

Certificate of Analysis

Certified Reference Material- Ethanol Water Solution

This Certified Ethanol Reference Solution is a solution of ethanol (ethyl alcohol – Chemical Abstracts Service [CAS] Registry Number 64-17-5) in water.

Lot Code:	<u>21KP41172</u>	Nominal Value:	<u>121.00</u>	mg/dL
Min. Sample Size:	<u>500mL</u>	Certified Value:	<u>121.50</u>	± <u>1.46</u> mg/dL
Solute:	<u>Ethanol</u>	Certification Date:	<u>11/9/2021</u>	
Diluent	<u>Water</u>	Expiration Date:	<u>11/9/2023</u>	

INTENDED USE:

- For the calibration of instruments used to measure breath alcohol concentration.
- The above nominal value in mg/dL is equivalent to 0.100 BAC with a partition ratio of 2100:1 when solution is used in a breath alcohol simulator operating at 34 ±0.2 °C.
- Bottles are filled to an approximate volume of 500mL. Each bottle is to be used in its entirety.
- The solution should be used immediately after opening the bottle to avoid concentration changes due to evaporation.
- Not suitable for human or animal consumption.

TRACEABILITY

- Solution is gravimetrically prepared using qualified balances calibrated by ISO 17025:2017 accredited calibration laboratories.
- Concentration of this certified reference material has been analytically verified through the use of gas chromatography.
- Measurements are traceable to SI through NIST.

HANDLING and STORAGE

- No special handling is required. Use proper disposal methods.
- Recommended storage temperature: 4-25°C / 39-77°F
- Do not freeze. Do not utilize this certified reference material if it has been frozen or the seal has been compromised.


ANALYTICAL VERIFICATION:

Concentration of the certified value is calculated as the average of multiple analyses carried out utilizing a validated gas chromatography\flame ionization detector method; this method has been demonstrated to adequately detect and quantify concentrations of ethanol in water in the ranges of 5mg/dL to 500mg/dL. Samples are measured gravimetrically through the use of calibrated scales and weights traceable to SI.

Continued:

Uncertainties are reported with a coverage factor $k=2$ with a confidence level of approximately 95%. This certified reference material meets the requirements of ISO 17034:2016. Environmental conditions are controlled to 4-25°C / 39-77°F during manufacturing and testing of this reference material.




Eric Williamson
Laboratory Manager

Lifeloc Technologies certifies that this solution meets the specifications stated in this certificate and warrants this product to meet the stated accuracy through the expiration date when stored unopened as recommended. Warranty does not apply to bottles stored after opening or that have sustained damage or been altered. This certificate may only be reproduced in full.

SUPERVISOR TEST

Alaska Department of Public Safety
 DATAMASTER dmt: 100375

Date: 12/22/2021
 Time: 11:44:23

SUPERVISOR NAME:
 COLLEEN S OBRYANT
 OPERATOR'S #: 6237

EXTERNAL STANDARD INFORMATION
 NOMINAL: 0.100

BLANK TEST	0.000	11:45
INTERNAL STANDARD	VERIFIED	11:45
EXTERNAL STANDARD	0.099	11:45
BLANK TEST	0.000	11:46
EXTERNAL STANDARD	0.099	11:47
BLANK TEST	0.000	11:48
EXTERNAL STANDARD	0.100	11:48
BLANK TEST	0.000	11:49
EXTERNAL STANDARD	0.100	11:49
BLANK TEST	0.000	11:50
EXTERNAL STANDARD	0.100	11:50
BLANK TEST	0.000	11:51

Average = 0.0996
 Std Dev = 0.0005

0.100

Lot: 21KP41172

Exp: 11/9/23

Simulator SN: DR5298

Calibrated 6/16/21

0.0996

0.1004

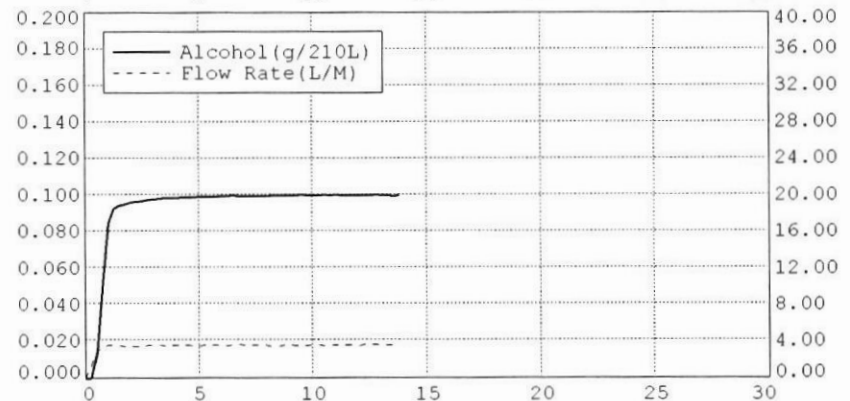
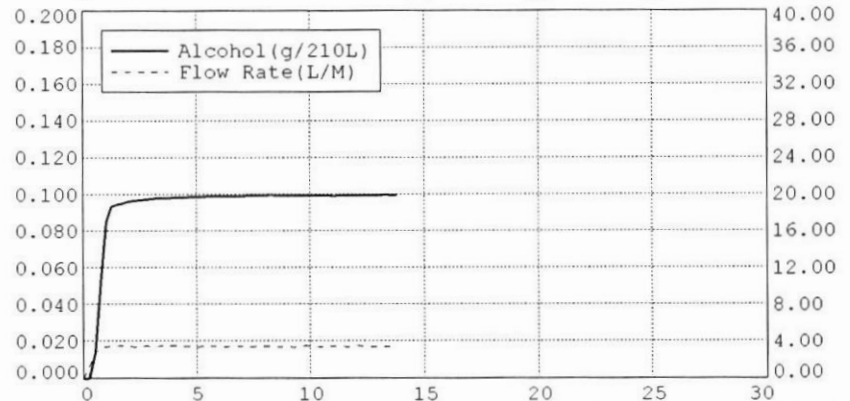
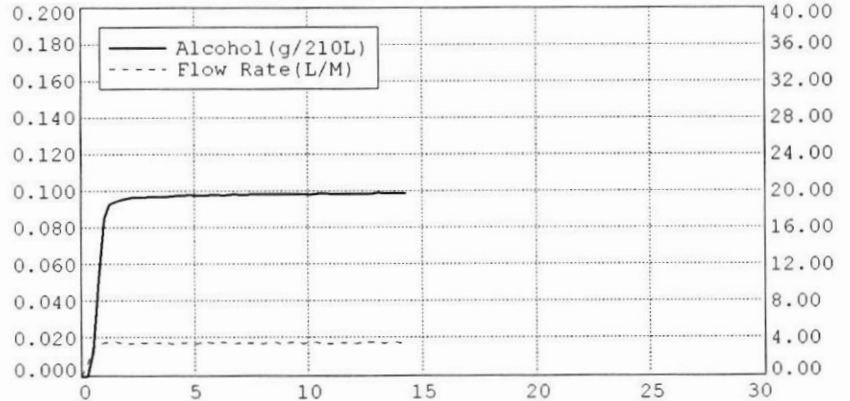
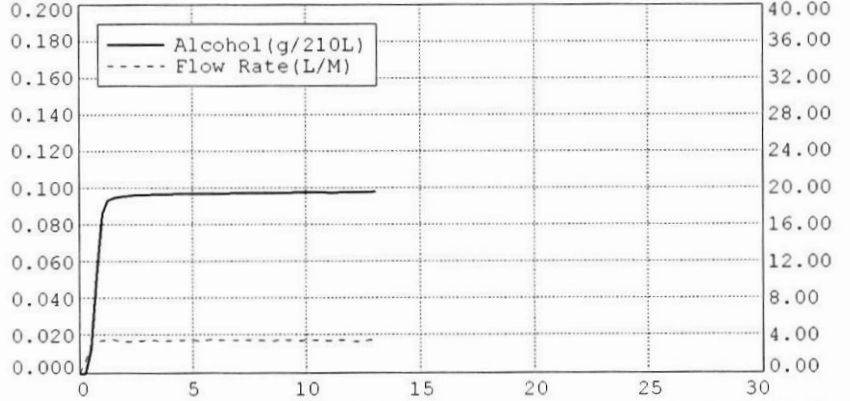
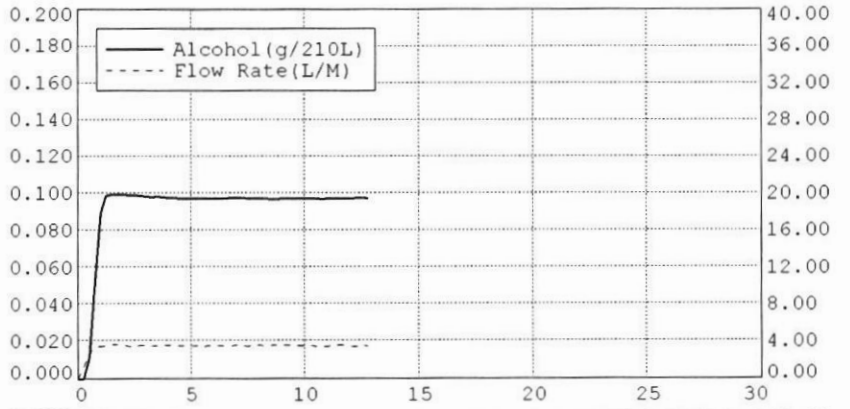
0.1020

Avg
 ✓

0.101

COB

12/22/2021



SUPERVISOR TEST

Alaska Department of Public Safety
 DATAMASTER dmt: 100405

Date: 12/22/2021
 Time: 11:47:10

SUPERVISOR NAME:
 COLLEEN S OBRYANT
 OPERATOR'S #: 6237

EXTERNAL STANDARD INFORMATION
 NOMINAL: 0.100

BLANK TEST	0.000	11:50
INTERNAL STANDARD	VERIFIED	11:50
EXTERNAL STANDARD	0.100	11:50
BLANK TEST	0.000	11:51
EXTERNAL STANDARD	0.100	11:51
BLANK TEST	0.000	11:52
EXTERNAL STANDARD	0.100	11:52
BLANK TEST	0.000	11:53
EXTERNAL STANDARD	0.101	11:54
BLANK TEST	0.000	11:55
EXTERNAL STANDARD	0.101	11:55
BLANK TEST	0.000	11:56

