

TURN KEY CEMENT PLANTS AND
OTHER MINERAL PROCESSING PLANTS

RAW MATERIAL PROCESS SYSTEM

LIME CALCINATION SYSTEM

CEMENT PLANT CORE EQUIPMENT

MATERIAL HANDLING EQUIPMENT

CRUSHING & SCREENING EQUIPMENT

MATERIAL FEEDING EQUIPMENT

VALVES & GATES

A new realm of
possibilities

M MOVERS
(INDIA) PRIVATE LTD.

Movers (India) Private Ltd.
Engineering Organization specialized in turn key cement plant and other mineral processing plants.

Raw material process system	Clinker/slag/mineral grinding Ball mills / systems
Lime calcination system	Vertical kiln / Rotary kiln
Wide range of products manufactured (custom made)	
Cement Plant Core equipment	Vertical shaft kiln Rotary kiln Ball mills Crushing equipment
Material Handling equipment	Belt conveyors Screw conveyors Pan conveyors Apron conveyors Bucket elevators (belt/chain)
Pneumatic Handling equipment	Airlift Silo aeration system Air slides
Crushing & Screening equipment	Double roller crusher Jaw crusher (single/double toggle) Hammer crusher/hammer mill Vibrating screen with single/ double/triple deck
Raw Material feeding equipment	Table feeders Rotary vane feeders Belt feeders Screw feeders Rotary air lock Vertical rotary feeders Mechanical vibro feeders Reciprocating feeders
Valves & Gates	Pendulum flap valve (Single & double) Dozing valves Rotary cut-off valves Slide gates Rack & pinion gate Rod gate
Equipment Spare Parts	
For Ball Mill	We can supply girth gear assembly, trunion bearing socket duly white metalled and machined condition, counter shaft bearing with pinion assembly, mill liner plates, sealing arrangement.
For VS Kiln	Spares like rotary chute assembly, king shaft with rigid coupling, gun metal bush, kiln grate assembly, kiln main gear box and its spares like input & output shaft and gears.
For Belt Conveyor	Spares like idlers, rollers and pulleys
For Bucket Elevator	Spares like drum pulley, elevator chain, spare buckets,
For Screw Conveyor	Spare screw flights, end bearing bush, hanger bearings and shafts.
For Crusher	Liner plates, hammers, suspension bars



Movers India. Charting a new course.

In the year 1979, when the term globalization was an unheard of phrase, a group of technocrats with a wealth of experience and expertise behind them, were setting up a company called Movers (India) which would in due course of time, make the world sit up and take notice of it.

Right from its inception, the company has always believed that nothing can stop an idea whose time has come. Ideas are the lifeline of any business, more so in an intensely competitive environment, where only the fittest and the most imaginative can flourish. While the Indian economic situation has undergone cataclysmic changes in the past decade, Movers (India) has suitably adapted to the changing scenario to keep in tune with market needs and aspirations.

Movers (India) has successfully rendered its services to the Process Industry for more than twenty-five years and in the process built a relationship of trust with the customer who feels a genuine sense of loyalty to the firm. Such customer relationships have been born out of successive experiences of customer satisfaction. At Movers (India) it is the ongoing creation of value that has strengthened and enriched the industry.

Services Rendered

Movers (India) strives to provide '**Value Beyond the Purchase Price**' to meet the requirements of upcoming process industries. The company's portfolio of services includes technical consultancy for the Process Industry. It also undertakes project assignments for cement plants and bulk material handling systems on a turnkey basis.

Movers (India) provides a comprehensive array of solutions to the cement industry - right from identifying and exploring the raw material (limestone) resources, which are available at various remote places, and converting the cement grade limestone to quality cement. The company believes in continuous innovation in design to achieve workmanship of the highest quality.

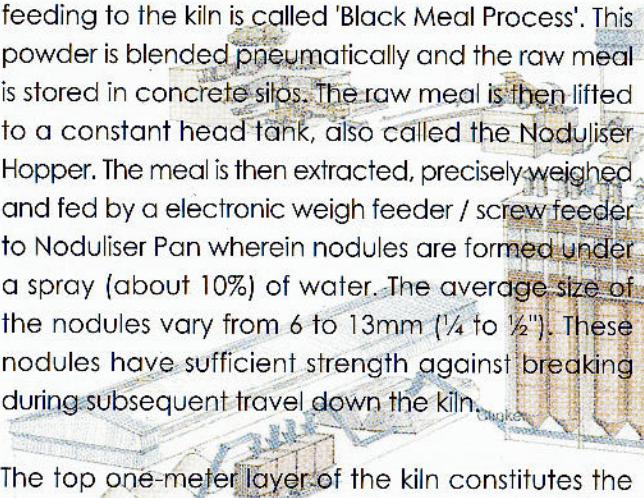
Scores of cement plants have been installed on a turnkey basis with capacities ranging from 33,000 tons per annum to 1,98,000 tons per annum. Apart from this, the company has also installed clinker grinding units with Ball Mill and Classifier System for converting clinker/slag and manufacturing Ordinary Portland Cement / Portland Slag Cement.

