

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>23IP41233</u>	Nominal Value:	<u>121.00</u>	mg/dL
Min. Sample Size:	500mL	Certified Value:	<u>121.51</u>	<u>±1.64 mg/dL</u>
Solute:	Ethanol	Expiration Date:	<u>9/20/2025</u>	
Diluent	Water			

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.

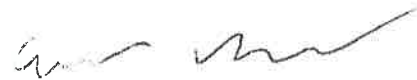
ANALYTICAL VERIFICATION:

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

9/21/23
Date

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: 12/13/2023
Time: 14:37:26

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

EXTERNAL STANDARD INFORMATION
NOMINAL: 0.100

BLANK TEST	0.000	14:38
INTERNAL STANDARD	VERIFIED	14:38
EXTERNAL STANDARD	0.102	14:38
BLANK TEST	0.000	14:39
EXTERNAL STANDARD	0.102	14:40
BLANK TEST	0.000	14:41
EXTERNAL STANDARD	0.102	14:41
BLANK TEST	0.000	14:42
EXTERNAL STANDARD	0.102	14:42
BLANK TEST	0.000	14:43
EXTERNAL STANDARD	0.102	14:43
BLANK TEST	0.000	14:44

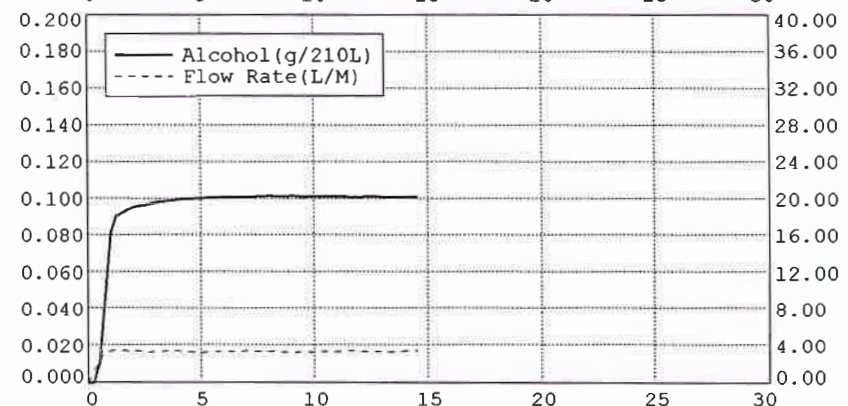
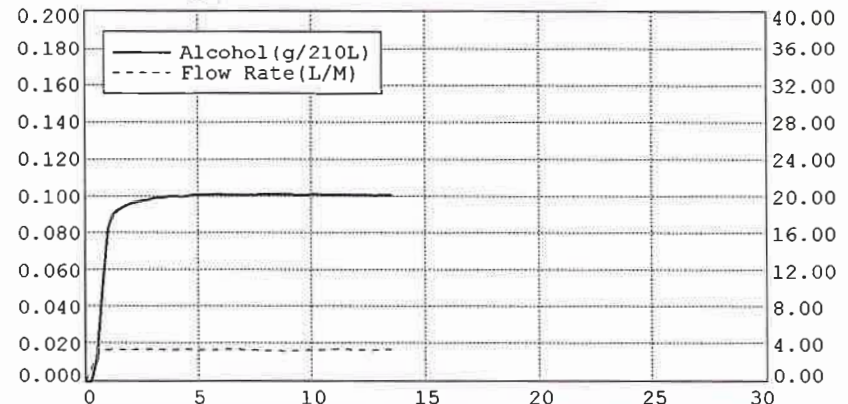
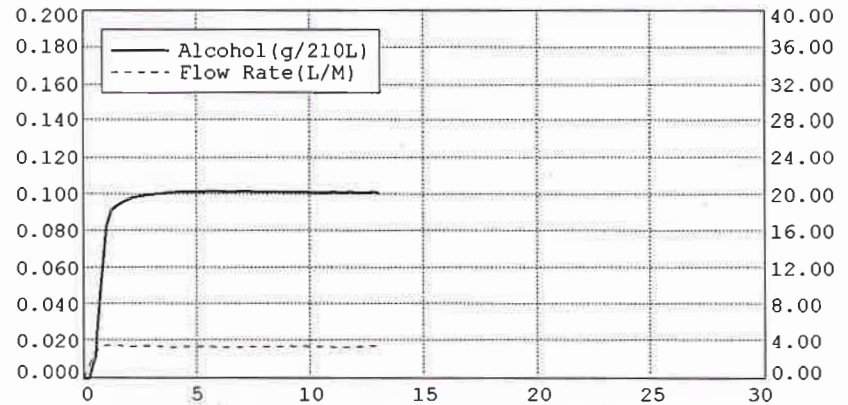
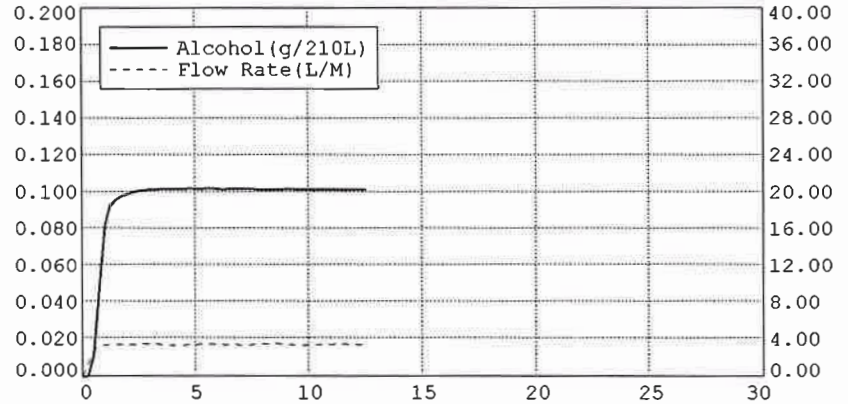
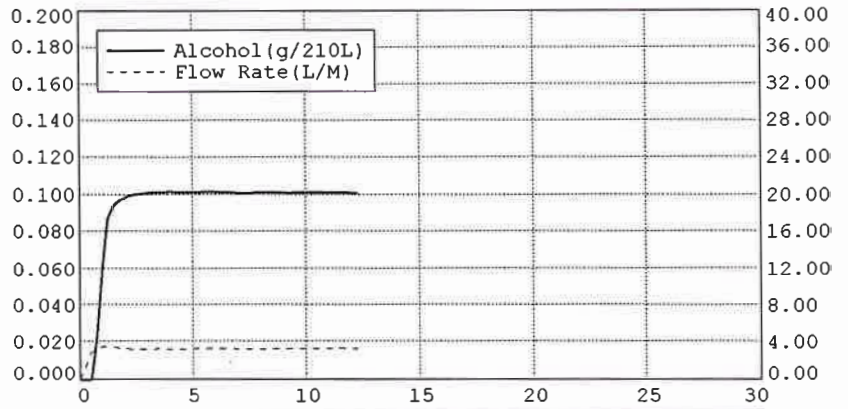
Average = 0.1020
Std Dev = 0.0000

*Lot 231P41233
Exp 9/20/25*

*Simulator SD1176
Exp 1/9/24*

COB 12/13/25

Arg = 0.102



SUPERVISOR TEST

Alaska Department of Public Safety
DATAMASTER dmt: 100397

Date: 12/13/2023
Time: 13:49:48

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

EXTERNAL STANDARD INFORMATION
NOMINAL: 0.100

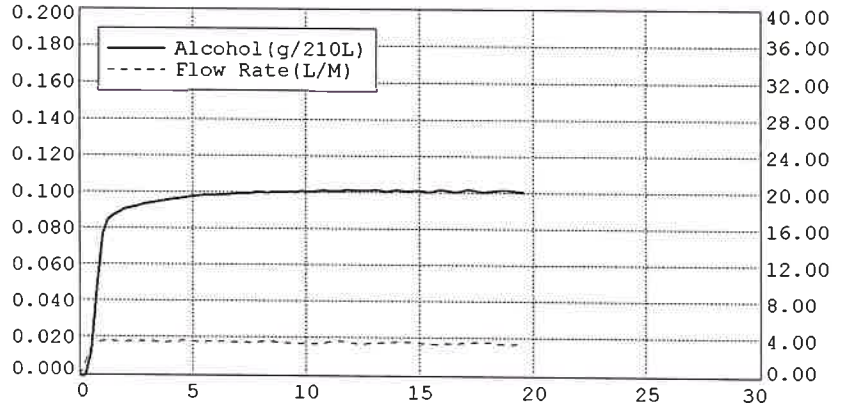
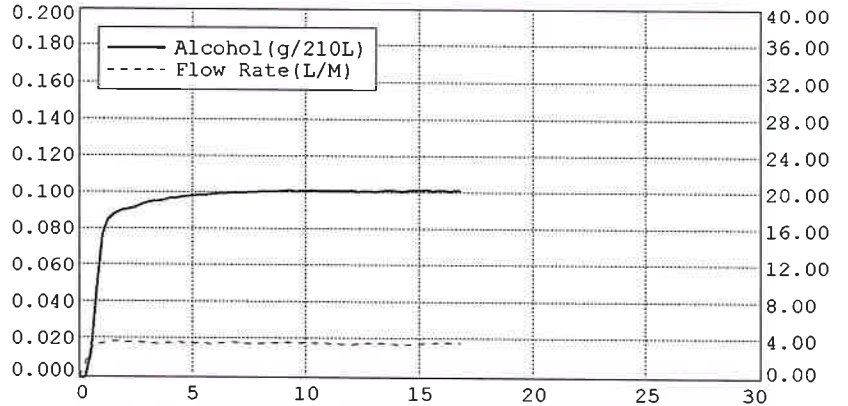
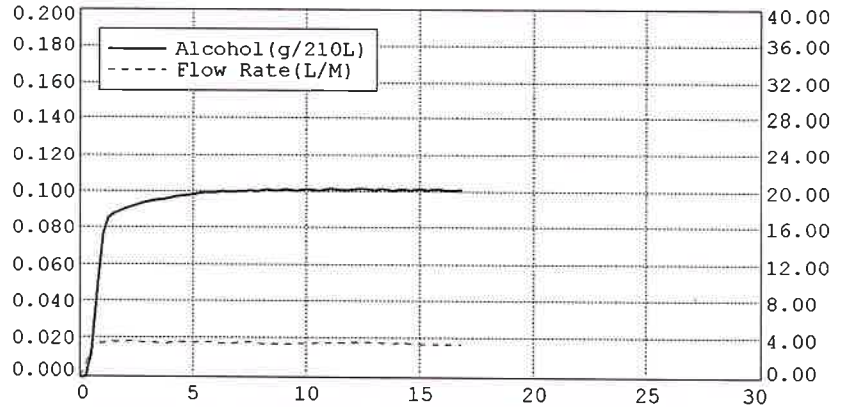
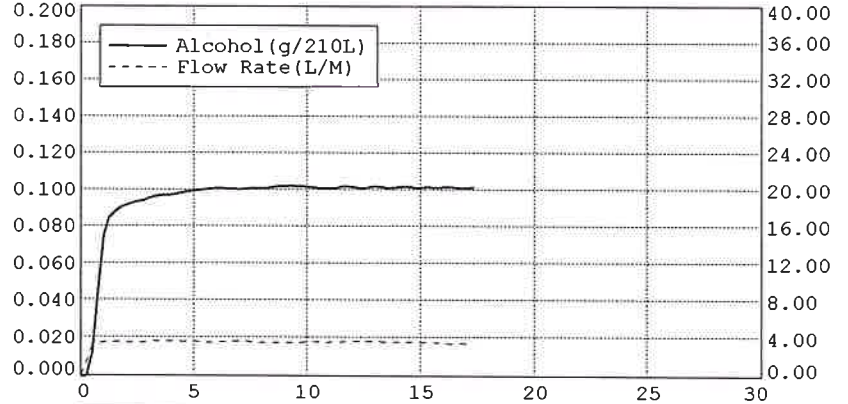
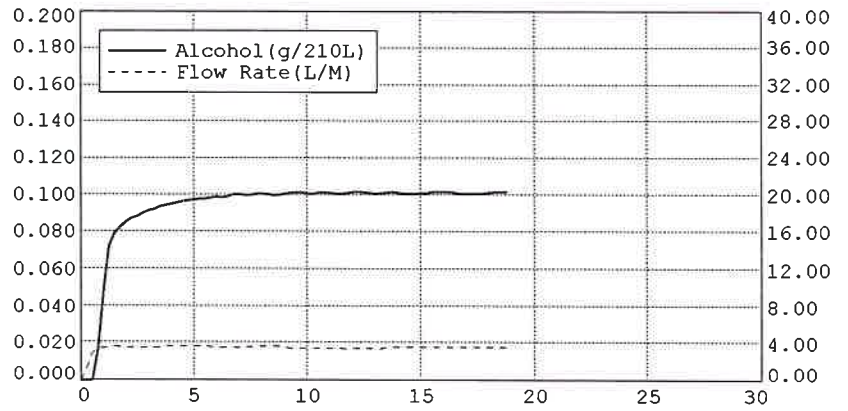
BLANK TEST	0.000	14:28
INTERNAL STANDARD	VERIFIED	14:28
EXTERNAL STANDARD	0.102	14:28
BLANK TEST	0.000	14:29
EXTERNAL STANDARD	0.102	14:29
BLANK TEST	0.000	14:30
EXTERNAL STANDARD	0.102	14:31
BLANK TEST	0.000	14:32
EXTERNAL STANDARD	0.102	14:32
BLANK TEST	0.000	14:33
EXTERNAL STANDARD	0.102	14:33
BLANK TEST	0.000	14:34

