



EUROPEAN MANUFACTURERS REVIEW

Jonathan Rowland, Editor of World Cement, reviews some of the major non-German European equipment suppliers to the cement industry.





European suppliers to the cement industry are numerous. In this first part of two features that profile some of the major players, we look at those companies based outside of Germany, including two of the world's majors: FLSmidth and Fives.

FLSmidth

FLSmidth is one of the best-known names in the cement industry, having grown from a one-man engineering consultancy founded in 1882 to a multinational conglomerate serving the cement and mining industries. The company and its product brands – which include Airtech, MAAG, Pfister, and Ventomatic – is now a full flowsheet provider of cement plants.

According to the latest annual report, it is mining, however, that is driving FLSmidth's financial performance, accounting for 56% of revenue and 62% of its gross profit. In another sign of changing times, services – rather than capital equipment – contribute a larger share of revenue: 54% in 2018.

"The cement market is stable with few large projects and fierce competition," said

Vagn Sørensen and Thomas Schulz, the company's Chairman and CEO, respectively, in their Letter to Our Shareholders in the 2018 Annual Report. "With no improvements in pricing levels, our key focus is on internal efficiency. During 2018, we took actions to lower our cost base and improve cement profitability through redundancies and continued standardisation efforts."

The company went through a series of changes to its organisation in 2018, moving from four business divisions to focus on two industries: cement and mining. Sales and services were reorganised from a country-based structure to one based around seven regions.

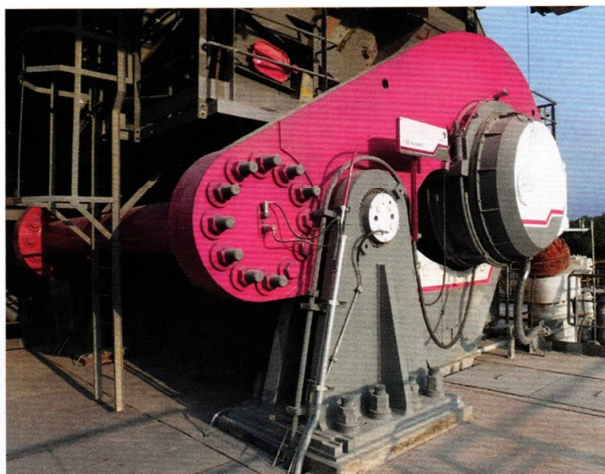
"With the end markets recovering, our customers accelerate to invest in productivity enhancing and digital solutions," said Schulz when announcing the new structure. "To support our customers' growth, the two industries will deliver integrated productivity offerings through the regions."

As part of the restructuring, Jan Kjærsgaard was named as the new President of the Cement Industry and member of the Executive Board. A Danish national, Kjærsgaard was





Fives has supplied four of the five production lines at the Umm Bab cement plant, including line 5, for which a provisional acceptance certificate was signed last year.



Fives supplied three identical FCB Horomill® grinding mills to Cementos Fortaleza's Tula cement plant as part of the turnkey supply of a 3300 tpd clinker production line. The final acceptance certificate was received last year.

previously CEO of Bladt Industries, a steel contractor serving the oil and gas sector, and before that held various management positions at Siemens. The company also announced the appointment of Mikael Lindholm as Chief Digital Officer, who heads a new central digitalisation organisation at the company.

Although not as common as they once were, major project announcements from FLSmidth's cement business included contracts for two cement plants in Central America: a 2000 tpd greenfield plant and 3500 tpd brownfield plant, with a combined contract value of more than €250 million. Meanwhile, in March of this year, the company announced a contract from Xuan Thanh Cement for a 12 500 tpd production line in Ha Nam, Vietnam, valued at DKK550 million in March 2019.

Fives

The Cement and Minerals business line of **Fives**, a French engineering conglomerate, offers design, supply and installation of core process equipment, as well as complete plants, to the cement industry. Its product line includes technologies for crushing,

grinding, pyroprocessing, combustion, and gas treatment, developed by its three divisions: Fives FCB, Fives Pillard, and Fives Solios.

In contrast to FLSmidth, Fives Group derives its revenues from a far greater range of industries: in the 2018 Financial Year 6% of order intake came from the cement industry. Metals was the company's largest business, accounting for 23% of order intake, followed by energy (20%) and logistics (20%), automotive (18%) and aerospace and industry (13%). Order intake for Fives' cement business was €144.5 million in FY18.

"With the exception of a few supporting regions (Mexico, Southeast Asia), few capacity related projects are being discussed, while the movement towards market concentration [...] favours a wait-and-see approach with the new merged groups pursuing clear objectives to reduce their investments," the company wrote in its most recent financial report. "In this context, the group's commercial activity was mainly focused on modernising existing capacities, supplying individual pieces of equipment and developing services."

