

ภาคผนวก จ

ใบแสดงการตรวจเทียบเครื่องมือ (Calibration Data Sheet)



TE-5009X TSP/PM10 Calibration Worksheet

Date:

29 Feb 24

Temp (°C):

30

Barometric pressure (mm Hg):

758

Reference Standard Calibration

Equipment:

Orifice

Model No:

TE-5025A

Serial No:

4218

Manufacturer:

Tisch

Unit Under Test

Equipment:

High Volume Blower

Model No:

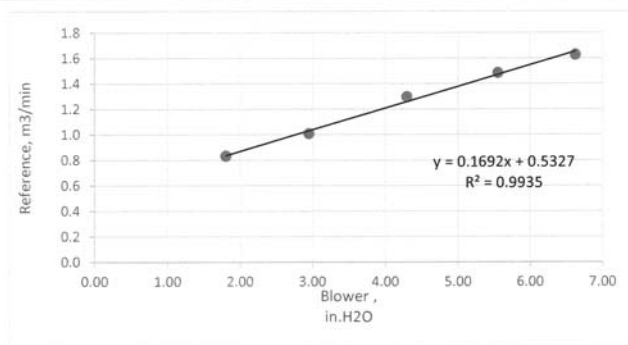
TE-5009X

Serial No:

BH-026

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	11.79	1.63	6.69	6.63
2	9.79	1.49	5.61	5.56
3	7.44	1.30	4.34	4.30
4	4.45	1.01	2.98	2.95
5	3.01	0.83	1.82	1.80

Approved by : *Wittaya K.*

SECOT CO., LTD.

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E-Mail: envserv@secot.co.th



TE-5009X TSP/PM10 Calibration Worksheet

Date:

1 Mar 24

Temp (°C):

33

Barometric pressure (mm Hg):

759

Reference Standard Calibration

Equipment:

Orifice

Model No:

TE-5025A

Serial No:

4218

Manufacturer:

Tisch

Unit Under Test

Equipment:

High Volume Blower

Model No:

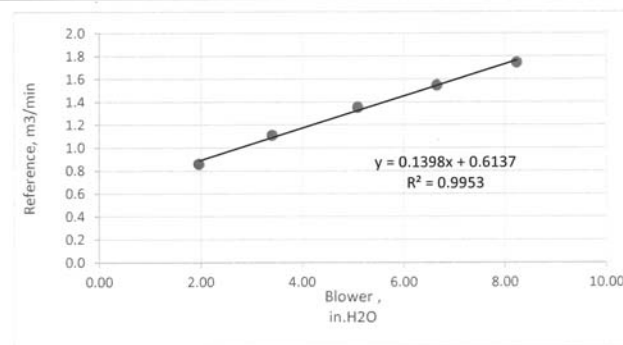
TE-5009X

Serial No:

BH-035

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	13.67	1.75	8.35	8.23
2	10.71	1.55	6.75	6.66
3	8.16	1.35	5.17	5.10
4	5.45	1.11	3.46	3.41
5	3.23	0.86	1.99	1.96

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TE-5009X TSP/PM10 Calibration Worksheet

Date:

29 Feb 24

Temp (°C):

30

Barometric pressure (mm Hg):

758

Reference Standard Calibration

Equipment:

Orifice

Model No:

TE-5025A

Serial No:

4218

Manufacturer:

Tisch

Unit Under Test

Equipment:

High Volume Blower

Model No:

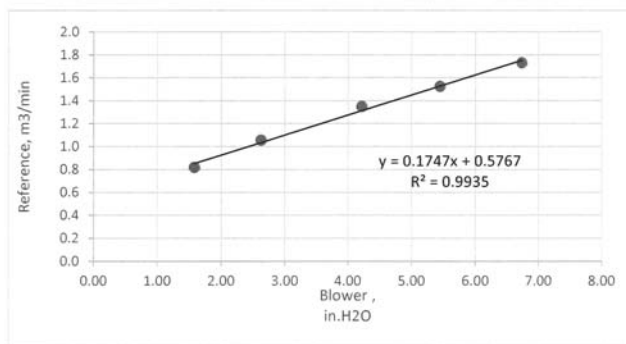
TE-5009X

Serial No:

BH-007

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	13.34	1.73	6.80	6.73
2	10.32	1.53	5.50	5.45
3	8.05	1.35	4.26	4.22
4	4.89	1.06	2.65	2.62
5	2.90	0.82	1.60	1.58



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TE-5009X TSP/PM10 Calibration Worksheet

Date:

29 Feb 24

Temp (°C):

35

Barometric pressure (mm Hg):

758

Reference Standard Calibration

Equipment:

Orifice

Model No:

TE-5025A

Serial No:

4218

Manufacturer:

Tisch

Unit Under Test

Equipment:

High Volume Blower

Model No:

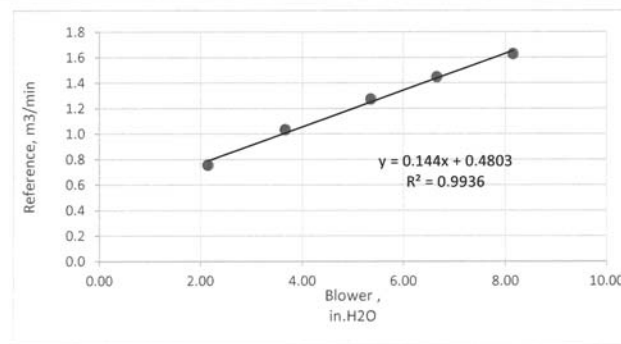
TE-5009X

Serial No:

BH-002

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	11.98	1.63	8.30	8.15
2	9.43	1.45	6.78	6.66
3	7.27	1.27	5.45	5.35
4	4.76	1.03	3.73	3.66
5	2.51	0.76	2.19	2.15



