Schedule of Accreditation

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Micron Metrology 2000 Limited

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Calibration performed by the Organisations at the locations specified below

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details		Activity	Location code
Address Eurolab House Unit 10 Valepits Road Garretts Green Industrial Estate Birmingham B33 0TD	**Local contact** Mr A A Smith	Dimensional Electrical Mass Torque Pressure	A

Site activities performed away from the locations listed above:

Location details		Activity	Location code
At customers premises	Mr A A Smith	Dimensional Electrical Mass Pressure	B

DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k=2)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH			NOTES	
Gauge blocks		Class (see footnote)	**Class C** uncertainties apply to the measurement of length of steel and tungsten carbide gauges by comparison with grade K standards of length of a similar material. Class C uncertainties apply to grade 0, 1 and 2 gauges to BS EN ISO 3650:1999 and BS 4311:2007. **Class D** uncertainties represent the best capability for the measurement of length of gauges by comparison with grade K standards of length of a dissimilar material.	A
Inch (Steel and tungsten carbide)	BS 4311:2007 0.01 in to 0.4 in 0.4 in up to 1 in Size 2 in 3 in 4 in	C D 3.0 4.0 4.0 5.0 5.0 7.0 µ in 6.0 8.0 7.0 10		
Millimetre (Steel and tungsten carbide)	BS EN ISO 3650:1999 0.5 to 10 10 up to 25 Size 30, 40, 50 60, 70, 75 80, 90, 100	C D 0.080 0.10 0.10 0.13 0.12 0.17 0.15 0.21 0.18 0.25		
Thread measuring cylinders	BS 5590 and specials 0.1 to 5	0.50		A
Plain plug gauges (parallel) cylindrical setting standards and rollers	1 to 25 diameter 25 to 100 diameter 100 to 150 diameter 150 to 200 diameter 200 to 300 diameter 300 to 600 diameter	0.50 0.80 1.2 on diameter 1.5 2.0 4.0		A
Plain plug gauges (taper)				A
Parallel to 1 in 8 on diameter	3 to 50 diameter 50 to 100 diameter 100 to 200 diameter 200 to 300 diameter	3.0 4.0 5.0 6.0		
1 in 8 to 1 in 3 on diameter	3 to 50 diameter 50 to 100 diameter 100 to 200 diameter 200 to 300 diameter	on diameter 5.0 6.0 7.0 8.0		
Plain ring gauges (parallel) and setting standards	2 to 25 diameter 25 to 100 diameter 100 to 150 diameter 150 to 200 diameter 200 to 400 diameter 400 to 600 diameter	0.8 1.0 2.0 on diameter 3.0 4.0 6.0		A

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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH (cont'd)			NOTES (cont'd)	
Plain ring gauges (taper)				A
Parallel to 1 in 8 on diameter	2 to 50 diameter 50 to 100 diameter 100 to 150 diameter 150 to 200 diameter	4.0 5.0 6.0 7.0	1 The uncertainty quoted is for the departure from either flatness, straightness, parallelism, or squareness, i.e. the distance separating the two parallel planes which just enclose the surface under consideration.	
1 in 8 to 1 in 3 on diameter	2 to 50 diameter 50 to 100 diameter 100 to 150 diameter 150 to 200 diameter	on diameter 6.0 7.0 8.0 9.0		
Length gauges, flat and spherical ended	0 to 600	1.0 + (5.0 x length in m)	2. Calibrations may also be given in lbf.in and lbf.ft.	A
Plain gap gauges (parallel)	0.5 to 100 100 to 200 200 to 300	3.0 5.0 8.0	3. Single start, symmetrical thread forms only.	A
Receiver, position and profile gauges, jigs, fixtures (see note 1)	0 to 400 x 200 x 200	Minimum per coordinate: 3.0 + (10 x length in m)	4. Single and multi-start symmetrical and asymmetrical thread forms.	A
Parallels	As BS 906:1972 5 to 50 x 100 x 400	.5 to 5.0		A
Vee blocks	As BS 3731:1987 20 to 150	2.5 to 5.0		A

