



๐๔ พฤศจิกายน ๒๕๖๔

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท โอกลา เทสต์ติ้ง แอนด์ คอนซัลติ้ง เซอร์วิส จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๑๒ กรกฎาคม ๒๕๖๔

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

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

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท โอกลา เทสต์ติ้ง แอนด์ คอนซัลติ้ง เซอร์วิส จำกัด
ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

- | | |
|-----------------------------|----------------------------|
| ๑) นายธวัชชัย จงวุฒิชัย | ทะเบียนเลขที่ ว-๒๑๙-ค-๕๑๒๔ |
| ๒) นางสาวปนัดดา พันธุ์กะจับ | ทะเบียนเลขที่ ว-๒๑๙-ค-๖๖๙๙ |
| ๓) นางสาวจามจุรี คำปุย | ทะเบียนเลขที่ ว-๒๑๙-ค-๙๖๖๓ |

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

- | | |
|--|----------------------------|
| ๑) นางสาวธัญชนก ขำขุน | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๔๑๖ |
| ๒) ว่าที่ร้อยตรีหญิงสาวตรี เวียงจันทร์ | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๔๑๗ |
| ๓) นางสาวภาณุชนารถ เชี่ยวชาญ | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๔๑๘ |
| ๔) นางสาววันวิสา หวังแวกลาง | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๔๑๙ |
| ๕) นางสาวธิดารัตน์ กลัดตลาด | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๔๒๐ |
| ๖) นางสาวรัตตชา ศรีปราสาท | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๔๒๑ |
| ๗) นางสาวแพรวพรรณ กองกะแซง | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๔๒๒ |
| ๘) นางสาวจุลฑา สมบุญ | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๔๒๓ |
| ๙) นางสาวนิจินา มะติยาภักดิ์ | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๔๒๔ |
| ๑๐) นางสาวเบญจพร อินแก้ว | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๖๖๔ |
| ๑๑) นายธนทัต เวชกิจ | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๖๖๕ |
| ๑๒) นายปริญญา กล้าน้อย | ทะเบียนเลขที่ ว-๒๑๙-จ-๙๖๖๖ |

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๙ รายการ และ
อากาศเสีย จำนวน ๕ รายการ รวมทั้งสิ้น ๑๔ รายการ ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๑๕ สิงหาคม ๒๕๖๗ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อ
กรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



ผู้อำนวยการกองจยและเอนกยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเอนกยมลพิษโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๔-๖
โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙
ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.gmail.go.th

Certificate No. : HIT-2236-1228

Page : 1 of 2

CERTIFICATE OF CALIBRATION

Equipment :	COD Test Tube Heater		
Meter Model :	HI839800-02	Serial No. :	07130034101
Tube Heater :	25 Vial Capacity	Accuracy :	$\pm 2^{\circ}\text{C}$
Temperature Range :	-10°C to 160°C	Temperature of Reaction :	150°C
Ambient Temperature :	$(25 \pm 2)^{\circ}\text{C}$	Relative Humidity :	$(50 \pm 15)\% \text{ RH}$
Manufacturer :	Hanna Instruments	Made in :	Romania
Condition As-Received :	Used Product	Reference :	RE220817
Customer name :	Okla Testing & Consulting Service Co., Ltd. 67/35-36, 3RD Floor, Phetkasem 7/1 Rd., Wat Tha Pra Sub-district, Bangkok Yai District, Bangkok 10600 Thailand		
Received date :	24 August 2022		
Calibrate date :	6 September 2022		
Issue date :	7 September 2022		
Calibrated Location :	Hanna Instruments (Thailand) Ltd.		
Calibration Procedure :	This calibrator was conducted by using in-house: calibration procedure CP-04 by using certified reference material		

Calibrated by :



Calibration Engineer

Approved by :



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).



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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



NSC-TISI-TIS 17025
CALIBRATION 0059
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CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : CONDUCTIVITY METER
MANUFACTURER : HANNA INSTRUMENTS
MODEL / TYPE : HI5521/HI76312
SERIAL NO. : 04160019101/0614117M
CLID. NO. : 272201302
JOB CONTROL NO. : 220426042325

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

DATE OF RECEIVED : 26 April 2022

DATE OF ISSUED : 29 April 2022

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Calibration Engineer

Approved By :

Authorized Signatory

29 April 2022

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. Q22042325

F3-011-04/01-12

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@clccalibration



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NSC-TISI-TIS 17025
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REPORT OF CALIBRATION

FOR

NOMENCLATURE : CONDUCTIVITY METER
MANUFACTURER : HANNA INSTRUMENTS
MODEL / TYPE : HI5521/HI76312
SERIAL NO. : 04160019101/0614117M
DATE OF CALIBRATION : 28 April 2022

ENVIRONMENT CONDITIONS :

Temperature : $(25 \pm 2.5) ^\circ\text{C}$

Relative Humidity : $(50 \pm 15) \% \text{ RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. **WI-305-130**. The calibration was performed by direct measurement with Certified Reference Material (CRM).

REFERENCE STANDARD USED :

Potassium Chloride Solution (nominal 0.147 mS/cm)

Potassium Chloride Solution (nominal 1.41 mS/cm)

Potassium Chloride Solution (nominal 12.8 mS/cm)

TRACEABILITY :

The measurements are traceable to International System of Units (SI) , through Merck Co., Ltd.

Certificate No. HC90696057 , HC02139203 , HC04515254. Due Date 31 August 2022 , 30 June 2023 , 30 November 2023.

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:2021)"

Certificate No. Q22042325

F3-011-04/01-12

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CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The table in the following gives the calibration results and associated measurement uncertainties of Conductivity Meter.

CALIBRATION DATA

Conductivity Solution Test @ 25°C

Standard Conductivity Solution	DUC Reading	Uncertainty of Measurement
146.00 μ S/cm	146.0 μ S/cm [Cell Constant 1.1165]	$\pm 2.10 \mu$ S/cm
1.412 mS/cm	1.412 mS/cm [Cell Constant 1.1200]	± 0.021 mS/cm
12.85 mS/cm	12.85 mS/cm [Cell Constant 1.1550]	± 0.19 mS/cm

Note. The Scope of Accredited TISI Certificate No. 19C087/0655 Issue 1 Page 79 of 111

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

End of Certificate

Certificate No. Q22042325

F3-011-04/01-12

page 3 of 3



@clccalibration



GIIC Calibration Laboratory

700/20-21 Phaholyothin Rd., Samsennai, Phayathai,
Bangkok 10400 Thailand

Tel : +66 (02) 615 4999

Fax : +66 (02) 615 4644

E-mail : cal@giic.co.th



NSC-TISI-TIS 17025
CALIBRATION 0256

CERTIFICATE No.CAL00639-22..... PAGE1..... OF3.....

Certificate of Calibration

Equipment : DIGITAL THERMO-HYGROMETER
Manufacturer : DIGICON
Model / Type : TH-03
Serial No. : 115092766
ID No. : -
Customer : OKLA TESTING & CONSULTING SERVICE CO., LTD.
67/35-36, 3rd Floor, Phetkasem 7/1, Watthapra,
Bangkokyai, Bangkok 10600 Thailand.
C.S.R. No. : H0000639-22
Received Date : 04 May 2022
Calibration Date : 05 May 2022

Calibrated By :

Approved By :

Issue Date :

05 May 2022

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

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CERTIFICATE No. CAL00639-22 PAGE 2 OF 3

CALIBRATION REPORT

Condition of this calibration result:

1. Environment : Temperature : (25 ± 3) °C
Relative Humidity : (50 ± 15) % RH

2. Reference / procedure Used :

- This equipment was calibrated by comparison to precision humidity measuring instrument into humidity chamber for humidity measurement and a platinum resistance thermometer into temperature chamber for temperature measurement according to GILC Calibration Laboratory
- Calibration Procedure No. GILCLAB-CP-H01, GILCLAB-CP-H03.

3. Reference Standard Instrument :

Instrument	Model	Serial No	Certificate No	Due Dated
Platinum Resistance Thermometer	PCR-1	RB-31604	21I703	6 Jul 22
Data Logger	HC2-S	60936993	21T9467	11 Oct 22
Dual Measurement Multimeter	GDM 8261A	GEP925925	CAL00436-22	19 Mar 23

4. This Certification is traceable to the SI unit through :

- Technology Promotion Association (Thailand-Japan) Calibration Services and Environmental Analysis Department.
- Quality Calibration
- GILC Calibration Laboratory

5. Uncertainty :

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

6. Disclaimer :

- The laboratory accepted that was we has done in our calibration method. It with no guarantee that it works as you believe that it should and user accept the risks that occur. We accept no liability for any damage or financial losses.



CERTIFICATE No. ...CAL00639-22... PAGE ...3... OF ...3...

CALIBRATION REPORT

The temperature scale used was based on ITS-90.

All data shown below were as-received values without adjustment.

Calibration result :

Function : Temperature Measurement.

Standard Temperature (°C)	¹ U.U.C. Reading (°C)	Error (°C)	Uncertainty of Measurement (± °C)
9.986	10	0.014	0.88
24.989	25	0.011	0.88
40.028	40	-0.028	0.88

Function : Humidity Measurement. : (25.01 °C)

Standard Humidity (% rh)	¹ U.U.C. Reading (% rh)	Error (% rh)	Uncertainty of Measurement (± % rh)
24.99	23	-1.99	1.8
49.94	44	-5.94	1.8
85.94	81	-4.94	2.9

¹U.U.C. = Unit Under Calibration

This result of calibration was found accurate as show on data and place of calibration only.

- END -

CERTIFICATE OF CALIBRATION

Certificate No. : CL-087-65
Page 1 of 2

Equipment Name: Digital Thermometer with -
Temperature Sensor.

Manufacturer: EUTECH
Model: ECO SCAN TEMP5
Serial No: 816366
ID No: -

Customer

Name: OKLA Testing and Consulting Service Co.,Ltd.
Address: 67/35-36 Floor 3, Soi Petchkasem 7/1,
Petchkasem Rd, Watthapra, Bangkokyai, Bangkok
10600.

Received date: 18 May 2022
Calibration date: 03 Jun 2022
Issue date: 06 Jun 2022

Reference Used During Calibration

1. Standard Temperature Probe Model: STS-100 A500,
Serial No.: 667682-09, Due date: 23 Mar 2023
2. Digital Temperature Indicator Model: DTI-1000-A MK
II, Serial No.: 671407-00591 Due date: 04 June 2022

Calibration Condition

Temperature: $(23 \pm 3)^{\circ}\text{C}$
Relative Humidity: $(55 \pm 15)\%$

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-0034-22, Certificate number: ER-0032-
21

Calibrated by

- ☐ Mr. Sorawit Thachalad
☒ Miss Jitraporn Lertsomphol



Approved Signatory:

Calibration Department Manager

Certificate No. : CL-087-65

Page 2 of 2

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 – 30 °C

Function:

Table 1: This equipment was connected with Thermocouple sensor type K.
Dimension of probe: Diameter 3 mm, Length 116 mm.

