

Calibration Certificate

Certificate No.: YEA(C)/ 231223A/I965/001
 ULR No.: CC222123000082846F

Dated : 30.12.2023

Calibrated for : ICTC, Ngopa CHC
 Dist.: Champhai, Mizoram,
 Pin - 796290.

| Calibrated on. | Next Calibration Due On. | Page No. | No. of Pages |
|----------------|--------------------------|----------|--------------|
| 26.12.2023 | 26.12.2024 | 1 | 3 |

Description of Instrument

Name : Micro Pipette
Identification : ICTC/NGP/MP-01
Range : 5 - 50 μ l
Least Count : 1 μ l
Make : Handypette (Sl. No. : 101701438)

Service Request No. / Order Reference : 231223A/I965/001-004

Receipt of Instrument : 23.12.2023

Location where calibration performed : At permanent laboratory

Applicable Specification of Instrument to be Calibrated : Not Specified

Condition of Instrument to be Calibrated : Satisfactory

Basis of Calibration : Comparison method with reference to YEA/WI/M-47

Environmental Condition during Calibration : *Temp.* : (23 \pm 4) $^{\circ}$ C *RH* : (50 \pm 10)%

Equipment used for Calibration : Standard Electronic Balance & Distilled Water

Traceability : To National Standard vide Certificate No:
 YEA(C)/230925/Y001/001 valid till 24.09.2024

Measurement Uncertainty : The figures are stated in the result at coverage factor
 $k = 2$ corresponding to confidence probability of
 95% for normal distribution.

Laboratory Identification : Sticker is affixed for authentication of calibration.

The above Instrument/Equipment/Machine has been calibrated &
 The results are given in the page 2 to 3 ...of the certificate.

Contd...2

YEA(C)/F-08



Certificate No.: YEA(C)/ 231223A/1965/001

ULR No.: CC222123000082846F

Calibrated By : S. Das

Date: 30.12.2023

Page 2 of 3 Pages

Calibration Results

Mechanical Calibration

A) Calibration Result of Micro Pipette :

| Sl. No. | DUC Value | Standard Value | Mean Value | Systematic Error (es) | Random Error (cv) | Measurement Uncertainty |
|---------|------------|----------------|------------|--|-------------------|-------------------------|
| | (μ l) | (μ l) | (μ l) | (μ l) | (μ l) | ($\pm \mu$ l) |
| 1 | 5 | 5.033 | 5.008 | -0.008 | 0.028 | 0.021 |
| 2 | | 5.004 | | | | |
| 3 | | 4.996 | | | | |
| 4 | | 5.019 | | Standard Limit Value as Per ISO 8655 - 2 : 2002 ($\pm \mu$ l) | | |
| 5 | | 5.037 | | | | |
| 6 | | 4.996 | | | | |
| 7 | | 4.969 | | | | |
| 8 | | 4.962 | | 0.125 | 0.075 | |
| 9 | | 5.046 | | | | |
| 10 | | 5.018 | | | | |

| Sl. No. | DUC Value | Standard Value | Mean Value | Systematic Error (es) | Random Error (cv) | Measurement Uncertainty |
|---------|------------|----------------|------------|--|-------------------|-------------------------|
| | (μ l) | (μ l) | (μ l) | (μ l) | (μ l) | ($\pm \mu$ l) |
| 1 | 25 | 24.982 | 24.960 | 0.040 | 0.030 | 0.022 |
| 2 | | 24.993 | | | | |
| 3 | | 24.942 | | | | |
| 4 | | 24.961 | | Standard Limit Value as Per ISO 8655 - 2 : 2002 ($\pm \mu$ l) | | |
| 5 | | 24.944 | | | | |
| 6 | | 24.965 | | | | |
| 7 | | 24.914 | | | | |
| 8 | | 24.932 | | 0.500 | 0.200 | |
| 9 | | 25.012 | | | | |
| 10 | | 24.955 | | | | |

cont. 0.3





YEA

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E-mail : calibration@yeagroup.org ★ Visit us at : www.yeagroup.org