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TE-5009X TSP/PM10 Calibration Worksheet

Date: 29 Feb 24

Temp (°C): 30

Barometric pressure (mm Hg): 758

Reference Standard Calibration

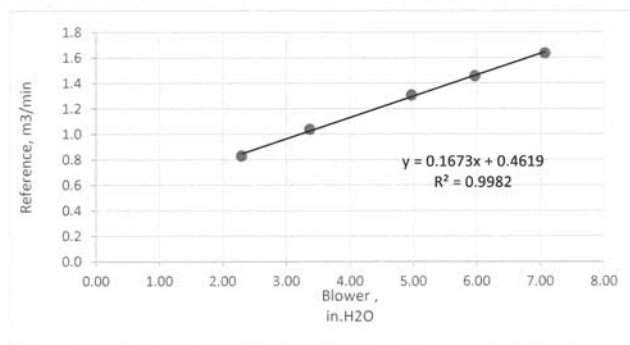
Equipment: Orifice
 Model No: TE-5025A
 Serial No: 4218
 Manufacturer: Tisch

Unit Under Test

Equipment: High Volume Blower
 Model No: TE-5009X
 Serial No: BH-031

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	11.90	1.64	7.14	7.07
2	9.41	1.46	6.03	5.97
3	7.55	1.31	5.02	4.97
4	4.73	1.04	3.40	3.37
5	2.98	0.83	2.32	2.30

Approved by : *Wittaya Kr.*

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TE-5009X TSP/PM10 Calibration Worksheet

Date: 1 Mar 24

Temp (°C): 27

Barometric pressure (mm Hg): 759

Reference Standard Calibration

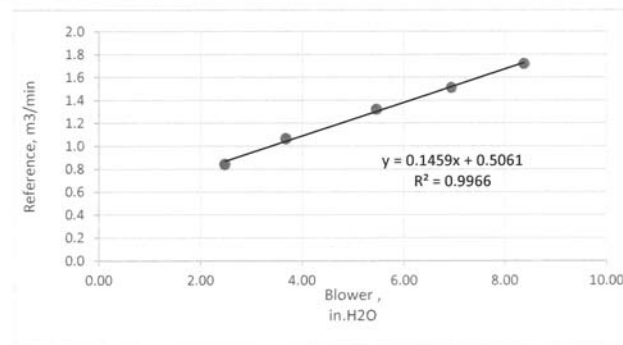
Equipment: Orifice
 Model No: TE-5025A
 Serial No: 4218
 Manufacturer: Tisch

Unit Under Test

Equipment: High Volume Blower
 Model No: TE-5009X
 Serial No: BH-022

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	13.00	1.72	8.41	8.38
2	10.02	1.51	6.97	6.94
3	7.63	1.32	5.48	5.46
4	4.92	1.07	3.70	3.69
5	3.04	0.84	2.49	2.48

Approved by : *Wittaya Kr.*

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TE-5009X TSP/PM10 Calibration Worksheet

Date:

29 Feb 24

Temp (°C):

30

Barometric pressure (mm Hg):

758

Reference Standard Calibration

Equipment:

Orifice

Model No:

TE-5025A

Serial No:

4218

Manufacturer:

Tisch

Unit Under Test

Equipment:

High Volume Blower

Model No:

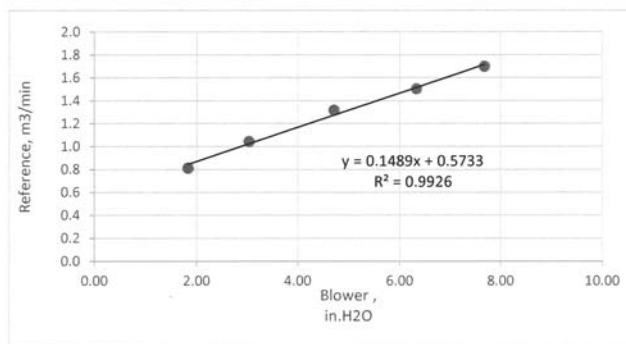
TE-5009X

Serial No:

BH-008

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	12.84	1.70	7.75	7.68
2	10.04	1.51	6.39	6.33
3	7.66	1.32	4.76	4.71
4	4.78	1.05	3.07	3.04
5	2.85	0.81	1.85	1.83



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TE-5009X TSP/PM10 Calibration Worksheet

Date:

29 Feb 24

Temp (°C):

34

Barometric pressure (mm Hg):

758

Reference Standard Calibration

Equipment:

Orifice

Model No:

TE-5025A

Serial No:

4218

Manufacturer:

Tisch

Unit Under Test

Equipment:

High Volume Blower

Model No:

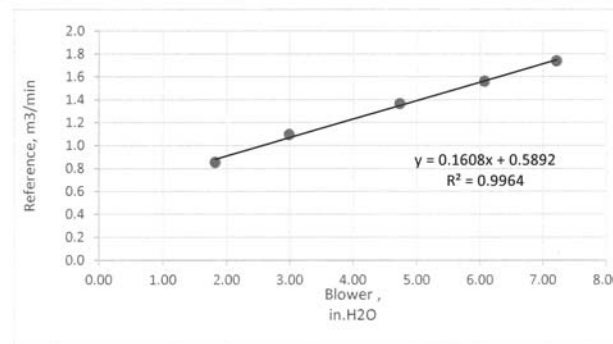
TE-5009X

Serial No:

BH-017

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	13.61	1.74	7.33	7.21
2	10.96	1.56	6.17	6.07
3	8.35	1.37	4.81	4.73
4	5.34	1.10	3.04	2.99
5	3.21	0.85	1.85	1.82



