has categorized the research society into two main divisions: including certified public accountants and beneficiary parties.

The results of the empirical study have shown that the research hypotheses were correct, as they proved that long lasting audit assignments, the provision of additional professional services to audit clients, and the reduction and undisclosed audit fees do not affect negatively the auditor's independence.

By way of conclusion, the researcher has highlighted the need for auditors' legal protection in order to sustain their independence, and finally she highlighted the need for improving auditors and public awareness of the auditor's role and nature of work.

Keywords: auditor's independence, auditing, auditor, audit fees, audit offices.

خلال مراجعة الأدبيات السابقة ذات العلاقة بموضوع البحث بغية استخلاص مجموعة من المؤشرات التي يمكن الاعتماد عليها في إجراء الدراسة الميدانية، واختبار فرضيات البحث. كما تم جمع البيانات باستخدام أداة الاستبانة وتحليلها باستخدام الأساليب الإحصائية الملائمة. وقد اعتمدت الباحثة - في إجراء الدراسة الميدانية - تقسيم مجتمع البحث إلى طرفين رئيسيين: يشمل الطرف الأول المحاسبين القانونيين، ويشمل الطرف الثاني المستفيدين من خدمات مكاتب المراجعة. وقد تم اختيار عينة البحث عشوائياً من الطرفين محل البحث.

المخلص: يهدف هذا البحث إلى كشف النقاب عن مدى تأثير عدد من العوامل المختارة على استقلال المراجع في المملكة العربية السعودية، وتشمل تلك العوامل: استمرار المراجع لسنوات طويلة في مراجعة حسابات عميل معين، وتقديم خدمات مهنية إضافية إلى جانب مراجعة الحسابات، وانخفاض وتدني أتعاب المراجعة وعدم الإفصاح عنها.

وتتبع أهمية هذا البحث من الحاجة إلى توافر أسس يمكن الاستناد إليها في تقييم تأثير تلك العوامل وبالتالي التقليل من آثارها السلبية. ولتحقيق هدف البحث، تم توظيف النظرية الإيجابية من

مشكلة البحث:

على الرغم من كون جميع الجهات المختصة بتنظيم المهنة كانت ولا تزال تؤكد على استقلال المراجع الخارجي، إلا أن الجدل القائم حول مدى وجود ذلك الاستقلال الفعلي للمراجع الخارجي الواضح من خلال العديد من الدراسات والبحوث يشير إلى وجود شك مستمر حول فاعلية استقلال المراجع الخارجي أو تأثره بعوامل مختلفة (السديري، 1426 هـ).

وحيث أن قيمة تقرير المراجع تستمد عادةً من ثقة مستخدمي المعلومات التي يشتمل عليها ذلك التقرير في استقلال المراجع وموضوعيته، فإنه بدون تلك الثقة لن نتاح للمراجع الفرصة الكاملة لتقديم خدماته. وعليه تتنبع مشكلة البحث من أن فقدان الاستقلال نتيجة أحد تلك العوامل المؤثرة عليه سيؤدي إلى عواقب وخيمة ليس فقط على المراجع كفرد بل على مستوى المهنة بشكل عام وتنظيمها الذاتي الذي تتمتع به، الأمر الذي طالما حاول المهنيون تفاديه بمختلف الوسائل لما له من آثار تؤدي إلى فقدان المزايا التي يكفلها التنظيم والتي تتمشى مع تحقيق مصالح المهنيين (السديري، 1426 هـ).

ونذكر من العوامل التي قد تؤثر على استقلال المراجع الخارجي على سبيل المثال لا الحصر: استمرار المراجع لسنوات طويلة في مراجعة حسابات عميل معين، تقديم خدمات مهنية أخرى بجانب مراجعة الحسابات لعميل معين، مستوى المنافسة بين مكاتب المراجعة، تدني وانخفاض أتعاب المراجعة، تعارض المصالح بين الفئات المختلفة.

هدف البحث وأهميته:

تهدف هذه الدراسة بصفة رئيسية إلى كشف النقاب عن مدى تأثير عدد من العوامل المختارة على استقلال مراجع الحسابات وموضوعيته في إبداء رأيه عن القوائم المالية، وذلك من خلال استطلاع آراء المهتمين في ذلك المجال وتحديد المراجعين ومدراء الشركات - محل المراجعة - وملاكها والمستثمرين ومسؤولي البنوك والأكاديميين والكتاب الماليين والاقتصاديين والمحليين الماليين والمسؤولين الحكوميين.

وفي سبيل تحقيق ذلك الهدف يعتمد البحث على توظيف نموذج نظري تم تطويره من خلال عدد من البحوث المرتبطة بموضوع استقلال المراجع، ويقدم هذا النموذج عدداً من المؤشرات التي سوف يتم الاستناد إليها عند إجراء الدراسة الميدانية التي يقدمها البحث في تقييم مدى تأثير عدد من العوامل التي قد تضعف استقلال المراجع الخارجي، ويرتبط تحديد تلك المؤشرات بتحديد تلك العوامل وهي:

- 1 - استمرار المراجع لسنوات طويلة في مراجعة حسابات عميل معين.
- 2 - تقديم خدمات مهنية أخرى بجانب مراجعة الحسابات لعميل معين.
- 3 - تدني وانخفاض أتعاب المراجعة وعدم الإفصاح عنها.

وتتبع أهمية البحث من الحاجة إلى توافر رؤية واضحة عن مدى تأثير عدد من العوامل المختارة على استقلال المراجع الخارجي حتى يمكن تجنب آثارها السلبية، ومن الحاجة إلى توافر أسس يمكن الاستناد إليها في تقديم طرق لتدعيم الاستقلال من قبل

وقد أشارت نتائج الدراسة الميدانية إلى صحة فرضيات البحث، حيث أثبتت أن استمرار المراجع لسنوات طويلة في مراجعة حسابات عميل معين، وتقديم خدمات مهنية إضافية إلى جانب مراجعة الحسابات، وانخفاض وتدني أتعاب المراجعة وعدم الإفصاح عنها، لا تؤثر سلباً على استقلال المراجع.