<u>Immersion</u> <u>Depth</u> (mm)	<u>Standard</u> <u>Reading</u> (°C)	<u>UUC</u> <u>Reading</u> (°C)	<u>Error</u> (°C)	<u>Uncertainty</u> (°C)
110	20.055	20.0	-0.1	0.19
110	22.056	22.0	-0.1	0.19
110	24.053	24.0	-0.1	0.19
110	26.053	26.0	-0.1	0.19
110	28.048	28.0	0.0	0.19
110	30.047	30.0	0.0	0.19

UUC* : Unit Under Calibration

The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%.

*** End of Certificate ***





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CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : DIGITAL THERMOMETER
MANUFACTURER : HANNA INSTRUMENTS
MODEL / TYPE : HI5521/HI7662-W
SERIAL NO. : 04160019101/0615024N
CLID. NO. : 232202088
JOB CONTROL NO. : 220426042327

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

DATE OF RECEIVED : 26 April 2022

DATE OF ISSUED : 29 April 2022

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Calibration Engineer

Approved By :

Authorized Signatory

29 April 2022

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. Q22042327

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REPORT OF CALIBRATION FOR

NOMENCLATURE : **DIGITAL THERMOMETER**
MANUFACTURER : **HANNA INSTRUMENTS**
MODEL / TYPE : **HI5521/HI7662-W**
SERIAL NO. : **04160019101/0615024N**
DATE OF CALIBRATION : **28 April 2022**

ENVIRONMENT CONDITIONS :

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

Relative Humidity : $(55 \pm 10) \% \text{ RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. **WI-305-187** based on **ASTM E 644-04** as calibration guidelines.

The calibration was performed by using Calibration Bath, Precision Thermometer and IPRT which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

1. Calibration Bath, Kambic Model OB-22/2 ULT S/N. 17115653.
2. Precision Thermometer, ASL Model F200-A-8 S/N. 014433/03.
3. IPRT, ASL Model T100-250-1D S/N. L0193A-1-1.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI) , through Calibration Laboratory Co., Ltd. Certificate No. Q22007520, Due Date 22 January 2023.

2. The measurements are traceable to International System of Units (SI) , through Thailand Institute of Scientific and Technological Research (TISTR). Certificate No. PSL-T 0717/64, Due Date 14 June 2022.

3. The measurements are traceable to International System of Units (SI) , through National Institute of Metrology (Thailand). Certificate No. TT-0121-21, Due Date 24 November 2022.

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:2021)"

Certificate No. **Q22042327**

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CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The DUC Reading were recorded and the means value were reported of five times measurement in the table below.

CALIBRATION DATA

CORRECTION OF TEMPERATURE [THERMISTOR]

Immersion depth (mm)	Actual Temperature (°C)	DUC Reading (°C)	Correction (°C)	Uncertainty \pm (°C)
105	24.00	24.1	- 0.10	0.07
	25.00	25.1	- 0.10	
	27.00	27.1	- 0.10	

Note. Probe \varnothing 3.5 mm

Materials : Metal Sheath.

The Scope of Accredited TISI Certificate No. 19C087/0655 Issue 1 Page 28 of 111

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

End of Certificate

Certificate No. Q22042327

F3-011-04/01-12

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CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : DO METER
MANUFACTURER : HANNA INSTRUMENTS
MODEL / TYPE : HI5421/HI76483
SERIAL NO. : 04240005101/KC1A11T8H
CLID. NO. : 272101220
JOB CONTROL NO. : 220426042326

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

DATE OF RECEIVED : 26 April 2022

DATE OF ISSUED : 28 April 2022

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Calibration Engineer

Approved By :

28 April 2022

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. Q22042326

F3-011-04/01-12

page 1 of 3



REPORT OF CALIBRATION

FOR

NOMENCLATURE : **DO METER**
MANUFACTURER : **HANNA INSTRUMENTS**
MODEL / TYPE : **HI5421/HI76483**
SERIAL NO. : **04240005101/KC1A11T8H**
DATE OF CALIBRATION : **27 April 2022**

ENVIRONMENT CONDITIONS :

Temperature : $(25 \pm 2.5) ^\circ\text{C}$

Relative Humidity : $(50 \pm 15) \% \text{RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. **CLC-CPCH-06**. The calibration was performed by direct measurement with Certified Reference Material (CRM).

REFERENCE STANDARD USED :

Dissolved Oxygen, Sigma-Alorich Product ID QC3077-500ML .

TRACEABILITY :

The measurements are traceable to International System of Units (SI) , through Merck Co., Ltd.

Lot LRAD0713.01 , Due Date September 2023.

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:2021)"

Certificate No. **Q22042326**

F3-011-04/01-12

page 2 of 3



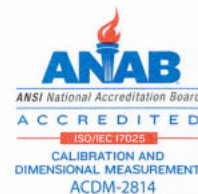


CLC
Accredited
ISO/IEC 17025

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 : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The table in the following gives the calibration results and associated measurement uncertainties of Do Meter.

CALIBRATION DATA

Nominal Value (mg/L)	DUC Reading (mg/L)	Correction (mg/L)	Uncertainty (mg/L)
5.91	5.88	+0.03	± 0.22

Note. The Scope of Accredited ANAB Certificate No. ACDM-2814 Version 008 Page 4 of 54

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

End of Certificate

Certificate No. Q22042326

F3-011-04/01-12

page 3 of 3



@clccalibration



MIRACLE INTERNATIONAL TECHNOLOGY CO.,LTD

214 Bangwaek Rd. Bangpai Bangkae Bangkok 10160
Tel.: 0-2865-4647-8 Fax: 0-2865-4649 <http://www.mit.in.th>



CALIBRATION CERTIFICATE

Certificate No. : SS2206-022-0001

Date Issued : 10-Jun-22

Customer : OKLA TESTING & CONSULTING SERVICE CO.,LTD
63/13 Soi.Petchkasem 7, Petchkasem Rd., Thapra, Bangkok Yai, Bangkok
10600

Equipment : Electronic Balance

Manufacturer : Sartorius

Model : BSA224S-CW

Serial No. : 35790699

ID No./Tag No. : -

Date Received : 03-Jun-22

Date Calibrated : 03-Jun-22

Calibrated by : Mr. Nirot Parnkamnoed

Calibration Method or Calibration Procedure Used

In-house method : CP-06 base on UKAS LAB 14 Edition 6 October 2019.

This certificate is traceable to national standards, which realize the units of measurement according to the International System of Units (SI).

Result of Calibration

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

This certificate may not be reproduced other than in full except with the prior written approval of the Miracle International Technology Company Limited.

Approved by



Certificate No. : SS2206-022-0001

Environment : Ambient Temperature : Start record 25.5 °C , Stop record 25.6 °C
Relative Humidity : Start record 54.5 %RH , Stop record 54.6 %RH
Atmospheric Pressure : Start record 1001.2 mbar , Stop record 1001.3 mbar

Max. Capacity : 220 g Resolution : 0.0001 g

Departure from nominal value

Nominal Value (g)	Correction Value (g) Before Adjusted	Correction Value After Adjusted	Uncertainty ± (g)
0 *	0.0000	-	0.000082
20	- 0.0001	-	0.00025
40	- 0.0001	-	0.00026
60	- 0.0001	-	0.00028
80	- 0.0002	-	0.00028
100	- 0.0001	-	0.00028
120	- 0.0002	-	0.00046
140	- 0.0002	-	0.00046
160	- 0.0002	-	0.00046
180	- 0.0003	-	0.00046
220	- 0.0002	-	0.00059

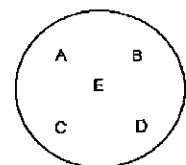
Marked * are not included in the NSC-ONSC accreditation schedule for our laboratory.

Repeatability of reading

Load (g) : 220
Standard deviation (g) : 0.00000
Maximum difference (g) : 0.0000
between successive reading

Off-centre loading

Load (g) : 100
Position A (g) : 100.0000
Position B (g) : 100.0000
Position C (g) : 100.0000
Position D (g) : 100.0000
Position E (g) : 100.0000
Maximum (g) : 0.0000
difference



Front View

Condition As-Received : Used Item

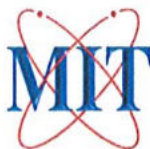
The measurement results and statements of conformity with specification only relate to the item calibrated.

Measurement Standards Used & Traceability :

The International System of Units (SI) through

SPC Certificate No. C02220774 for Weight Set E2 600g Serial No. MIT-STD-280, Due 08-Apr-23

End of Certificate



MIRACLE INTERNATIONAL TECHNOLOGY CO.,LTD

214 Bangwaek Rd. Bangpai Bangkae Bangkok 10160
Tel.: 0-2865-4647-8 Fax: 0-2865-4649 <http://www.mit.in.th>



CALIBRATION CERTIFICATE

Certificate No. : SS2206-022-0002

Date Issued : 10-Jun-22

Customer : OKLA TESTING & CONSULTING SERVICE CO.,LTD
63/13 Soi.Petchkasem 7, Petchkasem Rd., Thapra, Bangkok Yai, Bangkok
10600

Equipment : Electronic Balance

Manufacturer : Mettler Toledo

Model : PL3001-S

Serial No. : 1230040028

ID No./Tag No. : -

Date Received : 03-Jun-22

Date Calibrated : 03-Jun-22

Calibrated by : Mr. Nirot Parnkamnoed

Calibration Method or Calibration Procedure Used

In-house method : CP-06 base on UKAS LAB 14 Edition 6 October 2019.

This certificate is traceable to national standards, which realize the units of measurement according to the International System of Units (SI).

Result of Calibration

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

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Approved by:



Certificate No. : SS2206-022-0002

Environment : Ambient Temperature : Start record 25.4 °C , Stop record 25.5 °C
Relative Humidity : Start record 54.5 %RH , Stop record 54.6 %RH
Atmospheric Pressure : Start record 1001.2 mbar , Stop record 1001.3 mbar

Max. Capacity : 3100 g

Resolution : 0.1 g

Departure from nominal value

Nominal Value (g)	Before Adjusted Correction (g)	After Adjusted Correction (g)	Uncertainty ± g
0 *	0.0	-	0.082
300	0.0	-	0.082
600	0.0	-	0.082
900	0.0	-	0.082
1200	0.0	-	0.082
1500	0.0	-	0.082
1800	0.0	-	0.082
2100	0.0	-	0.082
2400	0.0	-	0.082
3000	0.0	-	0.083
3100	0.0	-	0.083

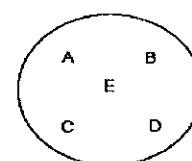
Marked * are not included in the NSC-ONSC accreditation schedule for our laboratory.

Repeatability of reading

Load (g) : 3100
Standard deviation (g) : 0.00
Maximum difference (g) : 0.0
between successive reading

Off-centre loading

Load (g) : 1000
Position A (g) : 1000.0
Position B (g) : 1000.0
Position C (g) : 1000.0
Position D (g) : 1000.0
Position E (g) : 1000.0
Maximum (g) : 0.0
difference



Front View

Condition As-Received : Used Item

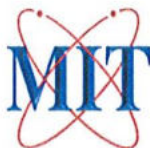
The measurement results and statements of conformity with specification only relate to the item calibrated.

