Indocement Group— Indonesia's fastest growing cement company

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Introduction

The Indocement Group, presently the largest cement manufacturer in Indonesia, has been recognised by the industry as one of the most rapidly growing cement companies in Southeast Asia. It began production in August 1975 with an annual capacity of 500 000 t, which, within a year, was doubled upon completion of its phase-2 project. In December 1978, the phase-3 project was completed, bringing to the Group another 1 million t annual production and, at about the same time, plans were finalised to build two more plants in its manufacturing complex: phase-4 project with still 1 million tpy, and phase-5 a 200 000 tpy white cement plant. As a result of these continuous expansions, Indocement's present 2 million tpy operation is expected to rise to 3.2 million t by the end of 1980, within a mere lapse of five years since the Group first went into production.

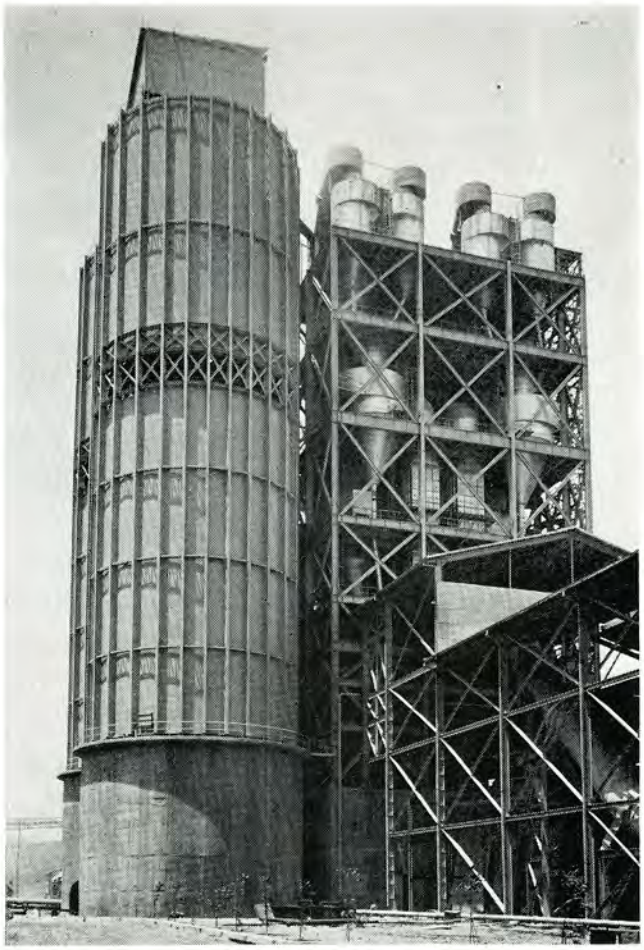
Spanish and Japanese loans

The Indocement Group was founded in 1973, in the name of P.T. Distinct Indonesia Cement Enterprise (DICE), a joint venture between P.T. Perkasa Indonesia Cement Enterprise of Indonesia, and Distinct Investment Ltd. of Hong Kong. Plant and equipment for the first two production lines were supplied by Kawasaki Heavy Industries Ltd., Japan.

In 1976, P.T. Perkasa Indonesia Cement Enterprise (PICE), a 100% domestic investment negotiated with Centunion, a Spanish financing and engineering company, for a long-term loan to finance the Group's US $100 million phase-3 project. Upon conclusion of the agreement, KHD Industrieanlagen AG (Humboldt-Wedag) of West Germany was awarded the contract for the supply of machinery and equipment for a 1 million tpy plant.

In June 1978, PICE entered with the Spanish firm another loan agreement, under which KHD was again entrusted with the Group's phase-4 project of the same investment and capacity, with improved raw material processing and cement despatch systems. This project is targetted for production in the fall of 1980.

