

At the edge of the desert

Exposed to the Sahara desert climate, a new cement plant has been taking shape some 40km north of Biskra, Algeria. In the hot arid summer with temperatures reaching 49.4°C and an annual rainfall of less than 100mm, the construction of the Algeria Spa CILAS cement works presented its own challenges, but a flexible approach by main contractor CBMI contributed to the successful completion of the project.

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On 28 April 2014, Algeria Spa CILAS, a joint venture between Algeria's Souakri Group and LafargeHolcim, awarded the engineering, procurement and construction (EPC) contract for a new 5000tpd greenfield cement plant near Biskra to China-based CBMI. The new works is expected to help alleviate the country's current cement shortage.

The contract's scope of work included the engineering, equipment supply, civil work, erection, training and commissioning of the entire production line from limestone crushing to cement packaging and dispatch.

From the effective date of the contract, 21 May 2014, completion of the cement mill was scheduled for 21 months later and 26 months for the ignition of the kiln. Industrial testing was due to be completed at 29 months, with preliminary take-over to follow four months later.



The five-chamber cement silo was erected in record time

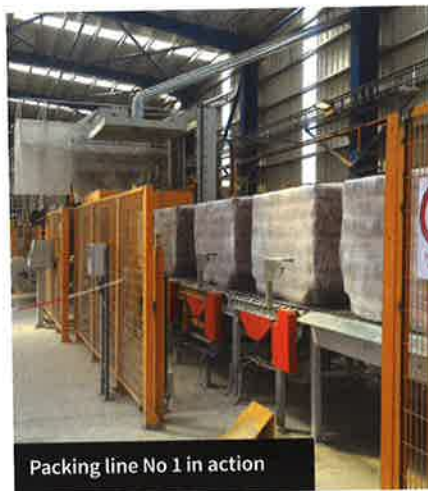


The new cement works of Algeria Spa CILAS was successfully commissioned on 10 July 2016

Core equipment

Limestone and clay crushing in the quarry is carried out by mixed crushing technology, while CBMI's proprietary technology was employed to build the stacker and reclaimer for additives and blending.

Germany-based Gebr Pfeiffer SE supplied the plant's MVR 6000 R-6 raw mill. The mill is equipped with a conventional drive with an installed power of 6120kW



Packing line No 1 in action

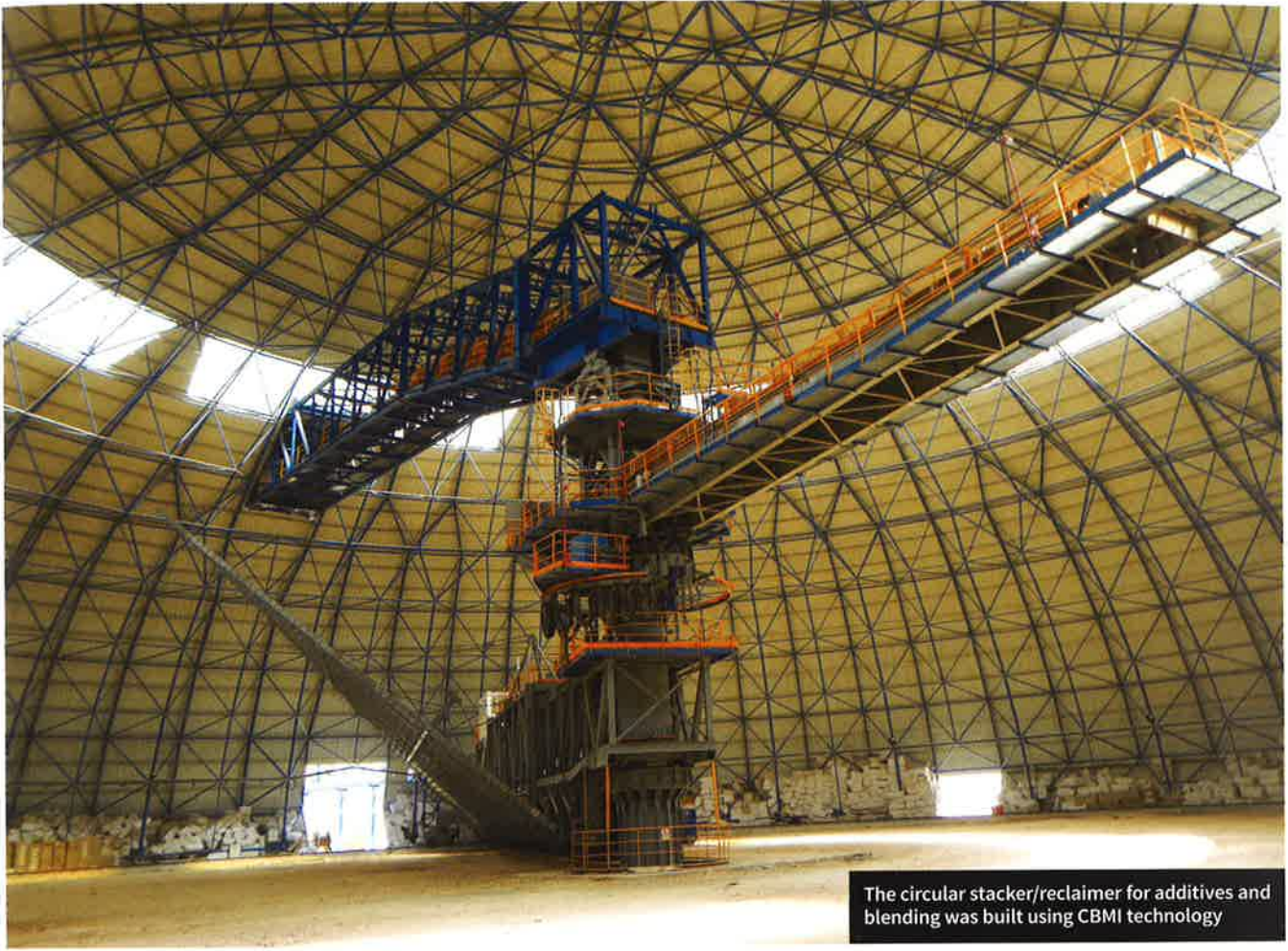
and is designed to grind 680tph of raw materials to a finished product fineness of ≤ 12 per cent $R90\mu\text{m}$ and in the case of limestone, 460tph to ≤ 1 per cent $R150\mu\text{m}$.

