



Breath Alcohol Calibration Verification Test No. 22-5691 Summary Report

Each sample pack consisted of four 34L NIST traceable reference material dry gas cylinders which participants were requested to analyze. Data were returned from 49 participants and are compiled into the following tables:

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This report contains the data received from the participants in this test. Since these participants are located in many countries around the world, and it is their option how the samples are to be used (e.g., training exercise, known or blind proficiency testing, research and development of new techniques, etc.), the results compiled in the Summary Report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such. The Summary Comments are included for the benefit of participants to assist with maintaining or enhancing the quality of their results. These comments are not intended to reflect the general state of the art within the profession.

Participant results are reported using a randomly assigned "WebCode". This code maintains participant's anonymity, provides linking of the various report sections, and will change with every report.

Manufacturer's Information

Each sample set consisted of four 34L NIST traceable reference material dry gas cylinders (Items 1-4). Participants were requested to analyze the contents of each cylinder and report the apparent breath alcohol concentration and their uncertainty.

SAMPLE PREPARATION-

Cylinders were sourced from a specialty gas material vendor. The Certificate of Analysis for each lot of dry gas cylinders was compared to the requested breath alcohol concentration. Once confirmed each cylinder within a lot was labeled with the appropriate Item number.

SAMPLE SET ASSEMBLY: Each sample set was assembled with an Item 1, 2, 3 and 4 in a pre-labeled sample pack box.

<u>Item</u>	<u>Breath Alcohol Concentration</u> <u>(g/210L)</u>	<u>Manufacturer's Uncertainty</u> <u>(g/210L)</u>
1	0.160	± 0.003
2	0.310	± 0.006
3	0.090	± 0.002
4	0.040	± 0.002

Summary Comments

This test was designed to allow participants to assess their proficiency in the last calibration performed on their breath alcohol instrument. Each participant was supplied with a sample set consisting of four 34L NIST traceable reference material dry gas cylinders which contained different breath alcohol concentration (BrAC) values. (Refer to Manufacturer's Information for production details.)

En analysis was performed on reported results for each item. En is not calculated for labs who did not report their expanded uncertainty. Participants with extreme data (En absolute values greater than 1.00) have been marked with an "X". Please refer to the En Analysis Guide for more information on this statistical analysis. A total of 49 participants reported results; however, not all participants reported an expanded uncertainty for every item. The percentage of participants reporting their expanded uncertainty for each item was 71%. A breakdown of the number of participants reporting extreme data per item based on En analysis is as follows: one for Item 1, six for Item 2, and two for Item 3. Participants are advised to consider their reported expanded uncertainty when evaluating their En results. CTS uses a coverage factor equal to 2 in its analysis. At this time, the linearity of the results for each participant will not be analyzed utilizing regression statistics.

CTS noted many participants reported their instrument's serial numbers. For the sake of anonymity, CTS did not reproduce this information in the report.

En Analysis Guide

Normalized Error, or E_n , is used in proficiency testing in many other industries to judge the quality of measurement results. It measures the relationship of a participant's value to the reference value, relative to the combined uncertainties of those values. E_n is calculated as follows:

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

Where the assigned value, X_{ref} , is determined in the manufacturer's reference laboratory, U_{ref} is the expanded uncertainty of X_{ref} , and U_{lab} is the Expanded Uncertainty of a participant's result, X_{lab} . E_n is not calculated for participants who did not report their Expanded Uncertainty.

Absolute values of E_n less than **1.00** should be obtained for the measurements to be acceptable. This is because there is a 95% probability that the calculated E_n will fall within an absolute value of 1.00. Any absolute values over 1.00 have been highlighted with an "X".

The following table and graph represent the results reported by participants.

X_{ref} and U_{ref} were determined by the dry gas cylinder manufacturer, which is ISO 17025 accredited.

Reported Results

As a verification of calibration, report the ethanol concentration of each cylinder and the uncertainty determined during the last calibration of the instrument.

TABLE 1 - Item 1

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

Xlab: Participant's concentration
 Xref: Manufacturer's concentration
 Ulab: Participant's uncertainty
 Uref: Manufacturer's uncertainty

Item 1 Manufacturer's Concentration: 0.160 g/210L

Item 1 Manufacturer's Uncertainty: 0.0030 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in En)	Performance Statistic (En)
2LCWVC	EC	0.154	0.0090	1001	-0.63
	IR	0.161	0.0090	1001	0.11
2UMYGC	EC	0.160	0.0090	1023	0.00
	IR	0.163	0.0090	1023	0.32
323YAU	Thermo electrically cooled lead selenide infrared	0.162		1018 mbar	
3EMJR3	Electrochemical Fuel Cell	0.158	0.0070	746 mm Hg	-0.26
3QGXQE	IR	0.159	0.0070	857 hPa	-0.13
6ZH6K6	IR	0.159	0.0040	962.425	-0.20
77FBEX	EC (Fuel Cell)	0.154	0.0090	751.6	-0.63
7LVC93	IR	0.158	0.0050	908 mb	-0.34
8PB4ZV	Infrared	0.162	0.0060	1022 hPa	0.30
8Q6RHQ	Thermo electrically cooled lead selenide infrared	0.161		1010 mbar	
8VCFVT	IR	0.156		976	
98N8W8	IR	0.158	0.0090	Start = 984.8, Finish = 985.6	-0.21
9KBFWT	Infrared	0.160			
AH2P66	Fuel Cell	0.161	0.0030	748.1 mmHg	0.24
AL2ZZ6	Fuel Cell	0.159	0.0060	757	-0.15

TABLE 1 - Item 1

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 1 Manufacturer's Concentration: 0.160 g/210L