Measurement Standards Used & Traceability :

The International System of Units (SI) through

Calibratech Certificate No. 64-210359-1 for Weight Standard 6 kg (F1) Serial No. MIT-STD-61, Due 05-Aug-22

End of Certificate



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214 Bangwaek Rd. Bangpai Bangkae Bangkok 10160
Tel.: 0-2865-4647-8 Fax: 0-2865-4649 <http://www.mit.in.th>



CALIBRATION CERTIFICATE

Certificate No. : SS2206-022-0003

Date Issued : 10-Jun-22

Customer : OKLA TESTING & CONSULTING SERVICE CO.,LTD
63/13 Soi.Petchkasem 7, Petchkasem Rd., Thapra, Bangkok Yai, Bangkok
10600

Equipment : Electronic Balance

Manufacturer : Mettler Toledo

Model : PL6001-S

Serial No. : 1230510473

ID No./Tag No. : -

Date Received : 03-Jun-22

Date Calibrated : 03-Jun-22

Calibrated by : Mr. Nirot Parnkamnoed

Calibration Method or Calibration Procedure Used

In-house method : CP-06 base on UKAS LAB 14 Edition 6 October 2019.

This certificate is traceable to national standards, which realize the units of measurement according to the International System of Units (SI).

Result of Calibration

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

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Approved by:



Certificate No. : SS2206-022-0003

Environment : Ambient Temperature : Start record 25.4 °C , Stop record 25.5 °C
Relative Humidity : Start record 54.5 %RH , Stop record 54.6 %RH
Atmospheric Pressure : Start record 1001.2 mbar , Stop record 1001.3 mbar

Max. Capacity : 6000 g

Resolution : 0.1 g

Departure from nominal value

Nominal Value (g)	Before Adjusted Correction (g)	After Adjusted Correction (g)	Uncertainty ± g
0 *	0.0	-	0.082
600	0.0	-	0.082
1200	0.0	-	0.082
1800	0.0	-	0.082
2400	0.0	-	0.082
3000	0.0	-	0.083
3600	0.0	-	0.083
4200	0.0	-	0.083
4800	0.0	-	0.083
5400	0.0	-	0.083
6000	0.0	-	0.083

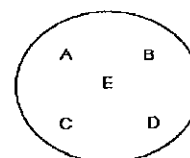
Marked * are not included in the NSC-ONSC accreditation schedule for our laboratory.

Repeatability of reading

Load (g) : 6000
Standard deviation (g) : 0.00
Maximum difference (g) : 0.0
between successive reading

Off-centre loading

Load (g) : 2000
Position A (g) : 2000.0
Position B (g) : 2000.0
Position C (g) : 2000.0
Position D (g) : 2000.0
Position E (g) : 2000.0
Maximum (g) : 0.0
difference



Front View

Condition As-Received : Used Item

The measurement results and statements of conformity with specification only relate to the item calibrated.

Measurement Standards Used & Traceability :

The International System of Units (SI) through

Calibratech Certificate No. 64-210359-1 for Weight Standard 6 kg (F1) Serial No. MIT-STD-61, Due 05-Aug-22

Calibratech Certificate No. 65-210114-1 for Weight Standard 5 kg (F1) ** Serial No. MIT-STD-138, Due 15-Mar-23

End of Certificate

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : REFRIGERATOR [FREEZER]
MANUFACTURER : SHIMAX
MODEL / TYPE : MAC3D
SERIAL NO. : N/A[011/190118]
CLID. NO. : 332200066
JOB CONTROL NO. : 220112003165

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

DATE OF RECEIVED : 12 January 2022

DATE OF ISSUED : 21 January 2022

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Calibration Engineer

Approved By :

21 January 2022

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. Q22003165

F3-011-04/01-12

page 1 of 4



@clccalibration

REPORT OF CALIBRATION

FOR

NOMENCLATURE : REFRIGERATOR [FREEZER]
MANUFACTURER : SHIMAX
MODEL / TYPE : MAC3D
SERIAL NO. : N/A[011/190118]
LOCATION SITE : OKLA 67
DATE OF CALIBRATION : 17 January 2022

ENVIRONMENT CONDITIONS :

Temperature : 28 °C to 30 °C

Relative Humidity : 52% to 55 %

PROCEDURE USED :

This instrument was calibrated under procedure No. **WI-305-165** based on **TLAS G-20** as calibration guidelines.

The calibration was performed by using Hydra Data Logger which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

Hydra Data Logger, Fluke Model 2620 S/N. 5592550.

TRACEABILITY :

The measurements are traceable to International System of Units (SI) , through Calibration Laboratory Co., Ltd.

Certificate No. Q21068655, Due Date 27 July 2022.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table 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:2013)"

Certificate No. Q22003165

F3-011-04/01-12

page 2 of 4



@clccalibration



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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



NSC-TISI-TIS 17025
CALIBRATION 0059
CLC

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The table in the following gives the calibration results and associated measurement uncertainties of the measuring refrigerator [freezer].

CALIBRATION DATA

1. REFRIGERATOR [FREEZER] PERFORMANCE

DUC		Measured Uniformity	Measured Stability	Measured Overall
Setting (°C)	Indicating (°C)	(°C)	(°C)	Variation (°C)
2.0	2.0	0.76	0.35	1.62
4.0	4.0	0.76	0.21	1.34
6.0	6.0	0.71	0.08	1.14

Certificate No. Q22003165

F3-011-04/01-12

page 3 of 4



@clccalibration

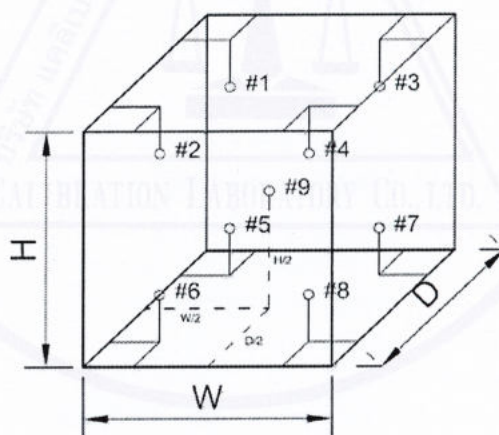
CALIBRATION DATA

2. TEMPERATURE DISTRIBUTION

DUC		Measured Temperature (°C)@Probe No.9 is Ref.									Uncertainty ± (°C)	Coverage factor k
Setting (°C)	Indicating (°C)	1	2	3	4	5	6	7	8	9		
2.0	2.0	2.06	2.02	0.91	1.10	1.45	1.46	0.97	0.85	1.38	0.61	2,00
4.0	4.0	3.88	3.87	2.85	2.99	3.29	3.38	2.82	2.76	3.19	0.51	2,00
6.0	6.0	5.88	5.87	4.96	5.06	5.32	5.41	4.86	4.84	5.21	0.46	2,00

Technical Note : W = 50 cm, D = 38 cm, H = 125 cm.

The Scope of Accredited TISI Certificate No. 19C087/0655 Issue 1 Page 105 of 111



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

End of Certificate

Certificate No. Q22003165

F3-011-04/01-12

page 4 of 4



@clccalibration



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Tel.: 0-2865-4647-8 Fax: 0-2865-4649 <http://www.mit.in.th>



CALIBRATION CERTIFICATE

Certificate No. : SS2206-022-0006

Date Issued : 10-Jun-22

Customer : OKLA TESTING & CONSULTING SERVICE CO.,LTD
63/13 Soi.Petchkasem 7, Petchkasem Rd., Thapra, Bangkok Yai,
Bangkok 10600

Equipment : Freezer

Manufacturer : S-Cool

Model : SM61M 9.5 Q

Serial No. : OKLA-LAB-011/190118

ID No./Tag No. : -

Date Received : 03-Jun-22

Date Calibrated : 03-Jun-22

Calibrated by : Mr. Nirot Parnkamnoed

Calibration Method or Calibration Procedure Used

Standard method : CP-05 TLAS G-20.

This certificate is traceable to national standards, which realize the units of measurement according to the International System of Units (SI).

Result of Calibration

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

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Approved by



Page 1 of 2

Certificate No. : SS2206-022-0006

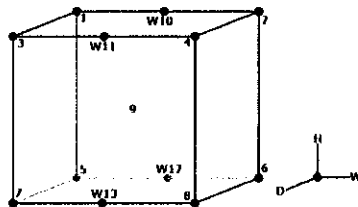
Environment : Ambient Temperature : Start record 25.5 °C, Stop record 25.6 °C
Relative Humidity : Start record 54.6 %RH, Stop record 54.7 %RH

Calibration Temperature (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Stability ¹ (°C)	Measured Uniformity ² (°C)	Overall Variation ³ (°C)
2	2.0	2.2	0.12	1.38	2.37
4	4.0	4.0	0.14	0.90	1.82
6	6.0	6.0	0.05	1.08	1.74

Without adjustment

Calibration Temperature (°C)	Standard Reading (°C), Probe No. 9 is Reference Probe										Uncertainty ⁴ ±°C
2	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9		
	2.58	0.88	2.44	1.14	1.67	1.61	2.19	1.20	1.70		
	No. W10	No. W11	No. W12	No. W13							0.38
4	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9		
	4.36	2.72	4.19	2.98	3.42	3.29	3.94	2.97	3.50		
	No. W10	No. W11	No. W12	No. W13							0.31
6	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9		
	6.11	4.69	6.08	4.91	5.23	5.07	5.78	4.88	5.24		
	No. W10	No. W11	No. W12	No. W13							0.30
	5.79	6.28	5.46	4.62							

Setting Air Fresh No. -



Condition As-Received : Used Item

The measurement results and statements of conformity with specification only relate to the item calibrated.

Measurement Standards Used & Traceability :

The International System of Units (SI) through

MIT Certificate No. AD2202-080-0001 for Digital Thermometer with Probe (Agilent) Module 1 (245) Serial No. US37005130, Due 04-Aug-22

Notes : 1. The temperature stability is the one-half of greatest maximum difference of measured temperatures at any one probe.

2. The temperature uniformity is the maximum difference of measured temperatures between of any probes and the measured temperature at the reference location which are observed at same time.

3. Overall variation is the difference of maximum and minimum measured temperatures throughout observation time.

4. The uncertainty of measurement is included temperature stability.

5. The temperature uniformity, stability, overall variation and indicating temperature is applicable to all air or gas filled temperature controlled enclosures at atmospheric pressure.

End of Certificate



MIRACLE INTERNATIONAL TECHNOLOGY CO.,LTD

214 Bangwaek Rd. Bangpai Bangkae Bangkok 10160

Tel.: 0-2865-4647-8 Fax: 0-2865-4649 <http://www.mit.in.th>



CALIBRATION CERTIFICATE

Certificate No. : SS2206-022-0004

Date Issued : 10-Jun-22

Customer : OKLA TESTING & CONSULTING SERVICE CO.,LTD
63/13 Soi.Petchkasem 7, Petchkasem Rd., Thapra, Bangkok Yai,
Bangkok 10600

Equipment : Hot Air Oven

Manufacturer : KWF

Model : S0V70B

Serial No. : KWF2021021902

ID No./Tag No. : -

Date Received : 03-Jun-22

Date Calibrated : 03-Jun-22

Calibrated by : Mr. Nirot Parnkamnoed

Calibration Method or Calibration Procedure Used

Standard method : CP-05 TLAS G-20.

This certificate is traceable to national standards, which realize the units of measurement according to the International System of Units (SI).

Result of Calibration

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

This certificate may not be reproduced other than in full except with the prior written approval of the Miracle International Technology Company Limited.

