www.globalcement.com

Contents Subscribe Ad Index

MAY 2020

global cement™ MAGAZINE

DALOG®


Optimization of Crushers and Mills
Machine Learning Algorithms
Cloud-Based Maintenance Support
Load and Vibration Measurements
Condition Monitoring Training

www.dalog.net

Online Condition Monitoring and Predictive Analytics

- Global Data-Driven Maintenance
- Increase Production Efficiency
- Reduce Environmental Footprint

For more information contact:
Christoph Muschaweck
E-mail: christoph.muschaweck@dalog.net
Phone: +49 821 74777 - 115

global cement MAGAZINE

www.globalcement.com

Exclusive Official Magazine for

Global Cement Conferences: Global CemFuels, Global Ash, Global Slag, Global GypSupply, FutureCem, Global CemBoards, Global WellCem, Global CemProcess

Editorial Director
Dr Robert McCaffrey
rob@propubs.com
(+44) (0) 1372 840 951

Editor
Peter Edwards
peter.edwards@propubs.com
(+44) (0) 1372 840 967

Web Editor
David Perilli
david.perilli@propubs.com
(+44) (0) 1372 840 952

Editorial Assistant
Jacob Winskell
jacob.winskell@propubs.com
(+44) (0) 1372 840 953

Commercial Director
Paul Brown
paul.brown@propubs.com
Mobile: (+44) (0) 7767 475 998

Business Development Executive
Sören Rothfahl
soeren.rothfahl@propubs.com
Mobile: (+44) (0) 7850 669 169

Account Executive - North America
Tina Rich
tina.rich@propubs.com
Mobile: (+44) (0) 7809 679 695
Office: (+44) (0) 1372 840 955

Company manager
Sally Hope • sally.hope@propubs.com

Subscriptions
Amanda Crow • amanda.crow@propubs.com

Office administration
Jane Coley • jane.coley@propubs.com

ISSN: 1753-6812
Published by Pro Global Media Ltd
Ground Floor, Octagon House, 20 Hook Road,
Epsom, Surrey, UK KT19 8TR
Tel: +44 (0)1372 743837 / Fax: +44 (0)1372 743838

On the cover...

DALOG Diagnosesysteme GmbH provides online condition monitoring solutions for data-driven maintenance and process optimisation. Its solutions improve machine availability, lifetime and energy efficiency with the goal of increasing profitability while lowering the environmental footprint of industries worldwide.

The DALOG Diagnostic Center serves hundreds of customers around the globe, helping them minimise downtime and optimise the life cycle of their machines. The company can count on its in-house development team for sensor, data logger and software technologies.

Email: info@dalog.net **www:** www.dalog.net

Dear readers,

Welcome to the May 2020 issue of *Global Cement Magazine* - the world's most widely-read cement magazine! This issue is the first that the *Global Cement* team has published under the sudden constraints of the COVID-19 outbreak. As a team we are extremely glad to have at our fingertips the many and varied technologies of the modern world that help everyone keep in touch - with family, friends, colleagues and contacts throughout the global cement community. We hope that 'you and yours' are as well as possible given the current circumstances.

All of society's 'modern wizardry' means that, over the course of the outbreak, *Global Cement* will continue to be issued as a print and digital magazine, while *Global Cement Weekly* will offer the latest news and analysis of the events that affect our sector. We have now also introduced our *Global Cement Live* webinar series, a news and discussion forum around the themes of the past week. This is held every Thursday at 14:00 Central European Time (Paris, Berlin, Rome, etc). Visit: *www.globalcement.com/live* to join the conversation.

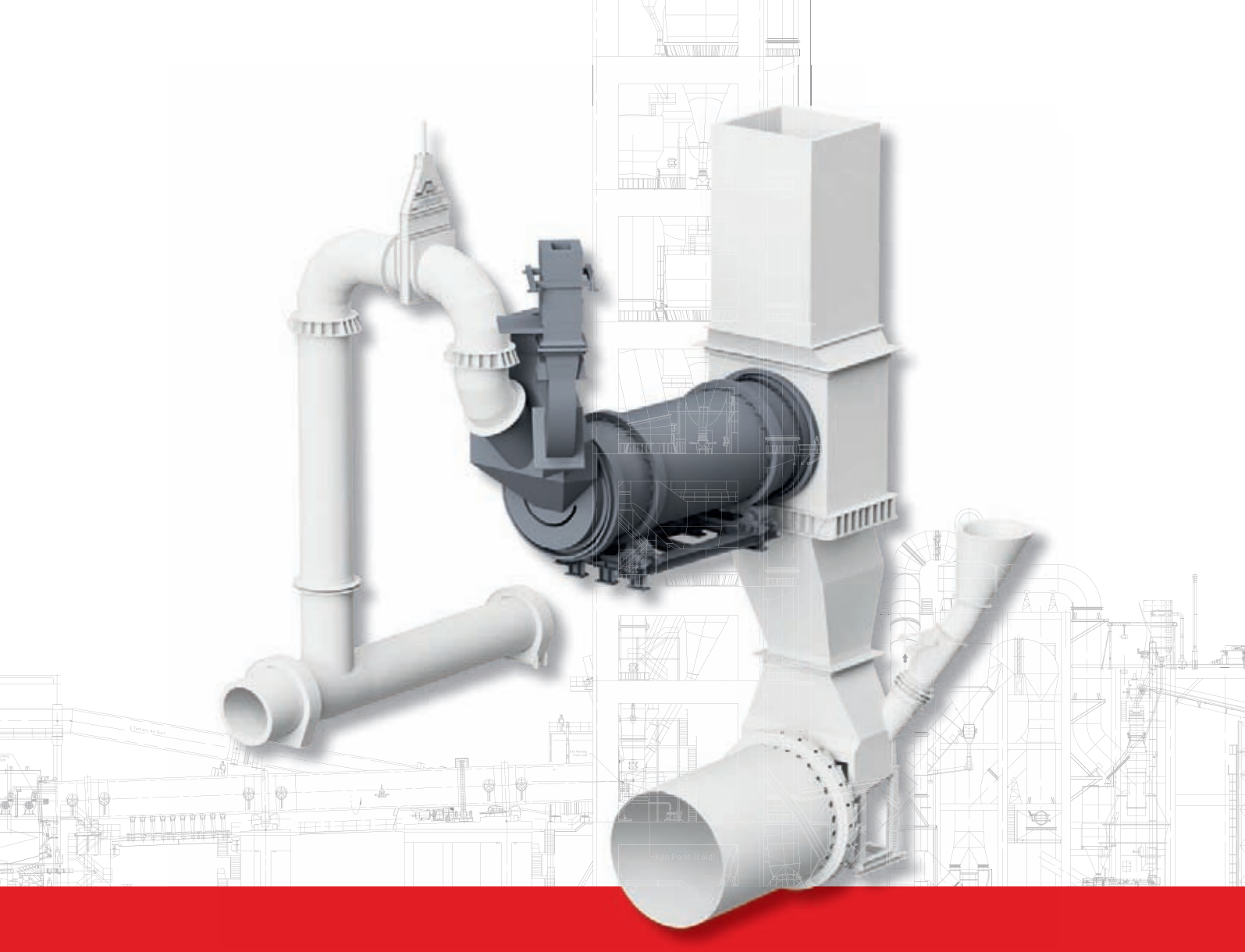
Additionally, two of our planned 'real-world' events will instead take place online. The *Global CemProcess Conference*, which was due to be held in Munich, Germany, will now take place as a virtual conference on 21-22 April 2020, with the PCA's Ed Sullivan confirmed as a speaker. This event is free to the first 500 cement producers who register at *www.cemprocess.com*. Meanwhile the *Global Slag Conference*, previously scheduled for 6-7 May 2020 in Vienna, Austria has been converted into a virtual conference on 6 May 2020, with the 'real world' version now set to follow on 11-12 November 2020 in Vienna. Register for both at *www.globalslag.com*.

These changes will only be temporary, although it may not feel that way sometimes. *Global Cement* is ready to weather the storm, to forge new relationships and to emerge stronger on 'the other side.'

Enjoy the issue and stay safe!

PKEdwards

Peter Edwards
Editor



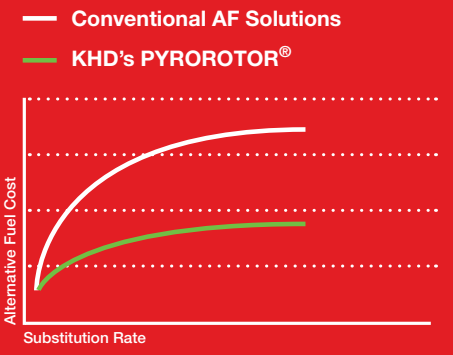
ALTERNATIVE FUEL OPTIONS? TIME TO RAISE YOUR EXPECTATIONS.

Whole tires. Coarsest waste matter. Material with extremely poor burning properties. Forget about pre-processing and spark your fuel concept with PYROROTOR®!

The PYROROTOR® constantly revolves fuel with sufficient retention time to guarantee a complete burn-out. This let's you use the coarsest waste-derived materials, without any pre-processing, to produce energy.

KHD's solution gives you a simpler procurement process, more sourcing options, and above all, much lower operational costs.

Expecting more now?
Get in touch today to discuss your individual use case.



Moving Cement Production Forward
Without Leaving The Environment Behind

get more out of your plant

KHD | HUMBOLDT WEDAG

Real time flue gas analysis in the cement plant

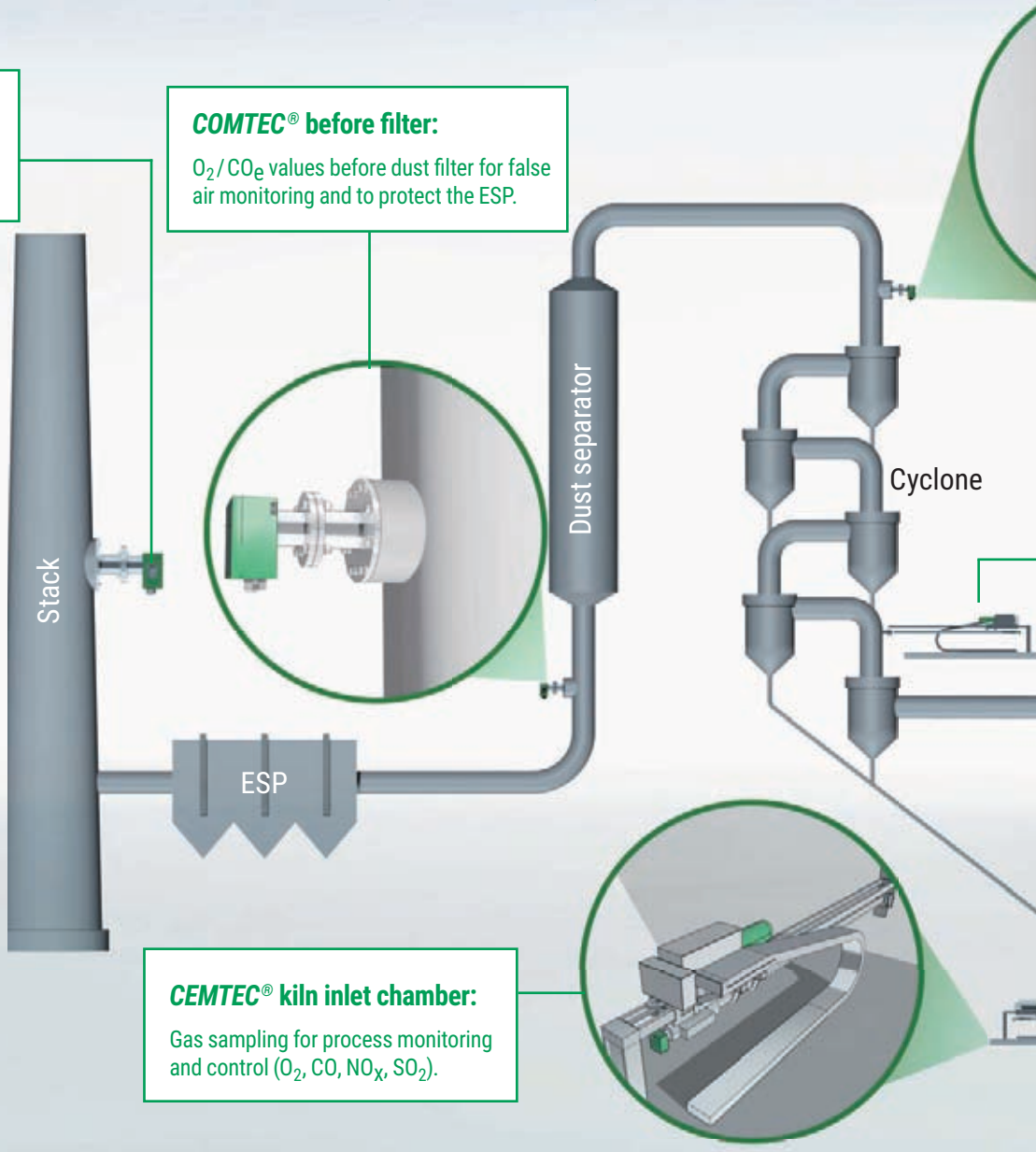
Reduce NOx to its limits. Improve product quality. Less energy input.

OXITEC® at the stack:

O_2 reference measurement for CEMS according to European standards.

COMTEC® before filter:

O_2 / CO_e values before dust filter for false air monitoring and to protect the ESP.



CEMTEC® kiln inlet chamber:

Gas sampling for process monitoring and control (O_2, CO, NO_X, SO_2).

ENOTEC – Product overview

CEMTEC® 4000

- High temperature gas sampling system
- 95% availability in 100% dust

OXITEC® 5000

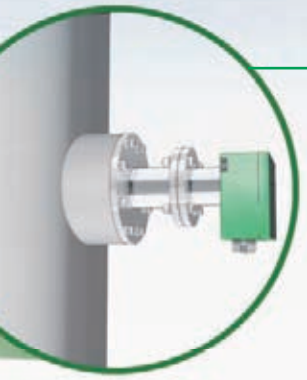
- Always measure oxygen accurately
- Robust, fast and maintenance-free

COMTEC® 6000

- Redundant O_2 / CO_e measurement
- Safely optimize combustion processes

SILOTEC® 8000

- Zone 20 CO_e / O_2 silo monitoring
- Process monitoring in real time



***COMTEC*® after cyclone:**

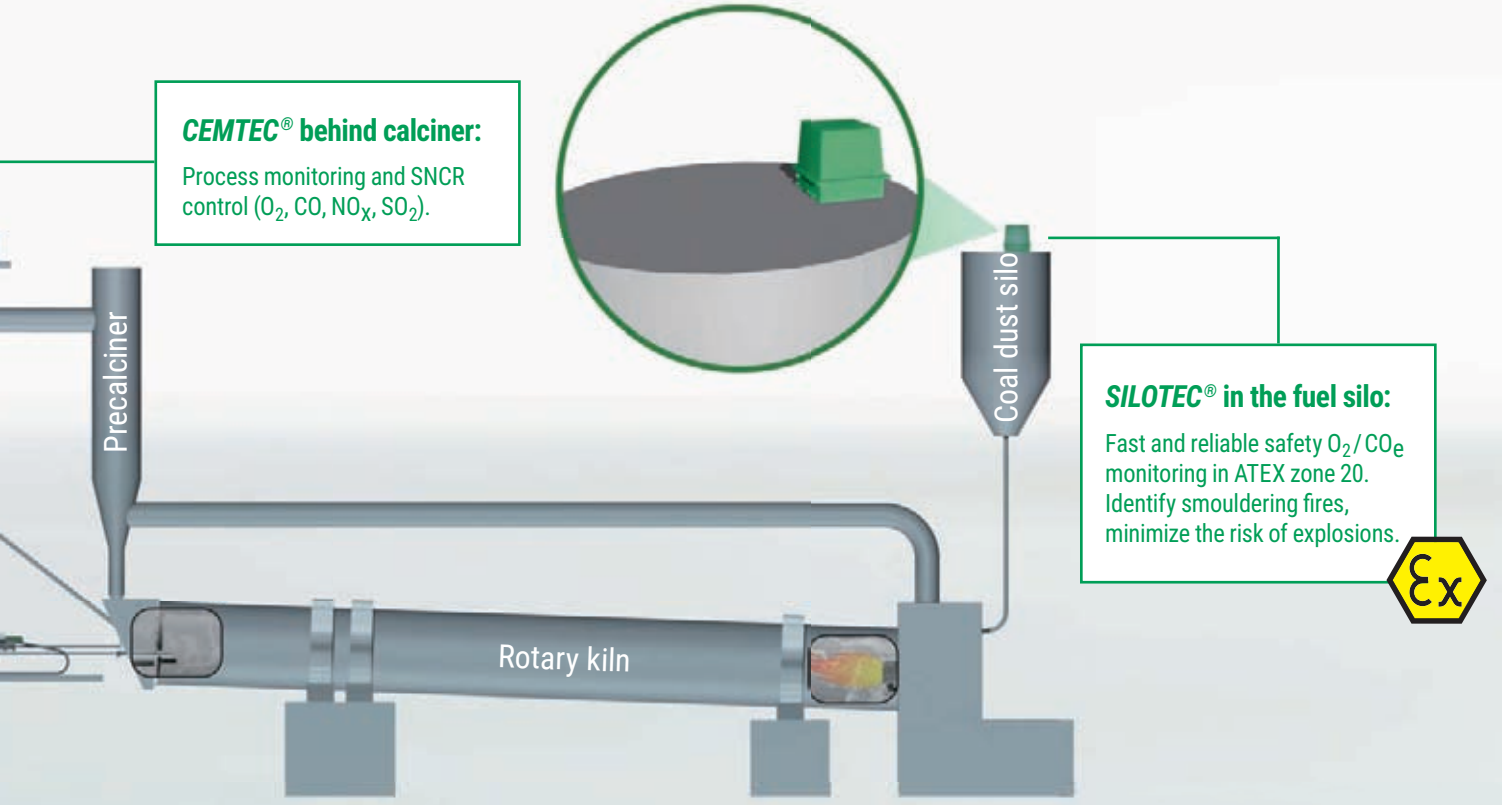
Process monitoring and control by measuring the O_2 and CO_e values.

Also available:
***COMTEC* DustEx in coal grinding plant:**

O_2 / CO_e monitoring of inert operation to prevent a spontaneous combustion / explosion of coal dust.

***CEMTEC*® behind calciner:**

Process monitoring and SNCR control (O_2, CO, NO_X, SO_2).



***SILOTEC*® in the fuel silo:**

Fast and reliable safety O_2 / CO_e monitoring in ATEX zone 20. Identify smouldering fires, minimize the risk of explosions.

Your benefits

- Decreased ammonia consumption due to improved SNCR efficiency
- Reduced fuel consumption due to higher combustion efficiency in the rotary kiln and in the calciner
- Higher refractory lining durability due to lower CO emissions
- Lower maintenance of the cyclones and riser duct due to reduced material build-up
- Lower emissions due to reduced fuel consumption and continuous emissions monitoring

ENOTEC has been offering products and systems for gas analysis since 1980. 100 % Made in Germany with a high degree of accuracy, quality and durability, completely developed and manufactured by ENOTEC. Our flexibility also makes it possible to react quickly to customer requests – worldwide.

Höher Birken 6
51709 Marienheide

T.: +49 (0) 2264 4578 0
F.: +49 (0) 2264 4578 30

www.enotec.com
info@enotec.com

ENOTEC
GAS SENSING SOLUTIONS SINCE 1980

Features

Technical

Europe

Americas

Asia

Middle East & Africa

Regulars & Comment

GLOBAL CEMENT MAGAZINE: *DIARY DATES*

Contents
Subscribe
Ad Index

SOLIDS Dortmund - NEW DATES
24-25 June 2020, Dortmund, Germany
www.solids-dortmund.de

IFAT 2020 - NEW DATES
7-11 September 2020, Munich, Germany
www.ifat.de

POWTECH 2020
29 September - 1 October 2020, Nuremberg, Germany
www.powtech.de

Global CemProcess Virtual Conference
21-22 April 2020, Virtual Event
www.CemProcess.com

Global Slag Virtual Conference
6 May 2020, Virtual Event
www.GlobalSlag.com

15th Global Slag Conference - NEW DATES
11-12 November 2020, Vienna, Austria
www.GlobalSlag.com

25th Arab-International Cement Conference
1-3 December 2020, Riyadh, Saudi Arabia
www.aucbm.net

1st Global Ash Conference
9-10 December 2020, Brussels, Belgium
www.GlobalAsh.com

62nd IEEE-IAS/PCA Cement Industry Conference
23-27 May 2021, Orlando, US
www.cementconference.org

Download 2020 Media Information from www.propubs.com

ADVANCED PROCESS CONTROL
INNOVATIVE MEASUREMENTS

KIMA PROCESS CONTROL

GRINDING TO PERFECTION

WITH SMARTFILL™ & MILLMASTER PACKAGE

GRINDING OPTIMIZATION USING FILL LEVEL MEASUREMENT

- increased production
- improved product quality
- higher energy efficiency
- less wear out

THAT'S WHAT WE CALL THE KIMA PROCESS.