وفي خاتمة البحث، أبرزت الباحثة الحاجة إلى توفير الحماية القانونية للمراجعين للحفاظ على استقلالهم، كما أشارت إلى أهمية تحديث نتائج البحث بشكل مستمر من خلال متابعة البحث حول تأثير تلك العوامل بتطبيق منهجيات بحثية حديثة، وأخيراً أكدت ضرورة نشر الوعي بين المراجعين لرفع كفاءتهم وبين الأطراف المستفيدة لتعريفهم بدور المراجع وطبيعة عمله.

الكلمات المفتاحية: استقلال مراجع الحسابات، مراجعة الحسابات، المحاسبة القانونية، أتعاب المراجعة، مكاتب المراجعة.

المقدمة

برزت الحاجة لوجود مهنة المراجعة من ظهور أهمية توفر رأي صادق وعادل عن القوائم المالية للمنشآت بهدف حماية مصالح الملاك وغيرها من الأهداف المختلفة لجميع المستخدمين، ويعتمد إبداء المراجع لرأيه السليم والموضوعي على العديد من العوامل من ضمنها استقلال المراجع الخارجي (السديري، 1426 هـ)، وبذلك أصبحت الحاجة ماسة لتأطير هذا الحياد والاستقلال وضمان تدعيمه. الأمر الذي جعل استقلال مراجع الحسابات من أهم موضوعات المراجعة التي نالت اهتمام كبير منذ البدايات الأولى لتكوين مهنة المراجعة، لاسيما وأنه يعد أحد المعايير العامة للمهنة، بالإضافة إلى كونه الركيزة الأساسية للثقة التي يضيفها تقرير المراجع على القوائم المالية للمنشآت (العنقري، 1424 هـ؛ غالي، 2001 م).

ولا شك أن حياد وموضوعية المراجع يعتمد على استقلاله الفكري في جميع ما يتعلق بالمراجعة وخاصة عند تقييمه للأدلة والقرائن الناتجة من اختبارات المراجعة وعند الوصول إلى رأيه في القوائم المالية. ولكن من المهم أيضاً أن يتجنب المراجع الخارجي العلاقات المالية والإدارية والاجتماعية التي من شأنها أن تؤدي إلى شك الآخرين في حياده وموضوعيته نظراً لعدم توفر الفرصة لدى المراجع لإزالة شك من يعتمدون على تقريره. ولذلك تضمنت قوانين الشركات وقواعد السلوك المهني الصادرة في أغلب دول العالم العديد من الضوابط التشريعية والمهنية التي تستهدف أن تجنب المراجع المواقف التي قد تؤثر على استقلاله (جمعة، 1426 هـ).

ويأخذ حياد وموضوعية واستقلال المراجع الخارجي درجة كبيرة من الأهمية في المملكة العربية السعودية نظراً للتغيرات الاجتماعية السريعة وللتطور المستمر في اتجاه العامة إلى الاستثمارات المالية ومن ثم احتياجهم إلى قوائم مالية تتميز بدرجة عالية من الثقة في محتوياتها كإحدى مصادر المعلومات لتقييم بدائل الاستثمار المتاحة لهم واتخاذ القرارات. ومن ثم قد يؤدي الشك في حياد وموضوعية واستقلال المراجع الخارجي إلى فقدان الثقة في تقريره وبالتالي في القوائم المالية موضوع المراجعة، مما قد يؤدي إلى صعوبة الاعتماد عليها في اتخاذ القرارات الاقتصادية السليمة، وإلى إعاقة اتجاه العامة نحو الاستثمارات المالية.

الحسابات في الحقيقة، وذلك من منطلق أن مفهوم الاستقلال في الحقيقة لم يكن ملحوظ بالنسبة للمستثمرين. وفي سبيل تحقيق هذا الهدف قام الباحثون باختبار الاستقلال باستخدام اختلاف مستويات الإفصاح العام عن نطاق الخدمات المهنية الأخرى التي تقدمها مكاتب المحاسبة بجانب خدمة المراجعة. ولقد أشار الباحثون إلى تقسيم (SEC) و American Institute (AICPA) (for Certified Public Accountants) ولجنة معايير الاستقلال (Board, ISB) لمفهوم الاستقلال إلى نوعين وهما: الاستقلال في الحقيقة، والذي يشير بأن المراجع يمتلك فكر مستقل عندما يخطط وينفذ عملية المراجعة، وأن تقرير المراجعة الذي يصدره غير متحيز؛ والاستقلال في الظاهر، والذي يتبين من كون المراجع يظهر للمستخدمين بأنه مستقل. وأخيراً توصل الباحثون إلى أن الإفصاح عن المعلومات حول الخدمات المهنية الأخرى التي تقدمها مكاتب المحاسبة بجانب خدمة المراجعة لا تزيد دقة اعتقادات المستثمرين حول درجة الاستقلال في الظاهر ماعدا في الحالة التي يكون المراجع فيها مستقلاً في الظاهر وفي الحقيقة، وفي المقابل تتخفف دقة اعتقادات المستثمرين بشكل معنوي حول استقلال المراجع في الحقيقة عندما يكون المراجع مستقلاً في الحقيقة ولكنه غير مستقلاً في الظاهر، أو عندما يكون مستقلاً في الظاهر ولكنه غير مستقلاً في الحقيقة.

