

# 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>20AP41118</u>	Nominal Value:	<u>121.00</u>	mg/dL
Min. Sample Size:	500mL	Certified Value:	<u>121.89</u>	$\pm$ <u>1.44</u> mg/dL
Solute:	Ethanol	Certification Date:	<u>1/15/2020</u>	
Diluent	Water	Expiration Date:	<u>1/15/2022</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  $34 \pm 0.2$  °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 10mg/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.



  
\_\_\_\_\_  
Kyle Mathena  
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: 100353

Date: 08/21/2020  
Time: 13:32:12

SUPERVISOR NAME:  
BRANDI BARNETT  
OPERATOR'S #: 7038

EXTERNAL STANDARD INFORMATION  
NOMINAL: 0.100

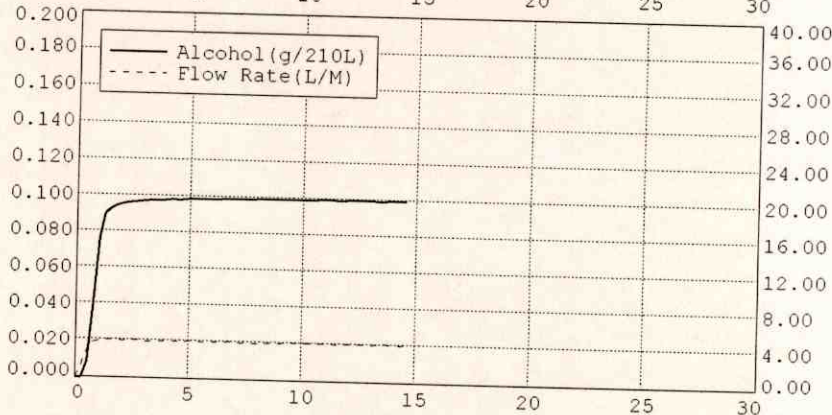
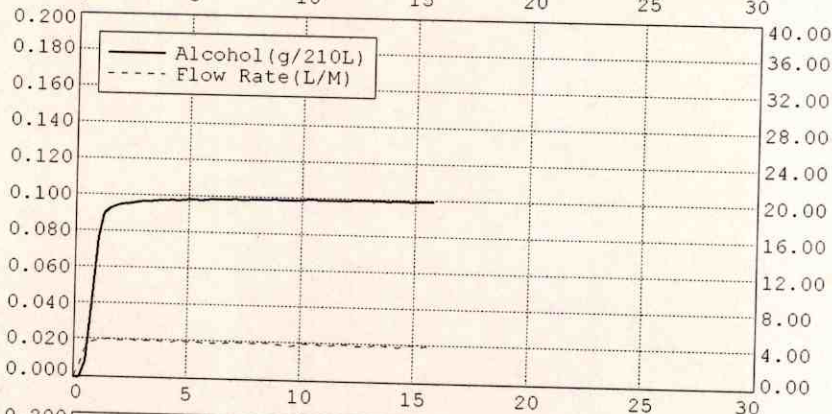
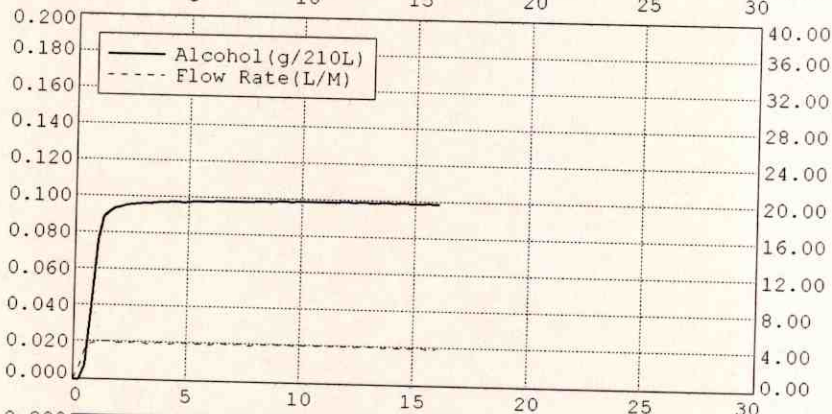
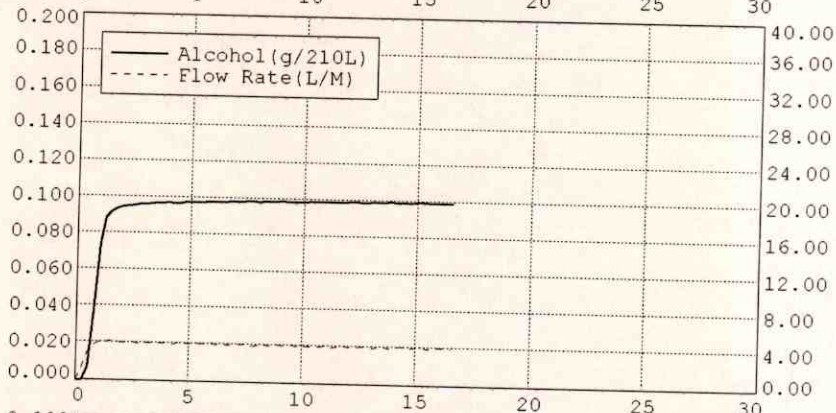
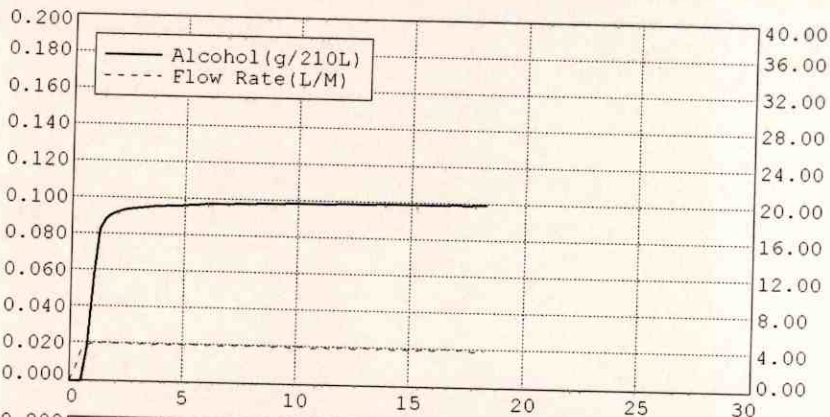
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INTERNAL STANDARD	VERIFIED	13:33
EXTERNAL STANDARD	0.101	13:33
BLANK TEST	0.000	13:34
EXTERNAL STANDARD	0.101	13:35
BLANK TEST	0.000	13:36
EXTERNAL STANDARD	0.101	13:36
BLANK TEST	0.000	13:37
EXTERNAL STANDARD	0.101	13:37
BLANK TEST	0.000	13:38
EXTERNAL STANDARD	0.101	13:39
BLANK TEST	0.000	13:40