Average = 0.1004
 Std Dev = 0.0005

0.100

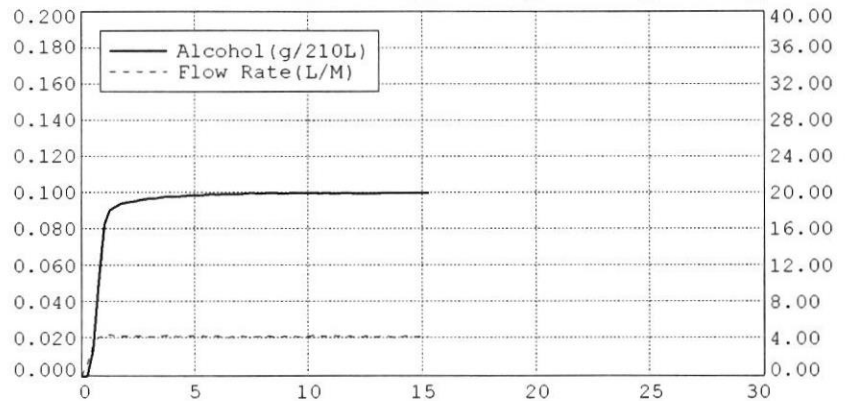
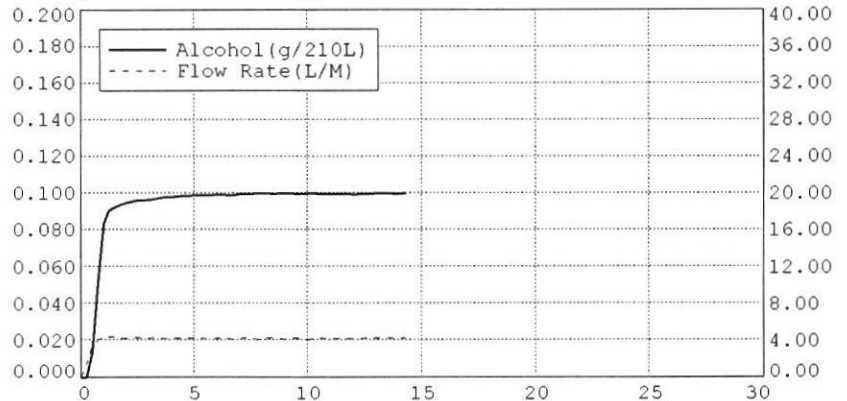
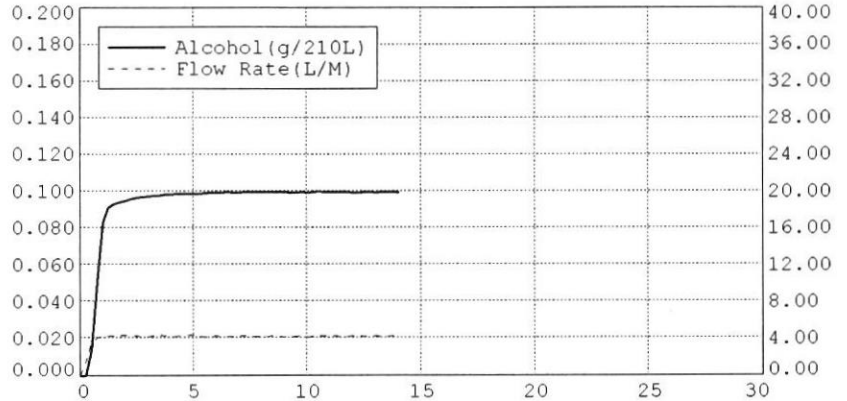
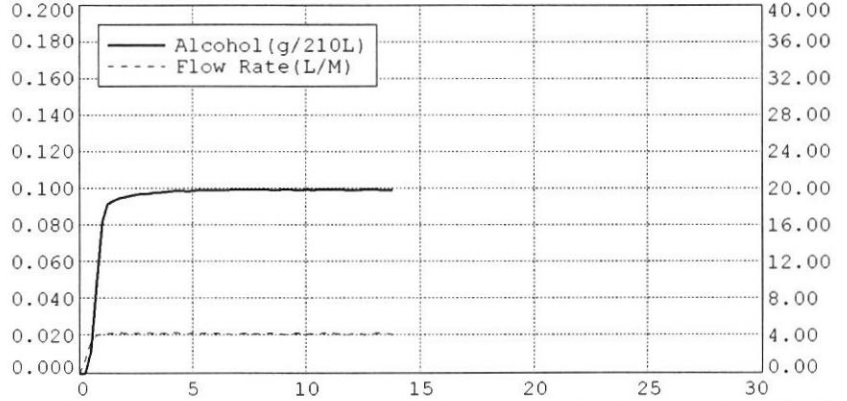
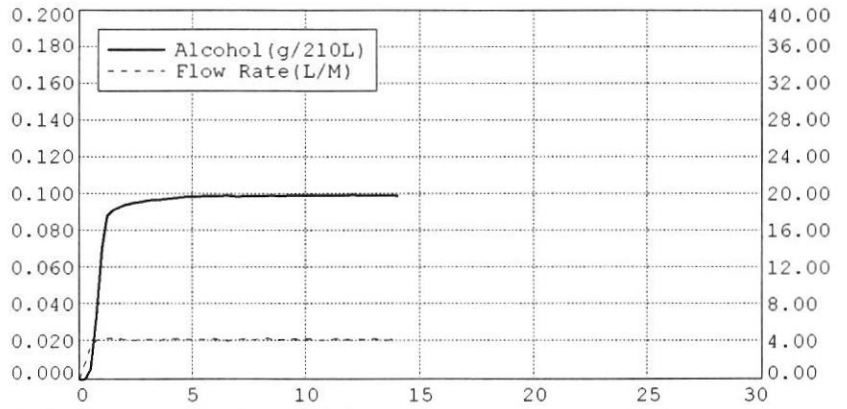
Lot: 21KP41172

Exp: 11/9/23

Simulator SN: DR5298

Calibrated: 6/16/21

COB 12/22/21



SUPERVISOR TEST

Alaska Department of Public Safety
DATAMASTER dmt: 100399

Date: 12/22/2021
Time: 11:55:56

SUPERVISOR NAME:
COLLEEN S OBRYANT
OPERATOR'S #: 6237

EXTERNAL STANDARD INFORMATION
NOMINAL: 0.100

BLANK TEST	0.000	11:57
INTERNAL STANDARD	VERIFIED	11:57
EXTERNAL STANDARD	0.102	11:57
BLANK TEST	0.000	11:58
EXTERNAL STANDARD	0.102	11:58
BLANK TEST	0.000	11:59
EXTERNAL STANDARD	0.102	12:00
BLANK TEST	0.000	12:01
EXTERNAL STANDARD	0.102	12:01
BLANK TEST	0.000	12:02
EXTERNAL STANDARD	0.102	12:02
BLANK TEST	0.000	12:03

Average = 0.1020
Std Dev = 0.0000

0.100

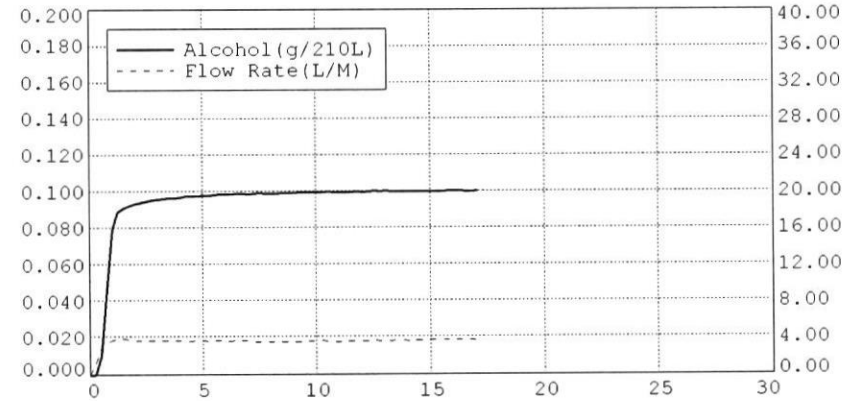
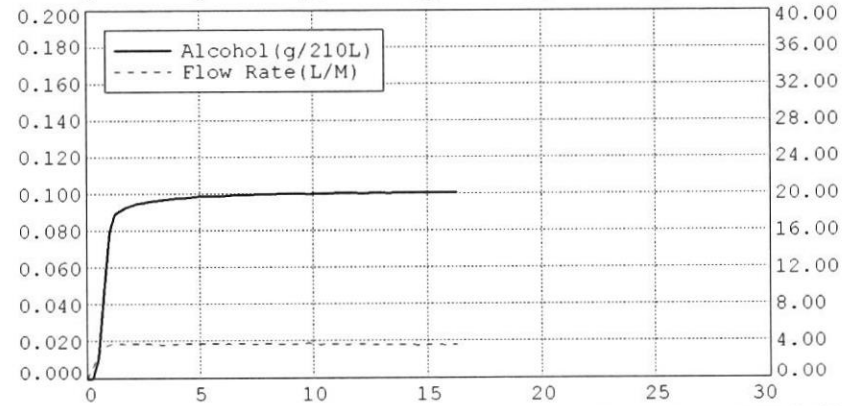
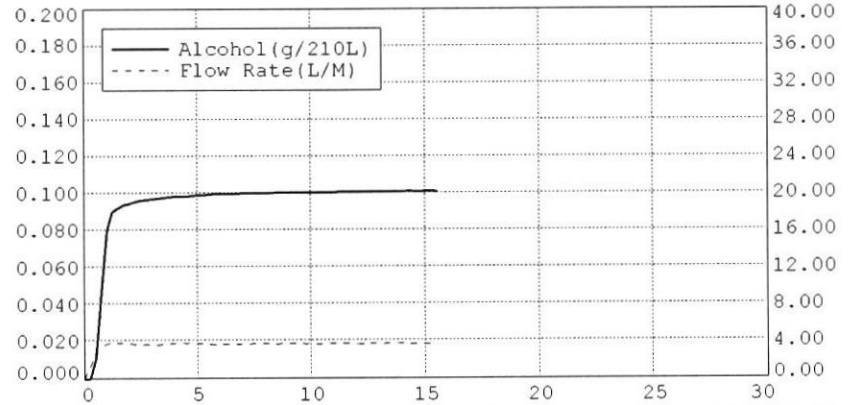
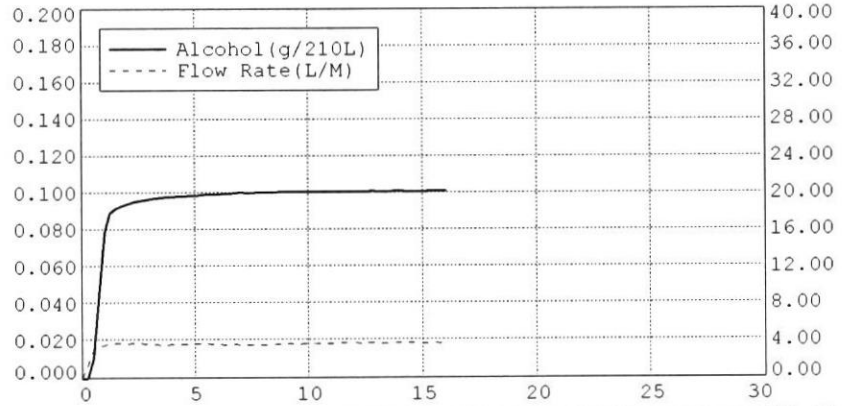
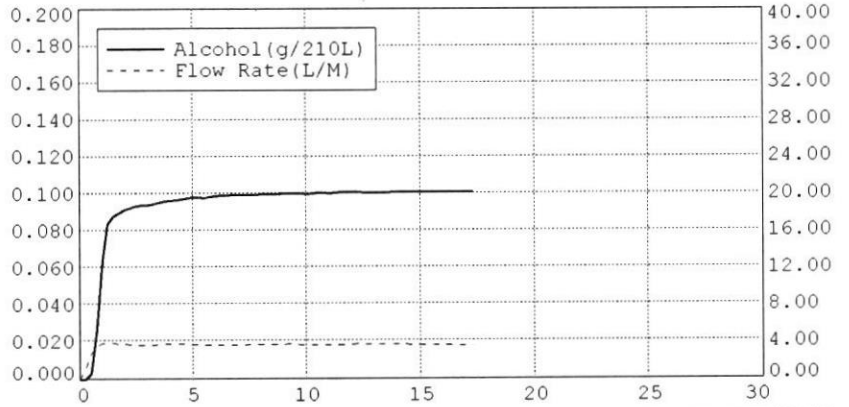
Lot: 21K P41172

Exp: 11/9/23

Simulator SN: DR5298

Calibrated: 6/16/21

COB 12/22/21



DIAGNOSTIC RECORD

Alaska Department of Public Safety
DATAMASTER dmt: 100375

Date: 12/22/2021
Time: 10:35:53

VERSIONS

DMT: 3.02
PIC: 3.02
Modem: 2.6
Questions: 2.2

TEMPERATURES

Sample Chamber = 49.0°C PASSED
(44.0°C - 52.0°C)
Breath Tube = 48.1°C PASSED
(38.0°C - 50.0°C)

