

ภาคผนวก ง

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ใบรับรองการสอบเทียบเครื่องมือ

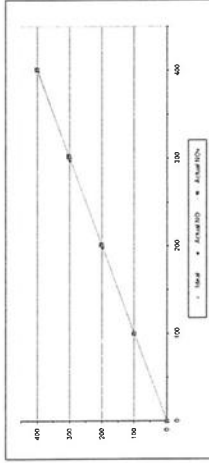




MULTIPOINT CALIBRATION REPORT

Calibration Date: 2-Jul-24  
Equipment Name: NOx Analyzer  
Manufacturer: HORIBA  
Model: APNA-370  
Serial No.: BEA000000  
Equipment ID: RYQ\_F00281  
Calibrator Manufacturer: TeleSigns API  
Model: 947  
Serial No.: 55 88  
Ref. Gas Concentration (PPM): 55.88  
Cylinder No.: GND027222  
Cylinder Pressure (psi): 1800  
Certified By: Alissa Inc.  
Expiry Date: 8-Feb-25

Point	CALIBRATION RESULTS			
	Ideal	Actual NO	%Error NO	%Error NOx
ZERO	0.00	0.10	0.10	0.10
1	100.00	94.70	-1.30	100.10
2	200.00	197.70	-2.30	201.20
3	300.00	299.10	-0.30	300.00
4	400.00	398.50	-1.50	401.40
AVERAGE (%)				-0.87



Calibrated By

Approved By

(Mr. Jirawat Jitramont)  
Field Environmental Scientist (S)

(Mr. Jirawat Jitramont)  
Assistant General Manager

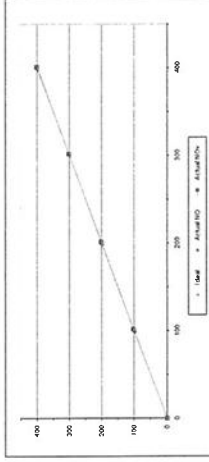
FORM NO. F-04-006 - REVISION NO. - ISSUE DATE 02/04/17



MULTIPOINT CALIBRATION REPORT

Calibration Date: 2-Jul-24  
Equipment Name: NOx Analyzer  
Manufacturer: HORIBA  
Model: APNA-370  
Serial No.: ALPO000000  
Equipment ID: RYQ\_F00465  
Calibrator Manufacturer: TeleSigns API  
Model: 947  
Serial No.: 55 88  
Ref. Gas Concentration (PPM): 55.88  
Cylinder No.: GND027222  
Cylinder Pressure (psi): 1800  
Certified By: Alissa Inc.  
Expiry Date: 8-Feb-25

Point	CALIBRATION RESULTS			
	Ideal	Actual NO	%Error NO	%Error NOx
ZERO	0.00	0.10	0.10	0.10
1	100.00	94.50	-1.40	101.60
2	200.00	194.40	-1.20	201.30
3	300.00	297.00	-1.00	301.80
4	400.00	392.50	-1.50	401.30
AVERAGE (%)				-0.89



Calibrated By

Approved By

(Mr. Jirawat Jitramont)  
Field Environmental Scientist (S)

(Mr. Jirawat Jitramont)  
Assistant General Manager

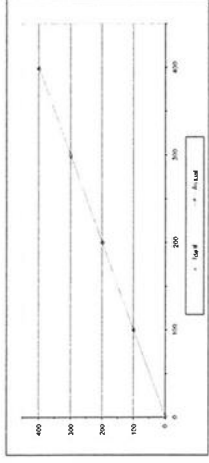
FORM NO. F-04-006 - REVISION NO. - ISSUE DATE 02/04/17



MULTIPOINT CALIBRATION REPORT

Calibration Date: 4-Jul-24  
Equipment Name: NOx Analyzer  
Manufacturer: HORIBA  
Model: APNA-370  
Serial No.: YP000000  
Equipment ID: RYQ\_F00283  
Calibrator Manufacturer: TeleSigns API  
Model: 947  
Serial No.: 55 88  
Ref. Gas Concentration (PPM): 55.88  
Cylinder No.: GND027222  
Cylinder Pressure (psi): 1800  
Certified By: Alissa Inc.  
Expiry Date: 8-Feb-25

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	97.40	-2.60	-2.60
2	200.00	197.40	-2.60	-1.30
3	300.00	297.40	-2.60	-0.80
4	400.00	397.40	-2.60	-0.60
AVERAGE (%)				-0.90



Calibrated By

Approved By

(Mr. Jirawat Jitramont)  
Field Environmental Scientist (S)

(Mr. Jirawat Jitramont)  
Assistant General Manager

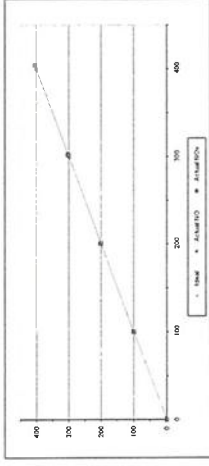
FORM NO. F-04-006 - REVISION NO. - ISSUE DATE 02/04/17



MULTIPOINT CALIBRATION REPORT

Calibration Date: 3-Jul-24  
Equipment Name: NOx Analyzer  
Manufacturer: HORIBA  
Model: APNA-370  
Serial No.: TBR000000  
Equipment ID: RYQ\_F00461  
Calibrator Manufacturer: TeleSigns API  
Model: 947  
Serial No.: 55 88  
Ref. Gas Concentration (PPM): 55.88  
Cylinder No.: GND027222  
Cylinder Pressure (psi): 1800  
Certified By: Alissa Inc.  
Expiry Date: 8-Feb-25

Point	CALIBRATION RESULTS			
	Ideal	Actual NO	%Error NO	%Error NOx
ZERO	0.00	0.10	0.10	0.10
1	100.00	97.70	-1.30	100.10
2	200.00	201.00	0.50	201.00
3	300.00	298.70	-1.30	298.70
4	400.00	396.40	-1.60	396.40
AVERAGE (%)				-0.47



Calibrated By

Approved By

(Mr. Jirawat Jitramont)  
Field Environmental Scientist (S)

(Mr. Jirawat Jitramont)  
Assistant General Manager

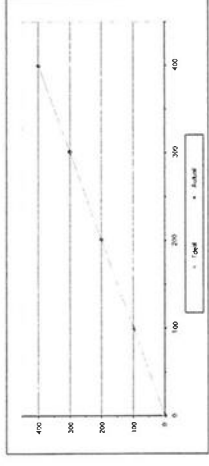
FORM NO. F-04-006 - REVISION NO. - ISSUE DATE 02/04/17



MULTIPOINT CALIBRATION REPORT

Calibration Date: 3-Jul-24  
Equipment Name: NOx Analyzer  
Manufacturer: HORIBA  
Model: APNA-370  
Serial No.: H000000  
Equipment ID: RYQ\_F00464  
Calibrator Manufacturer: TeleSigns API  
Model: 947  
Serial No.: 55 88  
Ref. Gas Concentration (PPM): 55.88  
Cylinder No.: GND027222  
Cylinder Pressure (psi): 1800  
Certified By: Alissa Inc.  
Expiry Date: 8-Feb-25

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	97.30	-2.70	-2.70
2	200.00	200.80	0.80	0.40
3	300.00	297.20	-2.80	-0.90
4	400.00	397.20	-2.80	-0.70
AVERAGE (%)				-0.18



Calibrated By

Approved By

(Mr. Jirawat Jitramont)  
Field Environmental Scientist (S)

(Mr. Jirawat Jitramont)  
Assistant General Manager

FORM NO. F-04-006 - REVISION NO. - ISSUE DATE 02/04/17









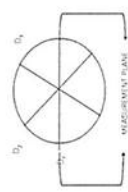
# DIGITAL TEMPERATURE CALIBRATION DATA SHEET

[illegible]

Mr. Martin: I just want to say that we have a very good feeling about the way the committee has handled this matter.

