

Calibration Samples

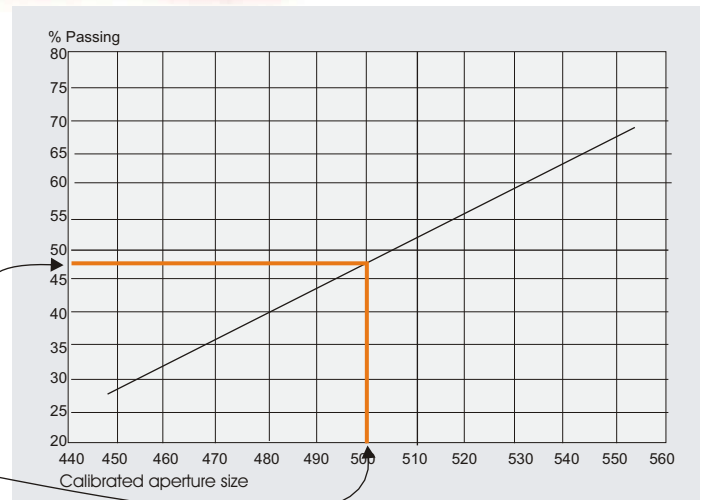
For accurate test sieve calibration



Traceable to the National Physical Laboratory

How to accurately calibrate test sieves in a matter of minutes

1. Select the calibration sample size that matches the aperture size of the sieve.
2. Place a weighed sample on the sieve under test and shake for 2 minutes.
3. Weigh the sample again and calculate the percentage passing through the sieve.
4. Simply read off the percentage passing along a graph like this supplied with every Calibration Sample...
5. ...and the mean average aperture size in μm can be read off here against the graph



What are calibration samples?

Endecotts calibration samples are microspheres formed of soda-lime glass that range from 3.35 mm down to 20 micron sizes. Because of the precise nature and extent of the range of spheres, samples can be supplied to enable the accurate calibration of individual sieves to an accuracy of approx $1\mu\text{m}$. The microspheres pass over, almost, the total surface of the sieve enabling more apertures to be examined than with any other method. Consequently, calibration samples are one of the most accurate methods of sieve calibration available.

Endecotts glass microspheres are calibrated by an external laboratory who are recognised as one of the leading particle analysis laboratories by the BCR, and by 20 other leading European particle size analysis laboratories.

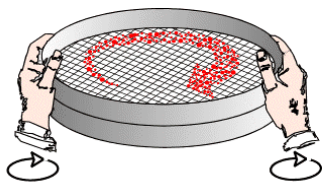
The table opposite lists the nominal aperture size of a specific sieve and the appropriate Calibration Sample required (Product Code).

The samples are supplied in 'Single Use' vials complete with calibration certificate.