وفي نفس السياق تشير دراسة (Baker, 2005) إلى استمرار تغير مفهوم استقلال المراجع عبر الزمن، وتحديدًا خلال السنوات المائة والخمسين الماضية، فالمفهوم الأولي لاستقلال المراجع الذي ظهر أثناء القرن التاسع عشر الميلادي يستند إلى المسلمة القائلة بأن الواجب الرئيسي للمراجعين كان الإشراف على استثمارات الإمبراطورية البريطانية، وأثناء هذه الفترة كان عدد صغير نسبياً من شركات المحاسبة يمكن أن يقدم خدمة المراجعة لعدد كبير نسبياً من المنشآت التي قد يكون لهم مصالح فيها. بينما مفهوم استقلال المراجع خلال العصر الحالي لا يتحمل إمكانية قيام المراجع بمراجعة منشأة له فيها مصالح حتى لو بشكل غير مباشر.

الدراسات التي تناولت العوامل المؤثرة على استقلال المراجع :

ناقشت دراسة (Flaming, 2002) تأثير زيادة مستويات تقديم خدمات مهنية غير المراجعة بواسطة مكاتب المحاسبة لعملائهم على استقلاليتهم وجوده مراجعاتهم، حيث ذكر الباحث أن متطلبات الإفصاح الجديدة لهيئة سوق الأوراق المالية الأمريكية (SEC) تكشف أن معدل أجور الخدمات المهنية الأخرى بخلاف المراجعة إلى أجور المراجعة تزيد عن 200 %، وأن تلك الخدمات الأخرى لا تؤثر فقط على قدرة المراجع ليكون مستقلاً بل على مفاهيم الاستثمار العامة للمراجع، ولقد أكدت نتائج التحليل أن تصورات استقلال المراجع تتأثر سلبياً بتقديم خدمات مهنية بجانب المراجعة لنفس العميل.

كما حاولت دراسة (Abu Bakar et al., 2005) تقديم فهم عن العوامل المؤثرة على استقلال المراجع من وجهة نظر مسؤولي القروض التجارية في ماليزيا والذين يشكلون عينة الدراسة باعتبارهم أحد فئات مستخدمي القوائم المالية الذين يدركون أهمية تقرير المراجعة وقضية استقلال المراجع،

الجهات المختصة بتنظيم المهنة، كما يستمد هذا البحث أهميته من الفوائد التي ستعود – بحول الله – على مهنة المراجعة من خلال نتائج البحث التي تأمل الباحثة أن تسهم بشكل فعال في إثراء البحث العلمي وخدمة الفكر المحاسبي بشكل عام ومهنة المراجعة بشكل خاص، وذلك من خلال كونها ستقدم أساساً أكاديمياً لدراسات أخرى مرتبطة - على سبيل المثال - بالتغيرات التي طرأت على مفهوم الاستقلال على مر الزمن في المحيط المهني بالبيئة المحلية.

مراجعة الأدبيات السابقة ذات العلاقة

الدراسات التي تناولت مفهوم استقلال المراجع وأهميته:

تعددت الدراسات التي ناقشت مفهوم استقلال مراجع الحسابات وأهميته في بيئات مختلفة. فمثلاً دراسة (Jenkins, 2003)، والتي كان يهدف فيها الباحث إلى فحص الروابط والمصالح المشتركة بين إدارات الشركات من جانب ونوعين من آليات الرقابة من جانب آخر، هما: لجان المراجعة واستقلال المراجع. تلك الروابط والمصالح المشتركة - كما أشار البحث - تسبب وجود نوع من القلق حول قلة الإشراف من قبل لجان المراجعة وتأثير تقديم خدمات استشارية بجانب المراجعة على استقلال المراجع وبالتالي على جودة التقارير المالية، وهو ما استدعى قيام هيئة سوق الأوراق المالية الأمريكية (SEC) بإصدار مجموعة من التعليمات والقواعد التي تحكم عمل لجان المراجعة واستقلال المراجع. وفي سبيل تحقيق ذلك الهدف، اعتمدت الدراسة على البيانات المجمعة من القوائم المالية الممثلة لعام 2001م من عينة مكونة من 1000 شركة، وتوصل إلى أن توافر لجان مراجعة فعالة ومراجعين مستقلين يؤثر بشكل إيجابي على جودة التقارير المالية.

وفي دراسة أخرى (Taylor et al., 2003) قدم من خلالها الباحثون إطاراً جديداً لموضوعية المراجع، يعيد بدوره وضع وموقف استقلال المراجع إلى مهنة المراجعة. هذا الإطار يتطلب - كما أشار الباحثون - توافر ثلاثة عناصر أساسية لتحقيق الرقابة الذاتية في قرارات وأحكام المراجع وهي: الاستقلال، والأمانة، والخبرة. واختتم الباحثون بقولهم أن الهدف الأساسي للمراجعة الخارجية المستقلة هو تزويد المستخدمين بتأكيد معقول بأن القوائم المالية خالية من الغش المادي، وتمثل بعدالة نتائج الأعمال والمركز المالي وفق متطلبات المبادئ المحاسبية المتعارف عليها. إضافة إلى ذلك، أكد الباحثون على أن المنهجيات التقليدية في البحوث المتعلقة بالاستقلال تقترح دائماً أن ضمان استقلال المراجع يوجد فقط في حالة اعتقاد العملاء (ملاك المنشآت محل المراجعة) بأن المراجع مستقل ومتحرر من تعارض المصالح سواء في الحقيقة أو في الظاهر، وعليه فإن ممارسي المهنة والباحثين يسلطون الضوء على الاستقلال كأحد أهم الوسائل لتقديم الضمان لهؤلاء العملاء، بالرغم من أن التاريخ يشير بوضوح إلى أن المراجعين يواجهون بشكل مستمر صعوبة في الحفاظ على هذا الاستقلال كحجر زاوية للمهنة وأساساً لثقة المجتمع فيها.

