

## บริษัท ป.ศิริภัณฑ์ศิลา จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม

และมาตรการติดตามตรวจสอบคุณภาพสิ่งแวดล้อม (ระยะดำเนินการ)

เหมืองแร่หินอุตสาหกรรมชนิดหินปูน เพื่ออุตสาหกรรมก่อสร้าง

ฉบับที่ 2 ระหว่างเดือนกรกฎาคม ถึงเดือนธันวาคม พ.ศ. 2567

ภาคผนวก จ

ผลการตรวจวัดคุณภาพสิ่งแวดล้อม

## ANALYSIS REPORT

Project	: P.Siriphansila	Report No.	: RN241210118
Sampling Source	: Ambient Air Quality	Sampling Location	: P. Siriphansila
Sampling Date	: Dec 19-22, 2024	Sampling Point	: Construction Area
Received Date	: Dec 24, 2024	Analytical Date	: Dec 26, 2024
Sampling Method	: US EPA 40 CFR 50	Sample Condition	: Good
Method of Analysis	: High-Volume Air Sampler/ Gravimetric Method		

Item	Parameter	Sampling Date	Result (mg/cu.m)	Standard (mg/cu.m) <sup>1/</sup>
1	Total Suspended Paticulate (TSP)	Dec 19-20, 2024	0.142	0.330
2	Total Suspended Paticulate (TSP)	Dec 20-21, 2024	0.133	0.330
3	Total Suspended Paticulate (TSP)	Dec 21-22, 2024	0.131	0.330

Remark : <sup>1/</sup> Notification of National Environmental Board No.24 (B.E. 2547) Prescription of Air Quality  
Standard in General Atmosphere

Sampling By :

Analyzed By :

Approved By :

(Ta )

ANALYSIS REPORT

Project : P.Siriphansila Report No. : RN241210119  
Sampling Source : Ambient Air Quality Sampling Location : P. Siriphansila  
Sampling Date : Dec 19-22, 2024 Sampling Point : Construction Area  
Received Date : Dec 24, 2024 Analytical Date : Dec 26, 2024  
Sampling Method : US EPA 40 CFR 50 Sample Condition : Good  
Method of Analysis : High-Volume Air Sampler/ Gravimetric Method

Item	Parameter	Sampling Date	Result (mg/cu.m)	Standard (mg/cu.m) <sup>1/</sup>
1	Paticulate Matter < 10 micron (PM-10)	Dec 19-20, 2024	0.049	0.120
2	Paticulate Matter < 10 micron (PM-10)	Dec 20-21, 2024	0.071	0.120
3	Paticulate Matter < 10 micron (PM-10)	Dec 21-22, 2024	0.071	0.120

Remark : <sup>1/</sup> Notification of National Environmental Board No.24 (B.E. 2547) Prescription of Air Quality

Standard in General Atmosphere

Sampling By :

Analyzed By :

Approved By :



## NOISE MONITORING REPORT

Project Name : P. Siriphansila Report No. : RN241230298  
 Sampling Source : Community Noise Sampling Location : Construction area  
 Sampling Date : Dec 19-20, 2024 Sampling Point : Construction area  
 Received Date : Dec 24, 2024 Analytical Date : Dec 26, 2024  
 Sampling Method : - Sampling Condition : Good  
 Measured Instrument : Integrated Sound Level Meter Cirrus Serial No. : G305858

Interval Time	Noise Level (dB(A))		
	Leq	Lmax	L90
11:00 - 12:00	54.2	70.8	50.4
12:00 - 13:00	54.9	75.7	50.1
13:00 - 14:00	54.6	71.9	50.2
14:00 - 15:00	54.7	71.0	49.8
15:00 - 16:00	53.2	69.7	47.6
16:00 - 17:00	48.8	61.5	45.8
17:00 - 18:00	49.7	66.5	48.3
18:00 - 19:00	54.1	60.8	49.1
19:00 - 20:00	53.6	57.2	50.8
20:00 - 21:00	52.9	56.1	52.7
21:00 - 22:00	47.2	49.8	46.5
22:00 - 23:00	48.3	54.5	47.1
23:00 - 00:00	48.3	52.6	46.9
00:00 - 01:00	48.1	52.7	46.7
01:00 - 02:00	49.8	56.4	48.6
02:00 - 03:00	49.4	53.9	48.1
03:00 - 04:00	48.7	52.3	47.7
04:00 - 05:00	48.3	56.3	46.3
05:00 - 06:00	51.1	66.2	47.1
06:00 - 07:00	52.3	70.5	48.6
07:00 - 08:00	55.3	72.9	50.2
08:00 - 09:00	55.0	72.2	50.7
09:00 - 10:00	54.2	75.9	48.9
10:00 - 11:00	54.3	72.6	49.4
24 Hour	52.5	75.9	46.5
Standard*	70.0	115.0	-

Remark: \* Notification of the Ministry of National Environmental Board, No.15, B.E.2540, which was published in the Royal Government Gazette, Vol.114, Part 27D, B.E.2540

Sampling By :

Approved By :

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## NOISE MONITORING REPORT

Project Name : P. Siriphansila Report No. : RN241230299  
 Sampling Source : Community Noise Sampling Location : Construction area  
 Sampling Date : Dec 20-21, 2024 Sampling Point : Construction area  
 Received Date : Dec 24, 2024 Analytical Date : Dec 26, 2024  
 Sampling Method : - Sampling Condition : Good  
 Measured Instrument : Integrated Sound Level Meter Cirrus Serial No. : G305858

Interval Time	Noise Level (dB(A))		
	Leq	Lmax	L90
11:00 - 12:00	53.1	72.9	47.5
12:00 - 13:00	53.3	70.3	48.6
13:00 - 14:00	53.1	72.1	48.1
14:00 - 15:00	52.7	70.3	48.1
15:00 - 16:00	50.1	69.1	46.7
16:00 - 17:00	49.2	60.7	46.7
17:00 - 18:00	49.2	60.1	47.0
18:00 - 19:00	48.7	60.3	47.6
19:00 - 20:00	48.5	64.4	46.6
20:00 - 21:00	49.2	61.4	46.7
21:00 - 22:00	47.5	50.7	45.9
22:00 - 23:00	47.7	52.4	45.8
23:00 - 00:00	48.3	55.3	46.9
00:00 - 01:00	49.2	67.9	47.2
01:00 - 02:00	48.6	51.5	47.4
02:00 - 03:00	49.0	55.6	47.4
03:00 - 04:00	49.4	66.4	47.8
04:00 - 05:00	50.6	67.9	47.1
05:00 - 06:00	54.1	68.8	47.4
06:00 - 07:00	53.1	68.0	47.2
07:00 - 08:00	52.8	69.9	48.0
08:00 - 09:00	54.6	71.1	49.2
09:00 - 10:00	56.5	86.0	49.1
10:00 - 11:00	52.5	69.1	47.1
24 Hour	51.6	86.0	46.6
Standard*	70.0	115.0	-

Remark: \* Notification of the Ministry of National Environmental Board, No.15, B.E.2540, which was published in the Royal Government Gazette, Vol.114, Part 27D, B.E.2540

Sampling By :

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Approved By :

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## NOISE MONITORING REPORT

Project Name : P. Siriphansila	Report No. : RN241230300
Sampling Source : Community Noise	Sampling Location : Construction area
Sampling Date : Dec 21-22, 2024	Sampling Point : Construction area
Received Date : Dec 24, 2024	Analytical Date : Dec 26, 2024
Sampling Method : -	Sampling Condition : Good
Measured Instrument : Integrated Sound Level Meter Cirrus	Serial No. : G305858

Interval Time	Noise Level (dB(A))		
	Leq	Lmax	L90
11:00 - 12:00	52.6	70.2	46.4
12:00 - 13:00	55.1	73.1	49.2
13:00 - 14:00	57.5	75.1	47.2
14:00 - 15:00	55.8	73.0	49.3
15:00 - 16:00	51.5	70.2	47.2
16:00 - 17:00	49.7	72.9	45.7
17:00 - 18:00	48.0	59.1	46.0
18:00 - 19:00	52.1	63.4	47.8
19:00 - 20:00	54.8	66.1	51.5
20:00 - 21:00	52.4	62.4	47.8
21:00 - 22:00	57.3	67.9	53.6
22:00 - 23:00	54.4	65.7	48.9
23:00 - 00:00	49.5	57.1	48.4
00:00 - 01:00	48.6	51.5	47.7
01:00 - 02:00	48.2	57.4	47.1
02:00 - 03:00	49.0	55.8	47.6
03:00 - 04:00	49.1	55.0	47.6
04:00 - 05:00	48.5	55.7	46.2
05:00 - 06:00	52.1	71.0	45.7
06:00 - 07:00	50.3	65.6	46.6
07:00 - 08:00	51.0	70.5	47.9
08:00 - 09:00	49.5	68.7	48.6
09:00 - 10:00	50.8	69.8	49.3
10:00 - 11:00	51.6	70.5	49.8
24 Hour	52.6	75.1	46.1
Standard*	70.0	115.0	-

Remark: \* Notification of the Ministry of National Environmental Board, No.15, B.E.2540, which was published  
 in the Royal Government Gazette, Vol.114, Part 27D, B.E.2540

Sampling By :

(Pariya Klumnoi)

Approved By :

(Tawatchai Chongvutichai)



## ANALYSIS REPORT

Project : P.Siriphansila Report No. : RN241210120  
Sampling Source : Ambient Air Quality Sampling Location : บ้านข้ามมอ  
Sampling Date : Dec 19-22, 2024 Sampling Point : บ้านข้ามมอ  
Received Date : Dec 24, 2024 Analytical Date : Dec 26, 2024  
Sampling Method : US EPA 40 CFR 50 Sample Condition : Good  
Method of Analysis : High-Volume Air Sampler/ Gravimetric Method

Item	Parameter	Sampling Date	Result (mg/cu.m)	Standard (mg/cu.m) <sup>1/</sup>
1	Total Suspended Paticulate (TSP)	Dec 19-20, 2024	0.030	0.330
2	Total Suspended Paticulate (TSP)	Dec 20-21, 2024	0.040	0.330
3	Total Suspended Paticulate (TSP)	Dec 21-22, 2024	0.040	0.330

Remark : <sup>1/</sup> Notification of National Environmental Board No.24 (B.E. 2547) Prescription of Air Quality  
Standard in General Atmosphere

Sampling By :

Analyzed By :

Approved By :

(Tai ai)



## ANALYSIS REPORT

Project	: P.Siriphansila	Report No.	: RN241210121
Sampling Source	: Ambient Air Quality	Sampling Location	: บ้านข้ามอ
Sampling Date	: Dec 19-22, 2024	Sampling Point	: บ้านข้ามอ
Received Date	: Dec 24, 2024	Analytical Date	: Dec 26, 2024
Sampling Method	: US EPA 40 CFR 50	Sample Condition	: Good
Method of Analysis	: High-Volume Air Sampler/ Gravimetric Method		

Item	Parameter	Sampling Date	Result (mg/cu.m)	Standard (mg/cu.m) <sup>1/</sup>
1	Paticulate Matter < 10 micron (PM-10)	Dec 19-20, 2024	0.017	0.120
2	Paticulate Matter < 10 micron (PM-10)	Dec 20-21, 2024	0.020	0.120
3	Paticulate Matter < 10 micron (PM-10)	Dec 21-22, 2024	0.011	0.120

Remark : <sup>1/</sup> Notification of National Environmental Board No.24 (B.E. 2547) Prescription of Air Quality  
 Standard in General Atmosphere

Sampling By :

Analyzed By :

Approved By :

(Taw...ai)

NOISE MONITORING REPORT

Project Name : P. Siriphansila
Sampling Source : Community Noise
Sampling Date : Dec 19-20, 2024
Received Date : Dec 24, 2024
Sampling Method : -
Measured Instrument : Integrated Sound Level Meter

Report No. : RN241230301
Sampling Location : บ้านข้ามมอ
Sampling Point : บ้านข้ามมอ
Analytical Date : Dec 26, 2024
Sampling Condition : Good
Serial No. : G305836

Interval Time	Noise Level (dB(A))		
	Leq	Lmax	L90
11:00 - 12:00	59.6	80.6	54.8
12:00 - 13:00	59.4	79.8	56.1
13:00 - 14:00	59.0	75.0	55.8
14:00 - 15:00	58.9	76.3	55.6
15:00 - 16:00	61.5	71.9	57.8
16:00 - 17:00	61.5	79.0	58.4
17:00 - 18:00	59.2	75.6	56.2
18:00 - 19:00	58.7	72.9	56.4
19:00 - 20:00	56.3	69.6	54.4
20:00 - 21:00	56.4	76.6	54.4
21:00 - 22:00	55.9	72.9	54.8
22:00 - 23:00	59.4	84.9	53.7
23:00 - 00:00	55.7	74.7	53.8
00:00 - 01:00	56.4	66.1	54.6
01:00 - 02:00	54.4	64.2	53.8
02:00 - 03:00	54.5	64.5	53.9
03:00 - 04:00	57.1	68.1	55.2
04:00 - 05:00	57.2	76.6	54.9
05:00 - 06:00	59.5	75.4	55.5
06:00 - 07:00	60.7	82.4	55.9
07:00 - 08:00	60.5	82.8	55.5
08:00 - 09:00	59.8	82.2	54.7
09:00 - 10:00	57.2	75.4	54.2
10:00 - 11:00	58.2	80.5	54.2
24 Hour	58.7	84.9	53.8
Standard*	70.0	115.0	-

Remark: \* Notification of the Ministry of National Environmental Board, No.15, B.E.2540 , which was published in the Royal Government Gazette, Vol.114, Part 27D , B.E.2540

Sampling By :



(Pariya Klumnoi)

Approved By :



(Thirachai)

\*\*\* Reported analysis refers to submitted sample only. Report analysis shall not be reproduced except in full, without written approval of Laboratory.\*\*\*



## NOISE MONITORING REPORT

Project Name : P. Siriphansila	Report No. : RN241230302
Sampling Source : Community Noise	Sampling Location : บ้านข้ามอ
Sampling Date : Dec 20-21, 2024	Sampling Point : บ้านข้ามอ
Received Date : Dec 24, 2024	Analytical Date : Dec 26, 2024
Sampling Method : -	Sampling Condition : Good
Measured Instrument : Integrated Sound Level Meter Cirrus	Serial No. : G305836

Interval Time	Noise Level (dB(A))		
	Leq	Lmax	L90
11:00 - 12:00	58.4	78.4	54.6
12:00 - 13:00	56.5	78.2	53.6
13:00 - 14:00	57.5	77.6	53.9
14:00 - 15:00	58.6	79.5	54.9
15:00 - 16:00	61.0	84.9	56.2
16:00 - 17:00	61.6	75.1	58.5
17:00 - 18:00	61.1	79.0	57.6
18:00 - 19:00	58.3	71.9	56.4
19:00 - 20:00	58.0	72.9	55.2
20:00 - 21:00	56.1	66.6	54.3
21:00 - 22:00	56.7	76.6	54.8
22:00 - 23:00	54.9	66.9	53.6
23:00 - 00:00	59.5	84.9	53.8
00:00 - 01:00	57.6	81.5	53.8
01:00 - 02:00	57.9	81.2	54.3
02:00 - 03:00	59.1	83.9	53.3
03:00 - 04:00	61.1	80.9	54.4
04:00 - 05:00	62.2	81.3	55.4
05:00 - 06:00	64.4	81.9	58.6
06:00 - 07:00	60.4	78.0	56.6
07:00 - 08:00	59.7	75.4	55.4
08:00 - 09:00	60.2	82.7	54.7
09:00 - 10:00	60.7	82.6	54.4
10:00 - 11:00	57.2	81.9	54.3
24 Hour	59.7	84.9	53.6
Standard*	70.0	115.0	-

Remark: \* Notification of the Ministry of National Environmental Board, No.15, B.E.2540, which was published in the Royal Government Gazette, Vol.114, Part 27D, B.E.2540

Sampling By :

(Panya Khamrui)

Approved By :

(Jiraporn Jai)



## NOISE MONITORING REPORT

Project Name : P. Siriphansila Report No. : RN241230303  
 Sampling Source : Community Noise Sampling Location : บ้านข้ามอ  
 Sampling Date : Dec 21-22, 2024 Sampling Point : บ้านข้ามอ  
 Received Date : Dec 24, 2024 Analytical Date : Dec 26, 2024  
 Sampling Method : - Sampling Condition : Good  
 Measured Instrument : Integrated Sound Level Meter Cirrus Serial No. : G305836

Interval Time	Noise Level (dB(A))		
	Leq	Lmax	L90
11:00 - 12:00	57.9	83.1	54.0
12:00 - 13:00	55.6	73.2	54.0
13:00 - 14:00	58.2	81.8	54.3
14:00 - 15:00	55.3	73.0	53.7
15:00 - 16:00	54.8	72.0	53.9
16:00 - 17:00	54.6	69.1	53.9
17:00 - 18:00	54.5	65.2	54.1
18:00 - 19:00	54.8	77.0	54.1
19:00 - 20:00	54.8	76.9	53.5
20:00 - 21:00	56.1	74.3	53.6
21:00 - 22:00	62.8	88.4	54.2
22:00 - 23:00	64.2	94.9	53.9
23:00 - 00:00	64.4	87.4	54.5
00:00 - 01:00	55.1	72.0	53.9
01:00 - 02:00	54.6	68.5	53.8
02:00 - 03:00	54.6	69.1	54.1
03:00 - 04:00	54.8	77.0	54.1
04:00 - 05:00	54.7	76.9	53.5
05:00 - 06:00	55.6	67.6	53.5
06:00 - 07:00	60.7	83.6	54.2
07:00 - 08:00	65.0	94.9	53.9
08:00 - 09:00	64.7	87.4	54.5
09:00 - 10:00	60.2	82.6	54.2
10:00 - 11:00	46.7	64.4	43.1
24 Hour	59.5	94.9	53.5
Standard*	70.0	115.0	-

Remark: \* Notification of the Ministry of National Environmental Board, No.15, B.E.2540, which was published  
 in the Royal Government Gazette, Vol.114, Part 27D, B.E.2540

Sampling By :

(Panya Kaminor)

Approved By :

( )



ห้องปฏิบัติการวิเคราะห์เอกชน บริษัท โอกลา เทสติ้ง แอนด์ คอนซัลติง เซอร์วิส จำกัด

63/13 เพชรเกษม ซอย 7 แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600

โทร: (66)02-868-1246 โทรสาร: (66)02-868-1247 Website: [www.okla-testing.com](http://www.okla-testing.com) J-NAC Group

## ANALYSIS REPORT

Project : P.Siriphansila Report No. : RN241210122  
Sampling Source : Ambient Air Quality Sampling Location : รพ. สต.บ้านชำสมอ  
Sampling Date : Dec 19-22, 2024 Sampling Point : รพ. สต.บ้านชำสมอ  
Received Date : Dec 24, 2024 Analytical Date : Dec 26, 2024  
Sampling Method : US EPA 40 CFR 50 Sample Condition : Good  
Method of Analysis : High-Volume Air Sampler/ Gravimetric Method

Item	Parameter	Sampling Date	Result (mg/cu.m)	Standard (mg/cu.m) <sup>1/</sup>
1	Total Suspended Paticulate (TSP)	Dec 19-20, 2024	0.054	0.330
2	Total Suspended Paticulate (TSP)	Dec 20-21, 2024	0.032	0.330
3	Total Suspended Paticulate (TSP)	Dec 21-22, 2024	0.030	0.330

Remark : <sup>1/</sup> Notification of National Environmental Board No.24 (B.E. 2547) Prescription of Air Quality

Standard in General Atmosphere

Sampling By :

Analyzed By :

Approved By :

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## ANALYSIS REPORT

Project	: P.Siriphansila	Report No.	: RN241210123
Sampling Source	: Ambient Air Quality	Sampling Location	: รพ. สต.บ้านชำสมอ
Sampling Date	: Dec 19-22, 2024	Sampling Point	: รพ. สต.บ้านชำสมอ
Received Date	: Dec 24, 2024	Analytical Date	: Dec 26, 2024
Sampling Method	: US EPA 40 CFR 50	Sample Condition	: Good
Method of Analysis	: High-Volume Air Sampler/ Gravimetric Method		

Item	Parameter	Sampling Date	Result (mg/cu.m)	Standard (mg/cu.m) <sup>1/</sup>
1	Paticulate Matter < 10 micron (PM-10)	Dec 19-20, 2024	0.019	0.120
2	Paticulate Matter < 10 micron (PM-10)	Dec 20-21, 2024	0.018	0.120
3	Paticulate Matter < 10 micron (PM-10)	Dec 21-22, 2024	0.016	0.120

Remark : <sup>1/</sup> Notification of National Environmental Board No.24 (B.E. 2547) Prescription of Air Quality

Standard in General Atmosphere

Sampling By :

Analyzed By :

Approved By :

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## NOISE MONITORING REPORT

Project Name : P. Siriphansila Report No. : RN241230304  
 Sampling Source : Community Noise Sampling Location : รพ.สต.บ้านชำสมอ  
 Sampling Date : Dec 19-20, 2024 Sampling Point : รพ.สต.บ้านชำสมอ  
 Received Date : Dec 24, 2024 Analytical Date : Dec 26, 2024  
 Sampling Method : - Sampling Condition : Good  
 Measured Instrument : Integrated Sound Level Meter Delta OHM Serial No. : 17030644673

Interval Time	Noise Level (dB(A))		
	Leq	Lmax	L90
12:00 - 13:00	56.5	86.1	51.7
13:00 - 14:00	59.9	93.2	51.1
14:00 - 15:00	56.3	83.9	50.2
15:00 - 16:00	56.1	83.1	50.0
16:00 - 17:00	54.2	82.9	49.1
17:00 - 18:00	54.2	81.5	48.4
18:00 - 19:00	50.2	69.9	48.2
19:00 - 20:00	52.2	69.8	48.2
20:00 - 21:00	52.4	67.6	48.6
21:00 - 22:00	49.2	62.8	47.9
22:00 - 23:00	49.9	64.4	48.2
23:00 - 00:00	50.1	63.5	48.6
00:00 - 01:00	50.7	67.7	48.8
01:00 - 02:00	50.2	62.3	48.4
02:00 - 03:00	50.0	65.7	48.5
03:00 - 04:00	50.1	57.8	48.9
04:00 - 05:00	52.2	64.4	49.1
05:00 - 06:00	52.9	70.5	49.5
06:00 - 07:00	58.8	90.3	51.2
07:00 - 08:00	56.8	78.4	50.4
08:00 - 09:00	55.4	74.4	51.5
09:00 - 10:00	62.4	86.4	50.4
10:00 - 11:00	59.8	85.0	50.4
11:00 - 12:00	57.1	84.3	49.5
24 Hour	55.8	93.2	48.2
Standard*	70.0	115.0	-