The white cement plant, owned by P.T. Perkasa Indah Cement Putih Indonesia Enterprise (PIIC), became Indocement's phase-5 project soon after the finalisation of the phase-4 contract in 1978, and by November the same year, contracts were signed with a Japanese consortium comprising Marubeni Corporation, Kawasaki Heavy Industries Ltd., and Nihon Cement Co. Ltd., who provide finance, equipment and technical know-how, respectively.



The new Pyroclon preheater comprising two parallel preheater lines each with four cyclone stages.

Raw materials

Indocement's 80-hectare factory complex is situated in Cibinong, a subdistrict of Bogor (where there is the world's largest botanical garden) about 30 km

south of Jakarta. It has two limestone quarries, designated as A- and D-quarries located about 2.5 km northeast, and 4 km southeast of the factory, respectively. Until No. 3 kiln was in production, A-quarry had been responsible for the supply of limestone at about 5000 tpd, via an overland belt conveyor built by Production Equipment Pty. Ltd. (PROK), Australia. D-quarry began supplying limestone to all production lines in February 1979, via another 4 km long PROK overland belt conveyor.

Clay and sandy clay are won from deposits at the nearby A-quarry. Plans are being made to transport a rock type sandstone from a newly acquired deposit by means of a 9 km PHB bicable ropeway system. Iron ore in abundant supply is delivered by road from East Java.

Existing plant

The existing plant consists of production lines 1 and 2. The raw materials preparation section has two Kawasaki-Hazemag AP-7N impeller breakers of 400 tph each, a 2 × 20 000 t limestone reclaimer hall and two 3.4 m dia. × 34 m long clay dryers utilizing kiln waste gases.

The raw meal grinding section has two 2500 kw central-drive 3.9 dia. × 12 m long raw mills, each with a capacity of 120 tph and two pairs of 1000 t blending silos built on top of two pairs of 2000 t storage silos.

The clinker burning section has two suspension preheater kilns, each rated at 1500 tpd:

Kiln No. 1: Kawasaki four-stage preheater; rotary kiln 4.5 m dia. × 78 m long; and Kawasaki double-deck horizontal grate cooler.

Kiln No. 2: Kawasaki four-stage preheater with RSP precalciner (Onoda system); rotary kiln 3.7 m dia. × 58 m long; and Kawasaki double-deck horizontal grate cooler.

An A-shape clinker storage hall of 10 000 tons capacity is used, which will be replaced with two 25 000 t concrete silos in 1980.

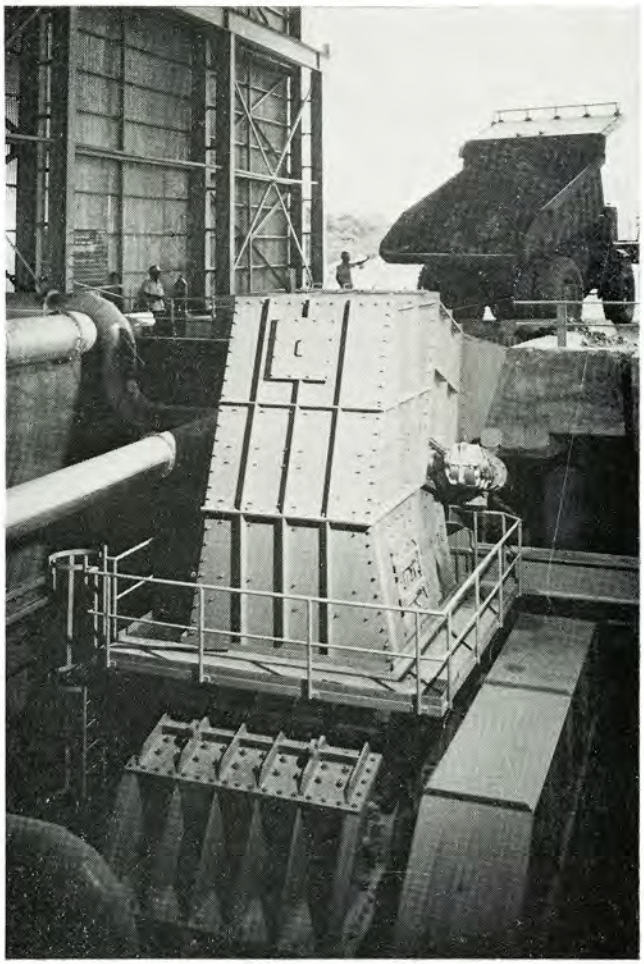
The finish grinding section has two 3000 kw central-drive 4.1 m dia. × 12 m long mills, each 80 tph, with Wedag type cyclone separators. Cement is stored in six 5000 t silos, 15 m dia. × 45 m high.

