



**Experts in Solid
Dosage Technology**

A Division of *Spraying Systems Co.*



GRANUMILL[®] SIZE REDUCTION SYSTEMS

Impact and Screening Mills
in a Single System



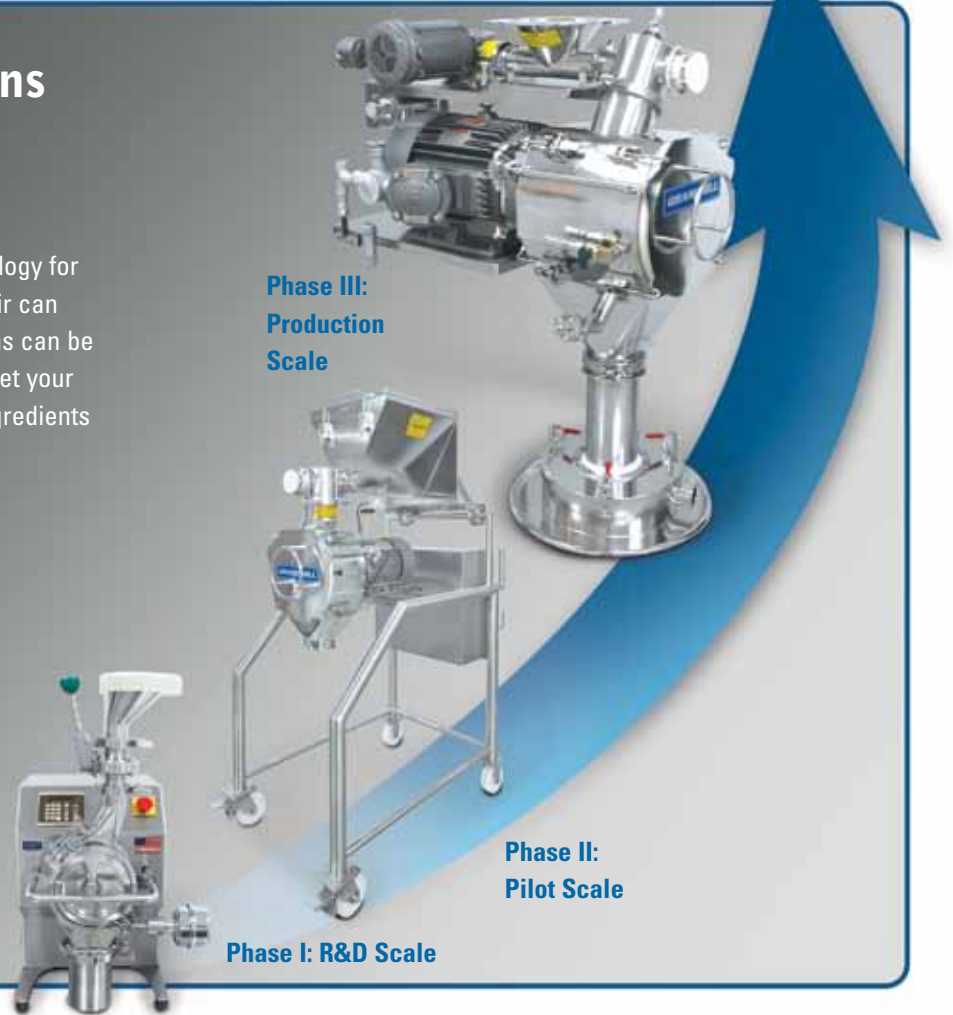
Size Reduction Solutions

Design flexibility ensures peak performance for size reduction systems.

Whether you need solid dosage sizing technology for R&D, pilot, or production applications, Fluid Air can help. Our GRANUMILL® size reduction systems can be quickly and cost-effectively customized to meet your unique processing challenges. Processing ingredients with special requirements? Let us help you optimize your process.

