



**CEMENT PROJECTS**  
A COMPLETE SOLUTION PROVIDER

**Vision** is the ability  
of great **perception**.....

Four decades ago Ashoka manufactured its first mill gear for the cement industry. It was the satisfied customer who proved to us what we did was very good and much appreciated. With dedication to quality, unshaken confidence and customer backing, Ashoka diversified into manufacturing other parts of the mill and then other equipment for the cement plant.

After considerable horizontal integration, we envisioned ourselves as a one stop shop for the cement and mineral processing industry. Keeping that vision alive our company has grown into providing not only individual equipment but also complete plants. We supplied our first cement project exceeding the expectations of our valued customer not only in terms of quality and reliability but also production capacity output. We succeeded in synthesizing customer needs with our ability to create a robust design and supplying that little extra to get to the extra in result and satisfaction.

We have managed to build a brand as a manufacturer and exporter of equipment designed to last for long periods at lowest maintenance levels and least down times. We are a brand that builds equipment most suitable adjusted to customer requirements and not just a standard. We are a brand which has successfully utilized its vast experience of serving to many other industries to incorporate a better solution for our cement machinery.

Ashoka an ISO 9001:2008 company, undertakes its production activities from two self sufficient units located outside the national capital New Delhi covering approximately 120,000 sq. feet of covered area with further expansion plans underway. The company comprises of a dedicated and talented team of over 200 skilled professionals including engineers, design draftsmen, management experts and certified machinists.

.....one must **envision**  
in order to **achieve**.





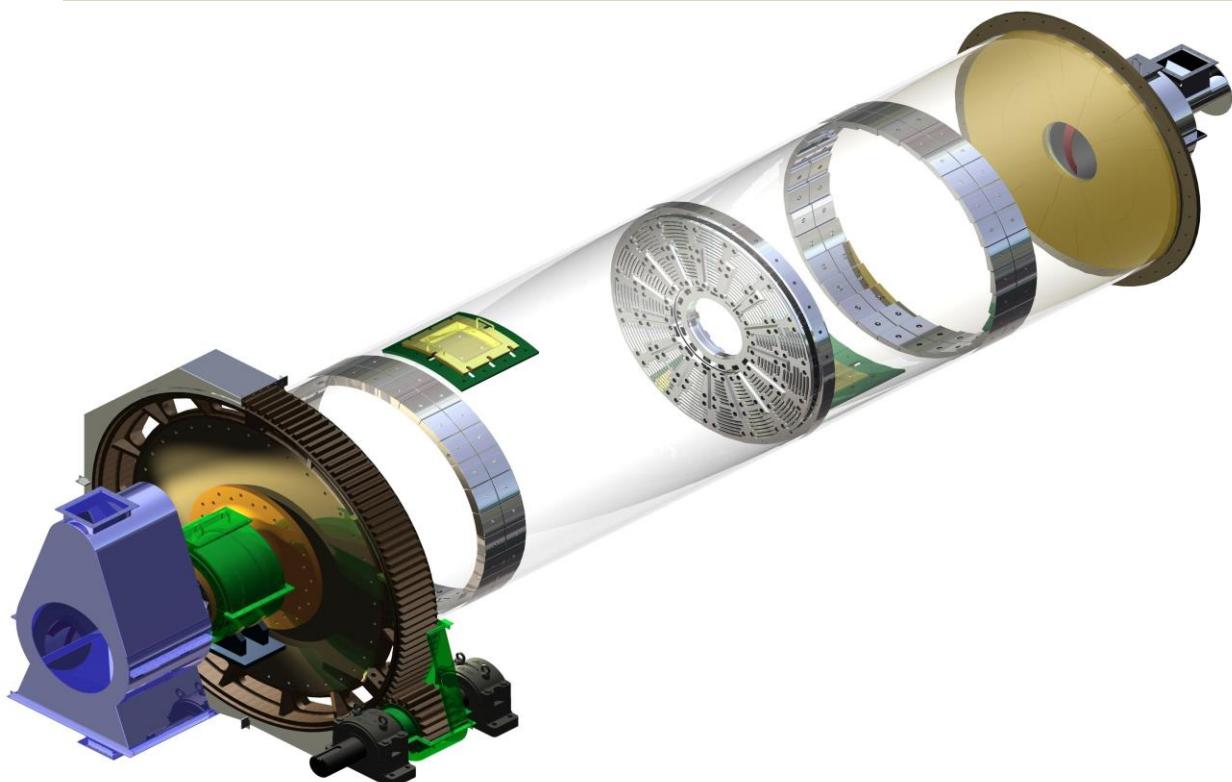
## Integration is the ability to **unite**, **synthesize**, and **amalgamate** to create a whole.

At Ashoka, our vision is to integrate, to provide ‘total solution’ to our customer. We firmly believe that one needs holistic approach in order to exceed. We have well anticipated the diverse and growing needs of our customer and become a total solution provider. We have emerged as a single window for all major activities relating to setting up a cement plant including-

- Conducting site surveys for site selection,
- Raw materials (limestone) testing and suitability analysis,
- Preparation of detailed project reports,
- Basic and detailed plant engineering and design,
- Manufacturing of process machinery,
- Manufacturing and supply of factory sheds and steel structures,
- Selection and procurement of bought outs,
- Project planning and scheduling,
- Civil works designing and drawing development,
- Equipment inspections and CIF dispatch to international destinations,
- Erection and commissioning of plant machinery,
- On site training of plant personnel.

We undertake contracts on **EPC** basis in order to be the one stop shop for our customer.

Works and services are outsourced to extremely experienced experts in the respective activity whether it be process design and engineering or on site services.





## OUR RANGE OF SUPPLY

- Vertical shaft kiln cement plants
- Rotary kiln cement plants
- Clinker grinding units
- Lime plants
- Sponge iron plants
- Grinding units for special minerals such as - Feldspar, dolomite, slag based minerals, quartz etc.