Despatch of cement is made by eight 6-spout in-line packers via 16 truck loading belts and two bulk loading stations. The packing plant is capable of handling the total daily production of both kilns within one shift.

The entire plant is powered by a diesel generating station consisting of seven 5000 kw Mirrless-Blackstone generating sets.

New plant

The new plant, production line 3, starts with two 750 tph Humboldt double-hammer crushers supplying limestone to all three production lines. Crushed limestone is delivered to a 80 000 t storage hall by overland belt conveyor at 1500 tph. In the storage



One of the 750 tph Humboldt double-hammer crushers which supplies limestone to all three production lines.

The 80 000 t capacity limestone storage building.

hall a PHB bridge type reclaimer reclaims the limestone at rates from 30 to 300 tph as may be determined by the laboratory automation system.

Clay, sand and iron ore are delivered by a tripper belt conveyor into their respective compartments in a storage hall after being crushed in primary crushers. Clay is again crushed in a secondary roll crusher, then dried in a 3 m dia. × 16 m rotary dryer. Dried clay is stored in the fourth compartment in the same storage hall.

Dried clay, sand and iron ore are separately fed by

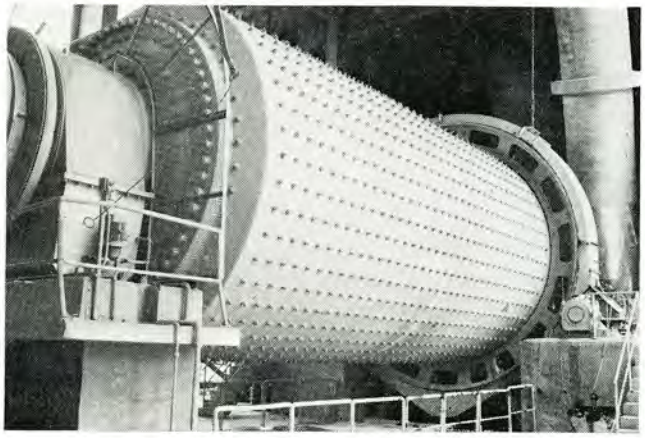
PHB bridge-type reclaimer which can handle limestone at 30-300 tph.

payloaders to hoppers and are proportioned by chain conveyors underneath, these being controlled by Schenck belt scales. Mixed clay is then dosed onto the limestone reclaimer belt conveyor which carries all materials to a 4.8 m dia. × 24 m drum dryer for secondary drying. This rather thorough handling and drying process is necessary due to the extremely sticky nature of the clay, which during rainy seasons contains moisture of up to 25%.

Raw grinding

Dried raw mix is fed to the raw mill through a feed hopper equipped with a Schenck weighing feeder. The raw mill, a 5 m dia. × 9.8 m long airswept ball mill, driven by twin 1800 kw motors, has a capacity of 240 tph. It is equipped with two cyclone classifiers, and is heated by preheater waste gases which are later dedusted in a horizontal electrostatic precipitator commonly used with the kiln. Raw meal is fed through an airlift conveyor into two 2000 t capacity homogenizing silos built on top of two 6500 t storage silos. The silos, 15 m diameter and 62.5 m high, all in welded steel construction, are equipped with a Claudius Peters blending and aeration system. Raw meal discharged from the storage silos is delivered to a level tank supported by load cells that actuate the silo discharge device.