Approved by:



Page 1 of 2

Certificate No. : SS2206-022-0004

Environment : Ambient Temperature : Start record 25.5 °C, Stop record 25.7 °C
Relative Humidity : Start record 54.6 %RH, Stop record 54.7 %RH

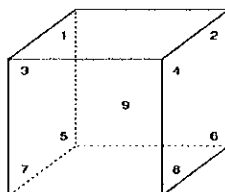
Calibration Temperature (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Stability ¹ (°C)	Measured Uniformity ² (°C)	Overall Variation ³ (°C)
104	104.0	104.0	0.21	0.62	0.82
140	140.0	140.0	0.23	0.82	0.94
160	160.0	160.0	0.21	1.39	1.68
180	180.0	180.0	0.34	1.30	1.81

Without adjustment

Calibration Temperature (°C)	STD No. 1 (°C)	STD No. 2 (°C)	STD No. 3 (°C)	STD No. 4 (°C)	STD No. 5 (°C)	STD No. 6 (°C)	STD No. 7 (°C)	STD No. 8 (°C)	STD No. 9 (°C)	Uncertainty ⁴ ±°C
104	104.56	104.42	104.30	104.43	104.54	104.68	104.34	104.68	104.81	0.95
140	140.25	140.43	140.58	140.51	140.55	140.65	140.32	140.68	140.04	1.0
160	160.16	160.62	160.39	160.55	159.32	160.51	159.73	160.44	159.45	1.1
180	180.50	180.66	180.50	180.45	179.48	180.40	179.69	180.13	179.59	1.1

Note : Probe No. 9 is Reference Probe

Setting Air Fresh No. -



Condition As-Received : Used Item

The measurement results and statements of conformity with specification only relate to the item calibrated.

Measurement Standards Used & Traceability :

The International System of Units (SI) through

MIT Certificate No. AD2202-084-0002 for Data Acquisition Module 2 TC type T Serial No. US37003770, Due 08-Aug-22

Notes : 1. The temperature stability is the one-half of greatest maximum difference of measured temperatures at any one probe.

2. The temperature uniformity is the maximum difference of measured temperatures between of any probes and the measured temperature at the reference location which are observed at same time.

3. Overall variation is the difference of maximum and minimum measured temperatures throughout observation time.

4. The uncertainty of measurement is included temperature stability.

5. The temperature uniformity, stability, overall variation and indicating temperature is applicable to all air or gas filled temperature controlled enclosures at atmospheric pressure.

End of Certificate



MIRACLE INTERNATIONAL TECHNOLOGY CO.,LTD

214 Bangwack Rd. Bangpai Bangkae Bangkok 10160
Tel.: 0-2865-4647-8 Fax: 0-2865-4649 <http://www.mit.in.th>



CALIBRATION CERTIFICATE

Certificate No. : SS2206-022-0005

Date Issued : 10-Jun-22

Customer : OKLA TESTING & CONSULTING SERVICE CO.,LTD
63/13 Soi.Petchkasem 7, Petchkasem Rd., Thapra, Bangkok Yai,
Bangkok 10600

Equipment : Hot Air Oven

Manufacturer : Labtech

Model : LDO-060E

Serial No. : DLCCCL0513C

ID No./Tag No. : -

Date Received : 03-Jun-22

Date Calibrated : 03-Jun-22

Calibrated by : Mr. Nirot Parnkamnoed

Calibration Method or Calibration Procedure Used

Standard method : CP-05 TLAS G-20.

This certificate is traceable to national standards, which realize the units of measurement according to the International System of Units (SI).

Result of Calibration

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

This certificate may not be reproduced other than in full except with the prior written approval of the Miracle International Technology Company Limited.

Approved by:



Certificate No. : SS2206-022-0005

Environment : Ambient Temperature : Start record 25.5 °C, Stop record 25.7 °C
Relative Humidity : Start record 54.6 %RH, Stop record 54.7 %RH

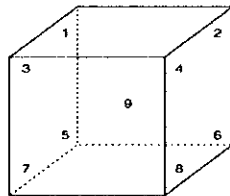
Calibration Temperature (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Stability ¹ (°C)	Measured Uniformity ² (°C)	Overall Variation ³ (°C)
104	104	104	0.52	1.46	2.19
140	140	140	0.98	1.54	2.40
160	160	160	0.98	1.46	2.38
180	180	180	1.45	2.48	3.32

Without adjustment

Calibration Temperature (°C)	STD No. 1 (°C)	STD No. 2 (°C)	STD No. 3 (°C)	STD No. 4 (°C)	STD No. 5 (°C)	STD No. 6 (°C)	STD No. 7 (°C)	STD No. 8 (°C)	STD No. 9 (°C)	Uncertainty ⁴ ±°C
104	104.77	104.49	104.15	103.88	104.11	104.29	103.44	103.33	103.56	1.2
140	140.90	140.59	140.83	140.69	141.17	141.13	140.69	140.79	140.75	1.6
160	160.95	160.54	160.79	160.78	161.19	161.15	160.92	161.15	160.74	1.7
180	181.55	181.08	181.34	181.30	181.83	182.02	181.42	181.61	181.36	2.1

Note : Probe No. 9 is Reference Probe

Setting Air Fresh No. -



Condition As-Received : Used Item

The measurement results and statements of conformity with specification only relate to the item calibrated.

Measurement Standards Used & Traceability :

The International System of Units (SI) through

MIT Certificate No. AD2202-084-0002 for Data Acquisition Module 2 TC type T Serial No. US37003770, Due 08-Aug-22

Notes : 1. The temperature stability is the one-half of greatest maximum difference of measured temperatures at any one probe.

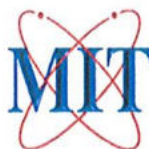
2. The temperature uniformity is the maximum difference of measured temperatures between of any probes and the measured temperature at the reference location which are observed at same time.

3. Overall variation is the difference of maximum and minimum measured temperatures throughout observation time.

4. The uncertainty of measurement is included temperature stability.

5. The temperature uniformity, stability, overall variation and indicating temperature is applicable to all air or gas filled temperature controlled enclosures at atmospheric pressure.

End of Certificate



MIRACLE INTERNATIONAL TECHNOLOGY CO.,LTD

214 Bangwaek Rd. Bangpai Bangkae Bangkok 10160

Tel.: 0-2865-4647-8 Fax: 0-2865-4649 <http://www.mit.in.th>



CALIBRATION CERTIFICATE

Certificate No. : SS2206-022-0008

Date Issued : 10-Jun-22

Customer : OKLA TESTING & CONSULTING SERVICE CO.,LTD
63/13 Soi.Petchkasem 7, Petchkasem Rd., Thapra, Bangkok Yai,
Bangkok 10600

Equipment : Incubator

Manufacturer : S-Cool

Model : SM 61 M

Serial No. : 18021147

ID No./Tag No. : -

Date Received : 03-Jun-22

Date Calibrated : 03-Jun-22

Calibrated by : Mr. Nirot Parnkamnoed

Calibration Method or Calibration Procedure Used

Standard method : CP-05 TLAS G-20.

This certificate is traceable to national standards, which realize the units of measurement according to the International System of Units (SI).

Result of Calibration

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

This certificate may not be reproduced other than in full except with the prior written approval of the Miracle International Technology Company Limited.

Approved by:



Page 1 of 2

Certificate No. : SS2206-022-0008

Environment : Ambient Temperature : Start record 25.5 °C, Stop record 25.6 °C
Relative Humidity : Start record 54.5 %RH, Stop record 54.6 %RH

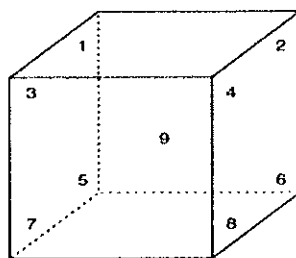
Calibration Temperature (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Stability ¹ (°C)	Measured Uniformity ² (°C)	Overall Variation ³ (°C)
20	20.0	20.0	0.08	0.76	1.11

Without adjustment

Calibration Temperature (°C)	STD No. 1 (°C)	STD No. 2 (°C)	STD No. 3 (°C)	STD No. 4 (°C)	STD No. 5 (°C)	STD No. 6 (°C)	STD No. 7 (°C)	STD No. 8 (°C)	STD No. 9 (°C)	Uncertainty ⁴ ±°C
20	19.47	19.38	19.65	19.80	19.39	20.25	19.26	19.95	20.00	0.25

Note : Probe No. 9 is Reference Probe

Setting Air Fresh No. -



Condition As-Received : Used Item

The measurement results and statements of conformity with specification only relate to the item calibrated.

Measurement Standards Used & Traceability :

The International System of Units (SI) through

MIT Certificate No. AD2111-076-0001 for Digital Thermometer with Probe (Agilent) Module 1 (08) NTC & Pt1000 Serial No. MY44000197, Due 05-Jun-22

Notes : 1. The temperature stability is the one-half of greatest maximum difference of measured temperatures at any one probe.

2. The temperature uniformity is the maximum difference of measured temperatures between of any probes and the measured temperature at the reference location which are observed at same time.

3. Overall variation is the difference of maximum and minimum measured temperatures throughout observation time.

4. The uncertainty of measurement is included temperature stability.

5. The temperature uniformity, stability, overall variation and indicating temperature is applicable to all air or gas filled temperature controlled enclosures at atmospheric pressure.

End of Certificate

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : pH METER
MANUFACTURER : HANNA INSTRUMENTS
MODEL / TYPE : HI5521/HI1131
SERIAL NO. : 04160019101/061334CN
CLID. NO. : 272101219
JOB CONTROL NO. : 220426042324

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

DATE OF RECEIVED : 26 April 2022

DATE OF ISSUED : 29 April 2022

Report of calibration screening must not be taken in part. Except complete. Without the approval of the Calibration Laboratory Co., Ltd.

Calibrated By :

Calibration Engineer

Approved By :

Authorized Signatory

29 April 2022

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. Q22042324

F3-011-04/01-12

page 1 of 3



@clccalibration

REPORT OF CALIBRATION

FOR

NOMENCLATURE : **pH METER**
MANUFACTURER : **HANNA INSTRUMENTS**
MODEL / TYPE : **HI5521/HI1131**
SERIAL NO. : **04160019101/061334CN**
DATE OF CALIBRATION : **27 April 2022**

ENVIRONMENT CONDITIONS :

Temperature : $(25 \pm 2.5) ^\circ\text{C}$

Relative Humidity : $(50 \pm 15) \% \text{ RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. **WI-305-128**. The calibration was performed by direct measurement with Certified Reference Material (CRM).

REFERENCE STANDARD USED :

1. pH Standard Solution, NIMT TRM CODE TRM-S-2003, TRM CODE TRM-S-2007.
2. pH Standard Solution, Control Company Catalog Number 06-664-260,11754256, Lot Number CC728484.

TRACEABILITY :

1. The measurements are traceable to International System of Units (SI) , through National Institute of Metrology (Thailand).
Lot Number. 160221 , 180121. Due Date 14 June 2022.
2. The measurements are traceable to International System of Units (SI) , through Control Company.
Certificate No. 4281-12405788 , Due Date 30 June 2023.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor complies with the table 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:2021)"

Certificate No. Q22042324

F3-011-04/01-12

page 2 of 3





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



NSC-TISI-TIS 17025
CALIBRATION 0059
CLC

CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

The table in the following gives the calibration results and associated measurement uncertainties of pH meter.

