

Modern milling in Mexico

Encouraged by healthy construction demand and promising growth potential, two regional cement manufacturers have decided to invest in cement grinding facilities in Yucatán, Mexico. Both Cementos Fortaleza and Holcim México have entrusted Gebr Pfeiffer to deliver these facilities and the required capacity to satisfy immediate demand.

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For some, thinking of the Yucatán Peninsula brings to mind student parties, also known as Spring Break. However, for the more discerning tourist, this somewhat remote peninsula holds a wide variety of more cultural attractions. Among them is the Mayan city of Chichen Itza, which was built with limestone blocks chiselled from nearby quarries 1000 years ago. Or there are the ‘cenotes’ (from the Mayan word ‘dzonot’ meaning ‘fountain’), which offered the Mayan people places of worship where they could speak with the gods and receive the divine blessing of fresh water. Today, one can swim or snorkel in these natural sinkholes and marvel at the extensive system of underground caves and rivers formed by rain dissolving limestone over thousands of years.

Plentiful was the limestone that Mayans used to build their cities. But how will the people of Yucatán build for the future? This is where Gebr Pfeiffer comes in with its state-of-the-art material preparation systems, as implemented for two Mexican cement producers discussed below.

Cementos Fortaleza – pioneers in Yucatán

Cementos Fortaleza belongs to the Elementia Group, and with its new Progreso plant the company has established four facilities in Mexico and the first production facility in the Yucatán state. The grinding works commenced operations in September 2020 with a capacity of 0.375Mta.

Technology	R2G 2500 C-4
Material	Cement
Production rate (tph)	50
Fineness (cm ² /g acc to Blaine)	4850
Mill motor Installed power (kW)	1250

Figure 1: illustration of a typical Gebr Pfeiffer ready2grind plant



The Progreso plant layout has the broadest scope available within Gebr Pfeiffer’s ready2grind (R2G) line-up. This includes prefeeding, grinding, downstream material transport to silos and, ultimately, packing and palletising (see Figure 1).

Flexible production – efficient use of space

With an average capacity of 50tph, this plant is the integration of a Gebr Pfeiffer MVR 2500 C-4 vertical mill, with handling equipment and automation from experienced European equipment suppliers to the cement industry. The MVR 2500 C-4 provides the flexibility to produce many types of cement, enabling a change-over between products in a comparably impressive short time.

The Progreso facility occupies a site that is less than 16.9ha (17 acres), dimensioned to accommodate the Gebr Pfeiffer plant with a footprint of only ~110 x 94m (360 x 310ft).

The facility complies with all local environmental regulations, such as the required share of tree/greenfield areas and maximum

permitted building height. Furthermore, this modular grinding system is most efficient in terms of electrical power and water consumption. It easily achieves common global standards for dust and noise pollution.

Holcim México – consolidating operations

Meanwhile, Holcim México, which has long been committed to the Yucatán Peninsula and present since 1992, has recently commissioned a new grinding facility that is currently coming into operation. The Quetzal plant, located in Umán, near Merida, will contribute 0.65Mta of capacity to the region.

A smart combination

The Quetzal plant is the second grinding terminal in the Yucatán Peninsula. It is a smart combination of Gebr Pfeiffer’s MVR 3350 C-4 mill with some of the modular design elements taken from the ready2grind concept. The production rate is 103tph and the mill motor power is 2200kW (see Table 2).

Additionally, it is complemented by equipment for feed material reception



Figure 2: Cementos Fortaleza's Progreso plant and its Gebr Pfeiffer MVR 2500 C-4



via rail and road, feed material storage capacity, a customised mill feed system, product storage capacity, a dispatch system allowing for bulk, bagged or palletised transport, plant automation and all electric motors.

Fast-track project

Although the project includes some conventional plant components, the lessons learned from the modular ready2grind, combined with great project coordination between LafargeHolcim and Gebr Pfeiffer, streamlined the lead time – almost matching that of a conventional R2G system. With the first shipments

made after five months from contract signature and final goods dispatched after 11 months, the delivery target – although ambitious – was executed well.

Committed to development

The Progreso and Quetzal plants are good examples of private investments with a long-term commitment to the Yucatán Peninsula. The plants provide a combined cement capacity of 1.1Mta to the local construction market and a significant economic stimulus during a challenging time where it is necessary to revive the local economy.

Customer decisions and trust in

Gebr Pfeiffer as an innovative supplier of state-of-the-art grinding plants also underline a commitment to the best quality. Moreover, the ready2grind systems are future-proof

and flexible, as they are equipped with frequency converters on the mill motor. This enables Pfeiffer customers to always adapt their products to market requirements – for instance, if future market demand requires a plant to produce a higher product fineness for cements with lower clinker content.