Item 1 Manufacturer's Uncertainty: 0.0030 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in E _n)	Performance Statistic (E _n)
AZ66P6	IR	0.157	0.0090	998.4 mBar	-0.32
CDGJKZ	IR	0.155		1020 hPas	
CZV4GZ	Fuel Cell	0.160	0.0030	745	0.00
DLRZUK	Thermo Electrically Cooled Lead Selenide Infrared	0.159		1016 mbar	
E227HP	Fuel Cell	0.162	0.0050	N/A - on board barometer	0.34
EJGH9U	IR	0.157	0.0040	977	-0.60
FMQVXE	EC	0.161	0.0040	939 Mbar	0.20
	IR	0.164	0.0040	939 Mbar	0.80
GDKRGF	Thermo electrically cooled lead selenide infrared.	0.160		1022 mbar	
GZH2XW	IR	0.162	0.0080	954	0.23
HXNZ7Y	Infrared	0.159	0.0070	843.7 hPa	-0.13
J9NKDX	EC	0.149	0.0090	999	-1.16 X
	IR	0.157	0.0090	999	-0.32
JQ4YQL	Fuel Cell	0.158	0.0070	750 mmHg	-0.26
JRFT7L	electrochemical (EC) fuel cell	0.158	0.0070	739 mm Hg	-0.26
K22C4R	3.4 and 9.4 um dual-wavelength detectors	0.156	3.6000	842 Mb/hpa	0.00
K89LRM	IR, Pyro-electric Detector	0.157		Instrument: 970.1 hPa, Druck Pressure Monitor: 968.9 hPa	
KFZ2GR	Fuel Cell	0.162	0.0040	923 mBar	0.40

TABLE 1 - Item 1

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 1 Manufacturer's Concentration: 0.160 g/210L

Item 1 Manufacturer's Uncertainty: 0.0030 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in E _n)	Performance Statistic (E _n)
KVTQFU	EC	0.155	0.0090	978	-0.53
	IR	0.158	0.0090	978	-0.21
M2VL9T	EC	0.159		1017 mbar	
	IR	0.160		1017 mbar	
MK2YB8	EC	0.157	0.0040	857	-0.60
	IR	0.160	0.0040	857	0.00
NEDTKK	IR	0.162		937 CF: 1.08	
NWT6BP	Fuel Cell	0.159	0.0080	751	-0.12
P2KWWR	IR	0.161		934.4	
PEV3AE	Fuel Cell	0.162	0.0050	N/A - measured by on board barometer	0.34
PGYXWN	Electrochemical fuel cell	0.157	0.0080	767 mmHg	-0.35
PHV9TQ	Infrared (IR)	0.164	0.0120	756 mm Hg	0.32
Q7U8Q7	Thermo electrically cooled lead selenide infrared	0.163		1021 mbar	
QKEPGP	IR	0.157	0.0070	858	-0.39
QRF46C	Electrochemical Fuel Cell	0.161	0.0100	994.7	0.10
QUH2DJ	IR	0.162		1021 hPas	
TLHG4M	Infrared	0.1614	0.0041	992.2	0.28
VY3JYK	EC	0.156	0.0090	967	-0.42
	IR	0.153	0.0080	967	-0.82
WT4NC3	Infrared	0.160	0.0080	30.00 inHg	0.00

TABLE 1 - Item 1

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 1 Manufacturer's Concentration: 0.160 g/210L

Item 1 Manufacturer's Uncertainty: 0.0030 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in En)	Performance Statistic (En)
YRJLHY	Thermo electrically cooled lead selenide infrared	0.161		1010 mbar	
ZNG3XC	EC	0.152	0.0090	997	-0.84
	IR	0.157	0.0090	997	-0.32

TABLE 1 - Item 2

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

Xlab: Participant's concentration
 Xref: Manufacturer's concentration
 Ulab: Participant's uncertainty
 Uref: Manufacturer's uncertainty

Item 2 Manufacturer's Concentration: 0.310 g/210L

Item 2 Manufacturer's Uncertainty: 0.0060 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in En)	Performance Statistic (En)
2LCWVC	EC	0.289	0.0140	1001	-1.38 X
	IR	0.310	0.0150	1001	0.00
2UMYGC	EC	0.301	0.0150	1023	-0.56
	IR	0.313	0.0150	1023	0.19
323YAU	Thermo electrically cooled lead selenide infrared	0.311		1018 mbar	
3EMJR3	Electrochemical Fuel Cell	0.303	0.0140	746 mm Hg	-0.46
3QGXQE	IR	0.307	0.0110	857 hPa	-0.24
6ZH6K6	IR	0.306	0.0080	962.425	-0.40
77FBEX	EC (Fuel Cell)	0.300	0.0160	751.6	-0.59
7LVC93	IR	0.307	0.0070	908 mb	-0.33
8PB4ZV	Infrared	0.315	0.0130	1022 hPa	0.35
8Q6RHQ	Thermo electrically cooled lead selenide infrared	0.309		1010 mbar	
8VCFVT	IR	0.301		976	
98N8W8	IR	0.304	0.0090	Start = 984.8, Finish = 985.6	-0.55
9KBFWT	Infrared	0.307			
AH2P66	Fuel Cell	0.310	0.0030	748.1 mmHg	0.00
AL2ZZ6	Fuel Cell	0.307	0.0060	757	-0.35
AZ66P6	IR	0.304	0.0090	998.4 mBar	-0.55
CDGJKZ	IR	0.301		1020 hPas	
CZV4GZ	Fuel Cell	0.309	0.0030	745	-0.15
DLRZUK	Thermo Electrically Cooled Lead Selenide Infrared	0.305		1016 mbar	
E227HP	Fuel Cell	0.317	0.0050	N/A - on board barometer	0.90

TABLE 1 - Item 2

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 2 Manufacturer's Concentration: 0.310 g/210L