وهناك العديد من الدراسات التي تناولت مفهوم استقلال المراجع وتباينه بين الظاهر والحقيقة، فمثلاً دراسة (Dopuch et al., 2003) والتي تهدف إلى تقصي مدى توافر استقلال مراجع

هدفت دراسة (بكر، 1427هـ) إلى توضيح مفهوم القيمة المضافة لمراجعة الحسابات في جيلها الرابع وكشف النقاب عن معوقات تقديمها والطلب عليها في المملكة العربية السعودية، وتشمل عينة الدراسة المحاسبين القانونيين والأطراف المستفيدة من خدماتهم، وقد أكدت نتائج الدراسة الميدانية وجود علاقة عكسية بين تقديم المراجع للخدمات ذات القيمة المضافة واستقلاله.

وفي المقابل نجد وجهة النظر حول الخدمات المهنية الأخرى مختلفة أو معاكسة في دراسة (الجفري، 1427هـ) التي تهدف إلى الكشف عن دوافع اتجاه مكاتب المراجعة في المملكة العربية السعودية نحو توسيع نطاق خدماتها المهنية لتتضمن خدمات استشارية مالية وإدارية واقتصادية وتقنية إلى جانب خدمات المحاسبة والمراجعة، كما تناقش الدراسة أثر تقديم تلك الخدمات إلى عميل المراجعة على استقلال المراجع. ولتحقيق هذا الهدف تم تحديد ثلاث فرضيات تم اختبارها باستخدام استبانة تشتمل على عدد من المحددات والمقاييس تم توظيفها للتعامل مع كل فرضية، وتم تقسيم العينة إلى طرفين، يمثل الطرف الأول المحاسبين القانونيين جانب العرض ويمثل الطرف الثاني المستفيدين من خدمات مكاتب المراجعة جانب الطلب. ولقد أشارت نتائج الدراسة إلى اتفاق طرفي العينة على مجموعة من عوامل عرض وتقديم مكاتب المراجعة الخدمات الأخرى خلاف المراجعة التقليدية، ومجموعة أسباب الطلب عليها، كذلك تشير النتائج إلى أن تقديم مكاتب المراجعة تلك الخدمات إلى عميل المراجعة له تأثير محدود أو لا يؤثر على استقلال المراجع.

وفي دراسة (Craswell et al., 2002) والتي تم إجراؤها على عينة من الشركات الأسترالية خلال الفترة ما بين 1994م و1996م، وباستخدام نموذج يتكون من مجموعة من المتغيرات التي تهدد استقلال المراجع لدراسة أثر تحديد الأتعاب على استقلال المراجع. شملت تلك المتغيرات: حجم منشأة العميل، وخطر المراجعة، وحجم مكتب المراجعة. وأشارت نتائج الدراسة إلى أن شركات المراجعة الكبرى أكثر حرصاً على المحافظة على سمعة المكتب، وأكثر قدرة على اكتشاف الأخطاء والمخالفات، حيث تشكل أتعاب المراجعة التي يتقاضاها المكتب الكبير من العميل جزءاً أقل في الأهمية من الأتعاب التي يتقاضاها المكتب الصغير، مما يجعله أكثر عرضة واستعداداً لفقد الاستقلال. أما دور الإدارة في تعيين المراجع فقد تم التطرق إليه أيضاً في هذه الدراسة من واقع أنه يزيد الضغط على المراجعين. وقد أظهرت الدراسة نتائج هامة تشير إلى تزايد مقدرة المراجعين على إصدار الرأي المتحفظ أو المعارض في الحالات التي يتم فيها الإفصاح الإيجابي عن الأتعاب، بغض النظر عن الأهمية الاقتصادية للعميل بالنسبة للمراجع.

وفي نفس السياق، ناقشت دراسة (Dopuch et al, 2003) مدى استجابة المستثمرين للإفصاح عن أتعاب الخدمات المهنية الأخرى بخلاف المراجعة عند تقييم مدى استقلال المراجعين، ومدى تأثير أتعاب المراجعة بقاعدة الاستقلال الحديثة الصادرة من قبل (SEC) في 15 نوفمبر 2000م، والتي تتطلب من الشركات المساهمة الإفصاح في قوائمها المالية السنوية عن حجم أتعاب الخدمات المهنية التي تم الحصول عليها بخلاف المراجعة، وذلك من منطلق أن الإفصاح الجديد سينطوي على إخبار المستثمرين بدوافع المراجعين للتنازل عن استقلالهم. وصُممت الدراسة باستخدام أسواق تجريبية وباستخدام أسلوب الملاحظة

وتوصلت الدراسة إلى أن حجم شركات المراجعة، وعمل تلك الشركات ضمن مستوى عالٍ من البيئة التنافسية، وطول فترة خدمة شركة المراجعة للعميل، ومستوى أتعاب المراجعة، وتقديم خدمات إدارية واستشارية لعملاء المراجعة، وعدم وجود لجنة مراجعة لدى الشركات محل المراجعة، كلها عوامل يُنظر إليها بأنها مسبب كبير لفقدان استقلال المراجع. ويرى الباحثون أن حجم شركة المراجعة يظهر بأنه العامل الأكثر تأثيراً على استقلال المراجع ويليه عوامل المنافسة وتقديم الخدمات الاستشارية والإدارية ومستوى أتعاب المراجعة.

أما دراسة (Ryan et al., 2001) فقد استعرضت وناقشت خمس عوامل مرتبطة باستقلال المراجع، والتي ذكرتها (SEC) وهي: المبادئ التي تنظم وتحدد مدى استقلال المراجع، العلاقات المالية والضغط الاقتصادي لعميل المراجعة، تقديم خدمات مهنية بخلاف المراجعة للعميل في آنٍ واحد، الإفصاح عن أجور الخدمات المهنية الأخرى بخلاف المراجعة.