With its Head Office / Operation Office located in the heart of Bangalore, Movers (India) is equipped with advanced infrastructure facilities to cater to the varied needs of both the domestic and international markets.

With the economy looking upbeat, Movers (India) is all set to explore uncharted territories and realize its vision of becoming a global company. Movers (India) is committed to serve the process industry cost effectively while at the same time living up to global quality standards.

VERTICAL KILN

Limestone, Clay, Additive and Coke Breeze/Petcoke are ground into powder in a Ball Mill. This method of grinding coke/coal along with raw materials for feeding to the kiln is called 'Black Meal Process'. This powder is blended pneumatically and the raw meal is stored in concrete silos. The raw meal is then lifted to a constant head tank, also called the Noduliser Hopper. The meal is then extracted, precisely weighed and fed by a electronic weigh feeder / screw feeder to Noduliser Pan wherein nodules are formed under a spray (about 10%) of water. The average size of the nodules vary from 6 to 13mm ($\frac{1}{4}$ to $\frac{1}{2}$ "). These nodules have sufficient strength against breaking during subsequent travel down the kiln.



The top one-meter layer of the kiln constitutes the preheating zone. The next one meter is the burning zone where the temperature of material reaches about 1450°C (2650°F). Clinker is formed in this section. The rest of the kiln forms the cooling zone where in the clinker cools as it travels down. The journey time from raw meal feed to clinker delivery varies from 6 to 9 hours.

A rotating grate at the bottom of the clinker bed not only shears and breaks large clinker but also gives regulated discharge of material while allowing free passage of combustion air upwards. The combustion air pumped from below the grate passes through the

porous nodule bed upward while getting heated up during its travel to burning zone. Therefore it stands to reason that larger nodules with sufficient strength prevents its breakage and in the process aid better burning. The suggested average nodule size is between 10-13 mm ($\frac{3}{8}$ to $\frac{1}{2}$ ") in diameter.

The Cellular Table Feeder has the dual responsibility of extracting the clinker from the MBH for regulated delivery and not allowing free entry of atmospheric air into the kiln. The temperature of clinker discharged from the kiln is normally less than 100°C (212°F). Maximum lump size will be less than 150 mm (6").

The combustion gases produced in the kiln passes through a Wet Scrubber before escaping into the atmosphere through the chimney. The Wet Scrubber collects the dust and dissolves a part of the noxious gases into water. The dust generated at the Noduliser and Material Blocking Hopper is collected by the Bag Filters, keeping the dust nuisance from the kiln, at minimal level.

The clinker from kiln is conveyed to a storage area by means of a heat resisting Belt Conveyor or a Pan Conveyor and stored for 15 days for natural cooling. This seasoning of clinker will not only cool the clinker to less than 60°C (140° deg F) for better grindability but also dissipate the harmful effect of free lime, should it be higher than the permissible limit.

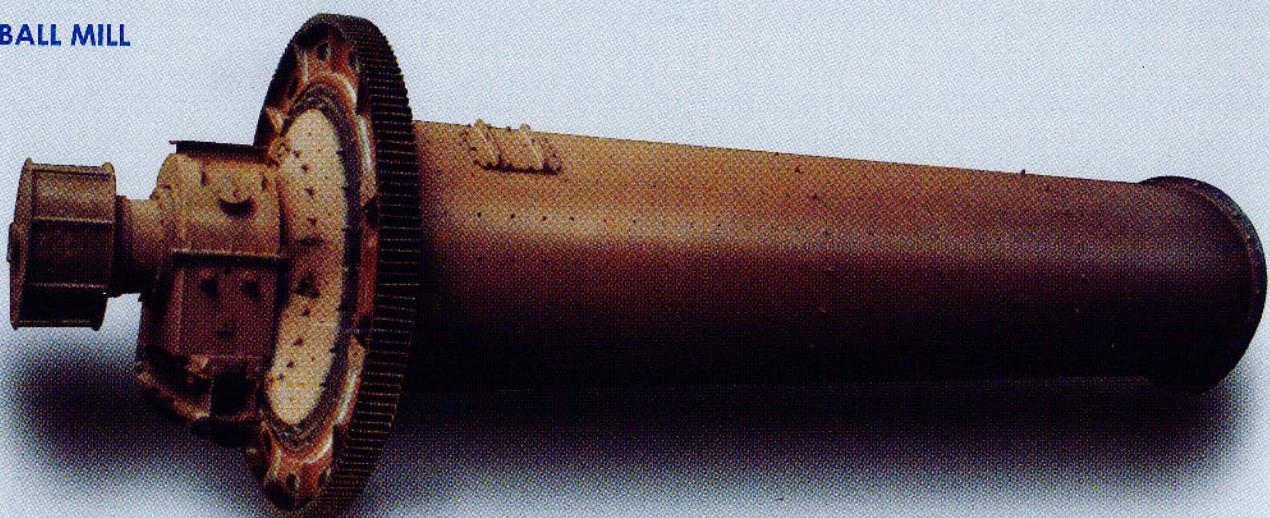
VS KILN GEAR BOX



Gear boxes are specially designed for kiln operation. This is a heavily built equipment consisting of set of hardened gears (input & output gears) fitted to the shaft. The main shaft is connected to the king shaft of the kiln and the gear box runs at a very low rpm and makes the kiln to run at a slow speed. The main gear box will be operated

with the help of drive unit (primary gear box and motor).