CALIBRATION DATA

pH METER RESULT @ 25 °C

Standard pH Buffer Solution (pH)	pH Meter Reading (pH)	pH Meter Reading (mV)	Correction (pH)	Uncertainty of pH Measurement (\pm pH)	k Factor
4.000	4.01	121.0	-0.010	0.023	2,87
6.996	7.01	-47.4	-0.014	0.015	2,06
10.007	10.04	-203.7	-0.033	0.100	2,25

Note. The Scope of Accredited TISI Certificate No. 19C087/0655 Issue 1 Page 79 of 111

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

End of Certificate

Certificate No. Q22042324

F3-011-04/01-12

page 3 of 3



@clccalibration



MIRACLE INTERNATIONAL TECHNOLOGY CO.,LTD

214 Bangwaek Rd. Bangpai Bangkae Bangkok 10160
Tel.: 0-2865-4647-8 Fax: 0-2865-4649 <http://www.mit.in.th>



CALIBRATION CERTIFICATE

Certificate No. : SS2206-022-0007

Date Issued : 10-Jun-22

Customer : OKLA TESTING & CONSULTING SERVICE CO.,LTD
63/13 Soi.Petchkasem 7, Petchkasem Rd., Thapra, Bangkok Yai,
Bangkok 10600

Equipment : Water Bath

Manufacturer : Labtech

Model : LWB-222A

Serial No. : BCCLJ23001C

ID No./Tag No. : -

Date Received : 03-Jun-22

Date Calibrated : 03-Jun-22

Calibrated by : Mr. Nirot Parnkamnoed

Calibration Method or Calibration Procedure Used

In-house method : CP-14 base on ASTM E 715-80 (Reapproved 2011).

This certificate is traceable to national standards, which realize the units of measurement according to the International System of Units (SI).

Result of Calibration

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

This certificate may not be reproduced other than in full except with the prior written approval of the Miracle International Technology Company Limited.

Approved by



Page 1 of 2

Certificate No. : SS2206-022-0007

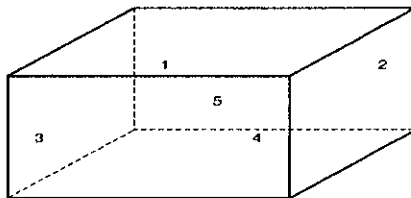
Environment : Ambient Temperature : Start record 25.4 °C, Stop record 25.5 °C
Relative Humidity : Start record 54.5 %RH, Stop record 54.5 %RH

Calibration Temperature (°C)	Setting Temperature (°C)	Indicating Temperature (°C)	Measured Stability ¹ (°C)	Measured Uniformity ² (°C)	Overall Variation ³ (°C)
60	60	60	0.24	1.02	1.03

Without adjustment

Calibration Temperature (°C)	STD No. 1 (°C)	STD No. 2 (°C)	STD No. 3 (°C)	STD No. 4 (°C)	STD No. 5 (°C)	Uncertainty ⁴ ±°C
60	61.20	61.18	61.11	61.20	61.59	0.40

Note : Probe No. 5 is Reference Probe



Condition As-Received : Used Item

The measurement results and statements of conformity with specification only relate to the item calibrated.

Measurement Standards Used & Traceability :

The International System of Units (SI) through

MIT Certificate No. AD2111-076-0001 for Digital Thermometer with Probe (Agilent) Module 1 (08) NTC & Pt1000
Serial No. MY44000197, Due 05-Jun-22

- Notes :
1. The temperature stability is the one-half of greatest maximum difference of measured temperatures at any one probe.
 2. The temperature uniformity is the maximum difference of measured temperatures between of any probes and the measured temperature at the reference location which are observed at same time.
 3. Overall variation is the difference of maximum and minimum measured temperatures throughout observation time.
 4. The uncertainty of measurement is included temperature stability.

End of Certificate

ที่ อก ๐๓๑๐(๑)/ ๑๐๗๖๖



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ เขตราชเทวี
กรุงเทพมหานคร ๑๐๔๐๐

๒๔ กันยายน ๒๕๖๓

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอชวีอี จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๕ พฤษภาคม ๒๕๖๓

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอชวีอี จำกัด จำนวน ๒ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอชวีอี จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ว-๑๖๕ สถานที่ตั้งเลขที่ ๖๐๓ ซอยจรัญสนิทวงศ์ ๔๖ ถนนจรัญสนิทวงศ์ แขวงบางยี่ขัน
เขตบางพลัด กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอชวีอี จำกัด ต่ออายุหนังสือรับขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

- | | |
|----------------------------|----------------------------|
| ๑) นายศิวพันธุ์ ชูอินทร์ | ทะเบียนเลขที่ ว-๑๖๕-ค-๓๕๙๙ |
| ๒) นายเอกลักษณ์ ลีลาบริหาร | ทะเบียนเลขที่ ว-๑๖๕-ค-๕๘๘๐ |

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

- | | |
|-----------------------------|----------------------------|
| ๑) นางสาวทิพวรรณ วงศ์บุญตัน | ทะเบียนเลขที่ ว-๑๖๕-จ-๘๔๙๒ |
| ๒) นางสาวสุปรียา หล้าอิน | ทะเบียนเลขที่ ว-๑๖๕-จ-๘๔๙๓ |
| ๓) นางสาวอังคณา วงศ์วิเศษ | ทะเบียนเลขที่ ว-๑๖๕-จ-๘๙๐๗ |
| ๔) นางสาวยมพร เหมพนม | ทะเบียนเลขที่ ว-๑๖๕-จ-๘๙๐๘ |
| ๕) นางสาวจิราภรณ์ ผงผานอก | ทะเบียนเลขที่ ว-๑๖๕-จ-๘๙๐๙ |
| ๖) นายพิษณุนาถ นาพิลา | ทะเบียนเลขที่ ว-๑๖๕-จ-๘๙๑๐ |

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๓๑ รายการ

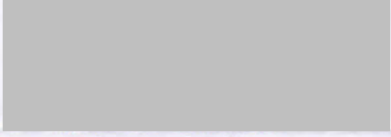
ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้...

หนังสือฉบับนี้จะหมดอายุในวันที่ ๑๕ พฤษภาคม ๒๕๖๖ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อ
กรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นสุดอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ


นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๒๐๒ ๔๐๐๒ ๐ ๒๒๐๒ ๔๑๔๖

โทรสาร ๐ ๒๓๕๔ ๓๒๐๘ ๐ ๒๓๕๔ ๓๔๑๕

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอชวีอี จำกัด

เลขทะเบียน ว-๑๖๕

ที่ อก ๐๓๑๐(๑)/ ๑๐๗๖๖

ลงวันที่ ๒๕ กันยายน ๒๕๖๓

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ รายการ


น้ำเสีย จำนวน 31 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldicarb	High-Performance Liquid Chromatographic Method
2	Aldicarb sulfone	High-Performance Liquid Chromatographic Method
3	Aldicarb sulfoxide	High-Performance Liquid Chromatographic Method
4	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method
5	BDMC	High-Performance Liquid Chromatographic Method
6	α -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method
7	Biochemical Oxygen Demand	5-Day BOD Test, Azide Modification Method
8	Carbaryl	High-Performance Liquid Chromatographic Method
9	Carbofuran	High-Performance Liquid Chromatographic Method
10	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method
11	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method
12	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method
13	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method
14	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method
15	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method
16	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method
17	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method
18	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method
19	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method
20	Methiocarb	High-Performance Liquid Chromatographic Method
21	Methomyl	High-Performance Liquid Chromatographic Method
22	1-Naphthol	High-Performance Liquid Chromatographic Method
23	Oil & Grease	Liquid-Liquid, Partition-Gravimetric Method
24	Oxamyl	High-Performance Liquid Chromatographic Method
25	pH	Electrometric Method
26	Propoxur	High-Performance Liquid Chromatographic Method
27	Sulfide	ZnS Precipitation, Iodometric Method
28	Temperature	Laboratory and Field Methods

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
29	Total Dissolved Solids	Dried at 180 °C
30	Total Kjeldahl Nitrogen	Macro-Kjeldahl, Titrimetric Method
31	Total Suspended Solids	Dried at 103-105 °C

เอกสารอ้างอิง

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

(น 
ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ



NSC-TISI-TIS 17025
CALIBRATION 0224



DKSH

CALIBRATION CERTIFICATE

Certificate No. : 21ST215

Job No. : 109918

Issue Date : 19 April 2021
Location of Calibration : Microorganism Laboratory
Customer Name : HVE CO., LTD.
603 Soi. Jaransanitwong 46, Jaransanitwong Rd.,
Bangyeekun, Bangplad, Bangkok 10700

Equipment Name : Autoclave
Manufacturer : LABTECH
Model : LAC-5100SC
Serial No. : PXOPXV10240
ID No. : 080
Resolution : 1 °C
Condition of calibrated item : Good
Received Date : 7 April 2021
Calibration Date : 7 April 2021
Ambient Temperature : (25 ± 10) °C
Relative Humidity : (50 ± 30) %
Line Voltage : (220 ± 10 %) Voltage

Calibrated by :



The statement of compliance is based on a 95% coverage probability for the expanded uncertain

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head of Calibration Laboratory Department.

DKSH (Thailand) Limited

Technology

141/12 Moo 1, Tambon Payom, TICON Logistics Park (TPARK WANGNO) Phaholyothin Road km. 55.5, Wangnoi District,

Pra-nakorn Sri Ayuthaya 13170 Phone 0-2301-7208, Fax : 0-3579-9832, E-mail: premote.r@dksh.com

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CALIBRATION REPORT

Certificate No. : 21ST215

Job No. : 109918

1. Calibration Procedure :

- This instrument was calibrated by Temperature data logger type RTD installation three sensors into the chamber of autoclave therefore calibration procedure CP-T15-01 in-house methods based on BS 2646 : Autoclaves for sterilization in laboratories ; Part 5 Methods of test for function and performance
- The temperature scale used was based on ITS - 90 .
- All data show below were final values of calibration process and the initial data may be obtained upon customer request.

2. Reference Standards Instrument :

Instrument	Serial No.	Certificate No.	Traceability	Due Date
Temperature Data Logger Type RTD	P11006	20T0151	DKSH	18 August 2021
	P11007	20T0152		18 August 2021
	P11008	20T0153		18 August 2021

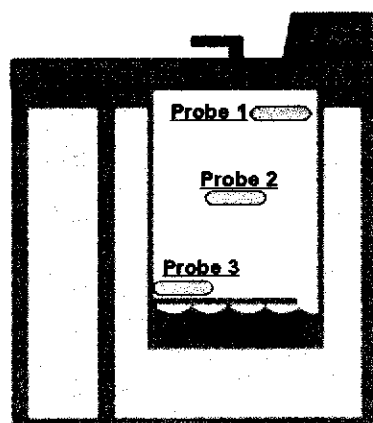
This certificate is traceable to The International System of Unit.