SETTINGS

Lamp Voltage = 1.52 V PASSED
(0.92 V - 2.16 V)
Cooler Voltage = 1.57 V PASSED
(0.92 V - 2.16 V)
Bias Voltage = 79 V PASSED
(47 V - 111 V)
Chopper Freq = 543 Hz PASSED
(475 Hz - 575 Hz)
Barometer = 29.8 in

PUMP INFO

Flow Rate = 3.964 L/M PASSED
(3.500 L/M - 6.500 L/M)

DETECTOR INFO

PUMP ON PASSED
(0.002 V <= 0.010 V)
PUMP OFF PASSED
(0.002 V <= 0.010 V)

FILTER INFO

Filter 1 PASSED
Filter 2 PASSED
Filter 3 PASSED

INTERNAL STANDARD

Xq = 0.091 0.19% (0.00% - 4.00%) PASSED

Technician Screen

DATAMASTER dmt: 100375

Date: 12/22/2021
Time: 10:42 AM

Temperatures (°C)

Sample Cell: 49.0°C
Breath Tube: 48.1°C

Current Barometer 29.8 in
Volume (Ltr) 0.00

Settings

Lamp: 1.52 V
Bias: 80 V
Cooler: 1.59 V
Chopper: 541 Hz

Voltages (V)

Flow: 1.05 V
Detector: 0.099 V

LINEARITY CHECK

Alaska Department of Public Safety
DATAMASTER dmt: 100375

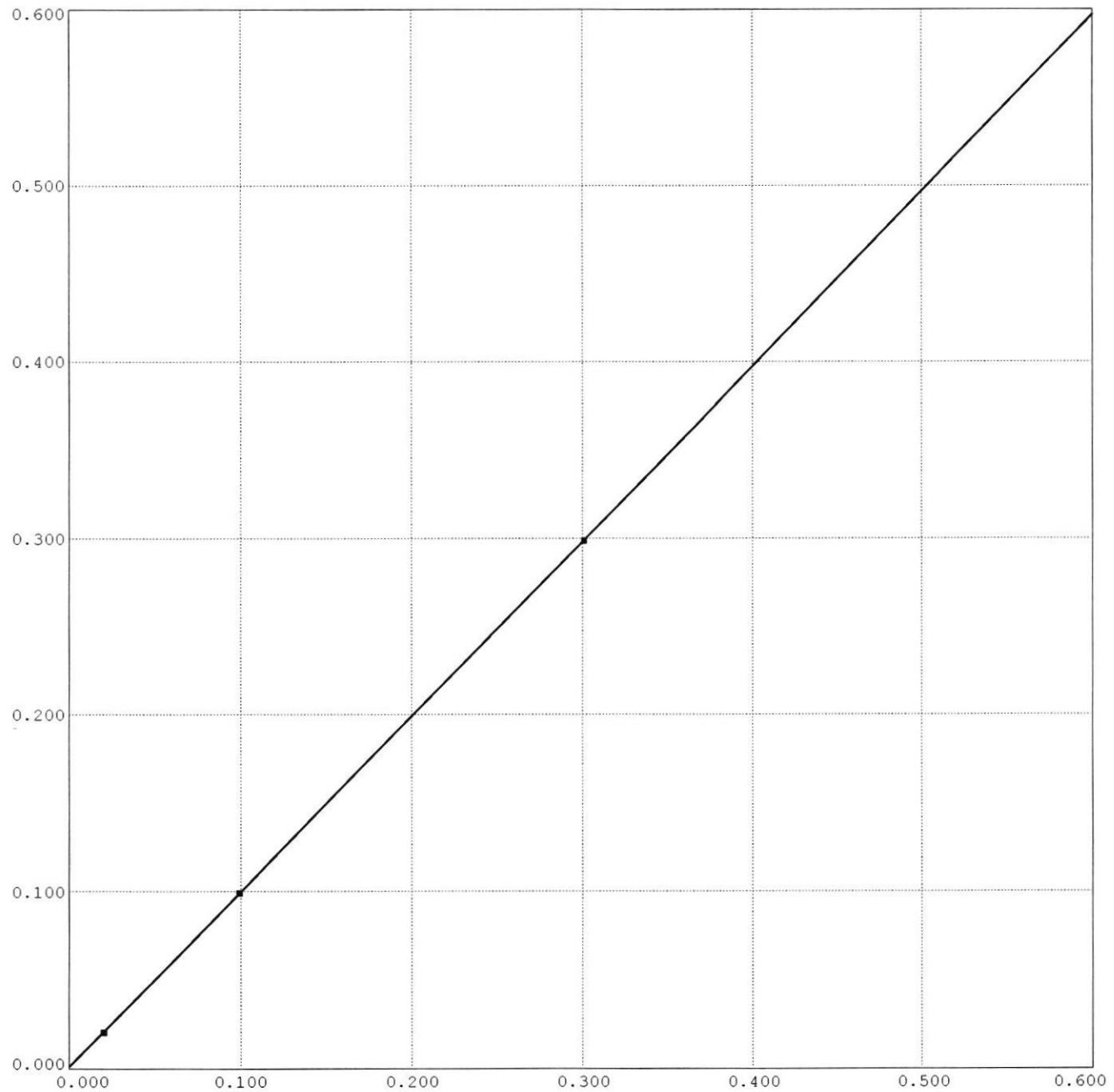
Date: 12/22/2021
Time: 10:43:21

SUPERVISOR NAME:
COLLEEN S OBRYANT
OPERATOR'S #: 6237

TARGET	AVERAGE	STD. DEV.
0.020	0.0210	0.0000
0.099	0.1000	0.0000
0.300	0.2992	0.0015

SLOPE = 0.993076
R² = 0.999996

(YAS)



LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety
DATAMASTER dmt: 100375

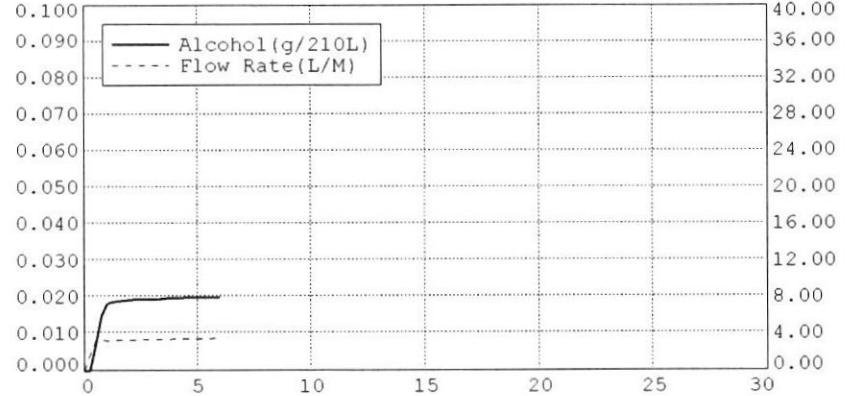
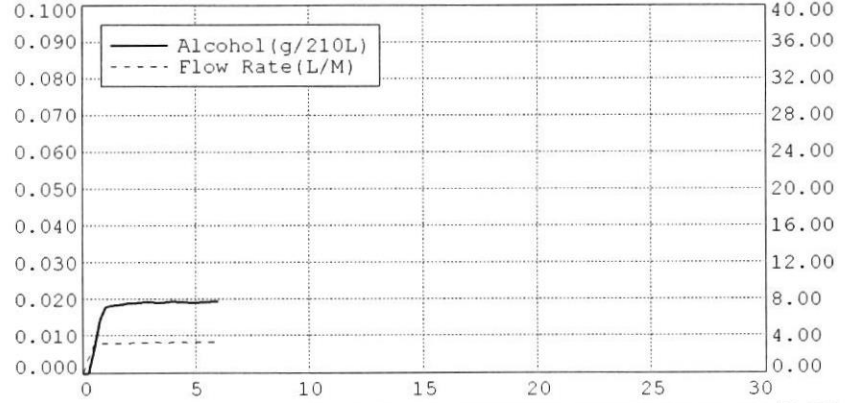
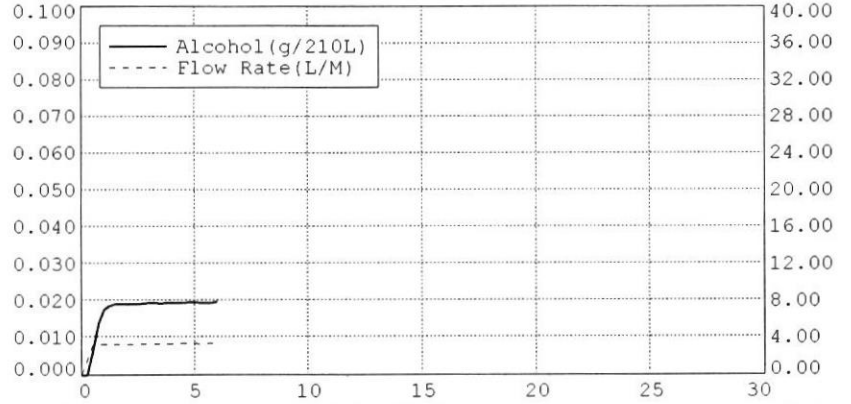
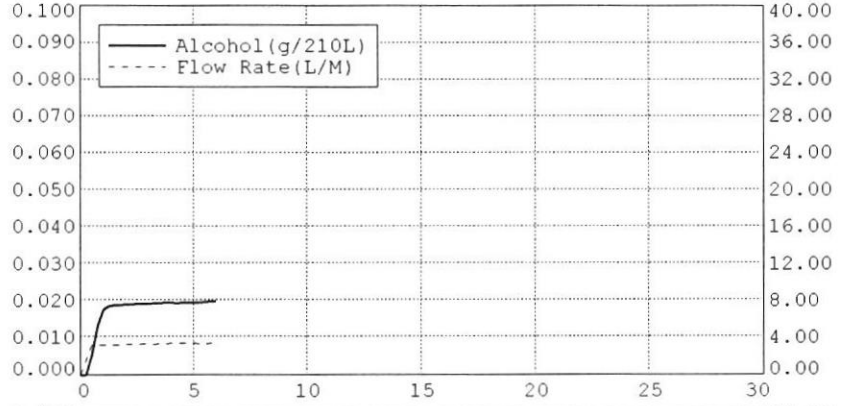
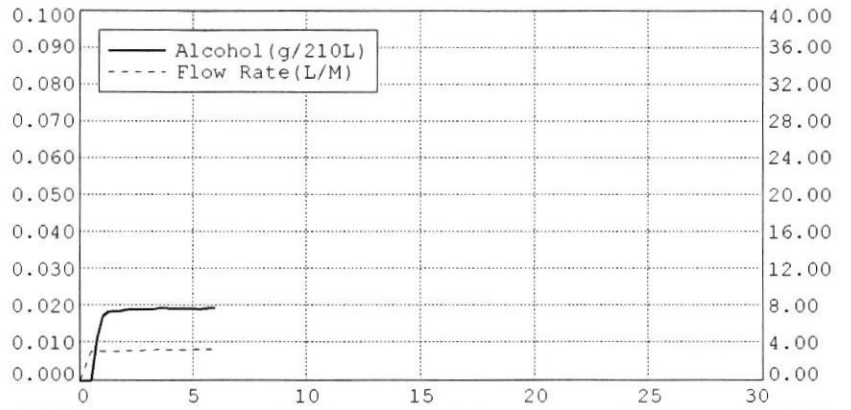
Date: 12/22/2021
Time: 10:43:23

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020
TARGET AT 29.76: 0.020
LOT #: AG100401
EXPIRATION: 01/04/2023
TANK PRESSURE: 827 psi

BLANK TEST	0.000	10:44
INTERNAL STANDARD	VERIFIED	10:44
EXTERNAL STANDARD	0.021	10:44
BLANK TEST	0.000	10:45
EXTERNAL STANDARD	0.021	10:46
BLANK TEST	0.000	10:46
EXTERNAL STANDARD	0.021	10:47
BLANK TEST	0.000	10:48
EXTERNAL STANDARD	0.021	10:48
BLANK TEST	0.000	10:49
EXTERNAL STANDARD	0.021	10:49
BLANK TEST	0.000	10:50

