Schedule of Accreditation

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United Kingdom Accreditation Service

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0566

Accredited to ISO/IEC 17025:2017

Tyneside Standards Limited

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Rolling Mill Road
Viking Industrial Park
Jarrow
Tyne & Wear
NE32 3DP

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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 Rolling Mill Road Viking Industrial Park Jarrow Tyne & Wear NE32 3DP	**Local contact** Mr H L Thompson/Mr J Wood Tel: +44 (0)191 428 3471 Fax: +44 (0)191 428 3485 E-Mail: sales@tyneside-standards.co.uk	Dimensional Electrical Pressure Torque Mass (Weighing machines)	A

Site activities performed away from the locations listed above:

Location details		Activity	Location code
At customers premises	Mr H L Thompson/Mr J Wood	Dimensional Electrical Pressure Mass (Weighing machines)	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			
PLAIN PLUG & RING GAUGES			NOTES	
Plain plug gauges (parallel), cylindrical setting standards and rollers See Note 5	1 to 50 diameter 50 to 100 diameter 100 to 150 diameter 150 to 200 diameter 200 to 300 diameter	0.80 1.0 1.5 2.0 3.0	1. All linear calibrations may be made in inch units. 2. The uncertainty quoted is for the departure from : flatness, straightness, or squareness; i.e. the distance separating the two parallel planes which just enclose the surface under consideration. 3. Single start symmetrical threads only 4. Functional test of size using setting plugs calibrated with a CMC of 3.0 µm 5. Calibrated using length measuring machine and/or end standards. 6. Calibrated using a profile projector.	A
Thread measuring cylinders	As BS 3777, BS 5590 and specials. 0.1 to 5	0.5 on diameter		A
Steel and synthetic ruby balls See Note 5	1 to 50 diameter 50 to 100 diameter	0.80 on diameter 1.0 on diameter		A
Plain ring gauges (parallel) and setting standards See Note 5	1 to 12 diameter 12 to 25 diameter 25 to 50 diameter 50 to 100 diameter 100 to 150 diameter 150 to 200 diameter 200 to 300 diameter	2.0 0.8 1.0 1.5 on diameter 2.0 3.0 4.0		A
Plain gap gauges, parallel See Note 5	3 to 50 50 to 100 100 to 150	3.0 5.0 8.0		A
SCREW THREAD GAUGES				
Screw plug gauges (parallel) See Notes 3 and 5	1 to 100 diameter 100 to 150 diameter 150 to 300 diameter	3.0 5.0 8.0		A
Screw plug gauges (taper) including check plugs See Notes 3 and 5	1.5 to 100 diameter 100 to 250	5.0 10		A
Screw ring gauges (parallel) See Notes 3 and 5	1.5 to 100 diameter 100 to 150 diameter 150 to 300 diameter	5.0 6.0 on pitch 10 diameter		A
Screw ring gauges(taper) See Notes 3 and 5	1.5 to 100 100 to 250	7.0 10		A
Screw pitch See Notes 3 and 5	0.2 to 8	1.5		
Screw flank angle See Note 6	0° to 52°	5.0 minutes of arc		
Screw calliper gauges, parallel	From 3 up to 150	See note 4		A

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				
Feeler gauges	BS 957:2008	1.0		A
Micrometers				A
External	BS 870:2008 0 to 600	Heads: 2.0		
Internal	BS 959:2008 0 to 900	Setting and extension rods		
Depth	BS 6468:2008 0 to 300	1.0 + (8.0 x length in m)		
Length Gauges, Flat & Spherical-ended (excluding length bars) – See Note 5	0 to 3000	1.0 + (8.0 x length in m) Minimum 1.5		A
Micrometers, 3 point bore	0 to 100	5.0	Calibrated using the checking fixture and / or by comparison with setting rings.	A
OTHER MEASURING INSTRUMENTS, EQUIPMENT AND MACHINES				
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
Height gauges - (Simple) including vernier, dial and digital types	BS EN ISO 13225:2012 (0 to 1000)	Overall performance: 10.0 + (30 x length in m)		A
Dial gauges and dial test indicators	As BS 907:2008 and BS 2795:1981 0 to 50	2.0		A
Steel rules	0 to 1000 mm	15 + (10 x length in m)	Calibrated using a profile projector.	A
ANGLE				
Bevel protractors	As BS 1685:2008 0° to 360°	6 0 minutes of arc		A
Squares				
Blade type (see npote 2)	As BS 939:2007 50 to 300 300 to 450	 3.0 5.0		A
Sine Bars and Tables	BS 3064:1978 0 to 500 length	Linear dimensions 1.0 + (10 x length in m) Overall performance 3.0 seconds of arc		A

