


# 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><b>0247</b></p> <p>Accredited to ISO/IEC 17025:2017</p>	<p><b>Poulten Selfe and Lee Ltd</b></p> <p>Issue No: 032 Issue date: 02 May 2024</p>	
	<p>PSL Calibration Laboratory Russell House Burnham Business Park Burnham-on-Crouch Essex CM0 8TE</p>	<p>Contact: Mr S J Gosling Tel: +44 (0)1621 787100 Fax: +44 (0)1621 787175 E-Mail: sales@psl-rheotek.com Website: www.psl-rheotek.com</p>
<p><b>Calibration performed at the above address only</b></p>		

### Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ( $k = 2$ )	Remarks
<b>TEMPERATURE</b>			
Digital thermometers	-40 °C to 0 °C Ice Point (0 °C) 0 °C to 150 °C	0.010 °C 0.010 °C 0.010 °C	Digital contact thermometers as per D8278 for use according to ASTM D445, IP71 part1 and ISO3104  Different immersion characteristics may increase the uncertainty value
<b>VISCOSITY</b>			
Capillary viscometer calibration			
Viscosity constant 'C'			
Master viscometers - Ubbelohde	'C' (mm <sup>2</sup> s <sup>-1</sup> )s <sup>-1</sup> 0.001 0.003 0.01 0.03 0.05 0.1 0.3 0.5 1 3 5 15 30 100	0.11 % 0.11 % 0.25 % 0.26 % 0.26 % 0.27 % 0.28 % 0.29 % 0.30 % 0.31 % 0.32 % 0.34 % 0.35 % 0.36 %	Calibrated to ASTM D2162-21



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ( $k = 2$ )		Remarks
<b>VISCOSITY (cont'd)</b>				
Reference viscometers: Direct flow – PSL suspended level type	'C' ( $\text{mm}^2\text{s}^{-1}$ ) $\text{s}^{-1}$ 0.001 0.003 0.01 0.03 0.1 0.3 1 3 10 30 100	0.26 % 0.26 % 0.26 % 0.27 % 0.28 % 0.29 % 0.31 % 0.32 % 0.34 % 0.49 % 0.49 %		Calibrated to ASTM D446-23(2023) and ISO 3105:1994 in direct comparison with master viscometers calibrated to ASTM D2162-21
Routine viscometers: Ubbelohde Suspended Level	'C' ( $\text{mm}^2\text{s}^{-1}$ ) $\text{s}^{-1}$ 0.001 0.003 0.01 0.03 0.1 0.3 1 3 10 30 100	Direct flow	Reverse flow	Calibrated to ASTM D446-23 (2023) and ISO 3105:1994 in direct comparison with reference viscometers or using viscosity standards calibrated to ASTM D2162-21.
		0.27 % 0.27 % 0.27 % 0.28 % 0.30 % 0.31 % 0.32 % 0.36 % 0.36 % 0.50 % 0.50 %	0.31 % 0.31 % 0.31 % 0.34 % 0.35 % 0.37 % 0.40 % 0.43 % 0.43 % 0.55 % 0.55 %	
Viscosity Reference Standards and Viscosity Measurement	$\text{mm}^2\text{s}^{-1}$ 0.4 to 8.8 8.9 to 21 22 to 46 47 to 127 128 to 260 261 to 620 621 to 1130 1131 to 2560 2561 to 6850 6851 to 20450 20451 to 43450 43451 to 150000	Kinematic	Dynamic	Viscosity reference standards calibrated to ASTM D2162-21.  Temperature range 20 °C to 150 °C.
		0.38 % 0.38 % 0.40 % 0.42 % 0.42 % 0.71 % 0.72 % 0.73 % 0.75 % 0.83 % 0.84 % 0.84 % 0.95 %	0.38 % 0.38 % 0.40 % 0.42 % 0.42 % 0.71 % 0.72 % 0.73 % 0.75 % 0.83 % 0.84 % 0.84 % 0.95 %	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ( $k = 2$ )		Remarks
<b>VISCOSITY (cont'd)</b>				
Viscosity Reference Standards and Viscosity Measurement	mm <sup>2</sup> s <sup>-1</sup> 0.4 to 21 22 to 260 261 to 1130 1131 to 150000	Kinematic 0.46 % 0.48 % 0.76 % 0.95 %		Viscosity reference standards calibrated to ASTM D2162-21 using reference viscometers.  Temperature range -40 °C to 0 °C.
Viscosity Reference Standards and Viscosity Measurement	mm <sup>2</sup> s <sup>-1</sup> 0.4 to 8.8 8.9 to 21 22 to 46 47 to 127 128 to 260 261 to 620 621 to 1130 1131 to 2560 2561 to 6850 6851 to 20450 20451 to 43450 43451 to 150000	Kinematic 0.44 % 0.45 % 0.46 % 0.48 % 0.75 % 0.76 % 0.77 % 0.79 % 0.86 % 0.86 % 0.86 % 0.86 % 0.95 %	Dynamic 0.44 % 0.45 % 0.46 % 0.48 % 0.75 % 0.76 % 0.77 % 0.79 % 0.86 % 0.86 % 0.86 % 0.86 % 0.95 %	Viscosity reference standards calibrated to ASTM D2162-21 using reference viscometers.  Temperature range 20 °C to 150 °C.
<b>DENSITY</b>				
Liquids	0.65 g/ml to 0.93 g/ml	0.070 %		Calibrated to IP 189/190-2005  Temperature range 20 °C to 150 °C.

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