WWW.KIMA-PROCESS.DE

SINCE 1996 INNOVATIONS MADE IN GERMANY

Interview by Peter Edwards, Global Cement Magazine

In discussion: Charlie Zeynel, ZAG International

Interview conducted on 19 February 2020.

Global Cement recently spoke with Charlie Zeynel, of supplementary cementitious material (SCM) trading firm ZAG International, to discuss current and future trends in granulated blast furnace slag (GBFS), fly ash and other SCMs.

Above: Charlie Zeynel, ZAG International.

Below: There is overcapacity in the European steel sector, but cement producers need more GBFS.

GC: How has the supply of granulated blast furnace slag (GBFS) changed since we spoke in 2019?

Charlie Zeynel (CZ): The major change over the past 12 months has been the emergence of new entrants from South East Asia onto the GBFS export scene. They have been coming up over the past 2-3 years, but the past 12 months have seen them really ramp up production of their new blast furnaces, generating something in the region of 2-3Mt of GBFS. This has relieved some of the pressure being faced by the Japanese producers, who had been sold out for quite some time.

It's generally positive for customers in the region because this new capacity may have actually put some price pressure on the Japanese suppliers. This shows us how quickly apparently stable situations can change. These new entrants have been very proactive to market their GBFS, knowing that it was scarce in the region. They have also made great inroads into the Middle East.

GC: How has this affected the major Chinese GBFS producers?

CZ: The new producers in South East Asia have not really affected Chinese players. Steel, and hence GBFS production, has been reduced for the past two years due to government-mandated capacity closures and environmental campaign operations. This has been in an effort to reduce energy consumption and emissions. Therefore, relatively small amounts of GBFS have been exported from China since 2018.

Now we have the added complication of the Coronavirus outbreak, which has disrupted many industries, including steel mills and coal-fired power plants. People are not back to work, often stuck far from their workplace due to the fact that the virus took hold over Chinese New Year. The result? It is even tougher than normal to get material out of China. This could be a short-term delay or morph into something that impacts the whole year.

On a more macro level, and with more serious long term implications on potential supply, we have the fact that over the past 10 years China has steadily increased the proportion of recycled steel in the mix, reflected in the increasing number of electric arc furnaces. In 2010 almost 100% of Chinese steel was produced in blast furnaces. Today, it is estimated only 70% is made in blast furnaces, with 30% recycled. This represents a switch to a consumer-led economy rather than a production-led economy, with a big associated fall in future GBFS volumes as the conversion trend continues.

GC: What's the wider picture?

CZ: We estimate that there were 25-30Mt of GBFS moved long-distance in 2019. At the global scale, there is a lack of GBFS compared to the amount that the cement sector would like to absorb. Unfortunately for the cement sector, the opposite is true of steel itself, which has significant overcapacity.

This points to future reductions in steel output and GBFS supply. The major steel manufacturers will continue to consolidate their activities, especially in Europe, and even elsewhere. There will be a de-

crease in the number of new blast furnaces coming online, but the extent of that trend is not clear at the moment. Over the long term there is a trend towards electric arc furnaces, as I mentioned in China.

***GC:* Where is demand for GBFS increasing the most at the moment?**

CZ: There is a steady rise in demand from most markets. The drivers behind this are familiar ones that include pressure to reduce CO_2 emissions by reducing the clinker factor as well as more stringent performance requirements in concrete. All of the major producers are working towards these goals using a number of levers.

If pushed, I'd say that the most recent regions to join the GBFS import party are the US, mostly in the coastal regions, and Africa, where we've seen more enquiries over the past year than ever before. A lot of the new grinding plants being built are for GBFS as well as clinker. Major markets here include Nigeria in the west and Kenya in the east. Interest is also on the rise in South America.

***GC:* Has the increase in supplies from south east Asia affected prices?**

CZ: In our 2019 discussions, I mentioned that there had been push-back from GBFS buyers, who were saying that they could no longer absorb further price increases. This trend has continued, in part due to the emergence of the new suppliers. Every time a new supply could be verified, buyers were saying to the established players, '*Come on, you've got to reassess your pricing!*' This has meant that Asian GBFS prices seem to have stabilised so far in 2020 and have not continued to rise.

In quite a number of places we continue to see users take other approaches to reducing their GBFS costs. Among these is to substitute small amounts of less reactive and therefore less costly GBFS (80-85% reactive), in place of more reactive GFBS (90-95%).

This has put some pressure on the higher price GBFS providers to make concessions, but its not necessarily the case everywhere. In Europe where ArcelorMittal has a major supply position and continues to adjust its steel portfolio, prices appear to be more stable and less resistant to change. Indeed, by way of illustration, we know that six to eight 40,000t ships GBFS-laden ships came to the UK from Japan in 2019. That's a long way to transport GBFS and highlights the dearth of this material in Europe, especially in the UK.

***GC:* You mentioned South America as an area that was picking up. Can you expand on that?**

CZ: We are mostly seeing increases in interest for GBFS from the west coast of South America. Brazil, it appears, may now finally be turning around its multi-year slump with solid cement sector growth, albeit from a low base. Last time we spoke, I mentioned two new GBFS point suppliers in Brazil. These are now focused more on their traditional domestic market. Indeed, some Brazilian cement producers are increasingly looking at imports, including GBFS. Clearly, Brazil is turning around... ...and it is a big market.

Left: Shale oil prices have fallen in the US in the past 12 months, putting increased pressure on coal-fired power plants and, hence, fly ash supplies.

Every time a new supply could be verified, buyers were saying to the established players... 'Come on, you've got to reassess your pricing!'

***GC:* In 2019 you said that GBFS cost more than clinker in the Middle East. Is this still the case?**

CZ: Yes - This is still the case, though there have been efforts to stem the losses due to the 'price war' in ground GBFS. However, with the recent US-Iranian tensions, the freight rates have actually increased due to a doubling of war insurance premiums. This has not helped to get GBFS into the region. There's a scarcity of ships willing to come into the region too, which adds further to the cost.

***GC:* Lastly on our global tour, what about North America?**

CZ: The US retains much of the stockpile of domestic GBFS in the Mid-West. However, as pointed out previously, this is essentially inaccesible to anyone other than adjacent and regional customers. There are increasing imports into the coastal regions, not just for GBFS, but for fly ash, clinker, cement... if it's cementitious, the US is importing it and, crucially, investing in infrastructure. It's a strong and growing market for cementitious material imports.

Above: Cement producers are attempting to reduce their CO_2 emissions by any means they can, some motivated by taxes and trading schemes. SCMs are one approach to lower emissions.

Fly ash and other SCMs

***GC:* What has changed in the global fly ash scene in the past 12 months?**

CZ: Coal-fired power plant closures have continued in the US and in the EU. Indeed, there are increasingly few reasons to use coal for electricity. In the US it's the plentiful supply of low-cost shale gas and old, high-cost coal-fired power plants that do not warrant the re-investment costs. In the EU, there's the EU Emissions trading Scheme (ETS), which is driving investment in renewables. Germany has recently said that it will close its last coal-fired capacity by 2038 at the latest. While that seems a long way off, many expect the end to come faster than that. In Italy, one of the large operators, ENEL, which also has interests in Spain, has brought forward its plans to end its use of fossil fuels from 2025 to within the next 12-24 months. A lot of traders, including ourselves, had been anticipating steady supplies of fly ash coming out of Italy, Spain and Portugal, but now what's left is already allocated. The little fly ash that had been available is now very much under presure.

***GC:* How much fly ash is traded?**

CZ: We estimate that 2-3Mt of fly ash was traded long-distance in 2019, around 10% of the GBFS volume. Fly ash is limited by volumes but also by logistics and permitting. ZAG now carries out routine long-distance shipments of fly ash but setting up some of these movements took 2-3 years!

Below: Some cement sector players are looking increasingly into pozzolanic materials, but their extraction could prove unpopular in many areas.

***GC:* Where is the most fly ash in the world?**

CZ: The two countries that have built the most coal-fired power stations over the past decade are India and China. We know for sure that China is chock-full of fly ash but the logistics can be difficult, as are quality and pricing issues. There are no reliable suppliers because of a lack of facilities and the cost of getting material to port. There is also a strong internal demand for these materials. There are more valuable exports for China to focus on.

***GC:* What can be done to secure supplies of other SCMs, given the pressures on GBFS and fly ash?**

CZ: In the US there is a lot of talk and some activity involving digging up ash ponds, but there are all kinds of environmental, process and cost challenges associated with these endeavours. It does bear watching as there are serious efforts underway. There is increasing talk about using natural pozzolans, but we have yet to see much more activity than what has already been out there for the past few years. However, natural pozzolans fall down on a number of sustainability fronts. Some do not consider them to be renewable resources and the cost and political difficulty of extracting them is high in many places. People and governments are not generally in favour of new mines or quarries, certainly in developed markets.

Another big area that seems to be entering the collective conscience is calcined clays. These have already been exploited on a local basis where available. They can be used as clinker extenders but also in the raw feed. However, they carry many of the same sustainability and logistical issues as natural pozzolans.

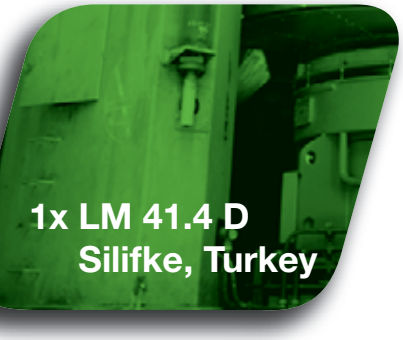
***GC:* Do you think these could be overcome with time?**

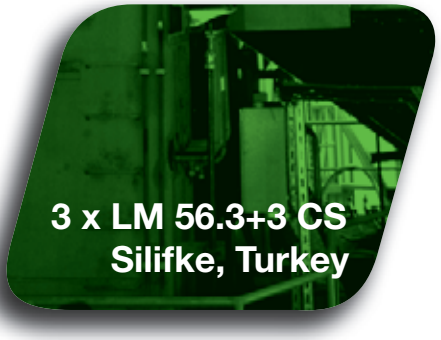
CZ: Nobody has asked us to source or transport pozzolans or clays yet, but very recently, a major South American cement group made an announcement that they were introducing a calcined clay based cement. There will be more to come on this for sure! We have definitely seen an uptick in cement sector players investigating a wide range of non-clinker materials. The cement producers want to find ways to make less CO_2, be it with SCMs, alternative fuels or geopolymers. There's also a lot of focus on CO_2 capture, novel cement chemistries, geopolymers and more. There's no Holy Grail yet and still no single answer to the SCM supply issue. However, the global cement industry is clearly evolving and as they say, we need to 'watch this space.' Things will change!

***GC:* Thank you for an interesting discussion.**

CZ: You are welcome - Always good to talk!

ALL MILL TYPES
FROM A SINGLE SOURCE





EVOLVE THE FUTURE

www.loesche.com

LOESCHE®

INNOVATIVE ENGINEERING

Interview by Peter Edwards, Global Cement Magazine

Ecocem Dunkirk: A modern slag grinding plant

Ecocem opened its Dunkirk slag grinding plant in 2018. *Global Cement* visited before the coronavirus shutdown to see the plant and speak with its manager Anne Debenath...

Above: Anne Debenath has been the plant manager of the Ecocem France Dunkirk plant since September 2017. She led the commissioning process, with first product on 2 May 2018. She studied Geological Engineering, with specialisms in quarrying and mineral processing, at the University of Strasbourg and worked for Carmeuse and Omya prior to joining Ecocem France.

"I have always been fond of trucks, quarries and big machines," says Debenath. "I am really happy to be working in this industry, with such a large mill!"

***Global Cement (GC):* Can you introduce the plant?**

Anne Debenath (AD): The Dunkirk plant was established by Ecocem France, a joint-venture between Ecocem, based in Ireland, and ArcelorMittal (AM), It was conceived after the success of its sister plant in Fos-sur-Mer in the south of France, which celebrated its 10th Anniversary in late 2019. Construction began in the Port of Dunkirk in 2016. I began my role as plant manager in September 2017 and was the first person on site!

***GC:* How was the commissioning process?**

AD: Any plant commissioning is always a huge undertaking and is dependent on a lot of people with different specialities. From September 2017 to January 2018, I hired staff to run production, logistics and the laboratory. It was too early for most of the staff to come to work here, so they were trained at the Fos-sur-Mer plant for a minimum of three months. There they learned their craft so that they all knew their role 'inside out' by the time we started production. This was particularly important for this site, as we recruited people from a wide range of backgrounds. Most had never seen a vertical roller mill before.

Once training was completed we could start up parts of the plant. This involved people from Ecocem in Ireland, from AM, Loesche, other suppliers and more. The plant was fully commissioned on 2 May 2018.

After commissioning, one of the shift operators from Fos-sur-Mer came to Dunkirk for several months to help bed in the plant and further train our workforce once the plant was up-and-running.

***GC:* What was the biggest commissioning issue?**

AD: We had no big issues, just a few surprises. The worst time was Christmas 2017 when we hadn't been able to install the roof due to high winds. It snowed on the mill and water got into some of the electronics. Some parts were damaged but we were very careful to check each component, repair and/or replace, and then continue with commissioning afterwards.

***GC:* What is the plant's production process?**

AD: The Dunkirk plant is Ecocem's most recent project and as such is the most advanced in the group. It is very similar to the Fos-sur-Mer plant, albeit with some improvements. Both of these have vertical roller mills, unlike the Dublin (Ireland) and

Plant profile

Location:	Dunkirk, Northern France
Main market:	Paris / N France / N Sea
Construction:	Late 2016 - September 2017
First product:	2 May 2018
Capacity:	0.7Mt/yr
Fuels:	Blast furnace gas
	Natural gas (start-up)
Staff:	Operators = 12 (6 teams of 2)
	Laboratory = 4
	Plant Manager & Deputy = 2
	Logistics, Sales & Administration = 7
	Total = 25

Left: The Ecocem Dunkirk plant seen behind GGBS from the adjacent ArcelorMittal steel plant.

Moerdijk (Netherlands) plants, which have ball mills. Slag is sourced from two of AM's three blast furnaces at its Dunkirk steel works, which is around 500m away. Every morning I receive the chemical analysis of the slag and we 'order' what we need. It comes to the site via truck and we mix it using a front-end loader in our open-air yard. The front-end loader feeds an 80t hopper. This is a very important job, not only for consistent chemical composition but for constant moisture. The slag arrives with 8% moisture but, over time, it becomes wetter at the bottom. This helps the mill to operate smoothly. We keep track using a moisture sensor to ensure a constant 8% moisture level in the feed material.

From the hopper, the slag is conveyed to the top of a 100t/hr Loesche vertical roller mill, with a 4.6m table diameter and a 3.1MW drive. It has two main rollers and two auxiliary rollers. I would say that it is the best available technology for slag grinding. On the way it passes a cross-belt analyser and magnet array to remove any remaining ferrous material. There's a weighfeeder to regulate the mill feed. The mill grinds the slag to around 4300-4500g/cm^3 (Blaine).

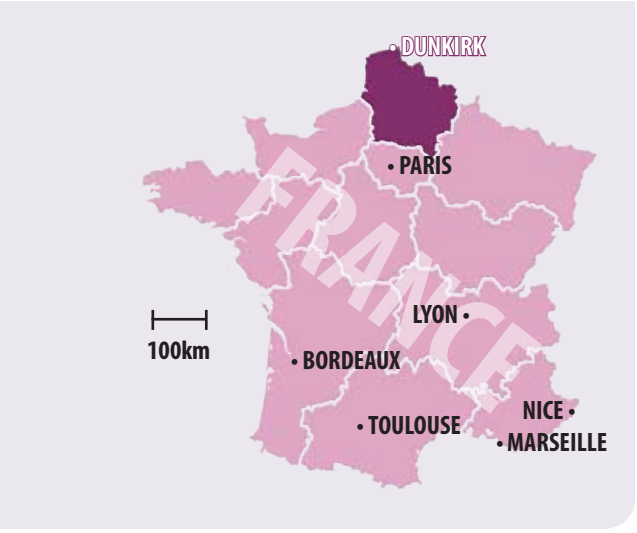
To dry the slag while grinding, we need hot air, which is present in the mill at around 200°C. This is supplied by a burner from Loesche. The fuel is predominantly blast furnace gas, a byproduct from the blast furnaces that is high in carbon monoxide (CO). The use of this fuel is facilitated by a dual fuel burner, which is unique to Dunkirk within the Ecocem group. Dunkirk only uses natural gas for start up, which takes only a few minutes. This is great because we can use two by-products from AM, the slag and the gas. After the classifier, there is a big bag filter from Scheuch. Some of the hot air from the bag filter can be fed back to the mill, depending on what is required.

Slag is then transported up by Aumund bucket elevator to two IBAU Hamburg storage silos (one concrete and one steel) with a total capacity of

Opposite page: The Dunkirk plant.

Below left: Summary plant details and location within France.

Below: ArcelorMittal's Dunkirk steel plant supplies the Ecocem plant with slag from two of its three blast furnaces.



11,000t. There are then two options. We can dispense slag directly to silo trucks or vessels or divert it to the blending building. In this facility, we mix the slag with CEM I and other ingredients to produce CEM III and other binders that contain high levels of slag.

***GC:* When you look at the data from AM in the morning, what are the most important factors?**

AD: I look at chemical properties, predominantly the basicity index, i.e. the main element ratios (aluminium, silicon, magnesium, calciumium) and the titanium content**.** It is not that physical parameters are unimportant, but rather we know from experience that AM's granulated slag is >99% amorphous, the form required for slag to be an hydraulic binder.

***GC:* Is the plant operating at full speed?**

AD: We had a really quick start-up, which was fantastic. In 2019, our first full year, we processed 0.55Mt. In the early part of 2020 we turned the plant up to maximum speed and had planned to produce 0.7Mt before the onset of the coronavirus outbreak. We have a weekly maintenance programme but this is just for checks, small tasks, lubrication and so on. All maintenance work is carried out by our 12 operators. There is no separate maintenance team, so the operators really know the machinery that they are using. We made a lot of tweaks at the start but are now in a stable place after a couple of very busy years. It is nice to have reached this point.

***GC:* What products were made in 2019?**

AD: The vast bulk of our output was pure slag, with a minority of CEM III products. The slag has an embodied CO_2 emissions in the region of 20kg/t, around 30-40 times less than a traditional cement-based binder. This is a major advantage for Ecocem, particularly in northern Europe as environmental awareness rises. It is the right time to come to market with this kind of product, especially with major works like the Grand Paris infrastucture improvements in Paris.

Right: At the heart of the process is a 100t/hr Loesche vertical roller mill, with a 4.6m table diameter and a 3.1MW drive.

Right: Magnets are used to intercept pig iron before it enters the Loesche mill. It is used as a filler for dense concrete products like lift counterweights.

Far right: The Dunkirk plant is unique in the Ecocem group as it uses blast furnace gas to heat its mill.


PlastRetard®
The Multifunctional Additive
Your Natural FUTURE
made in Italy
www.plastretard.com

Right: The plant serves the northern half of France, with around 40% of dispatches by road. Over 1000t/day heads straight to Paris.

Far right: An AUMUND bucket elevator transfers ground slag from the mill to the top of the silos.

***GC:* What markets are supplied?**

AD: As mentioned earlier, this plant is ideally located to serve the north of France, as well as some areas in the west of Belgium. In 2019 around 40% of our product left in trucks, with more than half of the trucks heading to Paris. Around 60% of our product was sent out in vessels, either directly to customers in and around the North Sea or to Ecocem terminals in Runcorn (UK), Sheerness (UK) and Gavle (Sweden). Marine dispatch is carried out by Dunkirk Multibulk Terminal (DMT), which loads vessels from an adjacent wharf.

Right: Around 60% of the plant's output is dispatched by sea, via Ecocem's partner Dunkirk Multibulk Terminals.

***GC:* Have you noticed any changes in dispatch patterns since the UK left the EU on 31 January 2020?**

AD: We have not seen any changes in the routes so far. Even if the UK Transition Period ends in a 'crash-out' I don't think the civil works in London will stop!

***GC:* Are there any plans to increase capacity at Dunkirk? There's certainly a lot of space available...**

AD: From the outset Ecocem planned two lines to operate at the Dunkirk site. Now that the first is well established in a strong and growing market, I think it will be only a matter of time before work commences on the second line. I look forward to this development, whenever it may transpire.

***GC:* Thank you for your time today Anne.**

AD: You are very welcome indeed.

Below: The plant's laboratory acts as the reference facility for the Ecocem group, thanks to its modern equipment and central location within the group's operations.

Below right: Inside the control room. At night just two personnel are on site, one in the control room and one in the front-end loader to fill the hopper.

global slag™ VIRTUAL CONFERENCE 2020

globalslag.com

#globalslag

Slag for profit

The 15th *Global Slag Conference* has been postponed from May 2020 until 11-12 November 2020 due to the coronavirus outbreak. The *Global Slag Virtual Conference* will additionally run on 6 May 2020...

