



Knowledge Beyond Measure.

# Fluidized Bed Aerosol Generator

Model 3400A



## Effectively deagglomerate powders for dispersion over a wide range of concentrations

TSI's Fluidized Bed Aerosol Generator Model 3400A<sup>\*</sup> contains a fluidized bed chamber and a powder reservoir. The fluidized bed consists of 100- $\mu\text{m}$  bronze beads supported by a porous screen that allows clean, dry air to pass through, yet prevents the passage of any powder.

During operation, a bead chain meters powder into the fluidized bed. As air forces its way up through the screen and into the bed, it creates a boiling action, which deagglomerates the powder and causes it to be carried upward by the airflow through a vertical elutriator.

A cyclone at the top of the vertical elutriator prevents any particles that are not fully deagglomerated from being dispersed. With a flow rate of 9 liters/min, the cyclone allows only respirable dust<sup>†</sup> to be generated. Separate flowmeters measure the bed flow rate and the bead purge flow rate.

The powder reservoir is equipped with a gear-driven rake that rocks back and forth, preventing the formation of a channel in the powder due to the movement of the bead chain through the powder reservoir. This assures a constant, even feed rate into the fluidized bed chamber. The airflow pattern through the porous screen further stabilizes the concentration of the output aerosol.

<sup>\*</sup>Developed in cooperation with the University of Minnesota Particle Technology Laboratory.

<sup>†</sup>Respirable dust is defined by the American Conference of Governmental Industrial Hygienists. The flow rate through the 0.5 inch HASL cyclone is that which is recommended by the American Industrial Hygiene Association Aerosol Technology Committee.

## Features

- Particle size range from 0.5 to 40  $\mu\text{m}$
- Bed of bronze beads breaks up powder agglomerates
- Stable output and concentration

## Applications

- Generating dust for inhalation and toxicology studies
- Evaluating performance and calibrating dust samplers and monitors
- Dust erosion in high-speed gas flows
- Generating particles for laser velocimeter applications



## Specifications

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### Output Concentration Range

10 to 100 mg/m<sup>3</sup>

### Powder Feed Rate Range

3 to 30 mm<sup>3</sup>/min, adjustable  
(equates to a feed rate of 180 to  
1800 mg/hour, assuming unit density)

### Carrier Gas Flow Rate Range

5 to 15 liters/min at 345 KPa (50 psi)

### Particle Size Range

Related to size of powder to be dispersed.  
Maximum size is approximately 40- $\mu$ m  
aerodynamic diameter; particles smaller  
than 0.5  $\mu$ m do not deagglomerate efficiently.

### Cyclone

Stainless steel, 0.5-in. diameter,  
classifies respirable dust at 9 liters/min

### Power Requirements

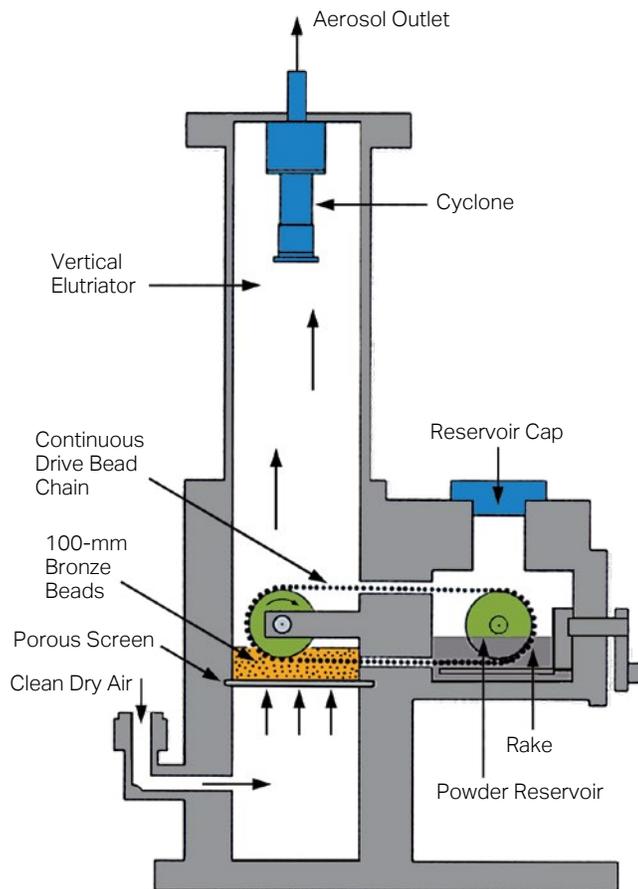
115, 230 VAC; 50 to 60 Hz; 45 W

### Dimensions (LWH)

264 × 368 × 150 mm (10.4 × 14.5 × 5.9 in.);  
with elutriator, H = 483 mm (19 in.)

### Weight

11 kg (24 lbs)



It is recommended that the powder dispersers described in this brochure be used with the TSI® Air Supply System 3074B.

**Warning:** Dispersed dusts may be toxic and hazardous. TSI® assumes no responsibility for personal injury or property damage due to inappropriate use of these instruments.

### To Order

#### Fluidized Bed Aerosol Generator

Specify	Description
3400A	Fluidized Bed Aerosol Generator

#### Optional Accessories

Specify	Description
3012/3012A	Aerosol Neutralizer
1502574	Bronze Beads

Specifications are subject to change without notice.

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