

ภาคผนวก ค-3

เอกสารสอบเทียบเครื่องมือ

THAILAND INSTITUTE OF SCIENTIFIC AND TECHNOLOGICAL RESEARCH (TISTR)

Mechanical Engineering Standards Laboratory Soi 1, Bangpoo Industrial Estate, Muang, Samutprakan 10280, Thailand.

Request No.23-66/0161

MTC.No.23-66/0161

Number of page(s) 2

CALIBRATION CERTIFICATE

Nomenclature : MASS FLOWMETER

Manufacturer : TSI

Serial No.: 41461443012

Model : 4199

Scale range : 0 l/min to 20 l/min

Subdivision : 0.001 l/min

Submitted by : M GREEN GROUP CO.,LTD

188/46, Pracha-Uttd Rd.,

Thungkru, Bangkok 10140, Thailand.

Received date : 10 January 2023 Condition of measured item : Normal

Calibration date : 18 January 2023

Standard :

Standard	Certificate No.	Date due	Traceability
RTD Thermometer	PSL-T 643/65	1-Jun-24	TISTR
Molbox/Pressure Transducer/UpStream	MP-0013-21	25-Jan-23	NIMT
Primary Flow Calibrator S/N 117982	MW-0011-21	8-Apr-23	NIMT
Primary Flow Calibrator S/N 119521	MW-		

Calibrated by

Appr

Mechanical Engineering Standards Laboratory

Ref. 2013266011000059001

Issued Date 18 January 2023

The results relate only to the items tested/calibrated or value assigned.

Advertising the Report/Certificate and publicity of the results except in full are prohibited unless written permission is obtained from the governor of TISTR.

FM.BL.MTC.002 Rev.4

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Fax. (66) 0 2579 8592
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Request No.23-66/0161

2/2

MTC.No.23-66/0161

Calibration point : (0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 1, 2, 3) l/min
Ambient condition : Temperature (23 ± 3) °C , Relative humidity (55 ± 15) %

Atmospheric pressure (1010±13) hPa

Calibration method : The flowmeter (UUC) was calibrated by comparison method with standard flowmeter according to CP-370.01.

The reported value is the value that converted to value at reference condition within pressure and temperature of the actual gas entering the UUC

Measurement data :

UUC Value (l/min)	Standard Value (l/min)	Temperature (°C)	Pressure (hPa)	Deviation (%)	Uncertainty (%)
0.054	0.0572	24.920	1008.08	-5.52	1.42
0.105	0.1060	24.903	1008.16	-0.90	1.13
0.204	0.2058	24.897	1008.25	-0.88	1.02
0.304	0.3038	24.922	1008.32	-0.05	1.02
0.402	0.4039	24.937	1008.38	-0.47	1.03
0.504	0.5032	24.919	1008.45	+0.23	1.02
0.999	0.9948	24.906	1008.60	+0.45	0.92
2.003	1.9789	24.922	1009.20	+1.22	0.87
3.007	2.9759	24.923	1009.90	+1.04	0.87

The reported expanded uncertainties are based on standard uncertainties multiplied by a coverage factor $k=2$, which provides a level of confidence of approximately 95%.

The end of calibration certificate.

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FM.BL.MTC.002 Rev.4

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E-mail : sumalee@tistr.or.th

Certificate of Calibration

Certificate No. : 66-200300-1

Page : 1 of 2

Submitted by : M Green Group Co., Ltd.

188/46 Wisatesuknakhon 25, Pracha-Utid Rd., Thungkru, Bangkok 10140 Thailand

Equipment : Electronic Balance

Manufacturer : SHIMADZU Model : AP225WD

Serial No. : D316300690

Capacity : 220 g Resolution : 0.00001g/102g, 0.0001g/220g

Environment : On site calibration was carried out at the Laboratory, M Green Group Co., Ltd.

Ambient Temperature : (25.6 to 26.7) °C

Relative Humidity : (54.4 to 56.6) %

Air Pressure : 1010.0 mbar

Date of Received : 20 September 2023

Date of Calibration : 20 September 2023

Date of Issue : 22 September 2023

Calibrated by : Akaradath Thippichai

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

Edition 7 - November 2022

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

Standard Weights

ID.No.	Cert.No.	Due Date	Traceability
E261-E2624	C02222345	10 Nov 2023	National Institute of Metrology (Thailand), (NIMT)

Approved by

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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



Certificate of Calibration

Certificate No. : 66-200300-1

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Departure of indication from nominal value

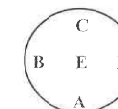
Nominal Value (g)	Correction (g)	Uncertainty ± (g)
0.001	0.00000	0.000012
0.01	0.00000	0.000013
0.1	0.00000	0.000015
1	0.00000	0.000026
10	0.00000	0.000053
20	-0.00003	0.000071
50	0.00004	0.00011
100	-0.00009	0.00020
150	0.00000	0.00038
200	-0.0001	0.00038

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

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor $k = 2.15$, providing a level of confidence of approximately 95%

Eccentric error Load test : 50 g

A	B	C	D	E
-0.00003	0.00000	0.00000	-0.00005	0.00000



Repeatability Load test : 200 g

Stdev. : 0.000048 g

- o0o -





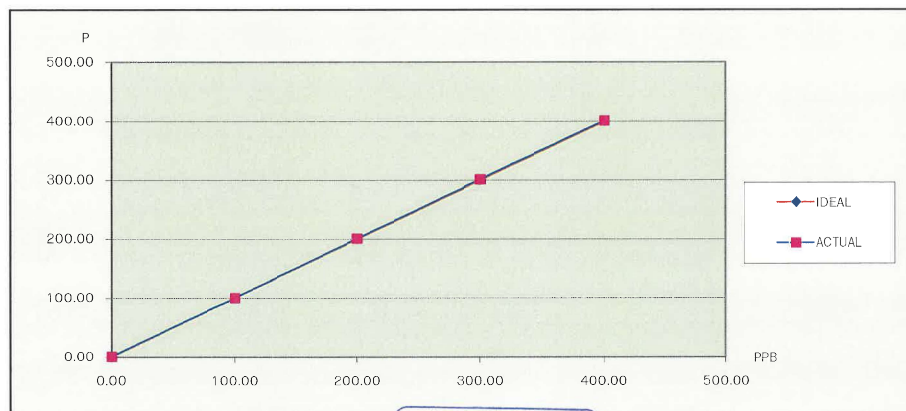
JIRANATEE ASSOCIATES CO.,LTD.

TEST REPORT

CUSTOMER NAME : M GREEN GROUP COMPANY LIMITED			
EQUIPMENT NAME : SO ₂ Analyzer			
MANUFACTURER : HORIBA	MODEL : APSA-370	SERIAL NO : G8KGHRMX	
STANDARD GAS CONCENTRATION (PPM) : 53.29 PPM		CYLINDER NO : CC734373	
CYLINDER PRESSURE (PSI) : 1,000 PSI		CERTIFIED DATE : 12/05/2020	
CERTIFIED BY : AIRGAS		EXPIRED DATE : 12/05/2028	

TEST RESULTS

POINT NO	TEST RESULTS			
	IDEAL	ACTUAL	ERROR	%ERROR
ZERO	0.00	0.22	0.22	-
1	100.00	99.88	-0.1	-0.12
2	200.00	200.25	0.3	0.13
3	300.00	300.72	0.7	0.24
4	400.00	400.54	0.5	0.14
AVERAGE (%)				0.10



CALIBRATED BY :

CHECKED BY :

ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : เจ้าหน้าที่ฝ่ายบริการหลังการขาย , โทร 02-868-0812 # 15-16 , E-Mail : Engineer@jiranatee.com

เลขที่ 63/14-15, 67/35-36 ถนน ซอยเพชรเกษม 7,7/1 เพชรเกษม แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600 โทร : 02-868-0812-13 โทรสาร : 02-868-1889

FO-EN-206 R01/22-10-14



JIRANATEE ASSOCIATES CO.,LTD.

CHECK LIST

CUSTOMER NAME : M GREEN GROUP COMPANY LIMITED		
EQUIPMENT NAME : SO ₂ Analyzer		
MANUFACTURER : HORIBA	MODEL : APSA-370	SERIAL NO. : G8KGHRMX

TEST VALUES

NO.	Ambient SO ₂ Monitor	UNIT	BEFORE	AFTER
1	SIGNAL	mV (Voltage of the measured SO ₂ Value)	6.50	6.40
2	LAMP	mV (200mV to 1200 mV)	609.00	602.80
3	CELL	°C (Ambient tembient temperature +(5°C to 15°C))	30.70	36.00
4	PUMP	kPa (65 kPa or less)	42.50	43.70
5	AMBIENT	kPa	102.50	101.50
6	SAMPLE	L/min (0.6 L/min to 1.0 L/min)	-	-
7	DC 24 V	V (24 V ± 0.5 V)	23.90	23.90
8	DC 5 V	V (5 V ± 0.5 V)	5.00	5.00
9	SAMPLE SO2 Reading	PPB	1.38	2.06
10	Zero	PPB	-1.12	0.22
11	Span	PPB	472.42	400.54

Remark : Reference EX-EN-019-56 , Ambient SO₂ Monitor APSA-370 Operation Manual Page #78

(Ambient temperature = 5°C to 40°C)

อาการที่ตรวจพบ

- มีน้ำเข้าเครื่อง ทำให้ Cal ไม่ขึ้น , หน้าจอตกไม่ได้

รายละเอียดการดำเนินการ

- ทำการไล่ น้ำออกจากเครื่อง , เปลี่ยน Touch Panel ใหม่ , ทำ Calibration Zero/Span , Multipoint

ผลการดำเนินการ

- เรียบร้อย เครื่องสามารถดำเนินการตรวจวัดได้ตามปกติ

CALIBRATED BY :

CHECKED BY :

ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : เจ้าหน้าที่ฝ่ายบริการหลังการขาย , โทร 02-868-0812 # 15-16 , E-Mail : Engineer@jiranatee.com

เลขที่ 63/14-15, 67/35-36 ซอยเพชรเกษม 7,7/1 ถนนเพชรเกษม แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600 โทร : 02-868-0812-13 โทรสาร : 02-868-1889

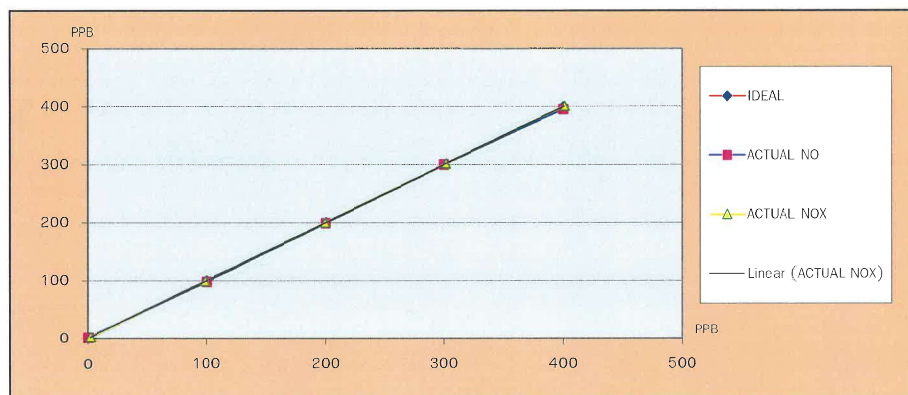
FO-EN-207 R01/28-09-14

TEST REPORT

CUSTOMER NAME	: M GREEN GROUP COMPANY LIMITED						
EQUIPMENT NAME	: NO _x Analyzer						
MANUFACTURER	: HORIBA	MODEL	: APNA-370	SERIAL NO	: RSBHK673		
STANDARD GAS CONCENTRATION (PPM) : 53.15 PPM				CYLINDER NO	: CC734373		
CYLINDER PRESSURE (PSI) : 1,000 PSI				CERTIFIED DATE	: 12/05/2020		
CERTIFIED BY : AIRGAS				EXPIRED DATE	: 12/05/2028		

TEST RESULTS

POINT NO	TEST RESULTS						
	IDEAL	ACTUAL NO	ERROR NO	%ERROR NO	ACTUAL NO _x	ERROR NO _x	%ERROR NO _x
ZERO	0.00	0.88	0.88	-	1.20	1.20	-
1	100.00	102.49	2.49	2.49	101.79	1.79	1.79
2	200.00	201.84	1.84	0.92	201.89	1.89	0.94
3	300.00	301.20	1.20	0.40	302.15	2.15	0.72
4	400.00	400.51	0.51	0.13	401.16	1.16	0.29
AVERAGE (%)				0.98			0.94



CALIBRATED BY :

CHECKED BY :

ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : เจ้าหน้าที่ฝ่ายบริการหลังการขาย , โทร 02-868-0812 # 15,16 , E-Mail : Engineer@jiranatee.com

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CHECK LIST

CUSTOMER NAME	: M GREEN GROUP COMPANY LIMITED		
EQUIPMENT NAME	: NO _x Analyzer		
MANUFACTURER	: HORIBA	MODEL : APNA-370	SERIAL NO. : RSBHK673

TEST VALUES				
NO.	NO _x Analyzer (APNA-370)	UNIT	BEFORE	AFTER
1	Signal (NO)	mV	14.600	2.800
2	Signal (NO _x)	mV	35.400	16.600
3	Detector	Temp °C , Standard Value : Ambient temp+(5°Cto15°C)	42.500	42.900
		Pressure kPa , Standard Value : (Ambient/1013x100-20)+4kPa	79.000	70.500
4	AMBIENT	kPa	102.500	101.500
5	SAMPLE	L/min (1.1 L/min ± 0.3 L/min)	-	-
6	DC 24 V	V (24 V ± 0.5 V)	23.700	23.700
7	DC 5 V	V (5 V ± 0.5 V)	5.000	5.000
8	Sampling NO Reading	PPB	12.940	2.540
9	Sampling NO ₂ Reading	PPB	20.050	21.400
10	Sampling NO _x Reading	PPB	32.990	24.000
11	Zero (NO)	PPB	-0.600	0.880
12	Span(NO)	PPB	364.620	400.510
13	Zero (NO _x)	PPB	-0.410	1.220
14	Span (NO _x)	PPB	357.370	401.160

Remark : Reference EX-EN-022-56 , "Ambient NO_x Monitor APNA-370 Operation Manual " Page #48

(Ambient temperature = 5°C to 40°C)

อาการที่ตรวจพบ

- มีน้ำเข้าเครื่อง ทำให้ Cal ไม่ขึ้น , หน้าจอติดไม่ได้

รายละเอียดการดำเนินการ

- ทำการไล่น้ำออกจากเครื่อง , เปลี่ยน Touch Panel ใหม่ , ทำ Calibration Zero/Span , Multipoint

ผลการดำเนินการ

- เรียบร้อย เครื่องสามารถดำเนินการตรวจวัดได้ตามปกติ

CALIBRATED BY :

CHECKED BY :

ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : เจ้าหน้าที่ฝ่ายบริการหลังการขาย , โทร 02-868-0812 # 15-16 , E-Mail : Engineer@jiranatee.com

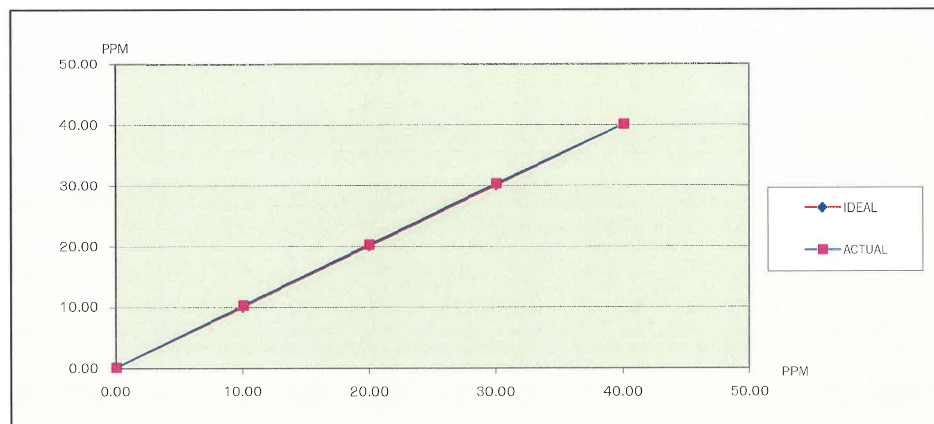
เลขที่ 63/14-15,67/35-36 ซอยเพชรเกษม 7,7/1 ถนนเพชรเกษม แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600 โทร 02-868-0812-13 โทรสาร 02-868-1889

TEST REPORT

CUSTOMER NAME : M GREEN GROUP COMPANY LIMITED			
EQUIPMENT NAME : CO Analyzer			
MANUFACTURER : HORIBA	MODEL : APMA-370	SERIAL NO : 84XJ1GRC	
STANDARD GAS CONCENTRATION (PPM) : 4533 PPM		CYLINDER NO : CC734373	
CYLINDER PRESSURE (PSI) : 1,000 PSI		CERTIFIED DATE : 12/05/2020	
CERTIFIED BY : AIRGAS		EXPIRED DATE : 12/05/2028	

TEST RESULTS

POINT NO	CALIBRATION RESULTS			
	IDEAL	ACTUAL	ERROR	%ERROR
ZERO	0.00	0.00	0.00	-
1	10.00	10.20	0.2	2.00
2	20.00	20.21	0.2	1.05
3	30.00	30.21	0.2	0.70
4	40.00	40.00	0.0	0.00
AVERAGE (%)				0.94



CALIBRATED BY :

CHECKED BY :

ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : เจ้าหน้าที่ฝ่ายบริการหลังการขาย , โทร 02-8681246 , E-Mail : Sales@okla-testing.com
63/14-15,67/35-36 ซอยเพชรเกษม 7,7/1 แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600 เบอร์โทร 02-8681246 แฟกซ์ 02-8680860

FO-EN-206 R01/22-10-14

CHECK LIST

CUSTOMER NAME : M GREEN GROUP COMPANY LIMITED		
EQUIPMENT NAME : CO Analyzer		
MANUFACTURER : HORIBA	MODEL : APMA-370	SERIAL NO. : 84XJ1GRC

TEST VALUES				
NO.	CO Analyzer (APMA-370)	UNIT	BEFORE	AFTER
1	Signal (MAIN)	mV	9.70	4.40
2	Signal (COMP)	mV	0.30	-4.50
3	CELL	°C , Standard Value : Ambient temperature +(5°Cto15°C)	28.40	32.00
4	PUMP	kPa	40.10	39.20
5	AMBIENT	kPa	102.50	101.50
6	SAMPLE	L/min (1 L/min to L/min)	-	-
7	OVER FLOW	L/min (1.2 L/min or more)	0.00	0.00
8	DC 24 V	V (24 V ± 0.5 V)	23.90	23.90
9	DC 5 V	V (5 V ± 0.5 V)	4.90	4.90
10	Sample Reading	PPM	0.83	0.86
11	Zero	PPM	-1.56	0.00
12	Span	PPM	41.55	40.00

Remark : Reference EX-SM-100-58 , "Ambient CO Monitor APMA-370 Operation Manual" Page #48
(Ambient temperature = 5°C to 40°C)

อาการที่ตรวจพบ

- มีน้ำเข้าเครื่อง ทำให้ Cal ไม่ขึ้น , หน้าจอติดไม่ได้ , Special Oring เสื่อมสภาพ ทำให้ Cal ไม่ขึ้น

รายละเอียดการดำเนินการ

- ทำการไล่น้ำออกจากเครื่อง , เปลี่ยน Touch Panel ใหม่ , เปลี่ยน Special Oring ใหม่

ทำ Check List Analyzer , ทำ Calibration Zero/Span , Multipoint

ผลการดำเนินการ

- เรียบร้อย เครื่องสามารถดำเนินการตรวจวัดได้ตามปกติ

CALIBRATED BY :

CHECKED BY :

ต้องการข้อมูลทางด้านเทคนิคเพิ่มเติม : เจ้าหน้าที่ฝ่ายบริการหลังการขาย , โทร 02-868-0812 # 15-16 , E-Mail : Engineer@jiranatee.com

เลขที่ 63/14-15,67/35-36 ซอยเพชรเกษม 7,7/1 ถนนเพชรเกษม แขวงวัดท่าพระ เขตบางกอกใหญ่ กรุงเทพฯ 10600 โทร 02-868-0812-13 โทรสาร 02-868-1889

FO-EN-207 R00/01-08-13

Validation Calibration Report

Customer Name: PINTHONG GROUP MANAGEMENT AND
CONSULTANTS CO.,LTD. CO.,LTD.

Department: LAB Analytical

Present By: Meshcotech Co., Ltd.

Instrument System ID: GC 1

Instrument List in System

Name and Model	Serial Number	Manufacturer
Clarus 580	580S17020103	Perkin Elmer
TotalChrom	Version. 6.3.2.0646	Perkin Elmer

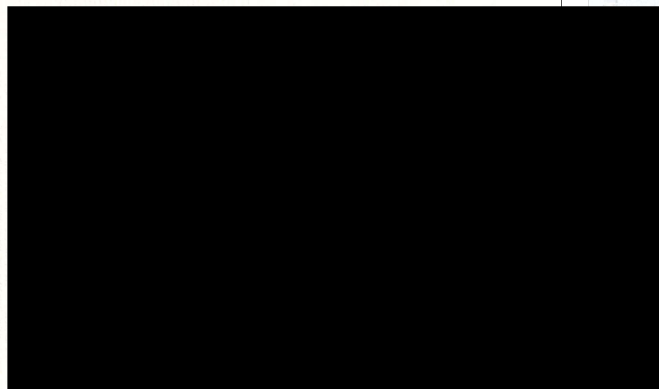
This report confirms that the above instrument has been calibrated.

The actual measurement results are stated on the inside of Validation Calibration Report.

