

SOLUTIONS FOR CLASSIFYING FINE POWDERS

# ROTO-SIZER®

**Classification Systems**



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## ULTIMATE CONTROL IN FINE POWDER CLASSIFICATION (0.5-45 MICRONS)

The Roto-Sizer is engineered to provide the most efficient classification of your feed stock. Its advanced design ensures that particles are classified at a precise cut point with product yields in excess of 92%. The Roto-Sizer provides ultimate control of particle size distribution and is adjustable within a wide range of speeds to produce the desired cut point. Efficient rotor and chamber designs ensure that the highest quality product is manufactured.

### APPLICATIONS

#### **SANITARY, STERILE APPLICATIONS:**

pharmaceuticals • foods • cosmetics

#### **ABRASIVE MATERIALS:**

minerals • ores • polishing compounds

#### **COLORING MATERIALS:**

toners • pigments • dyes

#### **AGRICULTURAL MATERIALS:**

pesticides • herbicides • fungicides

#### **HEAT-SENSITIVE MATERIALS:**

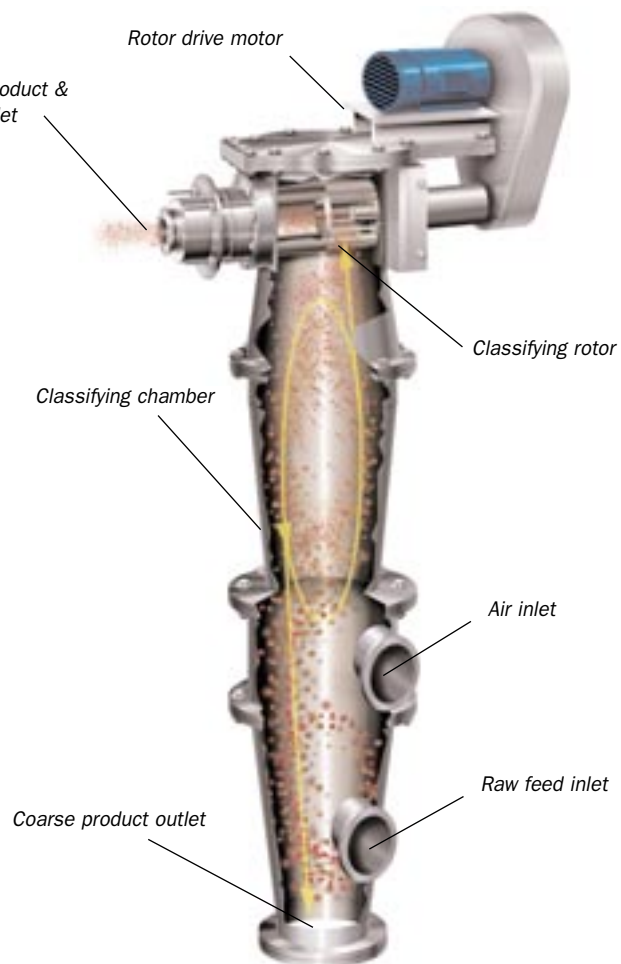
waxes • plastics • resins



We bring a wealth of technical and engineering expertise to our manufacturing process and closely involve the customer in every project. The result is a custom engineered and cost-effective classification circuit operating with the most advanced technology in the industry.

#### **OPERATING PRINCIPLE**

The Roto-Sizer consists of a cylindrical chamber, orientated along its vertical axis, with a horizontally-mounted classifying rotor. Feed material is fed into the upper section of the housing where it falls by gravity and is washed by uprising air injected into the classifying chamber. This elutriation is the



Above: Cut-away illustration details the classification process inside the Roto-Sizer. Left: Model 8 Roto-Sizer designed as a separate classification system with raw material being metered by a volumetric screw feeder.

first step in the Roto-Sizer's classification that actually separates most of the feed's fine and coarse particles. The uprising air carries the fines to the classifying rotor while the coarse particles fall against the air flow and are discharged from the coarse outlet at the bottom.

The second step of the classification is performed at the edge of the classifying rotor. The high speed of the rotor creates a high-velocity air stream at the rotor's periphery. This high-velocity air further washes the fines from the coarse particles before the fines enter the open vane areas of the rotor. This forced-vortex area also deagglomerates and separates the fines in preparation for final classification.

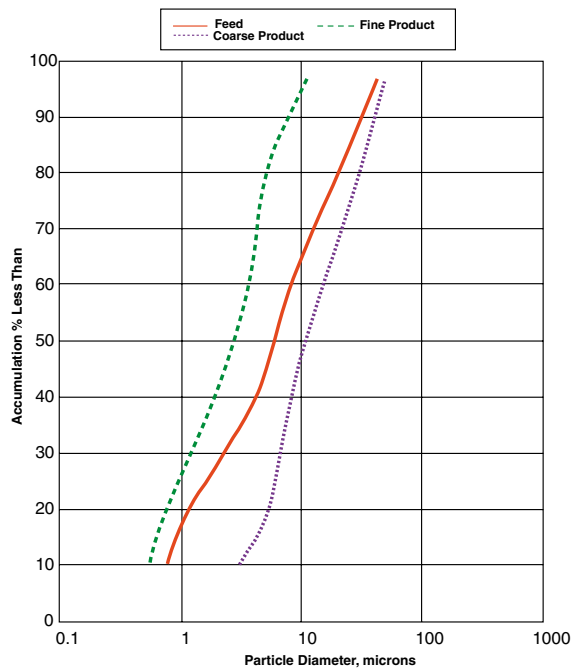
The final classifying step occurs within the rotor. Due to the high centrifugal forces created within the rotor, coarse particles are expelled back to the main chamber where steps 1 and 2 are repeated. The fine particles flow with the air to the fines outlet. A precise classification is

established by varying the rotor speed and air flow to create the desired cut size and sharpness.

