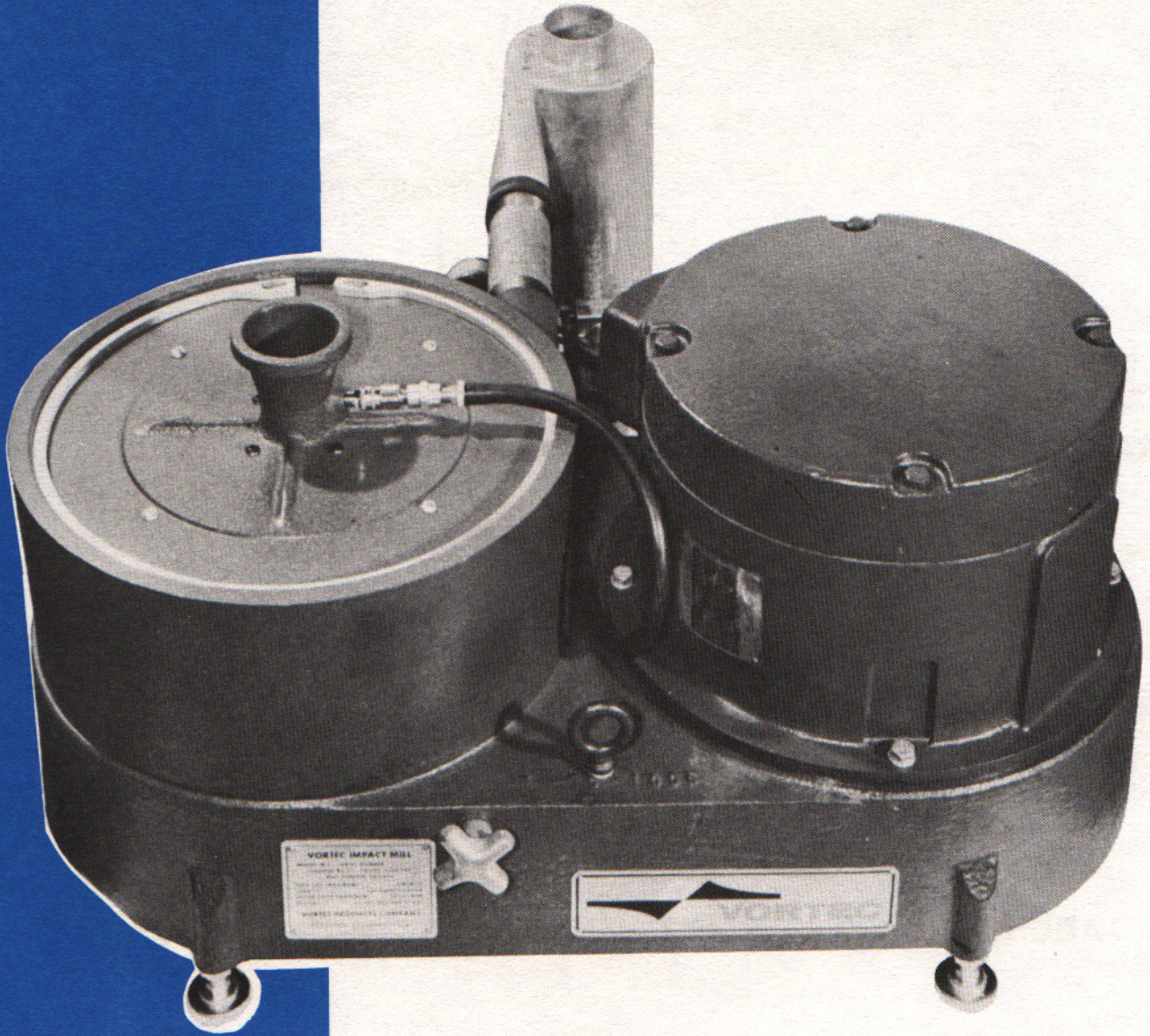
