


# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

	<b>Avon Calibration Services</b>	
	<b>Issue No: 015      Issue date: 13 October 2004</b>	
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### SUMMARY OF ACCREDITATION

#### Calibration performed on permanent laboratory premises

#### DIMENSIONAL

Angle plates, box angle plates  
Balls  
Clinometers  
Comparators  
Cylindrical setting standards  
Dial gauges, lever  
Dial gauges, plunger  
Feeler gauges  
Gauge block accessories  
Gauge blocks (by comparison)  
Height gauges, electronic  
Height gauges, setting masters  
Length bar accessories  
Length gauges, flat & spherical ended  
Levels, electronic  
Levels, spirit  
Micrometers, 3 point bore  
Micrometer heads  
Micrometers, bench  
Micrometers, depth  
Micrometers, external  
Micrometers, height setting  
Micrometers, height setting riser blocks  
Micrometers, internal  
Parallels, engineers  
Plain gap gauges, parallel  
Plain plug gauges parallel  
Plain ring gauges, parallel  
Plain setting rings, parallel  
Protractors, bevel  
Receiver & position gauges, jigs, fixtures  
Screw caliper gauges, parallel  
Screw plug gauges, parallel  
Screw plug gauges, taper  
Screw ring gauges, parallel  
Screw ring gauges, taper  
Sine bars, centres, tables  
Squares, blade  
Squares, block  
Squares, cylindrical  
Steel rules, engineers  
Straightedges  
Surface plates & tables

Thread diameter measuring machines  
Thread measuring cylinders  
Thread measuring vee pieces (prisms)

Vee blocks  
Vernier gauges, caliper  
Vernier gauges, depth  
Vernier gauges, height



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#### DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Best Measurement Capability Expressed as an Expanded Uncertainty ( $k=2$ )	Remarks
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED			
LENGTH			NOTES
Gauge blocks		Class (see notes)	<p><b>Class C</b> uncertainties apply to the measurement of length of steel gauges by comparison with grade K standards of length of a similar material. Class C uncertainties apply to new grade 0, 1 and 2 gauges to BS 4311:Part 1:1993 and represent the best capability for all grades of used gauges to BS 4311:Part 3:1993.</p> <p><b>Class D and E</b> uncertainties are the maximum applicable to the measurement of length of steel grade 3 and 4 gauges respectively to BS 4311:Part 3:1993, by comparison with grade K standards of length of a similar material.</p> <p>1 All calibrations must be carried out in accordance with procedures agreed by UKAS</p> <p>2 In addition to specified items other similar items, including parts of measuring instruments and machines, may be calibrated (see note 1) to the uncertainties stated. Where the item or part calibrated is lower quality due to wear, errors in geometry of form, poor surface texture, or where any other factor that adversely affects the measurement capability, greater uncertainties must be quoted.</p> <p>3 The uncertainty quoted is for the departure from either flatness, straightness, parallelism planes, which just enclose the surface under consideration.</p> <p>4 Single start, symmetrical thread forms only.</p> <p>5 Single start symmetrical and asymmetrical thread forms only.</p>
Inch (steel)	As BS 4311:Parts 1 & 3:1993	C D E	
	Up to 0.4 in	3 4 6	
	Above 0.4 in up to 1 in	4 5 8	
	Size 2 in	5 7 10	
	Size 3 in	6 8 12	
	Size 4 in	7 10 14	
		] $\mu$ in	
Millimetre (steel)	As BS EN ISO 3650:1999	0.08 0.10 0.15	
	Up to 10	0.1 0.13 0.20	
	Above 10 up to 25	0.12 0.17 0.25	
	Sizes 30, 40, 50, 60, 70, 75 80, 90, 100	0.15 0.21 0.30 0.18 0.25 0.35	
Gauge blocks accessories	As BS 888 and BS 4311:Part 2	0.3	
Length bar accessories	As BS 1790:1961 and BS 5317	0.3	
Thread measuring cylinders	As BS 5590:1978 and specials	0.5	
plain plug gauges (parallel), cylindrical standards and rollers	From 1 up to 50 diameter From 50 up to 150 diameter	0.8 1	
Plain ring gauges (parallel) and setting standards	From 1 up to 50 Above 50 up to 100	1.5 2	
Steel balls - steel	Up to 50	1	
Plain gap gauges (parallel)	From 0.5 up to 100 Above 100 up to 200 200 up to 300	3 5 8	
Screw plug gauges (parallel) including check and setting plugs See Note 5	From 1 up to 100 diameter	3	
Screw plug gauges (taper) including check plugs See Note 4	From 1 up to 100 diameter	4	
Screw ring gauges (parallel) See Note 5	From 1 up to 6 diameter From 6 up to 100 diameter	By check plugs 5	
Screw ring gauges (taper) See Note 4	From 5 up to 50 diameter Form 10 to 150	By check plugs 7 on pitch diameter	
		on pitch diameter	
		pitch: 1.0 flank angle: $2 + (800/(M \times P))$	
		Minutes of arc Where $M$ is projector magnification and $P$ is pitch in mm	