**Reliable Construction:** The Roto-Sizer System is constructed entirely in the USA of only the highest quality components. All parts are made in the USA which guarantees rapid delivery of spare items. Comprehensive engineering and durable construction enable our systems to operate continuously 24 hours a day, 365 days a year.

**Engineering Support and Service:** Roto-Sizer testing is done at our facility in Pennsylvania where detailed process data can be obtained for your application. Fluid Energy engineers and quality service technicians are immediately available to provide technical assistance and to guarantee that the Roto-Sizer System performs to your complete satisfaction.

### TYPICAL CLASSIFICATION CURVE



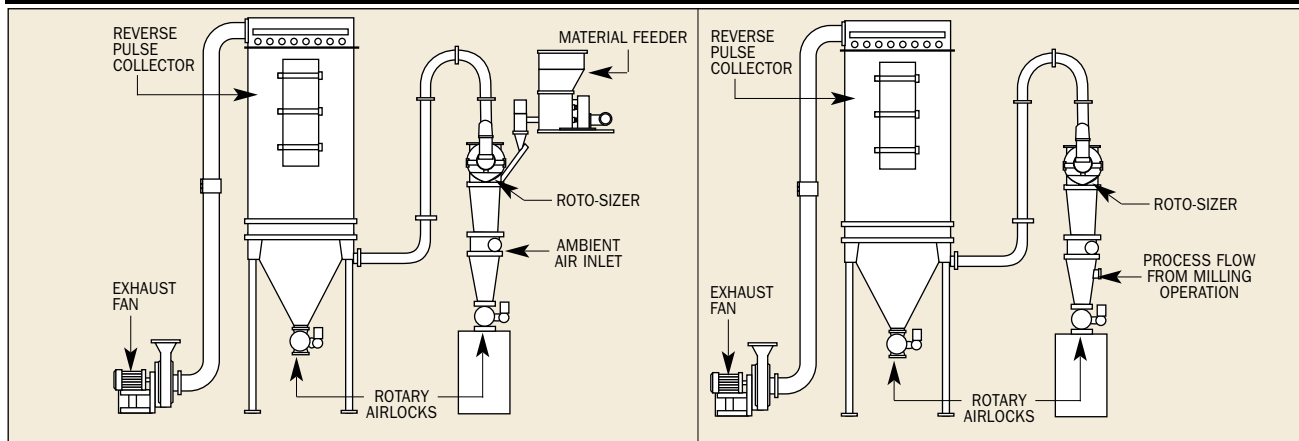
### TYPICAL INSTALLATIONS

- Producing fine powders with steep particle size distribution and precise top size limit (i.e. making a top cut).
- Dedusting of powders to remove objectionable fines (i.e. making a bottom cut). Example: Removing fines from toner.
- Fines "milking" from a larger product stream to obtain a high quality product. Example: Mineral fillers such as calcium carbonate, kaolin, talc, etc.
- Increasing process efficiencies by removing "in-specification" product from grinding circuits and avoiding over-grinding.

### TYPICAL OPERATING PARAMETERS

MODEL RS	FINES ( $d_{97}$ )	FEED RATE (LBS/HR)	CLASSIFIER SPEED (RPM)	POWER (hp)
8	3-80	30-400	1,200-12,000	5
16	4-80	200-1,600	800-8,000	10
24	5-100	800-4,000	600-6,000	20
30	6-100	1,600-9,000	500-5,000	30

### TYPICAL ROTO-SIZER SYSTEM CONFIGURATIONS



Left: Roto-Sizers can be configured as a stand alone classification system utilizing a material feeder, fines collector and exhaust fan.  
 Right: Roto-Sizers can be configured into existing operations utilizing the process flow from a mechanical mill or jet mill.

## 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

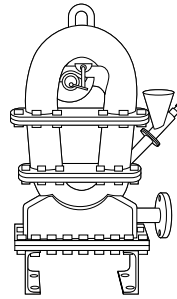
**Rental Systems:** Most of Fluid Energy's advanced systems are available on a rental basis to fulfill your immediate processing requirements.

**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.



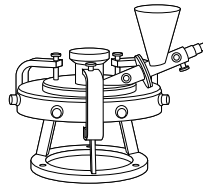
**Fluid Energy** is the world's largest jet mill supplier, representing over fifty years of experience in jet milling and flash drying technologies.

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.



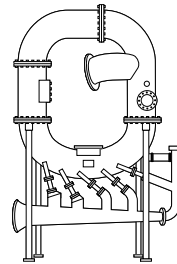
### JET-O-MIZER

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.



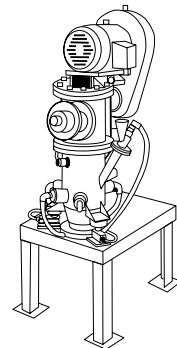
### MICRO-JET

The MICRO-JET is a complete line of horizontal grinding mills capable of producing ultra-fine material down to 0.5-45 micron averages. Replaceable liners and nozzles provide effective grinding of sticky and abrasive materials. An innovative design allows for rapid disassembly and cleaning.



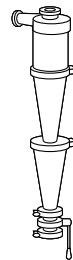
### THERMAJET

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.



### 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.



### 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.