CIN : U74140WB2005PTC106389 ★ Toll Free Help Desk : 1800 345 9001

Certificate No.: YEA(C)/ 231223A/1965/001
ULR No.: CC222123000082846F
Calibrated By : S. Das

Date: 30.12.2023
Page 3 of 3 Pages

| Sl. No. | DUC Value | Standard Value | Mean Value | Systematic Error (es) | Random Error (cv) | Measurement Uncertainty |
|---------|------------|----------------|------------|--|-------------------|-------------------------|
| | (μ l) | (μ l) | (μ l) | (μ l) | (μ l) | ($\pm \mu$ l) |
| 1 | 50 | 50.077 | 50.122 | -0.122 | 0.031 | 0.023 |
| 2 | | 50.128 | | | | |
| 3 | | 50.144 | | | | |
| 4 | | 50.104 | | Standard Limit Value as Per ISO 8655 - 2 : 2002 ($\pm \mu$ l) | | |
| 5 | | 50.144 | | | | |
| 6 | | 50.132 | | | | |
| 7 | | 50.078 | | | | |
| 8 | | 50.143 | | 0.500 | 0.200 | |
| 9 | | 50.172 | | | | |
| 10 | | 50.101 | | | | |

DUC : Device Under Calibration

REMARKS : The above Micro Pipette has been calibrated and the readings are tabulated above.

NOTES : This certificate refers to the results tabulated at the time of calibration only for the above mentioned item submitted for calibration and this should not be reproduced, other than in full except with prior written approval from the head of calibration laboratory.

Authorised By

A. Das

Manager Calibration

*** End of the Calibration Certificate ***





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Calibration Certificate

Certificate No.: YEA(C)/ 231223A/I965/002

ULR No. : CC222123000082847F

Dated : 30.12.2023

Calibrated for : ICTC, Ngopa CHC

Dist.: Champhai, Mizoram,

Pin - 796290.

| Calibrated on. | Next Calibration Due On. | Page No. | No. of Pages |
|----------------|--------------------------|----------|--------------|
| 26.12.2023 | 26.12.2024 | 1 | 3 |

Description of Instrument

Name : Micro Pipette
Identification : ICTC/NGP/MP-02
Range : 2 - 20 µl
Least Count : 0.2 µl
Make : Accupipet (Sl. No. : V45532)

Service Request No. / Order Reference

: 231223A/I965/001-004

Receipt of Instrument

: 23.12.2023

Location where calibration performed

: At permanent laboratory

Applicable Specification of Instrument to be Calibrated

: Not Specified

Condition of Instrument to be Calibrated

: Satisfactory

Basis of Calibration

: Comparison method with reference to YEA/WI/M-47

Environmental Condition during Calibration

: **Temp.** : (23±4)°C **RH** : (50±10)%

Equipment used for Calibration

: Standard Electronic Balance & Distilled Water

Traceability

: To National Standard vide Certificate No:
YEA(C)/230925/Y001/001 valid till 24.09.2024

Measurement Uncertainty

: The figures are stated in the result at coverage factor
 $k = 2$ corresponding to confidence probability of
95% for normal distribution.

Laboratory Identification

: Sticker is affixed for authentication of calibration.

The above Instrument/Equipment/Machine has been calibrated

The results are given in the page 2 to 3 ...of the certificate.

Cont...2

YEA(C)/F-08



CC-2221



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Certificate No.: YEA(C)/ 231223A/I965/002

ULR No. : CC222123000082847F

Calibrated By : M. Gayan

Date: 30.12.2023

Page 2 of 3 Pages

Calibration Results

Mechanical Calibration

A) Calibration Result of Micro Pipette :