Average = 0.1020
Std Dev = 0.0000

*Lot 231P41233
Exp 9/30/25*

*Simulator SD1176
Exp 1/9/24*

CAB 12/13/25



SUPERVISOR TEST

Alaska Department of Public Safety
 DATAMASTER dmt: 100399

Date: 12/13/2023
 Time: 14:33:17

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

EXTERNAL STANDARD INFORMATION
 NOMINAL: 0.100

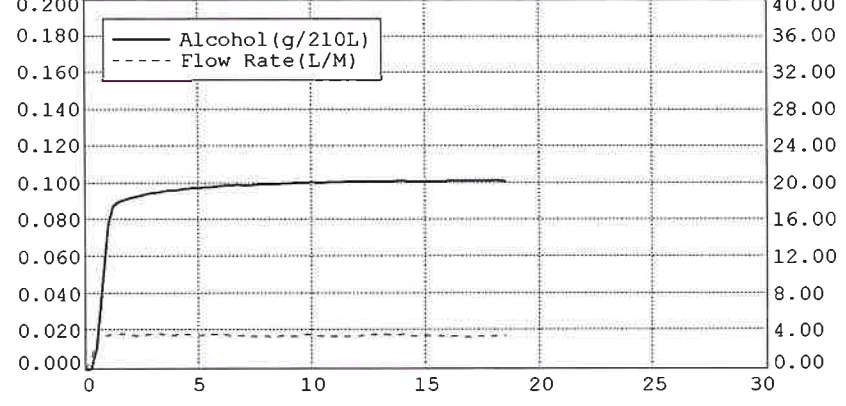
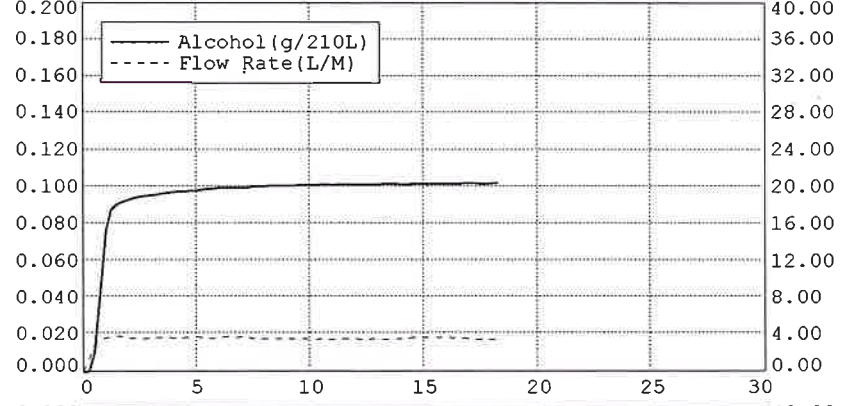
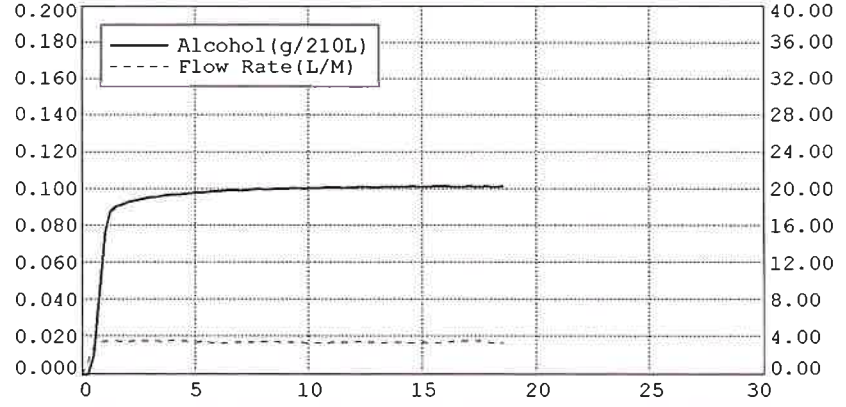
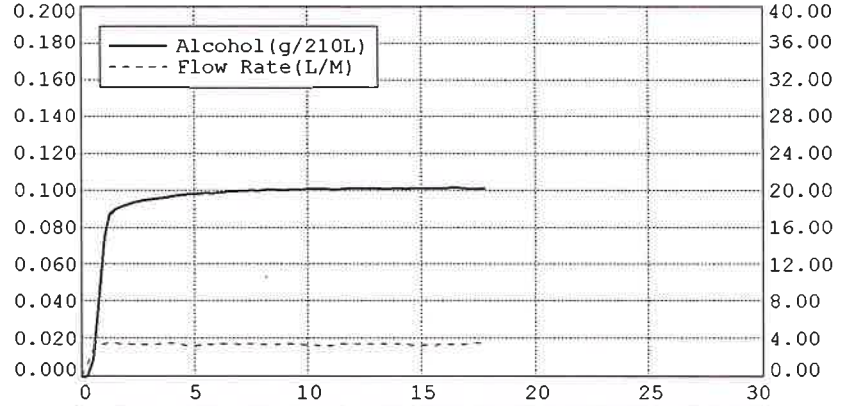
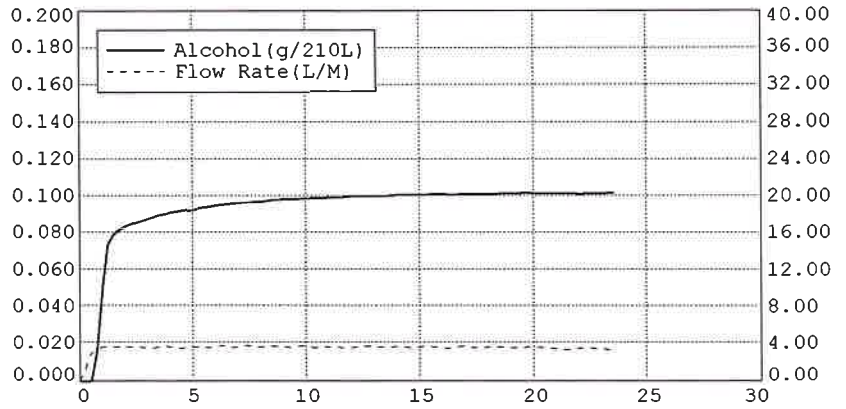
BLANK TEST	0.000	14:34
INTERNAL STANDARD	VERIFIED	14:34
EXTERNAL STANDARD	0.102	14:35
BLANK TEST	0.000	14:36
EXTERNAL STANDARD	0.103	14:36
BLANK TEST	0.000	14:37
EXTERNAL STANDARD	0.103	14:37
BLANK TEST	0.000	14:38
EXTERNAL STANDARD	0.103	14:39
BLANK TEST	0.000	14:40
EXTERNAL STANDARD	0.103	14:40
BLANK TEST	0.000	14:41

Average = 0.1028
 Std Dev = 0.0004

*Lot AG 231P41233
 Exp 9/20/25*

*Simulator SD1176
 Exp 1/9/24*

COB 12/13/25



DIAGNOSTIC RECORD

In House QA
100375, 100397, 100399

Completed on 2023.12.13 by COB

Alaska Department of Public Safety
DATAMASTER dmt: 100375

Date: 12/13/2023
Time: 11:19:54

VERSIONS
DMT: 3.02
PIC: 3.02
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 = 1.57 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 = 540 Hz PASSED
(475 Hz - 575 Hz)
Barometer = 28.9 in

PUMP INFO

Flow Rate = 3.835 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 PASSED
Xq = 0.092 0.29% (0.00% - 4.00%)

Technician Screen

DATAMASTER dmt: 100375

Date: 12/13/2023
Time: 11:26 AM

Temperatures (°C)

Sample Cell: 48.7°C
Breath Tube: 48.1°C

Current Barometer 28.9 in
Volume (Ltr) 0.00

Settings

Lamp: 1.54 V
Bias: 80 V
Cooler: 1.57 V
Chopper: 539 Hz

Voltages (V)