Remark: \* Notification of the Ministry of National Environmental Board, No.15, B.E.2540, which was published in the Royal Government Gazette, Vol.114, Part 27D, B.E.2540

Sampling By :



Approved By :

(Ta ai)



## NOISE MONITORING REPORT

Project Name	: P. Siriphansila	Report No.	: RN241230305
Sampling Source	: Community Noise	Sampling Location	: รพ.สต.บ้านชำสมอ
Sampling Date	: Dec 20-21, 2024	Sampling Point	: รพ.สต.บ้านชำสมอ
Received Date	: Dec 24, 2024	Analytical Date	: Dec 26, 2024
Sampling Method	: -	Sampling Condition	: Good
Measured Instrument	: Integrated Sound Level Meter Delta OHM Serial No. : 17030644673		

Interval Time	Noise Level (dB(A))		
	Leq	Lmax	L90
12:00 - 13:00	57.6	84.3	49.7
13:00 - 14:00	51.2	76.9	45.0
14:00 - 15:00	49.9	81.4	44.0
15:00 - 16:00	50.9	77.6	42.0
16:00 - 17:00	51.1	82.6	42.1
17:00 - 18:00	50.4	73.0	43.0
18:00 - 19:00	48.5	77.5	41.7
19:00 - 20:00	43.7	66.3	41.5
20:00 - 21:00	44.5	72.3	41.1
21:00 - 22:00	43.4	51.9	41.5
22:00 - 23:00	50.5	82.2	41.8
23:00 - 00:00	44.0	70.0	41.6
00:00 - 01:00	43.0	69.2	41.2
01:00 - 02:00	51.8	85.0	41.1
02:00 - 03:00	43.5	67.2	41.3
03:00 - 04:00	42.3	58.0	41.6
04:00 - 05:00	45.1	64.3	42.7
05:00 - 06:00	50.7	75.9	42.8
06:00 - 07:00	51.2	76.7	44.5
07:00 - 08:00	51.8	76.7	45.7
08:00 - 09:00	52.5	81.2	46.3
09:00 - 10:00	54.8	83.4	45.8
10:00 - 11:00	51.9	78.8	44.1
11:00 - 12:00	50.0	74.6	43.0
24 Hour	50.7	85.0	41.2
Standard*	70.0	115.0	-

Remark: \* Notification of the Ministry of National Environmental Board, No.15, B.E.2540, which was published  
 in the Royal Government Gazette, Vol.114, Part 27D, B.E.2540

Sampling By :

  
 (Panya Kaminor)

Approved By :

  
 (Tanatana Chongvatichai)





## NOISE MONITORING REPORT

Project Name : P. Siriphansila Report No. : RN241230306  
Sampling Source : Community Noise Sampling Location : รพ.สต.บ้านชำสมอ  
Sampling Date : Dec 21-22, 2024 Sampling Point : รพ.สต.บ้านชำสมอ  
Received Date : Dec 24, 2024 Analytical Date : Dec 26, 2024  
Sampling Method : - Sampling Condition : Good  
Measured Instrument : Integrated Sound Level Meter Delta OHM Serial No. : 17030644673

Interval Time	Noise Level (dB(A))		
	Leq	Lmax	L90
12:00 - 13:00	55.9	86.1	51.3
13:00 - 14:00	59.9	93.2	51.2
14:00 - 15:00	56.3	83.9	50.7
15:00 - 16:00	53.2	75.5	50.2
16:00 - 17:00	56.0	83.1	49.5
17:00 - 18:00	53.8	82.9	49.0
18:00 - 19:00	53.9	81.5	48.2
19:00 - 20:00	50.1	69.8	48.0
20:00 - 21:00	53.7	67.6	49.9
21:00 - 22:00	49.5	62.7	48.0
22:00 - 23:00	49.6	64.4	48.1
23:00 - 00:00	49.9	63.2	48.2
00:00 - 01:00	50.6	67.7	48.7
01:00 - 02:00	50.2	65.7	48.5
02:00 - 03:00	49.8	61.5	48.6
03:00 - 04:00	50.7	59.9	49.0
04:00 - 05:00	51.9	64.4	49.1
05:00 - 06:00	57.9	90.3	50.2
06:00 - 07:00	56.0	77.4	50.7
07:00 - 08:00	56.9	78.4	50.8
08:00 - 09:00	52.7	70.9	51.8
09:00 - 10:00	53.8	72.7	50.2
10:00 - 11:00	51.2	67.3	49.1
11:00 - 12:00	50.9	66.0	48.4
24 Hour	54.2	93.2	48.1
Standard*	70.0	115.0	-

Remark: \* Notification of the Ministry of National Environmental Board, No.15, B.E.2540, which was published in the Royal Government Gazette, Vol.114, Part 27D, B.E.2540

Sampling By :

(Pa

Approved By :

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ANALYSIS REPORT

Project : บริษัท ป.ศิริภัณฑ์ศิลา จำกัด Report No. : RN241240100  
Sampling Source : เข้มืองแร่หินอุตสาหกรรมชนิดหินปูน Sampling Location : บ้านเรือนราษฎรด้านทิศตะวันตก (ใกล้หลักหมุดที่ 16)  
Sampling Date : Dec 20, 2024 Sampling Point : บ้านเรือนราษฎรด้านทิศตะวันตก (ใกล้หลักหมุดที่ 16)  
Received Date : Dec 24, 2024 Analytical Date : Dec 26, 2024  
Sampling Method : - Sampling Condition : Good  
Measured Instrument : Vibrock Serial No. : 2342

เวลา	Transverse			Vertical			Longitudinal		
	ความถี่ (เฮิร์ตซ์)	ความเร็วอนุภาค (มม./วินาที)	การจัด (มม.)	ความถี่ (เฮิร์ตซ์)	ความเร็วอนุภาค (มม./วินาที)	การจัด (มม.)	ความถี่ (เฮิร์ตซ์)	ความเร็วอนุภาค (มม./วินาที)	การจัด (มม.)
16:05:20	23.8	0.02	0.14	0.5	0.02	0.13	21.7	0.02	0.16
มาตรฐาน	24.0	30.2	0.20	1.0	4.7	0.75	22.0	27.6	0.20

Remark : มาตรฐานตามประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมระดับเสียงและความสั่นสะเทือนจากการทำเหมืองหิน (พ.ศ.2548)

Analyzed By :



Approved By :



(Rawatchai Chongvutichai)

ANALYSIS REPORT

Project : บริษัท ป.ศิริภัณฑ์ศิลา จำกัด

Report No. : RN241240101

Sampling Source : เขื่อนแควน้อยลุ่มน้ำยมตอนบน

Sampling Location : บ้านเรือนราษฎรด้านทิศตะวันตก (ใกล้หลักหมุดที่ 12)

Sampling Date : Dec 19, 2024

Sampling Point : บ้านเรือนราษฎรด้านทิศตะวันตก (ใกล้หลักหมุดที่ 12)

Received Date : Dec 24, 2024

Analytical Date : Dec 26, 2024

Sampling Method : -

Sampling Condition : Good

Measured Instrument : Vibrock

Serial No. : 2342

เวลา	Transverse			Vertical			Longitudinal		
	ความถี่ (เฮิรตซ์)	ความเร็วอนุภาค (มม./วินาที)	การจัด (มม.)	ความถี่ (เฮิรตซ์)	ความเร็วอนุภาค (มม./วินาที)	การจัด (มม.)	ความถี่ (เฮิรตซ์)	ความเร็วอนุภาค (มม./วินาที)	การจัด (มม.)
16:13:18	55.6	0.08	0.01	35.7	0.02	0.01	71.4	0.12	0.01
มาตรฐาน	>40	50.8	0.20	36.0	45.2	0.20	>40	50.8	0.20

Remark : มาตรฐานตามประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมระดับเสียงและความสั่นสะเทือนจากการทำเหมืองหิน (พ.ศ.2548)

Analyzed By : 

Approved By : 

(Parinya Klumnoi)

(Tawatchai Chongvutichai)



ANALYSIS REPORT

Project : บริษัท ปศุสัตว์ จำกัด Report No. : RN241240102  
Sampling Source : เหมืองแร่หินอุตสาหกรรมชนิดหินปูน Sampling Location : บ้านเรือนราษฎรทางด้านทิศใต้  
Sampling Date : Dec 19, 2024 Sampling Point : บ้านเรือนราษฎรทางด้านทิศใต้  
Received Date : Dec 24, 2024 Analytical Date : Dec 26, 2024  
Sampling Method : - Sampling Condition : Good  
Measured Instrument : Vibrock Serial No. : 2341

เวลา	Transverse			Vertical			Longitudinal		
	ความถี่ (เฮิร์ตซ์)	ความเร็วอนุภาค (มม./วินาที)	การจัด (มม.)	ความถี่ (เฮิร์ตซ์)	ความเร็วอนุภาค (มม./วินาที)	การจัด (มม.)	ความถี่ (เฮิร์ตซ์)	ความเร็วอนุภาค (มม./วินาที)	การจัด (มม.)
16:22:42	7.1	0.05	0.22	9.3	0.04	0.01	7.4	0.04	0.19
มาตรฐาน	8.0	12.7	0.25	10.0	12.7	0.20	8.0	12.7	0.25

Remark : มาตรฐานตามประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุมระดับเสียงและความสั่นสะเทือนจากการทำเหมืองหิน (พ.ศ.2548)

Analyzed By :



(Parinya Klumnoi)

Approved By :



(Tawatchai Chongvutichai)

ANALYSIS REPORT

CUSTOMER NAME : EIA Monitor\_P.Siriphansila  
ADDRESS : เขื่อนแควน้อยบำรุงแดน จังหวัดพิษณุโลก  
SAMPLING LOCATION : บ่อดักตะกอนดินของโครงการ (น้ำผิวดิน)  
SAMPLING METHOD : GRAB  
SAMPLING CONDITION : NORMAL  
CHARACTERISTICS OF WATER :ใส ไม่มีตะกอน ไม่มีกลิ่น  
SAMPLING DATE : DECEMBER 21, 2024  
SAMPLING TIME : 11:00  
SAMPLING BY : นายปริญญา กล้าน้อย  
REPORT NO. : RN241213050  
SAMPLING SOURCE : SURFACE WATER  
RECEIVED DATE : DECEMBER 23, 2024  
ANALYTICAL DATE : DECEMBER 23, 2024-JANUARY 06, 2025  
REPORT DATE : JANUARY 17, 2025

PARAMETER	UNIT	METHODS OF ANALYSIS	RESULT	MDL	STANDARD**
pH	-	Electrometric (SM: 4500-H <sup>+</sup> B.)	7.0 at 25°C	-	5-9
Total Dissolved Solids	mg/l	Total Dissolved Solids Dried at 180 °C (SM: 2540 C.)	250.0	-	-
Suspended Solids	mg/l	Suspended Solids Dried at 103-105 °C (SM: 2540 D.)	Not Detected	-	-
Turbidity	NTU	Nephelometric Method, (SM: 2130 B.)	<1.0	-	-
Sulphate	mg/l	APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 4500-SO <sub>4</sub> <sup>2-</sup> E	64.09	-	-
Total Hardness	mg/l	APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 2340 C	184.0	-	-
Arsenic	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3120 B	0.006	-	≤0.01
Cadmium	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3111 B	0.00242	-	≤0.05
Iron	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3111 B	Not Detected	-	-
Lead	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3120 B	0.0011	-	≤0.05

SM : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24<sup>th</sup> ED., 2023 (AWWA, APHA, WEF)

- Remark : 1. mean analysis were performed by HVE CO.,LTD  
2. \*\* Notification of the National Environment Board No.8 B.E. 2537 (1994), Surface Water Quality Standard. (Class 3)  
3. Not Detected หมายถึง ตรวจไม่พบ

(MR TAWATCHAI CHONGVUTICHAI)

LABORATORY SUPERVISOR

\*\*\* Reported analysis refers to submitted sample only. Report analysis shall not be reproduced except in full, without written approval of Laboratory.\*\*\*



ANALYSIS REPORT

CUSTOMER NAME : EIA Monitor\_P.Siriphansila  
ADDRESS : เมืองแร่ ป.ศิริพันธ์ศิลา จังหวัดระยอง.  
SAMPLING LOCATION : หนองปรือ (น้ำผิวดิน)  
SAMPLING METHOD : GRAB  
SAMPLING CONDITION : NORMAL  
CHARACTERISTICS OF WATER :ใส ไม่มีตะกอน ไม่มีกลิ่น  
SAMPLING DATE : DECEMBER 21, 2024  
SAMPLING TIME : 11:00  
SAMPLING BY : นายปริญญา กล้าน้อย  
REPORT NO. : RN241213051  
SAMPLING SOURCE : SURFACE WATER  
RECEIVED DATE : DECEMBER 23, 2024  
ANALYTICAL DATE : DECEMBER 23, 2024-JANUARY 06, 2025  
REPORT DATE : JANUARY 17, 2025

PARAMETER	UNIT	METHODS OF ANALYSIS	RESULT	MDL	STANDARD**
pH	-	Electrometric (SM: 4500-H <sup>+</sup> B.)	7.0 at 25°C	-	5-9
Total Dissolved Solids	mg/l	Total Dissolved Solids Dried at 180 °C (SM: 2540 C.)	415.0	-	-
Suspended Solids	mg/l	Suspended Solids Dried at 103-105 °C (SM: 2540 D.)	3.0	-	-
Turbidity	NTU	Nephelometric Method, (SM: 2130 B.)	<1.0	-	-
* Sulphate	mg/l	APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 4500-SO <sub>4</sub> <sup>2-</sup> E	123.0	-	-
* Total Hardness	mg/l	APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 2340 C	298.0	-	-
* Arsenic	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3120 B	0.0040	-	≤0.01
* Cadmium	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3111 B	0.00473	-	≤0.05
* Iron	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3111 B	0.0903	-	-
* Lead	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3120 B	0.0048	-	≤0.05

SM : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24<sup>th</sup> ED.,2023 (AWWA,APHA, WEF)

Remark : 1. \* mean analysis were performed by HVE CO.,LTD  
2. \*\* Notification of the National Environment Board No.8 B.E. 2537 (1994), Surface Water Quality Standard. (Class 3)

(MR TAWATCHAI CHONGVUTICHA)

LABORATORY SUPERVISOR

\*\*\* Reported analysis refers to submitted sample only. Report analysis shall not be reproduced except in full, without written approval of Laboratory.\*\*\*

ANALYSIS REPORT

CUSTOMER NAME : EIA Monitor\_P.Siriphansila  
ADDRESS : เหมืองแร่ ป.ศิริพันธ์ศิลา จังหวัดระยอง.  
SAMPLING LOCATION : น้ำบาดาลบ้านข้ามอ (น้ำใต้ดิน)  
SAMPLING METHOD : GRAB  
SAMPLING CONDITION : NORMAL  
CHARACTERISTICS OF WATER : ไส้ ไม่มีตะกอน ไม่มีกลิ่น  
SAMPLING DATE : DECEMBER 21, 2024  
SAMPLING TIME : 11:00  
SAMPLING BY : นายปริญญา กล้าน้อย  
REPORT NO. : RN241213052  
SAMPLING SOURCE : GROUND WATER  
RECEIVED DATE : DECEMBER 23, 2024  
ANALYTICAL DATE : DECEMBER 23, 2024-JANUARY 06, 2025  
REPORT DATE : JANUARY 17, 2025

PARAMETER	UNIT	METHODS OF ANALYSIS	RESULT	MDL	STANDARD**
pH	-	Electrometric (SM: 4500-H <sup>+</sup> B.)	6.5 at 25°C	-	7.0-8.5
Total Dissolved Solids	mg/l	Total Dissolved Solids Dried at 180 °C (SM: 2540 C.)	315.0	-	600.0
Suspended Solids	mg/l	Suspended Solids Dried at 103-105 °C (SM: 2540 D.)	3.0	-	-
Turbidity	NTU	Nephelometric Method, (SM: 2130 B.)	<1.0	-	≤5.0
* Sulphate	mg/l	APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 4500-SO <sub>4</sub> <sup>2-</sup> E	8.882	-	≤200
* Total Hardness	mg/l	APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 2340 C	117.0	-	≤300
* Arsenic	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3120 B	0.0020	-	Not Detected
* Cadmium	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3111 B	0.00374	-	Not Detected
* Iron	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3111 B	0.0430	-	≤0.5
* Lead	mg/l	In-house method based on APHA, AWWA, WEF 24 <sup>th</sup> ed. 2023, 3030 E, 3120 B	0.0075	-	Not Detected

SM : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24<sup>th</sup> ED.,2023 (AWWA,APHA, WEF)

- Remark : 1. \* mean analysis were performed by HVE CO.,LTD  
2. \*\* Notification of Ministry of Natural Resources and Environment, Established criteria and Technical measure for the protection of public health, and the protection in toxic environment B.E. 2551 (2008)  
3. Not Detected หมายถึง ตรวจไม่พบ

(MR TAWATCHAI CHONGVUTICHA)

LABORATORY SUPERVISOR

\*\*\* Reported analysis refers to submitted sample only. Report analysis shall not be reproduced except in full, without written approval of Laboratory.\*\*\*



## บริษัท ป.ศิริภัณฑ์ศิลา จำกัด

รายงานผลการปฏิบัติตามมาตรการป้องกันและแก้ไขผลกระทบสิ่งแวดล้อม

และมาตรการติดตามตรวจสอบคุณภาพสิ่งแวดล้อม (ระยะดำเนินการ)

เหมืองแร่หินอุตสาหกรรมชนิดหินปูน เพื่ออุตสาหกรรมก่อสร้าง

ฉบับที่ 2 ระหว่างเดือนกรกฎาคม ถึงเดือนธันวาคม พ.ศ. 2567

ภาคผนวก จ

หนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

และเอกสารสอบเทียบเครื่องมือ



**๑๑ กันยายน ๒๕๖๗**

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท โอกลา เทสต์ติ้ง แอนด์ คอนซัลติ้ง เซอร์วิส จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๑๕ กรกฎาคม ๒๕๖๗

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท โอกลา เทสต์ติ้ง แอนด์ คอนซัลติ้ง เซอร์วิส จำกัด จำนวน ๑ แผ่น

ตามคำขอที่อ้างถึง บริษัท โอกลา เทสต์ติ้ง แอนด์ คอนซัลติ้ง เซอร์วิส จำกัด ขอต่ออายุหนังสือ  
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๑๙ สถานที่ตั้งเลขที่ ๖๓/๑๓ ซอยเพชรเกษม ๗  
แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท โอกลา เทสต์ติ้ง แอนด์ คอนซัลติ้ง เซอร์วิส จำกัด  
ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน

- |                           |                            |
|---------------------------|----------------------------|
| ๑) นายธวัชชัย จงวุฒิชัย   | ทะเบียนเลขที่ ว-๒๑๙-ค-๐๐๐๑ |
| ๒) นางสาวปนัดดา พันธกะจับ | ทะเบียนเลขที่ ว-๒๑๙-ค-๐๐๐๒ |
| ๓) นางสาวจามจุรี คำปุย    | ทะเบียนเลขที่ ว-๒๑๙-ค-๐๐๐๓ |

ข. เจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน

- |                               |                            |
|-------------------------------|----------------------------|
| ๑) นางสาวนิจินาท มะติยาภักดิ์ | ทะเบียนเลขที่ ว-๒๑๙-จ-๐๐๐๑ |
| ๒) นางสาวภาณุชนารถ เชื้อวชาญ  | ทะเบียนเลขที่ ว-๒๑๙-จ-๐๐๐๒ |
| ๓) นางสาวธิดารัตน์ กลัดตลาด   | ทะเบียนเลขที่ ว-๒๑๙-จ-๐๐๐๓ |
| ๔) นางสาวเบญจพร อินแก้ว       | ทะเบียนเลขที่ ว-๒๑๙-จ-๐๐๐๔ |
| ๕) นางสาววันวิสา หวังแวกลาง   | ทะเบียนเลขที่ ว-๒๑๙-จ-๐๐๐๕ |
| ๖) นางสาวรัตตชา ศรีปราสาท     | ทะเบียนเลขที่ ว-๒๑๙-จ-๐๐๐๖ |
| ๗) นายปริญญญา กล้าน้อย        | ทะเบียนเลขที่ ว-๒๑๙-จ-๐๐๐๗ |
| ๘) นายโกวิท บุพา              | ทะเบียนเลขที่ ว-๒๑๙-จ-๐๐๐๘ |
| ๙) นายพีรพล ถวิลหวัง          | ทะเบียนเลขที่ ว-๒๑๙-จ-๐๐๐๙ |



ค. ขอบข่ายชนิดสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำ/น้ำเสีย และอากาศเสียตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๑๕ สิงหาคม ๒๕๗๑ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๖๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นายพรยศ กลั่นกรอง)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th





เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท โอกลา เทสติ้ง แอนด์ คอนซัลติ้ง เซอร์วิส จำกัด เลขทะเบียน ว-๒๑๙

ที่ อก ๐๓๑๐(๑)/ ๙๒๔ ๖

ลงวันที่ ๑๑ กันยายน ๒๕๖๗

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรมจำนวน ๑๔ รายการ

น้ำ/น้ำเสีย จำนวน 9 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method <sup>[2]</sup> 2) 5-Day BOD Test, Membrane Electrode Method <sup>[2]</sup>
2	Free Chlorine	Iodometric Method <sup>[2]</sup>
3	Oil & Grease	Liquid-Liquid, Partition Gravimetric Method <sup>[2]</sup>
4	pH	Electrometric Method <sup>[2]</sup>
5	Sulfide	Iodometric Method <sup>[2]</sup>
6	Temperature	Laboratory and Field Methods <sup>[2]</sup>
7	Total Dissolved Solids	Dried at 180 °C <sup>[2]</sup>
8	Total Kjeldahl Nitrogen	Macro-Kjeldahl Method <sup>[2]</sup>
9	Total Suspended Solids	Dried from 103 to 105 °C <sup>[2]</sup>

อากาศเสีย (ปล่องระบาย) จำนวน 5 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	Instrument Analyzer Method <sup>[3]</sup>
2	Opacity	Ringelmann's Method <sup>[1]</sup>
3	Oxides of Nitrogen	Instrument Analyzer Method <sup>[3]</sup>
4	Sulfur Dioxide	Instrument Analyzer Method <sup>[3]</sup>
5	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method <sup>[3]</sup>

#### เอกสารอ้างอิง

1. กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดค่าปริมาณเขม่าควันที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำของโรงงาน พ.ศ. 2549. ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125 ง.

2. APHA, AWWA, WEF. **Standard Methods for the Examination of Water and Wastewater.** 24<sup>th</sup> ed. Washington, DC: APHA, 2023.

3. United States Environmental Protection Agency. **Standard of Performance for New Stationary Source.** 40 CFR 60. Appendix A, 2019.





