

# GRINDING MILL

GM



## VIBRO-ENERGY GRINDING MILLS

THE MOST VERSATILE LINE OF WET OR  
DRY GRINDING MILLS FOR SIZE  
REDUCTION OF GRANULAR MATERIALS  
TO SUBMICRON PARTICLE RANGE



DM1 GRINDING MILL

# 3-DIMENSIONAL VIBRATORY ACTION

Fast, low-cost particle size reduction to submicron range



M18-5 GRINDING MILL



## VIBRO-ENERGY GRINDING MILLS

SWECO Vibro-Energy Grinding Mills. The most versatile line of mills available today. Wet or dry grinding. With or without particle-size classification. Closed or open-circuit processing. From small lab batches to full production grinding.

SWECO wet grinding mills have working capacities as small as 1 pint and as large as 182 gallons and dry grinding with chamber capacities up to 17 cu. ft.

The key feature of every SWECO Grinding Mill is its Vibro-Energy motion. A three-dimensional vibratory action, this precise, high-frequency motion is the reason why SWECO Mills can grind a greater variety of materials to a particle size of 1/2 micron or less ... with results so consistent that batch time guesswork is virtually eliminated.

## HIGH GRINDING EFFICIENCY

The high-frequency, low-amplitude motion, as employed in the Vibro-Energy Mill is the most effective method of converting energy to accomplish particle size reduction from 100-micron to submicron range.

## LOWEST MATERIAL CONTAMINATION

Contamination of materials while grinding is an important consideration in many industries. Due to the rapid wear of the grinding media in ball or pebble mills, these machines cannot be used in many applications. In contrast, Vibro-Energy Mills introduce negligible media and lining contamination due to the small impact forces generated.

## REDUCED ELECTROSTATIC CHARGING OR AGGLOMERATION

Pigments produced by precipitation and filtration frequently acquire electrostatic charges during the process. These charges bond the pigment particles very tightly, slowing down conventional grinders. The high frequency impacts in a Vibro-Energy Mill quickly dissipate the small static charges originally existing in the pigment.

## REQUIRES LESS ENERGY INPUT

The movement of media in a Vibro-Energy is very small, so a high percentage of the energy is directed into the grinding effort. Once the motion generator is up to operating speed, the inertia of the rotating eccentric weights greatly reduces the power input required to maintain this speed. Consequently, very low-energy input is required per unit of ground product produced.

## NO SPECIAL INSTALLATION

Unlike conventional ball and pebble mills, the Vibro-Energy Mill does not require deep, heavy concrete foundations or specially reinforced structures. The major vibrating forces are directed to the grinding chamber with a minimum of vibration transmitted to the base. This results in a substantial savings in installation costs.

## LOW MAINTENANCE COST

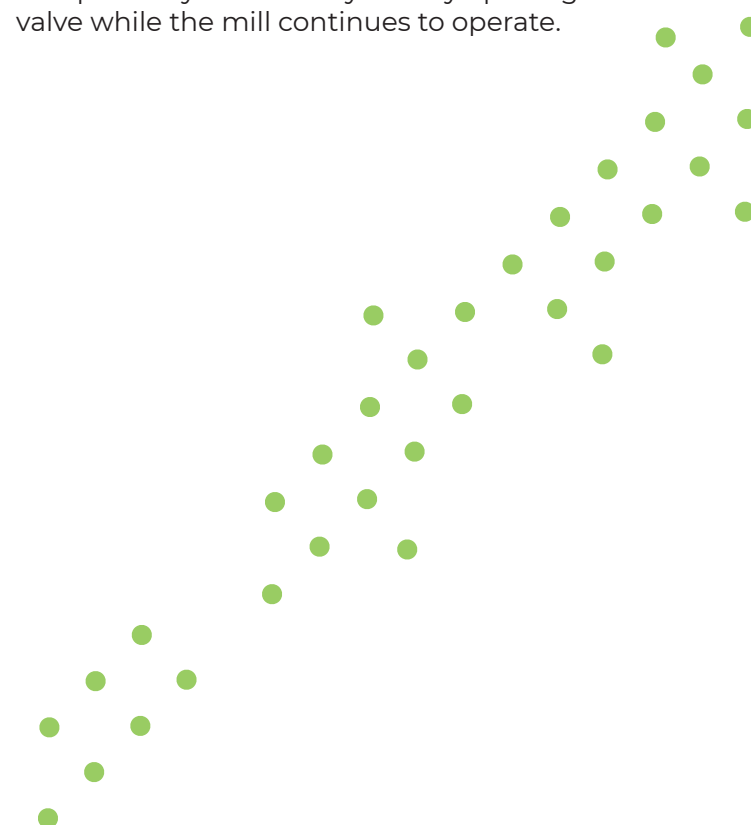
The inside surfaces of the grinding vessel are constructed of abrasion-resistant polyurethane, with other linings available for special applications. This feature, combined with few moving parts in the mill, significantly reduces maintenance costs.