3. Result of Calibration : Without Adjustment

3.1 Environment condition :

Ambient temperature :	Minimum Value	25.0 °C	Maximum Value	30.0 °C
Relative humidity :	Minimum Value	50.0 %	Maximum Value	60.0 %
Line voltage supplied :	Minimum Value	225.3 VAC	Maximum Value	228.5 VAC

3.2 Installation Standard Thermometer :



Position Diagrams

Probe 1 : Installation Attached to the load temperature probe, within 20 mm

Probe 2 : Installation in the half of the Chamber autoclave

Probe 3 : Installation in the Chamber drain, within 100 mm



CALIBRATION REPORT

Certificate No. : 21ST215

Job No. : 109918

Table1 : Reporting of Temperature within chamber autoclaves

Calibration point (°C)	Average Measured Temperature (°C) @ Sensor No. (Sensor No.2 is REF)			Uncertainty ($k = 2$) \pm (°C)
	#1	#2	#3	
115	115.03	115.09	115.28	0.88
121	121.65	121.71	122.07	0.92

Table 2 : Reporting of Characterization within chamber autoclaves

Indicator Set point (°C)	Indicator Reading (°C)		Mpa	Stability \pm (°C)	Uniformity (°C)	Overall variation (°C)
	MAX	MIN				
113	113	113	0.10	0.47	0.58	1.07
120	120	120	0.12	0.50	0.70	1.34

Note :

Time in Sterilization is 20 minutes and Setting interval time is 2 seconds per record data

The measured by temperature data readout by software "Madgetech Data Logger Software"

The quoted uncertainty include " Stability " and Loading effect (20% of Temp 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 the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the bath under steady state conditions.

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

Indicating Temperature - the average reading of indicating device that forms the integral part

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

The statements of compliance with specification (or requirement) is based on a 95% coverage probability for the expanded uncertainty of the measurement results on which the decision of compliance is based.

CALIBRATION REPORT

Certificate No. : 21ST215

Job No. : 109918

Result of calibration : Measured Temperature

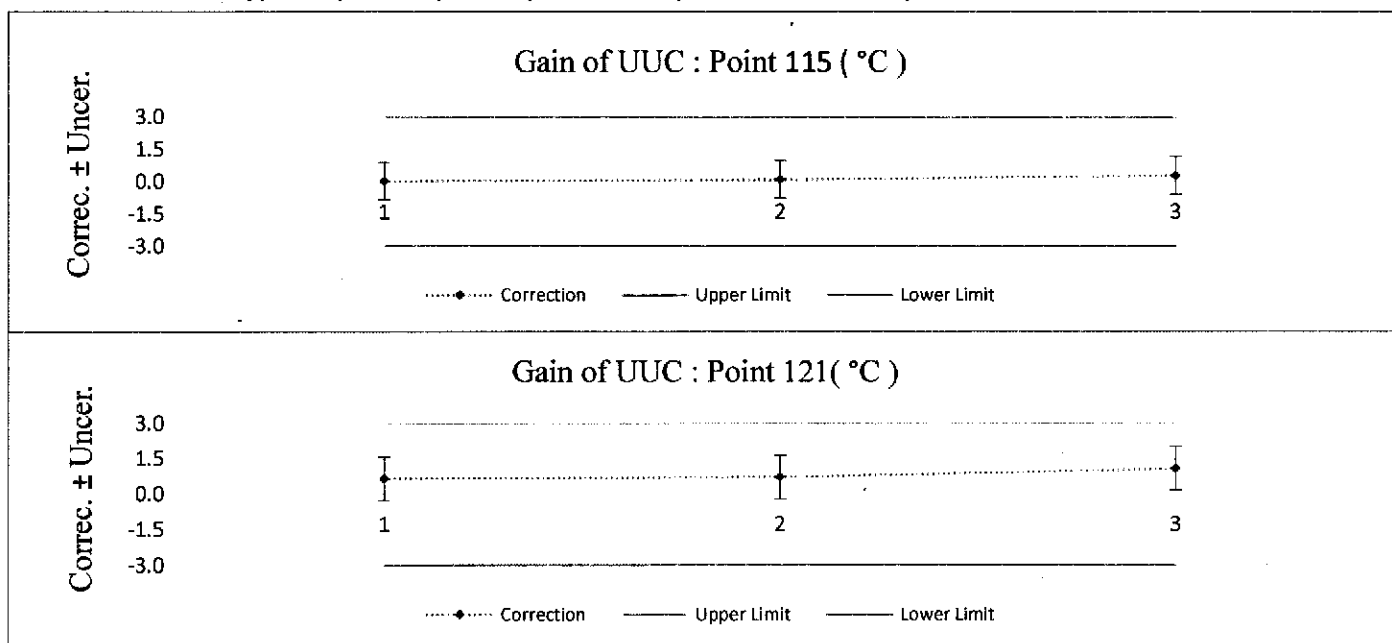
Calibration Point (°C)	Correction + Uncertainty (°C)			Correction - Uncertainty (°C)			Gain of UUC : From the specified of the customer ± (°C)	
	#1	#2	#3	#1	#2	#3		
115	0.91	0.97	1.16	-0.85	-0.79	-0.60	3.0	-3.0
121	1.57	1.63	1.99	-0.27	-0.21	0.15	3.0	-3.0

Measurement results are reported as:

- Pass - acceptance based on simple acceptance; the measurement result being below the acceptance limit, AL=TL
- Fail - rejection based on if the measurement result is above acceptance limit AL=TL

Note :

- AL Meaning Acceptance Limit.
- TL Meaning Tolerance Limit.
- Decision Rules : Type simple acceptance (Customer specified the criteria)



--END--

Certificate of Calibration

Certificate No. : 64-300284-7

Page : 1 of 2

Submitted by : HVE Co.,Ltd.

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

Equipment : Buret

Manufacturer : JSGW

Capacity : 25 ml Graduation : 0.05 ml

ID No. : BU25/2

Environment : Ambient Temperature : (23 ± 2) °C

Relative Humidity : (50 ± 15) %

Air Pressure : 1006.4 mbar.

Date of Received : 16 April 2021

Date of Calibration : 24 April 2021

Date of Issue : 24 April 2021

Calibrated by : Areerat Sombun

Calibration Method : In-house method CAL-M3001 based on ASTM E 542-01

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

Electronic Balance

ID No.	Cert. No.	Due Date	Traceability
241003	63-200378-2	02 Jun 2021	National Institute of Metrology (Thailand) (NIMT)

Approved by :



The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 64-300284-7

Page : 2 of 2

Result of Calibration : This result of true Volume is referred to standard temperature at 20 °C

UUC Condition As-Received : Good

Delivery Time : 67.89 sec.

Nominal Volume (ml)	Measuring Volume (ml)
5	5.0296
15	14.9950
25	24.9986

Uncertainty of measurement with in \pm 0.0066 ml

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%

- o0o -



Certificate of Calibration

Certificate No. : 64-430024-1

Page : 1 of 2

Submitted by : HVE Co., Ltd.

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

Equipment : Digital Conductivity meter with probe

Manufacturer : Ohaus

Model : STARTER 30

Serial No. : B207710458

ID No. : N/A

Probe

Model : STCON3

Serial No. : 8333079641

Environment : Ambient Temperature : (25 ± 2) °C

Relative Humidity : (50 ± 15) %

Date of Received : 27 November 2021

Date of Calibration : 02 December 2021

Date of Issue : 02 December 2021

Calibrated by : Bunjerd Masri

Calibration Method : This instrument was calibrated by In-house method direct measurement by conductivity buffer solution

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

Standard Buffer Solution

Conductivity (µS/cm)	Cert. No.	Due Date	Traceability
84	09J93	09 Oct 2022	National Institute of Standards and Technology (NIST), U.S.A., S.R.M.
1413	11L72	01 Dec 2022	National Institute of Standards and Technology (NIST), U.S.A., S.R.M.
12880	31E73	01 May 2022	National Institute of Standards and Technology (NIST), U.S.A., S.R.M.

Approved by :



The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 64-430024-1

Page : 2 of 2

Result of Calibration :

UUC Condition As-Received : Good

Function : Conductivity measurement

Adjustment Curve at nominal Conductivity	Standard Buffer	UUC Reading	Correction	Uncertainty (±)	Unit
84	84.0	84.0	0.0	4.8	µS/cm
1413	1413	1413	0	63	µS/cm
12.880	12.880	12.88	0.00	0.58	mS/cm

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

- oOo -





NSC-TISI-TIS 17025
CALIBRATION 0224



CALIBRATION CERTIFICATE

Certificate No. : 20ST0552

Job No. : 00097834

Issue Date : 14 October 2020

Location of Calibration : Analysis Laboratory

Customer Name : HVE CO., LTD.
603 Soi. Jaransanitwong 46, Jaransanitwong Rd.,
Bangyeekun, Bangplad, Bangkok 10700

Equipment Name : Temperature Chamber

Manufacturer : Memmert

Model : UNB 500

Serial No. : C507.1007

ID No. : 012

Resolution : 0.5 °C

Received Date : 8 October 2020

Calibration Date : 8 October 2020

Ambient Temperature : (25 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by :



The statement of compliance is based on a 95% coverage probability for the expanded uncertainty.

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DKSH (Thailand) Limited

Technology

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Phra-nakorn Sri Ayutthaya 13170 Phone 0-2301-7208, Fax : 0-3579-9832, E-mail: pramote.r@dksh.com

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PAGE 1/4

Condition of this result of calibration :

1. Calibration Procedure :

- This instrument was calibrated by insert 9 standard RTD PT100 into chamber and Calibration according to CP-T06-01 follow up to TLAS G-20-1/02-08 (E) : Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
- The temperature scale used was based on ITS - 90 .
- All data show below were final values and the initial data may be obtained upon request.

2. Reference Standards Instrument :

Instrument	Serial No./Ins No.	Certificate No.	Traceability	Due Date
Digital Thermometer with RTD	MY49003268 / No. 1	20T0164	DKSH	17 September 2021
	Channel : 201 to 209			

This certificate is traceable to The International System of Unit.

3. Condition of Calibrated item : Good

3.1 UUC Description :

Time Constant 1 Hour 6 Minute At 104 °C

Air value or air slider level : Off ; Fan Level : -

4. Result of Calibration : Without adjustment

4.1 Environment condition :

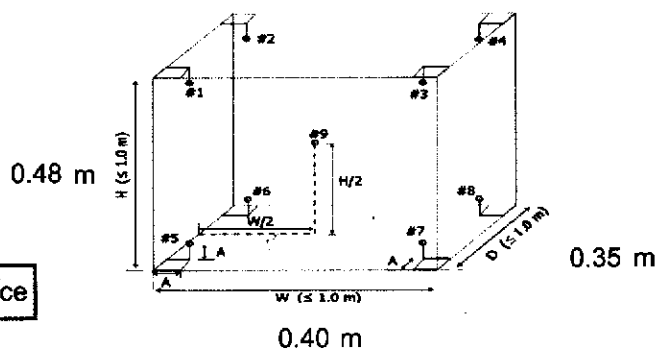
Ambient temperature :	Minimum Value	23.7 °C	Maximum Value	27.3 °C
Relative humidity :	Minimum Value	46.0 %	Maximum Value	56.3 %
Line voltage supplied :	Minimum Value	228.0 VAC	Maximum Value	234.0 VAC

4.2 Sensors Installation Diagram :

When ;

A = Distance between sensor and wall of chamber
is 10 % of the length of the each side
(W × D × H)

Sensor installation location in Chamber @ Working Space



CALIBRATION REPORT

Certificate No. : 20ST0552

Job No. : 00097834

Table1 : Reporting of Temperature

Calibration point (°C)	Average Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty (k = 2) ± (°C)
	#1	#2	#3	#4	#5	#6	#7	#8	#9	
104	104.72	104.64	104.53	104.86	103.92	103.83	103.83	103.80	103.42	0.74

Table 2 : Reporting of Characterization Result

Indicator Set Point (°C)	Indicator Reading (°C)		Stability ± (°C)	Uniformity (°C)	Overall variation (°C)
	MAX	MIN			
105.5	105.5	105.5	0.41	1.67	1.79

Note

The reference sensor is preferably located of the geometric center

The measured temperature data readout by software "Benchlink Datalogger 3"

The quoted uncertainty include " Stability " and " Loading effect (20% of Temp 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 the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady state conditions.