The 5 m dia × 9.8 m long, 240 tph air swept raw mill.

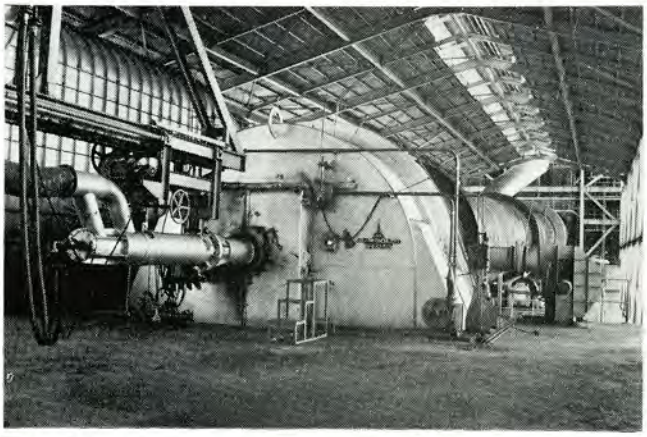


From the level tank the flow of raw meal to the preheater is regulated by a pair of Schenck flowmeters.

Pyroclon® preheater and kiln

The Humboldt preheater comprises two parallel preheater lines each having four cyclone stages. The top stage (Stage I) of each line has two cyclones while each of the other stages has one cyclone. Each preheater line has two precalcining burners positioned at the riser duct between the kiln inlet and the Stage IV cyclone, for either oil or gas firing. Preheater waste gases are drawn by two 640 kW ID fans into a 8 m dia. × 36 m tall spray tower en route to the raw mill system.

The rotary kiln, measuring 4.6 m dia. and 70 m long, is supported on three roller stations at 3.5% inclination. It is driven by twin 360 kw motors at a maximum speed of 4.2 rpm. The kiln, rated at 3200 tpd, is oil-fired with provisions for gas firing in the future.



Part of the 4.6 m dia. × 70 m long kiln. It is driven by twin 360 kW motors at a maximum speed of 4.2 rpm and is rated at 3200 tpd.

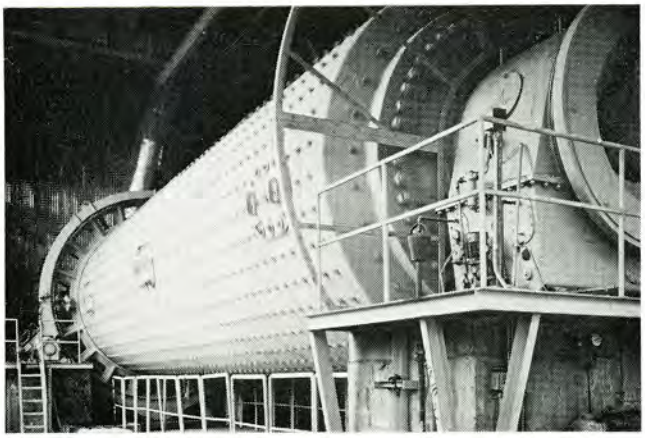
Clinker cooler and storage

Clinker is cooled in a Claudius Peters three-stage inclined grate cooler having a cooling area of about 110 m². Dedusting is effected in a double multiclone dust collector. A tertiary air duct is connected to the first stage of the cooler, to supply hot air to the precalciner, through a dust settling chamber and V-ducts.

Clinker discharge from the cooler is transported to two 15 000 t capacity silos of steel construction, by means of a steel plate conveyor and two bucket elevators of which one serves as a standby. On top of the silos are two apron conveyors for feeding clinker into the respective silos.