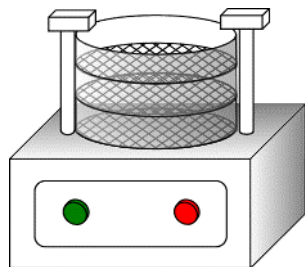
Nominal Aperture	Aperture Range	Product Code	Nominal Aperture	Aperture Range	Product Code
20 μm	15 - 25 μm	ZSICSA-.020	315 μm	255 - 355 μm	ZSICSA-.300
25 μm	20 - 32 μm	ZSICSA-.025	355 μm	300 - 425 μm	ZSICSA-.355
32 μm	25 - 38 μm	ZSICSA-.032	400 μm	355 - 500 μm	ZSICSA-.425
36 μm	32 - 45 μm	ZSICSA-.038	425 μm	355 - 500 μm	ZSICSA-.425
38 μm	32 - 45 μm	ZSICSA-.038	450 μm	355 - 500 μm	ZSICSA-.425
40 μm	32 - 45 μm	ZSICSA-.038	500 μm	425 - 600 μm	ZSICSA-.500
45 μm	38 - 53 μm	ZSICSA-.045	560 μm	500 - 710 μm	ZSICSA-.600
50 μm	45 - 63 μm	ZSICSA-.053	600 μm	500 - 710 μm	ZSICSA-.600
53 μm	45 - 63 μm	ZSICSA-.053	630 μm	500 - 710 μm	ZSICSA-.600
56 μm	45 - 63 μm	ZSICSA-.053	710 μm	600 - 850 μm	ZSICSA-.710
63 μm	53 - 75 μm	ZSICSA-.063	800 μm	710 μm - 1 mm	ZSICSA-.850
71 μm	63 - 90 μm	ZSICSA-.075	850 μm	710 μm - 1 mm	ZSICSA-.850
75 μm	63 - 90 μm	ZSICSA-.075	900 μm	710 μm - 1 mm	ZSICSA-.850
80 μm	63 - 90 μm	ZSICSA-.075	1.00 mm	850 μm - 1.18 mm	ZSICSA-1.00
90 μm	75 - 106 μm	ZSICSA-.090	1.12 mm	1.0 - 1.4 mm	ZSICSA-1.18
100 μm	90 - 125 μm	ZSICSA-.106	1.18 mm	1.0 - 1.4 mm	ZSICSA-1.18
106 μm	90 - 125 μm	ZSICSA-.106	1.25 mm	1.0 - 1.4 mm	ZSICSA-1.18
112 μm	90 - 125 μm	ZSICSA-.106	1.40 mm	1.18 - 1.7 mm	ZSICSA-1.40
125 μm	106 - 150 μm	ZSICSA-.125	1.60 mm	1.4 - 2.0 mm	ZSICSA-1.70
140 μm	125 - 180 μm	ZSICSA-.150	1.70 mm	1.4 - 2.0 mm	ZSICSA-1.70
150 μm	125 - 180 μm	ZSICSA-.150	1.80 mm	1.4 - 2.0 mm	ZSICSA-1.70
160 μm	125 - 180 μm	ZSICSA-.150	2.00 mm	1.7 - 2.36 mm	ZSICSA-2.00
180 μm	150 - 212 μm	ZSICSA-.180	2.24 mm	2.0 - 2.8 mm	ZSICSA-2.36
200 μm	180 - 250 μm	ZSICSA-.212	2.36 mm	2.0 - 2.8 mm	ZSICSA-2.36
212 μm	180 - 250 μm	ZSICSA-.212	2.50 mm	2.0 - 2.8 mm	ZSICSA-2.36
224 μm	180 - 250 μm	ZSICSA-.212	2.80 mm	2.36 - 3.35 mm	ZSICSA-2.80
250 μm	212 - 300 μm	ZSICSA-.250	3.15 mm	2.84 - 4.0 mm	ZSICSA-3.35
280 μm	250 - 355 μm	ZSICSA-.300	3.35 mm	2.84 - 4.0 mm	ZSICSA-3.35
300 μm	250 - 255 μm	ZSICSA-.300	3.55 mm	2.84 - 4.0 mm	ZSICSA-3.35

Each individual calibration sample is supplied with a Certificate of Calibration

SIEVE CALIBRATION BY THE GLASS MICROSPHERE METHOD



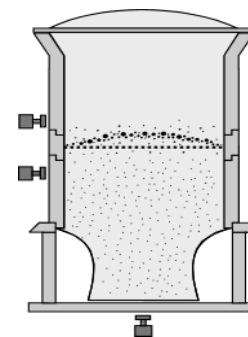
By Hand
(for sieves above 45 μm)



Mechanical Sieve Shaking
(for sieves above 45 μm)



Air Jet Sieve
(for sieves 20 - 1000 μm)



Sonic Sieve
(for sieves 20 - 1000 μm)

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

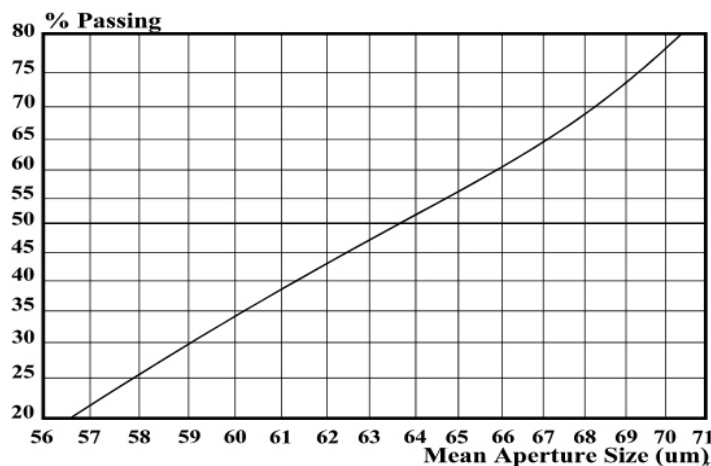
Run time run typically 1 minute. An amplitude of 30 is sufficient to fluidize most standards but increase if necessary.

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 100 μm a 5% difference in weight passing usually only corresponds to a 1 μm 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 63 μm sieve standard