

Level 3 Calibration Report

Pipette Calibration Services, Inc.  
 150 Wells Ave  
 Newton, MA 02459  
 Tel: (866)964-0039

ISO/IEC 17025:2005 Accredited  
 Accreditation #63119



Calibrated By: Shanjun Zhang  
 Cal. Date: May/23/2017  
 Standard: METTLER MCP1-S  
 Balance SN: 1128380328  
 Balance Recal Due: Jul/31/2017  
 Weight Set: 29673  
 Wt.Recal Due: Jul/31/2017  
 Environ. Logger ID: OM04  
 Logger Recal Due: Jan/31/2018  
 Air/Water Temp(C): 22.8 / 23.1  
 Humidity %RH: 41.2 Evap Trap in Use (> 50%)  
 Barometer mm. Hg: 767.8  
 Water Den. (g/ml): 0.99647  
 Z factor (1/density): 1.00354

Calibrated at: Client Site  
 Recal. Due: Nov/23/2017  
 Make: Rainin  
 Model: L-200 ul 12 ch XLS  
 Serial Number: 'B641141052  
 Id Marks:  
 Tracking Number: 560064.0035

As Left 20 ul

Repetition (mg)	1	2	3	4	5	6	7	8
1	19.7	19.8	19.8	19.9	19.9	19.8	19.9	19.9
2	19.8	19.8	19.8	19.9	19.9	19.8	19.9	19.8
3	19.6	19.6	19.6	19.7	19.7	19.8	19.8	19.8
4	19.5	19.7	19.6	19.8	19.7	19.6	19.8	19.8
Average(ul)	19.7	19.8	19.8	19.9	19.9	19.8	19.9	19.9
Inaccuracy(%)	1.40	1.03	1.15	0.52	0.65	0.90	0.40	0.52
Imprecision(%CV)	0.65	0.48	0.58	0.48	0.58	0.50	0.29	0.25
Accuracy	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Precision	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

As Left 200 ul

Repetition (mg)	1	2	3	4	5	6	7	8
1	199.5	199.6	199.4	199.4	199.4	199.6	199.5	199.6
2	199.8	199.6	199.6	199.6	199.6	199.6	199.7	199.8
3	199.9	199.7	199.7	199.8	199.9	199.8	199.9	199.9
4	199.9	199.9	199.7	199.8	199.9	199.9	199.9	200.0
Average(ul)	200.5	200.4	200.3	200.4	200.4	200.4	200.5	200.5
Inaccuracy(%)	0.24	0.20	0.15	0.18	0.20	0.22	0.23	0.27
Imprecision(%CV)	0.09	0.07	0.07	0.10	0.12	0.07	0.10	0.09
Accuracy	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
Precision	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

Manufacturer Specifications

Volume	20 ul	200 ul
Accuracy (ul)	'19.5 - 20.5	'198.4 - 201.6
Precision%	'1	'0.15

Procedure:

This pipette was calibrated gravimetrically using Pipette Calibration Services, Inc Standard Operating Procedures. This is to certify that the above item was calibrated using standards whose measurement results are traceable to reference standards developed and maintained by (NMI) National Metrology Institutes, such as (NIST, USA) to International System of Units(SI) and/or based on fundamental physical constants. Pipette Calibration Services, Inc.'s quality management system is in compliance with ISO/IEC 17025:2005 standard. Test Uncertainty Ratio (TUR) is greater than 4:1, unless otherwise noted. This certificate and the data shall not be reproduced except in full without written approval of Pipette Calibration Services, Inc. management. Measurement results pertain only to the item calibrated and apply at the time of measurements. The measurement uncertainty(MU) associated with the measurement results reported in this certificate is available from the organization upon request and was not accounted for in making the decision of compliance or non-compliance with the relevant specifications identified above. The average(ul) and error % reported is calculated by multiplying the average weight as measured by the balance by the Z factor as shown in the standards and conditions.

Parts Replaced:  
 Lubricated

Comments:

Remedial action:  
 Items replaced as indicated in "Parts Replaced".



Report reviewed by: \_\_\_\_\_  
 Patience Miller, Quality Assurance

Date of review: \_\_\_\_\_