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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH (cont'd)				
Screw plug gauges (parallel) including check and setting plugs See Note 4	1 to 100 diameter 100 to 300 300 to 600	3.0 5.0 8.0 on pitch diameter	5. Functional test of size using setting plugs calibrated with a CMC of 3.0 µm	A
Screw plug gauges (taper) including check plugs See Note 3	2 to 100 100 to 300 300 to 500	5.0 8.0 10	6. Includes use of check plugs for screw rings from 1 mm to 2.5 mm diameter.	
Screw ring gauges (parallel) See Note 4 and 6	1 to 100 diameter 100 to 150 150 to 200 200 to 300 300 to 600	5.0 6.0 7.0 8.0 12 on pitch diameter		
Screw ring gauges (tapered) See Note 3	6 to 100 diameter 100 to 200 200 to 400 400 to 600	7.0 10 13 16		
Screw pitch Screw flank angle	0.2 to 8 0° to 52°	1.5 5.0 minutes of arc		
Screw thread adjustable caliper gauges (parallel) See Note 4	1 to 200 diameter	See note 5		A
Vee grooved jaw blades	0.6 (40 tpi) to 6.0 (4.5 T.P.I)	3.0		A
Annular vee grooved standards: External Internal	0.6 (40 tpi) to 6.0 (4.5 T.P.I)	 3.0 4.0		A
Vee grooved end pieces	0.6 (40 T.P.I) to 6.0 (4.5 T.P.I)	3.0		A
Plain end pieces	0 to 0.001	0.50 on flatness		A
Thread Stylii	0.6 (40 T.P.I) to 6.0 (4.5 T.P.I)	0.10 on form		A
Thread measuring vee pieces (prisms)	NPL Schedule MOY/SCM1/60 0 to 4.5	0.50		A
Orifice plates	BS EN ISO 5167-1:1991 0 to 1000	8		A
Penetration needles and cones	Needles to BS 2000-49:2007 0 to 2 diameter Cones to BS 2000:Part 50:1993 0 to 10 diameter	 3.0 on diameter Mass 5.0 mg		A

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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
ANGLE				
Squares				A
Blade type	BS 939:2007 50 to 300 300 to 600 600 to 1000	 3.0 5.0 8.0		
Cylindrical	BS 939:2007 75 to 300 300 to 600 600 to 1000	 2.0 On squareness 4.0 See Note 1 7.0		
Block	BS 939:2007 50 to 300 300 to 600 600 to 1000	 3.0 5.0 8.0		
Angle plates and box angle plates	BS 5535:1978 50 to 600	Squareness: 3.0 + (1.0 per 100 mm) Parallelism: 1.0 + (1.0 per 100 mm) See Note 1		A
Sine bars and tables	BS 3064:1978 0 up to 500	Linear dimensions: 1.0 + (10 x length in m) Overall performance: 3.0 seconds of arc		A
Sine centres Compound sine tables	0 to 500 length or between centres 0 to 500 length	Linear dimensions: 1.0 + (10 x length in m) Overall performance: 3.0 seconds or arc		A
FORM				
Roundness External Internal	 0 to 350 diameter 5 to 350 diameter	 0.050 on radius		A
Straightedges Cast iron, Steel and Granite	 BS 5204:Part 1:1975 BS 5204:Part 2:1977 0 to 2000	 1.0 + (2.0 x length in m) See Note 1		A
Precision balls: Steel and Tungsten Carbide	 1 to 30	 0.80 on diameter		A
Surface plates Granite	BS 817:1988 160 x 100 to 10m x 6m	1.50 + (0.80 x diagonal in m) See Note 1		A,B

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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
FORM (cont'd)				
Surface texture (excluding measurement standards and roughness comparison specimens)	BS 1134:Part 1:1988 Ra 0.02 µm to 80 µm	7.0 % of measured value		A
MEASURING INSTRUMENTS AND MACHINES				
Micrometers				A
External	BS 870:2008 0 to 600	Heads:2.0 between any two points		
Internal	BS 959:2008 0 to 900	Setting and extension rods 1.0 + (5.0 x length in m)		
Depth	BS 6468:2008 0 to 300			
3 point bore	0 to 150 150 to 250	5.0 8.0		A
Micrometer heads	BS 1734:1951 0 to 100	1.0		A
Bench micrometer	NPL MOY/SCMI 22 0 to 100	Overall performance 2.0		A
Vernier caliper, height and depth gauges	BS 887:2008 0 to 1000 BS 1643:2008 0 to 1000 BS 6365:2008 0 to 600	Overall performance 10 + (30 x length in m)		A
Dial gauges and dial test indicators	BS 907:2008 and BS 2795:1981 0 to 50	1.0		A
Displacement transducers	0 to 200	1.0		A
Height setting micrometer	0 to 300	Heads 1.0 Overall performance 3.0		A
Riser blocks for above	150 300	2.5 5.0		A
Bench centres	to 1000 between centres	Linear dimensions 1.0 + (10 x length in m)		A
Thread diameter measuring	MOY/SCM1/9 and MOY/SCM1/12 0 to 300	Overall performance 1.5		A

