



STANDARD OPERATING PROCEDURE

Department: Microbiology	SOP No.:
Title: Procedure for Operation and Calibration of Micropipette	Effective Date:
Supersedes: Nil	Review Date:
Issue Date:	Page No.:

1.0 OBJECTIVE:

To lay down a procedure for operation and calibration of micropipette.

2.0 SCOPE:

This SOP is applicable for operation and calibration of micropipette in Microbiology Section of Quality Control Laboratory.

3.0 RESPONSIBILITY:

Officer / Executive - Microbiologist

4.0 ACCOUNTABILITY:

Head – QC

5.0 PROCEDURE:

5.1 Calibrate the Micropipettes for a volume of 20 to 200 µl and for 100 to 1000 µl.

5.2 Set the desired volume using the Volume-Setting Knob e.g. for 20 to 200 µl set 50 µl, 100 µl & 200 µl and for 100 µl to 1000 µl set 100 µl, 500 µl & 1000 µl.

5.3 Carefully fit the tip into tip cone and pick up the Distilled Water and flush out to set the tip with pipettes.

5.4 Weigh the empty Vial (A).

5.5 Pick up the set water volume and add into the vial at temperature 25°C to 27°C.

5.6 Observe the weight of vial with water (B).

5.7 Calculate the exact weight of water $M = B - A$.

5.8 Divide the value of M with the D i.e. 0.997 gm (D is specific gravity of water at 27°C) to obtain actual volume in ml.

5.9 Repeat the procedure for three times with high set volume and RSD should not be more than 2%.

5.10 Record the Calibration Details in **Annexure-I**, Titled “**Calibration of Micropipettes (20-200 µl)**”.

5.11 Record the Calibration Details in **Annexure-II**, Titled “**Calibration of Micropipettes (100-1000 µl)**”.

5.12 Frequency : Once in a 3 Months

5.13 Acceptance Criteria:



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	TOLERANCE LIMIT IN μL	
	MINIMUM	MAXIMUM
50	49.95	50.05
100	99.90	100.1
200	199.8	200.2
500	499.5	500.5
1000	999.0	1001.0

6.0 REFERENCES:

Not Applicable

7.0 ANNEXURES:

ANNEXURE No.	TITLE OF ANNEXURE	FORMAT No.
Annexure – I	Calibration of Micropipettes (20-200 μl)	
Annexure – II	Calibration of Micropipettes (100-1000 μl)	

ENCLOSURES: SOP Training Record

8.0 DISTRIBUTION:

- Controlled Copy No. 01 Quality Assurance Department
- Controlled Copy No. 02 Quality Control Department
- Master Copy Quality Assurance Department

9.0 ABBREVIATIONS:

μl	Micro liter
ml	Milliliter
No.	Number
QA	Quality Assurance
QC	Quality Control
SOP	Standard Operating Procedure
RSD	Relative Standard Deviation

10.0 REVISION HISTORY:

CHANGE HISTORY LOG

Revision No.	Details of Changes	Reason for Change	Effective Date	Updated By
00	New SOP	Nil		



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ANNEXURE – I

CALIBRATION OF MICROPIPETTES (20-200 µL)

Date of Calibration	Next Due Date
Micropipette Make	Micropipette ID
Volume Range	

OBSERVATION TABLE:

S.No.	Empty Vial wt. (A)	Volume Pipetted in µl	Wt. of Vial & Water (B)	Wt. of Water (M=B-A)	Density of Water at 25°C	Actual Volume (V=M/D)
For 50µl						
1.						
2.						
3.						
% RSD:				Average		
For 100µl						
1.						
2.						
3.						
% RSD:				Average		
For 200µl						
1.						
2.						
3.						
% RSD:				Average		

RSD should be not more then 2%.

LIMITS:

VOLUME IN µL	TOLERANCE LIMIT IN µL	
	MINIMUM	MAXIMUM
50	49.95	50.05
100	99.90	100.1
200	199.8	200.2

Remarks: The Calibration of Micropipettes Complies / Doesn't Comply as per requirement.

Microbiologist:
Date:

Checked By:
Date:

Approved By:
Date:



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ANNEXURE II CALIBRATION OF MICROPIPETTES (100-1000 µL)

Date of Calibration		Next Due Date	
Micropipette Make		Micropipette ID	
Volume Range			

OBSERVATION TABLE:

S.No.	Empty Vial wt. (A)	Volume Pipetted in µl	Wt. of Vial & Water (B)	Wt. of water (M=B-A)	Density of Water at 25°C	Actual Volume (V=M/D)
For 100µl						
1.						
2.						
3.						
% RSD:						
Average						
For 500µl						
1.						
2.						
3.						
% RSD:						
Average						
For 1000µl						
1.						
2.						
3.						
% RSD:						
Average						

RSD should be not more then 2%.

LIMITS:

VOLUME IN µL	TOLERANCE LIMIT IN µL	
	Minimum	Maximum
100	99.90	100.1
500	499.5	500.5
1000	999.0	1001.0

Remarks: The Calibration of Micropipettes Complies / Doesn't Comply as per requirement.

Microbiologist:
Date:

Checked By:
Date:

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