WHICH STANDARD SHOULD I USE?

The aperture size of every sieve manufactured from 20 to 3350 microns can be certified to NIST traceability. Our standards are named after the 30 most popular sieves (R40/3) but can also be used for the 30 intermediate sizes. If you are unsure of the standard you should be using just check the table below (table 1).
The 'primary' sieve size is highlighted in bold, the sieve on either side can also be calibrated using the same Sieve Standard.

TOLERANCES

Please note that although the sieve may not conform to the exact nominal size, it is still in specification if the variation about the mean is accordance with table 2.

Table 1: Selecting the Correct Standard

Sieve Size		
-	**20 µm**	-
-	**25 µm**	-
-	**32 µm**	-
36 µm	**38 µm**	40 µm
-	**45 µm**	50 µm
-	**53 µm**	56 µm
-	**63 µm**	-
71 µm	**75 µm**	80 µm
-	**90 µm**	-
100 µm	**106 µm**	112 µm
-	**125 µm**	-
140 µm	**150 µm**	160 µm
-	**180 µm**	-
200 µm	**212 µm**	224 µm
-	**250 µm**	280 µm
-	**300 µm**	315 µm
-	**355 µm**	-
400 µm	**425 µm**	450 µm
-	**500 µm**	-
560 µm	**600 µm**	630 µm
-	**710 µm**	-
800 µm	**850 µm**	900 µm
-	**1.00mm**	-
1.12mm	**1.18mm**	1.25mm
-	**1.40mm**	1.55mm
1.60mm	**1.70mm**	1.80mm
-	**2.00mm**	-
2.24mm	**2.36mm**	2.50mm
-	**2.80mm**	3.15mm
-	**3.35mm**	3.55mm

Table 2: Recommended Tolerances – Microscopy (ISO 3310-1:2000 and ASTM E-11)

Nominal Sieve size	Mesh #	ISO Tolerance @ mean	ASTM Tolerance @ mean	ISO Max single aperture	ASTM Max single aperture	ISO Max SD =D84%	ASTM Max @ D95%	ISO Count for microscopy
20µm	635	17.7 – 22.3µm	17 – 23µm	34µm	35µm	25.7µm	29µm	2 x 300
25µm	500	22.5 – 27.5µm	22 – 28µm	41µm	41µm	31.1µm	34µm	2 x 300
32µm	450	29.3 – 34.7µm	29 – 35µm	51µm	50µm	38.8µm	42µm	2 x 300
38µm	400	35.1 – 40.9µm	35 – 41µm	58µm	57µm	45.7µm	48µm	2 x 300
45µm	325	41.9 – 48.1µm	42 – 48µm	67µm	66µm	53.3µm	57µm	2 x 250
53µm	270	49.6 – 56.3µm	49 – 57µm	77µm	76µm	62.0µm	66µm	2 x 250
63µm	230	59.3 – 66.7µm	59 – 67µm	89µm	89µm	72.9µm	77µm	2 x 250
75µm	200	70.9 – 79.1µm	70 – 80µm	104µm	103µm	85.8µm	91µm	2 x 250
90µm	170	85.4 – 94.6µm	85 – 95µm	122µm	122µm	102.0µm	108µm	2 x 200
106µm	140	100.8 – 111.2µm	100 – 112µm	141µm	141µm	119.2µm	126µm	2 x 200
125µm	120	119.2 – 130.8µm	118 –132µm	163µm	163µm	139.4µm	147µm	2 x 200
150µm	100	143.4 – 156.6µm	142 – 158µm	193µm	192µm	166.3µm	174µm	2 x 200
180µm	80	172.4 – 187.6µm	171 – 189µm	227µm	227µm	198.0µm	207µm	2 x 200
212µm	70	203.3 – 220.7µm	202 – 222µm	264µm	263µm	232.0µm	242µm	2 x 160
250µm	60	240.1 – 259.9µm	238 – 262µm	308µm	306µm	272.4µm	283µm	2 x 160
300µm	50	288 – 312µm	286 – 314µm	365µm	363µm	325.4µm	337µm	2 x 160
355µm	45	342 – 368µm	339 – 371µm	427µm	425µm	383.2µm	396µm	2 x 160
425µm	40	409 – 441µm	406 – 444µm	506µm	502µm	457.2µm	471µm	2 x 120
500µm	35	482 – 518µm	480 – 520µm	589µm	585µm	535.9µm	550µm	2 x 120
600µm	30	579 – 621µm	575 – 625µm	701µm	695µm	640.5µm	660µm	2 x 100
710µm	25	685 - 735µm	680 – 740µm	822µm	815µm	755.8µm	775µm	2 x 100
850µm	20	821 – 879µm	815 – 880µm	977µm	970µm	902.2µm	925µm	2 x 80
1.00mm	18	0.97 – 1.03mm	0.96 – 1.04mm	1.14mm	1.135mm	1.059mm	1.083mm	2 x 80
1.18mm	16	1.14 – 1.22mm	1.135 – 1.225mm	1.34mm	1.330mm	1.247mm	1.270mm	2 x 80
1.40mm	14	1.35 – 1.45mm	1.35 – 1.45mm	1.58mm	1.565mm	1.487mm	1.505mm	2 x 80
1.70mm	12	1.64 – 1.76mm	1.64 – 1.76mm	1.90mm	1.890mm	1.787mm	1.820mm	2 x 50
2.00mm	10	1.93 – 2.07mm	1.93 – 2.07mm	2.23mm	2.215mm	2.105mm	2.135mm	2 x 50
2.36mm	8	2.28 – 2.44mm	2.28 – 2.44mm	2.61mm	2.609mm	2.474mm	2.515mm	2 x 40
2.80mm	7	2.71 - 2.89mm	2.705 – 2.895mm	3.09mm	3.070mm	2.930mm	2.975mm	2 x 40
3.35mm	6	3.24 - 3.46mm	3.24 – 3.46mm	3.67mm	3.66mm	3.501mm	3.55mm	2 x 40

