

ภาคผนวก ง

ใบรับรองการสอบเทียบเครื่องมือ



ผู้แทนฝ่ายผู้ฟ้องคดี / ทนาย

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effectively



www.elsevier.com/locate/jmb

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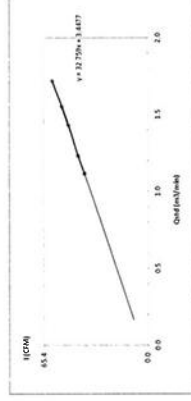
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High Volume Air Sampler Calibration Worksheet

Price Sheet :		TOTAL Qty : Unlimited Load Co., Ltd.	7552
Calibrate Location :		WUHAN GUANGYUAN SHIPREPAIR CO., LTD.	
Calibrate Date :		11-06-20	2825
Calibration Sheet No.:		C-11-024 HWT L250A-2	RIG P55642
Calibrator's ID:		RWT P2206	TF 52098
Calibrator's Model:		TE 5516A	61575
Calibrator's S/N:		1593	Calibrator Shape :
			Calibrator Interval :
			-0.025/3
			Breumatic Pressure (mm Hg) :
			Temperature (°C) :
			High Volume (lit)
			High Volume (mold)
			High Volume (S/N)

Test No.	Initial ΔD (mm)	Q_{ult} (mm)	1-Chair (OTM)	Linear Regression
1	2.7	1.1100	40	Slope 21.7540
2	3.3	1.2290	46	Intercept 3.4477
3	4.5	1.6310	50	Correlation Coefficient 0.9992
4	5.2	1.5510	54	
5	6.5	1.7150	60	



Calibrated by _____
(Mr Norman Troughton)

Approved by _____
(Mr. Joseph J. Sullivan)

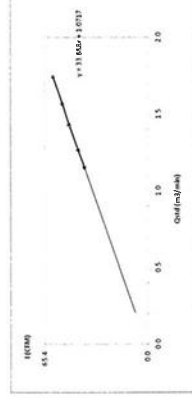
INM No. 106-071 1070005 No. 2 87280488 26/11/21



High Volume Air Sampler Calibration Worksheet

WMA Research and Development Co., Ltd.		7553	
Project Size:		Barometric Pressure (mm Hg):	755.3
Calibrator Location:	WMA Research and Development Co., Ltd.	Temperature (°C):	23.5
Calibrator Date:	1-10-24	High Volume (L):	RYG 180603
Calibrator Serial No.:	C-11874-2023-2 gms2	High Volume (mL):	11-509X
Calibrator ID#:	RYG 252526	High Volume (mL):	62.0
Calibrator Model:	11-1232A	Calibrator Slope:	1.48469
Calibrator S/N:	1540	Calibrator Intercept:	-0.97323

Test No.	Polymer (fresh)	Q _{ox} (m ² /m ² /h)	1-Chart (g/m ²)	Linear Regression
1	2.9	1.1545	40	37 ± 5
2	3.5	1.2050	44	1.017
3	4.5	1.4319	59	
4	5.8	1.5662	5.8	Coefficient
5	6.2	1.7817	60	0.995



Calculated by _____
(Mr Norraison Tattongkhano)
Field Scientist (U2)

Approved by: _____
(Mr. Stephen J. Janssen)
Facilities Coordinator, Somerset (H)

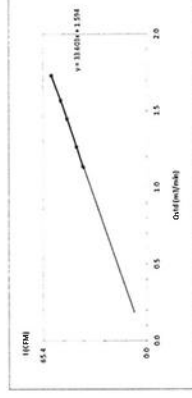
FORM NO. 106 OF 1971 REVISION NO. 3 EFFECTIVE DATE 10/11/72



High Volume Air Sampler Calibration Worksheet

Product Size:	WMA Regional Industrial Land Co. Ltd.	Internal Pressure (mm Hg):	755.2
Calibration Location:	WMA/Chongqing Area (L3)	Temperature (°C):	37.5
Calibration Date:	1,261,124	High Volume (L):	100 (19241)
Calibration Set No.:	5-11034 (MG-75029)	High Volume Model:	TE-5120
Calibration File:	R376-230206	High Volume S/N:	5233
Calibration Model:	TE-502FA	Calibration Slope:	1.4640
Calibration S/N:	1543	Calibration Intercept:	-0.08233

Test No.	Incineration Temp. (°C)	Qua. (mg/min)	11 Short (2000)	Linear Regression
1	230	1.1180	49	32.6573
2	3.5	1.2148	44	1.5949
3	8.6	1.4475	59	
4	5.4	1.5662	54	
5	6.6	1.7298	60	



Calibrated by _____
(Mr Norman Tshongkham)
Field Scientist (2)

Aggrieved by _____
(Mr Noypong Jurdapuan)
Firearm Field Coordinator or Scientist (3)

FORM NO. 164-011 REVISED NO. 2 E24 DATE 20/11/2

(Mr. Northing [unintelligible])
 Eastern Field Coordinator, Scientist (1)

FORM NO. 106 OF 1971 REVISION NO. 3 EFFECTIVE DATE 10/11/72

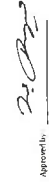


Aggrieved by _____
(Mr. Naypong Jurnarupun)
Favron Field Coordinator/Scientist

FORM NO. 104-011 REVISED NO. 2 EXPIRATION DATE: 12/31/2004



Calibrated by _____
(Mr Norranon Tathongkham
Field Scientist (2)



Approved by: _____
(Mr. N. Spong Juntaraporn)
Envirol Field Coordinator Scientist (3)

FORM NO. 1-66-071 REVISION NO. 2 EXPIRATION DATE 20-11-12

ALS
MULTIPOINT CALIBRATION REPORT

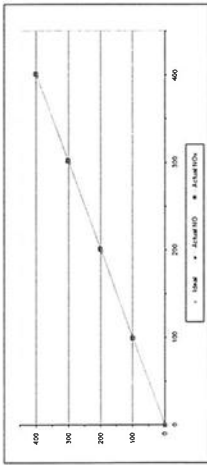
Calibration Date: 3-Jul-24
Equipment Name: NOx Analyzer
Manufacturer: HORIBA
Model: APNA-370
Serial No.: BUL594U
Equipment ID: BOC F61000
Calibrator Manufacturer: 700

Serial No.: 847
Std. Gas Concentration (PPM): 55.88
Cylinder No.: GN027222
Cylinder Pressure (psi): 1800
Certified By: Alana Inc.
Expiry Date: 8-Feb-25

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	91.70	-8.30	-8.30	91.70	-8.30
2	200.00	191.70	-8.30	-4.15	191.70	-4.15
3	300.00	291.70	-8.30	-2.77	291.70	-2.77
4	400.00	381.70	-18.30	-4.58	381.70	-4.58

AVERAGE (N): -4.54

0.18



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McJannet, Balam)
Field Environmental Scientist (2)
Assistant General Manager

FORM NO. F-68-06, REVISION NO. 1, ISSUE DATE: 02/04/22

ALS
MULTIPOINT CALIBRATION REPORT

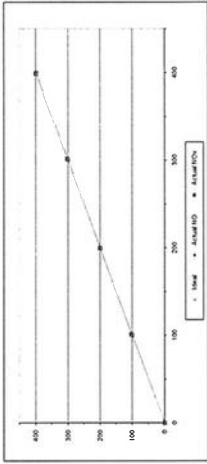
Calibration Date: 3-Jul-24
Equipment Name: NOx Analyzer
Manufacturer: HORIBA
Model: APNA-370
Serial No.: NV0870H
Equipment ID: RYG F60459
Calibrator Manufacturer: 700

Serial No.: 847
Std. Gas Concentration (PPM): 55.88
Cylinder No.: GN027222
Cylinder Pressure (psi): 1800
Certified By: Alana Inc.
Expiry Date: 8-Feb-25

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	%Error NOx
ZERO	0.00	0.05	0.05	0.05	0.10	0.10
1	100.00	99.50	-0.50	-0.50	101.20	1.20
2	200.00	199.70	-0.30	-0.15	199.70	-0.15
3	300.00	299.10	-0.90	-0.30	301.40	0.40
4	400.00	398.30	-1.70	-0.43	398.30	-0.43

AVERAGE (N): -0.13

0.28



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McJannet, Balam)
Field Environmental Scientist (2)
Assistant General Manager