Approved by :

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TE-5009X TSP/PM10 Calibration Worksheet

Date:

1 Mar 24

Temp (°C):

28

Barometric pressure (mm Hg):

759

Reference Standard Calibration

Equipment:

Orifice

Model No:

TE-5025A

Serial No:

4218

Manufacturer:

Tisch

Unit Under Test

Equipment:

High Volume Blower

Model No:

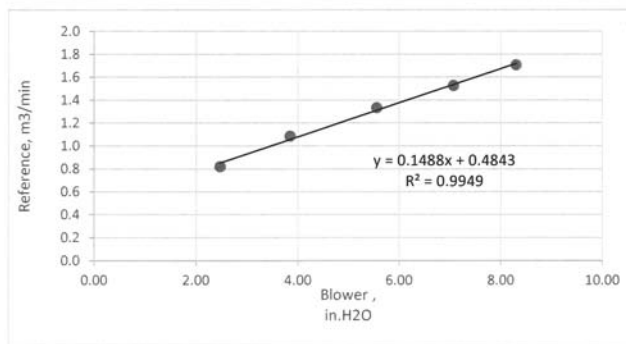
TE-5009X

Serial No:

BH-006

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	12.87	1.71	8.35	8.30
2	10.25	1.53	7.11	7.07
3	7.80	1.33	5.59	5.56
4	5.12	1.09	3.87	3.85
5	2.90	0.82	2.49	2.48



Approved by :

Wittaya b.

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TE-5009X TSP/PM10 Calibration Worksheet

Date:

1 Mar 24

Temp (°C):

28

Barometric pressure (mm Hg):

759

Reference Standard Calibration

Equipment:

Orifice

Model No:

TE-5025A

Serial No:

4218

Manufacturer:

Tisch

Unit Under Test

Equipment:

High Volume Blower

Model No:

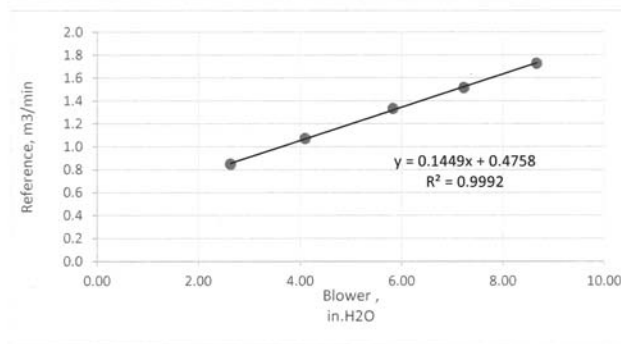
TE-5009X

Serial No:

BH-030

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	13.17	1.73	8.71	8.66
2	10.10	1.52	7.27	7.23
3	7.80	1.33	5.86	5.83
4	5.01	1.07	4.12	4.10
5	3.10	0.85	2.65	2.64



Approved by :

Wittaya b.

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TE-5009X TSP/PM10 Calibration Worksheet

Date:

1 Mar 24

Temp (°C):

33

Barometric pressure (mm Hg):

759

Reference Standard Calibration

Equipment:

Orifice

Model No:

TE-5025A

Serial No:

4218

Manufacturer:

Tisch

Unit Under Test

Equipment:

High Volume Blower

Model No:

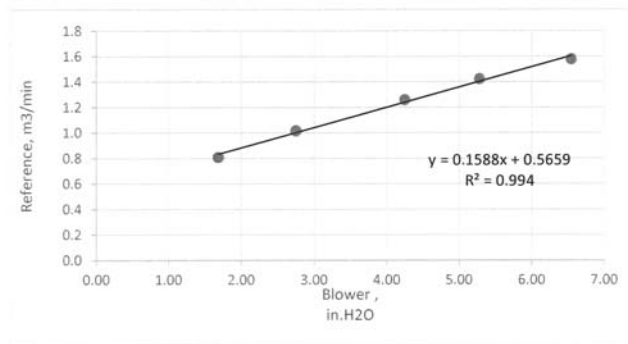
TE-5009X

Serial No:

BH-029

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	11.15	1.58	6.64	6.55
2	9.05	1.42	5.36	5.29
3	7.05	1.26	4.31	4.25
4	4.56	1.02	2.79	2.75
5	2.85	0.81	1.71	1.69



Approved by :

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TE-5009X TSP/PM10 Calibration Worksheet

Date:

29 Feb 24

Temp (°C):

30

Barometric pressure (mm Hg):

758

Reference Standard Calibration

Equipment:

Orifice

Model No:

TE-5025A

Serial No:

4218

Manufacturer:

Tisch

Unit Under Test

Equipment:

High Volume Blower

Model No:

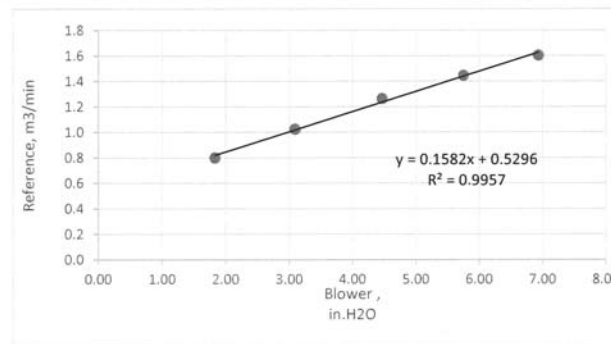
TE-5009X

Serial No:

BH-019

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	11.43	1.60	7.00	6.93
2	9.27	1.45	5.81	5.75
3	7.05	1.26	4.51	4.47
4	4.59	1.02	3.12	3.09
5	2.76	0.80	1.85	1.83



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CONTROL UNIT CALIBRATION

(Metric units, mm)

Date 12 Jan 24

Initial Final Average
Barometric press, Pb 758 758 758 mmHg

Dry Gas Meter Data

Console No. M50-07

Metering System ID

DGM Number 90331

DGM Model MST-C2-1

Calibrated by Montri P.