Average = 0.0210
Std Dev = 0.0000



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety
DATAMASTER dmt: 100375

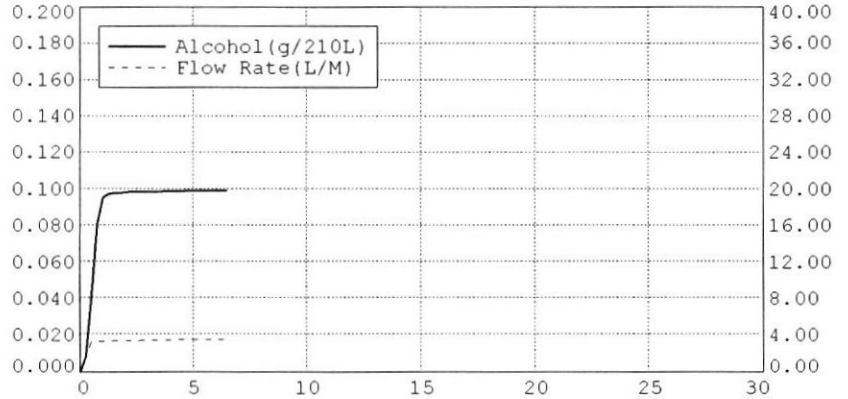
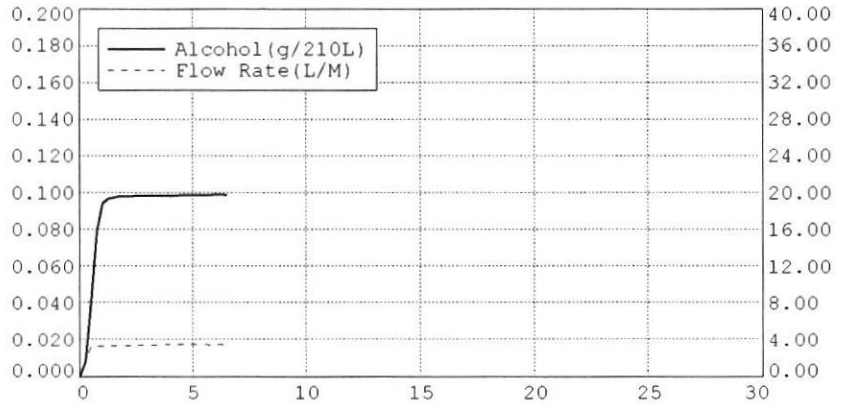
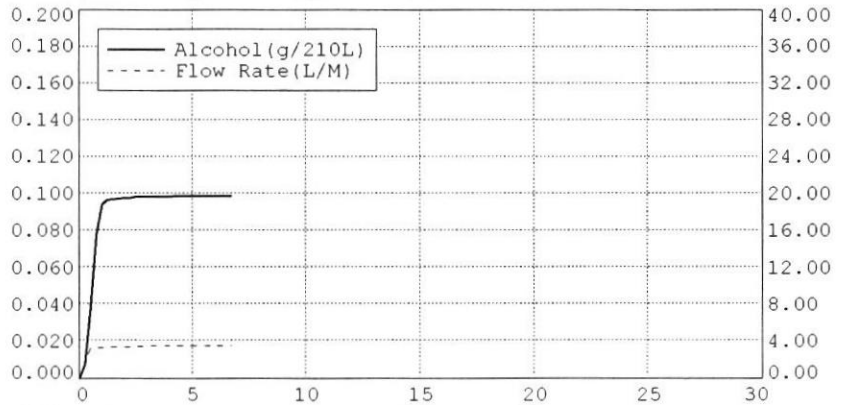
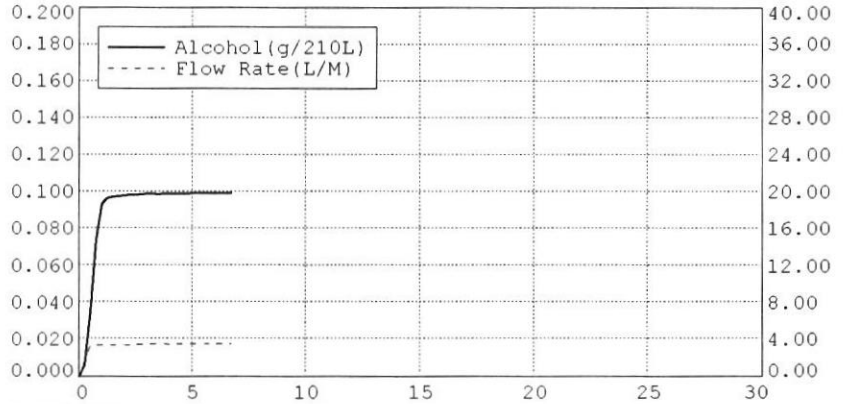
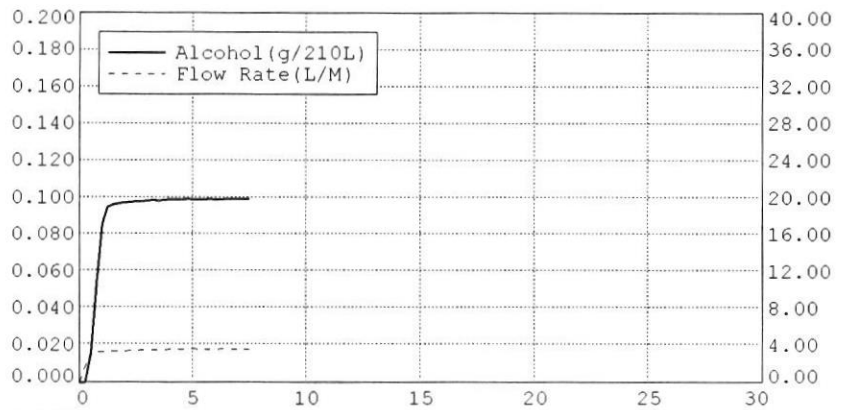
Date: 12/22/2021
Time: 10:51:03

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.100
TARGET AT 29.77: 0.099
LOT #: AG108404
EXPIRATION: 03/25/2023
TANK PRESSURE: 852 psi

BLANK TEST	0.000	10:52
INTERNAL STANDARD	VERIFIED	10:52
EXTERNAL STANDARD	0.100	10:52
BLANK TEST	0.000	10:53
EXTERNAL STANDARD	0.100	10:53
BLANK TEST	0.000	10:54
EXTERNAL STANDARD	0.100	10:55
BLANK TEST	0.000	10:56
EXTERNAL STANDARD	0.100	10:56
BLANK TEST	0.000	10:57
EXTERNAL STANDARD	0.100	10:57
BLANK TEST	0.000	10:58

Average = 0.1000
Std Dev = 0.0000



LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety
 DATAMASTER dmt: 100375

Date: 12/22/2021
 Time: 11:02:24

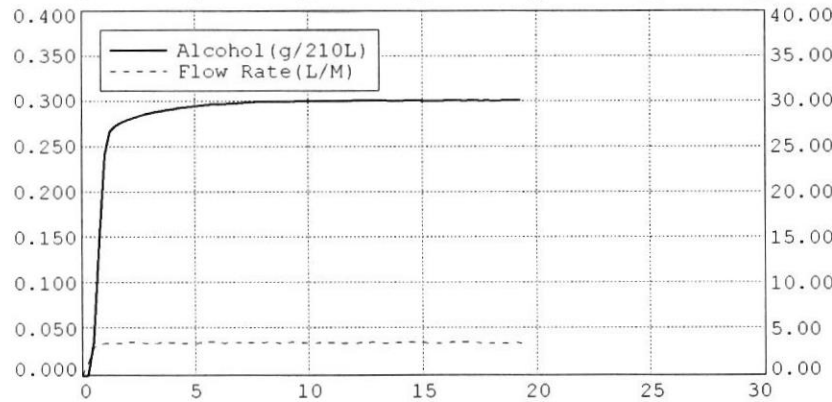
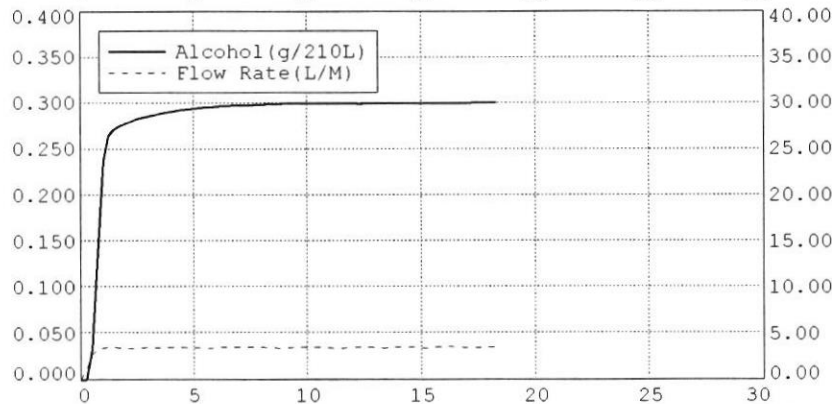
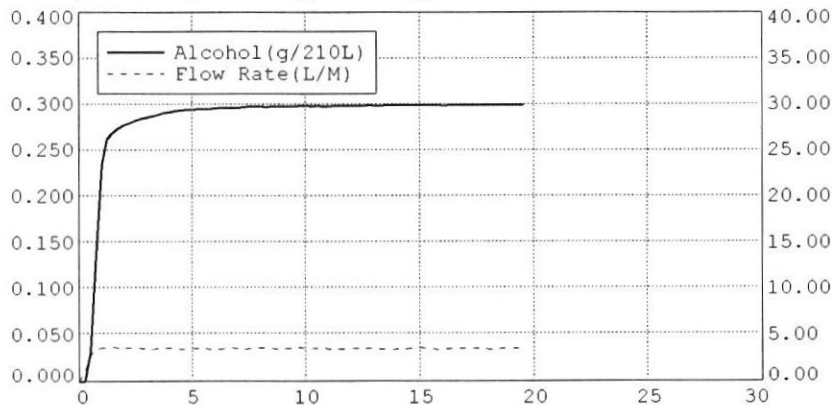
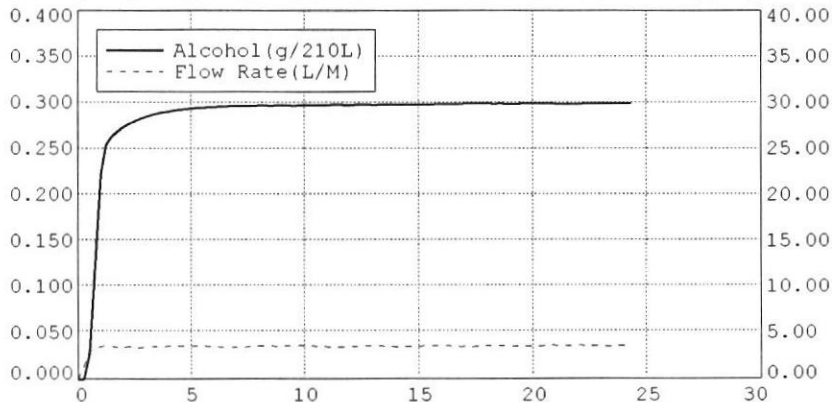
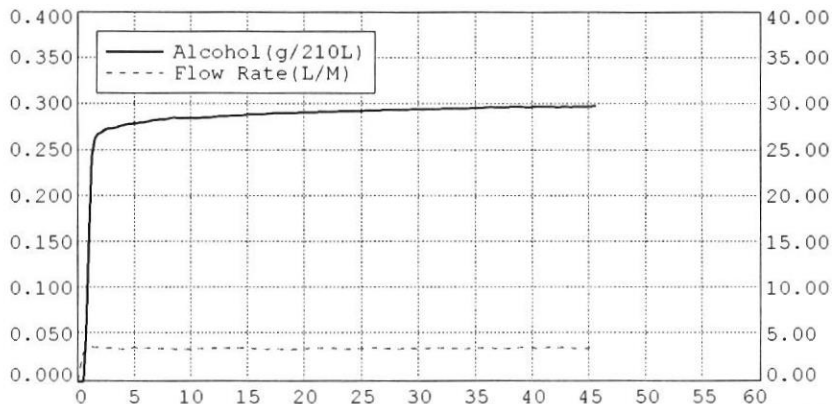
EXTERNAL STANDARD INFORMATION