Flow: 1.05 V
Detector: -0.010 V

LINEARITY CHECK

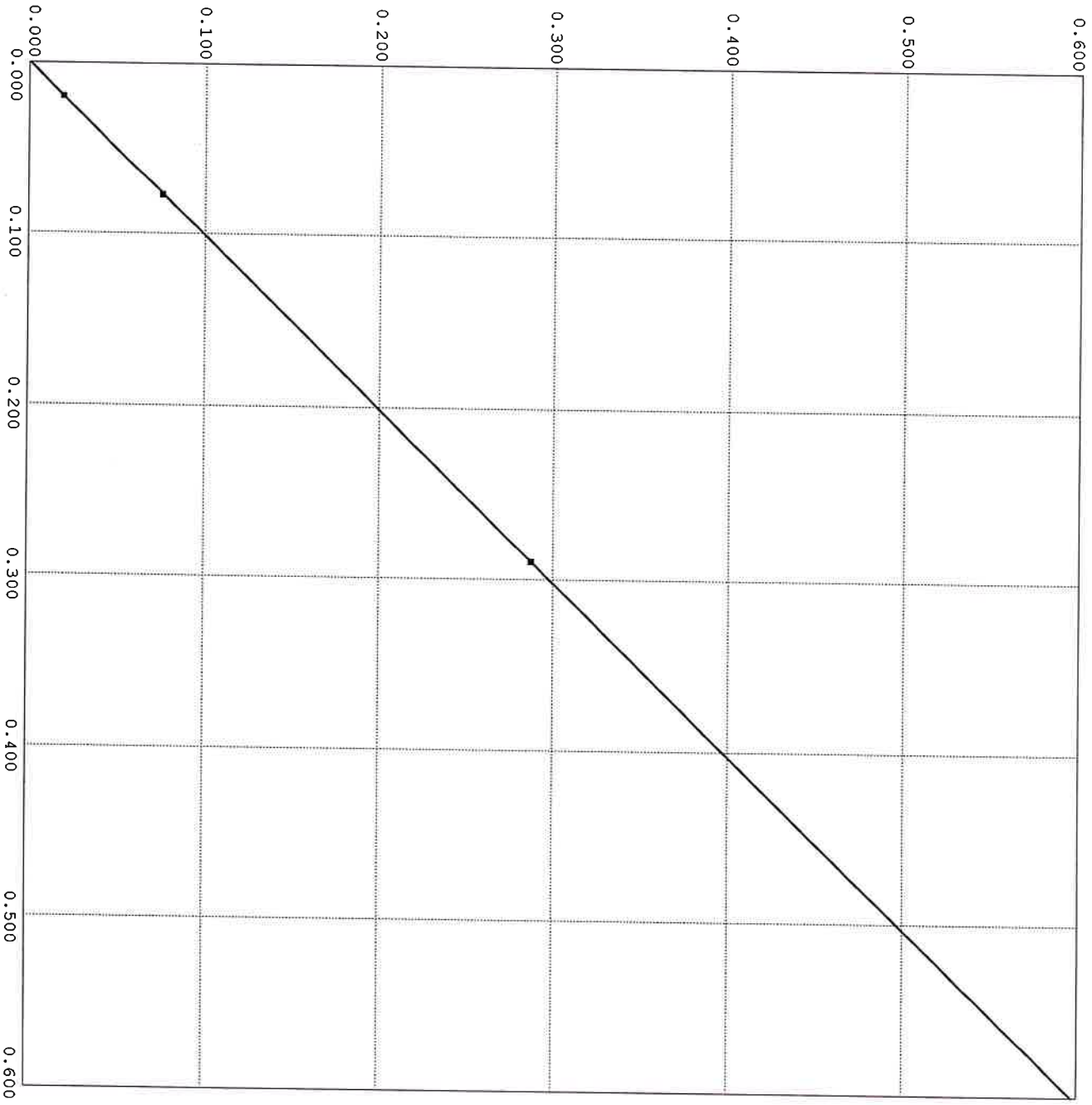
Alaska Department of Public Safety
DATAMASTER dmt: 100375

Date: 12/13/2023
Time: 11:31:03

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

TARGET	AVERAGE	STD. DEV.
0.019	0.0200	0.0000
0.077	0.0768	0.0004
0.289	0.2882	0.0004

SLOPE = 0.994367
R² = 0.999990



CVB

LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety
DATAMASTER dmt: 100375

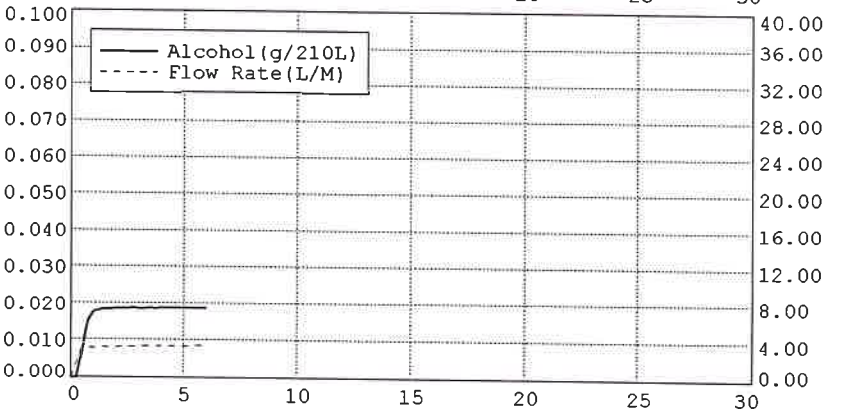
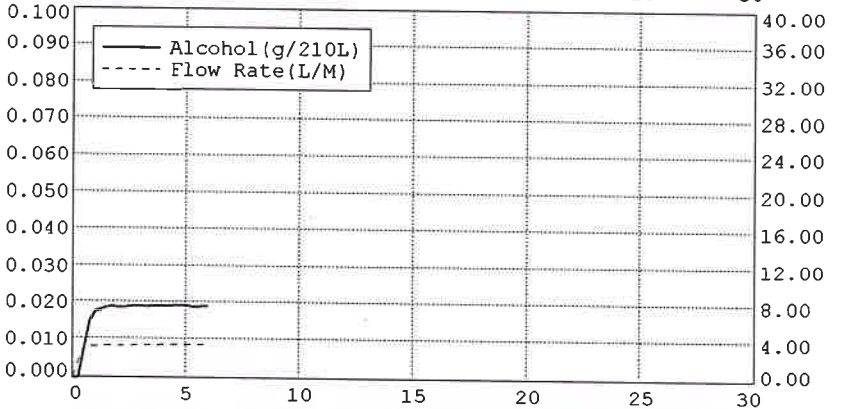
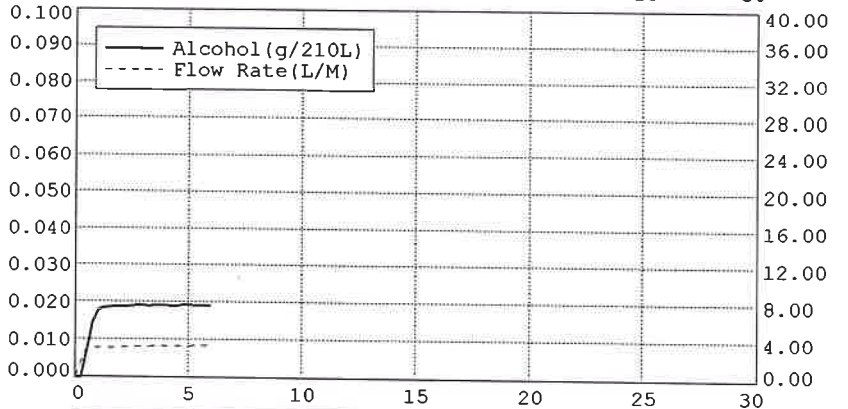
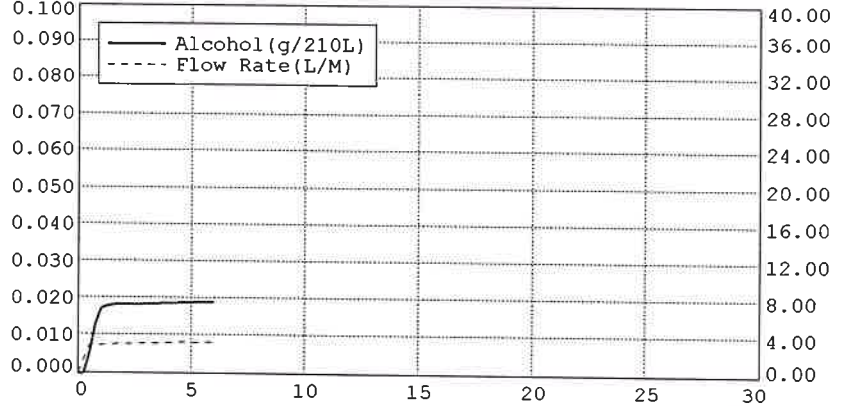
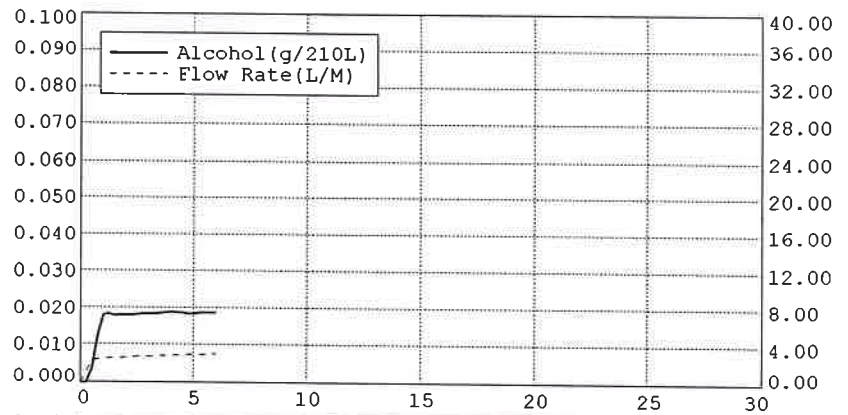
Date: 12/13/2023
Time: 11:31:05

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020
TARGET AT 28.86: 0.019
LOT #: AG217902
EXPIRATION: 06/28/2024
TANK PRESSURE: 668 psi

BLANK TEST	0.000	11:32
INTERNAL STANDARD	VERIFIED	11:32
EXTERNAL STANDARD	0.020	11:32
BLANK TEST	0.000	11:33
EXTERNAL STANDARD	0.020	11:33
BLANK TEST	0.000	11:34
EXTERNAL STANDARD	0.020	11:34
BLANK TEST	0.000	11:35
EXTERNAL STANDARD	0.020	11:35
BLANK TEST	0.000	11:36
EXTERNAL STANDARD	0.020	11:37
BLANK TEST	0.000	11:37