**Technical
Innovations for
Smoother
Operations**

BALL MILL

Ball Mills, although one of the oldest forms of grinding machines, still forms the most significant class of equipment used today in the field of particle size reduction. As a result of their slow rotational speeds, simplicity of design and rugged construction, they have no equal for the grinding of hard and abrasive materials particularly where continuity of service and low maintenance cost are the criteria. Ball mills offer extreme reliability and long life.

Movers (India) Mills are designed for heavy duty and incorporates modern features like automatic feed control, self / pressure lubrication system and a variety of renewable liners.

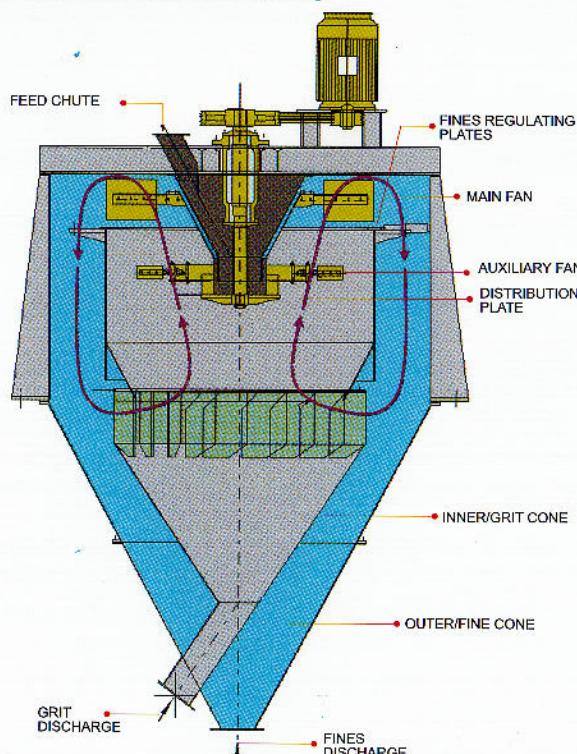
Our service extends from feasibility studies of clients' materials to system and equipment design, engineering, installation and commissioning of complete grinding installations.

With our range of ancillary equipment, particularly classifiers,

crushers and material handling equipment, Movers (India) is in a unique position to provide the full range of services.

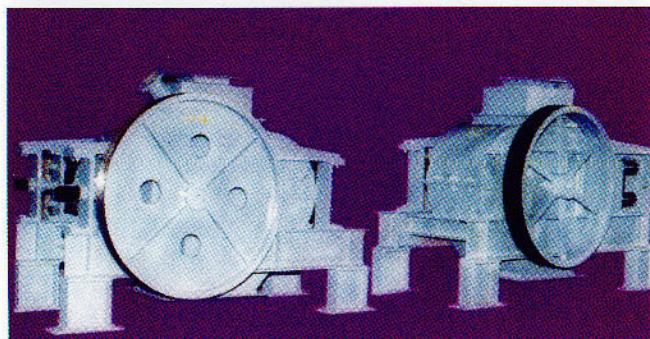
Every plant is custom-built to satisfy the particular requirements of each client's individual process.

Ball Mills are available in 3 types namely, **Simplex** (single compartment), **Duplex** (two compartments), **Triplex** (three compartments). Mills are also supplied with closed circuit employed with classifier system.

CLASSIFIER (AIR SEPARATOR)

MOVERS (INDIA)'s Mechanical Classifier (also called Air Separator) is a dispersion type separator widely used in cement and allied industries for separation of fine particles from coarse powders. This kind of separator employs a distribution plate to disperse feed material in to the air stream passing through the separating space. There are two fans fixed in a single axis. The top one is a radial type while the bottom one, above the distribution plate, is an auxiliary fan with adjustable blade angle. The radial fan creates within the Classifier a circulating air stream, which helps to separate fines from the coarse material.

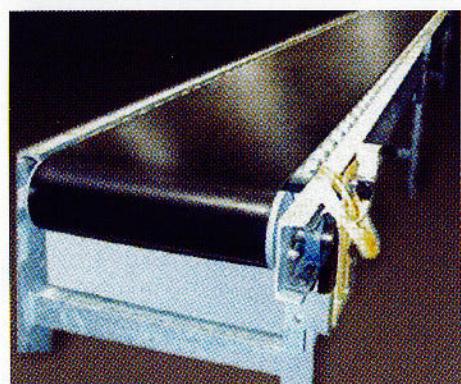
The Classifier is exclusively designed for classification of coarse and fine material. The classifier is incorporated in Ball Mill circuits for efficient classification.