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

Indicating Temperature - the average reading of indicating device that forms the integral part of the enclosure.

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

The statements of compliance with specification (or requirement) is based on a 95% coverage probability for the expanded uncertainty of the measurement results on with the decision of compliance is based.

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CALIBRATION REPORT

Certificate No. : 20ST0552

Job No. : 00097834

Result of calibration : Measured Temperature

Calibration Point (°C)	Correction + Uncertainty (°C)									Gain of UUC : From the specified of the Calibration laboratory ± (°C)	
	#1	#2	#3	#4	#5	#6	#7	#8	#9		
104	1.46	1.38	1.27	1.60	0.66	0.57	0.57	0.54	0.16	1.7	-1.7

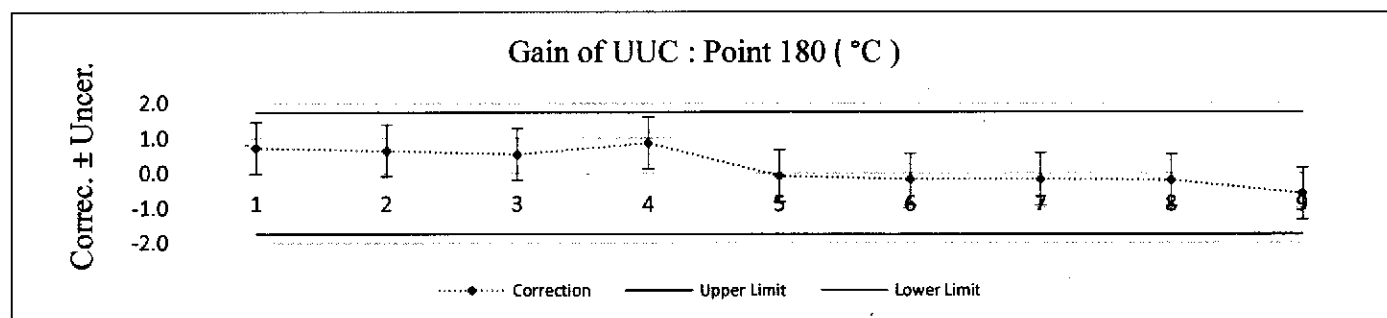
Calibration Point (°C)	Correction - Uncertainty (°C)									Gain of UUC : From the specified of the Calibration laboratory ± (°C)	
	#1	#2	#3	#4	#5	#6	#7	#8	#9		
104	-0.02	-0.10	-0.21	0.12	-0.82	-0.91	-0.91	-0.94	-1.32	1.7	-1.7

Measurement results are reported as:

- Pass - acceptance based on simple acceptance; the measurement result being below the acceptance limit, AL=TL
- Fail - rejection based on if the measurement result is above acceptance limit AL=TL

Note :

- AL Meaning Acceptance Limit.
- TL Meaning Tolerance Limit.
- Decision Rules : Type simple acceptance (Specific risk < 50% Probability of False Accept)



--END--



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

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



Certificate No. : CAL-21-772

Page : 1 of 4

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	:	Customer Laboratory
Date of Receipt	:	23 November 2021
Date of Calibration	:	23 November 2021
Date of Issue	:	23 November 2021
Ambient Temperature	:	(25±10) °C
Relative Humidity	:	(60±20) %
Condition As-Received	:	Used Item

Calibrated by



Calibration Engineer

Approved by



Calibration Manager

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

This certificate may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

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



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CALIBRATION LABORATORY

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Certificate No. : CAL-21-772

Page : 2 of 4

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	90313	2 Mar 23
Didymium Glass Filter	RM-DG	24562	90311	2 Mar 23
Neutral Density Filter	RM-1N2N3N	24568	90324	3 Mar 23
Potassium Dichromate Solution	RM-06	24567	90327	3 Mar 23

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 the Guide to CPM-CAL-02 based on ASTM E275-08 (2013) 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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Certificate No. : CAL-21-772

Page : 3 of 4

CALIBRATION REPORT

Wavelength Calibration

Certified Values of Reference Material (nm)	Nominal Value (nm)	UUC*Reading (nm)	Error (nm)	Uncertainty of Measurement (\pm nm)
361.00	361.00	360.8	-0.20	0.13
536.66	536.66	536.9	0.24	0.13
879.27	879.27	879.8	0.53	0.13

Photometric Calibration for Visible

Wavelength (nm)	Certified Values of Reference Material (A)	UUC* Reading (A)	Error (A)	Uncertainty of Measurement (\pm A)
420.0	Zero	0.000	0.0000	0.0028
	0.5824	0.582	-0.0004	0.0044
	0.7266	0.725	-0.0016	0.0040
	1.0377	1.037	-0.0007	0.0040
440.0	Zero	0.000	0.0000	0.0028
	0.5659	0.565	-0.0009	0.0042
	0.7126	0.711	-0.0016	0.0037
	1.0172	1.016	-0.0012	0.0037
465.0	Zero	0.000	0.0000	0.0028
	0.5256	0.526	0.0004	0.0044
	0.6705	0.669	-0.0015	0.0035
	0.9562	0.955	-0.0012	0.0034
546.1	Zero	0.000	0.0000	0.0028
	0.5236	0.523	-0.0006	0.0036
	0.6962	0.695	-0.0012	0.0031
	0.9933	0.992	-0.0013	0.0032
590.0	Zero	0.000	0.0000	0.0028
	0.5578	0.556	-0.0018	0.0036
	0.7523	0.750	-0.0023	0.0031
	1.0747	1.073	-0.0017	0.0032
635.0	Zero	0.000	0.0000	0.0028
	0.5655	0.564	-0.0015	0.0035
	0.7321	0.731	-0.0011	0.0031
	1.0454	1.043	-0.0024	0.0031

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-21-772

Page : 4 of 4

CALIBRATION REPORT

Photometric Calibration for UV

Wavelength (nm)	Certified Values of Reference Material (A)	UUC* Reading (A)	Error (A)	Uncertainty of Measurement (\pm A)
235.0	Zero	0.000	0.0000	0.0050
	0.7434	0.740	-0.0034	0.0051
257.0	Zero	0.000	0.0000	0.0050
	0.8607	0.856	-0.0047	0.0052
313.0	Zero	0.000	0.0000	0.0050
	0.2910	0.291	0.0000	0.0051
350.0	Zero	0.000	0.0000	0.0050
	0.6387	0.635	-0.0037	0.0054

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

Note:

UUC* : Unit Under Calibration

- End of Report -

CALIBRATION CERTIFICATE

Certificate No. : 21SB142

Job No. : 109918

Issue Date : 20 April 2021
Location : Analysis Laboratory
Customer Name : HVE Co.,Ltd.
603 Soi. Jaransanitwong 46, Jaransanitwong Rd.,
Bangyeekun, Bangplad, Bangkok 10700

Equipment Name : Electronic Balance
Manufacturer : SHIMADSU
Model : AX200
Serial No. : D432620040
ID No. : 114
Weighing Capacity : 200 g
Resolution : 0.0001 g
Received Date : 7 February 2021
Condition of Calibrated Item : Good

Calibration Date : 7 February 2021
Ambient Temperature : (25 ± 10) °C
Relative Humidity : (50 ± 30) %
Atmospheric Pressure : (1010 ± 30) mbar
Procedure Used : This calibration was conducted by using in-house calibration
procedure number CP-B01-01 based on UKAS LAB14 : 2015

Reference Standard :

Instrument	Serial No.	Certificate No.	Traceability	Due Date
Weight Set E2 (1 kg to 1 mg)	3HZ8	M1805061S	TCS	10-May-2021

This certification is traceable to the International System of Unit.

Calibrated by



The statement of compliance is based on a 95% coverage probability for the expanded uncertainty.

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Technology

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Phra nakorn Sri Ayuthaya 13170 Phone 0-2301-7268, Fax : 0-3579-9832, E-mail: pramote.r@dksh.com

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CALIBRATION REPORT

Certificate No. : 21SB142

Job No. : 109918

Result of calibration : Before adjustment.

Applied Weight (g)	Balance Reading (g)	Correction Value (g)	Uncertainty (\pm g)	Coverage Factor (k)
100.0000	99.9993	0.0007	0.00020	2.00
200.0001	199.9974	0.0027	0.00030	2.00

Result of calibration : After adjustment of external calibration function at 200 g**1. Repeatability (n = 5 number of measurement)**

Nominal Value (g)	Standard deviation of reading (g)
200	0.00005

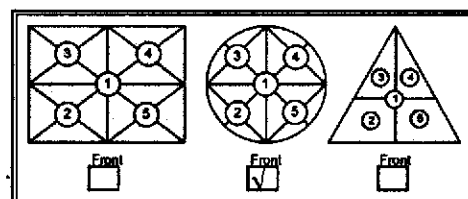


Figure A.1

2. Error of indication from nominal

Applied Weight (g)	Balance Reading (g)	Correction Value (g)	Uncertainty (\pm g)	Coverage Factor (k)
Unload	0.0000	0.0000	0.00012	2.06
20.0000	20.0001	-0.0001	0.00012	2.06
39.9999	40.0001	-0.0002	0.00014	2.05
60.0001	60.0003	-0.0002	0.00020	2.00
80.0000	80.0001	-0.0001	0.00020	2.00
100.0000	100.0002	-0.0002	0.00020	2.00
120.0000	120.0002	-0.0002	0.00030	2.00
139.9999	140.0001	-0.0002	0.00030	2.00
160.0001	160.0001	0.0000	0.00030	2.00
180.0000	180.0000	0.0000	0.00030	2.00
200.0001	199.9999	0.0002	0.00030	2.00

3. Eccentric or off-centre loading (Figure A.1)

Nominal Value 100 (g)				
Position 1	Position 2	Position 3	Position 4	Position 5
Off-Centre	0.0005	0.0015	0.0004	0.0004
Maximum difference between off-centre loading = 0.0015 (g)				

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

The statements of compliance with specification (or requirement) is based on a 95% coverage probability for the expanded uncertainty of the measurement results on with the decision of compliance is based.

Delivering growth – in Asia and beyond.