Reference Dry Gas Meter Data

Serial No. 358794

Model S110

Correction factor (Yr) 1.0068

Last Calibration Date 26 Oct 23

Orifice manometer setting, ΔH mm H2O	Ref. DGM Volume V _r Liters	DGM Volume V _m Liters	Temperature (°C)				Time ⊙ min	DGM Correction factor (Y)	ΔH@ mm
			Ref DGM T _r	Dry Gas Meter					
				Inlet T _i	Outlet T _o	Avg T _m			
12.5	100.0	100.6	25	25	24	24.5	9.72	0.9981	53.7523
25.0	100.2	100.2	25	25	24	24.5	6.48	1.0029	47.6709
50.0	100.0	100.8	25	25	24	24.5	4.77	0.9919	51.7327
76.0	100.2	100.9	25	25	24	24.5	3.90	0.9908	52.4606
100.0	100.1	99.6	25	25	24	24.5	3.90	1.0005	53.0627
150.0	100.2	98.9	25	25	24	24.5	2.82	1.0032	54.0289

Average 0.9979 52.1180

Approved by :



CONTROL UNIT CALIBRATION

(Metric units, mm)

Date 6 Jan 24

Initial Final Average
Barometric press, Pb 759 759 759 mmHg

Dry Gas Meter Data

Console No. M50-09

Metering System ID

DGM Number 333249

DGM Model ES-110

Calibrated by : Montri P.

Reference Dry Gas Meter Data

Serial No. 358794

Model S110

Correction factor (Yr) 1.0068

Last Calibration Date 26 Oct 23

Orifice manometer setting, ΔH mm H2O	Ref. DGM Volume V _r Liters	DGM Volume V _m Liters	Temperature (°C)				Time ⊙ min	DGM Correction factor (Y)	ΔH@ mm
			Ref DGM T _r	Dry Gas Meter					
				Inlet T _i	Outlet T _o	Avg T _m			
12.5	100.3	99.0	25	25	24	24.5	8.53	1.0165	41.1799
25.0	100.0	99.5	25	25	24	24.5	6.08	1.0073	42.0742
50.0	100.1	99.8	25	25	24	24.5	4.47	1.0041	45.2483
76.0	100.4	99.1	25	25	24	24.5	3.55	1.0114	43.2112
100.0	100.1	99.4	25	25	24	24.5	3.55	1.0024	44.6038
150.0	100.1	98.9	25	25	24	24.5	2.57	1.0022	44.8941

Average 1.0073 43.5352

Approved by :



PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Date : 09-01-2024

Calibration Duct No.: CD-0123

Calibration Standard Pitot tube data

Pitot No. : Std-02

Coefficient (Cp) : 0.99

Type S Pitot No. : PS20-01

Calibrated by : Mr. Montri P.

A Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(A)
1	15.00	21.50	0.8269	-0.0065
2	15.00	21.00	0.8367	0.0033
3	15.00	21.00	0.8367	0.0033

C_{P(A),avg} 0.8334

B Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(B)
1	15.00	21.00	0.8367	0.0065
2	15.00	21.50	0.8269	-0.0033
3	15.00	21.50	0.8269	-0.0033

C_{P(B),avg} 0.8302

| CP(A)-CP(B) | = 0.0033

C_{P(Avg)} = 0.8318Approved by : 

*** δ must be ≤ 0.01 for the test to be acceptable ***
 *** | Cp(A)-Cp(B) | must also be < 0.01 if average of Cp(A) and Cp(B) is to be used ***



PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Date : 09-01-2024

Calibration Duct No.: CD-0123

Calibration Standard Pitot tube data

Pitot No. : Std-02

Coefficient (Cp) : 0.99

Type S Pitot No. : PS20-02

Calibrated by : Mr. Montri P.

A Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(A)
1	15.00	21.00	0.8367	-0.0068
2	15.00	20.50	0.8468	0.0034
3	15.00	20.50	0.8468	0.0034

C_{P(A),avg} 0.8435

B Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(B)
1	15.00	21.00	0.8367	0.0000
2	15.00	21.00	0.8367	0.0000
3	15.00	21.00	0.8367	0.0000

C_{P(B),avg} 0.8367

| CP(A)-CP(B) | = 0.0068

C_{P(Avg)} = 0.8401Approved by : 

*** δ must be ≤ 0.01 for the test to be acceptable ***
 *** | Cp(A)-Cp(B) | must also be < 0.01 if average of Cp(A) and Cp(B) is to be used ***

Certificate Of Analysis
Special Gases Mixture

Customer Details

Name: Secot Co., Ltd. Address: 239 Rimklongprapa Rd. Bangsue Khet Bangsue Bangkok 10800 Customer Tag No.:

Certificate Details

Number: 0484/23 Date of Issue: 22-Feb-2023 Expiry date: 21-Feb-2027
Material Details
Production Order: 90176403 Material Code: 478100-J-62 Cylinder No.: 12360
Gas content: 6.520 M³ (nominal) Filling pressure: 145 bar (g) Valve: CGA 590 BRASS
Cylinder Owner: LINDE Cylinder Material: STEEL Cylinder Size: 47 L

Laboratory Report

Component	Normal Concentration	Analysis Result ¹	Uncertainty ²	Method of Analysis ³
Oxygen	8.00%	7.94%	± 2% relative	(1) SG-O-01
In Nitrogen				

Recommend usage condition

Minimum utilization: 5% of actual content or before expire date whichever comes first.