Last year, Fives and Qatar National Cement Co. signed the provisional acceptance certificate, thus finalising the implementation, on an EPC basis, of Umm Bab line 5 with a 5000 tpd clinker capacity. The project included the design and supply of all equipment, from raw material preparation to cement dispatch, including a 440 tph raw meal grinding plant, a 2 x 115 tph cement grinding plant and the burning line. Fives has completed four of the five Umm Bab cement plant production lines, which has a production capacity of 16 000 tpd of clinker.

Also in 2018, Fives successfully completed all performance tests on the Tula production line (3300 tpd of clinker) and obtained the final acceptance certificate from Cementos Fortaleza, which concludes this turnkey capacity extension project. The new line includes three identical FCB Horomill® grinding mills: one for raw meal grinding plant, and two for cement grinding plant, offering flexibility and low energy consumption. The tests reported

an overall energy consumption of 63.8 kWh/t of cement for the entire production line.

A final highlight on 2018 was the start of construction work for the fifth cement production line at Cooperativa La Cruz Azul's Lagunas site in Mexico. Fives was awarded a turnkey contract for the engineering, supply, construction, and commissioning of a 300 tph FCB Horomill® raw grinding plant. Cooperativa La Cruz Azul also awarded Fives another turnkey contract to supply the 280 tph FCB Horomill® grinding plant on the new clinker production line at its Hidalgo site, as well as an order for petcoke grinding at the two sites.

More recently, Fives Group announced a strategic agreement with Chinese engineering group, CNBM, that is said to be worth at least €600 million over three years. The agreement covers three 'axes of collaboration':

- In China: CNBM is committed to a wide-ranging programme of modernisation and upgrades to its production lines. Specific projects have been identified where Fives' technologies, in grinding in particular, will improve performance and return on investment.
- Internationally: CNBM is working on numerous projects for which the two groups will combine their expertise and technologies to create modern, high-performance plants.
- A Joint Engineering Centre to implement these projects and promote the best technologies. The centre was inaugurated on 28 February in Shanghai.

"The complementary qualities of the two groups will deliver high-performance installations that



Fives began construction on a fifth production line at Cooperativa La Cruz Azul's Lagunas cement plant, which will be supplied on a turnkey basis by Fives.

respect the environment, while guaranteeing production quality at an optimum price," Fives said in a press release that announced details of the agreement. "This agreement also shows the mutual trust between the two companies, notably with respect to intellectual property."

Mills and grinding

In addition to both FLSmidth and Fives Group, Europe boasts a number of companies specialising in mills and grinding within the cement industry. Although a good number of these are based in Germany – and are therefore beyond the remit of this article – the following companies from Spain, Belgium, and Austria offer global equipment supply and support to the grinding of raw meal, cement, and solid fuels.

Cemengal is an EPC contractor specialising in the design and construction of new grinding plants, as well as the upgrade of existing facilities. It is perhaps best-known for its Plug&Grind modular grinding units.

In January 2019, the company announced a contract with Cementos Melon for the supply of a new Plug&Grind XTREME modular grinding unit to be installed on the outskirts of Punta Arenas in southern Chile.

Other Plug&Grind projects undertaken through 2018 included a new Plug&Grind Classic for Cemento Regional in El Salvador, the commissioning of a Plug&Grind XL for LafargeHolcim in Morocco, the completion of a Plug&Grind XL for Ndovu Cement in Kenya, and the commissioning of a Plug&Grind XL for CEMINDO in Indonesia.

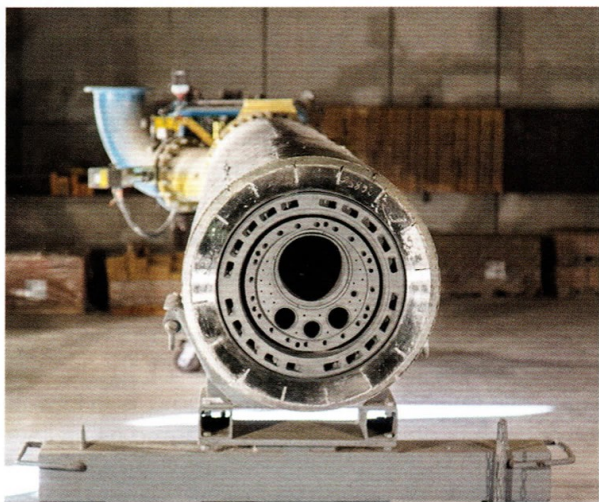
In addition, the company was awarded a new contract for the supply a second cement grinding plant to ACICO Cement in Kuwait.

