THE RELIABLE MIKRO-PULVERIZER® HAMMER & SCREEN MILL

THE MIKRO-PULVERIZER® HAMMER & SCREEN MILL is a high speed mechanical impact mill designed for continuous size reduction of a wide range of materials down to $D_{90} = 45$ microns. This device was originally invented by Hosokawa Micron Powder Systems in 1923 and has evolved into the preeminent industrial mill with thousands of worldwide installations.

OPTIONS:
- Carbon steel, stainless steel
- Pressure shock resistant (PSR) fabricated design
- Cryogenic milling - liquid nitrogen injection
- Gravity or pneumatic discharge
- Various feeding options – screw, gravity or pneumatic
- Hammer & knife rotors available

DESIGN & FEATURES:
- Suitable for Chemical, Mineral, Food, Pharmaceuticals, Plastics, and Cosmetic applications
- Laboratory scale to production models available with 3/4 HP to 300 HP
- Capacity ranges from 0.5 lbs/hr up to 30,000 lbs/hr
- Suitable for grinding soft to medium-hard materials with a Moh’s hardness of less than 4
- Energy efficient & economical to operate
- Dust free operation
- No ancillary equipment required
- Easy to clean and maintain
- Compact design
- Long life & minimal downtime

EFFICIENT AND COMPACT
Mikro Pulverizer® Hammer & Screen Mills provide substantial savings in power consumption over conventional size reduction methods. Payback often occurs through power savings alone. Mikro Pulverizer® Hammer & Screen Mills are remarkably compact considering the volume of product they typically handle.
The Mikro Pulverizer® Hammer & Screen Mill is built to continuously grind a wide range of materials. Designed with flexible controls and numerous configurations, this device can be used for coarse granulation or as a fine size reduction machine.

**DESIGN**
The Mikro Pulverizer® Hammer & Screen Mill uses a high speed rotor assembly fitted with sets of hammers. The grinding chamber is fitted with a cover containing a multiple deflector liner and a retaining screen at the bottom of the grinding zone. The grinding process is controlled by the type of hammers, the rotor speed, the type of retaining screen and the liner.

In the standard Mikro Pulverizer® Hammer & Screen Mill design, the mill body and housing are made of high strength cast iron. Stainless steel and fabricated designs are available for sanitary, abrasive and hazardous materials. Pressure shock resistant (PSR) models are also available and can be rated up to 10 bar (g) overpressure.

**AMERICAN MADE AND BUILT TO LAST**

**DESIGNED, MANUFACTURED AND ASSEMBLED IN THE USA**
The Mikro Pulverizer® Hammer & Screen Mill was designed by the Pulverizing Machinery Company in 1923. The company name was later changed to Hosokawa Micron Powder Systems in 1985. This legendary device has thousands of installations worldwide and carries a reputation for reliability, consistency and durability. The Mikro Pulverizer® Hammer & Screen Mill is designed, manufactured and assembled in the USA and comes with our pledge to performance and guaranteed dependability. Many units built over a half century ago are still in active service today.
FEEDING
As a standard, the device is equipped with a volumetric feed screw mechanism used to convey feed material into the grinding chamber. Other options include pneumatic or gravity feeding.

ROTOR & HAMMERS
Inside the grinding chamber, material is introduced to the hammer path. Hammers are available in a variety of materials and finishes. Particles are pulverized by mechanical impact until the material is fine enough to discharge through the retaining screen. The clearance between the hammers and the liner is critical to the outstanding performance of the Mikro Pulverizer® Hammer & Screen Mill.

DEFLECTOR LINER
Various liner types are available. The most common is the multiple deflector liner mounted inside the grinding chamber cover. The liner is serrated and designed to redirect the particles to the hammer path. The liner is easily accessed for inspection, cleaning or replacement. Liners are available in carbon steel, hardened steel and stainless steel.

RETAINING SCREEN
A retaining screen is positioned below the grinding chamber to control residence time and hence particle size. There are various screen configurations and perforation sizes available to accommodate a wide range of materials to control the end particle size distribution. Finished material can be gravity discharged from the mill or pneumatically conveyed away from the mill.