Storage condition: Keep in well ventilation and secure area.

Comments

Note:

- All results expressed in this report are on mole/mole basis, unless otherwise specified.
- The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The measurement of this material is traceable to the SI through the reference gas standard which is traceable to Swiss National Standard of Mass or other recognised national metrology institutes.
- (1) Gas Chromatography, (2) Paramagnetic Oxygen Analyzer, (3) Electrochemical Oxygen Analyzer, (4) Electrochemical Moisture Analyzer, (5) Total Hydrocarbon Analyzer, (6) Other - Specified

Sukanya Parinyasontorn
Signatory for and on behalf of Linde (Thailand) Co., Ltd.

Page 1 of 1

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PB-002/F004

Iss:K/2, 15 Oct 2021

บริษัท ลินด์ (ประเทศไทย) จำกัด (มหาชน)

เลขที่ใบอนุญาตประกอบกิจการ 0107531000785

ชั้น 15 อาคารทาวเวอร์ เอ 2/3 หมู่ 14 ถนนบางนา-ตราด กม. 6.5 แขวงบางนา

เขตคลองเตย กรุงเทพมหานคร 10540 โทรศัพท์ (66) 2338-6100 โทรสาร (66) 2338-6333

โรงงานผลิต: 105 หมู่ 5 ตำบลบางนา อำเภอบางนา จังหวัดชลบุรี 24180

โทรศัพท์ (66) 38.570-479-93

โทรสาร (66) 38.570-323

Linde (Thailand) Public Company Limited

P.L.C. Registration no. 0107531000785

15th Floor, Bangna Tower A, 2/3 Moo 14, Bangna Trad KM. 6.5 Road, Bangkaew

Bangplee, Samutprakarn 10540, Tel (66) 2338-6100 Fax (66) 2338-6333

Wellgrow Plant: 105 Moo 5, T.Bangsamak, A.Bangpakong, Chachoengsao 24180

Thailand, Tel (66) 38.570-479-93

Fax (66) 38.570-323

Certificate Of Analysis
Special Gases Mixture

Customer Details

Name: Secot Co., Ltd. Address: 239 Rimklongprapa Rd., Bangsue, Bangkok 10800 Customer Tag No.:

Certificate Details

Number: 0528/23 Date of Issue: 8-Mar-2023 Expiry date: 8-Mar-2026
Material Details
Production Order: 90176406 Material Code: S11600-SK-34 Cylinder No.: A00722SK
Gas content: 5.20 M³ Filling pressure: 137.0 bar Valve: CGA 660 SS
Cylinder Owner: LINDE Cylinder Material: Spectra seal Cylinder Size: 40 L

Laboratory Report

Analytical Result

Component	Normal Concentration	Analysis Result ¹	Uncertainty ²	Method of Analysis ³	Assay Date
Nitric Oxide	40.0 ppm	39.6 ppm	± 1% relative	(6) I-PB-352	1-Mar & 8-Mar-2023
Other NOx impurity		Less than 1.9 ppm			
Carbon Monoxide	40.0 ppm	41.9 ppm	± 1% relative	(6) I-PB-352	1-Mar-2023
In Nitrogen					

Reference Standard used in Assay

Reference Standard	Cylinder number	Concentration	Expiry date:
Nitric Oxide	133261SG	25.61 ± 0.13 ppm	6-May-2023
Carbon Monoxide	ND52320	25.03 ± 0.13 ppm	7-Oct-2023
In Nitrogen			

Analytical Instruments used in Assay

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
FTIR Spectrometers Nicolet iS50	FTIR-NO	28-Feb-2023
FTIR Spectrometers Nicolet iS50	FTIR-CO	25-Feb-2023

Recommend usage condition

Minimum utilization: 5% of actual content or before expire date whichever comes first.

Storage condition: Keep in well ventilation and secure area.

Comments

When reordering, please quote the material number

Note:

- All results expressed in this report are on mole/mole basis, unless otherwise specified. The Assay of this Standard has been performed in accordance with the EPA Traceability Protocol EPA-600/R-12/531 for the Assay and Certification of Gaseous Calibration Standards using procedure G1
- The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The measurement of this material is traceable to the SI through the reference gas standard which is traceable to Swiss National Standard of Mass or other recognised national metrology institutes.
- (1) Gas Chromatography, (2) Paramagnetic Oxygen Analyzer, (3) Electrochemical Oxygen Analyzer, (4) Electrochemical Moisture Analyzer, (5) Total Hydrocarbon Analyzer, (6) Other - Specified

Sukanya Parinyasontorn
Signatory for and on behalf of Linde (Thailand) Co., Ltd.

Page 1 of 1

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บริษัท ลินด์ (ประเทศไทย) จำกัด (มหาชน)

เลขที่ใบอนุญาตประกอบกิจการ 0107531000785

ชั้น 15 อาคารทาวเวอร์ เอ 2/3 หมู่ 14 ถนนบางนา-ตราด กม. 6.5 แขวงบางนา

เขตคลองเตย กรุงเทพมหานคร 10540 โทรศัพท์ (66) 2338-6100 โทรสาร (66) 2338-6333

โรงงานผลิต: 105 หมู่ 5 ตำบลบางนา อำเภอบางนา จังหวัดชลบุรี 24180

Linde (Thailand) Public Company Limited

P.L.C. Registration no. 0107531000785

15th Floor, Bangna Tower A, 2/3 Moo 14, Bangna Trad KM. 6.5 Road, Bangkaew

Bangplee, Samutprakarn 10540, Tel (66) 2338-6100 Fax (66) 2338-6333

Wellgrow Plant: 105 Moo 5, T.Bangsamak, A.Bangpakong, Chachoengsao 24180

THE LINDE GROUP

Linde

Certificate Of Analysis
Special Gases Mixture

Customer Details

Name: Secot Co., Ltd. Address: 239, Rimklongprapa Rd., Bangsue, Bangkok 10800 Customer Tag No.:

Certificate Details

Number: 0275/22 Date of Issue: 4-Feb-2022 Expiry date: 4-Feb-2026
Material Details
Production Order: 90169722 Material Code: 631500-SK-44 Cylinder No.: D636195
Gas content: 5.52 M³ Filling pressure: 145.0 bar Valve: CGA 660 SS
Cylinder Owner: LINDE Cylinder Material: Spectra seal Cylinder Size: 40 L

Laboratory Report

Analytical Result

Component	Normal Concentration	Analysis Result ¹	Uncertainty ²	Method of Analysis ³	Assay Date
Sulphur Dioxide In Nitrogen	20.0 ppm	20.4 ppm	± 1% relative	(6) I-PB-352	28-Jan & 4-Feb-22

Reference Standard used in Assay

Reference Standard	Cylinder number	Concentration	Expiry date:
Sulphur Dioxide In Nitrogen	145754SG	25.03 ± 0.25 ppm	18-Aug-2022

Analytical Instruments used in Assay

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
FTIR Spectrometers Nicolet iS50	FTIR-SO2	27-Jan-2022

Recommend usage condition

Minimum utilization: 5% of actual content or before expiry date whichever comes first.
Storage condition: Keep in well ventilation and secure area.

Comments

When reordering, please quote the material number

Note:

1. All results expressed in this report are on mole/mole basis, unless otherwise specified. The Assay of this Standard has been performed in accordance with the EPA Traceability Protocol EPA-600/R-12/531 for the Assay and Certification of Gaseous Calibration Standards using procedure G1
2. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The measurement of this material is traceable to the SI through the reference gas standard which is traceable to Swiss National Standard of Mass or other recognised national metrology institutes.
3. (1) Gas Chromatography, (2) Paramagnetic Oxygen Analyzer, (3) Electrochemical Oxygen Analyzer, (4) Electrochemical Moisture Analyzer, (5) Total Hydrocarbon Analyzer, (6) Other - Specified

Page 1 of 1

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บริษัท ลินด์ (ประเทศไทย) จำกัด (มหาชน)

เลขที่เอกสาร: 0107537000785

ชั้น 15 อาคารทาวเวอร์ 2/3 หมู่ 14 ถนนบางนา-ตราด กม. 6.5 บางนา กรุงเทพฯ

หมายเลขโทรศัพท์: 10540 โทรสาร (66) 2338-6100 โทรสาร (66) 2338-6333

โรงงานผลิต: 105 หมู่ 5 แขวงคลองจั่น เขตคลองจั่น กรุงเทพมหานคร 10110

โทรสาร (66) 38.570-479-93

โทรสาร (66) 38.570-323

Sukanya Parinyasontorn

Signatory for and on behalf of Linde (Thailand) Co., Ltd.

PB-002/F006

Linde (Thailand) Public Company Limited

PLC Registration no. 0107537000785

15th Floor, Bangna Tower A, 2/3 Moo 14, Bangna Trad KM. 6.5 Road, Bangkok

Bangplee, Samyitprakan 10540, Tel (66) 2338-6100 Fax (66) 2338-6333

Wellgrow Plant: 105 Moo 5, T.Bangsamak, A.Bangpakong, Chachoengsao 24180

Thailand, Tel (66) 38.570-479-93

Fax (66) 38.570-323

Sheet No. :

CR-515-2024-277



SOUND LEVEL METER CALIBRATION

Calibration Location:

SECOT

Calibration Date:

Sep 20, 24

ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref. Calibrated (dB)	Eff. Calibrated (dB)
Cirrus	CR:515	94296	1000.00	94.0	93.7

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
14	Cirrus	CR162B	G300709	93.7	0.0
15	Cirrus	CR162B	G300769	93.5	0.2
42	Cirrus	CR162B	G302738	93.7	0.0
44	Cirrus	CR162B	G302742	93.6	0.1
50	Cirrus	CR162B	G302333	93.7	0.0

Calibrated by :

Approved by :

Preeda S.

CR-515-2024-277/Ca/07/10/2024

SECOT CO., LTD.

239 Rimklongprapa Rd. Bangsue, Bangkok, 10800, THAILAND

Tel: (662) 959-3600 Fax: (662) 959-3535

E-Mail: envserv@secot.co.th



SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: 07-08-2024

ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref.Calibrated (dB)	Eff.Calibrated (dB)
Cirrus	CR:515	94296	1000.00	94	93.8

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
1	SCARLET TECH	ST-21D	820729	93.8	0.0
2	SCARLET TECH	ST-21D	820723	93.8	0.0
3	SCARLET TECH	ST-21D	820725	93.8	0.0
4	SCARLET TECH	ST-21D	820727	93.8	0.0
5	SCARLET TECH	ST-21D	820726	93.8	0.0
6	SCARLET TECH	ST-21D	820728	93.8	0.0
7	SCARLET TECH	ST-21D	820722	93.8	0.0

Calibrated by :

Approved by :

Suh Sathumman



SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: 06-11-2024

ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref.Calibrated (dB)	Eff.Calibrated (dB)
Cirrus	CR:515	97097	1000.00	94	93.8

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
1	SCARLET TECH	ST-21D	820722	93.8	0.0
2	SCARLET TECH	ST-21D	820725	93.8	0.0
3	SCARLET TECH	ST-21D	820723	93.8	0.0
4	SCARLET TECH	ST-21D	820727	93.8	0.0
5	SCARLET TECH	ST-21D	820726	93.8	0.0

Calibrated by :

Approved by :