## VIBRO-ENERGY MILLS ARE VERSATILE

SWECO Grinding Mills can easily be operated in series for continuous processing. The units can be used in either open-circuit or closed-circuit grinding.

## EASE OF SAMPLING AND DISCHARGE

Because of the unique vibratory motion, discharge of material from the Vibro-Energy Mill is accomplished rapidly and easily while the unit is in operation. Even thixotropic materials flow readily. Samples may be taken by merely opening the valve while the mill continues to operate.



# WET OR DRY GRINDING

Any material that can be broken by impact can be ground in a SWECO Grinding Mill

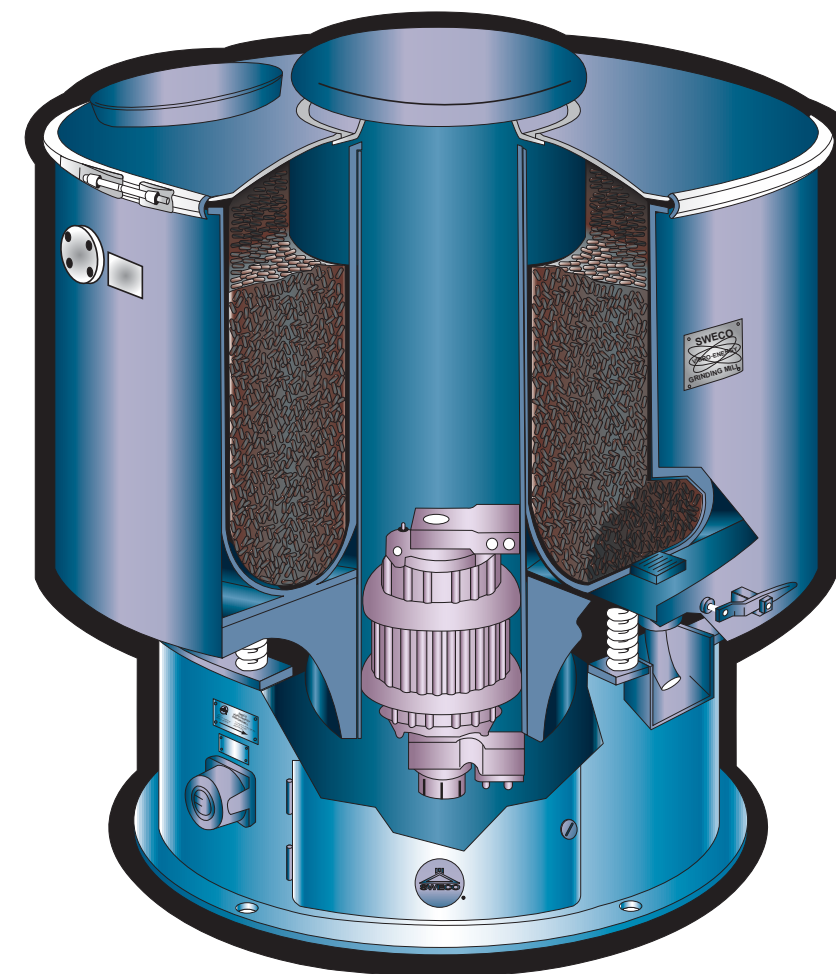
## THE GRINDING CHAMBER

Basically, the Vibro-Energy Mill consists of a grinding chamber and vibrating mechanism. The grinding chamber is in the form of a vertical cylinder which is filled with small pieces of very hard grinding media. Most often this is sintered alumina, in the form of half-inch cylinders. The material to be ground is introduced into the voids between the grinding media. The vibration mechanism is attached directly to the base of the grinding chamber. The whole assembly is suspended on high-tensile steel springs. Thus, all the energy from the vibrating mechanism is imparted directly to the grinding media without the necessity for intermediate gears, drives or clutches.

## THE MOTION GENERATOR

The vibrating mechanism consists of a specially designed electric motion generator having a heavy shaft mounted in heavy-duty bearings. At each end of the shaft are attached "out-of-balance" weights. The top weight, which is in the same horizontal plane as the top of the suspension springs, is connected to the motion generator shaft in a fixed position.

The top eccentric weight causes a horizontal gyration of the grinding chamber, while the bottom eccentric weight provides a gyrating tilt. This unique motion causes three-dimensional, high-frequency vibration, which constitutes the transfer agent converting the motive energy into grinding impacts.



