

# Raymond® Imp™ Mills

## For low cost grinding of a wide variety of materials

- Designed for fine to medium grinds
- Simultaneously pulverizes, classifies flash dries and flash calcines various materials
- Available in six sizes
- Heavy-duty all welded construction
- Custom designed for your processing application



The Raymond® Imp™ Mill is a versatile and dependable high speed air-swept swing hammer impact mill designed for fine to medium grinding of soft non-metallic minerals, coals, various chemical compounds, food products, and other materials. Capable of processing almost any solid material with a nominal 1 inch top size that is softer than 2 on the Mohs Scale can be effectively pulverized to a fineness from 1,000 microns to as little as 5 microns

### **Imp mill system**

The typical Raymond® Imp™ Mill system can be configured in a number of ways, it's capable of simultaneously pulverizing, classifying, flash drying and flash calcining various materials. Available in six sizes with capacities from 250-40,000 lb/hr / 113.3-18143.6 kg/hr.

### **Dependability**

The Raymond® Imp™ Mill system features heavy-duty all-welded plate construction designed to provide the kind of 24 hour-a-day dependability and long life that our customers have come to rely on.

### **Custom engineered systems**

Each Raymond® Imp™ Mill system is custom designed to achieve the best solution for your processing application. The mill, feeder, classifier, fan, cyclone, dust collector, and other system components, are selected to meet the requirements and characteristics of the material processed.

### **Experience**

Raymond® pulverizing and classification equipment has been setting the standard in size reduction since 1887, serving many types of mineral processing industries. Our portfolio includes not only the Raymond® Imp™ Mill, but the Raymond® Roller Mill, Raymond® Bowl Mill, Raymond® Vertical Mill, Raymond® Ultra Fine Mill and others.

Raymond® is known for its reliable size reduction and classification equipment by customers worldwide. Our products are supported by our engineering, field service and replacement parts departments to ensure the highest level of customer satisfaction, while delivering the reliability and high level of performance that today's industrial applications require.

#### Standard Imp™ mill system

The Raymond® Series 3 Imp™ Mill system is the ideal solution to many size reduction applications. A typical system consists of the Imp mill with either rotary or vibratory feeder, elevated in-stream classifier, system fan, cyclone and bag house. This basic configuration has proven itself time and again.

#### Imp™ mill system with flash drying

Various materials contain free water in the form of moisture that has to be removed in order to increase the value of the pulverized material and allow it to be handled more efficiently. The Imp mill system has the flexibility to pulverize and dry the material simultaneously.

The imp mill system with flash drying requires waste heat or a source of heated air. The heated air is used to flash dry the material as it is pulverized and swept from the mill. Depending on the initial moisture content of the feed, a portion of the dried product may be combined with moist material in a double paddle mixer. This "conditioned" feed is easier to handle and is more efficiently dried and pulverized. A vent is provided to remove a portion of the moist air returning the balance to the system where it is mixed with fresh, hot gas from the air heater or other heat sources.

#### Imp™ mill system with flash calcining

In addition to some moisture, some materials, such as gypsum, contain chemically bound water that must be removed in order to change the physical characteristics of the material. This process, known as calcination, can be easily accomplished with the Imp mill system.

Essentially similar to the imp mill system with flash drying, the Imp mill with flash calcining is provided with a number of special features which make it suitable for the higher temperatures involved.

Airflow and power requirements for Raymond® Imp™ Mill systems

| Mill Size | Nominal Airflow* |             | Fan Power |        | Mill Power-Min |        | Mill Power-Max |        | Turbine Power |       |
|-----------|------------------|-------------|-----------|--------|----------------|--------|----------------|--------|---------------|-------|
|           |                  |             |           |        |                |        |                |        |               |       |
| 13        | 1000 acfm        | 1700 m³/hr  | 7.5 hp    | 5.5 kW | 20 hp          | 15 kW  | 25 hp          | 19 kW  | 5 hp          | 4 kW  |
| 43        | 3000 acfm        | 5100 m³/hr  | 20 hp     | 15 kW  | 30 hp          | 22 kW  | 75 hp          | 55 kW  | 15 hp         | 11 kW |
| 53        | 6000 acfm        | 10200 m³/hr | 40 hp     | 30 kW  | 50 hp          | 37 kW  | 150 hp         | 110 kW | 25 hp         | 18 kW |
| 63        | 12000 acfm       | 20400 m³/hr | 75 hp     | 55 kW  | 125 hp         | 93 kW  | 250 hp         | 185 kW | 50 hp         | 37 kW |
| 83        | 25000 acfm       | 42500 m³/hr | 150 hp    | 110 kW | 300 hp         | 223 kW | 500 hp         | 375 kW | 100 hp        | 75 kW |
| 103       | 36000 acfm       | 61200 m³/hr | 250 hp    | 185 kW | 400 hp         | 315 kW | 900 hp         | 800 kW | 125 hp        | 90 kW |

\*airflow for many applications will exceed nominal values

### Design features

Heavy-duty construction – housing and bases feature heavy gauge steel plate construction for structural rigidity, long service life and the mass required to ensure smooth performance.

Housing liners – mill housing fitted with bolt-on replacement liners, available in a variety of alloys.

Bearings – cast iron split pillow block with self-aligning spherical roller bearings.