Qualifier's signature / Date

Acceptor's signature / Date

Performance Qualification Report





PQR-1

Carrier Pressure Accuracy Result

Customer: **PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD.** Qualifier: **Mescotech Co., Ltd.**
Department: **LAB Analytical** Procedure: **VKIT.GC.FLOW**
Manufacturer: **PERKIN ELMER** Model: **Clarus 580**
Serial No: **580S17020103** Detector Type: **FID**
Standard Batch: **N/A** Traceable To: **4071-DMA**
Expiry Date: **March 31,2024** System ID: **GC 1**

The result reference to raw data on page: 1

Setpoint Pressure PSI.	Observed Pressure PSI.	Deviation ml/min. % Error
5.00	4.90	2.00
10.00	10.00	0.00
20.00	20.10	0.50
30.00	30.20	0.67
40.00	40.30	0.75

Acception criteria $\leq 5\%$.

of absolute deviation

Evaluate Result

PASS



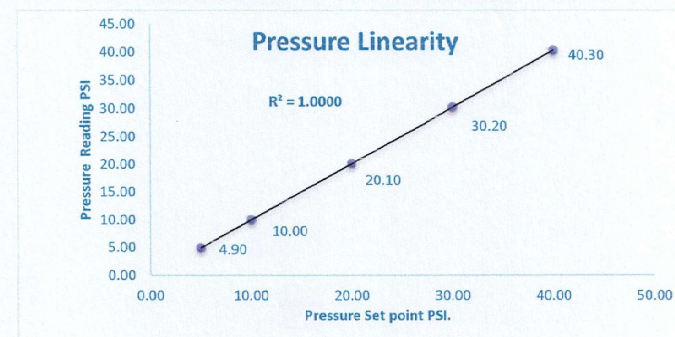
PQR-2

Carrier Pressure Linearity Result

Customer: **PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD.** Qualifier: **Mescotech Co., Ltd.**
Department: **LAB Analytical** Procedure: **VKIT.GC.FLOW**
Manufacturer: **PERKIN ELMER** Model: **Clarus 580**
Serial No: **580S17020103** Detector Type: **FID**
Standard Batch: **N/A** Traceable To: **4071-DMA**
Expiry Date: **March 31,2024** System ID: **GC 1**

The result reference to raw data on page: 1

Flow Rate Setpoint (ml/min)	Flow Rate (ml/min) Reading
5.00	4.90
10.00	10.00
20.00	20.10
30.00	30.20
40.00	40.30
R-Square	1.0000

Acception criteria of R^2 > 0.9990

Evaluate Result

PASS

PQR

82 Moo.18, Buengkamproi, Lamlukka, Pathum thani, Thailand 12150
Tel. (6698)970-7090, Fax.(662)540-2541 Email: sales.meshcotect@gmail.com

VCR-CARRFLOW

PQR

Tel. (6698)970-7090, Fax.(662)540-2541 Email: sales.meshcotect@gmail.com

VCR-CARRFLOW



Detector Gas Flow Rate Accuracy Result

Customer: **PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD.** Qualifier: **Mescotech Co., Ltd.**
Department: **LAB Analytical** Procedure: **VKIT.GC.FLOW**
Manufacturer: **PERKIN ELMER** Model: **Clarus 580**
Serial No: **580S17020103** Detector Type: **FID**
Standard Batch: **N/A** Traceable To: **4075-GFM**
Expiry Date: **March 31,2024** System ID: **GC 1**

The result reference to raw data on page: 2

Setpoint Flow Rate ml/min.	Observed Flow Rate ml/min.	Deviation ml/min. % Error
20.00	19.80	1.00
30.00	29.40	2.00
40.00	39.50	1.25
50.00	49.30	1.40
60.00	59.20	1.33
Acception criteria of absolute deviation		≤ 5%.
Evaluate Result		PASS



Carrier Gas Flow Rate Accuracy Result

Customer: **PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD.** Qualifier: **Mescotech Co., Ltd.**
Department: **LAB Analytical** Procedure: **VKIT.GC.FLOW**
Manufacturer: **PERKIN ELMER** Model: **Clarus 580**
Serial No: **580S17020103** Detector Type: **FID**
Standard Batch: **N/A** Traceable To: **4075-GFM**
Expiry Date: **March 31,2024** System ID: **GC 1**

The result reference to raw data on page: 3

Setpoint Flow Rate ml/min.	Observed Flow Rate ml/min.	Deviation ml/min. % Error
100.00	98.80	1.20
200.00	197.60	1.20
300.00	295.30	1.57
400.00	394.70	1.33
Acception criteria of absolute deviation		≤ 5%.
Evaluate Result		PASS



PQR-5

GC Column OvenTemperature Performance Result

Customer: PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD. Qualifier: **Mescotech Co., Ltd.**
Department: **LAB Analytical** Procedure: **VKIT.GC.TEMPACC**
Manufacturer: **PERKIN ELMER** Model: **Clarus 580**
Serial No: **580S17020103** Detector Type: **FID**
Standard Batch: **N/A** Traceable To: **1513-DTM**
Expiry Date: **March 31,2024** System ID: **GC 1**

The result reference to raw data on page: 4

Setpoint	Collected 1	Collected 2	Collected 3	Collected 4	Collected 5	Average	Deviation of Accuracy
Temperature	Temperature	Temperature	Temperature	Temperature	Temperature	Temperature	Absolute/°C.
(°C)	(°C)	(°C)	(°C)	(°C)	(°C)	(°C)	(Set Temp-Average Temp)
40.0	39.8	39.8	39.7	39.8	39.7	39.8	0.24
100.0	100.5	100.3	100.3	100.3	100.4	100.4	0.36
150.0	150.2	150.3	150.3	150.4	150.5	150.3	0.34
200.0	200.2	200.2	200.4	200.4	200.5	200.3	0.34
280.0	280.0	280.2	280.3	280.3	280.3	280.2	0.22

Acception criteria $\leq 1^{\circ}\text{C}.$
of absolute deviation Accuracy

Evaluate Result **PASS**



PQR-6

GC Column OvenTemperature Stability Performance Result

Customer: PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD. Qualifier: **Mescotech Co., Ltd.**
Department: **LAB Analytical** Procedure: **VKIT.GC.TEMPSTEB**
Manufacturer: **PERKIN ELMER** Model: **Clarus 580**
Serial No: **580S17020103** Detector Type: **FID**
Standard Batch: **N/A** Traceable To: **4078-DTM**
Expiry Date: **March 31,2024** System ID: **GC 1**

The result reference to raw data on page: 5

Setpoint	Collected Point1	Collected Point2	Collected Point3	Collected Point4	Collected Point5	Average	STDEV
Temperature	Temperature	Temperature	Temperature	Temperature	Temperature	Temperature	Temperature
(°C)	(°C)	(°C)	(°C)	(°C)	(°C)	(°C)	(°C)
100.0	100.5	100.3	100.3	100.3	100.4	100.36	0.09

Acception criteria $\leq 0.5^{\circ}\text{C}.$
of absolute deviation Stability

Evaluate Result **PASS**

Qu

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PQR-7

GC Injector Temperature Performance Result

Customer: **PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD.** Qualifier: **Mescotech Co., Ltd.**
Department: **LAB Analytical** Procedure: **VKIT.GC.TEMPACC**
Manufacturer: **PERKIN ELMER** Model: **Claruss 580**
Serial No: **580S17020103** Detector Type: **FID**
Standard Batch: **N/A** Traceable To: **4078-DTM**
Expiry Date: **March 31,2024** System ID: **GC 1**

The result reference to raw data on page: 6

Setpoint Temperature (°C)	Collected Temperature (°C)	Deviation of Accuracy Absolute/°C. (Set Temp-Average Temp)
150.0	146.5	3.5
200.0	196.5	3.5
280.0	276.7	3.3

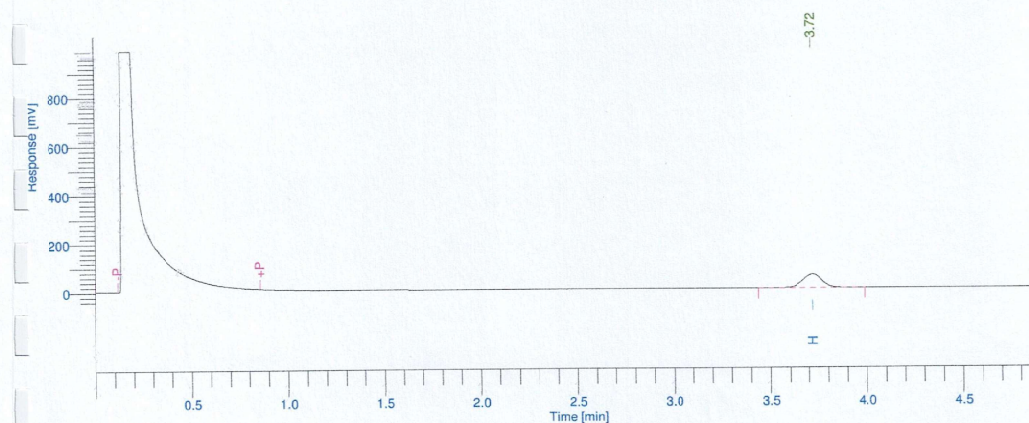
Acceptance criteria
of absolute deviation Accuracy $\leq 10^{\circ}\text{C}$.
Evaluate Result **PASS**

Page 1 of 8
Raw Data

Software Version : 6.3.2.0646
Operator : manager
Sample Number : 006
AutoSampler : BUILT-IN
Instrument Name : Claruss580
Instrument Serial # : None
Delay Time : 0.00 min
Sampling Rate : 12.5000 pts/s
Sample Volume : 1.000000 ul
Sample Amount : 1.0000
Data Acquisition Time : 01-Apr-24 2:43:50 PM

Date : 01-Apr-24 2:59:22 PM
Sample Name : Carry Over Blank 1
Study : Calibration
Rack/Vial : 0/1
Channel : A
A/D mV Range : 1000
End Time : 5.00 min
Area Reject : 0.000000
Dilution Factor : 1.00
Cycle : 6

Raw Data File : D:\PMOQ2023\Carry Over Blank 1_006.raw
Result File : D:\PMOQ2023\Carry Over Blank 1_006.rst [Editing in Progress]
Inst Method : d:\pmocq2023\calibration2023_1 from D:\PMOQ2023\Carry Over Blank 1_006.raw
Proc Method : d:\pmocq2023\calibration2023_1 from D:\PMOQ2023\Carry Over Blank 1_006.rst [Editing in Progress]
Calib Method : d:\pmocq2023\calibration2023_1 from D:\PMOQ2023\Carry Over Blank 1_006.rst [Editing in Progress]
Report Format File : D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Hexadecane	3.721	378105.11	56147.29	100.00	100.00	0.3781
			378105.11	56147.29	100.00	100.00	0.3781

Missing Component Report
Component Expected Retention (Calibration File)

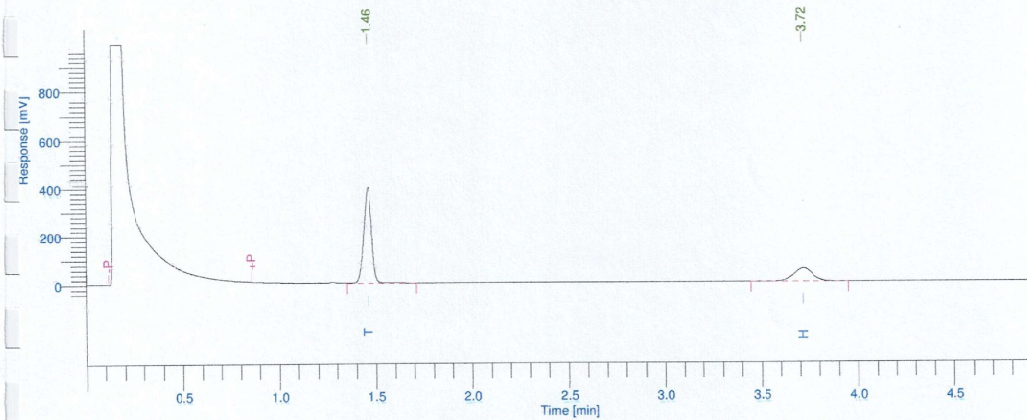
Teradecane 1.450

Software Version : 6.3.2.0646
 Operator : manager
 Sample Number : 009
 AutoSampler : BUILT-IN
 Instrument Name : Clarus580
 Instrument Serial # : None
 Delay Time : 0.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 3:38:06 PM

Date : 01-Apr-24 3:50:32 PM
 Sample Name : Precision 8
 Study : Calibration
 Rack/Vial : 0/5
 Channel : A
 A/D mV Range : 1000
 End Time : 5.00 min

Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 14

Raw Data File : D:\PMOQ2023\Precision 8_014.raw
 Result File : D:\PMOQ2023\Precision 8_014.rst [Editing in Progress]
 Inst Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 8_014.raw
 Proc Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 8_014.rst [Editing in Progress]
 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 8_014.rst [Editing in Progress]
 Report Format File : D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Tetradecane	1.461	1131130.47	387781.56	75.57	75.57	1.1311
2	Hexadecane	3.715	365705.34	54365.48	24.43	24.43	0.3657
		1496835.81	452147.04	100.00	100.00	1.4968	

Missing Component Report
 Component Expected Retention (Calibration File)

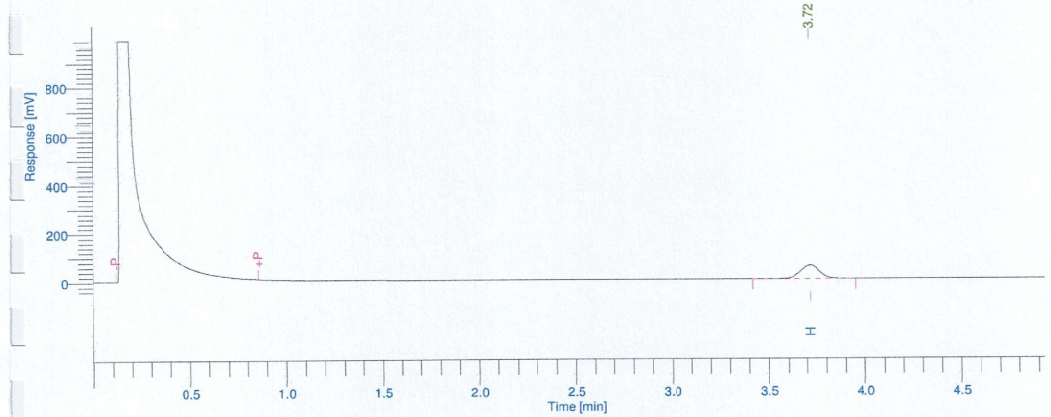
All components were found

Software Version : 6.3.2.0646
 Operator : manager
 Sample Number : 010
 AutoSampler : BUILT-IN
 Instrument Name : Clarus580
 Instrument Serial # : None
 Delay Time : 0.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 3:44:57 PM

Date : 01-Apr-24 3:51:48 PM
 Sample Name : Carry Over Blank 2
 Study : Calibration
 Rack/Vial : 0/1
 Channel : A
 A/D mV Range : 1000
 End Time : 5.00 min

Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 15

Raw Data File : D:\PMOQ2023\Carry Over Blank 2_015.raw
 Result File : D:\PMOQ2023\Carry Over Blank 2_015.rst [Editing in Progress]
 Inst Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Carry Over Blank 2_015.raw
 Proc Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Carry Over Blank 2_015.rst [Editing in Progress]
 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Carry Over Blank 2_015.rst [Editing in Progress]
 Report Format File : D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Hexadecane	3.718	373276.70	55744.69	100.00	100.00	0.3733
		373276.70	55744.69	100.00	100.00	0.3733	

Missing Component Report
 Component Expected Retention (Calibration File)

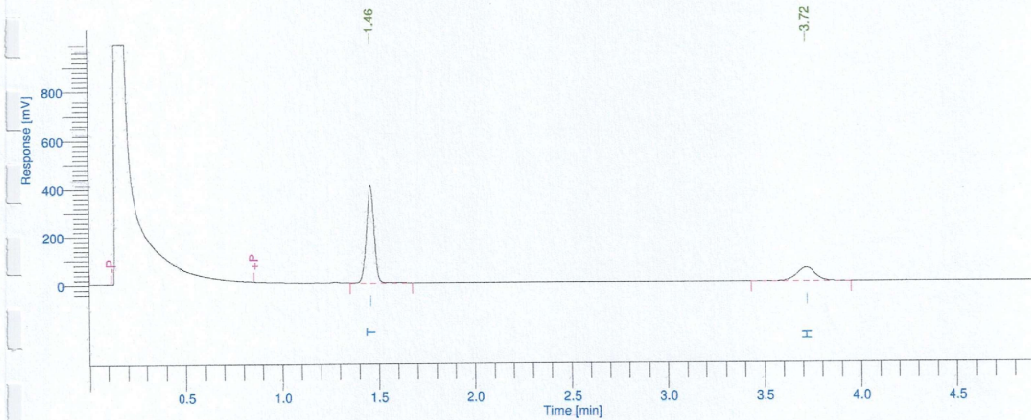
Tetradecane 1.450

Software Version : 6.3.2.0646
 Operator : manager
 Sample Number : 007
 AutoSampler : BUILT-IN
 Instrument Name : Clarus580
 Instrument Serial # : None
 Delay Time : 0.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 2:50:38 PM

Date : 01-Apr-24 3:04:37 PM
 Sample Name : Precision 1
 Study : Calibration
 Rack/Vial : 0/5
 Channel : A
 A/D mV Range : 1000
 End Time : 5.00 min

Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 7

Raw Data File : D:\PMOQ2023\Precision 1_007.raw
 Result File : D:\PMOQ2023\Precision 1_007.rst [Editing in Progress]
 Inst Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 1_007.raw
 Proc Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 1_007.rst [Editing in Progress]
 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 1_007.rst [Editing in Progress]
 Report Format File : D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Tetradecane	1.461	1146805.50	405483.26	75.49	75.49	1.1468
2	Hexadecane	3.719	372264.12	55556.46	24.51	24.51	0.3723
			1519069.62	461039.73	100.00	100.00	1.5191

Missing Component Report
 Component Expected Retention (Calibration File)

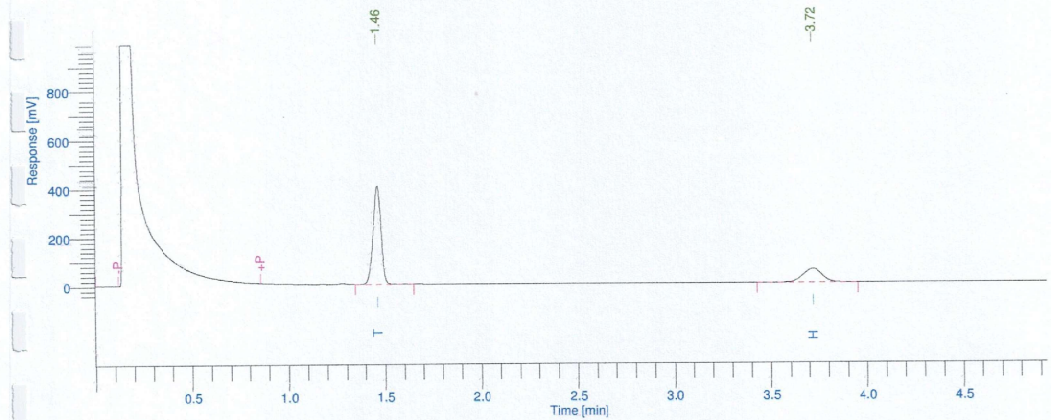
All components were found

Software Version : 6.3.2.0646
 Operator : manager
 Sample Number : 008
 AutoSampler : BUILT-IN
 Instrument Name : Clarus580
 Instrument Serial # : None
 Delay Time : 0.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 2:57:22 PM

Date : 01-Apr-24 3:06:20 PM
 Sample Name : Precision 2
 Study : Calibration
 Rack/Vial : 0/5
 Channel : A
 A/D mV Range : 1000
 End Time : 5.00 min

Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 8

Raw Data File : D:\PMOQ2023\Precision 2_008.raw
 Result File : D:\PMOQ2023\Precision 2_008.rst [Editing in Progress]
 Inst Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 2_008.raw
 Proc Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 2_008.rst [Editing in Progress]
 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 2_008.rst [Editing in Progress]
 Report Format File : D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Tetradecane	1.462	1142966.78	404053.91	75.57	75.57	1.1430
2	Hexadecane	3.719	369492.88	55077.66	24.43	24.43	0.3695
			1512459.66	459131.57	100.00	100.00	1.5125

Missing Component Report
 Component Expected Retention (Calibration File)

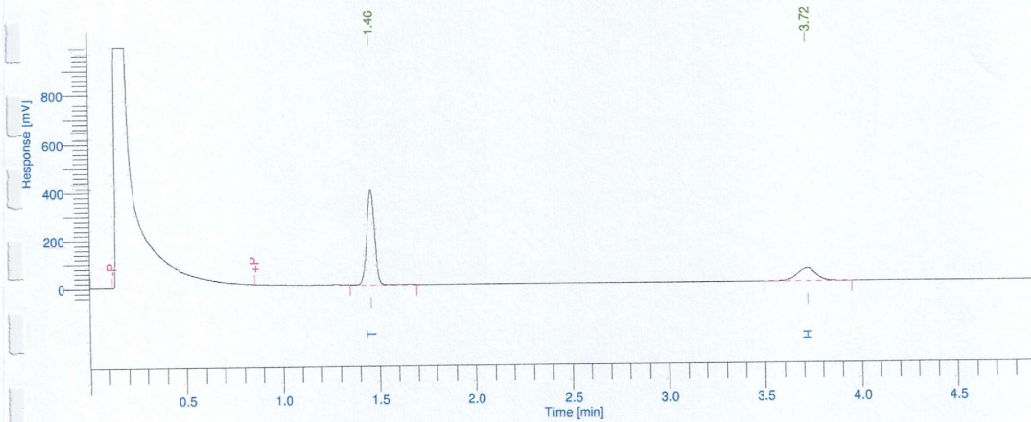
All components were found

Software Version : 6.3.2.0646
 Operator : manager
 Sample Number : 008
 AutoSampler : BUILT-IN
 Instrument Name : Clarus580
 Instrument Serial # : None
 Delay Time : 0.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 3:04:10 PM

Date : 01-Apr-24 3:12:08 PM
 Sample Name : Precision 3
 Study : Calibration
 Rack/Vial : 0/5
 Channel : A
 A/D mV Range : 1000
 End Time : 5.00 min

Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 9

Raw Data File : D:\PMOQ2023\Precision 3_009.raw
 Result File : D:\PMOQ2023\Precision 3_009.rst [Editing in Progress]
 Inst Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 3_009.raw
 Proc Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 3_009.rst [Editing in Progress]
 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 3_009.rst [Editing in Progress]
 Report Format File: D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Tetradecane	1.460	1137811.87	397094.47	75.51	75.51	1.1318
2	Hexadecane	3.720	367090.85	54445.14	24.49	24.49	0.3671
		1498902.72	451539.61	100.00	100.00	1.4989	

Missing Component Report
 Component Expected Retention (Calibration File)

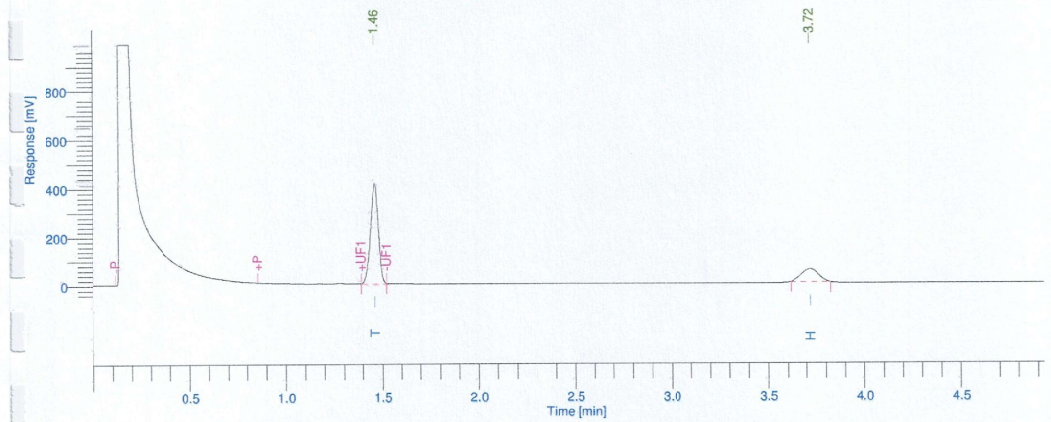
All components were found

Software Version : 6.3.2.0646
 Operator : manager
 Sample Number : 008
 AutoSampler : BUILT-IN
 Instrument Name : Clarus580
 Instrument Serial # : None
 Delay Time : 0.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 3:10:58 PM

Date : 01-Apr-24 3:22:04 PM
 Sample Name : Precision 4
 Study : Calibration
 Rack/Vial : 0/5
 Channel : A
 A/D mV Range : 1000
 End Time : 5.00 min

Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 10

Raw Data File : D:\PMOQ2023\Precision 4_010.raw
 Result File : D:\PMOQ2023\Precision 4_010.rst [Editing in Progress]
 Inst Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 4_010.raw
 Proc Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 4_010.rst [Editing in Progress]
 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 4_010.rst [Editing in Progress]
 Report Format File: D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

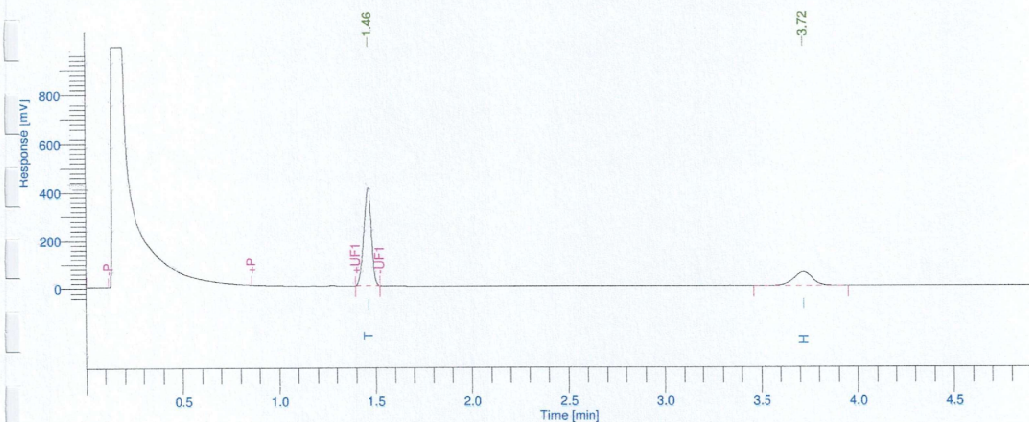
Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Tetradecane	1.463	1159745.44	413355.95	78.19	78.19	1.1597
2	Hexadecane	3.720	323562.84	53364.38	21.81	21.81	0.3236
		1483308.28	466720.33	100.00	100.00	1.4833	

Missing Component Report
 Component Expected Retention (Calibration File)