## WE HAVE EXPORTED EQUIPMENT TO

ASHOKA has emerged as a growing exporter with more than 50% of its annual throughput being supplied to the foreign markets. The countries where our products are supplied to are as follows:

- **AMERICA**- United States, Canada
- **EUROPE**- United Kingdom, France, Italy, Greece, Norway
- **AFRICA**- Kenya, Nigeria, South Africa, Madagascar, Ghana, Djibouti
- Australilia
- **GULF**- UAE, Jordan, Iraq, Iran, Turkey, Oman
- **SOUTH AMERICA**- Peru, Guatemala, Venezuela
- **ASIA**- Bangladesh, Pakistan, Vietnam, Indonesia, Thailand, Singapore

## WE ARE MEMBERS OF

A number of reputed Government owned and operated trade organizations in the country such as:

- Fed of Indian Chamber of Commerce & Industry (FICCI)
- Confederation of Indian Industry (CII)
- Engineering Export Promotion Council (EEPC)

## WE ARE APPROVED BY

We are an **ISO 9001:2008** company certified by **Det Norske Veritas (DNV)**. Additionally the company is also approved and recognized by internationally renowned quality inspection agencies such as:

- Det Norske Veritas (DNV)
- SGS
- Lloyds Register of Shipping
- Tata Projects Limited (TPL)
- Bureau Veritas (BV)



# Clientele

TYPE OF INDUSTRY	CLIENT NAME
Cement Industry	<ul style="list-style-type: none"> <li>▪ Grasim Industries Limited</li> <li>▪ DOEL Group (Bangladesh)</li> <li>▪ Mecatal (France)</li> <li>▪ Cement Corporation of India</li> <li>▪ UP State Cement Corporation</li> <li>▪ Deepak Cement Pvt. Limited</li> <li>▪ Valley Iron Cement</li> <li>▪ TAG Co (Jordan)</li> <li>▪ Barak Valley Cement</li> <li>▪ KC Cement Company (UAE)</li> <li>▪ Diamond Cement (Togo)</li> <li>▪ SIFCO</li> <li>▪ Triveni Cement Limited</li> <li>▪ Al-Haj Cement (Bangladesh)</li> <li>▪ Reliance Industries (Nepal)</li> <li>▪ Pakland Cement Ltd. (Pakistan)</li> <li>▪ Hill Cement Limited</li> <li>▪ Cosmos Cement Limited (Nepal)</li> <li>▪ Ministry of Djibouti (Djibouti)</li> <li>▪ Dhofar Cement (Oman)</li> <li>▪ Walchandnagar Industries Limited</li> <li>▪ ECO Trinayani Cement</li> <li>▪ JK Cements</li> <li>▪ Tamil Nadu Cements</li> </ul>
Heavy Equipment Industry	<ul style="list-style-type: none"> <li>▪ Loesche Limited</li> <li>▪ HPP Mecamidi (Indo French)</li> <li>▪ SPX Clyde Limited</li> <li>▪ AV Terence (Canada)</li> <li>▪ Heavy Engineering Corporation (HEC)</li> <li>▪ Mecatel (France)</li> <li>▪ Escorts Class Limited</li> <li>▪ McNally Bharat Limited</li> <li>▪ Jindal Group</li> <li>▪ Tata Robins Frasier (TRF)</li> <li>▪ ISGEC</li> <li>▪ Jaiswal Nico Limited</li> <li>▪ McLanahan India Limited (USA)</li> <li>▪ Mindex (United Kingdom)</li> <li>▪ Elecon Engineering Limited</li> <li>▪ Andritz Hydro Limited</li> <li>▪ Langley Group (UK)</li> <li>▪ Multipower International (Iraq)</li> <li>▪ METSO</li> <li>▪ Steel Authority of India (SAIL)</li> <li>▪ Inox Group</li> <li>▪ Bharat Heavy Electricals Limited (BHEL)</li> </ul>
Minerals & Ore Grinding	<ul style="list-style-type: none"> <li>▪ National Fertilizer Limited</li> <li>▪ Hindustan Copper Limited</li> <li>▪ Hindustan Zinc Limited</li> <li>▪ J&amp;K Minerals</li> <li>▪ Sponge Iron India Limited</li> <li>▪ EGAT (Thailand)</li> <li>▪ Makina Group (Turkey)</li> <li>▪ APPGENCO</li> <li>▪ Saurashtra Calcine Limited</li> <li>▪ Saurashtra Chemicals Limited</li> <li>▪ Stotz Blacksmiths Limited</li> <li>▪ Deify Infrastructure Limited</li> <li>▪ HEG Limited</li> <li>▪ PT Moments Group (Indonesia)</li> <li>▪ Tata Iron &amp; Steels Limited</li> </ul>



# Supply Range

## CEMENT PROJECTS

Cement manufacturing is a core industry wherein the production process and technology has undergone many stages of transformation and advancements over the period of time. Ashoka has developed great knowledge of the industry during the company's initial stages of supplying process spares and gradually learnt the advancements and incorporated them to create more efficient process machinery. The following are the types of projects supplied by

**ROTARY KILN  
PLANT**

**VERTICAL SHAFT  
KILN PLANT**

**CLINKER  
GRINDING UNIT**

TYPE OF PROJECT	TYPE OF PROCESS	PRODUCTION CAPACITY
VSK CEMENT PLANTS	Vertical Shaft Kiln	50 tons per day to 300 tons per day
ROTARY CEMENT PLANTS	Rotary Kiln (horizontal tube)	300 tons per day to 2000 tons per day
CLINKER GRINDING UNITS	Open circuit and closed circuit	50 tons per day to 3500 tons per day
LIME AND QUICK LIME PLANTS	Hydrated and non hydrated plants	50 tons per day to 1000 tons per day
SPONGE IRON PLANTS	Rotary kiln (horizontal tubular)	100, 350 and 500 tons per day
SPECIAL MINERAL GRINDING UNITS	Feldspar, dolomite, quarts, slag, iron ore, chromite, coke, gypsum etc.	50 tons per day to 2000 tons per day
MINERAL BENEFICATION PLANTS	Various mineral ore as above	50 tons per day to 2000 tons per day