Expired by \_\_\_\_\_ 5/1/2009 \_\_\_\_\_  
 (No Signature Required)  
 Acquired by \_\_\_\_\_  
 (No Signature Required)  
 Expired by \_\_\_\_\_  
 (No Signature Required)

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PROBE NOZZLE DIAMETER  
CALIBRATION DATA SHEET[illegible]

Adapted from: *Journal of the American Medical Association*, 1997; 277: 1000-1005.

[illegible]

(ii)  $\{f_n(x)\}$  converges uniformly  
on the interval  $[0, \infty)$

\_\_\_\_\_

Ans: Part \_\_\_\_\_



## Stopwatch Calibration Test Report

**Console Control Meter Data**

City, Country	Bea, USA
Model	AC 572 M
Serial No.	1523012

Reference Slipswatch Data

Slipswatch ID No.	Model	Serial No.	Calibration Date	Certificate No.
1	Model A	12345	2023-01-15	123456789
2	Model B	67890	2023-02-01	987654321
3	Model C	24680	2023-03-10	567890123
4	Model D	13579	2023-04-20	345678901
5	Model E	98765	2023-05-05	234567890
6	Model F	45678	2023-06-18	123456789
7	Model G	32109	2023-07-03	098765432
8	Model H	87654	2023-08-12	876543210
9	Model I	76543	2023-09-25	765432109
10	Model J	65432	2023-10-08	654321098

[illegible]

Contributed by

[illegible]

# DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Project Description		Project Location		Project Dates		Project Status		Project Budget		Project Progress		Project Notes	
Project ID	Project Name	Project Location	Project Dates	Project Status	Project Budget	Project Progress	Project Notes	Project ID	Project Name	Project Location	Project Dates	Project Status	Project Budget
001	Project A	Location A	2023-01-01 to 2023-03-31	Completed	\$100,000	100%	Project A completed successfully.	002	Project B	Location B	2023-04-01 to 2023-06-30	In Progress	\$200,000
003	Project C	Location C	2023-07-01 to 2023-09-30	On Hold	\$150,000	0%	Project C on hold due to budget constraints.	004	Project D	Location D	2023-10-01 to 2023-12-31	Planned	\$300,000
005	Project E	Location E	2024-01-01 to 2024-03-31	Planned	\$250,000	0%	Project E planned for Q1 2024.	006	Project F	Location F	2024-04-01 to 2024-06-30	Planned	\$350,000
007	Project G	Location G	2024-07-01 to 2024-09-30	Planned	\$400,000	0%	Project G planned for Q3 2024.	008	Project H	Location H	2024-10-01 to 2024-12-31	Planned	\$450,000
009	Project I	Location I	2025-01-01 to 2025-03-31	Planned	\$500,000	0%	Project I planned for Q1 2025.	010	Project J	Location J	2025-04-01 to 2025-06-30	Planned	\$550,000
011	Project K	Location K	2025-07-01 to 2025-09-30	Planned	\$600,000	0%	Project K planned for Q3 2025.	012	Project L	Location L	2025-10-01 to 2025-12-31	Planned	\$650,000
013	Project M	Location M	2026-01-01 to 2026-03-31	Planned	\$700,000	0%	Project M planned for Q1 2026.	014	Project N	Location N	2026-04-01 to 2026-06-30	Planned	\$750,000
015	Project O	Location O	2026-07-01 to 2026-09-30	Planned	\$800,000	0%	Project O planned for Q3 2026.	016	Project P	Location P	2026-10-01 to 2026-12-31	Planned	\$850,000
017	Project Q	Location Q	2027-01-01 to 2027-03-31	Planned	\$900,000	0%	Project Q planned for Q1 2027.	018	Project R	Location R	2027-04-01 to 2027-06-30	Planned	\$950,000
019	Project S	Location S	2027-07-01 to 2027-09-30	Planned	\$1,000,000	0%	Project S planned for Q3 2027.	020	Project T	Location T	2027-10-01 to 2027-12-31	Planned	\$1,050,000
021	Project U	Location U	2028-01-01 to 2028-03-31	Planned	\$1,100,000	0%	Project U planned for Q1 2028.	022	Project V	Location V	2028-04-01 to 2028-06-30	Planned	\$1,150,000
023	Project W	Location W	2028-07-01 to 2028-09-30	Planned	\$1,200,000	0%	Project W planned for Q3 2028.	024	Project X	Location X	2028-10-01 to 2028-12-31	Planned	\$1,250,000
025	Project Y	Location Y	2029-01-01 to 2029-03-31	Planned	\$1,300,000	0%	Project Y planned for Q1 2029.	026	Project Z	Location Z	2029-04-01 to 2029-06-30	Planned	\$1,350,000
027	Project AA	Location AA	2029-07-01 to 2029-09-30	Planned	\$1,400,000	0%	Project AA planned for Q3 2029.	028	Project AB	Location AB	2029-10-01 to 2029-12-31	Planned	\$1,450,000
029	Project AC	Location AC	2030-01-01 to 2030-03-31	Planned	\$1,500,000	0%	Project AC planned for Q1 2030.	030	Project AD	Location AD	2030-04-01 to 2030-06-30	Planned	\$1,550,000
031	Project AE	Location AE	2030-07-01 to 2030-09-30	Planned	\$1,600,000	0%	Project AE planned for Q3 2030.	032	Project AF	Location AF	2030-10-01 to 2030-12-31	Planned	\$1,650,000
033	Project AG	Location AG	2031-01-01 to 2031-03-31	Planned	\$1,700,000	0%	Project AG planned for Q1 2031.	034	Project AH	Location AH	2031-04-01 to 2031-06-30	Planned	\$1,750,000
035	Project AI	Location AI	2031-07-01 to 2031-09-30	Planned	\$1,800,000	0%	Project AI planned for Q3 2031.	036	Project AJ	Location AJ	2031-10-01 to 2031-12-31	Planned	\$1,850,000
037	Project AK	Location AK	2032-01-01 to 2032-03-31	Planned	\$1,900,000	0%	Project AK planned for Q1 2032.	038	Project AL	Location AL	2032-04-01 to 2032-06-30	Planned	\$1,950,000
039	Project AM	Location AM	2032-07-01 to 2032-09-30	Planned	\$2,000,000	0%	Project AM planned for Q3 2032.	040	Project AN	Location AN	2032-10-01 to 2032-12-31	Planned	\$2,050,000
041	Project AO	Location AO	2033-01-01 to 2033-03-31	Planned	\$2,100,000	0%	Project AO planned for Q1 2033.	042	Project AP	Location AP	2033-04-01 to 2033-06-30	Planned	\$2,150,000
043	Project AQ	Location AQ	2033-07-01 to 2033-09-30	Planned	\$2,200,000								

