



PRECISION AND PERFORMANCE



JET MILLS AND CUSTOM PROCESSING

THE JET PULVERIZER COMPANY, INC[®]



Jet Pulverizer



NO DETAIL IS TOO SMALL. AT THE JET PULVERIZER COMPANY, THIS DESCRIBES NOT ONLY THE GUIDING PRINCIPLE OF OUR TECHNICAL OPERATIONS, BUT ALSO OUR PHILOSOPHY OF CUSTOMER SERVICE.

SINCE 1946, JET PULVERIZER HAS BEEN DEFINING AND REFINING WHAT IS POSSIBLE IN THE WORLD OF FINE GRINDING AND MILLING. WE SERVE CUSTOMERS IN A WIDE RANGE OF HIGH PURITY, HIGH QUALITY INDUSTRIES.

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- | | |
|------------------|--------------------|
| • PHARMACEUTICAL | • AEROSPACE |
| • COSMETIC | • PIGMENT |
| • CHEMICAL | • FOOD PROCESSING |
| • NUTRACEUTICAL | • PLASTIC |
| • PAINT | • CERAMIC |
| • ELECTRONICS | • POWER GENERATION |
-

AWARDED SOME OF THE EARLY PATENTS FOR JET ENERGY MILLING EQUIPMENT TECHNOLOGY, THE COMPANY HAS MAINTAINED ITS REPUTATION FOR EXCELLENCE IN BOTH JET MILL SALES AND CUSTOM PROCESSING SERVICES. WITH THE INTRODUCTION OF THE REVOLUTIONARY LIQUAJET® MILLING TECHNOLOGY FOR PLASTICS AND POLYMERS, JET PULVERIZER WILL CONTINUE TO SHAPE THE FUTURE OF FINE GRINDING.



CUSTOM PROCESSING SERVICES

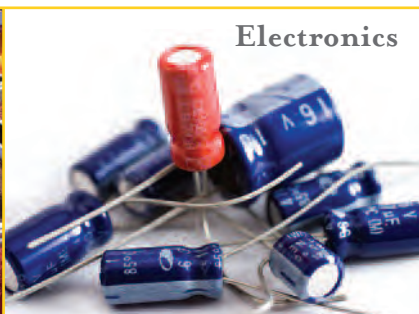
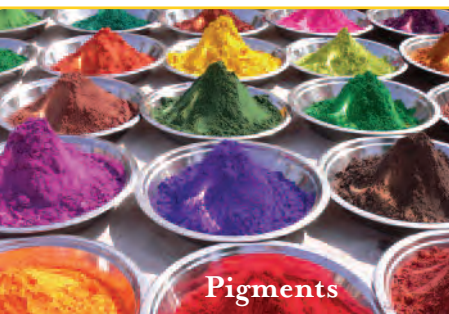
THE FINEST, WHEN SIZE MATTERS

The Custom Processing Division of Jet Pulverizer specializes in size reduction of dry powders in the ranges of 0.25 to 44 microns. As an ISO 9001 and FDA registered company, we support our customers through test grinding, pilot scale, toll processing and process development. We occupy 15,000 square feet of workspace that includes sixteen dedicated processing stations. Processing resources include 12,000 SCFM of oil-free compressed air, 1,000 SCFM of nitrogen gas and 9,000 gallons of liquid nitrogen storage.

PROCESS TECHNOLOGIES AND CAPACITIES

A complete list of the vertically integrated processes we perform include pre-crushing, blending, drying, classifying, mechanical milling, jet milling, and particle size analysis. We process orders ranging from test samples less than one-pound to multi-ton shipments with the same attention to detail, exacting accuracy, and concern for quality. We process a broad range of materials and compounds.

- ABRASIVES
- HEAT & MOISTURE SENSITIVE
- PHARMACEUTICALS
- COSMETICS
- NUTRACEUTICALS
- ORALS & TOPICALS
- PIGMENTS
- FOOD ADDITIVES



OUR QUALITY STANDARD

In compliance with the ISO & FDA requirements, our processing techniques and procedures are designed to maintain the highest level of quality control and safety. Complete processing quality control is maintained with the latest testing technologies including Horiba and Coulter laser diffraction analyzers with wet and dry modules, as well as Multisizer, sieves, tap density and microscopy.



