

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:	22HP41201	Nominal Value:	121.00	mg/dL
Min. Sample Size:	500mL	Certified Value:	121.21	± 1.93 mg/dL
Solute:	Ethanol	Expiration Date:	8/24/2024	
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

8/24/22
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: 02/28/2023
Time: 09:19:28

SUPERVISOR NAME:
TATIANA MALNOSKE
OPERATOR'S #: 10437

EXTERNAL STANDARD INFORMATION
NOMINAL: 0.100

BLANK TEST	0.000	09:20
INTERNAL STANDARD	VERIFIED	09:21
EXTERNAL STANDARD	0.100	09:21
BLANK TEST	0.000	09:22
EXTERNAL STANDARD	0.100	09:22
BLANK TEST	0.000	09:23
EXTERNAL STANDARD	0.100	09:23
BLANK TEST	0.000	09:24
EXTERNAL STANDARD	0.100	09:25
BLANK TEST	0.000	09:26
EXTERNAL STANDARD	0.100	09:26
BLANK TEST	0.000	09:27

Average = 0.1000
Std Dev = 0.0000

0.100

Lot #: 22HP41201

Exp: 08/24/2024

Simulator SN: DK4163

Calibrated: 01/09/2023

TLM 02/28/23

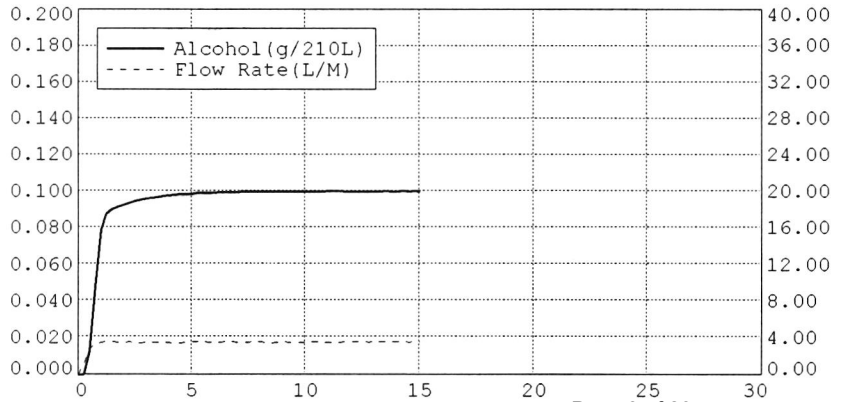
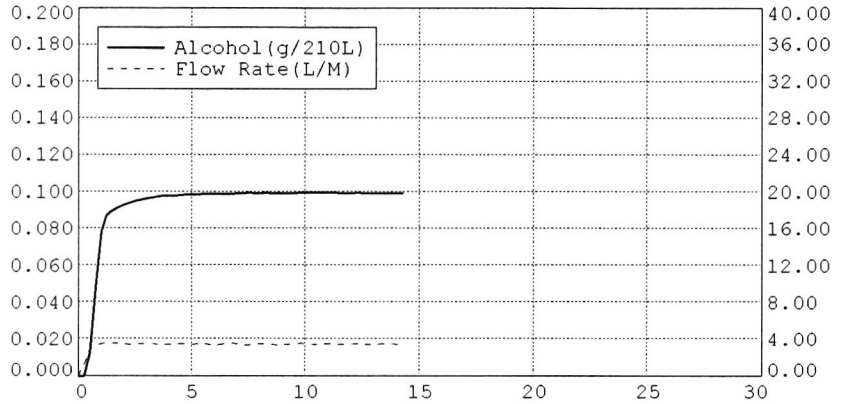
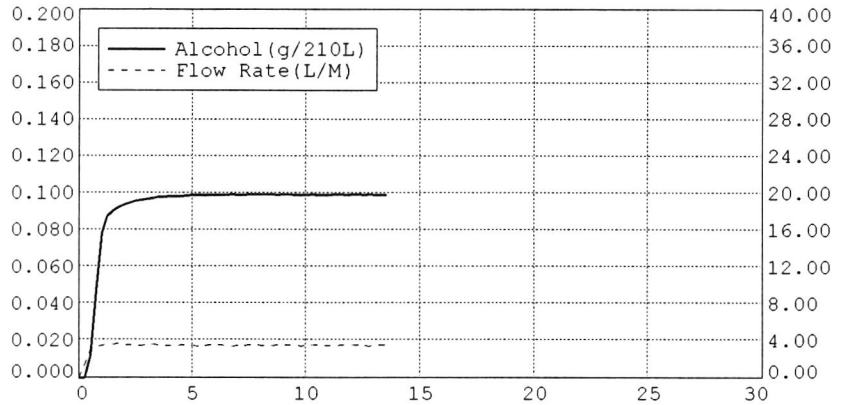
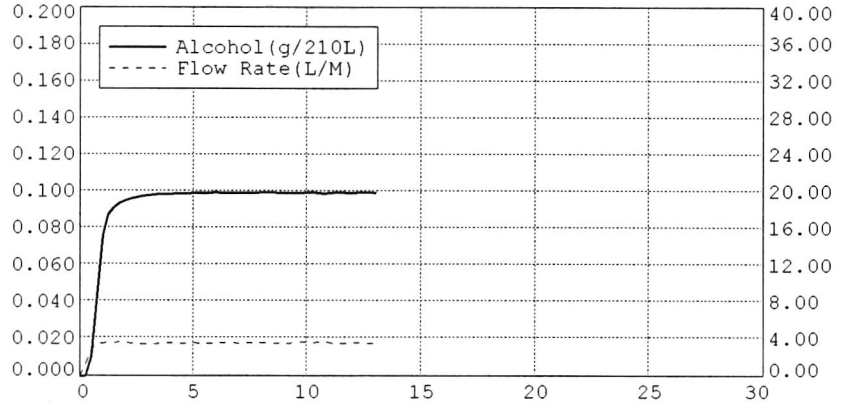
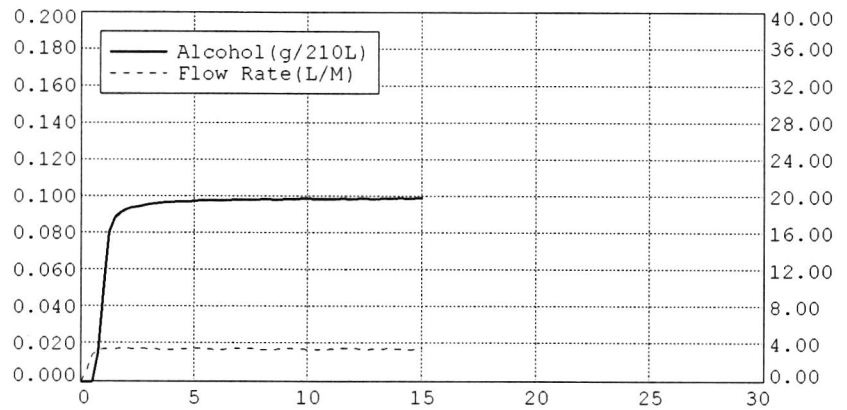
0.1000

0.1014

0.1020

0.101

22HP41201 Lifeloc 0.100 EXP 08/24/2024



SUPERVISOR TEST

Alaska Department of Public Safety
DATAMASTER dmt: 100397

Date: 02/28/2023
Time: 09:21:00

SUPERVISOR NAME:
TATIANA MALNOSKE
OPERATOR'S #: 10437

EXTERNAL STANDARD INFORMATION
NOMINAL: 0.100

BLANK TEST	0.000	09:22
INTERNAL STANDARD	VERIFIED	09:22
EXTERNAL STANDARD	0.101	09:22
BLANK TEST	0.000	09:23
EXTERNAL STANDARD	0.101	09:24
BLANK TEST	0.000	09:24
EXTERNAL STANDARD	0.102	09:25
BLANK TEST	0.000	09:26
EXTERNAL STANDARD	0.101	09:26
BLANK TEST	0.000	09:27
EXTERNAL STANDARD	0.102	09:27
BLANK TEST	0.000	09:28

Average = 0.1014
Std Dev = 0.0005

0.100

Lot#: 22HP41201

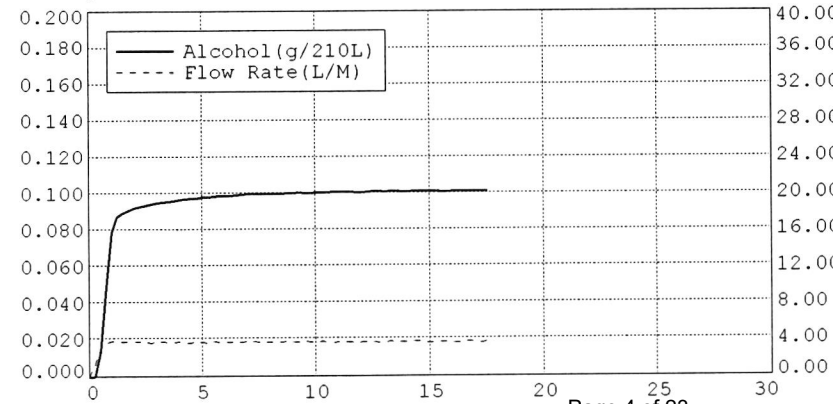
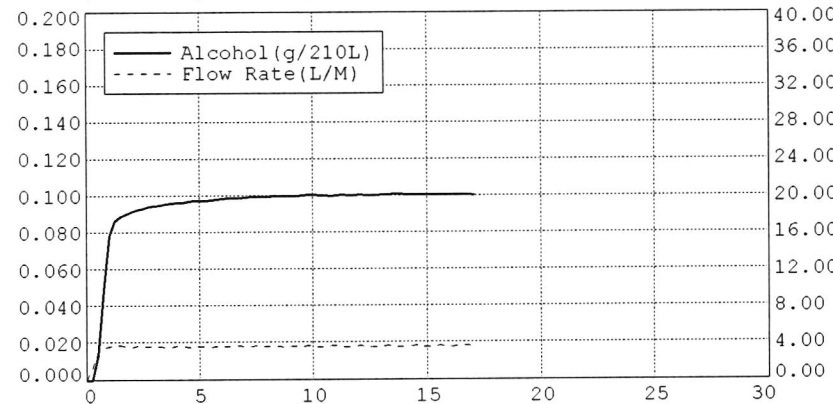
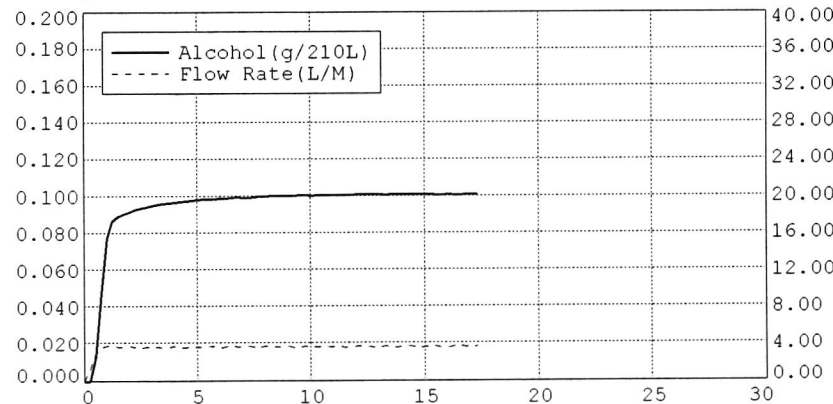
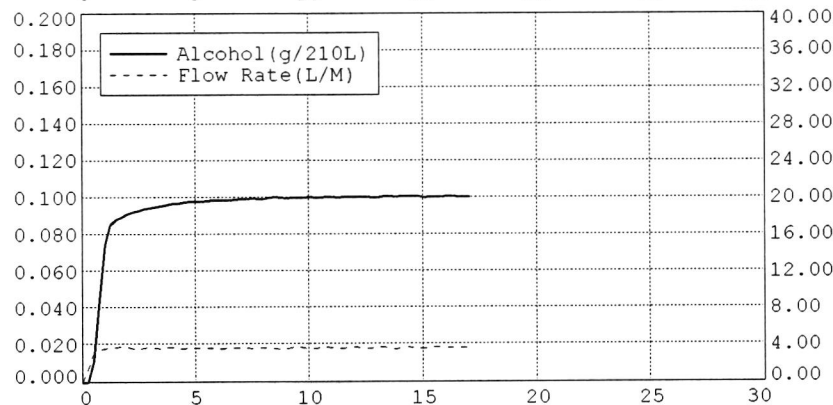
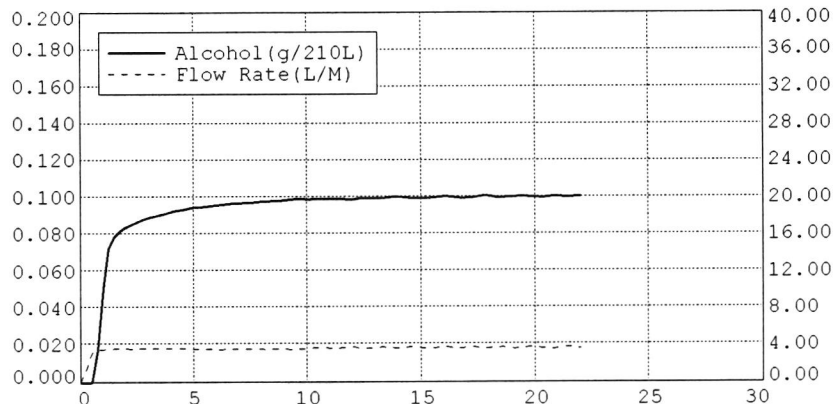
Exp: 08/24/2024