Average = 0.1010  
Std Dev = 0.0000

Lifeloc 0.100  
Lot# 20AP41118  
Exp: 1/15/22  
BMB 8/21/20

Simulator DR6267  
Calibrated 10/08/19

Final  
Avg: 0.099 g/210L  
BMB 8/26/20



SUPERVISOR TEST

Alaska Department of Public Safety  
 DATAMASTER dmt: 100671

Date: 08/21/2020  
 Time: 14:16:17

SUPERVISOR NAME:  
 BRANDI BARNETT  
 OPERATOR'S #: 7038

EXTERNAL STANDARD INFORMATION  
 NOMINAL: 0.100

BLANK TEST	0.000	14:17
INTERNAL STANDARD	VERIFIED	14:17
EXTERNAL STANDARD	0.096	14:18
BLANK TEST	0.000	14:18
EXTERNAL STANDARD	0.097	14:19
BLANK TEST	0.000	14:20
EXTERNAL STANDARD	0.097	14:20
BLANK TEST	0.000	14:21
EXTERNAL STANDARD	0.097	14:21
BLANK TEST	0.000	14:22
EXTERNAL STANDARD	0.097	14:23
BLANK TEST	0.000	14:23

Average = 0.0968  
 Std Dev = 0.0004

Lifeloc 0.100

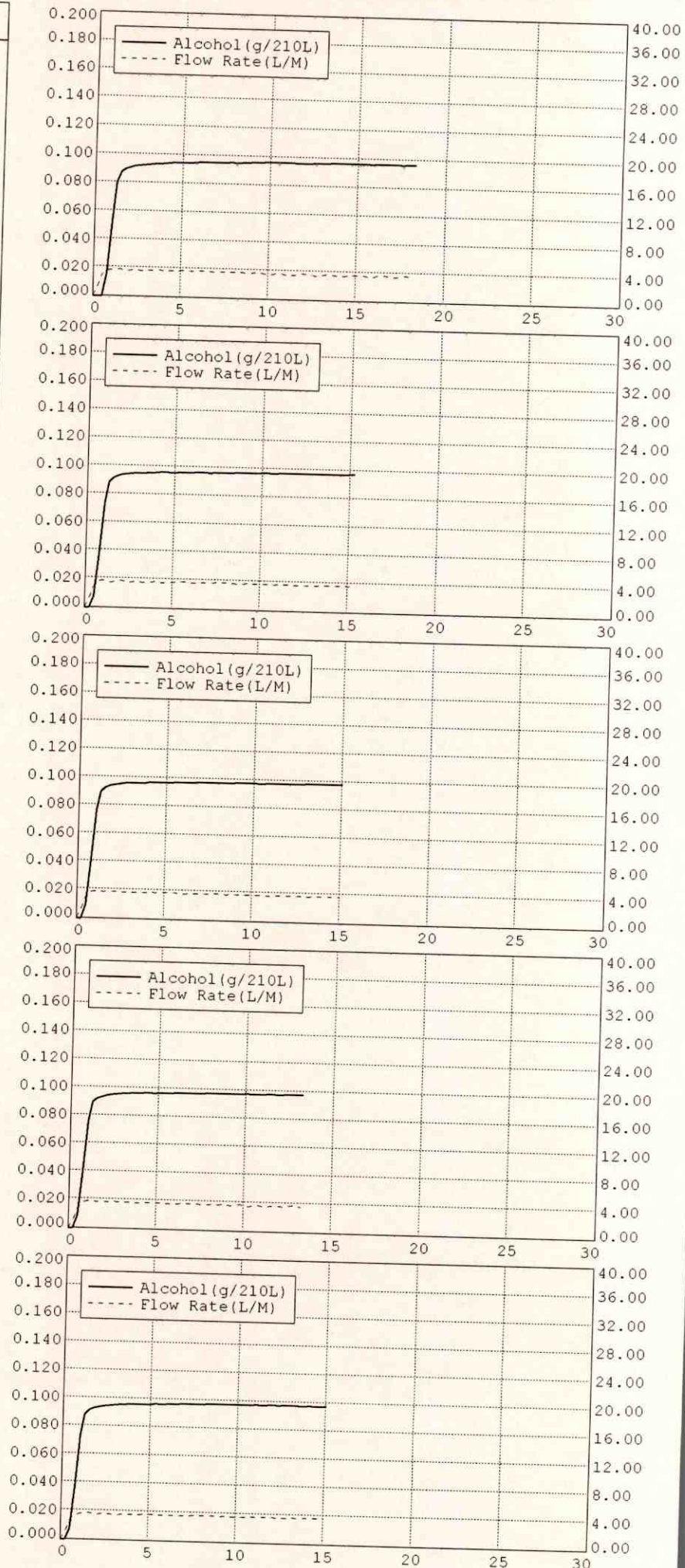
Lot#: 20AP41118

Exp: 11/15/22

BMB 8/21/20

Simulator DR6267

Calibrated 10/08/19



SUPERVISOR TEST

Alaska Department of Public Safety  
 DATAMASTER dmt: 100405

Date: 08/21/2020  
 Time: 13:47:26

SUPERVISOR NAME:  
 BRANDI BARNETT  
 OPERATOR'S #: 7038

EXTERNAL STANDARD INFORMATION  
 NOMINAL: 0.100

BLANK TEST	0.000	13:48
INTERNAL STANDARD	VERIFIED	13:48
EXTERNAL STANDARD	0.099	13:49
BLANK TEST	0.000	13:50
EXTERNAL STANDARD	0.099	13:50
BLANK TEST	0.000	13:51
EXTERNAL STANDARD	0.099	13:51
BLANK TEST	0.000	13:52
EXTERNAL STANDARD	0.099	13:52
BLANK TEST	0.000	13:53
EXTERNAL STANDARD	0.099	13:54
BLANK TEST	0.000	13:55