Benefits

- Simplify your scale-up
- Minimize process downtime
- Cost-effective
- Reduce maintenance
- Improve product quality



Simplified Scale-Up/Validation

Rotor blade types and tip speeds are maintained from R&D and production systems, making your process easier to validate and scale up.

Quiet Operation

An innovative rotor design and the mill's housing geometry allow GRANUMILL systems to achieve better results at lower speeds, reducing fines, machine noise, and minimizing particle distribution curves.

Cost-Effective – A Single System for High and Low Speed Milling

GRANUMILL size reduction systems meet SUPAC (Scale Up and Post Approval Changes) guidelines and are both impact mills and screening mills. Basic operating principles allow for low-RPM screening of agglomerates and high-speed impact milling within the same machine.



GRANUMILL® Size Reduction System Advantages

- Variable speed operation allows for both high-speed fine grinding as well as low-speed deagglomeration of wet or dry materials
- GMP design and quick-release housing allow entire mill to be broken down in minutes for cleaning
- Virtually identical tip speed from R&D through production scale ensures scale-up and validation
- Three interchangeable rotor designs available (square/flat, round and knife) for greater particle size control
- Approved for USDA 3A applications including dairy processing
- Choose from multiple feed and discharge options to fit your process
- Quiet operation
- Custom applications

GMP Design

GRANUMILL systems are equipped with a quick-release housing allowing product contact parts to be completely disassembled in a matter of minutes. The components can then be soaked in a tub with detergent and cleaned in significantly less time than is required to disassemble and clean other mills.

Definitions

What is Particle Size Reduction?

There are many different names used to describe particle size reduction – milling, grinding, granulating, comminuting and more. GRANUMILL systems size reduce wet or dry powders in the range of 10 to 400 mesh (2000-27 microns). A typical GRANUMILL system consists of an inlet, chamber with rotor, screen and an outlet. The particle size distribution generated is dependent upon the speed of the rotor, rotor type, screen hole size and the feed rate of the product. All of these parameters are critical and will affect the end particle distribution. As both a screen mill and an impact mill in one machine, GRANUMILL systems offer two applications to suit your processing needs at any scale.

Impact Mills

Impact mills use a high-speed spinning rotor to impact the product, causing it to shatter and reduce in size. A screen in the mill's discharge prevents the particles to escape until they are appropriately sized.

Screening Mills

Screening mills use a low-speed rotor to push the product through a screen, reducing the size of the particles. Screening mills work best on friable materials that break down easily with minimal force.



GRANUMILL® Size Reduction Systems: Specifications

Model	Granumill Jr.*	Granumill 007*	Granumill 014*
Speed (RPM)	500 - 10000	500 - 5000	600 - 3600
Finished particle size mesh (micron)	10 - 400 (2000 - 27)	10 - 400 (2000 - 27)	10 - 400 (2000 - 27)
Throughput (lbs/kg)/hour	0.2 - 60 / .1 - 25	2 - 2250 / 1 - 1000	4-3860 / 2-1750
Height (inches/mm)	25 / 635	80 / 2032	80 / 2032
Width (inches/mm)	12 / 304	32 / 813	40 / 1016
Length (inches/mm)	15 / 381	60 / 1524	68 / 1727
Screen width (inches/mm)	4 / 102	7 / 178	14 / 356

*Dimensions include screwfeeder

Additional Resources

A Guide to Spray Technology for Pharmaceutical and Biopharmaceutical Processing, Bulletin 599

Addresses tablet coating nozzles and manifolds, SprayDry® nozzles, vessel cleaning nozzles and more.



MAGNAFLO®/MAGNACOATER® Fluid Bed Systems, Bulletin FA100

Describes how these systems optimize drying, granulating and coating.



PHARMX® High-Shear Granulating Mixer Systems, Bulletin FA101

Explains how granulating efficiency is maximized and downtime between batches is reduced.



Retrofit Batch Equipment and Controls, Bulletin FA103

Explains how to update and expand the capabilities of current equipment through software upgrades and/or machine conversions.



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