Simulator SN: DK416B

Calibrated: 01/09/2023

TLM 02/28/23

22HP41201 Lifeloc 0.100 EXP 08/24/2024



SUPERVISOR TEST

Alaska Department of Public Safety
DATAMASTER dmt: 100399

Date: 02/28/2023
Time: 09:26:43

SUPERVISOR NAME:
TATIANA MALNOSKE
OPERATOR'S #: 10437

EXTERNAL STANDARD INFORMATION
NOMINAL: 0.100

BLANK TEST	0.000	09:27
INTERNAL STANDARD	VERIFIED	09:28
EXTERNAL STANDARD	0.102	09:28
BLANK TEST	0.000	09:29
EXTERNAL STANDARD	0.102	09:29
BLANK TEST	0.000	09:30
EXTERNAL STANDARD	0.102	09:31
BLANK TEST	0.000	09:32
EXTERNAL STANDARD	0.102	09:32
BLANK TEST	0.000	09:33
EXTERNAL STANDARD	0.102	09:33
BLANK TEST	0.000	09:34

Average = 0.1020
Std Dev = 0.0000

0.100

Lot# : 22HP41201

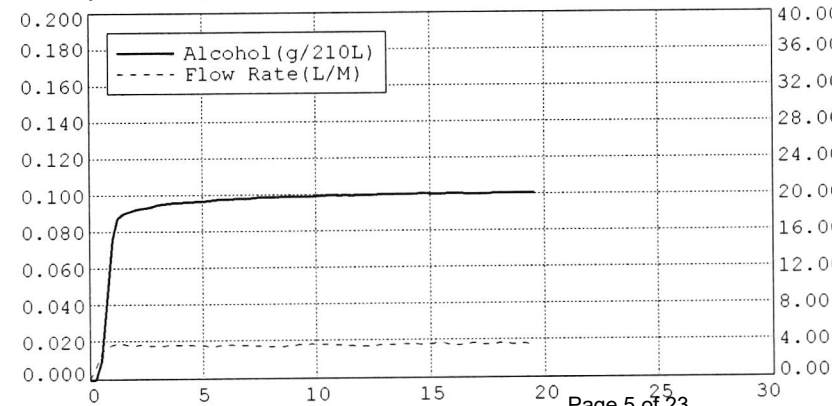
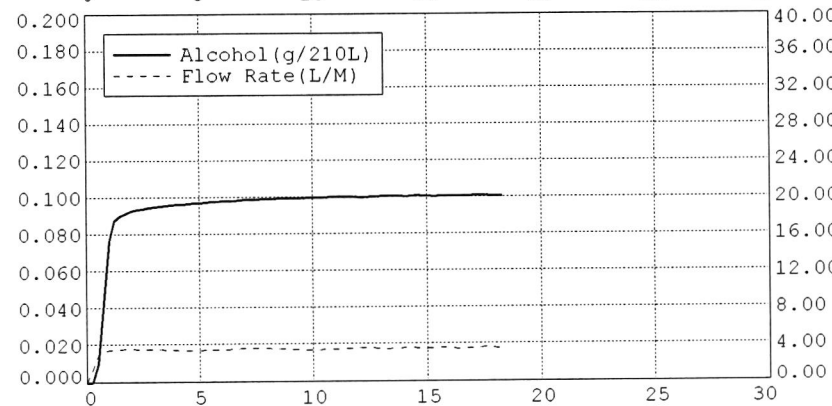
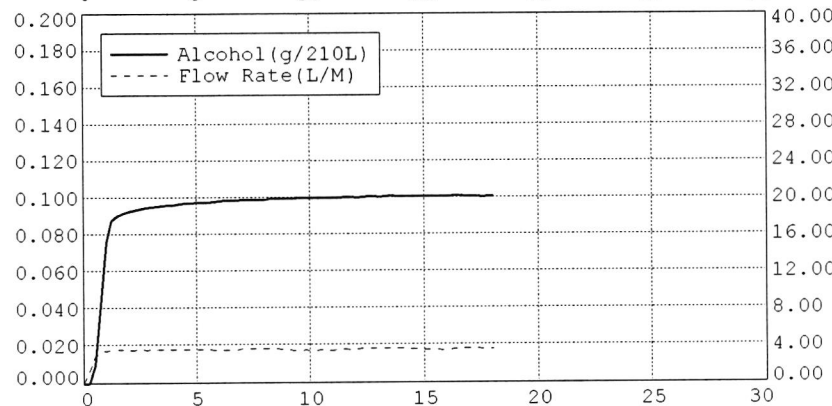
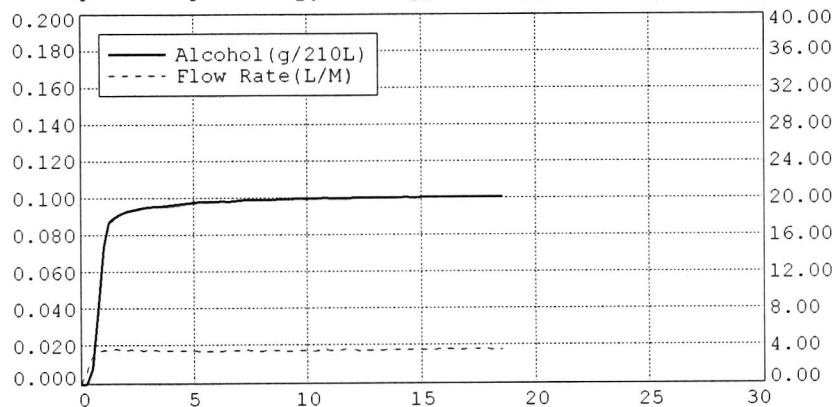
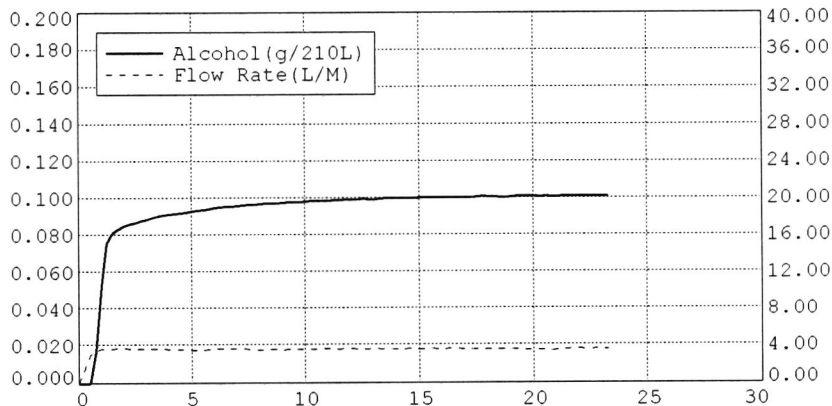
Exp: 08/24/2024

Simulator SN: DK4163

Calibrated: 01/09/2023

TLM 02/28/23

22HP41201 Lifeloc 0.100 EXP 08/24/2024



DIAGNOSTIC RECORD

 Alaska Department of Public Safety
 DATAMASTER dmt: 100375

Date: 02/28/2023
 Time: 07:57:23

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 = 1.49 V	PASSED
(0.92 V - 2.16 V)	
Cooler Voltage = 1.65 V	PASSED
(0.92 V - 2.16 V)	
Bias Voltage = 79 V	PASSED
(47 V - 111 V)	
Chopper Freq = 541 Hz	PASSED
(475 Hz - 575 Hz)	
Barometer = 29.4 in	

PUMP INFO

Flow Rate = 3.967 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 = 0.091 0.10%	PASSED
(0.00% - 4.00%)	

Technician Screen

DATAMASTER dmt: 100375

Date: 02/28/2023

Time: 8:06 AM

Temperatures (°C)

Sample Cell: 48.7°C

Breath Tube: 48.1°C

Current Barometer 29.4 in

Volume (Ltr) 0.00

Settings

Lamp: 1.54 V

Bias: 79 V

Cooler: 1.54 V

Chopper: 541 Hz

Voltages (V)

