Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

0773

Accredited to ISO/IEC 17025:2017

TORUS Measurement Systems Ltd

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Nedge Hill Science Park
Telford
Shropshire
TF3 3AJ

Contact: Ms Denise Ball
Tel: +44 (0)1952 210020
E-Mail: denise.ball@torus-group.com
Website: www.torus-group.com

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 Nedge Hill Science Park Telford Shropshire TF3 3AJ	**Local contact** Denise Ball	Dimensional	A

Site activities performed away from the locations listed above:

Location details		Activity	Location code
The location must be suitable for the nature of the particular calibrations undertaken and will be the subject of contract review arrangements between the laboratory and the customer	**Local contact** Denise Ball	Dimensional	B

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH				
Plain plug gauges (parallel) cylindrical setting standards and rollers.	1 to 3 diameter 3 to 100 100 to 150 150 to 300	0.79 on diameter 1.0 1.5 2.3	By comparison with reference standards	A
Plain plug gauges, taper.	0 to 100	3.3	By comparison with reference standards	A
Receiver and position gauges, jigs and fixtures.	0 to 1500 x 900 x 800	2.2 + (2.3 x length in m) 3.5 + (2.2 x length in m)	Using a CMM Using first principles Documented in-house methods using first principles and/or a CMM. The stated uncertainties are based on the calibration of an ideal item under ideal conditions. The reported uncertainties will reflect the item calibrated and the conditions at the time of the calibration.	A
Beverage Masters	1 to 200 height / diameter 1 to 4 flange width 2 to 4 curl opening 10 to 90 curl diameter 20 to 70 inner curl dia 0.1 to 1.5 thickness 10 to 70 external reform diameter 1 to 5 reform depth 30 to 100 master punch ironing ring diameter 10 to 70 internal reform diameter	3.3 2.2 2.4 1.6 5.0 0.80 5.9 12 2.4 7.0	Documented in-house methods using the following equipment: Reference standards, electronic probe, surface table, vertical and horizontal length measuring machines, probe comparator, dedicated fixtures, sine table, master scanner and standard metrology holding equipment.	A

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
Beverage Masters Length Blocks	300	1.4 + (6.6 x length in m)	Comparison to reference standards	A
Height gauges (complex) Tesa electronic height gauges, for E, B and R	0 to 1000 Length measurement error, E	1.6 + (7.0 x length in m)	BS EN ISO13225:2012 comparison to length standards	A & B
	Bidirectional length measurement error, B	1.6 + (7.0 x length in m)		A & B
Height gauge setting masters.	25	2.0	Comparison to reference standards	A
Performance verification of co-ordinate measuring machines (CMM's)	Length measurement – E_L 0 to 1500 (longest diagonal)	0.78 + (1.1 x length in m)	ISO 10360-2:2009 using end standards	A & B
	Single stylus probing test: $P_{Form.Sph.1×25:SS:Tact}$ $P_{Size.Sph.1×25:SS:Tact}$	 0.37 0.46	ISO 10360-5:2020 Using a 10 to 50 mm test sphere	
	Single stylus probing test P_{FTU}	0.17	ISO 10360-5:2010 (withdrawn) Using a 10 to 50 mm test sphere	
Performance verification of non-cartesian co-ordinate measuring machines (CMM's)	Length measurement - E_{Bi} E_{Uni} 0 to 1545 diameter	 2.9 + (1.3 x length in m) 2.9 + (1.3 x length in m)	ISO 10360-12:2016 using end standards. Test value uncertainties based on ISO/TS 23165:2006	A & B
	Probing measurement - $P_{Size.SPH.1x25}$ $P_{Form.SPH.1x25}$	 2.2 2.2	ISO 10360-12:2016 using a 10 mm to 51 mm diameter test sphere. Test value uncertainties based on ISO/TS 17865:2016	
	Articulated location measurement - $L_{Dia.5x5:Art}$	 2.2	ISO 10360-12:2016 using a 10 mm to 51 mm diameter test sphere. Test value uncertainties based on ISO/TS 17865:2016	

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 measurement uncertainty 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 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 measurement uncertainty is calculated according to the procedures given in the GUM 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 measurement uncertainty in certificates issued under its accreditation.

Expression of CMCs - symbols and units

It should be noted that the percentage symbol (%) represents the number 0.01. In cases where the measurement uncertainty is stated as a percentage, this is to be interpreted as meaning percentage of the measurand.
Thus, for example, a measurement uncertainty of 1.5 % means $1.5 \times 0.01 \times q$, where q is the quantity value.

The notation Q[a, b] stands for the root-sum-square of the terms between brackets: $Q[a, b] = [a^2 + b^2]^{1/2}$