15th global slag™ CONFERENCE EXHIBITION AWARDS 2020

Global Slag Enquiries

Promotion and Sponsorship:
paul.brown@propubs.com

Programme and speakers:
robert.mccaffrey@propubs.com

Organised by:

global cement MAGAZINE

Kevin R Peterson, Vortex Global

Handling slag with Vortex equipment

A look at slag handling case studies with Vortex Global...

Above: Kevin R Peterson is the Business Development Director for Vortex Global. He has worked at Vortex for 25 years.

Original slag can be categorised as ferrous or non-ferrous. Ferrous slag, accounting for around 90% of all slag, comes from iron and steel production. Of these, blast furnace slag is typically blended with rocks and sand for use as a road base. It can also be finely ground and added to cement to increase strength, while reducing concrete permeability and the clinker factor (CO_2 emissions). Electric arc furnace slag is typically blended with fly ash and lime to be used as pavement material or construction fill, while oxygen furnace slag is typically blended with fly ash and lime as a pavement material or soil conditioner. Slag offers advantages when used in road construction compared to natural aggregates. It is harder and more compact and wears less rapidly, offering a longer life. It retains its adhesiveness with wear, not becoming smooth or slippery. One disadvantage is its high density, which leads to high transportation costs.

Producers of secondary steel rely heavily on **synthetic slag**, a critical component of the secondary steelmaking process. It is slag that has been crushed, blended and refined such that it draws out impurities and reduces the sulphur level, making the steel purer and stronger. Synthetic slag also reduces the melting temperature of steel, which saves energy. It enhances liquidity, shortens production time and chemically protects the liquid steel during the casting process.

Slag handling case studies

All slags are abrasive, which should be taken into consideration when purchasing handling equipment for them. When a major synthetic slag producer made the decision to build a new facility in the central US, it chose Vortex Global as a supplier for slide gates and telescoping loading spouts.

Above left: Vortex slide gate.

Left: Vortex filter and loading spout.

Slide Gates: The client's process involves blending dry materials. Vortex's Titan Slide Gates were installed beneath its silos to dose material to conveyors. The slide gates have abrasion-resistant blade and inlet liners to extend service life and displacement end pockets that prevent material from packing and wearing the end seals upon gate closure. In addition, wear-compensating 'live loaded' bonnet seals limit material migration to the bonnet area and to the atmosphere.

Loading Spouts: Vortex also supplied loading spouts to load bulk material into silo trucks. The four-cable hoist drive offers maximum stability and improved cable service over traditional two- and three-cable systems. A motor brake prohibits the cable from 'jumping the pully,' decreasing downtime. CNC-machined pulleys ensure rounded edges and properly sized cable grooves, in contrast to traditional spouts that can have sharp-edged pulleys and inconsistent grooves that cause cables to bind or overlap.

Filtration System: The client also purchased a Vortex Filter as its facility is located near a town. The client wanted to ensure that it contained the dust from the loading process, for both the benefit of residents and its own workforce. As material is loaded, a fan on the filter draws fine dust upwards, internally through an area between the spout cones and the outer sleeve to the filter unit. Pleated cartridges within the filter temporarily trap the dust until a pulse jet periodically liberates the dust from the cartridges, sending it back into the load. Instead of transporting the material to a dust collector, the company re-entrains the dust back into the load. It is sold as part of the load, rather than being disposed of.

A second client, engaged in processing and repurposing slag as an abrasive for air-blasting, an ingredient in roofing products and a concrete additive, also opted for Vortex slide gates. It uses these to load slag dust into large bulk bags for distribution to customer sites on flatbed trailers. It also uses Vortex Telescoping Loading Spouts for bulk trailer loading. Both clients benefit from Vortex's attention to designs that address slag abrasion and offer extended service life.

CEMENGAL

N&VER GIVE UP

INSIST RESIST PERSIST

MODULAR GRINDING SYSTEMS

WWW.CEMENGAL.COM

Alexandra Kirchhoff, Tobias Egle & Felix Bartknecht, SICK AG

Controlling NO_x effectively

The general trend towards environmental awareness in the cement sector has prompted plants to reduce or eliminate emissions of hazardous substances. Here, SICK AG reports on a NO_x emissions abatement project at HeidelbergCement's Geseke plant in Germany.

Supporting effective climate protection and preserving and restoring a clean environment are major goals for modern cement producers, whether it is due to new environmental legislations, pressure from local populations, external organisations and company stakeholders or due to self-imposed sustainability commitments. Nitrogen oxides (NO_x) and other nitrogen compounds that arise from cement production are a major cause of photochemical smog and the formation of nitric acid and acid rain. They are formed either by a combination of fuel-based nitrogen with oxygen within the flame or by a combination of atmospheric nitrogen with the combustion air.

The two main mechanisms for the production of NO_x in a clinker manufacturing process are the reaction of nitrogen (N_2) in combustion air at high temperatures (thermal NO_x) and the combustion of nitrogen-containing fuels (fuel NO_x). Globally the emission limits for NO_x are heading down rapidly, with increasingly strict penalties for non-compliance. However, there are still large differences. Most national limits are in the region 500-1000mg/Nm^3. Some plants in the EU have taken pioneering roles by having fixed emission limit values as low as 200mg/Nm^3, depending on which kiln process is applied and the type of fuel.

Even though primary measures such as flame cooling, installation of low-NO_x burners, staged combustion and general process optimisation can go a long way to cutting NO_x emissions, secondary measures are now seen as a vital route to meeting even lower NO_x emission limits. In cement production there are two main secondary measures: selective catalytic reduction (SCR) and selective non-catalytic reduction systems (SNCR). These have gained popularity in recent years and are accepted and proven technologies when controlled properly.

SCR and SNCR technologies

SCR and SNCR denitrification ($DeNO_x$) plants use ammonia (NH_3) or urea (CH_4N_2O) to reduce NO_x to form harmless nitrogen (N_2) and water (H_2O). The main difference between the two technologies is whether or not a catalyst is used. The SNCR, i.e. $DeNO_x$ without a catalyst, is installed in the riser duct or calciner after the rotary kiln at a temperature range of 900-1000°C. Depending on the type of the SCR it can be placed in the high-dust raw gas stream (e.g. directly after the pre-heater) or before the main stack in the low-dust gas stream as a so-called 'tail-end' or 'low-dust' SCR.

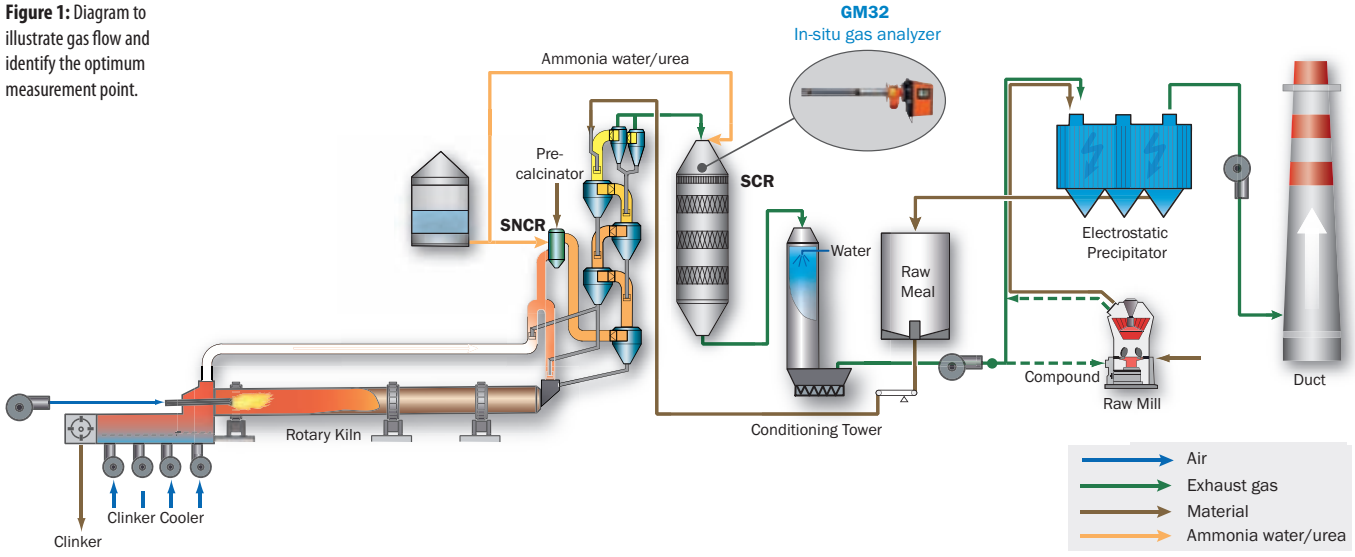


Figure 1: Diagram to illustrate gas flow and identify the optimum measurement point.

SCR systems consist of a specific number of catalyst layers and operate at gas temperatures of around 300-350°C. The reducing agent, typically ammonia water or urea, is injected at the SCR inlet. For initial reduction of NO_x emissions an SNCR is often sufficient. Such systems are lower in cost than SCR systems.

The efficiency of the reaction between NH_3 and NO_x is critically temperature dependent. At temperatures greater than 1200°C, NH_3 converts to NO_x. At temperatures lower than 800°C, some ammonia remains unreacted (termed ammonia slip). Thus, efficient and well-adjusted ammonia injection is of high importance for the compliance of gas emission limits when using an SNCR. The presence of the catalyst in the SCR allows the operation at lower temperatures and offers a higher stoichiometric ratio. This requires less reducing agent and ensures lower NH_3 slip. This ensures that even low NH_3 and NO_x emission limits can be adhered to.

Case-study at HeidelbergCement Geseke

Due to the rising demand for SCR and SNCR units in cement production, the need for a measurement technology that can be used to control these plants efficiently is also on the rise. There has been a 200mg/Nm^3 emission limit for NO_x in Germany since 1 January 2019, as well as a 30mg/Nm^3 limit for NH_3. To comply with local emission regulations, HeidelbergCement decided to invest in an SCR system in addition to a previously-installed SNCR solution at its Geseke plant in North Rhine-Westphalia, Germany. Installation of the solution was completed in March 2019.

During planning and implementation of the project, the question of the best type of analyser that could fulfil the requirements for an efficient SCR control was addressed. The device would be placed at the SCR inlet between the ammonia water injection nozzles and the catalyst (Figure 1). Of high importance was a fast analyser response time to enable very efficient control of the ammonia water injection. A long maintenance interval was also critical, especially in the very challenging operating conditions.

The advantage of measuring at the inlet is the simultaneous measurement of the NH_3 and NO levels that enter the SCR. Here, NH_3 is the sum of ammonia evaporation from the raw materials, the ammonia slip of the SNCR and the ammonia water injection for the SCR. It was also possible to measure the NO concentration from the combustion process. With this measurement and a continuous emission monitoring system (CEMS) at the main stack as backup, feed forward control would be possible.

Left - Figure 2: Installation of the GM32 at the SCR inlet at the Geseke plant.

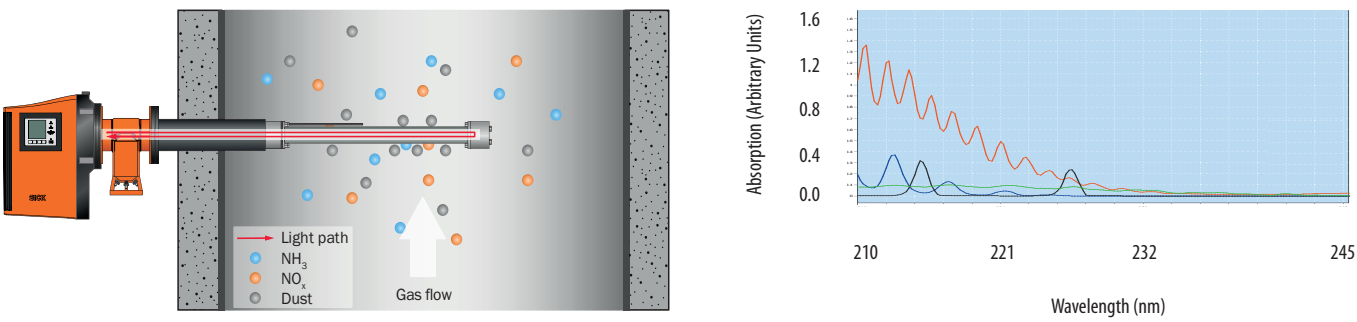
During the planning phase, HeidelbergCement contacted SICK to provide a solution that best fitted the above requirements. As the only provider of all major gas measuring principles and technologies alongside many years of experience, SICK is able to provide the high-quality measuring technology for each application. In this case, the company recommended its GM32 in-situ analyser in order to cope with the very challenging process conditions: high dust, high temperature and vibrations.

GM32: The innovative in-situ gas analyser

The in-situ GM32 gas analyser simultaneously measures up to four components - NO, NO_2, NH_3, SO_2 - as well as the temperature and pressure directly inside the process gas stream. The direct measurement inside the duct (in-situ) leads to fast measuring results due to a short response time, making it well suited to process control. The analyser unit is equipped with a gas permeable probe (GPP), which is positioned inside the duct (Figure 3).

Using wavelength-specific light absorption by the gas mixture on the active measuring path, the sender/receiver unit determines the concentration of the gas

Below - Figure 3: GM32 measurement technology: Optical path (left) and UV absorption spectra (right).



Right - Figure 4: GM32 on site during a preventive check-up.

components present. UV light sent from the sender/receiver unit passes the active measuring path of the GPP probe and is reflected by a triple reflector at the end of the probe. The permeable filter element - the heart of the GPP - keeps all dust outside of the measurement path, where the light passes through. The gas quickly permeates through the pores, ensuring a real-time measurement, hence a rapid response time is ensured.

The GM32 uses the differential optical absorption spectroscopy (DOPAS) principle where the absorption lines of specific gases in a particular wavelength range are evaluated. Neither the filter nor the rest of the gas analyser require weekly or monthly checks, cleaning or other high frequency maintenance work.

Due to the higher temperature and possible temperature fluctuations at the measuring location, stack movements are possible. With the implemented auto alignment correction, which aligns the light beam continuously during operation, stack movements as well as vibrations can be compensated for. This ensures a stable and reliable measurement.

In comparison with many other measuring systems, many of which require frequent test gas calibration, the GM32's integrated filters for zero and span check (approved according to EN15267) automatically compensate for drift and ensure correct and accurate measurements. This helps to keep operational expenditures very low.

Proven technology

The final commissioning of the in-situ gas analyser at the HeidelbergCement Geseke plant took place in March 2019 (Figure 4). During a 12-month testing period up until March 2020, SICK and the cement plant proved that, for this application, the GM32 only needs to be checked once every 9-12 months. With the help of the SICK Meeting Point Router remote service, on-site tests were performed and a large amount of additional process data, including the CEMS concentration values at the main stack, was collected and evaluated in various ways. During the test period it was proven that the analyser has a stable reaction time of <20s (Figure 5), without the need for any cleaning or maintenance work.

The process data showed that, with a delay of up to 2-17 minutes (depending on the measuring component), a CEMS alone is not sufficient for $DeNO_x$ process control. This is especially the case for NH_3 values, for which the CEMS exhibits a huge delay in comparison to the in-situ process gas measurement (Figure 5). This is due to the high adsorption of ammonia on surfaces such as the filter and heated measurement lines. Controlling the SCR with such delayed measuring values will lead to an excessive injection of ammonia water and rapid breach of the NO and NH_3 emission limit values at the main stack. Therefore, SICK's GM32 in-situ measurement device has proven to be the right device for this kind of application.

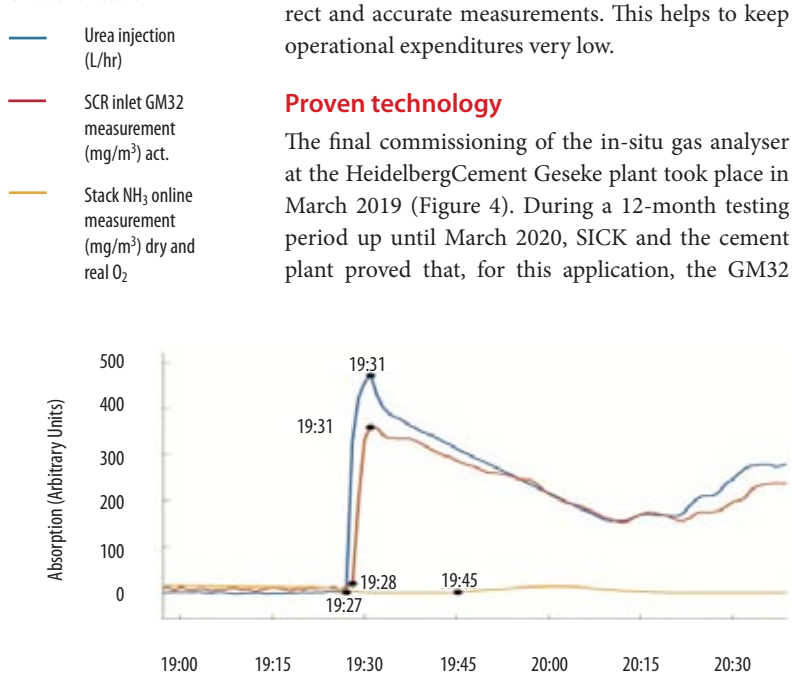
"We are very satisfied with the performance of the GM32 gas analyser," stated Dr.-Ing. Steffen Gajewski, Geseke Plant Manager, and Dipl.-Ing. Stefan Naber, the plant's Operations Manager. "The GM32 project was executed in full compliance with the requirements and schedule. We are looking forward to continued good cooperation."

Remote service and condition monitoring

In the future SICK and HeidelbergCement plan to implement SICK's Monitoring Box in order to offer predictive maintenance services for all of the plant's gas analysers and dust measurement equipment. This solution allows SICK to optimise maintenance, monitor critical components or device conditions and to monitor product health and recommend maintenance actions remotely. This will enable immediate troubleshooting, which reduces travel expenses and labour hours for service engineers. Furthermore, continuous remote condition monitoring combined with remote assistance and agreed response times assure compliance with local emission regulations, process stability and continuous production.

Due to the performance of the GM32 in-situ gas analyser and the excellent cooperation between SICK and the operators at the Geseke plant, another HeidelbergCement plant in Germany has now also decided to equip its existing $DeNO_x$ system with two GM32 analysers for SCR control. The project is scheduled for completion in April 2020. This together with an open and intense information exchange during various environmental and process seminars have contributed to a strong partnership between SICK and HeidelbergCement.

Below - Figure 5: Comparison of NH_3 response times between GM32 *in-situ* measurement at SCR inlet and CEMS at main stack.