| Sl. No. | DUC Value | Standard Value | Mean Value | Systematic Error (es) | Random Error (cv) | Measurement Uncertainty |
|---------|------------|----------------|------------|--|-------------------|-------------------------|
| | (μ l) | (μ l) | (μ l) | (μ l) | (μ l) | ($\pm \mu$ l) |
| 1 | 2.0 | 2.025 | 1.985 | 0.015 | 0.028 | 0.022 |
| 2 | | 1.988 | | | | |
| 3 | | 1.966 | | | | |
| 4 | | 2.011 | | | | |
| 5 | | 1.999 | | Standard Limit Value as Per ISO 8655 - 2 : 2002 ($\pm \mu$ l) | | |
| 6 | | 2.015 | | | | |
| 7 | | 1.984 | | | | |
| 8 | | 1.973 | | | | |
| 9 | | 1.961 | | | | |
| 10 | | 1.934 | | | | |
| | | | | 0.080 | 0.040 | |

| Sl. No. | DUC Value | Standard Value | Mean Value | Systematic Error (es) | Random Error (cv) | Measurement Uncertainty |
|---------|------------|----------------|------------|--|-------------------|-------------------------|
| | (μ l) | (μ l) | (μ l) | (μ l) | (μ l) | ($\pm \mu$ l) |
| 1 | 10.0 | 9.991 | 10.004 | -0.004 | 0.038 | 0.028 |
| 2 | | 9.983 | | | | |
| 3 | | 9.974 | | | | |
| 4 | | 9.957 | | Standard Limit Value as Per ISO 8655 - 2 : 2002 ($\pm \mu$ l) | | |
| 5 | | 10.050 | | | | |
| 6 | | 10.062 | | | | |
| 7 | | 10.053 | | | | |
| 8 | | 10.004 | | | | |
| 9 | | 10.002 | | | | |
| 10 | | 9.967 | | | 0.120 | |

cont. 3





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ULR No. : CC222123000082847F

Calibrated By : M. Gayan

Date: 30.12.2023

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| Sl. No. | DUC Value | Standard Value | Mean Value | Systematic Error (es) | Random Error (cv) | Measurement Uncertainty |
|---------|------------|----------------|------------|--|-------------------|-------------------------|
| | (μ l) | (μ l) | (μ l) | (μ l) | (μ l) | ($\pm \mu$ l) |
| 1 | 20.0 | 19.958 | 20.040 | -0.040 | 0.040 | 0.029 |
| 2 | | 20.049 | | | | |
| 3 | | 20.069 | | | | |
| 4 | | 20.024 | | | | |
| 5 | | 20.045 | | Standard Limit Value as Per ISO 8655 - 2 : 2002 ($\pm \mu$ l) | | |
| 6 | | 20.028 | | | | |
| 7 | | 20.080 | | | | |
| 8 | | 20.058 | | | | |
| 9 | | 20.002 | | 0.200 | 0.100 | |
| 10 | | 20.092 | | | | |

DUC : Device Under Calibration

REMARKS : The above Micro Pipette has been calibrated and the readings are tabulated above.

NOTES : This certificate refers to the results tabulated at the time of calibration only for the above mentioned item submitted for calibration and this should not be reproduced, other than in full except with prior written approval from the head of calibration laboratory.

Authorised By

A. Das

Manager Calibration

*** End of the Calibration Certificate ***



Calibration Certificate

Certificate No.: YEA(C)/ 231223A/1965/003

Dated : 30.12.2023

ULR No. : CC222123000082848F

Calibrated for : ICTC, Ngopa CHC

Dist.: Champhai, Mizoram,

Pin - 796290.

| Calibrated on. | Next Calibration Due On. | Page No. | No. of Pages |
|----------------|--------------------------|----------|--------------|
| 26.12.2023 | 26.12.2024 | 1 | 3 |

Description of Instrument

Name : Micro Pipette
Identification : ICTC/NGP/MP-03
Range : 20 - 200 μ l
Least Count : 0.2 μ l
Make : Accupipet



CC-2221

Service Request No. / Order Reference : 231223A/1965/001-004

Receipt of Instrument : 23.12.2023

Location where calibration performed : At permanent laboratory

Applicable Specification of Instrument to be Calibrated : Not Specified

Condition of Instrument to be Calibrated : Satisfactory

Basis of Calibration : Comparison method with reference to YEA/WI/M-47

Environmental Condition during Calibration : *Temp.* : (23 \pm 4) $^{\circ}$ C *RH* : (50 \pm 10)%

Equipment used for Calibration : Standard Electronic Balance & Distilled Water

Traceability : To National Standard vide Certificate No: YEA(C)/230925/Y001/001 valid till 24.09.2024

Measurement Uncertainty : The figures are stated in the result at coverage factor $k = 2$ corresponding to confidence probability of 95% for normal distribution.