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Co-located by	Approved by	 (100) Brown, David S. (100) (100) Brown, David S. (100)
 (100) Brown, David S. (100) (100) Brown, David S. (100)	 (100) Brown, David S. (100) (100) Brown, David S. (100)	 (100) Brown, David S. (100) (100) Brown, David S. (100)

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### Type S Pitot Tube Calibration

Parameter	Value	Allowable Range	Check
$\sigma_1$	0.6	$10^{-6} \leq \sigma_1 \leq 10^{-7}$	OK
$\sigma_2$	1.4	$10^{-6} \leq \sigma_2 \leq 10^{-7}$	OK
$\sigma_3$	-2.3	$-5^{-6} \leq \sigma_3 \leq -5^{-7}$	OK
$\beta_2$	-0.5	$-5^{-6} \leq \beta_2 \leq -5^{-7}$	OK
$\gamma$	1.1	-	-
$\theta$	1.3	-	-
$\tau$	1.3	-	-
$\tau_1$	0.033	$2 \times 10^{-6} \leq \tau_1 \leq 10^{-5}$	OK
$\tau_2$	0.033	$\tau_1 \leq \tau_2 \leq 10^{-5}$	OK
$\tau_3$	1.113	$0.18^{\circ} \leq \tau_3 \leq 1.5^{\circ}$	OK
$\tau_4$	1.475	$1.05^{\circ} \leq \tau_4 \leq 1.5^{\circ}$	OK
$A/2\sigma_1$	0.4	$2 \times 10^{-5} \leq A/2\sigma_1 \leq 10^{-4}$	OK
$A/2\sigma_2$	0.4	$2 \times 10^{-5} \leq A/2\sigma_2 \leq 10^{-4}$	OK

Certify that pilot tube/porbe meets or exceeds all specifications, applicable design features and is hereby assigned a pilot tube fact of 0.84. See 40 CFR Pt. 60, App. A, EPA Method 2

Calculated by: Mr. Sabasi Phansamphit  
(Mr. Sabasi Phansamphit)  
RFD Field Services Scientist (4)

Agreed By: Nattapong Jangwong  
(Mr. Nattapong Jangwong)  
RFD Field Services Specialist (11)

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[illegible]

FORM NO. 106-114 REVISED 6-85 SUPPL. DATE 10/12/79























# **CERTIFICATE OF ANALYSIS** Grade of Product: EPA Protocol

Per Number: E02N02E340000  
Reference Number: 92-4910725-1  
Lot Number: 2214 F800  
Cylinder Pressure: 2214 PSIG  
Cylinder Volume: 2214 PSIG  
Certification Date: Oct 23, 2017  
Expiration Date: Oct 23, 2019

ANALYTICAL RESULTS			
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty
Carbon Monoxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Dioxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Nitrogen	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable

CALIBRATION STANDARDS			
Type	Lot ID	Cylinder No.	Expiry Date
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017

ANALYTICAL EQUIPMENT			
Instrument/Model	Lot Number	Expiry Date	Expiry Date
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017



TESTING CERT No. 200442  
Page 1 of 2

Approved for Release

# **CERTIFICATE OF ANALYSIS** Grade of Product: EPA PROTOCOL STANDARD

Customer: AIR LIQUIDE  
Per Number: 180-020140013-1  
Lot Number: 2472 CF  
Cylinder Pressure: 2214 PSIG  
Cylinder Volume: 2214 PSIG  
Certification Date: Feb 11, 2022  
Expiration Date: Feb 11, 2023

ANALYTICAL RESULTS			
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty
Carbon Monoxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Dioxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Nitrogen	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable

CALIBRATION STANDARDS			
Type	Lot ID	Cylinder No.	Expiry Date
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017

ANALYTICAL EQUIPMENT			
Instrument/Model	Lot Number	Expiry Date	Expiry Date
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017

TESTING CERT No. 200442  
Page 1 of 2

Approved for Release

# **CERTIFICATE OF ANALYSIS** Grade of Product: EPA Protocol

Per Number: E02N02E340000  
Reference Number: 92-4910725-1  
Lot Number: 2214 F800  
Cylinder Pressure: 2214 PSIG  
Cylinder Volume: 2214 PSIG  
Certification Date: Oct 23, 2017  
Expiration Date: Oct 23, 2019

ANALYTICAL RESULTS			
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty
Carbon Monoxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Dioxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Nitrogen	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable

CALIBRATION STANDARDS			
Type	Lot ID	Cylinder No.	Expiry Date
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017

ANALYTICAL EQUIPMENT			
Instrument/Model	Lot Number	Expiry Date	Expiry Date
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017



TESTING CERT No. 200442  
Page 1 of 2

Approved for Release

# **CERTIFICATE OF ANALYSIS** Grade of Product: EPA Protocol

Customer: AIR LIQUIDE  
Per Number: 180-020140013-1  
Lot Number: 2472 CF  
Cylinder Pressure: 2214 PSIG  
Cylinder Volume: 2214 PSIG  
Certification Date: Feb 11, 2022  
Expiration Date: Feb 11, 2023

ANALYTICAL RESULTS			
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty
Carbon Monoxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Dioxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Nitrogen	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable

CALIBRATION STANDARDS			
Type	Lot ID	Cylinder No.	Expiry Date
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017

ANALYTICAL EQUIPMENT			
Instrument/Model	Lot Number	Expiry Date	Expiry Date
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017

TESTING CERT No. 200442  
Page 1 of 2

Approved for Release

# **CERTIFICATE OF ANALYSIS** Grade of Product: EPA Protocol

Per Number: E02N02E340000  
Reference Number: 92-4910725-1  
Lot Number: 2214 F800  
Cylinder Pressure: 2214 PSIG  
Cylinder Volume: 2214 PSIG  
Certification Date: Oct 23, 2017  
Expiration Date: Oct 23, 2019

ANALYTICAL RESULTS			
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty
Carbon Monoxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Dioxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Nitrogen	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable

CALIBRATION STANDARDS			
Type	Lot ID	Cylinder No.	Expiry Date
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017

ANALYTICAL EQUIPMENT			
Instrument/Model	Lot Number	Expiry Date	Expiry Date
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017



TESTING CERT No. 200442  
Page 1 of 2

Approved for Release

# **CERTIFICATE OF ANALYSIS** Grade of Product: EPA PROTOCOL STANDARD

Customer: AIR LIQUIDE  
Per Number: 180-020140013-1  
Lot Number: 2472 CF  
Cylinder Pressure: 2214 PSIG  
Cylinder Volume: 2214 PSIG  
Certification Date: Feb 11, 2022  
Expiration Date: Feb 11, 2023

ANALYTICAL RESULTS			
Component	Requested Concentration	Actual Concentration	Total Relative Uncertainty
Carbon Monoxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Dioxide	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable
Carbon Nitrogen	80.00 PPM	80.00 PPM	+/- 0.5% NIST Traceable