Average = 0.0990  
 Std Dev = 0.0000

Lifeloc 0.100

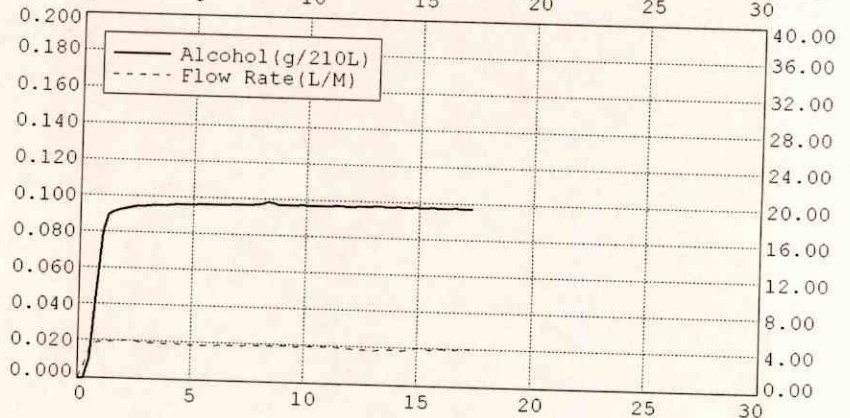
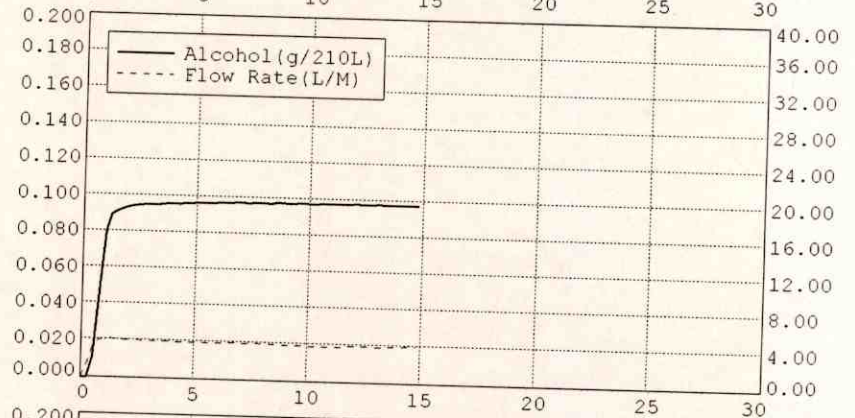
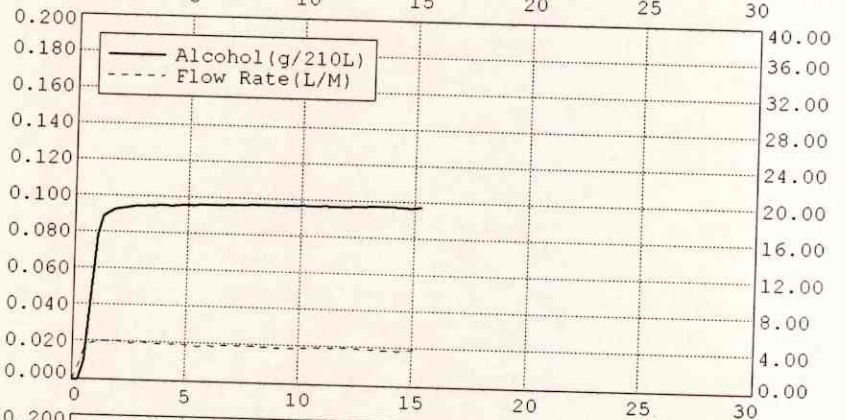
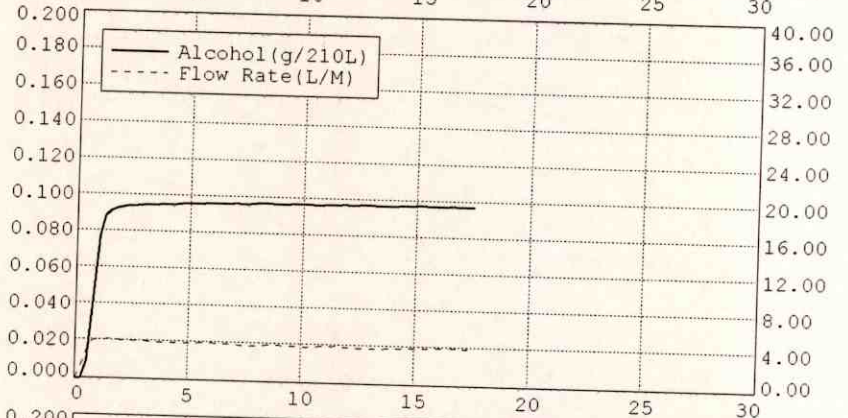
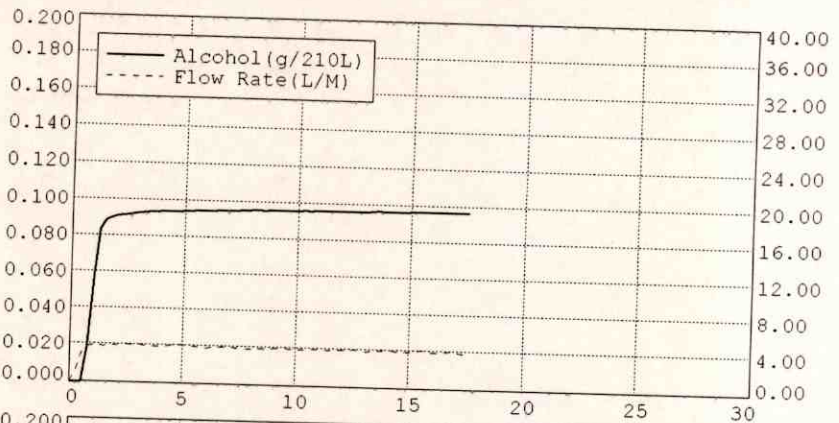
Lot: 20AP41118