Average = 0.0200
Std Dev = 0.0000



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety
 DATAMASTER dmt: 100375

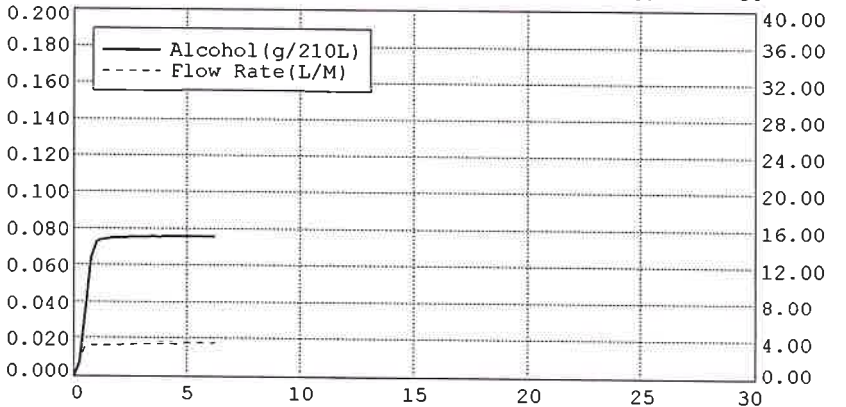
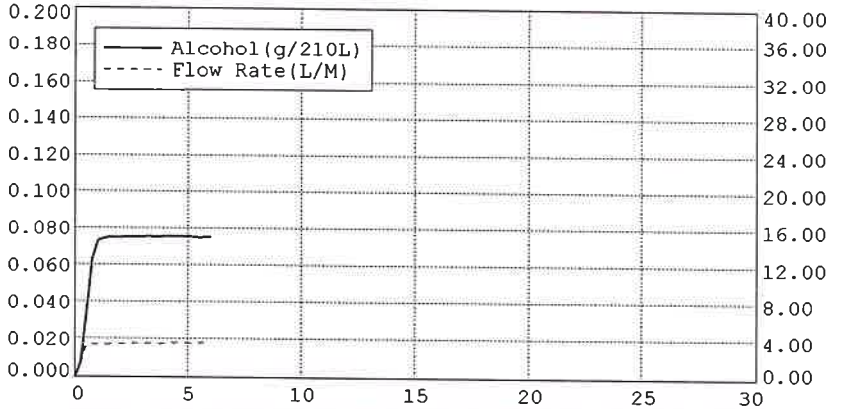
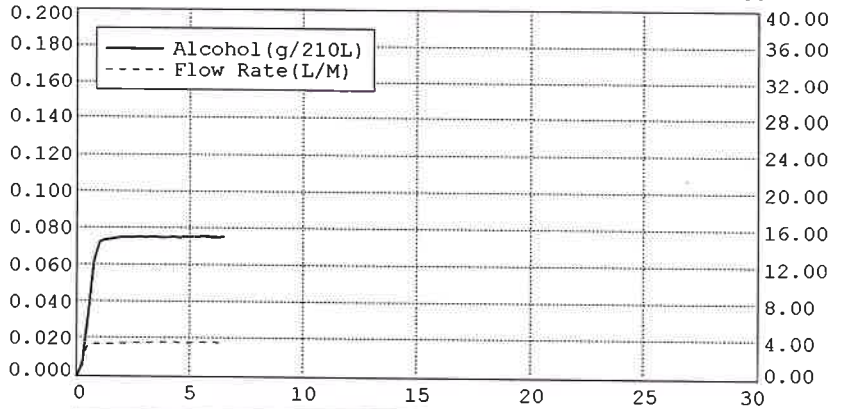
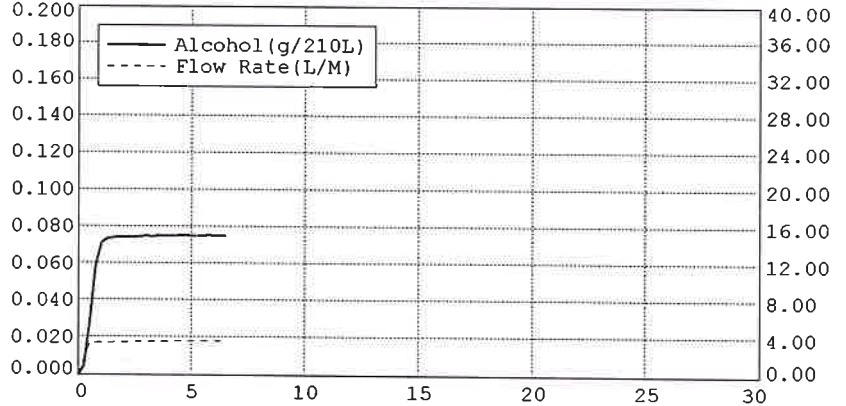
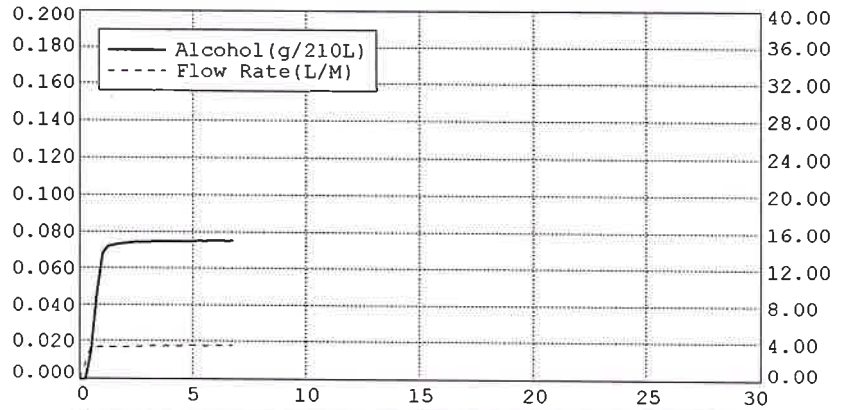
Date: 12/13/2023
 Time: 11:40:34

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.080
 TARGET AT 28.86: 0.077
 LOT #: AG135004
 EXPIRATION: 12/16/2023
 TANK PRESSURE: 854 psi

BLANK TEST	0.000	11:41
INTERNAL STANDARD	VERIFIED	11:41
EXTERNAL STANDARD	0.077	11:42
BLANK TEST	0.000	11:42
EXTERNAL STANDARD	0.076	11:43
BLANK TEST	0.000	11:44
EXTERNAL STANDARD	0.077	11:44
BLANK TEST	0.000	11:45
EXTERNAL STANDARD	0.077	11:45
BLANK TEST	0.000	11:46
EXTERNAL STANDARD	0.077	11:46
BLANK TEST	0.000	11:47

Average = 0.0768
 Std Dev = 0.0004



LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety
DATAMASTER dmt: 100375

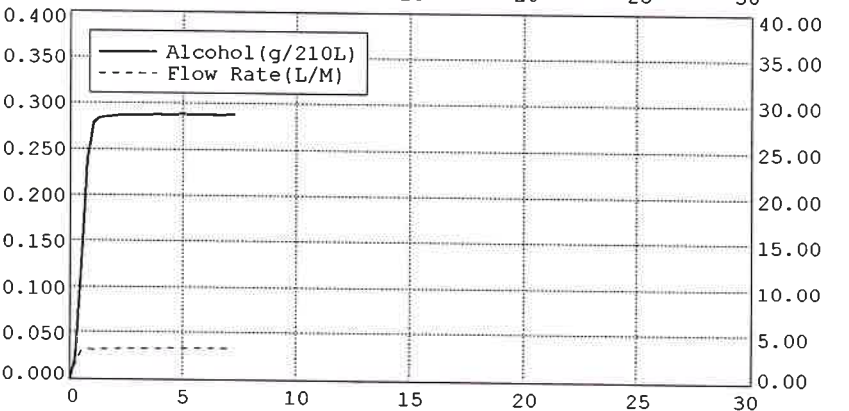
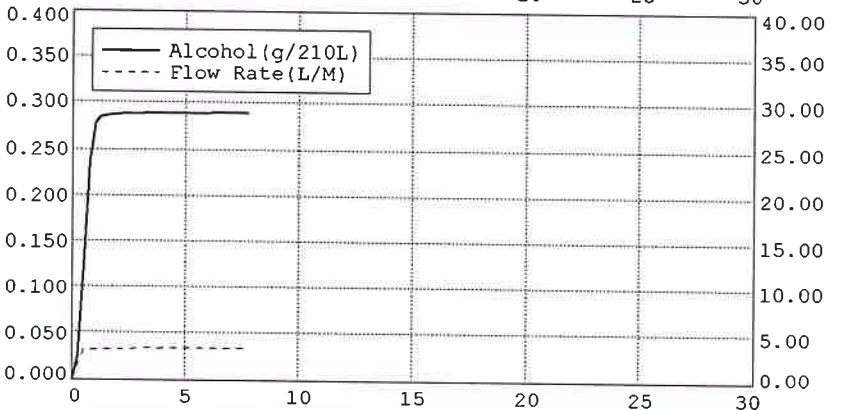
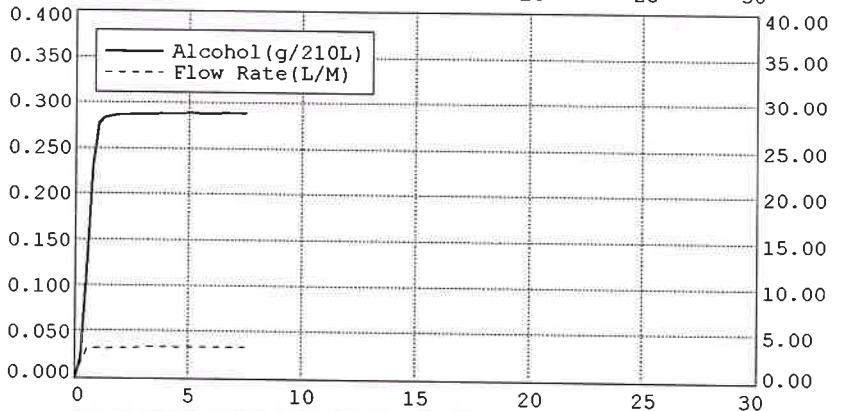
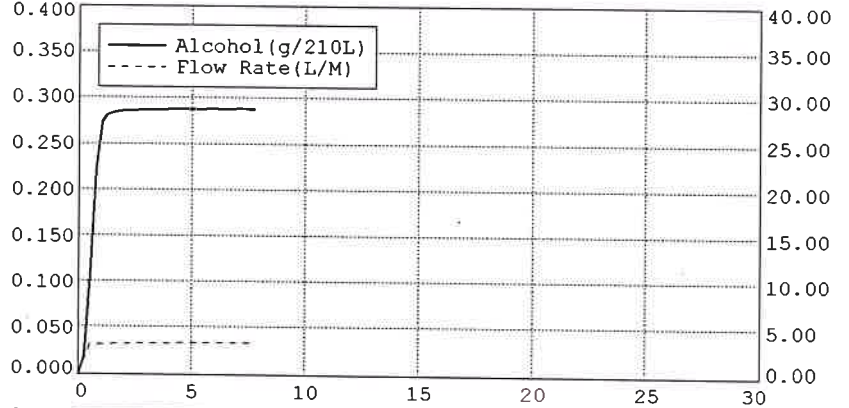
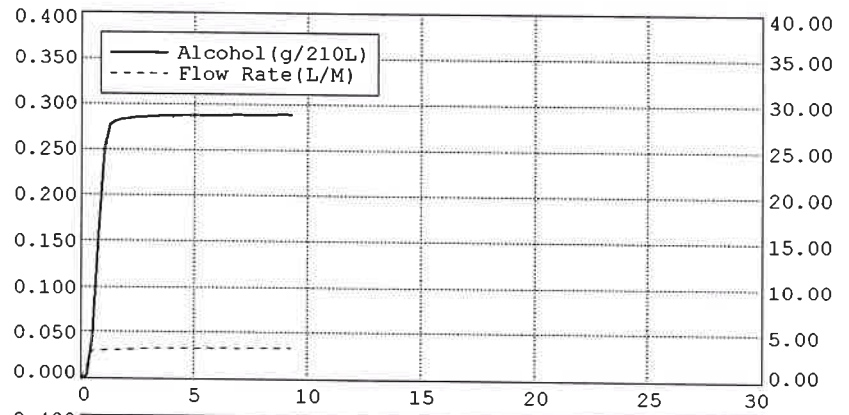
Date: 12/13/2023
Time: 11:49:58

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.300
TARGET AT 28.86: 0.289
LOT #: AG327804
EXPIRATION: 10/05/2025
TANK PRESSURE: 502 psi