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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED			
Screw thread adjustable caliper gauges (parallel) See Note 5 Length gauges, flat and spherical ended	From 3 up to 50 diameter  Up to 1 m	By setting plugs  $1 + (8 \times \text{length in m})$	
Engineers parallels	As BS 906:Part 1:1972 up to 50 x 100 x 400	Dependant on size and grade From 1.5 up to 5	
Vee blocks	As BS 3731:1987 up to 150	Dependant on size and grade. Minimum per co-ordinate	
Receiver, position and profile gauges, jigs and fixtures	Up to 1000 x 600 x 600	$3 + (20 \times \text{length in m})$ $3 + (10 \times \text{length in m})$	
ANGLE			
Squares			
Blade type	As BS 939:1977 up to 300 Above 300 up to 600	3 5	] See note 3
Cylindrical	As BS 939:1977 up to 300 Above 300 up to 600	2 5	
Block	As BS 939:1977 up to 300 Above 300 up to 600	3 5	
Right angle and box angle plates	As BS 5535:1978	Squareness: $3 + (1 \text{ per } 100 \text{ mm})$ Parallelism: $1 + (1 \text{ per } 100 \text{ mm})$	
Sine bars and tables	As BS 3064:1978 up to 250 length	Linear dimensions $1 + (10 \times \text{length in m})$ Overall performance 3 seconds of arc	
Electronic indicating levels	Up to 20 minutes of arc	1 % of range Minimum 0.5 seconds of arc	
Spirit levels	As BS 3509:1962 and BS 958:1968	Mean sensitivity 10% of nominal Minimum 0.5 seconds of arc	
Clinometers	From 0 - 360 deg	10 seconds of arc or greater Dependant on sensitivity	
Thread measuring vee pieces (prisms)	As NPL Schedule MOY/SCM1/60	Within schedule requirements	
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<b>FORM</b>			
Surface plates Granite Cast iron	As BS 817:1988 and above up to 1600 x 1000	1.5 + (0.8 x diagonal in m) See note 3	
Straightedges Cast iron Steel Granite	As BS 5204:Part 1:1975 As BS 5204:Part 2:1977 Up to 1800	1 + (2 x length in m) See note 3	
<b>MEASURING INSTRUMENTS AND MACHINES</b>			
Micrometers External Internal Depth	As BS 870:1959 As BS 959::1959 As BS 6468:1984	Heads: 2.0 Setting and extension rods 1 + (8 x length in m)	
Micrometer heads	As BS 1734:1951	1.0	
Bore micrometers (three point)	Up to 150 diameter	5.0	
Bench micrometers		Overall performance 2.0	
Height setting micrometer	Up to 300	Heads:1.2 Stepped column 2 Overall performance 2.5	
Riser blocks for above	150 300	1.0 2.0	
Vernier caliper, height and depth gauges	As BS 887:1982 and BS 1643:1983	Overall performance 10 + (30 x length in m)	
Comparators (external)	As BS 1054:1975 up to 10 000 magnifications	1% of range Minimum 0.2	
Electronic Height Gauges with microprocessor control	Up to 1m	1 + (8 x length in m)	
Dial gauges and dial test indicators	As BS 907:1965 and BS 2795:1981	1.0	
Bevel protractors	As BS 1685:1959	1 minute of arc + 1 vernier division	
Thread diameter measuring	Up to 200 capacity	Dependant on quality and overall performance	
Steel Rules	As BS 4372:1968 Up to 1000	15 + (20 X length in m)	
Feeler Gauges	As BS 975:Part 1:1941 BS 957:Part 2:1969	3	
END			