

AERO S AND AERO M WITH FUNNEL SAMPLE FEEDER

Rapid QC measurements for bulk powder samples



PARTICLE SIZE

Key benefits

- Measurement of dry powder particle size distributions over a wide 0.1 – 3500µm range†
- Simple, effective sample introduction and measurement for bulk powders.
- Decreased time-to-results, supporting routine QC operations
- Analysis of large sample masses, ensuring good sampling and reproducible measurements
- Software verification of sample dispersion and measurement settings, for assured method control and standardization.

The Funnel Sample Feeder is designed to help users achieve rapid, reproducible bulk dry powder particle size measurements by allowing samples to be added directly to the Aero S and Aero M dry powder dispersion units without opening the dispersion unit lid. This speeds up and simplifies the process of introducing samples for analysis, decreasing the time required to obtain results. Samples of up to 15g can be loaded directly via the feeder, enabling quick and consistent measurements of bulk powders to be achieved as part of routine product quality control testing.



When measuring the particle size and size distribution of bulk materials, dry powder dispersion is advantageous as it enables the analysis of a large mass of powder. This helps when sampling materials which are polydisperse, improving result reproducibility and assisting detection of out-of-specification materials. In addition, dry powder dispersion eliminates the need for liquid dispersants, reducing the cost of measurement compared to wet dispersion analysis.

The Aero S and Aero M units disperse dry powders by accelerating particles through a venturi using compressed air. Dispersion is achieved through the shearing of agglomerates as well as by particle-particle collisions and particle-wall collisions. This ensures that agglomerated materials are dispersed to a primary particle size prior to measurement using the Mastersizer 3000 or Mastersizer 3000E laser diffraction particle size analysis system. The energy associated with each dispersion mechanism is user-defined and is controlled by setting the air pressure drop across the venturi, enabling dispersion to be achieved without particle break-up.

Management of the sample feed rate into the venturi is required to ensure that reproducible dispersion is achieved. The Funnel Sample Feeder includes a vibrating tray which directs the flow of the powder sample into the venturi. Control of the vibration amplitude, coupled with adjustments to the Funnel Feeder configuration, enables reproducible sample flow to be achieved, even for polydisperse or cohesive materials.

Specifications

Measurement size range	0.1 - 3500 μm † *
Dispersion pressure range	0 - 4 bar
Pressure setting precision	+/- 0.1 bar
Pressure setting accuracy	+/- 0.03 bar
Sample mass which can be measured	15g maximum †
Materials in contact with sample	316 stainless 410 hardened stainless Borosilicate glass EPDM PTFE Polyurethane Carbon filled acetal Aluminium Neoprene Polycarbonate Neodymium
Minimum time between measurements	less than 60 sec †
Dimensions	260 mm x 180 mm x 380 mm (LxWxH)
Mass	10.5kg
Power supply	Supplied via the Mastersizer optical unit

† Sample dependent

* Relates to the use of the unit with the Mastersizer 3000.
Upper limit is 1000 μm when used with the Aero M on the Mastersizer 3000E

Note:

Magnetic materials cannot be measured using the funnel sample feeder as the feeder includes magnetic components.



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