NOMINAL: 0.300
 LOT #: 21030
 EXPIRATION: 02/02/2023

BLANK TEST	0.000	11:04
INTERNAL STANDARD	VERIFIED	11:04
EXTERNAL STANDARD	0.297	11:05
BLANK TEST	0.000	11:06
EXTERNAL STANDARD	0.299	11:06
BLANK TEST	0.000	11:07
EXTERNAL STANDARD	0.299	11:08
BLANK TEST	0.000	11:09
EXTERNAL STANDARD	0.300	11:09
BLANK TEST	0.000	11:10
EXTERNAL STANDARD	0.301	11:10
BLANK TEST	0.000	11:11

Average = 0.2992
 Std Dev = 0.0015

*Simulator SN: SD1202
 Calibrated: 6/15/21
 CAB 12/22/21*



DIAGNOSTIC RECORD

Alaska Department of Public Safety
DATAMASTER dmt: 100399

Date: 12/22/2021
Time: 10:28:32

VERSIONS
DMT: 3.02
PIC: 3.03
Modem: 2.6
Questions: 2.2

TEMPERATURES

Sample Chamber = 48.8°C PASSED
(44.0°C - 52.0°C)
Breath Tube = 48.1°C PASSED
(38.0°C - 50.0°C)

SETTINGS

Lamp Voltage = 1.66 V PASSED
(1.00 V - 2.32 V)
Cooler Voltage = 1.65 V PASSED
(0.99 V - 2.31 V)
Bias Voltage = 81 V PASSED
(49 V - 113 V)
Chopper Freq = 524 Hz PASSED
(475 Hz - 575 Hz)
Barometer = 29.8 in

PUMP INFO

Flow Rate = 4.441 L/M PASSED
(3.500 L/M - 6.500 L/M)

DETECTOR INFO

PUMP ON PASSED
(0.002 V <= 0.010 V)
PUMP OFF PASSED
(0.001 V <= 0.010 V)

FILTER INFO

Filter 1 PASSED
Filter 2 PASSED
Filter 3 PASSED

INTERNAL STANDARD

Xq = 0.085 0.52% (0.00% - 4.00%) PASSED

Technician Screen

DATAMASTER dmt: 100399

Date: 12/22/2021
Time: 10:38 AM

Temperatures (°C)
Sample Cell: 48.9°C
Breath Tube: 47.9°C

Current Barometer 29.8 in
Volume (Ltr) 0.00

Settings
Lamp: 1.66 V
Bias: 81 V
Cooler: 1.65 V
Chopper: 523 Hz

Voltages (V)
Flow: 1.06 V
Detector: 0.077 V

LINEARITY CHECK

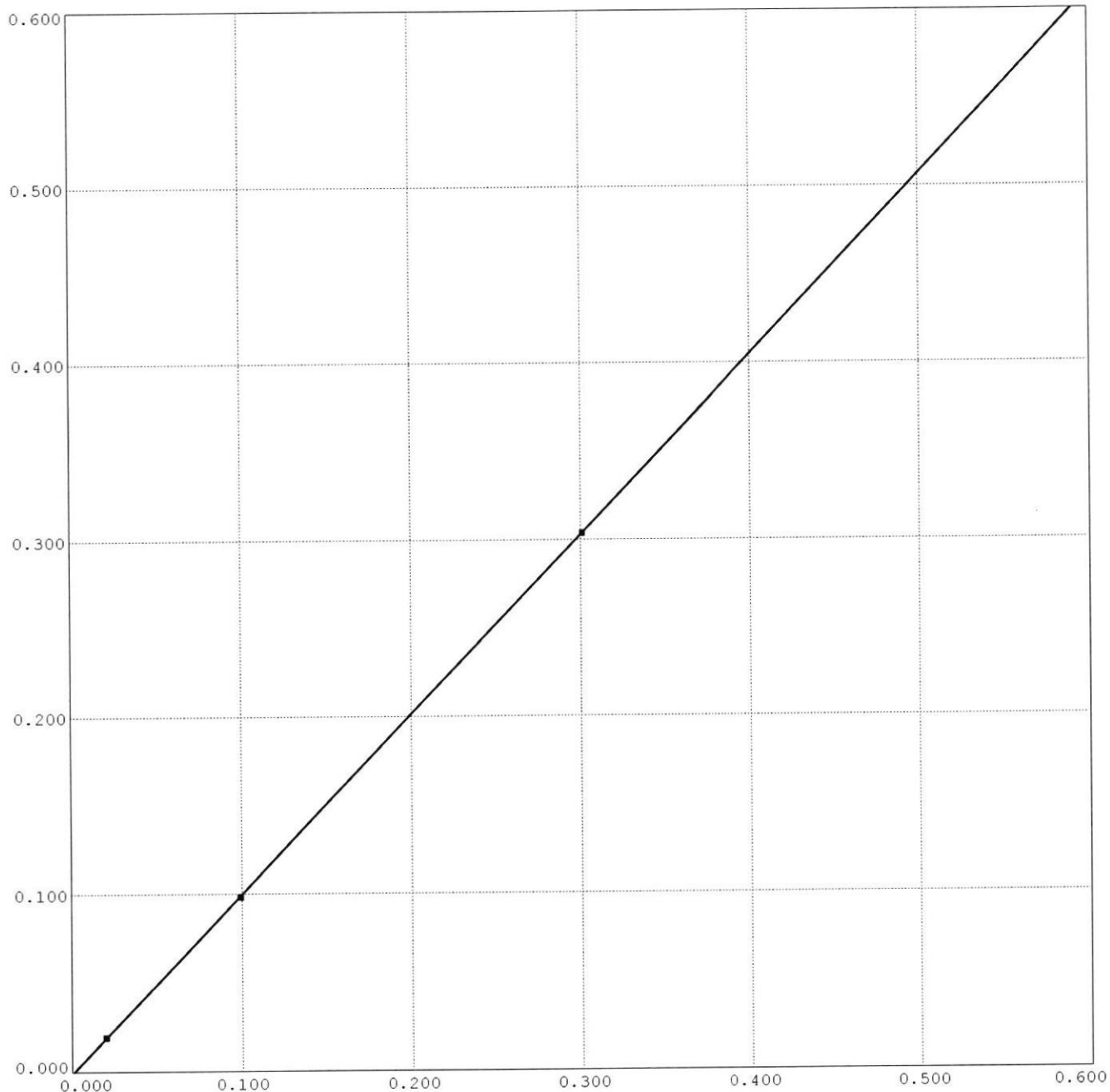
Alaska Department of Public Safety
DATAMASTER dmt: 100399

Date: 12/22/2021
Time: 10:38:59

SUPERVISOR NAME:
COLLEEN S OBRYANT
OPERATOR'S #: 6237

TARGET	AVERAGE	STD. DEV.
0.020	0.0198	0.0004
0.099	0.0994	0.0005
0.300	0.3044	0.0005

SLOPE = 1.017109
R² = 0.999993



CAB

LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety
 DATAMASTER dmt: 100399

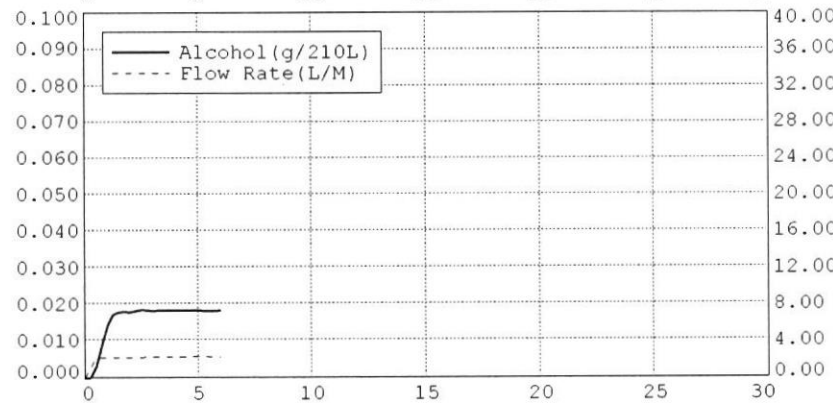
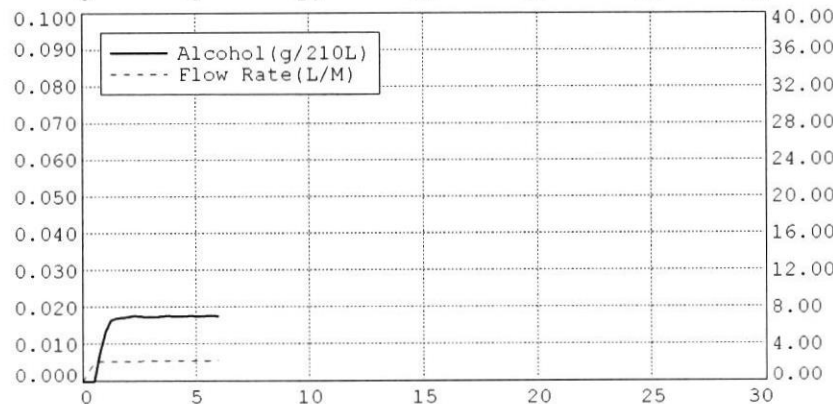
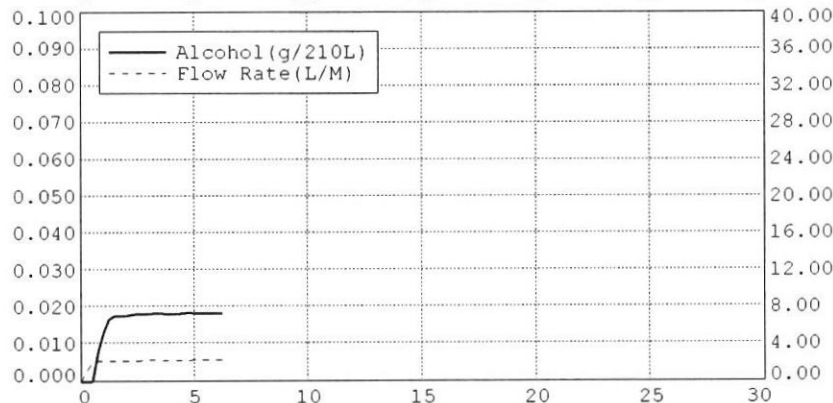
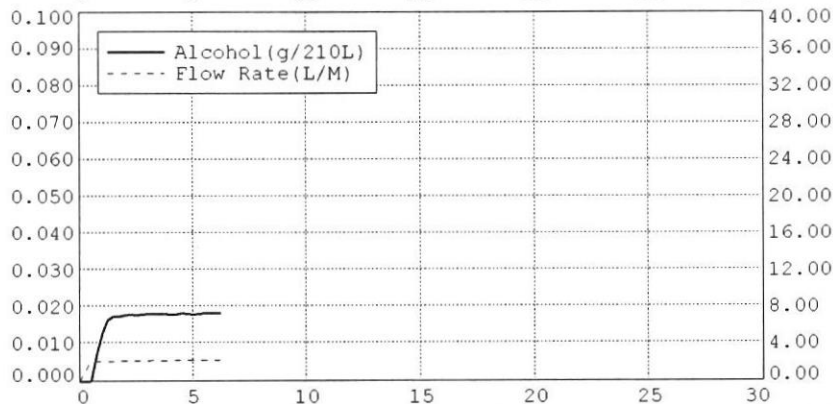
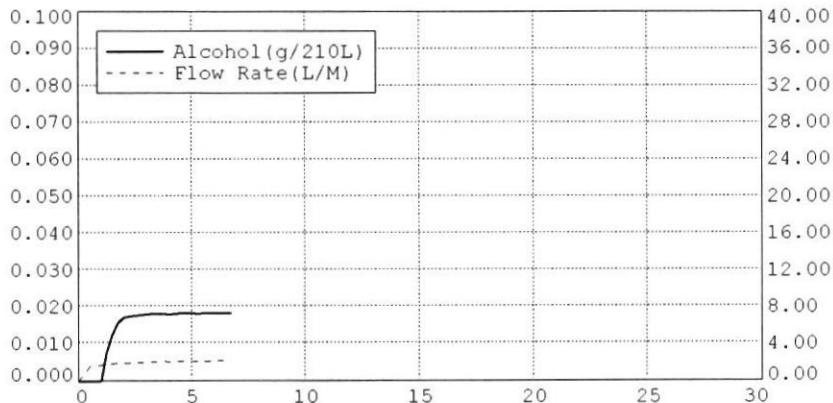
Date: 12/22/2021
 Time: 10:39:01