Flow: 1.05 V

Detector: 0.037 V

LINEARITY CHECK

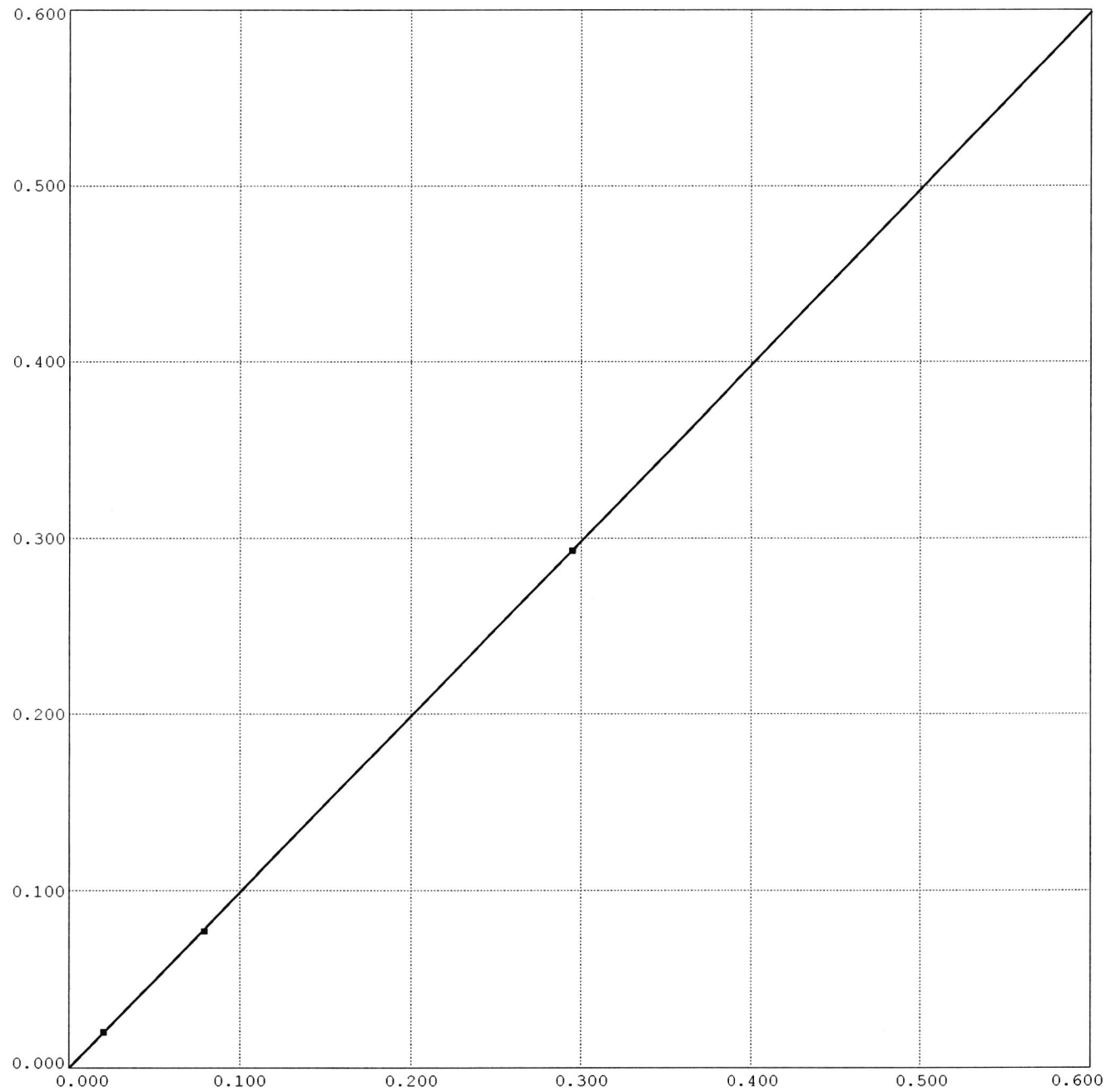
Alaska Department of Public Safety
DATAMASTER dmt: 100375

Date: 02/28/2023
Time: 08:37:32

SUPERVISOR NAME:
TATIANA MALNOSKE
OPERATOR'S #: 10437

TARGET	AVERAGE	STD. DEV.
0.020	0.0208	0.0004
0.079	0.0780	0.0000
0.294	0.2936	0.0005

SLOPE = 0.997548
R² = 0.999965



TLM

LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety
DATAMASTER dmt: 100375

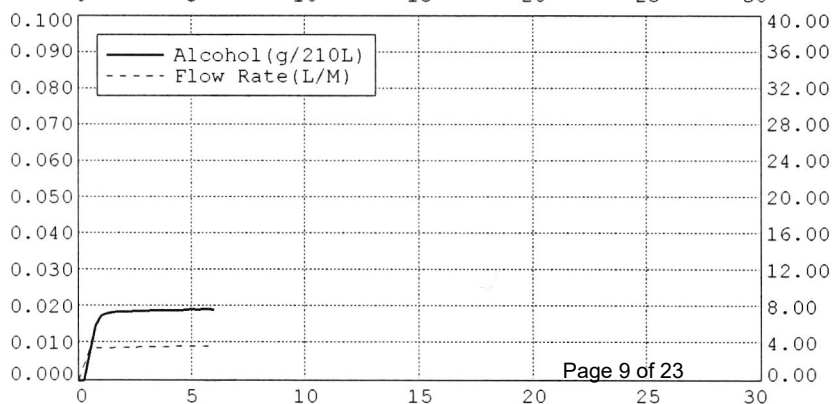
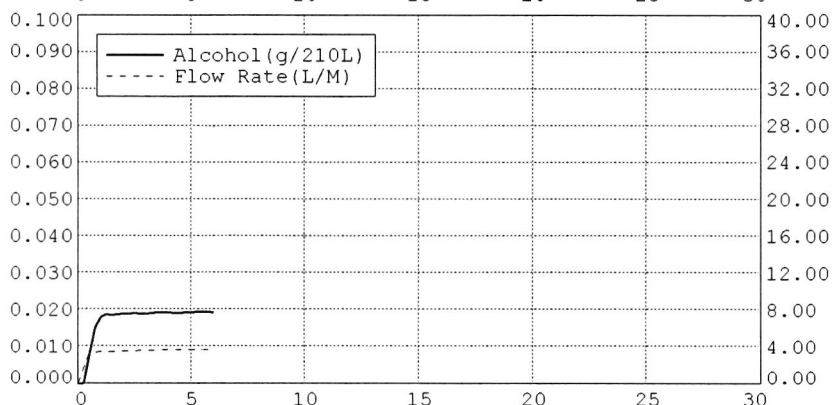
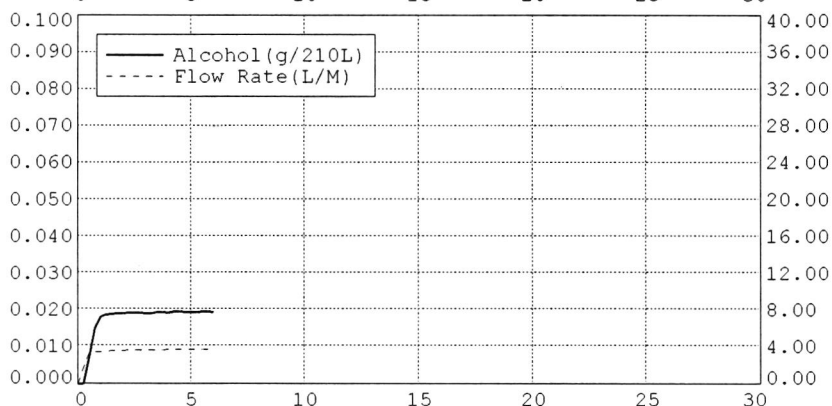
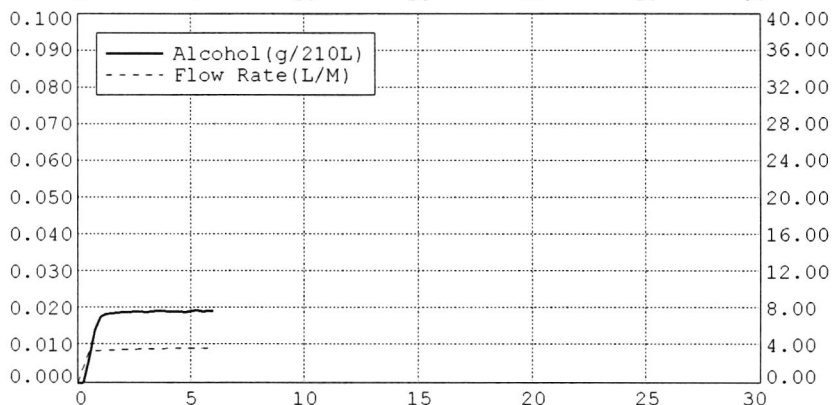
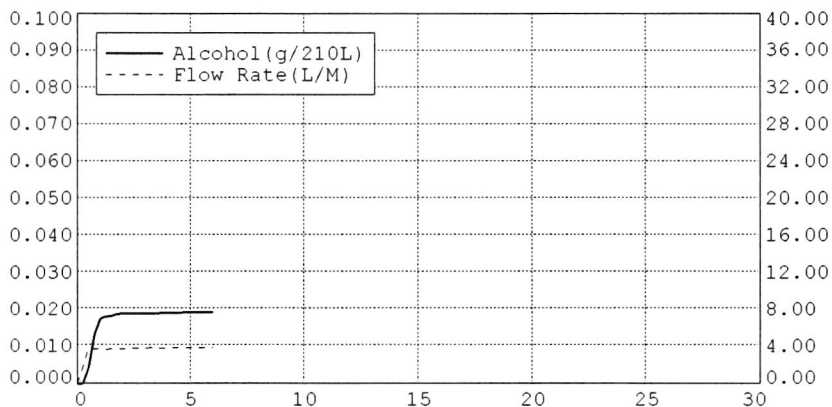
Date: 02/28/2023
Time: 08:37:34

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020
TARGET AT 29.36: 0.020
LOT #: AG217902
EXPIRATION: 06/28/2024
TANK PRESSURE: 980 psi

BLANK TEST	0.000	08:39
INTERNAL STANDARD	VERIFIED	08:39
EXTERNAL STANDARD	0.020	08:39
BLANK TEST	0.000	08:40
EXTERNAL STANDARD	0.021	08:40
BLANK TEST	0.000	08:41
EXTERNAL STANDARD	0.021	08:41
BLANK TEST	0.000	08:42
EXTERNAL STANDARD	0.021	08:42
BLANK TEST	0.000	08:43
EXTERNAL STANDARD	0.021	08:43
BLANK TEST	0.000	08:44

