# International Combustion (India) Limited

## RAYMOND ROLLER MILLS

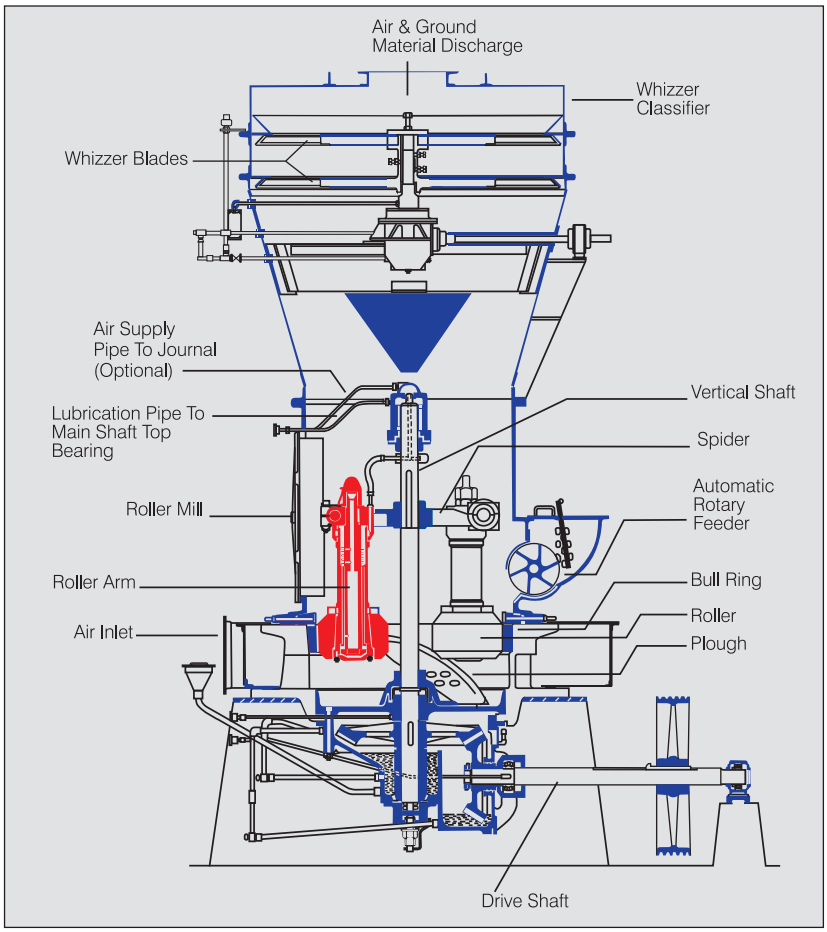




For service in the fields of medium fine and fine grinding, Raymond Roller Mills have an unsurpassed record of dependability and economy in maintenance. These machines are incorporated in an automatic and dustless system for grinding and classifying non-metallic minerals and manufactured products to a high degree of product uniformity. This type of mill has been in operation for many years, providing reliable and efficient service.

Raymond Roller mills are airswept with a classifier fitted directly above the grinding chamber to give continuous classification of the ground material. They are ideal for economic production of very fine powder and can handle difficult, sticky materials. The airswept roller / grinding ring configuration also enables the mill to accept feeds containing a relatively high proportion of fine materials, e.g. barytes and phosphate floatation products.

Mill systems can be supplied complete with air heaters for simultaneous drying and grinding of moist materials. The mill operates under suction which prevents leakage of dust to the atmosphere, and for combustible or explosive materials the mills can be arranged to operate with an inert atmosphere.




*Raymond Roller Mill - Typical Construction Feature*
*(Arrangement Varies With Mill Sizes)*

## Feed and end product

From a feed ranging in size12/20 mm down, the roller mill can produce particles ranging from coarse, granular products of approximately 90% minus 40 mesh to as fine as 99.98% minus 325 mesh.

## Principle of operation

Raymond roller mills operate on the simple and effective grinding principle of size reduction from the action of rolls running inside a stationary ring.