## CEMENT PLANT MACHINERY

EQUIPMENT	TYPE	PURPOSE
<b>Crushers</b>	Jaw, Hammer, Impact type	Crushing of raw material to a suitable feed size
<b>Stacker Reclaimer</b>	Single/multiple boom type	For stacking and reclaiming of raw materials
<b>Tubular Grinding Mills</b>	Ball and rod mills	Grinding of material into usable product fines
<b>Kilns and Kiln Shells</b>	Vertical shaft & rotary kilns	Slow heating of raw mix for preparation of clinker
<b>Coolers</b>	Rotary and grate	For cooling of clinker/materials
<b>Separators/Classifiers</b>	Dynamic High Efficiency	Separation of coarse material from fine material
<b>Preheaters &amp; Pre calciners</b>	Multi stage, suspension type	Preheating of raw mix to enhance clinker production
<b>Feeders</b>	Reciprocating, weigh feeders	Weighed feeding of materials to next station
<b>Elevators</b>	Bucket belt, chain	For elevating material for storage or feeding
<b>Conveyors</b>	Screw & belt type conveyors	Conveying materials to desired process station
<b>Air Slides &amp; Air Lifts</b>	Air blowing, pneumatic	Conveying or lifting materials to desired station
<b>Hoppers and Silos</b>	MS Fabricated	For storage and discharge of materials

## PLANT SPARES (Gears, Pinion Shafts, Rollers, Riding Rings, Tyres & Mill Ends)

ITEM	MAXIMUM SIZE	MATERIAL OF CONSTRUCTION
<b>Spur, Helical &amp; Worm Gears</b>	8500 mm dia x 55 Module	Cast & forged steels, cast irons, bronze
<b>Segment Girth Gears</b>	8500 mm dia x 55 Module	Cast & forged steels, cast irons, bronze
<b>Bevel Gears and Pinions</b>	2000 mm dia x 25 Module	Cast & forged alloy steels
<b>Pinion &amp; Pinion Shafts</b>	55 Module, 5000mm Length	Forged alloy steels
<b>Worm Gear Reducers</b>	Up to 500 HP	CI housing, bronze/steel internals
<b>Helical Gear Reducers</b>	Up to 2000 HP	CI or fab housing, alloy steel internals
<b>Sprockets</b>	Simplex, Duplex, Triplex	Cast & fabricated steels
<b>Kiln Tyres &amp; Riding Rings</b>	6300 mm dia x 1500 mm	Cast alloy steels
<b>Kiln Shells</b>	90 mm thickness	Boiler quality and wear resistant plates
<b>Support Rollers</b>	2000 mm dia x 1500 mm	Cast & forged alloy steels
<b>Mill Internals</b>	Customized liners and diaphragms	Mn and Hi Cr Steels and Ceramics
<b>Mill Headers / Ends</b>	As per drawings	Steel castings & cast irons
<b>Torsion Shafts</b>	2000 mm dia x 10000 mm	Cast/forged Steel fabrication
<b>Rope Drums</b>	Up to 4000 mm dia	Cast & fabricated steels

# Brief on Pyro Process Technology

## TYPES OF CLINKERIZATION PROCESS

### ROTARY KILN PROCESS

This is the most well established process to produce portland cement. A rotary kiln is a long cylinder rotating about its axis which is inclined at a slight angle and at one end a burner is placed that provides the necessary heat to inside the kiln. This process provides continuous production with more uniform product quality for relatively larger quantities in comparison to shaft kilns.

The rotation causes the raw meal to gradually pass along from where it enters at the cool end, to the hot end where it eventually drops out and cools.

### WET PROCESS KILNS

The original rotary cement kilns were called 'wet process' kilns. In their basic form they were relatively simple compared with modern developments. The raw meal was supplied at ambient temperature in the form of a slurry. A wet process kiln may be up to 200 m long and 6 m in diameter. It has to be long because a lot of water has to be evaporated and the process of heat transfer is not very efficient as it takes a lot of energy to evaporate and therefore various developments of the wet process were aimed at reducing the water content of the raw meal. The wet process has survived because many raw materials are suited to blending as a slurry. However, most new cement kilns are of the 'dry process' type.

### DRY PROCESS KILNS

The dry process is much more thermally efficient than the wet process and hence most widespread. In this the meal is a dry powder and there is little or no water that has to be evaporated and the process of transferring heat is much more efficient in a dry process kiln.

In modern works, the blended raw material enters the kiln through the pre-heater tower. Here, hot gases from the kiln, and generally the clinker cooler at the far end of the kiln, are used to heat the raw meal. As a result, the raw meal is already hot before it enters the kiln.

The basic dry process system consists of the kiln and a suspension preheater. The raw materials, limestone and shale, additives etc., are ground finely and blended to produce the raw meal. The raw meal is fed in at the top of the preheater tower and passes through the series of cyclones in the tower. Hot gas from the kiln and, often, hot air from the clinker cooler are blown through the cyclones. Heat is transferred efficiently from the hot gases to the raw meal.

A development of this process is the 'precalciner' kiln which is an addition of another burner, or precalciner. With the additional heat, the meal is decarbonated before it enters the kiln. Since meal enters the kiln at about 900°C (compared with about 200°C in the wet process), the kiln can be much shorter and of smaller diameter for the same output thus reducing the capital costs of a cement project. Similarly the addition of a precalciner reduces the required length of the kiln.

The kiln is made of a steel casing lined with refractory bricks. There are many different types of refractory brick and they have to withstand not only the high temperatures in the kiln but reactions with the meal and gases in the kiln, abrasion and mechanical stresses induced by deformation of the kiln shell as it rotates. Bricks in the burning zone are in a more aggressive environment compared with those at the cooler end of the kiln, so different parts of the kiln are lined with different types of bricks.

As the meal passes through the burning zone, it reaches clinkering temperatures of about 1400 C - 1500 C. Nodules form as the burning zone is approached. When the clinker has passed the burning zone, it starts to cool, slowly at first, then much more quickly as it passes over the 'nose ring' at the end of the kiln and drops out into the cooler. The cooler cools the clinker by extracting the heat from which is then used to heat the raw materials. Cooled clinker is conveyed and fed into the cement mill for grinding to produce fine cement.