Exp: 11/15/22

BMB 8/21/20

Simulator DR6267

Calibrated 10/08/19



DIAGNOSTIC RECORD

Alaska Department of Public Safety  
DATAMASTER dmt: 100671

Date: 08/21/2020  
Time: 10:33:12

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 = 46.5°C PASSED  
(38.0°C - 50.0°C)

SETTINGS

Lamp Voltage = 1.67 V PASSED  
(1.01 V - 2.37 V)  
Cooler Voltage = 1.76 V PASSED  
(1.00 V - 2.32 V)  
Bias Voltage = 78 V PASSED  
(47 V - 111 V)  
Chopper Freq = 544 Hz PASSED  
(475 Hz - 575 Hz)  
Barometer = 29.4 in

PUMP INFO

Flow Rate = 4.699 L/M PASSED  
(3.500 L/M - 6.500 L/M)

DETECTOR INFO

PUMP ON PASSED  
(0.001 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 = 0.100 1.78% PASSED  
(0.00% - 4.00%)

Technician Screen

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DATAMASTER dmt: 100671  
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Date: 08/21/2020  
Time: 10:50 AM

Temperatures (°C)

Sample Cell: 48.7°C  
Breath Tube: 46.7°C

Current Barometer 29.5 in  
Volume (Itr) 0.00

Settings

Lamp: 1.69 V  
Bias: 78 V  
Cooler: 1.78 V  
Chopper: 542 Hz

Voltages (V)

Flow: 1.07 V  
Detector: 0.057 V

LINEARITY CHECK

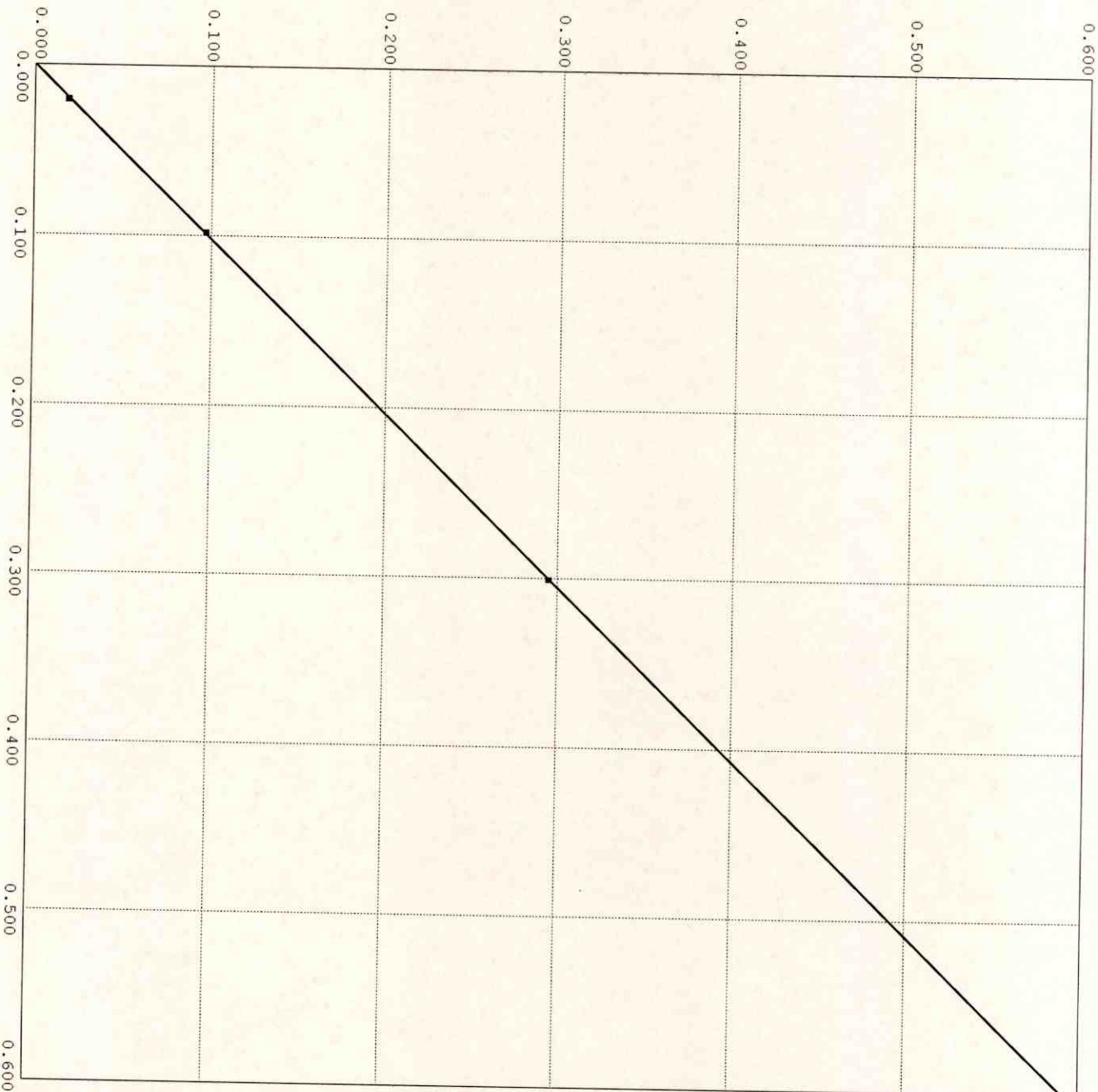
Alaska Department of Public Safety  
DATAMASTER dmt: 100671

