

MIKRO® UMP **Universal Milling System**



HOSOKAWA
MICRON POWDER SYSTEMS

Combining the resources of

ALPINE • MIKRO • MAJAC • MICRON • VRIECO-NAUTA

ECONOMICAL GRINDING DOWN TO D97 = 35 MICRONS

THE MIKRO® UMP UNIVERSAL MILLING SYSTEM

is a compact, high speed impact mill capable of coarse granulation or fine size reduction with interchangeable rotor configurations. The UMP is the next step in the evolution of the Mikro Pulverizer® Hammer & Screen Mill by providing the same grind as the classic hammer & screen setup while adding the flexibility of converting to a pin mill for fine size reduction or a rigid rotor for de-agglomeration.

DESIGN & FEATURES:

- Capable of ultra-fine grinding to D97 = 35 µm
- Lab & production models available with 1 HP to 40 HP
- Capacity ranges from 5 grams/batch up to 3,000 lbs/hour
- Suitable for pharmaceutical, food & chemical applications
- Energy efficient & economical to operate
- Designed for milling soft to medium-hard materials with a Moh's hardness of 4 or less
- Fabricated stainless steel construction
- Finishes available to 0.6 micron Ra
- Variable speed rotor drive
- Cantilevered design for easy cleaning & rotor changes
- Maintenance free, sealed for life bearings
- Double lip seals & gas purging between drive & process area
- Compact design & dust free operation



Hammer & Screen Configuration



Mikro® UMP Universal Milling System - Pilot Scale Model

OPTIONS & ACCESSORIES:

- Gravity or pneumatic conveying discharge available
- Wear protection options include stellite, tungsten carbide and other wear resistant materials
- Cryogenic operation available
- Different rotor options available
 - High Speed Pin rotor for ultra-fine milling
 - Hammer & screen configuration for fine milling
 - Low speed knife rotor for coarse granulation
- Variety of feeding options and system configurations
- Isolator installations available for high containment applications

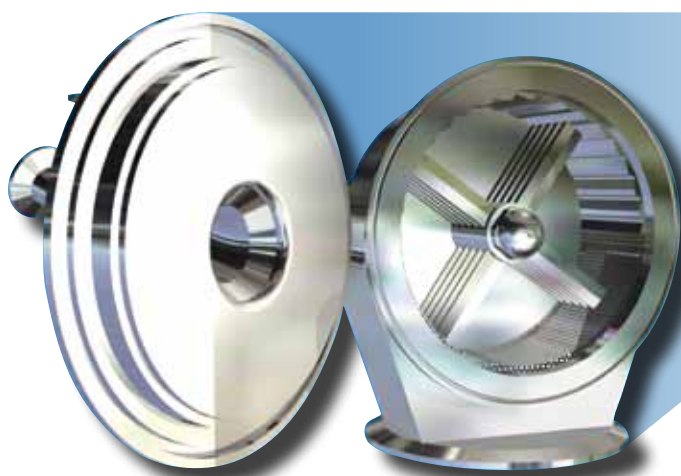
EASY OPERATION — SUPERIOR PERFORMANCE

OPERATION

The Mikro® UMP Universal Milling System utilizes the same design and operating principles perfected in the original Mikro Pulverizer® Hammer & Screen Mill.

The Mikro® UMP was developed to meet the increased market demand for high performance machines for multiple applications. An interchangeable grinding mechanism for flexible particle size distribution is a key feature to this machine's design.

Multiple feed and collection options further enhance the flexibility of the Mikro® UMP Universal Milling System across food, pharmaceutical and chemical applications.