Crushing Equipment**DOUBLE ROLLER CRUSHER**

This crusher is designed for crushing. Minerals like coal, iron ore, clinker and other raw materials (for size reduction from 100mm to 10mm). This equipment has 2 rollers running in opposite direction and made out of MN Steel supported by MS body and has two individual drive motors. By adjusting the roller gap, one can achieve better results in crushing different materials.

HAMMER CRUSHER (REVERSIBLE IMPACTOR)

The Hammer Crusher has standard design capacity ranging from 25tph to 75tph. These crushers are very effective for crushing of lime stone, iron ore, coke, coal, clinker etc. Movers (India) crushers are used as secondary crushers for size reduction of materials from 50mm to 10mm. The crusher has a set of swing hammers mounted on to the rotor supported by anti-friction bearings. The inside body is lined with Mn. Steel while outer body is MS fabricated. Due to the impact of swing hammers, the lumpy material will be crushed into smaller sizes and discharged at the bottom of the crusher.

**Material Handling Equipment****BELT CONVEYOR**

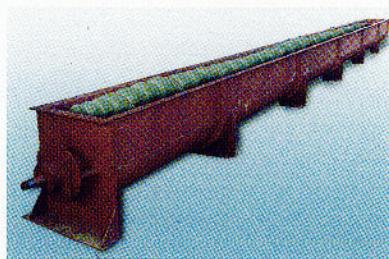
Belt conveyors are very simple solutions for transporting the different types of bulk/lumpy raw materials and other free flowing materials to the process place. Belt conveyors are designed as per the site conditions to convey / transport the raw material in a straight line and also with maximum inclination (with lift) to discharge the material to the raw material storage hoppers.



Different types of belt conveyors are used for material conveying application - like portable conveyor / bag handling conveyors for conveying packed cement bags. Belt conveyors are available in different types like flat conveyors, rough top conveyors for bag handling, troughed conveyors, tripper conveyors, inclined conveyors and slide walled conveyors.

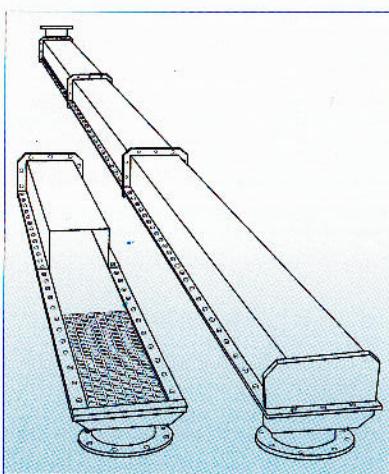
Challenging the Limit

SCREW CONVEYORS



Screw Conveyors are of two types i.e. U-trough and round pipe type having uniform flights inside. Screw Conveyors are designed to convey powder type materials like cement powder, limestone powder and other chemicals which are abrasion free. It can function horizontally or convey / transport the material with maximum inclination of up to 20° . Vertical lifting could be designed.

AIR SLIDES



Air Slide is a simple device which is MS fabricated box like structures. The aeration cloth is fixed throughout the length inside. This will function with the help of a suitable capacity fan. This equipment is also very effective in handling powdered materials. Air Slides are recommended in cement plants at mill discharge point, for handling cement and grits.

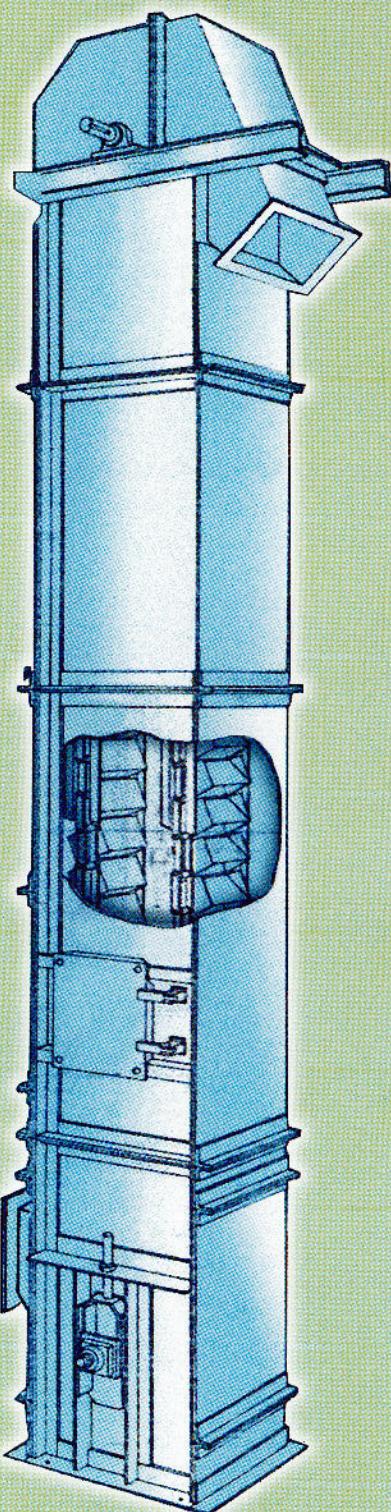
BUCKET ELEVATOR (BELT/CHAIN)

Bucket Elevators are of three types namely continuous type discharge, positive type discharge and centrifugal type discharge. This equipment is very effective in transporting and discharging of many bulk materials ranging from light to heavy and fine to large lumps and free flowing materials.