ที่ อก ๐๓๑๐(๑)/ ๑ ๒ ๓ ๗ ๒

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒ ๘ สิงหาคม ๒๕๖๖

เรื่อง ขันทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอชวีอี จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๑๘ พฤษภาคม ๒๕๖๖

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอชวีอี จำกัด จำนวน ๒ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอชวีอี จำกัด ขอขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน พร้อม  
รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์และรายการสารมลพิษ  
ที่จะทำการวิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอชวีอี จำกัด ขันทะเบียนห้องปฏิบัติการ  
วิเคราะห์เอกชน มีเลขทะเบียน ว-๓๕๘ สถานที่ตั้งเลขที่ ๖๐๓ ซอยเจริญสนิทวงศ์ ๔๖ แขวงบางยี่ขัน  
เขตบางพลัด กรุงเทพมหานคร โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

- |                             |                            |
|-----------------------------|----------------------------|
| ๑) นายเอกลักษณ์ สีสาบิหาร   | ทะเบียนเลขที่ ว-๓๕๘-ค-๐๐๐๑ |
| ๒) นางสาวทิพวรรณ วงศ์บุญตัน | ทะเบียนเลขที่ ว-๓๕๘-ค-๐๐๐๒ |
| ๓) นายพล ม่วงใหญ่           | ทะเบียนเลขที่ ว-๓๕๘-ค-๐๐๐๓ |

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

- |                              |                            |
|------------------------------|----------------------------|
| ๑) นางสาวสุปรียา หล้าอิน     | ทะเบียนเลขที่ ว-๓๕๘-จ-๐๐๐๑ |
| ๒) นางสาวจิราภรณ์ ผงผานอก    | ทะเบียนเลขที่ ว-๓๕๘-จ-๐๐๐๒ |
| ๓) นายธรรมรัตน์ จิรยวัฒน์สุข | ทะเบียนเลขที่ ว-๓๕๘-จ-๐๐๐๓ |
| ๔) นางสาวธนภรณ์ กำทา         | ทะเบียนเลขที่ ว-๓๕๘-จ-๐๐๐๔ |
| ๕) นางสาวณัฐรดา คงบัน        | ทะเบียนเลขที่ ว-๓๕๘-จ-๐๐๐๕ |
| ๖) นายฐานันท์ นิภารัตน์      | ทะเบียนเลขที่ ว-๓๕๘-จ-๐๐๐๖ |
| ๗) นายมนโรด สุดจันทร์        | ทะเบียนเลขที่ ว-๓๕๘-จ-๐๐๐๗ |

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสียและอากาศเสีย ตามสิ่งที่

ส่งมาด้วย

หนังสือฉบับ...

หนังสือฉบับนี้มีอายุครั้งละ ๓ ปี นับจากวันที่กรมโรงงานอุตสาหกรรมออกหนังสือหากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชนทั้งนี้สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๔๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th





เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอชวีอี จำกัด

เลขทะเบียน ว-๓๕๘

ที่ ออก ๐๓๑๐(๑)/ ๑ ๒ ๓ ๗ ๒

ลงวันที่ ๒๘ สิงหาคม ๒๕๖๖

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ รายการ

น้ำเสีย จำนวน 30 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldicarb	High-Performance Liquid Chromatographic Method <sup>[1]</sup>
2	Aldicarb sulfone	High-Performance Liquid Chromatographic Method <sup>[1]</sup>
3	Aldicarb sulfoxide	High-Performance Liquid Chromatographic Method <sup>[1]</sup>
4	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1]</sup>
5	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1]</sup>
6	Biochemical Oxygen Demand	5-Day BOD Test, Azide Modification Method <sup>[1]</sup>
7	Carbaryl	High-Performance Liquid Chromatographic Method <sup>[1]</sup>
8	Carbofuran	High-Performance Liquid Chromatographic Method <sup>[1]</sup>
9	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method <sup>[1]</sup>
10	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1]</sup>
11	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1]</sup>
12	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1]</sup>
13	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1]</sup>
14	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1]</sup>
15	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1]</sup>
16	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1]</sup>
17	Heptachlo Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1]</sup>
18	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method <sup>[1]</sup>
19	Methiocarb	High-Performance Liquid Chromatographic Method <sup>[1]</sup>
20	Methomyl	High-Performance Liquid Chromatographic Method <sup>[1]</sup>
21	1-Naphthol	High-Performance Liquid Chromatographic Method <sup>[1]</sup>
22	Oil & Grease	Liquid-Liquid, Partition-Gravimetric Method <sup>[1]</sup>
23	Oxamyl	High-Performance Liquid Chromatographic Method <sup>[1]</sup>
24	pH	Electrometric Method <sup>[1]</sup>
25	Propoxur	High-Performance Liquid Chromatographic Method <sup>[1]</sup>
26	Sulfide	Iodometric Method <sup>[1]</sup>
27	Temperature	Laboratory and Field Methods <sup>[1]</sup>
28	Total Dissolved Solids	Dried at 180 °C <sup>[1]</sup>
29	Total Kjeldahl Nitrogen	Macro Kjeldahl Method <sup>[1]</sup>
30	Total Suspended Solids	Dried at 103-105 °C <sup>[1]</sup>

**อากาศเสีย (ปล่อยระบาย) จำนวน 1 รายการ**

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Opacity	Ringelmann's Method <sup>[2]</sup>

**เอกสารอ้างอิง**

1. APHA, AWWA, WEF. **Standard Methods for the Examination of Water and Wastewater**. 23<sup>rd</sup> ed. Washington, DC: APHA, 2017.

2. กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดค่าปริมาณเขม่าควันที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำของโรงงาน พ.ศ. 2549. ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125ง.





Ref No. : 0303/16972

## CERTIFICATE OF TESTING LABORATORY ACCREDITATION

This is to certify that

*Laboratory of HVE Co., Ltd.*

*603 Soi Jarunsanitwong 46, Jarunsanitwong Road,*

*Bangyeekhan, Bang Phlat, Bangkok 10700*

has successfully undergone assessment according to ISO/IEC 17025 : 2017  
and under the Bureau of Laboratory Accreditation, Department of Science Service  
for the requirements, regulations and criteria for the competence of testing laboratories

LABORATORY ACCREDITATION  
Accreditation Number TESTING - 0090  
BLA-DSS

The scope of accreditation is as annexed hereto

Issue date : 26<sup>th</sup> November 2024

Expired date : 25<sup>th</sup> November 2028

Signature :

(Mrs. Chantararat Vorasapavit)

Director of Bureau of Laboratory Accreditation

Bureau of Laboratory Accreditation, Department of Science Service,  
Ministry of Higher Education, Science, Research and Innovation

## Scope of Laboratory Accreditation

Laboratory Name : Laboratory of HVE Co., Ltd.

Address : 603 Soi Jarunsanitwong 46, Jarunsanitwong Road,  
Bangyeekhan, Bang Phlat, Bangkok 10700

Accreditation Number : Testing - 0090

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1	Water	<p>- pH 6.0 to 9.0</p> <p>- Copper 0.1 mg/L to 1.5 mg/L</p> <p>- Copper 0.03 mg/L to 0.5 mg/L</p>	<p>Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 24<sup>th</sup> ed., 2023, part 4500-H<sup>+</sup> B</p> <p>Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 24<sup>th</sup> ed., 2023, part 3111 B, 3030 E</p> <p>Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 24<sup>th</sup> ed., 2023, part 3120 B, 3030 E</p>

Initial Issue Date 18<sup>th</sup> September 2012

Issue Number 8

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation



## Scope of Laboratory Accreditation

Laboratory Name : Laboratory of HVE Co., Ltd.

Address : 603 Soi Jarunsanitwong 46, Jarunsanitwong Road,  
Bangyeekhan, Bang Phlat, Bangkok 10700

Accreditation Number : Testing - 0090

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Manganese 0.02 mg/L to 0.4 mg/L  - Manganese 0.03 mg/L to 0.5 mg/L  - Zinc 0.2 mg/L to 0.9 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3111 B, 3030 E  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3120 B, 3030 E  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3111 B, 3030 E

Initial Issue Date 18<sup>th</sup> September 2012

Issue Number 8

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation

## Scope of Laboratory Accreditation

Laboratory Name : Laboratory of HVE Co., Ltd.

Address : 603 Soi Jarunsanitwong 46, Jarunsanitwong Road,  
Bangyeekhan, Bang Phlat, Bangkok 10700

Accreditation Number : Testing - 0090

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Zinc 0.03 mg/L to 0.5 mg/L  - Mercury 2 µg/L to 8 µg/L  - Aluminium 0.2 mg/L to 10 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3120 B, 3030 E  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3112 B  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3111 D, 3030 E

Initial Issue Date 18<sup>th</sup> September 2012

Issue Number 8

Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Higher Education, Science, Research and Innovation



## Scope of Laboratory Accreditation

Laboratory Name : Laboratory of HVE Co., Ltd.

Address : 603 Soi Jarunsanitwong 46, Jarunsanitwong Road,

Bangyeekhan, Bang Phlat, Bangkok 10700

Accreditation Number : Testing - 0090

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Aluminium 0.03 mg/L to 0.5 mg/L  - Arsenic 2 µg/L to 10 µg/L  - Arsenic 0.03 mg/L to 0.5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3120 B, 3030 E  In – house method : WI-LA-049 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3114 C  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3120 B, 3030 E

Initial Issue Date 18<sup>th</sup> September 2012

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Selenium 1 µg/L to 10 µg/L  - Selenium 0.01 mg/L to 0.1 mg/L  - Barium 0.2 mg/L to 1.5 mg/L	In – house method : WI-LA-050  based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3114 C  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3120 B, 3030 E  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3111 D, 3030 E

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Issue Number 8

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Accreditation Number : Testing - 0090

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Barium 0.03 mg/L to 0.5 mg/L  - Cadmium 0.005 mg/L to 0.5 mg/L  - Cadmium 0.001 mg/L to 0.1 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3120 B, 3030 E  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3111 B, 3030 E  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3120 B, 3030 E

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Bangyeekhan, Bang Phlat, Bangkok 10700

Accreditation Number : Testing - 0090

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Chromium 0.05 mg/L to 0.9 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3111 B, 3030 E
		- Chromium 0.03 mg/L to 0.5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3120 B, 3030 E
		- Iron 0.05 mg/L to 0.4 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3111 B, 3030 E

Initial Issue Date 18<sup>th</sup> September 2012

Issue Number 8

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Laboratory Name : Laboratory of HVE Co., Ltd.

Address : 603 Soi Jarunsanitwong 46, Jarunsanitwong Road,  
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Accreditation Number : Testing - 0090

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Iron 0.03 mg/L to 0.5 mg/L  - Lead 0.02 mg/L to 0.09 mg/L  - Lead 0.03 mg/L to 0.5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3120 B, 3030 E  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3113 B, 3030 E  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3120 B, 3030 E

Initial Issue Date 18<sup>th</sup> September 2012

Issue Number 8

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Laboratory Name : Laboratory of HVE Co., Ltd.

Address : 603 Soi Jarunsanitwong 46, Jarunsanitwong Road,  
Bangyeekhan, Bang Phlat, Bangkok 10700

Accreditation Number : Testing - 0090

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Silver 0.02 mg/L to 0.45 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3111 B, 3030 E
		- Silver 0.03 mg/L to 0.5 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 3120 B, 3030 E
		- Cyanide 0.05 mg/L to 0.16 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 4500-CN <sup>-</sup> C, E

Initial Issue Date 18<sup>th</sup> September 2012

Issue Number 8

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Laboratory Name : Laboratory of HVE Co., Ltd.

Address : 603 Soi Jarunsanitwong 46, Jarunsanitwong Road,  
Bangyeekhan, Bang Phlat, Bangkok 10700

Accreditation Number : Testing - 0090

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Turbidity 1 NTU to 800 NTU  - Color 5 CU to 30 CU  - Odor Odor or Odorless	In – house method : WI-LA-040 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 2130 B  In – house method : WI-LA-044 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 2120 C  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 2150 B

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Accreditation Number : Testing - 0090

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Phenol 1 µg/L to 150 µg/L  - MBAS (Calculated as LAS) 0.16 mg/L to 0.3 mg/L  - Total solids dried from 103 °C to 105 °C 85 mg/L to 500 mg/L	In – house method : WI-LA-045 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 5530 C  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 5540 C  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 2540 B

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Total hardness (Calculated as $\text{CaCO}_3$ ) 13 mg/L to 300 mg/L  - Chloride 4.5 mg/L to 150 mg/L  - Fluoride 0.15 mg/L to 1.6 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 2340 C  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 4500- $\text{Cl}^-$ B  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 4500- $\text{F}^-$ D

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- Nitrate 0.2 mg/L to 5 mg/L  - Sulfate 8 mg/L to 40 mg/L  - Total coliform MPN/100 mL	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 4500-NO <sub>3</sub> <sup>-</sup> E  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 4500-SO <sub>4</sub> <sup>2-</sup> E  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 9221 B, C

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	<p>- <i>E. coli</i> Detected or not detected/100 mL</p> <p>- <i>Clostridium perfringens</i> Detected or not detected/100 mL</p> <p>- <i>Salmonella</i> spp. Detected or not detected/100 mL</p>	<p>Standard Methods for the Examination of Water and Wastewater, APHA, AWWA &amp; WEF, 24<sup>th</sup> ed., 2023, part 9221 B, F</p> <p>Standing Committee of Analysts, Methods for the Examination of Waters and Associated Materials, The Microbiology of Drinking Water (2021), Part 6</p> <p>ISO 19250 : 2010</p>

Initial Issue Date 18<sup>th</sup> September 2012

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Accreditation Number : Testing - 0090

Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
1 (cont.)	Water	- <i>Staphylococcus aureus</i> Detected or not detected/100 mL	In – house method : WI-LA-508 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 9213 B
2	Ice	- Chlorine (Calculated as Cl <sub>2</sub> ) 0.29 mg/L to 1.0 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 4500-Cl B
3	Wastewater	- pH 4.0 to 9.0	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 4500-H <sup>+</sup> B

Initial Issue Date 18<sup>th</sup> September 2012

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Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	- Total suspended solids dried from 103 °C to 105 °C 23 mg/L to 100 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 2540 D
		- Total dissolved solids dried at 180 °C 134 mg/L to 500 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 2540 C
		- Total dissolved solids dried from 103 °C to 105 °C 132 mg/L to 500 mg/L	In – house method : WI-LA-026 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 2540 C

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Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	- Settleable solids 0.5 mL/L to 500 mL/L  - Sulfide 0.6 mg/L to 2.0 mg/L  - Total kjeldahl nitrogen 18 mg/L to 50 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 2540 F  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 4500-S <sup>2-</sup> F  In – house method : WI-LA-012 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 4500-N <sub>org</sub> B

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	- BOD 15 mg/L to 500 mg/L  - Oil and grease 7 mg/L to 50 mg/L	Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 5210 B  Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 5520 B

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	Pesticide residues Organochlorine group : - $\alpha$ - BHC - Heptachlor - Heptachlor epoxide (Isomer A) - Heptachlor epoxide (Isomer B) - Endosulfan I - Endosulfan II - Aldrin - Dieldrin - Endrin - 4,4'-DDE - 4,4'-DDD Detected or not detected	In – house method : WI-LA-159 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 6630 B

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Laboratory Status : ☒ Permanent ☐ Site ☐ Temporary ☐ Mobile

Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	Pesticide residues Pyrethroid group : - Bifenthrin - Lambda-Cyhalothrin - Permethrin - Cyfluthrin - Cypermethrin - Esfenvalerate - Deltamethrin Detected or not detected  Organophosphorus group : - Chlorthiophos - Chlorpyrifos - Profenofos - Ethion - EPN Detected or not detected	In – house method : WI-LA-159 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 6630 B  In – house method : WI-LA-159 based on United States Environmental Protection Agency, 2007, EPA Method 8141 B, Revision 2

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	Pesticide residues Carbamate group : - Aldicarb Sulfoxide - Aldicarb Sulfone - Oxamyl - Methomyl - 3-Hydroxy-Carbofuran - Aldicarb Detected or not detected	In – house method : WI-LA-158 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 6610 B

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Item Number	Test Material / Product	Test Item / Range of Testing	Test Method / Technique Used
3 (cont.)	Wastewater	Pesticide residues Carbamate group : - Propoxur - Carbofuran - Carbaryl - Naphthol - Methiocarb - BDMC Detected or not detected	In – house method : WI-LA-158 based on Standard Methods for the Examination of Water and Wastewater, APHA, AWWA & WEF, 24 <sup>th</sup> ed., 2023, part 6610 B

Issue Date : 26<sup>th</sup> November 2024

Signature :

(Mrs. Chantarat Vorasapavit)

Director of Bureau of Laboratory Accreditation

Initial Issue Date 18<sup>th</sup> September 2012

Issue Number 8

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OKLA TESTING & CONSULTING SERVICE CO., LTD. (Head office)

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FAX: (66) 02 868 0860

E-MAIL: sales@okla-testing.com

Website: www.okla-testing.com

J-NAC Group

Tax ID: 0105553003058



## TSP Calibration Report

Location: OKLA-Testing Lab

Date: 02-12-2024

Sampler: EM-TSP-01

Serial No:

Barometric pressure, mm Hg (Pa): 757

Temperature, Deg C (Ta): 24

Transfer Standard Type: Tisch TE 5025A

Serial No: 1758

Last Calibration Date: 17-Sep-24

Operator: Mr.Parinya

Qstd Slope: 1.26862

Qstd Intercept: -0.0199

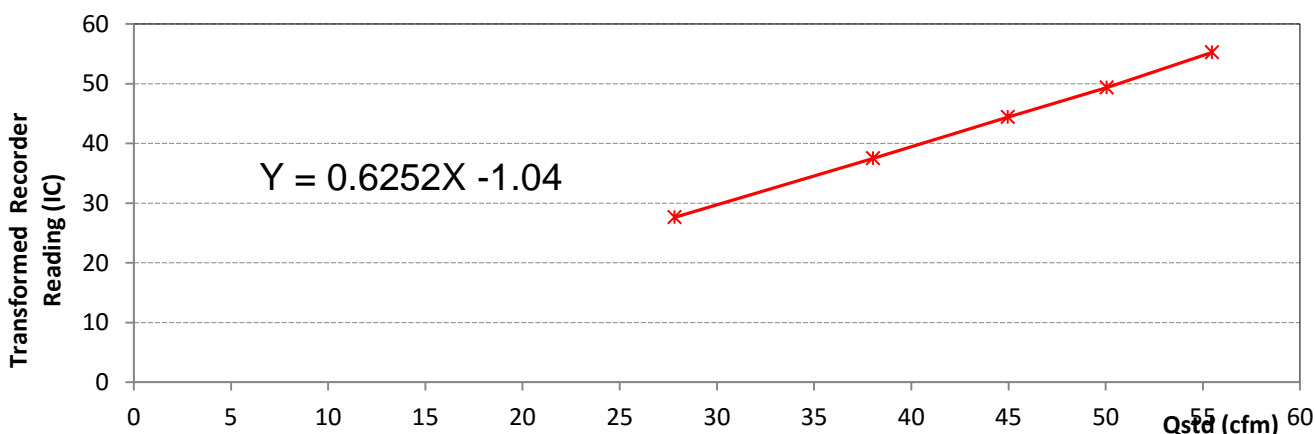
Plate No	H2O (in)	Qstd		I (Chart)	IC (corrected)
		(m3/min)	(cfm)		
1	10.00	2.512	88.705	55.00	54.98
2	9.00	2.384	84.189	52.00	51.98
3	8.00	2.249	79.415	50.00	49.99
4	5.00	1.782	62.930	34.00	33.99
5	2.00	1.134	40.059	26.00	25.99

Linear Regression

Slope: 0.6252

Intecept: -1.0400

Corr. Coeff: 0.9804



CALIBRATION BY :	Parinya Klumnoi	DATE :	02-12-24
APPROVED BY :	Tawatchai Chongvutichai	DATE :	02-12-24
ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : นายปริญญา กล้าน้อย 02-8681246 ต่อ 22			
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Website: www.okla-testing.com

J-NAC Group

Tax ID: 0105553003058



## PM10 Calibration Report

Location: OKLA-Testing Lab

Date: 02-12-2024

Sampler: EM-PM10-01

Serial No:

Barometric pressure, mm Hg (Pa): 757

Temperature, Deg C (Ta): 25

Transfer Standard Type: Tisch TE 5025A

Serial No: 1758

Last Calibration Date: 17-Sep-24

Operator: Mr.Parinya

Qstd Slope: 1.26862

Qstd Intercept: -0.0199

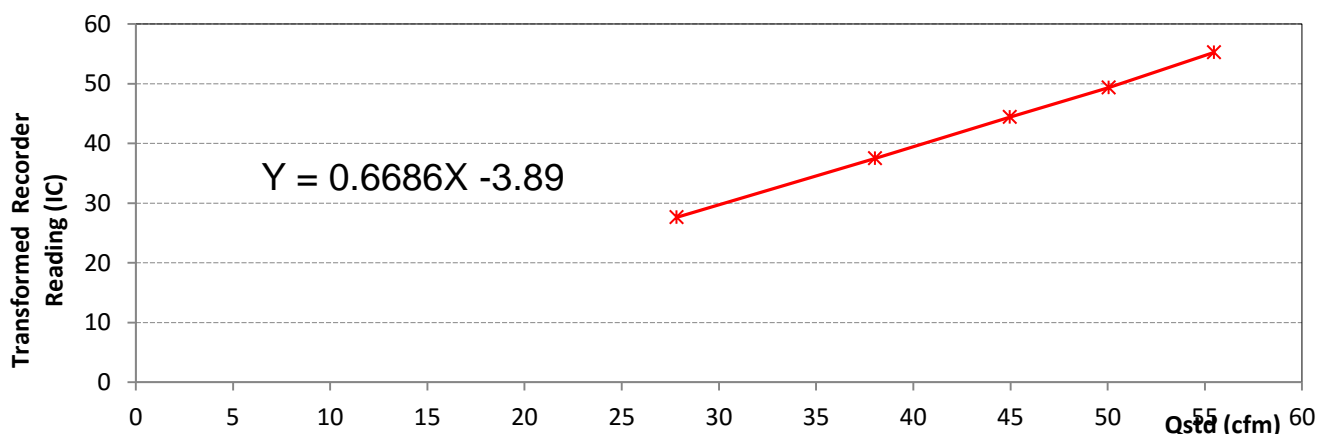
Plate No	H2O (in)	Qstd		I (Chart)	IC (corrected)
		(m3/min)	(cfm)		
1	11.00	2.629	92.846	57.00	56.89
2	9.00	2.380	84.049	55.00	54.89
3	8.00	2.245	79.282	47.00	46.91
4	5.00	1.779	62.825	40.00	39.92
5	2.00	1.132	39.993	22.00	21.96