*Mikro® UMP Universal Milling System
- Production Model*

Model	LPM-2	UMP-B	UMP-1	UMP-2	UMP-3
HP	1	1.5	5-10	20	40
Hammer & Screen (LFS)					
Rotor RPM - Max	36,000	14,000	9,600	6,900	4,150
Scale Factor	—	0	1	4	8
Air Flow - SCFM Nom.	10	50	80	200	600
Pin Disc Rotor					
Rotor RPM - Max	36,000	27,500	18,000	12,000	9,000
Scale Factor	-	0	1	2	4
Air Flow - SCFM Max.	10	25	100	250	550

TRULY UNIVERSAL

DESIGN & COMPONENTS

GRINDING CHAMBER

The fabricated grinding chamber is constructed in 316 stainless steel with a high quality 0.6 micron Ra finish. Higher quality finishes are available for specialty applications. The access door is hinged to the grinding chamber and is secured with a tri-clamp connection for easy and quick inspection and cleaning.

The bearing housing is a cantilevered design and includes maintenance free, sealed for life bearings. There are double lip seals and a gas purge between the drive and process areas to eliminate material contamination and premature wear to drive components.



Mikro® UMP Universal Milling System for pharmaceutical applications

ROTOR & GRINDING MEDIA OPTIONS

Pin Disc – A pin disc assembly includes a stationary pin rotor disc mounted to the inside door cover and a rotating pin disc mounted to the main drive shaft of the mill. The pins interlace creating a labyrinth for materials to pass through when rotating. The rotors have a one piece pressed pin design to provide for ease of cleaning. The high speed of the rotating pins makes this option capable of ultra-fine grinding to a $D_{97} = 35 \mu\text{m}$.

Hammer Rotor – This rotor produces the tightest particle size distribution of the Mikro® UMP grinding options. Material is pulverized by mechanical impact until the material is fine enough to discharge through the retaining screen. There are a variety of retaining screens and deflector liners available to produce the required size reduction and desired particle size distribution.

Rigid Knife – A fixed blade rigid rotor uses a cutting or impact force (depending on the orientation of the rotor) to reduce materials to coarse or granular powders. This option is well suited for large materials when a wider and coarse particle size distribution is necessary.



Pin Disc Rotor



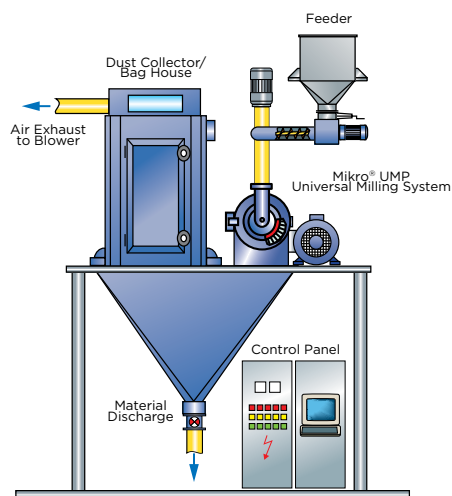
Hammer & Screen Configuration



Rigid Knife Rotor

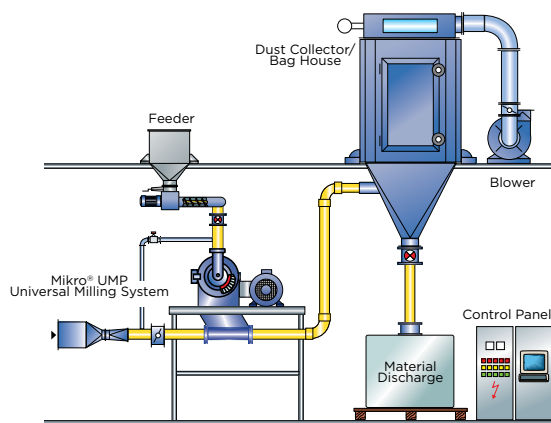
SYSTEM CONFIGURATIONS

GRAVITY/BUNKER SYSTEM



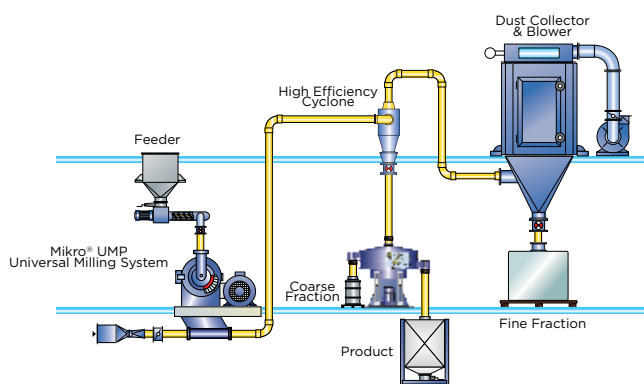
The Mikro® UMP Gravity/Bunker System is a simple and compact milling system designed for batch processing that requires minimal floor space.