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	RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED			
MEASURING INSTRUMENTS AND MACHINES (cont'd)				
Height gauges, electronic	0 to 1000	1.0 + (5.0 x length in m)		A
Profile projectors	10 to 100 magnifications Linear 0 to 300 Angular 0° to 360°	Magnification 125 at screen Linear 5.0 Angular 2.0 mins of arc		A,B
Bevel protractors	As BS 1685:2008 0° to 360°	6 0 minutes of arc		A
Comparators (external)	As BS 1054 250 to 10 000 magnifications	1.0 % or range Minimum 0.20		A
Co-ordinate tables	0 to 500 square with 150 movement	Overall performance 3.0		A
Spirit levels	As BS 3509:1962 and BS 958:1968 5 seconds of arc to 60 minutes of arc nominal sensitivity	Mean sensitivity 10 % of nominal Minimum 0.50 seconds of arc		A
Electronic indicating levels	0 to 20 minutes of arc	1.0 % or range Minimum 0.50 seconds of arc		A
Luer (taper) gauges	BS 3930:Part 1:1987 and BS 3930:Part 2:1991 0.3 to 8	As per plain taper and screw taper gauges above		A
NPL type Wedge Micrometer	MOY/SMI/89 2.5 micrometer travel	0.30		A
Steel Rules	BS 4372:1968 0 to 1000	15 + (20 x L in m)		A
Feeler gauges	BS 957:2008 0.025 to 1	3.0		A
TORQUE				
Hand torque tools	BS EN 6789:2003 1 N.m to 1000 N.m	1.6 % See Note 2		A

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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
PRESSURE				
Hydraulic pressure (gauge)				
Calibration of pressure indicating instruments and gauges, Pressure equivalent calibration of deadweight testers.	550 kPa to 110 MPa	0.017 %	Calibration of devices with an electrical output may be undertaken.	A,B
Gas pressure (gauge)				
Calibration of pressure indicating instruments and gauges, Pressure equivalent calibration of deadweight testers.	-93 kPa to 600 kPa 3.5 kPa to 100 kPa 100 kPa to 700 kPa 700 kPa to 12 MPa	0.018 % + 42 Pa 0.013 % 0.012 % 0.012 %		A,B
Gas pressure (absolute)				
Calibration of pressure indicating instruments and gauges	80 kPa to 120 kPa	0.080 %		A,B
Gas Pressure (Differential)				
Calibration of pressure indicating instruments and gauges	2.5 kPa to 100 kPa (line pressure 1.2 MPa to 10 MPa)	0.60 ppm/MPa of line pressure, plus 0.0080 % of differential pressure, plus 10.0 Pa		A
ELECTRICAL				
DC VOLTAGE	0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1 kV	20 ppm + 0.50 μV 15 ppm 15 ppm 15 ppm 20 ppm		A,B
RESISTANCE	0 Ω to 20 Ω 20 Ω to 200 Ω 200 Ω to 2 kΩ 2 kΩ to 20 kΩ 20 kΩ to 200 kΩ 200 kΩ to 2 MΩ 2 MΩ to 20 MΩ 20 MΩ to 200 MΩ 200 MΩ to 100 GΩ	30 ppm + 5 μΩ 30 ppm 20 ppm 20 ppm 50 ppm 70 ppm 500 ppm 0.10 % 0.10 %		A,B