CALIBRATION STANDARDS			
Type	Lot ID	Cylinder No.	Expiry Date
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017
Standard	2001-14	CC-0984	Oct 23, 2017

ANALYTICAL EQUIPMENT			
Instrument/Model	Lot Number	Expiry Date	Expiry Date
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017
Model 550 FTR AP20154545	2214 F800	Oct 23, 2017	Oct 23, 2017

TESTING CERT No. 200442  
Page 1 of 2

Approved for Release





Cert. No. : ACL16012  
Job No. : VCE7AC004  
Pages : 7 of 8

B. Level linearity (including the level range control)

Range	Assigned Value (dB)	Measured Value (dB)	Decoded Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	94.0	±0.1

Time	Test Sign element, TB	Measured		Decoded		Acceptance Limits
		Value dB	Value dB	Value dB	Value dB	
Weighting	1	106.0	106.0	-0.1	105.5-106.5	±0.1
	2	117.0	117.0	0.0	116.5-117.5	±0.1
Filter	2	117.0	117.0	0.0	116.5-117.5	±0.1
	3	127.0	127.0	0.0	126.5-127.5	±0.1
Slope	2	127.0	127.0	0.0	126.5-127.5	±0.1
	3	137.0	137.0	0.0	136.5-137.5	±0.1
S/L	2	137.0	137.0	0.0	136.5-137.5	±0.1
	3	147.0	147.0	0.0	146.5-147.5	±0.1



Summary of Measurement Result :

Parameter	Pass	Uncertainty (dB)	Maximum permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	-0.2	N/A
2. Self-generated noise	✓	-0.2	N/A
3. Acoustic signal line of frequency weighting	✓	-0.1	0.6
125 Hz	✓	-0.2	0.6
1000 Hz	✓	-0.2	0.6
8000 Hz	✓	-0.3	0.7
4. Electrical signal line of frequency weighting	✓	-0.2	0.6
For 10 Hz to 10 kHz	✓	-0.3	0.7
For > 10 kHz to 20 kHz	✓	-0.2	0.6
5. Frequency and time weighting at 1 kHz	✓	-0.2	0.2
6. Long-term stability	✓	-0.1	0.1
7. Level linearity on the reference level noise	✓	-0.2	0.3
8. Level linearity including the level range control	✓	-0.2	0.3
9. Tone burst response	✓	-0.2	0.3
10. Peak C-weight level	✓	-0.2	0.35
11. Overload indication	✓	-0.2	0.25
12. High-level stability	✓	-0.1	0.1

Note : Peak C-weight level for each parameter will be considered together from the acceptance limit and the Maximum permitted uncertainty of measurement.

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7. Level linearity on the reference level noise

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
127.0	127.0	0.0	+1.1
128.0	128.0	0.0	+1.1
129.0	129.0	0.0	+1.1
130.0	130.0	0.0	+1.1
131.0	131.0	0.0	+1.1
132.0	132.0	0.0	+1.1
133.0	133.0	0.0	+1.1
134.0	134.0	0.0	+1.1
135.0	135.0	0.0	+1.1
136.0	136.0	0.0	+1.1
137.0	137.0	0.0	+1.1
138.0	138.0	0.0	+1.1
139.0	139.0	0.0	+1.1
140.0	140.0	0.0	+1.1
141.0	141.0	0.0	+1.1
142.0	142.0	0.0	+1.1
143.0	143.0	0.0	+1.1
144.0	144.0	0.0	+1.1
145.0	145.0	0.0	+1.1
146.0	146.0	0.0	+1.1
147.0	147.0	0.0	+1.1
148.0	148.0	0.0	+1.1
149.0	149.0	0.0	+1.1
150.0	150.0	0.0	+1.1
151.0	151.0	0.0	+1.1
152.0	152.0	0.0	+1.1
153.0	153.0	0.0	+1.1
154.0	154.0	0.0	+1.1
155.0	155.0	0.0	+1.1
156.0	156.0	0.0	+1.1
157.0	157.0	0.0	+1.1
158.0	158.0	0.0	+1.1
159.0	159.0	0.0	+1.1
160.0	160.0	0.0	+1.1
161.0	161.0	0.0	+1.1
162.0	162.0	0.0	+1.1
163.0	163.0	0.0	+1.1
164.0	164.0	0.0	+1.1
165.0	165.0	0.0	+1.1
166.0	166.0	0.0	+1.1
167.0	167.0	0.0	+1.1
168.0	168.0	0.0	+1.1
169.0	169.0	0.0	+1.1
170.0	170.0	0.0	+1.1
171.0	171.0	0.0	+1.1
172.0	172.0	0.0	+1.1
173.0	173.0	0.0	+1.1
174.0	174.0	0.0	+1.1
175.0	175.0	0.0	+1.1
176.0	176.0	0.0	+1.1
177.0	177.0	0.0	+1.1
178.0	178.0	0.0	+1.1
179.0	179.0	0.0	+1.1
180.0	180.0	0.0	+1.1
181.0	181.0	0.0	+1.1
182.0	182.0	0.0	+1.1
183.0	183.0	0.0	+1.1
184.0	184.0	0.0	+1.1
185.0	185.0	0.0	+1.1
186.0	186.0	0.0	+1.1
187.0	187.0	0.0	+1.1
188.0	188.0	0.0	+1.1
189.0	189.0	0.0	+1.1
190.0	190.0	0.0	+1.1
191.0	191.0	0.0	+1.1
192.0	192.0	0.0	+1.1
193.0	193.0	0.0	+1.1
194.0	194.0	0.0	+1.1
195.0	195.0	0.0	+1.1
196.0	196.0	0.0	+1.1
197.0	197.0	0.0	+1.1
198.0	198.0	0.0	+1.1
199.0	199.0	0.0	+1.1
200.0	200.0	0.0	+1.1

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Result of calibration :

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
65.8

3.2 The maximum of the sound level under was captured by electrical signal input level :

Frequency Weighting	Measured Value (dB)
A-weight	11.3
C-weight	17.5
Flat	23.1

3. Acoustic signal line of frequency weighting

Near free-field acoustic response at a level of 84 dB

Frequency (Hz)	Flat	C-weight	Acceptance Limits
125	0.4	0.4	0.5
1000	0.0	0.0	+1.0
8000	-1.2	-1.1	+1.1

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8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	+1.1

9. Tone burst response

Time Weighting	Time burst duration, 1/3 Oct	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
First	0.25	1	108.0	107.9	-0.1	1.5 - 5.0
2	8	8	117.0	117.0	0.0	1.0 - 2.5
2000	500	500	134.0	134.0	0.0	+1.0
2	8	8	108.0	108.0	0.0	1.5 - 5.0
2000	500	500	127.6	127.6	0.0	+1.0
0.25	1	1	99.9	99.9	0.0	1.5 - 5.0
2	8	8	108.0	108.0	0.0	1.0 - 2.5
2000	500	500	128.0	128.0	0.0	+1.0

10. Peak C-weight level

Number of Cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	+3.0
Positive half cycle	133.0	133.0	0.0	+3.0
Negative half cycle	133.0	133.0	0.0	+3.0

Number of Cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	+3.0
Positive half cycle	133.0	133.0	0.0	+3.0
Negative half cycle	133.0	133.0	0.0	+3.0

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4. Identical signal tests of frequency weightings

Weighting filter response within 0.1 dB

Frequency (Hz)	Flat	C-weight	Acceptance Limits
63	-0.1	0.0	-0.1
125	0.0	0.0	0.0
250	0.0	0.0	0.0
500	0.0	0.0	0.0
1000	0.0	0.0	0.0
2000	0.0	0.0	0.0
4000	0.0	0.0	0.0
8000	0.0	0.1	0.1

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	+0.1
Slow	94.0	94.0	0.0	+0.1
Long-term stability	94.0	94.0	0.0	+0.1

6. Long-term stability

Frequency Weighting	S.M.Deviation at 1000 Hz (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0

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11. Overload indication

Measured value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Positive one half cycle	89.6	-0.1
Negative one half cycle	89.6	-0.1

12. High-level stability

Frequency Weighting	S.M.Deviation at 1000 Hz (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.0	0.0

The reported uncertainty is based on a standard deviation multiplied by coverage factor k = 2, or any value following calculation providing a level of confidence of approximately 95 %.