## VERTICAL SHAFT KILN PLANT

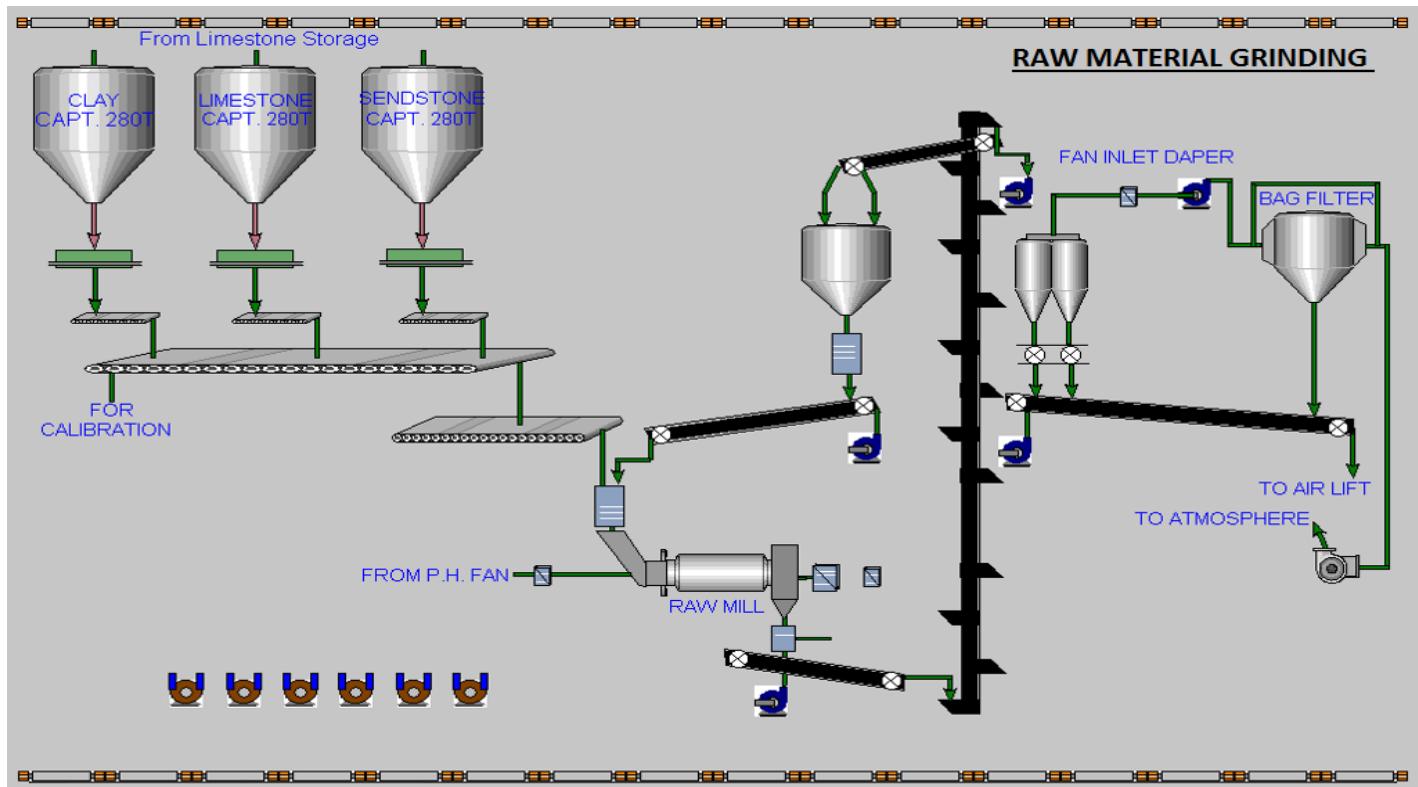
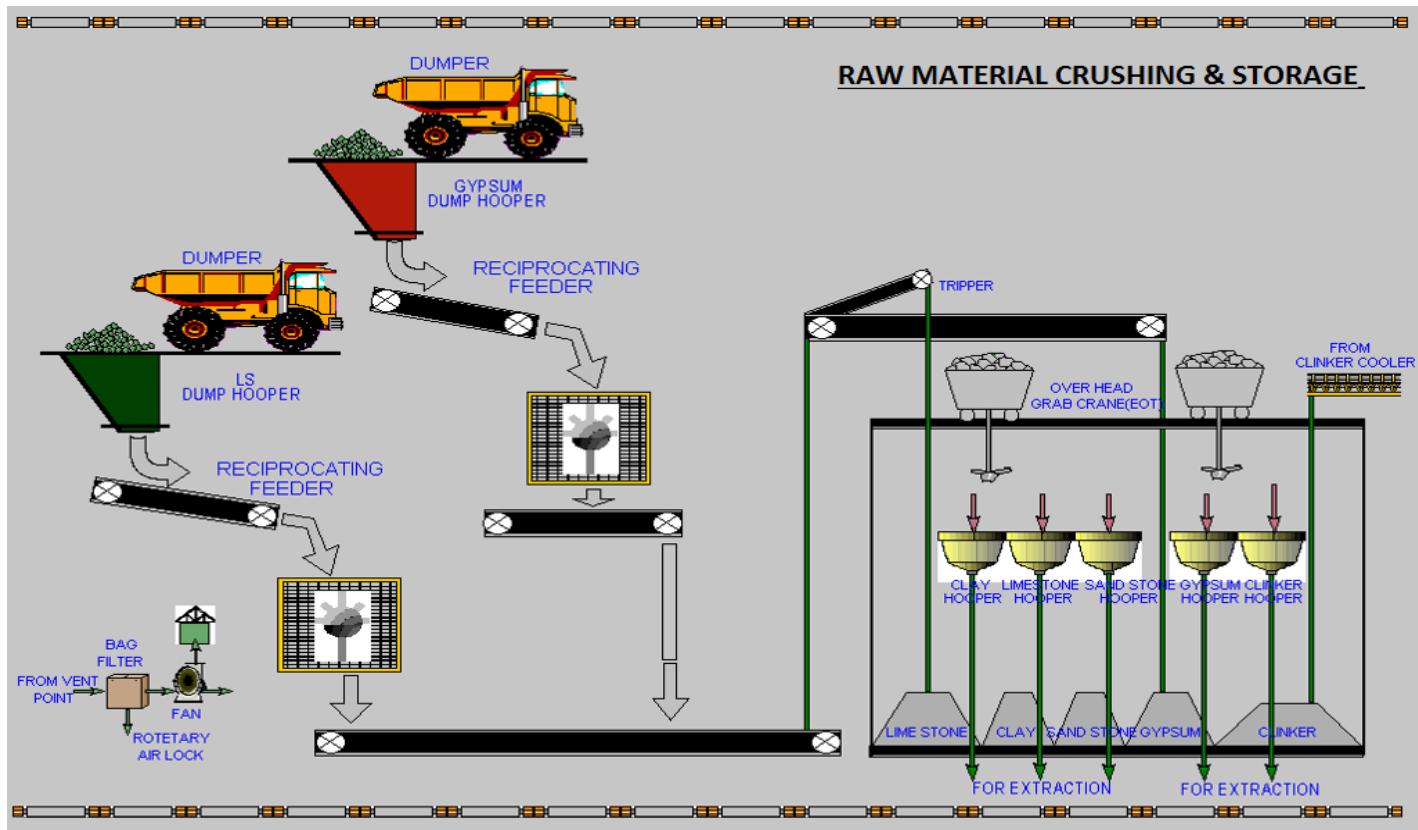
A VSK plant is generally available in smaller capacity ranging from 50TPD to 300 TPD. So there is a limitation in the maximum capacity that can be effectively produced by this process. However, this form of production is also a modern day answer to a cost effective way of cement production and is therefore widely used in developing countries. With low initial investments this is a perfect way to start cement business for new entrants and entrepreneurs.