With nearly 160 years of experience in the development of minerals material preparation systems, Gebr Pfeiffer provides a competitive edge with its innovative ready2grind concept. One reason is that these ultra-modern plants offer many advantages: from easy transportation, short installation times and fast commissioning to smooth and highly efficient grinding operations and the highest quality standards. Many references worldwide are evidence of this perception.

A wide range of digital solutions and technical services, as well as Gebr Pfeiffer's strategically installed customer service centres, complete the company's product portfolio to ensure the best possible operating results for customers.

Table 2: Holcim México project	
Technology	R2G 3350 + standard plant
Material	Cement
Production rate (tph)	103 (CPC 30)
	77 (CPC 40)
Fineness (cm ² /g acc. to Blaine)	4500
Mill motor installed power (kW)	2200

Figure 3: Holcim México's Quetzal plant



Figure 4: the Gebr Pfeiffer MVR 3350 C-4





Charter loading at the port of origin and equipment unloading at Progreso Port

Project execution in a pandemic

Executing multinational project coordination during a global pandemic was unprecedented. Social distancing, travel restrictions, lockdowns, curfews and uncertainty about the future of the economy were some of the challenges that Gebr Pfeiffer faced. However, through extraordinary efforts its customers have been pleased with the outcome of project completions.

The introduction of safe practices during the very first weeks of COVID-19 threatened delivery schedules from the outset. Coordinating work with sub-suppliers, which for a while did not have access to important documentation, proved frustrating. Fortunately, in good time, everybody learned to work remotely and efficiently.

Travel restrictions made on-site inspections impossible. Instead, Gebr Pfeiffer introduced electronic alternatives and discovered there is no such thing as too much communication.

Shipping and transportation have been heavily impacted. The delivery of some 4500t from Europe to a very small port facility in Yucatán would present a logistical challenge even under normal circumstances. Container vessel sailings

were drastically reduced because of COVID-19, so keen logistic planning was key to guaranteeing space on board.

Many cargoes were consolidated in four charter vessels. Some 3500 items, including over-dimensional pieces, arrived at the destination port in Mexico in record time. Inland transportation required more than 800 trucks to mobilise this entire volume at both ends.

Installation and commissioning did not escape the impact of COVID-19 either. Foreign technicians were not able to travel to Mexico in all the planned phases. Nonetheless, continuous remote assistance for installation activities has proven quite effective. As soon as travel was permitted, engineering specialists were mobilised to complete the delicate tasks of optimisation and commissioning.

A modern grinding concept

The Gebr Pfeiffer ready2grind design is currently available in three standard sizes: R2G 1800 C-4, R2G 2500 C-4 and R2G 3000 C-4.

The R2G 2500 C-4 is the most popular, with eight units already in operation or at the commissioning stage with a cement throughput rate of 50-72tph, depending on the type and fineness required.

The R2G 1800 C-4 is the smallest system, designed for a throughput rate of 20-30tph. It is suitable for low to medium market demand, or for ready-mix companies looking to improve their business by producing their own cement with a surplus that can be placed on the market.

The R2G 3000 C-4 can achieve throughput rates above 75tph, with producers that need to increase production significantly or are in a medium- to high-demand market. In addition to the sizes listed in Table 3, the MVR 3350 C-4 is partly modular and also benefits from the ready2grind concept.

Moreover, the R2G 3350 is selected where the market has the right conditions and demands a production rate in the range of 100tph. By the end of 2021 three more large ready2grind plants will be operating in the Americas.

Gebr Pfeiffer ready2grind systems are a proven technology with more than 15 systems installed worldwide providing the benefits of a modular plant for fast delivery and quick installation. Quality and the highest availability are the main reasons that new and existing producers select Gebr Pfeiffer as their preferred supplier. ■

Table 3: throughput of Gebr Pfeiffer’s ready2grind systems*

	Portland cement CEM I		Limestone cement CEM II / B-L		Ground granulated blastfurnace slag (GGBS)	
	3300	4000	4000	5000	3800	4500
Fineness (cm ² /g according to Blaine)	3300	4000	4000	5000	3800	4500
Grindability (kWh/t)	17.4	21.4	14.8	18.7	20.5	24.2
Production rate (tph)	29/67/76	23/54/62	34/79/90	27/62/71	26/61/70	22/52/59
Maximum feed grain size (mm)	40 / 60 / 60					
Approx annual production rate (tpa)	up to 250,000 / up to 580,000 / up to 660,000					
Installed mill motor power (kW)	630 / 1450 / 1640					
Approx total installed power (kW)	1400 / 2750 / 3200					

■ R2G 1800 C-4 ■ R2G 2500 C-4 ■ R2G 3000 C-4 *also available for higher capacities