SIEVE CALIBRATION STANDARD

Whitehouse Scientific®

www.WhitehouseScientific.com

NIST Traceable

SIEVE CALIBRATION STANDARD

REQUIRES V2.1 NEW BATCH SIEVE CALCULATOR

2.00mm

Catalogue No: SS417 Nominal Wt: 5 x 20.0g Batch No: 02 FOR REFERENCE ONLY

Whitehouse Scientific
Whitchurch Road
Waverton
Chester CH3 7PB
UK
+44 1244 332626
Whatever the particle sizing method...we have the perfect solution! www.WhitehouseScientific.com

Certificate of Analysis

NIST TRACEABLE SIEVE CALIBRATION STANDARD

Sieve Size:

2.00mm

1. Electroformed Sieve Analysis

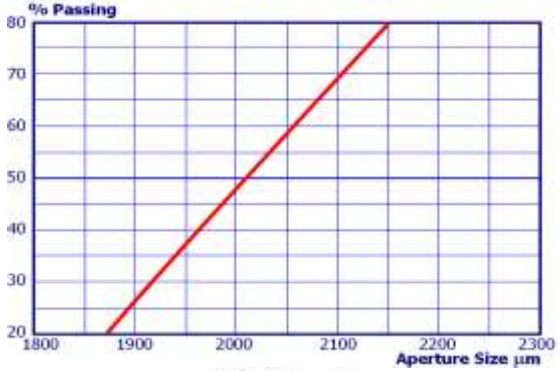
Sieve Size (μm)	Weight Fraction (%)	Cumulative % Undersize
2244	0.9	99.1
1999	51.2	47.9
1806	42.8	5.1
1410	5.1	0

5 random samples from the spinning riffler
Sample recovery > 99%
Max Standard Deviation = +/- 0.3% - for 98% of the distribution

2. Interpolated Data

% Passing	Aperture Size (μm)	% Passing	Aperture Size (μm)
20	1872	55	2034
25	1895	60	2056
30	1918	65	2080
35	1939	70	2103
40	1962	75	2127
45	1985	80	2151
50	**2009**		

3. Calibration Graph



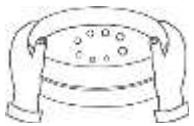
Issued by: Dr G R Rideal
Senior Analyst

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 (Ref 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. The data supplied herein applies for single use only. For repeated use, losses must be kept below 3% of original weight. **(Use within 5 years of date stamp)**
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

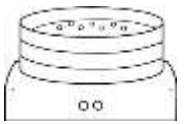
Place the 200mm or 8 inch sieve to be calibrated with the collecting pan on a 0.01g resolution balance and tare. Select the appropriate calibration standard for the sieve and record the initial weight of the microspheres. Shake the full contents of the bottle over the surface of the sieve. Test the sieve 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



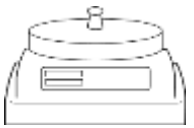
By Hand
(for sieves above 45μm)

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



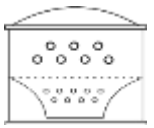
Mechanical Sieve Shaking
(for sieves above 45μm)

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.

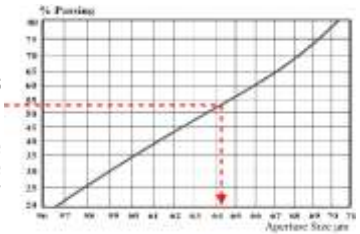


Sonic Sieve
(for sieves 20-1000μm)

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).