Hammers – available in various shapes and materials to assure maximum grinding action and efficiency.

Housing – split housing design provides quick access to mill interior, reducing maintenance costs and lost of production.

Hammer disk/rotor assembly – constructed of heavy gauge steel plate with abrasion resistant liners, mounted, on a hot-rolled steel shaft and electronically balanced at high speed for smooth operations, long life and enough inertia to absorb heavy impact.



### System flexibility and options

Hammer configuration – a variety of hammer types are available to ensure maximum flexibility. By varying the number and position of the hammers on the hammer disks, a rough degree of fineness variation can be obtained, which is later “fine tuned” by adjusting the setting of the classifier.

Material of construction – a selection of materials of construction is available to ensure long life and efficient operation with a wide variety of abrasive and corrosive materials, or for applications that require special treatment. These materials can be incorporated into the mill's housing, shaft, housing liners, hammers and hammer disks, as well as ductwork and classifier. They include abrasion resistant and stainless steels as well as other corrosion and heat resistant alloys, special overlays, coatings and liners.

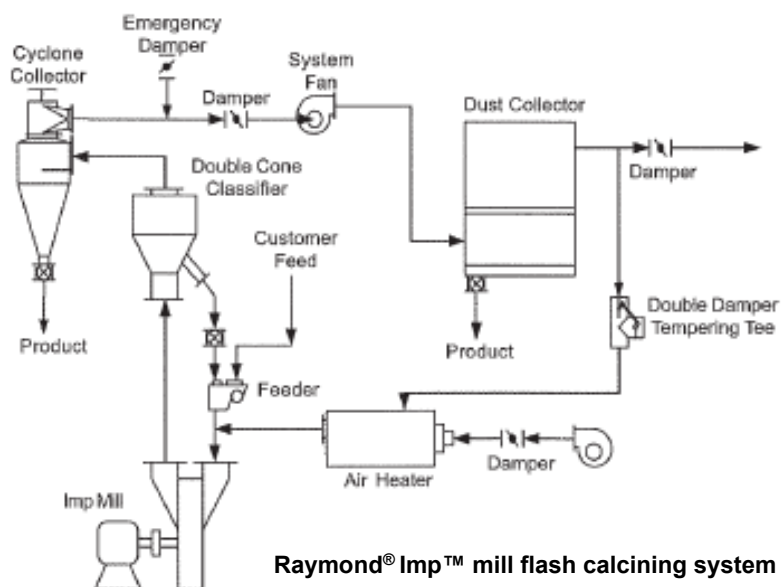
Product collection – high efficiency cyclone collectors are supplied to separate the entrained pulverized solid particles from the air stream. Air exiting the cyclone is normally recirculated to the mill, with a small portion vented to a secondary collector, usually of the fabric filter type, or the full air stream may be directed to the secondary collector.

Integral and instream classifiers – when operated in closed circuit with an elevated instream classifier, oversized particles are continuously returned to the grinding chamber until they are reduced to the required fineness. This not only provides good particle size control, it also improves the mill's grinding efficiency.

A variety of classifiers, e.g. double cone, twin cyclone, top drive whizzer and turbine classifier, are available to meet the requirements of almost any application for the imp mill system.

### Nominal capacity of Raymond® Imp™ Mill - stph

| Material                   | Moisture  |         | Fineness |      | Mill Size |     |     |     |     |     |
|----------------------------|-----------|---------|----------|------|-----------|-----|-----|-----|-----|-----|
|                            | Initial-% | Final-% | %Passing | Mesh | 13        | 43  | 53  | 63  | 83  | 103 |
| Bark                       | 57        | 45      | 90       | 8    | .05       | 1.4 | 2.8 | 4.5 | 9.0 | 14  |
| Calcium Carbonate          | 30        | 0.5     | 99       | 325  | 0.5       | 1.5 | 3.0 | 5.0 | 10  | 15  |
| Clay, Ball                 | 25        | 2       | 90       | 200  | 1.0       | 2.7 | 5.4 | 9.0 | 18  | 27  |
| Gypsum (FDG calcining)     | 23        | 5.5     | 75       | 325  | 1.3       | 3.5 | 6.7 | 13  | 28  | 40  |
| Gypsum (natural calcining) | 21        | 5.0     | 70       | 325  | 1.2       | 3.1 | 6.0 | 12  | 26  | 36  |
| Gypsum (waste)             | -         | -       | 90       | 100  | 0.8       | 1.7 | 3.8 | 7.5 | 15  | 23  |
| Kaolin Clay                | 15        | 1       | 99.9     | 325  | 1.6       | 4.5 | 9.0 | 15  | 30  | 45  |
| Soy Flour                  | -         | -       | 95       | 100  | 0.8       | 2.0 | 4.0 | 7.0 | 14  | 21  |
| Soy Protein                | 73        | 8.0     | 50       | 100  | 0.1       | 0.2 | 0.4 | 0.8 | 1.5 | 2.3 |
| Talc                       | 15        | 0.2     | 99.5     | 325  | 0.7       | 1.8 | 3.6 | 6.0 | 12  | 18  |
| Wood Waste                 | 55        | 30      | 85       | 10   | 0.5       | 1.5 | 3.0 | 5.0 | 10  | 15  |



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