Item 2 Manufacturer's Uncertainty: 0.0060 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in En)	Performance Statistic (En)
EJGH9U	IR	0.304	0.0080	977	-0.60
FMQVXE	EC	0.316	0.0040	939 Mbar	0.83
	IR	0.320	0.0040	939 Mbar	1.39 X
GDKRGF	Thermo electrically cooled lead selenide infrared.	0.309		1022 mbar	
GZH2XW	IR	0.309	0.0150	954	-0.06
HXNZ7Y	Infrared	0.304	0.0110	843.7 hPa	-0.48
J9NKDX	EC	0.283	0.0140	999	-1.77 X
	IR	0.302	0.0150	999	-0.50
JQ4YQL	Fuel Cell	0.304	0.0140	750 mmHg	-0.39
JRFT7L	electrochemical (EC) fuel cell	0.306	0.0140	739 mm Hg	-0.26
K22C4R	3.4 and 9.4 um dual-wavelength detectors	0.301	3.6000	842 Mb/hpa	0.00
K89LRM	IR, Pyro-electric Detector	0.302		Instrument: 970.1 hPa, Druck Pressure Monitor: 968.9 hPa	
KFZ2GR	Fuel Cell	0.305	0.0040	923 mBar	-0.69
KVTQFU	EC	0.298	0.0150	978	-0.74
	IR	0.308	0.0150	978	-0.12
M2VL9T	EC	0.306		1017 mbar	
	IR	0.303		1017 mbar	
MK2YB8	EC	0.304	0.0040	857	-0.83
	IR	0.310	0.0040	857	0.00
NEDTKK	IR	0.308		937 CF: 1.08	
NWT6BP	Fuel Cell	0.304	0.0140	751	-0.39
P2KWWR	IR	0.306		934.4	
PEV3AE	Fuel Cell	0.294	0.0050	N/A - measured by on board barometer	-2.05 X

TABLE 1 - Item 2

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 2 Manufacturer's Concentration: 0.310 g/210L

Item 2 Manufacturer's Uncertainty: 0.0060 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in En)	Performance Statistic (En)
PGYXWN	Electrochemical fuel cell	0.302	0.0130	767 mmHg	-0.56
PHV9TQ	Infrared (IR)	0.318	0.0120	756 mm Hg	0.60
Q7U8Q7	Thermo electrically cooled lead selenide infrared	0.312		1021 mbar	
QKEPGP	IR	0.304	0.0110	858	-0.48
QRF46C	Electrochemical Fuel Cell	0.303	0.0290	994.7	-0.24
QUH2DJ	IR	0.314		1021 hPas	
TLHG4M	Infrared	0.3061	0.0041	992.2	-0.54
VY3JYK	EC	0.295	0.0140	967	-0.98
	IR	0.294	0.0140	967	-1.05 X
WT4NC3	Infrared	0.307	0.0080	30.00 inHg	-0.30
YRJLHY	Thermo electrically cooled lead selenide infrared	0.309		1010 mbar	
ZNG3XC	EC	0.286	0.0140	997	-1.58 X
	IR	0.303	0.0150	997	-0.43

TABLE 1 - Item 3

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 3 Manufacturer's Concentration: 0.090 g/210L

Item 3 Manufacturer's Uncertainty: 0.0020 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in E _n)	Performance Statistic (E _n)
2LCWVC	EC	0.086	0.0060	1001	-0.63
	IR	0.091	0.0060	1001	0.16
2UMYGC	EC	0.090	0.0060	1023	0.00
	IR	0.092	0.0060	1023	0.32
323YAU	Thermo electrically cooled lead selenide infrared	0.093		1018 mbar	
3EMJR3	Electrochemical Fuel Cell	0.090	0.0050	746 mm Hg	0.00
3QGXQE	IR	0.090	0.0040	857 hPa	0.00
6ZH6K6	IR	0.091	0.0030	962.425	0.28
77FBEX	EC (Fuel Cell)	0.087	0.0050	751.6	-0.56
7LVC93	IR	0.090	0.0050	908 mb	0.00
8PB4ZV	Infrared	0.091	0.0040	1022 hPa	0.22
8Q6RHQ	Thermo electrically cooled lead selenide infrared	0.092		1010 mbar	
8VCFVT	IR	0.088		976	
98N8W8	IR	0.091	0.0030	Start = 984.8, Finish = 985.6	0.28
9KBFWT	Infrared	0.091			
AH2P66	Fuel Cell	0.090	0.0030	748.1 mmHg	0.00
AL2ZZ6	Fuel Cell	0.090	0.0030	757	0.00
AZ66P6	IR	0.089	0.0040	998.4 mBar	-0.22
CDGJKZ	IR	0.088		1020 hPas	

TABLE 1 - Item 3

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 3 Manufacturer's Concentration: 0.090 g/210L

Item 3 Manufacturer's Uncertainty: 0.0020 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in En)	Performance Statistic (En)
CZV4GZ	Fuel Cell	0.089	0.0030	745	-0.28
DLRZUK	Thermo Electrically Cooled Lead Selenide Infrared	0.091		1016 mbar	
E227HP	Fuel Cell	0.089	0.0050	N/A - on board barometer	-0.19
EJGH9U	IR	0.090	0.0030	977	0.00
FMQVXE	EC	0.093	0.0020	939 Mbar	1.06 X
	IR	0.093	0.0020	939 Mbar	1.06 X
GDKRGF	Thermo electrically cooled lead selenide infrared.	0.092		1022 mbar	
GZH2XW	IR	0.093	0.0050	954	0.56
HXNZ7Y	Infrared	0.090	0.0040	843.7 hPa	0.00
J9NKDX	EC	0.084	0.0060	999	-0.95
	IR	0.089	0.0060	999	-0.16
JQ4YQL	Fuel Cell	0.089	0.0050	750 mmHg	-0.19
JRFT7L	electrochemical (EC) fuel cell	0.089	0.0050	739 mm Hg	-0.19
K22C4R	3.4 and 9.4 um dual-wavelength detectors	0.088	0.0036	842 Mb/hpa	-0.49
K89LRM	IR, Pyro-electric Detector	0.090		Instrument: 970.1 hPa, Druck Pressure Monitor: 968.9 hPa	
KFZ2GR	Fuel Cell	0.093	0.0020	923 mBar	1.06 X
KVTQFU	EC	0.090	0.0060	978	0.00
	IR	0.092	0.0060	978	0.32

TABLE 1 - Item 3

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 3 Manufacturer's Concentration: 0.090 g/210L