Centrifugal discharge bucket elevator: These elevators are designed and engineered for handling grain and other raw materials like coal, clinker lumps, limestone and other minerals. The chain bucket elevators are with two strand arrangement for effective lift and discharge of the material.

Continuous discharge bucket elevator: These elevators have continuous bucket design while head shafts are fixed. The boot shafts are of screw and gravity take-ups. These elevators are very effective in lifting and discharging of different types of raw materials to the process machinery at a fixed height.

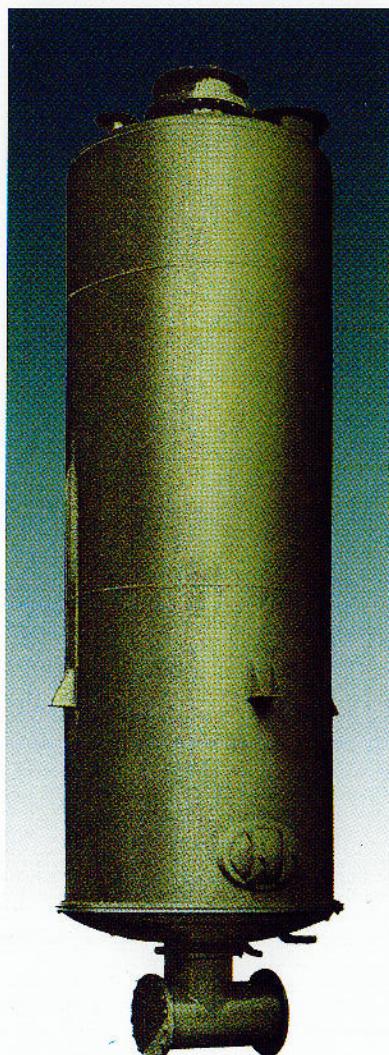
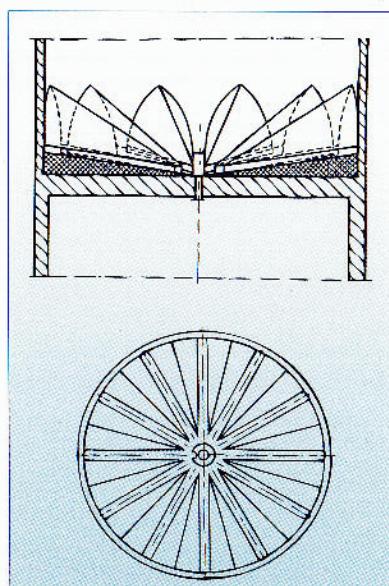
Buckets are spaced continuously and loaded by direct feeding. Spillage between buckets are prevented by close spacing. As bucket discharges, the materials flow over the preceding buckets, thus creating effective discharge of material to the chute portion.



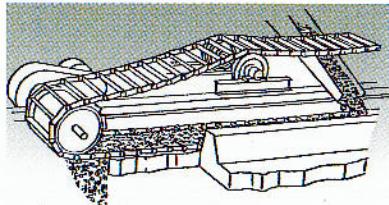
A Passion for Excellence

AIRLIFT

Airlift pneumatic pumps are used for lifting powdered materials which is mildly abrasive. Airlifts are very effective in lifting and discharging powder type material like cement powder and other powdered material to a maximum height of 30 to 50 mtrs. This will work with the help of a specified capacity of roots blower with drive motor which will blow the air to the airlift vessel and the powdered material will be lifted to a fixed height and discharged to the silos.

**SILO AERATION SYSTEM**

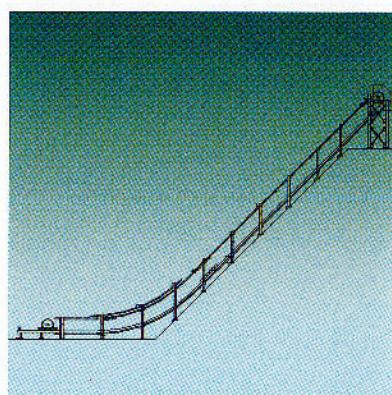
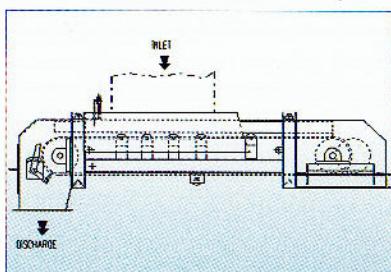
This is designed for raw material powder and also cement powder aeration and it is fixed within the silo which has a number of aeration pads (aeration cloth fixed into the series of trays). This will work with a suitable capacity roots blower with drive motor. Due to the air impact, the aeration pads will help for continuous aeration inside the silo and avoids settlement of cement powder and allows free flow of powder from the silo.