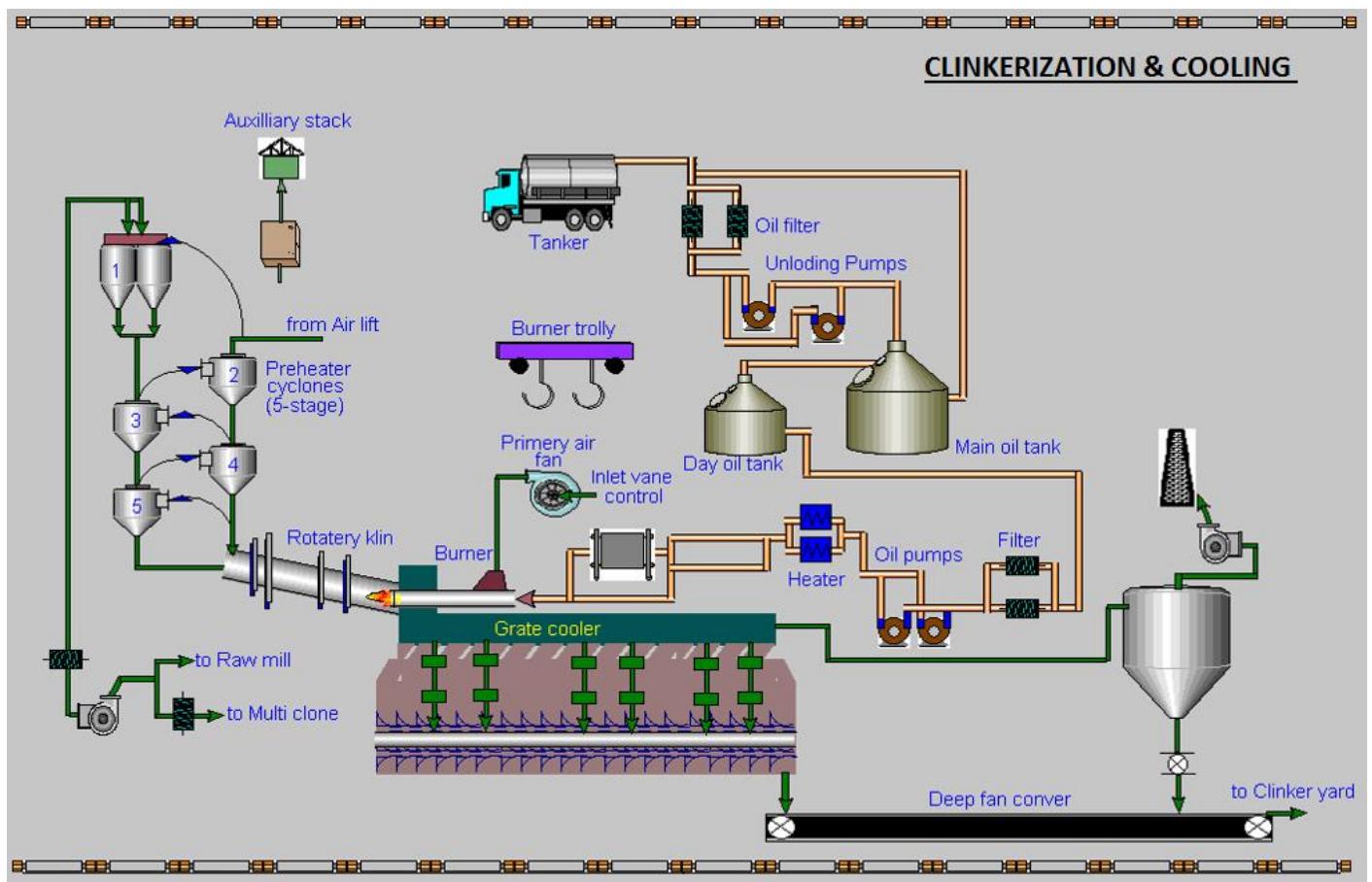
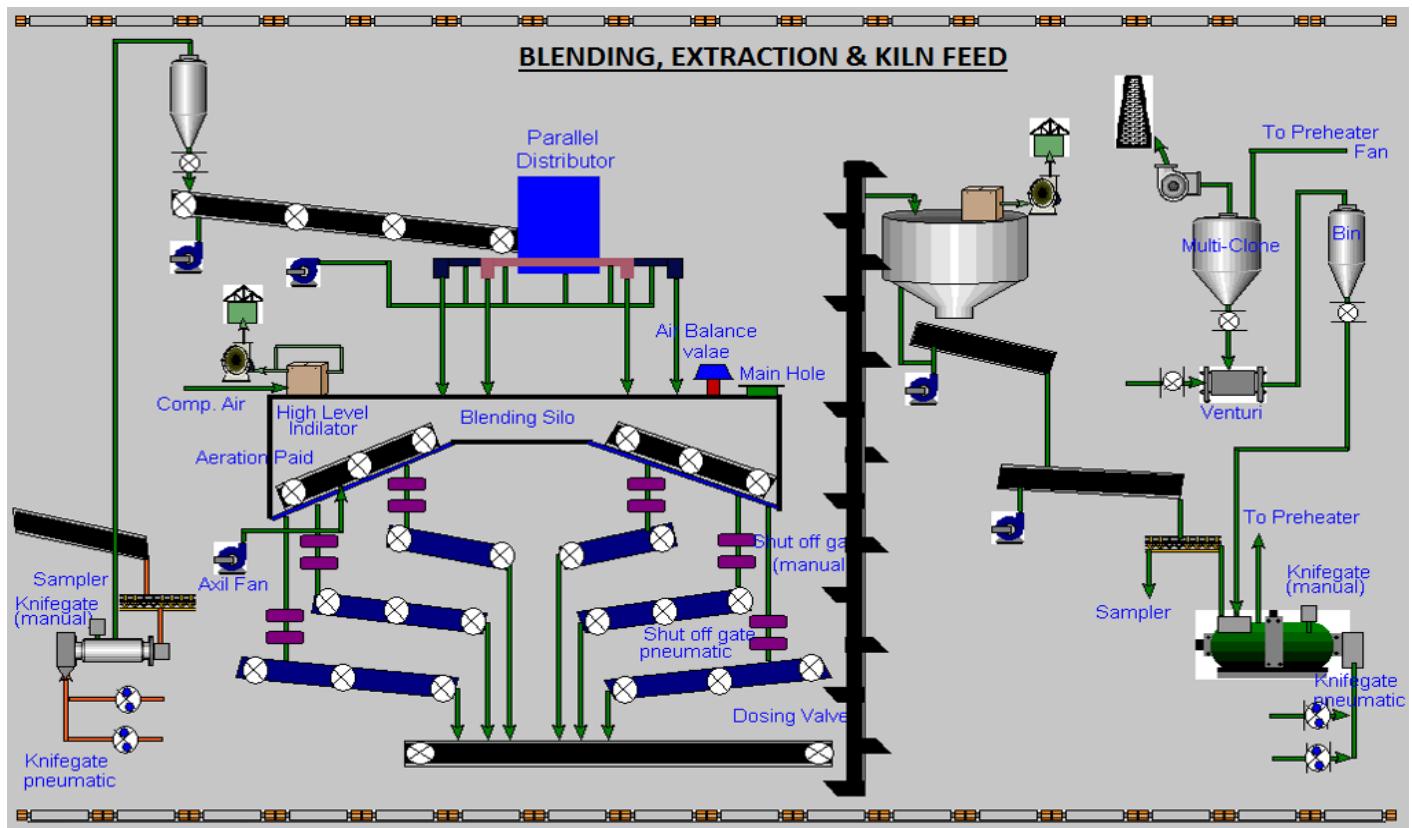
This method of production of clinker is generally referred to as the 'Black Meal' process. In the black-meal process based on VSK technology, the low-volatile fuel, that is, coke-breeze or low-volatile coal, is uniformly and proportionately mixed with limestone to form the raw material for grinding and homogenizing and then followed by nodulizing in a pan type nodulizer. The nodulizer consists of an inclined pan rotating about its axis. The raw meal is fed into the nodulizer using a screw feeder and water is sprayed. The nodules slide down the chute and are continuously distributed in the vertical-shaft kiln evenly all along its periphery using a rotary feeder. The kiln is a vertical shell with a conical portion at the top and is lined with refractory bricks. The entire space of the kiln is filled with nodules. Air required for burning the clinker enters from the bottom of the kiln and moves upwards through the voids and gaps in the burnt clinker. The various zones of reaction starting from the top of the kiln are- *drying zone, calcining zone, sintering zone and cooling zone*. The whole kiln rests on a grate rotating slowly at the bottom of the kiln and mounted over the kiln shaft. The clinker is cooled rapidly and the air is preheated. Fuel particles of the raw-meal nodules burn, when the preheated air is in contact with them. The cooled clinker is discharged out of the kiln from its bottom.