BLANK TEST	0.000	11:51
INTERNAL STANDARD	VERIFIED	11:51
EXTERNAL STANDARD	0.288	11:51
BLANK TEST	0.000	11:52
EXTERNAL STANDARD	0.288	11:52
BLANK TEST	0.000	11:53
EXTERNAL STANDARD	0.288	11:53
BLANK TEST	0.000	11:54
EXTERNAL STANDARD	0.289	11:54
BLANK TEST	0.000	11:55
EXTERNAL STANDARD	0.288	11:55
BLANK TEST	0.000	11:56

Average = 0.2882
Std Dev = 0.0004



DIAGNOSTIC RECORD

Alaska Department of Public Safety
DATAMASTER dmt: 100397

Date: 12/13/2023
Time: 11:01:05

VERSIONS

DMT: 3.02
PIC: 3.02
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 = 1.80 V PASSED
(1.01 V - 2.37 V)
Cooler Voltage = 1.61 V PASSED
(1.04 V - 2.44 V)
Bias Voltage = 81 V PASSED
(49 V - 113 V)
Chopper Freq = 529 Hz PASSED
(475 Hz - 575 Hz)
Barometer = 28.9 in

PUMP INFO

Flow Rate = 4.050 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 = 0.093 1.02% (0.00% - 4.00%) PASSED

Technician Screen

DATAMASTER dmt: 100397

Date: 12/13/2023
Time: 11:07 AM

Temperatures (°C)

Sample Cell: 48.7°C
Breath Tube: 48.1°C

Current Barometer 28.9 in
Volume (Ltr) 0.00

Settings

Lamp: 1.80 V
Bias: 81 V
Cooler: 1.61 V
Chopper: 527 Hz

Voltages (V)

Flow: 1.05 V
Detector: -0.048 V

LINEARITY CHECK

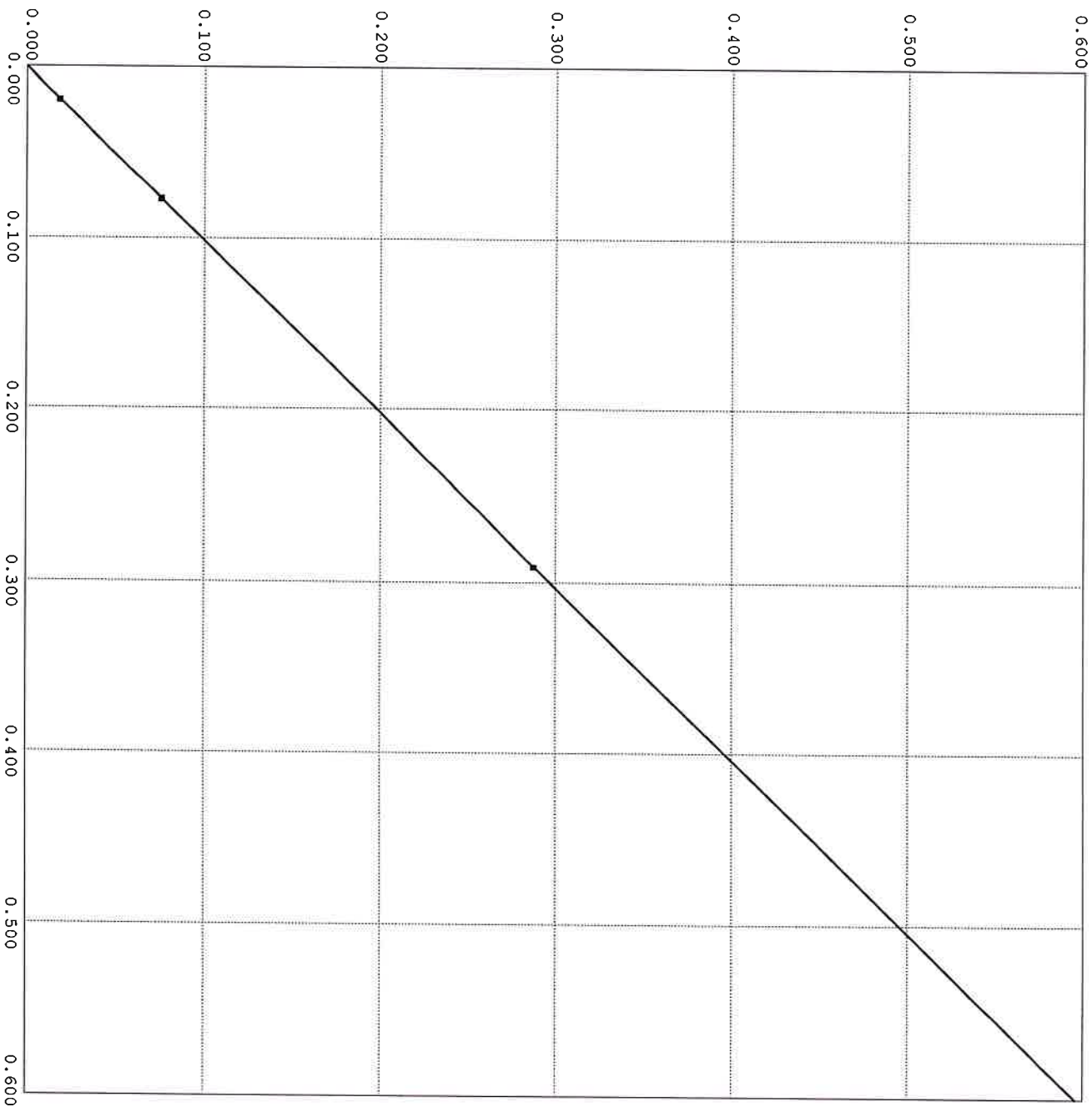
Alaska Department of Public Safety
DATAMASTER dmt: 100397

Date: 12/13/2023
Time: 11:13:20

SUPERVISOR NAME:
COLLEEN S O'BRYAN
OPERATOR'S #: 6237

TARGET	AVERAGE	STD. DEV.
0.019	0.0190	0.0000
0.077	0.0766	0.0005
0.290	0.2882	0.0004

SLOPE = 0.993377
R² = 1.000000



CDB

LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety
DATAMASTER dmt: 100397

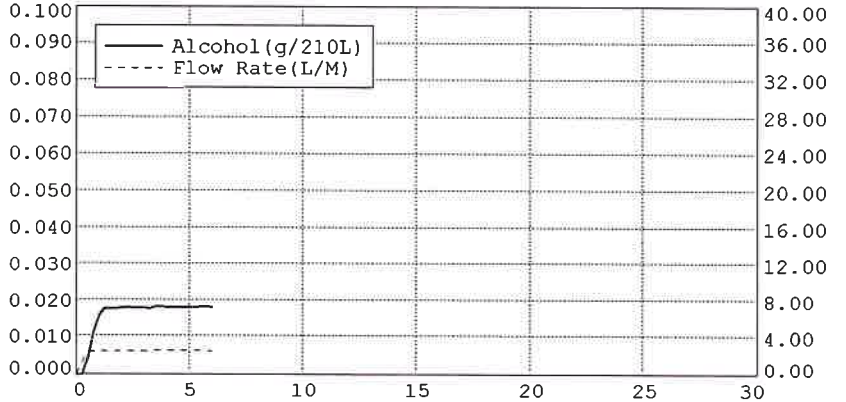
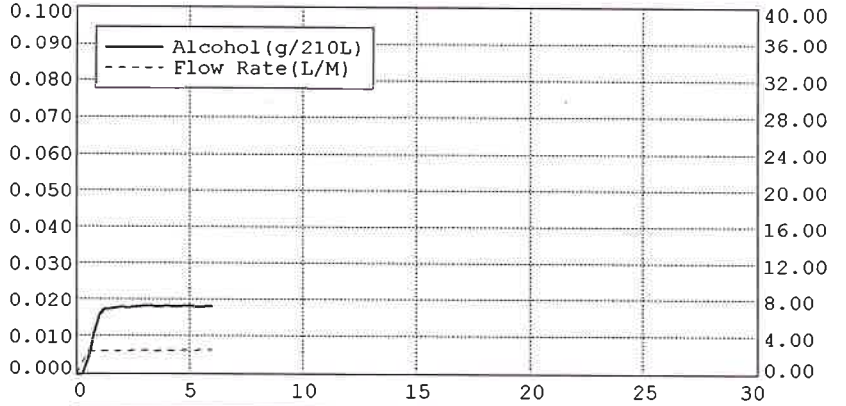
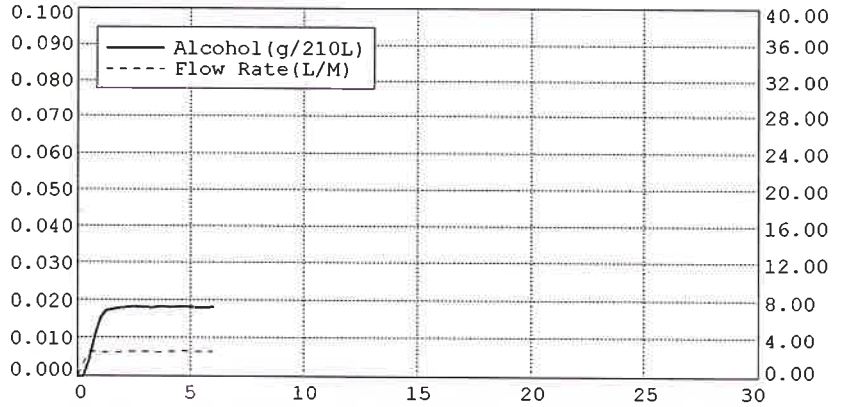
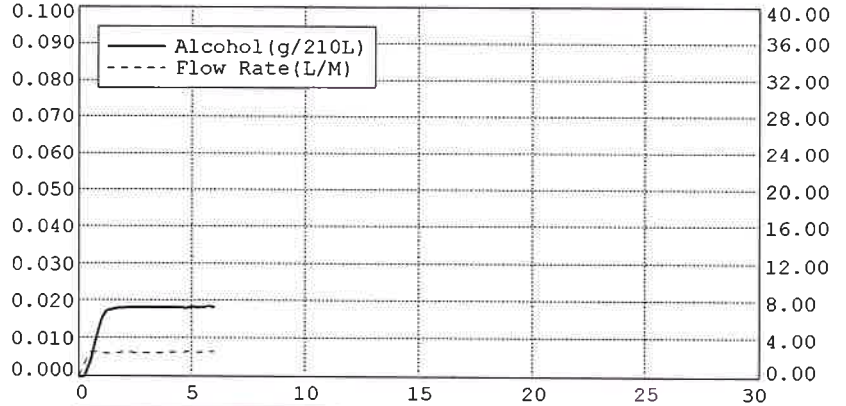
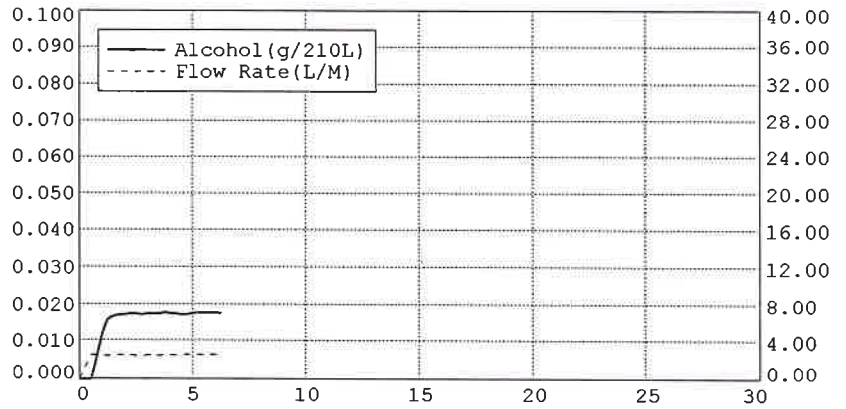
Date: 12/13/2023
Time: 11:13:22