VACUUM/ PNEUMATIC CONVEYING SYSTEM



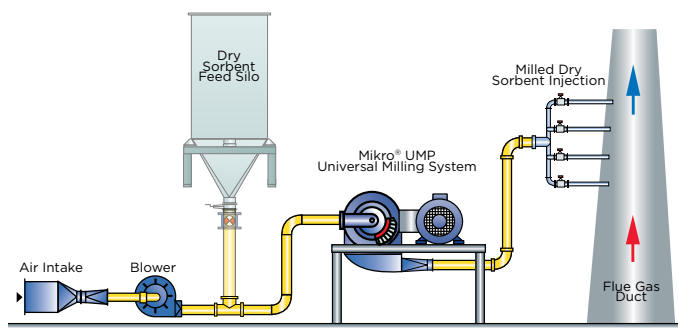
This system is designed for long batch or continuous processing. It requires less vertical space than the Bunker Configuration but uses more floor space.

DOWNSTREAM CLASSIFICATION SYSTEM



Hosokawa can install a cyclone or other air classifiers in-line with your Mikro® UMP Universal Milling System for materials separation and collection.

BLOW THROUGH SYSTEM



This system is designed for dry sorbent injection for flue gas desulfurization. An upstream pressure blower pumps the feed material & conveying air in high pressure piping through the Mikro® UMP to the downstream injection point. Product is injected in a flue gas duct in dry sorbent injection systems.

TYPICAL APPLICATIONS

Material	Feed	Product
LFS Hammer Rotor (Rotor Speeds up to 18,000 ft./sec)		
Thermo Plastic Polymer	1/4"	90% < 400 µm
Elastomers	800 µm	90% < 250 µm
HP Methylcellulose	1/8"	90% < 470 µm
HD Polyethylene	750 µm	90% < 250 µm
Herbicide	400 µm	90% < 100 µm
Polyester Resin	3 mm	90% < 500 µm
Polysaccharide	500 µm	90% < 250 µm
Vitamins	100 µm	90% < 30 µm
Lactose	320 µm	90% < 59 µm
Beans	1/4"	90% < 425 µm
Peas	1/4"	90% < 425 µm
Pin Rotor (Rotor Speeds up to 29,000 ft./sec)		
Vitamins	80 µm	90% < 25 µm
Salt	700 µm	90% < 180 µm
Exchange Resin	-	90% < 617 µm
Sodium Bicarbonate	75 µm	50% < 18 µm
Trona	75 µm	50% < 18 µm
Dextrose	395 µm	90% < 58 µm
Iron Based Food Additive	450 µm	90% < 180 µm
Potassium Phosphate	240 µm	90% < 48 µm
Enzymes (Cryogenic)	150 µm	90% < 110 µm
Knife Rotor (Rotor Speeds up to 15,000 ft./sec)		
Iron Based Food Additive	1/2"	90% < 355 µm
Thermo Plastic Polymer	2-5 mm	90% < 1070 µm
Gypsum	72 µm	90% < 52 µm
Polyester Resin	21% < 35 mesh	99.95% < 35 mesh

Data provided in this chart is a guideline only and does not represent a performance guarantee.



Mikro® UMP Universal Milling System - Laboratory Model

MIKRO® LPM - LABORATORY PIN MILL

The Mikro® LPM - Laboratory Pin Mill is the smallest model in the UMP line used for small sample grinding of 5 to 100 grams. The device has interchangeable rotor configurations similar to options available on the larger UMP models and is capable of producing materials down to D97 = 35 µm. This compact model has self-contained controls and product collection and can be operated in a small glove box or flexible isolator.