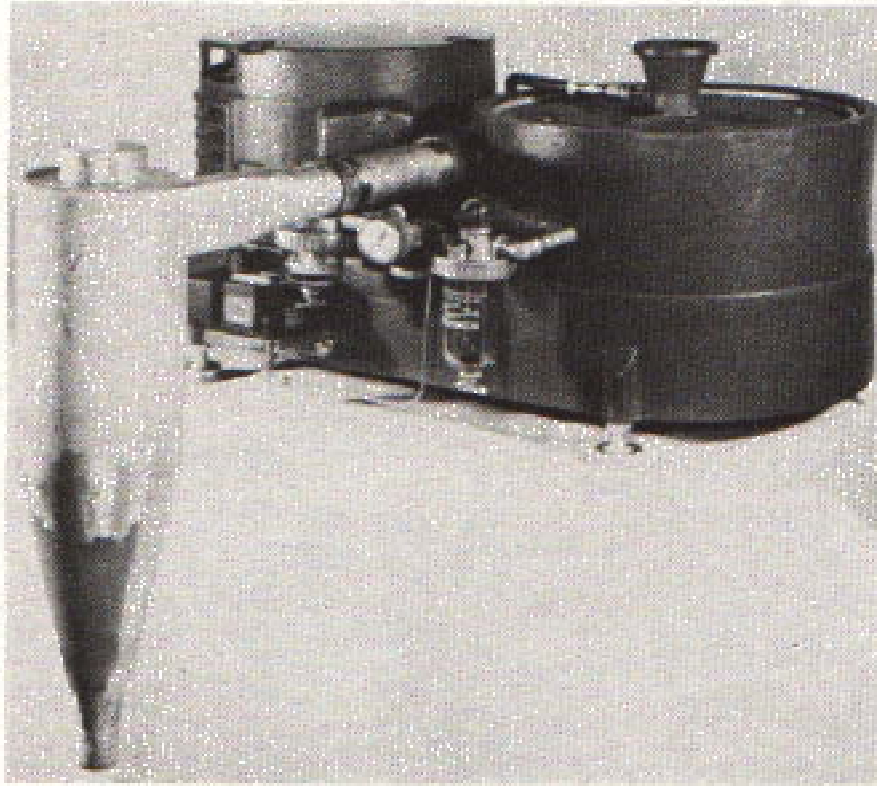