Laboratory Identification : Sticker is affixed for authentication of calibration.

The above Instrument/Equipment/Machine has been calibrated

The results are given in the page 2 to 3 ...of the certificate.

Cont.  2





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ULR No. : CC222123000082848F

Calibrated By : M. Gayan

Date: 30.12.2023

Page 2 of 3 Pages

Calibration Results

Mechanical Calibration

A) Calibration Result of Micro Pipette :

| Sl. No. | DUC Value | Standard Value | Mean Value | Systematic Error (es) | Random Error (cv) | Measurement Uncertainty |
|---------|------------|----------------|------------|--|-------------------|-------------------------|
| | (μ l) | (μ l) | (μ l) | (μ l) | (μ l) | ($\pm \mu$ l) |
| 1 | 20.0 | 19.995 | 20.062 | -0.062 | 0.040 | 0.030 |
| 2 | | 20.080 | | | | |
| 3 | | 20.095 | | | | |
| 4 | | 20.106 | | | | |
| 5 | | 20.045 | | | | |
| 6 | | 20.028 | | | | |
| 7 | | 20.092 | | | | |
| 8 | | 20.016 | | | | |
| 9 | | 20.059 | | | | |
| 10 | | 20.106 | | | | |
| | | | | Standard Limit Value as Per ISO 8655 - 2 : 2002 ($\pm \mu$ l) | | |
| | | | | 0.200 | 0.100 | |

| Sl. No. | DUC Value | Standard Value | Mean Value | Systematic Error (es) | Random Error (cv) | Measurement Uncertainty |
|---------|------------|----------------|------------|--|-------------------|-------------------------|
| | (μ l) | (μ l) | (μ l) | (μ l) | (μ l) | ($\pm \mu$ l) |
| 1 | 100.0 | 99.998 | 100.083 | -0.083 | 0.040 | 0.030 |
| 2 | | 100.079 | | | | |
| 3 | | 100.088 | | | | |
| 4 | | 100.105 | | | | |
| 5 | | 100.078 | | | | |
| 6 | | 100.052 | | | | |
| 7 | | 100.089 | | | | |
| 8 | | 100.099 | | | | |
| 9 | | 100.088 | | | | |
| 10 | | 100.156 | | | | |
| | | | | Standard Limit Value as Per ISO 8655 - 2 : 2002 ($\pm \mu$ l) | | |
| | | | | 0.800 | 0.300 | |

cont. 1.3





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Date: 30.12.2023

Page 3 of 3 Pages

| Sl. No. | DUC Value | Standard Value | Mean Value | Systematic Error (es) | Random Error (cv) | Measurement Uncertainty |
|---------|-------------------|-------------------|-------------------|---|-------------------|-------------------------|
| | (μl) | (μl) | (μl) | (μl) | (μl) | ($\pm \mu\text{l}$) |
| 1 | 200.0 | 199.946 | 200.038 | -0.038 | 0.045 | 0.033 |
| 2 | | 200.033 | | | | |
| 3 | | 200.005 | | | | |
| 4 | | 200.079 | | | | |
| 5 | | 200.065 | | Standard Limit Value as Per ISO 8655 - 2 : 2002 ($\pm \mu\text{l}$) | | |
| 6 | | 200.082 | | | | |
| 7 | | 200.026 | | | | |
| 8 | | 200.002 | | 1.600 | 0.600 | |
| 9 | | 200.066 | | | | |
| 10 | | 200.079 | | | | |

DUC : Device Under Calibration

REMARKS : The above Micro Pipette has been calibrated and the readings are tabulated above.

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*** End of the Calibration Certificate ***

