

Into the foothills of the Himalayas

As Nepal's cement sector expands, Gebr Pfeiffer has been awarded a range of contracts for its vertical roller mill (VRM) technology from domestic producers. From raw material and coal grinding to finish cement, recent orders include the largest mill delivered to Nepal.

■ by **Bernd Henrich**, Gebr Pfeiffer, Germany

Over the past 24 months German grinding specialist Gebr Pfeiffer has successfully established itself in the Nepal market. Within a 13-month period the company has received four orders for its VRM technology. A total of five mills are currently under various stages of execution, two of which are in the commissioning phase.

Not only have the mills been ordered to produce blended cements where, in addition to gypsum, fly ash, limestone, natural pozzolana or granulated blastfurnace slag (GBS) are added to the clinker as extenders, but also for raw material grinding, in particular limestone, and pulverised coal production.

Market entry with Kapilvastu cement mill contract

The first order Gebr Pfeiffer received in Nepal was from Kapilvastu Cement Udhyog for an MVR cement mill. Part of the Ghorahi Cement conglomerate, Kapilvastu Cement originally planned on establishing a new grinding plant in Sonparwa, Barkalpure, Kapilvastu district. However, during the detailed planning stage it was discovered that the local conditions did not meet the requirements for the subsoil, particularly in terms of the foundations for the silos. It was therefore decided that the grinding unit should instead be erected at Ghorahi Cement's existing plant site in Ghorahi.

An order was placed with Gebr Pfeiffer for an MVR 3070 C-4 mill to grind ordinary Portland cement (OPC) at a capacity of

70tph. A high-efficiency SLS 2650 BC classifier is mounted on top of the mill for a compact design. This enables cements to be ground using GBS and fly ash.

In this grinding process the feed material contains water and therefore, external heat is required to dry the material. Initially, the installation of a hot gas generator was planned at the original Kapilvastu site, which would also have enabled the use of secondary fuels. However, as the VRM was installed at Ghorahi Cement's existing plant site, exhaust air from the clinker cooler is used.

The core components of the MVR mill and the 1250kW gearbox were supplied by Gebr Pfeiffer SE from Germany. The remaining vertical mill and classifier components were supplied by Gebr

The contracts in Nepal build on Gebr Pfeiffer's success in the neighbouring Indian market, where the company has supplied some 140 mills, including this six-roller MVR 6000 R-6 raw mill



Pfeiffer's Indian subsidiary, Gebr Pfeiffer (India) Pvt Ltd. Gebr Pfeiffer (India) also supplied almost all the grinding plant's other components including material feeding and product removal equipment, plant filter, plant fan, motors, frequency converters and proportioning belt scales. The Indian subsidiary designed the plant layout for the customer.

Coordination and supervision services for the erection and commissioning phases completed Gebr Pfeiffer's scope of supply.

Table 1: MVR 3070 C-4 mill, Ghorahi cement plant, Ghorahi Cement Industry Pvt Ltd

Production rate (tph)	70
Fineness – Blaine (cm ² /g)	3200
Power (kW)	1250
Product	granulated blastfurnace slag and cement, fly ash cement

Table 2: MVR 3350 C-4 mill, Sunwal plant, Palpa Cement Industries

Product	Cement	Blastfurnace slag
Production rate (tph)	130	100
Fineness – Blaine (cm ² /g)	3000	3800
Power (kW)	2150	

Table 3: raw material and coal mills at the Ghorahi plant, Ghorahi Cement Industry

Mill type	MVR 5600 R-4	MPS 250 BK
Production rate (tph)	525	39
Fineness – R 0.090mm (%)	18	15
Power (kW)	5350	535
Product	Raw materials	Coal

Palpa Cement's new finish mill

Gebr Pfeiffer's second VRM order in Nepal is currently being built at Palpa Cement Industries plant in Sunwal, Nawalparasi district. The MVR 3350 C-4 mill, with a total drive power of 2150kW, will grind 130tph of cement at 3000cm²/g Blaine and 100tph of GBS at 3800cm²/g Blaine (see Table 2).

The scope of equipment delivered by Gebr Pfeiffer from Europe, and the services rendered and equipment supplied by Gebr Pfeiffer (India) are similar to those of the previously-mentioned Kapilvastu order.

One of the key factors behind Palpa Cement opting for Gebr Pfeiffer's MVR technology is its proven success in the field worldwide and guaranteed smooth operating and grinding efficiency.

Ghorahi Cement orders mega raw material mill plus coal VRM

Ghorahi Cement Industry is also planning to expand capacity at its Ghorahi works with a second kiln line. As part of the expansion, Gebr Pfeiffer has been awarded the contract to supply two vertical mills: one for raw material milling and the other to grind imported coal.