ولقد أشار الباحثون إلى أن القاعدة الحالية لـ (SEC) تتطلب من الشركات تصنيف الخدمات المهنية الأخرى إلى نوعين: تلك المتعلقة بنظم المعلومات المالية وتلك المتعلقة بجميع الخدمات الأخرى، بالإضافة إلى ضرورة الإفصاح عن إجمالي الأتعاب لكلا النوعين، كما تتطلب هذه القاعدة الإفصاح عما إذا كانت لجنة المراجعة تأخذ في اعتبارها تأثير تقديم المراجع لخدمات مهنية غير المراجعة بنوعها على استقلال المراجع. وقد تم تعديل هذه القاعدة بحيث أصبح يطلب من مكاتب المحاسبة تحديد نسبة إجمالي ساعات المراجعة المؤداة فقط في حال كانت النسبة تزيد عن 50%.

وبالمثل، تساءلت دراسة (Hay et al., 2006) عن البيئة النيوزيلندية حول ما إذا كان المراجعون الذين يقدمون خدمات مهنية بخلاف خدمة المراجعة أكثر يُعدون أقل استقلالاً؟ وقد استخدم الباحثون ثلاث مجموعات من الاختبارات لمعالجة تلك القضية، الأولى تفحص ما إذا كان هناك علاقة بين أتعاب المراجعة وأتعاب الخدمات المهنية الأخرى، والثانية تفحص ما إذا كان هناك علاقة بين أتعاب الخدمات المهنية الأخرى وتقرير المراجعة المعدل، والثالثة تفحص ما إذا كان هناك علاقة بين أتعاب الخدمات المهنية الأخرى واستقرار مدة خدمة المراجعة، وتوصلت الدراسة إلى ضعف استقلال المراجع في حالة تقديم المراجعين للخدمات مهنية أخرى بجانب خدمة المراجعة لنفس العميل.

من جانب آخر، ناقشت دراسة (Krishnan, 2006) قضية ما إذا كان المستثمرون يدركون بأن استقلال المراجع يكون ضعيفاً عندما يقوم المراجع بتقديم خدمات مهنية أخرى بجانب المراجعة لعميله. ولهذا الغرض قام الباحثون باختبار ردود فعل سوق الأسهم المالية تجاه الإيرادات غير المتوقعة للشركات التي تطلب المستويات العليا من الخدمات الاستشارية بأنها تكون أقل من تلك التي تطلب المستويات الأدنى من تلك الخدمات. وفي هذا الصدد تم استخدام بيانات أتعاب المراجعين الواردة في سجلات الشركات الممتلئة خلال الفترة من فبراير وحتى نهاية ديسمبر من عام 2001م، وتوصلت النتائج إلى أن تقديم الخدمات الاستشارية لعميل المراجعة من شأنه إضعاف استقلال مراجع الحسابات.

وفي البيئة المحلية نجد دراسات مماثلة ذات نتائج مشابهة، حيث

تلك الخدمات إلى عميل المراجعة له تأثير محدود أو لا يؤثر على استقلال المراجع.

الإطار المنهجي للبحث

تم في هذا البحث استخدام المنهج الإيجابي الذي يهتم بالتحليل والتنبؤ بما سوف يحدث بالاعتماد على ما هو كائن فعلاً في واقع الظاهرة محل الدراسة، من خلال مراجعة الأدبيات السابقة ذات العلاقة. واستناداً إلى مضمون ومقتضيات المنهجية البحثية المستخدمة تم صياغة الفرضيات التالية كأساس للدراسة الميدانية التي سيتم إجراؤها على محيط مهنة المراجعة بالمملكة العربية السعودية، وذلك تمهيداً لاختبارها وتحليلها إحصائياً:

1 - الاستمرار لسنوات طويلة في مراجعة حسابات عميل معين لا يؤثر سلباً على استقلال المراجع.

2 - تقديم خدمات مهنية إضافية إلى جانب مراجعة الحسابات لا يؤثر سلباً على استقلال المراجع.

3 - انخفاض وتدني أتعاب مراجعة الحسابات وعدم الإفصاح عنها لا يؤثر سلباً على استقلال المراجع.

وفيما يختص بجمع وتحليل بيانات الدراسة الميدانية، تم الاعتماد على أسلوب الاستبانة كأداة لجمع البيانات من عينة البحث لمجتمع مكاتب المراجعة العاملة في المملكة العربية السعودية. وقد تم تصميم استبانة الاختبار وفقاً لمتطلبات مقياس ليكرت ذي النقاط الخمس وبما يتلاءم مع مضمون الفرضيات الثلاث المحددة تمهيداً لاختبارها وتحليل نتائجها إحصائياً من خلال استخدام مجموعة من الأساليب الإحصائية المناسبة لطبيعة البيانات، ونوع العينة، وأهداف الدراسة.

وفيما يتعلق بمجتمع البحث، فقد تم تحديده في الطرفين التاليين:

1 - المحاسبون القانونيون المنتسبون لمكاتب المراجعة العاملة بالمملكة العربية السعودية. فالتركيز على وجهات نظر هؤلاء المهنيين يساعد في تحقيق أهداف البحث خاصة وأنهم المعنيون بشكل مباشر بالمحاور الثلاثة محل الدراسة الميدانية (استمرار المراجع لسنوات طويلة في مراجعة حسابات عميل معين، تقديم خدمات مهنية أخرى بجانب مراجعة الحسابات، انخفاض أتعاب المراجعة وعدم الإفصاح عنها).

2 - المستفيدون من الخدمات التي تقدمها مكاتب المحاسبين القانونيين في المملكة العربية السعودية من مدراء وملاك بعض الشركات ومستثمرين ومدراء ماليين ومسؤولين في البنوك ومسؤولين حكوميين وأكاديميين ومحللين ماليين وكتاب ماليين أو اقتصاديين.

