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Certificate of Analysis

NIST TRACEABLE SIEVE CALIBRATION STANDARD

Sieve Size:

425 microns

1. Electroformed Sieve Analysis

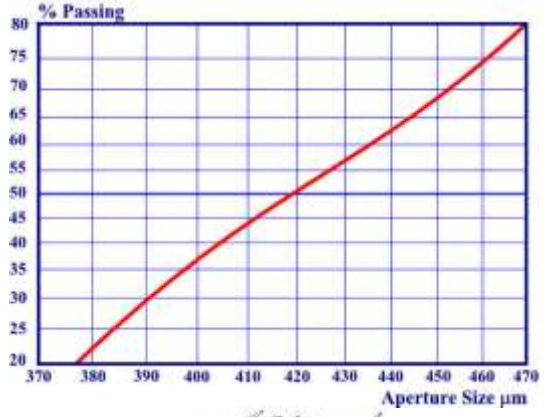
Sieve Size (μm)	Weight Fraction (%)	Cumulative % Undersize
498.4	3.8	96.2
423.6	43.2	53.0
349.8	52.2	0.8
298.2	0.8	0

5 random samples from the spinning riffler
Average sample recovery 99.9%
Mean Standard Deviation = +/- 0.09% - for 98% of the distribution

2. Interpolated Data

% Passing	Aperture Size (μm)	% Passing	Aperture Size (μm)
20	376.8	55	426.2
25	384.2	60	435.5
30	390.7	65	443.9
35	398.2	70	452.3
40	404.7	75	461.6
45	412.2	80	470.0
50	**418.7**		

3. Calibration Graph



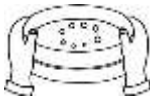
Issued by: Dr G R Rideal
Senior Analyst

Notes:
1. The Electroformed Sieves used to certify the sieve standards were calibrated by optical microscopy using a Stage Reference Graticules by NIST (test No.821/263573-00) and (NPL) National Physical Laboratory, UK (Reference No. 08A038/970127/106-66).
2. For full details of methodology see G R Rideal, J Storey, T R Morris, 'Sieve Calibration - A New Simple but High Precision Approach 'Particle and Particle Systems Characterization, 17, (2000). For other publications see www.WhitehouseScientific.com.
3. Whitehouse Scientific Ltd does not accept responsibility for losses, financial of otherwise which may occur as a result of the interpretation or use of the information contained within this certificate.
4. Do not reuse the standards or use 3 years after date stamp without consulting Whitehouse Scientific.
5. Certificate only valid when used in conjunction with Whitehouse Scientific labelled bottles/standards.
6. Whitehouse Scientific is the leading European Particle Size Certification Laboratory for the Community Bureau of Reference(BCR) Brussels (Laboratory News - August 1996), Brighton, UK.

SIEVE CALIBRATION BY THE GLASS MICROSPHERE METHOD

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 record the initial weight of the microspheres. Shake the full contents of the bottle over the surface of the sieve. Test the sieve using one of the generic methods shown below until the end-point is reached (recommended run times are shown 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. Enter the initial weight and the retained weight into the Whitehouse Scientific Sieve Aperture Size Calculator to display your sieves aperture size. Alternatively, from the retained weight, calculate the percentage of microspheres passing the sieve and use the calibration graph supplied opposite to determine the mean aperture size.

SIEVE SHAKING METHODS



By Hand
(for sieves above 45μm)
Use a vigorous swirling action to disperse the standard over the sieve surface. 2–3 cycles per second for 1 min is recommended.

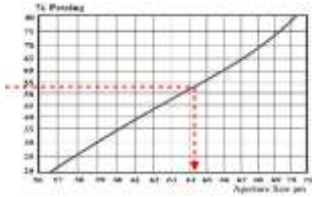
Mechanical Sieve Shaking
(for sieves above 45μm)
Shaking times may vary from 1-3 minutes depending on the sieve shaker. Empty and check the pan each minute to determine the end-point

Air Jet Sieve
(for sieves 20-1000μm)
A vacuum of 2000–2200Pa for 3 minutes is adequate for most sizes above 30μm. The end-point is when the retained fraction is constant.

Sonic Sieve
(for sieves 20-1000μm)
Run time 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 Whitehouse Scientific Sieve Aperture Size Calculator Software.



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 soft bristle bush 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).

SIEVE CALIBRATION STANDARD

Whitehouse Scientific
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NIST Traceable
SIEVE CALIBRATION STANDARD

425μm (also calibrates 400 and 450μm sieves)
Catalogue No: SS408 Nominal Weight: 5 x 2.5g FOR REFERENCE ONLY