All components were found

Software Version : 6.3.2.0646
 Operator : manager
 Sample Number : 008
 AutoSampler : BUILT-IN
 Instrument Name : Clarus580
 Instrument Serial # : None
 Delay Time : 0.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 3:17:45 PM
 Date : 01-Apr-24 3:27:24 PM
 Sample Name : Precision 5
 Study : Calibration
 Rack/Vial : 0/5
 Channel : A
 A/D mV Range : 1000
 End Time : 5.00 min
 Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 11

Raw Data File : D:\PMOQ2023\Precision 5_011.raw
 Result File : D:\PMOQ2023\Precision 5_011.rst [Editing in Progress]
 Inst Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 5_011.raw
 Proc Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 5_011.rst [Editing in Progress]
 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\Precision 5_011.rst [Editing in Progress]
 Report Format File : D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Tetradecane	1.461	1158710.81	412581.94	74.83	74.83	1.1587
2	Hexadecane	3.718	389670.70	58566.34	25.17	25.17	0.3897
		1548381.51	471148.27	100.00	100.00	1.5484	

Missing Component Report
 Component Expected Retention (Calibration File)

All components were found



Data System Number of Detection Check

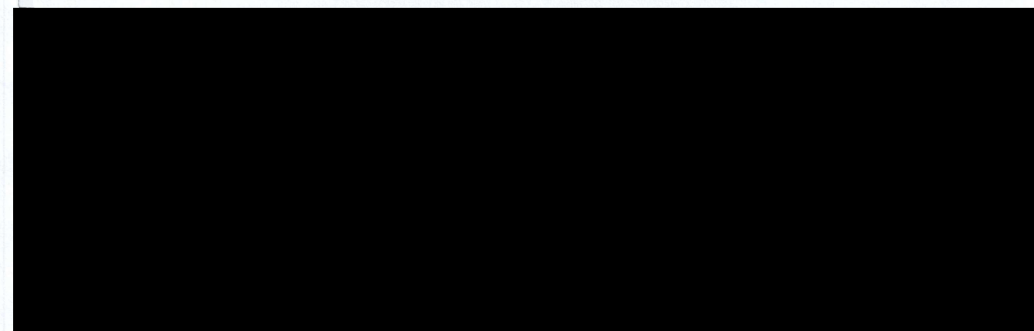
Customer: **PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD.** Qualifier: **Mescotech Co., Ltd.**
 Department: **LAB Analytical** Procedure: **Validator Method**
 Manufacturer: **PERKIN ELMER** Model: **TotalChrom**
 Software Version: **6.3.2.0646** Traceable To: **Validator™**
 Standard Batch: **N/A** Traceable To: **Validator™**
 Expiry Date: **March 31,2023** System ID: **GC 1**

The result reference to raw data on page: 32

Peak Count#	Peak count Detected
Peak Detected Specify	
≥ 32 Peak Number	36 Peak Number

Acceptance criteria of absolute deviation ≥ 32 Peak

Evaluate Result **PASS**





Data System Square Peak High Check

Customer: **PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD.** Qualifier: **Mescotech Co., Ltd.**
Department: **LAB Analytical** Procedure: **Validator Method**
Manufacturer: **PERKIN ELMER** Model: **TotalChrom**
SoftWare Version: **6.3.2.0646** Traceable To: **Validator™**
Standard Batch: **N/A** Traceable To: **Validator™**
Expiry Date: **March 31,2023** System ID: **GC 1**

The result reference to raw data on page: 33

Peak Number#	Peak high /1000	%deviation	Evaluate Result
Peak Detection Specify	Collected (millivolt)		
1 500 millivolt	499.9929	0.00	PASS
2 1000 millivolt	999.998	0.00	PASS
		Acception criteria	≤1%
		of % deviation	
		Evaluate Result	PASS



Data System Retention Time Reproduced Check

Customer: **PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD.** Qualifier: **Mescotech Co., Ltd.**
Department: **LAB Analytical** Procedure: **Validator Method**
Manufacturer: **PERKIN ELMER** Model: **TotalChrom**
SoftWare Version: **6.3.2.0646** Traceable To: **Validator™**
Standard Batch: **N/A** System ID: **GC 1**
Expiry Date: **March 31,2023**

The result reference to raw data on page: 34

Peak Number#	Retention Time	Previus peak-Curent peak	Evaluate Result
	Apex	Abslute time /min.	
1	0.476	N/A	
2	1.897	1.421	PASS
3	3.318	1.421	PASS
4	4.738	1.420	PASS
5	6.159	1.421	PASS
6	7.580	1.421	PASS
		Acception criteria	1.41-1.43 Minute
		of absolute deviation	
		Evaluate Result	PASS

Qualification Raw Data
Attached

Carrier Gas Inlet Pressure Accuracy Raw data Record

Raw Data Page 1

Customer Name: PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD.
Instrument Model: Clarus 580 GC
Gas Type: He

Department: Quality Control
Serial Name: 580S17020103

Carrier Gas Inlet Pressure

Inlet Pressure Setpoint (PSI)	Pressure Reading
5.00	4.90
10.00	10.00
20.00	20.10
30.00	30.20
40.00	40.30

Report Reference Number: VCP NO. GC-0427-074

Engineer/Technical : Prasittisarl Maliphan

Raw Data Page 2

Department: Quality Control
Serial Name: 580S17020103

Flow rate ml/min	Flow rate reading
20.00	19.40
30.00	29.40
40.00	39.50
50.00	49.30
60.00	59.20

Engineer/Technical : Prasit H. Sent Maliphan

Raw Data Page 3

Customer Name: PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD. Department: Quality Control
Instrument Model: Clarus 580 GC Serial Name: 580S17020103
Gas Type: Air

Flow rate ml/min	Flow rate reading
100.00	198.80
200.00	197.60
300.00	205.20
400.00	294.70

Engineer/Technical : Prasittisunt Maliphan

Column Oven Temperature Raw data Reading

Raw Data Page 4

Customer Name: PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD.
Instrument Model: Clarus 580 GC

Department: Quality Control
Serial Name: 580S17020103

Oven Temperature °C	Temperature Reading °C				
Temperature Set °C	Temp at 40 °C	Temp at 100 °C	Temp at 150 °C	Temp at 200 °C	Temp at 280 °C
Reading 1	39.8	100.5	150.2	200.2	280.0
Reading 2	39.6	100.3	150.3	200.2	280.2
Reading 3	39.7	100.3	150.3	200.4	280.3
Reading 4	39.8	100.3	150.4	200.4	280.3
Reading 5	39.7	100.4	150.5	200.5	280.3

T1: 39.90 T2: E01 T1-T2: E04 31-03 14:14:00	T1: 100.50 T2: E01 T1-T2: E04 31-03 13:07:34	T1: 150.20 T2: E01 T1-T2: E04 31-03 13:18:00	T1: 200.20 T2: E01 T1-T2: E04 31-03 13:34:47	T1: 280.00 T2: E01 T1-T2: E04 31-03 13:49:40
T1: 39.80 T2: E01 T1-T2: E04 31-03 14:15:59	T1: 100.30 T2: E01 T1-T2: E04 31-03 13:09:00	T1: 150.30 T2: E01 T1-T2: E04 31-03 13:20:35	T1: 200.20 T2: E01 T1-T2: E04 31-03 13:36:53	T1: 280.20 T2: E01 T1-T2: E04 31-03 13:51:45
T1: 39.70 T2: E01 T1-T2: E04 31-03 14:17:52	T1: 100.30 T2: E01 T1-T2: E04 31-03 13:10:07	T1: 150.30 T2: E01 T1-T2: E04 31-03 13:24:50	T1: 200.40 T2: E01 T1-T2: E04 31-03 13:37:56	T1: 280.30 T2: E01 T1-T2: E04 31-03 13:53:22
T1: 39.80 T2: E01 T1-T2: E04 31-03 14:18:10	T1: 100.30 T2: E01 T1-T2: E04 31-03 13:11:26	T1: 150.40 T2: E01 T1-T2: E04 31-03 13:27:55	T1: 200.40 T2: E01 T1-T2: E04 31-03 13:40:59	T1: 280.30 T2: E01 T1-T2: E04 31-03 13:54:41
T1: 39.70 T2: E01 T1-T2: E04 31-03 14:18:52	T1: 100.40 T2: E01 T1-T2: E04 31-03 13:13:00	T1: 150.50 T2: E01 T1-T2: E04 31-03 13:30:37	T1: 200.50 T2: E01 T1-T2: E04 31-03 13:42:31	T1: 280.30 T2: E01 T1-T2: E04 31-03 13:55:57

Report Reference Number: NCA NO GC-0423-034

Engineer/Technical: Prasittisunt Maliphan

Raw Data Page 5

Column Oven Temperature Stability Raw data Reading

Customer Name: PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD.
Instrument Model: Clarus 580 GC

Department: Quality Control
Serial Name: 580S17020103

Oven Temperature Stability at 100 °C

Temperature °C put on Position #	Temp stability Reading at Position
Position 1	100.5
Position 2	100.3
Position 3	100.3
Position 4	100.3
Position 5	100.4

Report Reference Number: NCA NO GC-0423-034

Engineer/Technical: Prasittisunt Maliphan

Injector port Temperature Raw data Reading

Customer Name: PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD. Department: Quality Control
 Instrument Model: Clarus 580 GC Serial Name: 580S17020103
 Injector Type: Split/Splitless

Injection Port Temperature °C

Temperature °C	Injector Temp 150 °C	Injector Temp 200 °C	Injector Temp 280 °C
Temperature Reading	146.5	196.5	216.7

T1: 146.60
 T2: E01
 T1-T2: E04
 S1-Q3 14:22:51

T1: 196.50
 T2: E01
 T1-T2: E04
 S1-Q3 14:25:44

T1: 276.70
 T2: E01
 T1-T2: E04
 S1-Q3 14:28:54

Report Reference Number: VCP NO. GC-0423-034

Engineer/Technical: Prasitthient Maliphan

Base Detector Temperature Raw data Reading

Customer Name: PINTHONG GROUP MANAGEMENT AND CONSULTANTS CO.,LTD. Department: Quality Control
 Instrument Model: Clarus 580 GC Serial Name: 580S17020103
 Detector Type: FID

Base Detector Temperature

Temperature Setpoint°C	Base Detector Temp 200 °C	Base Detector Temp 300 °C
Temperature Reading	197.1	297.0

T1: 197.10
 T2: E01
 T1-T2: E04
 S1-Q3 14:32:51

T1: 297.00
 T2: E01
 T1-T2: E04
 S1-Q3 14:36:51

Report Reference Number: VCP NO. GC-0423-034

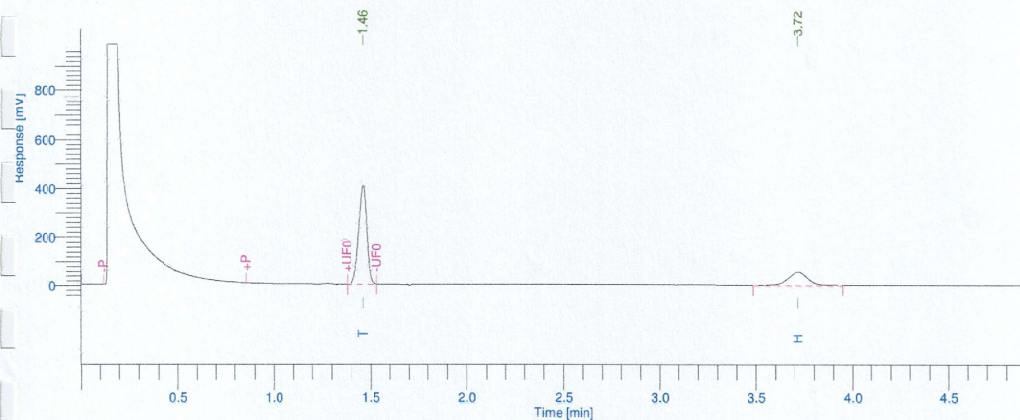
Engineer/Technical: Prasitthient Maliphan

Software Version : 6.3.2.0646
 Operator : manager
 Sample Number : 008
 AutoSampler : BUILT-IN
 Instrument Name : Clarus580
 Instrument Serial # : None
 Delay Time : 0.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 3:24:29 PM

Date : 01-Apr-24 3:32:36 PM
 Sample Name : Precision 6
 Study : Calibration
 Rack/Vial : 0/5
 Channel : A
 A/D mV Range : 1000
 End Time : 5.00 min

Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 12

Raw Data File : D:\PMOQ2023\Precision 6_012.raw
 Result File : D:\PMOQ2023\Precision 6_012.rst [Editing in Progress]
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 Report Format File: D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Tetradecane	1.461	1150475.11	409190.63	75.48	75.48	1.1505
2	Hexadecane	3.718	373769.66	55477.69	24.52	24.52	0.3738
		1524244.77	464668.32	100.00	100.00	1.5242	

Missing Component Report
 Component Expected Retention (Calibration File)

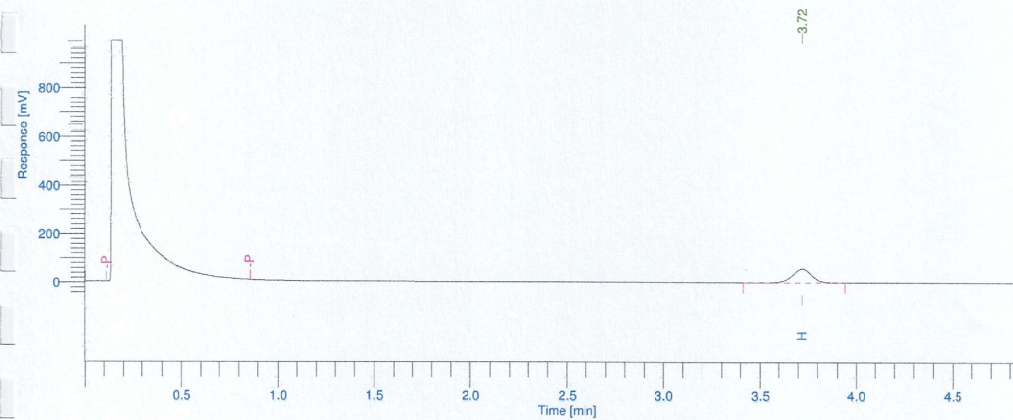
All components were found

Software Version : 6.3.2.0646
 Operator : manager
 Sample Number : 001
 AutoSampler : BUILT-IN
 Instrument Name : Clarus580
 Instrument Serial # : None
 Delay Time : 0.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 2:09:54 PM

Date : 01-Apr-24 2:41:13 PM
 Sample Name : FID Linearity 1
 Study : Calibration
 Rack/Vial : 0/1
 Channel : A
 A/D mV Range : 1000
 End Time : 5.00 min

Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 1

Raw Data File : D:\PMOQ2023\FID Linearity 1_001.raw
 Result File : D:\PMOQ2023\FID Linearity 1_001.rst [Editing in Progress]
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 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\FID Linearity 1_001.rst [Editing in Progress]
 Report Format File: D:\DATA\REPORT FORMAT\Data Analysis.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



*****Data analysis*****

FMC

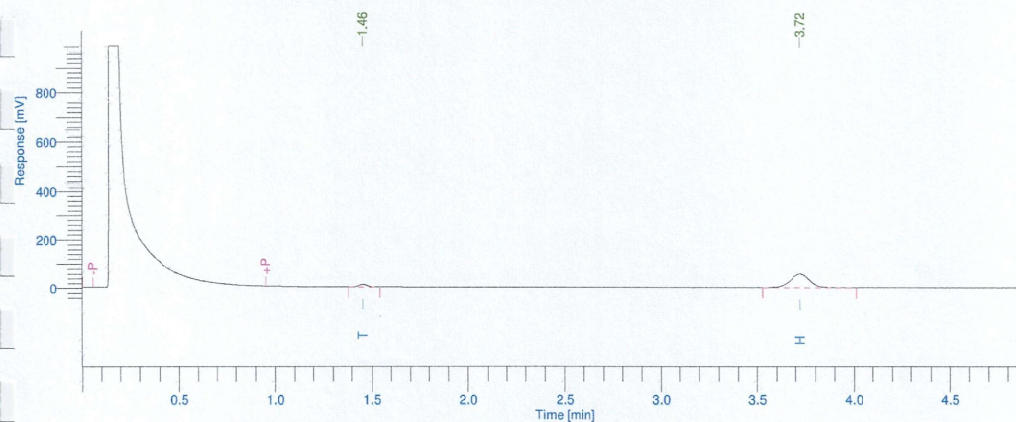
Peak #	Component Name	Time [min]	Area [uV*sec]	Area [%]	Raw Amount
1	Hexadecane	3.721	385225.09	100.00	0.3852
			385225.09	100.00	0.3852

Missing Component Report
 Component Expected Retention (Calibration File)

Tetradecane 1.450

Software Version : 6.3.2.0646 Date : 01-Apr-24 2:44:45 PM
 Operator : manager Sample Name : FID Linearity 2
 Sample Number : 002 Study : Calibration
 AutoSampler : BUILT-IN Rack/Vial : 0/2
 Instrument Name : Clarus580 Channel : A
 Instrument Serial # : None A/D mV Range : 1000
 Delay Time : 0.00 min End Time : 5.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 2:16:40 PM
 Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 2

Raw Data File : D:\PMOQ2023\FID Linearity 2_002.raw
 Result File : D:\PMOQ2023\FID Linearity 2_002.rst [Editing in Progress]
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 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\FID Linearity 2_002.rst [Editing in Progress]
 Report Format File : D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

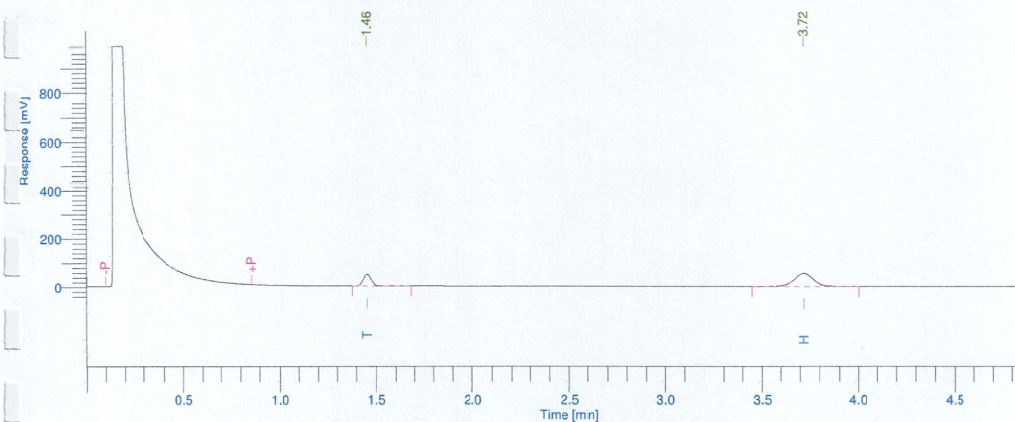
Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Tetradecane	1.455	31325.75	11227.44	7.55	7.55	0.0313
2	Hexadecane	3.723	383781.45	57135.48	92.45	92.45	0.3838
		415107.21	63362.92	100.00	100.00	0.4151	

Missing Component Report
 Component Expected Retention (Calibration File)

All components were found

Software Version : 6.3.2.0646 Date : 01-Apr-24 2:46:39 PM
 Operator : manager Sample Name : FID Linearity 3
 Sample Number : 003 Study : Calibration
 AutoSampler : BUILT-IN Rack/Vial : 0/3
 Instrument Name : Clarus580 Channel : A
 Instrument Serial # : None A/D mV Range : 1000
 Delay Time : 0.00 min End Time : 5.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 2:23:28 PM
 Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 3

Raw Data File : D:\PMOQ2023\FID Linearity 3_003.raw
 Result File : D:\PMOQ2023\FID Linearity 3_003.rst [Editing in Progress]
 Inst Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\FID Linearity 3_003.raw
 Proc Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\FID Linearity 3_003.rst [Editing in Progress]
 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\FID Linearity 3_003.rst [Editing in Progress]
 Report Format File : D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

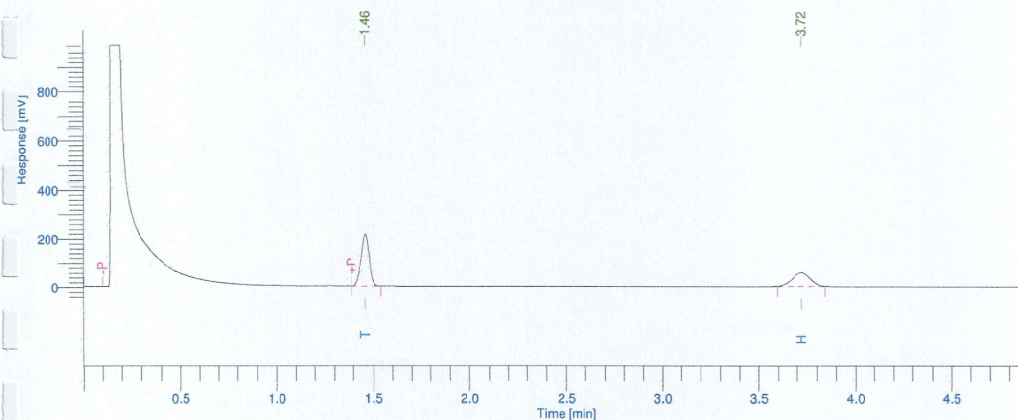
Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Tetradecane	1.455	140126.66	49638.09	27.81	27.81	0.1401
2	Hexadecane	3.721	363761.09	54315.90	72.19	72.19	0.3638
		503887.74	103953.99	100.00	100.00	0.5039	

Missing Component Report
 Component Expected Retention (Calibration File)

All components were found

Software Version : 6.3.2.0646 Date : 01-Apr-24 2:58:02 PM
 Operator : manager Sample Name : FID Linearity 4
 Sample Number : 004 Study : Calibration
 AutoSampler : BUILT-IN Rack/Vial : 0/4
 Instrument Name : Clarus580 Channel : A
 Instrument Serial # : None A/D mV Range : 1000
 Delay Time : 0.00 min End Time : 5.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 2:30:15 PM
 Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 4

Raw Data File : D:\PMOQ2023\FID Linearity 4_004.raw
 Result File : D:\PMOQ2023\FID Linearity 4_004.rst [Editing in Progress]
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 Proc Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\FID Linearity 4_004.rst [Editing in Progress]
 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\FID Linearity 4_004.rst [Editing in Progress]
 Report Format File : D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

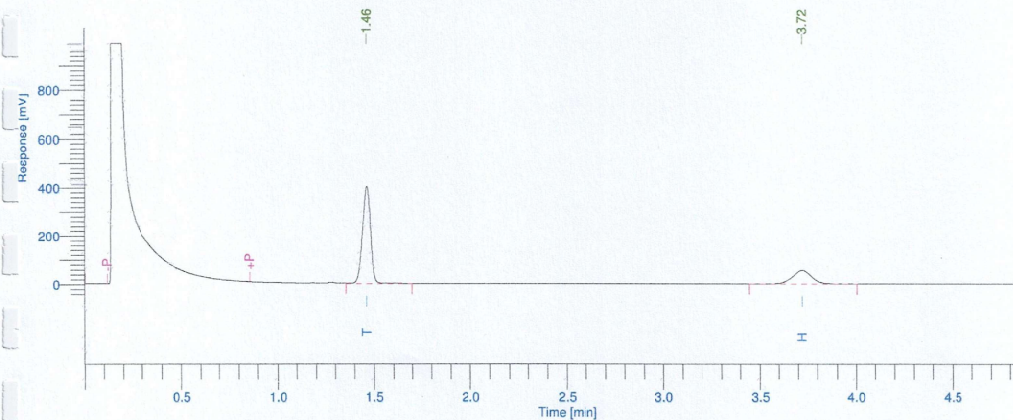
Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Tetradecane	1.459	605206.45	214149.83	61.95	61.95	0.6052
2	Hexadecane	3.722	371770.35	57745.51	38.05	38.05	0.3718
		976976.80	271895.44	100.00	100.00	0.9770	

Missing Component Report
 Component Expected Retention (Calibration File)

All components were found

Software Version : 6.3.2.0646 Date : 01-Apr-24 2:52:16 PM
 Operator : manager Sample Name : FID Linearity 5
 Sample Number : 005 Study : Calibration
 AutoSampler : BUILT-IN Rack/Vial : 0/5
 Instrument Name : Clarus580 Channel : A
 Instrument Serial # : None A/D mV Range : 1000
 Delay Time : 0.00 min End Time : 5.00 min
 Sampling Rate : 12.5000 pts/s
 Sample Volume : 1.000000 ul
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Apr-24 2:36:59 PM
 Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 5