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020
TARGET AT 28.88: 0.019
LOT #: AG217902
EXPIRATION: 06/28/2024
TANK PRESSURE: 638 psi

BLANK TEST	0.000	11:22
INTERNAL STANDARD	VERIFIED	11:23
EXTERNAL STANDARD	0.019	11:23
BLANK TEST	0.000	11:24
EXTERNAL STANDARD	0.019	11:24
BLANK TEST	0.000	11:25
EXTERNAL STANDARD	0.019	11:25
BLANK TEST	0.000	11:26
EXTERNAL STANDARD	0.019	11:26
BLANK TEST	0.000	11:27
EXTERNAL STANDARD	0.019	11:27
BLANK TEST	0.000	11:28

Average = 0.0190
Std Dev = 0.0000



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety
DATAMASTER dmt: 100397

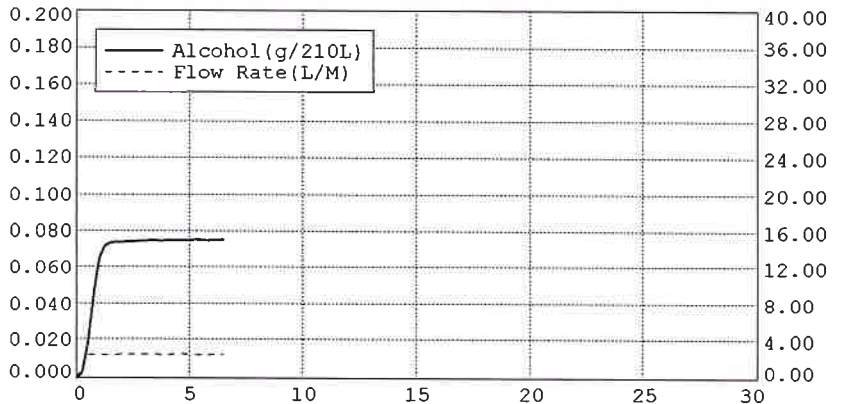
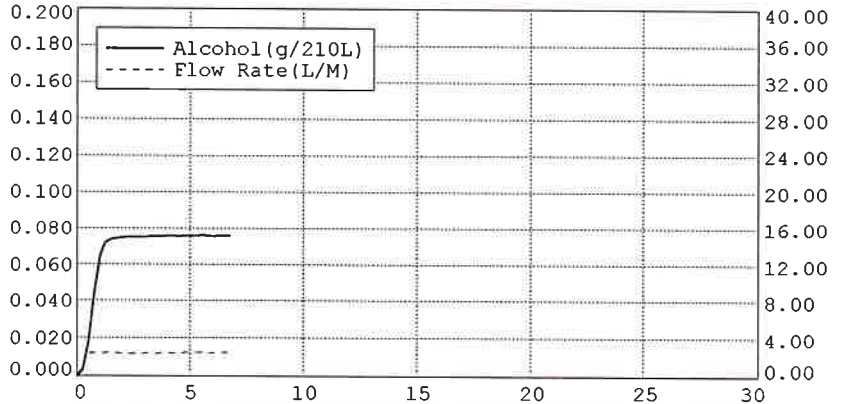
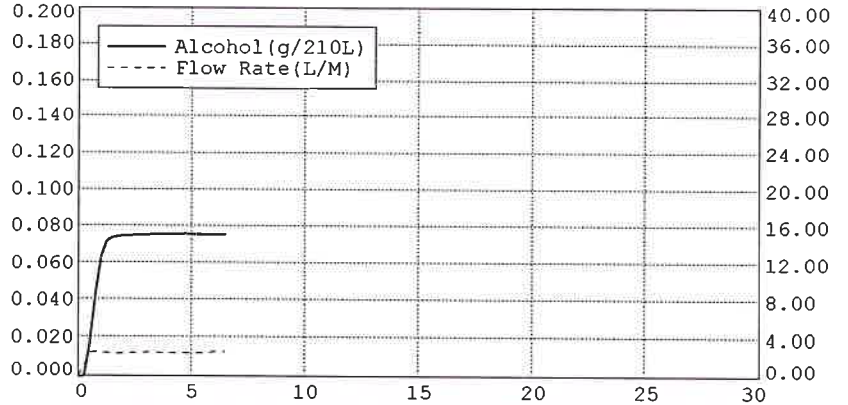
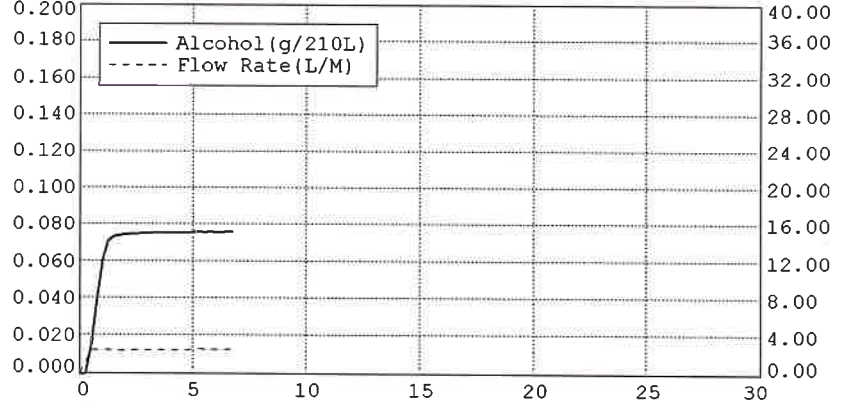
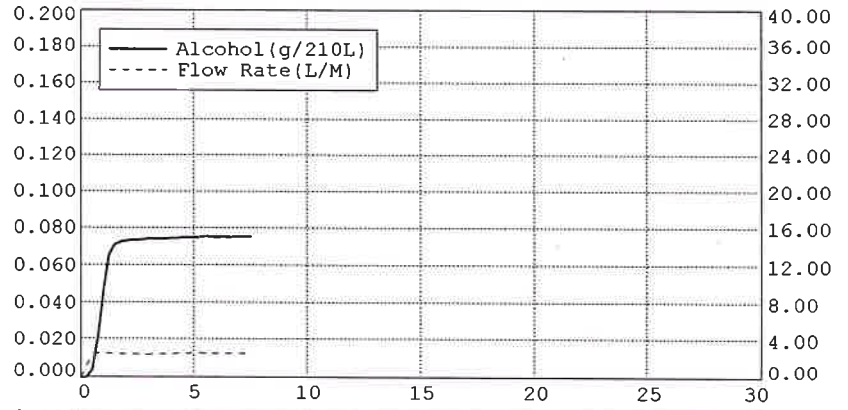
Date: 12/13/2023
Time: 11:28:55

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.080
TARGET AT 28.88: 0.077
LOT #: AG135004
EXPIRATION: 12/16/2023
TANK PRESSURE: 545 psi

BLANK TEST	0.000	11:30
INTERNAL STANDARD	VERIFIED	11:30
EXTERNAL STANDARD	0.076	11:30
BLANK TEST	0.000	11:31
EXTERNAL STANDARD	0.077	11:31
BLANK TEST	0.000	11:32
EXTERNAL STANDARD	0.076	11:32
BLANK TEST	0.000	11:33
EXTERNAL STANDARD	0.077	11:34
BLANK TEST	0.000	11:34
EXTERNAL STANDARD	0.077	11:35
BLANK TEST	0.000	11:36

Average = 0.0766
Std Dev = 0.0005



LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety
 DATAMASTER dmt: 100397

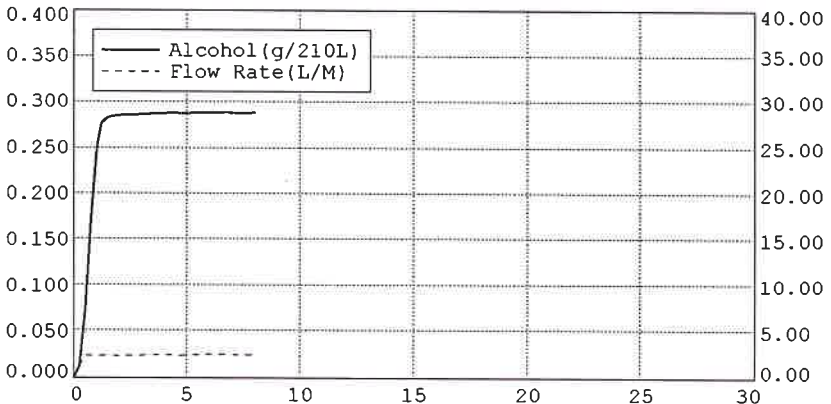
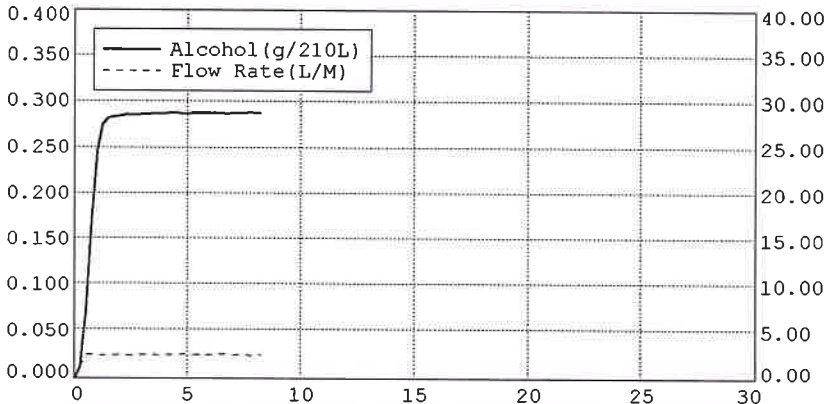
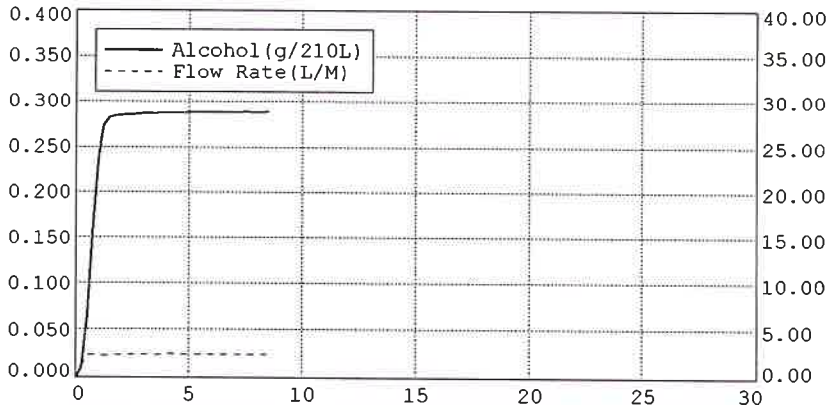
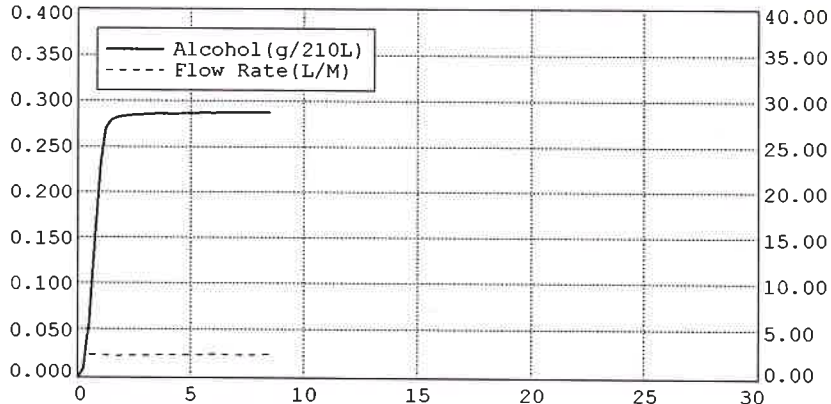
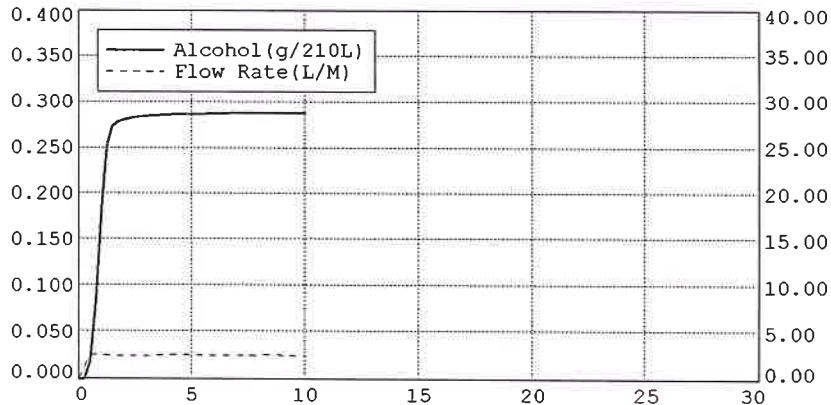
Date: 12/13/2023
 Time: 11:41:09