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
Profile projectors	10 to 100 magnifications Linear 0 to 300 Angular 0° to 360°	231 at the screen3.0 2.0 minutes of arc	Calibrated using glass scales / graticules.	A, B
FORM				
Surface plates Granite and Cast iron	BS 817:2008	1.5 + (0.80 x diagonal in m) See Note 2		A, B
ELECTRICAL MEASUREMENTS All electrical measurements a carried out using the method of direct comparison or transfer to laboratory reference standards unless otherwise determined in the remarks column.				
RESISTANCE	0 Ω to 100 Ω 100 Ω to 1 kΩ 1 kΩ to 10 kΩ 10 kΩ to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ	55 ppm + 4.6 mΩ 58 ppm + 43 mΩ 59 ppm + 58 mΩ 64 ppm + 4.2 Ω 32 ppm + 1.2 kΩ 0.25 % + 12 kΩ 0.55 % + 49 kΩ		A, B
DC VOLTAGE	0 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	21 ppm + 4.0 μV 37 ppm + 3.5μV 9.5 ppm + 58 μV 19 ppm + 870 μV 9.9 ppm + 11 mV		A, B
DC CURRENT	0 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 3 A	130 ppm + 740 nA 130 ppm + 12 μA 100 ppm + 150 μA 100 ppm + 480 μA		A, B
AC VOLTAGE				A, B
	30 μV to 100 mV 40 Hz to 10 kHz	87 ppm + 30 μV		
	100 mV to 1 V 40 Hz to 10 kHz	350 ppm + 160 μV		
	1 V to 10 V 40 Hz to 10 kHz	280 ppm + 3.1 mV		
	10 V to 100 V 40 Hz to 10 kHz	280 ppm + 23 mV		
	100 V to 1 kV 40 Hz to 10 kHz	230 ppm + 150 mV		
AC CURRENT	10 mA to 1 A *40 Hz to 1 kHz* 1 A to 3 A *40 Hz to 1 kHz*	0.074 % + 350 μA 0.10 % + 1.5 mA		A, B

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
GENERATION				
RESISTANCE				A, B
Spot Values	167 mΩ	5.9 mΩ		
	270 mΩ	5.9 mΩ		
	1.24 Ω	10 mΩ		
	10 Ω	6.8 mΩ		
	100 Ω	11 mΩ		
	1 kΩ	310 mΩ		
	10 kΩ	5.9 Ω		
	100 kΩ	7.8 Ω		
	1 MΩ	140 Ω		
	10 MΩ	3.5 k Ω		
	100 MΩ	410 k kΩ		
	1000 MΩ	9.8 MΩ		
DC VOLTAGE	0 mV to 200 mV	8.7 μV		A, B
	0.2 V to 2 V	65 μV		
	2 V to 20 V	1.3 mV		
	20 V to 200 V	13 mV		
	200 V to 1 000 V	770 mV		
DC CURRENT	0 μA to 200 μA	600 nA		A, B
	0.2 mA to 2 mA	390 nA		
	2 mA to 20 mA	1.6 μA		
	20 mA to 200 mA	22 μA		
	0.2 mA to 1 A	200 μA		
	1 A to 30 A	8.2 mA		
AC VOLTAGE				A, B
	40 Hz to 20 kHz			
	20 mV to 200 mV	100 μV		
	200 mV to 2 V	780 μV		
	2 V to 20 V	16 mV		
	20 V to 200 V	210 mV		
	200 V to 1000 V	1.3 V		
AC CURRENT				
	40 Hz to 1 kHz			
	20 μA to 200 μA	410 nA		A, B
	200 μA to 2 mA	1.7 μA		
	2 mA to 20 mA	16 μA		
	20 mA to 200 mA	160 μA		
	200 mA to 2 A	6.9 mA		
	2 A to 30 A	75 mA		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
CAPACITANCE	1 nF 10 nF 20 nF 50 nF 100 nF 1 μF 10 μF 100 μF 1 mF 10 mF	27 pF 56 pF 97 pF 260 pF 420 pF 4.8 nF 100 nF 760 nF 14 μF 140 μF		A, B
INDUCTANCE	1 mH 10 mH 20 mH 30 mH 50 mH 100 mH 1 H 10 H	6.5 μH 55 μH 110 μH 160 μH 270 μH 540 μH 11 mH 56 mH		
Measurements to support 17th edition type test equipment				A,B
Earth Bond resistance	2 mΩ to 600 mΩ 600 mΩ to 10 Ω	5.6 mΩ 67 mΩ		
Continuity Reisitance	12 mΩ to 600 mΩ 600 mΩ to 100 Ω	14 mΩ 610 mΩ		
AC Resistance (50 Hz nominal)	50 mΩ to 10 Ω 10 Ω to 1 kΩ	12 mΩ 610 mΩ		
Earth Bond Current	0 A to 100 mA 100 mA to 30 A	11 mA 650 mA		
Insulation Resistance	5 MΩ to 1 GΩ	0.78 % + 37 Ω		
Insulation Voltage Loading Resistance	10 kΩ to 5 MΩ	0.40 % + 1.2 Ω		
Insulation Voltage	50 V to 1 kV	6.5 V		
PAT Test Voltage	50 V to 3 kV	12 V		
PAT Leakage Current	0 A to 10 mA	0.80 % + 350 μA		
RCD Trip Current	10 mA to 300 mA 500 mA to 1 A	0.25 % + 350 μA 0.17 % + 500 μA		
RCD Trip Time	0 s to 1000 s	0.20 % + 4.0 ms		
Load for PAT	0.13 kW	15 Ω	At nominal UK mains supply voltage	A, B