2 X 100TPD Vertical Shaft Kiln Plant

# Process Flow- Pyro Processing





# Brief on Clinker Grinding Technology

After the production of clinker the next phase is grinding and packing it into retatable cement. As a matter of fact, a lot of factories around the world enter the cement business by first establishing a clinker grinding plant only instead of a complete cement plant. Clinker along with small quantities of additives are procured as the main raw materials, mixed and ground into cement which is then stored in silos and thereafter packed in bags for dispatch. It is generally seen that after successful entry as a cement supplier backward expansions into mine quarrying and clinker production is established. As the capital investment into clinker grinding unit is much lower than the complete process this is one way of entering the cement production business with a lower initial capital investment.

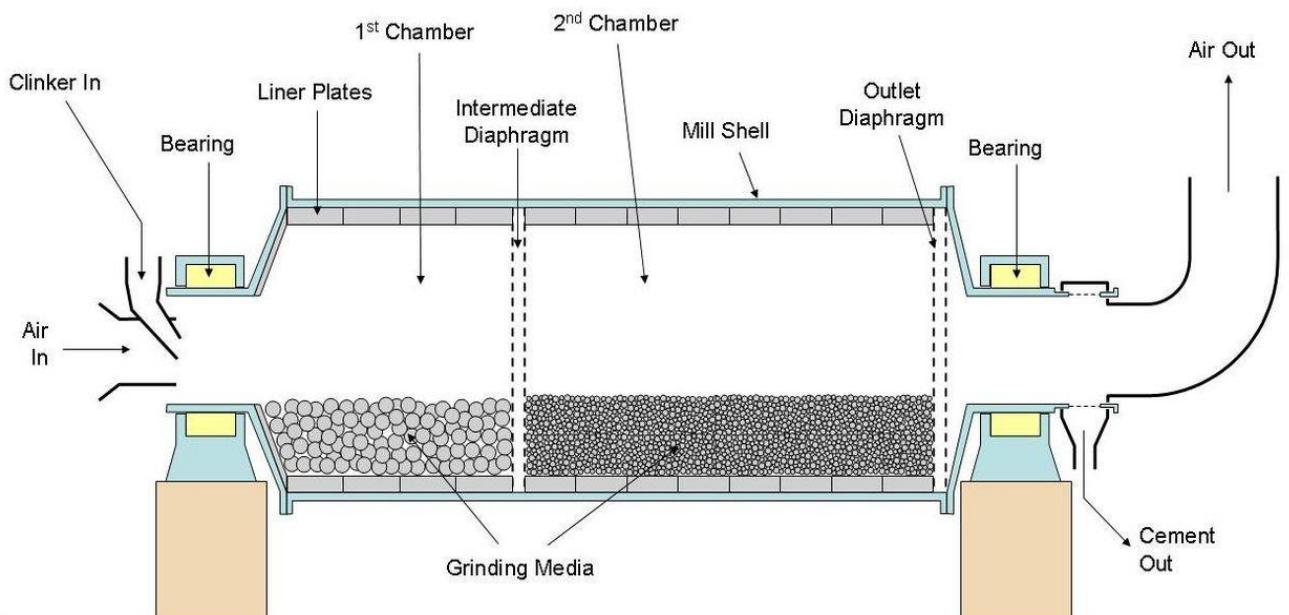