FORM NO. F-68-06, REVISION NO. 1, ISSUE DATE: 02/04/22

ALS
MULTIPOINT CALIBRATION REPORT

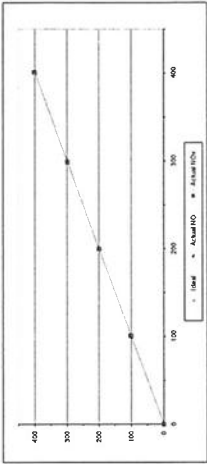
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Equipment Name: NOx Analyzer
Manufacturer: HORIBA
Model: APNA-370
Serial No.: ANX070R
Equipment ID: RYG F60459
Calibrator Manufacturer: 700

Serial No.: 847
Std. Gas Concentration (PPM): 55.88
Cylinder No.: GN027222
Cylinder Pressure (psi): 1800
Certified By: Alana Inc.
Expiry Date: 8-Feb-25

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90	101.10	1.10
2	200.00	198.10	-1.90	-0.95	199.10	-0.50
3	300.00	296.10	-3.90	-1.30	296.10	-1.30
4	400.00	394.10	-5.90	-1.48	394.10	-1.48

AVERAGE (N): -1.21

0.19



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McJannet, Balam)
Field Environmental Scientist (2)
Assistant General Manager

FORM NO. F-68-06, REVISION NO. 1, ISSUE DATE: 02/04/22

ALS
MULTIPOINT CALIBRATION REPORT

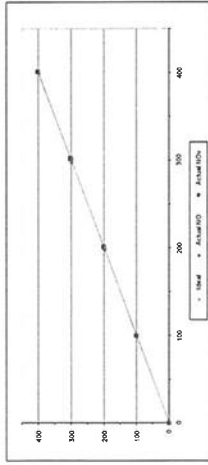
Calibration Date: 3-Jul-24
Equipment Name: NOx Analyzer
Manufacturer: HORIBA
Model: APNA-370
Serial No.: BEA705E
Equipment ID: RYG F10201
Calibrator Manufacturer: 700

Serial No.: 847
Std. Gas Concentration (PPM): 55.88
Cylinder No.: GN027222
Cylinder Pressure (psi): 1800
Certified By: Alana Inc.
Expiry Date: 8-Feb-25

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	94.70	-5.30	-5.30	94.70	-5.30
2	200.00	187.70	-12.30	-6.15	187.70	-6.15
3	300.00	274.70	-25.30	-8.43	274.70	-8.43
4	400.00	357.70	-42.30	-10.58	357.70	-10.58

AVERAGE (N): -8.67

0.38



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McJannet, Balam)
Field Environmental Scientist (2)
Assistant General Manager

FORM NO. F-68-06, REVISION NO. 1, ISSUE DATE: 02/04/22

ALS
MULTIPOINT CALIBRATION REPORT

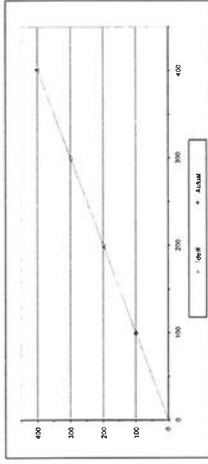
Calibration Date: 3-Jul-24
Equipment Name: NOx Analyzer
Manufacturer: HORIBA
Model: BOC F61000
Serial No.: X070YUJ
Equipment ID: BOC F61000
Calibrator Manufacturer: 700

Serial No.: 847
Std. Gas Concentration (PPM): 55.88
Cylinder No.: GN027222
Cylinder Pressure (psi): 1800
Certified By: Alana Inc.
Expiry Date: 8-Feb-25

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	98.40	-1.60	-1.60	98.40	-1.60
2	200.00	197.40	-2.60	-1.30	197.40	-1.30
3	300.00	297.40	-2.60	-0.87	297.40	-0.87
4	400.00	393.20	-6.80	-1.70	393.20	-1.70

AVERAGE (N): -1.39

0.29



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McJannet, Balam)
Field Environmental Scientist (2)
Assistant General Manager

FORM NO. F-68-06, REVISION NO. 1, ISSUE DATE: 02/04/22

ALS
MULTIPOINT CALIBRATION REPORT

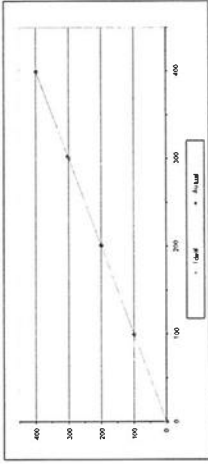
Calibration Date: 3-Jul-24
Equipment Name: NOx Analyzer
Manufacturer: HORIBA
Model: RYG F60459
Serial No.: PAU077A
Equipment ID: RYG F60459
Calibrator Manufacturer: 700

Serial No.: 847
Std. Gas Concentration (PPM): 55.88
Cylinder No.: GN027222
Cylinder Pressure (psi): 1800
Certified By: Alana Inc.
Expiry Date: 8-Feb-25

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	94.50	-5.50	-5.50	94.50	-5.50
2	200.00	189.00	-11.00	-5.50	189.00	-5.50
3	300.00	283.50	-16.50	-5.50	283.50	-5.50
4	400.00	378.00	-22.00	-5.50	378.00	-5.50

AVERAGE (N): -5.50

0.22



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McJannet, Balam)
Field Environmental Scientist (2)
Assistant General Manager

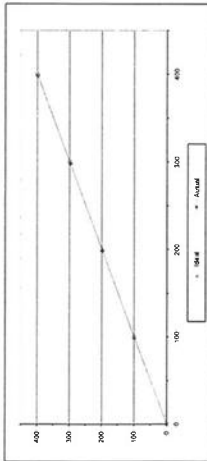
FORM NO. F-68-06, REVISION NO. 1, ISSUE DATE: 02/04/22

ALS

MULTIPOINT CALIBRATION REPORT

Calibration Date: 6-Jul-24
Equipment Name: 802 Analyzer
Manufacturer: HORIBA
Model: APHA-370
Serial No.: BRMSJ31
Equipment ID: RYO-F0462
Calibrator Manufacturer: BKT
Model: 700
Serial No.: 68.3
Cylinder No.: G8027222
Cylinder Pressure (psi): 1800
Certified Date: 6-Jul-22

Point	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.60	-1.40	-1.40
2	200.00	199.00	-2.00	-1.00
3	300.00	298.00	-2.00	-0.67
4	400.00	397.50	-2.50	-0.63
AVERAGE (N)				
-0.87				



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McIlroyth, J. J.)
Assistant General Manager

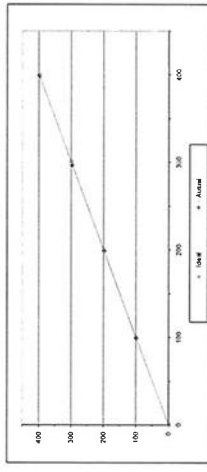
FORM 403 - 06/04 - Revision 10 - ISSUE DATE: 06/04

ALS

MULTIPOINT CALIBRATION REPORT

Calibration Date: 6-Jul-24
Equipment Name: 802 Analyzer
Manufacturer: HORIBA
Model: APHA-370
Serial No.: VAFB43H
Equipment ID: RYO-F0469
Calibrator Manufacturer: BKT
Model: 700
Serial No.: 68.3
Cylinder No.: G8027222
Cylinder Pressure (psi): 1800
Certified Date: 6-Jul-22

Point	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.70	-1.30	-1.30
2	200.00	199.40	-1.20	-0.60
3	300.00	298.50	-1.50	-0.50
4	400.00	398.20	-1.80	-0.45
AVERAGE (N)				
-0.68				



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McIlroyth, J. J.)
Assistant General Manager

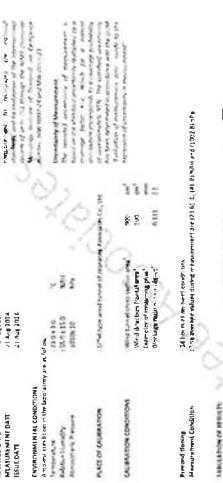
FORM 403 - 06/04 - Revision 10 - ISSUE DATE: 06/04

J NAC

CERTIFICATE OF CALIBRATION

Calibration Date: 6-Jul-24
Equipment Name: 802 Analyzer
Manufacturer: HORIBA
Model: APHA-370
Serial No.: VAFB43H
Equipment ID: RYO-F0469
Calibrator Manufacturer: BKT
Model: 700
Serial No.: 68.3
Cylinder No.: G8027222
Cylinder Pressure (psi): 1800
Certified Date: 6-Jul-22

Point	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.70	-1.30	-1.30
2	200.00	199.40	-1.20	-0.60
3	300.00	298.50	-1.50	-0.50
4	400.00	398.20	-1.80	-0.45
AVERAGE (N)				
-0.68				



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McIlroyth, J. J.)
Assistant General Manager