Linear Regression

Slope: 0.6686

Intecept: -3.8900

Corr. Coeff: 0.9891



CALIBRATION BY :	Parinya Klumnoi	DATE :	02-12-24
APPROVED BY :	Tawatchai Chongvutichai	DATE :	02-12-24
ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : นายปริญญา กล้าน้อย 02-8681246 ต่อ 22			
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OKLA TESTING & CONSULTING SERVICE CO., LTD. (Head office)

บริษัท โอคลา เทสติ้ง แอนด์ คอนซัลติง เซอร์วิส จำกัด (สำนักงานใหญ่)

67/35-36, 3<sup>rd</sup> Floor., Phetkasem 7/1 Rd., Wat Tha Pra, Bangkokyai, Bangkok, THAILAND 10600

Tel: (66) 02 868 1246

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FAX: (66) 02 868 0860

E-MAIL: sales@okla-testing.com

Website: www.okla-testing.com

J-NAC Group

Tax ID: 0105553003058



## TSP Calibration Report

Location: OKLA-Testing Lab

Date: 02-12-2024

Sampler: EM-TSP-02

Serial No:

Barometric pressure, mm Hg (Pa): 756

Temperature, Deg C (Ta): 25

Transfer Standard Type: Tisch TE 5025A

Serial No: 1758

Last Calibration Date: 24-Aug-24

Operator: Mr.Parinya

Qstd Slope: 2.00829

Qstd Intercept: -0.01752

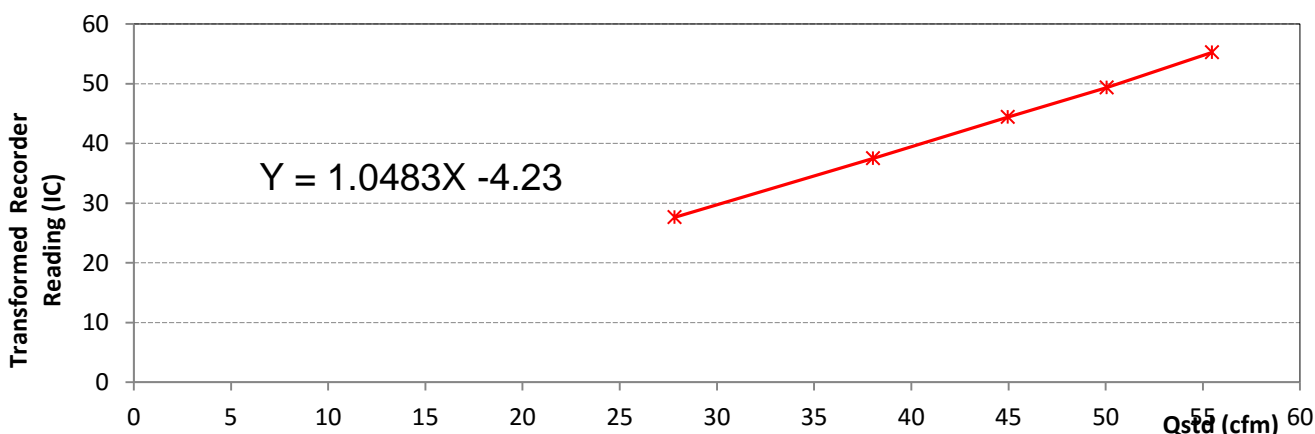
Plate No	H2O (in)	Qstd		I (Chart)	IC (corrected)
		(m3/min)	(cfm)		
1	11.00	1.665	58.786	58.00	57.85
2	9.50	1.548	54.675	53.00	52.86
3	7.00	1.331	47.020	45.00	44.88
4	4.50	1.071	37.823	35.00	34.91
5	2.50	0.803	28.349	26.00	25.93

Linear Regression

Slope: 1.0483

Intecept: -4.2300

Corr. Coeff: 0.9994



CALIBRATION BY :	Parinya Klumnoi	DATE :	02-12-24
APPROVED BY :	Tawatchai Chongvutichai	DATE :	02-12-24
ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : นายปริญญา กล้าน้อย 02-8681246 ต่อ 22			
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67/35-36, 3<sup>rd</sup> Floor., Phetkasem 7/1 Rd., Wat Tha Pra, Bangkokyai, Bangkok, THAILAND 10600

Tel: (66) 02 868 1246

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FAX: (66) 02 868 0860

E-MAIL: sales@okla-testing.com

Website: www.okla-testing.com

J-NAC Group

Tax ID: 0105553003058



## PM10 Calibration Report

Location: OKLA-Testing Lab

Date: 02-12-2024

Sampler: EM-PM10-02

Serial No:

Barometric pressure, mm Hg (Pa): 756

Temperature, Deg C (Ta): 25

Transfer Standard Type: Tisch TE 5025A

Serial No: 1758

Last Calibration Date: 24-Aug-24

Operator: Mr.Parinya

Qstd Slope: 2.00829

Qstd Intercept: -0.01752

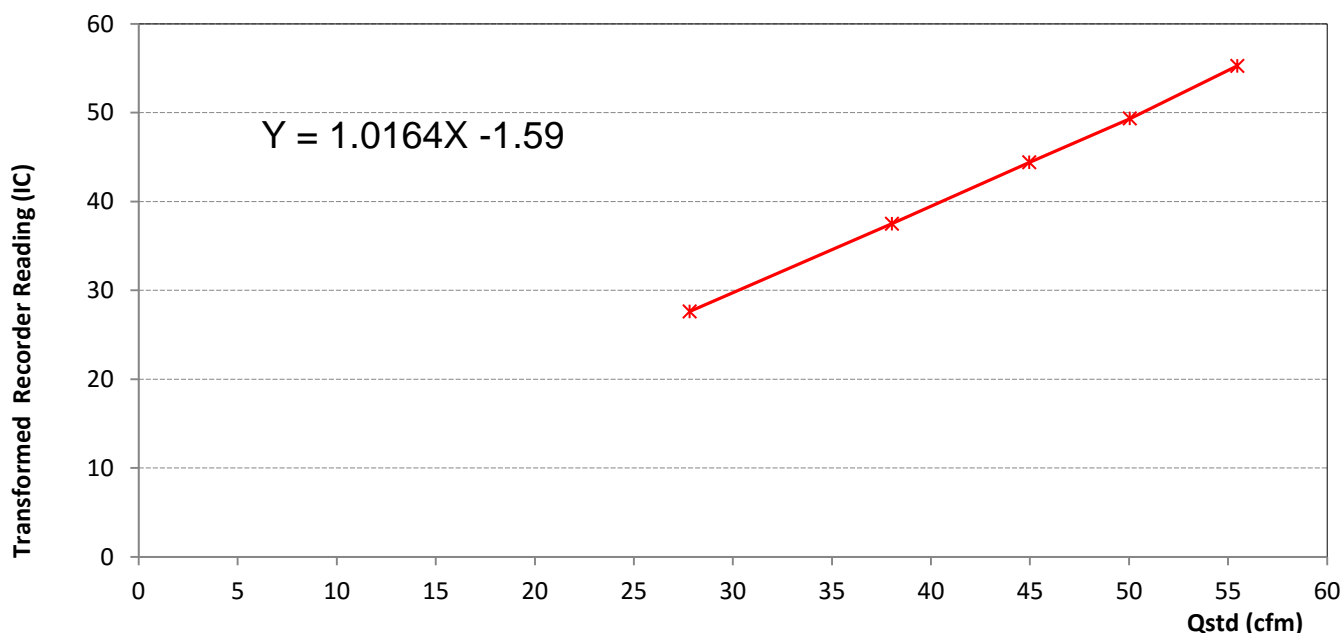
Plate	H2O	Qstd		I	IC
No	(in)	(m3/min)	(cfm)	(Chart)	(corrected)
1	10.50	1.627	57.449	57.00	56.85
2	9.50	1.548	54.675	54.00	53.86
3	6.50	1.284	45.332	45.00	44.88
4	3.00	0.878	30.996	29.00	28.92
5	2.00	0.720	25.421	25.00	24.93

Linear Regression

Slope: 1.0164

Intecept: -1.5900

Corr. Coeff: 0.9990



CALIBRATION BY :	Parinya Klumnoi	DATE :	02-12-24
APPROVED BY :	Tawatchai Chongvutichai	DATE :	02-12-24
ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : นายปริญญากุลน้อย 02-8681246 ต่อ 22			
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FAX: (66) 02 868 0860

E-MAIL: sales@okla-testing.com

Website: www.okla-testing.com

J-NAC Group

Tax ID: 0105553003058



## TSP Calibration Report

Location: OKLA-Testing Lab

Date: 02-12-2024

Sampler: EM-TSP-03

Serial No:

Barometric pressure, mm Hg (Pa): 757

Temperature, Deg C (Ta): 24

Transfer Standard Type: Tisch TE 5025A

Serial No: 1758

Last Calibration Date: 17-Sep-24

Operator: Mr.Parinya

Qstd Slope: 1.26862

Qstd Intercept: -0.0199

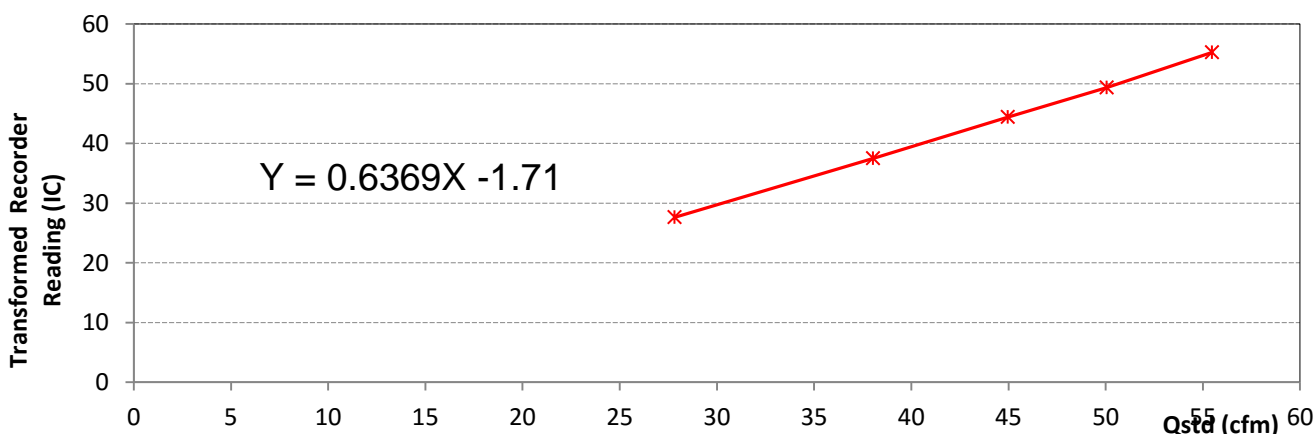
Plate No	H2O (in)	Qstd		I (Chart)	IC (corrected)
		(m3/min)	(cfm)		
1	10.00	2.512	88.705	57.00	56.98
2	9.00	2.384	84.189	52.00	51.98
3	7.50	2.178	76.915	46.00	45.99
4	6.00	1.950	68.869	40.00	39.99
5	2.00	1.134	40.059	25.00	24.99

Linear Regression

Slope: 0.6369

Intecept: -1.7100

Corr. Coeff: 0.9897



CALIBRATION BY :	Parinya Klumnoi	DATE :	02-12-24
APPROVED BY :	Tawatchai Chongvutichai	DATE :	02-12-24
ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : นายปริญญา กล้าน้อย 02-8681246 ต่อ 22			
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E-MAIL: sales@okla-testing.com

Website: www.okla-testing.com

J-NAC Group

Tax ID: 0105553003058



## PM10 Calibration Report

Location: OKLA-Testing Lab

Date: 02-12-2024

Sampler: EM-PM10-03

Serial No:

Barometric pressure, mm Hg (Pa): 757

Temperature, Deg C (Ta): 25

Transfer Standard Type: Tisch TE 5025A

Serial No: 1758

Last Calibration Date: 24-Aug-24

Operator: Mr.Parinya

Qstd Slope: 1.26862

Qstd Intercept: -0.0199

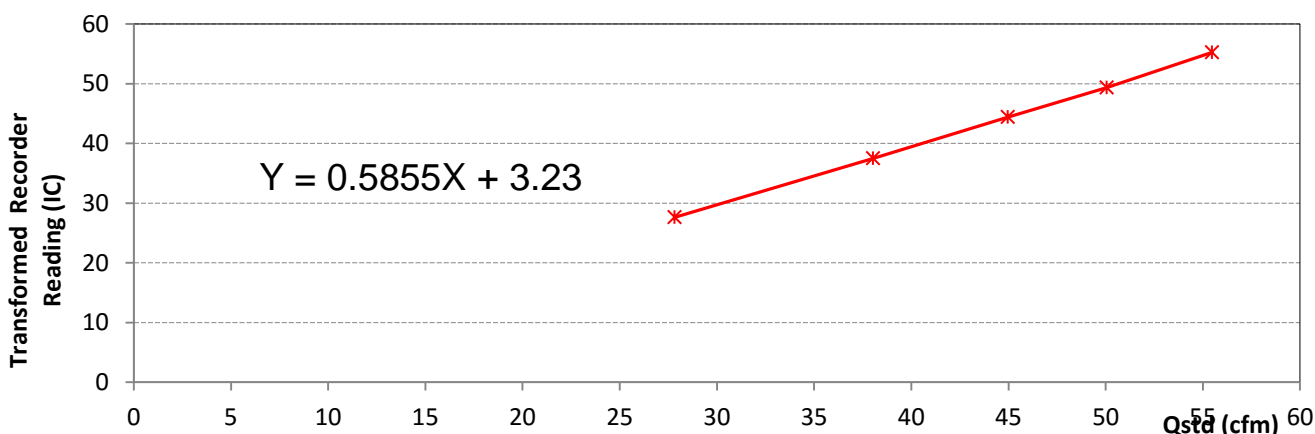
Plate No	H2O (in)	Qstd		I (Chart)	IC (corrected)
		(m3/min)	(cfm)		
1	10.00	2.508	88.557	56.00	55.89
2	9.00	2.380	84.049	53.00	52.90
3	7.00	2.101	74.207	45.00	44.91
4	5.00	1.779	62.825	40.00	39.92
5	2.50	1.264	44.630	30.00	29.94

Linear Regression

Slope: 0.5855

Intecept: 3.2300

Corr. Coeff: 0.9950



CALIBRATION BY :	Parinya Klumnoi	DATE :	02-12-24
APPROVED BY :	Tawatchai Chongvutichai	DATE :	02-12-24
ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : นายปริญญา กล้าน้อย 02-8681246 ต่อ 22			
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E-MAIL: [sales@okla-testing.com](mailto:sales@okla-testing.com) Website: [www.okla-testing.com](http://www.okla-testing.com) J-NAC Group

Tel: (66) 02 868 1246  
FAX: (66) 02 868 0860  
Tax ID: 0105553003058

**Sound level Calibration report**

**Instrument Calibrated**

**Description** : Sound Level Meter

**Manufacturer** : Cirrus Research plc

**Model** : CR: 171A

**Serial No.** : G305858

**Microphone No.** : 218359D

**Ambient Enviroment**

**Temperature** : (25±3)°C

**Relative Humidity** : (55±15)%

**Ambient Pressure** : (1008±5)hPa

**Standards Used**

- Sound Level Calibrator Delta ohm HD 2020 S/N 17000992

**Measurement Result**

Method	Standard Reference (dB)	Reading (dB)	Error (dB)	After Adjustment ± (dB)
Sound level Calibrator HD-2020	94.0	94.0	0.0	94.0

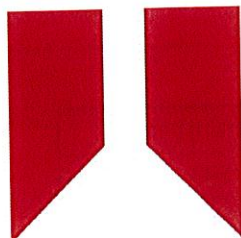
CALIBRATION BY : Parinya Klumnoi	02-12-2024
APPROVED BY : Tawatchai Chongvutichai	02-12-2024
ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : กรุณา โทร 02-8681246 ต่อ 22	
67/35-36, 3 <sup>rd</sup> Petkasem 7/1 Rd., Thapra, Bangkokyai, Bangkok 10600 Tel: (66) 0-28681246 Fax: (66) 0-2868-0860	

# CERTIFICATE OF CALIBRATION

ISSUED BY **Cirrus Research plc**

DATE OF ISSUE **13 August 2024**

CERTIFICATE NUMBER **220215**



**Cirrus Research plc  
Acoustic House  
Bridlington Road  
Hunmanby  
North Yorkshire  
YO14 0PH  
United Kingdom**

Page 1 of 2

Approved signatory

K.Besau

Electronically signed:

## Sound Level Meter : IEC 61672-3:2013

### Instrument information

Manufacturer: Cirrus Research plc  
Model: CR:171A  
Serial number: G305836  
Class: 1  
Firmware version: 5.8.3251

Notes:

### Test summary

Date of calibration: 05 August 2024

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.

Periodic tests were performed in accordance with procedures from IEC 61672-3:2013.

**The sound level meter submitted for testing successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.**

However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to determine that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

### Notes

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a coverage probability of approximately 95%.



# CERTIFICATE OF CALIBRATION

Certificate Number:  
**220215**

Page 2 of 2

## Environmental conditions

The following conditions were recorded at the time of the test:

<b>Before</b>	Pressure: 100.49 kPa	Temperature: 22.1 °C	Humidity: 46 %
<b>After</b>	Pressure: 100.47 kPa	Temperature: 22.4 °C	Humidity: 44.7 %

## Test equipment

Equipment	Manufacturer	Model	Serial number
Signal Generator	TTi	TGA1241	439193
Attenuator	Cirrus Research	ZE:952	80380
Environmental Monitor	Comet	T7510	21961307

## Additional instrument information

Instruction manual:

Reference level range: Single range

Pattern approval: No

Source of pattern approval: -

### Preamplifier

Model: MV:200F

Serial number: 14553F

### Microphone

Model: MK:224

Serial number: 218347D

## Test results summary

Test	Result
Overload indication	Complies
Electrical noise-floor	Complies
Toneburst response	Complies
Linearity	Complies
Electrical Frequency weightings	Complies
Frequency and time weightings at 1 kHz	Complies
C-weighted peak	Complies
High level stability	Complies
Long-term stability	Complies

# CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 13 August 2024 CERTIFICATE NUMBER 220219



Cirrus Research plc  
Acoustic House  
Bridlington Road  
Hunmanby  
North Yorkshire  
YO14 0PH  
United Kingdom

Page 1 of 2

Approved signatory

K.Besau

Electronically signed:

## Octave-band filter : IEC 61260:1995

### Instrument information

Manufacturer:	Cirrus Research plc	Notes:
Model:	CR:171A	
Serial number:	G305836	
Class:	1	
Firmware version:	5.8.3251	

### Test summary

Date of calibration: 05 August 2024

The calibration was performed respecting the requirements of ISO/IEC 17025:2017.  
Periodic tests were performed in accordance with procedures from IEC 61260:1995.

The filter submitted for testing successfully completed the Relative Attenuation test of IEC 61260 for the environmental conditions under which the test was performed.

### Notes

It provides traceability of measurement to the SI system of units and/or to units of measurement realised at a recognised national metrology institute. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a coverage probability of approximately 95%.

# CERTIFICATE OF CALIBRATION

Certificate Number:  
**220219**

Page 2 of 2

## Environmental conditions

The following conditions were recorded at the time of the test:

**Before**    Pressure: 100.49 kPa    Temperature: 22.1 °C    Humidity: 46.0 %  
**After**     Pressure: 100.47 kPa    Temperature: 22.4 °C    Humidity: 44.7 %

## Test equipment

Equipment	Manufacturer	Model	Serial number
Signal Generator	TTi	TGA1241	439193
Attenuator	Cirrus Research	ZE:952	80380
Environmental Monitor	Comet	T7510	21961307

## Filters information

Filter class: 1  
Filter base: 2  
Reference attenuation: 0.0 dB

## Additional instrument information

Instruction manual:  
Pattern approval: No  
Source of pattern approval: -  
Reference level range: Single range

## Laboratory uncertainties

Requirement	Value (dB)
Relative Attenuation High	0.41
Relative Attenuation Mid	0.18
Relative Attenuation Low	0.12

# CERTIFICATE OF CALIBRATION

ISSUED BY

Cirrus Research plc

DATE OF ISSUE

13 August 2024

CERTIFICATE NUMBER 220231



**Cirrus Research plc**  
**Acoustic House**  
**Bridlington Road**  
**Hunmanby**  
**North Yorkshire**  
**YO14 0PH**  
**United Kingdom**

Page 1 of 2

Test engineer:

D.Swalwell

Electronically signed:



## Microphone

### Microphone capsule

Manufacturer: Cirrus Research plc

Model: MK:224

Serial Number: 218347D

### Calibration procedure

Open circuit: 53.5 mV/Pa

Sensitivity at 1 kHz: -25.4 dB rel 1 V/Pa

The microphone capsule detailed above has been calibrated to the published data as described in the operating manual of the associated sound level meter (where applicable).

The frequency response was measured using an electrostatic actuator in accordance with BS EN 61094-6:2005 with the free-field response derived via standard correction data traceable to a National Measurement Institute.

The absolute sensitivity at 1 kHz was measured using an acoustic calibrator conforming to IEC 60942:2003 Class 1.