MIKRO PULVERIZER® HAMMER & SCREEN MILL MODELS

<table>
<thead>
<tr>
<th></th>
<th>Samplmill</th>
<th>Bantam</th>
<th>MP 1</th>
<th>MP 2</th>
<th>MP 3</th>
<th>MP 4</th>
<th>MP 44</th>
<th>MP 66</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor (HP)</td>
<td>0.75</td>
<td>1</td>
<td>5</td>
<td>20</td>
<td>50</td>
<td>100</td>
<td>200</td>
<td>300</td>
</tr>
<tr>
<td>Max. Rotor Speed (RPM)</td>
<td>14,000</td>
<td>14,000</td>
<td>9,600</td>
<td>6,900</td>
<td>4,650</td>
<td>3,450</td>
<td>3,450</td>
<td>2,300</td>
</tr>
<tr>
<td>Approx. Air Flow (ft³/ min)</td>
<td>60-80</td>
<td>150-200</td>
<td>450-600</td>
<td>600-800</td>
<td>1,000 - 1,500</td>
<td>2,000 - 3,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scale Up Factor</td>
<td>N/A</td>
<td>0.2</td>
<td>1.0</td>
<td>4.0</td>
<td>10</td>
<td>20</td>
<td>40</td>
<td>60</td>
</tr>
</tbody>
</table>
MAINTENANCE & CLEANING

With proper maintenance and regular inspections, your Mikro-Pulverizer® Hammer & Screen Mill will operate efficiently for decades. All material contact parts can be easily accessed for cleaning or replacement. The hammers, retaining screen and deflector liner should be regularly inspected for wear to ensure optimum machine performance. Hosokawa’s After-market Department stocks parts for all Mikro Pulverizer® Hammer & Screen Mills and can usually have replacement parts shipped in 24 hours.
# CHEMICALS, MINERALS, FOOD, PHARMAcEUTICALS, PLASTICS & COSMETICS

## MIKRO PULVERIZER® HAMMER & SCREEN MILL APPLICATION DATA

<table>
<thead>
<tr>
<th>Material</th>
<th>Product</th>
<th>Nominal Rates (pounds per HP/HR)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common Food/Food Ingredients</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammonium Sulfate</td>
<td>99% &lt; 150 um</td>
<td>100 - 130 lbs/HP/HR</td>
</tr>
<tr>
<td>Ascorbic Acid</td>
<td>81% &lt; 45 um</td>
<td>200 - 250 lbs/HP/HR</td>
</tr>
<tr>
<td>Gum Arabic</td>
<td>95%&lt; 150 um</td>
<td>50 - 70 lbs/HP/HR</td>
</tr>
<tr>
<td>Corn Flour</td>
<td>87% &lt; 200 um</td>
<td>20 - 30 lbs/HP/HR</td>
</tr>
<tr>
<td>Corn Starch</td>
<td>99.9% &lt; 75 um</td>
<td>220 - 280 lbs/HP/HR</td>
</tr>
<tr>
<td>Lactose</td>
<td>99% &lt; 100 um</td>
<td>30 - 45 lbs/HP/HR</td>
</tr>
<tr>
<td>Sugar 6X (Beet)</td>
<td>93% &lt; 75 um</td>
<td>75 - 100 lbs/HP/HR</td>
</tr>
<tr>
<td>Wheat Flour</td>
<td>97% &lt; 300 um</td>
<td>25 - 35 lbs/HP/HR</td>
</tr>
<tr>
<td><strong>Common Spices</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Pepper</td>
<td>90% &lt; 500 um</td>
<td>50 - 70 lbs/HP/HR</td>
</tr>
<tr>
<td>Caraway Seeds</td>
<td>62% &lt; 500 um</td>
<td>10 - 15 lbs/HP/HR</td>
</tr>
<tr>
<td>Cinnamon</td>
<td>98% &lt; 250 um</td>
<td>15 - 20 lbs/HP/HR</td>
</tr>
<tr>
<td>Ginger</td>
<td>76% &lt; 150 um</td>
<td>25 - 30 lbs/HP/HR</td>
</tr>
<tr>
<td>Nutmeg</td>
<td>92% &lt; 500 um</td>
<td>50 - 70 lbs/HP/HR</td>
</tr>
<tr>
<td><strong>Common Chemical Compounds</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borax</td>
<td>58% &lt; 150 um</td>
<td>600 - 650 lbs/HP/HR</td>
</tr>
<tr>
<td>Calcium Sulfate</td>
<td>98% &lt; 75 um</td>
<td>210 - 240 lbs/HP/HR</td>
</tr>
<tr>
<td>Magnesium Sulfate</td>
<td>82% &lt; 75 um</td>
<td>60 - 80 lbs/HP/HR</td>
</tr>
<tr>
<td>Potassium Carbonate</td>
<td>95% &lt; 75 um</td>
<td>220 - 250 lbs/HP/HR</td>
</tr>
<tr>
<td>Potassium Chloride</td>
<td>80% &lt; 150 um</td>
<td>900 - 1000 lbs HP/HR</td>
</tr>
<tr>
<td>Sodium Bicarbonate</td>
<td>99% &lt; 75 um</td>
<td>130 - 150 lbs/HP/HR</td>
</tr>
<tr>
<td>Sodium Chloride</td>
<td>92% &lt; 150 um</td>
<td>250 - 275 lbs/HP/HR</td>
</tr>
<tr>
<td>Sodium Phoshate</td>
<td>70% &lt; 45 um</td>
<td>75 - 90 lbs/HP/HR</td>
</tr>
</tbody>
</table>