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
FREQUENCY				A, B
	100 mHz to 1 Hz	30 μHz		
	1 Hz to 50 MHz	5.0 ppm + 66 mHz		
TIME				
Elapsed time	0 s to 10^4 Seconds	50 ms	Electronically triggered event	A, B
Events	240 RPM to 60 000 RPM	2.5 RPM	Optical tachometers	
ELECTRICAL SIMULATION OF TEMPERATURE READING AND MEASURING DEVICES				
Thermocouples				
Type K	-200 °C to -50 °C	1.2 °C	Including Cold Junction compensation.	A, B
	-50 °C to 0 °C	0.55 °C		
	0 °C to 1300 °C	0.40 °C		
Type K	-200 °C to -50 °C	1.2 °C	Excluding Cold Junction compensation.	
	-50 °C to 0 °C	0.50 °C		
	0 °C to 1300 °C	0.35 °C		
Type J	-180 °C to - 50 °C	1.30 °C		A, B
	-50 °C to 0 °C	0.40 °C	Including Cold Junction compensation.	
	0 °C to 700 °C	0.30 °C		
Type T	-250 °C to - 50 °C	1.30 °C		A, B
	-50 °C to 0 °C	0.40 °C	Including Cold Junction compensation.	
	0 °C to 400 °C	0.30 °C		
Type R	0 °C to 400 °C	0.80 °C	Ambient 20 ± 5.0 °C	A, B
	400 °C to 1700 °C	0.70 °C		
Type S	0° C to 400 °C	0.40 °C		A, B
	400 °C to 1700 °C	0.30 °C	Including Cold Junction compensation.	
Type N	-200 °C to - 50 °C	1.1 °C		A, B
	-50 °C to 0 °C	0.40 °C	Including Cold Junction compensation.	
	0 °C to 1200 °C	0.30 °C		
Type B	0 °C to 1000 °C	0.40 °C		
	1000 °C to 1820 °C	0.30 °C	Including Cold Junction compensation.	A, B
Type E	0 °C to 1000 °C	0.30 °C		A, B
			Including Cold Junction compensation.	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
ELECTRICAL SIMULATION OF TEMPERATURE READING AND MEASURING DEVICES Continued				
PRT Displays				
RTD PT 100	-50 °C to 0 °C 0 °C to 1000°C	0.40 °C 0.30 °C		A, B
Suitable for reference junction Measurements when using electrical simulation	0 ºC in liquid 18 ºC to 25 ºC in air	0.20 ºC 0.50 ºC	Temperature measurements for supporting thermocouple reference junction claims.	A,B
PRESSURE			Methods consistent with EURAMET CG17	
Gas pressure (Gauge)				
Calibration of indicating instruments and gauges	-90 kPa to 0 Pa 0 Pa to 1.5 MPa 1.5 MPa to 3.5 MPa 3.5 MPa to 10.0 MPa	87 Pa 193 Pa 274 Pa 2.3 kPa	Calibration of pressure instruments with an electrical output may be undertaken. Absolute pressures within this range can be calibrated, attracting an additional uncertainty of 22 Pa.	A
	-90 kPa to 0 Pa 0 Pa to 200 kPa 200 kPa to 2 MPa	0.84 kPa 100 Pa 0.89 kPa		B
Hydraulic pressure (Gauge)				
Calibration of indicating instruments and gauges	300 kPa to 1 MPa 1 MPa to 110 MPa	0.080 % 0.040 %		A, B
TORQUE				
Torque Wrenches	0.1 N·m to 1356 N·m to BS EN ISO 6789-2:2017	1.0 %	The uncertainty quoted is for both the application of the calibration torque and the characteristics of the device being calibrated. Calibration results may also be given in units of lbf·in and lbf·ft.	A
Hand Torque Tools	0.1 N·m to 1356 N·m BS EN ISO 6789:2003 (Withdrawn & superseded)	1.6 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
MASS			Methods consistent with EURAMET CG18.	
NON AUTOMATIC WEIGHING MACHINES (Digital, self verifying only)	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 200 kg	0.010 mg 0.010 mg 0.010 mg 0.020 mg 0.025 mg 0.035 mg 0.045 mg 0.070 mg 0.135 mg 0.370 mg 0.700 mg 2.120 mg 3.850 mg 10.500 mg 450.0 mg 740.0 mg 2.120 g 4.200 g 8.500 g	Weights available in OIML class E2 from 1mg to 500g Max Grouped load 1.1kg F1 from 1g to 5kg, Max Grouped load 9kg M1 from 1g to 20Kg Max grouped load 250Kg Other loads within the overall listed range may also be used.	A, B
END				