21-22 APRIL 2020 ON YOUR DESKTOP

global cemprocess™

PROCESS OPTIMISATION IN CEMENT MANUFACTURE

CEMENT INDUSTRY 4.0 CONFERENCE & EXHIBITION

CemProcess.com

#cemprocess

Virtual

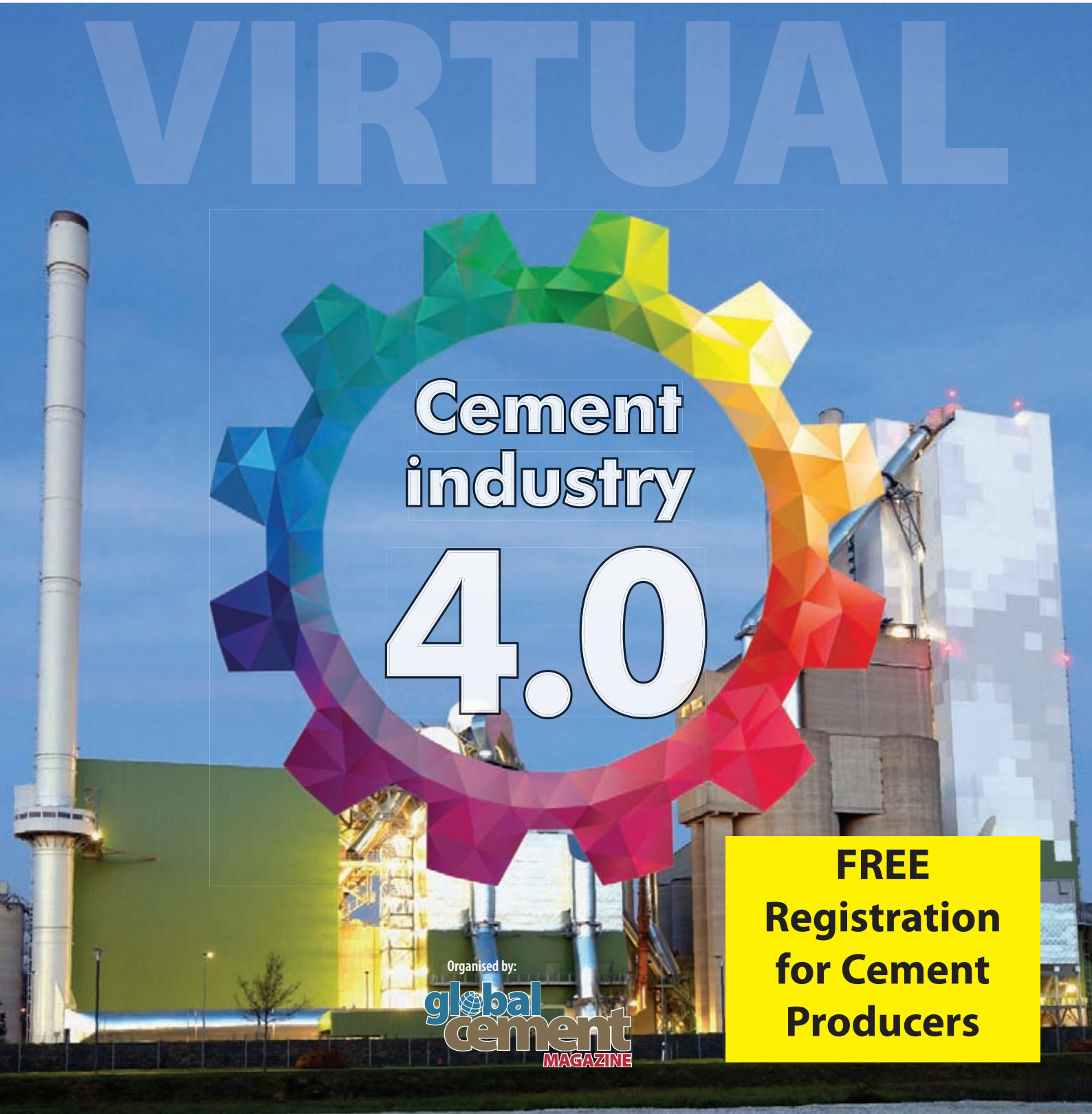
- Cement Industry 4.0
- Process optimisation
- Production maximisation
- De-bottlenecking and troubleshooting

Global CemProcess Enquiries

Exhibition and sponsorship:
paul.brown@propubs.com

Programme and speakers:
robert.mccaffrey@propubs.com

VIRTUAL



Organised by: global cement MAGAZINE

FREE Registration for Cement Producers

Lukas Steiner, Wikov

Solid but compact gearbox replacement

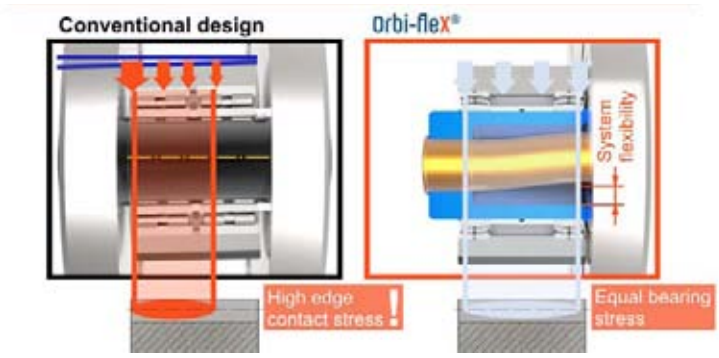
Planetary gear manufacturer Wikov reports on a recent case-study...

Wikov recently delivered a planetary gearbox for the central drive of a ball mill at a cement plant in Alicante, Spain. The project was a drop-in replacement for an original gearbox. The goal was to keep all connecting dimensions while delivering a much more compact gearbox and to keep its original power output.

The original weight of the central gear unit, including the base frame, was 104.5t, whereas the Orbi-fleX® planetary gearbox installed by Wikov weighs 67t, a 36% reduction in mass. Such compactness positively influences the capital cost.

The high power density of Wikov's planetary gear units is enabled through a multi-satellite arrangement and utilisation of a flexible pin in an open carrier structure. This design solution gives the gearbox higher power density but it is also critical in terms of operational safety. Wherever shockloads occur or higher safety factors are required, satellites mounted on a flexible pin in the open carrier structure flex, bringing benefits to the end-user.

Flexibility with Orbi-fleX® gearboxes means that the planetary gears are able to adjust position to compensate for any misalignents and deformations caused by shock loads from the driven machine through the output shaft and the carrier to the meshing points. This occurs via flexible pins that bring controlled flexibility into the system and help to reduce peak torque during shock load events. This consequently reduces load to gears and bearings. As a result gears and bearings do not suffer from damage and gearbox lifetime is enhanced. End-users benefit from a compact solutions that enables significantly reduced weight without compromising on power and safety.



Right: Comparison of behaviour of the conventional rigid pin solution and the shock load-eliminating flexible pin system from Wikov.

Below: Cross-section shows satellites with the flexible pin on two stages of the ball mill central drive.

Below right: The drive awaiting dispatch at the Wikov workshop.

CemCat

leading-edge SCR catalysts for the cement industry




CemCat creates flexible SCR systems that are adaptable to any process condition in any new or existing cement plant. For clean air: www.cemcat.com

CemCat - a business unit of Maerz Ofenbau AG, Richard-Wagner-Strasse 28, 8002 Zurich, Switzerland

Markus Theus & Daniel Schneider, CemCat AG, a business unit of Maerz Ofenbau AG

China's first high-dust SCR systems

CemCat presents a pair of recent NO_x emissions reduction case-studies from China...

Major cement manufacturers are increasingly taking measures to ensure compliance with more and more stringent limits on NO_x and ammonia (NH_3) emissions. In various Chinese Provinces the limit values have been reduced in the recent past or will be reduced further in the near future.

CemCat was contacted by cement plants at Jining and Zhongguo, both operated by Anhui Conch, where limits of 100mg/Nm^3 for NO_x (hourly average) and 8mg/Nm^3 for ammonia slip (daily average) needed to be met. These targets can be met reliably with CemCat's high-dust Selective Catalytic Reduction (SCR) technology.

Compared with semi-dust SCR plants, high-dust SCR solutions have a very low pressure drop, around 500Pa. The temperature drop is also around 10°C lower than a semi-dust SCR configuration. This means that the amount of ammonia injected can be reduced by around 60%, lowering costs and reducing the risk of ammonia slip. High-dust SCR systems are also more stable than semi-dust systems.

Anhui Conch was responsible for the complete concrete and structural steel work, including provision of the material. Maerz Ofenbau AG provided all of the core components, including the catalyst modules, from Europe, which Anhui Conch installed. Maerz was responsible for commissioning the units. The project was completed very rapidly by the partners, in around 10 months in total. This compares very favourably with time-scales in other world regions, such as Europe, where a similar project might take twice as long.

The construction period at both sites was around five months, with the CemCat SCR plant in Jining being commissioned in August 2019 and the unit at Zhongguo commissioned in October 2019. CemCat designed the two units for the denitrification of 340,000Nm^3/hr of flue gas per kiln line (See Table 1) to ensure permanent compliance with the emission specifications. A key element of the high-dust SCR system is the dust cleaning system. This ensures that the high-dust load (approximately 95mg/Nm^3) at the two plants is blown together with the flue gas through the catalyst elements and does not clog them up.

Right: CemCat high-dust SCR at Anhui Conch's Jining plant.

Right: CemCat high-dust SCR at Anhui Conch's Zhongghuo cement plant.

Territory	Design Data	Operating Data
Kiln output (t/day)	5100	~6000
Gas flow (Nm^3/hr)	330,000	~380,000
Gas temperature (°C)	320	~325
NO_x before SCR (mg/Nm^3)	805	~700
NO_x after SCR (10% O_2, dry) (mg/Nm^3)	100	<50
NH_3 slip after SCR (10% O_2, dry) (mg/Nm^3)	8	<3

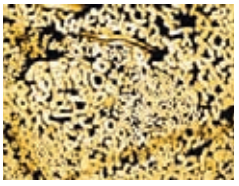
Right - Table 1: Design parameters for both SCR installations, plus operating data for the Jining plant.

Right: CemCat's high-dust SCR dust cleaning system.

What can pasta teach us about filtration?

P84® filter bags ensure the best filtration performance. The unique multi-lobed P84® fibre shape maximizes the filter surface and minimizes emissions and pressure drop.
The Profile makes the difference.

P84



Evonik Fibres GmbH
Gewerbepark 4
4861 Schörfling
Austria
Phone +43 7662 6006 2891
Fax +43 7662 60069 2891
www.P84.com

EVONIK
Leading Beyond Chemistry

Interview by Global Cement staff

In-process fan balancing case-study: LafargeHolcim Siggenthal plant, Switzerland

Markus Rufle, the Maintenance Manager at LafargeHolcim's Siggenthal plant in Switzerland, offers a plant perspective on an in-process fan-balancing project with Hofmann Mess- und Auswuchttechnik GmbH & Co. KG of Germany.

***Global Cement (GC):* How did you hear about the Hofmann balancing system?**

Markus Rufle (MR): I have worked in the cement industry for many years and am now Maintenance Manager at the Siggenthal cement plant, so I know how important it is to have a production operation with the highest possible availability. I am always looking for solutions that offer a high degree of optimisation to further improve the production process and costs.

LafargeHolcim plants with preheater fans around the world have fitted their fans with Hofmann's AB9000 fan balancing system to counteract the build-up of deposits, especially when high exhaust gas temperatures and alternative fuels are combined. This build-up causes imbalances that can lead to vibrations with high amplitudes. These lead to disruptions in the production process and frequent stoppages for cleaning and maintenance, which results in considerable downtime costs.

With Hofmann's AB9000 active balancing system, the time between stops can be significantly extended. In addition, a less intense vibrations mean that the system experiences less wear and tear. The fan and its surroundings experience a significantly reduced load compared to operating without the active balancing system. I have personally inspected the system at several locations and evaluate it as very efficient.

***GC:* For which application did the Siggenthal plant intend to use the system?**

MR: The plant had vibration problems with its raw mill fan. The impeller wears out during operation due to the continuous dust load, which means that the

Right: The fan during installation of the AB9000 system.

Left: Impeller wear leading to increased vibrations.

desired quiet running is no longer possible. The use of the balancing system allows us to optimise interim maintenance of the fan. However, the most important point for me is process safety: This depends strongly on the smoothness of the running of the fan. It was possible to increase safety levels because the mechanical load was reduced. Although there's not the same potential gain as when balancing a preheater fan, it still makes sense because the fan now runs at a significantly lower vibration level than before.

***GC:* How did the project with Hofmann go?**

MR: The cooperation with Hofmann went very well. Thanks to the high flexibility of the company, we were able to implement the project within a very short time. At first we had doubts whether the system could be integrated into our fan at all due to lack of space. However, Hofmann is specialised in these applications, with experience of more than 60 applications in the cement, steel, titanium dioxide, chemical, waste incineration and paper industries. We received a proposal within a very short time, which was then implemented. Today the system works without issues. However, the project is not yet complete...

***GC:* What else is there to do?**

MR: The Siggenthal plant operates at a very high technological level. Among other things, we use a condition monitoring system from DALOG Diagnosesysteme GmbH for our critical drives around the kiln and the raw mill. This system stores process data and evaluates it as required. Hofmann's balancing system generates additional data that can be used to optimise our production process. Together with Hofmann, we want to feed this data into the DALOG system and use it to make appropriate evaluations in order to improve predictive maintenance for the fans. The corresponding electronic components, including interface management, will be developed and provided by Hofmann. We will be the first LafargeHolcim plant to combine Hofmann's active balancing system with the DALOG system.

***GC:* What is your conclusion about the Hofmann AB9000 active balancing system?**

MR: It is a very useful investment, especially for cement plants where the preheater fan has temperatures of >350°C. Of course, there are other possible applications, such as the raw mill fan at our Siggenthal plant, but the biggest benefit is in the preheater fan. This is essential for the production process and must therefore be operated for as long as possible between maintenance stops. Every stop that can be avoided saves money, so the payback period for the investment is relatively short.

***GC:* Thank you for your time today.**

MR: You are welcome indeed!

Left: The AB9000 balancing unit system installed.

Switzerland: Liebherr reveals all-electric cement mixer

Swiss construction firm Liebherr has announced a first for heavy-duty construction sites, an all-electric concrete mixer truck. The ETM is a five-axle semi truck mixer based on the 670 HP all-electric Volvo FM. While Liebherr has offered electric drum drive models in the past, the ETM is the first that has an electric mixer drum drive mounted to a fully electric truck chassis.

US: EPA reaches settlement with Massachusetts concrete producer

The US Environmental Protection Agency (EPA) has reached a US$90,300 settlement with Boro Sand and Stone Corp., a Massachusetts-based concrete and stone producer that EPA cited for violations of two federal Clean Air Act regulations at its facility in North Attleborough.

EPA alleged that Boro failed to comply with federal Clean Air Act (CAA) regulations at two of the facility's rock crushers that used diesel engines to generate electricity to power the crushers. Boro shut down both rock crushers and stopped using the diesel generators after receiving a notice from EPA regarding its CAA violations in November 2019 and has since connected electrical power supplies to its rock crushing operations at the facility.

Germany: CSC Gold Certification for Schwenk Zement plants

Schwenk Zement's 1.2Mt/yr Karlstadt cement plant in Bavaria, 1.0Mt/yr Allmendingen and Mergelstetten cement plants in Baden Württemberg and 0.86Mt/yr Bernburg cement plant in Saxony-Anhalt have all achieved the Concrete Sustainability Council (CSC)'s gold certification, enabling the use of their cements in concrete for CSC certified sustainable buildings. Schwenk building consultancy head Werner Rothenbacher said, "Schwenk is committed to sustainable cement production at all locations. More works will follow soon." In addition to its cement plants, Schwenk operates numerous ready-mix concrete production facilities in Germany.

South America: Concrete mixers repurposed in fight against coronavirus

Concrete mixer trucks that have been converted into massive soap dispensers are among the innovative ways that concrete producers have been helping the fight against the coronavirus outbreak in South America. Cemex Panama first had the idea and converted its fleet of 8-10m^3 mixers to mix soap and water instead of concrete. Cemex Colombia soon followed, then a range of other producers. One use in which soap mixers are particularly useful is to clean areas that will be converted to temporary hospitals.

World: Ready-mix market to be worth US$1.2tn by 2027

The global ready-mix concrete market size is expected to reach US$1.21tn by 2027, expanding at a revenue-based CAGR of 7.9%, according to a new report by Grand View Research, Inc. Growing construction activities in commercial and infrastructure segments across the globe are expected to drive the demand.

In 2019, the demand for ready-mix concrete stood at US$656.1bn, around half the forecast level anticipated for 2027. This rise will be due to rapid infrastructural expansion, particularly in the US, Mexico, Brazil, China, India, Thailand, Singapore, Indonesia and the UAE.

LafargeHolcim & Forney LP

LafargeHolcim removes human error from ready-mix concrete testing with ForneyVault®

LafargeHolcim technicians no longer record results by hand and manually transfer data...

LafargeHolcim is the global leader in building materials and solutions and is active in four business segments: Cement, aggregates, solutions and products and specialises in offering ready-mix concrete. Its solutions are precision-engineered to meet stringent safety and infrastructure needs for each market and application it services.

Javier Castillo, the national ready-mix concrete quality coordinator for Holcim Mexico, part of LafargeHolcim, had an important task. He and his performance team needed to improve the accuracy, efficiency and transparency of its ready-mix tests. On top of this, the team wanted to find a single solution that could be used reliably across different tests and laboratories. Before embarking on its search for a solution, the team studied the existing ready-mix testing process. Uncovering the areas that most needed help would be critical to finding the perfect solution. There were three main weaknesses:

1. Unreliable specimen assurance;
2. Inconsistent testing;
3. Incorrect data entry.

Unreliable specimen assurance

Prior to Castillo's team's study, Holcim Mexico's ready-mix concrete segment had no defined method for specimen assurance. Instead, it relied on its technicians to take proper care. This had drawbacks.

Prior to the test itself, technicians would manually label a specimen and store it for curing. Any mistake here could lead to improper testing or even biased results. For example, if the label became smudged or the original handwriting was illegible, the next technician in the workflow could potentially misread the ID. This might mix up results with another specimen and skew the data. Human error, unfortunately, is inevitable and even the best technicians make mistakes. Trusting that they were checking and selecting specimens correctly was not enough for Holcim Mexico. The team needed a better way to verify that the correct samples were being tested.

Below: Holcim Mexico has been able to greatly reduce errors in its ready-mix concrete testing laboratories following the implementation of ForneyVault from Forney LP. This has helped it offer an even more consistent and better value product to its customers.

Inconsistent testing

Holcim Mexico's laboratories used manual machines to conduct most of their ready-mix tests. This was a major bottleneck for technicians, who all had a number of important competing tasks to manage. Additionally, the test process on manual machines was itself inconsistent and variable. So much of each process relied on human operation.

Again, human error is unavoidable. Fatigue from manually preloading and running tests all day affects different people in different ways. In a worst case-scenario, it could even be possible for five different technicians to produce five different sets of test results on the same day. How accurate can a data set be if the results are generated inconsistently? This was a question that Castillo's performance team kept coming back to.

Incorrect data entry

The third, and most egregious, weakness that Castillo's performance team discovered was incorrect data entry. To start with, the data entry process was an incredibly time-intensive process. Technicians at Holcim Mexico spent up to two hours per day manually typing results from a clipboard into its SAP-based computer system for analysis. This was time not spent running tests and completing other, potentially far more valuable, tasks.

However, this waste of time didn't just represent an opportunity cost. It also led to an *actual* cost. Looking at its key performance indicators (KPI), the Holcim Mexico team noticed higher costs. It traced these back to higher variance, a metric measured through the standard deviation of test results and then homed in on another source of variability: typing errors.

It all adds up

Taken together, unreliable specimen assurance, inconsistent testing and incorrect data entry were increasing the cost of Holcim Mexico's products. The variability impacted total cement consumption, the most expensive material used in concrete. In order to control costs, improve overall operations and solidify its reputation, Castillo's team needed to transform its ready-mix testing process into something far more consistent and reliable. From its prior research and experience, Holcim Mexico knew that there was only one solution that could solve these issues: Automation.

Solution: A process of elimination

"We knew right away that we needed automation to mitigate these costly errors," explains Castillo. "What we didn't know, however, was just how automated we could become in other areas of our testing process."

At first, Castillo's performance team conducted a general search for an automated Laboratory Information Management System (LIMS). However, when it came to addressing human error at all stages of the testing workflow, including before and after the testing process itself, the solutions the team found were either underwhelming or too conceptual and lacking in real-world applicability.

While LIMS and other construction materials testing software offered great project management or billing value, Holcim Mexico needed a solution that could integrate into its entire construction materials testing (CMT) process. This would fill in the missing links in the process and remove the potential for human error. This would have to go beyond addressing human error and actually *improve* human performance. This was a solution that, as of yet, didn't appear to exist. On top of that, the company wanted a true partner, a well-established company that was still forward-looking and innovative.

Step forward Forney LP

Through networking, Castillo discovered Forney, LP, a leading manufacturer of testing equipment for the construction industry. Founded in 1916, Forney had deep knowledge and experience in the CMT space, designing thousands of innovative scientific testing, measuring and processing instruments for the concrete, soils and asphalt industries worldwide. It understood testing protocols and knew the industry's 'pain points.' When Castillo was introduced to ForneyVault, Forney's flagship integrated construction materials testing platform, a lightbulb went on.

Results: Truly automated testing

Castillo's team in Mexico City became the first of many Holcim Mexico laboratories to implement ForneyVault. They were able to all but eliminate the potential for human error from their ready-mix testing process, from specimen assurance to data analysis.

This is because the platform integrates directly with LIMS and other third-party software, which means that technicians no longer have to manually type results into the SAP system. Data from the testing machine could automatically transfer to the database for storage and long-term trend analysis.

Above: Sample assurance, inconsistent test and incorrect data entry had all been adding up for Holcim Mexico.

However, it wasn't just the results workflow, the machines became 'smarter' too. ForneyVault automatically feeds specimen data to the machine before the test. This means the machine 'knows' what it's testing. With the preloaded data, it can verify that the right specimen is being tested on the right day according to the right protocol, completely eliminating the potential for false tests. Holcim Mexico had transformed its entire testing workflow with one solution, producing staggering results.

"Since implementing ForneyVault in Mexico City, we've seen a 95% error reduction in our laboratories, which has translated to a lower variability and allows us to optimise the cost of our products due to lower cement consumption," explained Castillo. "Plus, our trends over time are more accurate, which means we can continuously improve on our ready-mix offerings."

Also, because test results physically can't be altered or mistyped from machine to database, the company can now confidently prove that it really does offer the most consistent and reliable product on the market. "It is not possible to modify or delete any result. ForneyVault guarantees traceability to all test results at any time," commented Castillo.

Cutting data entry

"We moved from two hours a day of data entry to just two minutes," adds Castillo. "From using three technicians for three machines we've gone to one technician for three machines, saving not just on error reductions but also technician time."

Most of Holcim Mexico's laboratories use automatic machines, allowing for more consistent and repeatable testing. However, even the two remaining laboratories that still use manual machines can connect to ForneyVault via the ForneyLink™ touchscreen interface. This means that every laboratory receives the benefits of automated data transfer and undeniable verifiability.

After the success of the Mexico City lab, Holcim Mexico didn't waste any time. The firm immediately deployed ForneyVault in five more laboratories. The team plans to roll it out to seven more during 2020.