Average = 0.0208
Std Dev = 0.0004



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety
DATAMASTER dmt: 100375

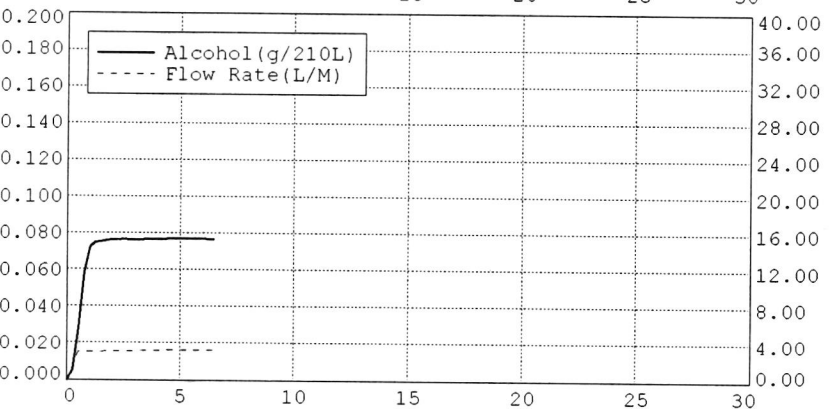
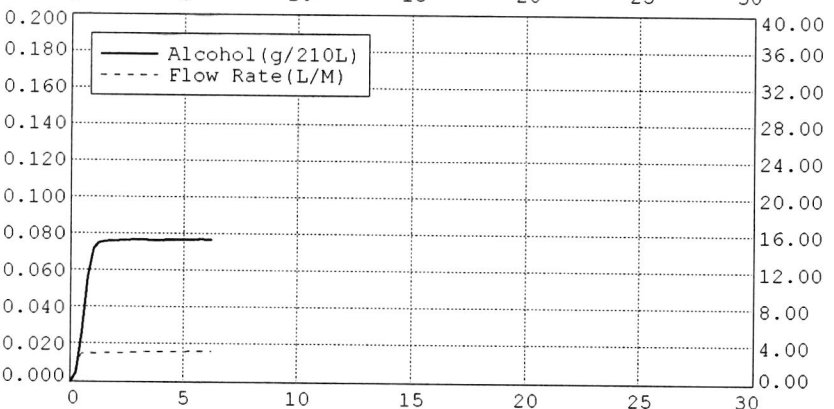
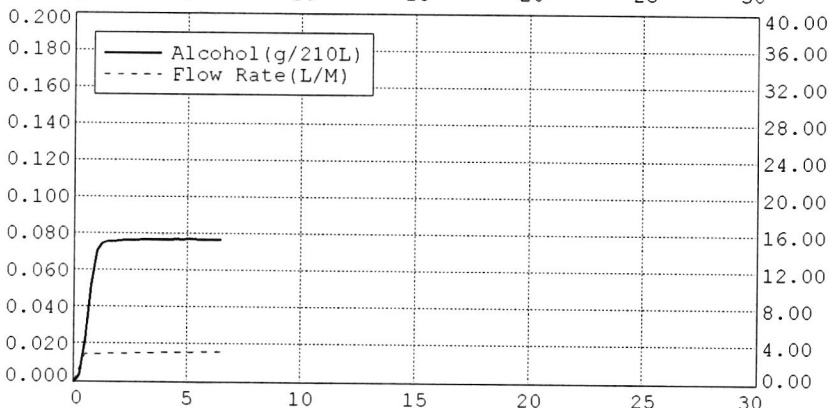
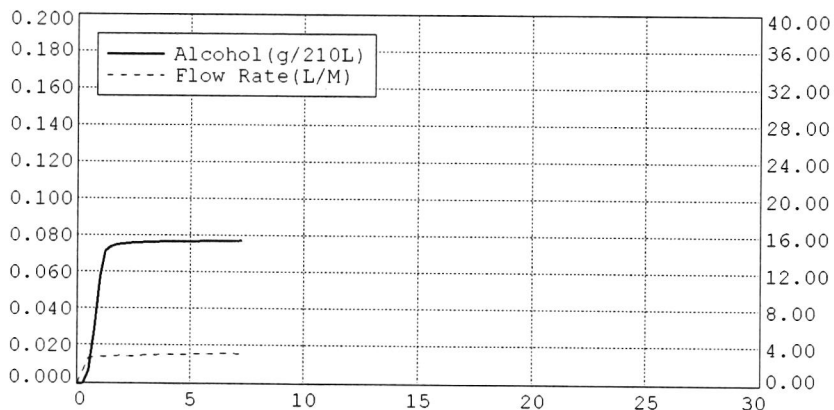
Date: 02/28/2023
Time: 08:48:02

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.080
TARGET AT 29.37: 0.079
LOT #: AG113402
EXPIRATION: 05/14/2023
TANK PRESSURE: 416 psi

BLANK TEST	0.000	08:49
INTERNAL STANDARD	VERIFIED	08:49
EXTERNAL STANDARD	0.078	08:49
BLANK TEST	0.000	08:50
EXTERNAL STANDARD	0.078	08:50
BLANK TEST	0.000	08:51
EXTERNAL STANDARD	0.078	08:51
BLANK TEST	0.000	08:52
EXTERNAL STANDARD	0.078	08:52
BLANK TEST	0.000	08:53
EXTERNAL STANDARD	0.078	08:53
BLANK TEST	0.000	08:54

Average = 0.0780
Std Dev = 0.0000



LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety
DATAMASTER dmt: 100375

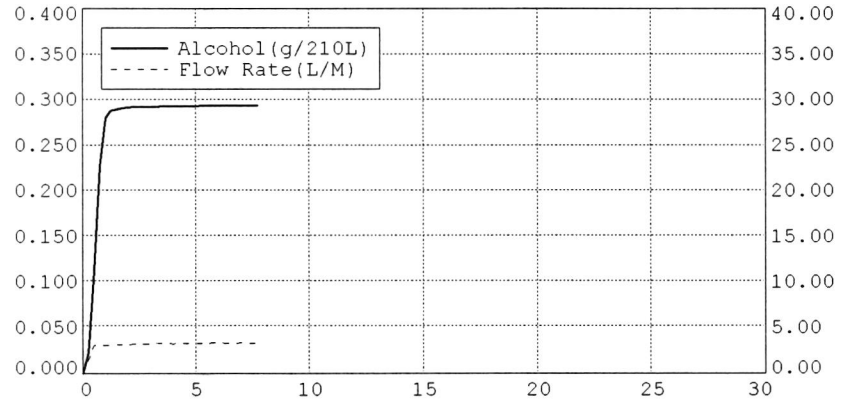
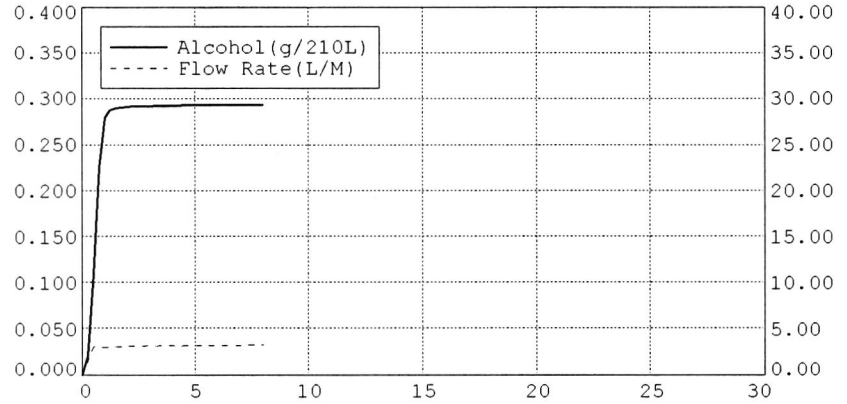
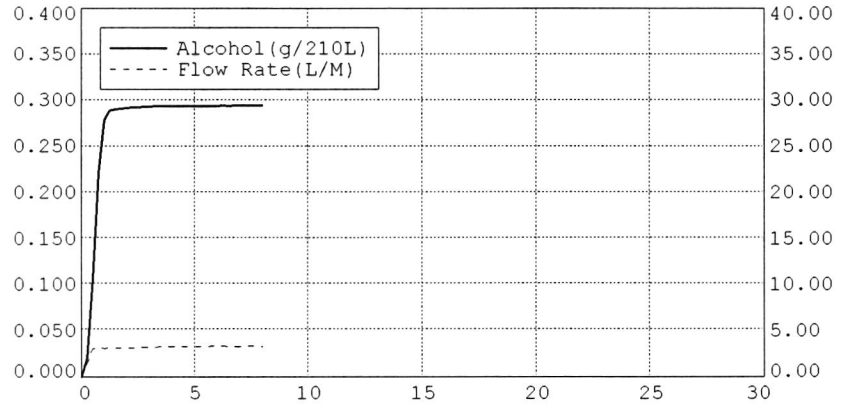
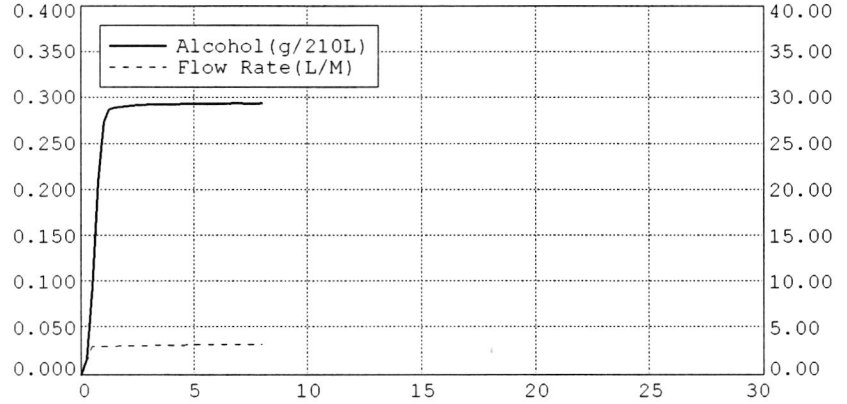
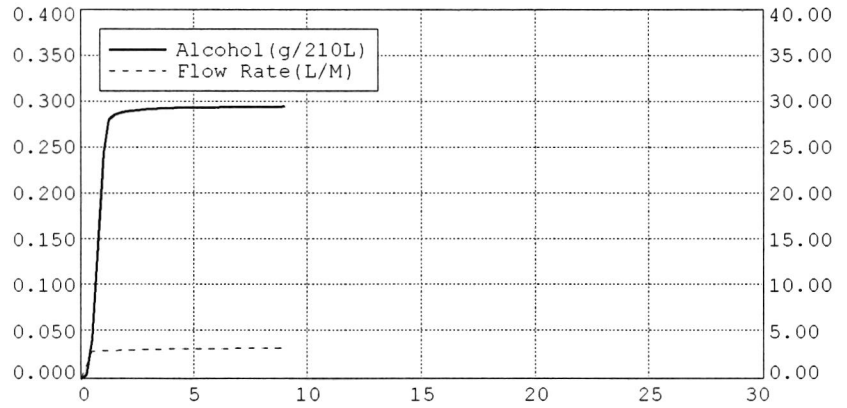
Date: 02/28/2023
Time: 08:55:49

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.300
TARGET AT 29.35: 0.294
LOT #: AG217903
EXPIRATION: 06/28/2024
TANK PRESSURE: 388 psi

BLANK TEST	0.000	08:56
INTERNAL STANDARD	VERIFIED	08:56
EXTERNAL STANDARD	0.294	08:57
BLANK TEST	0.000	08:58
EXTERNAL STANDARD	0.294	08:58
BLANK TEST	0.000	08:59
EXTERNAL STANDARD	0.294	08:59
BLANK TEST	0.000	09:00
EXTERNAL STANDARD	0.293	09:00
BLANK TEST	0.000	09:01
EXTERNAL STANDARD	0.293	09:01
BLANK TEST	0.000	09:02