FORM 403 - 06/04 - Revision 10 - ISSUE DATE: 06/04

J NAC

CERTIFICATE OF CALIBRATION

Calibration Date: 6-Jul-24
Equipment Name: 802 Analyzer
Manufacturer: HORIBA
Model: APHA-370
Serial No.: VAFB43H
Equipment ID: RYO-F0469
Calibrator Manufacturer: BKT
Model: 700
Serial No.: 68.3
Cylinder No.: G8027222
Cylinder Pressure (psi): 1800
Certified Date: 6-Jul-22



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McIlroyth, J. J.)
Assistant General Manager

FORM 403 - 06/04 - Revision 10 - ISSUE DATE: 06/04

J NAC

CERTIFICATE OF CALIBRATION

Calibration Date: 6-Jul-24
Equipment Name: 802 Analyzer
Manufacturer: HORIBA
Model: APHA-370
Serial No.: VAFB43H
Equipment ID: RYO-F0469
Calibrator Manufacturer: BKT
Model: 700
Serial No.: 68.3
Cylinder No.: G8027222
Cylinder Pressure (psi): 1800
Certified Date: 6-Jul-22



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McIlroyth, J. J.)
Assistant General Manager

FORM 403 - 06/04 - Revision 10 - ISSUE DATE: 06/04

J NAC

CERTIFICATE OF CALIBRATION

Calibration Date: 6-Jul-24
Equipment Name: 802 Analyzer
Manufacturer: HORIBA
Model: APHA-370
Serial No.: VAFB43H
Equipment ID: RYO-F0469
Calibrator Manufacturer: BKT
Model: 700
Serial No.: 68.3
Cylinder No.: G8027222
Cylinder Pressure (psi): 1800
Certified Date: 6-Jul-22



Calibrated By: *[Signature]*
Approved By: *[Signature]*
(McIlroyth, J. J.)
Assistant General Manager

FORM 403 - 06/04 - Revision 10 - ISSUE DATE: 06/04

CERTIFICATE OF CALIBRATION

[illegible]

Case	Ref. [7]
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Qty	Unit Price	Unit Cost	Unit Profit	Unit Margin
15,000	15.00	12.00	3.00	20.00%
10,000	10.00	8.00	2.00	20.00%
5,000	5.00	4.00	1.00	20.00%
2,500	2.50	2.00	0.50	20.00%
1,250	1.25	1.00	0.25	20.00%
625	0.625	0.50	0.125	20.00%
312.5	0.3125	0.25	0.0625	20.00%
156.25	0.15625	0.125	0.03125	20.00%
78.125	0.078125	0.0625	0.015625	20.00%
39.0625	0.0390625	0.03125	0.0078125	20.00%
19.53125	0.01953125	0.015625	0.00390625	20.00%
9.765625	0.009765625	0.0078125	0.001953125	20.00%
4.8828125	0.0048828125	0.00390625	0.0009765625	20.00%
2.44140625	0.00244140625	0.001953125	0.00048828125	20.00%
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0.000000582076609134674072265625	0.000000000582076609134674072265625	0.0000000004656612873077392578125	0.000000000116415321826934814453125	20.00%
0.0000002910383045673370361328125	0.0000000002910383045673370361328125	0.0000000002		

$\mathbf{A} = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \end{bmatrix}$ and $\mathbf{B} = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \end{bmatrix}$ are symmetric matrices.

[illegible]

LIBRATION

PROPERTY IDENTIFICATION 1. Name of the property: _____ 2. Address: _____ 3. City: _____ 4. State: _____ 5. Zip: _____ 6. Owner's name: _____ 7. Owner's address: _____ 8. Owner's city: _____ 9. Owner's state: _____ 10. Owner's zip: _____ 11. Date of purchase: _____ 12. Date of sale: _____ 13. Date of transfer: _____ 14. Date of acquisition: _____ 15. Date of disposition: _____ 16. Date of completion: _____ 17. Date of termination: _____ 18. Date of expiration: _____ 19. Date of annulment: _____ 20. Date of rescission: _____ 21. Date of voidance: _____ 22. Date of nullification: _____ 23. Date of annihilation: _____ 24. Date of obliteration: _____ 25. Date of erasure: _____ 26. Date of deletion: _____ 27. Date of removal: _____ 28. Date of destruction: _____ 29. Date of annihilation: _____ 30. Date of obliteration: _____ 31. Date of erasure: _____ 32. Date of deletion: _____ 33. Date of removal: _____ 34. Date of destruction: _____ 35. Date of annihilation: _____ 36. Date of obliteration: _____ 37. Date of erasure: _____ 38. Date of deletion: _____ 39. Date of removal: _____ 40. Date of destruction: _____ 41. Date of annihilation: _____ 42. Date of obliteration: _____ 43. Date of erasure: _____ 44. Date of deletion: _____ 45. Date of removal: _____ 46. Date of destruction: _____ 47. Date of annihilation: _____ 48. Date of obliteration: _____ 49. Date of erasure: _____ 50. Date of deletion: _____ 51. Date of removal: _____ 52. Date of destruction: _____ 53. Date of annihilation: _____ 54. Date of obliteration: _____ 55. Date of erasure: _____ 56. Date of deletion: _____ 57. Date of removal: _____ 58. Date of destruction: _____ 59. Date of annihilation: _____ 60. Date of obliteration: _____ 61. Date of erasure: _____ 62. Date of deletion: _____ 63. Date of removal: _____ 64. Date of destruction: _____ 65. Date of annihilation: _____ 66. Date of obliteration: _____ 67. Date of erasure: _____ 68. Date of deletion: _____ 69. Date of removal: _____ 70. Date of destruction: _____ 71. Date of annihilation: _____ 72. Date of obliteration: _____ 73. Date of erasure: _____ 74. Date of deletion: _____ 75. Date of removal: _____ 76. Date of destruction: _____ 77. Date of annihilation: _____ 78. Date of obliteration: _____ 79. Date of erasure: _____ 80. Date of deletion: _____ 81. Date of removal: _____ 82. Date of destruction: _____ 83. Date of annihilation: _____ 84. Date of obliteration: _____ 85. Date of erasure: _____ 86. Date of deletion: _____ 87. Date of removal: _____ 88. Date of destruction: _____ 89. Date of annihilation: _____ 90. Date of obliteration: _____ 91. Date of erasure: _____ 92. Date of deletion: _____ 93. Date of removal: _____ 94. Date of destruction: _____ 95. Date of annihilation: _____ 96. Date of obliteration: _____ 97. Date of erasure: _____ 98. Date of deletion: _____ 99. Date of removal: _____ 100. Date of destruction: _____ 101. Date of annihilation: _____ 102. Date of obliteration: _____ 103. Date of erasure: _____ 104. Date of deletion: _____ 105. Date of removal: _____ 106. Date of destruction: _____ 107. Date of annihilation: _____ 108. Date of obliteration: _____ 109. Date of erasure: _____ 110. Date of deletion: _____ 111. Date of removal: _____ 112. Date of destruction: _____ 113. Date of annihilation: _____ 114. Date of obliteration: _____ 115. Date of erasure: _____ 116. Date of deletion: _____ 117. Date of removal: _____ 118. Date of destruction: _____ 119. Date of annihilation: _____ 120. Date of obliteration: _____ 121. Date of erasure: _____ 122. Date of deletion: _____ 123. Date of removal: _____ 124. Date of destruction: _____ 125. Date of annihilation: _____ 126. Date of obliteration: _____ 127. Date of erasure: _____ 128. Date of deletion: _____ 129. Date of removal: _____ 130. Date of destruction: _____ 131. Date of annihilation: _____ 132. Date of obliteration: _____ 133. Date of erasure: _____ 134. Date of deletion: _____ 135. Date of removal: _____ 136. Date of destruction: _____ 137. Date of annihilation: _____ 138. Date of obliteration: _____ 139. Date of erasure: _____ 140. Date of deletion: _____ 141. Date of removal: _____ 142. Date of destruction: _____ 143. Date of annihilation: _____ 144. Date of obliteration: _____ 145. Date of erasure: _____ 146. Date of deletion: _____ 147. Date of removal: _____ 148. Date of destruction: _____ 149. Date of annihilation: _____ 150. Date of obliteration: _____ 151. Date of erasure: _____ 152. Date of deletion: _____ 153. Date of removal: _____ 154. Date of destruction: _____ 155. Date of annihilation: _____ 156. Date of obliteration: _____ 157. Date of erasure: _____ 158. Date of deletion: _____ 159. Date of removal: _____ 160. Date of destruction: _____ 161. Date of annihilation: _____ 162. Date of obliteration: _____ 163. Date of erasure: _____ 164. Date of deletion: _____ 165. Date of removal: _____ 166. Date of destruction: _____ 167. Date of annihilation: _____ 168. Date of obliteration: _____ 169. Date of erasure: _____ 170. Date of deletion: _____ 171. Date of removal: _____ 172. Date of destruction: _____ 173. Date of annihilation: _____ 174. Date of obliteration: _____ 175. Date of erasure: _____ 176. Date of deletion: _____ 177. Date of removal: _____ 178. Date of destruction: _____ 179. Date of annihilation: _____ 180. Date of obliteration: _____ 181. Date of erasure: _____ 182. Date of deletion: _____ 183. Date of removal: _____ 184. Date of destruction: _____ 185. Date of annihilation: _____ 186. Date of obliteration: _____ 187. Date of erasure: _____ 188. Date of deletion: _____ 189. Date of removal: _____ 190. Date of destruction: _____ 191. Date of annihilation: _____ 192. Date of obliteration: _____ 193. Date of erasure: _____ 194. Date of deletion: _____ 195. Date of removal: _____ 196. Date of destruction: _____ 197. Date of annihilation: _____ 198. Date of obliteration: _____ 199. Date of erasure: _____ 200. Date of deletion: _____ 201. Date of removal: _____ 202. Date of destruction: _____ 203. Date of annihilation: _____ 204. Date of obliteration: _____ 205. Date of erasure: _____ 206. Date of deletion: _____ 207. Date of removal: _____ 208. Date of destruction: _____ 209. Date of annihilation: _____ 210. Date of obliteration: _____ 211. Date of erasure: _____ 212. Date of deletion: _____ 213. Date of removal: _____ 214. Date of destruction: _____ 215. Date of annihilation: _____ 216. Date of obliteration: _____ 217. Date of erasure: _____ 218. Date of deletion: _____ 219. Date of removal: _____ 220. Date of destruction: _____ 221. Date of annihilation: _____ 222. Date of obliteration: _____ 223. Date of erasure: _____ 224. Date of deletion: _____ 225. Date of removal: _____ 226. Date of destruction: _____ 227. Date of annihilation: _____ 228. Date of obliteration: _____ 229. Date of erasure: _____ 230. Date of deletion: _____ 231. Date of removal: _____ 232. Date of destruction: _____ 233. Date of annihilation: _____ 234. Date of obliteration: _____ 235. Date of erasure: _____ 236. Date of deletion: _____ 237. Date of removal: _____ 238. Date of destruction: _____ 239. Date of annihilation: _____ 240. Date of obliteration: _____ 241. Date of erasure: _____ 242. Date of deletion: _____ 243. Date of removal: _____ 244. Date of destruction: _____ 245. Date of annihilation: _____ 246. Date of obliteration: _____ 247. Date of erasure: _____ 248. Date of deletion: _____ 249. Date of removal: _____ 250. Date of destruction: _____ 251. Date of annihilation: _____ 252. Date of obliteration: _____ 253. Date of erasure: _____ 254. Date of deletion: _____ 255. Date of removal: _____ 256. Date of destruction: _____ 257. Date of annihilation: _____ 258. Date of obliteration: _____ 259. Date of erasure: _____ 260. Date of deletion: _____ 261. Date of removal: _____ 262. Date of destruction: _____ 263. Date of annihilation: _____ 264. Date of obliteration: _____ 265. Date of erasure: _____ 266. Date of deletion: _____ 267. Date of removal: _____ 268. Date of destruction: _____ 269. Date of annihilation: _____<