Contents
Subscribe
Ad Index

Togo: Gebr. Pfeiffer and Intercem Engineering to supply new mill

Cim Metal Group subsidiary Cimco has received a Gebr. Pfeiffer 6400kW, CEM I - CEM IV MVR 6000 C-6 grinding mill. Germany-based Intercem Engineering will install the mill, which grinds CEM I to a fineness of 3800cm^2 at a rate of 370t/hr, at Cimco's Lomé grinding plant. Gebr. Pfeiffer has said that this is the 12th MVR mill installed in Africa.

India: New KHD raw mill

KHD's subsidiaries Humboldt Wedag India and Humboldt Wedag have signed a deal with LafargeHolcim's subsidiary ACC to build a new raw meal grinding unit and a pyroprocessing line for an existing cement plant. The contracts also include the supply and installation of the electrical and instrumentation package for the entire cement plant. The entire contract package is worth over Euro35m.

US: Solar plant for the Alamo

Buzzi-Unicem subsidiary Alamo Cement Company has signed a contract with Italy-based renewable power supply expert Renergetica for the construction of a 10MW solar power plant at its 1.1Mt/yr integrated cement plant in San Antonio, Texas.

US: FCT wins Pennsuco contract

FCT combustion has announced that it has won an engineering, procurement and construction (EPC) contract with Titan Cement for the upgrade of the 5000t/day kiln line at its Pennsuco plant in Florida to 100% natural gas firing. The upgrade consists of the installation of two new burners: a dual-fuel capability Gyro-Therm Mk3 and a back-up natural gas-firing Gyro-Therm Mk3. The company has said that it will also supply accessories, field instruments, burner management system and valve train.

Denmark: ScanChain distribution deals

Denmark-based chain specialist ScanChain has announced that it will produce and distribute chains from a new facility located in Poznan in the province of Greater Poland. The company says it has extended its partnership with a partial ownership by UK-based John King Chains.

ScanChain said, "Over the past three years we have seen a great growth in new markets. We are pleased that both ScanChain and John King Chains wish to establish a strong link going forward."

Germany: Currax-Siemens collaboration

Currax and Siemens have announced their collaboration on a mill operations digitisation pilot project involving the Simotics Connect 400 motor data collector and transmitter. They hope that analysis of data processed via the Simotics 400 will better enable the remote operating of mills 'to increase efficiency and component life' and accelerate the shift towards automated production methods that are resilient to crises such as COVID-19.

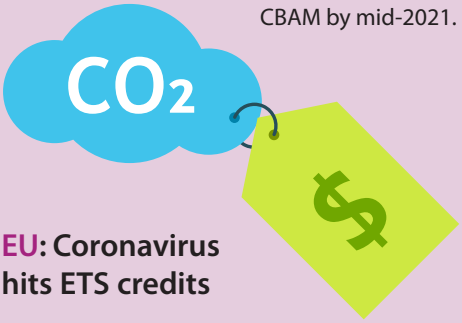
India: Cement producers negotiate major municipal supply contract

Representatives from Aditya Birla subsidiary UltraTech, Ramco Cements, India Cements, JSW Cement and KCP have met with Andhra Pradesh Chief Minister Jaganmohan Reddy and other state officials to negotiate the sale of their products to construction companies working on public projects, 'at lower prices.'

The Hindu newspaper has reported that the state forecasts a year-on-year rise in its annual cement consumption of 67%, to 30Mt in 2020 from 18Mt in 2019. India Cements' vice chair and managing director Narendra Srinavasan said that all planned infrastructure projects, "Ought to be implemented in order to bail out the industry from the turmoil it has been undergoing."

EU: Cembureau welcomes CO_2 Border Adjustment Mechanism

Cembureau has welcomed the European Commission's proposal for consultations on setting up a carbon border adjustment mechanism (CBAM) for imported goods, including cement. The association has set out a number of 'design principles' that 'should apply'. According to Cembureau, a CBAM ought to be: complementary to EU emissions trading scheme (ETS) free allowances (in the initial phase), World Trade Organisation (WTO) compatible, based on importers' verified emissions (including indirect emissions), applicable to all ETS sectors and capable of providing a CO_2 charge exemption for EU exporters. The European Commission has said that it will present a final proposal for a CBAM by mid-2021.



EU: Coronavirus hits ETS credits

The coronavirus has caused emissions credits sold under the Emissions Trading Scheme to take a price dive. From a recent high of Euro25.6/t on 19 February 2020, they sank to Euro15.24/t on 18 March 2020, before recovering marginally to Euro17.86/t by 3 April 2020.

Environmental consultancy firm Energy Aspects said, "As the COVID-19 outbreak is now spreading rapidly in Europe, it will start to reduce emissions as lockdowns are put in place in multiple countries."

The European Commission now forecasts a 1.0% contraction in EU GDP in 2020, revising its February 2020 estimate of 1.4% growth year-on-year. This would correspond to a reduction in industrial CO_2 emissions of between 10.0Mt and 20.0Mt by the end of 2020.

Europe: LEILAC 2 project announced

Australia-based Calix has announced that construction will shortly begin on its second low emissions intensity lime and cement (LEILAC) carbon capture and storage (CCS) installation at a 'European cement plant.' Collaborators on the project, which has received Euro16m under the EU's Horizon 2020 grant scheme, include Portugal-based Cimpor, Germany-based HeidelbergCement, Germany-based IKN, France-based Engie and Belgium-based minerals and lime company Lhoist.

Calix has said that the 0.1Mt/yr process emissions capture facility will be operational in late 2024.

UK: Hope to continue

Breedon Group has suspended production at all UK sites except operations that 'serve critical supply needs.' This includes its Hope, Derbyshire, cement plant. The group's Ireland operations also continue, 'pending further guidance from the Irish government.' Breedon Group says that it has taken the temporary measures 'to ensure the safety and wellbeing of colleagues, subcontractors, customers and communities.'

Mineral Products Association (MPA) CEO Nigel Jackson had earlier written to the UK Chancellor, Rishi Sunak, welcoming his deferment of value added tax (VAT) and urging the extension of this deferment to Employer National Insurance (ENI), Corporation Tax and Business Rates.

"What business needs now are fast and simple solutions that enable them to keep cash in their businesses and their employees in their jobs," said Jackson. "Once the recovery starts the pent-up demand will be immense."

Switzerland: LafargeHolcim coronavirus measures

LafargeHolcim has announced measures to limit the 'volatile' impacts of coronavirus on health and business. The measures, which overrule its previous 2020 guidance, consist of: a year-on-year capital expenditure (capex) reduction of Euro378m; a year-on-year fixed cost reduction of Euro283m; and a reduction of net working capital 'at least in line with its level of activity.' LafargeHolcim has said that it had Euro7.56bn of strongly liquid assets as of 26 March 2020.

LafargeHolcim predicts that global construction's cement demand will decline in April and May 2020. It said the construction sector has begun to recover in China, where all of its cement plants outside of Hubei province are once more operational. At the time of going to press it said that it expected to deliver 70% of its April 2019 Chinese volumes in April 2020.

Germany: HeidelbergCement on 2020 roller coaster

HeidelbergCement started 2020 better than ever before, according to chief executive officer (CEO) Dominik von Achten. He reported that this had been mainly due to good weather before the onset of the coronavirus outbreak. Von Achten added that the situation for the multinational had already changed beyond recognition since mid-February 2020.

He said that the coronavirus outbreak had not only caused plants to be closed, either by enforcement or due to a lack of demand, but because migrant workers are unable to travel to construction sites.

According to Von Achten, HeidelbergCement is now paying particular attention to its costs and has deferred all unnecessary investments, but that it has has considerable liquidity leeway. He added that the group is likely to benefit significantly from lower fuel costs as conditions improve over the course of 2020.

Greece: Titan drops in 2019

Titan Group's profit dropped by 5.5% year-on-year to Euro50.9m in 2019, from Euro53.8m in 2018. The group said that it 'demonstrated strength' in 'sustaining a growth performance' despite challenges in Southeastern Europe and the Eastern Mediterranean. Sales were Euro1.61bn, up by 8.0% from Euro1.49bn in 2018, led by Titan Group's US subsidiary Titan America's sales growth of 10.7%, to Euro952m from Euro860m. Titan Group's Greece and Western Europe sales grew to Euro245m, up by 3.3% from Euro237m in 2018, with sales gains from the private sector offsetting the decreased revenue from delays in public infrastructure projects. Cement exports, especially to the US, were also a major regional sales contributor, while clinker exports fell.

Group volumes of cement, including clinker and cementitious materials, were 17.0Mt in 2019, down by 7% from 18.2Mt.

Estonia: Kunda Nordic Tsement plant to close

HeidelbergCement's Estonian subsidiary Kunda Nordic Tsement announced the planned closure of its 0.8Mt/yr integrated Kunda plant in Kunda, Lääne-Viru County in March 2020. The closure will result in 80 redundancies. The company said that the closure was due to the plant's wet process equipment, which has been rendered economically unviable by the EU Emissions Trading Scheme (ETS) due to its high CO_2 process emissions.

Spain: Cement plants dispose of medical waste

Members of the Spanish cement association Oficemen have offered help to the government in the disposal of medical waste contaminated with the coronavirus, for which any kiln line with the right alternative fuel processing capabilities will be made available. Minister for Industry Reyes Maroto said that the plants will be used for waste elimination 'only insofar as companies can continue operating.'

Interview by Peter Edwards, Global Cement Magazine

Burglengenfeld: One of Germany's most modern cement plants

Above: Henrik Wesseling, Plant Manager at the HeidelbergCement Burglengenfeld plant since 2015. He began working for HeidelbergCement in 2001 and worked in a number of positions for the company around Germany over the next five years. Between 2006 and 2012 he spent time in the US, first as assistant plant manager at the LehighHanson Mitchell plant in Indiana and then as plant manager at the LehighHanson Permanente plant in Cupertino, California. Upon his return to Germany he spent three years as Head of Group for Energy Purchasing for HeidelbergCement, before taking up his current post. **Source:** HeidelbergCement.

We speak to Henrik Wesseling, Plant Manager of HeidelbergCement's Burglengenfeld plant in Germany, one of the most modern facilities in the country...

***Global Cement (GC):* Could you outline the history of the Burglengenfeld plant?**

Henrik Wesseling (HW): The plant was founded in 1912 and production began in 1914. In 1954 the plant saw the commissioning of its first preheater kiln, before a pair of 2000t/day 4-stage dual string preheater kilns from KHD came online in 1968 and 1974. In 1971 the plant made more than 1Mt of cement for the first time.

After 45-50 years of operation of these two kilns, a decision was taken in 2014 to convert one of the two lines to 4000t/day with an extensive upgrade project. The other kiln would be decommissioned. This major project took place over 18 months during 2016-2018. The modernisation included a new raw mill department, a new kiln exhaust baghouse and a high-efficiency selective non-catalytic reduction (SNCR) system, a new 5-stage dual string preheater tower and a new 4000t/day clinker cooler, as well as a new alternative fuel storage and dosing area.

***GC:* What prompted the decision to upgrade?**

HW: The preheater kilns had served the plant very well, reaching an impressive 60% alternative fuel level. However, with only a preheater kiln, the only place to burn alternative fuels was in the main burner, where we had reached the technical limits. The company wanted to burn more alternative fuels and reduce its emissions, especially in light of lower European emission limits that came in to force in January 2019.

The contract for the modernisation was awarded to IKN, which would oversee the installation of a state-of-the-art 5-stage precalciner kiln. Cement plant construction expert Hoffmeier Industrieanlagen supplied and carried out most of the structural design, supply and installation.

***GC:* How was the construction process?**

HW: The modernisation presented the teams with a very challenging brownfield project. Both of the kilns had to maintain operation during the build. This involved actually building the new tower over a hot rotating kiln! We had to construct the foundations of the 104m-high new preheater tower, with 108 pillars (1m x 11m). These had to be drilled, concreted and built upon while the kiln ran at maximum capacity.

Plant profile

Location:	Burglengenfeld, Bavaria
Main market:	Bavaria, Southern Germany
Established:	1912
First cement:	1914
First dry line:	1954
Twin KHD lines:	2000t/day (1968 & 1974)
Major renovation:	2017 - 2018
Capacity:	4000t/day (1.3Mt/yr)
Preheater:	5-stage, single string
Kiln:	L = 61m, Ø = 4.8m
Cooler:	IKN Pendulum, 4000t/day
Alternative fuels:	90% (Permit for 100%)

Left: The plant during the main construction phase.
Source: HeidelbergCement.

We had 80 days from Christmas 2017 until mid March 2018 for the final conversion. This final push included the replacement of the 2000t/day cooler with a 4000t/day cooler in the same building footprint, installing a new kiln hood in order to connect the tertiary air duct on the one side, while at the same time cutting 6m off the kiln in order to install the new feed chute. During that period we also had to connect all the ductwork between the gas conditioning towers, the raw mills and the baghouse. In that phase we had more than 450 construction workers on site, which had to be orchestrated and managed extremely closely. Before the project we implemented a very stringent health and safety regime and consequences management to avoid any severe injuries before they occur.

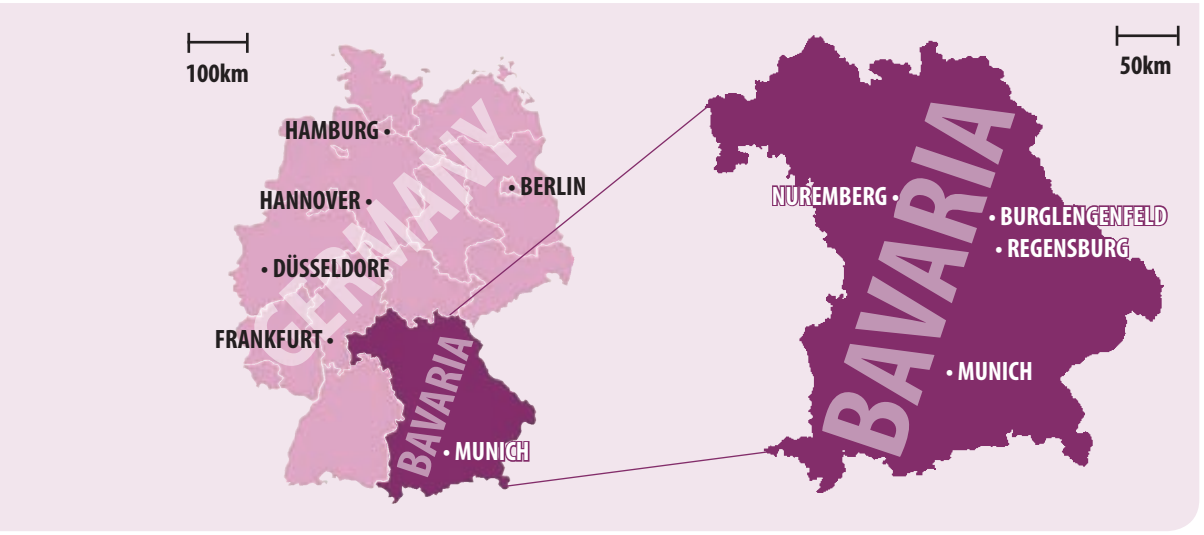
***GC:* What was the worst moment during construction?**

HW: There were no major sticking points. I would say that the biggest problem, constantly, was to meet the deadlines. We really did have to be finished with the main build by Christmas 2017, no option. There was the constant risk that a small delay could snowball into a month. If that had happened, there could have been knock-on effects for the plant all through 2018.

***GC:* Please outline the new production process.**

HW: The quarry at the Burglengenfeld plant is part of the Jura lime deposit, a 150 million year old reserve in the southeast of Germany. The deposit has great ratios of calcium and silicon, and to a certain extent aluminium oxide, for cement production. Clay and fly ash are added as an aluminium source. Iron is added as an external secondary raw material as well as fly ash as an additional aluminium source.

Quarrying takes place in a ~40 hectare active quarry. Due to the age of the mining operation, eight



Left: Summary plant details and location within Germany.

Opposite page: The Burglengenfeld plant from the north east.
Source: HeidelbergCement.

Right: Extensive construction work, including 5000t of structural steel, was carried out by Hoffmeier Industrieanlagen. **Source:** Hoffmeier Industrieanlagen.

hectares are already reclaimed and are an integral part of the public-relation ambitions of the plant. The reclaimed area includes a nature and geology teaching path, an area for a green classroom for the local schools as well as an arena for open-air concerts.

The limestone is mined by drilling and blasting. The blasted rock is transported by three 90t heavy-duty trucks to a semi-mobile Thyssenkrupp double rotor hammer crusher that has a rated capacity of 1600t/hr. The crushed rock is continuously monitored by a Thermo Fisher cross belt analyser and, depending on the quality, the chemistry can be adjusted by selective mining.

The limestone rock is stored in two covered longitudinal mixing beds and one open mixing bed, totalling 40,000t. Together with the corrective additives, the limestone is then conveyed through a second Thermo Fisher cross belt analyser to two identical MPS 4250 vertical roller mills from Gebr. Pfeiffer, each with a capacity of 200t/hr. The raw meal is stored in eight silos.

After the modernised kiln - more on that later - the clinker is cooled in an IKN pendulum cooler that has a KIDS® static inlet. The cooler has a cooling surface area of 107m² and is pushed directly by two variable frequency drives via eccentric discs. The necessary chlorine bypass system is dedusted by a Scheuch fabric filter baghouse and dedusting of the cooler is accomplished by two electrostatic precipitators from ELEX, installed in 2000 and 2001. The clinker is stored in one large clinker silo and a longitudinal storage hall.

Cement is ground by two Polysius ball mills and one combined roller-press (Polycom) – ball mill circuit (O&K). The plant's cement products are stored in 14 silos. The packing plant from Haver & Boecker

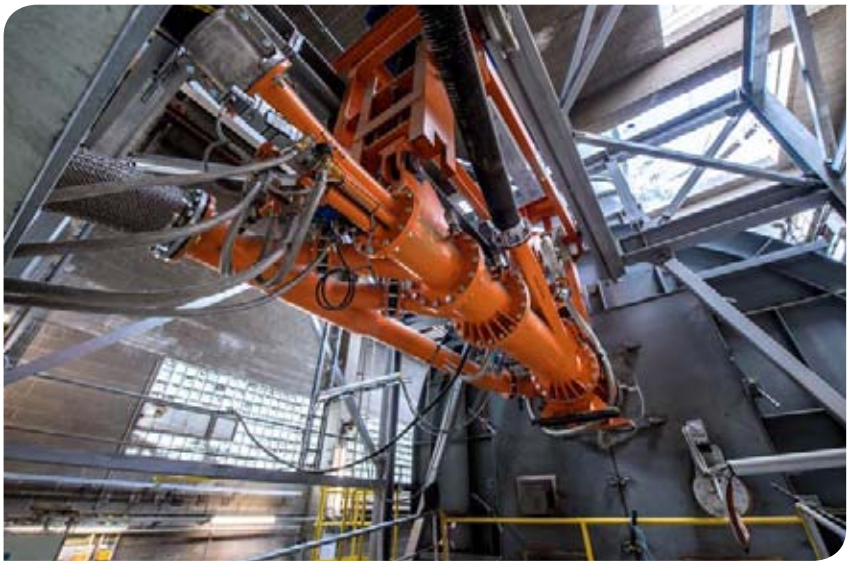
Below: A front-end loader fills one of the plant's three 90t haul trucks. **Source:** HeidelbergCement.

runs a 16 spout rotary packer and there is an automated palletiser from Beumer.

***GC:* How was the commissioning process?**

HW: As with any other commissioning, we went over the start-up scenario prior to day one over and over again to try to anticipate any challenges that might arise. We sent each of our control room operators and shift bosses through a Simulex training programme and to another calciner kiln plant for them to learn the operation 'in the flesh.' We also included the production and maintenance team in the engineering and we had regular inspections with various plant crews during the construction phase. The visits were very valuable, not only for knowledge transfer, but also for last minute field fit modifications, where they were still possible!

We were working with a tremendously motivated and skilled commissioning team from IKN, Hoffmeier and the other suppliers, as well as from the HeidelbergCement Technology Center (HTC) and some of our sister plants at HeidelbergCement AG. We scheduled each of the four commissioning teams to work for four weeks in our schedule. Experienced commissioning engineers were put together with young plant engineers, HTC experts and our own shift crew. The teams quickly formed strong relationships and, as always, there was healthy competition between the different shifts. In the end it was the strong commitment of each team member and their combined team spirit that led to success. Of course, we also had to live through some painful night shifts and weekends. There was one incident when a tiny



Above: The main burner, supplied by Greco.
Source: HeidelbergCement.

Opposite: Polysius roller press for cement grinding.
Source: HeidelbergCement.