Item 3 Manufacturer's Uncertainty: 0.0020 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in En)	Performance Statistic (En)
M2VL9T	EC	0.091		1017 mbar	
	IR	0.091		1017 mbar	
MK2YB8	EC	0.090	0.0020	857	0.00
	IR	0.091	0.0020	857	0.35
NEDTKK	IR	0.094		937 CF: 1.08	
NWT6BP	Fuel Cell	0.088	0.0080	751	-0.24
P2KWWR	IR	0.094		934.4	
PEV3AE	Fuel Cell	0.090	0.0050	N/A - measured by on board barometer	0.00
PGYXWN	Electrochemical fuel cell	0.088	0.0080	767 mmHg	-0.24
PHV9TQ	Infrared (IR)	0.094	0.0090	756 mm Hg	0.43
Q7U8Q7	Thermo electrically cooled lead selenide infrared	0.093		1021 mbar	
QKEPGP	IR	0.089	0.0040	858	-0.22
QRF46C	Electrochemical Fuel Cell	0.090	0.0050	994.7	0.00
QUH2DJ	IR	0.093		1021 hPas	
TLHG4M	Infrared	0.093	0.0041	992.2	0.66
VY3JYK	EC	0.091	0.0060	967	0.16
	IR	0.089	0.0060	967	-0.16
WT4NC3	Infrared	0.092	0.0030	30.00 inHg	0.55
YRJLHY	Thermo electrically cooled lead selenide infrared	0.092		1010 mbar	

TABLE 1 - Item 3

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 3 Manufacturer's Concentration: 0.090 g/210L

Item 3 Manufacturer's Uncertainty: 0.0020 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in En)	Performance Statistic (En)
ZNG3XC	EC	0.086	0.0060	997	-0.63
	IR	0.090	0.0060	997	0.00

TABLE 1 - Item 4

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 4 Manufacturer's Concentration: 0.040 g/210L

Item 4 Manufacturer's Uncertainty: 0.0020 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in E _n)	Performance Statistic (E _n)
2LCWVC	EC	0.038	0.0040	1001	-0.45
	IR	0.040	0.0040	1001	0.00
2UMYGC	EC	0.040	0.0040	1023	0.00
	IR	0.040	0.0040	1023	0.00
323YAU	Thermo electrically cooled lead selenide infrared	0.041		1018 mbar	
3EMJR3	Electrochemical Fuel Cell	0.038	0.0050	746 mm Hg	-0.37
3QGXE	IR	0.038	0.0050	857 hPa	-0.37
6ZH6K6	IR	0.040	0.0020	962.425	0.00
77FBEX	EC (Fuel Cell)	0.037	0.0050	751.6	-0.56
7LVC93	IR	0.040	0.0040	908 mb	0.00
8PB4ZV	Infrared	0.040	0.0020	1022 hPa	0.00
8Q6RHQ	Thermo electrically cooled lead selenide infrared	0.041		1010 mbar	
8VCFVT	IR	0.039		976	
98N8W8	IR	0.042	0.0030	Start = 984.8, Finish = 985.6	0.55
9KBFWT	Infrared	0.040			
AH2P66	Fuel Cell	0.039	0.0030	748.1 mmHg	-0.28
AL2ZZ6	Fuel Cell	0.039	0.0030	757	-0.28
AZ66P6	IR	0.039	0.0040	998.4 mBar	-0.22
CDGJKZ	IR	0.039		1020 hPas	

TABLE 1 - Item 4

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 4 Manufacturer's Concentration: 0.040 g/210L

Item 4 Manufacturer's Uncertainty: 0.0020 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in E _n)	Performance Statistic (E _n)
CZV4GZ	Fuel Cell	0.038	0.0030	745	-0.55
DLRZUK	Thermo Electrically Cooled Lead Selenide Infrared	0.041		1016 mbar	
E227HP	Fuel Cell	0.040	0.0030	N/A - on board barometer	0.00
EJGH9U	IR	0.040	0.0020	977	0.00
FMQVXE	EC	0.040	0.0020	939 Mbar	0.00
	IR	0.041	0.0020	939 Mbar	0.35
GDKRGF	Thermo electrically cooled lead selenide infrared.	0.040		1022 mbar	
GZH2XW	IR	0.043	0.0050	954	0.56
HXNZ7Y	Infrared	0.041	0.0050	843.7 hPa	0.19
J9NKDX	EC	0.036	0.0040	999	-0.89
	IR	0.039	0.0040	999	-0.22
JQ4YQL	Fuel Cell	0.039	0.0050	750 mmHg	-0.19
JRFT7L	electrochemical (EC) fuel cell	0.039	0.0050	739 mm Hg	-0.19
K22C4R	3.4 and 9.4 um dual-wavelength detectors	0.040	0.0036	842 Mb/hpa	0.00
K89LRM	IR, Pyro-electric Detector	0.041		Instrument: 970.1 hPa, Druck Pressure Monitor: 968.9 hPa	
KFZ2GR	Fuel Cell	0.042	0.0020	923 mBar	0.71
KVTQFU	EC	0.040	0.0040	978	0.00
	IR	0.041	0.0040	978	0.22

TABLE 1 - Item 4

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 4 Manufacturer's Concentration: 0.040 g/210L

Item 4 Manufacturer's Uncertainty: 0.0020 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in E _n)	Performance Statistic (E _n)
M2VL9T	EC	0.039		1017 mbar	
	IR	0.040		1017 mbar	
MK2YB8	EC	0.040	0.0020	857	0.00
	IR	0.040	0.0020	857	0.00
NEDTKK	IR	0.043		937 CF: 1.08	
NWT6BP	Fuel Cell	0.039	0.0040	751	-0.22
P2KWWR	IR	0.043		934.4	
PEV3AE	Fuel Cell	0.039	0.0030	N/A - measured by on board barometer	-0.28
PGYXWN	Electrochemical fuel cell	0.038	0.0020	767 mmHg	-0.71
PHV9TQ	Infrared (IR)	0.041	0.0030	756 mm Hg	0.28
Q7U8Q7	Thermo electrically cooled lead selenide infrared	0.041		1021 mbar	
QKEPGP	IR	0.040	0.0050	858	0.00
QRF46C	Electrochemical Fuel Cell	0.040	0.0050	994.7	0.00
QUH2DJ	IR	0.041		1021 hPas	
TLHG4M	Infrared	0.0419	0.0041	992.2	0.42
VY3JYK	EC	0.041	0.0040	967	0.22
	IR	0.040	0.0040	967	0.00
WT4NC3	Infrared	0.041	0.0030	30.00 inHg	0.28
YRJLHY	Thermo electrically cooled lead selenide infrared	0.041		1010 mbar	