Clinker is ground in a horizontal, cylindrical shaped, tubular drum which is made to rotate around its horizontal central axis at speeds generally within 17-25 rotations per minute. Gypsum (calcium sulphates) and sometimes additional cementitious materials such as blast furnace slag, coal fly ash, natural pozzolanas, etc. or inert materials such as limestone are added to the clinker to attain either better grinding efficiencies or improved cement properties. All constituents are ground leading to a fine and homogenous powder.

The two methods of production of cement are dry and wet grinding out of which dry grinding technology is a more common. In dry grinding technology the materials are ground without any addition of moisture and the grinding action takes place using special wear resistant steel balls and cyppebs against which the materials are made to collide inside the mill due to the action of its rotation. In wet grinding process water is added to the mill and the grinding media is generally pebbles or ceramic balls.

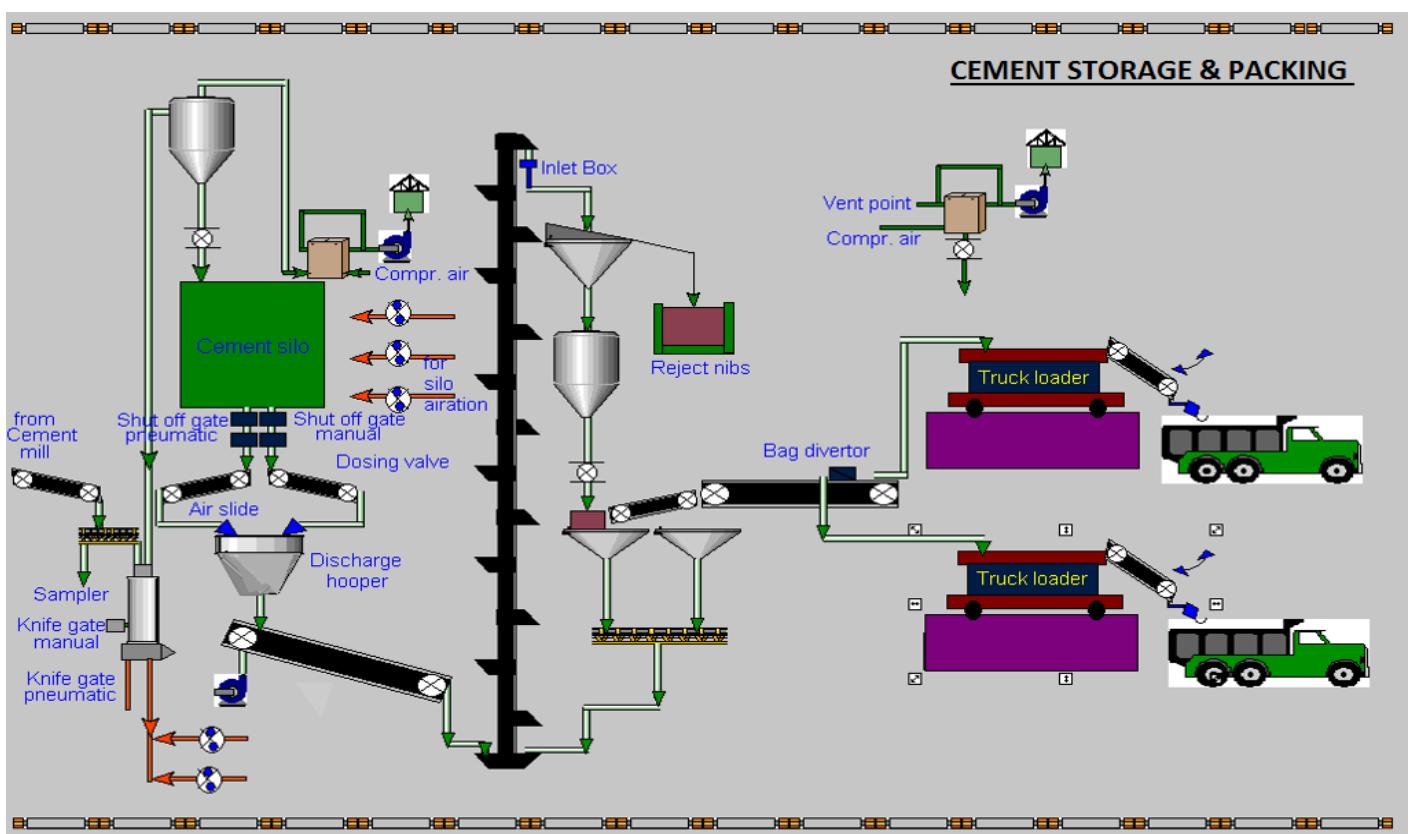
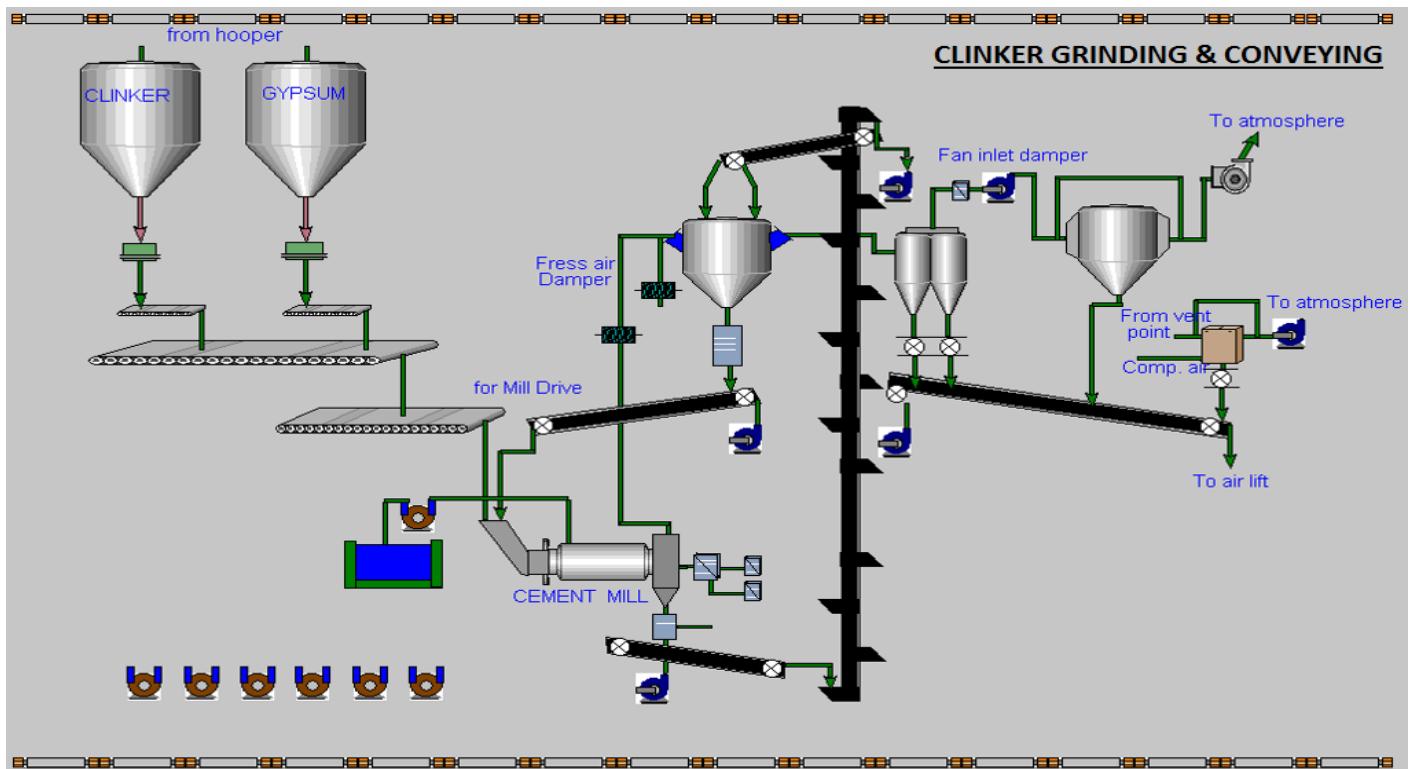
## OPEN AND CLOSED CIRCUIT GRINDING