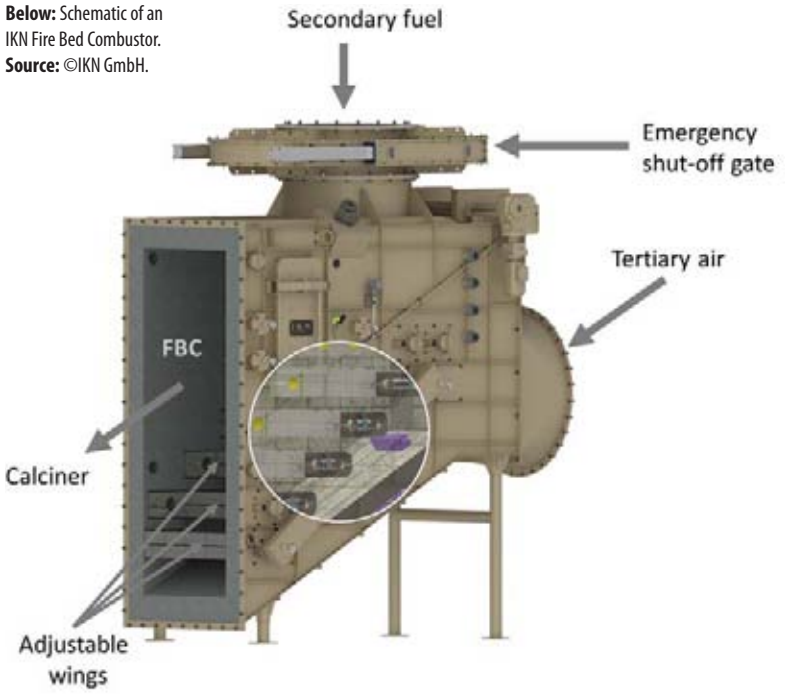
20mA connector took down a kiln drive and, subsequently, the entire kiln. This is hardly avoidable during the commissioning of complex systems.

***GC:* Is the plant now operating at 'full speed?'**

HW: The kiln was up and running at a stable and reliable 4000t/day within the first weeks thanks to our skilled and result-focused teams of men and women. It was a pleasure to work with them. HeidelbergCement hadn't built a precalciner kiln in Germany before. An installation of this size in Western Europe is fairly unusual in itself of course.

***GC:* Are there any other upgrade projects currently underway at the plant or things left to be done?**

Below: Schematic of an IKN Fire Bed Combustor.
Source: ©IKN GmbH.



HW: There are no major projects ongoing or in the pipeline, but we continuously tweak the plant to improve it, find little efficiencies here and there and generally develop it as much as we can.

Fuels and emissions

***GC:* What is the plant's alternative fuel story?**

HW: After a switch from heavy oil to coal in the early 1980s due to the oil crisis, the plant installed its first alternative fuel system, for whole tyres, in 1988. This move into alternative fuels was early on in the international scene. In 1997 a dosing system was installed for wood chips. In 2000 this was converted to feed fluff. By the end of their long run in 2018 the two KHD preheater kilns were using 60% alternative fuels, but this was essentially their technical limit.

***GC:* What fuels does the plant use today?**

HW: The kiln is permitted to run on 100% alternative fuels. We have operated with 100% for limited periods, but it is not currently possible on a continuous basis. We target 90% in 2020.

Low calorific value and coarse fluff is fed to two IKN Fire-Bed Combustors (FBC), a pilot technology at this plant. They are essentially a combustor for dense and coarse alternative fuels with a long residence time. They are positioned next to the calciner. Heat transfers from the FBC to the calciner where it is used with the tertiary air. Most of the fuel is only partly combusted in the FBC. When the fuel particles are light enough to fly, they enter the calciner where they burn out completely. It's a sophisticated apparatus.

We feed high calorific value fluff at the main burner and lower calorific coarse fluff at the calciner using a system from Walter Materials handling, a member of ATS Group. We aim to control the temperature in the calciner with the same high quality fluff as used in the main burner. We also burn dried sewage sludge. As a primary fuel we use a low proportion of pulverised lignite dust. As a fall-back position, we keep the old coal mill, which we maintain but have not operated since 2018.

***GC:* Are there supply side issues with some fuels?**

HW: Absolutely not. There is sufficient alternative fuel from our long-standing waste handling suppliers, both within the local area and more widely in southern Germany.

***GC:* What emissions abatement systems are used at the Burglengenfeld plant?**

HW: For NO_x control we use a high-efficiency SNCR system, supplied by Lechler and STEAG, in order to meet the EU standards of 200mg/Nm^3 (daily average) for NO_x and 30mg/Nm^3 (daily average) for NH_3. In order to minimise dust emissions we operate a modern baghouse from Scheuch. Mercury emissions are controlled by an activated carbon injection system while the kiln operates in direct mode. Due to the excellent limestone in this region, which has little, or even zero, sulphur, there is no need for an SO_2 abatement system.

GC: **How does the plant perform in terms of CO_2 emissions?**

HW: At the Burglengenfeld plant we have been focused on CO_2 reduction over the past decade in two ways. Firstly, we have increased the alternative fuel rate, most recently by installation of the new precalciner. Secondly, we have developed cement types with a low CO_2 footprint. From 1990 to 2018 the HeidelbergCement Group as a whole reduced its specific CO_2 emissions by 20% to 599.2kg CO_2 per tonne of cement. By 2030 we want to reduce emissions to 30% below the 1990 baseline.

GC: **How does the EU Emissions Trading Scheme (ETS) affect the plant?**

Right: One of two identical MPS 4250 vertical roller mills from Gebr. Pfeiffer, each with a capacity of 200t/hr.
Source: HeidelbergCement.

Far right: The bulk of cement from the Burglengenfeld plant is dispatched by road.
Source: HeidelbergCement website.

HW: The ETS does not affect the plant on a day-to-day basis because we are already well motivated to reduce our CO_2 emissions. On top of the factors I mentioned in the previous answer, I strongly believe that HeidelbergCement has been on the right track as a group over the past decade when it comes to CO_2 emissions. HC participates and drives many different innovations around the globe.

GC: **Does the plant use renewable power sources?**

HW: Not at present, but this is another potential avenue to explore. We do already use excess heat from the clinker cooler to dry slag and to heat water for use at the plant and by the local community.

Markets and the future

GC: **What cement types are made?**

HW: The plant produces nine types of cement: limestone cements, slag cements and OPC. To provide the market with cement types with a lower CO_2 footprint, we also produce CEM II / B-M cements (clinker factor to as low as 65%) and we will produce CEM II / C-M type cement (minimum clinker factor of 50%) in the future. Both of these products contain ground granulated slag and limestone alongside clinker.

GC: **Where are the plant's main markets?**

HW: The Burglengenfeld plant mainly serves the Bavarian cement market. A large portion is delivered to the major cities of Regensburg, Nuremberg and Munich (See Page 43).

The majority of customers receive cement by truck, either via our logistics team or their own trucks. Just 4% of our output is bagged cement, which is fairly typical in Germany. Another 4% is delivered

Right: View of the plant from the south west.
Source: HeidelbergCement.

as bulk by train to our customers. We are actively seeking further customers that can receive cement by train to lower our delivery emissions.

***GC:* What is the biggest threat to the Burglengenfeld plant over the next few years?**

HW: Burglengenfeld has been operating in a solid and growing market in recent decades. This may change given the current situation regarding the coronavirus outbreak but that will hopefully be realised as pent up demand later in 2020 and into 2021. I don't see any plant-specific threats, other than those that apply to the German cement sector as a whole.

***GC:* What's the biggest opportunity over the same time?**

HW: Thanks to our latest modernisation and the precalciner kiln, the Burglengenfeld cement plant is well equipped and has a solid foundation for the future. Further emission reduction and the development of low CO_2 cement remain our goals. We are also exploring new opportunities in the digital world. Our industry still has great potential for improvement by adopting digital processes that are already well established in other industries. Both of these aims have been part of the strategy of HeidelbergCement for some time. Together with all other colleagues from HeidelbergCement AG, we will diligently and continuously improve our cement plant in the 2020s and beyond.

***GC:* Thank you for a great insight into the plant!**

HW: Thank you for the opportunity.

Contents
Subscribe
Ad Index

Jacob Winskell, Global Cement Magazine

Cement in Austria and Switzerland

Global Cement Magazine explores cement production in Austria and Switzerland and developments to look forward to in the future.

Both Austria and Switzerland came into being out of the Holy Roman Empire. Switzerland achieved its independence in the Peace of Westphalia in 1648. Austria only emerged in its present form upon the collapse of the Austro-Hungarian empire in 1918. Austria is famous for its classical music and gothic architecture, its food and beer and some of the personalities it has given the world, from Wittgenstein to Schwarzenegger. Switzerland is characterised by its mercantilism and 'permanent armed neutrality,' which dates back to the European wars of religion (1522 - 1714). Its complex political system arose to balance the interests of a population divided both by religion (Catholic and Reformed) and by language (French, German, Italian and Romansch). Predominantly Catholic, Austria's official and national language is German, which 89% of Austrians speak natively. Another important difference to be borne in mind is that, while both Austria and Switzerland participate in the EU single market, only Austria is a member state. Austria's per-capita Gross Domestic Product (GDP) in 2018 was US$51,500, compared to an EU average of US$36,600. Switzerland's was US$82,800, second only to Luxembourg globally.[1] Both countries' economies are services-orientated, but cement production, primarily for domestic consumption, remains a source of jobs and revenue.

Right: The Beauregard Dam, Valais, Switzerland.
Source: *Shutterstock.*

Austria and Switzerland's 15 integrated cement plants have a combined capacity of 10.0Mt/yr. A couple of generalisations apply to all of them:

1 - Low capacity: The average Austrian integrated cement plant has a production capacity of just over 0.6Mt/yr. Its Swiss equivalent has a capacity of 0.7Mt/yr. Only Swiss-based Lafarge-Holcim subsidiary Lafarge Cement GmbH's 1.2Mt/yr Mannersdorf plant in Mannersdorf am Leithagebirge, Lower Austria, exceeds 1.0Mt/yr capacity. Only Wietersdorfer subsidiary w&p Zement GmbH's 0.4Mt/yr Peggau plant in Klein St. Paul in the southern Austrian state of Carinthia, and Holcim (Schweiz) AG's 0.9Mt/yr Untervaz, Graubünden, plant, have more than one line. Each has two lines, although the former's were both mothballed in 2018.

2 - Well-equipped: Austrian and Swiss cement plants are generally old but, by global standards, highly modernised. All but two produce cement using the dry method. CRH subsidiary Juracime SA's 0.3Mt/yr single line at its Corneaux, Neuchâtel plant is semidry, as were w&p Zement GmbH's Peggau plant's pair before they were mothballed.

Both countries' governments drive the reduction of indirect emissions by renewable energy subsidiaries, though progress is at the mercy of Austria and Switzerland's particular political cultures. For example, Austria voted to ban nuclear power immediately after the construction of the 692MW Zwentendorf Nuclear Power Plant. In 2019 Austria sourced 33% of its energy from renewable sources, compared to an EU average of 18%,[2] while Switzerland's rate of renewable power consumption was over 75%. Hydroelectricity is the main method of renewable power generation in both countries.

A major difference between the two cement industries is related to ownership. Four of Austria's nine plants belong to single-plant owners. In contrast, all Swiss plants are controlled by multinationals. Switzerland's own LafargeHolcim operates alongside Ireland-based CRH and France-based Vicat.

Austria

Austria, population 8.85m,[1] is a Central European federal republic and presidential democracy. Though legally 'permanently neutral' since 26 October 1955, a date commemorated as Austria's annual National Day, Austria participates in the EU's Common Foreign and Security Policy and in military actions under NATO's Partnership for Peace. It hosts one of the four Offices of the United Nations. Economically, Austria's key sectors are food, electronics production (mostly for export) and tourism. Austrian industry has been mostly privatised since 1980, however the labour lobby continues to exert considerable pressure on the state to regulate employers. Construction generated Euro53.6bn in 2019 - up by 6.2% from Euro50.5bn in 2018 - corresponding to 6.0% of national GDP.[3]

To the cement world, Austria is possibly best known as a global cement equipment manufacturer and supplier. Shredding technology for alternative fuel (AF) production is one particular field where Austrian names such as Lindner and Untha predominate. Energy saving developed early as a theme in the history of cement production in Austria, where fuel was a major cost. The shredding industry allowed Austrian producers to be the first to invest in and benefit from AF.

Austrian plants produce clinker using on average 79% AF, compared to an all-EU figure of 46%. Statistics from the Vereinigung der Österreichischen Zementindustrie (VÖZ), the body that represents the interests of Austria's cement sector, showed that the country's average cement fuel mix in 2018 produced CO_2 emissions of 65.0kg/GJ, down by 3.0% year-on-year from 67.0kg/GJ in 2017.[4] In 2017, Austria's CO_2 emissions per unit of cement were 539kg/t, the world's lowest, down by 20% over the preceding two years from 674kg/t in 2015. At that time, the VÖZ set out a roadmap for the reduction of the carbon footprint of a unit of cement by 77% to 157kg/t. Increased alternative fuels substitution is to be responsible for a 4.2% decrease (28.0kg/t) and clinker factor reduction for a simultaneous 5.6% decrease (38.0kg/t), while the uptake of carbon capture and storage (CCS) technology is to account for a 55% decrease (374kg/t), giving a total reduction of 517kg/t between 2015 and 2050.[5]

Production

Austria's integrated cement production capacity is 5.7Mt/yr. Its nine plants span six states. Lower Austria, Upper Austria and Styria each have two plants, while Carinthia, Salzburg and Tyrol have one each. Figure 1 shows cement capacity by federal state. We will follow the *Global Cement Directory 2020* in analysing the industry on a producer-by-producer basis.

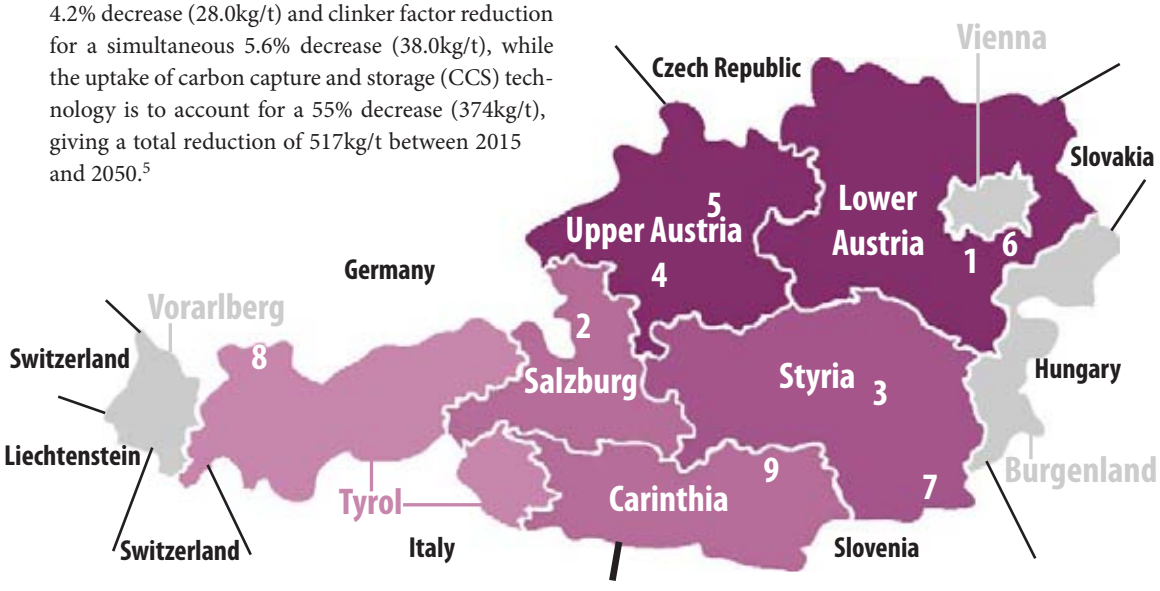
LafargeHolcim

With a capacity share of 30%, LafargeHolcim is Austria's largest cement producer. Its subsidiary Lafarge Zement GmbH operates an integrated production capacity of 1.7Mt/yr, employing 250 people. It was founded in 1997 by France-based Lafarge upon the latter's acquisition of the 1.2Mt/yr Mannersdorf cement plant in Mannersdorf am Leithagebirge from Perlmooser Zementwerke AG.

Cement production at Mannersdorf dates back to 1904. KHD supplied the plant with its first dry kiln in 1968, bringing its capacity to 0.8Mt/yr. In 1984 the present line, a Parallel Air Serial Combustion (PASEC) system produced by a joint venture of Voest Alpine Austria and East Germany-based Sket ZAB Dessau, was installed. A notable feature at the time was the line's low specific heat consumption. Its exhaust gas has a temperature of just 300°C.

Lafarge Zement GmbH has continued the tradition of innovation at the plant, which is fitted with an Austrian Unitherm Mono Airduct System burner and Schenck Process dosing and feeding systems. AF use, which began with animal meal and liquid AF in 1996, had reached a substitution rate of 10% by 1998. By May 2019 this had risen to 85%. As with most plants in this part of the world, production is seasonal. The Mannersdorf plant shuts for all of February, when the weather in Lower Austria is at its coldest. 2019 volumes were 1.1Mt, corresponding to a capacity utilisation of 92%.

Below left - Figure 1: Austrian federal states by integrated cement production capacity. **Source:** *Global Cement Directory 2020.*



0Mt/yr
<0.4Mt/yr
0.4 - 0.8Mt/yr
0.8 - 1.2Mt/yr
1.2 - 1.6Mt/yr

Left - Figure 1: Austrian integrated cement plants.
1. Wopfinger Baustoffindustrie GmbH, Wopfing, 0.3Mt/yr.
2. Zement Leube GmbH, Gartenau, 0.8Mt/yr.
3. w&p Zement GmbH, Peggau, 0.4Mt/yr.
4. Zementwerk Hatschek GmbH, Gmunden, 0.8Mt/yr.
5. Kirchdorfer Zementwerk Hofmann GmbH, Kirchdorf, 0.5Mt/yr.
6. Lafarge Zement GmbH, Mannersdorf am Leithagebirge, 1.2Mt/yr.
7. Lafarge Zement GmbH, Retznei, 0.5Mt/yr.
8. Schretter & Cie GmbH & Co. KG, Vils, 0.4Mt/yr.
9. w&p Zement GmbH, Wietersdorf, 0.8Mt/yr.

Right opposite: Gartenau plant, Austria.
Source: *Leube.at.*

The 0.5Mt/yr Retznei cement plant in Styria is LafargeHolcim's smaller Austrian venture and is itself a popular visitor attraction. Its big news of 2019 was the successful installation in April of a new Euro15.0m A TEC calciner.

In January 2018 the European Cement Research Academy (ECRA) launched its Oxyfuel CCS project at the Retznei plant. The joint cost of the installation - and another at a HeidelbergCement plant in Italy - was Euro80.0m, towards which cement producers contributed Euro25.0m. LafargeHolcim and other ECRA members hope to use Oxyfuel in conjunction with Australia-based Calix's Leilac CCS platform to reduce process CO_2 emissions to zero.

Retznei was an early adopter of AF as a main fuel constituent. It burns over 80% of AF from various sources. The plant receives solid shredded waste (SSW) from a nearby 100,000t/yr waste processing plant, a joint venture of Lafarge Zement GmbH and Saubermacher Dienstleistungs AG.

Wietersdorfer

Wietersdorfer is an industrial conglomerate based in Klagenfurt am Wörthersee, Carinthia, that was founded in 1893. In 2011 it separated the rebranded w&p Zement GmbH from the former lime and building materials divisions of its subsidiary Wietersdorfer & Peggauer Zementwerke GmbH. w&p Zement GmbH's two cement plants command 1.2Mt/yr of integrated capacity - 21% of the national total.

The Wietersdorf cement plant started life with a single shaft kiln in 1893, as one of seven cement plants in Carinthia. In 2020 it is the state's only remaining cement plant, equipped with a single dry 0.8Mt/yr kiln. A regenerative thermal oxidiser (RTO) and mercury reducer were installed in 2017. The kiln line has burned AF since 1987.

The company acquired the Peggau plant through its merger with Peggauer Zementwerke Alois Kern GmbH in 1988. It has an integrated capacity of 0.4Mt/yr across both of its mothballed semi-dry lines. As of April 2020 w&p Zement has indicated no intention to resume use of the ISO-14001 and EU Eco-Management and Audit Scheme (EMAS) certified plant for any purpose other than to grind clinker produced at the Wietersdorf plant.

w&p Zement uses Switzerland-based ABB robots at its testing facilities and Germany-based PSI's software for logistics.

Rohrdorfer

Germany-based Rohrdorfer acquired Zementwerk Hatschek GmbH, which operates the 0.8Mt/yr Gmunden, Upper Austria, plant in 2004, just prior to the plant's 100th anniversary.

In 2018 and 2019 Zementwerk Hatschek GmbH invested Euro50m in upgrades to production and a waste heat recovery (WHR) system to provide heating to the local area.

Leube

Leube subsidiary Zement Leube GmbH produces up to 0.8Mt/yr of cement at its Gartenau plant in St. Leonhard, Salzburg. The plant entered production in 1854 and took up AF use in 1998. Zement Leube GmbH acquired a 25% stake in multinational cement producer Asamer Baustoffe AG in November 2018.

Kirchdorfer

Kirchdorfer is the parent company of Kirchdorfer Zementwerk Hofmann GmbH, which operates the 0.5Mt/yr Kirchdorf cement plant in Kirchdorf an der Krems, Upper Austria. It was founded in 1880. The plant's flagship product is its ÖKO Universalzement, an ordinary Portland cement (OPC) with 20% lower CO_2 emissions than standard OPC. The plant achieved this with the use of Scheuch GmbH's DeCONO$_x$ exhaust purifier and WHR system, through which it also supplies Kirchdorf an der Krems with 20GWh/yr of heat.