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020
 TARGET AT 29.77: 0.020
 LOT #: AG100401
 EXPIRATION: 01/04/2023
 TANK PRESSURE: 789 psi

BLANK TEST	0.000	10:57
INTERNAL STANDARD	VERIFIED	10:57
EXTERNAL STANDARD	0.020	10:57
BLANK TEST	0.000	10:58
EXTERNAL STANDARD	0.020	10:58
BLANK TEST	0.000	10:59
EXTERNAL STANDARD	0.020	10:59
BLANK TEST	0.000	11:00
EXTERNAL STANDARD	0.019	11:00
BLANK TEST	0.000	11:01
EXTERNAL STANDARD	0.020	11:01
BLANK TEST	0.000	11:02

Average = 0.0198
 Std Dev = 0.0004



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety
 DATAMASTER dmt: 100399

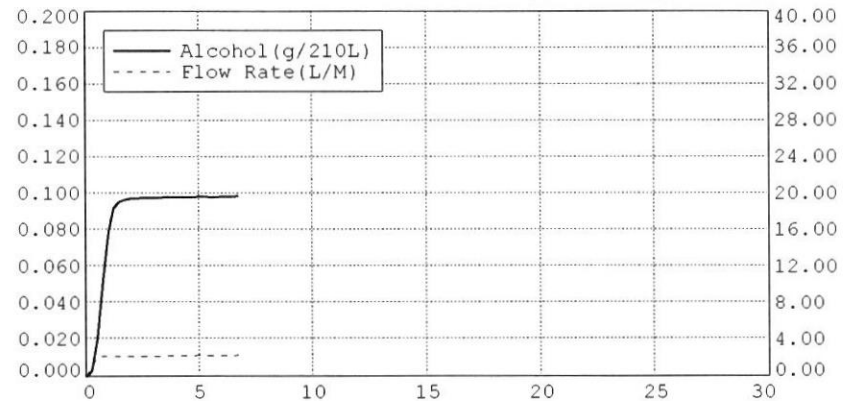
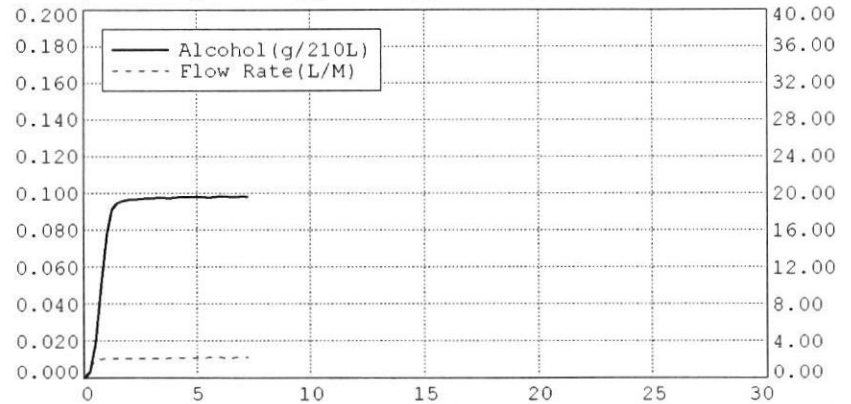
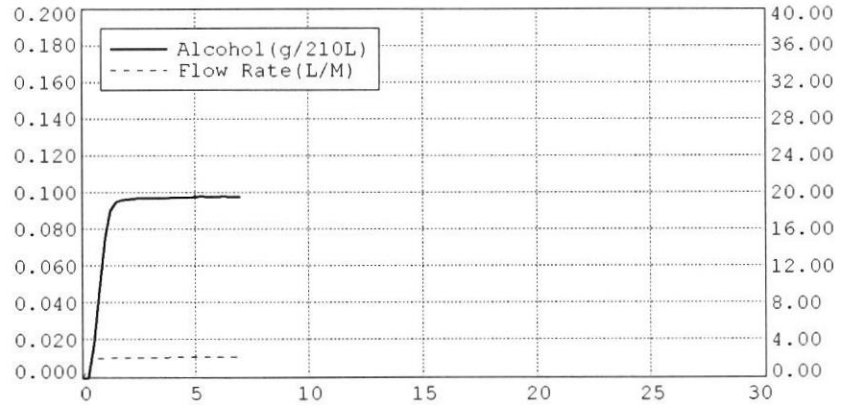
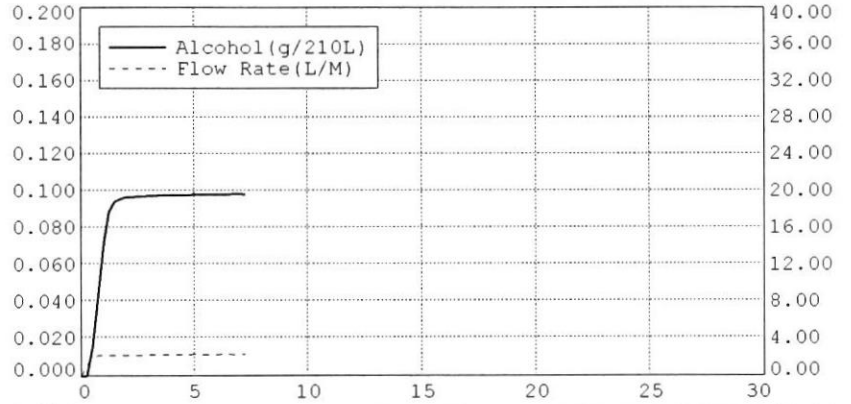
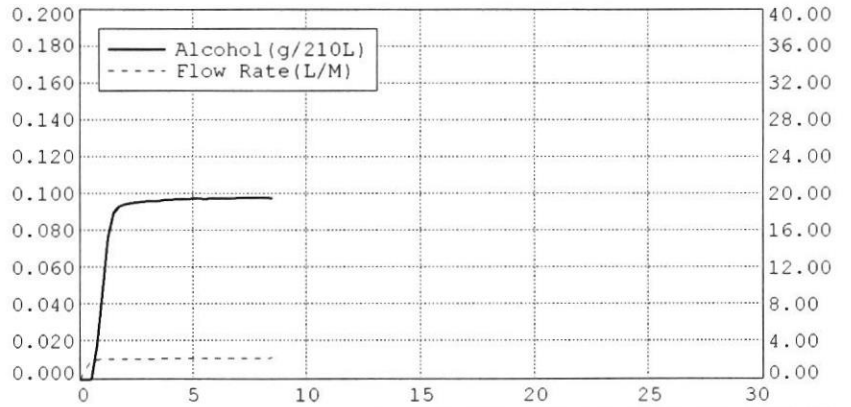
Date: 12/22/2021
 Time: 11:04:39

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.100
 TARGET AT 29.76: 0.099
 LOT #: AG108404
 EXPIRATION: 03/25/2023
 TANK PRESSURE: 817 psi

BLANK TEST	0.000	11:05
INTERNAL STANDARD	VERIFIED	11:06
EXTERNAL STANDARD	0.099	11:06
BLANK TEST	0.000	11:07
EXTERNAL STANDARD	0.099	11:07
BLANK TEST	0.000	11:08
EXTERNAL STANDARD	0.099	11:08
BLANK TEST	0.000	11:09
EXTERNAL STANDARD	0.100	11:09
BLANK TEST	0.000	11:10
EXTERNAL STANDARD	0.100	11:10
BLANK TEST	0.000	11:11

Average = 0.0994
 Std Dev = 0.0005



LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety
 DATAMASTER dmt: 100399

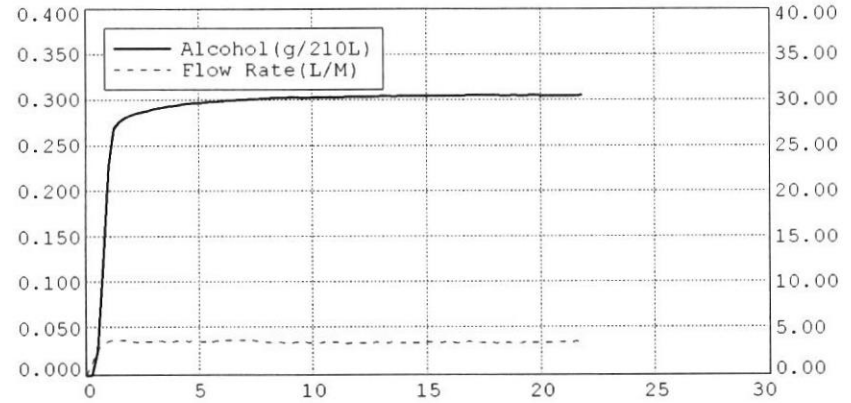
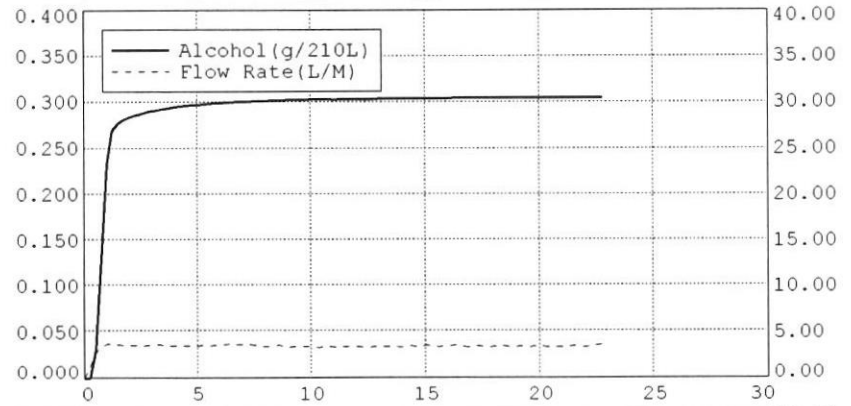
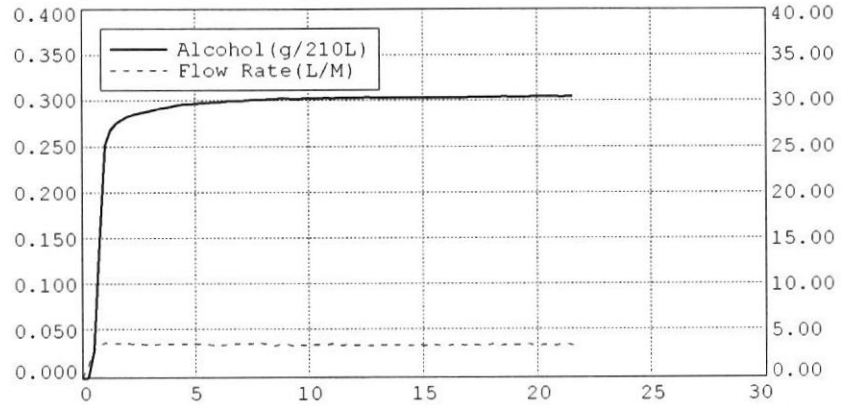
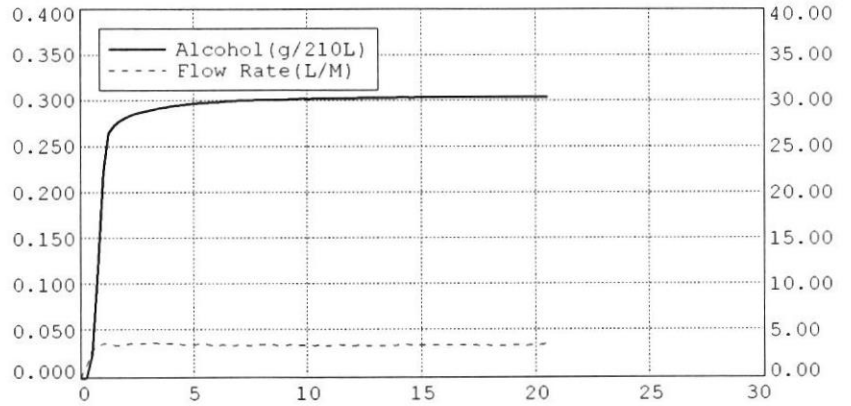
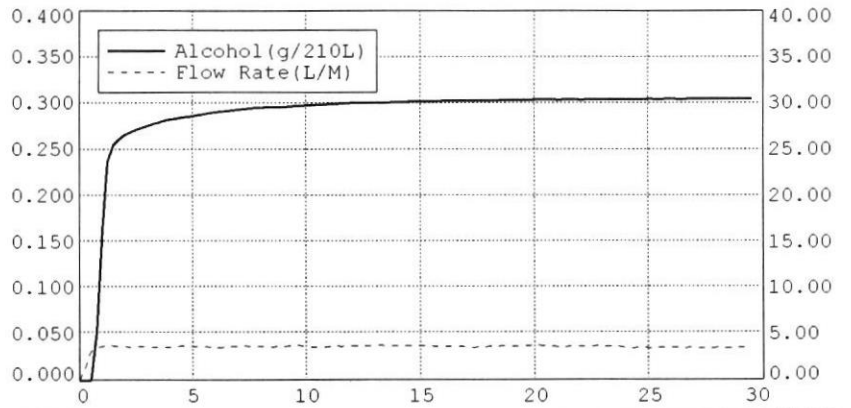
Date: 12/22/2021
 Time: 11:11:54