Suh Sathumman

Sheet No. : CAL-2411-0034-01



SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: 06-11-2024

ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref.Calibrated (dB)	Eff.Calibrated (dB)
Cirrus	CR:515	97097	1000.00	94	93.7

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
1	Cirrus	CR162B	G302738	93.7	0.0
2	Cirrus	CR162B	G302741	93.7	0.0

Calibrated by: Approved by: 

CER_BIC_2411-0034_Leq/CAL SHEET01/12/2/2024

SECOT CO., LTD.
239 Rimklongprapa Rd, Bangsue, Bangkok, 10800, THAILAND
Tel: (662)959-3600 Fax: (662) 959-3535
E-Mail: envserv@secot.co.th

Calibration Certificate

BEIJING J.T TECHNOLOGY CO., LTD.
www.jttech.com
www.jttech.com

Instrument information

Name	WET BULB GLOBE TEMPERATURE (WBGT)METER
Series No	3522210172
Type	JT2011-E2A

Customer	SECOT CO., LTD.
Address	239 Rim Klong Prapa Road, Bang Sue, Bang Sue, Bangkok 10800

Integrity check of instrument

Appearance	✓
Parts integrity	✓
Screen display or touch	✓
Instrument button	✓
Power supply	✓
battery	✓
Data storage and export	✓
Deviation degree of comparison test with standard instrument	✓

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (± °C)
WET	25.0	25.1	-0.1	0.2
	30.0	30.1	0.1	0.2
	35.0	35.2	-0.2	0.2
	40.0	39.9	0.1	0.2
	45.0	45.1	-0.1	0.2
DRY	25.0	24.9	0.1	0.2
	30.0	29.9	0.1	0.2
	35.0	35.1	-0.1	0.2
	40.0	39.8	0.2	0.2
	45.0	44.9	0.1	0.2
GLOBE	25.0	24.9	0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	39.9	0.1	0.2
	45.0	44.9	0.1	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers, Manufacturer: BGRI, Model: STA, SN : 2-56,
Calibrated Date : 20 February 2023, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000075

Calibration Engineer : 

Date : January 16, 2024

Instrument information



Name	WET BULB GLOBE TEMPERATURE (WBGT)METER
Series No	3522210173
Type	JT2011-E2A
Customer	SECOT CO., LTD.
Address	239 Rim Klong Prapa Road, Bang Sue, Bang Sue, Bangkok 10800

Integrity check of instrument

Appearance	✓
Parts integrity	✓
Screen display or touch	✓
Instrument button	✓
Power supply	✓
battery	✓
Data storage and export	✓
Deviation degree of comparison test with standard instrument	✓

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
WET	25.0	24.9	0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	40.2	-0.2	0.2
	45.0	45.1	-0.1	0.2
DRY	25.0	24.9	0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	40.2	-0.2	0.2
	45.0	45.1	-0.1	0.2
GLOBE	25.0	24.9	0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	35.2	-0.2	0.2
	40.0	40.1	-0.1	0.2
	45.0	45.1	-0.1	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers, Manufacturer: BGRI, Model: STA, SN : 2-56,
Calibrated Date : 20 February 2023, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000075

Calibration Engineer : _____

Date : January 16, 2024



Instrument information



Name	WET BULB GLOBE TEMPERATURE (WBGT)METER
Series No	3522210174
Type	JT2011-E2A
Customer	SECOT CO., LTD.
Address	239 Rim Klong Prapa Road, Bang Sue, Bang Sue, Bangkok 10800

Integrity check of instrument

Appearance	✓
Parts integrity	✓
Screen display or touch	✓
Instrument button	✓
Power supply	✓
battery	✓
Data storage and export	✓
Deviation degree of comparison test with standard instrument	✓

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
WET	25.0	25.1	-0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	40.1	-0.1	0.2
	45.0	44.8	0.2	0.2
DRY	25.0	24.9	0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	34.9	0.1	0.2
	40.0	39.8	0.2	0.2
	45.0	45.1	-0.1	0.2
GLOBE	25.0	24.9	0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	34.9	0.1	0.2
	40.0	39.8	0.2	0.2
	45.0	44.9	0.1	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers, Manufacturer: BGRI, Model: STA, SN : 2-56,
Calibrated Date : 20 February 2023, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000075

Calibration Engineer : _____

Date : January 16, 2024



Instrument information



Name	WET BULB GLOBE TEMPERATURE (WBGT)METER
Series No	3522210176
Type	JT2011-E2A
Customer	SECOT CO., LTD.
Address	239 Rim Klong Prapa Road, Bang Sue, Bang Sue, Bangkok 10800

Integrity check of instrument

Appearance	✓
Parts integrity	✓
Screen display or touch	✓
Instrument button	✓
Power supply	✓
battery	✓
Data storage and export	✓
Deviation degree of comparison test with standard instrument	✓

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
WET	25.0	24.9	0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	40.1	-0.1	0.2
	45.0	45.2	-0.2	0.2
DRY	25.0	25.1	-0.1	0.2
	30.0	30.2	-0.2	0.2
	35.0	35.2	-0.2	0.2
	40.0	39.8	0.2	0.2
	45.0	44.8	0.2	0.2
GLOBE	25.0	24.9	0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	39.9	0.1	0.2
	45.0	44.8	0.2	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers, Manufacturer: BGRI, Model: STA, SN : 2-56,
Calibrated Date : 20 February 2023, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000075

Calibration Engineer : _____

Date : January 16, 2024



Instrument information



Name	WET BULB GLOBE TEMPERATURE (WBGT)METER
Series No	3522210177
Type	JT2011-E2A
Customer	SECOT CO., LTD.
Address	239 Rim Klong Prapa Road, Bang Sue, Bang Sue, Bangkok 10800