Raw Data File : D:\PMOQ2023\FID Linearity 5_005.raw
 Result File : D:\PMOQ2023\FID Linearity 5_005.rst [Editing in Progress]
 Inst Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\FID Linearity 5_005.raw
 Proc Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\FID Linearity 5_005.rst [Editing in Progress]
 Calib Method : d:\pmoq2023\calibration2023_1 from D:\PMOQ2023\FID Linearity 5_005.rst [Editing in Progress]
 Report Format File : D:\DATA\REPORT FORMAT\ANALYSIS REPORT.rpt
 Sequence File : D:\PMOQ2023\Calibration2023.seq



ANALYSIS REPORT

Peak #	Component Name	Time [min]	Area [uV*sec]	Height [uV]	Area [%]	Norm. Area [%]	Adjusted Amount
1	Tetradecane	1.463	1143527.90	401621.70	75.58	75.58	1.1435
2	Hexadecane	3.720	369538.04	55181.59	24.42	24.42	0.3695
		1513065.94	456803.29	100.00	100.00	1.5131	

Missing Component Report
 Component Expected Retention (Calibration File)

All components were found

Software Version : 6.3.2.0646
Operator : service
Sample Number :
AutoSampler :
Instrument Name :
Interface Serial # :
Delay Time : 0.00 min
Sampling Rate : 10.0006 pts/s
Sample Volume : 1.000000 µL
Sample Amount : 1.0000
Data Acquisition Time : 01-Jan-80 12:00:01 AM

Date : 31-Mar-24 3:29:48 PM
Sample Name :
Study :
Rack/Vial : 0/1
Channel : A
A/D mV Range : 1000
End Time : 8.50 min

Area Reject : 0.000000
Dilution Factor : 1.00
Cycle : 1

Raw Data File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-1dat-SS420x.raw
Result File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-1dat-SS420x.rst [Editing in Progress]
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Calib Method : E:\Calibration\Calibration QA HPL I 23 2016\Method\Software Cal from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-1dat-SS420x.rst [Editing in Progress]
Report Format File: DEFAULT.rpt
Sequence File :

DEFAULT REPORT

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	0.134	25072.50	10006.09	0.02	0.02	BB	2.5057
2	0.197	49996.70	20002.24	0.04	0.04	BB	2.4996
3	0.271	75001.00	30003.39	0.06	0.06	BB	2.4998
4	0.377	100003.10	40002.73	0.08	0.08	BB	2.4999
5	0.441	125004.10	50002.86	0.10	0.10	BB	2.4999
6	0.542	150006.40	60004.06	0.12	0.12	BB	2.4999
7	0.622	175000.25	70001.15	0.14	0.14	BB	2.5000
8	0.705	199998.50	79999.49	0.16	0.16	BB	2.5000
9	0.790	225008.30	90003.14	0.18	0.18	BB	2.5000
10	0.869	250013.50	100004.00	0.20	0.20	BB	2.5000
11	0.944	275008.50	110001.13	0.22	0.22	BB	2.5001
12	1.052	300007.30	131169.88	0.24	0.24	BB	2.2872
13	1.125	325013.30	130003.49	0.26	0.26	BB	2.5000
14	1.202	350011.45	140002.31	0.28	0.28	BB	2.5000
15	1.290	375010.65	150000.44	0.30	0.30	BB	2.5001
16	1.382	400017.10	160003.59	0.32	0.32	BB	2.5001
17	1.450	425014.00	170002.19	0.34	0.34	BB	2.5001
18	1.535	450010.80	179999.19	0.36	0.36	BB	2.5001
19	1.628	475019.00	190002.06	0.38	0.38	BB	2.5001
20	1.714	500016.95	200001.35	0.40	0.40	BB	2.5001
21	1.802	525004.71	209997.53	0.42	0.42	BB	2.5001
22	1.880	550014.10	219999.59	0.44	0.44	BB	2.5001
23	1.964	575018.40	230000.61	0.46	0.46	BB	2.5001
24	2.048	600016.41	239999.66	0.48	0.48	BB	2.5001
25	2.137	625009.61	249998.06	0.50	0.50	BB	2.5001
26	2.209	650010.48	259997.01	0.51	0.51	BB	2.5001
27	2.295	675014.51	269996.84	0.53	0.53	BB	2.5001
28	2.370	700023.41	279999.06	0.55	0.55	BB	2.5001
29	2.464	725013.51	289997.61	0.57	0.57	BB	2.5001
30	2.540	750017.81	299997.84	0.59	0.59	BB	2.5001
31	2.632	775016.21	309996.61	0.61	0.61	BB	2.5001
32	2.701	800024.26	319998.04	0.63	0.63	BB	2.5001
33	2.797	825018.61	329997.98	0.65	0.65	BB	2.5001
34	2.876	850019.81	339998.39	0.67	0.67	BB	2.5001
35	2.956	875021.56	349996.13	0.69	0.69	BB	2.5001
36	3.050	900020.01	359996.06	0.71	0.71	BB	2.5001
37	3.132	925021.41	369997.06	0.73	0.73	BB	2.5001
38	3.217	950020.81	383410.76	0.75	0.75	BB	2.4778
39	3.300	975019.31	393413.66	0.77	0.77	BB	2.4784
40	3.382	1000014.71	403144.35	0.79	0.79	BB	2.4805
41	3.465	1025015.61	409994.59	0.81	0.81	BB	2.5001
42	3.547	1050009.91	419992.57	0.83	0.83	BB	2.5001
43	3.625	1075012.36	429990.20	0.85	0.85	BB	2.5001
44	3.712	1100021.01	439992.61	0.87	0.87	BB	2.5001
45	3.800	1125006.91	449988.57	0.89	0.89	BB	2.5001
46	3.870	1150000.41	459987.79	0.91	0.91	BB	2.5001

31-Mar-24 3:29:48 PM Result: D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-1dat-SS420x.rst

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
47	3.958	1175014.36	469989.44	0.93	0.93	BB	2.5001
48	4.050	1200013.11	479988.06	0.95	0.95	BB	2.5001
49	4.132	1224994.21	489984.61	0.97	0.97	BB	2.5001
50	4.217	1249997.21	499986.84	0.99	0.99	BB	2.5001
51	4.292	1275007.46	509987.21	1.01	1.01	BB	2.5001
52	4.382	1300000.71	519983.12	1.03	1.03	BB	2.5001
53	4.468	1325001.86	529985.58	1.05	1.05	BB	2.5001
54	4.550	1349997.51	539985.84	1.07	1.07	BB	2.5001
55	4.631	1375005.61	549985.49	1.09	1.09	BB	2.5001
56	4.705	1400008.71	559983.49	1.11	1.11	BB	2.5001
57	4.798	1424996.31	569982.06	1.13	1.13	BB	2.5001
58	4.881	1449984.62	579980.49	1.15	1.15	BB	2.5001
59	4.959	1474990.87	589979.40	1.17	1.17	BB	2.5001
60	5.048	1499998.12	602769.06	1.19	1.19	BB	2.4885
61	5.123	1524994.22	609980.06	1.21	1.21	BB	2.5001
62	5.213	1549988.62	619981.84	1.23	1.23	BB	2.5001
63	5.300	1574989.82	629978.48	1.25	1.25	BB	2.5001
64	5.383	1600003.62	642851.22	1.27	1.27	BB	2.4889
65	5.463	1625001.72	649982.06	1.29	1.29	BB	2.5001
66	5.545	1649984.82	659980.17	1.31	1.31	BB	2.5001
67	5.632	1674991.22	669978.37	1.33	1.33	BB	2.5001
68	5.703	1700010.92	679983.12	1.35	1.35	BB	2.5001
69	5.786	1724999.57	689980.30	1.37	1.37	BB	2.5001
70	5.877	1749985.52	699978.84	1.39	1.39	BB	2.5001
71	5.963	1774990.02	709977.61	1.41	1.41	BB	2.5001
72	6.050	1800004.27	722495.59	1.43	1.43	BB	2.4914
73	6.122	1825005.22	729980.96	1.45	1.45	BB	2.5001
74	6.213	1849994.37	739981.50	1.47	1.47	BB	2.5001
75	6.295	1875004.72	749982.06	1.49	1.49	BB	2.5001
76	6.378	1900016.27	759982.05	1.50	1.50	BB	2.5001
77	6.452	1925005.27	769978.29	1.52	1.52	BB	2.5001
78	6.537	1949999.42	779981.84	1.54	1.54	BB	2.5001
79	6.634	1975002.92	789983.46	1.56	1.56	BB	2.5001
80	6.715	2000017.42	799982.59	1.58	1.58	BB	2.5001
81	6.798	2025012.32	809982.12	1.60	1.60	BB	2.5001
82	6.875	2049997.92	819981.02	1.62	1.62	BB	2.5001
83	6.965	2075007.77	829982.05	1.64	1.64	BB	2.5001
84	7.045	2100022.32	839983.24	1.66	1.66	BB	2.5001
85	7.125	2125017.92	849980.23	1.68	1.68	BB	2.5001
86	7.213	2150008.62	859983.02	1.70	1.70	BB	2.5001
87	7.286	2175008.72	869982.12	1.72	1.72	BB	2.5001
88	7.385	2200025.62	87905.53	1.74	1.74	BB	2.3457
89	7.452	2225025.12	889981.55	1.76	1.76	BB	2.5001
90	7.536	2250005.12	899980.12	1.78	1.78	BB	2.5001
91	7.623	2275004.87	909980.69	1.80	1.80	BB	2.5001
92	7.715	2300020.37	919981.18	1.82	1.82	BB	2.5001
93	7.796	2325026.12	929982.06	1.84	1.84	BB	2.5001
94	7.875	2350007.12	939980.12	1.86	1.86	BB	2.5001
95	7.963	2375003.17	949979.32	1.88	1.88	BB	2.5001
96	8.040	2400022.22	959980.02	1.90	1.90	BB	2.5001
97	8.130	2425021.92	969977.20	1.92	1.92	BB	2.5001
98	8.213	2450014.52	979979.49	1.94	1.94	BB	2.5001
99	8.293	2475007.43	989978.67	1.96	1.96	BB	2.5001
100	8.371	2500031.52	999979.49	1.98	1.98	BB	2.5001

1.26e+08 5.06e+07 100.00 100.00

Warning -- Signal level out-of-range in peak

Missing Component Report
Component Expected Retention (Calibration File)

All components were found

Type your text

Software Version : 6.3.2.0646
Operator : service
Sample Number :
Auto Sampler :
Instrument Name :
Interface Serial # :
Delay Time : 0.00 min
Sampling Rate : 10.0006 pts/s
Sample Volume : 1.000000 µL
Sample Amount : 1.0000
Data Acquisition Time : 01-Jan-80 12:00:01 AM

Date : 31-Mar-24 3:31:11 PM
Sample Name :
Study :
Rack/Vial : 0/1
Channel : A
A/D mV Range : 1000
End Time : 8.5C min

Area Reject : 0.0C0000
Dilution Factor : 1.0C
Cycle : 1

Raw Data File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-2dat-SS420x.raw
Result File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-2dat-SS420x.rst [Editing in Progress]
Inst Method : DEFAULT from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-2dat-SS420x.raw
Proc Method : E:\Calibra from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-2dat-SS420x.rst [Editing in Progress]
Calib Method : E:\Calibration\Calibration QA HPL I 23 2016\Method\Software Cal from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-2dat-SS420x.rst [Editing in Progress]
Report Format File: DEFAULT.rpt
Sequence File :

DEFAULT REPORT

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	0.134	25072.50	10006.09	0.02	0.02	BB	2.5057
2	0.197	49996.70	20002.24	0.04	0.04	BB	2.4996
3	0.271	75001.00	30003.39	0.06	0.06	BB	2.4998
4	0.377	100003.10	40002.73	0.08	0.08	BB	2.4999
5	0.441	125004.10	50002.86	0.10	0.10	BB	2.4999
6	0.542	150006.40	60004.06	0.12	0.12	BB	2.4999
7	0.622	175000.25	70001.15	0.14	0.14	BB	2.5000
8	0.705	199998.50	79999.49	0.16	0.16	BB	2.5000
9	0.790	225008.30	90003.14	0.18	0.18	BB	2.5000
10	0.869	250013.50	100004.00	0.20	0.20	BB	2.5000
11	0.944	275008.50	110001.13	0.22	0.22	BB	2.5001
12	1.052	300007.30	131159.88	0.24	0.24	BB	2.2872
13	1.125	325013.30	130003.49	0.26	0.26	BB	2.5000
14	1.202	350011.45	140002.31	0.28	0.28	BB	2.5000
15	1.290	375010.65	150000.44	0.30	0.30	BB	2.5001
16	1.382	400017.10	160003.59	0.32	0.32	BB	2.5001
17	1.450	425014.00	170002.19	0.34	0.34	BB	2.5001
18	1.535	450010.80	179999.19	0.36	0.36	BB	2.5001
19	1.628	475019.00	190002.06	0.38	0.38	BB	2.5001
20	1.714	500016.95	200001.35	0.40	0.40	BB	2.5001
21	1.802	525004.71	209997.53	0.42	0.42	BB	2.5001
22	1.880	550014.10	219999.59	0.44	0.44	BB	2.5001
23	1.964	575018.40	230000.61	0.46	0.46	BB	2.5001
24	2.048	600016.41	239999.66	0.48	0.48	BB	2.5001
25	2.137	625005.61	249998.06	0.50	0.50	BB	2.5001
26	2.209	650010.48	259997.01	0.51	0.51	BB	2.5001
27	2.295	675014.51	269996.84	0.53	0.53	BB	2.5001
28	2.370	700023.41	279999.06	0.55	0.55	BB	2.5001
29	2.464	725013.51	289997.61	0.57	0.57	BB	2.5001
30	2.540	750017.81	299997.84	0.59	0.59	BB	2.5001
31	2.632	775016.21	309996.61	0.61	0.61	BB	2.5001
32	2.701	800024.26	319998.04	0.63	0.63	BB	2.5001
33	2.797	825018.61	329997.98	0.65	0.65	BB	2.5001
34	2.876	850019.81	339998.39	0.67	0.67	BB	2.5001
35	2.956	875021.56	349996.13	0.69	0.69	BB	2.5001
36	3.050	900020.01	359996.06	0.71	0.71	BB	2.5001
37	3.132	925021.41	369997.06	0.73	0.73	BB	2.5001
38	3.217	950020.81	383410.76	0.75	0.75	BB	2.4778
39	3.300	975019.31	393413.66	0.77	0.77	BB	2.4784
40	3.382	1000014.71	403144.35	0.79	0.79	BB	2.4805
41	3.465	1025015.61	409994.59	0.81	0.81	BB	2.5001
42	3.547	1050009.91	419992.57	0.83	0.83	BB	2.5001
43	3.625	1075012.36	429990.20	0.85	0.85	BB	2.5001
44	3.712	1100021.01	439992.61	0.87	0.87	BB	2.5001
45	3.800	1125006.91	449998.57	0.89	0.89	BB	2.5001
46	3.870	1150000.41	459997.79	0.91	0.91	BB	2.5001

31-Mar-24 3:31:11 PM Result: D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-2dat-SS420x.rst

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
47	3.958	1175014.36	463989.44	0.93	0.93	BB	2.5001
48	4.050	1200013.11	473988.06	0.95	0.95	BB	2.5001
49	4.132	1224994.21	483984.61	0.97	0.97	BB	2.5001
50	4.217	1249997.21	493986.84	0.99	0.99	BB	2.5001
51	4.292	1275007.46	503987.21	1.01	1.01	BB	2.5001
52	4.382	1300000.71	513983.12	1.03	1.03	BB	2.5001
53	4.468	1325001.86	523985.58	1.05	1.05	BB	2.5001
54	4.550	1349997.51	533985.84	1.07	1.07	BB	2.5001
55	4.631	1375005.61	543985.49	1.09	1.09	BB	2.5001
56	4.705	1400008.71	553983.49	1.11	1.11	BB	2.5001
57	4.798	1424996.31	563982.06	1.13	1.13	BB	2.5001
58	4.881	1449984.62	573980.49	1.15	1.15	BB	2.5001
59	4.959	1474990.87	583979.40	1.17	1.17	BB	2.5001
60	5.048	1499998.12	602769.08	1.19	1.19	BB	2.4885
61	5.123	1524994.22	609980.06	1.21	1.21	BB	2.5001
62	5.213	1549988.62	619981.84	1.23	1.23	BB	2.5001
63	5.300	1574989.82	629978.48	1.25	1.25	BB	2.5001
64	5.383	1600003.62	642851.22	1.27	1.27	BB	2.4889
65	5.463	1625001.72	649982.06	1.29	1.29	BB	2.5001
66	5.545	1649984.82	659980.17	1.31	1.31	BB	2.5001
67	5.632	1674991.22	669978.37	1.33	1.33	BB	2.5001
68	5.703	1700010.92	679983.12	1.35	1.35	BB	2.5001
69	5.786	1724999.57	689980.30	1.37	1.37	BB	2.5001
70	5.877	1749985.52	699978.84	1.39	1.39	BB	2.5001
71	5.963	1774990.02	709977.61	1.41	1.41	BB	2.5001
72	6.050	1800004.27	722495.59	1.43	1.43	BB	2.4814
73	6.122	1825005.22	729980.96	1.45	1.45	BB	2.5001
74	6.213	1849994.37	739981.50	1.47	1.47	BB	2.5001
75	6.295	1875004.72	749982.06	1.49	1.49	BB	2.5001
76	6.378	1900016.27	759982.05	1.50	1.50	BB	2.5001
77	6.452	1925005.27	769978.29	1.52	1.52	BB	2.5001
78	6.537	1949999.42	779981.84	1.54	1.54	BB	2.5001
79	6.634	1975002.92	789983.46	1.56	1.56	BB	2.5001
80	6.715	2000017.42	799982.59	1.58	1.58	BB	2.5001
81	6.798	2025012.32	809982.12	1.60	1.60	BB	2.5001
82	6.875	2049997.92	819981.02	1.62	1.62	BB	2.5001
83	6.965	2075007.77	829982.05	1.64	1.64	BB	2.5001
84	7.045	2100022.32	839983.24	1.66	1.66	BB	2.5001
85	7.125	2125017.92	849980.23	1.68	1.68	BB	2.5001
86	7.213	2150008.62	859983.02	1.70	1.70	BB	2.5001
87	7.286	2175008.72	869982.12	1.72	1.72	BB	2.5001
88	7.385	2200025.62	937905.53	1.74	1.74	BB	2.3457
89	7.452	2225025.12	889981.55	1.76	1.76	BB	2.5001
90	7.536	2250005.12	899980.12	1.78	1.78	BB	2.5001
91	7.623	2275004.87	909980.69	1.80	1.80	BB	2.5001
92	7.715	2300020.37	919981.18	1.82	1.82	BB	2.5001
93	7.796	2325026.12	929982.06	1.84	1.84	BB	2.5001
94	7.875	2350007.12	939980.12	1.86	1.86	BB	2.5001
95	7.963	2375003.17	949979.32	1.88	1.88	BB	2.5001
96	8.040	2400022.22	959980.02	1.90	1.90	BB	2.5001
97	8.130	2425021.92	969977.20	1.92	1.92	BB	2.5001
98	8.213	2450014.52	979979.49	1.94	1.94	BB	2.5001
99	8.293	2475007.43	989978.67	1.96	1.96	BB	2.5001
100	8.371	2500031.52	999979.49	1.98	1.98	BB	2.5001

1.26e+08 5.06e+07 100.00 100.00

Warning -- Signal level out-of-range in peak

Missing Component Report
Component Expected Retention (Calibration File)

All components were found

Software Version : 6.3.2.0646
Operator : service
Sample Number :
AutoSampler :
Instrument Name :
Interface Serial # :
Delay Time : 0.00 min
Sampling Rate : 10.0006 pts/s
Sample Volume : 1.000000 µL
Sample Amount : 1.0000
Data Acquisition Time : 01-Jan-80 12:00:01 AM

Date : 31-Mar-24 3:32:15 PM
Sample Name :
Study :
Rack/Vial : 0/1
Channel : A
A/D mV Range : 1000
End Time : 8.50 min

Area Reject : 0.000000
Dilution Factor : 1.00
Cycle : 1

Raw Data File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-3dat-SS420x.raw
Result File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-3dat-SS420x.rst [Editing in Progress]
Inst Method : DEFAULT from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-3dat-SS420x.raw
Proc Method : E:\Calibra from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-3dat-SS420x.rst [Editing in Progress]
Calib Method : E:\Calibration\Calibration QA HPLI 23 2016\Method\Software Cal from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-3dat-SS420x.rst [Editing in Progress]
Report Format File: DEFAULT.rpt
Sequence File :

DEFAULT REPORT

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	0.073	24997.70	10003.00	0.02	0.02	BB	2.4990
2	0.137	50006.60	20003.00	0.04	0.04	BB	2.4997
3	0.227	75001.63	30003.28	0.06	0.06	BB	2.4998
4	0.313	100005.10	40004.00	0.08	0.08	BB	2.4999
5	0.393	125006.40	50003.44	0.10	0.10	BB	2.5000
6	0.493	150013.20	60006.00	0.12	0.12	BB	2.5000
7	0.567	175006.40	70003.00	0.14	0.14	BB	2.5000
8	0.670	200001.80	80002.00	0.16	0.16	BB	2.5000
9	0.732	225011.30	90004.00	0.18	0.18	BB	2.5000
10	0.837	250014.20	100006.00	0.20	0.20	BB	2.5000
11	0.907	275010.00	110004.00	0.22	0.22	BB	2.5000
12	0.982	300011.80	120003.00	0.24	0.24	BB	2.5000
13	1.067	325018.00	130005.00	0.26	0.26	BB	2.5000
14	1.160	350017.20	140005.00	0.28	0.28	BB	2.5000
15	1.240	375012.70	150003.00	0.30	0.30	BB	2.5000
16	1.330	400022.00	160006.00	0.32	0.32	BB	2.5000
17	1.415	425026.10	170006.00	0.34	0.34	BB	2.5001
18	1.498	450024.20	180005.53	0.36	0.36	BB	2.5001
19	1.570	475024.40	190005.84	0.38	0.38	BB	2.5001
20	1.668	500026.10	200005.61	0.40	0.40	BB	2.5001
21	1.747	525021.00	210002.00	0.42	0.42	BB	2.5001
22	1.818	550026.20	220004.00	0.44	0.44	BB	2.5001
23	1.915	575025.00	230005.53	0.46	0.46	BB	2.5000
24	2.000	600024.65	240003.52	0.48	0.48	BB	2.5001
25	2.080	625029.30	250004.00	0.50	0.50	BB	2.5001
26	2.158	650029.80	260003.00	0.51	0.51	BB	2.5001
27	2.253	675021.31	270002.49	0.53	0.53	BB	2.5001
28	2.334	700033.41	282003.00	0.55	0.55	BB	2.4816
29	2.415	725033.31	290004.51	0.57	0.57	BB	2.5001
30	2.492	750037.56	300004.61	0.59	0.59	BB	2.5001
31	2.573	775030.31	310003.35	0.61	0.61	BB	2.5001
32	2.660	800041.71	320007.00	0.63	0.63	BB	2.5001
33	2.753	825043.21	330006.00	0.65	0.65	BB	2.5001
34	2.818	850043.21	340004.68	0.67	0.67	BB	2.5001
35	2.915	875034.51	350004.06	0.69	0.69	BB	2.5001
36	3.003	900034.81	360004.06	0.71	0.71	BB	2.5001
37	3.077	925041.11	370003.45	0.73	0.73	BB	2.5001
38	3.159	950044.41	380003.38	0.75	0.75	BB	2.5001
39	3.240	975038.31	390002.83	0.77	0.77	BB	2.5001
40	3.326	1000029.26	400000.07	0.79	0.79	BB	2.5001
41	3.413	1025044.51	410002.18	0.81	0.81	BB	2.5001
42	3.498	1050040.31	420000.49	0.83	0.83	BB	2.5001
43	3.582	1075030.06	431962.69	0.85	0.85	BB	2.4887
44	3.649	1100028.51	439998.98	0.87	0.87	BB	2.5001
45	3.746	1125031.26	449998.18	0.89	0.89	BB	2.5001
46	3.823	1150035.31	459997.84	0.91	0.91	BB	2.5001