CERTIFICATE OF CALIBRATION

[illegible]

Year	Degrees (°)	Degrees (°)	Degrees (°)	Degrees (°)	Degrees (°)
1900	5	5	5	5	5
1910	10	10	10	10	10
1920	15	15	15	15	15
1930	20	20	20	20	20
1940	25	25	25	25	25
1950	30	30	30	30	30
1960	35	35	35	35	35
1970	40	40	40	40	40
1980	45	45	45	45	45
1990	50	50	50	50	50
2000	55	55	55	55	55
2010	60	60	60	60	60
2020	65	65	65	65	65
2030	70	70	70	70	70
2040	75	75	75	75	75
2050	80	80	80	80	80
2060	85	85	85	85	85
2070	90	90	90	90	90
2080	95	95	95	95	95
2090	100	100	100	100	100
2100	105	105	105	105	105
2110	110	110	110	110	110
2120	115	115	115	115	115
2130	120	120	120	120	120
2140	125	125	125	125	125
2150	130	130	130	130	130
2160	135	135	135	135	135
2170	140	140	140	140	140
2180	145	145	145	145	145
2190	150	150	150	150	150
2200	155	155	155	155	155
2210	160	160	160	160	160
2220	165	165	165	165	165
2230	170	170	170	170	170
2240	175	175	175	175	175
2250	180	180	180	180	180
2260	185	185	185	185	185
2270	190	190	190	190	190
2280	195	195	195	195	195
2290	200	200	200	200	200
2300	205	205	205	205	205
2310	210	210	210	210	210
2320	215	215	215	215	215
2330	220	220	220	220	220
2340	225	225	225	225	225
2350	230	230	230	230	230
2360	235	235	235	235	235
2370	240	240	240	240	240
2380	245	245	245	245	245
2390	250	250	250	250	250
2400	255	255	255	255	255
2410	260	260	260	260	260
2420	265	265	265	265	265
2430	270	270	270	270	270
2440	275	275	275	275	275
2450	280	280	280	280	280
2460	285	285	285	285	285
2470	290	290	290	290	290
2480	295	295	295	295	295
2490	300	300	300	300	300
2500	305	305	305	305	305
2510	310	310	310	310	310
2520	315	315	315	315	315
2530	320	320	320	320	320
2540	325	325	325	325	325
2550	330	330	330	330	330
2560	335	335	335	335	335
2570	340	340	340	340	340
2580	345	345	345	345	345
2590	350	350	350	350	350
2600	355	355	355	355	355
2610	360	360	360	360	360
2620	365	365	365	365	365
2630	370	370	370	370	370
2640	375	375	375	375	375

Result of calibration:

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.9%)	93.9	0.0	±0.3

2. Self-generated noise

Measured Value (dB)	1.3.6
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2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency	Measure value (dl)
Weighting	
A = weight	12.6
C = weight	19.2
Flat	24.8

3. Acoustical signal tests of frequency weighting

Meter free-field acoustic response at a level of 145 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			Acceptance limits
	Flat	C-weight	A-weight	
125	0.3	0.3	0.1	+1.5
1000	0.0	0.0	0.0	+1.0
3000	1.0	1.1	1.1	-45.0

7. Let'sh.

8. Level linearity: including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A _{max}	94.0	94.0	0.0	±1.8

9. Tone burst response

Hour	Time base duration, T (hrs)	Cycle	Anticipated Voltage (V)	Measured Voltage (V)	Dedicated Voltage (V)	Acceptance margin (dB)
Fast	0.25	1	108.0	107.9	0.1	3.5:5.0
	2	1	117.6	117.6	0.0	1.0:3.0
Slow	2	60	134.0	134.1	0.1	1.0:3.0
	5	60	166.9	166.9	0.0	1.0:3.0
SIL	0.25	1	96.0	96.0	0.1	1.5:5.0
	2	60	128.3	128.0	0.3	1.0:2.5

10. Peak C sound level

Number of cycles in	Anticipated Value (dB)	Measured Value, Legend (dB)	Divided Value (dB)	Acceptance Limits (dB)
1000 \pm 10%	133.0	135.0	0.0	± 3.0
Continuum	136.4	136.3	-0.1	± 3.0

Number of cycle in test signal	Anticipated Value (dB)	Mixture Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	± 0
Positive half cycle	135.4	135.2	-0.2	± 0
Negative half cycle	135.4	135.3	-0.1	± 0

Y. P. P. P.

Summary of Measurement Results:

Parameter	Uncertainty (dB)	Maximum permitted uncertainty of measure ment (dB)
1. Absolute stability	0.2	N/A
2. Self generated noise	0.2	N/A
3. Acoustical signal form of frequency assignments	0.3	0.6
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.1	0.7
4. Electrical signal form of frequency assignments		
For 10 Hz to 5 Hz	0.3	0.6
For 4 Hz to 0.4 Hz	0.3	0.7
For 10 Hz to 20 kHz	-	1.0
5. Frequency - level calibration		
For 10 Hz to 20 kHz	0.2	0.2
6. Temp. - level calibration	0.2	0.1
7. Level linearity in the reference level range	0.1	0.1
8. Level linearity including the level range control	0.2	0.3
9. Temp. level response	0.2	0.3
10. Peak A - sound level	0.2	0.3
11. Overload - recovery	0.2	0.2
12. A in level stability	0.1	0.1

9. *Leptis*.