OUTSOURCING FOR GREATER EFFICIENCY

Many of our customers find it is more economical to outsource their processing needs to our Custom Processing Division. Jet Pulverizer has the advantage of generating its own efficient power for compressed air, the availability of various mill configurations, process monitoring, state-of-the art laboratory for powder analysis, and an experienced staff all supported by years of process knowledge. In addition to substantial cost savings, our customers know they can depend on our commitment to quality, purity, reliability, and flexibility.

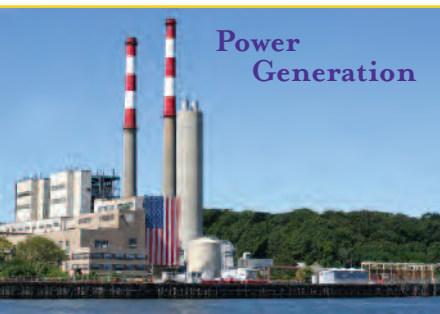




MICRON-MASTER® JET PULVERIZERS

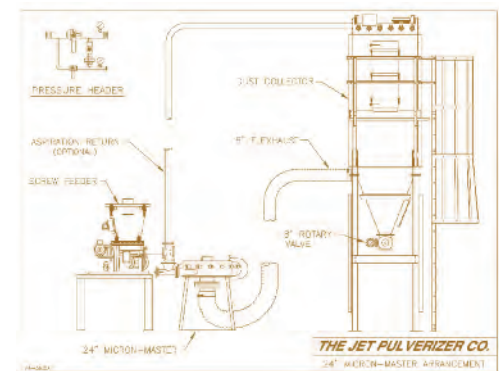
Our legendary Micron-Master® jet pulverizers are a complete line of jet energy mills designed to grind any type of crystalline or friable materials to your exact specifications. From talc to diamonds, Micron-Master® mills deliver precise, consistent and uniform processing performance with no detectable product contamination or heat of attrition. Micron-Master® mills deliver the highest-quality finished ground materials.

Our patented “Orbital”, “W”, and “Volute” Micron-Master® mills provide leading-edge performance in jet pulverizing and fluid energy grinding. These advanced systems are capable of producing an average particle size of 1/3 to 15 microns. Because the jet pulverization process creates no internal temperature increase, our mills can easily handle heat-sensitive materials that cannot be safely processed in conventional grinders.



DESIGNED AND BUILT TO MEET YOUR NEEDS

We manufacture four mill models in eleven sizes, from a 1” Laboratory Mill to our 42” Production Mill. Sanitary mills are available with IQ/OQ protocol documentation for Qualification Test Planning. But beyond our standard options, we can also engineer and produce mills to meet custom configurations using our in-house CAD / CAM capabilities. Constructed from steel or stainless steel, Micron-Master® mills can be equipped with a wide selection of liners to meet specific processing needs, ranging from soft rubber to diamond-hard ceramics.



HOW DO THEY WORK?

Pulverizing in the Micron-Master® is accomplished by the impact of millions of particles, driven at near sonic velocity by jets of air or steam, against millions of other particles of the same material.

The Micron-Master® contains no moving parts or screens, but the construction of the mill is engineered to enhance both the number and velocity of the collisions.

Our designs allow highly predictable and repeatable particle size distribution of the finished material.

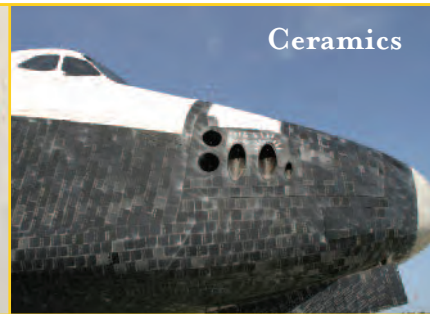


SIMPLE INSTALLATION – DEPENDABLE OPERATION

Micron-Master® mills are engineered and built for easy installation and continuous, trouble-free operation. Processing results are consistently uniform and repeatable, and parts wear is minimal. Clean out is not required for most materials, but, when necessary, disassembly for cleaning or sterilizing is easily accomplished. All points of wear are designed to be easily and directly replaced.