Average = 0.2936
Std Dev = 0.0005



DIAGNOSTIC RECORD

 Alaska Department of Public Safety
 DATAMASTER dmt: 100397

Date: 02/28/2023
 Time: 07:49:31

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

TEMPERATURES

Sample Chamber = 48.7°C	PASSED
(44.0°C - 52.0°C)	
Breath Tube = 48.1°C	PASSED
(38.0°C - 50.0°C)	

SETTINGS

Lamp Voltage = 1.74 V	PASSED
(1.01 V - 2.37 V)	
Cooler Voltage = 1.69 V	PASSED
(1.04 V - 2.44 V)	
Bias Voltage = 81 V	PASSED
(49 V - 113 V)	
Chopper Freq = 535 Hz	PASSED
(475 Hz - 575 Hz)	
Barometer = 29.4 in	

PUMP INFO

Flow Rate = 4.227 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 = 0.093 1.67% (0.00% - 4.00%)	

Technician Screen

DATAMASTER dmt: 100397

Date: 02/28/2023

Time: 8:03 AM

Temperatures (°C)

Sample Cell: 48.9°C

Breath Tube: 48.1°C

Current Barometer 29.4 in

Volume (Ltr) 0.00

Settings

Lamp: 1.85 V

Bias: 81 V

Cooler: 1.51 V

Chopper: 535 Hz

Voltages (V)

Flow: 1.06 V

Detector: 0.020 V

LINEARITY CHECK

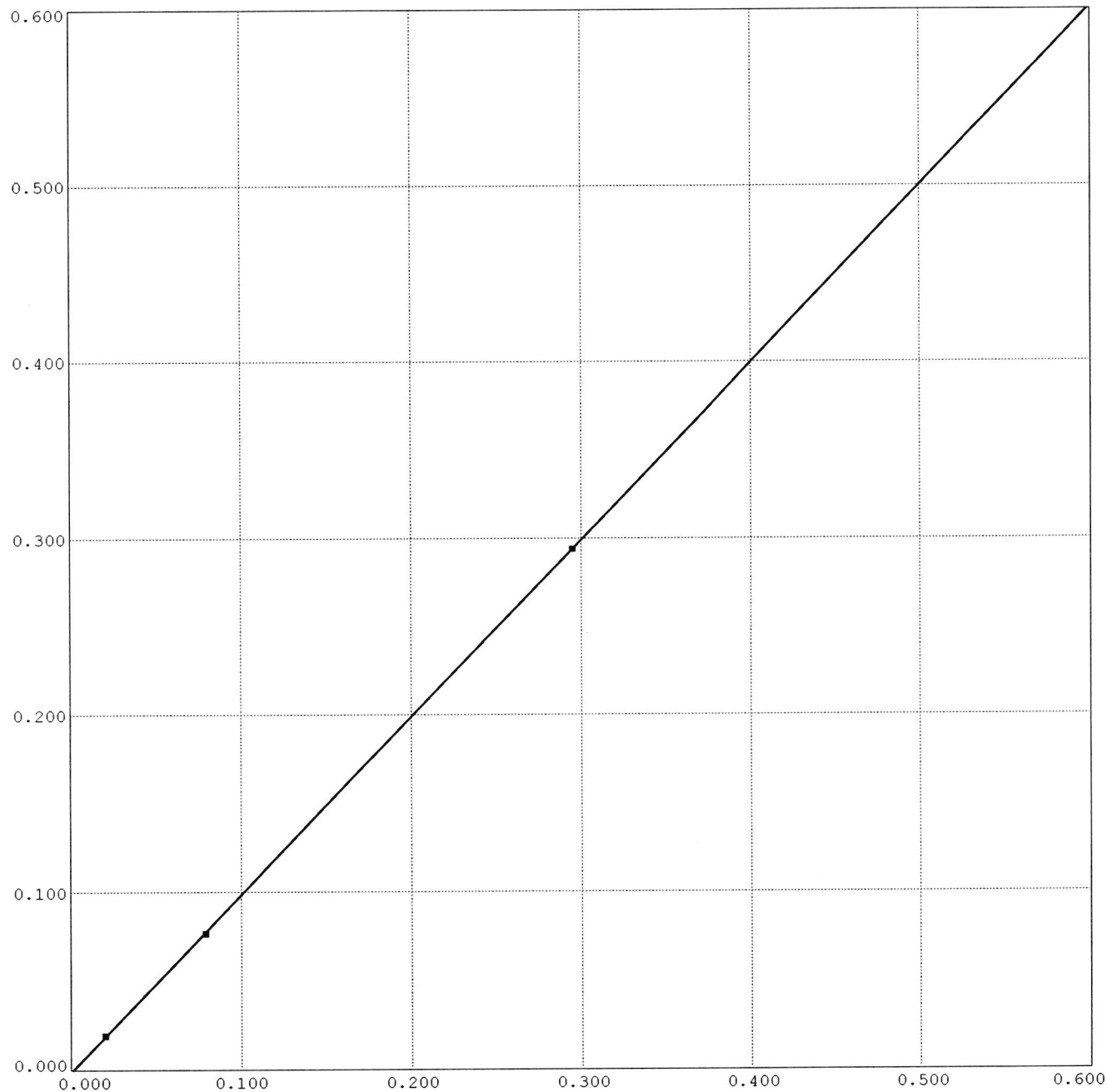
Alaska Department of Public Safety
DATAMASTER dmt: 100397

Date: 02/28/2023
Time: 08:30:42

SUPERVISOR NAME:
TATIANA MALNOSKE
OPERATOR'S #: 10437

TARGET	AVERAGE	STD. DEV.
0.020	0.0198	0.0004
0.079	0.0776	0.0005
0.294	0.2946	0.0005

SLOPE = 1.004635
R² = 0.999973



TLM

LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety
DATAMASTER dmt: 100397

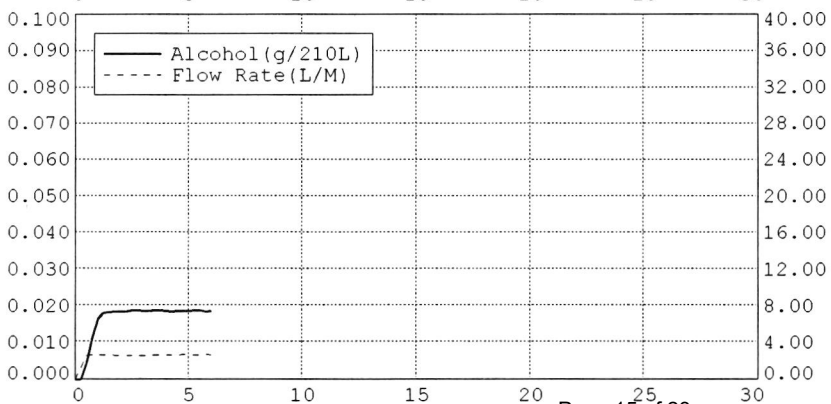
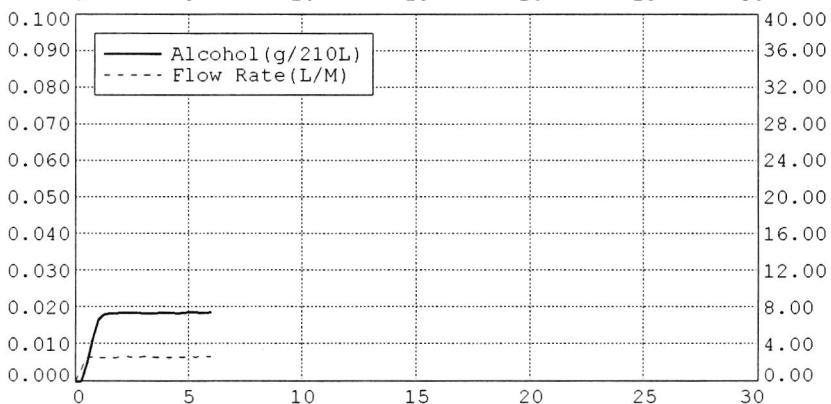
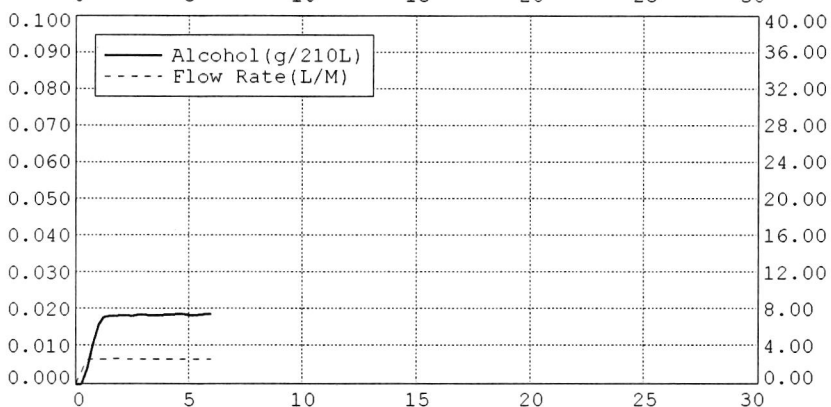
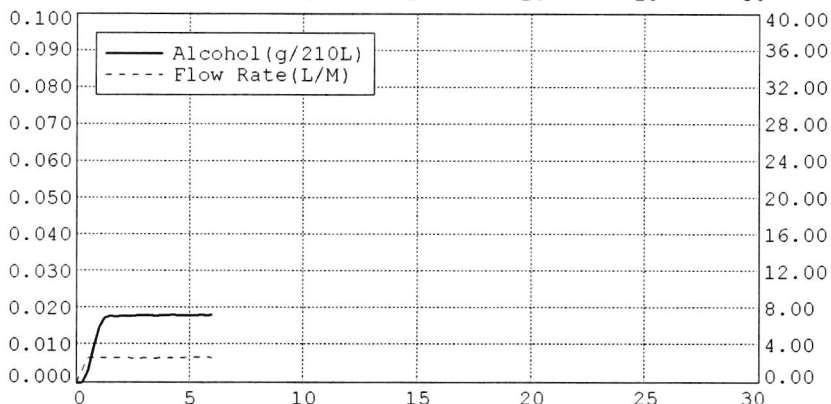
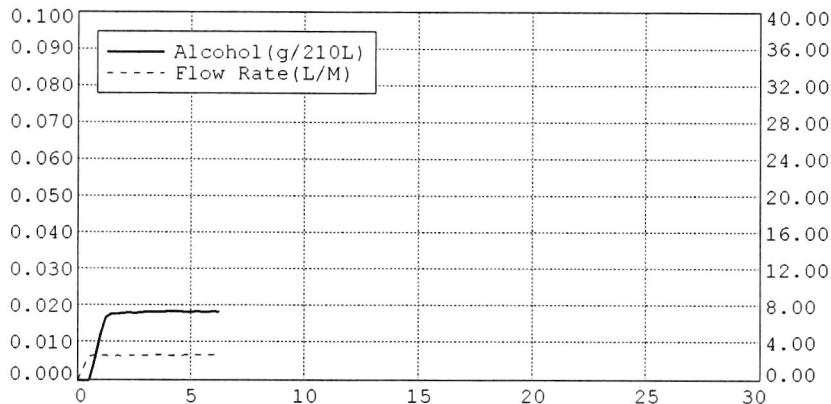
Date: 02/28/2023
Time: 08:30:44