7. Level linearity on the reference level range

Measured	Derived	Average
Value (mV)	Value (mV)	Value (mV)
1300	0.0	+1.1
1280	0.0	+1.1
1260	0.0	+1.1
1240	0.0	+1.1
1220	0.0	+1.1
1200	0.0	+1.1
1180	0.0	+1.1
1160	0.0	+1.1
1140	0.0	+1.1
1120	0.0	+1.1
1100	0.0	+1.1
1080	0.0	+1.1
1060	0.0	+1.1
1040	0.0	+1.1
980	0.0	+1.1
960	0.0	+1.1
940	0.0	+1.1
920	0.0	+1.1
900	0.0	+1.1
880	0.0	+1.1
860	0.0	+1.1
840	0.0	+1.1
820	0.0	+1.1
800	0.0	+1.1
780	0.0	+1.1
760	0.0	+1.1
740	0.0	+1.1
720	0.0	+1.1
680	0.0	+1.1
660	0.0	+1.1
640	0.0	+1.1
620	0.0	+1.1
580	0.0	+1.1
560	0.0	+1.1
540	0.0	+1.1
520	0.0	+1.1
480	0.0	+1.1
460	0.0	+1.1
440	0.0	+1.1
390	-0.1	+1.1
380	0.0	+1.1
340	0.0	+1.1
300	0.0	+1.1
280	2.9	-0.1
260	2.9	-0.1
240	2.9	-0.1
220	28.5	-0.2
200	28.5	-0.2
180	22.9	+1.1

Calibration Certificate

Equipment : SUPW01 FV11 ME17R
Manufacturer : RUPON
Model : SU-32A, Measurement UC-52, Transmitter NI-92
Serial No.: 9062391 / 19018 / 2419
ID No.: RYC130616

Condition As Found : G300
Customer : AUSA HONGKONG GROUP (HONGKONG) LTD.
100 HUA LIANSHAN ROAD, HONGKONG
KUNWANG PRAKTIKAMAKAN KIRI : SUAN LIANG,
BANGKOK, 10250 THAILAND
Location : (21.0 ± 1.3) °C
Ambient Temperature : (101.3 ± 1.3) kPa
Pressure : (50.0 ± 20.3) %
Relative Humidity :
Received Date : 19 DECEMBER 2023
Calibration Date : 08 JANUARY 2024
Date of Issue : 08 JANUARY 2024

Calibrated by : Naphakorn Pongman

Approved by :
(Thankorn Pichumol)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, and may not be reproduced
other than in full, except with the prior written approval of the holder of this certificate (laboratory)

Cert. No. : AC120013
Job No. : VU27AC0044
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
90.909(583)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.1

2.2 The microphone of the sound level meter was replaced by electrical signal input device

Frequency (Hz)	Measured Value (dB)	Acceptance Limit (dB)
125	11.8	±1.5
1000	20.3	±1.0
3000	25.8	±5.0

3. Acoustical signal test of frequency weightings

Next free field acoustic response at a level of 94 dB

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limit (dB)
125	0.2	0.2	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
3000	1.5	1.6	1.6	±5.0

Calibration Procedure : CP-AC-04

Calibration Method :

The equipment was calibrated by follow on IEC 61672-2 (2013) standard for sound level meter (SLM)
the SLM had test to Acoustical and Electrical signal test of frequency weighting with Acoustic chamber and Reference
Standard Instruments.

For more results of each item were made by observation of each instrument display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	3320A	NY54007096	11-0999-23	07 FEB 24
Waveform Generator	33510A	NY55302542	01-0610-23	07-11-24
Digital Multimeter	3361A	NY55290104	01-1407-20266	13 FEB 24
Digital Multimeter	3361A	NY55220036	FEL-89-290266	13 FEB 24
Digital Multimeter	3361A	NY54005273	1-1-101-31-0266	14 FEB 24
Programmable Attenuator	M015096	02100114	EF-0011-21	08-04-24
Calibrator	4100	A0-100153	14 FEB 24	
Microphone Amplifier	N4-026A1	34004925	AA-3002-23	14 FEB 24

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.

3. This certificate is traceable to the International system of unit maintained at :

- 3.1 National Institute of Metrology (China)
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR)

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

Cert. No. : AC120013
Job No. : VU27AC0044
Pages : 5 of 8

4. Electrical signal test of frequency weightings

Weighting result at response with tolerance 1 kHz

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)	Acceptance Limit (dB)
63	-0.1	0.0
125	0.0	0.0
250	0.0	0.0
500	0.0	0.1
1000	0.0	0.0
2000	0.0	0.0
4000	0.0	0.1
8000	0.0	0.1

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency (Hz)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
94.0	94.0	0.0	±0.2
94.0	94.0	0.0	±0.2
94.0	94.0	0.0	±0.2

5.2 Time weightings at 1 kHz

Frequency (Hz)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
94.0	94.0	0.0	±0.1
94.0	94.0	0.0	±0.1
94.0	94.0	0.0	±0.1

6. Long-term stability

SLM Display Frequency (dB)	SLM Display Value (dB)	Deviation (dB)	Acceptance Limit (dB)
94.0	94.0	0.0	±0.3

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Cert. No. : AC120013
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Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limit (dB)
137.0	137.0	0.0	±1.1
135.0	135.0	0.0	±1.1
133.0	133.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
127.0	127.0	0.0	±1.1
125.0	125.0	0.0	±1.1
123.0	123.0	0.0	±1.1
121.0	121.0	0.0	±1.1
119.0	119.0	0.0	±1.1
117.0	117.0	0.0	±1.1
115.0	115.0	0.0	±1.1
113.0	113.0	0.0	±1.1
111.0	111.0	0.0	±1.1
109.0	109.0	0.0	±1.1
107.0	107.0	0.0	±1.1
105.0	105.0	0.0	±1.1
103.0	103.0	0.0	±1.1
101.0	101.0	0.0	±1.1
99.0	99.0	0.0	±1.1
97.0	97.0	0.0	±1.1
95.0	95.0	0.0	±1.1
93.0	93.0	0.0	±1.1
91.0	91.0	0.0	±1.1
89.0	89.0	0.0	±1.1
87.0	87.0	0.0	±1.1
85.0	85.0	0.0	±1.1
83.0	83.0	0.0	±1.1
81.0	81.0	0.0	±1.1
79.0	79.0	0.0	±1.1
77.0	77.0	0.0	±1.1
75.0	75.0	0.0	±1.1

4. Electrical signal level of frequency weightings

Weighting network response with reference to 1 kHz.

Frequency (Hz)	Filter	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	+2.0
125	0.0	0.1	0.1	+1.5
250	0.0	0.0	0.0	+1.5
500	0.0	0.1	0.0	+1.5
1000	0.0	0.0	0.0	+1.0
2000	0.0	0.1	0.0	+2.0
5000	0.0	0.0	0.0	+3.0
10000	0.0	0.1	0.1	+5.0

5. Frequency and time weightings at 1 kHz

5.1.1. Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	93.0	94.0	-0.0	-0.2
C-weight	93.0	94.0	0.0	+0.2
Flat	93.0	94.0	0.0	+0.2

5.2. Time-weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	93.0	94.0	0.0	+0.1
Slow	93.0	94.0	0.0	+0.1
1/3 Oct	93.0	94.0	0.0	+0.1

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	93.0	94.1	0.1	+0.3

7. P. P. P.

11. Overall stability

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	93.7	0.0
Negative one-half cycle	93.7	0.0

12. High level stability

Frequency Weighting	SLM Display at final (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.0	0.0	+0.3

The repeated uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$,
giving a value following calculation: providing a level of confidence of approximately 95 %.