DRAG CHAIN CONVEYORS

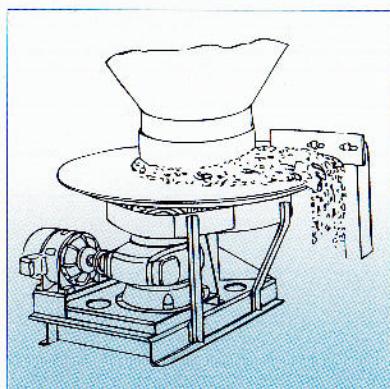
Drag chain conveyors are designed to handle heavy/lumpy material like hot clinker which is effective in handling the end product which has high temperature. The steel links at regular intervals convey the material and is driven by a suitable drive unit.

PAN CONVEYORS

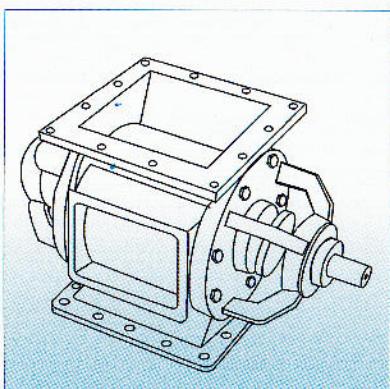
Pan Conveyors are designed to handle hot clinker having temperature more than 80-120°. The total conveyor is made out of steel structure and a series of buckets will be running on the rails in a zig zag manner (horizontal/ vertical). This conveyor is specially used for clinker transportation from the kiln discharge to the yard.

**Raw Material Feeding Equipment.****BELT FEEDERS**

A Belt Feeder is a short belt conveyor, installed under a storage facility. The belt is flat and supported on closely spaced idlers or on a smooth slide plate. Belt feeders are used for handling fine/free flowing/abrasive materials. Even properly designed belt feeders are used for handling lumpy material.

TABLE FEEDERS

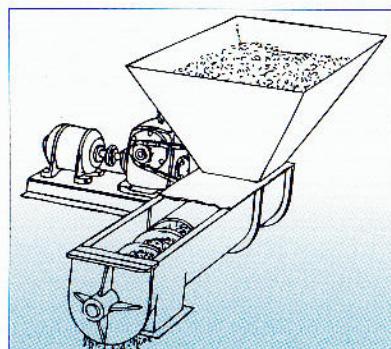
A Table Feeder consists of a horizontal circular plate rotating under a circular opening in the bottom of a conical bin or hopper. By adjustment of the blade, the material will be discharged freely, thus the flow will be continuous. Table Feeders are designed to regulate the feed materials (different types of raw materials) and discharge to the belt conveyor in a uniform way.

ROTARY AIR LOCKS

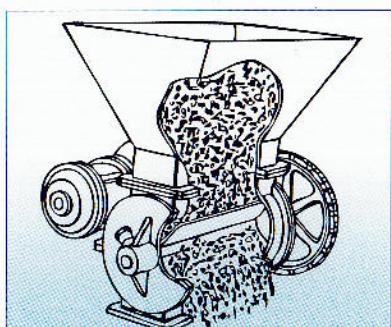
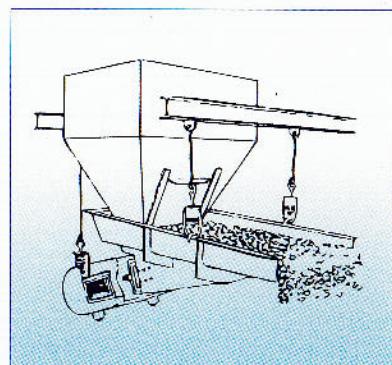
This is a simple device used at the outlets of classifier, cyclone and dust collector to prevent air leakages in the main equipment. A vane's fixed to the shaft connected to the drive unit. When the motor is on, the vane will open and close, thus allowing material to discharge and also prevent air leakage.

SCREW FEEDERS

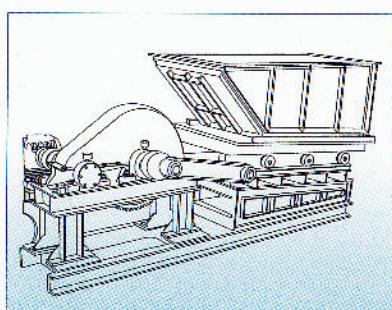
Screw Feeders are designed to feed powdered material with small percent of lumps and is good for milled non-abrasive materials. This is a screw conveyor used for regulating the flow of the material uniformly, continuously and effectively.