## MORE EFFICIENT MOTION

Vibro-Energy Grinding Mills using small amounts of energy with high frequency vibration is more efficient than the high-impact, low-frequency principle applied in conventional grinding systems.

## DRY GRINDING MILLS

| MODEL | CHAMBER CAPACITY |                | MOTOR HP | MEDIA LOAD ALUMINA |      | WIDTH |      | HEIGHT |      | SHIPPING WEIGHT |      |
|-------|------------------|----------------|----------|--------------------|------|-------|------|--------|------|-----------------|------|
|       | FT <sup>3</sup>  | M <sup>3</sup> |          | LB                 | KG   | IN    | MM   | IN     | MM   | LB              | KG   |
| DM1   | 1.2              | 0.034          | 0.5      | 80                 | 36   | 24    | 610  | 39     | 991  | 220             | 100  |
| DM4   | 6.5              | 0.184          | 2.5/5    | 500                | 227  | 39    | 991  | 42     | 1067 | 900             | 410  |
| DM10  | 10               | 0.283          | 5        | 1000               | 454  | 48    | 1219 | 44     | 1118 | 1600            | 725  |
| DM20  | 20               | 0.566          | 10       | 2000               | 907  | 63    | 1600 | 60     | 1524 | 2700            | 1225 |
| DM70  | 70               | 1.982          | 40       | 7000               | 3175 | 89    | 2261 | 74     | 1880 | 11000           | 5000 |

## WET GRINDING MILLS

| MODEL | MAX WORKING CAPACITY |       | MOTOR HP | MEDIA LOAD ALUMINA |      | WIDTH |      | HEIGHT |      | SHIPPING WEIGHT |      |
|-------|----------------------|-------|----------|--------------------|------|-------|------|--------|------|-----------------|------|
|       | GAL                  | LITER |          | LB                 | KG   | IN    | MM   | IN     | MM   | LB              | KG   |
| M18   | 2.6                  | 10    | 0.5      | 200                | 91   | 18    | 457  | 30     | 762  | 220             | 90   |
| M38   | 9                    | 34    | 2.5/5    | 675                | 306  | 39    | 991  | 42     | 1067 | 900             | 410  |
| M45   | 27                   | 102   | 5        | 2000               | 907  | 48    | 1219 | 55     | 1397 | 3500            | 1600 |
| M60   | 58                   | 220   | 10       | 4500               | 2041 | 66    | 1676 | 76     | 1930 | 5500            | 2500 |
| M80   | 182                  | 689   | 40       | 14000              | 6350 | 83    | 2108 | 103    | 2616 | 16000           | 7250 |

## UNIFORM PARTICLE SIZE

In most industries which process finely ground materials, uniform particle size is of utmost importance but has been extremely difficult to achieve with ball and pebble mills. The use of cylindrical grinding media, coupled with the unique Vibro-Energy motion, enables SWECO Mills to achieve a narrow particle size distribution.





# CREVICE-FREE, FULLY-DRAINABLE

## APPLICATIONS

In countless industries, SWECO Mills are providing the particle size reduction and distribution needed to fulfill specific application requirements. And in many cases, they have created opportunities for the development of products not even possible with competitive grinding methods.

**Ceramics.** A closely-controlled particle size distribution is extremely valuable in the production of body slips and glazes. Grinding time cycles are also reduced.

**Pharmaceuticals and Cosmetics.** Production of a uniform fine particle size is important in the grinding and dispersing of dermatological grinding and dispersion of emulsions in suspension.

**Agricultural Chemicals.** In the production of pesticides, herbicides and fungicides, SWECO Mills help create superior flowables with uniform solids-to-liquid ratios. Products have

a longer shelf life without settling-out, and spray jet clogging is reduced. In addition, the increased total surface area of the finer particles enhances the effectiveness of the materials. This permits smaller amounts of material to be used in achieving the desired results.

**Abrasives.** In the abrasives industry where media wear is a problem, the use of Vibro-Energy Mills provide extended media life and subsequent savings. The ability to grind particles under 10 microns is of particular importance in the development of new artificial abrasives.

**Special Applications.** SWECO Mills are also well suited to processing a wide variety of other materials including: powdered metals, tungsten carbides, rubber molding compounds, catalyst carriers and iron oxide for magnetic tape production.



## Manufacturers worldwide rely on SWECO.

We span five continents with 9 manufacturing and support facilities and over 100 sales and service representative offices.

So, wherever you are, be assured that SWECO – the global leader in screening technology – is there when you need us.

SWECO has sales agents and/or licensees in most countries.