TABLE 1 - Item 4

$$E_n = \frac{(X_{lab} - X_{ref})}{\sqrt{U_{lab}^2 + U_{ref}^2}}$$

X_{lab}: Participant's concentration
 X_{ref}: Manufacturer's concentration
 U_{lab}: Participant's uncertainty
 U_{ref}: Manufacturer's uncertainty

Item 4 Manufacturer's Concentration: 0.040 g/210L

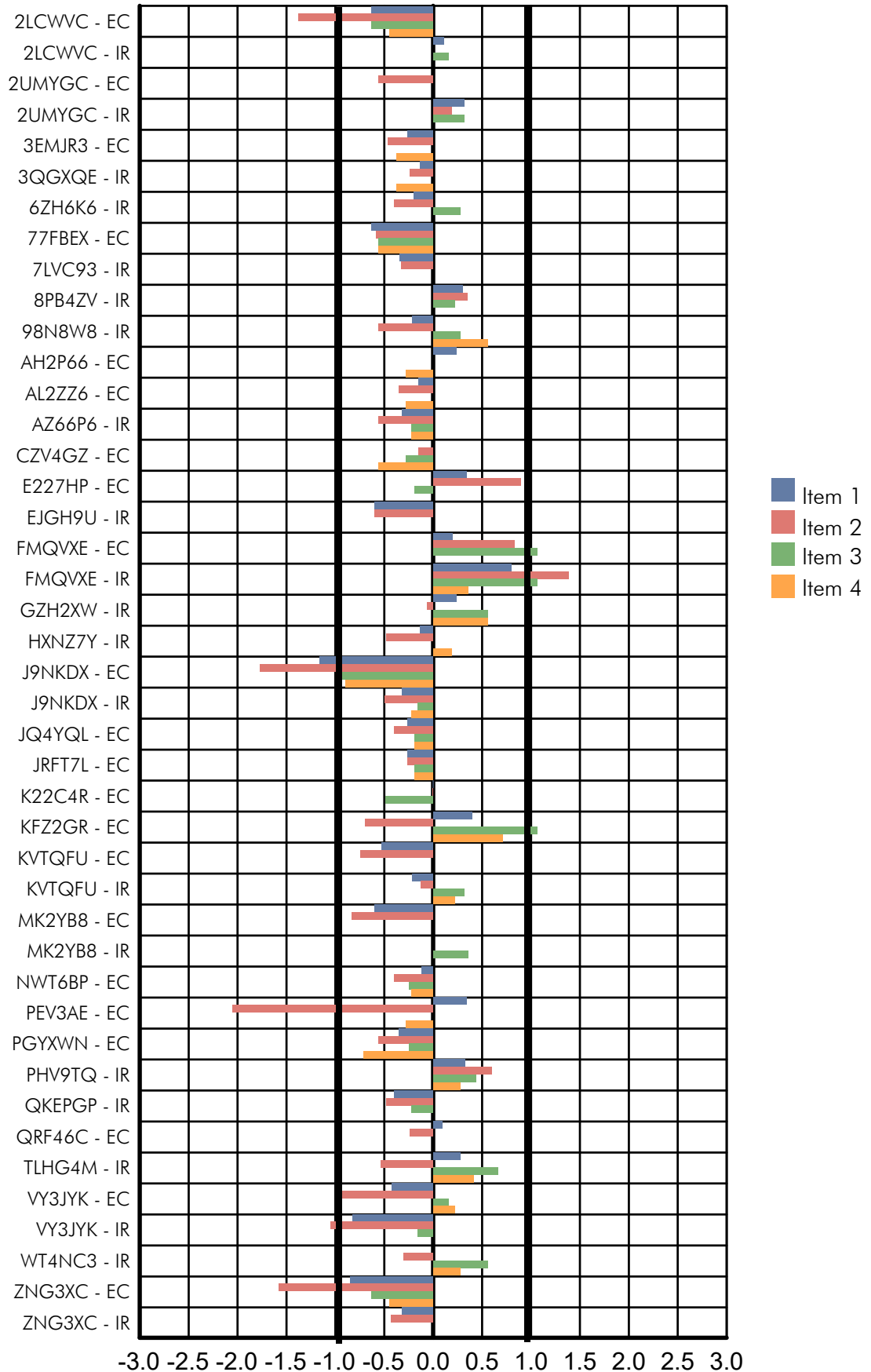
Item 4 Manufacturer's Uncertainty: 0.0020 g/210L

WebCode	Detector Type	Concentration (g/210L)	Uncertainty k=2 (g/210L)	Barometric Pressure (not used in E _n)	Performance Statistic (E _n)
ZNG3XC	EC	0.038	0.0040	997	-0.45
	IR	0.040	0.0040	997	0.00

En Results

WebCode - Detector

Graph 1



Raw Data Adjustments

TABLE 2

List the type and amount of any adjustments made on the raw data to produce the reported concentration, such as for barometric pressure, the wet/dry offset, etc.