### Environmental conditions

Pressure: 101.20 kPa

Temperature: 21.0 °C

Humidity: 52.0 %



# CERTIFICATE OF CALIBRATION

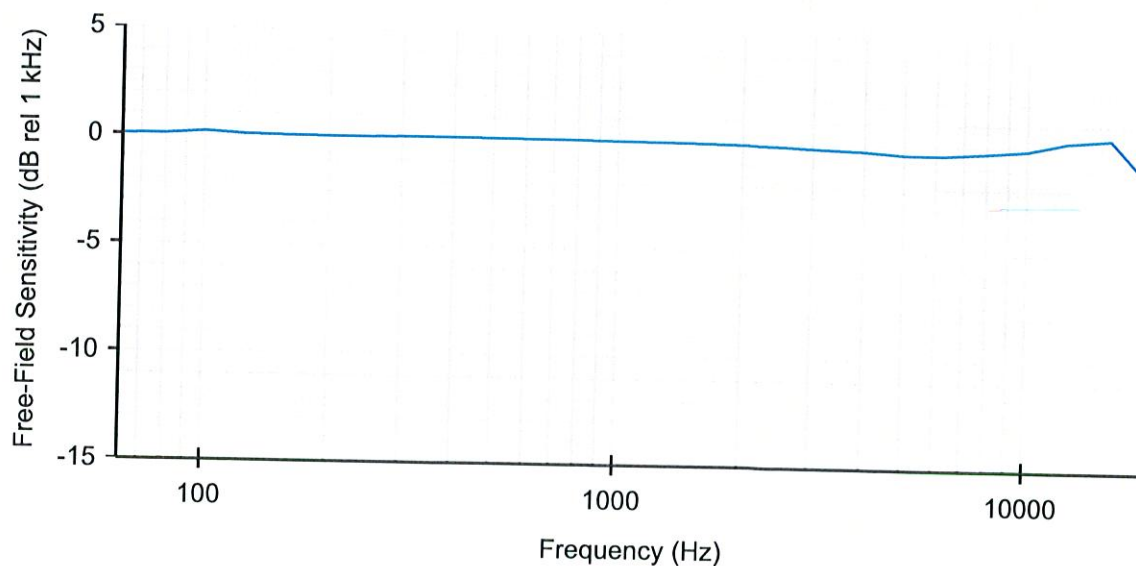
Certificate Number:  
**220231**

Page 2 of 2

## Free-Field Frequency Response : Tabular

Frequency (Hz)	Free-Field Sensitivity (dB rel 1 kHz)	Actuator Response (dB)
63	0.05	-0.16
80	0.05	-0.05
100	0.18	0.16
125	0.08	0.06
160	0.05	0.06
200	0.04	0.06
250	0.04	0.07
315	0.07	0.08
400	0.05	0.08
500	0.05	0.06
630	0.03	0.04
800	0.03	0.02
1 000	0.00	-0.02
1 250	-0.01	-0.07
1 600	-0.04	-0.17
2 000	-0.07	-0.29
2 500	-0.13	-0.49
3 150	-0.23	-0.81
4 000	-0.28	-1.22
5 000	-0.41	-1.81
6 300	-0.42	-2.55
8 000	-0.30	-3.52
10 000	-0.15	-4.85
12 500	0.25	-6.22
16 000	0.42	-7.43
20 000	-1.53	-10.59

## Free-Field Frequency Response : Graphical





**QUALITY CALIBRATION CO.,LTD.**

235 Petchkasem 63/2 Road, Laksong, Bangkae, Bangkok 10160  
Tel (662) 421-5402, (662) 444-0152-3, Fax (662) 809-4584

[www.qcalibration.com](http://www.qcalibration.com)

CERTIFICATE No : 24E1476  
REFERENCE No : 72222-3

PAGE : 1 OF 2

**Certificate of Calibration**

**EQUIPMENT** : SOUND LEVEL METER

**MANUFACTURER** : DELTAOHM

**MODEL** : HD2010UC

**SERIAL No** : 17030644673

**ID No** : EM-SLM007

**SUBMITTED BY** : OKLA TESTING & CONSULTING SERVICE CO.,LTD.  
67/35-36, 3 RD FLOOR., PHETKHEM 7/1 RD.,  
WAT THA PRA, BANGKOKYAI, BANGKOK,  
THAILAND 10600

**CALIBRATED BY** : CHAICHARN CH.

**CALIBRATION DATE** : 29-Feb-24

**APPROVED BY** : 

**ISSUED DATE** : 29-Feb-24

**RECEIVED DATE** : 20-Feb-24

THIS CERTIFICATE MAY NOT BE REPRODUCED OTHER THAN IN FULL EXCEPT WITH THE PRIOR WRITTEN APPROVAL OF  
QUALITY CALIBRATION CO., LTD.

F-G010 REV 03



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[www.qcalibration.com](http://www.qcalibration.com)

CERTIFICATE No : 24E1476

PAGE : 2 OF 2

## Calibration Report

**EQUIPMENT** : SOUND LEVEL METER  
**MANUFACTURER** : DELTAOHM  
**S/N** : 17030644673  
**RECEIVED DATE** : 20-Feb-24  
**AMBIENT TEMPERATURE** : 23°C ± 3°C  
**MODEL** : HD2010UC  
**ID No** : EM-SLM007  
**CALIBRATION DATE** : 29-Feb-24  
**RELATIVE HUMIDITY** : 50 % RH ± 20% RH

### CONDITION OF THIS RESULTS OF CALIBRATION

1. THIS INSTRUMENT WAS CALIBRATED ACCORDING TO IEC 61672-2 :2003-04 AGAINST MULTIFUNCTION SOUND CALIBRATOR.  
THIS INSTRUMENT WAS PERFORMED SELF-CALIBRATION BY CALIBRATOR FROM CUSTOMER AT 114 Hz BEFORE CALIBRATION.

2. REFERENCE STANDARD INSTRUMENTS :-

<u>INSTRUMENT</u>	<u>MODEL</u>	<u>SERIAL No</u>	<u>CERTIFICATE No</u>	<u>DUE DATE</u>
1) MULTIFUNCTION SOUND CALIBRATOR	1986	02023	23E6274	06-Jul-24

3. THE CERTIFICATE IS VALID FOR THE ITEM CALIBRATED AS SHOWN ON THE DATE AND PLACE OF CALIBRATION ONLY.

4. THIS RESULT EXCLUDE LONG TERM STABILITY OF THE UNIT UNDER CALIBRATION.

5. THIS CERTIFICATE IS TRACEABLE TO :-

- NATIONAL INSTITUTE OF METROLOGY (THAILAND) THROUGH THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR).

### RESULT OF CALIBRATION :- WITHOUT ADJUSTMENT

#### 1. A-WEIGHTING ACOUSTIC FREQUENCY RESPONSE

FREQUENCY (Hz)	STANDARD EXPECTED READING (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
125.00	-16.10	-16.0	-0.1	0.50
250.00	-8.60	-8.5	-0.1	0.50
500.00	-3.20	-3.0	-0.2	0.50
1000.00	0.00	0.0	0.0	0.50
2000.00	1.20	0.8	0.4	0.50

#### 2. C-WEIGHTING ACOUSTIC FREQUENCY RESPONSE

FREQUENCY (Hz)	STANDARD EXPECTED READING (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
125.00	-0.20	0.0	-0.2	0.50
250.00	0.00	0.1	-0.1	0.50
500.00	0.00	0.1	-0.1	0.50
1000.00	0.00	0.0	0.0	0.50
2000.00	-0.20	-0.5	0.3	0.50

#### 3. SOUND LEVEL LINEARITY TEST AT 1000 Hz

STANDARD APPLIED (dB)	UUC READING (dB)	CORRECTION (dB)	UNCERTAINTY OF MEASUREMENT (± dB)
74	73.9	0.1	0.50
84	84.0	0.0	0.50
94	94.0	0.0	0.50
104	104.0	0.0	0.50
114	114.0	0.0	0.50

UUC\* : UNIT UNDER CALIBRATION

THE REPORTED UNCERTAINTY OF MEASUREMENT WAS BASED ON A STANDARD UNCERTAINTY MULTIPLIED  
FACTOR k =2, PROVIDING A LEVEL OF CONFIDENCE APPROXIMATELY 95%.

END OF CALIBRATION REPORT

F-G



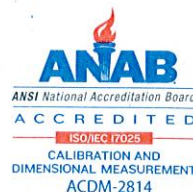


CLC  
Accredited  
ISO/IEC 17025

# CALIBRATION LABORATORY Co., LTD.

2/10-11,14, 55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230

Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail:sale@cal-laboratory.com



## CERTIFICATE OF CALIBRATION FOR

NOMENCLATURE : VIBRATION METER  
MANUFACTURER : VIBROCK  
MODEL / TYPE : V9000  
SERIAL NO. : 2341  
CLID. NO. : 252200818  
JOB CONTROL NO. : 240305023239  
CALIBRATION SERVICE : ☒ IN-LABORATORY ☐ ON-SITE

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.  
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD.,  
WATTHAPRA, BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 05 March 2024

DATE OF ISSUED : 08 March 2024

The report of calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Suwit Phuanbusabong  
Calibration Engineer



Approved By :

Mongkol Yotsoontorn  
Authorized Signatory  
08 March 2024



This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the  
International System of Units (SI)

Certificate No. Q24023239

F3-011-05/12-23

page 1 of 3



@clccalibration



## REPORT OF CALIBRATION FOR

NOMENCLATURE	:	VIBRATION METER
MANUFACTURER	:	VIBROCK
MODEL / TYPE	:	V9000
SERIAL NO.	:	2341
DATE OF CALIBRATION	:	06 March 2024

### ENVIRONMENT CONDITIONS :

Temperature :  $(23 \pm 2) ^\circ\text{C}$

Relative Humidity :  $(55 \pm 15) \% \text{RH}$

### PROCEDURE USED :

This instrument was calibrated under procedure No. **CLC-CPEE-08** based on **ISO 16063-21** as calibration guideline.

The calibration was performed by using Digital Multimeter, Programmable Timer/Counter and Accelerometer with Conditioning Amplifier which maintained by the Calibration Laboratory Co., Ltd.

### REFERENCE STANDARD USED :

1. Digital Multimeter, Hewlett Packard Model 34401A S/N. 3146A75935.
2. Programmable Timer/Counter, Philips Model PM6680B S/N. SM607101.
3. Accelerometer with Measuring Amplifier, Bruel & Kjaer Model 8305, 2626 S/N. 705491, 1741406.

### TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through National Institute of Metrology (Thailand) Certificate No. EE-0130-23, Due Date 29 November 2024.
2. The measurements are traceable to International System of Units (SI), through Aeronautical Radio of Thailand Ltd. Certificate No. 07-0043/23, Due Date 12 April 2024.
3. The measurements are traceable to International System of Units (SI), through National Institute of Metrology (Thailand) Certificate No. AV-0053-23, Due Date 12 October 2024.

### UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k = 2,00$  which for a normal distribution corresponds to a coverage probability of approximately 95 %.

It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. **Q24023239**

F3-011-05/12-23

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@clccalibration





**CLC**  
Accredited  
ISO/IEC 17025

# CALIBRATION LABORATORY Co., LTD.

2/10-11,14,55 Soi Prasert Manukit 29 Yaek 4, Prasert Manukit Rd., Ladphrao, Bangkok 10230

Tel. 02-578-0353-4 Fax: 02-578-2672 www.cal-laboratory.com E-mail:sale@cal-laboratory.com



**CONDITION OF CALIBRATION ITEM : RECEIVED IN GOOD OPERATIONAL CONDITION**

**MEASUREMENT RESULTS : ( X ) without adjustment ( ) adjustment**

## CALIBRATION DATA

### VELOCITY RESULT

Test point		Mode	STD Reading	DUC Reading	Correction	Uncertainty
( mm/s )	( frequency )		( mm/s )	( mm/s )	( mm/s )	± ( % of rdg. )
10	160 Hz	peak	10.00	9.83	+0.17	1.1
20	160 Hz		20.00	19.11	+0.89	0.9
40	160 Hz		40.00	38.71	+1.29	0.9
60	160 Hz		60.00	57.81	+2.19	0.9
80	160 Hz		80.00	76.23	+3.77	0.9
100	160 Hz		100.00	94.98	+5.02	0.9

Note. The Scope of Accredited ANAB Certificate No. ACDM-2814 Version 012 Page 2 of 67

**This report is valid for the above stated instrument/s only.**

**### End of Certificate ###**

Certificate No. Q24023239

F3-011-05/12-23

page 3 of 3



@clccalibration

## CERTIFICATE OF CALIBRATION FOR

NOMENCLATURE : VIBRATION METER  
MANUFACTURER : VIBROCK  
MODEL / TYPE : V9000  
SERIAL NO. : 2342  
CLID. NO. : 252200819  
JOB CONTROL NO. : 240305023240  
CALIBRATION SERVICE : ☒ IN-LABORATORY ☐ ON-SITE

CUSTOMER : OKLA TESTING & CONSULTING SERVICE CO., LTD.  
67/35-36, 3RD FLOOR, PHETKASEM 7/1 RD.,  
WATTHAPRA, BANGKOKYAI, BANGKOK 10600 THAILAND

DATE OF RECEIVED : 05 March 2024

DATE OF ISSUED : 08 March 2024

The report of calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Suwit Phuanbusabong  
Calibration Engineer



Approved By :

Mongkol Yotsoontorn  
Authorized Signatory  
08 March 2024



This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the  
International System of Units (SI)

Certificate No. Q24023240

F3-011-05/12-23

page 1 of 3



@clccalibration



## REPORT OF CALIBRATION FOR

NOMENCLATURE : VIBRATION METER  
MANUFACTURER : VIBROCK  
MODEL / TYPE : V9000  
SERIAL NO. : 2342  
DATE OF CALIBRATION : 06 March 2024

### ENVIRONMENT CONDITIONS :

Temperature :  $(23 \pm 2) ^\circ\text{C}$

Relative Humidity :  $(55 \pm 15) \% \text{RH}$

### PROCEDURE USED :

This instrument was calibrated under procedure No. **CLC-CPEE-08** based on **ISO 16063-21** as calibration guideline.

The calibration was performed by using Digital Multimeter, Programmable Timer/Counter and Accelerometer with Conditioning Amplifier which maintained by the Calibration Laboratory Co., Ltd.

### REFERENCE STANDARD USED :

1. Digital Multimeter, Hewlett Packard Model 34401A S/N. 3146A75935.
2. Programmable Timer/Counter, Philips Model PM6680B S/N. SM607101.
3. Accelerometer with Measuring Amplifier, Bruel & Kjaer Model 8305, 2626 S/N. 705491, 1741406.

### TRACEABILITY :

1. The measurements are traceable to International System of Units (SI), through National Institute of Metrology (Thailand) Certificate No. EE-0130-23, Due Date 29 November 2024.
2. The measurements are traceable to International System of Units (SI), through Aeronautical Radio of Thailand Ltd. Certificate No. 07-0043/23 , Due Date 12 April 2024.
3. The measurements are traceable to International System of Units (SI), through National Institute of Metrology (Thailand) Certificate No. AV-0053-23, Due Date 12 October 2024.

### UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k = 2,00$  which for a normal distribution corresponds to a coverage probability of approximately 95 %.

It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q24023240

F3-011-05/12-23

page 2 of 3



@clccalibration



**CONDITION OF CALIBRATION ITEM : RECEIVED IN GOOD OPERATIONAL CONDITION**

**MEASUREMENT RESULTS : ( X ) without adjustment ( ) adjustment**

## CALIBRATION DATA

### VELOCITY RESULT

Test point		Mode	STD Reading	DUC Reading	Correction	Uncertainty
( mm/s )	( frequency )		( mm/s )	( mm/s )	( mm/s )	± ( % of rdg. )
10	160 Hz	peak	10.00	9.93	+0.07	1.1
20	160 Hz		20.00	19.88	+0.12	0.9
40	160 Hz		40.00	38.66	+1.34	0.9
60	160 Hz		60.00	58.11	+1.89	0.9
80	160 Hz		80.00	77.34	+2.66	0.9
100	160 Hz		100.00	97.56	+2.44	0.9

Note. The Scope of Accredited ANAB Certificate No. ACDM-2814 Version 012 Page 2 of 67

**This report is valid for the above stated instrument/s only.**

**### End of Certificate ###**

Certificate No. Q24023240

F3-011-05/12-23

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@clccalibration


Certificate No. : HIT-2410-0320

Page : 1 of 2

**CERTIFICATE OF CALIBRATION**

<b>Equipment :</b>	pH/mV and EC/TDS/Salinity/Resistivity Meter		
<b>Meter Model :</b>	HI5521-02	<b>Serial No. :</b>	04160019101
<b>Probe Model :</b>	HI1131B	<b>Serial No. :</b>	094430BN
<b>Resolution (pH) :</b>	0.01	<b>Resolution (mV) :</b>	0.1
<b>Manufacturer :</b>	Hanna Instruments	<b>Made in :</b>	Romania
<b>Condition As-Received :</b>	Used Product	<b>Reference :</b>	RE240370
<b>Ambient Temperature :</b>	( 25 ± 2 ) °C	<b>Relative Humidity :</b>	( 50 ± 15 ) % RH
<b>Customer name :</b>	Okla Testing & Consulting Service Co., Ltd. 67/35-36, 3RD Floor, Phetkasem 7/1 Road, Wat Tha Pra, Bangkok Yai, Bangkok 10600 Thailand		
<b>Received date :</b>	28 February 2024		
<b>Calibrate date :</b>	4 March 2024		
<b>Issue date :</b>	5 March 2024		
<b>Calibrated Location :</b>	Hanna Instruments (Thailand) Ltd.		
<b>Calibration Procedure :</b>	This calibrator was conducted by using in-house: calibration procedure CP-01, CP-02 by using certified reference material (CRM)		

**Calibrated by :** ☒ Mr. Pichit Petthong  
☐ Mr. Channarong Soinak

**Approved by :**   
Mr. Anan Suwanchaisakul

Authorized Signatory



This certificate was certified only for the instrument we calibrated.

This result of calibration was found accurate on date and place of calibration only.

\*\* This certificate may not be reproduced other than in full, except with the prior written \*\*

approval of the head of Hanna Instrument (Thailand)



### Condition of this calibration result

1. Reference Standard Instruments : This certification is traceable to the international unit of unit maintained through:

Instruments	Model	Serial No.	Certificate No.	Traceable
Documenting Process Calibrator	Fluke 753	43160061	LF24-0014	Measuretronix Limited.
Thermometer with sensor	HI98509	39643D	23T1453	Technology Promotion Association (Thailand-Japan).
Digital Thermo-Hygrometer	HT-771SD	AI.07155	24H41	

2. Reference Standard Materials : pH calibration standard traceable thru CPA chem Ltd.

Buffer Solution	Manufacture	Certified Value	Lot Number	Exp. date
pH 4.0	CPA chem	$4.008 \pm 0.006 @ 25^{\circ}\text{C}$	898494	3 June 2024
pH 7.0	CPA chem	$6.985 \pm 0.007 @ 25^{\circ}\text{C}$	898500	28 May 2024
pH 10.0	CPA chem	$10.011 \pm 0.012 @ 25^{\circ}\text{C}$	898502	24 May 2024

### Calibration Result :

1. Performing standard curve by Simulator at: -177.5, 0.0, 177.5 mV

(Measurement Electrical Potential) After Adjust Result.

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement ( $\pm$ mV)
	pH	mV	pH	mV	
pH Meter S/N 04160019101	4.01	177.5	4.01	177.5	0.097
	7.01	0.0	7.01	0.0	0.058
	10.01	-177.5	10.01	-177.5	0.097

2. Performing three buffer standard curve by using buffer nominal : pH 4,7,10 After Adjustment.

Unit Under Calibration	Standard pH Buffer Solution	Actual Reading (pH)	Actual Reading (mV)	Uncertainty of Measurement ( $\pm$ pH)
pH Electrode S/N 094430BN	4.008	4.02	159.3	0.010
	6.985	6.99	-13.6	0.011
	10.011	10.04	-187.9	0.014

The report uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95%

\*\* End of certificate \*\*





JIRANATEE ASSOCIATES CO.,LTD.

Jiranatee Associates Co.,Ltd  
63/14-15, 67/35-36  
Petchkasem 7,7/1, Rd. Watthapra, Bangkokyai,  
Bangkok 10600 (Thailand)  
Tel: +6608680812  
Mobile: +66863999453  
E-mail: jnac-calibration@jiranatee.com  
Web site: www.jiranatee.com

Accredited calibration laboratory  
ISO/IEC 17025:2017  
NSC-TISI-TIS 17025  
CALIBRATION 0367

Temperature measurement laboratory  
Calibration services department.



## CERTIFICATE OF CALIBRATION

Certificate No. : CDT-181-67

Page 1 of 2 Pages

**MEASUREMENT ITEM** : Digital Thermometer with Temperature Sensor  
**MANUFACTURER** : HANNA INSTRUMENTS  
**MODEL/TYPE** : HI5521  
**SERIAL NUMBER** : 04160019101  
**ID NUMBER** : -  
**CONDITION AS-RECEIVED** : Used item  
**CUSTOMER** : OKLA Testing and Consulting Service Co.,Ltd.  
67/35-36 Floor 3, Soi Petchakasem 7/1,  
Petchakasem Rd, Watthapra, Bangkokyai, Bangkok 10600.

**RECEIVED DATE** : 04 Nov 2024  
**MEASUREMENT DATE** : 07 Nov 2024  
**ISSUE DATE** : 11 Nov 2024

### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature :  $23.0 \pm 3.0$  °C  
Relative Humidity :  $55.0 \pm 15.0$  %RH

**NOTED:** The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.

### Calibration procedure:

The temperature calibration was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

### Traceability:

The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number: ER-0113-24

### Reference Used During Calibration:

- Standard Temperature Probe  
Model: STS-100 A500, Serial No.: 667682-09,  
Due date: 26 Mar 2025
- Digital Temperature Indicator  
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 21 Oct 2025

### Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor  $k=2$ , Which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM 'Evaluation of measurement data - Guide to the expression of uncertainty in measurement'

### Calibrated by:

- ☐ Mr. Sorawit Thachalad  
☐ Miss Jitraporn Lertsomphol  
☒ Miss Ruangrumpai Phoommit



Approved signature



Calibration Department Manager



JIRANATEE ASSOCIATES CO.,LTD.

Continuation of Certificate of Calibration Number CDT-181-67

Page 2 of 2 Pages

**Result of Calibration:** ☒ Without Adjustment ☐ With Adjustment

**Calibration Range:** 20 °C to 30 °C

**Function:**

Table 1: This equipment was connected with temperature sensor Model: HI7662-W, S/N: 0615024N.  
Dimension: Diameter 3 mm., Length 116 mm.

<u>Immersion Depth</u> (mm)	<u>Standard Reading</u> (°C)	<u>UUC Reading</u> (°C)	<u>Error</u> (°C)	<u>Uncertainty</u> (°C)
110	20.040	20.1	0.1	0.099
110	25.037	25.1	0.1	0.099
110	30.034	30.1	0.1	0.099

UUC\*: Unit Under Calibration

\*\*\*End of Certificate of Calibration\*\*\*





# Certificate of Calibration

Certificate No.: WK2402-300-865

Page 1 of 2

**Customer** : OKLA TESTING & CONSULTING SERVICE CO., LTD.  
67/35-36, 3rd Floor, Petchkasem 7/1, Petchkasem Rd.,  
Watthapra, Bangkok Yai, Bangkok 10600 Thailand.

<b>Instrument</b>	: Dissolved Oxygen	<b>Ambient Temperature</b>	: (25.0 ± 2) °C
<b>Manufacturer</b>	: HANNA	<b>Humidity</b>	: (50.0 ± 15) %RH
<b>Model</b>	: HI5421	<b>Received Date</b>	: 27-Feb-24
<b>Serial No.</b>	: 04240005101	<b>Calibrated Date</b>	: 27-Feb-24
<b>Identity No.</b>	: KC1A11T8H	<b>Issued Date</b>	: 27-Feb-24
<b>Range</b>	: See to data	<b>Calibrated Location</b>	: In Lab
<b>Resolution</b>	: See to data		
<b>Calibration Method</b>	: CP-WK-C03		

## Reference standard instruments :

<u>Instrument</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>	<u>Traceability to</u>
Zero Oxygen Solution	HI7040L	S0115/20	30-Aug-25	NIST
DO Meter	874477	WK2305-300-241	25-May-24	WK Electric Co.,Ltd.
Digital Thermometer	WK-CT-025	WK2402-300-25	25-Feb-25	WK Electric Co.,Ltd.

NIST : National Institute of Standard and Technology.

