

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

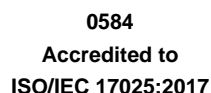
2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 0584 Accredited to ISO/IEC 17025:2017	Tinius Olsen Limited	
	Issue No: 024 Issue date: 06 January 2022	
	6 Perrywood Business Park Honeycrock Lane Salfords Redhill Surrey RH1 5DZ	Contact: Matt Fletcher Tel: +44 (0)1737-765001 Fax: +44 (0)1737-764768 E-Mail: quality2@tinusolsen.com Website: www.tiniusolsen.com
Calibration performed by the Organisations at the locations specified below		

Locations covered by the organisation and their relevant activities

Site activities performed away from the locations listed above:

Location details	Activity	Location code
Customers' sites or premises Ms L Mart The customer's sites or premises must be suitable for the nature of the particular calibrations undertaken and will be subject of contract review arrangements between the laboratory and the customer	Force	S

**Tinius Olsen Limited**

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Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k=2$)	Remarks	Location Code
FORCE				
UNIVERSAL MATERIALS TESTING MACHINES				S
Verification and calibration of the force measuring system by force proving instruments in tension	From 100 N up to 500 kN for Class 0.5, 1, 2 and 3 machines to BS EN ISO 7500-1:2018 From 100 N up to 1340 kN to ASTM E4-20	0.22 %		
Verification and calibration of the force measuring system by force proving instruments in compression	From 100 N up to 2 000 kN for Class 0.5, 1, 2 and 3 machines to BS EN ISO 7500-1:2018 From 100 N up to 4450 kN ASTM E4-20	0.22 %		
Verification and calibration of the force measuring system by calibrated masses in tension	From 0.05 N up to 200 N for Class 0.5, 1, 2 and 3 machines to BS EN ISO 7500-1:2018 and ASTM E4-20	0.22 %		
Verification and calibration of the force measuring system by calibrated masses in compression	From 0.05 N up to 200 N for Class 0.5, 1, 2 and 3 machines to BS EN ISO 7500-1:2018 and ASTM E4-20	0.22 %		
EXTENSOMETRY Extensometers	As BS EN ISO 9513:2012 for the following classes and gauge lengths: Class 0.2 from 25mm Class 0.5 from 10 mm Class 1 from 5 mm Class 2 from 5 mm As ASTM E83-16 for the following classes and gauge lengths: A from 50 mm B-1 from 20 mm B-2 from 10 mm C from 5 mm Displacements 0.02 mm to 1 mm 1 mm to 25 mm			S
		1.2 μm $\sqrt{1.0^2 + (0.54 \times L)^2} \mu\text{m}$ L is displacement in mm		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k=2$)	Remarks	Location Code
EXTENSOMETRY (cont'd)				S
Extensometer, Long travel	As BS ISO 5893:2019 for classes C, D and E Displacements: 4 mm to 16.7 mm 16.7 mm to 800 mm	0.020 mm 0.24 %		
DISPLACEMENT				S
Displacement measuring systems used in Material Testing Machines	As ASTM E2309/E2309M-20 4 mm to 16.7 mm 16.7 mm to 800 mm	0.02 mm 0.20 %		
Displacement measuring devices used in Material Testing Machines	As ASTM E2309/E2309M-20 0.02 mm to 1 mm 1 mm to 25 mm	1.2 μm $\sqrt{1.0^2 + (0.54 \times L)^2} \mu\text{m}$ L is displacement in mm		
Cross head speed	As ASTM E2658-15 0.10 mm/min to 100 mm/min 100 mm/min to 1000 mm/min	0.50 % 0.70 %		S
END				



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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: $Q[a, b] = [a^2 + b^2]^{1/2}$