Crude material to be pulverised is fed to the mill from the storage bin through an automatic roll feeder. Within the grinding chamber, ploughs set in front of each roller lift and project the material in a continuous stream between the rollers and the pulverizing ring. The roller arms are pivoted at their upper ends and carried by a spider secured to the centre shaft. As the entire assembly rotates, the rollers swing outwards due to centrifugal force and crush the material against the stationary ring.

Air enters the mill through a number of tangential ports located around the base of the grinding chamber and sweeps the fine and medium fine fraction into the classifier directly above. The classifier separator the ground material and continuously returns the oversize to the grinding chamber for further reduction. All sized material is carried in the air stream to the cyclone collector, where the air and product are separated and the material discharged. Clean air is recirculated to the mill through the system fan in closed circuit.

## Custom engineered systems

Each roller mill system is tailored in design for each application. The proper mill feeder, roller mill size, classifier, fan, cyclone, dust collector and other system components are each selected for specific applications.

## Standard Mill sizes

| Mill Size | Ring Dia. |
|---|---|
| 303 W/T | 762 mm |
| 504 W/T | 1270 mm |
| 505 W/T | 1270 mm |
| 544 W/T | 1372 mm |
| 605 W/T | 1520 mm |
| 665 W/T | 1676 mm |
| 666 W/T | 1676 mm |

## Applications :

Some examples of materials ground in Raymond roller mills are :

Activated Carbon • Barytes • Bentonite • Burnt Lime • Calcium Oxide • Calcium Silicate • Calcined Bone • Calcined Petroleum Coke • Chalk • Clays • Coal • Cryolite • Dolomite • Expanded Perlite • Graphite • Gypsum • Hydrated Lime • Iron Oxide Pigments • Kaolin • Lime • Limestone • Magnesite • Manganese Oxide • Marble • Natural Earth Colours • Organic Insecticides • Phosphate Rock • Pigments • Slate • Soapstone • Sulphur • Graphite • Synthetic Resins • Talc • Titanium Dioxide

## Factors influencing capacity

Major factors affecting the capacity of any given roller mill include desired fineness, grindability and initial moisture. The capacity of the mill decreases when fineness increases. Furthermore, the harder a material is to grind, lower the capacity of the mill. High initial moisture may also decrease mill capacity because of limitation on the drying capacity of the mill.

## Hazardous applications

Certain applications are hazardous and require use of explosion relief vents, heavier construction and other special design features. Among these applications are Coal, Sulphur, Phenolic Resins and Starch.

## Roller mill system components

Pulverizing systems are assembled from various components based on the results desired.



*Raymond Roller Mill installation with hot air generator*

### *Cyclone*

High-efficiency cyclone collectors are supplied in roller mill systems. This cyclone collector, which is external to the mill, separates the entrained, pulverized solids from the air stream.

### *System fan*

A system fan provides the air moving capability and is engineered to meet properly the airflow and pressure requirements of the system. The heavy duty construction of the fan is designed for the conditions under which it will be operated.