This result calibrate was found accurate as shown on date place of calibrate only

This certificate is traceability to th International System of Unit (SI)

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$  , providing a level of confidence approximately 95 %

Calibrated by : Mr. Usa Phuangphiphat

Approved by :

Mr. Ratchadawut Rungravee  
Authorized Signatory

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## Calibration Results

Certificate No. : WK2402-300-865

Page 2 of 2

### Calibration Result of the Accuracy

Function : Dissolved Oxygen Measurement at 25 °C

Resolution : 0.01 mg/L

Unit : mg/L

STD Solution	UUC Reading		Error	Uncertainty ( ± mg/L )
	Before Adjustment	After Adjustment		
0.00	0.32	0.00	0.00	0.15
8.40	9.15	8.37	-0.03	0.33
8.70	9.01	8.65	-0.05	0.33
9.00	9.24	8.92	-0.08	0.33

( ) Without Adjustment ( X ) After Adjustment

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\*\*\*\* End of Certificate\*\*\*\*



# Certificate of Calibration

Certificate No. : MT24-5501

Page : 1 of 2

**Customer** : บริษัท โอกลา เทสติ้ง แอนด์คอนซัลติ้ง เซอร์วิส จำกัด  
**Address** : 67/35-36 ชั้น 3 ซอยเพชรเกษม 7/1 แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600

**Description** : Drying Oven  
**Manufacturer** : N/A  
**Model** : SOV70B  
**Serial No.** : KWF2021021902  
**Identification No.** : OKLA-LAB-013/170621  
**Calibration Place** : Laboratory

**Order No.** : 2026/24  
**Received date** : Jun 24, 2024  
**Calibration date** : Jun 24, 2024  
**Environment Condition** :  
**Temperature** : ( 25+/-10 ) °C  
**Humidity** : ( 50+/-30 ) %RH

**Calibration Method** : Calibration were conducted using In-house calibration procedure CP-MT-006 According to comparison with LXI Data Acquisition Switch Unit with sensor. The calibration methods based on Euramet Calibration Guide No.20 - guidelines on the Calibration of Temperature and/or Humidity Controlled Enclosures.

## Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
LXI Data Acquisition Switch Unit with Sensor	34972A	MY57003222	MT23-5938	Oct 05, 2024

The effect that the result relate only to the items calibrated. It was found accurate as shown on date and place of calibration only.

**Traceability** : This measurement are traceable to the International System of Unit (SI), through National Institute of Metrology Thailand ( NIMT )

The reported expanded uncertainty of measurement was based on standard uncertainty multiplied by coverage factor  $k = 2$ , providing a level of confidence of not less than 95%



**Calibrated by :** Mr.Suriyan Panyim

**Approved by** 

**Issue date** : 

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**Certificate No. : MT24-5501**

**Page : 2 of 2**

**Function : Temperature measurement**

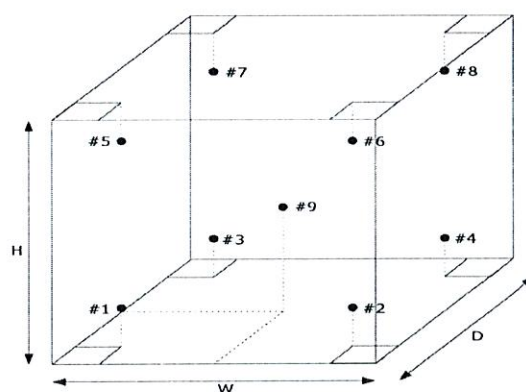
**Result : Without adjustment**

**Calibration point : 104, 140, 160, 180 °C**

**Resolution : 0.1 °C**

Calibration point ( °C )	Temperature of UUC* at each position ( °C )									Uncertainty of measurement ( +/- °C )
	Ch.1	Ch.2	Ch.3	Ch.4	Ch.5	Ch.6	Ch.7	Ch.8	Ch.9	
104	104.456	104.237	105.035	104.871	104.694	105.043	104.255	104.486	104.956	0.67
140	141.286	140.733	141.403	141.502	140.674	141.611	139.677	141.949	141.131	0.87
160	161.706	160.284	161.505	161.802	160.657	161.912	159.449	161.991	161.106	0.91
180	181.164	179.786	180.990	181.272	180.128	181.374	178.909	181.619	180.617	0.90

Setting temperature ( °C )	Indicating Temperature ( °C )	Measured stability ( +/- °C )	Measured uniformity ( °C )	Overall variation ( °C )
104.0	104.1 to 104.3	0.53	1.0	1.6
140.0	140.1 to 140.3	0.61	2.1	3.1
160.0	160.1 to 160.3	0.65	2.1	3.6
180.0	180.1 to 180.3	0.64	2.2	3.6



- #1 Lower Left Front
- #2 Lower Right Front
- #3 Lower Left Rear
- #4 Lower Right Rear
- #5 Upper Left Front
- #6 Upper Right Front
- #7 Upper Left Rear
- #8 Upper Right Rear
- #9 Geometric Center

**Front view**

**UUC\*** = Unit under calibration

**Uniformity** = Maximum and Minimum difference of measured temperature at any probes and the measured temperature at the reference and same time.

**Overall Variation** = Difference of temperature value between the maximum and minimum any time.

**Stability** = One half of the maximum difference of measured temperatures at any one probe.



## Certificate of Calibration

**Certificate No. :** 67-400117-1

**Page : 1 of 2**

**Submitted by :** Okla Testing & Consulting Service Co., Ltd.  
67/35-36, 3rd Floor, Petchkasem 7/1, Petchkasem Rd.,  
Wattapra, Bangkok Yai, Bangkok 10600 Thailand

**Equipment :** Temperature controlled enclosure (Incubator)

**Manufacturer :** S-Cool

**Model :** SM 61 M

**Range :** N/A °C

**Resolution :** 0.1 °C

**Serial No. :** 18021147

**ID No. :** OKLA-LAB-011/190

**Environment :** On site calibration was carried out at the Laboratory,  
Okla Testing & Consulting Service Co., Ltd.

**Ambient Temperature :** (32.0 to 33.0) °C

**Relative Humidity :** (50 to 55) %

**Line Voltage :** (221.0 to 223.0) V

**Date of Received :** 26 February 2024

**Date of Calibration :** 26 February 2024

**Date of Issue :** 29 February 2024

**Calibrated by :** Kittisak Kokaeo

**Calibration Method :** CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units  
Standard Digital Thermometer with RTD Probe

ID No.	Cert. No.	Due Date	Traceability
400046 & 400047	67-400047-2	26 Jul 2024	National Institute of Metrology Thailand (NIMT)

Approved by :

( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full except with the prior written approval of the Calibratech Co.,Ltd.



## Certificate of Calibration

**Certificate No. : 67-400117-1**

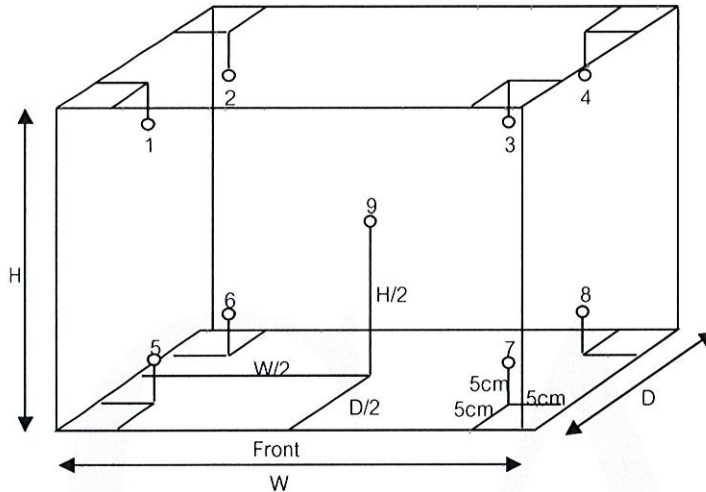
**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement

This instrument was setting air ventilation at position 0 (close)



Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty (± °C)
			1	2	3	4	5	6	7	8	9	
20.0	20.0	20.0	20.46	20.25	19.60	19.58	19.84	19.64	19.45	19.59	20.01	0.34

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
20.0	20.0	20.0	0.589	0.073	1.129

**Remark** The uncertainty is not combine uniformity of the air chamber

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95%

- o0o -





**Certificate No. : J048-TC24021201**

**Page : 1 of 3**

## Certificate of Calibration

**Customer** : Okla Testing & Consulting Service Co., Ltd.

**Address** : 67/35-36, 3<sup>rd</sup> Floor, Phetkasem 7/1 Rd.,  
Watthapra, Bangkokyai, BKK. 10600

**Equipment** : Refrigerator

**Manufacturer** : SANDEN

**Model** : SPB-0500

**Serial No.** : SPB0500-231007454

**ID No.** : -

**Resolution** : 0.1 °C

**Location of Calibration** : Central Laboratory FL.3

**Reference Job No.** : JB24048

**Received Request Date** : 12 February 2024

**Calibrated by** : Pawut Wongnarakornkul

**Date of Calibration** : 12 February 2024

**Approved by :**

☒ Mr. Pawut Choocha

☐ Mr. Sarawut Panpet

**Date of Issue** : 13 February 2024

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

This certificate may not be reproduced other than in full except with the prior written approval the Megafil Co.,Ltd.



## Calibration Report

Equipment : Refrigerator Manufacturer : SANDEN  
Model : SPB-0500 Serial No : SPB0500-231007454  
Environment : Ambient Temperature ( 24.3 to 24.9 ) °C  
Relative Humidity ( 45.3 to 51.9 ) %  
Line Voltage ( 226 to 228 ) V<sub>ac</sub>

### Detail of this calibration result. :

1. This instrument was calibrated by insert 9 standards Resistance Thermometer Detector, in to the chamber, under no load condition in according to TLAS G-20-1/02-08 (E).
2. The temperature scale used was based on ITS-90.
3. Reference standards instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date
Data Acquisition Switch unit	34972A	MY49010832	QR23-2679	15 November 2024
Resistance Thermometer Detector	100 ohm	RTD505(01 to 10)	QR23-2679	15 November 2024

4. This certificate was certified only for the instrument we calibrated.
5. The measured values in this report refer to the time of examination.
6. This certificate is traceable to SI Unit through Quality Reborn Co.,Ltd.  
NSC - ONSC accredited no. Calibration 0292
7. Condition of calibrated item : Good

UUC Description :

Operation time 5 Hour 00 Minute Calibration point 2.0, 4.0, 6.0 °C

The air ventilation of the instrument was set at position.

Fresh Air Damper

X

Open Position ☐ Min ☐ Medium ☐ Max  
Close  
Not Available

### 8 Result of calibration :

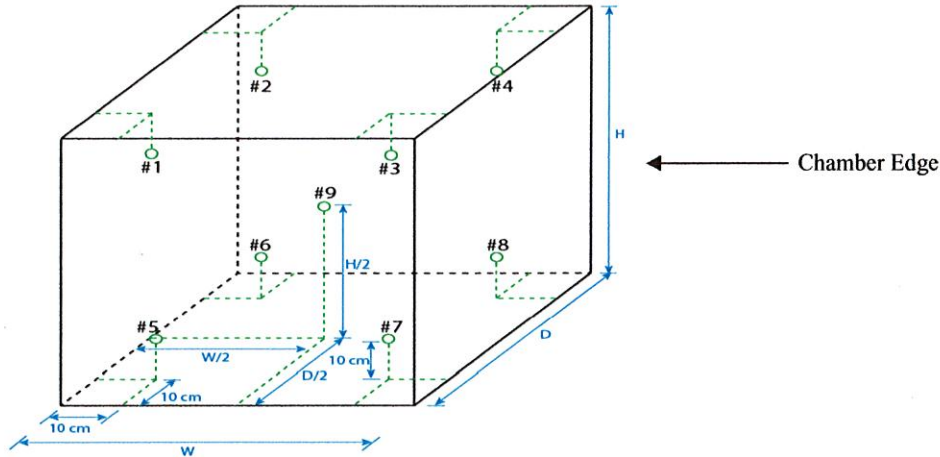
( X ) Without adjustment ( ) After adjustment

## Result of Calibration

Page : 3 of 3

Sensor installation at nine locations as show in figure.

Chamber capacity ( W x H x D ) : (0.55 x 1.61 x 0.42) m : 0.37 m<sup>3</sup>



Position	1	2	3	4	5	6	7	8	9
Ref. Std/ID No.:	RTD50501	RTD50502	RTD50503	RTD50504	RTD50505	RTD50506	RTD50507	RTD50508	RTD50509

## Temperature distribution

Cal. Point (°C)	Setting Temperature ( °C )	Indicating Temperature (°C)	Measured Temperature ( °C ) @ Sensor No. <div>4.06 6.039      7.09</div> <div>(Sensor No.9 is REF)</div>									Uncertainty  ( ± °C )
			1	2	3	4	5	6	7	8	9	
2.0	2.0	2.0	2.03	1.26	1.94	1.31	3.06	2.95	2.21	2.15	2.17	0.44
4.0	4.0	4.0	3.96	3.22	3.84	3.31	5.05	4.91	4.19	4.18	4.14	0.44
6.0	6.0	6.0	5.85	5.16	5.88	5.32	7.07	6.91	6.18	6.24	6.10	0.44

## Chamber performance

Cal. Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)			Measured Uniformity (°C)	Measured Stability (± °C)	Overall Variation (°C)
		Min	Max	Average			
2.0	2.0	2.0	2.0	2.0	1.07	0.19	2.06
4.0	4.0	4.0	4.0	4.0	1.09	0.22	2.04
6.0	6.0	6.0	6.0	6.0	0.98	0.24	2.18

**Note:** The quoted uncertainty include Stability and 20% of Uniformity.

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensor.

Uniformity = The maximum difference of measured temperatures at any sensors and measured temperature at the reference location which are observed at the same time.

Overall Variation = The Difference of the maximum and minimum measured temperatures throughout observation.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2.00$ , providing a level of confidence of approximately 95%.

- End of Certificate -



## Certificate of Calibration

**Certificate No. :** 67-400117-4

**Page : 1 of 2**

**Submitted by :** Okla Testing & Consulting Service Co., Ltd.  
67/35-36, 3rd Floor, Petchkasem 7/1, Petchkasem Rd.,  
Wattapra, Bangkok Yai, Bangkok 10600 Thailand

**Equipment :** Water Bath

**Manufacturer :** LabTech

**Model :** LWB-222A

**Range :** N/A °C

**Resolution :** 0.01 °C

**Serial No. :** BCCLJ23001C

**ID No. :** OKLA-LAB-008/122011

**Environment :** On site calibration was carried out at the Laboratory,  
Okla Testing & Consulting Service Co., Ltd.

**Ambient Temperature :** (32.0 to 33.0) °C

**Relative Humidity :** (50 to 55) %

**Line Voltage :** (221.0 to 223.0) V

**Date of Received :** 26 February 2024

**Date of Calibration :** 26 February 2024

**Date of Issue :** 29 February 2024

**Calibrated by :** Permpon Chanpu

**Calibration Method :** This instrument was calibrated by In-house method CAL-M4006 based on ASTM E715-80  
The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units  
Standard Digital Thermometer with RTD probe

ID No.

Cert. No.

Due Date

Traceability

400029 & 400043

66-400593-1

25 Apr 2024

National Institute of Metrology Thailand (NIMT)

Approved by

( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

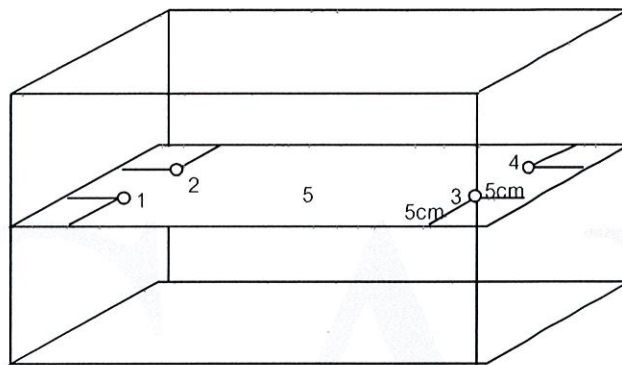
**Certificate No. : 67-400117-4**

**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement



Front

Test Point ( ° C )	Setting Temperature ( ° C )	Indicating Temperature ( ° C )	Measured Temperature ( ° C ) @ Sensor					Uncertainty ( ± ° C )	Measured Uniformity ( ° C )	Measured Stability ( ° C )
			No. 60.002							
			1	2	3	4	5			
60	As Mark 60	-	60.02	59.97	60.02	59.95	60.05	0.53	0.69	0.40

error = 0.002  
bias = -0.002

**Remark** The uncertainty is not combine uniformity of the water bath

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95%

- o0o -



## Certificate of Calibration

**Certificate No. :** 67-200069-1

**Page :** 1 of 2

**Submitted by :** Okla Testing&Consulting Service Co.,Ltd.  
67/35-36, 3rd Floor, Petchkasem 7/1, Petchkasem Rd.,  
Wattapra, Bangkok Yai, Bangkok 10600 Thailand

**Equipment :** Electronic Balance  
Manufacturer : Sartorius Model : BSA224S-CW  
Serial No. : 35790699  
Capacity : 200 g Resolution : 0.0001 g

**Environment :** On site calibration was carried out at tl Laboratory Environmental,Okla  
Testing&Consulting Service Co.,Ltd.

Ambient Temperature : (28.4 to 28.5) °C  
Relative Humidity : (49.4 to 51.1) %  
Air Pressure : 1012.0 mbar

**Date of Received :** 26 February 2024

**Date of Calibration :** 26 February 2024

**Date of Issue :** 27 February 2024

**Calibrated by :** Akaradath Thippichai

**Calibration Method :** In-house method CAL-M2001 based on UKAS Publication ref : LAB 14  
Edition 7 - November 2022

**Reference Standard Instruments :** This certification is traceable to the International System of Units

Standard Weights

ID No.	Cert. No.	Due Date	Traceability
E261-E2624	C02232088	08 Nov 2024	National Institute of Metrology (Thailand), (NIMT)

Approved by :

( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

**Certificate No. : 67-200069-1**

**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

Departure of indication from nominal value

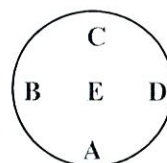
Nominal Value (g)	Correction (g)	Uncertainty $\pm$ (g)
0.01	0.0000	0.00011
0.05	0.0000	0.00011
0.1	0.0000	0.00011
0.2	0.0000	0.00011
0.5	0.0000	0.00011
1	0.0000	0.00011
10	0.0000	0.00011
50	0.0000	0.00014
100	0.0000	0.00020
150	0.0001	0.00038
200	0.0002	0.00038

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2.00$ , providing a level of confidence of approximately 95%

Eccentric error      Load test :      50      g

A	B	C	D	E	
-0.0001	0.0001	0.0001	0.0000	0.0000	g



Repeatability      Load test :      200      g

Stdev. :      0.00000      g

- o0o -







JIRANATEE ASSOCIATES CO.,LTD.

Jiranatee Associates Co.,Ltd  
63/14-15, 67/35-36  
Petchkasem 7,7/1, Rd. Watthapra, Bangkokyai,  
Bangkok 10600 (Thailand)  
Tel: +6608680812  
Mobile: +66863999453  
E-mail: jnac-calibration@jiranatee.com  
Web site: www.jiranatee.com

Accredited calibration laboratory  
ISO/IEC 17025:2017  
NSC-TISI-TIS 17025  
CALIBRATION 0367

Temperature measurement laboratory  
Calibration services department.



## CERTIFICATE OF CALIBRATION

Certificate No. : CDT-116-67

Page 1 of 2 Pages

**MEASUREMENT ITEM** : Digital Thermometer with Temperature Sensor  
**MANUFACTURER** : EUTECH  
**MODEL/TYPE** : ECO SCAN TEMPS  
**SERIAL NUMBER** : 816366  
**ID NUMBER** : -  
**CONDITION AS-RECEIVED** : Used item  
**CUSTOMER** : OKLA Testing and Consulting Service Co.,Ltd.  
67/35-36 Floor 3, Soi Petchakasem 7/1,  
Petchakasem Rd, Watthapra, Bangkokyai, Bangkok 10600.

**RECEIVED DATE** : 01 Jul 2024  
**MEASUREMENT DATE** : 03 Jul 2024  
**ISSUE DATE** : 04 Jul 2024

### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature :  $23.0 \pm 3.0$  °C  
Relative Humidity :  $55.0 \pm 15.0$  %RH

**NOTED:** The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.

### Calibration procedure:

The temperature calibration was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

### Traceability:

The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number: ER-0101-23

### Reference Used During Calibration:

1. Standard Temperature Probe  
Model: STS-100 A500, Serial No.: 667682-09,  
Due date: 26 Mar 2025
2. Digital Temperature Indicator  
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

### Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor  $k=2$ , Which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM 'Evaluation of measurement data - Guide to the expression of uncertainty in measurement'

### Calibrated by:

- ☐ Mr. Sorawit Thachalad  
☒ Miss Jitraporn Lertsomphol  
☐ Miss Ruangrumpai Phoommit



### Approved signature



Mr. Panhpa Booncharoen  
Calibration Department Manager



JIRANATEE ASSOCIATES CO.,LTD.

Continuation of Certificate of Calibration Number CDT-116-67

Page 2 of 2 Pages

**Result of Calibration:** ☒ Without Adjustment ☐ With Adjustment

**Calibration Range:** 20 °C to 30 °C

**Function:**

Table 3: This equipment was connected with Thermocouple sensor type K.  
Dimension: Diameter 3 mm. Length 116 mm.

<u>Immersion Depth</u> (mm)	<u>Standard Reading</u> (°C)	<u>UUC Reading</u> (°C)	<u>Error</u> (°C)	<u>Uncertainty</u> (°C)
110	20.047	20.1	0.0	0.26
110	25.043	25.0	0.0	0.26
110	30.034	30.0	0.0	0.26

UUC\*: Unit Under Calibration

\*\*\*End of Certificate of Calibration\*\*\*





JIRANATEE ASSOCIATES CO.,LTD.

Jiranatee Associates Co.,Ltd  
63/14-15, 67/35-36  
Petchkasem 7,7/1, Rd. Watthapra, Bangkokyai,  
Bangkok 10600 (Thailand)  
Tel: +6608680812  
Mobile: +66863999453  
E-mail: jnac-calibration@jiranatee.com  
Web site: www.jiranatee.com

Accredited calibration laboratory  
ISO/IEC 17025:2017  
NSC-TISI-TIS 17025  
CALIBRATION 0367

Relative humidity and Air Temperature measurement laboratory  
Calibration services department.

## CERTIFICATE OF CALIBRATION

Certificate No. : CRT-061-67

Page 1 of 2 Pages

**MEASUREMENT ITEM** : Digital Thermo Hygrometer  
**MANUFACTURER** : KEPLER Instrument  
**MODEL/TYPE** : KTH-02  
**SERIAL NUMBER** : 234011889  
**ID NUMBER** : -  
**CONDITION AS-RECEIVED** : Used item  
**CUSTOMER** : Okla Testing and consulting services Co., Ltd.  
67/35-36, 3rd Fl, Phetkasem soi 7/1, Wat Thapra,  
Bangkokyai, Bangkok, Thailand 10600.