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.300
 TARGET AT 28.90: 0.290
 LOT #: AG327804
 EXPIRATION: 10/05/2025
 TANK PRESSURE: 461 psi

BLANK TEST	0.000	11:42
INTERNAL STANDARD	VERIFIED	11:42
EXTERNAL STANDARD	0.288	11:42
BLANK TEST	0.000	11:43
EXTERNAL STANDARD	0.288	11:43
BLANK TEST	0.000	11:44
EXTERNAL STANDARD	0.289	11:45
BLANK TEST	0.000	11:45
EXTERNAL STANDARD	0.288	11:46
BLANK TEST	0.000	11:47
EXTERNAL STANDARD	0.288	11:47
BLANK TEST	0.000	11:48

Average = 0.2882
 Std Dev = 0.0004



DIAGNOSTIC RECORD

Alaska Department of Public Safety
DATAMASTER dmt: 100399

Date: 12/13/2023
Time: 10:58:47

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

TEMPERATURES

Sample Chamber = 48.9°C PASSED
(44.0°C - 52.0°C)
Breath Tube = 48.1°C PASSED
(38.0°C - 50.0°C)

SETTINGS

Lamp Voltage = 1.79 V PASSED
(1.00 V - 2.32 V)
Cooler Voltage = 1.60 V PASSED
(0.99 V - 2.31 V)
Bias Voltage = 81 V PASSED
(49 V - 113 V)
Chopper Freq = 525 Hz PASSED
(475 Hz - 575 Hz)
Barometer = 28.9 in

PUMP INFO

Flow Rate = 4.489 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 = 0.084 0.10% (0.00% - 4.00%) PASSED

Technician Screen

DATAMASTER dmt: 100399

Date: 12/13/2023

Time: 11:05 AM

Temperatures (°C)

Sample Cell: 48.7°C

Breath Tube: 48.1°C

Current Barometer 28.9 in

Volume (Ltr) 0.00

Settings

Lamp: 1.79 V

Bias: 81 V

Cooler: 1.58 V

Chopper: 524 Hz

Voltages (V)

Flow: 1.06 V

Detector: -0.019 V

LINEARITY CHECK

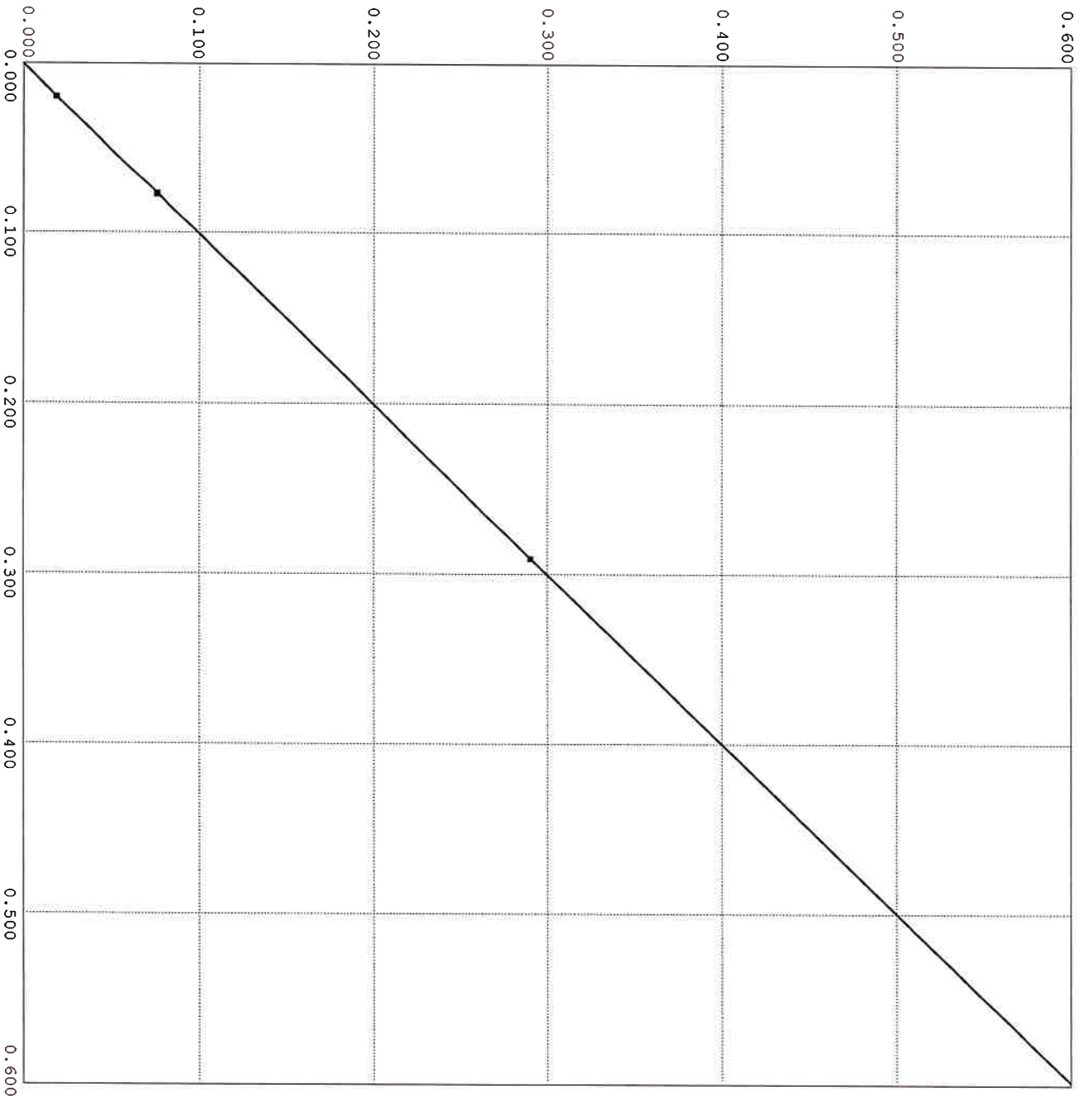
Alaska Department of Public Safety
DATAMASTER dmt: 100399

Date: 12/13/2023
Time: 11:11:42

SUPERVISOR NAME:
COLLEEN S O'BRYAN
OPERATOR'S #: 6237

TARGET	AVERAGE	STD. DEV.
0.019	0.0192	0.0004
0.077	0.0770	0.0000
0.290	0.2910	0.0000

SLOPE = 1.003423
R² = 0.999998



OK

LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety
 DATAMASTER dmt: 100399