**ROTARY VANE FEEDERS**

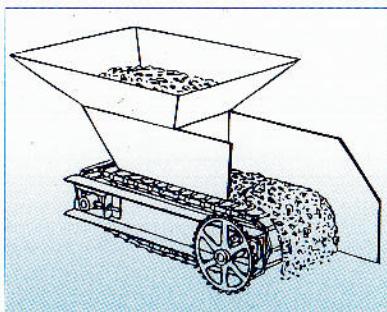
Rotary Vane Feeders are designed to extract and regulate uniform feed of the raw materials from the storage bins. The Rotary Vane Feeder consists of shaft mounted vanes within snuggly fitted enclosed casing. When the shaft revolves, the vanes spaces in the upper part of the feeder allows the materials to fill. As rotation continues, the material is carried around, inside the enclosing case and discharged by gravity at the bottom of the feeder. This also prevents entry of air, dust and other gases.

**MECHANICAL VIBRO FEEDERS**

With its vibrating action, Vibro Feeders are designed to handle a wide range of materials. The metallic pan is fixed to a supporting structure which has compression springs on four corners. This enables forward and backward movement of the pan – thereby helping free flow of feed material to the belt conveyor.

RECIPROCATING FEEDER

This feeder consists of a reciprocally driven pan or a plate operating horizontally or slightly declined and positioned under the bottom portion of bin. Reciprocating Feeders are adjustable to capacity, by the frequency of the pan/plate motion, by the length of the pan stroke and by the height of control gate. These feeders are effective in handling fines, mixture of lumps and small sized lumps.

APRON FEEDERS

Apron Feeders are used for handling more abrasive, heavy and lumpy material. The material is carried on an overlapping metal plate called pans, which is mounted between strands of the conveyor chain. Apron Feeders are placed under storage bin for regulating the feed material.

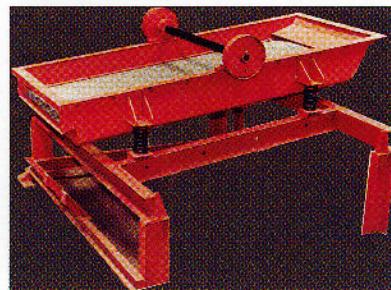
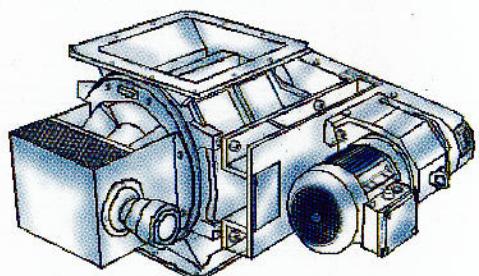
Valves & Gates**GATES**

The gates are designed to control the discharge rate of material from the storage bins. The different types of gates are Rack & Pinion Gate, Slide Gate and Screw Rod Gate. These gates are manually operated with a hand wheel or chain wheel.

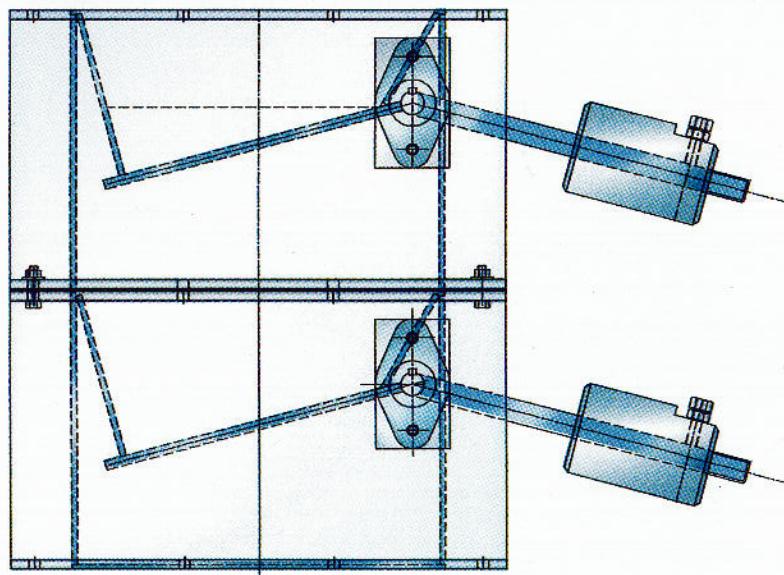
Other than standard equipment we are fully geared to design manufacture equipment for special application as per the requirement of customer.