Schretter & Cie GmbH & Co. KG

Schretter & Cie GmbH & Co. KG produces its SupraCem 45 brand cement at the 0.4Mt/yr Vils plant in Tyrol. The plant produced its first batch of OPC in 1904. In 2015 Germany-based Köppern Aufbereitungstechnik GmbH & Co. KG installed a compact two-stage Koesep air classifier into the plant's mill.

Schmid Industrie Holding

Schmid Industrie Holding subsidiary Wopfinger Baustoffindustrie GmbH, Austria's largest lime producer, operates the Wopfing Stone and Lime Works. The site has an integrated cement production capacity of 0.3Mt/yr as a result of a 1988 upgrade. It sells its cement in eastern Austria, Hungary and Slovakia.

Besides OPC, the Wopfing Stone and Lime Works also produces a ground granulated blast furnace slag (GGBFS) and fluorogypsum-based cementitious product called Slagstar, which is 'ground, not heated.'

Outlook

Austrian cement consumption was 5.18Mt in 2018, up by 2.5% year-on-year from 5.06Mt in 2017. CEMBUREAU has predicted stable growth in the long term.[6] Currently, global cement production is in an unseasonal hibernation due to the coronavirus pandemic, and the medium-term prospects for producers will depend on the actions of national governments on the other side of the crisis. On 6 April 2020, Austria had 12,100 confirmed cases, with 204 dead. Though citizens are permitted to go about 'urgent, necessary work,' the country's leading construction firm, Strabag, suspended building work at all of its approximately 1000 sites, after it deemed that the lawful social distancing minimum of one metre 'cannot be consistently maintained in construction operations.'[7] Thus even if production can continue, it will rapidly find demand wanting.

Switzerland

Switzerland is a confederacy of 26 cantons. Its growing population (8.52m in 2018, up by 0.8% year-on-year from 8.45m in 2017)[1] participates in setting the political agenda through referenda in a semi-direct democratic system of governance. Switzerland's economy is services-orientated and the greatest value (US$70.5bn, 10% of GDP) derives from financial services. Manufacturing centres on high-quality goods and niche markets.

Domestic cement demand in 2018 was 4.45Mt, down by 1.5% year-on-year from 4.52Mt in 2017. One area of sales growth was commercial construction, where companies reported a 7.3% increase in work orders.[8]

The country is a net cement importer. In 2018 it imported Euro115m-worth of cement, concrete and artificial stone from Germany, up by 1.6% year-on-year from Euro113m in 2017. Imports of these products from France also increased, by 34% to Euro34.5m from Euro25.7m, while those from Italy fell by 5.9% to Euro31.0m from Euro33.0m, and from Austria they fell by 0.5% to Euro20.3m from Euro20.4m.[9]

In 2019 the Swiss cement industry delivered 4.21Mt of cement, down by 1.7% from 4.29Mt in 2018. Over 90% of 2019 deliveries was of cement with reduced CO_2 emissions compared to normal OPC.[10]

Production

Five cantons - Aargau, Bern, Graubünden, Vaud and Nauchâtel - host Switzerland's six cement plants, which share a total capacity of 4.3Mt/yr. Aargau's two plants command 1.5Mt/yr (35%) of this, while Bern has 0.9Mt/yr (21%), Graubünden and Vaud 0.8Mt (19%) each and Neuchâtel 0.3Mt/yr (Figure 2). As with Austria, we will look at each Swiss cement producer in turn using information from the *Global Cement Directory 2020*.

LafargeHolcim

LafargeHolcim produces more cement than any other company outside of China - 208Mt in 2019, up by 0.5% on a like-for-like basis from 207Mt in 2018. It also runs aggregates, building solutions and concrete operations in 70 countries from its headquarters in Jona, St. Gallen.

The famous Holcim name combines the first three letters of Holderbank, a municipality of Aargau, and *ciment*. LafargeHolcim forebear and subsidiary Holcim (Schweiz) AG operates three plants with an integrated capacity of 2.5Mt/yr - 58% of the national total. Its original plant, the Holderbank-Wildegg, Aargau, plant was active between 1912 and 1987.

The 0.9Mt/yr Siggenthal plant in Würenlingen, Aargau, also entered operation in 1912 and obtained quarrying rights near its site in 1955. LafargeHolcim launched its 'Plants of Tomorrow' Industry 4.0 platform here in July 2019. It installed 30 proof-of concept digital products, targeting a 15% - 20% increase in efficiency. Holcim (Schweiz) AG also operates the 0.8Mt/yr Eclépens, Vaud, and 0.8Mt/yr Untervaz, Graubünden, cement plants.

LafargeHolcim reported a record profit of Euro1.95bn in 2019, up by 32% from Euro1.48bn in 2018. CEO Jan Jenisch noted particularly 'good growth in Europe and North America.' The influx of cash was fortuitously timed. In the space of a month, LafargeHolcim went from celebrating its successes of 2019 to withdrawing its guidance for 2020 due to the coronavirus crisis. On 26 March 2020 it launched a raft of cost-cutting measures, consisting of: a year-on-year capital expenditure (CAPEX) reduction of Euro378m, a year-on-year fixed cost reduction of Euro283m and a reduction of net working capital 'at least in line with level of activity.'

CRH

CRH entered Switzerland through its 2000 acquisition of Jura Cement Fabriken AG . Its two plants share 0.9Mt/yr of integrated capacity (21%).

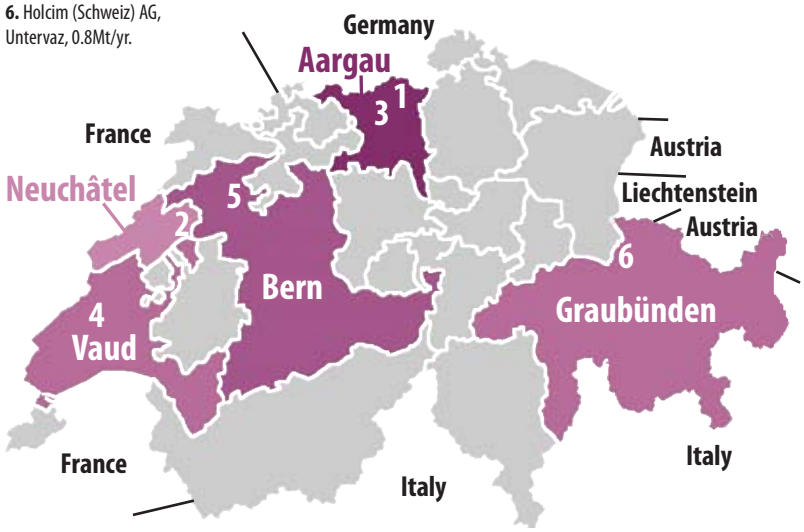
Jura Cement Fabriken AG built the Wildegg, Aargau, cement plant in 1890 and converted it to dry production with an integrated capacity of 0.6Mt/yr in 1986. Its second plant opened at Cornaux, Neuchâtel in 1966, with a capacity of 0.3Mt/yr. Both plants have an AF substitution rate of 70%.

Vicat

Vicat controls 0.9Mt/yr capacity via its subsidiary Vigier Ciment SA, which began production at its Péry, Vaud, plant in 1890. It was upgraded to its current capacity of 0.9Mt/yr in 2001. In April 2018 the plant received a modified Komatsu truck from Kuhn. The vehicle was converted to use electrical power rather than diesel. The plant is planning an expansion and greater AF use.

Bottom left - Figure 2: Swiss cantons by integrated cement production capacity.
Source: *Global Cement Directory 2020.*

Bottom left - Figure 2: Swiss integrated cement plants.
1. Holcim (Schweiz) AG, Würenlingen, 1.2Mt/yr.
2. Juracime SA, Cornaux, 0.3Mt/yr.
3. Jura Cement Fabriken AG, Wildegg, 0.6Mt/yr.
4. Holcim (Schweiz) AG, Eclépens, 0.8Mt/yr.
5. Vigier Ciment SA, Péry, 0.9Mt/yr.
6. Holcim (Schweiz) AG, Untervaz, 0.8Mt/yr.



Outlook

The resources that cement producers have to sustain themselves through a protracted closure and, ultimately, the length of that closure will determine whether the picture painted above looks the same in 2021. Switzerland had recorded 21,200 coronavirus cases, 724 of them fatal (3.4%) as of 6 April 2020. The Swiss Purchasing Manager's Index fell by 12% to 43.7 points in March 2020, its lowest since July 2009, from 49.5 points in February 2020. In response to the outbreak, the government has set out a Euro39.8bn company support plan for emergency loans and employee compensation. The country weathered the previous recession through the Swiss National Bank (SNB)'s devaluation of the franc (CHF) without increasing debt. If the coronavirus outbreak leads to another recession, Swiss cement may benefit by such a policy in increased exports to the EU.

Given the commercial - as opposed to residential - basis of domestic cement consumption, a swift recovery seems more likely for producers here than in other developed countries where homebuilding is the main source of demand, as in Spain post-2008.

Conclusion

The fates of Austria and Switzerland's cement sectors are tied to global forces. Provided they can weather the coronavirus and its financial impacts, there is no reason not to expect steady growth to return and to continue after the outbreak.

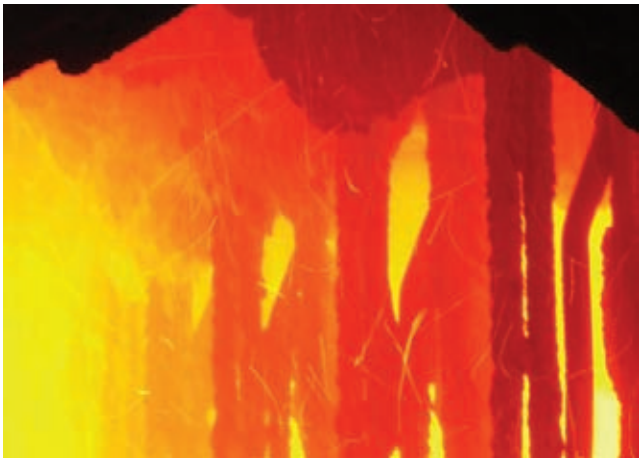
References

1. World Bank, *'Data: GDP, per capita; Population, total - Austria, Switzerland,'* 30 March 2020.
2. EuroStat, *'Share of renewable energy in the EU up to 18.0%,'* 23 January 2020.
3. Statistics Austria, *'Turnover in industry and construction increased by 1.1% in 2019,'* 31 March 2020.
4. VÖZ, *'Brennstoffentwicklungen'* 25 April 2018.
5. VÖZ, *'Roadmap der Internationalen Energieagentur,'* 9 September 2019.
6. Cembureau, *'Activity Report 2018,'* 10 May 2019.
7. Strabag, *'Coronavirus: STRABAG stellt österreichische Baustellen vorerst ein,'* 18 March 2020.
8. Canada West News, *'Swiss PMI falls to lowest level since July 2009,'* 3 April 2020.
9. Trading Economics, *'Switzerland exports/imports of cement, concrete or artificial stone,'* 6 April 2019.
10. CemSuisse, *'Leichte Abnahme der Lieferungen der Schweizer Zementindustrie 2019,'* 7 January 2020.

ENERGY INTENSIVE INDUSTRIES / INNOVATIVE TECHNOLOGIES

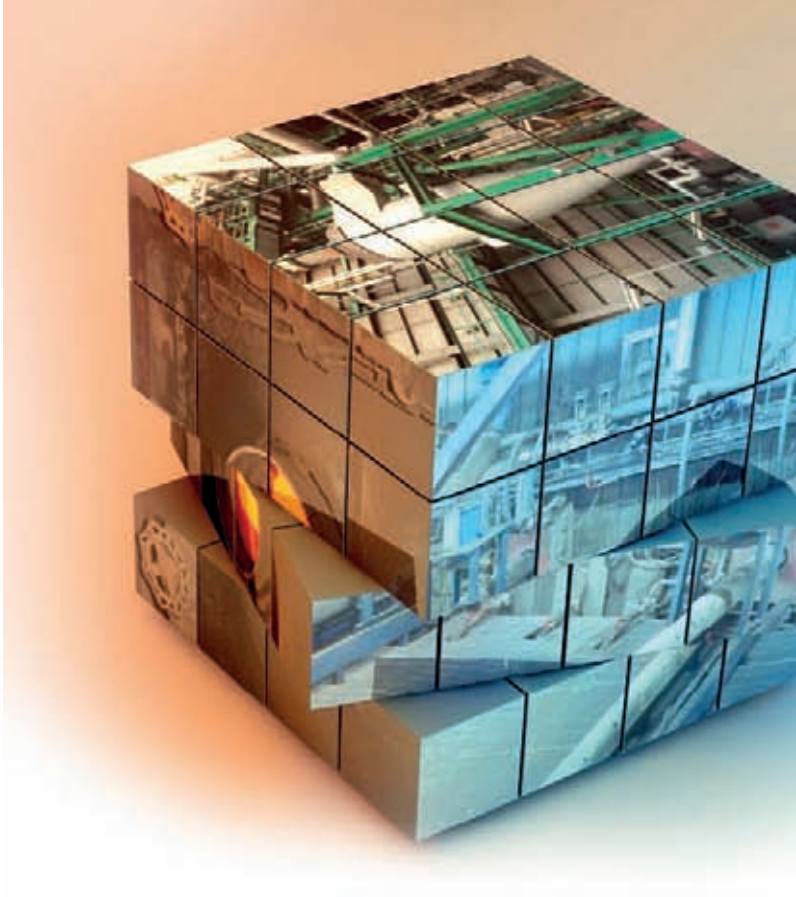
Fuels, Combustion, & Air Pollution Control

- **Analytical & Advisory Services:** Market research, studies and intelligence gathering
- **Business development:** Technical articles and webinar organization



Xavier d'Hubert • Senior Consultant

Tel: +33 6 44 23 66 57 or +1 502 819 0614
Email: xavier.dhubert@earthlink.net



when it comes to ...

- secondary fuel
- energy efficiency
- bypass optimization
- calciner efficiency
- combustion improvement
- flue gas cleaning
- ...

don't just toss the dice!

Ask the world leading process and simulation experts for the cement industry

aixergee
process optimization

+ 49 241 4134492-50 www.aixergee.de

Argentina: Loma Negra revenue falls

Loma Negra's net income in 2019 was US$61.8m, up by 3.7% year-on-year from US$59.6m in 2018. Its revenue fell by 15% to US$147m from US$173m in 2018. The company said that this was due to decreased demand in Argentina, where its cement, masonry and lime sales declined by 11% year-on-year to 1.28Mt of products from 1.44Mt in 2018, with bulk sales falling further than bagged. Profit growth was hampered by non-recurrent costs from cost-control and streamlining initiatives.

Loma Negra CEO Sergio Faifman said, "Argentina's business suffered more in 2019 than previously expected, however we were able to thrive and present results that we can feel proud of." He lobbied the new government to adopt policies to 're-establish financial stability and economic growth.'

An expansion to Loma Negra's 1.7Mt/yr integrated L'Amali plant is set to bring the plant's capacity to 2.4Mt/yr when commissioned in mid-2020.

Mexico: Cemex reports on sustainability

Cemex has shared its 2019 sustainability achievements in an integrated report entitled 'Innovating for a Better World,' which analyses the company's strategic vision, operational performance and corporate governance against its commitment to drive innovation in the cement sector. Throughout the year, the company introduced its new Climate Action strategy to reduce CO_2 emissions by 35% by 2030 and established an ambition to deliver net-zero CO_2 concrete by 2050. It achieved an alternative fuel substitution rate of 28%, its highest since 2014, bringing its net specific CO_2 emissions per tonne of cementitious product to 624kg.

El Salvador: Holcim raises green awareness

Holcim El Salvador has enlarged its partnership with the Environmental Fund of El Salvador (FonAES) to provide an environmental awareness education programme to 6000 pupils across six schools. The Noticias Financieras newspaper has reported that Holcim El Salvador will give a total of US$12,400 to the programme in 2020, up by 1.5% year-on-year from US$12,200 in 2019.

South America: Coronavirus cuts

Cementos Argos owner Grupo Argos has announced a raft of cuts to investments and expenses worth a total of US$245m in response to the impacts of the ongoing coronavirus outbreak. Noticias Financieras News has reported that US$61.2m of the cuts will be to planned investments in expansion projects and raw materials inventory restocking, including to some in the cement business. Group Argos President Jorge Mario Velasquez said that the measures would, "give additional currency for the different sources, cash and funding that the organization has access to and give us relative peace of mind in our cash structure." Grupo Argos added that it would stick to its US$3.67bn five-year investment plan.

Meanwhile, Mexico-based Cemex has announced the suspension of production at all of its plants in Panama and those of its Colombian subsidiary Cemex Latam Holdings from 25 March 2020. It said it 'may resume certain activities on or before 13 April 2020,' according to Noticias Financieras News. The NAFTA 2.0 newspaper has included Cemex on a list of Mexico's companies most exposed due to a large European presence to the impacts of the coronavirus there. Europe is the second-largest market for Cemex's products, generating 24% of its revenue in 2019.

Brazil: Votorantim improves

Votorantim Cimentos earned revenues of US$2.47bn in 2019, up by 3.0% year-on-year from US$2.39bn in 2018. Its earnings before interest, taxation, depreciation and amortisation rose by 1.1% to US$513m from US$507m in 2018. Throughout the year, the company says that it paid off approximately US$570m of debt and contracted with a syndicate of banks for a new committed credit facility (CCF) for its alternative fuel substitution and CCF reduction initiatives of US$55.1m, due in August 2024.

Honduras: Argos solar plant

Colombia-based Grupo Argos energy subsidiary Celsia has announced that it has installed a 10.6MW solar power plant at Cementos Argos' 1.0Mt/yr integrated Piedras Azules cement plant in Comayagua. Renewables Now News has reported that the 32,000-panel plant on the roof of the Piedras Azules plant will generate 20% of its operating power needs. Celsia says that the solar plant, its first in Honduras, will reduce Cementos Argos' annual CO_2 emissions by 10,000t/yr.

US: Roanoke fine settlement

Titan America subsidiary Roanoke Cement has settled on a fine of US$3640 with the Virginia Department of Environment Quality (DEQ) for the breach of emissions regulations after a kiln gas outlet at its 1.5Mt/yr Troutville plant in Botetourt County, Virginia, recorded an average temperature of 121°C over a nine-hour period on 26 June 2019. Virginia DEQ enforcer Marvin Booth said there was 'no documented harm to public health or the environment' resulting from the violation.

US: Energy Star for Rillito plant

The Environmental Protection Agency (EPA) has awarded Energy Star certification to Japan-based Taiheiyo Cement subsidiary CalPortland's 1.3Mt/yr integrated Rillito plant for the eighth consecutive year for its superior energy performance compared with other plants of comparable capacity in the country. CalPortland president and CEO Allen Hamblen said, "We continue to demonstrate our commitment to environmental stewardship and ENERGY STAR while also reducing our energy costs through the hard work of our employees and our corporate energy management culture."

US: PCA is EPA Energy Star Partner

The Environmental Protection Agency (EPA) has declared the Portland Cement Association its 2020 Energy Star Partner of the Year. The appointment recognises the PCA's 'leadership, innovation and commitment to environmental protection through energy efficiency. PCA president and CEO Mike Ireland said, "PCA and its members have greatly benefited from participation in the Energy Star programme. Cement plants have total annual source energy savings of 6.38bn mega joules and have reduced energy-related CO_2 emissions by 1.5Mt/yr."

US: Mitchell plant upgrade on hold

Lehigh Hanson has announced a suspension of work on its 2.0Mt/yr expansion of the 0.8Mt/yr Mitchell plant in Indiana to 2.8Mt/yr to early 2021 at the latest due to 'uncertainties resulting from' the coronavirus. The target date for commissioning has also moved, to late 2023 from September 2022. Lehigh Cement Mitchell plant manager Jerry Miller said, "A construction project of this magnitude has numerous components, such as supply chain certainty, material deliveries and, importantly, worker availability."

The upgrade received environmental clearance in July 2019 and the company broke ground at the site in October 2019.

Chile: Grinding company merger

The board of directors of Grupo Hurtado Vicuña (GHV) subsidiary Cemento Polpaico, which operates the 2.3Mt/yr integrated Cerro Blanco plant in Santiago and two grinding plants, has voted in favour of a merger with fellow GHV subsidiary Cementos Bicentario, which operates three grinding plants in the country. The Diario Financiario newspaper has reported that GHV first mooted the merger with the affected parties in February 2018.

Brazil: New Aumund Brazil CEO

Germany-based Aumund subsidiary Aumund Brazil has appointed Paulo Lima its chief executive officer. Lima brings many years' mechanical engineering experience, specialising in conveying technology in cement and other industries. He previously worked for Aumund Brazil in leading sales positions between 1996 and 2000 and from 2004 to 2008.

