


# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

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

 <p><b>UKAS</b> CALIBRATION</p> <p>0455</p> <p>Accredited to ISO/IEC 17025:2017</p>	<p><b>Sartorius UK Limited</b></p> <p>Issue No: 024 Issue date: 03 July 2019</p>	
	<p>Longmead Business Centre Blenheim Road Epsom Surrey KT19 9QQ</p>	<p>Contact: Andrew Vaughan Tel: +44 (0)1372 737143 Fax: +44 (0)1372 722151 E-Mail: andrew.vaughan@sartorius.com Website: www.sartorius.com</p>
<p>Calibration performed by the Organisations at the locations specified below</p>		

### Locations covered by the organisation and their relevant activities

#### Laboratory locations:

Location details	Activity	Location code
<p><b>Address</b> Longmead Business Centre Blenheim Road Epsom KT19 9QQ</p> <p><b>Local contact:</b> Andrew Vaughan</p>	<p>Volume Rotational speed Time Temperature</p>	<p>Perm</p>

#### Site activities performed away from the locations listed above:

Location details	Activity	Location code
<p>At customer premises</p> <p>The customers' site or premises 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.</p> <p><b>Contact:</b> Andrew Vaughan</p>	<p>Calibration of Non-Automatic Weighting Machines Volume Rotational speed Time Temperature</p>	<p>Site</p>



0455  
Accredited to  
ISO/IEC 17025:2017

**Schedule of Accreditation**  
issued by  
**United Kingdom Accreditation Service**  
2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

**Sartorius UK Limited**  
**Issue No: 024 Issue date: 03 July 2019**

Calibration performed by the Organisation at the locations specified

DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k=2$ )	Remarks	Location Code
NON-AUTOMATIC WEIGHING MACHINES Self-indicating and semi-self-indicating instruments. See notes 1 and 2.	100 mg 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 500 kg 1000 kg 2000 kg 5000 kg 6000 kg	0.013 mg 0.015 mg 0.020 mg 0.025 mg 0.030 mg 0.038 mg 0.052 mg 0.067 mg 0.095 mg 0.17 mg 0.34 mg 1.4 mg 2.8 mg 5.6 mg 14 mg 28 mg 56 mg 170 mg 2.1 g 4.9 g 13 g 23 g 50 g 120 g 160 g	Note 1 Weights are available in OIML class:  E2 1 mg to 200 g. max grouped load 400 g.  F1 100 g to 10 kg. Max grouped load 41 kg.  M1 10 kg to 250 kg. Max grouped load 6000 kg  Note 2. Other loads within the overall listed range may also be used.	Site
VOLUME of liquids (See Notes 3, 4 and 5)	Nominal value  Single Channel Pipettes 0.2 µL to 10.0 µL 10.0 µL to 20.0 µL 20.0 µL to 100 µL 100 µL to 200 µL 200 µL to 500 µL 0.5 mL to 1 mL 1 mL to 2 mL 2 mL to 5 mL 5 mL to 10 mL  Multi Channel Pipettes 0.5 µL to 10 µL 10.0 µL to 20.0 µL 20.0 µL to 100 µL 100 µL to 200 µL 200 µL to 500 µL 0.5 mL to 1.2 mL	0.18 µL 0.26 µL 0.41 µL 0.60 µL 1.4 µL 0.003 0 mL 0.008 0 mL 0.020 mL 0.030 mL  0.60 µL 1.1 µL 1.6 µL 2.3 µL 4.4 µL 0.007 3 mL	Note 3. For water delivered from piston and/or plunger operated volumetric apparatus.  Single Channel Pipettes and Multi-Channel Pipettes  Note 4. Gravimetric method 10 readings or 5 readings  Note 5. Users requiring conformity to ISO 8655 should note that this cannot be demonstrated using fewer than 10 readings.	Perm



0455  
Accredited to  
ISO/IEC 17025:2017

**Schedule of Accreditation**  
issued by  
**United Kingdom Accreditation Service**  
2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

**Sartorius UK Limited**  
Issue No: 024 Issue date: 03 July 2019

Calibration performed by the Organisation at the locations specified

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k=2$ )	Remarks	Location Code
VOLUME of liquids (See Notes 3, 4 and 5)	Nominal value  Single Channel Pipettes 0.2 µL to 10.0 µL 10.0 µL to 20.0 µL 20.0 µL to 100 µL 100 µL to 200 µL 200 µL to 500 µL 0.5 mL to 1 mL 1 mL to 2 mL 2 mL to 5 mL 5 mL to 10 mL  Multi Channel Pipettes 0.5 µL to 10 µL 10.0 µL to 20.0 µL 20.0 µL to 100 µL 100 µL to 200 µL 200 µL to 500 µL 0.5 mL to 1.2 mL	0.30 µL 0.40 µL 0.60 µL 0.80 µL 1.5 µL 0.004 0 mL 0.007 0 mL 0.020 mL 0.030 mL  0.60 µL 1.1 µL 1.6 µL 2.3 µL 4.4 µL 0.007 3 mL		Site
ROTATIONAL SPEED  Centrifuges	100 rpm to 1000 rpm 1000 rpm to 5000 rpm 5000 rpm to 20000 rpm 20000 rpm to 30000 rpm	2.9 rpm 3.4 rpm 12 rpm 18 rpm		Perm & Site
TEMPERATURE  Temperature controlled heat blocks  Temperature probes built in to centrifuges	37 °C nominal  0 °C to 10 °C	1.1 °C  2.6 °C	For calibration of <i>Ortho Clinical Diagnostics</i> heat blocks and similar devices.	Perm & Site
TIME  Timers	60 s to 900 s	1.3 s		Perm & Site
END				



0455  
Accredited to  
ISO/IEC 17025:2017

**Schedule of Accreditation**  
issued by  
**United Kingdom Accreditation Service**  
2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

**Sartorius UK Limited**  
Issue No: 024 Issue date: 03 July 2019

Calibration performed by the Organisation at the locations specified

## 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  $\mu$ V

Over the range 100 mV to 1 V, the CMC is 0.0025 %·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 %· $p$  + (0.12 · 10<sup>-6</sup>· $p$  · 10<sup>-6</sup>) + 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 · 0.01 ·  $i$ , where  $i$  is the instrument indication.