The two types of circuits of process flow are open and closed circuit grinding. In the former, clinker is passed through the mill inlet only once and the entire grinding action occurs once through the length of the mill, where as, in the latter cement which remains coarse is once again fed back into the mill. This process is also termed as air swept circuit as cement is swept away with an air suction mechanism and fed to the separator where segregation of fines from the coarse grades takes place. The fines are transferred to the storage silos while the remainder is sent back to the mill inlet for size reduction. The division of mill into number of chambers, length of each chamber, size of grinding media for each chamber etc. are factors which vary based on the type of circuit and desired fineness of cement.

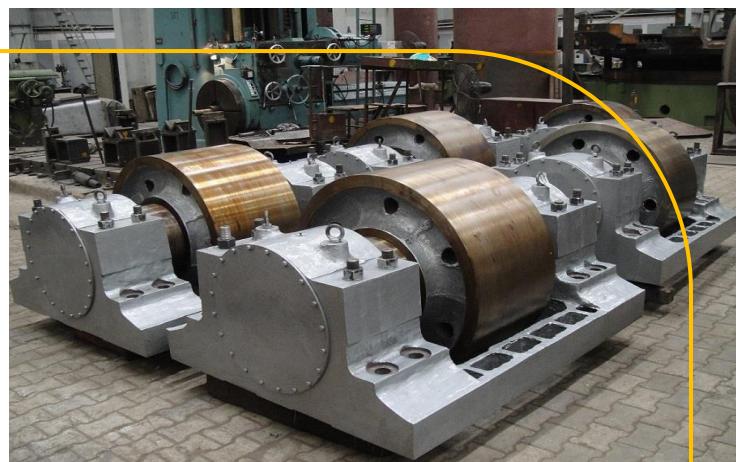
The following is a general schematic of a typical two chamber ball mill with.



# Process Flow- Clinker Grinding



# *International Representations*



**FACTORY LOCATIONS**

D-62-67, EPIP, Site V, Kasna,  
Greater Noida, UP- 201306, India

A-52, Sector 58, New Okhla Industrial Development Area, UP, India

**CONTACT INFORMATION****EMAILS**

Phone 91-120-2341600 | 2341601

General info@ashokamachines.com  
Sales sales@ashokamachines.com

Website www.ashokamachines.com

**WEB ADDRESS****USA OFFICE**

163 Gateshead Drive,

McMurray PA 15317, USA

Email ashokausa@gmail.com



---

**ASHOKA MACHINE TOOLS CORPORATION  
INDIA**