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020
TARGET AT 29.36: 0.020
LOT #: AG217902
EXPIRATION: 06/28/2024
TANK PRESSURE: 821 psi

BLANK TEST	0.000	08:32
INTERNAL STANDARD	VERIFIED	08:32
EXTERNAL STANDARD	0.020	08:32
BLANK TEST	0.000	08:33
EXTERNAL STANDARD	0.019	08:33
BLANK TEST	0.000	08:34
EXTERNAL STANDARD	0.020	08:34
BLANK TEST	0.000	08:35
EXTERNAL STANDARD	0.020	08:35
BLANK TEST	0.000	08:36
EXTERNAL STANDARD	0.020	08:36
BLANK TEST	0.000	08:37

Average = 0.0198
Std Dev = 0.0004



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety
DATAMASTER dmt: 100397

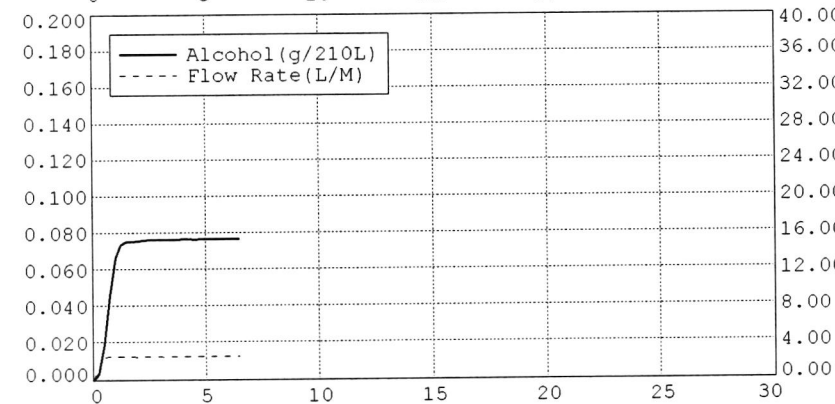
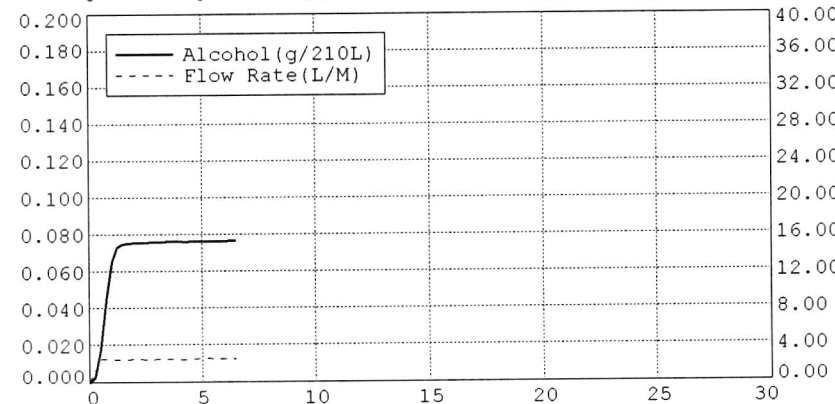
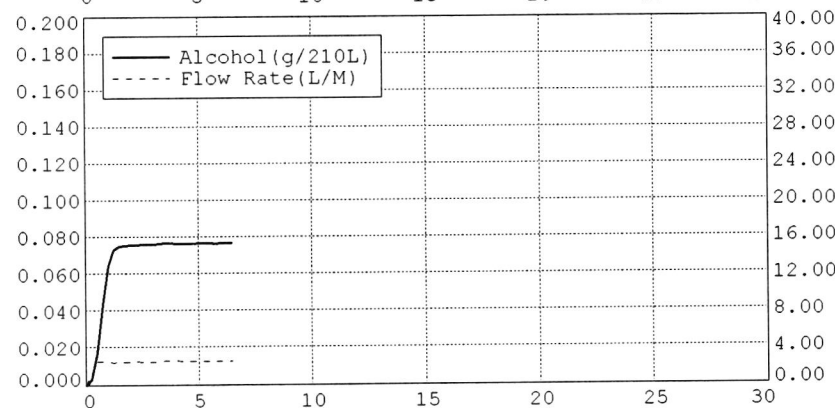
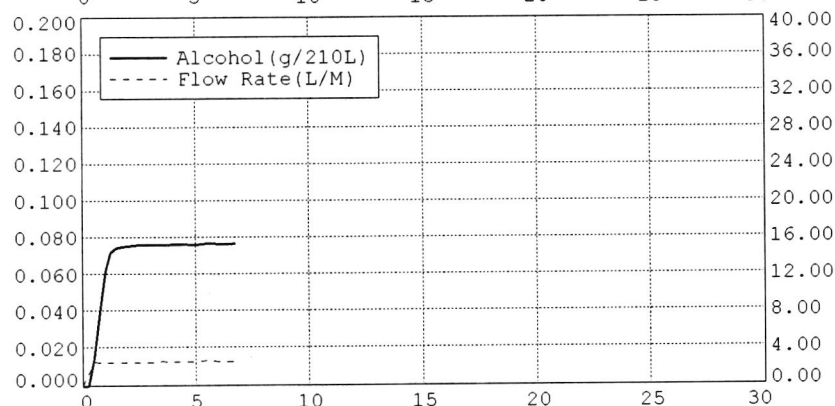
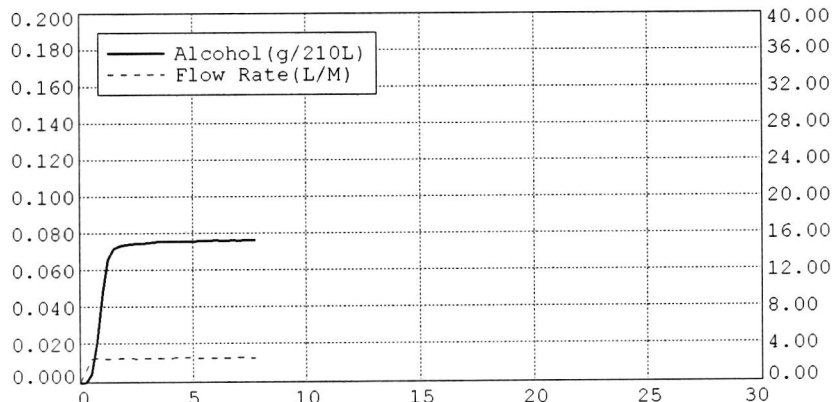
Date: 02/28/2023
Time: 08:40:33

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.080
TARGET AT 29.37: 0.079
LOT #: AG113402
EXPIRATION: 05/14/2023
TANK PRESSURE: 583 psi

BLANK TEST	0.000	08:41
INTERNAL STANDARD	VERIFIED	08:41
EXTERNAL STANDARD	0.077	08:42
BLANK TEST	0.000	08:43
EXTERNAL STANDARD	0.077	08:43
BLANK TEST	0.000	08:44
EXTERNAL STANDARD	0.078	08:44
BLANK TEST	0.000	08:45
EXTERNAL STANDARD	0.078	08:45
BLANK TEST	0.000	08:46
EXTERNAL STANDARD	0.078	08:46
BLANK TEST	0.000	08:47

Average = 0.0776
Std Dev = 0.0005



LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety
DATAMASTER dmt: 100397

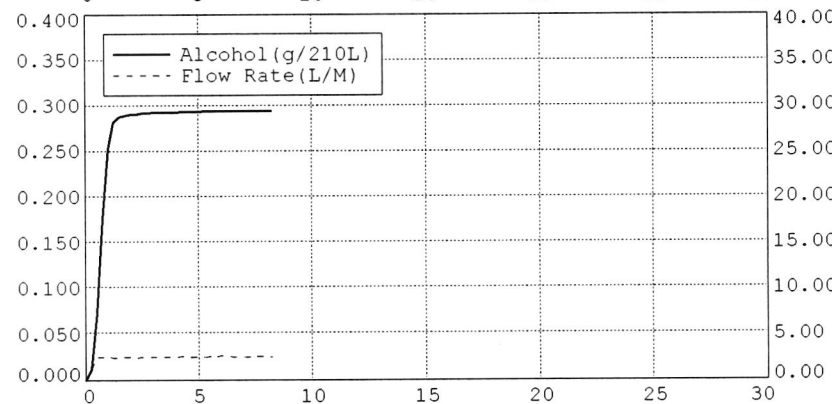
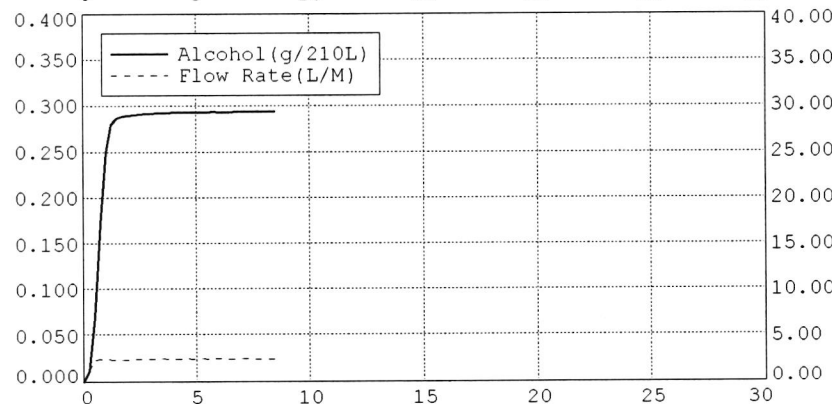
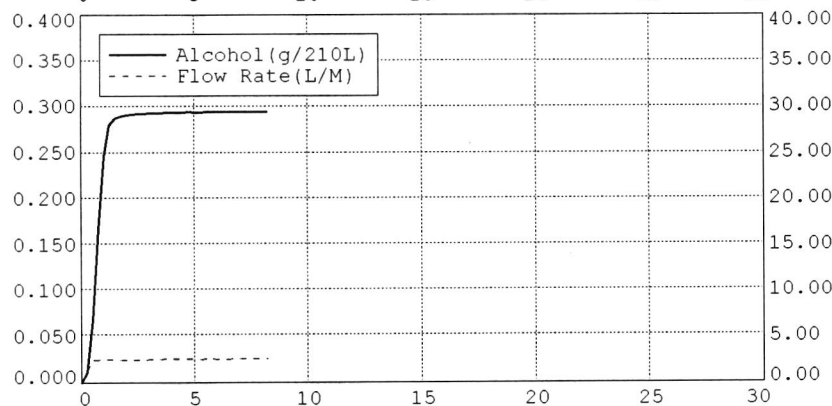
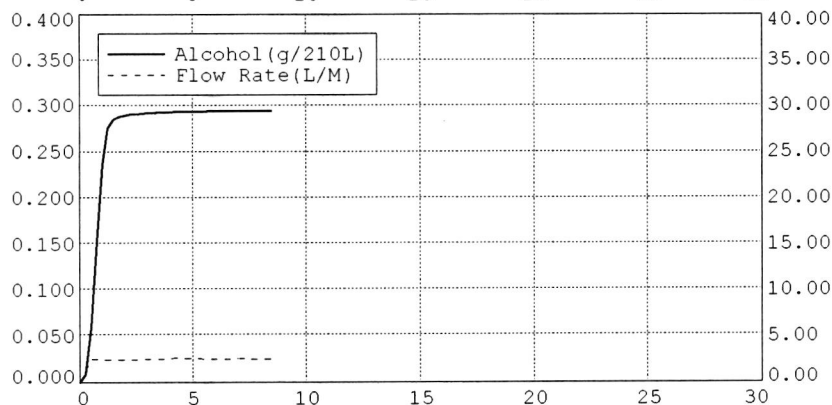
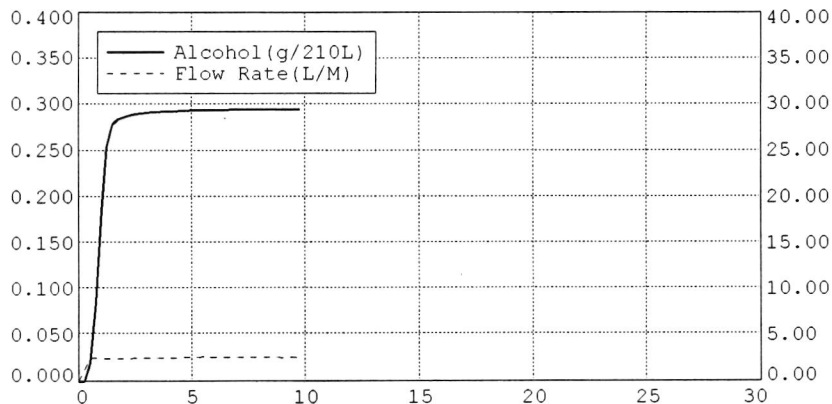
Date: 02/28/2023
Time: 08:48:32