End of Calibration Certificate

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### Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal level of frequency up to 6 Hz	0.3	0.6
125 Hz	0.3	0.6
1000 Hz	0.3	0.7
4. Acoustical signal level of frequency up to 6 Hz	0.3	0.6
8000 Hz	0.3	0.7
5. Frequency and level weighting at 1 kHz	-	0.2
For 10 Hz to 10 kHz	-	0.2
For > 10 kHz to 20 kHz	-	1.0
6. Frequency and level weighting at 1 kHz	0.2	0.2
7. Long-term stability	0.1	0.1
8. Self-generated noise in reference level range	0.2	0.3
9. Self-generated noise in level range external	0.2	0.3
10. Free beam response	0.2	0.3
11. Peak A sound level	0.2	0.3
12. Overall reduction	0.2	0.3
13. High level stability	0.1	0.1

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## 7. Level linearity on the reference level range

Asset pool	Market	Devalued	Accrued
Value (\$B)	Value (\$B)	Value (\$B)	Gain (\$B)
281	1310	0.0	+1.1
282	1310	0.0	+1.1
283	1310	0.0	+1.1
284	1310	0.0	+1.1
285	1310	0.0	+1.1
286	1310	0.0	+1.1
287	1310	0.0	+1.1
288	1310	0.0	+1.1
289	1310	0.0	+1.1
290	1310	0.0	+1.1
291	1310	0.0	+1.1
292	1310	0.0	+1.1
293	1310	0.0	+1.1
294	1310	0.0	+1.1
295	1310	0.0	+1.1
296	1310	0.0	+1.1
297	1310	0.0	+1.1
298	1310	0.0	+1.1
299	1310	0.0	+1.1
300	1310	0.0	+1.1
301	1310	0.0	+1.1
302	1310	0.0	+1.1
303	1310	0.0	+1.1
304	1310	0.0	+1.1
305	1310	0.0	+1.1
306	1310	0.0	+1.1
307	1310	0.0	+1.1
308	1310	0.0	+1.1
309	1310	0.0	+1.1
310	1310	0.0	+1.1
311	1310	0.0	+1.1
312	1310	0.0	+1.1
313	1310	0.0	+1.1
314	1310	0.0	+1.1
315	1310	0.0	+1.1
316	1310	0.0	+1.1
317	1310	0.0	+1.1
318	1310	0.0	+1.1
319	1310	0.0	+1.1
320	1310	0.0	+1.1
321	1310	0.0	+1.1
322	1310	0.0	+1.1
323	1310	0.0	+1.1
324	1310	0.0	+1.1
325	1310	0.0	+1.1
326	1310	0.0	+1.1
327	1310	0.0	+1.1
328	1310	0.0	+1.1
329	1310	0.0	+1.1
330	1310	0.0	+1.1
331	1310	0.0	+1.1
332	1310	0.0	+1.1
333	1310	0.0	+1.1
334	1310	0.0	+1.1
335	1310	0.0	+1.1
336	1310	0.0	+1.1
337	1310	0.0	+1.1
338	1310	0.0	+1.1
339	1310	0.0	+1.1
340	1310	0.0	+1.1
341	1310	0.0	+1.1
342	1310	0.0	+1.1
343	1310	0.0	+1.1
344	1310	0.0	+1.1
345	1310	0.0	+1.1
346	1310	0.0	+1.1
347	1310	0.0	+1.1
348	1310	0.0	+1.1
349	1310	0.0	+1.1
350	1310	0.0	+1.1
351	1310	0.0	+1.1
352	1310	0.0	+1.1
353	1310	0.0	+1.1
354	1310	0.0	+1.1
355	1310	0.0	+1.1
356	1310	0.0	+1.1
357	1310	0.0	+1.1
358	1310	0.0	+1.1
359	1310	0.0	+1.1
360	1310	0.0	+1.1
361	1310	0.0	+1.1
362	1310	0.0	+1.1
363	1310	0.0	+1.1
364	1310	0.0	+1.1
365	1310	0.0	+1.1
366	1310	0.0	+1.1
367	1310	0.0	+1.1
368	1310	0.0	+1.1
369	1310	0.0	+1.1
370	1310	0.0	+1.1
371	1310	0.0	+1.1
372	1310	0.0	+1.1
373	1310	0.0	+1.1
374	1310	0.0	+1.1
375	1310	0.0	+1.1
376	1310	0.0	+1.1
377	1310	0.0	+1.1
378	1310	0.0	+1.1
379	1310	0.0	+1.1
380	1310	0.0	+1.1
381	1310	0.0	+1.1
382	1310	0.0	+1.1
383	1310	0.0	+1.1
384	1310	0.0	+1.1
385	1310	0.0	+1.1
386	1310	0.0	+1.1
387	1310	0.0	+1.1
388	1310	0.0	+1.1
389	1310	0.0	+1.1
390	1310	0.0	+1.1
391	1310	0.0	+1.1
392	1310	0.0	+1.1
393	1310	0.0	+1.1
394	1310	0.0	+1.1
395	1310	0.0	+1.1
396	1310	0.0	+1.1
397	1310	0.0	+1.1
398	1310	0.0	+1.1
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414	1310	0.0	+1.1
415	1310	0.0	+1.1
416	1310	0.0	+1.1
417	1310	0.0	+1.1
418	1310	0.0	+1.1
419	1310	0.0	+1.1
420	1310	0.0	+1.1
421	1310	0.0	+1.1
422	1310	0.0	+1.1
423	1310	0.0	+1.1
424	1310	0.0	+1.1
425	1310	0.0	+1.1
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427	1310	0.0	+1.1
428	1310	0.0	+1.1
429	1310	0.0	+1.1
430	1310	0.0	+1.1
431	1310	0.0	+1.1
432	1310	0.0	+1.1
433	1310	0.0	+1.1
434	1310	0.0	+1.1
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436	1310	0.0	+1.1
437	1310	0.0	+1.1
438	1310	0.0	+1.1
439	1310	0.0	+1.1
440	1310	0.0	+1.1
441	1310	0.0	+1.1
442	1310	0.0	+1.1
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446	1310	0.0	+1.1
447	1310	0.0	+1.1
448	1310	0.0	+1.1
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451	1310	0.0	+1.1
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456	1310	0.0	+1.1
457	1310	0.0	+1.1
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463	1310	0.0	+1.1
464	1310	0.0	+1.1
465	1310	0.0	+1.1
466	1310	0.0	+1.1
467	1310	0.0	+1.1
468	1310	0.0	+1.1
469	1310	0.0	+1.1
470	1310	0.0	+1.1
471	1310	0.0	+1.1