End of Calibration Certificate

7. P. P. P.

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	+1.1
136.0	136.0	0.0	+1.1
135.0	135.0	0.0	+1.1
134.0	134.0	0.0	+1.1
133.0	133.0	0.0	+1.1
132.0	132.0	0.0	+1.1
131.0	131.0	0.0	+1.1
130.0	130.0	0.0	+1.1
129.0	129.0	0.0	+1.1
128.0	128.0	0.0	+1.1
127.0	127.0	0.0	+1.1
126.0	126.0	0.0	+1.1
125.0	125.0	0.0	+1.1
124.0	124.0	0.0	+1.1
123.0	123.0	0.0	+1.1
122.0	122.0	0.0	+1.1
121.0	121.0	0.0	+1.1
120.0	120.0	0.0	+1.1
119.0	119.0	0.0	+1.1
118.0	118.0	0.0	+1.1
117.0	117.0	0.0	+1.1
116.0	116.0	0.0	+1.1
115.0	115.0	0.0	+1.1
114.0	114.0	0.0	+1.1
113.0	113.0	0.0	+1.1
112.0	112.0	0.0	+1.1
111.0	111.0	0.0	+1.1
110.0	110.0	0.0	+1.1
109.0	109.0	0.0	+1.1
108.0	108.0	0.0	+1.1
107.0	107.0	0.0	+1.1
106.0	106.0	0.0	+1.1
105.0	105.0	0.0	+1.1
104.0	104.0	0.0	+1.1
103.0	103.0	0.0	+1.1
102.0	102.0	0.0	+1.1
101.0	101.0	0.0	+1.1
100.0	100.0	0.0	+1.1
99.0	99.0	0.0	+1.1
98.0	98.0	0.0	+1.1
97.0	97.0	0.0	+1.1
96.0	96.0	0.0	+1.1
95.0	95.0	0.0	+1.1
94.0	94.0	0.0	+1.1
93.0	93.0	0.0	+1.1
92.0	92.0	0.0	+1.1
91.0	91.0	0.0	+1.1
90.0	90.0	0.0	+1.1
89.0	89.0	0.0	+1.1
88.0	88.0	0.0	+1.1
87.0	87.0	0.0	+1.1
86.0	86.0	0.0	+1.1
85.0	85.0	0.0	+1.1
84.0	84.0	0.0	+1.1
83.0	83.0	0.0	+1.1
82.0	82.0	0.0	+1.1
81.0	81.0	0.0	+1.1
80.0	80.0	0.0	+1.1
79.0	79.0	0.0	+1.1
78.0	78.0	0.0	+1.1
77.0	77.0	0.0	+1.1
76.0	76.0	0.0	+1.1
75.0	75.0	0.0	+1.1
74.0	74.0	0.0	+1.1
73.0	73.0	0.0	+1.1
72.0	72.0	0.0	+1.1
71.0	71.0	0.0	+1.1
70.0	70.0	0.0	+1.1
69.0	69.0	0.0	+1.1
68.0	68.0	0.0	+1.1
67.0	67.0	0.0	+1.1
66.0	66.0	0.0	+1.1
65.0	65.0	0.0	+1.1
64.0	64.0	0.0	+1.1
63.0	63.0	0.0	+1.1
62.0	62.0	0.0	+1.1
61.0	61.0	0.0	+1.1
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52.0	52.0	0.0	+1.1
51.0	51.0	0.0	+1.1
50.0	50.0	0.0	+1.1
49.0	49.0	0.0	+1.1
48.0	48.0	0.0	+1.1
47.0	47.0	0.0	+1.1
46.0	46.0	0.0	+1.1
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24.0	24.0	0.0	+1.1
23.0	23.0	0.0	+1.1
22.0	22.0	0.0	+1.1
21.0	21.0	0.0	+1.1
20.0	20.0	0.0	+1.1
19.0	19.0	0.0	+1.1
18.0	18.0	0.0	+1.1
17.0	17.0	0.0	+1.1
16.0	16.0	0.0	+1.1
15.0	15.0	0.0	+1.1
14.0	14.0	0.0	+1.1
13.0	13.0	0.0	+1.1
12.0	12.0	0.0	+1.1
11.0	11.0	0.0	+1.1
10.0	10.0	0.0	+1.1
9.0	9.0	0.0	+1.1
8.0	8.0	0.0	+1.1
7.0	7.0	0.0	+1.1
6.0	6.0	0.0	+1.1
5.0	5.0	0.0	+1.1
4.0	4.0	0.0	+1.1
3.0	3.0	0.0	+1.1
2.0	2.0	0.0	+1.1
1.0	1.0	0.0	+1.1
0.0	0.0	0.0	+1.1

7. P. P. P.

Certificate of Calibration

Equipment

Model: SPECTROPHOTOMETER

Serial No. (or ID): DR6000

Manufacturer: HACH

Condition: In Condition

Customer: ALS Laboratory Group (Thailand) Co., Ltd. (Rayong Branch)

616/10 Moo 5 T. Maenam Kru.

A. Phukdang, Rayong 21140, Thailand

Environment Condition:

Temperature: 23.0 °C

Humidity: 65.3 %RH

Calibration Date:

18 September 2023

The standard used:

Technical (NIST) through Sigma Scientific Limited.

The standard for Photometric Certificate No. 111583 and 111584

The standard for Spectral resolution Certificate No. 111585

The standard for Slit width Certificate No. 111586 and 111587

The standard for Slit width Certificate No. 111588

The standard for Slit width Certificate No. 111589

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Certificate No.: C04250441 Page: 3 of 3

Calibration Results:
Without Adjustment

Wavelength	Standard Absorbance	Unit Under Calibration	Correction	Uncertainty
235 nm	0.0000	0.000	0.0000	0.0000
	0.7255	0.737	-0.0115	0.0000
257 nm	0.0000	0.000	0.0000	0.0000
	0.8574	0.857	0.0004	0.0000
313 nm	0.0000	0.000	0.0000	0.0000
	0.2864	0.290	-0.0036	0.0000
350 nm	0.0000	0.000	0.0000	0.0000
	0.8374	0.837	0.0004	0.0000

Step 1 (pH):

Standard solution	UUC Wavelength (nm)	UUC Transmittance (NT)	Absorbance (A)
20.82 ± 0.11 nm	206.6	1.3	1.886
301.44 ± 0.11 nm	301.4	1.3	1.886

Standard Solution *	Peak	Trough	Ratio	SNR
Nominal Concentration 0.02 % w/v	268.66	266.46	1.38	2.00
Standard Wavelength (nm)	268.2	266.1		
UUC Wavelength (nm)	0.6466	0.7380		
80 Absorbance (A)	0.613	0.330		

* Calibration Marker "Not TSI Accredited" in the Certificate have been included for completeness.

The End of Certificate

Delivering Growth - In Asia and Beyond

Cal. No. 236 16 10 Sep 2023



Cert No.: 24C1416 Page: 2 of 3

Condition of this calibration result:

1. Reference Standard Instrument

2. Ref. Standard Thermometer

3. The certificate is applicable to the International System of Unit measurement through:

4. This measurement is the one based on SI units (CIPM, Item 1.1)

5. The measurement is the one based on SI units (CIPM, Item 1.1)

6. The measurement is the one based on SI units (CIPM, Item 1.1)

7. The certificate is valid only in the form calibrated on this one piece of calibration

8. The certificate is valid only in the form calibrated on this one piece of calibration

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ใบตรวจสอบสภาพเครื่องวัดค่าคลอรีน

เครื่องวัด: SPECIOPHOTOMETER

หมายเลข: 1027845

วันที่: 18 Sep 2023

สถานที่: กรุงเทพฯ

ผู้ตรวจสอบ: M. Nittaporn Rungwong

ผู้รับ: M. Nittaporn Rungwong

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Cert. No.: 23UM125
Page: 1 of 2

Certificate of Calibration

- | Instruments | Serial No. | ID No. | Certificate No. | Due Date |
|-------------|------------|----------|-----------------|-------------|
| 1) Burn/In | - | 130BU10 | 23CG1172 | 22 Mar 2025 |
| 2) Balance | 1125143764 | 14RC0004 | 22MM50 | 20 Sep 2023 |

Material	Manufacturer	Lot/No	Assay
Endium Tl-201 (Mallinckrodt)	Mallinckrodt	AM175719	SNP 101

Titration Method (Azide Modification Method)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.18	8.17	0.0055

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1172155



Certificate of Calibration

- Resolved Under : _____
 Calibration Date : 28 May 2003
 Calibration Data : (50 ± 10) °C
 Relative Humidity : (50 ± 3) %
 Calibrated by : Man Palanipparambaan
-
- Approved by : *du*
 Approved Signature : _____
 Approved Date : 28 May 2003
 Approved Data : (50 ± 10) °C
 Approved Humidity : (50 ± 3) %

The *t*-values are for a confidence probability of approximately 95%.

A 0054967

Procedure Used :-

The temperature scale used was based on Industrial Platinum Resistance Thermometer (I

- | Instrument | Serial No. | Cart. No. | Traceable | Due Date |
|------------------------|------------|-----------|-----------|-------------|
| 1) Digital Thermometer | 2185-80 | 221285 | TPA | 21 Oct 2023 |

Result of Calibration :- (°) Without Adjustment
Function : Temperature measurement.