لسلوك المستثمرين خلال 12 دورة تسويقية، وتتضمن كل دورة 6 مستثمرين تتم مراقبتهم لمدة 15 يوماً تجريبياً، ولقد استنتج الباحثون أن الإفصاح عن أتعاب الخدمات المهنية الأخرى (غير المراجعة) يخفض من كفاءة أسواق رأس المال في حال إذا كان مثل هذا الإفصاح يشكل اعتقادات خاطئة لدى المستثمرين عن استقلال المراجع في الحقيقة، وهي أن المراجعين يبدون مستقلين في الظاهر بينما هم ليسوا كذلك في الحقيقة. كما تشير النتائج إلى اعتراف المراجع بأن ردة فعل المستثمرين ضد الإفصاح عن الأتعاب سوف تدفعهم لتغيير مستويات الحصول على الخدمات المهنية الأخرى بجانب المراجعة. وأخيراً يذكر الباحثون احتمالية عدم إدراك المستخدمين للاقتناع بالدليل التجريبي الذي يكشف مدى تمثيل استقلال المراجع في الظاهر لاستقلال المراجع في الحقيقة في الأسواق الفعلية، حيث أن شركات المراجعة تواجه باستمرار دوافع اقتصادية لتحافظ على الشركات العميلة (مثال: تخفيض التكاليف للمراجعات المستقبلية، والأجور الاقتصادية من تقديم خدمات مراجعة إضافية أو خدمات مهنية أخرى)، تلك الدوافع في حد ذاتها تُعد تهديد دائم لاستقلال المراجع.

وبالمثل، دراسة (Ashbaugh et al., 2003) والتي تهدف إلى التحري عن ردود أفعال السوق تجاه الإفصاح عن أتعاب المراجعة، وما إذا كان المراجعون يتنازلون عن استقلالهم في حالة زيادة أتعاب الخدمات المهنية الأخرى الإضافية نسبة إلى إجمالي الأتعاب. وهذا الهدف يأتي من منطلق قلق (SEC) حول تلك الزيادة خلال التسعينات، وهذا القلق بدوره يعتمد على المسلمة القائلة بأن تقديم خدمات مهنية أخرى غير المراجعة يزيد الأتعاب المدفوعة لشركات المحاسبة، وبذلك زيادة اعتماد شركة المحاسبة اقتصادياً على العملاء. ولقد استخدم الباحثون أسلوب التحليل التجريبي للعينة المكونة من شركتين لديهما نسبة أتعاب قدرها 73 %، وأحد الشركتين تم تقدير إجمالي أتعابها بمبلغ 71 ألف دولار، أما الأخرى فإجمالي أتعابها قدر بمبلغ 5,7 مليون دولار. وبالاعتماد على تلك النسب، فإن كلا الشركتين تتعرضان لتهديد فقدان استقلالهما، بينما فقط الأخيرة تُعد هامة اقتصادياً للمراجع. وتوصلت الدراسة إلى أن الارتباط بين إجمالي الأتعاب ونسبة الأتعاب غير معنوي إحصائياً، وبالتالي لا يوجد دليل على ردود أفعال السوق تجاه أهمية أتعاب الخدمات المهنية الأخرى بالنسبة إلى إجمالي الأتعاب.

ولقد اتضح للباحثة أن غالبية تلك الدراسات والبحوث ركزت على أثر توسيع نطاق الخدمات المهنية على استقلال المراجع باستخدام الأساليب والمناهج الحديثة من أجل تلبية احتياجات العملاء وحرصاً على التميز من خلال إضافة قيمة إلى عملية المراجعة. كما لاحظت من خلال استعراض تلك الأدبيات وجود تضارب في الآراء بين مجموعة تناادي وتدعو إلى توسيع نطاق الخدمات المهنية استجابة للظروف المحيطة بهم، وبين مجموعة أخرى تحذر من قيام المراجع الخارجي بأي خدمة مهنية خلاف المراجعة للعميل حفاظاً على حياده واستقلاله. ومن الجدير بالذكر أن معظم تلك الدراسات عارضت تقديم تلك الخدمات المهنية الأخرى لكونها تضعف استقلال المراجع، في حين أن عدداً محدوداً من الدراسات أشارت إلى أن تقديم مكاتب المراجعة

| المؤشرات الموجهة لاختبار فرضيات البحث | | |
|---------------------------------------|--|---|
| م | مؤشرات تأثير استمرار المراجع لسنوات طويلة في مراجعة حسابات عميل معين على استقلاله | مؤشرات تأثير تقديم خدمات مهنية أخرى بجانب مراجعة الحسابات على استقلال المراجع |
| 1 | نشوء علاقة خاصة بين فريق عمل المراجعة وموظفي إدارة منشأة العميل | ارتفاع نسبة إيرادات الخدمات المهنية الأخرى إلى نسبة إيرادات خدمة المراجعة المقدمة لنفس المنشأة |
| 2 | نشوء علاقة خاصة بين الشريك المسئول عن العملية والإدارة العليا لمنشأة العميل | زيادة الروابط الاقتصادية بين المراجع وإدارة منشأة العميل مما جعل الأول تابعاً وممثلاً للثاني |
| 3 | الاعتماد على نتائج المراجعة لسنوات سابقة بشكل كبير في تفادي القيام بمهام مراجعة أساسية بهدف تخفيض مستوى الأتعاب | عدم وجود تضارب في المصالح بين المراجع وإدارة منشأة العميل، على اعتبار أن المراجع مسئول أمام الإدارة عن الخدمات المهنية الأخرى |
| 4 | تقلص مستوى حس اليقظة المهنية والمفترض أن يتحلى به المراجع بشكل مستمر | تحول مسؤوليات والتزامات المراجع لتصبح أمام إدارة المنشأة محل المراجعة فقط بدلاً من ملاكها والأطراف الأخرى المستفيدة |
| 5 | الاعتماد بشكل كبير على موظفي منشأة العميل في القيام بمهام يفترض أن يؤديها فريق عمل المراجعة | تحول وظيفة مراجعة الحسابات من إضفاء الثقة على القوائم المالية المعدة بواسطة إدارة منشأة العميل لتصبح أداة تعكس جودة الخدمات المهنية الأخرى التي يقدمها المكتب المهني بجانب خدمة المراجعة |
| 6 | تراكم مستحقات مكتب المراجعة من الأتعاب عاماً بعد عام، مما يجعل المكتب يواجه ضغوط مالية من إدارة منشأة العميل | محاولة تقليص نطاق أعمال المراجعة للتقليل من تكاليف تنفيذها وإنجازها |
| 7 | قيام المراجع بتقديم النصح والاستشارات التي تساعد إدارة العميل في تطوير وتحسين نظمها وأنشطتها بشكل تلقائي غير متفق عليه | تحول هدف مراجعة الحسابات من إبداء رأي فني محايد عن مدى عدالة القوائم المالية المعدة بواسطة إدارة منشأة العميل إلى تأكيد سلامة وملاءمة إسهامات المراجع في تطوير النظم المحاسبية والرقابية والإدارية والمالية المستخدمة |
| 8 | قيام المراجع بمساعدة إدارة العميل في إعداد القوائم المالية | توافق الرؤى بين المراجع وإدارة منشأة العميل حول سلامة وملاءمة السياسات المحاسبية والرقابية والإدارية |
| 9 | تجنب إصدار تقرير متحفظ أو الامتناع عن إبداء الرأي من أجل الاحتفاظ بعميل المراجعة | تطور العلاقة بين إدارة منشأة العميل والمكتب المهني بحيث يصبح المكتب معتمداً على نجاح الإدارة لتكوين سمعة جيدة |
| 10 | رضوخ المراجع لمطالب إدارة منشأة العميل في تحسين صورة ومدلولات مفردات القوائم المالية حرصاً منه على استمرار علاقته المستمرة مع المنشأة محل المراجعة | تدخل المراجع في معالجة مواطن الضعف في السجلات والتقارير المحاسبية وأدوات الرقابة الداخلية بدلاً من التقرير عنها |