Integrity check of instrument

Appearance	✓
Parts integrity	✓
Screen display or touch	✓
Instrument button	✓
Power supply	✓
battery	✓
Data storage and export	✓
Deviation degree of comparison test with standard instrument	✓

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
WET	25.0	25.1	-0.1	0.2
	30.0	30.2	-0.2	0.2
	35.0	34.9	0.1	0.2
	40.0	39.8	0.2	0.2
	45.0	44.9	0.1	0.2
DRY	25.0	25.1	-0.1	0.2
	30.0	30.2	-0.2	0.2
	35.0	34.9	0.1	0.2
	40.0	39.8	0.2	0.2
	45.0	44.8	0.2	0.2
GLOBE	25.0	25.1	-0.1	0.2
	30.0	30.2	-0.2	0.2
	35.0	34.9	0.1	0.2
	40.0	40.2	-0.2	0.2
	45.0	45.1	-0.1	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers, Manufacturer: BGRI, Model: STA, SN : 2-56,
Calibrated Date : 20 February 2023, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000075

Calibration Engineer : _____

Date : January 16, 2024



Calibration Certificate

BEIJING J.T TECHNOLOGY CO., LTD.
www.jttech.com
www.jantech.com

Instrument information



Name	WET BULB GLOBE TEMPERATURE (WBGT)METER
Series No	3522210178
Type	JT2011-E2A
Customer	SECOT CO., LTD.
Address	239 Rim Klong Prapa Road, Bang Sue, Bang Sue, Bangkok 10800

Integrity check of instrument

Appearance	✓
Parts integrity	✓
Screen display or touch	✓
Instrument button	✓
Power supply	✓
battery	✓
Data storage and export	✓
Deviation degree of comparison test with standard instrument	✓

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
WET	25.0	25.1	-0.1	0.2
	30.0	29.9	0.1	0.2
	35.0	34.9	0.1	0.2
	40.0	40.1	-0.1	0.2
	45.0	45.1	-0.1	0.2
DRY	25.0	25.1	-0.1	0.2
	30.0	30.2	-0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	39.8	0.2	0.2
	45.0	44.8	0.2	0.2
GLOBE	25.0	25.1	-0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	35.1	-0.1	0.2
	40.0	39.9	0.1	0.2
	45.0	44.8	0.2	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers, Manufacturer: BGRI, Model: STA, SN : 2-56,
Calibrated Date : 20 February 2023, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000075

Calibration Engineer : _____

Date : January 16, 2024



Calibration Certificate

BEIJING J.T TECHNOLOGY CO., LTD.
www.jttech.com
www.jantech.com

Instrument information



Name	WET BULB GLOBE TEMPERATURE (WBGT)METER
Series No	3522210179
Type	JT2011-E2A
Customer	SECOT CO., LTD.
Address	239 Rim Klong Prapa Road, Bang Sue, Bang Sue, Bangkok 10800

Integrity check of instrument

Appearance	✓
Parts integrity	✓
Screen display or touch	✓
Instrument button	✓
Power supply	✓
battery	✓
Data storage and export	✓
Deviation degree of comparison test with standard instrument	✓

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
WET	25.0	24.8	0.2	0.2
	30.0	30.1	-0.1	0.2
	35.0	34.8	0.2	0.2
	40.0	40.1	-0.1	0.2
	45.0	45.1	-0.1	0.2
DRY	25.0	25.1	-0.1	0.2
	30.0	29.9	0.1	0.2
	35.0	35.1	-0.1	0.2
	40.0	40.2	-0.2	0.2
	45.0	44.8	0.2	0.2
GLOBE	25.0	24.8	0.2	0.2
	30.0	29.8	0.2	0.2
	35.0	34.8	0.2	0.2
	40.0	40.1	-0.1	0.2
	45.0	45.2	-0.2	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers, Manufacturer: BGRI, Model: STA, SN : 2-56,
Calibrated Date : 20 February 2023, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000075

Calibration Engineer : _____

Date : January 16, 2024



Instrument information



Name	WET BULB GLOBE TEMPERATURE (WBGT)METER
Series No	3522210180
Type	JT2011-E2A
Customer	SECOT CO., LTD.
Address	239 Rim Klong Prapa Road, Bang Sue, Bang Sue, Bangkok 10800

Integrity check of instrument

Appearance	✓
Parts integrity	✓
Screen display or touch	✓
Instrument button	✓
Power supply	✓
battery	✓
Data storage and export	✓
Deviation degree of comparison test with standard instrument	✓

Calibration Results

UUC Sensor	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
WET	25.0	25.1	-0.1	0.2
	30.0	29.8	0.2	0.2
	35.0	34.9	0.1	0.2
	40.0	39.8	0.2	0.2
	45.0	45.1	-0.1	0.2
DRY	25.0	25.1	-0.1	0.2
	30.0	30.2	-0.2	0.2
	35.0	35.2	-0.2	0.2
	40.0	39.8	0.2	0.2
	45.0	44.9	0.1	0.2
GLOBE	25.0	24.9	0.1	0.2
	30.0	29.9	0.1	0.2
	35.0	34.8	0.2	0.2
	40.0	40.2	-0.2	0.2
	45.0	45.2	-0.2	0.2

Environmental conditions: temperature: 26 °C±2°C, relative humidity: 30% RH±10RH%

Reference Standard : Standard Mercury Thermometers, Manufacturer: BGRI, Model: STA, SN : 2-56,

Calibrated Date : 20 February 2023, Calibration Certificate No. : RA21H-AB1000009

This Certificate is traceable to NCMT North China, Certificate No.: RA20J-AK000075

Calibration Engineer : _____

Date : January 16, 2024