31-Mar-24 3:32:15 PM Result: D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-3dat-SS420x.rst

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
47	3.907	1175033.31	469999.61	0.93	0.93	BB	2.5001
48	3.998	1200020.31	481887.91	0.95	0.95	BB	2.4902
49	4.080	1225024.41	489994.04	0.97	0.97	BB	2.5001
50	4.156	1250030.51	499995.49	0.99	0.99	BB	2.5001
51	4.249	1275030.81	509997.61	1.01	1.01	BB	2.5001
52	4.334	1300018.41	521958.18	1.03	1.03	BB	2.4907
53	4.415	1325031.61	529996.06	1.05	1.05	BB	2.5001
54	4.493	1350034.41	539995.49	1.07	1.07	BB	2.5001
55	4.585	1375027.41	550495.94	1.09	1.09	BB	2.3286
56	4.661	1400021.41	559995.49	1.11	1.11	BB	2.5001
57	4.742	1425024.61	569993.60	1.13	1.13	BB	2.5001
58	4.833	1450027.81	579991.84	1.15	1.15	BB	2.5001
59	4.910	1475021.76	589992.42	1.17	1.17	BB	2.5001
60	4.993	1500016.76	599993.07	1.19	1.19	BB	2.5001
61	5.081	1525022.56	609992.05	1.21	1.21	BB	2.5001
62	5.167	1550029.71	621665.25	1.23	1.23	BB	2.4934
63	5.238	1575017.07	629988.82	1.25	1.25	BB	2.5001
64	5.319	1600017.42	639991.69	1.27	1.27	BB	2.5001
65	5.406	1625023.22	649992.08	1.29	1.29	BB	2.5001
66	5.500	1650034.71	659993.55	1.31	1.31	BB	2.5001
67	5.580	1675022.42	669991.12	1.33	1.33	BB	2.5001
68	5.665	1700024.92	679995.53	1.35	1.35	BB	2.5001
69	5.745	1725030.12	689994.41	1.37	1.37	BB	2.5001
70	5.827	1750035.97	699992.70	1.39	1.39	BB	2.5001
71	5.918	1775028.87	706493.18	1.41	1.41	BB	2.3464
72	5.996	1800018.92	719992.63	1.43	1.43	BB	2.5001
73	6.072	1825036.32	729995.45	1.45	1.45	BB	2.5001
74	6.162	1850044.02	739994.84	1.47	1.47	BB	2.5001
75	6.237	1875039.47	749993.64	1.49	1.49	BB	2.5001
76	6.330	1900028.32	759994.93	1.50	1.50	BB	2.5001
77	6.412	1925030.22	769993.18	1.52	1.52	BB	2.5001
78	6.497	1950052.67	779996.16	1.54	1.54	BB	2.5001
79	6.573	1975046.02	789994.76	1.56	1.56	BB	2.5001
80	6.666	2000034.12	799996.06	1.58	1.58	BB	2.5001
81	6.747	2025041.12	809996.98	1.60	1.60	BB	2.5001
82	6.833	2050055.82	820981.00	1.62	1.62	BB	2.4971
83	6.915	2075052.07	829995.60	1.64	1.64	BB	2.5001
84	6.996	2100037.42	839996.12	1.66	1.66	BB	2.5001
85	7.072	2125034.27	849993.49	1.68	1.68	BB	2.5001
86	7.163	2150056.52	859996.06	1.70	1.70	BB	2.5001
87	7.241	2175056.12	869995.97	1.72	1.72	BB	2.5001
88	7.330	2200043.47	879996.05	1.74	1.74	BB	2.5001
89	7.411	2225043.32	889995.61	1.76	1.76	BB	2.5001
90	7.491	2250061.82	899995.70	1.78	1.78	BB	2.5001
91	7.585	2275064.87	909995.94	1.80	1.80	BB	2.3707
92	7.666	2300049.12	919997.02	1.82	1.82	BB	2.5001
93	7.748	2325046.32	930584.44	1.84	1.84	BB	2.4985
94	7.829	2350057.42	939994.61	1.86	1.86	BB	2.5001
95	7.913	2375060.12	949994.06	1.88	1.88	BB	2.5001
96	8.001	2400052.57	959995.58	1.90	1.90	BB	2.5001
97	8.071	2425042.42	969993.12	1.92	1.92	BB	2.5001
98	8.151	2450063.52	979994.32	1.94	1.94	BB	2.5001
99	8.234	2475068.42	989993.98	1.96	1.96	BB	2.5001
100	8.319	2500063.07	999996.27	1.98	1.98	BB	2.5001

1.26e+08 5.06e+07 100.00 100.00

Warning -- Signal level out-of-range in peak

Missing Component Report
Component Expected Retention (Calibration File)

All components were found

Software Version : 6.3.2.0646 Date : 31-Mar-24 3:33:11 PM
Operator : service Sample Name :
Sample Number : Study :
AutoSampler : Rack/Vial : 0/1
Instrument Name : Channel : A
Interface Serial # : A/D mV Range : 1000
Delay Time : 0.00 min End Time : 8.50 min
Sampling Rate : 10.0006 pts/s
Sample Volume : 1.000000 µL
Sample Amount : 1.0000
Data Acquisition Time : 01-Jan-80 12:00:01 AM

Area Reject : 0.000000
Dilution Factor : 1.00
Cycle : 1

Raw Data File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-4dat-SS420x.raw
Result File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-4dat-SS420x.rst [Editing in Progress]
Inst Method : DEFAULT from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-4dat-SS420x.raw
Proc Method : E:\Calibra from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-4dat-SS420x.rst [Editing in Progress]
Calib Method : E:\Calibration\Calibration QA HPLI 23 2016\Method\Software Cal from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-4dat-SS420x.rst [Editing in Progress]
Report Format File: DEFAULT.rpt
Sequence File :

DEFAULT REPORT

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	0.105	24992.60	10001.00	0.02	0.02	BB	2.4990
2	0.220	49996.20	20003.00	0.04	0.04	BB	2.4995
3	0.300	75002.10	30004.00	0.06	0.06	BB	2.4997
4	0.363	100003.10	40003.00	0.08	0.08	BB	2.4999
5	0.455	125005.40	50004.00	0.10	0.10	BB	2.4999
6	0.547	150006.70	60005.00	0.12	0.12	BB	2.4999
7	0.630	175005.90	70003.00	0.14	0.14	BB	2.5000
8	0.712	200005.80	80003.00	0.16	0.16	BB	2.5000
9	0.800	225010.40	90005.00	0.18	0.18	BB	2.5000
10	0.870	250016.20	100006.00	0.20	0.20	BB	2.5000
11	0.967	275012.90	110004.00	0.22	0.22	BB	2.5000
12	1.050	300011.20	120002.47	0.24	0.24	BB	2.5000
13	1.133	325015.30	130005.47	0.26	0.26	BB	2.5000
14	1.202	350019.20	140004.49	0.28	0.28	BB	2.5001
15	1.290	375018.40	150003.14	0.30	0.30	BB	2.5001
16	1.377	400023.35	160005.39	0.32	0.32	BB	2.5001
17	1.462	425016.10	170004.12	0.34	0.34	BB	2.5000
18	1.548	450019.80	180004.61	0.36	0.36	BB	2.5000
19	1.637	475029.15	190006.52	0.38	0.38	BB	2.5001
20	1.722	500024.75	200005.59	0.40	0.40	BB	2.5001
21	1.798	525018.70	210003.00	0.42	0.42	BB	2.5001
22	1.882	550022.65	220003.42	0.44	0.44	BB	2.5001
23	1.972	575030.10	230005.00	0.46	0.46	BB	2.5001
24	2.047	600027.40	240003.60	0.48	0.48	BB	2.5001
25	2.128	625022.06	250002.44	0.50	0.50	BB	2.5001
26	2.220	650020.41	260002.06	0.51	0.51	BB	2.5001
27	2.304	675022.61	270000.77	0.53	0.53	BB	2.5001
28	2.383	700033.40	280006.00	0.55	0.55	BB	2.5001
29	2.469	725024.01	290002.02	0.57	0.57	BB	2.5001
30	2.550	750032.31	300004.45	0.59	0.59	BB	2.5001
31	2.630	775013.51	309997.45	0.61	0.61	BB	2.5001
32	2.718	800041.31	320005.08	0.63	0.63	BB	2.5001
33	2.802	825031.91	330002.96	0.65	0.65	BB	2.5001
34	2.880	850033.61	340003.49	0.67	0.67	BB	2.5001
35	2.970	875037.91	350003.49	0.69	0.69	BB	2.5001
36	3.050	900036.51	360001.76	0.71	0.71	BB	2.5001
37	3.138	925032.01	370002.57	0.73	0.73	BB	2.5001
38	3.215	950033.21	380003.31	0.75	0.75	BB	2.5001
39	3.298	975036.46	390001.64	0.77	0.77	BB	2.5001
40	3.381	1000031.71	399998.49	0.79	0.79	BB	2.5001
41	3.472	1025031.51	420329.37	0.81	0.81	BB	2.4386
42	3.548	1050031.46	420000.88	0.83	0.83	BB	2.5001
43	3.628	1075028.91	429997.12	0.85	0.85	BB	2.5001
44	3.723	1100035.96	439998.51	0.87	0.87	BB	2.5001
45	3.800	1125028.06	449997.20	0.89	0.89	BB	2.5001
46	3.883	1150024.06	459996.79	0.91	0.91	BB	2.5001

31-Mar-24 3:33:11 PM Result: D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-4dat-SS420x.rst

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
47	3.973	1175036.51	513926.16	0.93	0.93	BB	2.2864
48	4.052	1200031.61	479995.06	0.95	0.95	BB	2.5001
49	4.133	1225018.41	489993.06	0.97	0.97	BB	2.5001
50	4.218	1250021.01	499996.12	0.99	0.99	BB	2.5001
51	4.298	1275029.01	509995.45	1.01	1.01	BB	2.5001
52	4.373	1300023.01	519991.00	1.03	1.03	BB	2.5001
53	4.461	1325022.36	529992.88	1.05	1.05	BB	2.5001
54	4.548	1350017.86	539994.49	1.07	1.07	BB	2.5001
55	4.639	1375025.81	560832.83	1.09	1.09	BB	2.4518
56	4.714	1400028.11	559992.78	1.11	1.11	BB	2.5001
57	4.801	1425018.11	569991.49	1.13	1.13	BB	2.5001
58	4.873	1450008.66	579989.34	1.15	1.15	BB	2.5001
59	4.960	1475022.61	589990.49	1.17	1.17	BB	2.5001
60	5.058	1500033.66	599992.52	1.19	1.19	BB	2.5001
61	5.138	1525021.61	609991.06	1.21	1.21	BB	2.5001
62	5.220	1550015.02	619992.06	1.23	1.23	BB	2.5001
63	5.293	1575017.62	629988.49	1.25	1.25	BB	2.5001
64	5.387	1600030.41	639991.84	1.27	1.27	BB	2.5001
65	5.468	1625026.02	649992.27	1.29	1.29	BB	2.5001
66	5.555	1650016.02	670545.04	1.31	1.31	BB	2.4607
67	5.627	1675018.32	669989.40	1.33	1.33	BB	2.5001
68	5.712	1700039.22	679993.38	1.35	1.35	BB	2.5001
69	5.800	1725029.32	689992.96	1.37	1.37	BB	2.5001
70	5.890	1750016.32	764850.78	1.39	1.39	BB	2.2880
71	5.962	1775022.52	709989.84	1.41	1.41	BB	2.5001
72	6.053	1800035.72	729393.12	1.43	1.43	BB	2.4679
73	6.135	1825039.12	729994.04	1.45	1.45	BB	2.5001
74	6.213	1850021.57	739992.72	1.47	1.47	BB	2.5001
75	6.297	1875029.32	749992.61	1.49	1.49	BB	2.5001
76	6.377	1900045.72	759994.98	1.50	1.50	BB	2.5001
77	6.470	1925034.32	769991.63	1.52	1.52	BB	2.5001
78	6.543	1950024.72	779993.49	1.54	1.54	BB	2.5001
79	6.638	1975031.22	789993.83	1.56	1.56	BB	2.5001
80	6.723	2000045.72	872713.20	1.58	1.58	BB	2.2918
81	6.796	2025042.62	809994.06	1.60	1.60	BB	2.5001
82	6.886	2050035.57	819996.47	1.62	1.62	BB	2.5001
83	6.960	2075036.62	829994.49	1.64	1.64	BB	2.5001
84	7.053	2100048.32	839994.61	1.66	1.66	BB	2.5001
85	7.140	2125047.82	926257.98	1.68	1.68	BB	2.2942
86	7.211	2150040.77	859995.41	1.70	1.70	BB	2.5001
87	7.290	2175044.27	869994.58	1.72	1.72	BB	2.5001
88	7.376	2200057.32	879995.15	1.74	1.74	BB	2.5001
89	7.466	2225055.72	889995.62	1.76	1.76	BB	2.5001
90	7.538	2250039.47	899993.86	1.78	1.78	BB	2.5001
91	7.638	2275041.72	918510.89	1.80	1.80	BB	2.4769
92	7.718	2300058.92	919996.49	1.82	1.82	BB	2.5001
93	7.800	2325063.12	929997.06	1.84	1.84	BB	2.5001
94	7.880	2350043.57	939995.66	1.86	1.86	BB	2.5001
95	7.962	2375044.17	949995.78	1.88	1.88	BB	2.5001
96	8.041	2400063.22	959995.12	1.90	1.90	BB	2.5001
97	8.134	2425060.72	969992.98	1.92	1.92	BB	2.5001
98	8.219	2450053.92	979995.02	1.94	1.94	BB	2.5001
99	8.299	2475047.07	989995.56	1.96	1.96	BB	2.5001
100	8.369	2500072.67	999996.24	1.98	1.98	BB	2.5001

1.26e+08 5.08e+07 100.00 100.00

Warning -- Signal level out-of-range in peak

Missing Component Report
Component Expected Retention (Calibration File)

All components were found

Software Version : 6.3.2.0646 Date : 31-Mar-24 3:34:04 PM
Operator : service Sample Name :
Sample Number : Study :
AutoSampler : Rack/Vial : 0/1
Instrument Name : Channel : A
Interface Serial # : A/D mV Range : 1000
Delay Time : 0.00 min End Time : 8.50 min
Sampling Rate : 10.0006 pts/s
Sample Volume : 1.000000 µL
Sample Amount : 1.0000
Data Acquisition Time : 01-Jan-80 12:00:01 AM

Area Reject : 0.000000
Dilution Factor : 1.00
Cycle : 1

Raw Data File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-5dat-SS420x.raw
Result File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-5dat-SS420x.rst [Editing in Progress]
Inst Method : DEFAULT from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-5dat-SS420x.raw
Proc Method : E:\Calibra from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-5dat-SS420x.rst [Editing in Progress]
Calib Method : E:\Calibration\Calibration QA HPL I 23 2016\Method\Software Cal from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-5dat-SS420x.rst [Editing in Progress]
Report Format File: DEFAULT.rpt
Sequence File :

DEFAULT REPORT

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	0.113	25176.99	10016.14	0.02	0.02	BB	2.5136
2	0.198	49996.20	20001.46	0.04	0.04	BB	2.4996
3	0.295	74999.65	30002.62	0.06	0.06	BB	2.4998
4	0.373	99998.30	40000.79	0.08	0.08	BB	2.4999
5	0.450	124998.85	50000.83	0.10	0.10	BB	2.4999
6	0.549	150001.20	60002.39	0.12	0.12	BB	2.4999
7	0.627	174998.20	69999.49	0.14	0.14	BB	2.5000
8	0.720	199997.05	81247.65	0.16	0.16	BB	2.4616
9	0.799	225004.55	90001.30	0.18	0.18	BB	2.5000
10	0.872	250005.25	100000.79	0.20	0.20	BB	2.5000
11	0.957	275000.60	109959.16	0.22	0.22	BB	2.5000
12	1.044	300000.60	119957.51	0.24	0.24	BB	2.5001
13	1.139	325004.70	142001.27	0.26	0.26	BB	2.2887
14	1.205	350004.15	139958.34	0.28	0.28	BB	2.5001
15	1.302	374999.10	151864.85	0.30	0.30	BB	2.4693
16	1.389	400007.60	174691.36	0.32	0.32	BB	2.2898
17	1.472	425003.20	185575.00	0.34	0.34	BB	2.2902
18	1.542	449999.45	179986.25	0.36	0.36	BB	2.5000
19	1.625	475004.30	189987.55	0.38	0.38	BB	2.5001
20	1.717	500001.81	199994.49	0.40	0.40	BB	2.5001
21	1.802	524997.01	212291.97	0.42	0.42	BB	2.4730
22	1.880	549999.31	219994.06	0.44	0.44	BB	2.5001
23	1.969	574998.51	229993.51	0.46	0.46	BB	2.5001
24	2.048	600002.86	239992.89	0.48	0.48	BB	2.5001
25	2.139	625001.36	272463.68	0.50	0.50	BB	2.2939
26	2.217	649992.81	259990.06	0.51	0.51	BB	2.5001
27	2.302	674990.41	272579.89	0.53	0.53	BB	2.4763
28	2.385	700004.61	279993.49	0.55	0.55	BB	2.5001
29	2.473	725001.16	289990.49	0.57	0.57	BB	2.5001
30	2.547	749997.26	299990.11	0.59	0.59	BB	2.5001
31	2.637	774985.66	312932.24	0.61	0.61	BB	2.4765
32	2.721	800003.61	319991.98	0.63	0.63	BB	2.5001
33	2.793	825003.71	329987.87	0.65	0.65	BB	2.5001
34	2.877	849996.56	339988.44	0.67	0.67	BB	2.5001
35	2.967	874994.06	349988.07	0.69	0.69	BB	2.5001
36	3.052	899996.91	362783.81	0.71	0.71	BB	2.4808
37	3.137	924995.41	369986.61	0.73	0.73	BB	2.5001
38	3.210	949996.36	379986.75	0.75	0.75	BB	2.5001
39	3.298	974983.51	389984.12	0.77	0.77	BB	2.5001
40	3.380	999985.31	399981.06	0.79	0.79	BB	2.5001
41	3.470	1024996.91	409984.06	0.81	0.81	BB	2.5001
42	3.548	1049987.31	419981.49	0.83	0.83	BB	2.5001
43	3.632	1074974.61	429979.33	0.85	0.85	BB	2.5001
44	3.719	1099981.71	439978.53	0.87	0.87	BB	2.5001
45	3.794	1124982.11	449977.02	0.89	0.89	BB	2.5001
46	3.885	1149977.11	459975.97	0.91	0.91	BB	2.5001

31-Mar-24 3:34:04 PM Result: D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 4-5dat-SS420x.rst

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
47	3.966	1174972.86	469977.05	0.93	0.93	BB	2.5001
48	4.043	1199973.61	479974.06	0.95	0.95	BB	2.5001
49	4.132	1224971.71	489971.70	0.97	0.97	BB	2.5001
50	4.210	1249977.01	499974.61	0.99	0.99	BB	2.5001
51	4.304	1274962.42	512887.82	1.01	1.01	BB	2.4859
52	4.382	1299958.02	519968.84	1.03	1.03	BB	2.5001
53	4.457	1324972.02	529970.61	1.05	1.05	BB	2.5001
54	4.543	1349967.67	539970.54	1.07	1.07	BB	2.5001
55	4.638	1374956.92	553738.24	1.09	1.09	BB	2.3158
56	4.715	1399962.42	559969.61	1.11	1.11	BB	2.5001
57	4.790	1424968.37	569967.29	1.13	1.13	BB	2.5001
58	4.887	1449956.02	579965.06	1.15	1.15	BB	2.5001
59	4.955	1474945.52	589963.00	1.17	1.17	BB	2.5001
60	5.055	1499949.42	646399.72	1.19	1.19	BB	2.3205
61	5.135	1524955.82	609963.84	1.21	1.21	BB	2.5001
62	5.216	1549956.47	619964.05	1.23	1.23	BB	2.5001
63	5.301	1574936.52	629960.06	1.25	1.25	BB	2.5001
64	5.374	1599945.07	639962.27	1.27	1.27	BB	2.5001
65	5.465	1624960.32	649963.49	1.29	1.29	BB	2.5001
66	5.551	1649957.57	659962.52	1.31	1.31	BB	2.5001
67	5.629	1674942.42	669960.37	1.33	1.33	BB	2.5001
68	5.715	1699952.22	679963.63	1.35	1.35	BB	2.5001
69	5.800	1724958.17	689962.30	1.37	1.37	BB	2.5001
70	5.887	1749958.52	702204.24	1.39	1.39	BB	2.4921
71	5.970	1774938.32	712159.55	1.41	1.41	BB	2.4923
72	6.047	1799941.92	719959.51	1.43	1.43	BB	2.5001
73	6.126	1824957.12	729961.12	1.45	1.45	BB	2.5001
74	6.210	1849954.17	739960.47	1.47	1.47	BB	2.5001
75	6.305	1874944.97	802590.89	1.49	1.49	BB	2.3361
76	6.377	1899942.82	759960.49	1.50	1.50	BB	2.5001
77	6.470	1924950.92	771892.94	1.52	1.52	BB	2.4938
78	6.539	1949957.42	779957.00	1.54	1.54	BB	2.5001
79	6.623	1974944.52	789958.18	1.56	1.56	BB	2.5001
80	6.715	1999944.22	799959.91	1.58	1.58	BB	2.5001
81	6.789	2024956.22	809957.30	1.60	1.60	BB	2.5001
82	6.880	2049963.62	819959.62	1.62	1.62	BB	2.5001
83	6.963	2074944.02	829957.65	1.64	1.64	BB	2.5001
84	7.046	2099938.03	839957.06	1.66	1.66	BB	2.5001
85	7.123	2124947.23	849955.29	1.68	1.68	BB	2.5001
86	7.220	2149955.83	861483.67	1.70	1.70	BB	2.4956
87	7.295	2174952.43	869958.12	1.72	1.72	BB	2.5001
88	7.386	2199939.93	879956.57	1.74	1.74	BB	2.5001
89	7.467	2224949.73	889954.84	1.76	1.76	BB	2.5001
90	7.548	2249960.13	899955.06	1.78	1.78	BB	2.5001
91	7.635	2274948.63	911159.52	1.80	1.80	BB	2.4968
92	7.718	2299935.73	919954.49	1.82	1.82	BB	2.5001
93	7.795	2324950.23	929953.51	1.84	1.84	BB	2.5001
94	7.881	2349957.23	939953.49	1.86	1.86	BB	2.5001
95	7.972	2374944.93	1.01e+06	1.88	1.88	BB	2.3595
96	8.054	2399932.93	959952.98	1.90	1.90	BB	2.5001
97	8.135	2424940.93	969949.84	1.92	1.92	BB	2.5001
98	8.209	2449956.73	979951.48	1.94	1.94	BB	2.5001
99	8.298	2474944.83	989949.84	1.96	1.96	BB	2.5001
100	3.379	2469940.18	999952.34	1.98	1.98	BB	2.5001

1.26e+08 5.08e+07 100.00 100.00

Warning -- Signal level out-of-range in peak

Missing Component Report
Component Expected Retention (Calibration File)

All components were found

Software Version : 6.3.2.0646
 Operator : service
 Sample Number :
 AutoSampler :
 Instrument Name :
 Interface Serial # :
 Delay Time : 0.00 min
 Sampling Rate : 10.0006 pts/s
 Sample Volume : 1.000000 µL
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Jan-80 12:00:01 AM

Date : 31-Mar-24 3:21:13 PM
 Sample Name :
 Study :
 Rack/Vial : 0/1
 Channel : A
 A/D mV Range : 1000
 End Time : 8.50 min
 Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 1

Raw Data File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 3dat-SS420x.raw
 Result File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 3dat-SS420x.rst [Editing in Progress]
 Inst Method : DEFAULT from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 3dat-SS420x.raw
 Proc Method : E:\Calibra from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 3dat-SS420x.rst [Editing in Progress]
 Calib Method : E:\Calibration\Calibration QA HPL I 23 2016\Method\Software Cal from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 3dat-SS420x.rst [Editing in Progress]
 Report Format File: DEFAULT.rpt
 Sequence File :