وبتطبيق الاختبارات الإحصائية على فروض البحث، توصلت الباحثة إلى النتائج التالية :

الفرض الأول: الاستمرار لسنوات طويلة في مراجعة حسابات عميل معين لا يؤثر سلباً على استقلال المراجع.

فهذا يعني أن إجابات العينة سواء كانت من المحاسبين القانونيين أو من غير المحاسبين القانونيين تميل إلى عدم الموافقة على أن تدني وانخفاض أتعاب مراجعة الحسابات وعدم الإفصاح عنها تؤثر سلباً على استقلال المراجع. وبالرجوع إلى نتائج اختبار تحليل التباين الأحادي "ف" بين متوسطات إجابات إجمالي العينة عن مدى معرفتهم بمحاور البحث تبعا للمؤهل الأكاديمي، نجد أن هناك فرق معنوي بين متوسطات إجابات العينة على معرفتها بمؤشرات هذا المحور المتعلق بتدني وانخفاض أتعاب مراجعة الحسابات وعدم الإفصاح عنها على استقلال المراجع يرجع إلى اختلاف المؤهل الأكاديمي. وهذا يعني قبول الفرض الثالث من فروض البحث.

وبذلك تم التوصل بشكل عام إلى نتائج تثبت ما يلي:

- 1 - أن الاستمرار لسنوات طويلة في مراجعة حسابات عميل معين لا يؤثر سلباً على استقلال المراجع.
- 2 - أن تقديم خدمات مهنية إضافية أخرى إلى جانب مراجعة الحسابات لا يؤثر سلباً على استقلال المراجع.
- 3 - أن انخفاض وتدني أتعاب مراجعة الحسابات وعدم الإفصاح عنها لا يؤثر سلباً على استقلال المراجع.

الخلاصة:

سبق الإشارة إلى أن هدف هذا البحث يكمن في كشف النقاب عن مدى تأثير استمرار المراجع لسنوات طويلة في مراجعة حسابات عميل معين، وتقديم خدمات مهنية أخرى بجانب مراجعة الحسابات لعميل معين، وتدني وانخفاض أتعاب المراجعة وعدم الإفصاح عنها، على استقلال مراجع الحسابات في المملكة العربية السعودية.

وقد تم تقسيم البحث إلى مقدمة تم من خلالها توضيح مشكلة البحث وهدفه وأهميته وإطاره. ثم مراجعة الأدبيات ذات العلاقة بموضوع البحث وذلك لاستخلاص مجموعة من المؤشرات تم الاعتماد عليها في إجراء الدراسة الميدانية، تليها استعراض الإطار المنهجي للبحث الذي يعتمد عليه كأساس لإجراء الدراسة الميدانية، حيث اعتمدت الباحثة على النظرية الإيجابية بغرض شرح وتفسير الظاهرة محل البحث، وقد قامت الباحثة بصياغة ثلاث فرضيات تمهيداً لاختبارها، شملت ما يلي:

- 1 - الاستمرار لسنوات طويلة في مراجعة حسابات عميل معين لا يؤثر سلباً على استقلال المراجع.
- 2 - تقديم خدمات مهنية إضافية إلى جانب مراجعة الحسابات لا يؤثر سلباً على استقلال المراجع.
- 3 - انخفاض وتدني أتعاب مراجعة الحسابات وعدم الإفصاح عنها لا يؤثر سلباً على استقلال المراجع.