VIBRATING SCREEN

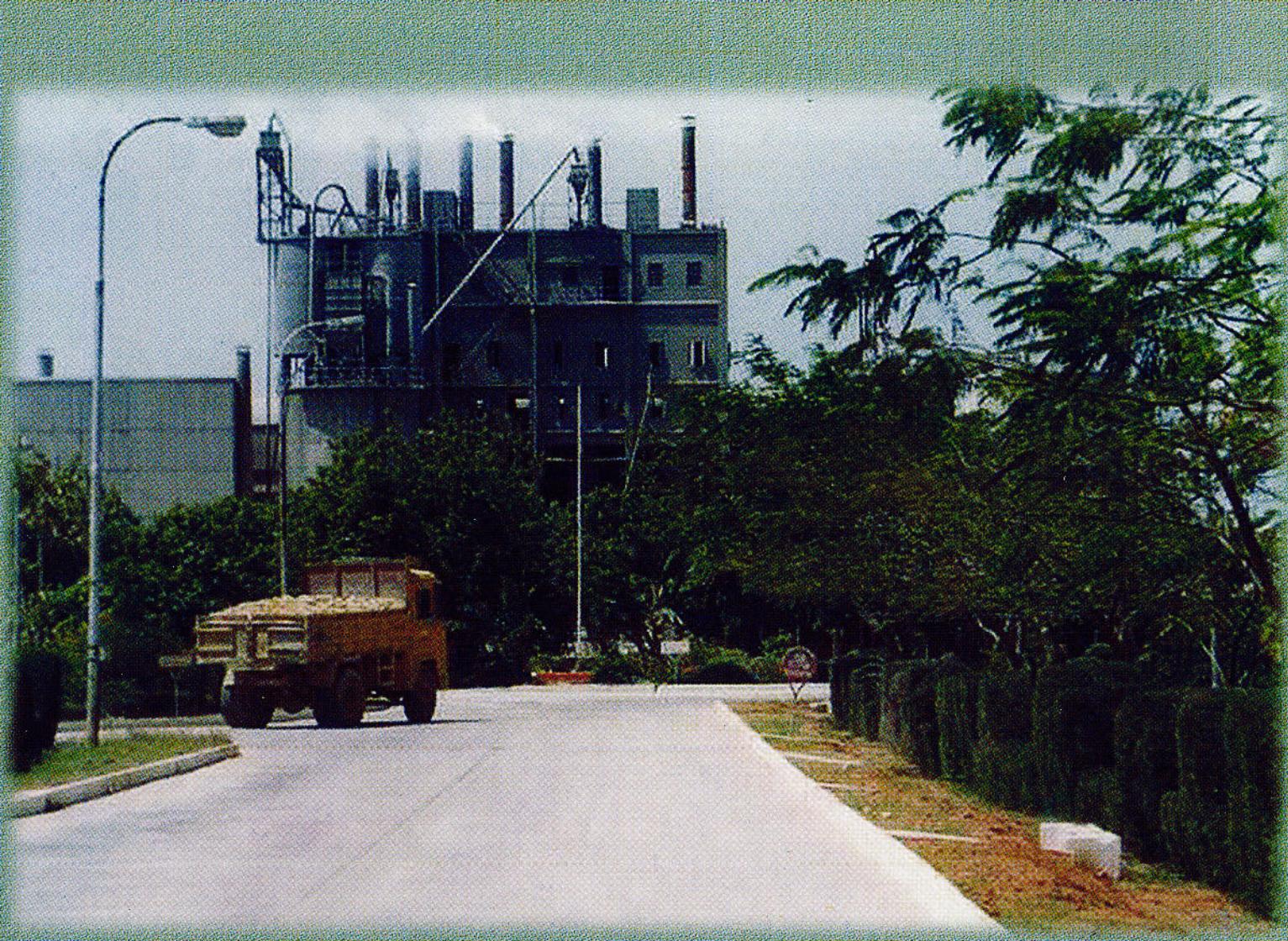
Vibrating screens are designed with single deck, double deck and triple deck operation. The screen mesh is fixed on to an MS frame and bolted to a high suspension compression screen. The whole thing is supported by a steel structure. This equipment is very effective in screening of the crushed raw materials (accepts & rejects). The screens are operated with a suitable capacity drive motor. Vibrating screens are used to segregate different sizes of granular materials.

**ROTARY CUT-OFF VALVES**

This is a simple device used at hopper outlet, silo discharge point to control and stop the feed. Valve (rotor) / gate can be manually operated with a handle fixed to the rotor body or can be power driven.

PENDULUM DOUBLE FLAP VALVES

This is a very simple device having flaps attached to the counter weight. When the material falls on to the flap and the load increases, the counter weight will make the flap to discharge the material. This is normally used at mill discharge portion to control the flow and avoid material clogging in the chute.



CEMENT PLANTS INSTALLED BY MOVERS (INDIA), INDIA & ABROAD



GRINDING UNIT INSTALLED IN INDIA & ABROAD



M MOVERS (INDIA) PRIVATE LTD.

Movers (India) Private Limited
Basava Bhavan, High Grounds
Bangalore - 560 001 India

Tel : + 91 80 22264498/22267503/65357603
Fax : + 91 80 22204025/22263606

E-mail: movers@vsnl.com
Website: www.movers-india.com