Mexico: Cement carrier sinks

A ship carrying cement from Cooperativa La Cruz Azul's 2.2Mt/yr plant in Lagunas, Oaxaca state, has sunk with 1500t of cement onboard. Maritime Bulletin has reported that the Togo-registered vessel, DUBAN, had been delivering cement to Manzanillo, Colima state.

Panama: Interoceanico to expand

Guatemala-based Cemento Progreso, which acquired Panama's Cemento Interoceanico on 21 November 2019, has shared plans to expand its 0.25Mt/yr La Chorrera plant to 0.3Mt/yr production capacity. Noticias Financieras News has reported that the company will also establish three new concrete plants, in David, Chiriquí province, Columbus, Columbus province, and Tocumen, Panama province. Through these it hopes to serve major infrastructure projects such as the construction of a fourth Panama canal bridge and to increase its cement market share from 10%.

CEMENTO INTEROCEANICO

India: Coronavirus closures spread

Several Indian cement producers have responded to the coronavirus pandemic with plant closures. Reuters has reported that India Cements has temporarily closed all of its plants. JK Lakshmi Cement has suspended cement production at its 4.2Mt/yr integrated plant in Jaykaypuram, Rajasthan and at three grinding plants. JK Lakshmi subsidiary Udaipur Cement has shut its 1.6Mt/yr Udaipur plant in Rajasthan.

Dalmia Bharat suspended operations across its entire integrated cement production apparatus, equalling 26.5Mt/yr of capacity, on 26 March 2020. The move was a direct response to a government ordnance of 25 March 2020 imposing a 21-day lockdown on the whole of India due to the coronavirus outbreak. Its facilities will be closed 'until further notice.'

India: Cement plant project lockdown

Construction workers employed at the site of Ramco Cement's Haridaspur, Odisha, grinding plant, which has been under construction since early 2018, have protested over an alleged lack of food being supplied to the plant, where they are currently in lockdown. The Pioneer newspaper has reported that the nationwide coronavirus lockdown prevented the 400 workers, from Bihar, Jharkhand and West Bengal, from returning home, leading them to take up residence in the Haridaspur plant. Police are talking with the protestors and Ramco Cement's management.

Vietnam: Coronavirus double-whammy

Cement producers in Vietnam are reported to be facing a 'double whammy' due to falling domestic demand from a slowdown in the domestic property and infrastructure sectors, as well as a marked decline in exports due to the ongoing coronavirus (COVID-19) outbreak. To help firms overcome the current difficulties, Nguyen Quang Cung, chairman of the Vietnam Cement Association, proposed that the government, the State Bank of Vietnam and other parties offer support to manufacturers in the form of tax cuts and lower interest rates. He said that Vietnam would still make 103Mt of cement in 2020.

Global Cement is sceptical that Vietnam's cement producers will meet this forecast. In January and February 2020 the country's domestic sales were 40% lower year-on-year compared to 2019.

India: UltraTech plant upgrade

UltraTech Cement has announced plans for a 3.5Mt/yr clinker production capacity expansion to its integrated plant in Bhogasamudram, Anantapur, Andhra Pradesh, from 6.5Mt/yr to 10Mt/yr, via installation of a new kiln. The new line will cost US$169m and will be completed by March 2022.

Pakistan: Massive growth in output in February 2020

Pakistan has recorded year-on-year production growth of 34%, to 4.49Mt in February 2020 from 3.35Mt in February 2019. Consumption grew by 31% to 3.74Mt from 2.84Mt in February 2019.

Exports throughout the month were 753,000t, up by 48% from 508,000t. Export growth was bolstered by a weak Pakistani Rupee. Exports were stronger in southern Pakistan than in northern Pakistan, with the latter feeling the effects of lowered Afghan demand and zero exports to India.

Australia: ACCC gives Barro / Adelaide deal green light

The Australian Competition and Consumer Commission (ACCC) says that Barro Group's acquisition of a 43% stake in Adelaide Brighton will not 'substantially' lessen competition.

The ACCC examined the completed acquisition closely as the two vertically-integrated companies have overlap in the market for the supply of cement, ready-mixed concrete and aggregates. It found that Barro and Adelaide Brighton will continue to face competition from Boral, Holcim and Hanson, three large vertically-integrated competitors with national operations, along with smaller independent competitors.

China: Strong 2019 for Chinese producers as reforms take effect

Supply-side restrictions by the Chinese authorities began to take effect in 2019 as the profitability of major producers rose markedly. The Ministry of Industry and Information Technology (MIIT) reported that net profit for the entire domestic cement sector grew by 20% year-on-year to US$26.6bn in 2019 from US$22.3bn in 2018. Total revenues reached US$144bn, representing an increase of 13% from US$128bn a year earlier.

Anhui Conch recorded a net profit of US$4.77bn in 2019, 13% higher than its 2018 net profit of US$4.23bn. Revenues rose by 22% year-on-year to US$22.2bn from US$18.2bn in 2018.

Hebei province-based Tangshan Jidong Cement's net 2019 profit was US$298m, up by 42% year-on-year from US$210m in 2018. Cement and clinker sales remained flat. The company attributed the rise to increased prices due to a 9.9% year-on-year increase in infrastructure spending to US$1.86tn. The company said that it had also completed energy-saving optimisation and upgrades to improve efficiency, implemented strategic marketing and reduced the cost of material procurement.

Meanwhile, China Shanshi Cement has reported a profit of US$420m for 2019, a rise of 35.3% year-on-year compared to 2018. Jiangxi Wannianqing Cement's net profit in 2019 was US$197m, representing a 20% year-on-year increase from US$164m, while Asia Cement (China) Holdings' whole-year net profit for 2019 was US$444m, up by 30% year-on-year from US$341m in 2018. Its revenues grew by 11%, to US$1.78bn from US$1.60bn in 2018.

Sri Lanka: Fly ash for sale

Norochcholai Coal Power Plant (NCPP) is courting buyers for its fly ash, of which it produces US$5.5m-worth annually. In 2019 NCPP sold US$3.3m to Sri Lankan cement producers. Daily News Sri Lanka has reported that the company has undertaken measures to increase the value of the fly ash to cement producers in order to obtain a higher price. NCPP manager Indrasiri Gallage said, "By selling fly ash to cement producers the plant has also helped to free the country from reliance on clinker imports."

An expansion, including the installation of a new 300MW coal-fired power plant, will eventually bring NCPP's capacity to 1200MW, providing even more fly ash to the local market.

Uzbekistan: Production falls in first two months

The total volume of cement produced in January and February 2020 in Uzbekistan was 1.02Mt, down by 20% year-on-year from 1.22Mt in the first two months of 2019. February 2020 production rose by 16% month-on-month and fell by 13% year-on-year, to 551,000t from 474,000t in January 2020 and 659,000t in February 2019.

Bangladesh: LafargeHolcim profit rises

LafargeHolcim Bangladesh has posted a 56% year-on-year increase in profit to US$20.5m in 2019 from US$13.1m in 2018. Sales rose by 100% to US$210m from US$105m in 2018. LafargeHolcim Bangladesh CEO Rajesh Surana told local press, "2019 was a challenging year for the cement industry. The impact of increased raw material costs and taxes was significant. Despite this, LafargeHolcim demonstrated a strong performance trend. Our focus on improving operational efficiencies, driving commercial innovation and cost optimisation continues to be effective. We are determined to build on this trust and further increase value to our stakeholders."

Zimbabwe: New grinding plant mooted

China-based Sino-Zimbabwe Cement Company and LiveTouch Invest, owner of Diamond Cement Zimbabwe, have acquired a six hectare site in the coal mining area of Hwange, Matabeleland North Province. They have announced a planned investment of US$30m in the construction of a grinding plant to grind clinker with waste materials from coal extraction to produce cement.

LiveTouch Invest had previously mooted the idea of a Zimbabwean clinker plant joint venture with South Africa-based PPC in July 2019.

Zimbabwe: New mortar line

Work began on a 43,000t/yr dry mortar production line at Lafarge Cement Zimbabwe's 0.5Mt/yr Manresa plant in Harare in early March 2020. The plant, supplied by Turkey-based Varlik Industries, will increase the company's mortar production capacity by 710% to 50,000t/yr from 7000t/yr. Lafarge Cement Zimbabwe chair Kumbirai Katsande said "The expansion project is three-pronged and will include doubling of cement capacity and tripling agricultural lime capacity as well as automation of the dry mortars plant."

Oman: Cement shortage reported

Construction companies in Oman have reported delays to several projects as the result of a cement shortage that began on 21 March 2020. Al-Watan newspaper has reported that most of the affected works are residential. The shortage has been caused by the suspension of cement imports from the UAE.

Nigeria: Truck kills six

A Dangote Cement truck overturned on a bridge in Lagos on 1 April 2020. It fell onto a taxi and killed six of its seven occupants. The seventh was hospitalised.

Tunisia: LafargeHolcim profit rises

Switzerland-based LafargeHolcim subsidiary LafargeHolcim Maroc has recorded a profit of Euro161m in 2019, up by 7.5% year-on-year from Euro149m in 2018. Its sales held steady at Euro744m. The company says that it 'does not anticipate any significant change in market conditions' in 2020, although this advice is likely now out of date given the conronavirus developments. Its new Agadir-Sousse grinding plant is scheduled to come online in 2020.

Nigeria: BUA acquires major construction firm

BUA Group has announced its acquisition of a majority shareholding in PW Nigeria, one of Nigeria's leading construction, engineering and mining companies. According to BUA, this was necessary to further deepen its investments in the infrastructure business in Sub-Saharan Africa.

Speaking on the acquisition, Abdul Samad Rabiu, executive chairman of BUA Group, said, "This acquisition marks the beginning of the next phase of our medium-term strategy for our infrastructure business following the completion of the consolidation of our cement arm, BUA Cement, in January 2020. BUA's acquisition of majority holdings in PW Nigeria provides a prime opportunity to increase our investments in the entire value chain of the cement, mining and construction sector. We believe PW Nigeria, with its solid experience in building dams, roads, airports, water projects and other infrastructure projects in Nigeria, provided a strong value proposition too difficult to ignore."

South Africa: New unloading system for PPC

PPC has reported that it has invested US$548,000 in the construction and installation of a pneumatic offloading facility, including a 250t silo, at its George Depot cement terminal in the Western Cape. The company said that it 'allows PPC to receive cement by rail, improving its turnaround to customers without compromising quality.'

Nigeria: Dangote donation

Dangote Cement has donated cement worth US$270,000 to the Lagos State government to support the ongoing reconstruction process at the Abule-Ado site in Amuwo-Odofin Local Government area, which was affected by a deadly pipeline explosion on 15 March 2020. The donation was made by the chairman of Dangote Cement, Aliko Dangote, represented by the company's Independent Non-Executive Director Emmanuel Ikazoboh.

South Africa: Sephaku appointments

The board of Sephaku Holdings, owner of Sephaku Cement and 36% owner of Dangote Cement South Africa, has re-elected Kenneth Capes as chief executive officer (CEO) of Métier Mixed Concrete. The board also re-elected Capes as an executive director of Sephaku Holdings, a position he first attained in 2013. He co-founded Métier in 2007.

Oman: Al Madina profit rises

Al Madina Cement Company recorded a net profit of US$48.2m in 2019, up by 61% year-on-year from US$29.9m in 2018. Its sales rose by 54% to US$141m from US$91.9m in 2018.

Egypt: Sinai posts 2019 loss

Sinai Cement's net loss in 2019 was US$28.1m, down by 44% year-on-year from US$50.2m in 2018. Arab Finance News reported that the company attributed the loss to accumulated effects of currency devaluation on imported fuel and to rises of electricity and oil prices.

Kuwait: Kuwait Portland Cement's results collapse

Kuwait Portland Cement has reported that its fourth quarter profit for 2019 fell by 44% to US$4.57m from US$8.15m in the fourth quarter of 2018. Its fourth quarter operating revenue in 2019 was US$76.3m, down by 36% from US$119m a year earlier.

These pages give *Global Cement Magazine*'s monthly review of global cement prices - in US$ for easy comparison. Some price information is only available to subscribers to *Global Cement Magazine*. Subscribe on Page 64. In this issue subscribers receive extra information from Africa, India, Egypt, the EU ETS, Malaysia and South Africa.

Prices are for metric tonnes unless otherwise stated. US$ conversions from local currencies are correct at the time of original publication.

Coronavirus Update: The ongoing coronavirus outbreak has introduced far more cement price volatility than usual. The information presented here - collected on 3 April 2020 - can therefore only act as a recent snap-shot. It is likely that cement prices will fall in major markets over the coming 3-4 months, with the possibility of a subsequent rise in late summer / autumn 2020. Any second half rise may be particularly marked if cement producers are unable to maintain sufficient production en-masse over the spring and early summer. This situation could potentially result in high demand at a time of low inventory. The exception to stagnant or falling prices at present is in China, where cement producers in some regions have been able to raise prices - See below.

China: All-China 42.5 grade cement prices from sunsirs.com. 28-29 March 2020 = US$66.81/t; 30 March 2020 = US$66.69/t; 31 March - 2 April 2020 = US$66.67/t. Prices have now fallen by around 14% since the start of January 2020 when they were US$77.30/t. Some price reduction is usual around Chinese New Year (25 January 2020), but the magnitude and length of the decrease has been most likely due to reduced construction amid the coronavirus outbreak.

However, there are signs that prices are slowly beginning to rise compared to recent months. Several cement manufacturers in the east and north west of China raised their prices by US$2.85-9.20/t in response to higher demand after the worst effects of the outbreak. It is anticipated that other regions will follow this trend as many of China's 15,000+ infrastructure projects are restarted nationwide. Cement demand is expected to increase dramatically through April and May 2020 compared to the first quarter of 2020.

Fuel Prices: One potential 'silver lining' for cement producers that could come into play later into 2020 (and 2021) is the relatively low price of fossil fuels. Oil prices have slumped in recent weeks on the back of a pre-coronavirus oil price war between Saudi Arabia and Russia that has now been exacerbated by lower demand. Brent Crude oil prices fell from US$68.60/barrel on 3 January 2020, to US$54.45/barrel on 3 February 2020, US$51.86/barrel on 3 March 2020 and US$29.94/barrel on 4 April 2020. This is a cumulative drop of 56% over the first quarter of 2020.

Global coal prices fell from US$45.55/t on 2 January 2020 to US$44.05/t on 4 February (and on 3 March 2020) then to US$34.05/t on 2 April 2020. This represents a drop of 26% so far in 2020.

India: Average regional Indian cement prices in February 2020, according to Anand Rathi Financial Services: North = US$4.48-4.54/bag (50kg); East = US$4.01-4.15/bag; Central = US$4.35-4.41/bag; West = US$4.35-4.641/bag; South = US$4.08-4.15/bag.

While prices had been expected to rise moderately in India over the coming months, the coronavirus situation now means that prices will stagnate or fall. At the close of March 2020 Sandip Ghose, CEO of Birla Cement said that prices 'may not increase, but are expected to remain stable' over the near term. Even this now seems optimistic.

Do you have your finger on the cement price pulse where you are?
If so, *Global Cement Magazine* needs you!

Contact: Peter Edwards
peter.edwards@propubs.com

Regular contributors receive a free subscription to *Global Cement Magazine*!

How long until the end of the coronavirus crisis?

Robert McCaffrey Editorial Director, ***Global Cement Magazine (rob@propubs.com)***

The early answers are starting to emerge about when to expect the coronavirus crisis to end. After all, we all want to get back to 'normality' as soon as possible.

It is best to look at what has already happened (this article is being written on 7 April). Wuhan is being slowly released from lockdown, ten weeks after first being quarantined in a severe regime on 23 January. Transport links were closed and people were confined at home. Now, with the aid of a QR-code-based phone app system which allocates users a green, yellow or red category according to a user's location, health information and travel history[1], restrictions are slowly being lifted and business is starting up again. Critically, those areas that are still suffering from ongoing infections remain under lockdown: medium and low-risk areas have lifted restrictions.[2] However, officials are concerned about the risk of a second wave of infections. The threat of a rebound in Wuhan remains high, according to Wang Zhonglin[3], chief of its Communist Party, ordering residents to avoid leaving their homes unless necessary. The number of new daily cases in China, according to official statistics, is fewer than 50, ironically with the majority imported from abroad.

South Korea did not have a lock-down, instead choosing to contact-trace every infection from the start, and rolling out mass testing. Daily new cases are now below 100, down from beyond 600 at the height of its outbreak. It took around six weeks (February 21 to 1 April) from the day when new cases rose above 100/day to when they are back to below 100/day.

In Spain, the last day when the number of daily new cases was below 100 was on 5 March. The country went into lockdown on 15 March, with no-one allowed to leave their homes for anything that is not essential (and even exercise is not allowed). Daily new cases peaked at above 8000 per day between 26 March and 2 April and are now reducing fast. Spanish Prime Minister Pedro Sanchez said "Flattening the curve was our first objective. We're getting close. The next objective is to reduce infections even more until the number of new contagions is lower than the number of people recovering each day. Once the curve is clearly descending, we will open a second phase - a progressive return to new social normality and the reconstruction of our economy." However, the strict lockdown will continue until at least 25 April - around six weeks from the start.

Italy went into lockdown on 10 March, when it was already at a level of around 2000 daily new cases. The first day with more than 5000 new infections was 19 March, and with new daily infections now steadily reducing, the last day with a daily new infection rate above 5000 was 29 March. Citizens have been barred from all but essential travel and only essential businesses remain open.

The first day that daily deaths due to COVID-19 in the US rose above 20 was on 16 March (when there were 983 new daily cases of infection). New modelling numbers that have come out of the US[4] suggest that daily deaths (not infections) will peak around 16 April at around 3000/day, but will reduce back down to around 20 per day by the end of May and reduce to nearly zero by mid-June. Due to the fact that the 50 states have a high degree of autonomy, the level of lockdown has varied enormously, with some states locked-down completely, and others not at all. The epidemic in the US looks likely to last about 12 weeks.

As I mentioned in my previous Last Word, there may be one global pandemic, but there are many epidemics - villages, towns, regions, states and countries all experiencing different infection trends. From the information above, it appears that epidemics can be brought under control within six to ten weeks if severe enough restrictions are put in place, longer if less severe restrictions are applied. *Ongoing measures will still be required.* However, all of the countries mentioned above (and the UK, France and Germany could also have been included) have more-or-less strong and highly organised health systems, and the ability to expand and to fund them (through borrowing if required).

What is not clear is the likely length and severity of epidemics in those countries in the world without strong health systems. It is chastening to recall that 30% of the global mortality from the 1918-1919 Influenza outbreak was in densely-populated India. Useful also to recall that Africa's population in 1918 was around 160m, but is now 1.3bn. What seems certain is that while some countries will rapidly return to 'normal,' other countries and regions will continue to suffer.

1https://www.japantimes.co.jp/news/2020/03/24/asia-pacific/china-green-light-alipay-app

2 https://en.wikipedia.org/wiki/2020_Hubei_lockdowns

3 https://www.worldometers.info/coronavirus/country/china/

4 https://covid19.healthdata.org/projections

GLOBAL CEMENT: *ADVERTISERS MAY 2020*

global cement MAGAZINE

Advertising enquiries:
Paul Brown: +44 (0) 7767 475 998 / paul.brown@propubs.com
Sören Rothfahl: +44 (0) 7850 669 169 / soeren.rothfahl@propubs.com
Tina Rich: +44 (0) 7809 679 695 / tina.rich@propubs.com

Editorial enquiries:
Peter Edwards: +44 (0) 1372 840 967 / peter.edwards@propubs.com
Jacob Winskell: +44 (0) 1372 840 953 / jacob.winskell@propubs.com

Next issue: June 2020

Country reports: United Kingdom

Advertising deadline: 13 May 2020

Plant report: UK cement plant
Technical: Process optimisation, Quarrying Maintenance, Chains, Metal Detectors, White Cement, Marine Transport

EcoEvolution
Technologies

KettenWulf

Maintenance free for continuous non-stop operation

SOLIDS DORTMUND
Dortmund, Germany

24.06.2020 – 25.06.2020
Visit us: Booth D03-4

RECLAIMER CHAINS

WITH **SEALED CHAIN SYSTEM (TYP SCS PO)**

For over 90 years, KettenWulf, as an expanding global company, has stood for quality, reliability and flexibility. More than 1400 employees develop, manufacture and market customized solutions in the field of bulk material handling industry at ten locations across Europe, America, Australia and Asia.

» **SCS PO – Permanently Oiled**
The chain joint is equipped with our special SCS PO design. The one hundred percent oil-tight system allows continuous maintenance-free operation.
» Protects the sealed chain joint against contamination
» Field-tested under the toughest environmental conditions

Designed & manufactured by KettenWulf – www.kettenwulf.com

KettenWulf Betriebs GmbH
Zum Hohenstein 15
59889 Eslohe-Kückelheim
Germany

T + 49.(0)2973.801-0
F + 49.(0)2973.801-228
service@kettenwulf.com
www.kettenwulf.com

Drop In Orbi-flex®

The Right Path to Success

- shock load resistance through flexible pin technology
- low operational costs through high efficiency
- extended gearbox lifetime
- reduced maintenance costs

Standardized solutions for individual requirements

Gearbox Selection Tool

The essence of engineering | www.wikov.com

WIKOV