WebCode	Raw Data Adjustments
323YAU	Barometric pressure. The DataMaster DMT is equipped with a barometric sensor. The target value is adjusted based on the site specific reading of barometric pressure.
3EMJR3	The mean of two raw data measurements is calculated. From this, the adjusted result is normalized for pressure and wet/dry offset. The following equation is used for this conversion: Adjusted result = mean result X (760/pressure reading) X 1.045
6ZH6K6	IR average as measured was adjusted to sea level equivalent
77FBEX	All adjustments were calculated by the internal instrument software. Multipoint protocol has a 4.5% wet/dry offset and barometric pressure adjustment.
7LVC93	C.F. = 1.11
8PB4ZV	Instrument Annual Compliance Testing performed prior to testing
8Q6RHQ	Barometric pressure. The dataMaster DMT is equipped with a barometric sensor. The target value is adjusted based on the site-specific reading of barometric pressure.
98N8W8	No adjustments were made
9KBFWT	N/A
AH2P66	4.5% was added to the result to adjust for wet/dry offset
AL2ZZ6	Raw data adjusted for wet/dry offset (+4.5%) and normalized to sea level (760/xxx x 760 mmHG)
AZ66P6	No adjustments (Intox 8000 has automatic compensation)
CDGJKZ	N/A
CZV4GZ	4.5% was added to the result to adjust for wet/dry offset
DLRZUK	Barometric pressure. The DataMaster DMT is equipped with a barometric sensor. The target value is adjusted based on the site specific reading of barometric pressure.
E227HP	4.5% off set for dry gas tanks. On board barometer and thermometer adjusts target of accuracy/calibration checks.
EJGH9U	Measurements were normalized to standard barometric pressure
FMQVXE	EC Cal Factor- 1155 CalGas, Inlet Drygas %- 1%, EC Drygas Offset- 10%, Adsorption- 3%, IR Cal Factor- 928, IR Slope Multiplier- 12373, EC Quadratic Correction- 18
GDKRGF	Barometric pressure. The DataMaster DMT is equipped with a barometric sensor. The target value is adjusted based on the site specific reading of barometric pressure.
HXNZ7Y	Submitted as reported by the instrument (truncated average of nine replicates).
JQ4YQL	The following calculation was used to normalize for barometric pressure and the wet/dry offset: (mean instrument value in g/210L) x (760/ barometric pressure reading) x 1.045= value normalized.

TABLE 2

WebCode	Raw Data Adjustments
JRFT7L	The mean value of 2 raw readings was adjusted for barometric pressure and the wet/dry offset as follows: (mean value) x (760/barometer reading) x 1.045 = reported concentration in g/210L
K22C4R	N/A
K89LRM	N/A
KFZ2GR	NIST certified barometer was used to verify EasyCal internal barometer settings before sample gas delivery. FC20BT dry gas correction factor was set at 1.050.
M2VL9T	NA
MK2YB8	None.
NEDTKK	N/A
NWT6BP	+4% dry gas correction, barometric pressure correction (760 mmHg/Lab Pressure mmHg)
P2KWWR	N/A
PEV3AE	+4.5% offset for dry gas. Instrument adjusts target value based on barometric pressure and temperature using built-in barometer and thermometer.
PGYXWN	The raw data is normalized to 760 mmHg and corrected with a factor of 4.5% to account for the wet/dry offset.
PHV9TQ	None
Q7U8Q7	Barometric pressure. The Datamaster DMT is equipped with a barometric sensor. The target value is adjusted based on the site specific reading of barometric pressure.
QKEPGP	None
QRF46C	An adjustment was not performed because the instrument has a built-in pressure transducer. The pressure transducer automatically corrects for the altitude and applies the dry/wet offset for the selected dry gas standard.
QUH2DJ	N/A
TLHG4M	No adjustments were made on the raw data to produce a reported concentration.
WT4NC3	Each measured average (of 5 replicates) was converted to standard pressure (average/(current pressure/standard pressure)) and rounded to 3 decimal places.
YRJLHY	Barometric pressure. The DataMaster DMT is equipped with a barometric sensor. The target value is adjusted based on the site specific reading of barometric pressure.

Instrument Information

TABLE 3

WebCode	Instrument used	Detector type
2LCWVC	ARKA-0041	EC
	ARKA-0041	IR
2UMYGC	ARLA-0024	EC
	ARLA-0024	IR
323YAU	DataMaster DMT [Serial Number]	Thermo electrically cooled lead selenide infrared
3EMJR3	Intoximeters, Inc Intox EC/IR II	Electrochemical Fuel Cell
3QGXE	Intoxilyzer 8000	IR
6ZH6K6	DMT [Serial Number]	IR
77FBEX	AlcoSensor V-XL	EC (Fuel Cell)
7LVC93	Intoxilyzer 9000	IR
8PB4ZV	Drager Alcotest 9510 [Serial Number]	Infrared
8Q6RHQ	DataMaster DMT [Serial Number]	Thermo electrically cooled lead selenide infrared
8VCFVT	Intoxilyzer 8000	IR
98N8W8	Intoxilyzer 8000	IR
9KBFWT	ARXC-0014 Draeger Alcotest 7110 MKIII-C	Infrared
AH2P66	Intox EC/IR II	Fuel Cell
AL2ZZ6	Intox EC/IR II	Fuel Cell
AZ66P6	Intoxilyzer 8000	IR
CDGJKZ	Draeger Alcotest 9510 [Serial Number]	IR
CZV4GZ	Intox EC/IR II	Fuel Cell
DLRZUK	DataMaster DMT [Serial Number]	Thermo Electrically Cooled Lead Selenide Infrared
E227HP	Alcosensor V XL	Fuel Cell
EJGH9U	DMT	IR
FMQVXE	Draeger Alcotest 9510	EC
	Draeger Alcotest 9510	IR
GDKRGF	DataMaster DMT [Serial Number]	Thermo electrically cooled lead selenide infrared.
GZH2XW	Intoxilyzer 8000	IR
HXNZ7Y	Intoxilyzer 8000	Infrared
J9NKDX	ARKA-0026	EC
	ARKA-0026	IR
JQ4YQL	Intoximeter Intox EC/IR II	Fuel Cell
JRFT7L	Intox EC/IR II	electrochemical (EC) fuel cell
K22C4R	[Serial Number]	3.4 and 9.4 um dual-wavelength detectors