Date: 08/21/2020  
Time: 11:16:19

SUPERVISOR NAME:  
BRANDI BARNETT  
OPERATOR'S #: 7038

TARGET	AVERAGE	STD. DEV.
0.020	0.0196	0.0005
0.098	0.0980	0.0000
0.300	0.2956	0.0005

SLOPE = 0.984216  
R<sup>2</sup> = 0.999965



*BB*



LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety  
 DATAMASTER dmt: 100671

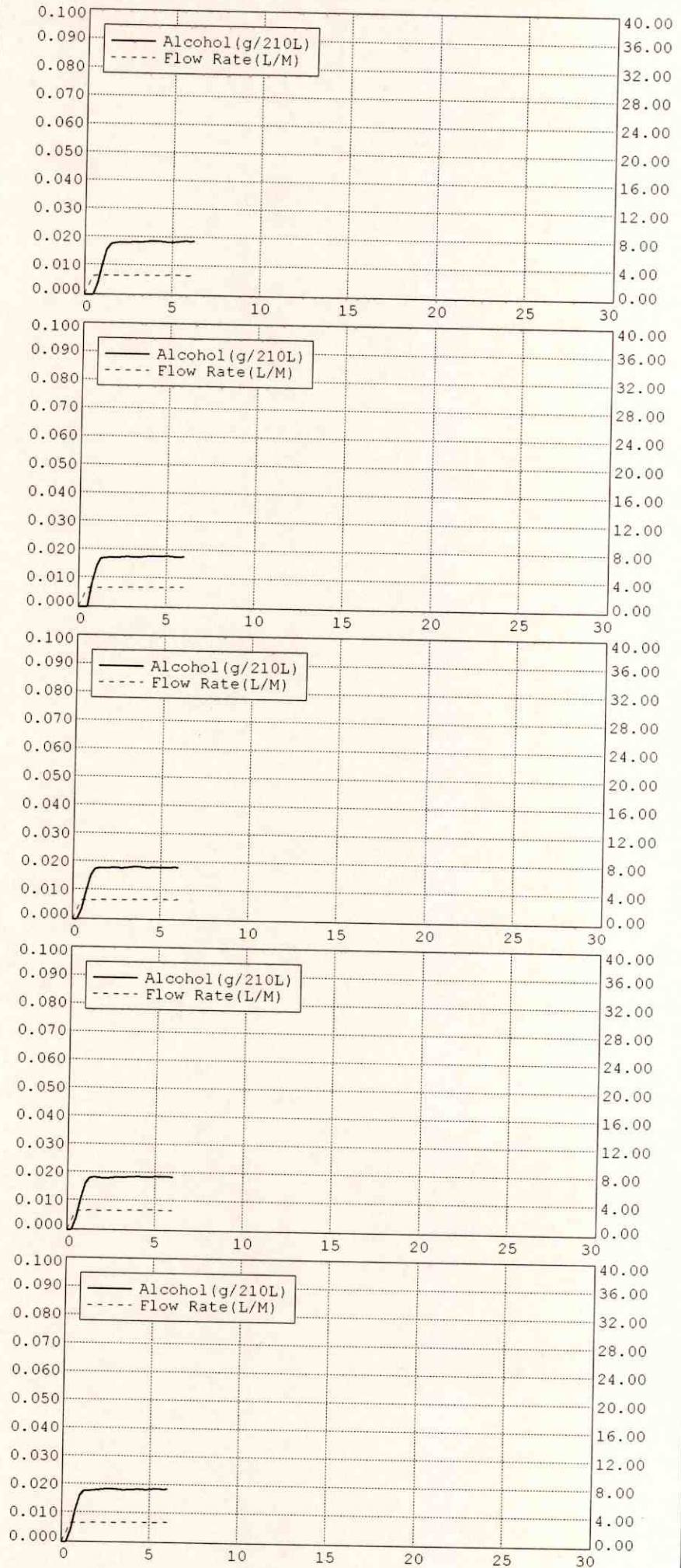
Date: 08/21/2020  
 Time: 11:16:21

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020  
 TARGET AT 29.45: 0.020  
 LOT #: AG928203  
 EXPIRATION: 10/09/2021  
 TANK PRESSURE: 763 psi