Appendix - Calibration and Measurement Capabilities

Introduction

The definitive statement of the accreditation status of a calibration laboratory is the Accreditation Certificate and the associated Schedule of Accreditation. This Schedule of Accreditation is a critical document, as it defines the measurement capabilities, ranges and boundaries of the calibration activities for which the organisation holds accreditation.

Calibration and Measurement Capabilities (CMCs)

The capabilities provided by accredited calibration laboratories are described by the Calibration and Measurement Capability (CMC), which expresses the lowest uncertainty of measurement that can be achieved during a calibration. If a particular device under calibration itself contributes significantly to the uncertainty (for example, if it has limited resolution or exhibits significant non-repeatability) then the uncertainty quoted on a calibration certificate will be increased to account for such factors. The CIPM-ILAC definition of the CMC is as follows:

A CMC is a calibration and measurement capability available to customers under normal conditions:
(a) as published in the BIPM key comparison database (KCDB) of the CIPM MRA; or
(b) as described in the laboratory's scope of accreditation granted by a signatory to the ILAC Arrangement.

The CMC is normally used to describe the uncertainty that appears in an accredited calibration laboratory's schedule of accreditation and is the uncertainty for which the laboratory has been accredited using the procedure that was the subject of assessment. The CMC is calculated according to the procedures given in M3003 and is normally stated as an expanded uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $k = 2$. An accredited laboratory is not permitted to quote an uncertainty that is smaller than the published CMC in certificates issued under its accreditation.

The CMC may be described using various methods in the Schedule of Accreditation:

As a single value that is valid throughout the range.
As an explicit function of the measurand or of a parameter (see below).
As a range of values. The range is stated such that the customer can make a reasonable estimate of the likely uncertainty at any point within the range.
As a matrix or table where the CMCs depend on the values of the measurand and a further quantity.
In graphical form, providing there is sufficient resolution on each axis to obtain at least two significant figures for the CMC.

Expression of CMCs - symbols and units

In general, only units of the SI and those units recognised for use with the SI are used to express the values of quantities and of the associated CMCs. Nevertheless, other commonly used units may be used where considered appropriate for the intended audience. For example, the term "ppm" (part per million) is frequently used by manufacturers of test and measurement equipment to specify the performance of their products. Terms like this may be used in Schedules of Accreditation where they are in common use and understood by the users of such equipment, providing their use does not introduce any ambiguity in the capability that is being described.

When the CMC is expressed as an explicit function of the measurand or of a parameter, this often comprises a relative term (e.g., percentage) and an absolute term, i.e. one expressed in the same units as those of the measurand. This form of expression is used to describe the capability that can be achieved over a range of values. Some examples are shown below. It should be noted that these expressions are *not* mathematical formulae but are instead written in a commonly used shorthand for expressing uncertainties - therefore, for purposes of clarity, an indication of how they are to be interpreted is also provided below.

DC voltage, 100 mV to 1 V: 0.0025 % + 5.0 µV

Over the range 100 mV to 1 V, the CMC is $0.0025\ \% \cdot V + 5.0\ \mu V$, where V is the measured voltage.

Hydraulic pressure, 0.5 MPa to 140 MPa: 0.0036 % + 0.12 ppm/MPa + 4.0 Pa

Over the range 0.5 MPa to 140 MPa, the CMC is $0.0036\ \% \cdot p + (0.12 \cdot 10^{-6} \cdot p \cdot 10^{-6}) + 4.0$ Pa, where p is the measured pressure in Pa.

It should be noted that the percentage symbol (%) simply represents the number 0.01. In cases where the CMC is stated only as a percentage, this is to be interpreted as meaning percentage of the measured value or indication.

Thus, for example, a CMC of 1.5 % means $1.5 \cdot 0.01 \cdot i$, where i is the instrument indication.