DESIGNED, MANUFACTURED AND ASSEMBLED IN THE USA

The Mikro® UMP Universal Milling System is an innovative mill, based on the design of a Mikro Pulverizer® Hammer & Screen Mill. It combines the performance and versatility of a hammer & screen mill

and a pin mill. It is designed, manufactured and assembled in the USA and comes with our pledge to performance and guaranteed dependability.

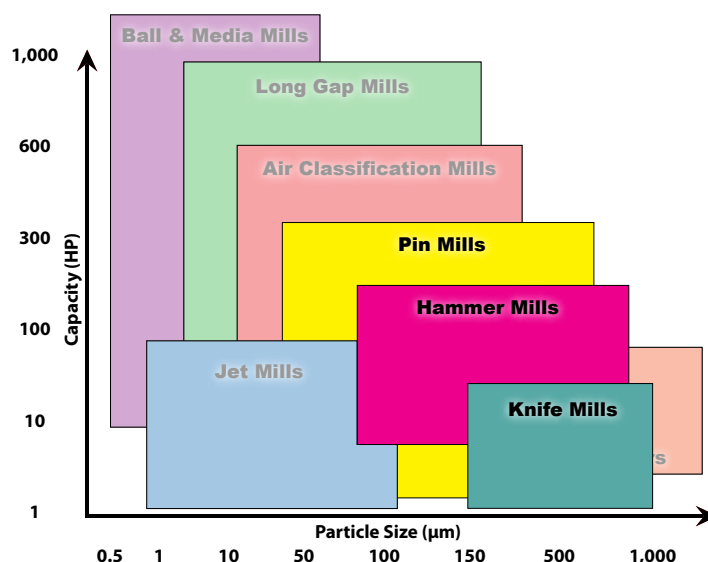


HOSOKAWA MICRON POWDER SYSTEMS

HOSOKAWA MILLING TECHNOLOGIES

Hosokawa Micron Powder Systems offers a wide range of equipment for coarse granulation to ultra-fine size reduction.

- Coarse Granulation to Ultra-fine Grinding
- Lab 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



SR SIZE REDUCTION EQUIPMENT

- Mikro ACM® - Air Classifying Mill
- Mikro Pulverizer® Hammer & Screen Mill
- Mikro® UMP - Universal Milling System
- Mikro LGM® - Long Gap Mill
- Mikro Atomizer® - Air Classifying Mill
- Alpine® AFG - Fluidized Bed Jet Mill
- Alpine® AS - Spiral Jet Mill
- Alpine® UPZ - Pin Mill
- Alpine® SO - Ball Mill

PA CLASSIFICATION & SEPARATION

- Majac® Acucut Air Classifier
- Mikro® Classifier
- Micron Separator
- Alpine® ATP Turboplex Classifier
- Alpine® ASP Stratoplex Classifier
- Alpine® TTSP Tandem Classifier

m/b MIXING, BLENDING & DRYING

- Vrieco-Nauta™ Conical Screw Mixer
- Micron Drymeister Flash Dryer
- Vrieco-Nauta™ Cyclomix
- Vrieco-Nauta™ Vacuum Dryer
- Vrieco-Nauta™ Active Freeze Dryer
- Micron Nobilta™

CI CONTAINMENT, FILLING & WEIGHING AND ISOLATION TECHNOLOGY

- Stott Rigid Wall Isolators
- Stott Hygienic Filling & Weighing Systems
- Stott Flexible Isolators
- Vitalair Downflow Booths

