Hammer Mills: Five Key Styles

Hammer mills are just one type of machinery among the larger category of size reduction equipment which also includes: shredders, jaw crushers, ram-fed grinders, roll mills, ball mills and more.

Among hammer mills, there are several styles to choose from. However, for each the functionality remains basically the same:

- Material is fed into the grinding chamber
- Contact with moving hammers, and the mill's interior component, as well as particle on particle collisions reduce the material's size
- Material remains in the grinding chamber until is able to pass through the screen or grate.

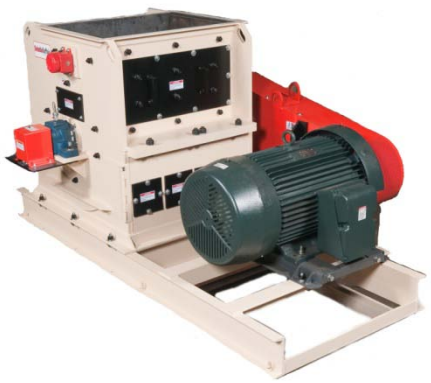
Comparison of Hammer Mills:

Industrial Gravity Discharge Hammer Mills

Industrial style hammer mills have the simplest and most recognizable design. A rectangular steel box houses a shaft to which swinging hammers are attached. As the shaft rotates at high speed, the hammers flail out and impact the material. In addition to the hammers, size reduction also occurs form particle on particle contact, and impact with the interior of the grinding chamber.

Important to know: Replaceable steel liner plates protect the mill's interior from wear caused by processing abrasive materials.

Ideal applications: glass, coal, coke, dry chemicals, metals, resins, aggregates, ceramics



Pneumatic Discharge Hammer Mills

The grinding mechanism of this group is quite similar to the industrial hammer mills. However, pneumatic mills typically have thinner hammers, and the interior walls of the grinding chamber feature a ribbed liner plate. This plate has a "washboard" affect, working in unison with the hammers, and particle on particle impact to reduce the material being processed. What sets the pneumatic mills apart is the use of air assistance to evacuate the material from the mill and convey it to storage.

Important to know: In addition to aiding in the discharge of light or low density materials, the pneumatic suction can increase throughput up to 400% over gravity discharge hammer mills.

Ideal applications: wood chips, wood shavings, biomass, paper, carpet, meat and bone meal

Full Circle Screen Hammer Mills

The nearly 300 degree screen coverage of the rotor translates to a greater area for the material to exit the grinding chamber. As a result, in comparison to other mill styles, the full circle screen hammer mill has the highest throughput to horsepower ratio.

Important to know: To achieve the nearly full coverage of the rotor requires the screen to be somewhat pliable, and therefore relatively thin. Because of this, the full circle screen hammer mill is best suited for light, easy to grind materials that do not require initial grinding against a breaker plate.

Ideal applications: corn, grains, grasses, planer shavings, sawdust

Hammer Mills: Five Key Styles

Horizontal In-Feed Hammer Mills

The unique quality of the horizontal in-feed hammer mill is that material is fed into the side of the mill, instead of the top. This design makes horizontal mills ideal for long, linear, or otherwise large, geometric materials to be processed without a pre grind. Horizontal in feed grinders include both trim scrap grinders and pallet grinders.
As with the prior hammer mill styles, the horizontal mills use heavy duty screens covering the discharge area to determine the finished particle size.

Important to know: The style and design of the hammers on the horizontal mills grasp and aggressively pull the material into the grinding chamber.

Ideal applications: trim scrap, truss plant scrap, 2x4s, whole pallets, pallet scrap

Lumpbreakers

Of all hammer mills styles, the lumpbreaker is the most unique. Instead of a swinging hammers attached to a shaft spinning at high speed, the lumpbreaker has stationary hammers attached to a slow moving shaft. As the shaft rotates, the hammers remain rigid and pass between steel combs attached to the wall of the grinding chamber. Lumpbreakers do not use screens to control the finished particle size. Instead, the configuration of spacing between the hammers and combs, along with the hammer size, and rotor speed determine the finished particle size.

Important to know: The open in-feed, fixed hammers, and slow shaft speed allow the lumpbreaker to accept a certain amount of head load, making it suitable for: large, blocky materials, de-agglomerating, de-lumping, and returning materials to a flowable consistency.

Ideal applications: sugar, cement, dry chemicals, agglomerated powders

For more information, click on any link below:

- Industrial Hammer Mills
- Pneumatic Discharge Hammer Mills
- Full Circle Screen Hammer Mills
- Horizontal In-Feed Hammer Mills
- Lump breakers

SchutteBuffalo

www.hammermills.com