SHARP PRODUCT CLASSIFICATION AND ENERGY-EFFICIENT PROCESSING

The output produced by the Micron-Master® shows a marked improvement over conventional mills, exhibiting a very narrow spread of particle sizes – classification is extremely sharp, and there are no large particles. The final product is similar to the uniformity obtained by passing a material through a conventional micronizer mill twice.



Micron-Master® mills consume a minimum of 20% less energy than conventional jet mills and also eliminate the need for refrigeration to avoid heat rise.

COST-SAVING LEASE/MAINTENANCE AGREEMENTS

In addition to equipment sales, we offer lease/maintenance agreements that assure that the customer's processing needs are met. We have 2", 12" 20" & 24" Micron-Master® systems available for lease. With our experience in a wide range of applications and industrial settings, we will work with our customers to determine which lease, purchase, maintenance, or outsourcing option will meet their needs the best.



WHY CERAMICS

With a MOH hardness of 9.6, ceramic linings have over 25X the abrasion resistance of tool steel. This property allows very abrasive materials such as silica and TiO₂ to be processed with little or no service requirements to maintain long mill life.

We'll build your Micron-Master® with the lining materials best suited to your particular processing requirements.

Other Micron-Master® lining materials include:

- TUNGSTEN CARBIDE
- PTFE
- HARDENED TOOL STEEL
- STAINLESS STEEL
- POLYURETHANE
- RUBBER

LIQUAJET®

WE'RE MILLING THE TOUGH STUFF

LiquaJet® LLC is a new advanced jet milling technology that is opening the door to new product innovations and enhancement opportunities. For the first time, polymers, plastics and elastomeric compounds that were previously considered ungrindable or difficult to grind can be milled finer than ever before. LiquaJet® is the product of The Jet Pulverizer Company's sixty-plus years of experience jet milling and developing process solutions for fine powders.

DEFINING THE DIFFERENCE

Using a proprietary technology made possible by the patented Micron-Master® jet mill, LiquaJet® offers superior, instant micronization with no attritional heat, no moving parts, and no contamination. The LiquaJet® mill is powered by compressed liquid nitrogen, unlike traditional jet mill technology that operates on compressed gas.

EXPLORING THE POSSIBILITIES

Industries that will greatly benefit from this new technology are those that value the highest purity and demand the finest powder possible. LiquaJet® is constantly searching for new material applications. We are open to collaborative opportunities with science and engineering partners to explore product development and research applications for this extraordinary new tool.



- PHARMACEUTICAL EXCIPIENTS
- ANTI-MICROBIAL
- COSMETIC EXTENDERS
- AEROSPACE COMPOSITES

SHAPING THE FUTURE

Toll, custom processing, and test grinding services are available. LiquaJet® is working with universities and industry pioneers to develop novel size reduction solutions. These clients are seeking to mill some of the toughest engineered materials ever created. Results show significant enhancement in the utilization and yield of materials such as: Polycaprolactone (PCL), Polymethyl-methacrylate (PMMA), Polycaprolactam (Nylon 6).

LiquaJet®
www.liquajetllc.com



GRINDING AHEAD:

FAMILY OWNED AND OPERATED SINCE 1946,
THE JET PULVERIZER COMPANY HAS SEEN MANY CHANGES IN
THE INDUSTRY THROUGH THE YEARS. AS TECHNOLOGIES
HAVE EVOLVED AND ADVANCED, REQUIRING FINER AND
HIGHER PURITY MATERIALS, WE HAVE STAYED AHEAD OF OUR
COMPETITORS. WE CONTINUE TO PURSUE WAYS TO GRIND
FINER, OBTAIN GREATER EFFICIENCY AND YIELD,
ENHANCE DURABILITY, INCREASE THROUGHPUT,
AND BROADEN OUR APPLICATION BASE.





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FOUNDED: 1946



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