CI LABORATORY & ANALYTICAL EQUIPMENT

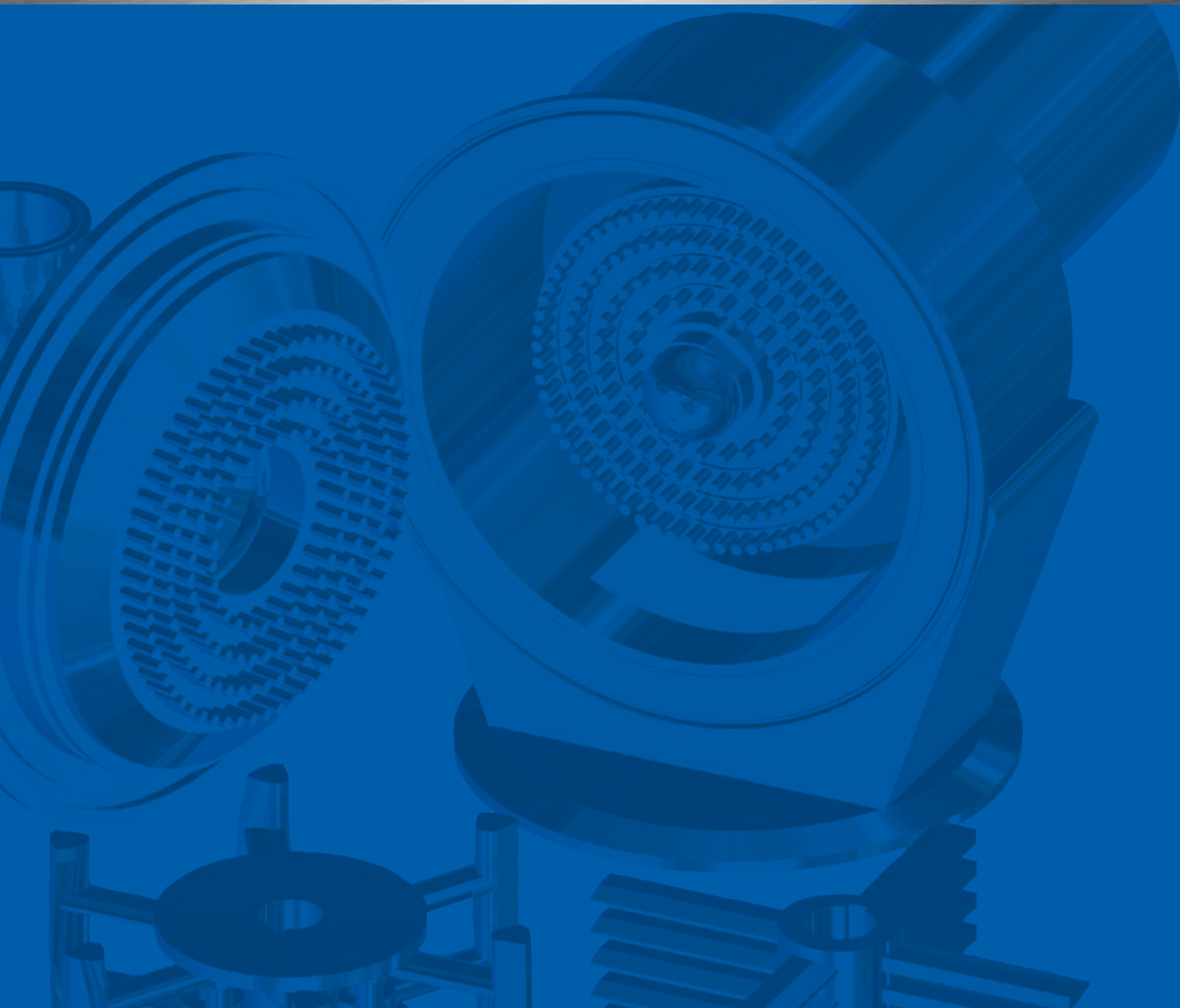
- Micron Air Jet Sieve MAJSb
- Mikro Air Jet Sieve™ MAJSx
- Mikro® LPM Laboratory Pin Mill
- Micron Powder Characteristics Tester PT-X
- Micron Viblette Wet Sieve VBL
- Micron Peneto PNT - N

Services

- Hosokawa Brand Parts
- Engineering & System Design
- Custom Toll Processing
- Test Center & Analytical Laboratory
- On-site Service & Maintenance
- Pre-Owned Equipment Sales
- Equipment Validation & Surveying
- Educational Programs & Training

MIKRO[®] UMP

Universal Milling System



HOSOKAWA **MICRON POWDER SYSTEMS**

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.*

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