**RECEIVED DATE** : 16 Dec 2024  
**MEASUREMENT DATE** : 19 Dec 2024  
**ISSUE DATE** : 19 Dec 2024

### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature	: $23.0 \pm 3.0$	°C
Relative Humidity	: $55.0 \pm 15.0$	%RH

**NOTED:** The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.

### Calibration procedure:

The Relative humidity and Air Temperature calibration was done by In-House calibration method as WI-CL-009 and WI-CL-010 according to comparison method with Standard Chilled Mirror hygrometer with Temperature sensor and standard Humidity generator chamber.

### Traceability:

The measurements are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT). Certificate number: TH-0079-23 and through Jiranatee Associates Co., Ltd. Certificate number: CDT-001-67.

### Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor  $k=2$ , Which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM 'Evaluation of measurement data - Guide to the expression of uncertainty in measurement'

### Calibrated by:

- ☐ Mr. Sorawit Thachalad  
☒ Miss Jitraporn Lertsomphol  
☐ Miss Ruangrumpai Phoommit



### Approved signatory:



Calibration Department Manager





JIRANATEE ASSOCIATES CO.,LTD.

Continuation of Certificate of Calibration Number: CRT-061-67

Page 2 of 2 Pages

**Measurement Results:**

The results of calibration and associated measurement uncertainties are reported in the table below.

**Result of Calibration:** ☒ Without Adjustment ☐ With Adjustment

**Table 1:** The results of calibration of air temperature are reported in table below.

**Calibration Range:** 20 °C to 30 °C

<u>Determined</u> (°C)	<u>Standard Reading</u> (°C)	<u>UUC Reading</u> (°C)	<u>Error</u> (°C)	<u>Uncertainty</u> ± (°C)
20.00	20.06	20.6	0.5	0.31
25.00	25.04	25.3	0.3	0.31
30.00	30.04	29.6	-0.4	0.31

**Table 2:** The results of calibration of relative humidity at 23 °C are reported in table below.

**Calibration Range:** 35%RH to 70%RH

<u>Air Temperature</u> (°C)	<u>Standard Reading</u> (%RH)	<u>UUC Reading</u> (%RH)	<u>Error</u> (%RH)	<u>Uncertainty</u> ± (%RH)
23.04	34.74	36	1	1.0
23.04	44.71	43	-2	1.3
23.00	59.68	58	-2	1.8
23.03	69.61	66	-4	1.8

**UUC\*:** Unit Under Calibration

\*\*\*End of Certificate of Calibration\*\*\*





**TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)**  
**CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES**  
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250  
TEL. 0-2717-3000 FAX. 0-2719-9484

**Cert.No.:** 24TW74

**Page.:** 1 of 2

## Certificate of Testing

**Equipment :** DO Meter  
**Manufacturer :** Digicon  
**Model :** DO-552SD  
**Serial No. :** AG.35318  
**ID No. :** -  
**Received Date :** 05 April 2024  
**Test Date :** 09 April 2024  
**Reference :** 2404-0175DN-1  
**Submitted by :** HVE Co.,Ltd  
603 Soi Jarransanitwong 46, Jarransanitwong Road,  
Bang Yi Khan, Bang Phlat Bangkok 10700  
**Laboratory Condition :** Temperature (  $25 \pm 5$  ) °C  
Humidity (  $50 \pm 20$  ) %  
**Test Procedure :** In - house method : CP-CH9  
by Comparison Technique with Azide Modification Method

**Tested by :** Walalak Sirithean

**Approved by :**

Approved Signatory

( ) Unopphol Harachai  
(✓) Ponpan Paipim  
( ) Saithip Meangmai

**Issue Date :** 10 April 2024

B 0338488



Cert.No.: 24TW74

Page.: 2 of 2

**Condition of this result of calibration**

1. Reference Standard Instruments :

This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

<u>Instruments</u>	<u>Serial No.</u>	<u>ID No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
1. Burette	-	130BU10	23CG1172	22 Mar 2025
2. Balance	14233821	110RC001	23MM405	16 July 2024

2. Standard Material :-

<u>Material</u>	<u>Manufacturer</u>	<u>Lot.No.</u>	<u>Assay</u>
Sodium Thiosulfate pentahydrate	Merck	AM1763316	100.2%

**Result :** Dissolved Oxygen Meter Adjustment With Air 100 %

Dissolved Oxygen Probe No.: 07-07

<b>Titration Method (Azide Modification Method)</b> (mg/L)	<b>DO Meter Reading</b> (mg/L)	<b>Standard Deviation</b> (mg/L)
8.20	8.2	0.045

This report was certified only for the instrument we tested. It is allowable to use for study  
Intend to use for advertising and referral purpose is prohibited. This report may not be reproduced  
other in full, without written approval of the laboratory

-o0o-



## Certificate of Calibration

**Certificate No. :** 67-400216-6

**Page : 1 of 2**

**Submitted by :** HVE Co., Ltd.

603 Soi Jarunsanitwong 46, Jarunsanitwong Road, Bangyeekun, Bangplad, Bangkok 10700

**Equipment :** Temperature controlled enclosure (Incubator)

Manufacturer : Lovibond

Model : ET636-6

Range : N/A °C

Resolution : 0.1 °C

Serial No. : 9982523-03

ID No. : 011

**Environment :** On site calibration was carried out at the Laboratory, HVE Co., Ltd.

Ambient Temperature : (27.0 to 28.0) °C

Relative Humidity : (50 to 55) %

Line Voltage : (229.0 to 230.0) V

**Date of Received :** 17 April 2024

**Date of Calibration :** 18 April 2024

**Date of Issue :** 19 April 2024

**Calibrated by :** Kittisak Kokaeo

**Calibration Method :** CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units  
Standard Digital Thermometer with RTD Probe

<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>	<u>Traceability</u>
400046 & 400047	67-400047-2	26 Jul 2024	National Institute of Metrology Thailand (NIMT)

Approved by :

( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

**Certificate No. : 67-400216-6**

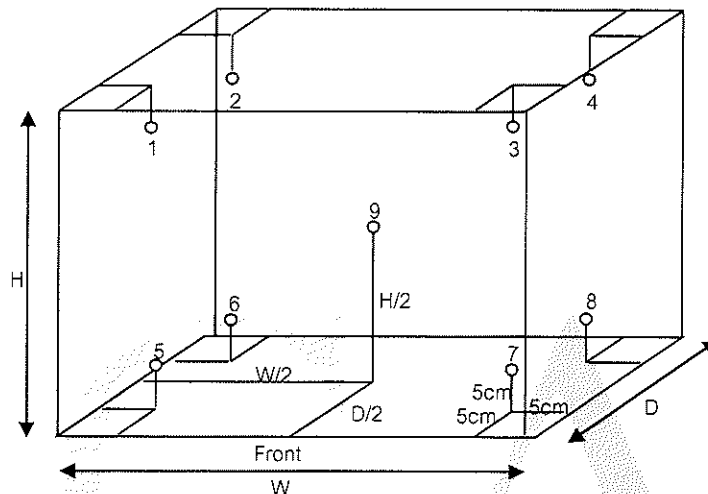
**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement

This instrument was setting air ventilation at position 0 (close)



Inside of Chamber

W = 0.53 m

D = 0.43 m

H = 1.40 m

Capacity = 0.32 m<sup>3</sup>

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty (±°C)
			1	2	3	4	5	6	7	8	9	
20.0	21.0	21.0	20.24	20.19	20.28	20.16	20.15	20.08	19.95	19.87	19.98	0.36

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
20.0	21.0	21.0	0.3	0.1	0.6

Remark The uncertainty is not combine uniformity of the air chamber

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 , providing a level of confidence of approximately 95%

- o0o -



## Certificate of Calibration

**Certificate No. :** 67-400216-7

**Page : 1 of 2**

**Submitted by :** HVE Co., Ltd.

603 Soi Jarunsanitwong 46, Jarunsanitwong Road, Bangyeekun, Bangplad, Bangkok 10700

**Equipment :** Temperature controlled enclosure (Incubator)

Manufacturer : Lovibond

Model : DE-44287

Range : N/A °C

Resolution : 0.1 °C

Serial No. : 0515/001080

ID No. : 112

**Environment :** On site calibration was carried out at the Laboratory, HVE Co., Ltd.

Ambient Temperature : (27.0 to 28.0) °C

Relative Humidity : (50 to 55) %

Line Voltage : (229.0 to 230.0) V

**Date of Received :** 17 April 2024

**Date of Calibration :** 18 April 2024

**Date of Issue :** 19 April 2024

**Calibrated by :** Kittisak Kokaeo

**Calibration Method :** CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units  
Standard Digital Thermometer with RTD Probe

ID No.	Cert. No.	Due Date	Traceability
400046 & 400042	67-400047-1	25 Jul 2024	National Institute of Metrology Thailand (NIMT)

Approved by :

( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full except with the prior written approval of the Calibratech Co.,Ltd.





## Certificate of Calibration

**Certificate No. : 67-400216-7**

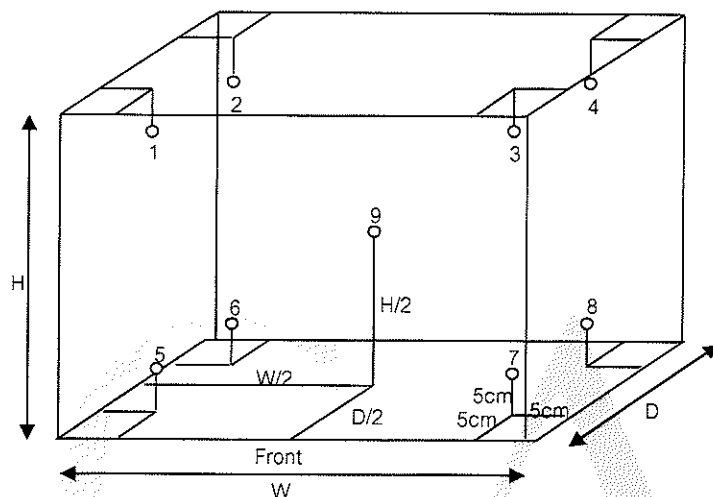
**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement

This instrument was setting air ventilation at position 0 (close)



Inside of Chamber

W = 0.65 m

D = 0.60 m

H = 1.50 m

Capacity = 0.59 m<sup>3</sup>

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty (± °C)
			1	2	3	4	5	6	7	8	9	
20.0	20.7	20.7	20.18	20.05	20.06	20.11	20.08	20.00	20.03	20.04	20.01	0.30

Test Point (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Uniformity (°C)	Measured Stability (°C)	Overall Variation (°C)
20.0	20.7	20.7	0.2	0.0	0.2

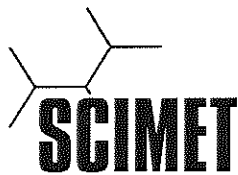
**Remark** The uncertainty is not combine uniformity of the air chamber

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95%

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**SCIMET Co., Ltd.**  
1194 Soi Wachirathamsathit 57, Bangchak,  
Phrakhanong, Bangkok 10260 Thailand  
Email:scimet2022@gmail.com, Tel: 02 460 9239  
<https://www.scimet.co.th>



**Certificate No. C17240065**

## Calibration Certificate

<b>Equipment</b>	Oven	
Model:	UNB 500	Job No.: KSMT2400663
Serial No.(or ID):	C507.1007 ( 012 )	Received Date: 01 April 2024
Manufacturer:	Memmert	Issued Date: 03 April 2024
Condition:	In Condition	Page: 1 of 4
Ventilation Valve:	Closed	Shelves(pc.): 2

### Customer

HVE Co., Ltd.  
603 Soi Charansanitwong 46, Charansanitwong Road Bang Yi Khan, Bang Phlat, Bangkok 10700

### Calibration Place

HVE Co., Ltd. ( Laboratory )  
603 Soi Charansanitwong 46, Charansanitwong Road Bang Yi Khan, Bang Phlat, Bangkok 10700

### Calibration Date

01 April 2024

### Environment Condition

Temperature: 30.1 °C ± 1.3 °C  
Humidity: 60.9 %RH ± 3.3 %RH

### The Method used

In-house method, WI17, based on TLAS-G20

### Traceability

This certificate is traceable to the SI Units maintained by  
National Institute of Metrology (NIMT), Thailand through  
Quality Reborn Co.,Ltd.Certificate No. QR23-1906

This certificate is issued the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognized national standard laboratories.

The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor ( $k=2$ ) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM).

These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of SCIMET Co., Ltd.



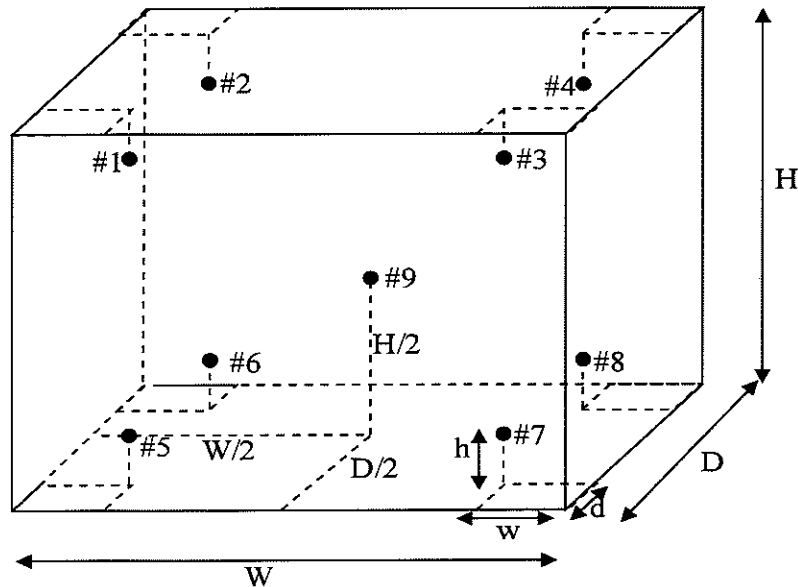
(Mr. Natapong Punnit)

Person in charge



(Mr. Thalerngkeat Pongngam)

Authorized signatory



### Standard Installation Locations

Volume (Calibration Zone)= 6 (Liters)

Inside chamber:  $W = 56$  (cm)  $D = 40$  (cm)  $H = 48$  (cm)

Standard Locations (#1, #2, #3, #4):  $w = 20$  (cm)  $d = 10$  (cm)  $h = 15$  (cm)

Standard Locations (#5, #6, #7, #8):  $w = 20$  (cm)  $d = 10$  (cm)  $h = 15$  (cm)

#9: Geometric center of the chamber

Position of Std	#1	#2	#3	#4	#5	#6	#7	#8	#9
Channel of Logger	101	102	103	104	105	106	107	108	109

### Definitions

**Indicating Temperature:** The average reading of indicating device which forms the integral part of the enclosure.

**Measured Temperature:** The average reading of standards at any positions or location.

**Measured Uniformity:** The maximum difference of measured temperatures between of any probes and the measured temperature at the reference location which are observed at same time or at close observation time as possible to determine the temperature pattern or homogeneity with the chamber at steady-state. The reference probe is preferably located in the geometric center of the chamber.

**Measured Stability:** The one-half of greatest maximum difference of measured temperatures at any one probe.

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



## Calibration Results:

### Pre-Calibration

Desired	Setting	Indicating	#1	#2	#3	#4	#5	#6	#7	#8	#9
104.0	104.0	104.0	103.23	103.17	103.10	103.10	101.81	101.68	101.89	101.61	102.51

### Without adjustment

Measurement Temperature at Spread Locations, Indicating of Unit Under Calibration: 105.5 °C

Locations	Measured Temperature (°C)	Correction (°C)	Uncertainty (± °C)
#1	104.48	0.48	0.39
#2	104.51	0.51	0.39
#3	104.43	0.43	0.39
#4	104.45	0.45	0.39
#5	103.20	-0.80	0.39
#6	103.11	-0.89	0.39
#7	103.27	-0.73	0.39
#8	103.07	-0.93	0.39
#9	103.87	-0.13	0.39

### Temperature Distribution

Desired (°C)	Setting (°C)	Indicating (°C)	Measured Temperature at Spread Locations (°C)									Uncertainty (± °C)*
			#1	#2	#3	#4	#5	#6	#7	#8	#9	
104.0	105.5	105.5	104.48	104.51	104.43	104.45	103.20	103.11	103.27	103.07	103.87	0.39

### Chamber Characterization

Indicating (°C)	Measured Uniformity (°C)	Measured Stability (± °C)	Overall Variation (°C)
105.5	0.89	0.12	1.64

Note: \* Maximum uncertainty of the each position

### Without adjustment (Cont.)

Measurement Temperature at Spread Locations, Indicating of Unit Under Calibration: 182.0 °C

Locations	Measured Temperature (°C)	Correction (°C)	Uncertainty (± °C)
#1	181.05	1.05	0.49
#2	181.24	1.24	0.49
#3	180.99	0.99	0.49
#4	181.18	1.18	0.49
#5	179.64	-0.36	0.50
#6	179.63	-0.37	0.51
#7	179.84	-0.16	0.50
#8	180.00	0.00	0.50
#9	180.18	0.18	0.50

### Temperature Distribution

Desired (°C)	Setting (°C)	Indicating (°C)	Measured Temperature at Spread Locations (°C)									Uncertainty (± °C)*
			#1	#2	#3	#4	#5	#6	#7	#8	#9	
180.0	182.0	182.0	181.05	181.24	180.99	181.18	179.64	179.63	179.84	180.00	180.18	0.51

### Chamber Characterization

Indicating (°C)	Measured Uniformity (°C)	Measured Stability (± °C)	Overall Variation (°C)
182.0	1.17	0.16	1.83

Note: \* Maximum uncertainty of the each position

**The End of Certificate**

## Statements of conformity:

This conformity certificate documents the validity of the following statements of conformity based on the measurement results of corresponding calibration certificate:

The correction of indication determined during calibration are under given measurement and environmental conditions and considering the expanded measurement uncertainty (coverage probability 95%) within the specification. The given measurement uncertainty already includes other all effects by according to the standard method, TLAS-G20. Therefore, those parameters have not

### Tolerance and Decision rules:

Assessment of the conformity of the measurement device are done based on direct comparison of the relevant measurement results with the tolerances and decision rule are prescribed by the customer.

- Decision rule :** ☐ Choice A Binary Statement for Simple Acceptance Rule ( $w = 0$ ), Specific Risk < 50% PFA.
- ☒ Choice B Non-binary statement with guard band ( $w = 1 U$ ), Pass or Fail Specific Risk < 2.5% PFA and Condition Pass or Condition Fail Specific Risk < 50% PFA.
- ☐ Choice C Customer defined, Customers may define arbitrary multiple of  $r$  to have applied as guard band ( $w = r U$ ) .
- ; PFA: Probability of False Accept



(Mr. Thalerngkeat Pongngam)  
Authorized signatory

### Without adjustment

Desired Temperature : 104.0°C

Tolerances : 1.0 °C

Measurement Temperature at Spread Locations, Indicating of Unit Under Calibration: 105.5 °C

Locations	Measured (°C)	Correction of UUC. (°C)	Guard band (W) (± °C)	Tolerance (± °C)	Conformity
#1	104.48	0.48	0.39	1.0	Pass
#2	104.51	0.51	0.39	1.0	Pass
#3	104.43	0.43	0.39	1.0	Pass
#4	104.45	0.45	0.39	1.0	Pass
#5	103.20	-0.80	0.39	1.0	Condition Pass
#6	103.11	-0.89	0.39	1.0	Condition Pass
#7	103.27	-0.73	0.39	1.0	Condition Pass
#8	103.07	-0.93	0.39	1.0	Condition Pass
#9	103.87	-0.13	0.39	1.0	Pass

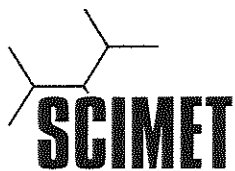
Correction of UUC.\* = Measured Temperature - Desired Temperature

The validity of the statements of conformity cannot be guaranteed for different places of use, environmental conditions or improper use.

### บริษัท ชายนีเมก จำกัด (SCIMET CO., LTD.)

1194 Soi Wachirathamsathit 57, Bangchak, Phrakhanong, Bangkok 10260 Thailand  
Email: scimet2022@gmail.com, Tel: 02 460 9239





Refer to Certificate No.: C17240065

Page: 2 of 2

**Statements of conformity:(Cont.)**

**Without adjustment (Cont.)**

Desired Temperature : 180.0°C

Tolerances : 2 °C

Measurement Temperature at Spread Locations, Indicating of Unit Under Calibration: 182.0 °C

Locations	Measured (°C)	Correction of UUC. (°C)	Guard band (W) (± °C)	Tolerance (± °C)	Conformity
#1	181.05	1.05	0.49	2	Pass
#2	181.24	1.24	0.49	2	Pass
#3	180.99	0.99	0.49	2	Pass
#4	181.18	1.18	0.49	2	Pass
#5	179.64	-0.36	0.50	2	Pass
#6	179.63	-0.37	0.51	2	Pass
#7	179.84	-0.16	0.50	2	Pass
#8	180.00	0.00	0.50	2	Pass
#9	180.18	0.18	0.50	2	Pass

Correction of UUC.\* = Measured Temperature - Desired Temperature

The validity of the statements of conformity cannot be guaranteed for different places of use, environmental conditions or improper use.