# VORTEC IMPACT MILL MODEL M-1



**VORTEC** PRODUCTS COMPANY



**Figure 1-1 M-1 Impact Mill**

## **GENERAL**

The purpose of the **M-1 IMPACT MILL** is to grind material to a selected size range. The quick and efficient means by which this machine reduces particle size has proven its superior effectiveness. The high speed **IMPACT MILL** unit and motor are featured together as a compact assembly.

The versatility of this machine lends itself to laboratory sample testing and production quantity pulverizing of dry materials for powdered metal, mineral and other chemical industries.

## SPECIFICATIONS

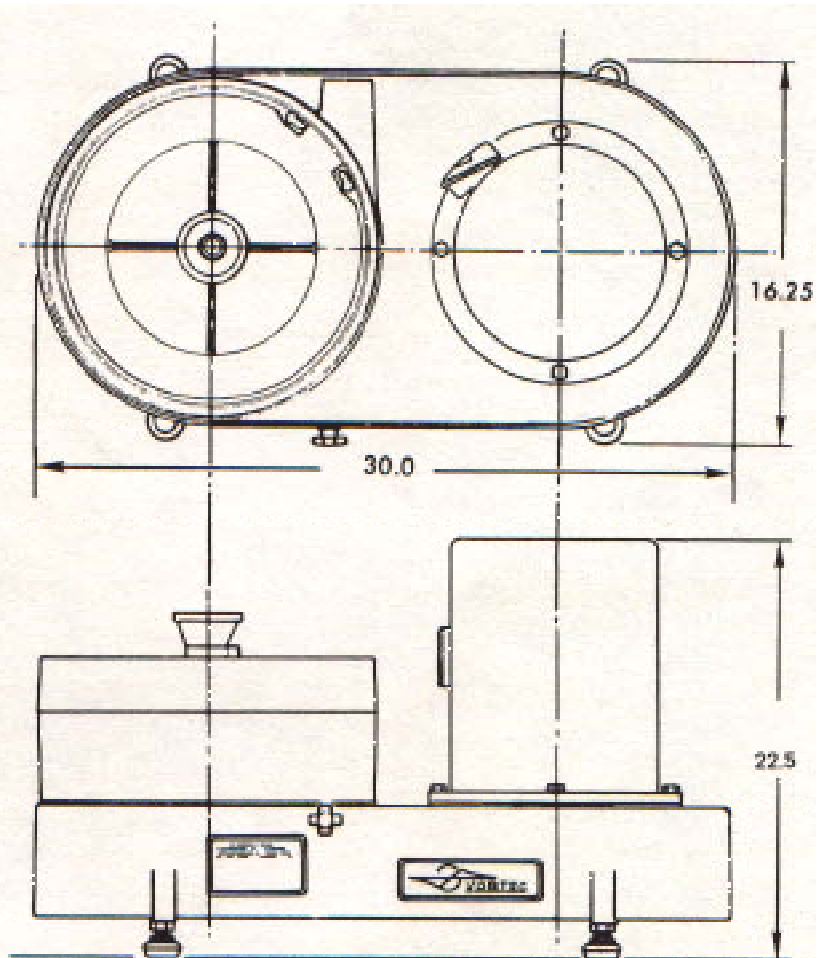


Figure 1-2 Dimensions

### **DIMENSIONS:**

30" wide, 16.25" deep, and 22.5 " high.  
(See Figure 1-2, Dimensions)

### **WEIGHT:**

350 pounds

### **DRIVE MOTOR:**

7.5 hp, 220/440 volts, 60 cycles; T.E.F.C. induction - type electric motor

## **LUBRICATION:**

Oil mist or grease-packed lubrication for rotor bearings, including air filter, pressure gauge, and pressure regulator. Grease packed motor and idler pulley bearings.

## **ROTOR SPEED:**

20,000 RPM (Oil mist lubrication maximum speed)  
Stock Pulleys may be ordered from factory for following speeds:

17,500 RPM  
15,000 RPM  
10,000 RPM (Grease-packed lubrication maximum speed)  
8,750 RPM  
7,500 RPM  
5,000 RPM

An optional Variable Speed Motor Controller will allow convenient speed control.

## **CAPACITY—Input:**

500 #/hr with standard drive motor.

## **PARTICLE SIZE—Input:**

Maximum 1/8 inch diameter. Other considerations include particle density and rotor speed.

## **PARTICLE SIZE—Output:**

Subsieve (less than 5 Microns) to coarse (over 200 Microns).  
Range of particle size varied by changing RPM of rotor and target distance.

## **SIZE REDUCTION CHARACTERISTICS:**

See Performance Graphs for typical examples of given materials at given rpm.  
(Fig. 1-4)

## **CHARACTERISTIC STRUCTURE OF PARTICLES AFTER SIZE REDUCTION:**

Fresh, rough surfaces, and sharp edges.

## **SIZE CONSISTENCY vs FEED RATE:**

Normally feed rate does not affect particle size consistency.

