

SOLUTIONS FOR GRINDING FINE POWDERS

MICRO-JET™

Size Reduction Systems



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UNSURPASSED QUALITY AND PRODUCTIVITY IN ULTRA-FINE (0.5–45 MICRON) GRINDING OF FINE POWDERS

The Micro-Jet delivers unsurpassed efficiency and effectiveness in the ultra-fine grinding and classification of dry powders for the chemical, pharmaceutical and mineral industries.

Each system is custom-engineered to the individual requirements to meet a broad range of grinding applications. The design of the Micro-Jet system makes operation simple and keeps production costs down. Systems are engineered for laboratory, pilot and full-scale production from 10 grams to 10,000 lb/hr.

APPLICATIONS

SANITARY, STERILE APPLICATIONS:

pharmaceuticals • foods • cosmetics

HEAT-SENSITIVE MATERIALS:

waxes • pigments • toners

HARD, ABRASIVE MATERIALS:

minerals • abrasives • rare earth alloys

SYNTHETIC MATERIALS:

polymers • plastics • precipitates

AGRICULTURAL MATERIALS:

fungicides • herbicides • pesticides

VOLATILE MATERIALS:

propellants • explosives • oxidizers



Model 8 Micro-Jet System designed for continuous processing of bulk pharmaceutical at a rate of 50 lbs/hr.

OPERATING PRINCIPLE

The Micro-Jet grinds and classifies in a single, variable cylindrical chamber. High-pressure air, gas or steam is introduced through specially designed nozzles, converting the potential energy of the compressed gas into a grinding stream of sonic or supersonic velocity. This elastic fluid creates a high-velocity helix that rotates around the center of the mill.

Raw materials are introduced into the grinding chamber through a venturi feed injector. The solid particles are entrained in the turbulent helical flow, causing them to collide. These high-velocity collisions pulverize the solids into micron and submicron particles.

The particles stratify and grind each other in direct relation to their inertia. As the particles are reduced to the desired size, the viscous drag of the exhaust draws only the reduced particles into the discharge stream.



Sanitary Micro-Jet is designed to meet USDA and pharmaceutical guidelines for cleaning and/or sterilization.

Exceptionally fine grinding: The Micro-Jet operates within a very narrow, adjustable range to provide 0.5 to 45 micron average finished product sizes.

Improved grinding efficiency: The air flow rate, air pressure and grinding pattern are easily adjusted by means of interchangeable grinding nozzles and liners. Individual Micro-Jet systems may be tailored to optimize both the desired particle size and the production rate.

TYPICAL OPERATING PARAMETERS

| MILL SERIES NUMBER | PRODUCTION CAPACITY (LB/HR) | SCFM AIR @70°F & 100 PSIG | STEAM (LB/HR) @550°F & 100 PSIG |
|--------------------|-----------------------------|---------------------------|---------------------------------|
| 2 | 0.5-5 | 20 | N/A |
| 4 | 1-50 | 25-75 | 50-200 |
| 8 | 3-100 | 50-150 | 200-500 |
| 12 | 25-200 | 150-300 | 400-1000 |
| 16 | 50-400 | 250-500 | 750-1500 |
| 20 | 75-600 | 400-800 | 1000-2000 |
| 24 | 100-1200 | 700-1200 | 1500-3000 |
| 30 | 200-3000 | 1100-1800 | 3000-5000 |
| 36 | 300-5000 | 1700-2500 | 4000-7000 |
| 42 | 400-10000 | 2400-3500 | 6000-9000 |

Replaceable liners for enhanced performance:

Abrasive, sticky and contamination-sensitive products can all be processed by means of specialized Micro-Jet liners. Specialized liners include:

- Alumina
- Tungsten Carbide
- Silicon Carbide
- PTFE
- Urethane
- Polyethylene

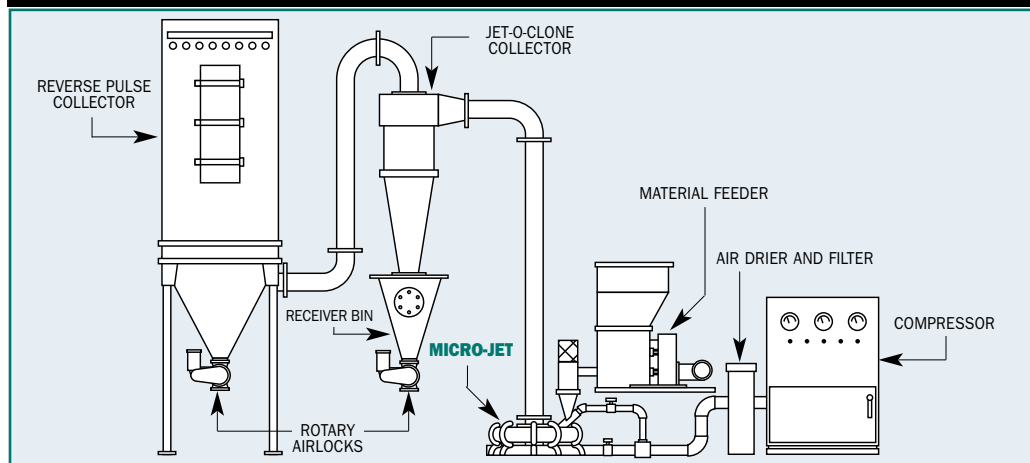
Simple cleanup and changeover: For batch runs and production that requires cleaning between runs, the Micro-Jet allows fast access to all product contact surfaces. The Micro-Jet is engineered for rapid disassembly without special tools.

Combined operations: The Micro-Jet can perform multiple operations simultaneously, for increased efficiency:

- Drying and Grinding
- Blending and Grinding
- Coating and Grinding
- Chemical Addition

Reduced production costs: The Micro-Jet system is engineered to provide maximum flexibility and production efficiency. Our application expertise enables us to provide the optimum system for individual customer requirements.

TYPICAL MICRO-JET SYSTEM



A Model 4 Micro-Jet laboratory system. The self-contained portable system includes all the components required for operation.



The Model 42 Micro-Jet designed to grind a chemical intermediate to a 6 micron average at 2 metric ton/hr.

APPLICATION ENGINEERING

Fluid Energy Processing & Equipment Company operates a complete test facility to demonstrate the performance of our equipment using your raw feed. Complete raw feed and finished product analyses are conducted in our Quality Control Lab. Engineering and process data are accumulated to develop a total system architecture for your application.

Whether your needs involve large-scale production control or basic benchtop convenience, our expert engineering and complete project coordination ensure efficient, cost-saving solutions to your critical application challenges.

SPECIAL SERVICES

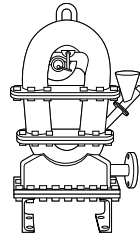
Rental Systems: Most of Fluid Energy's advanced systems are available on a rental basis to fulfill your immediate processing requirements.

Custom Processing: Fluid Energy maintains two facilities for coarse and fine grinding of your material on a contractual basis. Other services include blending, drying and packaging. The fully equipped QA laboratory in each facility is available for moisture, particle size and custom analyses of your products.



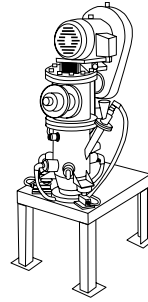
Fluid Energy is the world's largest jet mill supplier, representing over fifty years of experience in jet milling and flash drying technologies.

This strong background, combined with aggressive ongoing product development, makes Fluid Energy an innovative leader in the design of fine material processing systems and specialized equipment.



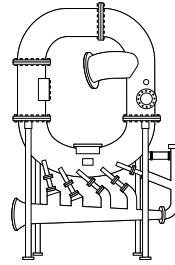
JET-O-MIZER

A unique design makes the JET-O-MIZER the most versatile of our product line, grinding dry materials to the 0.5-45 micron range. This vertical jet grinding mill ensures easy operation, consumes less power and produces a narrow particle size distribution.



ROTO-JET

The ROTO-JET is a grinding mill that utilizes a sophisticated grinding technology yielding more controlled size distribution. With the advanced design of the integrated, adjustable classifier, particle size distribution can be more easily controlled. Efficient compressed air usage and total system automation ensure manufactured product is of the highest quality.



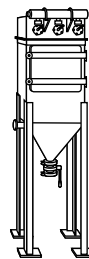
THERMAJET

The THERMAJET is an established line of compact, highly-efficient flash dryers to deagglomerate and dry any wet solid, slurry, centrifuge or filter cake. Ideal for safe processing of heat sensitive or reactive products, these dryers can also be used for flash calcining operations.



JET-O-CLONE

The JET-O-CLONE is a line of custom-designed cyclone separators that can provide primary collection of micron and sub-micron particles at 98%+ efficiency. These separators are commonly used in conjunction with our grinding and drying equipment.



DUST COLLECTORS

Fluid Energy applies its comprehensive processing experience to offer a complete line of DUST COLLECTORS. These advanced systems provide 99.99% effective particulate capture and are designed to ensure compatibility with our grinding and drying systems.

