Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

0611

Accredited to ISO/IEC 17025:2017

Cooper Research Technology Ltd

Issue No: 030 **Issue date:** 24 September 2019

Unit 1
Albert Court
Peasehill Road
Ripley
Derbyshire
DE5 3AQ

Contact: Mr C Kohut
Tel: +44 (0)1773 512174
Fax: +44 (0)1773 512175
E-Mail: carl.kohut@cooper.co.uk
Website: www.cooper.co.uk

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 Unit 1 Albert Court Peasehill Road Ripley Derbyshire DE5 3AQ	**Local contact** Mr C Kohut Tel: +44 (0)1773 512174 Fax: +44 (0)1773 512175 E-Mail: carl.kohut@cooper.co.uk	Force Dimensional	A

Site activities performed away from the locations listed above:

Location details		Activity	Location code
At customers' premises	As above	Force Dimensional	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
BITUMINOUS MIXTURE TESTING MACHINES			NOTES	
			1 Accreditation is limited to machines manufactured by Cooper Research Technology Ltd.	A & B
Small Wheeltrackers (See Note 1)			BS 598:PART 110:1998 And BS EN 12697 22:2003	
Wheel displacement (rut depth)	0 mm to 40 mm	0.055 mm		
Wheel load	500 N to 700 N	3.5 N		
Wheel diameter	150 mm to 250 mm	1.0 mm		
Tyre width	40 mm to 60 mm	0.30 mm		
Tyre thickness	0 mm to 20 mm	0.50 mm		
Tyre hardness	70 IRHD to 90 IRHD	2.4 IRHD		
Bearing play	0 mm to 1 mm	0.015 mm		
Tracking frequency	20 cycles per minute to 28 cycles per minute	0.20 cycles per minute		
Track length	220 mm to 240 mm	1.1 mm		
Centre measurement	0 mm to 20 mm	2.0 mm		
Large Wheeltrackers (See Note 1)			BS EN 12697-22:2003	A & B
Wheel load	At 5000 N	27 N		
Tyre contact width	70 mm to 90 mm	1.0 mm		
Tracking frequency	50 to 70 cycles per minute	0.10 cycles per minute over 1 minute 0.020 cycles per minute over 5 minutes		
Displacement transducer/depth gauge	0 mm to 25 mm	0.050 mm		
Track length	400 mm to 420 mm	1.0 mm		
Centrality of wheel track in mould	0 mm to 20 mm	1.0 mm		
Wheel angle of skew	-3 degrees to 3 degrees	0.040 degrees		
Large roller compactor fitted with pneumatic tyres (See Note 1)			BS EN 12697-33:2003	A & B
Wheel load	1000 N to 5000 N	1.9 %		
Wheel velocity	200 mm/s to 500 mm/s	1.1 %		
Centrality of wheel track in mould	0 mm to 20 mm	1.0 mm		
Nottingham asphalt testers (See Note 1)	,		**BS EN 12697-24:2004, BS EN 12697-25:2005, BS EN 12697-26:2004, DD226:1996 and DD213:1993**	A & B
ITSM LVDTs	0 µm to 100 µm	0.66 µm		
RLAT LVDTs	0 mm to 10 mm	0.0056 mm		
ITFT LVDTs	0 mm to 2 mm	0.0038 mm		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (*k*=2)	Remarks	Location Code
Nottingham asphalt testers (See Note 1) (cont'd)			BS EN 12697-24:2004, BS EN 12697-25:2005, BS EN 12697-26:2004, DD226:1996 and DD213:1993	A & B
Load rise time	115 ms to 135 ms	1.9 ms		
Load pulse & rest times	995 ms to 1005 ms	2.5 ms		
Load area percent	95 % to 105 %	1.4 %		
NAT Load cell	70 N to 450 N 0.45 kN to 4.5 kN 4.5 kN to 20 kN	1.0 % 0.69 % 0.55 %		
Duriez testing machines (See Note 1)			NF P 98-251-1:2002 (Clause 6.2) And BS EN 12697-12:2018 (Clauses 6.1.1 and 6.2.3)	A & B
Press load	60 kN to 180 kN	0.30 %		
Press rise time (free speed)	At 60 mm per minute	1.1 %		
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 %·V + 5.0 µV, 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.