Unit: Unit Under Calibration

Keywords: *Acute myocardial infarction; Hospitalization; Health status; Quality of life; Patient participation; Patient education; Patient empowerment; Patient decision making; Patient self-management; Patient self-efficacy*

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1120210

Reference :-
Result of Calibration :-
(*) Without Adjustment
2305-0000100-2

Function of UUC* :	Temperature Source
Fresh air setting :	Close

- Average^a**: The average of 30 values in each position

Overall Variation: The difference of the maximum and minimum measured temperatures throughout calibration

—000—

moment
RID)

- fresh air setting :  0503
- | Environment during calibration | |
|--------------------------------|----------|
| Beginning | Finished |
| Temp (°C) | 23 |
| REL Humid (%) | 54 |
| AC Supply (Vol) | 223 |
| | 222 |



1165130

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3-100-18, 1st FLOOR, 1-10-1, Nishi-Shinjuku, Shinjuku-Ku, Tokyo 163-0292, JAPAN
TEL 03-318-5005-79 FAX 03-2793-5844

BSC-SEA
BANGKOK SERVICE CENTER

Equipment: Humidity Oven
Condition As-Received: Used Bath
Reference: 2403-5693C-3
Function of Calibration: () Without Adjustment
Function of UUC: Temperature Source

Cert. No.: 24TM354
Page: 3 of 3

Procedure Used: Calibration was conducted using in-house calibration procedure CP-O104 Based on ASTM E715 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Transducer (PRT).

Condition of this result of calibration: Calibration was based on ITS-90.

1. Reference standard instrument:

Point (°C)	UUC ¹ Setting (°C)	Temperature stability (°C)	Temperature uniformity (°C)	Overall Coverage Variation Factor (°C)
15.0	160.0	0.20	1.2	2.0

Calibration:

Point (°C)	Measured Temperature (°C)								Uncertainty (°C)
	1	2	3	4	5	6	7	8	
104.0	104.00	103.560	103.148	103.712	103.772	103.720	104.249	103.695	0.42
18.0	180.203	179.239	179.795	179.799	180.127	180.138	180.055	179.313	0.42

Average: The average of 30 values in each position.

Temperature stability: One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity: One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature stability and uniformity: One-half of the greatest maximum difference of measured temperature at any one sensor.

Overall Variation: The difference of the maximum and minimum measured temperatures throughout observation.

UUC¹: Unit Under Calibration

Note: The reported uncertainty of measurement was included stability and excluded uniformity.

Note: The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

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TEL 03-318-5005-79 FAX 03-2793-5844

BSC-SEA
BANGKOK SERVICE CENTER

Equipment: Water Bath
Manufacturer: Mimmart
Model: WNR2
Serial No.: L513.0648
ID No.: RVG-EN0061

Submitted by: A.S. Laboratory Group (Thailand) Co. Ltd. (Rajong Brandu)
A. S. Laboratory Group (Thailand) Co. Ltd. (Rajong Brandu)
Rajong Brandu, 2144, Thailand

Locations: Wat Chemistry Lab

Received Order: 21 March 2024
Calibration Date: 21 March 2024
Relative Humidity: (50 ± 3) %
Calibrated by: Man Palmanpongpaiboon

Approved by: () Pongtappa Temyapikul
() Unnongpan Hensachul
() Sam Thong

Issue Date: 23 March 2024

The Uncertainty are for a confidence probability of approximately 95%

Approved by the head of Corporate Services 3: Comment Calibration of Service Service.

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3-100-18, 1st FLOOR, 1-10-1, Nishi-Shinjuku, Shinjuku-Ku, Tokyo 163-0292, JAPAN
TEL 03-318-5005-79 FAX 03-2793-5844

BSC-SEA
BANGKOK SERVICE CENTER

Equipment: Water Bath
Manufacturer: Mimmart
Model: WNR2
Serial No.: L513.0648
ID No.: RVG-EN0061

Submitted by: A.S. Laboratory Group (Thailand) Co. Ltd. (Rajong Brandu)
A. S. Laboratory Group (Thailand) Co. Ltd. (Rajong Brandu)
Rajong Brandu, 2144, Thailand

Locations: Wat Chemistry Lab

Received Order: 21 March 2024
Calibration Date: 21 March 2024
Relative Humidity: (50 ± 3) %
Calibrated by: Man Palmanpongpaiboon

Approved by: () Pongtappa Temyapikul
() Unnongpan Hensachul
() Sam Thong

Issue Date: 23 March 2024

The Uncertainty are for a confidence probability of approximately 95%

Approved by the head of Corporate Services 3: Comment Calibration of Service Service.

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TEL 03-318-5005-79 FAX 03-2793-5844

BSC-SEA
BANGKOK SERVICE CENTER

Equipment: Humidity Oven
Condition As-Received: Used Bath
Reference: 2403-5693C-3
Function of Calibration: () Without Adjustment
Function of UUC: Temperature Source

Cert. No.: 24TM355
Page: 3 of 3

Procedure Used: Calibration was conducted using in-house calibration procedure CP-O104 Based on ASTM E715 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Transducer (PRT).

Condition of this result of calibration: Calibration was based on ITS-90.

1. Reference standard instrument:

Point (°C)	UUC ¹ Setting (°C)	Temperature stability (°C)	Temperature uniformity (°C)	Overall Coverage Variation Factor (°C)
15.0	160.0	0.20	1.2	2.0

Calibration:

Point (°C)	Measured Temperature (°C)								Uncertainty (°C)
	1	2	3	4	5	6	7	8	
104.0	104.00	103.560	103.148	103.712	103.772	103.720	104.249	103.695	0.42
18.0	180.203	179.239	179.795	179.799	180.127	180.138	180.055	179.313	0.42

Average: The average of 30 values in each position.

Temperature stability: One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity: One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature stability and uniformity: One-half of the greatest maximum difference of measured temperature at any one sensor.

Overall Variation: The difference of the maximum and minimum measured temperatures throughout observation.

UUC¹: Unit Under Calibration

Note: The reported uncertainty of measurement was included stability and excluded uniformity.

Note: The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %.

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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TEL 03-318-5005-79 FAX 03-2793-5844

BSC-SEA
BANGKOK SERVICE CENTER

Equipment: Water Bath
Manufacturer: Mimmart
Model: WNR2
Serial No.: L513.0648
ID No.: RVG-EN0061

Submitted by: A.S. Laboratory Group (Thailand) Co. Ltd. (Rajong Brandu)
A. S. Laboratory Group (Thailand) Co. Ltd. (Rajong Brandu)
Rajong Brandu, 2144, Thailand

Locations: Wat Chemistry Lab

Received Order: 21 March 2024
Calibration Date: 21 March 2024
Relative Humidity: (50 ± 3) %
Calibrated by: Man Palmanpongpaiboon

Approved by: () Pongtappa Temyapikul
() Unnongpan Hensachul
() Sam Thong

Issue Date: 23 March 2024

The Uncertainty are for a confidence probability of approximately 95%

Approved by the head of Corporate Services 3: Comment Calibration of Service Service.

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3-100-18, 1st FLOOR, 1-10-1, Nishi-Shinjuku, Shinjuku-Ku, Tokyo 163-0292, JAPAN
TEL 03-318-5005-79 FAX 03-2793-5844

BSC-SEA
BANGKOK SERVICE CENTER

Equipment: Water Bath
Manufacturer: Mimmart
Model: WNR2
Serial No.: L513.0648
ID No.: RVG-EN0061

Submitted by: A.S. Laboratory Group (Thailand) Co. Ltd. (Rajong Brandu)
A. S. Laboratory Group (Thailand) Co. Ltd. (Rajong Brandu)
Rajong Brandu, 2144, Thailand

Locations: Wat Chemistry Lab

Received Order: 21 March 2024
Calibration Date: 21 March 2024
Relative Humidity: (50 ± 3) %
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Approved by: () Pongtappa Temyapikul
() Unnongpan Hensachul
() Sam Thong

Issue Date: 23 March 2024

The Uncertainty are for a confidence probability of approximately 95%

Approved by the head of Corporate Services 3: Comment Calibration of Service Service.

Certificate of Calibration

Equipment : HEATING BLOCK
Manufacturer : Environmental Express
Model : SC 196
Serial No. : 6974C6CYN285
Customer Code : BKK_EL0054
ID No. : TS306A3
Customer : AJS Laboratory Group (Thailand) Co., Ltd.
184 Phuthamkorn 40, Phuthamkorn Rd., Khwaeng Phuthamkorn,
Khet Sam Luang, Bangkok 10250

Customer Location : Acid Digestion Lab
Date of Receipt : 13 September 2023
Calibrated By : Sane Musilawon (Site Calibration Manager)
Approved By : /Sujar Nakkerd (Site Calibration Manager)
Date of Issue : 28 SEP 2023

The uncertainties are for a confidence probability of approximately 95%.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrological Center.