BLANK TEST	0.000	11:17
INTERNAL STANDARD	VERIFIED	11:17
EXTERNAL STANDARD	0.020	11:18
BLANK TEST	0.000	11:18
EXTERNAL STANDARD	0.019	11:19
BLANK TEST	0.000	11:20
EXTERNAL STANDARD	0.019	11:20
BLANK TEST	0.000	11:21
EXTERNAL STANDARD	0.020	11:21
BLANK TEST	0.000	11:22
EXTERNAL STANDARD	0.020	11:22
BLANK TEST	0.000	11:23

Average = 0.0196  
 Std Dev = 0.0005



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety  
 DATAMASTER dmt: 100671

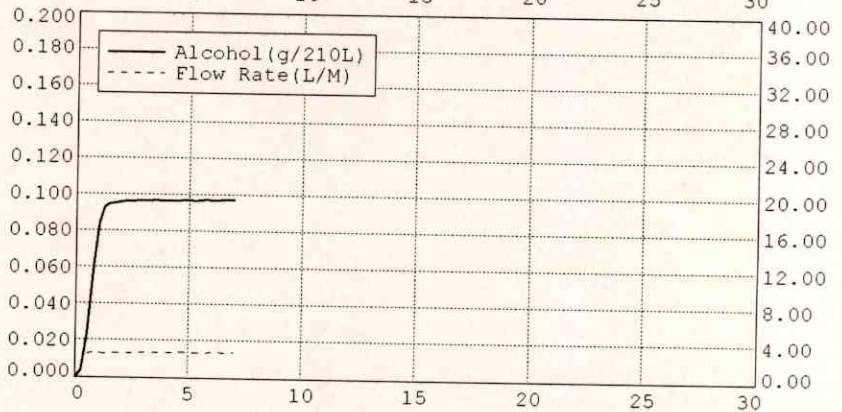
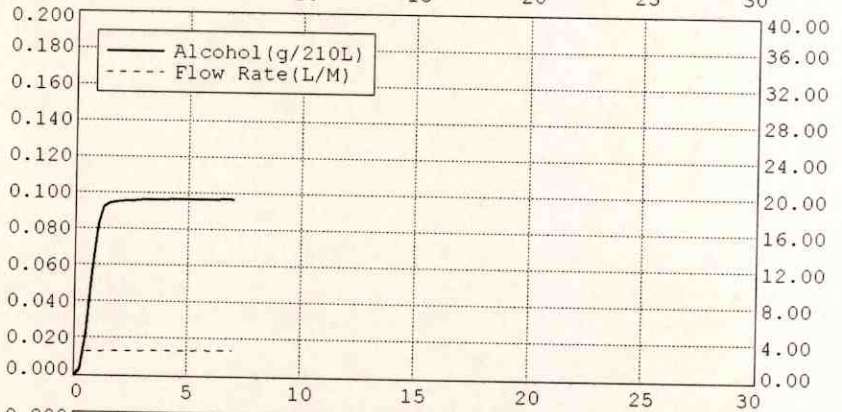
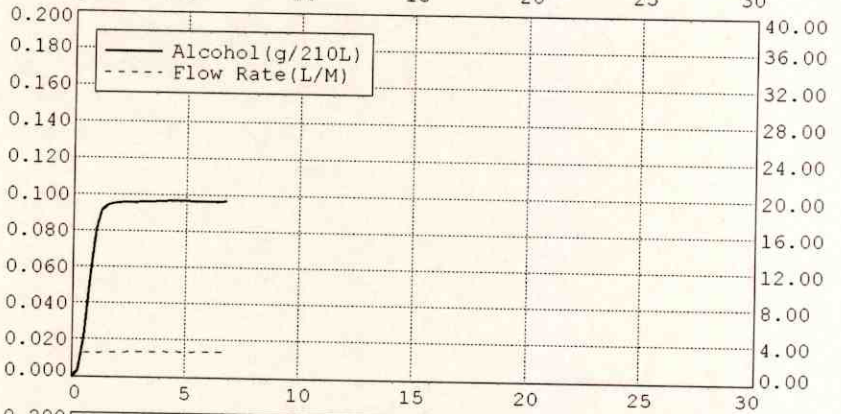
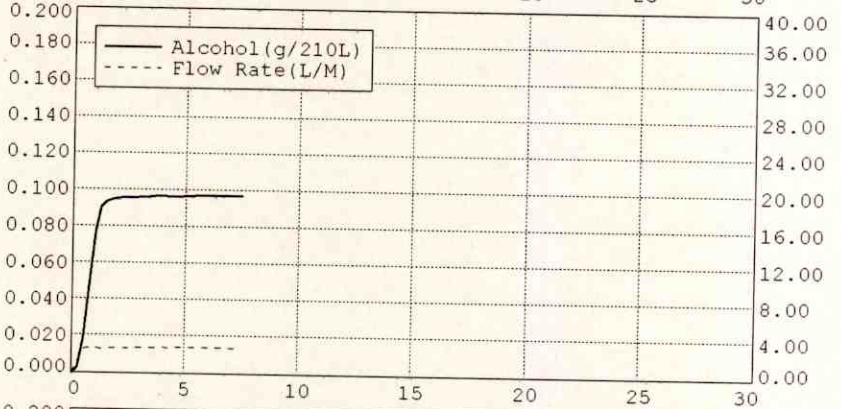
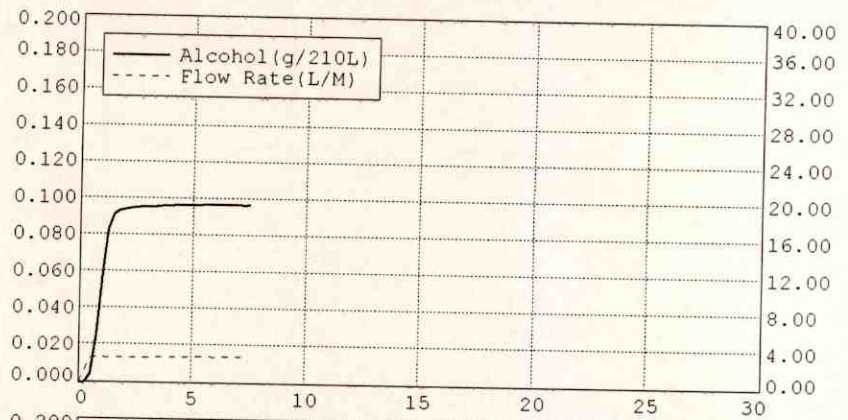
Date: 08/21/2020  
 Time: 11:26:33