### *Secondary dust collector*

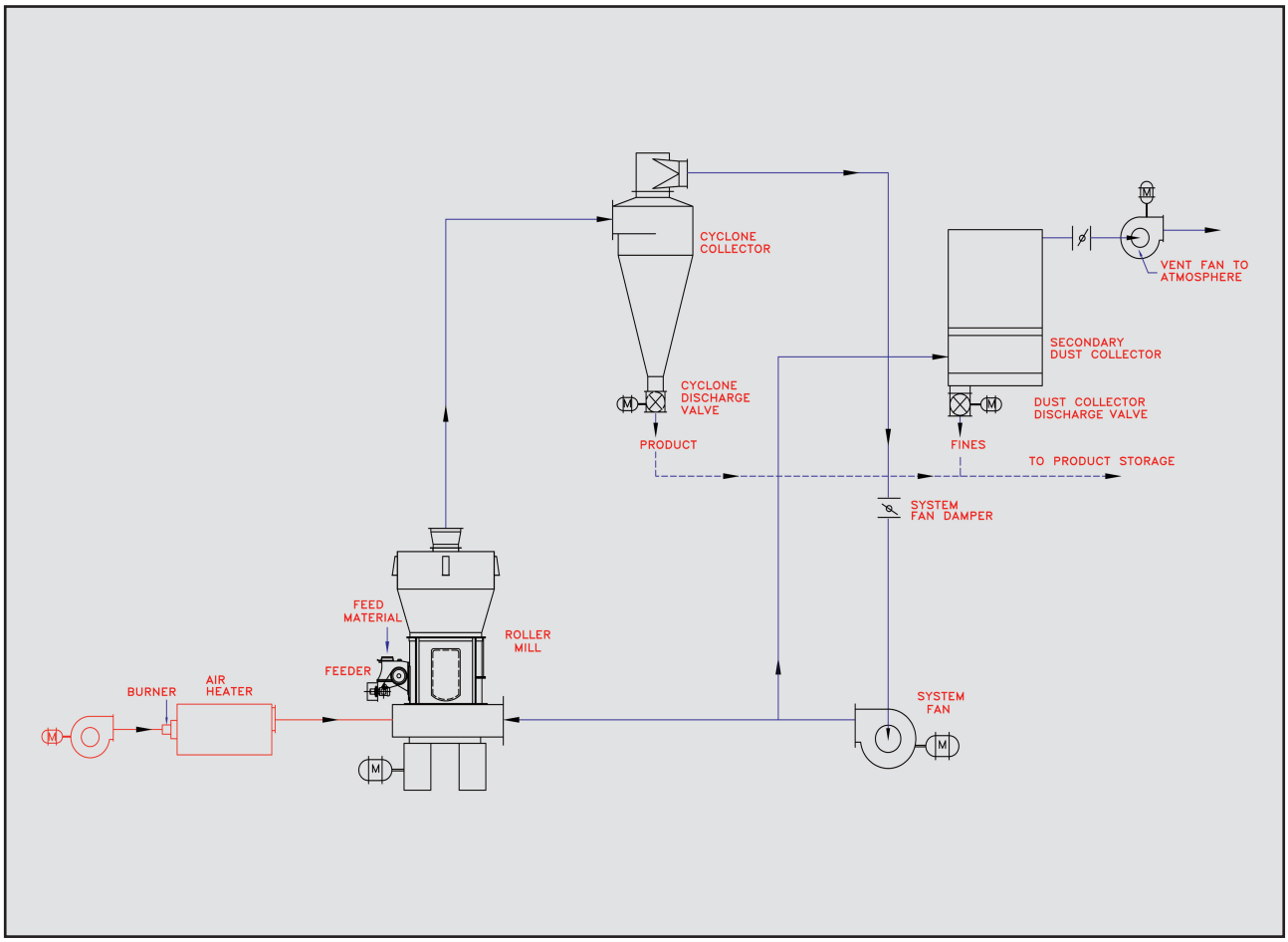
All air leaving the system is vented to a secondary dust collector. Usually of the pulse-jet bag filter type, this collector cleans the air of any residual solids prior to its release to the atmosphere.

### *Feed control*

An automatic, pneumatic feed control ensures mill operation at peak efficiency with high tonnage output for the power absorbed. This device is actuated by changes in air pressure differential across the mill, which are proportional to the mill load.

### *Classifier*

Choice of classifiers includes single cone, double cone, single whizzer, double whizzer and turbine types. Variable speed drives make possible a very wide range of particle sizes.




*Raymond Roller Mill Plant with Option of Drying and Grinding*

## Raymond Mill Flash Drying

Moist materials can be simultaneously dried and ground by introducing hot air into the Mill circuit from an auxiliary air heater, fired by oil or gas.

The air heaters are usually refractory lined and include a suitable Burner provided with flame protection and automatic temperature control.

Heated air is delivered to the Mill return air housing and introduced through air ports to the grinding zone in the Mill.

The air turbulence and particle size produced during the grinding process is ideal for almost instantaneous evaporation of moisture.


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