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (*k*=2)	Remarks	Location Code
ELECTRICAL (cont'd)				
AC RESISTANCE	50 Hz to 1 kHz			A,B
	1 mΩ to 10 mΩ	0.11 %		
	10 mΩ to 1Ω	0.098 %		
	1 Ω to 10 Ω	0.048 %		
	10 Ω to 100 Ω	0.057 %		
DC CURRENT	0 μA to 200 μA	80 ppm + 5.0 nA		A,B
	200 μA to 2 mA	80 ppm		
	2 mA to 20 mA	80 ppm		
	20 mA to 200 mA	80 ppm		
	200 mA to 2 A	150 ppm		
	2 A to 20 A	150 ppm + 1.0 mA	Generate only	
AC VOLTAGE	10 mV to 200 mV			A,B
	40 Hz to 10 kHz	0.030 %		
	10 kHz to 100 kHz	0.060 %		
	200 mV to 2 V			
	40 Hz to 10 kHz	0.030 %		
	10 kHz to 100 kHz	0.060 %		
	2 V to 20 V			
	40 Hz to 10 kHz	0.030 %		
	10 kHz to 100 kHz	0.062 %		
	20 V to 200 V			
	40 Hz to 10 kHz	0.030 %		
	10 kHz to 100 kHz	0.060 %		
	200 V to 1 kV			
	55 Hz to 10 kHz	0.045 %		
	10 kHz to 30 kHz	0.0630 %		
AC CURRENT	10 μA to 200 mA			A,B
	60 Hz to 1 kHz	0.070 %		
	200 mA to 2 A		Generate only	
	55 Hz to 1 kHz	0.070 %		
	2 A to 20 A			
	40 Hz to 3 kHz	0.070 % + 5.0 mA		
CURRENT SIMULATION				
0 to 1 000 Amperes	DC to 1 kHz	0.10 %	Appropriate for the calibration of AC/DC Current Clamps.	A,B

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (*k*=2)	Remarks	Location Code
FREQUENCY	1 MHz, 5 MHz, and 10 MHz	2.0 in 10^{9}		
	1 MHz to 60 MHz	3.0 in 10^{9}	Measure only	
	60 MHz to 1 GHz	1.0 in 10^{8}		
Tachometers	100 to 50 000 RPM	2.0 RPM		A,B
TEMPERATURE SIMULATION				A,B
Reference junction temperature for electrical simulation	0 ºC to 50 ºC	0.50 ºC	This is a supplementary measurement for monitoring temperature in air.	
Thermocouple indicator type:				
K	-140 ºC to 1350 ºC	0.50 ºC		
J	-200 ºC to 1200 ºC	0.50 ºC		
T	-270 ºC to 400 ºC	0.50 ºC		
R	-50 ºC to 1760 ºC	0.50 ºC		
Resistance PT 100s	-200 ºC to 800 ºC	0.050 ºC		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (*k*=2)	Remarks	Location Code
OSCILLOSCOPES				A,B
Vertical deflection coefficients:	*1 kHz* 5 mV to 50 mV 50 mV to 120 V	 1.2 % 0.40 %		
Horizontal deflection coefficients:	5 s/div to 5 ns/div	0.40 %		
MASS				
Weights and artefacts	25 000 g 20 000 g 10 000 g 5 000 g 2 000 g 1 000 g 500 g 200 g 100 g 50 g 20 g 10 g 5 g 2 g 1 g 0.5 g 0.2 g 0.1 g 0.05 g 0.02 g 0.01 g 0.005 g 0.002 g 0.001 g	250 mg 200 mg 100 mg 50 mg 20 mg 10 mg 5 mg 2 mg 1 mg 0.6 mg 0.5 mg 0.4 mg 0.3 mg 0.24 mg 0.20 mg 0.16 mg 0.12 mg 0.10 mg 0.08 mg 0.06 mg 0.05 mg 0.04 mg 0.04 mg 0.04 mg	Notes 1. Calibrations can be given in other units as required. 2. Intermediate values can be calibrated to an uncertainty interpolated from the next higher and lower values in the table.	A

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (*k*=2)	Remarks	Location Code
MASS (cont'd) NON AUTOMATIC WEIGHING MACHINES Lab & Site Electronic, single pan	200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg 2 kg 5 kg 10 kg 20 kg 50 kg 100 kg 107 kg	0.03 mg 0.03 mg 0.04 mg 0.05 mg 0.06 mg 0.07 mg 0.10 mg 0.12 mg 0.18 mg 0.36 mg 0.90 mg 1.8 mg 7.2 mg 18 mg 36.1 mg 72.4 mg 1.8 g 2.5 g 2.6 g	Notes 1. Weights are available in OIML Class: E2 from 200 mg to 500 g, max. grouped load 1 kg F1 from 1 g to 20 kg, max. grouped load 55 kg. M1 from 5 kg to 20 kg, max. grouped load 107 kg 2. Other loads within the overall listed range may also be used	A, B
END				