**The End of Statements of Conformity**

**บริษัท ซายน์เมท จำกัด (SCIMET CO., LTD.)**

1194 Soi Wachirathamsathit 57, Bangchak, Phrakhanong, Bangkok 10260 Thailand  
Email: scimet2022@gmail.com, Tel: 02 460 9239

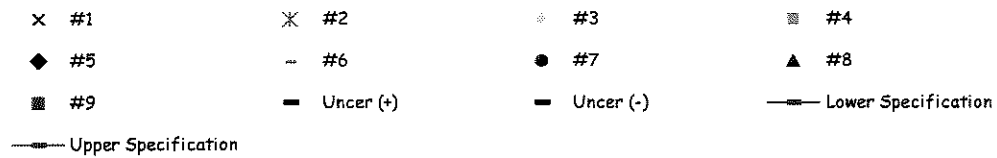
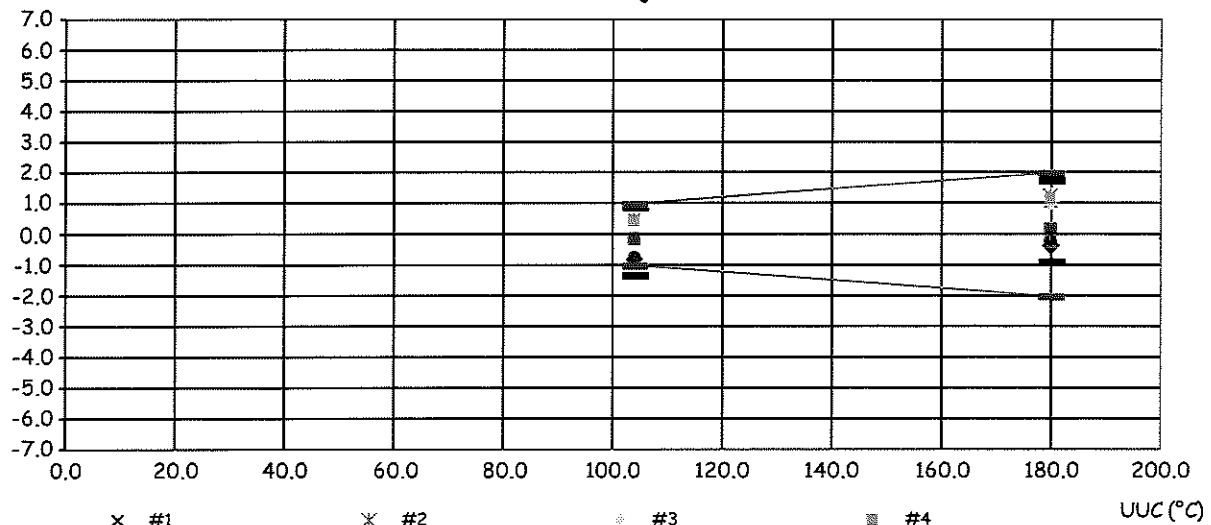
FC17-02: 30 MAY 2023

# Corr\_Distribution & Max\_Measurement Uncertainty

Job\_No. KSMT2400663

Without adjustment

Correction (°C)

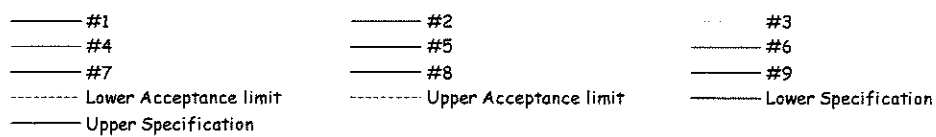
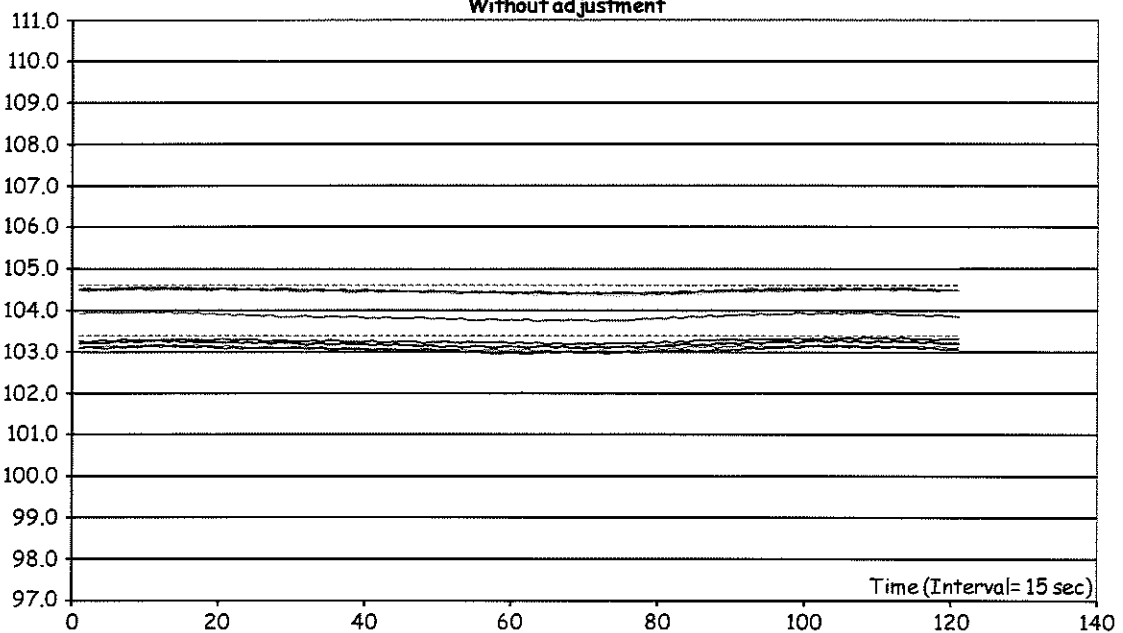


## Temperature Distribution @ 104.0°C

Job\_No. KSMT2400663

Without adjustment

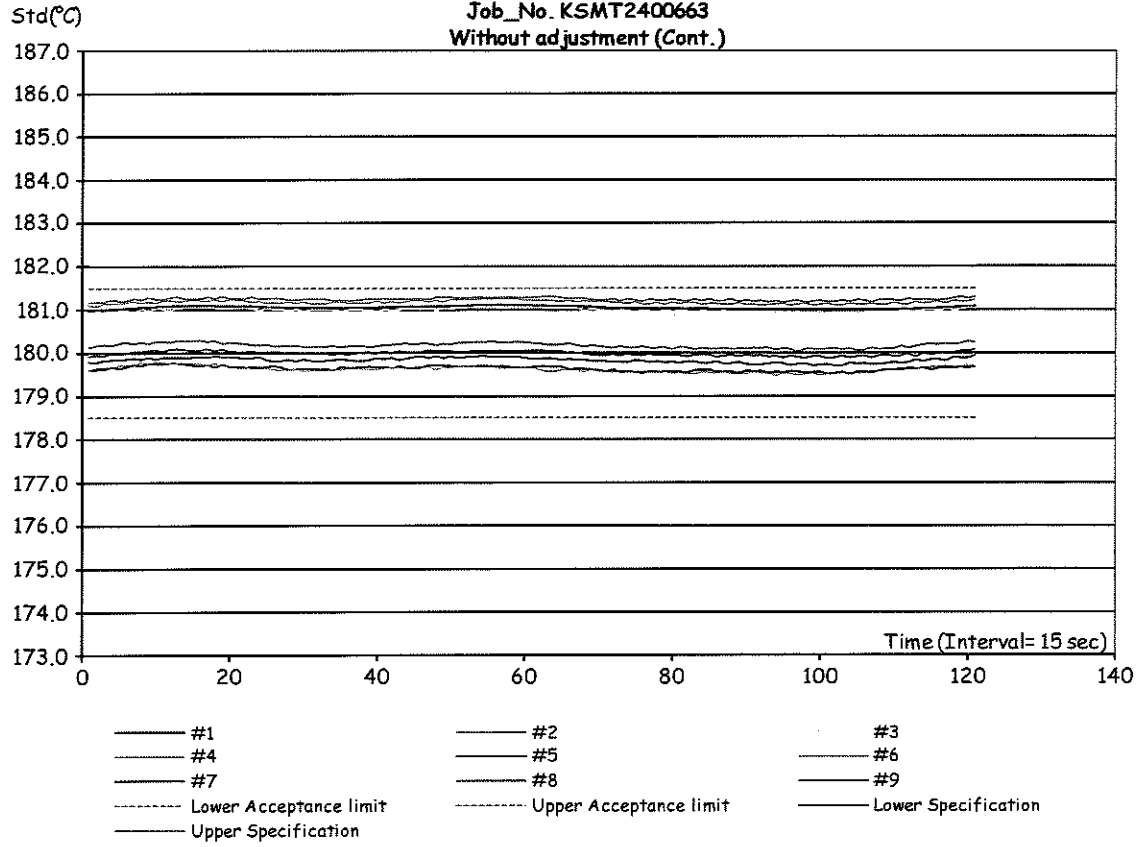
Std(°C)



# Temperature Distribution @ 180.0°C

Job\_No. KSMT2400663

Without adjustment (Cont.)





## Certificate of Calibration

**Certificate No. :** 67-400222-2

**Page : 1 of 2**

**Submitted by :** HVE Co.,Ltd.

603 Soi Jarunsanitwong 46 Jarunsanitwong Road, Bangyeekun Bangplad Bangkok 10700

**Equipment :** Digital Thermometer with Thermistor Probe (Temp pH)

Temperature Indicator

Manufacturer : Hanna

Model : HI 2211

Range : N/A °C

Resolution : 0.1 °C

Serial No. : 08376721

ID No. : N/A

Thermistor Probe

Model : N/A

Sheath Material : Stainless

Diameter : 3.5 mm.

Length : 100 mm.

Serial No. : N/A

ID No. : 08376721

**Environment :** On site calibration was carried out at the Laboratory, HVE Co., Ltd.

Ambient Temperature : (25.0 to 26.0) °C

Relative Humidity : (40 to 45) %

Line Voltage : (229.0 to 230.0) VAC

**Date of Received :** 18 April 2024

**Date of Calibration :** 18 April 2024

**Date of Issue :** 19 April 2024

**Calibrated by :** Permpon Chanpu

**Calibration Method :** This instrument was calibrated by In-house method comparison technique CAL-M4003 by compared with PRT in the liquid bath at the constant controlled temperature.

The temperature scale used was based on ITS-90

**Reference Standard Instruments :** This certification is traceable to the International System of Units

1. Platinum Resistance Thermometer (PRT)

ID No.	Cert. No.	Due Date	Traceability
400002	TT-0074-22	20 Jun 2024	National Institute of Metrology Thailand (NIMT)

2. Standard Digital Thermometer

ID No.	Cert. No.	Due Date	Traceability
400033	24E633	21 Feb 2026	National Institute of Metrology Thailand (NIMT)

Approved by :

(Saraen Prompong)

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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# CAL

Calibratech Co.,Ltd.

7/106-7 Moo 2, Sukhaphrachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com

## Certificate of Calibration

**Certificate No. :** 67-400222-2

**Page : 2 of 2**

**Result of Calibration :** Without Adjustment

**UUC Condition As-Received :** Good

**Function :** Temperature measurement

Immersion Depth ( mm. )	Standard Reading ( °C )	UUC Reading ( °C )	Correction ( °C )	Uncertainty ( ± °C )
100	25.002	24.8	0.2	0.19

### Remark

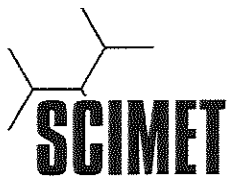
UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95%

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## ใบตรวจสอบสภาพเครื่องควบคุมอุณหภูมิ

เลขที่ใบงาน: KSMT2400663

ชนิดเครื่องมือ: Oven

รุ่น: UNB 500

หมายเลขเครื่อง: C507.1007 ( 012 )

ตรวจสอบ (รับ)		รายการตรวจเช็ค	ตรวจสอบ (ส่ง)		หมายเหตุ
01 Apr 2024			01 Apr 2024		
ปกติ	ไม่ปกติ		ปกติ	ไม่ปกติ	
		General			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. สายไฟ	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. การทำงาน Main Switch	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. การทำงาน Selector Key	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. การแสดงผล Display	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	5. การทำงาน พัดลม	<input type="checkbox"/>	<input type="checkbox"/>	ไม่มี
<input checked="" type="checkbox"/>	<input type="checkbox"/>	6. สภาพ Lever of Ventilation valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. สภาพ Lever door open / close	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. สภาพ Door seal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9. การทำงานของระบบ Safety	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	10. การทำงานของระบบทำความเย็น	<input type="checkbox"/>	<input type="checkbox"/>	ไม่มี
<input type="checkbox"/>	<input type="checkbox"/>	11. การทำงานของระบบทำความชื้น	<input type="checkbox"/>	<input type="checkbox"/>	ไม่มี
<input checked="" type="checkbox"/>	<input type="checkbox"/>	12. สภาพตัวเครื่อง	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	13. สภาวะแวดล้อม ณ สถานที่ตั้งเครื่อง	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

ข้อแนะนำ :

Mr. Hattapong Pumnil

Service Engineer

บริษัท ชายนัมเมท จำกัด (SCIMET CO., LTD.)

1194 Soi Wachirathamsathit 57, Bangchak, Phrakhanong, Bangkok 10260 Thailand  
Email: scimet2022@gmail.com, Tel: 02 460 9239

FI17-00: 08 MAR 2023



## Certificate of Calibration

**Certificate No. :** 67-420044-2

**Page : 1 of 2**

**Submitted by :** HVE Co., Ltd.

603 Soi Jarunsanitwong 46 Jarunsanitwong Road, Bangyeekun, Bangplad, Bangkok 10700

**Equipment :** pH Meter with electrode

pH meter

Manufacturer : Hanna

Model : HI 2211

Range : N/A pH

Resolution : 0.01 pH

Serial No. : 08376721

ID No. : N/A

Electrode

Model : HI 1131

Serial No. : 084809EN

**Environment :** On site calibration was carried out at the Laboratory, HVE Co., Ltd.

Ambient Temperature : (25.0 to 26.0)° C

Relative Humidity : (40 to 45) %

**Date of Received :** 18 April 2024

**Date of Calibration :** 18 April 2024

**Date of Issue :** 19 April 2024

**Calibrated by :** Permpon Chanpu

**Calibration Method :** In-house method CAL-M4201 direct measurement by using standard voltage calibrator and using certified reference material (CRM)

**Reference Standard Instruments :** This certification is traceable to the International System of Units

1. Multiproduct Calibrator

ID No.	Cert. No.	Due Date	Traceability
400005	SG-E-00307/66	23 Aug 2025	National Institute of Metrology Thailand (NIMT)

2. Certified Reference Material (CRM)

pH	Cert. No.	Lot No.	Exp. Date	Traceability
4.008	61293328	944535	27 Nov 2025	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
6.986	61281486	944537	17 Nov 2024	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
9.997	61281073	944536	17 Nov 2024	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025

Approved by :

( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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## Certificate of Calibration

**Certificate No. : 67-420044-2**

**Page : 2 of 2**

**Result of Calibration :**

**UUC Condition As-Received :** Good

**Function :** Electrical measurement

pH meter

Performing standard curve by Multiproduct Calibrator at pH (4,7) and (7,10)

Adjustment Curve at nominal pH	Applied Voltage ( mV )	Nominal Value ( pH )	UUC Reading		Correction ( mV )	Uncertainty ( ± mV )
			( pH )	( mV )		
4, 7	177.4800	4	4.00	177.3	0.2	0.12
	0.0000	7	7.00	0.0	0.0	0.086
7,10	0.0000	7	7.00	0.0	0.0	0.086
	-177.4800	10	10.00	-177.4	-0.1	0.12

**Function :** pH meter with electrode

Performing a three - buffer standard curve using buffer nominal pH (4,7) and (7,10)

Adjustment Curve at nominal pH	Standard Buffer ( pH )	UUC Reading ( pH )	Correction ( pH )	Uncertainty ( ± pH )
4, 7	4.008	4.01	0.00	0.010
	6.986	7.01	-0.02	0.011
7, 10	6.986	7.01	-0.02	0.011
	9.997	10.01	-0.01	0.014

Remark

UUC : Unit Under Calibration

This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95%

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## Certificate of Calibration

**Certificate No. :** 67-200134-1

**Page :** 1 of 2

**Submitted by :** HVE Co.,Ltd.

603 Soi Jarunsanitwong 46, Jarunsanitwong Road, Bangyeekun, Bangplad, Bangkok 10700

**Equipment :** Electronic Balance

**Manufacturer :** SHIMADZU **Model :** AX200

**Serial No. :** D432620040 **ID No. :** 114

**Capacity :** 200 g **Resolution :** 0.0001 g

**Environment :** On site calibration was carried out at the Laboratory, HVE Co., Ltd.

**Ambient Temperature :** (30.8 to 31.6) °C

**Relative Humidity :** (50.4 to 53.4) %

**Air Pressure :** 1008.0 mbar

**Date of Received :** 17 April 2024

**Date of Calibration :** 17 April 2024

**Date of Issue :** 24 April 2024

**Calibrated by :** Akaradath Thippichai

**Calibration Method :** In-house method CAL-M2001 based on UKAS Publication ref : LAB 14

Edition 7 - November 2022

**Reference Standard Instruments :** This certification is traceable to the International System of Units

Standard Weights

ID No.	Cert. No.	Due Date	Traceability
E261-E2624	C02232088	08 Nov 2024	National Institute of Metrology (Thailand), (NIMT)

Approved by :

( Surachai Promthong )

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full except with the prior written approval of the Calibratech Co.,Ltd.





## Certificate of Calibration

**Certificate No. : 67-200134-1**

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**Result of Calibration :** After Adjustment

**UUC Condition As-Received :** Good

Departure of indication from nominal value

Nominal Value (g)	Correction (g)	Uncertainty $\pm$ (g)	Error before Adjustment (g)
0.01	0.0000	0.00012	0.0000
0.1	0.0000	0.00012	0.0000
0.5	0.0000	0.00013	0.0000
1	-0.0001	0.00013	0.0000
10	0.0000	0.00013	-0.0002
20	0.0000	0.00014	-0.0003
50	0.0001	0.00015	-0.0004
100	0.0001	0.00020	-0.0007
150	0.0002	0.00038	-0.0014
200	0.0005	0.00038	-0.0019

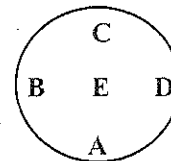
This result of calibration was found accurate as shown on date and place of calibration only.

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor  $k = 2.06$ , providing a level of confidence of approximately 95%

Eccentric error

Load test : 50 g

A B C D E  
0.0003 -0.0006 -0.0003 0.0006 0.0000 g



Repeatability

Load test : 200 g

Stdev. : 0.00005 g

- o O o -





**BECTHAI BANGKOK EQUIPMENT & CHEMICAL CO., LTD.**  
**CALIBRATION LABORATORY**

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E-mail: bkk@becthai.com Website: www.becthai.com



Certificate No. : CAL-24-567

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## CERTIFICATE OF CALIBRATION

Equipment	:	Spectrophotometer
Manufacturer	:	Thermo Scientific
Model	:	Genesys 10S UV-VIS
Serial No.	:	2L9Q310003
ID No.	:	071
Customer	:	HVE CO., Ltd.
	:	603 Soi Jarunsanitwong 46, Jarunsanitwong Road,
	:	Bangyeekun, Bangplad, Bangkok 10700
Location	:	แผนกน้ำบริโภค
Date of Receipt	:	18 November 2024
Date of Calibration	:	18 November 2024
Date of Issue	:	19 November 2024
Ambient Temperature	:	(25±10) °C
Relative Humidity	:	(60±20) %
Condition As-Received	:	Used Item

Calibrated by

Mr.Sompoph Duangguan

Calibration Engineer

( Ms. Jintana Sangthajaroenlap)

Calibration Manager

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

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Indicated values are valid for the state of the Spectrophotometer at the time of calibration only.



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## CALIBRATION REPORT

### Conditions of this result of calibration

#### 1. Reference Standard Material :

<u>Material</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert.No.</u>	<u>Due date</u>
Holmium Glass Filter	RM-HG	24563	109211	13 February 2025
Didymium Glass Filter	RM-DG	24562	109212	13 February 2025
Neutral Density Filter	RM-1N2N3N	24568	109249	14 February 2025
Potassium Dichromate Solution	RM-06	24567	109222	13 February 2025

#### 2. Traceability : This certification is traceable to the International System of Unit maintained at;

The Starna Scientific Ltd. Accredited Calibration Laboratory No. 0659.

#### 3. Method of calibration :

The calibration procedure was carried out according to ASTM E275-08 (2022) and ASTM E925-09 (2014).

#### 4. Result of calibration :

( ☒ ) without adjustment

( ☐ ) after adjustment

#### 5. Equipment Specifications:

Spectral Bandwidth :	1.8	nm
Data Interval :	0.1	nm
Scan Speed :	Slow	nm/min



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## CALIBRATION REPORT

### Wavelength Calibration

Certified Values of Reference Material	Nominal Value (nm)	UUC*Reading (nm)	Error (nm)	Uncertainty of Measurement ( $\pm$ nm)	k Factor
361.00	361.00	360.7	-0.27	0.13	2.00
536.66	536.66	536.6	-0.09	0.13	2.00
879.27	879.27	879.8	0.51	0.13	2.00

### Photometric Calibration for Visible

Wavelength (nm)	Certified Values of Reference Material (A)	UUC* Reading (A)	Error (A)	Uncertainty of Measurement ( $\pm$ A)	k Factor
420.0	Zero	0.000	0.0000	0.0028	2.00
	0.5835	0.588	0.0045	0.0045	2.00
	0.725	0.726	0.0010	0.0045	2.00
	1.0367	1.038	0.0013	0.0045	2.00
440.0	Zero	0.000	0.0000	0.0028	2.00
	0.5662	0.567	0.0008	0.0045	2.00
	0.7106	0.709	-0.0016	0.0045	2.00
	1.0159	1.014	-0.0019	0.0045	2.00
465.0	Zero	0.000	0.0000	0.0028	2.00
	0.5257	0.529	0.0033	0.0045	2.00
	0.6682	0.669	0.0008	0.0045	2.00
	0.9547	0.955	0.0003	0.0045	2.00
546.1	Zero	0.000	0.0000	0.0028	2.00
	0.5226	0.524	0.0014	0.0045	2.00
	0.6939	0.693	-0.0009	0.0045	2.00
	0.9919	0.991	-0.0009	0.0045	2.00
590.0	Zero	0.000	0.0000	0.0028	2.00
	0.5567	0.558	0.0013	0.0045	2.00
	0.7502	0.749	-0.0012	0.0045	2.00
	1.0732	1.071	-0.0022	0.0045	2.00
635.0	Zero	0.000	0.0000	0.0028	2.00
	0.5643	0.565	0.0007	0.0045	2.00
	0.7299	0.729	-0.0009	0.0045	2.00
	1.0437	1.043	-0.0007	0.0045	2.00

Remark : Each individual filter is measured against the empty filter holder (blank) used to zero the Spectrophotometer.

Note:

UUC\* : Unit Under Calibration





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Certificate No. : CAL-24-567

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## CALIBRATION REPORT

Photometric Calibration for UV

Wavelength (nm)	Certified Values of Reference Material (A)	UUC* Reading (A)	Error (A)	Uncertainty of Measurement ( $\pm$ A)	k Factor
235.0	Zero	0.000	0.0000	0.0050	2.00
	0.7385	0.738	-0.0005	0.0081	2.00
257.0	Zero	0.000	0.0000	0.0050	2.00
	0.8556	0.851	-0.0046	0.0081	2.00
313.0	Zero	0.000	0.0000	0.0050	2.00
	0.2882	0.286	-0.0022	0.0081	2.00
350.0	Zero	0.000	0.0000	0.0050	2.00
	0.6346	0.632	-0.0026	0.0081	2.00

Remark : The Potassium Dichromate Filled cells are measured against a Perchloric acid blank.

Note:

UUC\* : Unit Under Calibration

- End of Report -