Calibration Report

Measurement Results	
Calibration Point	Average Standard Reading at each position (°C)
RI Heat-Block	
CAL POINT	
101.2	101.21
101.2	101.22
101.2	101.23
101.2	101.24
101.2	101.25
101.2	101.26
101.2	101.27
101.2	101.28
101.2	101.29
101.2	101.30
101.2	101.31
101.2	101.32
101.2	101.33
101.2	101.34
101.2	101.35
101.2	101.36
101.2	101.37
101.2	101.38
101.2	101.39
101.2	101.40
101.2	101.41
101.2	101.42
101.2	101.43
101.2	101.44
101.2	101.45
101.2	101.46
101.2	101.47
101.2	101.48
101.2	101.49
101.2	101.50
101.2	101.51
101.2	101.52
101.2	101.53
101.2	101.54
101.2	101.55
101.2	101.56
101.2	101.57
101.2	101.58
101.2	101.59
101.2	101.60
101.2	101.61
101.2	101.62
101.2	101.63
101.2	101.64
101.2	101.65
101.2	101.66
101.2	101.67
101.2	101.68
101.2	101.69
101.2	101.70
101.2	101.71
101.2	101.72
101.2	101.73
101.2	101.74
101.2	101.75
101.2	101.76
101.2	101.77
101.2	101.78
101.2	101.79
101.2	101.80
101.2	101.81
101.2	101.82
101.2	101.83
101.2	101.84
101.2	101.85
101.2	101.86
101.2	101.87
101.2	101.88
101.2	101.89
101.2	101.90
101.2	101.91
101.2	101.92
101.2	101.93
101.2	101.94
101.2	101.95
101.2	101.96
101.2	101.97
101.2	101.98
101.2	101.99
101.2	102.00
101.2	102.01
101.2	102.02
101.2	102.03
101.2	102.04
101.2	102.05
101.2	102.06
101.2	102.07
101.2	102.08
101.2	102.09
101.2	102.10
101.2	102.11
101.2	102.12
101.2	102.13
101.2	102.14
101.2	102.15
101.2	102.16
101.2	102.17
101.2	102.18
101.2	102.19
101.2	102.20
101.2	102.21
101.2	102.22
101.2	102.23
101.2	102.24
101.2	102.25
101.2	102.26
101.2	102.27
101.2	102.28
101.2	102.29
101.2	102.30
101.2	102.31
101.2	102.32
101.2	102.33
101.2	102.34
101.2	102.35
101.2	102.36
101.2	102.37
101.2	102.38
101.2	102.39
101.2	102.40
101.2	102.41
101.2	102.42
101.2	102.43
101.2	102.44
101.2	102.45
101.2	102.46
101.2	102.47
101.2	102.48
101.2	102.49
101.2	102.50
101.2	102.51
101.2	102.52
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101.2	102.58
101.2	102.59
101.2	102.60
101.2	102.61
101.2	102.62
101.2	102.63
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101.2	102.66
101.2	102.67
101.2	102.68
101.2	102.69
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101.2	102.80
101.2	102.81
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101.2	102.86
101.2	102.87
101.2	102.88
101.2	102.89
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101.2	103.05
101.2	103.06
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101.2	103.08
101.2	103.09
101.2	103.10
101.2	103.11
101.2	103.12
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101.2	104.98
101.2	104.99
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101.2	105.01
101.2	105.02
101.2	105.03
101.2	105.04
101.2	105.05
101.2	105.06
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101.2	105.41
101.2	105.42
101.2	105.43
101.2	105.44
101.2	105.45
101.2	105.46
101.2	105.47
101.2	105.48
101.2	105.49
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101.2	105.52
101.2	105.53
101.2	105.54
101.2	105.55
101.2	105.56
101.2	105.57
101.2	105.58
101.2	105.59
101.2	105.60
101.2	105.61
101.2	105.62
101.2	105.63
101.2	105.64
101.2	105.65
101.2	105.66
101.2	105.67
101.2	105.68
101.2	105.69
101.2	105.70
101.2	105.71
101.2	105.72
101.2	105.73
101.2	105.74
101.2	105.75
101.2	105.76
101.2	105.77
101.2	105.78
101.2	105.79
101.2	105.80
101.2	105.81
101.2	105.82

Calibration Report

Measurement Results:

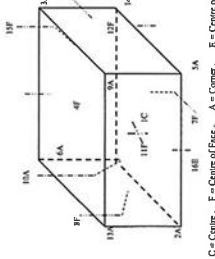
Sensors (°C)	Heating BECKS		Temperature Distribution	
	Stability (°C)	Repeatability (°C)	Stability (°C)	Repeatability (°C)
100.0	Min, Max	Average	Min, Max	Average
100.0	100.3, 100.5	100.4	0.3%	0.1%
100.0	100.6, 100.7	100.7	0.1%	0.1%

* The control on reading is under "uncertainty"
The calibration result only is by the above calibration item
The result of the test is based on average of three data and place of test
The report is based on the accuracy of the calibration certificate, which is based on the following providing
a level of confidence of approximately 95 %.

Approved By: _____

PM-LS101010-08-06

Calibration Report





Performance Verification Certificate for Mercury Analyzer

Quicktrace M-5000 - Teledyne Leco Lab

PRODUCT ID BKK EL0128 Mercury Analyzer

Equipment ID S/N: US22133002

BKK EL0128 Autosampler

S/N: 032422A540

Customer Name ALS Laboratory Group (Thailand) Co., Ltd.

Address 104 Soi Patana 40, Patana Rd, Sam Luang, Sam Luang, Bangkok 10250 Thailand

Date of Calibration December 6, 2024

Next Due Date December 6, 2025

This certificate for products which was performed in acceptable criteria specifications

Autosampler & Simple Introduction

Analyzer PASSED

Gas Liquid Separator & Dryer PASSED

PASSED

Electrical Mechanical PASSED

Data analysis/PC PASSED

Analytical test PASSED

Provided by

Scientist Instrument Co., Ltd.

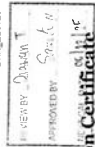
104 Soi Patana 40, Patana Rd, Sam Luang, Sam Luang, Bangkok 10250 Thailand

Bangkok 10250 Thailand

Certified by

Thanyaporn Saklaya

Service Engineer



Equipment: Autosampler

Condition As Received: Used Item

Reference: 2207-0250C-3

Result of Calibration: () Without Adjustment

Function of UUC: Temperature Source

Operating parameter Set: Temperature e 121 °C

121 °C

Stability

Pressure

Reading

Uncertainty

Coverage

Pictor

A

1.0

2

UUC: The average of 30 values in each position

Stability: One half of the greatest maximum difference of measured temperatures at any one position

UUC: Unit Under Calibration

Note: The reported uncertainty of measurement was included stability and accuracy uncertainty

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %

-400-

Certificate of Calibration

Equipment: Autosampler

Manufacturer: Sanyo

Model: MLC-3781

Serial No.: 830107

ID No.: BKK ML0037

Submitted by: ALS Laboratory Group (Thailand) Co., Ltd.

Address 104 Soi Patana 40, Patana Rd, Sam Luang, Sam Luang, Bangkok 10250 Thailand

Location: Media Preparation Room

Received Order: 17 July 2023

Received Date: 17 July 2023

Ambient Temperature: (26 ± 1) °C

Relative Humidity: (50 ± 3) %

Calibrated by: Precha Hahm

Approved by:

Approved Signature

() Precha Hahm, Bangkok

() M. Hahm, Bangkok

() S. Hahm, Bangkok

Issue Date: 24 July 2023

The uncertainty is for a combined probability of approximately 95%

Approved by:

Approved Signature

() Precha Hahm, Bangkok

() M. Hahm, Bangkok

() S. Hahm, Bangkok

Issue Date: 24 July 2023

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Approved by:

Approved Signature

() Precha Hahm, Bangkok

() M. Hahm, Bangkok

() S. Hahm, Bangkok

Issue Date: 24 July 2023

The uncertainty is for a combined probability of approximately 95%

Approved by:

Equipment: Autosampler

Condition As Received: Used Item

Reference: 2207-0250C-3

Result of Calibration: () Without Adjustment

Function of UUC: Temperature Source

Operating parameter Set: Temperature e 121 °C

121 °C

Stability

Pressure

Reading

Uncertainty

Coverage

Pictor

A

1.0

2

UUC: The average of 30 values in each position

Stability: One half of the greatest maximum difference of measured temperatures at any one position

UUC: Unit Under Calibration

Note: The reported uncertainty of measurement was included stability and accuracy uncertainty

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k, providing a level of confidence of approximately 95 %

-400-