472	1310	0.0	+1.1
473	1310	0.0	+1.1
474	1310	0.0	+1.1
475	1310	0.0	+1.1
476	1310	0.0	+1.1
477	1310	0.0	+1.1
478	1310	0.0	+1.1
479	1310	0.0	+1.1
480	1310	0.0	+1.1
481	1310	0.0	+1.1
482	1310	0.0	+1.1
483	1310	0.0	+1.1
484	1310	0.0	+1.1
485	1310	0.0	+1.1
486	1310	0.0	+1.1
487	1310	0.0	+1.1
488	1310	0.0	+1.1
489	1310	0.0	+1.1
490	1310	0.0	+1.1
491	1310	0.0	+1.1
492	1310	0.0	+1.1
493	1310	0.0	+1.1
494	1310	0.0	+1.1
495	1310	0.0	+1.1
496	1310	0.0	+1.1
497	1310	0.0	+1.1
498	1310	0.0	+1.1
499	1310	0.0	+1.1
500	1310	0.0	+1.1
501	1310	0.0	+1.1
502	1310	0.0	+1.1
503	1310	0.0	+1.1
504	1310	0.0	+1.1
505	1310	0.0	+1.1
506	1310	0.0	+1.1
507	1310	0.0	+1.1
508	1310	0.0	+1.1
509	1310	0.0	+1.1
510	1310	0.0	+1.1
511	1310	0.0	+1.1
512	1310	0.0	+1.1
513	1310	0.0	+1.1
514	1310	0.0	+1.1
515	1310	0.0	+1.1
516	1310	0.0	+1.1
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518	1310	0.0	+1.1
519	1310	0.0	+1.1
520	1310	0.0	+1.1
521	1310	0.0	+1.1
522	1310	0.0	+1.1
523	1310	0.0	+1.1
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525	1310	0.0	+1.1
526	1310	0.0	+1.1
527	1310	0.0	+1.1
528	1310	0.0	+1.1
529	1310	0.0	+1.1
530	1310	0.0	+1.1
531	1310	0.0	+1.1
532	1310	0.0	+1.1
533	1310	0.0	+1.1
534	1310	0.0	+1.1
535	1310	0.0	+1.1
536	1310	0.0	+1.1
537	1310	0.0	+1.1
538	1310	0.0	+1.1
539	1310	0.0	+1.1
540	1310	0.0	+1.1
541	1310	0.0	+1.1
542	1310	0.0	+1.1
543	1310	0.0	+1.1
544	1310	0.0	+1.1
545	1310	0.0	+1.1
546	1310	0.0	+1.1
547	1310	0.0	+1.1
548	1310	0.0	+1.1
549	1310	0.0	+1.1
550	1310	0.0	+1.1
551	1310	0.0	+1.1
552	1310	0.0	+1.1
553	1310	0.0	+1.1
554	1310	0.0	+1.1
555	1310	0.0	+1.1
556	1310	0.0	+1.1
557	1310	0.0	+1.1
558	1310	0.0	+1.1
559	1310	0.0	+1.1
560	1310	0.0	+1.1
561	1310	0.0	+1.1
562	1310	0.0	+1.1
563	1310	0.0	+1.1
564	1310	0.0	+1.1
565	1310	0.0	+1.1
566	1310	0.0	+1.1
567	1310	0.0	+1.1
568	1310	0.0	+1.1
569	1310	0.0	+1.1
570	1310	0.0	+1.1
571	1310	0.0	+1.1
572	1310	0.0	+1.1
573	1310	0.0	+1.1
574	1310	0.0	+1.1
575	1310	0.0	+1.1
576	1310	0.0	+1.1
577	1310	0.0	+1.1
578	1310	0.0	+1.1
579	1310	0.0	+1.1
580	1310	0.0	+1.1
581	1310	0.0	+1.1
582	1310	0.0	+1.1
583	1310	0.0	+1.1
584	1310	0.0	+1.1
585	1310	0.0	+1.1
586	1310	0.0	+1.1
587	1310	0.0	+1.1
588	1310	0.0	+1.1
589	1310	0.0	+1.1
590	1310	0.0	+1.1
591	1310	0.0	+1.1
592	1310	0.0	+1.1
593	1310	0.0	+1.1
594	1310	0.0	+1.1
595	1310	0.0	+1.1
596	1310	0.0	+1.1
597	1310	0.0	+1.1
598	1310	0.0	+1.1
599	1310	0.0	+1.1
600	1310	0.0	+1.1
601	1310	0.0	+1.1
602	1310	0.0	+1.1
603	1310	0.0	+1.1
604	1310	0.0	+1.1
605	1310	0.0	+1.1
606	1310	0.0	+1.1
607	1310	0.0	+1.1
608	1310	0.0	+1.1
609	1310	0.0	+1.1
610	1310	0.0	+1.1
611	1310	0.0	+1.1
612	1310	0.0	+1.1
613	1310	0.0	+

7. *Leleba*.

**Result of calibration:**

### 1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.6)	93.9	0.0	±0.3

## 2. Self-generated noise

Measural Value (dl)
14.8

**2.2** The microplane of the sound level meter was replaced by electrical signal input device.

Frequency	Measured value (dB)
Weighting	
A-weighting	13.8
C-weighting	20.6
Total	26.1

### 3. Acoustical signal tests of frequency weightings

Frequency (Hz)	Division from various frequency weighting response curve (dB)			Acceptance limits
	Flat	C-weight	A-weight	
125	0.1	0.1	0.1	+1.5
1000	0.0	0.0	0.0	+1.0
8000	1.2	1.3	1.3	-0

T. Letcher.

#### 8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Audio	0.1 to 0.5	0.1 to 0.5	0.0	

### 9. Tone burst response

Time Weighting	Time from start to the end (min.)	Cycle	Assigned Voltage (mV)	Measured Voltage (mV)	Deviation (mV)	Acceptance
Final	0-2.5	1	100.0	100.0	0.0	1.5 < 5.0
	2.5-5.0	5	117.0	117.0	0.1	1.0 < 2.5
Slope	200	500	134.0	135.1	0.1	1.0 < 2.5
	200	000	106.0	106.0	0.0	1.5 < 5.0
S=1	2.5-5.0	5	99.0	98.9	-0.1	1.5 < 5.0
	200	800	100.0	100.0	0.0	1.0 < 2.5
	200	800	128.0	128.0	0.0	1.5 < 5.0

## 10. Peak C' sound level

Number of cycle in test signal	Amplified Value (dB)	Measured Value, Level (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	136.0	-0.4	±2.0

Number of cycle in test signal	Amplified		Measured		Deviated		Acceptance limits (dB)
	Value	(dB)	Value	(dB)	Value	(dB)	
Continuous	133.0		133.0		0.0		+2.0
Positive half cycle	135.4		135.1		-0.3		+2.0
Negative half cycle	135.4		135.1		-0.3		+2.0