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.300
TARGET AT 29.36: 0.294
LOT #: AG217903
EXPIRATION: 06/28/2024
TANK PRESSURE: 440 psi

BLANK TEST	0.000	08:49
INTERNAL STANDARD	VERIFIED	08:49
EXTERNAL STANDARD	0.295	08:49
BLANK TEST	0.000	08:50
EXTERNAL STANDARD	0.295	08:51
BLANK TEST	0.000	08:52
EXTERNAL STANDARD	0.295	08:52
BLANK TEST	0.000	08:53
EXTERNAL STANDARD	0.294	08:53
BLANK TEST	0.000	08:54
EXTERNAL STANDARD	0.294	08:54
BLANK TEST	0.000	08:55

Average = 0.2946
Std Dev = 0.0005



DIAGNOSTIC RECORD

 Alaska Department of Public Safety
 DATAMASTER dmt: 100399

Date: 02/28/2023
 Time: 07:45:58

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

TEMPERATURES

Sample Chamber = 48.7°C	PASSED
(44.0°C - 52.0°C)	
Breath Tube = 48.1°C	PASSED
(38.0°C - 50.0°C)	

SETTINGS

Lamp Voltage = 1.71 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 = 29.4 in	

PUMP INFO

Flow Rate = 4.427 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 = 0.085 0.62% (0.00% - 4.00%)

Technician Screen

DATAMASTER dmt: 100399

Date: 02/28/2023

Time: 8:01 AM

Temperatures (°C)

Sample Cell: 48.9°C

Breath Tube: 48.1°C

Current Barometer 29.4 in

Volume (Ltr) 0.00

Settings

Lamp: 1.76 V

Bias: 81 V

Cooler: 1.58 V

Chopper: 523 Hz

Voltages (V)

Flow: 1.06 V

Detector: 0.017 V

LINEARITY CHECK

Alaska Department of Public Safety
DATAMASTER dmt: 100399

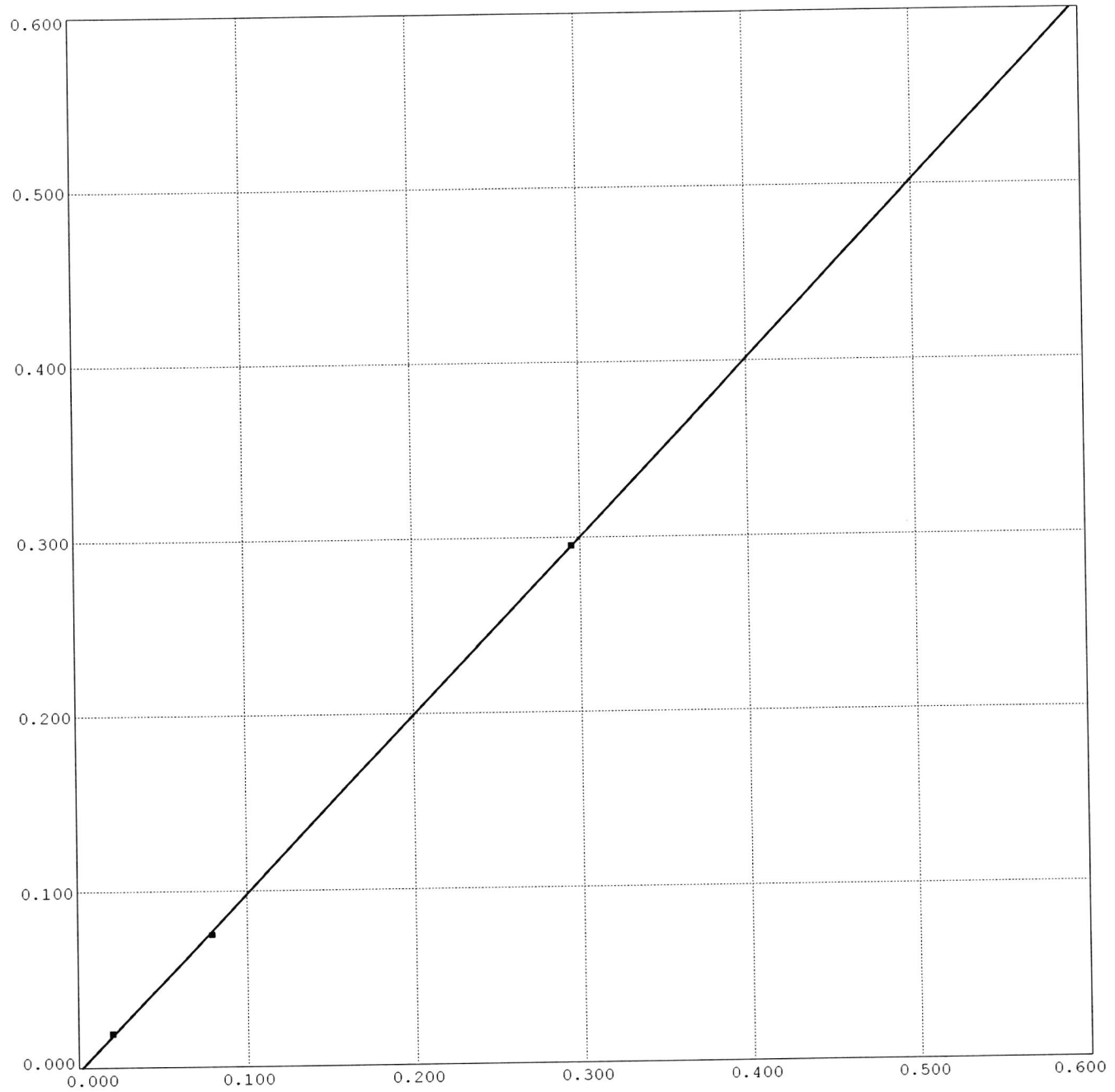
Date: 02/28/2023
Time: 08:37:47

SUPERVISOR NAME:
TATIANA MALNOSKE
OPERATOR'S #: 10437

TARGET	AVERAGE	STD. DEV.
0.020	0.0198	0.0004
0.079	0.0762	0.0004
0.294	0.2960	0.0007

SLOPE	= 1.011872
R ²	= 0.999867

TLM



LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety
DATAMASTER dmt: 100399

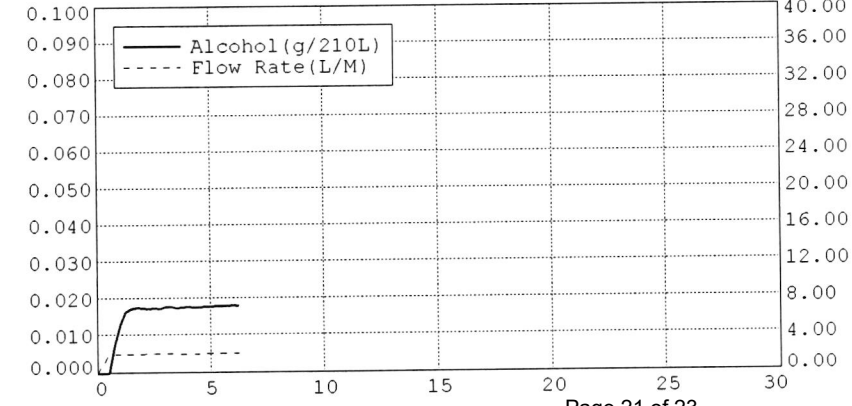
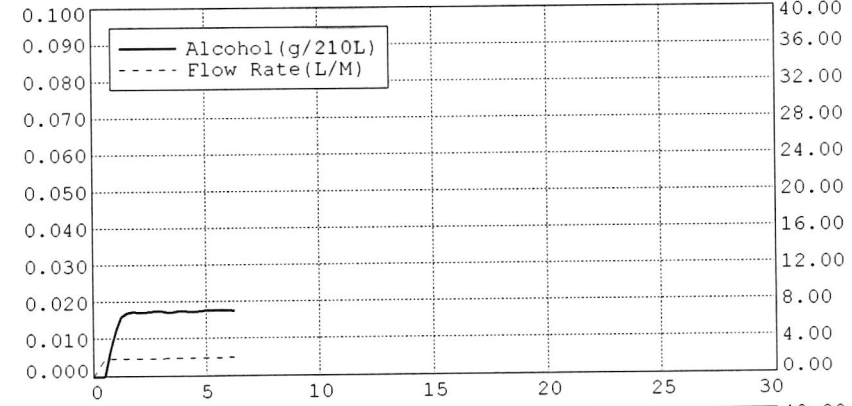
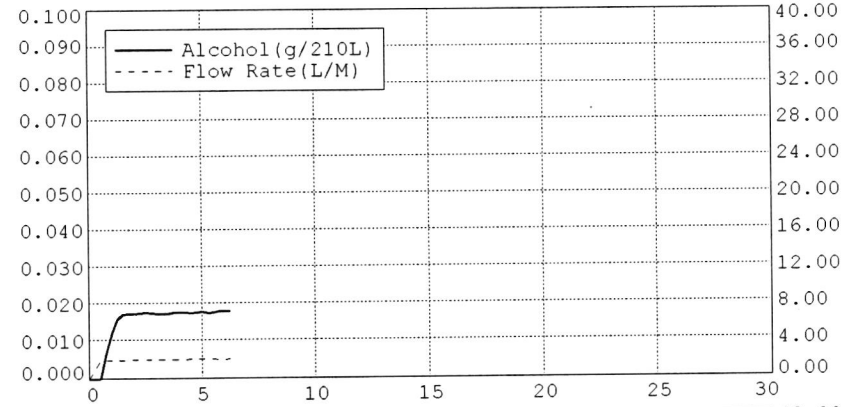
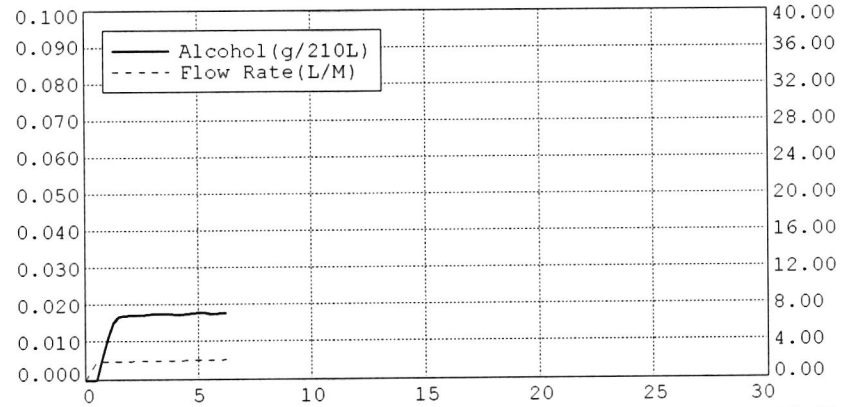
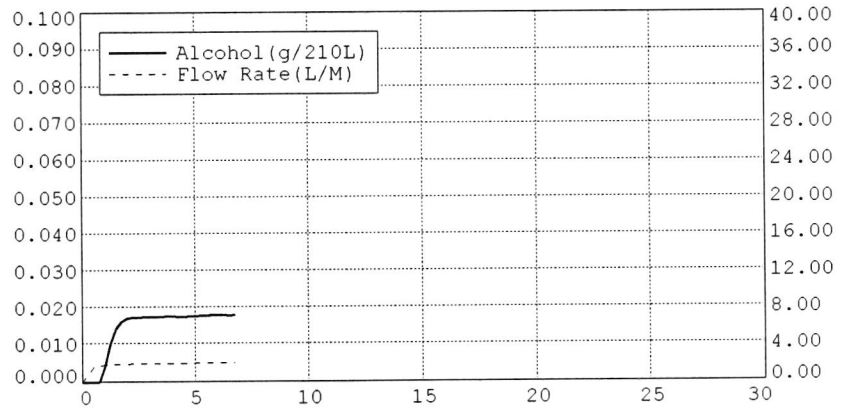
Date: 02/28/2023
Time: 08:37:49