CBMI also supplied the two-string, five-stage preheater and a dual-drive kiln with a diameter of 5m and a length of 74m. The DDF calciner can be easily operated to deal with the fuel. Downstream from the kiln, the third-generation grate clinker cooler ensures high cooling efficiency with a small footprint.

Cement is stored in a $\phi 22\text{m}$, five-compartment cement silo with an effective storage capacity of 25,600t. Packing facilities, supplied by Ventomatic, consist of two packing lines and two palletising lines, and include an automatic bag applicator, automatic palletiser and automatic film sheet applicator.

Safe project practice

Throughout the project CBMI has placed safety at the top of its agenda, pursuing a zero rating for fatal accidents, serious injuries and equipment accidents. A total of 34 full-time safety officers have



The circular stacker/reclaimer for additives and blending was built using CBMI technology

contributed significantly to induction and special operations training. Daily routine patrols and joint inspections with the customer have enabled the company to report 4m hours without accidents in the run-up to project completion in May 2016.

Flexible approach

The consistently-high temperatures and desert storms presented considerable issues to the staff working at the site.

In addition, complex local finance and taxation regulations, the extended time needed for the review and approval of drawings, quotas on work permits for Chinese workers and the lack of equipment and materials in the local market added to the challenges.

Therefore, a flexible approach was required. The project management team

adjusted the management and execution schedules, drawing up weekly and monthly plans, as well as employing experts to coordinate the review and approval of the drawings. Moreover, more local people and subcontractors were brought onto the project. Where material shortages occurred locally, equipment was purchased in the international market.



The lifting of the cement mill table (above) and the completed mill (right)





Building the plant's pyroprocessing line

As a result, the finalisation of the project was achieved in 10.5 months on 20 May 2016, one month earlier than scheduled.

Project milestones

On 22 August 2015 the cement packing plant started operation. Following connection to the power grid on 15 March 2016, Algeria Spa CILAS started up the cement mill on 16 April, ahead of contract time and taking only seven months

between erection and production.

While initially the clinker silo was scheduled to be ready at the same time as the pyroprocessing line, due to the steady progress of the cement mill, the customer requested CBMI to complete the structure earlier than anticipated. This called for an alternative way of building the silo. Because of the hot and dry climate, slip form work techniques could not be employed and the traditional turnover form work would not meet the new time

constraints. Therefore, a new approach was devised and the 25m-high clinker silo was built in 35 days.

The steel structure was largely preassembled and the main structure was finished within three days of civil work being handed over to steel structure erection. As a result, the silo was successfully completed two days before the cement mill started production.

The optimised design and advanced erection method enabled the timely completion of the preheater tower. In the 94 days since 20 August 2015, more than 2000t of components were lifted. CBMI's attention then turned to refractory and electrical work.

Ready to reduce domestic cement shortages

On 10 July 2016, Algeria Spa CILAS saw the successful start-up of its new clinker production line with the ignition of the kiln, 11 days ahead of schedule, in the presence of Didier Michel, representing CILAS' parent company LafargeHolcim, and Wang Hui of contractor CBMI. Both companies expressed their thanks and appreciation for the work completed and the teamwork shown. The plant is now ready to help lower Algeria's cement shortage and meet domestic market requirements. ■



CBMI also supplied the two-string, five-stage preheater and the $\phi 5 \times 74\text{m}$ kiln for the new works