7. Dutch.

#### 4. Electrical signal tests of frequency weightings

Frequency (Hz)	Deviation from visual frequency (wavelength response curve shift)				Acceptance margin
	Flat	Curve up	Curve up	Curve up	
63	0.0	0.0	0.0	+2.0	
125	0.0	0.0	0.1	0.1	+1.5
250	0.0	0.0	0.0	0.0	+1.5
500	0.0	0.1	0.0	0.1	+1.5
1000	0.0	0.0	0.0	0.0	+1.0
2000	0.0	0.0	0.0	0.0	+2.0
4000	0.0	0.0	0.0	0.0	+3.0
8000	0.0	0.1	0.1	0.1	+6.0

S. Frequency and time weightings at 1 kHz

### 5.1 Frequency weightings at 1 kHz

Frequency	Auto-purged Value (all)	Measured Value (all)	Devised Value (all)	Accepted Errors (all)
A-weight	94.0	94.0	0.0	+0.2
C-weight	94.0	94.0	0.0	+0.2
Flat	94.0	94.0	0.0	+0.2

### 5.2 Time weighting of IAPs

Property Weighing	Assigned Value (dl)	Measured Value (dl)	Percent Value (dl)	As square foot
Fast	91.0	91.0	0.0	+0.1
Slow	94.0	94.0	0.0	+0.1
Log	94.0	94.0	0.0	+0.1

## 6. Long-term stability

Frequency Weighting	SLM Display at visual (dB)	SLM Display at foot (dB)	Desired Value (dB)	Acceptance Margin (dB)
A-weight	91.0	91.1	91	-0.1

Rate:

## 11. Overload Indication

Measured value (dl)	Expected Value (dl)		Acceptance Limits (dl)
	Positive one-half cycle	Negative one-half cycle	
89.7	89.7	89.7	0.5

## 12. High level statistics

Frequency Weighing	S/M Display at initial (dB)	S/M Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.0	0.0	±0.5

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor  $k = 2$  or any value following calculation providing a level of confidence of reported results 95 %.

**End of Calibration Certificate**











ใบตรวจสอบสภาพเครื่องควบคุมอุณหภูมิ

Exposure	Exposed [°C]	Soaking [°C]	Softening [°C]	Maximum Temperature [°C]	Conversion % (dL/g)	Shrinkage (%)
A1				260.4	17.4	1.5
A2				265.1	17.4	1.5
A3				265.1	17.4	1.5
A4				357.7	17.7	1.5
A5				378.3	13.2	1.5
B1				325.1	15.1	1.5
B2				325.1	15.1	1.5
B3				376.8	15.1	1.5
B4				376.3	13.2	1.5
C1	200	200	200	378.4	13.4	1.5
C2				305.1	15.1	1.5
C3				305.1	15.1	1.5
C4				325.1	12.9	1.5
C5				312.7	13.2	1.5
C6				377.3	12.3	1.5
D1				305.5	15.5	1.5
D2				324.6	15.6	1.5
D3				324.6	15.6	1.5
D4				327.7	13.7	1.5
D5				374.7	12.7	1.5

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2000

[illegible]

24000

**Alignant Consulting Compliance Services**

Overall Log Amp Test Statistic

1995

Prepolymerized	2.2	°C	% solvent in K	5.0
10	1.0	5.0	5.0	5.0
10	1.0	5.0	5.0	5.0

Phase  
Cm  
Dm  
See also p. 100

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

---

Test	Peak	Retention Time (s)	MS/MS	Yield
1	1.0	1.0	1.0	1.0
2	1.0	1.0	1.0	1.0
3	1.0	1.0	1.0	1.0
4	1.0	1.0	1.0	1.0
5	1.0	1.0	1.0	1.0
6	1.0	1.0	1.0	1.0
7	1.0	1.0	1.0	1.0
8	1.0	1.0	1.0	1.0
9	1.0	1.0	1.0	1.0
10	1.0	1.0	1.0	1.0
11	1.0	1.0	1.0	1.0
12	1.0	1.0	1.0	1.0
13	1.0	1.0	1.0	1.0
14	1.0	1.0	1.0	1.0
15	1.0	1.0	1.0	1.0
16	1.0	1.0	1.0	1.0
17	1.0	1.0	1.0	1.0
18	1.0	1.0	1.0	1.0
19	1.0	1.0	1.0	1.0
20	1.0	1.0	1.0	1.0
21	1.0	1.0	1.0	1.0
22	1.0	1.0	1.0	1.0
23	1.0	1.0	1.0	1.0
24	1.0	1.0	1.0	1.0
25	1.0	1.0	1.0	1.0
26	1.0	1.0	1.0	1.0
27	1.0	1.0	1.0	1.0
28	1.0	1.0	1.0	1.0
29	1.0	1.0	1.0	1.0
30	1.0	1.0	1.0	1.0
31	1.0	1.0	1.0	1.0
32	1.0	1.0	1.0	1.0
33	1.0	1.0	1.0	1.0
34	1.0	1.0	1.0	1.0
35	1.0	1.0	1.0	1.0
36	1.0	1.0	1.0	1.0
37	1.0	1.0	1.0	1.0
38	1.0	1.0	1.0	1.0
39	1.0	1.0	1.0	1.0
40	1.0	1.0	1.0	1.0
41	1.0	1.0	1.0	1.0
42	1.0	1.0	1.0	1.0
43	1.0	1.0	1.0	1.0
44	1.0	1.0	1.0	1.0
45	1.0	1.0	1.0	1.0
46	1.0	1.0	1.0	1.0
47	1.0	1.0	1.0	1.0
48	1.0	1.0	1.0	1.0
49	1.0	1.0	1.0	1.0
50	1.0	1.0	1.0	1.0
51	1.0	1.0	1.0	1.0
52	1.0	1.0	1.0	1.0
53	1.0	1.0	1.0	1.0
54	1.0	1.0	1.0	1.0
55	1.0	1.0	1.0	1.0
56	1.0	1.0	1.0	1.0
57	1.0	1.0	1.0	1.0
58	1.0	1.0	1.0	1.0
59	1.0	1.0	1.0	1.0
60	1.0	1.0	1.0	1.0
61	1.0	1.0	1.0	1.0
62	1.0	1.0	1.0	1.0
63	1.0	1.0	1.0	1.0
64	1.0	1.0	1.0	1.0
65	1.0	1.0	1.0	1.0
66	1.0	1.0	1.0	1.0
67	1.0	1.0	1.0	1.0
68	1.0	1.0	1.0	1.0
69	1.0	1.0	1.0	1.0
70	1.0	1.0	1.0	1.0
71	1.0	1.0	1.0	1.0
72	1.0	1.0	1.0	1.0
73	1.0	1.0	1.0	1.0
74	1.0	1.0	1.0	1.0
75	1.0	1.0	1.0	1.0
76	1.0	1.0	1.0	1.0
77	1.0	1.0	1.0	1.0
78	1.0	1.0	1.0	1.0
79	1.0	1.0	1.0	1.0
80	1.0	1.0	1.0	1.0