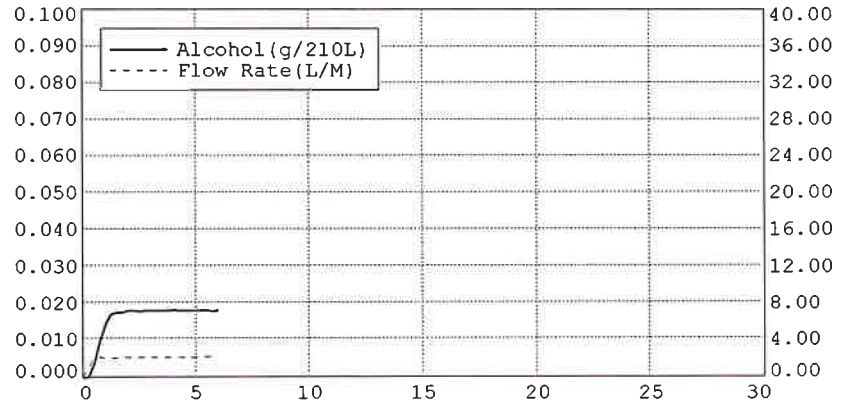
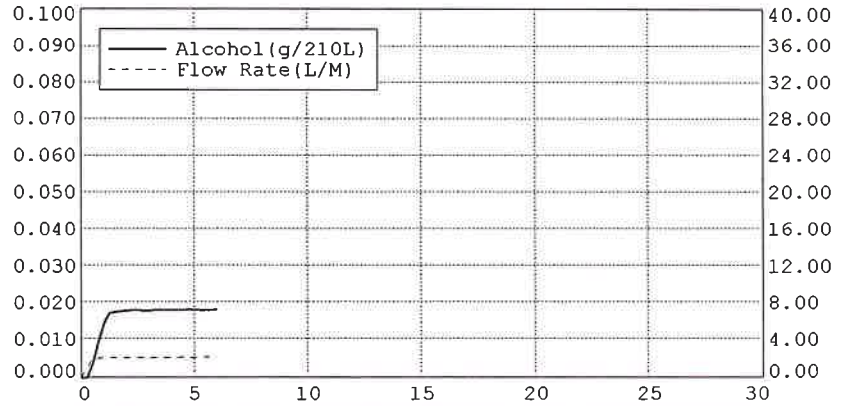
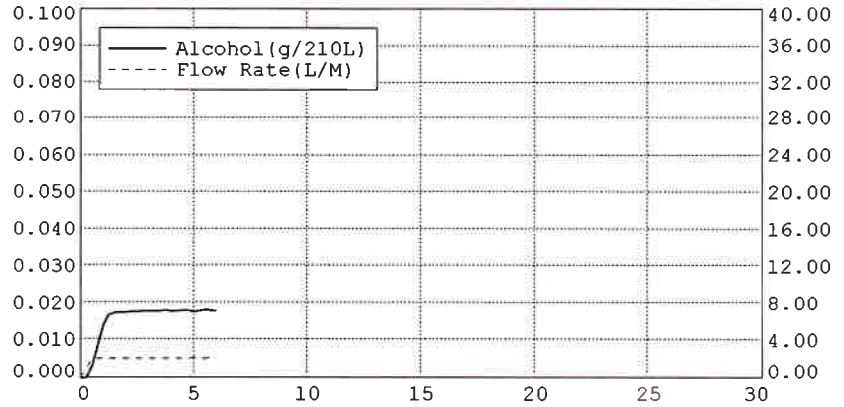
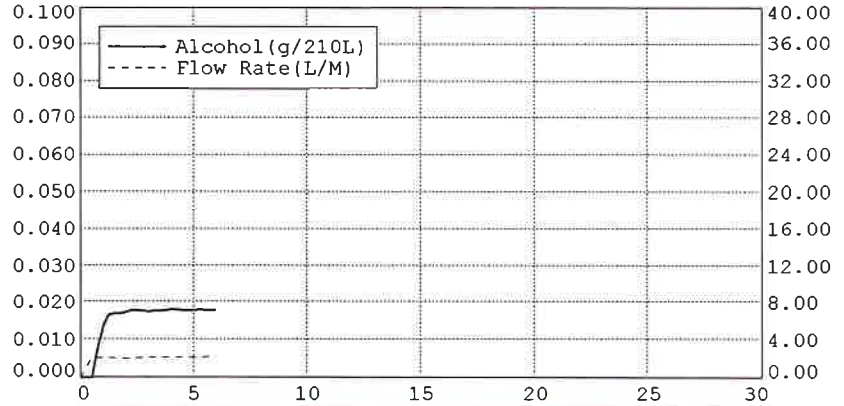
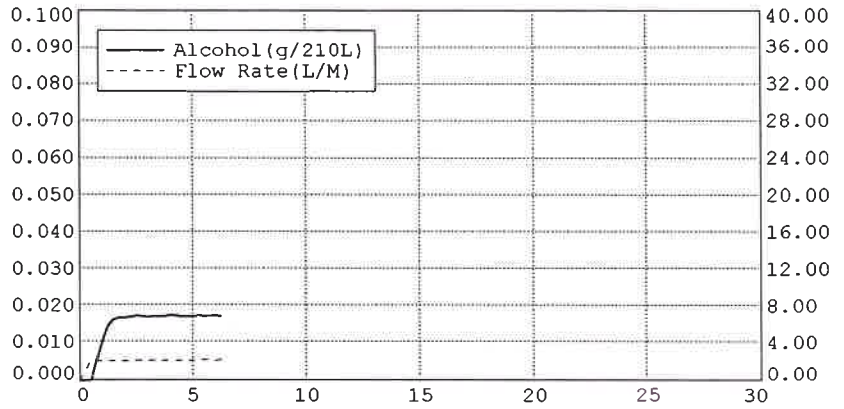
Date: 12/13/2023
 Time: 11:11:44

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020
 TARGET AT 28.87: 0.019
 LOT #: AG217902
 EXPIRATION: 06/28/2024
 TANK PRESSURE: 634 psi

BLANK TEST	0.000	11:27
INTERNAL STANDARD	VERIFIED	11:27
EXTERNAL STANDARD	0.019	11:28
BLANK TEST	0.000	11:29
EXTERNAL STANDARD	0.019	11:29
BLANK TEST	0.000	11:30
EXTERNAL STANDARD	0.019	11:30
BLANK TEST	0.000	11:31
EXTERNAL STANDARD	0.020	11:31
BLANK TEST	0.000	11:32
EXTERNAL STANDARD	0.019	11:32
BLANK TEST	0.000	11:33

Average = 0.0192
 Std Dev = 0.0004



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety
 DATAMASTER dmt: 100399

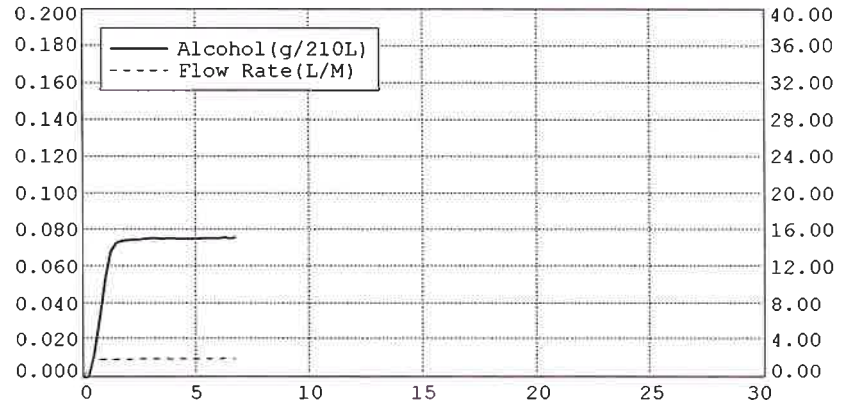
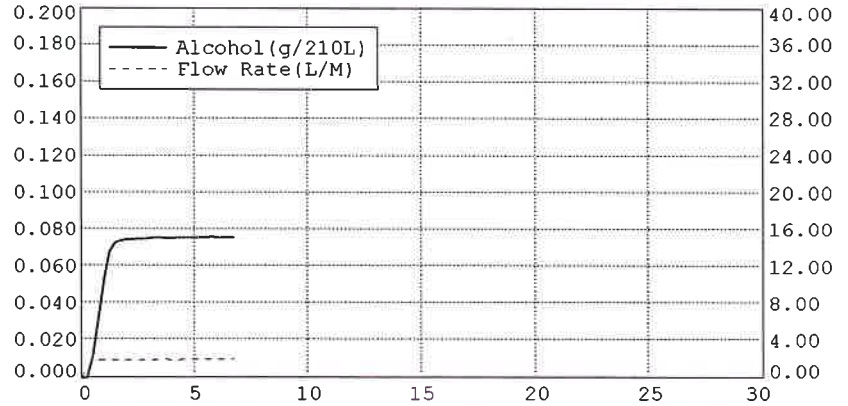
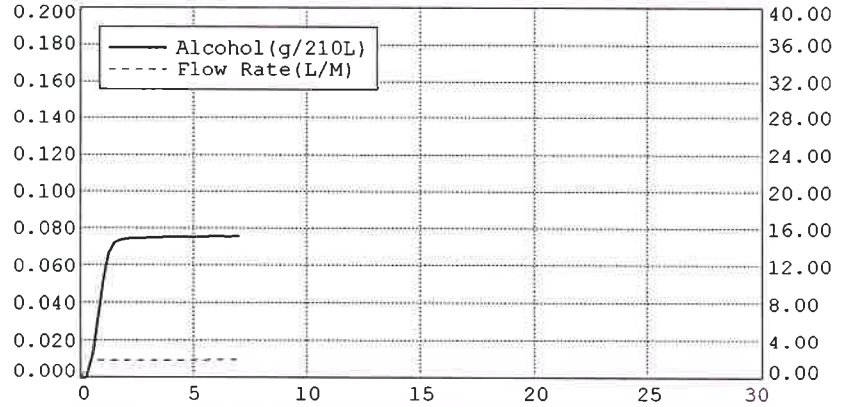
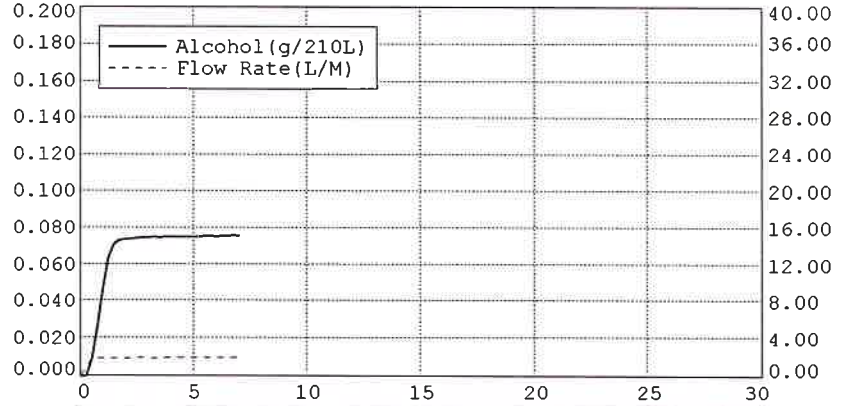
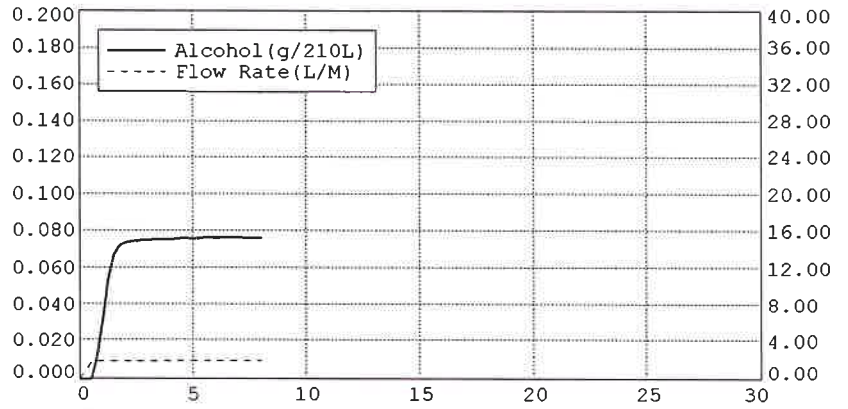
Date: 12/13/2023
 Time: 11:39:30

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.080
 TARGET AT 28.87: 0.077
 LOT #: AG310901
 EXPIRATION: 04/19/2025
 TANK PRESSURE: 329 psi

BLANK TEST	0.000	11:40
INTERNAL STANDARD	VERIFIED	11:40
EXTERNAL STANDARD	0.077	11:41
BLANK TEST	0.000	11:41
EXTERNAL STANDARD	0.077	11:42
BLANK TEST	0.000	11:43
EXTERNAL STANDARD	0.077	11:43
BLANK TEST	0.000	11:44
EXTERNAL STANDARD	0.077	11:44
BLANK TEST	0.000	11:45
EXTERNAL STANDARD	0.077	11:45
BLANK TEST	0.000	11:46

Average = 0.0770
 Std Dev = 0.0000



LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety
 DATAMASTER dmt: 100399

Date: 12/13/2023
 Time: 11:47:15

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.300
 TARGET AT 28.87: 0.290
 LOT #: AG327804
 EXPIRATION: 10/05/2025
 TANK PRESSURE: 446 psi

BLANK TEST	0.000	11:48
INTERNAL STANDARD	VERIFIED	11:48
EXTERNAL STANDARD	0.291	11:48
BLANK TEST	0.000	11:49
EXTERNAL STANDARD	0.291	11:50
BLANK TEST	0.000	11:51
EXTERNAL STANDARD	0.291	11:51
BLANK TEST	0.000	11:52
EXTERNAL STANDARD	0.291	11:52
BLANK TEST	0.000	11:53
EXTERNAL STANDARD	0.291	11:53
BLANK TEST	0.000	11:54

Average = 0.2910
 Std Dev = 0.0000

