

# RAYMOND® VERTICAL MILL

With more than 125 years of experience, Raymond is a leader in the design, manufacturing and construction of industrial milling equipment and has set the standard in size reduction.

## ADVANTAGES

- Uniform particle size.
- Unit swings open easily for inspection and maintenance.
- Easy replacement of wearing parts.
- Compact design requires little floor space.
- Available with integral flash drying or water-cooled grinding chambers.

## For Extreme Fineness

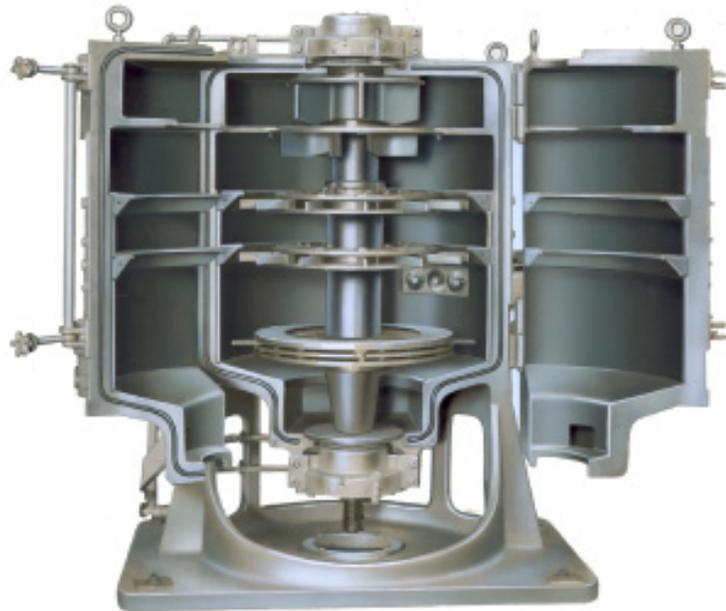
The Raymond Vertical Mill is a specialized unit intended for pulverizing materials in the extreme fineness range. The principle of integral air classification, originally developed by Raymond, has been applied with outstanding success to this mill and as a result a great number of materials can be produced in the lower micron sizes with a very minimum of oversize.

### Principle of Operation

The most distinguishing feature of the vertical mill is the straightforward manner of operation. One vertical shaft carries all the rotating parts within the mill. On top is the fan which produces the required air flow. Below this are the two banks of whizzers which do the classifying, and below these are the hammers or accelerating elements.

The feed enters the mill through the side mounted variable speed screw feeder between the hammers and the whizzer classifier. The airflow enters below the grinding chamber and carries pulverized material vertically, combining it with newly introduced feed, to the classifier where any acceptable material is removed from the mixture prior to being ground.

The classifier's high speed cyclonic action concentrates the coarser fraction along the walls where it falls back to the grinding chamber for further size reduction. The pulverizing action combines impact of the hammers and attrition with the grinding chamber walls. Properly sized material is then transported to the product collection system. The system airflow may recycle through the mill with only a portion vented in many applications, or it operates as a once-through system and all the air is vented when the feed material is heat sensitive.



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## Particle Size Range

In many cases, the mill operates in the fluid-energy mill fineness range. The ultimate crystalline particle size of the particular material handled has a definite effect on the fineness and determines the highest particle size range available. Many products can be reduced to 95% to 99% passing 15 to 20 microns while some products with smaller crystalline structure can be ground as fine as 95% to 99% passing 5 to 10 microns.

## Range of Uses

The mill is well adapted to grinding a substantial number of non-metallic minerals and manufactured materials in the extreme fineness range. Typical materials processed include graphite, limestone, cocoa powder, marble, kaolin, sugar, talc, certain synthetic resins, organic and inorganic colors, phosphate chemicals, pharmaceuticals, food products, and a variety of chemicals.

## Mill Sizes

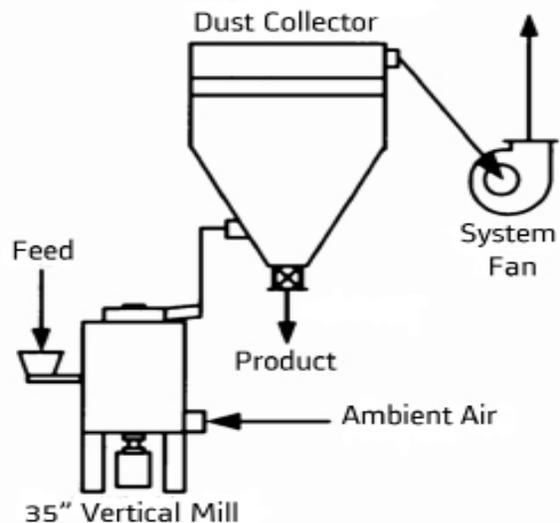
Available in two grinding chamber sizes, 18 and 35 inch, the mills are similar in operation and construction. Both are exceptionally compact requiring a small amount of floor space for their power transmission and product surface area capabilities.

## Preparation for Pulverizing

Materials to be ground should be pre-crushed to a maximum of 1/4 inch (6mm) in size and with some materials the best results can be obtained starting with a maximum of 10 to 20 mesh material.

## Raymond Vertical Mill Performance

Mill Size	18	35
Capacity Factor	1	7
Power - hp	20-25	150-220
Airflow - cfm	1000	3500
- m <sup>3</sup> /h	1700	5900



## Raymond 35" Vertical Mill Typical Performance

Material	Fineness		Rate	
	% Passing	Size	lb/h	kg/h
Alumina Trihydrate	90	10 microns	1400	630
Cocoa 18% butterfat	99	200 mesh	2400	1100
Talc	95	200 mesh	3500	1600
Sugar	99.9	20 microns	2500	1100