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020
TARGET AT 29.37: 0.020
LOT #: AG217902
EXPIRATION: 06/28/2024
TANK PRESSURE: 956 psi

BLANK TEST	0.000	08:39
INTERNAL STANDARD	VERIFIED	08:39
EXTERNAL STANDARD	0.020	08:40
BLANK TEST	0.000	08:40
EXTERNAL STANDARD	0.019	08:41
BLANK TEST	0.000	08:42
EXTERNAL STANDARD	0.020	08:42
BLANK TEST	0.000	08:43
EXTERNAL STANDARD	0.020	08:43
BLANK TEST	0.000	08:44
EXTERNAL STANDARD	0.020	08:44
BLANK TEST	0.000	08:45

Average = 0.0198
Std Dev = 0.0004



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety
DATAMASTER dmt: 100399

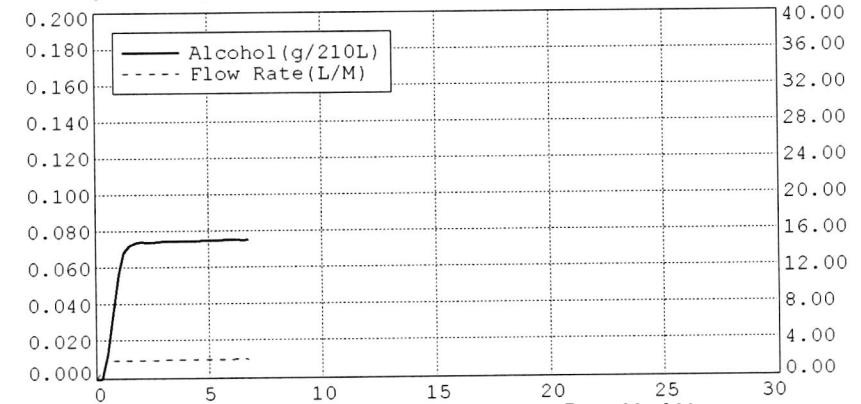
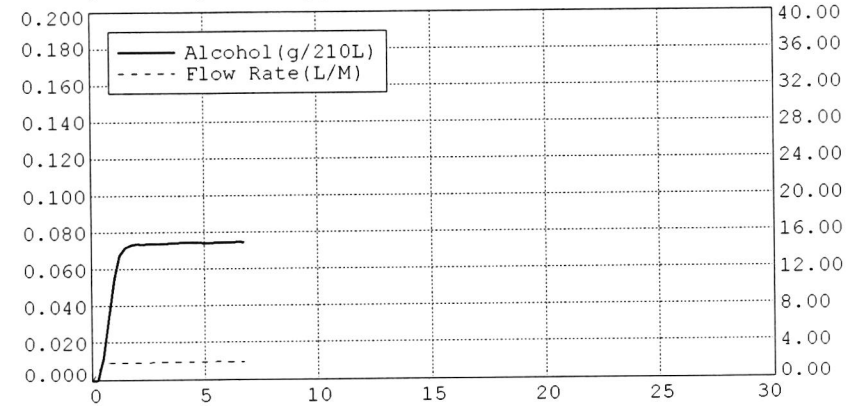
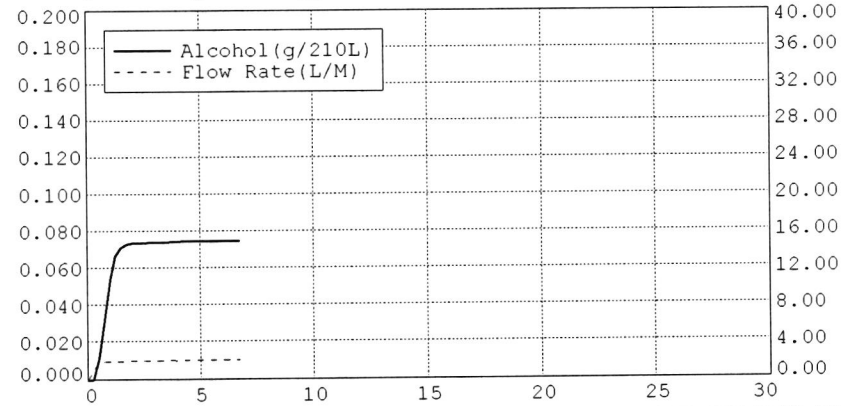
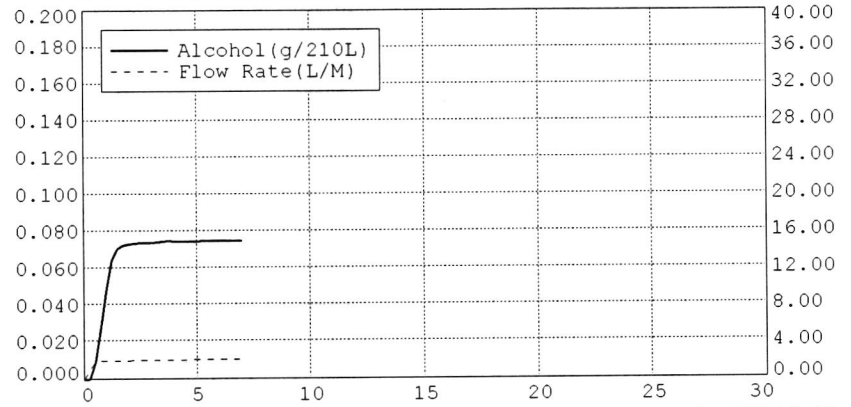
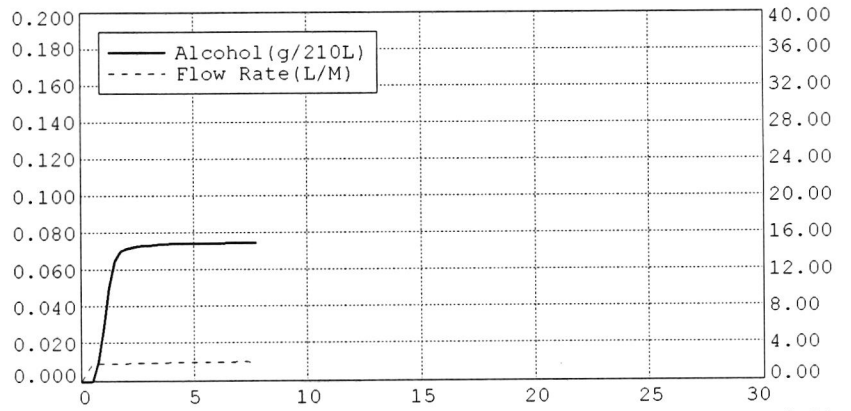
Date: 02/28/2023
Time: 08:46:30

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.080
TARGET AT 29.36: 0.079
LOT #: AG113402
EXPIRATION: 05/14/2023
TANK PRESSURE: 769 psi

BLANK TEST	0.000	08:47
INTERNAL STANDARD	VERIFIED	08:47
EXTERNAL STANDARD	0.076	08:48
BLANK TEST	0.000	08:49
EXTERNAL STANDARD	0.076	08:49
BLANK TEST	0.000	08:50
EXTERNAL STANDARD	0.076	08:50
BLANK TEST	0.000	08:51
EXTERNAL STANDARD	0.076	08:51
BLANK TEST	0.000	08:52
EXTERNAL STANDARD	0.077	08:52
BLANK TEST	0.000	08:53

Average = 0.0762
Std Dev = 0.0004



LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety
DATAMASTER dmt: 100399

Date: 02/28/2023
Time: 08:55:40

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.300
TARGET AT 29.36: 0.294
LOT #: AG217903
EXPIRATION: 06/28/2024
TANK PRESSURE: 350 psi

TEST TYPE	Value	Time
BLANK TEST	0.000	08:57
INTERNAL STANDARD	VERIFIED	08:57
EXTERNAL STANDARD	0.297	08:57
BLANK TEST	0.000	08:58
EXTERNAL STANDARD	0.296	08:58
BLANK TEST	0.000	08:59
EXTERNAL STANDARD	0.296	08:59
BLANK TEST	0.000	09:00
EXTERNAL STANDARD	0.295	09:01
BLANK TEST	0.000	09:02
EXTERNAL STANDARD	0.296	09:02
BLANK TEST	0.000	09:03

Average = 0.2960
Std Dev = 0.0007