DEFAULT REPORT

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	0.816	30028.48	8572.66	0.15	0.15	BB	3.5028
2	1.063	16146.02	4955.97	0.08	0.08	BB	3.2579
3	1.251	239883.85	54127.89	1.21	1.21	BB	4.4320
4	1.481	6957.15	3189.61	0.04	0.04	BB	2.1812
5	1.642	317252.92	78206.12	1.60	1.60	BV	4.0566
6	1.783	1264626.26	338316.70	6.37	6.37	VB	3.7380
7	2.117	73179.02	21464.61	0.37	0.37	BB	3.4093
8	2.294	11729.50	5107.78	0.06	0.06	BB	2.2964
9	2.583	320594.81	985243.14	16.15	16.15	BV	3.2540
10	2.732	736843.89	208870.02	3.71	3.71	VB	3.5278
11	3.079	34998.66	11516.75	0.18	0.18	BB	3.0389
12	3.385	1012797.19	341362.76	5.10	5.10	BB	2.9669
13	3.654	262028.39	79218.69	1.32	1.32	BV	3.3077
14	3.753	96286.47	27297.65	0.48	0.48	VV	3.5273
15	3.855	1262692.44	368387.51	6.36	6.36	VE	3.4276
16	3.953	100547.77	32900.12	0.51	0.51	EV	3.0562
17	4.113	1024569.01	275385.94	5.16	5.16	VE	3.7205
18	4.234	36364.97	11606.39	0.18	0.18	EB	3.1332
19	4.614	1637999.14	436244.00	8.25	8.25	BE	3.7548
20	4.797	61668.85	16416.08	0.31	0.31	EV	3.7566
21	4.933	1103776.89	323145.66	5.56	5.56	VV	3.4157
22	5.129	3484302.79	792493.98	17.55	17.55	VV	4.3966
23	5.279	96887.45	26319.41	0.49	0.49	VV	3.6812
24	5.373	75294.67	20847.88	0.38	0.38	VV	3.6116
25	5.519	2103875.08	508344.01	10.60	10.60	VV	4.1387
26	5.689	126779.57	33678.74	0.64	0.64	VB	3.7646
27	5.911	20302.15	6845.74	0.10	0.10	BB	2.9657
28	6.398	655346.16	181450.75	3.30	3.30	BV	3.6117
29	6.604	177376.86	50524.92	0.89	0.89	VB	3.5107
30	7.037	107577.92	29737.55	0.54	0.54	BB	3.6176
31	7.375	192377.99	54127.06	0.97	0.97	BV	3.5542
32	7.496	114192.46	27874.17	0.58	0.58	VV	4.0967
33	7.641	23849.60	6839.42	0.12	0.12	VB	3.4871
34	8.060	20086.11	5350.81	0.10	0.10	BB	3.7538
35	8.280	104478.34	27187.61	0.53	0.53	BV	3.8429
35	8.434	13844.79	4086.97	0.07	0.07	VB	3.3875
		9852503.62	541e+06	100.00	100.00		

Warning -- Signal level out-of-range in peak

Software Version : 6.3.2.0646
 Operator : service
 Sample Number :
 AutoSampler :
 Instrument Name :
 Interface Serial # :
 Delay Time : 0.00 min
 Sampling Rate : 10.0006 pts/s
 Sample Volume : 1.000000 µL
 Sample Amount : 1.0000
 Data Acquisition Time : 01-Jan-80 12:00:01 AM

Date : 31-Mar-24 3:16:24 PM
 Sample Name :
 Study :
 Rack/Vial : 0/1
 Channel : A
 A/D mV Range : 1000
 End Time : 8.50 min
 Area Reject : 0.000000
 Dilution Factor : 1.00
 Cycle : 1

Raw Data File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 2dat-SS420x.raw
 Result File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 2dat-SS420x.rst [Editing in Progress]
 Inst Method : DEFAULT from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 2dat-SS420x.raw
 Proc Method : E:\Calibra from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 2dat-SS420x.rst [Editing in Progress]
 Calib Method : E:\Calibration\Calibration QA HPL I 23 2016\Method\Software Cal from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 2dat-SS420x.rst [Editing in Progress]
 Report Format File: DEFAULT.rpt
 Sequence File :

DEFAULT REPORT

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	1.745	51000865.31	499992.91	33.33	33.33	MM	102.0032
2	5.120	1.02e+08	999997.88	66.67	66.67	MM	102.0009
		1.53e+08	1.50e+06	100.00	100.00		

Warning -- Signal level out-of-range in peak

Missing Component Report
 Component Expected Retention (Calibration File)

All components were found

Software Version : 6.3.2.0646
Operator : service
Sample Number :
AutoSampler :
Instrument Name :
Interface Serial # :
Delay Time : 0.00 min
Sampling Rate : 10.0006 pts/s
Sample Volume : 1.000000 µL
Sample Amount : 1.0000
Data Acquisition Time : 01-Jan-80 12:00:01 AM

Date : 31-Mar-24 2:37:56 PM
Sample Name :
Study :
Rack/Vial : 0/1
Channel : A
A/D mV Range : 1000
End Time : 8.50 min
Area Reject : 0.000000
Dilution Factor : 1.00
Cycle : 1

Raw Data File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 1dat-SS420x.raw
Result File : D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 1dat-SS420x.rst [Editing in Progress]
Inst Method : DEFAULT from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 1dat-SS420x.raw
Proc Method : E:\Calibra from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 1dat-SS420x.rst [Editing in Progress]
Calib Method : E:\Calibration\Calibration QA HPL I 23 2016\Method\Software Cal from D:\DATA\DATA\PMOQ2023\Software Calibration\Software Calibration 1dat-SS420x.rst [Editing in Progress]
Report Format File: DEFAULT.rpt
Sequence File :

DEFAULT REPORT

Peak #	Time [min]	Area [µV·s]	Height [µV]	Area [%]	Norm. Area [%]	BL	Area/Height [s]
1	0.476	489086.85	31252.72	1.59	1.59	BB	15.6494
2	1.897	978247.20	62493.55	3.17	3.17	BB	15.6536
3	3.318	1957326.85	124988.33	6.35	6.35	BB	15.6601
4	4.738	3915645.14	250001.18	12.70	12.70	BB	15.6625
5	6.159	7832807.33	499999.35	25.40	25.40	BB	15.6656
6	7.580	15667284.11	999990.93	50.80	50.80	BB	15.6674
		30840397.48	1.97e+06	100.00	100.00		

Warning -- Signal level out-of-range in peak

Missing Component Report
Component Expected Retention (Calibration File)

All components were found

Reference Certificate Index



Certificate of Analysis 211-FID

Product Description:

Product Name:	GC FID Standards 1-5	Composition:	n-Tetradecane and n-Hexadecane mixtures in Hexane
Batch Number:	211-FID	Part Code:	VSOL-GC100/5

Certified Values:

Standard	n-Tetradecane Concentration (µg/mL)	n-Hexadecane Concentration (µg/mL)
GC FID Standard 1	0.0	252.2
GC FID Standard 2	20.3	252.2
GC FID Standard 3	101.4	252.2
GC FID Standard 4	404.6	252.2
GC FID Standard 5	807.1	252.2

Preparation Information:

The standards are prepared using high purity materials, and tested for conformity by analytical methods, developed by V:KIT Ltd.

Homogeneity Information:

The standard is considered homogeneous for typically used aliquots of approximately 1 µL to 1.5 mL.

Intended Use:

The standards are intended for use to qualify a capillary gas chromatograph equipped with FID for injection precision, carryover, response linearity and retention time reproducibility.

Instruction for Use:

Ensure the ampoule is intact and undamaged. To open hold the ampoule with both hands, with one thumb against the narrow top section. Pull the bottom of the ampoule towards you while pushing the top section away from you with easy, even pressure. **Caution!** Appropriate PPE should be worn whilst handling the ampoules. Using a clean pipette transfer an appropriate amount of each standard, to separate GC autosampler vials, ensuring each is capped to prevent contamination.

Traceability Information:

a) Gravimetric Calibration

The weighing instruments used were calibrated with weights that are certified traceable to NIST (NBS) test no. 822/254143 using NIST HB44 calibration procedure and tolerances.

b) GC Instrumentation Calibration

The GC equipment is qualified routinely, using appropriate certified test and measuring equipment. The GC system performance is further verified prior to use.

Confidentiality Statement

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01.08.002 F014 v002

Page 1 of 2



Certificate of Analysis 211-FID

Packaging and Storage Conditions:

The standard is contained in brown glass ampoules, with a fill volume of approximately 1.5mL. Standards are supplied in a cardboard box, with vial dividers to protect vials during shipping. The standards should be retained in their box prior to use, and stored at ambient temperature, avoiding extremes of temperature and humidity.

Hazard Information:

Refer to the product Safety Datasheet (SDS) for relevant hazardous information.

Quality Information:

V:KIT Ltd. operate a quality management system the scope of which covers the manufacture, certification and sales of chemical standard solutions, software, measuring and test equipment (including calibration) used in the qualification of chemical analysis equipment.



Certificate No: 2596
ISO 9001

Validity Information:

Expiry date:	31 August 2025
Certifying Officer:	Neil Gowans BSc (Hons), Quality Manager
Issue Date:	15 August 2022

Contact Details:

V:KIT Ltd
Congleton, CW12 1LB
UNITED KINGDOM
info@v-kit.com
www.v-kit.com

Confidentiality Statement

This document is classified as 'V:Kit Public Circulation'. This document can be circulated in the public domain, in its entirety, without unauthorised modification

01.08.002 F014 v002

Page 2 of 2



Certificate of Calibration Simulated Calibration of Thermometer

Issued by V:KIT Ltd

Certificate No: 4078-DTM

Issue Date: 13-Jan-2023

V:KIT Ltd

16 John Bradshaw Court
Alexandria Way
Congleton,
Cheshire, CW12 1LB, UK
Tel: +44 (0) 1260 591385
www.v-kit.com - info@v-kit.com

Customer: MESHCO TECH CO., LTD.
Address: 82 Moo18, Buengkamproi
Lamlukka, Pathum thani 12150
Thailand

Unit Under Test: 2-Ch Thermometer Type K
Serial Number: 1531-G234
Manufacturer: V:KIT Ltd
Model: VKIT-1531

Customer PO No.: PO2023-01-001
Date of Receipt: 07-Dec-2022
Calibration performed by: Daniel John
Calibration Date: 13-Jan-2023

Equipment Condition: Acceptable
Calibration Range: 0 - 400°C
Ambient Temperature: 20.6°C
Expiry Date: 12-Jan-2024

Calibration Method

The unit under test was calibrated using V:KIT Quality Management System procedure ref 06.09.002. The test equipment used are certified and traceable to recognised National Standards. The unit under test was tested 'As Found'. If required the unit under test was adjusted to bring it within a pre-defined specification and re-tested to provide the Calibration Results ("As Left") reported in this certificate

Test Equipment Used

Calibration Equipment:	Identification:	Certificate ID:	Calibration Date:	Expiry Date:
Signal Calibrator	Ametek 1371098	01661	25-Nov-2021	24-Nov-2023
Digital Thermometer	Ametek 1293031	01668	30-Nov-2021	29-Nov-2023
Temperature Probe	Ametek 585197-02	01668	30-Nov-2021	29-Nov-2023

Calibration Results ("As Left")

T1	Applied Temp. °C	Indicated Temp. °C	Deviation °C	Specification °C	Uncertainty °C
	0.0	0.1	0.1	± 0.7	0.47
	25.0	25.1	0.1	± 0.7	0.47
	50.0	50.1	0.1	± 0.8	0.47
	100.0	100.1	0.1	± 1.0	0.47
	250.0	250.0	0.0	± 1.4	0.47
	400.0	399.8	0.2	± 1.9	0.47
T2	Applied Temp. °C	Indicated Temp. °C	Deviation °C	Specification °C	Uncertainty °C
	0.0	0.0	0.0	± 0.7	0.47
	25.0	25.0	0.0	± 0.7	0.47
	50.0	50.0	0.0	± 0.8	0.47
	100.0	100.0	0.0	± 1.0	0.47
	250.0	249.9	0.1	± 1.4	0.47
	400.0	399.7	0.3	± 1.9	0.47

Approved By: Tom Gowans

Approval Date: 13-Jan-2023



Certificate of Calibration Gas Flowmeter

Issued by V:KIT Ltd

Certificate No: 4075-GFM

Issue Date: 20-Dec-2022

V:KIT Ltd

16 John Bradshaw Court
Alexandria Way
Congleton
Cheshire, CW12 1LB, UK
Tel: +44 (0) 1260 591385
www.v-kit.com - info@v-kit.com

Customer: MESHCO TECH CO., LTD.
Address: 82 Moo18, Buengkamproi
Lamlukka, Pathum thani 12150
Thailand

Manufacturer: V:KIT Ltd
Model: VKIT-GFM3
Equipment Condition: Acceptable
Serial Number: 950577
Calibration Range: 0 - 500 mL/min
Test Media: Nitrogen
Reference Temperature: 0.0 °C
Expiry Date: 19-Dec-2023

Customer PO No.: PO2023-01-001
Date of Receipt: 07-Dec-2022
Calibration performed by: Tom Gowans
Calibration Date: 20-Dec-2022

Calibration Method

The flowmeter was tested and the indicated flow readings compared against reference flow rates using mass flow standards calibrated in an ISO 17025 accredited laboratory.

Test Equipment Used

Calibration Equipment:	Identification:	Certificate ID:	Calibration Date:	Expiry Date:
High Flow controller	Bronkhorst F-201CV s/n: M21209881A	EHTG28/5934430	05-May-2021	04-May-2023
Low Flow controller	Bronkhorst F-201CV s/n: M21209881B	EHTG74/5949355	18-May-2021	17-May-2023
Digital Thermometer	Ametek 1293031	01668	30-Nov-2021	29-Nov-2023
Temperature Probe	Ametek 585197-02	01668	30-Nov-2021	29-Nov-2023

Calibration Results ("As Left")

Reference Flow (mL/min)	Indicated Flow (mL/min)	Flow Accuracy (%)
0.0	0.0	0.0
10.0	9.9	-1.0
50.0	50.5	1.0
100.0	100.4	0.4
200.0	200.5	0.3
400.0	400.3	0.2

Limit Flow Accuracy ≤ 3.0 %

Uncertainty of Measurement ± 0.4 mL/min or 2.5 %, whichever is greater

Approved By: Tom Gowans

Approval Date: 20-Dec-2022



Certificate of Calibration Calibration of Digital Pressure Meter

Issued by V:KIT Ltd

Certificate No: 4071-DMA

Issue Date: 24-Jan-2023

V:KIT Ltd

15 John Bradshaw Court
Alexandria Way
Congleton
Cheshire, CW12 1LB, UK
Tel: +44 (0) 1260 591385
www.v-kit.com - info@v-kit.com

Customer: MESHCO TECH CO., LTD.

Address: 82 Moo18, Buengkamprai
Lamlukka, Pathum thani 12150
Thailand

Customer PO No.: PO2023-01-001

Unit Under Test: Pressure Meter for GC Inlet

Manufacturer: V:KIT Ltd

Model: VKIT-DMA2

Equipment Condition: New

Serial Number: DMA-0543

Calibration performed by: Tom Gowans

Calibration Date: 24-Jan-2023

Expiry Date: 23-Jan-2024

Calibration Method

The Unit Under Test was calibrated against measuring equipment whose values are traceable to recognised National Standards using QMS procedure 06.09.007.

Test Equipment Used

Calibration Equipment:	Identification:	Certification/ Calibration Details:	Expiry:
Pressure Source	CN10635094	3959-EPC	02-Nov-2023

Calibration Results ("As Left")

Actual Pressure (psi)	UUT Indicated Pressure (psi)	Absolute Deviation (psi)	Acceptance Criteria (psi)
0.0	0.0	0.0	0.0
10.0	10.0	0.0	0.1
15.0	14.9	0.1	0.2
25.0	24.9	0.1	0.3
50.0	49.9	0.1	0.5
80.0	80.2	0.2	0.8

Approved By: Tom Gowans

Approval Date: 24-Jan-2023

Chromatography Data System Validator Certificate of Calibration

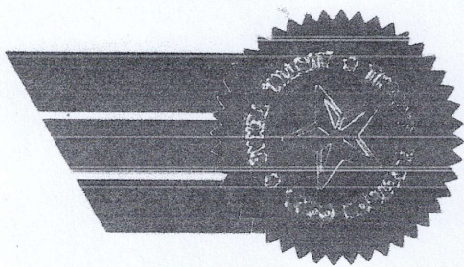
Validator™ Chromatography Data System Validator

The undersigned officers of Axxiom Chromatography, Inc. certify that this Validator™ unit, Serial Number 2455103, has been tested and calibrated to an NIST traceable standard on 11/10/2009.

Specific test data for this instrument is on file at Axxiom's home office location at 11968 Challenger Court, Moorpark, California, USA....and will be supplied upon request of an authorized distributor or end user

Presented by

Axxiom Chromatography Inc
11968 Challenger Court
Moorpark, California 93021-7121
USA



TRACE DSQ GC/MS
SERVICE &
INSTALLATION COURSE

Prasittisent Maliphan

Certificate No: 146

Has successfully completed 32 hours training and is
qualified to install and conduct service on

the Trace DSQ GC/MS



CERTIFICATE

The Certification Body
of TÜV SÜD Asia Pacific TÜV SÜD Group

certifies that



บริษัท เมชโคเทค จำกัด
MESHCO TECH CO., LTD.

MESHCO TECH CO., LTD.

82 Moo 18, Buengkamproi, Lamlukka, Pathumthani 12150, Thailand

has established and applies
a Quality Management System for

Trading, Calibration and Maintenance Service of
Chromatography and Analytical Instruments
(HPLC, LC-MS, GC, GC-MS, IC and Spectrophotometer).

An audit was performed, Report No. **721243408**.

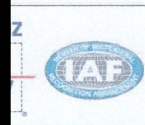
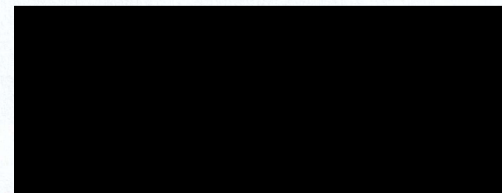
Proof has been furnished that the requirements according to

ISO 9001:2015

are fulfilled. The certificate is valid from 2023-05-11 until **2026-05-10**.

Certificate Registration No.: TUV100 11 4870

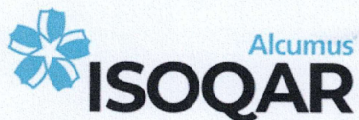
2023-05-11



the Joint Accreditation System
of the United Kingdom, the United States of America and New Zealand, URL:
iaf-nzs.org/register

TÜV SÜD Korea Ltd. • 2011, Two H.P.C. 10 Gokgeomgyung-ro, Teongjeong-gu • Seoul, 07326 • Korea

TUV®



Certificate of Registration

This is to certify that the Management System of:

V:Kit Limited

16 John Bradshaw Court, Alexandria Way, Congleton Business Park, Congleton CW12 1LB

has been approved by Alcumus ISOQAR and is compliant with the requirements of:

ISO 9001: 2015



Certificate Number: 2596-QMS-001
Initial Registration Date: 20/03/2001
Previous Expiry Date: 20/03/2022
Recertification Audit Date: 01/02/2022
Re-issue Date: 04/02/2022
Current Expiry Date: 20/03/2025

Scope of Registration:

The manufacture, certification and sales of chemical standard solutions, software, measuring and test equipment (including calibration) used in the qualification of chemical analysis equipment.

Signed:

Alyn Franklin, Chief Executive Officer
(on behalf of Alcumus ISOQAR)



This certificate will remain current subject to the company maintaining its system to the required standard. This will be monitored regularly by Alcumus ISOQAR. Further clarification regarding the scope of this certificate and the applicability of the relevant standards' requirement may be obtained by consulting Alcumus ISOQAR

Alcumus ISOQAR Limited, Coora Court, 1 Blackmore Road, Stretford, Manchester M32 0QY.

T: 0161 865 3699 E: isoqarenquiries@alcumus.com W: alcumus.com/isoqar

This certificate is the property of Alcumus ISOQAR and must be returned on request.

ใบรับรองการสอบเทียบ “เครื่อง Gas Chromatography-FID”
(Calibration Certificate of Gas Chromatography-FID)



ห้องปฏิบัติการวิเคราะห์เอกชน
เลขทะเบียน ว-244

Certificate of System Qualification

GC-OQ

System ID: GC_FID_CN12211142
Organization Name: Emex Association Co.,Ltd.
Organization Location: 28 Rama 2, Soi 30, Bangmod, Jomthong, Bangkok 10150, Thailand

Date: September 12, 2023 1:49:31 PM
EQP Name: AgilentRecommended
EQP Revision: GC.02.51
Overall Qualification Status: Pass

System Inspection and Basic Safety and Operation

Name: 7890
Setpoint Status: Pass

Overall System Inspection and Basic Safety and Operation Test Status
Pass

Inlet Pressure Decay

Name: 7890
Front SSL
Setpoint Status: Pass
Pressure: 25.0 psi
Pressure Change: 0.1 psi /5 minutes
Agilent Recommended: >= -2.0 and <= 0.5

Overall Inlet Pressure Decay Test Status
Pass

Inlet Pressure Accuracy

Name: 7890
Front SSL

Date: September 12, 2023 1:49:31 PM
System ID: GC_FID_CN12211142

Setpoint Status: Pass
Setpoint Actual
Inlet Pressure: 25.0 psi 25.1 psi
Accuracy: 0.1 psi
Agilent Recommended: <= 1.2

Overall Inlet Pressure Accuracy Test Status
Pass

Detector Flow Accuracy

Name: 7890
Front FID
Setpoint Status: Pass
Flow Type: Fuel
Setpoint: 30.0 mL/min Measured Flow: 29.6 mL/min
Accuracy: 0.2 mL/min
Agilent Recommended: <= 10.0 % setpoint (3.0 mL/min)
Limit is percentage of setpoint or 0.5 ml/minute, whichever is largest.

Setpoint Status: Pass
Flow Type: Oxidizer
Setpoint: 400.0 mL/min Measured Flow: 398 mL/min
Accuracy: 2.0 mL/min
Agilent Recommended: <= 10.0 % setpoint (40.0 mL/min)
Limit is percentage of setpoint or 0.5 ml/minute, whichever is largest.

Setpoint Status: Pass
Flow Type: Makeup
Setpoint: 25.0 mL/min Measured Flow: 24.8 mL/min
Accuracy: 0.2 mL/min
Agilent Recommended: <= 10.0 % setpoint (2.5 mL/min)
Limit is percentage of setpoint or 0.5 ml/minute, whichever is largest.

Date: September 12, 2023 1:49:31 PM
System ID: GC_FID_CN12211142

Overall Detector Flow Accuracy Test Status

Pass

GC Oven Temperature Accuracy

Name: 7890

Setpoint Status: Pass

Zone: Oven

Setpoint/Actual

Temperature: 230.0 231.2 °C

Accuracy: 1.2 °C

Agilent Recommended: >= -1.0 % setpoint in K (-5.0 °C)

<= 1.0 % setpoint in K (5.0 °C)

Setpoint Status: Pass

Zone: Oven

Setpoint/Actual

Temperature: 100.0 100.2 °C

Accuracy: 0.2 °C

Agilent Recommended: >= -1.0 % setpoint in K (-3.7 °C)

<= 1.0 % setpoint in K (3.7 °C)

Overall GC Oven Temperature Accuracy Test Status

Pass

GC Oven Temperature Stability

Name: 7890

Setpoint Status: Pass

Setpoint/Average

Temperature: 100.0 100.25 °C

Stability: 0.1 °C

Agilent Recommended: <= 0.5

Overall GC Oven Temperature Stability Test Status

Pass

Date: September 12, 2023 1:49:31 PM
System ID: GC_FID_CN12211142

Scouting Run

Tested Combination1 Front SSL / Front FID

Injection Tower

Name: 7693A

Setpoint Status: Completed

Injection Volume on Column: 1.0 uL

Overall Scouting Run Status

Completed

Noise and Drift

Tested Combination1 Front SSL / Front FID

Name: 7890

Setpoint Status: Pass

Base Signal: 14.4 pA

ASTM Noise Drift

pA pA/Hr

0.06 1.38

Agilent Recommended: <= 0.10 <= 2.50

Status: Pass Pass

Overall Noise and Drift Test Status

Pass

Injection Precision

Tested Combination1 Front SSL / Front FID

Name: 7693A

Setpoint Status:	Pass				
Injection Volume on Column:	1.0	uL			
Area RSD:	0.23	%	Retention Time RSD:	0.33	%
Agilent Recommended:	<= 3.00		<= 1.00		

Overall Injection Precision Test Status

Pass

Signal to Noise

Tested Combination1	Front	SSL	/ Front	FID
	Injection Tower			
Time:	7890			

Setpoint Status:	Pass				
Signal to Noise:	657777				
Agilent Recommended:	>= 300000				

Overall Signal to Noise Test Status

Pass

Instrument Details

Purpose

This section describes the as found system configuration.