Based in Enns, Austria, **CEMTEC Cement and Mining Technology** provides grinding technology to a range of industries, including complete cement grinding plants, raw meal grinding plants, and grinding plants for solid fuels. In December 2018, the company inaugurated its largest installed ball mill in Russia, at an event attended by Russian President, Vladimir Putin.

Belgium-headquartered **Magotteaux**, a subsidiary of Chilean company, Sigdo Koppers, supplies a range of grinding media, mill and crusher linings and wear parts, heat resistant castings, and classifiers to the cement industry.

The company recently announced a project to modernise three cement mills at Kuwait Cement Co. The project includes closing the open circuit with Magotteaux's fourth-generation XPI separators, installing new mill internals, and adapting a new ball charge gradation.

Mill linings, as well as mill inlet chute systems and diaphragms, are also provided by Spanish foundry, **Estanda**.



Unitherm Cemcon launched the next generation of its M.A.S burner this year: the M.A.S.^{DT}.

Pyroprocessing

Within the pyroprocessing element of cement manufacture, there is a range of equipment and services required: from complete systems – including preheater/precalciner, kiln and cooler (of which FLSmidth is the only complete supplier, although Fives Group offers preheater/precalciner and kiln) – to the burners that power the process, the refractories that line the kiln, and the thermal imaging systems that keep an eye on things.

Outside of the major suppliers (FLSmidth and Fives Pillard), Austria-based **Unitherm Cemcon** offers burners to the cement industry, commissioning almost 500 of its M.A.S. burners around the world since its introduction to the market in 1992. The company recently launched a new generation of the M.A.S. burner: the disc burner places the adjustable primary air openings directly at the burner mouth, allowing unobstructed injection of the air jets into the kiln.¹

Staying with burners, **A TEC Group** – also based in Austria, although owned by the German Loesche Group – offers its A TEC GRECO FLEXIFLAME burners for cement kilns and calciners, as well as engineering and consulting services to optimise cement pyroprocesses. In addition, the company offers complete alternative fuels systems, including material handling, preparation, storage, feeding to kiln, and optimised combustion.

According to the company's website, it has completed more than 450 cement plant optimisation projects with "all of the 'big players' in the industry".

Poland's **Geoservex** also offers pyroprocessing optimisation in the form of hot kiln alignment, which was developed by the company's founder, Dr Bolesław Krystowczyk. The technology has now been used to inspect over 1000 rotary kilns in 49 countries around the world.

Monitoring the pyroprocess is key to maintaining performance – and a number of European companies offer kiln monitoring solutions. These include **Thermoteknix** (thermal imaging) and **Ametek LAND** (temperature monitoring) in the UK, **HGH-Infrared** and **Mirion** (thermal imaging) in France, and **VisionTIR** (temperature monitoring) in Spain.

There is a wide range of European refractories suppliers, from global leader, **RHI Magnesita** of Austria, to **Groupe EML** of France, Sweden's **Höganäs Borgestad**, **Hasle Refractories** of Denmark, Spain's **Alfran** and **REYMA Materiales Refractarios**, UK-based **Vesuvius**, and **Silicon** of the Netherlands.

At the end of the pyroprocess lies the clinker cooler. As with milling, many of the leading suppliers of clinker coolers are based in Germany or are multinationals, such as FLSmidth. Elsewhere, **FONS Technology International**, which is headquartered in Istanbul, Turkey, offers its FONS Delta Cooler to the global cement industry, while Estanda of Spain also offers its planetary or satellite coolers.

Materials handling

From conveying to feeding and dosing, bulk cement loading, and bagging and packing, materials handling equipment provide the veins and arteries of the cement plant, moving the product through the major organs – the mills, kilns, coolers, etc. – and onto the customer. European suppliers of materials handling equipment are numerous: FLSmidth again tops the pile, supplemented by its product brands, Pfister (feeding/dosing) and Ventomatic (bagging and packing).

Founded in 1908, Italian company **Bedeschi** supplies various storage and stockpiling solutions, conveyors, and shiploading solutions to a broad range of bulk materials industry, including cement. Recent contracts include a clinker storage system for Cementeria Constantinopoli in Italy and the supply of two ecohoppers to the port of Houston.

Indeed, Italy is something of a focus for materials handling companies. In addition to Bedeschi, the country plays host to **Agudio** (rope conveyors), **B.S.P. Engineering** (cement and clinker silos), **Cimbria** (loading chutes), **Euromecc** (cement silos), **Gambarotta Gschwendt** (conveyors, bucket elevators, feeders), **Magaldi** (clinker conveyors, weighfeeders, belt cleaning systems), **MDG Handling Solutions** (conveyors, silos, bucket elevators, loading spouts, etc.), **Rulmeca** (conveyor rollers and motorised pulleys), **Scutti** (cement silos), **Società Italiana Gomma** (conveyor



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