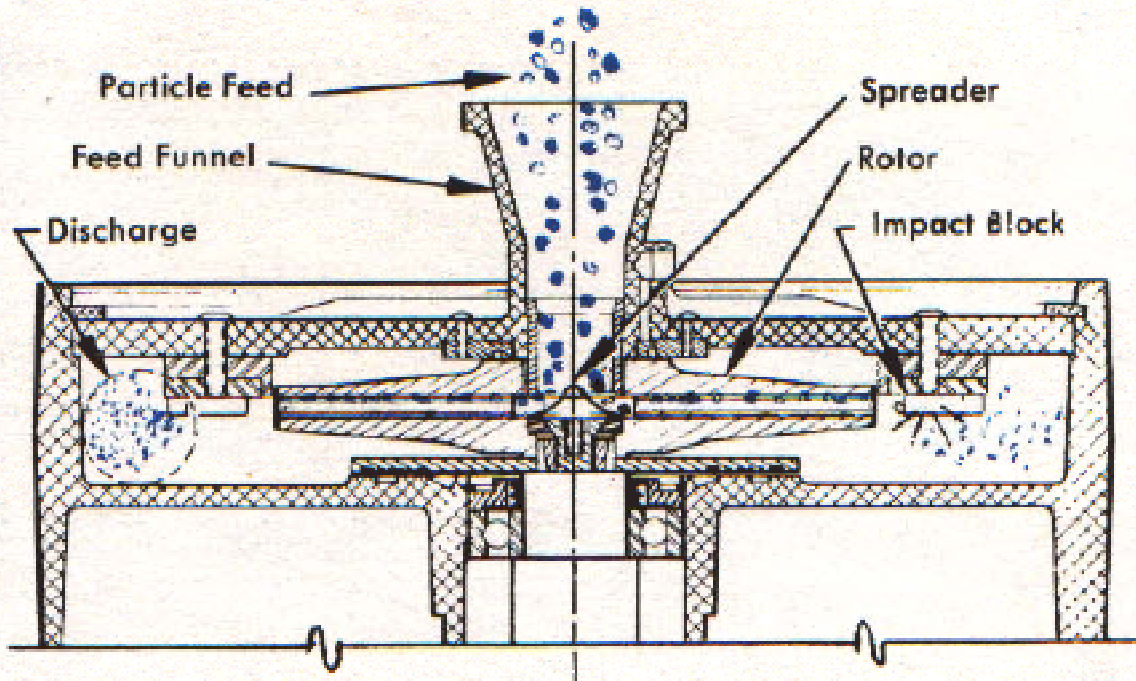
## **TEMPERATURE RISE OF MATERIAL:**

Approximately 50°F per pass through M-1 Impact Mill.

## **EFFICIENCY:**

Energy is used to accelerate particles to impacting speed; producing maximum grinding efficiency.

## PRINCIPLE OF OPERATION:



**Figure 1-3 M-1 Mill Particle Flow Circuit**

(See Figure 1-3, M-1 Particle Flow Circuit) During operation, material is poured into the feed funnel, to the center of the rotor and propelled outward through the rotor channels. The controlled air flow, produced by the rotor and the centrifugal force, carries the material outward. In traveling outward the material is accelerated tangentially and radially to reach maximum velocity at the rotor rim. Here, the material leaves the rotor at an angle determined by the combined tangential and radial velocity components, and is thrust against an impact block. The material is shattered along its natural structure lines. The shattered material is carried by the air flow to the scroll area of the mill for discharge to a cyclone and connecting container or classifier. Besides carrying the material out of the unit, the air flow constantly cools the equipment and product, and cleans the interior of the mill.

Selective grinding may be accomplished by choice of rotor speed. Size reduction may be defined as the ratio of new surface created. Within the operating limits of the unit, a doubling of rotor speed quadruples the new surface factor. Thus, by changing the rotor speed, variation in size reduction can be accomplished.

## PERFORMANCE

Illustrative interpretation of graph Ottawa Silica

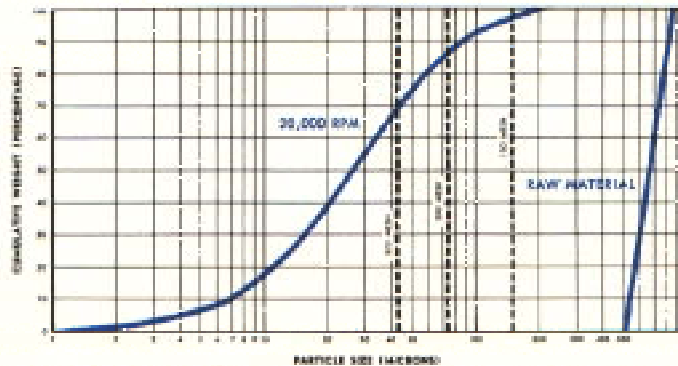
Raw material: (Blue Line)

Raw material particle size is from 500 microns to 850 microns  
70% (cumulative weight) of raw material ranges from 500 microns to 700 microns.  
Remaining 30% (cumulative weight) of raw material ranges from 700 microns to 850 microns.