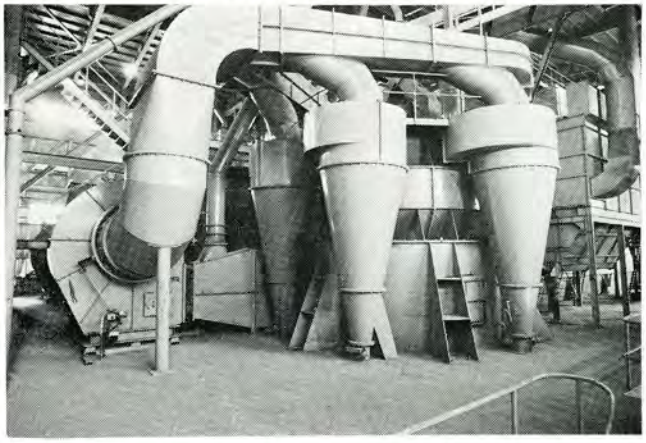
Finish grinding and cement silos

Clinker is extracted from the bottom of clinker silos by means of vibro feeders and is transferred to the mill hoppers via apron conveyors and a bucket elevator. Gypsum is fed into its hoppers via a series of belt conveyors. Two Humboldt double-compartment finish mills, 4 m dia. × 14.5 m long, each being driven by twin 1550 kw motors are used for finish



One of the 80 tph, 4 m dia. × 14.5 m long, double compartment finish mills.

The finish mills are equipped with these air separators.



grinding at a capacity of 80 tph each. The mills are equipped with Wedag classifiers, automatic water injection systems and electrostatic precipitators.

The finished cement is stored in three 15 000 t steel silos equipped with Claudius Peters aeration systems.

Packing and loading

Packing of cement is performed by 16 Haver & Boecker three-spout valve bag packing machines, and loading by telescopic belts into trucks. Two bulk cement loading stations are provided for loading the bulk tankers. At present about 90% of the production is being shipped in bags.

The cement packing station which has 32 loading bays.

Laboratory automation

A Siemens Laboratory Automation system is being installed for the on-line control of raw mix proportioning by the raw meal silo integration principle, using lime standard LSF, silica modulus SM and iron modulus IM as control parameters. The system comprises the following equipment:

Sampling and pneumatic tube system
Siemens MRS 300 X-ray spectrometer
Siemens 310 K process computer
Chart recorder, printer and display unit.

Power plant

The power plant has been well-known as one of the biggest private installations in Indonesia, having a total installed capacity of 64 MW, which will be expanded to over 100 MW by the end of 1980 when the company's phase-4 and phase-5 projects are completed.

The entire factory is supplied with medium-high voltage of 3 kV. The supply for the crushing plant in the quarry is stepped up to 13 kV for transmission over a distance of about 5 km, and then stepped down to 3 kV again for connection to the crusher distribution panel.

The plant is equipped with the latest automatic cleaning purifier for fuel oil treatment, and automatic voltage regulator (ARV), to ensure trouble-free operation and constant line-voltage at all times.

The following manufacturers supplied much of the equipment for the new plant:

Humboldt Wedag, West Germany and Spain
Main machinery and equipment

Pohlig-Heckel-Bleichert AG, West Germany
Bridge reclaimer

Production Equipment Ltd., Australia
Overland belt conveyors

Claudius Peters AG, West Germany
Clinker cooler, pneumatic conveyors and silo equipment

Haver & Bocker, West Germany
Cement packers

Carl Schenk GmbH, West Germany
Weighing machines

Citroen-Campabadal S/A, Spain
Main gear reducers

CENIT S/A (Pillard), Spain
Oil firing equipment

Gorco S/A, Spain
Bag filters

Alsthom Atlantique, France
Diesel power generators

Brown Boveri, Spain
High tension motors

Siemens S.A., Spain
D.C. and L.T. motors

Siemens AG, West Germany
X-ray analyser and process computer

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