*Data provided in chart is for demonstration purposes only and does not represent a performance guarantee.*
SIZE REDUCTION EQUIPMENT
Hosokawa Micron Powder Systems offers a wide range of equipment for coarse granulation to ultra-fine size reduction.

- Coarse Granulation to Ultra-fine Grinding
- Laboratory Scale to Large Production Models
- Air Classification Mills
- Jet Mills: Opposed Gun, Fluidized & Spiral
- Hammer & Screen Mills
- Pin & Universal Mills
- Pre-Crushers & Granulators
- Ball & Media Mills
- Attrition Mills
- Wet & Dry Grinding

ABOUT HOSOKAWA

Hosokawa Micron Powder Systems brings its customers the leading powder processing technologies from the most respected brand names throughout the world. Our Alpine, Micron, Mikro, Vrieco-Nauta, Stott and Vitalair brand names assure reliability, durability and optimal product performance.

We offer system engineering, process technology, equipment manufacturing and assembly, commissioning, on-site training, and process optimization. Hosokawa Micron Powder Systems can provide complete product development services from concept through commercialization.

EQUIPMENT & SERVICES
- Size Reduction & Milling
- Classification & Particle Separation
- Mixing, Blending & Drying
- Laboratory & Testing Equipment
- Compaction & Granulation
- Particle Design & Modification
- Test Center & Laboratory
- Custom Toll Processing
- Service & Maintenance
- Equipment Validation and Evaluation
- Pre-Owned Equipment & Refurbishing Services
- Engineering & System Design
- Educational Programming
Hosokawa Micron Powder Systems, located in Summit, New Jersey is a member of the Hosokawa Micron Group. We are a leading provider of equipment and systems for Size Reduction, Classification, Mixing/Blending, Drying, Particle Analysis, Compaction, Granulation as well as a full line of laboratory and analytical equipment. We also provide Contract Manufacturing, Complete Aftermarket Services and OEM parts, Equipment Leasing, Refurbishing, Product Development Services and Educational Programming. We serve the Chemical, Mineral, Food, Pharmaceutical, Cosmetic and Plastics processing industries.

Disclaimer: The content shown within this brochure may contain errors and omissions and is subject to change at anytime without notice. The data and details provided in this brochure is for promotional purposes only. The purpose of this brochure is to provide information about a specific device or service offered by Hosokawa Micron Powder Systems. This information does not constitute any equipment warranty or performance guarantee.