20,000 RPM (Blue Curve)

After one pass thru mill at 20,000 RPM, material particle size range is from 1 micron to 200 microns.  
70% (cumulative weight) of ground material ranges from 1 micron to 43 microns (325 mesh).  
Remaining 30% (cumulative weight) of ground material ranges from 43 microns (325 mesh) to approximately 200 microns (100 mesh).

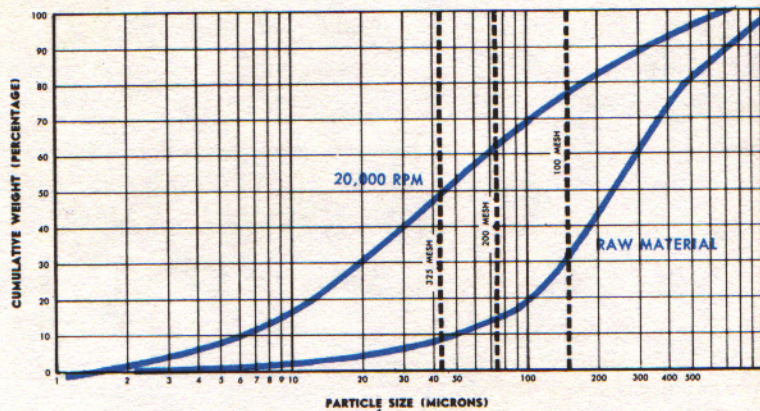
Ottawa Silica / M-1 Mill



Enlargement 120x

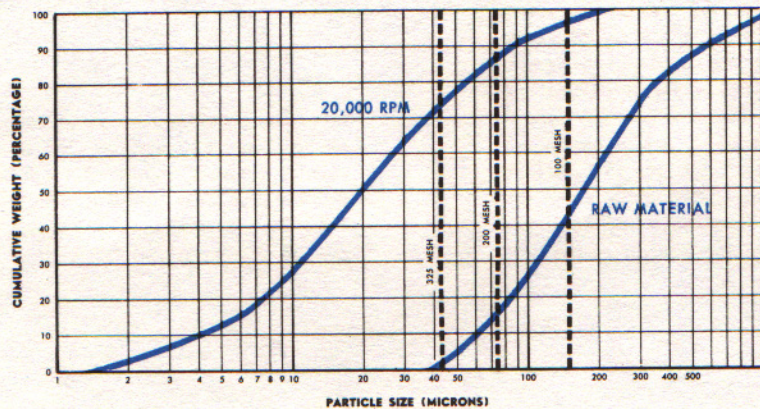
# PERFORMANCE (CONTINUED)

Cement / M-1 Mill



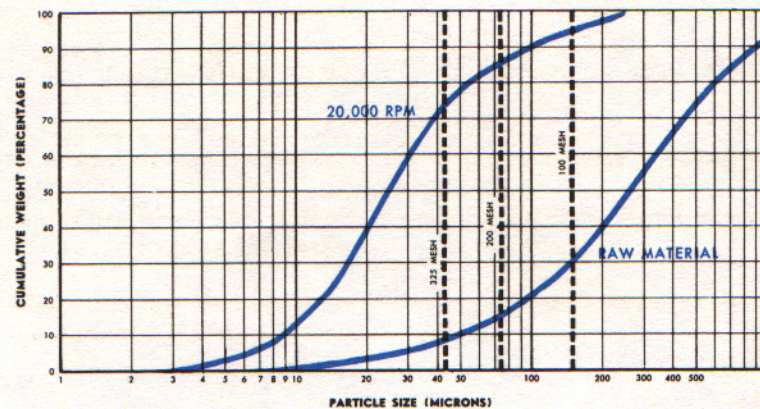
Enlargement 120X

Talc / M-1 Mill



Enlargement 120X

Limestone / M-1 Mill



Enlargement 120X

Figure 1-4 Performance Graphs and Product Samples

## **OTHER VORTEC PRODUCTS**

Vortec Impact Mill, Model M-2: Input capacity 10,000 pounds per hour.  
Vortec Particle Classifier, Model C-1: Input capacity 500 pounds per hour.  
Vortec Particle Classifier, Model C-2: Input capacity 10,000 pounds per hour.

For full information on these machines, write or call:

MR. HARRY TANG

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