Details

System

System ID	GC_FID_CN12211142
Manufacturer	Agilent Technologies
Name	7890
Flow Data Input	Manual Data
Temperature Data Input	Manual Data or Other Data Logging

Tested Combination1

Injection Technique	Injection Tower
Inlet	Front
Detector	Front
LTM Included?	No

Sampler 1

Manufacturer	Agilent Technologies
Type	Injection Tower
Name	7693A
Model Number	G4513A
Serial Number	CN12290137
Firmware Revision	A.10.08
Usage	Sample Injection
Location	Front
Syringe Volume (uL)	10

Date: September 12, 2023 1:49:31 PM
System ID: GC_FID_CN12211142

Sampler 2	
Manufacturer	Agilent Technologies
Type	Tray
Name	7693A
Model Number	G4514A
Serial Number	CN12230009
Firmware Revision	A.10.16
Vial Heater	Not installed
Mainframe 1	
Manufacturer	Agilent Technologies
Name	7890
Model Number	G3440A
Serial Number	CN12211142
Firmware Revision	A.01.15
Oven Type	Standard
Inlet 1	
Manufacturer	Agilent Technologies
Name	7890
Type	SSL
Location	Front
Carrier Gas	Helium
Control Type	Electronic Pressure Control (EPC)
Purged Inlet	Yes
Detector 1	
Manufacturer	Agilent Technologies
Name	7890
Type	FID
Adapter	Capillary
Control Type	Electronic Pressure Control (EPC)
Location	Front
Makeup Gas	Nitrogen

Electronic Signature

Purpose

This signature page was created and published because the ACE sign-off action was executed, which is valid for the entire document, including attachments. The ACE sign-off is an electronic signature that requires two distinct identification components: unique username and personal password. The Agilent representative who has delivered this service understands the meaning and legal status of an electronic signature. As a trained official operator, the Agilent representative has a unique password and login to access ACE and electronically sign this document. (Other e-signatures can be applied to this document using a Document Content Management or other suitable method defined in your data access and control procedures.)

Details

Full Name of Signer:	Sulkifli Mama
Logged On User Name:	sulkifli.mama@agilent.com
Signature Creation Date:	September 12, 2023
Reason for Signature:	Executed protocol and published this original version of document

Regulatory Disclaimer

This document provides a protocol to verify and record instrument configuration and evidence of proper operation. It has been prepared from our interpretation of applicable regulations as well as industry best practices. The document is designed to provide an important component of a complete compliance package. Validation depends upon many factors and use of this protocol alone does not assure compliance. Agilent Technologies makes no promises or representations as to its sufficiency for any specific regulatory program.

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User Name: sulkiti.mama

System Id: GC_FID_CN12211142

Report Generated by Hostname: AG-5CG2030XV

Print Date: September 12, 2023 1 49:33 PM

6006184127_Emex_OQGC_CN12211142 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
September 12, 2023 10:26:17 AM	Audit	SessionCreated	Session	None
September 12, 2023 10:26:17 AM	Start	Configuration	Session	None
September 12, 2023 10:26:17 AM	Audit	Entitlement	Licensing	User is FieldEngineer and does not require an unlock code
September 12, 2023 10:46:01 AM	Audit	EqpLoaded	Session	EQP details for primary technique [Gc] - File path: [ProtocolPacks/Gc/Configurations/02.51/Gc.02.51.eqp], EQP File Name: [Gc.02.51.eqp], EQP Name: [AgilentRecommended], Protocol Revision: [Gc.02.51]
September 12, 2023 10:46:08 AM	End	Configuration	Session	None
September 12, 2023 10:46:13 AM	Start	Qualification	Session	OQ
September 12, 2023 10:46:13 AM	Start	Execution	System Inspection and Basic Safety and Operation - 7890: - Qualitative Test - No setpoints associated	None
September 12, 2023 10:48:07 AM	End	Execution	System Inspection and Basic Safety and Operation - 7890: - Qualitative Test - No setpoints associated	Run Count : 1
September 12, 2023 10:48:10 AM	Start	Execution	Inlet Pressure Decay - Front SSL: - Pressure Controlled Inlet - S: 25.0 psi - L: >= -2.0 psi and <= 0.5 psi	None

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User Name: sulkiti.mama

System Id: GC_FID_CN12211142

Report Generated by Hostname: AG-5CG2030XV

Print Date: September 12, 2023 1 49:33 PM

6006184127_Emex_OQGC_CN12211142 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
September 12, 2023 10:48:33 AM	End	Execution	Inlet Pressure Decay - Front SSL: - Pressure Controlled Inlet - S: 25.0 psi - L: >= -2.0 psi and <= 0.5 psi	Run Count : 1
September 12, 2023 10:48:40 AM	Start	Execution	Inlet Pressure Accuracy - Front SSL: - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	None
September 12, 2023 10:48:54 AM	End	Execution	Inlet Pressure Accuracy - Front SSL: - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	Run Count : 1
September 12, 2023 10:49:01 AM	Start	Execution	Detector Flow Accuracy - Front FID: - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	None
September 12, 2023 10:49:36 AM	Audit	Data	Detector Flow Accuracy - Front FID: - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry
September 12, 2023 10:49:38 AM	End	Execution	Detector Flow Accuracy - Front FID: - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	Run Count : 1
September 12, 2023 10:50:28 AM	Start	Execution	Detector Flow Accuracy - Front FID: - Type: Oxidizer - S: 400.0 mL/min - L: <= 10.0% setpoint	None
September 12, 2023 10:51:08 AM	Audit	Data	Detector Flow Accuracy - Front FID: - Type: Oxidizer - S: 400.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry
September 12, 2023 10:51:11 AM	End	Execution	Detector Flow Accuracy - Front FID: - Type: Oxidizer - S: 400.0 mL/min - L: <= 10.0% setpoint	Run Count : 1
September 12, 2023 10:52:15 AM	Start	Execution	Detector Flow Accuracy - Front FID: - Type: Makeup - S: 25.0 mL/min - L: <= 10.0% setpoint	None

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Date: September 12, 2023 1:49:31 PM
System ID: GC_FID_CN12211142

User Name: sulki@l.mama

System Id: GC_FID_CN12211142

Report Generated by Hostname: AG-5CG2030XXV

Print Date: September 12, 2023 1:49:33 PM

6006184127_Emex_OQGC_CN12211142 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
September 12, 2023 10:53:03 AM	Audit	Data	Detector Flow Accuracy - Front FID: - Type : Makeup - S: 25.0 mL/min - L: <= 100% setpoint	Manual Data Entry
September 12, 2023 10:53:07 AM	End	Execution	Detector Flow Accuracy - Front FID: - Type : Makeup - S: 25.0 mL/min - L: <= 100% setpoint	Run Count : 1
September 12, 2023 10:53:10 AM	Start	Execution	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
September 12, 2023 10:54:39 AM	Audit	Data	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Manual Data Entry
September 12, 2023 10:54:41 AM	End	Execution	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Run Count : 1
September 12, 2023 10:54:46 AM	Start	Execution	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
September 12, 2023 11:06:02 AM	Audit	Data	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Manual Data Entry
September 12, 2023 11:06:04 AM	End	Execution	GC Oven Temperature Accuracy - 7890: - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Run Count : 1
September 12, 2023 11:06:07 AM	Start	Execution	GC Oven Temperature Stability - 7890: - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	None

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User Name: sulki@l.mama

System Id: GC_FID_CN12211142

Report Generated by Hostname: AG-5CG2030XXV

Print Date: September 12, 2023 1:49:33 PM

6006184127_Emex_OQGC_CN12211142 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
September 12, 2023 11:40:11 AM	Audit	Data	GC Oven Temperature Stability - 7890: - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	Manual Data Entry
September 12, 2023 11:40:13 AM	End	Execution	GC Oven Temperature Stability - 7890: - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	Run Count : 1
September 12, 2023 1:22:16 PM	Start	Execution	GC Scouting Run - Injection Tower, Front SSL, Front FID: - Part of System Preparation - No limits associated	None
September 12, 2023 1:27:32 PM	Audit	AcceClosed	Session	None
September 12, 2023 1:28:55 PM	Audit	AcceRestarted	Session	None
September 12, 2023 1:28:56 PM	Audit	SessionReloaded	Session	None
September 12, 2023 1:29:01 PM	Start	Qualification	Session	OQ
September 12, 2023 1:29:01 PM	Start	Execution	GC Scouting Run - Injection Tower, Front SSL, Front FID: - Part of System Preparation - No limits associated	None
September 12, 2023 1:31:01 PM	Audit	Data	GC Scouting Run - Injection Tower, Front SSL, Front FID: - Part of System Preparation - No limits associated	Data files Path: F:\Data\EMEX\OQ2023_GC-FID 2023-09-12 12-06-24\ISC.D\FID1A.ch
September 12, 2023 1:31:48 PM	End	Execution	GC Scouting Run - Injection Tower, Front SSL, Front FID: - Part of System Preparation - No limits associated	Run Count : 1

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Date: September 12, 2023 1:49:31 PM
System ID: GC_FID_CN12211142

User Name: sulikfil.mama

System Id: GC_FID_CN12211142

Report Generated by Hostname: AG-5CG2030XXV

Print Date: September 12, 2023 1:49:33 PM

6006184127_Emex_OQGC_CN12211142 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
September 12, 2023 1:31:51 PM	Start	Execution	Noise and Drift - Front FID: - Detector FID - L (Noise): <= 0.10 pA - L (Drift): <= 2.50 pA/hour	None
September 12, 2023 1:32:09 PM	Audit	Data	Noise and Drift - Front FID: - Detector FID - L (Noise): <= 0.10 pA - L (Drift): <= 2.50 pA/hour	Data files Path : F:\Data\EMEX\OQ2023_GC-FID 2023-09-12 12-06-24\ND_02.D\FID1A.ch
September 12, 2023 1:32:40 PM	End	Execution	Noise and Drift - Front FID: - Detector FID - L (Noise): <= 0.10 pA - L (Drift): <= 2.50 pA/hour	Run Count : 1
September 12, 2023 1:32:49 PM	Start	Execution	Injection Precision - Injection Tower, Front SSL, Front FID: - GC - L (Area): <= 3.00% - L (Ret. Time): <= 1.00%	None
September 12, 2023 1:33:08 PM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID: - GC - L (Area): <= 3.00% - L (Ret. Time): <= 1.00%	Data files Path : F:\Data\EMEX\OQ2023_GC-FID 2023-09-12 12-06-24\IP_2.D\FID1A.ch
September 12, 2023 1:33:08 PM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID: - GC - L (Area): <= 3.00% - L (Ret. Time): <= 1.00%	Data files Path : F:\Data\EMEX\OQ2023_GC-FID 2023-09-12 12-06-24\IP_3.D\FID1A.ch
September 12, 2023 1:33:08 PM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID: - GC - L (Area): <= 3.00% - L (Ret. Time): <= 1.00%	Data files Path : F:\Data\EMEX\OQ2023_GC-FID 2023-09-12 12-06-24\IP_4.D\FID1A.ch
September 12, 2023 1:33:08 PM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID: - GC - L (Area): <= 3.00% - L (Ret. Time): <= 1.00%	Data files Path : F:\Data\EMEX\OQ2023_GC-FID 2023-09-12 12-06-24\IP_5.D\FID1A.ch

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User Name: sulikfil.mama

System Id: GC_FID_CN12211142

Report Generated by Hostname: AG-5CG2030XXV

Print Date: September 12, 2023 1:49:33 PM

6006184127_Emex_OQGC_CN12211142 Transaction log :

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
September 12, 2023 1:33:08 PM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID: - GC - L (Area): <= 3.00% - L (Ret. Time): <= 1.00%	Data files Path : F:\Data\EMEX\OQ2023_GC-FID 2023-09-12 12-06-24\IP_6.D\FID1A.ch
September 12, 2023 1:33:08 PM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID: - GC - L (Area): <= 3.00% - L (Ret. Time): <= 1.00%	Data files Path : F:\Data\EMEX\OQ2023_GC-FID 2023-09-12 12-06-24\IP_7.D\FID1A.ch
September 12, 2023 1:33:32 PM	End	Execution	Injection Precision - Injection Tower, Front SSL, Front FID: - GC - L (Area): <= 3.00% - L (Ret. Time): <= 1.00%	Run Count : 1
September 12, 2023 1:33:42 PM	Start	Execution	Signal to Noise - Injection Tower, Front SSL, Front FID: - Detector FID - L: >= 300000	None
September 12, 2023 1:33:54 PM	Audit	Data	Signal to Noise - Injection Tower, Front SSL, Front FID: - Detector FID - L: >= 300000	Data files Path : F:\Data\EMEX\OQ2023_GC-FID 2023-09-12 12-06-24\SN.D\FID1A.ch
September 12, 2023 1:34:27 PM	End	Execution	Signal to Noise - Injection Tower, Front SSL, Front FID: - Detector FID - L: >= 300000	Run Count : 1
September 12, 2023 1:34:50 PM	End	Qualification	Session	OQ
September 12, 2023 1:34:50 PM	Start	Reporting	Session	None
September 12, 2023 1:48:10 PM	Audit	Reporting	Session	Report Generated : Certificate
September 12, 2023 1:48:36 PM	Audit	Reporting	Session	Report Generated : Report

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Date: September 12, 2023 1:49:31 PM
System ID: GC_FID_CN12211142



Certificate of Calibration

Certificate Number : SPR23030320-2 Page : 1 of 3

Customer : M Green Group Co.,Ltd
188/46, Pracha-Uttd Rd., Thungkru, Bangkok 10140, Thailand

Equipment Name : Sound Level Meter
Manufacturer : Pulsar
Model : 45
Serial Number : PN2448
ID. Number : N/A
Environmental Conditions
Ambient Temperature : 23 °C ± 3 °C Received Date : 20 Mar 2023
Relative Humidity : 50 % ± 15 % Calibration Date : 22 Mar 2023
Location of Calibration : In-Lab Recommend Due Date : 22 Mar 2024
Calibration Procedure : SP-CPE-04-01 Date of Issue : 23 Mar 2023

Method of Calibration

This certifies that the above instrument was calibrated in compliance with the calibration system requirement of ISO/IEC 17025:2017 in accordance with reference procedure. Standards used to perform this calibration are certified by to NIST or equivalent, National metrology institute, Natural physical constants, consensus standards. The result reported herein apply only to the calibration of the item described above as received. Our decision rule is to contact the customer if the item pass and fail calibration when the results include the uncertainties and the customer must determine if the results meets their needs.

All calibrations are performed within manufacture's specifications. The calibration certificate shall not be reproduced except in full, without written approval of SP Metrology System (Thailand).

Calibrated by : Mr.Chumpon Dokpikul

Calibration Officer

Approved by :

(Mr.Nirut Loha)

Authorized Signatory



Calibration Report

Certificate Number : SPR23030320-2 Page : 2 of 3

Reference Standards

Equipment Name	Model	Serial No.	Certificate No.	Due. Date
Sound Level Calibrator	ST-120	211203773	EEL.BP. 114/0166	17 Jan 2024

Traceability

This certification is traceable to the International System of Unit maintained at :
TISTR - Thailand Institute of Scientific and Technological Research



Result of Calibration

Certificate No. : SPR23030320-2

Page : 3 of 3

Range : 94 to 114 dB

Function : @1kHz

Select A		Unit : dB			
Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	93.9	93.9	-0.1	-0.1	0.15
114	113.9	113.9	-0.1	-0.1	0.15

Select C		Unit : dB			
Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	94.0	94.0	0.0	0.0	0.15
114	114.0	114.0	0.0	0.0	0.15

Select Z		Unit : dB			
Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	94.1	94.1	0.1	0.1	0.15
114	114.0	114.0	0.0	0.0	0.15

Note:

The result of calibration was found accurate as show on date and place of calibration only.
This Certificate is not certified for any commercial transaction.

Measurement Uncertainty

The reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor $k = 2.00$, providing a level of confidence approximately 95%.

- End of Certificate -



Certificate of Calibration

Certificate Number : SPR23030320-1

Page : 1 of 3

Customer : M Green Group Co.,Ltd

188/46, Pracha-Utid Rd., Thungkru, Bangkok 10140, Thailand

Equipment Name : Sound Level Meter

Manufacturer : Pulsar

Model : 45

Serial Number : PN2453

ID. Number : N/A

Environmental Conditions

Ambient Temperature : $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Received Date : 20 Mar 2023

Relative Humidity : $50\% \pm 15\%$ Calibration Date : 22 Mar 2023

Location of Calibration : In-Lab Recommend Due Date : 22 Mar 2024

Calibration Procedure : SP-CPE-04-01 Date of Issue : 23 Mar 2023

Method of Calibration

This certifies that the above instrument was calibrated in compliance with the calibration system requirement of ISO/IEC 17025:2017 in accordance with reference procedure. Standards used to perform this calibration are certified by to NIST or equivalent, National metrology institute, Natural physical constants, consensus standards. The result reported herein apply only to the calibration of the item described above as received. Our decision rule is to contact the customer if the item pass and fail calibration when the results include the uncertainties and the customer must determine if the results meets their needs.

All calibrations are performed within manufacture's specifications. The calibration certificate shall not be reproduced except in full, without written approval of SP Metrology System (Thailand).

Calibrated by : Mr.Chumpon Dokpikul

Approved by

Calibration Officer

(Mr.Nirut Loha)

Authorized Signatory



Calibration Report

Certificate Number : SPR23030320-1

Page : 2 of 3

Reference Standards

Equipment Name	Model	Serial No.	Certificate No.	Due. Date
Sound Level Calibrator	ST-120	211203773	EEL.BP. 114/0166	17 Jan 2024

Traceability

This certification is traceable to the International System of Unit maintained at :
TISTR - Thailand Institute of Scientific and Technological Research



Result of Calibration

Certificate No. : SPR23030320-1

Page : 3 of 3

Range : 94 to 114 dB

Function : @1kHz

Select A					Unit : dB
Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	93.8	93.8	-0.2	-0.2	0.15
114	113.7	113.7	-0.3	-0.3	0.15

Select C					Unit : dB
Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	93.9	93.9	-0.1	-0.1	0.15
114	113.8	113.8	-0.2	-0.2	0.15

Select Z					Unit : dB
Standard Setting	UUC Reading		Error		Uncertainty (±)
	Fast	Slow	Fast	Slow	
94	93.9	93.9	-0.1	-0.1	0.15
114	113.8	113.8	-0.2	-0.2	0.15

Note:

The result of calibration was found accurate as show on date and place of calibration only.
This Certificate is not certified for any commercial transaction.

Measurement Uncertainty

The reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor $k = 2.00$, providing a level of confidence approximately 95%.

- End of Certificate -



ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

975 Moo 4, Bangpoo Industrial Estate, Soi 8, Sukhumvit Road km 37,
Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280
Tel: +66 2709 4860 Fax: +66 2324 0917



Certificate No.: CP20230034EA
Operation No.: CP2023010028

Certificate of Calibration

Equipment: Sound Calibrator
Manufacturer: Scarlet Tech
Model/Type: ST-120
Serial No.: ST120C0247E
ID No.: -
Customer: M Green Group Co.,Ltd.
Address: 188/46, Pracha-Uttd Rd.,
Thungkru, Bangkok 10140 Thailand.
Received Date: 12 January 2023
Calibrated Date: 16 January 2023
Issued Date: 18 January 2023
Calibrated by: Ms. Juntaporn Kunhakorn

Approved by:

(Mr. Sittichai Swaksuriyawong)
Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor (k) 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 Electrical and Electronics Institute, Foundation for Industrial Development.



ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: CP20230034EA

Calibration Report

Equipment: Sound Calibrator
Manufacturer: Scarlet Tech
Model/Type: ST-120
Serial No.: ST120C0247E
ID No.: -
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %
Pressure: (101.3 ± 1.5) kPa

Method of Calibration :-
IEC 60942:2017

Condition of this result of calibration

1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2661000	AA-1020-22	14 June 2023
2) Waveform Generator	33511B	MY52302264	CK20220058EA	19 June 2023
3) Audio Analyzing DMM	2015-P	4079144	E1U221042	16 March 2023
4) Pressure humidity and Temperature Transmitter	PTU301	F0640002	CL1-P220024 CD20220164EA	17 March 2023 24 July 2023

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

3. This certification is traceable to the international system of unit maintained at :-

Reference standards instrument for Acoustic function

- National Institute of Metrology (Thailand)

Reference standards instrument for Electrical function

- Electrical and Electronics Institute; NSC Accredited Calibration No.0119

Result of Calibration:-

1. Function : Sound pressure level

Nominal Frequency (Hz)	Specified Sound Pressure level (dB)	Measured value (dB)	Deviated value ^[1] (dB)	Acceptance limit ^[3] (dB)
1000	94	94.04	0.04	±0.25
1000	114	114.10	0.10	±0.25

2. Function : Frequency

Nominal Sound Pressure level (dB)	Specified Frequency (Hz)	Measured value (Hz)	Deviated value ^[2] (%)	Acceptance limit ^[3] (%)
94	1000	999.5	0.0	±0.7
114	1000	999.6	0.0	±0.7

Certificate No.: CP20230034EA

Calibration Report

3. Function : Total distortion + noise

Normal	Normal	Measured value ^[4]	Acceptance limit ^[5]
Sound Pressure level (dB)	Frequency (Hz)	(%)	(%)
94	1000	0.5	2.5
114	1000	0.4	2.5

Uncertainty of measurement

Function	Uncertainty	Maximum-permitted uncertainty of measurement
Sound pressure level	0.10 dB	0.15 dB
Frequency	0.10 %	0.20 %
Total distortion + noise	0.40 %	0.50 %

Note: [1] The deviated value is the absolute value of the difference between the measured value and the corresponding specified sound pressure level.
 [2] The deviated value is the absolute value of the difference in percent between the measured value and the corresponding specified frequency.
 [3] The acceptance limit is for the deviated value.
 [4] The measured value is the total distortion + noise, measured over the frequency range from 20 Hz to 20 kHz.
 [5] The acceptance limit is for the Measured value.

Remarks: 1. Acceptance limit was IEC 60942:2017 Class 1.
 2. The coverage factor $k = 2.00$

-- End of Report --

Supplement to Calibration Certificate No. Q22102976

CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE : VIBRATION METER
 MANUFACTURER : N/A
 MODEL / TYPE : V9000
 SERIAL NO. : 2364
 CLID. NO. : 252102170
 JOB CONTROL NO. : 221008102976

CUSTOMER : M GREEN GROUP COMPANY LIMITED
 188/47 PRACHA UTHIT RD.,
 BANG MOT, THUNG KHRU, BANGKOK 10140

DATE OF RECEIVED : 08 October 2022

DATE OF ISSUED : 19 October 2022

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

Calibrated By :

Suwit Phuanbusabong
 Calibration Engineer



Approved By :

Mongkol Yotsoontorn
 Authorized Signatory
 19 October 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. Q22102976A1

F3-012-04/01-12





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-laborabry.com



REPORT OF CALIBRATION

FOR

NOMENCLATURE : VIBRATION METER
MANUFACTURER : N/A
MODEL / TYPE : V9000
SERIAL NO. : 2364
DATE OF CALIBRATION : 10 October 2022

ENVIRONMENT CONDITIONS :

Temperature : $(23 \pm 2) ^\circ\text{C}$ Relative Humidity : $(55 \pm 15) \% \text{RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. **WI-305-127** based on **ISO 16063-21** as calibration guideline.
The calibration was performed by using Digital Multimeter, High Resolution Programmable Timer/Counter, Accelerometer and Measuring Amplifier which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

- Digital Multimeter, Hewlett Packard Model 34401A S/N. 3146A75935.
- High Resolution Programmable Timer/Counter, Philips Model PM6680B S/N. SM607101.
- Accelerometer with Measuring Amplifier, Bruel & Kjaer Model 8305, 2525 S/N. 397018, 2434988.