EXTERNAL STANDARD INFORMATION
 NOMINAL: 0.300
 LOT #: 21030
 EXPIRATION: 02/02/2023

BLANK TEST	0.000	11:15
INTERNAL STANDARD	VERIFIED	11:15
EXTERNAL STANDARD	0.304	11:15
BLANK TEST	0.000	11:16
EXTERNAL STANDARD	0.304	11:17
BLANK TEST	0.000	11:18
EXTERNAL STANDARD	0.304	11:18
BLANK TEST	0.000	11:19
EXTERNAL STANDARD	0.305	11:20
BLANK TEST	0.000	11:21
EXTERNAL STANDARD	0.305	11:21
BLANK TEST	0.000	11:22

Average = 0.3044
 Std Dev = 0.0005

*Simulator SN: SD1002
 Calibrated: 6/15/21
 CBS 12/22/21*



DIAGNOSTIC RECORD

Alaska Department of Public Safety
DATAMASTER dmt: 100405

Date: 12/22/2021
Time: 10:29:47

VERSIONS

DMT: 3.02
PIC: 3.02
Modem: 2.6
Questions: 2.2

TEMPERATURES

Sample Chamber = 49.0°C PASSED
(44.0°C - 52.0°C)
Breath Tube = 47.9°C PASSED
(38.0°C - 50.0°C)

SETTINGS

Lamp Voltage = 1.69 V PASSED
(1.01 V - 2.37 V)
Cooler Voltage = 1.74 V PASSED
(1.01 V - 2.37 V)
Bias Voltage = 81 V PASSED
(49 V - 113 V)
Chopper Freq = 525 Hz PASSED
(475 Hz - 575 Hz)
Barometer = 29.8 in

PUMP INFO

Flow Rate = 5.161 L/M PASSED
(3.500 L/M - 6.500 L/M)

DETECTOR INFO

PUMP ON PASSED
(0.002 V <= 0.010 V)
PUMP OFF PASSED
(0.003 V <= 0.010 V)

FILTER INFO

Filter 1 PASSED
Filter 2 PASSED
Filter 3 PASSED

INTERNAL STANDARD PASSED
Xq = 0.088 0.20% (0.00% - 4.00%)

Technician Screen

DATAMASTER dmt: 100405

Date: 12/22/2021
Time: 10:38 AM

Temperatures (°C)

Sample Cell: 48.8°C
Breath Tube: 47.9°C

Current Barometer 29.8 in
Volume (Ltr) 0.00

Settings

Lamp: 1.74 V
Bias: 81 V
Cooler: 1.74 V
Chopper: 523 Hz

Voltages (V)

Flow: 1.05 V
Detector: -0.023 V

LINEARITY CHECK

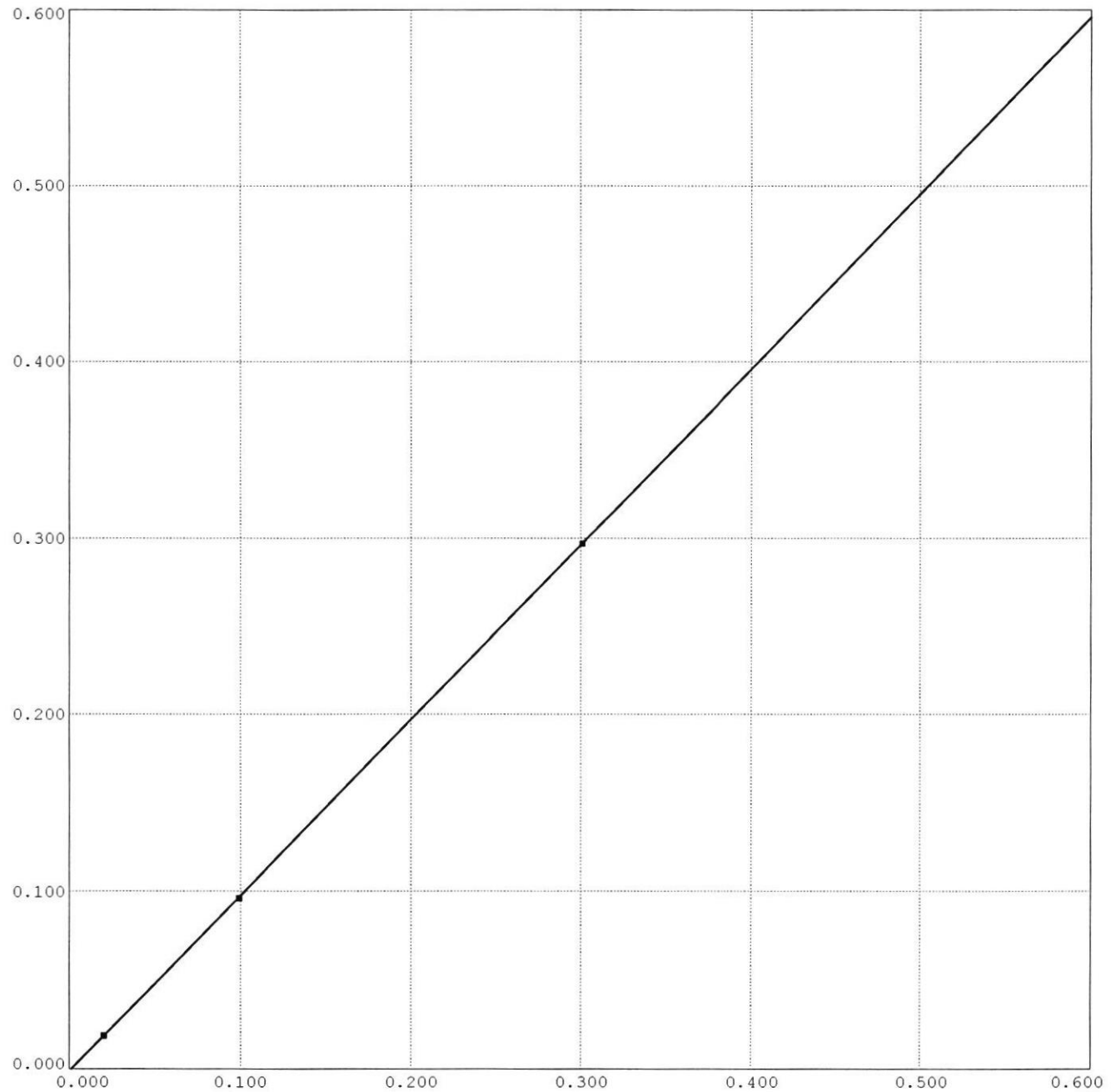
Alaska Department of Public Safety
DATAMASTER dmt: 100405