TABLE 3

WebCode	Instrument used	Detector type
K89LRM	Intoxilyzer 9000	IR, Pyro-electric Detector
KFZ2GR	Lifeloc FC20BT	Fuel Cell
KVTQFU	ARKC-0037	EC
	ARKC-0037	IR
M2VL9T	Draeger Alcotest 9510	EC
	Draeger Alcotest 9510	IR
MK2YB8	Draeger 9510	EC
	Draeger 9510	IR
NEDTKK	[Serial Number]	IR
NWT6BP	ECIR II (Intoximeters, Inc.) [Serial Number]	Fuel Cell
P2KWWR	Intoxilyzer 8000	IR
PEV3AE	AlcoSensor VXL	Fuel Cell
PGYXWN	Intoximeter EC/IR II	Electrochemical fuel cell
PHV9TQ	ARNK-0085 Draeger Alcotest 7110 Mark III C	Infrared (IR)
Q7U8Q7	Datamaster DMT [Serial Number]	Thermo electrically cooled lead selenide infrared
QKEPGP	Intoxilyzer 8000	IR
QRF46C	Drager Alcotest 7510 [Serial Number]	Electrochemical Fuel Cell
QUH2DJ	[Serial Number], Draeger Alcotest 9510	IR
TLHG4M	Intoxilyzer 9000	Infrared
VY3JYK	ARAF-0029	EC
	ARAF-0029	IR
WT4NC3	DataMaster DMT [Serial Number]	Infrared
YRJLHY	DataMaster DMT [Serial Number]	Thermo electrically cooled lead selenide infrared
ZNG3XC	ARKA-0026	EC
	ARKA-0026	IR

Additional Comments

TABLE 4

WebCode	Additional Comments
323YAU	Each item was analyzed three times. The average value of the three analyses for each item was reported to three decimal places (reported concentration). The laboratory only calculates expanded uncertainty for the calibration of the instrument, applying it to calibration measurements during the certification process. Uncertainty is not calculated for the verification of calibration, and hence not reported for the items.
3EMJR3	The estimated uncertainty of measurement at $k=2$ coverage is 4.6% or 0.005, whichever is greater.
8Q6RHQ	Each item was analyzed three times. The average value of the three analyses for each item was reported to three decimal places (reported concentration). The laboratory only calculates expanded uncertainty for the calibration of the instrument, applying it to calibration measurements during the certification process. Uncertainty is not calculated for the verification of calibration, and hence not reported for the item.
DLRZUK	Each item was analyzed three times. The average value of the three analyses for each item was reported to three decimal places (reported concentration). The laboratory only calculates expanded uncertainty for the calibration of the instrument, applying it to calibration measurements during the certification process. Uncertainty is not calculated for the verification of calibration, and hence not reported for the items.
FMQVXE	[Laboratory] reports results to a $K=3$ on its certificates. The samples were analyzed in triplicate with the results being reported from the average of the three replicate results.
GDKRGF	Each item was analyzed three times. The average value of the three analyses for each item was reported to three decimal places (reported concentration). The laboratory only calculates expanded uncertainty for the calibration of the instrument, applying it to calibration measurements during the certification process. Uncertainty is not calculated for the verification of calibration, and hence not reported for the items.
JQ4YQL	The uncertainty of measurement used is 4.6% or 0.005, whichever is greater, with a coverage factor of $k=2$; corresponding to a ~95% level of confidence.
JRFT7L	The Uncertainty of Measurement is 4.6% or 0.005 g/210L, whichever is greater, at $k=2$ (~95% confidence level).
K89LRM	Our uncertainty is built on historical data from the calibrations of all the instruments in service. We do not figure the uncertainty on the individual samples but on each of the 4 different reference materials used during calibrations: 0.050 +/-0.004 g/210L, 0.100 +/-0.004 g/210L, 0.200 +/-0.005 g/210L, 0.300 +/-0.010 g/210L. With that said, I cannot assign an uncertainty to the reported concentrations.
KFZ2GR	[Laboratory] reported uncertainty of measurement is based on expanded uncertainty with ~95% confidence interval ($k=3$)
M2VL9T	This laboratory has not determined uncertainty of measurement for breath calibration.
MK2YB8	[Laboratory] reports the uncertainty of measurement to ~95% confidence at a $k=3$.
NEDTKK	MU is only reported on calibrators; it is not reported on unknown concentrations.
P2KWWR	Measurement uncertainty is only reported on calibrators; it is not reported on unknown concentrations.

TABLE 4

WebCode	Additional Comments
PGYXWN	A laboratory certificate of instrument accuracy is issued with an expanded uncertainty using a coverage factor of $K=3$. The uncertainty of measurement is calculated for the certification process. Four concentrations of dry gas standards are used to certify the instrument's accuracy, and the measurement uncertainty is calculated for these concentrations. The uncertainty provided with reported concentration was determined using a coverage factor of $K=2$.
PHV9TQ	All the reported expanded measurements of uncertainty reflect a coverage factor of $k=4.09$, and 99.73% coverage of confidence, assuming a normal distribution.
Q7U8Q7	Each item was analyzed three times. The average value of the three analyses for each item was reported to three decimal places (reported concentration). The laboratory only calculates expanded uncertainty for the calibration of the instrument, applying it to calibration measurement during the certification process. Uncertainty is not calculated for the verification of calibration, and hence not reported for the items.
WT4NC3	Barometric pressure was measured before starting analysis on each of the 4 provided tanks.
YRJLHY	Each item was analyzed three times. The average value of the three analyses for each item was reported to three decimal places (reported concentration). The laboratory only calculates expanded uncertainty for the calibration of the instrument, applying it to calibration measurements during the certification process. Uncertainty is not calculated for the verification of calibration, and hence not reported for the items.

-End of Report-
(Appendix may follow)

Test No. 22-5691: Breath Alcohol Calibration Verification

DATA MUST BE SUBMITTED BY **Jan. 9, 2023, 11:59 p.m.** TO BE INCLUDED IN THE REPORT

Participant Code: U1234H

WebCode: 2F77PY

The Accreditation Release section can be accessed by using the "Continue to Final Submission" button above. This information can be entered at any time prior to submitting to CTS.

Items Submitted (Sample Pack BRC):

Items 1-4: 34L NIST traceable reference material dry gas cylinders

Item 1: Lot # 27622004A4; Exp. Date: November 5, 2024

Item 2: Lot # 27622002A2; Exp. Date: November 5, 2024

Item 3: Lot # 27622003A3; Exp. Date: November 5, 2024

Item 4: Lot # 27622001A1; Exp. Date: November 5, 2024

1.) Detector type:

If additional detectors used, click the "Add Detector" link below.

