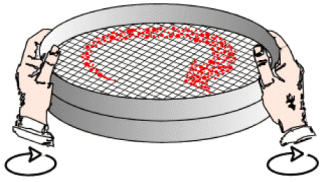
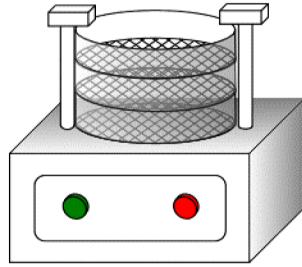


SIEVE CALIBRATION BY THE GLASS MICROSPHERE METHOD



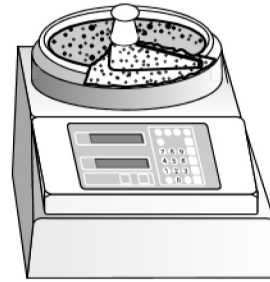
By Hand

(for sieves above 45µm)



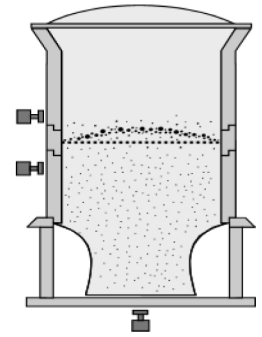
Mechanical Sieve Shaking

(for sieves above 45µm)



Air Jet Sieve

(for sieves 20 - 1000µm)



Sonic Sieve

(for sieves 20 - 1000µm)

Instructions

Place the 200mm or 8 inch sieve to be calibrated with the collecting pan on a 0.01g resolution balance and tare. Select the appropriate calibration standard for the sieve and pour on a single-shot bottle. Record the initial weight of the microspheres. Shake the standard over the surface of the sieve using one of the generic methods shown above until the end-point is reached – see below.

When complete, tap the frame a few times to dislodge near mesh beads and empty the undersize fraction from the pan into a collecting vessel. (These microspheres can be kept for future analysis by microscope if the maximum aperture size of the sieve needs to be determined). Reassemble the sieve and pan and tap a few more times by hand. If beads still fall through the mesh, the shaking time needs to be increased because the end-point has not been reached. Empty the pan again if necessary. Without resetting the tare on the balance, re-weigh the sieve and pan together with the retained microspheres. Record the weight. From the retained weight, calculate the percentage of microspheres passing the sieve and use the calibration graph supplied with the test certificate to determine the mean aperture size.

Sieve shaking methods

By Hand

Use a vigorous swirling action to disperse the standard over the sieve surface. 2 – 3 cycles per second for 1 minute is recommended.

Mechanical Sieve Shaking

Shaking times may vary from 1 – 3 minutes depending on the sieve shaker. Empty and check the pan each minute to determine the end-point.

Air Jet Sieve

A vacuum of 2000 – 2200Pa for 3 minutes is adequate for most sizes above 30 µm. The end-point is when the retained fraction is constant.

Sonic Sieve

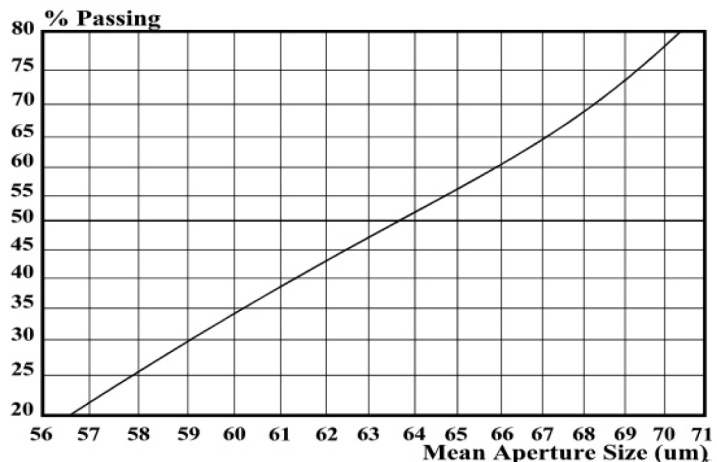
Run time run typically 1 minute. An amplitude of 30 is sufficient to fluidize most standards but increase if necessary.

Mean Aperture Calculation

1. Calculate the percentage of the microspheres passing.
2. Read off the mean aperture size from the calibration graph or use the calibration formula – available on request.

Notes:

- (a) For sieves below 100µm a 5% difference in weight passing usually only corresponds to a 1µm difference in aperture size, which makes this method one of the most accurate ways of calibrating a sieve.
- (b) To clean the sieve, lightly brush the underside with a good quality paintbrush or use an ultrasonic bath. Never use a wire brush or sharp object to remove trapped beads.
- (c) For 300 and 450mm sieves, use 2 to 5 bottles (see web site).



A calibration graph from a 63µm sieve standard