CALIBRATION CERTIFICATE

Certificate No. : 21SB142

Job No. : 109918

Issue Date : 20 April 2021
Location : Analysis Laboratory
Customer Name : HVE Co.,Ltd.
603 Soi. Jaransanitwong 46, Jaransanitwong Rd.,
Bangyeekun, Bangplad, Bangkok 10700

Equipment Name : Electronic Balance
Manufacturer : SHIMADSU
Model : AX200
Serial No. : D432620040
ID No. : 114
Weighing Capacity : 200 g
Resolution : 0.0001 g
Received Date : 7 February 2021
Condition of Calibrated item : Good

Calibration Date : 7 February 2021
Ambient Temperature : (25 ± 10) °C
Relative Humidity : (50 ± 30) %
Atmospheric Pressure : (1010 ± 30) mbar
Procedure Used : This calibration was conducted by using in-house calibration
procedure number CP-B01-01 based on UKAS LAB14 : 2015

Reference Standard :

Instrument	Serial No.	Certificate No.	Traceability	Due Date
Weight Set E2 (1 kg to 1 mg)	3HZ8	M1805061S	TCS	10-May-2021

This certification is traceable to the International System of Unit.

Calibrated by



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Technology

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Pracha-nakorn Sri Ayutthaya 13170 Phone 0-2301-7208, Fax : 0-3579-9832, E-mail: pramote.r@cksh.com

Delivering growth – in Asia and beyond.

CALIBRATION REPORT

Certificate No. : 21SB142

Job No. : 109918

Result of calibration : Error of indication from nominal

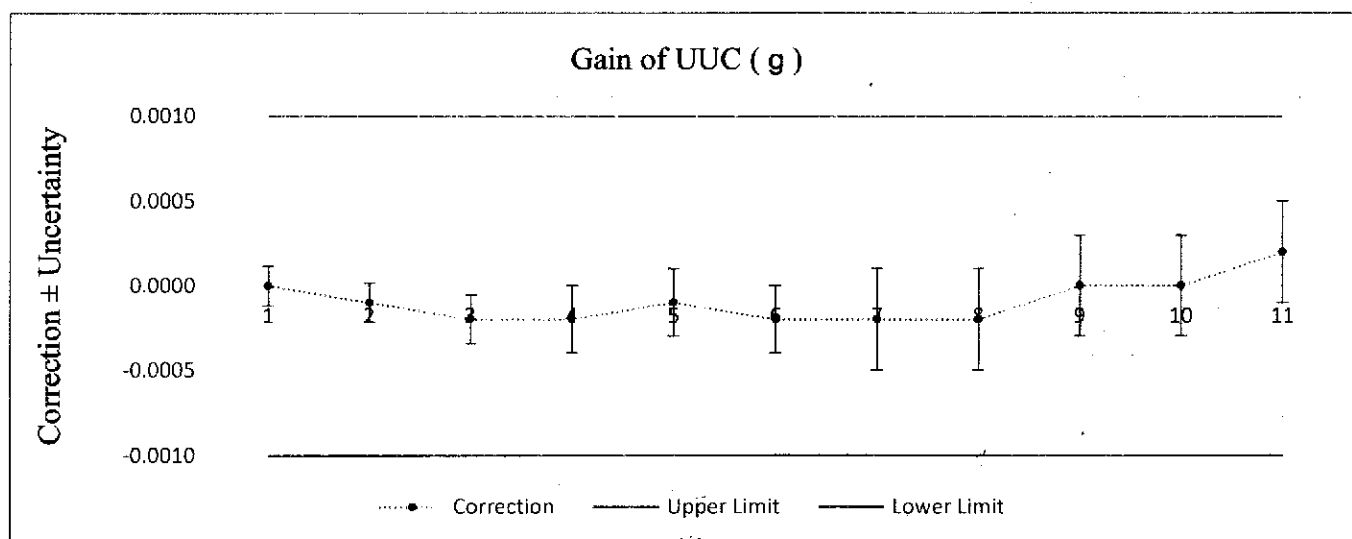
Applied Weight (g)	Correction+Uncertainty (g)	Correction-Uncertainty (g)	Gain of UUC : From the specified of the customer (\pm g)	
Unload	0.0001	-0.0001	0.0010	-0.0010
20.0000	0.0000	-0.0002	0.0010	-0.0010
39.9999	-0.0001	-0.0003	0.0010	-0.0010
60.0001	0.0000	-0.0004	0.0010	-0.0010
80.0000	0.0001	-0.0003	0.0010	-0.0010
100.0000	0.0000	-0.0004	0.0010	-0.0010
120.0000	0.0001	-0.0005	0.0010	-0.0010
139.9999	0.0001	-0.0005	0.0010	-0.0010
160.0001	0.0003	-0.0003	0.0010	-0.0010
180.0000	0.0003	-0.0003	0.0010	-0.0010
200.0001	0.0005	-0.0001	0.0010	-0.0010

Measurement results are reported as:

- Pass - acceptance based on simple acceptance; the measurement result being below the acceptance limit, AL=TL
- Fail - rejection based on if the measurement result is above acceptance limit AL=TL

Note :

- AL Meaning Acceptance Limit.
- TL Meaning Tolerance Limit.
- Decision Rules : Type simple acceptance (Customer specified the criteria)



-END-



NSC-TISI-TIS 17025
CALIBRATION 0224



CALIBRATION CERTIFICATE

Certificate No. : 21ST209

Job No. : 109918

Issue Date : 19 April 2021

Location of Calibration : Microorganism Laboratory

Customer Name : HVE CO., LTD.
603 Soi. Jaransanitwong 46, Jaransanitwong Rd.,
Bangyeekun, Bangplad, Bangkok 10700

Equipment Name : Temperature Chamber *incubator*

Manufacturer : MEMMERT

Model : IN 260

Serial No. : D613.0103

ID No. : 089

Resolution : 0.1 °C

Received Date : 7 April 2021

Calibration Date : 7 April 2021

Ambient Temperature : (25 ± 10) °C

Relative Humidity : (50 ± 30) %

Calibrated by



Approved by :



The statement of compliance is based on a 95% coverage probability for the expanded uncertainty.

This certificate may not be reproduced other than in full except with the prior written approval of the head of Calibration Laboratory Department.

DKSH (Thailand) Limited

Technology

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CALIBRATION REPORT

Certificate No. : 21ST209

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Condition of this result of calibration :

1. Calibration Procedure :

- This instrument was calibrated by insert 9 standard RTD PT100 into chamber and Calibration according to CP-T06-01 follow up to TLAS G-20-1/02-08 (E) : Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
- The temperature scale used was based on ITS - 90 .
- All data show below were final values and the initial data may be obtained upon request.

2. Reference Standards Instrument :

Instrument	Serial No. / Ins No.	Certificate No.	Traceability	Due Date
Digital Thermometer with RTD	MY49003268 / No. 1	20T0164	DKSH	17 September 2021
	Channel : 201 to 209			

This certificate is traceable to The International System of Unit.

3. Condition of Calibrated item : Good

3.1 UUC Description :

Time Constant 1 Hour 6 Minute At 35 °C

Air value or air slider level : Off ; Fan Level : -

4. Result of Calibration : Without adjustment

4.1 Environment condition :

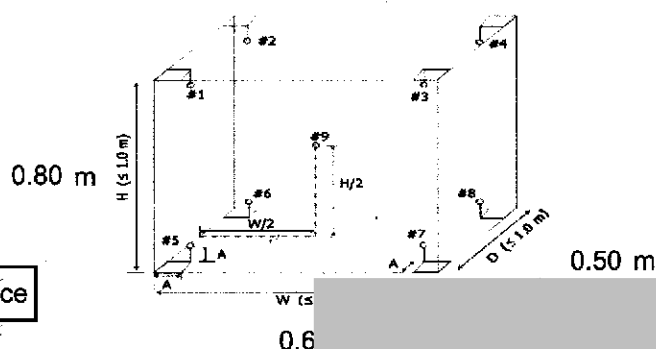
Ambient temperature : Minimum Value 23.6 °C Maximum Value 25.3 °C
 Relative humidity : Minimum Value 62.4 % Maximum Value 76.8 %
 Line voltage supplied : Minimum Value 225 VAC Maximum Value 229 VAC

4.2 Sensors Installation Diagram :

When ;

A = Distance between sensor and wall of chamber
 is 10 % of the length of the each side
 (W × D × H)

Sensor installation location in Chamber @ Working Space



CALIBRATION REPORT

Certificate No. : 21ST209

Job No. : 109918

Table1 : Reporting of Temperature

Calibration point (°C)	Average Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ($k = 2$) ± (°C)
	#1	#2	#3	#4	#5	#6	#7	#8	#9	
35	34.93	35.03	35.17	35.03	34.85	35.00	35.09	34.83	34.83	0.32

Table 2 : Reporting of Characterization Result

Indicator Set Point (°C)	Indicator Reading (°C)		Stability ± (°C)	Uniformity (°C)	Overall variation (°C)
	MAX	MIN			
35.0	35.0	35.0	0.08	0.41	0.42

Note

The reference sensor is preferably located of the geometric center

The measured temperature data readout by software "Benchlink Datalogger 3"

The quoted uncertainty include " Stability " and " Loading effect (20% of Temp 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 the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady state conditions.

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

Indicating Temperature - the average reading of indicating device that forms the ir

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

The statements of compliance with specification (or requirement) is based on a 95% coverage probability for the expanded uncertainty of the measurement results on with the decision of compliance is based.

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CALIBRATION REPORT

Certificate No. : 21ST209

Job No. : 109918

Result of calibration : Measured Temperature

Calibration Point (°C)	Correction + Uncertainty (°C)									Gain of UUC : From the specified of the customer ± (°C)	
	#1	#2	#3	#4	#5	#6	#7	#8	#9		
35	0.25	0.35	0.49	0.35	0.17	0.32	0.41	0.15	0.15	0.50	-0.50

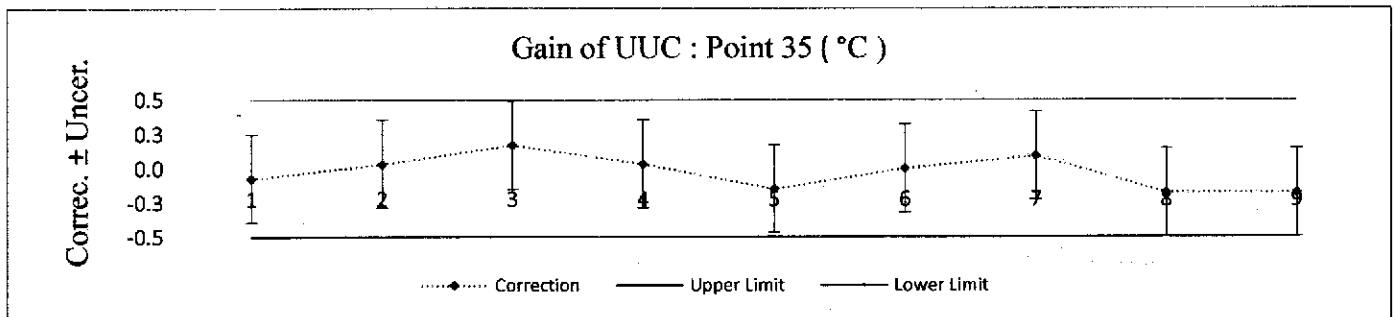
Calibration Point (°C)	Correction - Uncertainty (°C)									Gain of UUC : From the specified of the customer ± (°C)	
	#1	#2	#3	#4	#5	#6	#7	#8	#9		
35	-0.39	-0.29	-0.15	-0.29	-0.47	-0.32	-0.23	-0.49	-0.49	0.50	-0.50

Measurement results are reported as:

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Note :

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--END--