TRACEABILITY :

- The measurements are traceable to International System of Units (SI), through National Institute of Metrology (Thailand) Certificate No. EE-0112-21, Due Date 26 October 2022.
- The measurements are traceable to International System of Units (SI), through Aeronautical Radio of Thailand Ltd. Certificate No. 07-0001/22, Due Date 22 February 2023.
- The measurements are traceable to International System of Units (SI), through National Institute of Metrology (Thailand) Certificate No. AV-0009-22, Due Date 22 June 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. Q22102976

F3-011-04/01-12

page 2 of 3



@clccalibration



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-laborabry.com



CONDITION OF CALIBRATION ITEM : GOOD

MEASUREMENT RESULTS : (X) without adjustment () adjustment

CALIBRATION DATA

VELOCITY RESULT

Test point		Mode	STD Reading	DUC Reading	Correction	Uncertainty
(mm/s)	(frequency)		(mm/s)	(mm/s)	(mm/s)	\pm (% of rdg.)
10	160 Hz	peak	10.00	10.03	-0.03	1.0
20	160 Hz		20.00	20.02	-0.02	1.0
40	160 Hz		40.00	39.22	+0.78	1.0
60	160 Hz		60.00	57.60	+2.40	1.0
80	160 Hz		80.00	77.21	+2.79	1.0
100	160 Hz		100.00	96.25	+3.75	1.0

Note. The Scope of Accredited TISI Certificate No. 19C087/0655 Issue 1 Page 57 of 111

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

End of Certificate

Certificate No. Q22102976

F3-011-04/01-12

page 3 of 3



@clccalibration

Certificate of Calibration

Certificate No. : 66-420087-1

Page : 1 of 2

Submitted by : M Green Group Co.,Ltd.

188/46 Wisatesukhakhon 25, Pracha-Utid Rd., Thungkru Bangkok 10140 Thailand

Equipment : pH Meter with electrode

pH meter

Manufacturer : Eutech

Model : pH 700

Range : N/A

pH

Resolution : 0.01 pH

Serial No. : 2884323

ID No. : N/A

Electrode

Model : N/A

Serial No. : 01X099320

Environment : On site calibration was carried out at the Laboratory, M Green Group Co.,Ltd.

Ambient Temperature : (25.0 to 25.5)°C

Relative Humidity : (45 to 50) %

Date of Received : 20 September 2023

Date of Calibration : 20 September 2023

Date of Issue : 25 September 2023

Calibrated by : Permpon Chanpu

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

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

1. Multiproduct Calibrator

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

2. Standard Buffer Solution

pH	Cert. No.	Lot No.	Exp. Date	Traceability
4.008	61270213	915161	19 Jul 2025	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
6.985	61275614	898428	28 May 2024	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025
9.997	61281073	915163	19 Jul 2024	CPA Chem Ltd. Accredited to ISO 17034 and ISO/IEC 17025

Appr

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 66-420087-1

Page : 2 of 2

Result of Calibration :

UUC Condition As-Received : Good

Function : Electrical measurement

pH meter

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

Adjustment Curve at nominal pH	Applied Voltage (mV)	Nominal Value (pH)	UUC Reading		Correction (mV)	Uncertainty (± mV)
			(pH)	(mV)		
4, 7, 10	177.4800	4	4.00	177.5	0.0	0.12
	0.0000	7	7.00	0.1	-0.1	0.086
	-177.4800	10	10.00	-177.4	-0.1	0.12

Function : pH meter with electrode

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

Adjustment Curve at nominal pH	Standard Buffer (pH)	UUC Reading (pH)	Correction (pH)	Uncertainty (± pH)
4, 7, 10	4.008	4.01	0.00	0.010
	6.985	7.00	-0.01	0.011
	9.997	10.01	-0.01	0.014

Remark

UUC : Unit Under Calibration

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

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

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Certificate of Calibration

Certificate No. : 66-400519-1

Page : 1 of 2

Submitted by : M Green Group Co.,Ltd.
188/46 Wisatesukhakhon 25, Pracha-Uttd Rd., Thungkru Bangkok 10140 Thailand

Equipment : Digital Thermometer with Thermistor probe
Temperature Indicator

Manufacturer : Eutech Model : pH 700
Range : N/A °C Resolution : 0.1 °C
Serial No. : 2884323 ID No. : N/A

Thermistor probe

Model : N/A Sheath Material : Stainless
Diameter : 3.2 mm. Length : 100 mm.
Serial No. : PH5TEMB01P ID No. : N/A

Environment : On site calibration was carried out at the M Green Group Co.,Ltd.

Ambient Temperature : (25.0 to 26.0) °C
Relative Humidity : (56 to 60) %
Line Voltage : (224.0 to 225.2) VAC

Date of Received : 20 September 2023

Date of Calibration : 20 September 2023

Date of Issue : 25 September 2023

Calibrated by : Permpon Chanpu

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

The temperature scale used was based on ITS-90

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

1. Platinum Resistance Thermometer (PRT)

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

2. Standard Digital Thermometer

ID No.	Cert. No.	Due Date	Traceability
400033	22E569	22 Feb 2024	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. : 66-400519

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement

Immersion Depth (mm.)	Standard Reading (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (± °C)
100	25.006	24.9	0.1	0.19

Remark

UUC : Unit Under Calibration

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

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

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Certificate of Calibration

Certificate No. : 66-200300-1

Page : 1 of 2

Submitted by : M Green Group Co., Ltd.

188/46 Wisatesuknakhon 25, Pracha-Utid Rd., Thungkru, Bangkok 10140 Thailand

Equipment : Electronic Balance

Manufacturer : SHIMADZU Model : AP225WD

Serial No. : D316300690

Capacity : 220 g Resolution : 0.00001g/102g, 0.0001g/220g

Environment : On site calibration was carried out at the Laboratory, M Green Group Co., Ltd.

Ambient Temperature : (25.6 to 26.7) °C

Relative Humidity : (54.4 to 56.6) %

Air Pressure : 1010.0 mbar

Date of Received : 20 September 2023

Date of Calibration : 20 September 2023

Date of Issue : 22 September 2023

Calibrated by : Akaradath Thippichai

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

Edition 7 - November 2022

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

Standard Weights

ID.No.	Cert.No.	Due Date	Traceability
E261-E2624	C02222345	10 Nov 2023	National Institute of Metrology (Thailand), (NIMT)

Approved

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 66-200300-1

Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Departure of indication from nominal value

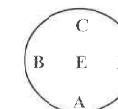
Nominal Value (g)	Correction (g)	Uncertainty ± (g)
0.001	0.00000	0.000012
0.01	0.00000	0.000013
0.1	0.00000	0.000015
1	0.00000	0.000026
10	0.00000	0.000053
20	-0.00003	0.000071
50	0.00004	0.00011
100	-0.00009	0.00020
150	0.00000	0.00038
200	-0.0001	0.00038

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

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor $k = 2.15$, providing a level of confidence of approximately 95%

Eccentric error Load test : 50 g

A	B	C	D	E
-0.00003	0.00000	0.00000	-0.00005	0.00000



Repeatability Load test : 200 g

Stdev. : 0.000048 g

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Certificate of Calibration

Certificate No. : 66-400520-1

Page : 1 of 2

Submitted by : M Green Group Co., Ltd.
188/46 Wisatesukhakhon 25, Pracha-Utid Rd., Thungkru Bangkok 10140 Thailand

Equipment : Air Chamber (Refrigerator)
Manufacturer : Biobase Model : BXC-V250M (II)
Range : N/A °C Resolution : 0.1 °C
Serial No. : YC025025190108 ID No. : N/A

Environment : On site calibration was carried out at the Laboratory, M Green Group Co., Ltd.
Ambient Temperature : (25.0 to 26.0) °C
Relative Humidity : (40 to 50) %
Line Voltage : (226.0 to 230.0) V

Date of Received : 20 September 2023

Date of Calibration : 20 September 2023

Date of Issue : 25 September 2023

Calibrated by : Permpon Chanpu

Calibration Method : CAL-M4004, TLAS G-20

The temperature scale used was based on ITS-90

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

ID No.	Cert. No.	Due Date	Traceability
400046 & 400042	66-400453-1	31 Jan 2024	National Institute of Metrology Thailand (NIMT)

Approved by _____
(Surachai Promthong)
Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 66-400520-1

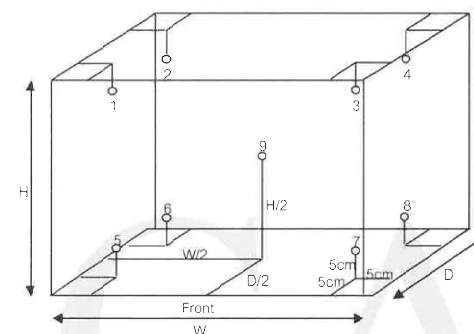
Page : 2 of 2

Result of Calibration : Without Adjustment

UUC Condition As-Received : Good

Function : Temperature measurement

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



Inside of Chamber
W = 0.50 m
D = 0.40 m
H = 1.20 m
Capacity = 0.24 m³

Test Point (° C)	Setting Temperature (° C)	Indicating Temperature (° C)	Measured Temperature (° C) @ Sensor No.									Uncertainty (± ° C)
			1	2	3	4	5	6	7	8	9	
4.0	2.0	2.0	4.05	4.04	4.27	4.89	4.10	4.05	4.92	4.37	4.43	0.46

Test Point (° C)	Setting Temperature (° C)	Indicating Temperature (° C)	Measured Uniformity (° C)	Measured Stability (° C)	Overall Variation (° C)
4.0	2.0	2.0	0.60	0.21	1.2

Remark The uncertainty is not combine uniformity of the air chamber

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

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

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CAL

Calibratech Co.,Ltd.

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

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

NSC-TISI-TIS17025
CALIBRATION 0030

Certificate of Calibration

Certificate No. : 66-300589-7

Page : 1 of 2

Submitted by : M Green Group Co., Ltd.

188/46 Wisatesuknakhon 25, Pracha-Utid Rd., Thungkru, Bangkok 10140 Thailand

Equipment : Burette

Manufacturer : GLASSCO

Class : A

Capacity : 10 ml

Graduation : 0.05 ml

ID No. : 2212-0344-1

Environment : Ambient Temperature : (20 ± 3) °CRelative Humidity : (50 ± 10) %

Air Pressure : 1006.7 mbar.

Date of Received : 20 September 2023

Date of Calibration : 27 September 2023

Date of Issue : 27 September 2023

Calibrated by : Wipa Tovadee

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	66-200196-2	02 Dec 2023	National Institute of Metrology (Thailand) (NIMT)

Approved

The Uncertainties are for a confidence probability of approximately 95%

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CAL-F0031-03

CAL

Calibratech Co.,Ltd.

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

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

Certificate of Calibration

Certificate No. : 66-300589-7

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 : 21.33 sec.

Nominal Volume (ml)	Measuring Volume (ml)
10	9.9913

Uncertainty of measurement with in \pm 0.0039 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%

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CAL-F0031-03

Certificate of Calibration

Certificate No. : 66-300590-1

Page : 1 of 2

Submitted by : M Green Group Co., Ltd.

188/46 Wisatesuknakhon 25, Pracha-Utid Rd., Thungkru, Bangkok 10140 Thailand

Equipment : Imhoff Cone

Manufacturer : VITLAB

Capacity : 1000 ml Graduation : 50 ml

ID No. : CY1000/01/22

Environment : Ambient Temperature : (20 ± 3) °C

Relative Humidity : (50 ± 10) %

Air Pressure : 1005.4 mbar.

Date of Received : 20 September 2023

Date of Calibration : 26 September 2023

Date of Issue : 26 September 2023

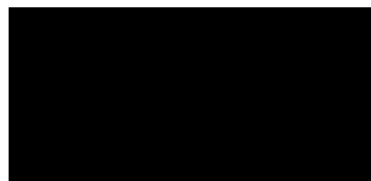
Calibrated by : Areerat Sombun

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
241002	66-200196-1	02 Dec 2023	National Institute of Metrology (Thailand) (NIMT)



The Uncertainties are for a confidence probability of approximately 95%

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Certificate of Calibration

Certificate No. : 66-300590-1

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

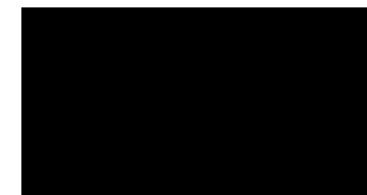
Nominal Volume (ml)	Measuring Volume (ml)
500	501.19
1000	1010.67

Uncertainty of measurement with in \pm 0.17 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%

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ใบรับรองการทวนสอบ "เครื่องกลั่นไนโตรเจน"

(Calibration Certificate of Distillation Unit VAPODEST

VAP20, VAP30s)

การดูแลบำรุงรักษาเชิงป้องกัน

Preventive Maintenance



บริษัท ดีเคเอสเอช เทคโนโลยี จำกัด

ฝ่ายบริการหลังการขาย

โทร 0 2 639 7000 E-mail: service.tec.th@dksh.com

ฝ่ายขายและการตลาด

โทร 0 2 639 7000 E-Mail : marketing.tec.th@dksh.com

Website : www.dksh.co.th/technology/scientific-thailand

เงื่อนไขการให้บริการ Preventive Maintenance

บริษัทฯ จะส่งวิศวกรผู้ชำนาญ เพื่อให้บริการตามขอบข่ายของการบริการ เฉพาะ ในวันและเวลา ราชการ หากมีความประสงค์ที่จะรับบริการนอกเหนือจากวัน เวลา ราชการ (วันหยุดเสาร์ – อาทิตย์ หรือวันหยุด นักขัตฤกษ์) บริษัทฯ จะคิดค่าบริการเพิ่มเติมตามอัตราที่กฎหมายแรงงานกำหนดไว้

ขอบข่ายการบริการ

- ตรวจสอบสภาพการทำงานต่าง ๆ ของเครื่องมือ
- ทดสอบประสิทธิภาพการทำงานของเครื่องมือ
- รายการผลการตรวจสอบเครื่องมือ

หมายเหตุ

- ราคานี้ไม่รวมถึงค่าบริการซ่อม หรือ เปลี่ยนอะไหล่ที่ชำรุดเสียหาย หรือหมดสภาพการใช้งาน
- ในกรณีที่ผู้รับบริการอยู่นอกเขตพื้นที่ให้บริการ บริษัทฯ จำเป็นต้องคิดค่าใช้จ่ายเพิ่มเติม ได้แก่ ค่าเดินทาง เป็นต้น
- บริษัท ฯ ขอสงวนสิทธิ์ในการเปลี่ยนแปลงราคา โดยไม่แจ้งให้ทราบล่วงหน้า



ช่องทางการติดต่อ

DKSH Technology Limited (บริษัท ดีเคเอสเอช เทคโนโลยี จำกัด)
เลขที่ 2533 ถนนสุขุมวิท แขวงบางจาก เขตพระโขนง กรุงเทพฯ 10260
เลขประจำตัวผู้เสียภาษี 010-555-001-4547 (สำนักงานใหญ่)



LINE: @dkshscientific



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Preventive Maintenance Contract

จำนวนในการทำสัญญาบริการ ครั้ง ต่อ ปี

ครั้งที่ 1/1 วันที่ 28 Mar 2023

รายละเอียดผู้รับบริการ

หน่วยงาน	บริษัท เทสท์ เทคโนโลยี จำกัด		
ที่อยู่	30,32 ซอยพระรามที่ 2 ซอย 63 ถนนพระรามที่ 2 แขวงสามยุค เขตบางขุนเทียน กรุงเทพมหานคร 10150		
โทรศัพท์	0-2893-4211-7	แฟกซ์	0-2893-4218

ผู้ติดต่อ

ชื่อ - นามสกุล	คุณมาริสา วิเศษสังข์		
ตำแหน่ง	หัวหน้าส่วน		
โทรศัพท์	0-2893-4211-7	เบอร์ต่อ	แฟกซ์ 0-2893-4218
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รายละเอียดผู้ให้บริการ

บริษัท ดีเคเอสเอช เทคโนโลยี จำกัด (ฝ่ายบริการหลังการขาย) (สำนักงานใหญ่) เลขที่ 2533 ถนนสุขุมวิท แขวงบางจาก เขตพระโขนง กรุงเทพฯ 10260 โทรศัพท์ 0 2 693 7000 Email: siriporn.sy@dksh.com Line ID : siripon3007 เจ้าหน้าที่ประสานงาน : คุณศิริพร อยู่ทองจ้อย โทรศัพท์ 090 678 6924, 02 301 7467			
เจ้าหน้าที่ผู้ให้บริการ	นายจิรายุช สเลอาด		
ตำแหน่ง	Specialist, Technical Service.		
โทรศัพท์	0938138736	แฟกซ์	-
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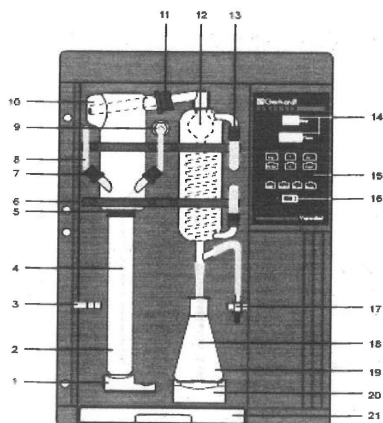
ลงนามผู้รับบริการ		ลงนามผู้ให้บริการ	
ตัวบรรจง	(.....)	ตัวบรรจง	(นายจิรายุช สเลอาด)
ตำแหน่ง		ตำแหน่ง	Specialist, Technical Service
วันที่ / ประทับตราบริษัท		วันที่ / ประทับตราบริษัท	28/3/2023

JOB No: Lspr2302591 MODEL: Vap30 S/N: 003718

Part : Operational Qualification (OQ)

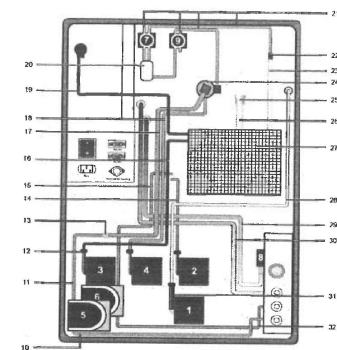
ตรวจสอบสภาพเครื่อง

FRONT



	Pass	Fail	N/A	Remark
1.Quick clamping device with wedge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Kjeldatherm digestion tube	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Holder for steam inlet tubing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. PTFP-Inlet tubing, steam	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Viton-cone	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Clamping for glassware	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Screw cap GL18 with silicone seal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. PTFP-Inlet tubing, NaOH	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. PP-Distributor with PP-threaded joint	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Distribution head, glass	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Screw cap GL32 with silicone seal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Distillation condenser	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Screw cap GL14 with plastic screw connection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Display	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Keyboard, chemical-resistant	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Main switch, green	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Ventilation valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Distillate outlet tubing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Erlenmeyer flask	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Platform	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Drip tray	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

REAR



	Pass	Fail	N/A	Remark
1. Diaphragm pump NaOH	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Diaphragm pump H ₃ BO ₃	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	vap 40 only
3. Diaphragm pump H ₂ O for steam generator	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Diaphragm pump H ₂ O for sample	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	vap 30,40 only
5. Peristaltic pump for suction sample	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	vap 30,40 only
6. Peristaltic pump for suction receiver	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	option
7. Pinch-solenoid valve, steam	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Magnetic valve with pressure control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Pinch-solenoid valve, shut-off	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Verprene-tubing 4x8 mm.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Verprene-tubing 4x8 mm.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	vap 30,40 only
12. Non-return valve for diaphragm pumps	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Tubing reduction PP 51x10x5 mm.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	vap 30,40 only
14. Silicone tubing 4x7 mm.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	vap 40 only
15. Silicone tubing 4x7 mm.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	option
16. Silicone -tubing 4x7 mm.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Verprene-tubing 8x12 mm.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	vap 30,40 only
18. Verprene tubing 4x7 mm.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	vap 30,40 only
19. Silicone tubing 4x7 mm.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Ventilation glass	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Novoprene-tubing 4.8x8 mm.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Tubing reduction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Silicone tubing 6x10 mm.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. PP-distributor with PP-thread	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. SKT-valve (built in with brass fitting)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Silicone tubing 8x16x80 mm.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Steam generator	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. PTFE-inlet tubing NaOH	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Silicone tubing 8x16 for cooling water inlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Silicone tubing 8x16 for cooling water outlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Viton-tubing 6x12*50 mm.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Silicone tubing 4x7 mm.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	option

รายละเอียดการตรวจสอบ

ขั้นตอนการบริการ

ตรวจสอบระบบไฟฟ้า (Electrical Test)

- ความต้านทานทางไฟฟ้าของเครื่องกับกราวด์
- กระแสไฟฟ้าที่ใช้งาน

ตรวจสอบสภาพเครื่อง (Optical Test)

- Main cable
- Electric wiring
- Pumps
- Distribution Head
- Condensor
- Steam generator
- Tubing
- Viton cone

ตรวจสอบ Function การทำงาน (The Function Test)

- ระบบสร้างและควบคุมความดันของ Steam
- ระบบการเติมน้ำเข้า Sample Tube
- ระบบการเติม Na OH
- ระบบการ Suction ตั้ง Sample Tube และ Receiver

รายงานผลการให้บริการ

1. TECHNICAL DATA

	Pass	Fail	N/A	Remark
Main Supply 220 volt + 10% 50 Hz with ground	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Normal current	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6 a

1.1 COOLING WATER BATH

	Pass	Fail	N/A	Remark
Temperature 15-20 °C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling Water Outlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control Temperature	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1.2 OPTICAL TEST VAP..30..

	Pass	Fail	N/A	Remark
Screw cap GL14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Screw cap GL18	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Screw cap GL32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Distillation Head	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Condensor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Viton Cone	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ventilation Valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Micro Switch Sample	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. SYSTEM COOLING WATER INLET

	Pass	Fail	N/A	Remark
Cooling Water Inlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling Water Outlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magnetic valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3.SYSTEM CONTROL

	Pass	Fail	N/A	Remark
Key Board	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Display	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Program	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adding H ₂ O	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	vap 30,40 only
Adding NaOH	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adding H ₃ BO ₃	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	vap 40 only
Suction Sample	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	vap 30,40 only

4.SYSTEM DISTILLATION

	Pass	Fail	N/A	Remark
Boiler	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Level Sensor	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Novoprene-Tubing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Solenoid Valve Shut-Off	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Solenoid Valve Steam	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excess Pressure Detector	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ventilation Valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heater	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. PUMP

	Pass	Fail	N/A	Remark
Pump H ₂ O Steam	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Non-Return Valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pump H ₂ O Sample	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Non-Return Valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pump NaOH	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Non-Return Valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pump H ₃ BO ₃	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
- Non-Return Valve	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pump Suction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. The Following Program Run :

	Pass	Fail	N/A	Remark
Addition H ₂ O 0-99 sec.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Addition NaOH 0-99 sec.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Addition H ₃ BO ₃ 0-99 sec.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Reaction Time 0-99 min.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Distillation Time 0-99 min	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steam Capacity 30%-100%	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Suction Time 0-99 sec.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Instrument is in perfect technical shape	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Remark :

.....

Part : ข้อมูลสนับสนุนด้านเทคนิค (General Technical Support)

การบำรุงรักษาทั่วไป (Basic maintenance)

Cleaning

Glass parts and suction pump should be cleaned before long periods of non-usage (i.e. holidays). This way blockages caused by crystalline deposits are avoided.

The following program should be run:

Addition H ₃ BO ₃	0	s
Addition H ₂ O:	13	s
Addition NaOH:	0	s
Reaction time:	0	s
Distillation time:	7	min.
Steam capacity:	100	%
Suction time:	20	s

Place an empty digestion tube and an Erlenmeyer flask into position, and start the program.

In case of extreme deposits in the glassware you can clean the system by putting about 10 ml of sulphuric acid into the digestion tube.

Error Code

The micro-processor continually surveys all the functions of the distillation system. As soon as an error arises it is shown on the display and accompanied by an acoustic signal.

Error message	Measures
No tap water	Check cooling water inlet for blockages. Ensure the tap is turned on → Enter
No sample tube	Insert tube → Enter
Check chemicals	Check set of tanks → Enter
Low water Press Enter	Check the water inlet distilled H ₂ O → Enter
↓	
Filling Steam generator	This message disappears as soon as steam generator is filled

After the above mentioned errors are corrected, the following message is displayed.

Error message	Measures
Stop Prog.No. x continue=Enter	Enter = continue of interrupted program Reset = Standby-mode

Other error messages

Error message	Measures
Wait for steam	Message disappears as soon as stand-by is reached
Add sol. > 1min Continue=Enter	Check programming Enter=continue of interrupted program Reset=Standby-mode
Program undefined	Check programming → Enter
Excess steam pressure	Switch the system off and call service
Sensor error	Switch the system off and call service