Raw material grinding

For raw material grinding, Ghorahi Cement opted for the MVR 5600 R-4 mill due to its energy and process benefits compared to the ball mill used for Kiln Line 1. The ball mill requires almost twice the amount of specific electric energy as the VRM. In addition, the ball mill only has limited

The MPS 250 BK coal mill under erection in Jordan, is identical to the mill delivered to Ghorahi Cement, Nepal



capacity to dry moist components in the feed material, which may have a moisture content as high as six per cent.

Therefore, during the engineering stage the company decided to set up the MVR mill to cover raw material grinding for the existing Line 1 and the new Line 2, and shut down the ball mill. However, this required installation of a larger MVR mill.

Therefore, the MVR 5600 R-4 mill will have the capacity to produce 525tph of raw material (see Table 3). With a ϕ 5.6m grinding table, the new mill will be the largest-ever mill delivered to the Nepali cement industry. It will also feature a drive power of 5350kW and be equipped with an SLS-B high-efficiency classifier.

The mill includes active redundancy of its grinding rollers, enabling operation with a reduced number of rollers. Even during unplanned maintenance work for any length of time, the kilns need not be shut down because part-load operation of the mill will ensure raw meal supply to the kilns, which will be able to continue operating in part-load mode.

The grinding plant has also been designed to use the residual heat from the two kilns. However, as a state-of-the-art waste heat recovery system is used for Kiln 2, the temperature of the process gases is relatively low and the heat available is insufficient to dry the feed materials for

Gebr Pfeiffer hosts Kathmandu Meet

Due to strong local interest in Gebr Pfeiffer technology, in 2018 the company hosted its '1st Pfeiffer Meet Nepal' in Kathmandu.

The event was aimed at informing decision makers from local cement producers (mostly run by family-owned firms) about Gebr Pfeiffer and its MVR mill technology. An informal get-together preceded a series of presentations, followed by a joint dinner. The well-attended event was positively received.



Table 4: MPS 225 BK mill, Lamahi Dang, Samrat Cement Co

Production rate (tph)	35
Fineness – R 0.090mm (%)	15
Power (kW)	370
Product	coal

“The core components of the MVR raw mill and the MPS coal mill as well as the 5350kW gearbox were supplied by Gebr Pfeiffer SE in Germany.”

both lines. Therefore, where possible, heat from the two clinker coolers helps to evaporate as much as 28tph of water contained in the feed material.

Coal grinding

As is common practice in this region of the world, the new kiln will be fired with pulverised coal. To this end, Gebr Pfeiffer has been contracted to supply an MPS 250 BK coal mill with an integrated SLS BK high-efficiency classifier. The mill is designed to be pressure-shockproof and is equipped with wear protection to cope with the abrasive Indian coal.

The core components of the MVR raw mill and the MPS coal mill as well as the 5350kW gearbox were supplied by Gebr Pfeiffer SE in Germany. The remaining components of the vertical mills and high-efficiency classifiers were supplied to Nepal by Gebr Pfeiffer (India). As before, Pfeiffer India supplied almost all the other components of the new grinding plant, such as material feeding and product removal equipment, plant filters, plant fans, motors, frequency converters and proportioning belt scales. The Indian subsidiary also completed the plant layout for the customer.

Erection and commissioning supervision and coordination services rounded off the scope of supply.

Coal mill for Samrat Cement Co

In the Dang region, southern Nepal, Samrat Cement Co is building a new production line. The kiln is being supplied by KHD, and the calciner will be fired with pulverised coal. To produce the pulverised coal, KHD ordered an MPS 225 BK grinding unit from Gebr Pfeiffer. Featuring a 370kW drive, the MPS mill is intended to grind 35tph of coal to a product fineness of 15 per cent R90µm (see Table 4). At the same time, the mill will help to reduce the feed moisture in the coal, which can be up to 10 per cent.

An integrated SLS 1800 BK, high-efficiency classifier separates the ground coal to obtain the product fineness. This classifier would also allow petcoke to be separated to a fineness of <1 per cent R90µm.

In addition to the mill and the classifier, Gebr Pfeiffer (India) has received an order for the supply of the equipment for the grinding plant. The company will provide manufacturing drawings for the ducting, chutes and other parts that can be produced on site.

KHD's order for a Pfeiffer MPS coal mill, which is being processed by KHD's Indian subsidiary, Humboldt Wedag India Pvt Ltd (HWI), demonstrates the confidence the customer places in Gebr Pfeiffer's technology. ■

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