ثم عرض ومناقشة المراحل الأساسية للدراسة الميدانية، حيث اعتمدت الباحثة على أسلوب الاستبانة كأداة لجمع البيانات ومعرفة آراء واتجاهات عينة البحث بناءً على مؤشرات تم وضعها بما يتلاءم مع متطلبات مقياس ليكرت الخماسي لتوضيح الدرجات المقابلة لرأي كل مشارك في الاستبانة وبما يحقق إمكانية اختبار كل من الفرضيات الثلاث على حدة، وفيما يتعلق بمجتمع البحث، فقد تم تحديده في المحاسبين القانونيين، والمستفيدين من الخدمات التي تقدمها مكاتب المراجعة مثل مدراء وملاك بعض الشركات والمستثمرين والمسؤولين في البنوك والمسؤولين الحكوميين

من نتائج اختبار "ت" للفرق بين متوسط إجابات إجمالي عينة البحث مقارنة بالقيمة (3.4)، أن قيمة الاحتمال المعنوية أقل من (0.05) وبناءً على ذلك نرفض فرض العدم (ف0) ونقبل الفرض البديل (ف1). أي أن هناك فرق معنوي ذو دلالة إحصائية بين متوسط إجابات العينة على مؤشرات المحور الخاص باستمرار المراجع لسنوات طويلة في مراجعة حسابات عميل معين، وبين القيمة المستخدمة في الاختبار. وحيث كان هذا الفرق بالسالب، فهذا يعني أن إجابات العينة سواء كانت المحاسبين القانونيين أو من غير المحاسبين القانونيين، تميل إلى عدم الموافقة مع أن استمرار المراجع لسنوات طويلة في مراجعة حسابات عميل معين تؤثر سلباً على استقلال المراجع. وبالرجوع لنتائج اختبار تحليل التباين الأحادي "ف" بين متوسطات إجابات إجمالي العينة عن مدى معرفتهم بمحاور البحث تبعا للمؤهل الأكاديمي، نجد أن هناك فرق معنوي بين متوسطات إجابات العينة على معرفتها بمؤشرات المحور المتعلق بتأثير استمرار المراجع لسنوات طويلة في مراجعة حسابات عميل معين على استقلال المراجع يرجع إلى اختلاف المؤهل الأكاديمي. وهذا يعني قبول الفرض الأول من فروض البحث.

الفرض الثاني: تقديم خدمات مهنية إضافية إلى جانب مراجعة الحسابات لا يؤثر سلباً على استقلال المراجع.

من نتائج اختبار "ت" للفرق بين متوسط إجابات إجمالي عينة البحث مقارنة بالقيمة (3.4)، أن قيمة الاحتمال المعنوية أقل من (0.05) وبناءً على ذلك نرفض فرض العدم (ف0) ونقبل الفرض البديل (ف1). أي أن هناك فرق معنوي ذو دلالة إحصائية بين متوسط إجابات العينة على مؤشرات المحور الخاص بتقديم خدمات مهنية أخرى بجانب مراجعة الحسابات لعميل معين، وبين القيمة المستخدمة في الاختبار. وحيث كان هذا الفرق بالسالب، فهذا يعني أن إجابات العينة سواء كانت من المحاسبين القانونيين أو من غير المحاسبين القانونيين، تميل إلى عدم الموافقة على أن تقديم خدمات مهنية إضافية إلى جانب مراجعة الحسابات لعميل معين تؤثر سلباً على استقلال المراجع. وبالرجوع لنتائج اختبار تحليل التباين الأحادي "ف" بين متوسطات إجابات إجمالي العينة عن مدى معرفتهم بمحاور البحث تبعا للمؤهل الأكاديمي، نجد أن هناك فرق معنوي بين متوسطات إجابات العينة على معرفتها بمؤشرات المحور المتعلق بتأثير تقديم خدمات مهنية إضافية إلى جانب مراجعة الحسابات لعميل معين على استقلال المراجع يرجع إلى اختلاف المؤهل الأكاديمي. وهذا يعني قبول الفرض الثاني من فروض البحث.

الفرض الثالث: انخفاض وتدني أتعاب مراجعة الحسابات وعدم الإفصاح عنها لا يؤثر سلباً على استقلال المراجع.

من نتائج اختبار "ت" للفرق بين متوسط إجابات إجمالي عينة البحث مقارنة بالقيمة (3.4)، أن قيمة الاحتمال المعنوية أقل من (0.05) وبناءً على ذلك نرفض فرض العدم (ف0) ونقبل الفرض البديل (ف1). أي أن هناك فرق معنوي ذو دلالة إحصائية بين متوسط إجابات العينة على مؤشرات المحور الخاص بتدني وانخفاض أتعاب المراجعة وعدم الإفصاح عنها، وبين القيمة المستخدمة في الاختبار. ونظراً لكون الفرق بالسالب

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والمحللين الماليين والكتاب الماليين أو الاقتصاديين والأكاديميين. وتم تحليل البيانات باستخدام مجموعة من الأساليب الإحصائية الملائمة لتحقيق أهداف الدراسة، وقد أشارت نتائج الدراسة الميدانية إلى صحة الفرضيات محل الاختبار.

الخاتمة

وفي ختام البحث تورد الباحثة فيما يلي عدد من التوصيات:

- 1 - ضرورة نشر الوعي وتشجيع الحياد والاستقلال بين المراجعين وعمل الدورات التدريبية لرفع كفاءتهم وتعميق مستوى فهمهم لمعايير وأدلة المراجعة. وأيضاً نشر الوعي بين عملاء المراجعة والأطراف ذات العلاقة بالمهنة لتعريفهم بدور المراجع ونطاق وطبيعة عمله، وذلك عن طريق عقد الندوات والدورات التثقيفية في هذا المجال.
- 2 - ضرورة توفير الحماية القانونية اللازمة للمراجع للحفاظ على حياده واستقلالته.
- 3 - تفعيل دور لجان المراجعة في تنظيم العلاقة بينها وبين مراجع الحسابات الخارجي، والاستفسار والتأكد من حيادية المراجع واستقلاله خلال عملية المراجعة وبعد إعداد تقرير المراجعة.
- 4 - الدعوة إلى الارتقاء بمستوى استقلال المراجع الداخلي وتدعيمه، فدرجة استقلال المراجع الداخلي لها تأثير على مدى قدرته على توفير أدلة الإثبات المطلوبة لإنجاز عمل المراجع الخارجي، الأمر الذي يسهم بتوفير الموضوعية والاستقلال في الفحص من جانب المراجع الخارجي بعيداً عن أي تحيز.

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