Date: 12/22/2021
Time: 10:39:23

SUPERVISOR NAME:
COLLEEN S OBRYANT
OPERATOR'S #: 6237

TARGET	AVERAGE	STD. DEV.
0.020	0.0192	0.0004
0.099	0.0970	0.0000
0.300	0.2976	0.0005

SLOPE = 0.995016
R² = 0.999991



CB

LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety
DATAMASTER dmt: 100405

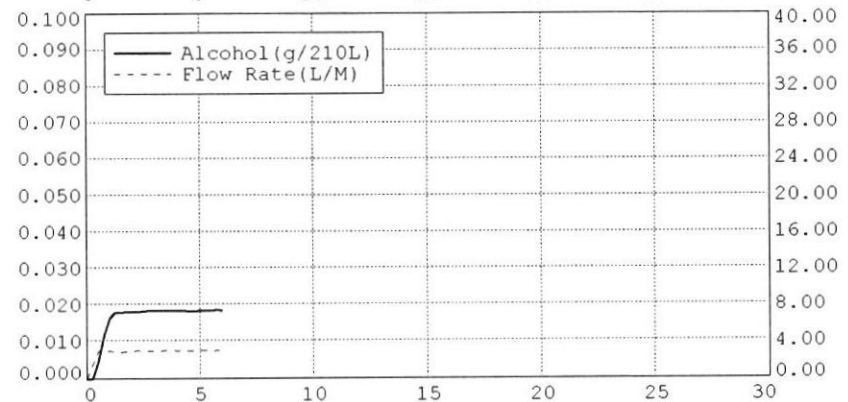
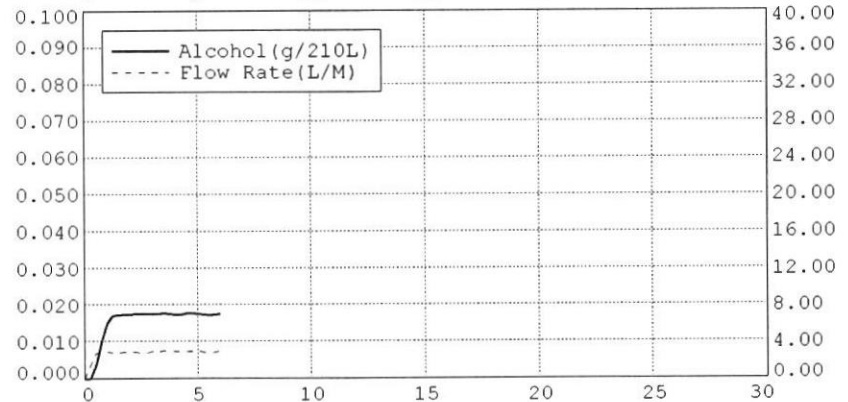
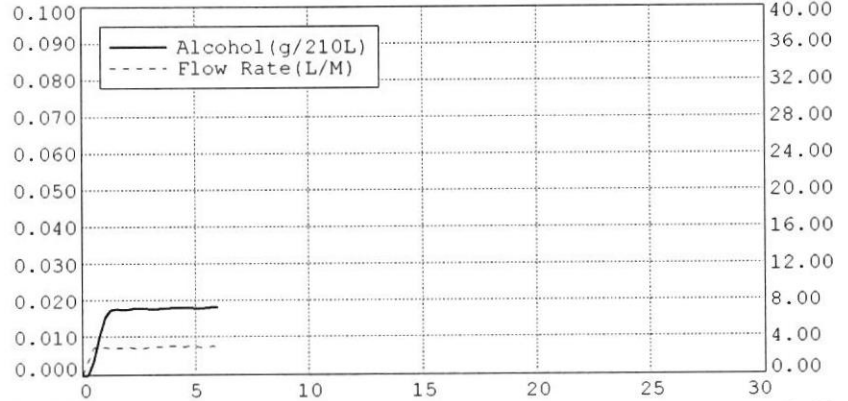
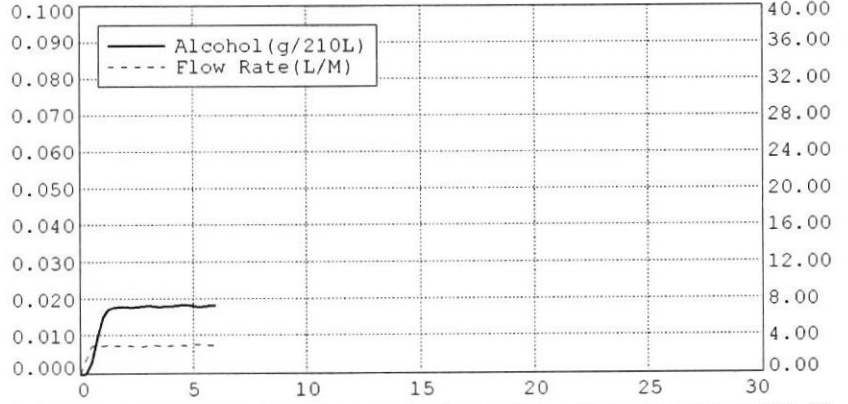
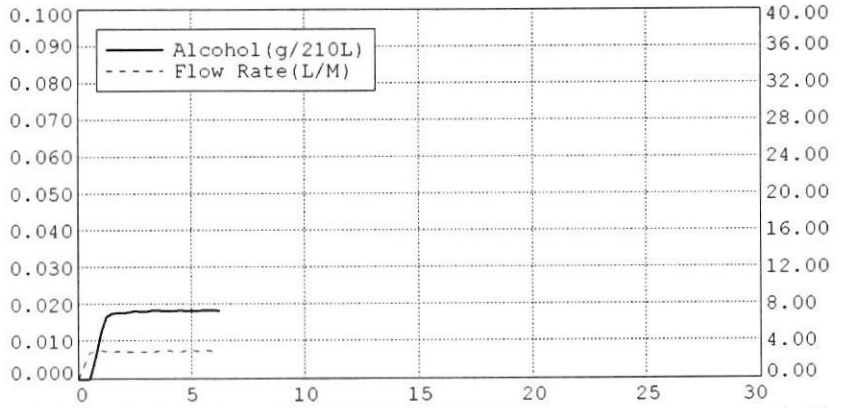
Date: 12/22/2021
Time: 10:39:25

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020
TARGET AT 29.77: 0.020
LOT #: AG100401
EXPIRATION: 01/04/2023
TANK PRESSURE: 796 psi

BLANK TEST	0.000	10:46
INTERNAL STANDARD	VERIFIED	10:46
EXTERNAL STANDARD	0.020	10:46
BLANK TEST	0.000	10:47
EXTERNAL STANDARD	0.019	10:47
BLANK TEST	0.000	10:48
EXTERNAL STANDARD	0.019	10:48
BLANK TEST	0.000	10:49
EXTERNAL STANDARD	0.019	10:49
BLANK TEST	0.000	10:50
EXTERNAL STANDARD	0.019	10:50
BLANK TEST	0.000	10:51

Average = 0.0192
Std Dev = 0.0004



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety
 DATAMASTER dmt: 100405

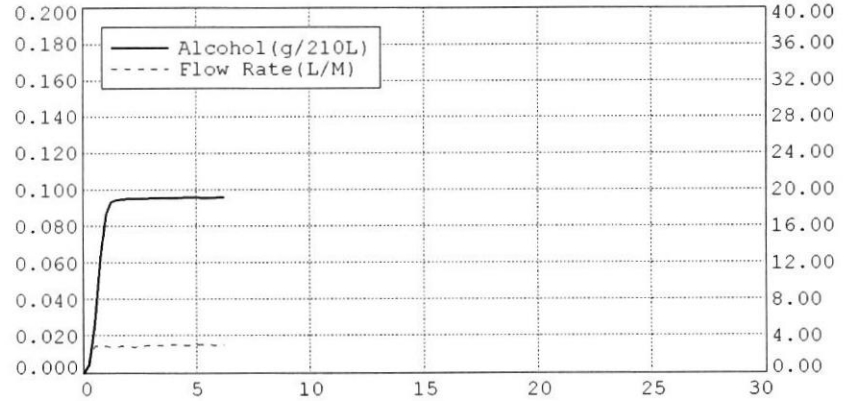
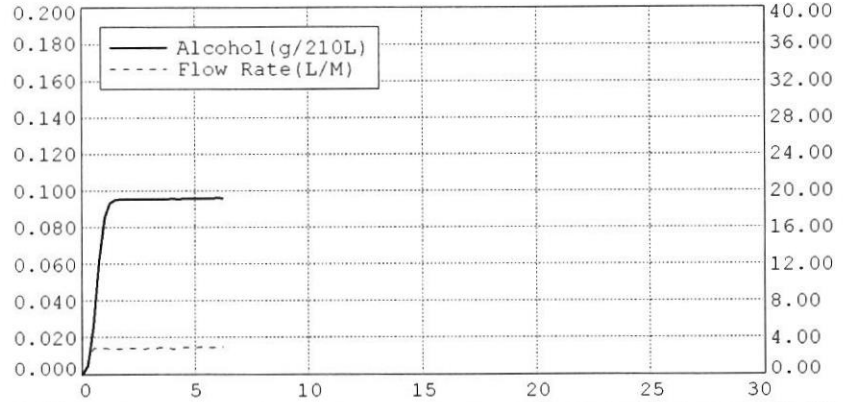
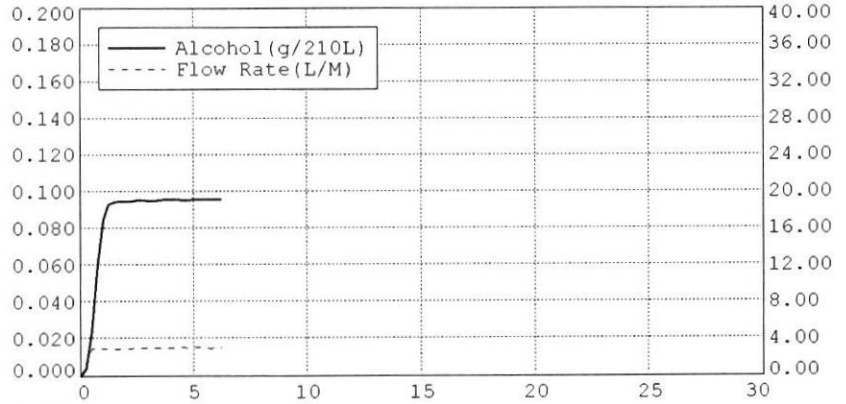
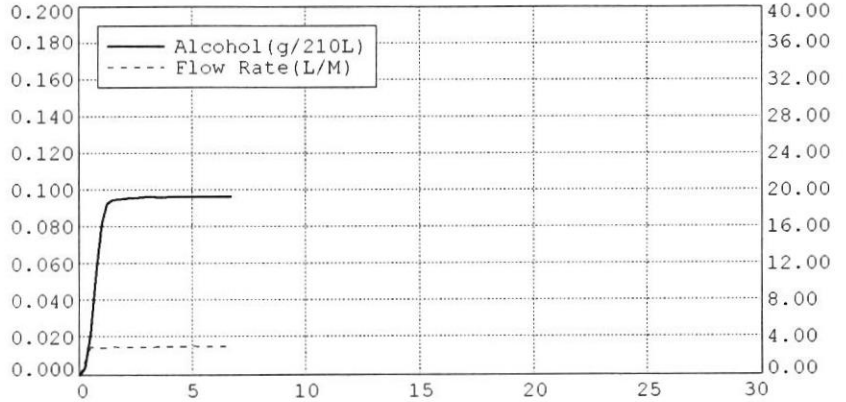
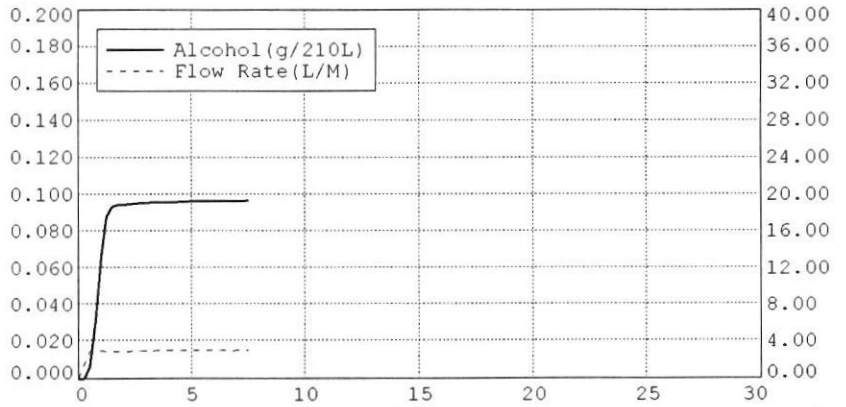
Date: 12/22/2021
 Time: 10:57:14

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.100
 TARGET AT 29.76: 0.099
 LOT #: AG108404
 EXPIRATION: 03/25/2023
 TANK PRESSURE: 819 psi

BLANK TEST	0.000	10:58
INTERNAL STANDARD	VERIFIED	10:58
EXTERNAL STANDARD	0.097	10:59
BLANK TEST	0.000	11:00
EXTERNAL STANDARD	0.097	11:00
BLANK TEST	0.000	11:01
EXTERNAL STANDARD	0.097	11:01
BLANK TEST	0.000	11:02
EXTERNAL STANDARD	0.097	11:02
BLANK TEST	0.000	11:03
EXTERNAL STANDARD	0.097	11:03
BLANK TEST	0.000	11:04

Average = 0.0970
 Std Dev = 0.0000



LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety
DATAMASTER dmt: 100405

Date: 12/22/2021
Time: 11:05:28

EXTERNAL STANDARD INFORMATION
NOMINAL: 0.300
LOT #: 21030
EXPIRATION: 02/02/2023

BLANK TEST	0.000	11:07
INTERNAL STANDARD	VERIFIED	11:07
EXTERNAL STANDARD	0.298	11:08
BLANK TEST	0.000	11:09
EXTERNAL STANDARD	0.297	11:09
BLANK TEST	0.000	11:10
EXTERNAL STANDARD	0.297	11:11
BLANK TEST	0.000	11:12
EXTERNAL STANDARD	0.298	11:12
BLANK TEST	0.000	11:13
EXTERNAL STANDARD	0.298	11:14
BLANK TEST	0.000	11:14

Average = 0.2976
Std Dev = 0.0005

*Simulator SN: SD1202
Calibrated: 6/15/21
CAB 12/22/21*