2.) As a verification of calibration, report the ethanol concentration of each cylinder and the expanded uncertainty determined during the last calibration of the instrument. Results should be reported to three decimal places in g/210L and use a coverage factor of 2 for expanded uncertainty.

	Reported Concentration (g/210L)	Uncertainty (k=2)
--	---------------------------------	-------------------

Item 1:	<input type="text"/>	± <input type="text"/>
---------	----------------------	------------------------

Item 2:	<input type="text"/>	± <input type="text"/>
---------	----------------------	------------------------

Item 3:	<input type="text"/>	± <input type="text"/>
---------	----------------------	------------------------

Item 4:	<input type="text"/>	± <input type="text"/>
---------	----------------------	------------------------

Please note that it is the responsibility of the laboratory to normalize for barometric pressure and the wet/dry offset (if applicable).

3.) Instrument used:

4.) Barometric Pressure

5) List the type and amount of any adjustments made on the raw data to produce the reported concentration, such as for barometric pressure, the wet/dry offset etc.

6.) Additional Comments

Please note: Any additional formatting applied in the free form space below will not transfer to the Summary Report and may cause your information to be illegible. This includes additional spacing and returns that present your responses in lists and tabular formats.

RELEASE OF DATA TO ACCREDITATION BODIES

The Accreditation Release is accessed by pressing the "Continue to Final Submission" button online and can be completed at any time prior to submission to CTS.

CTS submits external proficiency test data directly to ASCLD/LAB, ANAB, and/or A2LA. Please select one of the following statements to ensure your data is handled appropriately.

- This participant's data is intended for submission to ASCLD/LAB, ANAB, and/or A2LA. (Accreditation Release section below must be completed.)
- This participant's data is not intended for submission to ASCLD/LAB, ANAB, and/or A2LA.

Have the laboratory's designated individual complete the following steps **only if your laboratory is accredited in this testing/calibration discipline** by one or more of the following Accreditation Bodies.

Step 1: Provide the applicable Accreditation Certificate Number(s) for your laboratory.

ANAB Certificate No.
(Include ASCLD/LAB Certificate here)

A2LA Certificate No.

Step 2: Complete the Laboratory Identifying Information in its entirety.

Authorized Contact Person and Title

Laboratory Name

Location (City/State)



7 Eastgate Dr. • P.O. Box 790 • Jacksonville, IL 62651-0790
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Certificate of Analysis

Certificate ID: 15161
Part #: BAC34L160T
Cylinder Size: 34L
Lot Number: 27622004A4
Expiration: 11/5/2024

0.160 BAC (For the calibration of instruments used to determine breath alcohol concentration)

Contents: 34 Liters @ 500 psig 70°F (21°C)

Component:	Reported Concentration:	Analytical Accuracy (U, k=2):	Analytical Method:
Ethanol	417 ppm	+/- 2% (rel. ppm)	NDIR
Nitrogen	Balance		

*NIST Traceable to:
Certified Reference Material - 418.4 µmol/mol
Ethanol in Nitrogen - Serial No. ND7012 Lot No. 080722E3

Store in dry area, away from sources of heat, ignition and direct sunlight. Do not allow storage area to exceed 52 °C (125 °F).

Specialty Gas Lab Tech

11-01-2022
Issuance Date



The calibration results within this certificate were obtained at the facility listed above using equipment and standards capable of producing analytical results traceable to NIST, and apply only to the items contained on this certificate. ILMO Products Company makes no warranty or representation as to the suitability of the use of any information provided for any particular purpose. The information use is at the sole discretion and risk of the user. Liability shall be limited to established replacement cost of this material or service. This certificate applies only to the items described and shall not be reproduced other than in full, without written approval from the issuing facility.



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Certificate of Analysis

Certificate ID: 15162
Part #: BAC34L310T
Cylinder Size: 34L_310
Lot Number: 27622002A2
Expiration: 11/5/2024

0.310 BAC (For the calibration of instruments used to determine breath alcohol concentration)

Contents: 34 Liters @ 350 psig 70°F (21°C)

Component:	Reported Concentration:	Analytical Accuracy (U, k=2):	Analytical Method:
Ethanol	808 ppm	+/- 2% (rel. ppm)	Gravimetric
Nitrogen	Balance		


*NIST Traceable to:
Gravimetric Balance
Calibration Certificate No. 55752
Calibration Certificate No. 55753

Store in dry area, away from sources of heat, ignition and direct sunlight. Do not allow storage area to exceed 52 °C (125 °F).


Specialty Gas Lab Tech

10-31-2022
Issuance Date





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Certificate of Analysis

Certificate ID: 15160
Part #: BAC34L090T
Cylinder Size: 34L
Lot Number: 27622003A3
Expiration: 11/5/2024

0.090 BAC (For the calibration of instruments used to determine breath alcohol concentration)


Contents: 34 Liters @ 500 psig 70°F (21°C)

Component:	Reported Concentration:	Analytical Accuracy (U, k=2):	Analytical Method:
Ethanol	235 ppm	+/- 0.002 BAC (G/210L) [5.2 ppm]	NDIR
Nitrogen	Balance		


***Traceable to:**

Certified Reference Material - 261.0 µmol/mol
Ethanol in Nitrogen - Serial No. ND7017 Lot No. 080722E2

Store in dry area, away from sources of heat, ignition and direct sunlight. Do not allow storage area to exceed 52 °C (125 °F).


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10-31-2022
Issuance Date





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Certificate of Analysis

Certificate ID: 15159
Part #: BAC34L040T
Cylinder Size: 34L
Lot Number: 27622001A1
Expiration: 11/5/2024

0.040 BAC (For the calibration of instruments used to determine breath alcohol concentration)


Contents: 34 Liters @ 500 psig 70°F (21°C)

Component:	Reported Concentration:	Analytical Accuracy (U, k=2):	Analytical Method:
Nitrogen	Balance		


***Traceable to:**

Certified Reference Material - 105.4 µmol/mol
Ethanol in Nitrogen - Serial No. ND7023 Lot No. 080722E1

Store in dry area, away from sources of heat, ignition and direct sunlight. Do not allow storage area to exceed 52 °C (125 °F).


Specialty Gas Lab Tech

10-31-2022
Issuance Date





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