# MSL Proficiency Test MSL-PT-M01-2019

# Piston Pipettes

## Technical Protocol

### 1. Introduction

The purpose of this proficiency test is to verify the calibration capabilities of the participating laboratories in the field of gravimetric determination of volume by the use of piston pipettes in the volume range 1 mL to 2 µL. The artefacts to be calibrated are piston pipettes with nominal volumes of 1 mL, 200 µL and 20 µL. The pipettes will be initially calibrated by MSL then sent to each participating laboratory. Between measurements at each laboratory, the pipettes will be returned to MSL for a damage check and recalibration before being dispatched to the next participant. Finally, the pipettes will be recalibrated by MSL to determine any possible drift.

### 2. Equipment and handling

Artefacts:
BioPette PLUS 1000 µL, sn 340960146
BioPette PLUS 200 µL, sn 340950121
BioPette PLUS 20 µL, sn 240930058

On receipt, unpack and inspect the artefacts for any damage. Report any damage immediately to MSL. Once measurements are completed, repack the artefact in the original packaging and return by courier to:

Greg Reid
Measurement Standards Laboratory
Callaghan Innovation
69 Gracefield Road
Lower Hutt 5010

### 3. Measurements to be carried out

**Please do NOT service the pipettes or attempt any maintenance.**

Calibrate the pipettes following your normal procedures at 100%, 50% and 10% of nominal volume using the supplied tips.

### 4. Documents to be submitted

Within one week of completion of the measurements, participating laboratories are required to submit their results to MSL in the form of a calibration certificate as routinely reported to customers. In addition, all data collected in the calibration – worksheets, (electronic or physical) or screen captures of calibration software showing the data – should also be submitted. If commercial calibration

software is used, the version number should also be identified. These documents can be sent by email – see *Contact Information* below.

Uncertainties should be calculated using your usual method, which should be consistent with the method in the ISO *Guide to the Expression of Uncertainty in Measurement*. Uncertainties should be reported as expanded uncertainties at the 95 % level of confidence.

***Note:*** *It is acceptable for the purposes of this proficiency test to report an uncertainty below that on your Scope of Accreditation or to report results at points outside the range of the measurand on your Scope of Accreditation.*

## 5. Further information

*Schedule*

The comparison is scheduled to start in March 2019. Each laboratory will be assigned two weeks to complete the calibration plus one week to submit the results.

*Analysis*

Results from all participating laboratories will be compared to the reference values measured at MSL. The results will be reported as a table of normalised error ($E_n$) values, which are given by

$$E_n = \frac{\mathrm{LAB} - \mathrm{REF}}{\sqrt{U_{\mathrm{LAB}}^2 + U_{\mathrm{REF}}^2}},$$

where:

LAB = participating laboratory's correction,
REF = reference laboratory's correction,
$U_{\mathrm{LAB}}$ = participating laboratory's expanded uncertainty,
$U_{\mathrm{REF}}$ = reference laboratory's expanded uncertainty.

*Reporting*

Your laboratory will receive a customised interim report comparing your results with the most recent reference laboratory's calibration results, including a normalised error analysis and feedback on your submitted calibration certificate. The interim report will be available within two weeks of your results being submitted to MSL.

A draft final report will be compiled once all participating laboratories have completed their calibrations. This report will identify results only by the laboratory number and the same report will be issued to all participants. Laboratories will be given two weeks to comment on the draft final report, after which a final report will be issued.

*Contact information*

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