The Jenike Fluidization Segregation Tester measures the tendency of a powder to segregate when fluidized.

Fluidization is a state in which sufficient air or other gas is entrained in a bed of powder such that it behaves like a fluid. This commonly occurs when handling fine powders and it can result in the vertical separation of the powder by particle size, concentrating the smallest particles near the surface while coarser particles more readily settle and concentrate near the bottom. This behavior may result from gas counterflow (for example during the rapid filling of an enclosed vessel, blending or pneumatically conveying), or simply as air escapes from a bed of fine powder and the powder deaerates. Fluidization segregation is most likely to occur when handling a powder with a significant percentage of particles below 100 microns.

**General testing procedures**

A 75 mL sample is placed into the assembled tester using the expansion chamber as a funnel. A filter is installed and secured. The control parameters (air flow rates and times) are set using the controller's touch panel interface. The testing sequence is initiated and the fluidization/deaeration cycle proceeds automatically.

Upon completion of a test, the sample collection jars are positioned, and a handle is rotated, causing the sample to be divided and delivered to each jar. This unique design provides fast and easy sample collection. The stacked components of the test chamber can then be removed from the tester column for cleaning.

**Primary components**

- Control panel for air flow and sequence timing
- Tester column composed of:
  - 3 removable, acrylic cylinders that form the test chamber
  - Acrylic plenum base
  - Stainless steel fluidizing diffuser
  - Acrylic expansion chamber with filter ring for air / particle separation
  - Stainless steel base with locking mechanism
  - Collection jar adapter rings
- Tubing with quick release fitting to connect controller to test column
- Glass jars with lids for sample collection (1 pkg of 24)
- Paper filters (1 pkg of 100)
- Requires:
  - 110 - 240v power (specified when ordering)
  - clean, dry regulated air/nitrogen supply at 15 to 25 psi/170 kPa
The Jenike Sifting Segregation Tester measures the tendency of a powder or granular material to segregate by the sifting segregation mechanism during interparticle motion.

Sifting is the most common mechanism causing particle size based segregation. It occurs when smaller particles move through a matrix of larger ones, or as more mobile large particles tumble down the surface of a forming pile. This commonly occurs when interparticle motion is enabled by filling or transfer operations, and is more pronounced in free flowing materials with a range of particle sizes.

The Sifting Segregation Tester simulates the lateral separation of fine and coarse particles. It provides a trend through one or multiple fill and discharge cycles and allows the comparison of one material or production batch to another utilizing a standardized approach for repeatable, operator-independent results.

**General testing procedures**

A 1-liter sample (maximum particle size of 3 mm) of the material is placed into the steep-walled upper hopper of the assembled tester and is subsequently discharged into the shallow-walled lower hopper. The sample is then discharged from the lower hopper into jars for analysis with a collection valve.

A variation on this test method is to recirculate the material until a steady-state is reached. The tester is specially designed to make this procedure easy. By recirculating the material, the signal strength of the material’s segregation tendency is intensified, and the initial state of the blend is less critical.

A collection valve is used to dispense the sample into multiple jars and can operate in two modes: a “unit dose” mode collecting approximately 1.8cc of powder per withdrawal, as well as a standard valve withdrawal of approximately 55cc. This allows higher resolution sampling at the start and end of sample collection, and faster sample withdrawal between.

**Primary components**

- 1 Acrylic steep-walled upper hopper
- 1 Acrylic shallow-walled lower hopper with slide gate & stainless steel legs
- 1 Acrylic shallow-walled lower hopper with slicing valve
- Glass jars & lids for sample collection (1 pkg of 24)

**Professional services**

Our test equipment is invaluable if your company handles numerous materials in various applications, needs data for quality control purposes, or if you continuously develop new materials. However, if you need to analyze a limited number of materials or solve a specific handling/segregation problem, we can help.

Jenike & Johanson is a specialized engineering firm whose primary focus is to provide a means for companies to obtain reliable bulk solids handling. We offer a range of services in the area of bulk solids flow technology, including consulting, testing, engineering design, and equipment supply.