Received 15 November 2023; accepted 14 May 2024

From 1998

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GC Oven Temperature Accuracy Test Results

Peak	Retention Time (s)	MS/MS	Yield
1	1.00	1.00	1.00
2	1.00	1.00	1.00
3	1.00	1.00	1.00
4	1.00	1.00	1.00
5	1.00	1.00	1.00
6	1.00	1.00	1.00
7	1.00	1.00	1.00
8	1.00	1.00	1.00
9	1.00	1.00	1.00
10	1.00	1.00	1.00
11	1.00	1.00	1.00
12	1.00	1.00	1.00
13	1.00	1.00	1.00
14	1.00	1.00	1.00
15	1.00	1.00	1.00
16	1.00	1.00	1.00
17	1.00	1.00	1.00
18	1.00	1.00	1.00
19	1.00	1.00	1.00
20	1.00	1.00	1.00
21	1.00	1.00	1.00
22	1.00	1.00	1.00
23	1.00	1.00	1.00
24	1.00	1.00	1.00
25	1.00	1.00	1.00
26	1.00	1.00	1.00
27	1.00	1.00	1.00
28	1.00	1.00	1.00
29	1.00	1.00	1.00
30	1.00	1.00	1.00
31	1.00	1.00	1.00
32	1.00	1.00	1.00
33	1.00	1.00	1.00
34	1.00	1.00	1.00
35	1.00	1.00	1.00
36	1.00	1.00	1.00
37	1.00	1.00	1.00
38	1.00	1.00	1.00
39	1.00	1.00	1.00
40	1.00	1.00	1.00
41	1.00	1.00	1.00
42	1.00	1.00	1.00
43	1.00	1.00	1.00
44	1.00	1.00	1.00
45	1.00	1.00	1.00
46	1.00	1.00	1.00
47	1.00	1.00	1.00
48	1.00	1.00	1.00
49	1.00	1.00	1.00
50	1.00	1.00	1.00
51	1.00	1.00	1.00
52	1.00	1.00	1.00
53	1.00	1.00	1.00
54	1.00	1.00	1.00
55	1.00	1.00	1.00
56	1.00	1.00	1.00
57	1.00	1.00	1.00
58	1.00	1.00	1.00
59	1.00	1.00	1.00
60	1.00	1.00	1.00
61	1.00	1.00	1.00
62	1.00	1.00	1.00
63	1.00	1.00	1.00
64	1.00	1.00	1.00
65	1.00	1.00	1.00
66	1.00	1.00	1.00
67	1.00	1.00	1.00
68	1.00	1.00	1.00
69	1.00	1.00	1.00
70	1.00	1.00	1.00
71	1.00	1.00	1.00
72	1.00	1.00	1.00
73	1.00	1.00	1.00
74	1.00	1.00	1.00

Received 15 November 2023; accepted 14 May 2024









Certificate No. T231676 Page 4 of 6

### Calibration Report

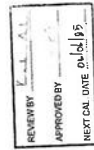
Measurement Results		Average Standard Reading at each position (°C)											
Calibration Point		TN21			TN22			TN23			TN24		
C10-TN21	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
C10-TN22	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
C10-TN23	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
C10-TN24	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
Average		95.01			95.01			95.01			95.01		

Approved By: \_\_\_\_\_  
TAMARIN 05/04/23

Certificate No. T23166 Page 1 of 4

### Certificate of Calibration

Equipment	: Chamber (Cooling Room)
Manufacturer	: KOLDECH
Model	: KM 320
Serial No.	: TRN-101206105
Customer Code	: BKX-EN0167
ID No.	: T246343
Customer	: ALS Laboratory Group (Thailand) Co., Ltd. 104 Phatthanakan-40, Phatthanakan Rd., Khwaeng Phatthanakan, Kiet Sum Liang, Bangkok 10250
Customer Location	: Laboratory
Date of Receipt	: 29 November 2023
Calibrated By	: Aiphong Rongant (Technician)
Approved By	: <u>[Signature]</u> / Boonchai Suriyavong (Site Calibration Manager)
Date of Issue	: 03 JAN 2024



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

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

TAMARIN 05/04/23

Certificate No. T231676 Page 5 of 6

### Calibration Report

Measurement Results		Average Standard Reading at each position (°C)											
Calibration Point		TN21			TN22			TN23			TN24		
C10-TN21	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
C10-TN22	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
C10-TN23	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
C10-TN24	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
Average		95.01			95.01			95.01			95.01		

Approved By: \_\_\_\_\_  
TAMARIN 05/04/23

Certificate No. T23166 Page 2 of 4

### Calibration Report

Equipment	: Chamber (Cooling Room)
Date of Calibration	: 6 December 2023
Environment	: Temperature : 23.4-24.9 °C Line Voltage : 221.4-230.2 V Relative Humidity : 55-65 %RH
Condition of this result of calibration :	
1. Thermopile was calibrated by using 16 standard thermopile type T-type in chamber, after other one standard thermopile type T-type for ambient temperature calibration. The calibration was done in accordance to NIST 2010 based on ASTM E145-14 (Reapproved 2010) and ASME B59.196.	
2. Reference Standard Instrument :	
3. This certificate is issued by Metrology (Thailand) through Metrological Center (NSC-TIS/ITS 7025 CALIBRATION 0244)	
4. Condition of calibrated item : good	
5. Adjustment : ( X ) without adjustment ( ) after adjustment	

Approved By: \_\_\_\_\_  
TAMARIN 05/04/23

TAMARIN 05/04/23

Certificate No. T231676 Page 6 of 6

### Calibration Report

Measurement Results		Average Standard Reading at each position (°C)											
Calibration Point		TN21			TN22			TN23			TN24		
C10-TN21	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
C10-TN22	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
C10-TN23	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
C10-TN24	Max	95.01			95.01			95.01			95.01		
	Min	95.01			95.01			95.01			95.01		
	Average	95.01			95.01			95.01			95.01		
Average		95.01			95.01			95.01			95.01		

\* The uncertainty estimate "u" is calculated by the calibration results only, not by the test results.

The result of calibration is based on the calibration results of the instrument, which is a standard instrument, and the result of the calibration is based on the calibration results of the instrument, which is a standard instrument.

Approved By: \_\_\_\_\_

TAMARIN 05/04/23

Certificate No. T23166 Page 3 of 4

### Calibration Report

Equipment	: Chamber (Cooling Room)
Date of Calibration	: 6 December 2023
Environment	: Temperature : 23.4-24.9 °C Line Voltage : 221.4-230.2 V Relative Humidity : 55-65 %RH
Condition of this result of calibration :	
1. Thermopile was calibrated by using 16 standard thermopile type T-type in chamber, after other one standard thermopile type T-type for ambient temperature calibration. The calibration was done in accordance to NIST 2010 based on ASTM E145-14 (Reapproved 2010) and ASME B59.196.	
2. Reference Standard Instrument :	
3. This certificate is issued by Metrology (Thailand) through Metrological Center (NSC-TIS/ITS 7025 CALIBRATION 0244)	
4. Condition of calibrated item : good	
5. Adjustment : ( X ) without adjustment ( ) after adjustment	

Approved By: \_\_\_\_\_  
TAMARIN 05/04/23

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