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.100  
 TARGET AT 29.45: 0.098  
 LOT #: AG924701  
 EXPIRATION: 09/04/2021  
 TANK PRESSURE: 851 psi

BLANK TEST	0.000	11:27
INTERNAL STANDARD	VERIFIED	11:27
EXTERNAL STANDARD	0.098	11:28
BLANK TEST	0.000	11:28
EXTERNAL STANDARD	0.098	11:29
BLANK TEST	0.000	11:30
EXTERNAL STANDARD	0.098	11:30
BLANK TEST	0.000	11:31
EXTERNAL STANDARD	0.098	11:31
BLANK TEST	0.000	11:32
EXTERNAL STANDARD	0.098	11:32
BLANK TEST	0.000	11:33

Average = 0.0980  
 Std Dev = 0.0000



LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety  
 DATAMASTER dmt: 100671

Date: 08/21/2020  
 Time: 11:36:52

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.300  
 LOT #: GUTH 19330  
 EXPIRATION: 11/13/2021

BLANK TEST	0.000	11:37
INTERNAL STANDARD	VERIFIED	11:38
EXTERNAL STANDARD	0.295	11:38
BLANK TEST	0.000	11:39
EXTERNAL STANDARD	0.295	11:39
BLANK TEST	0.000	11:40
EXTERNAL STANDARD	0.296	11:41
BLANK TEST	0.000	11:42
EXTERNAL STANDARD	0.296	11:42
BLANK TEST	0.000	11:43
EXTERNAL STANDARD	0.296	11:43
BLANK TEST	0.000	11:44

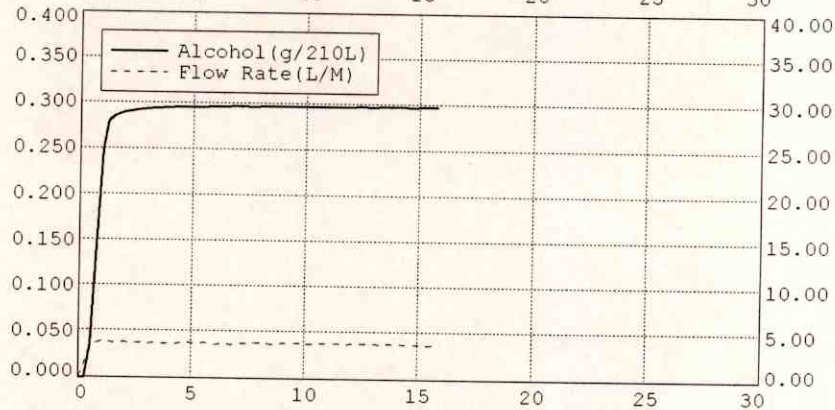
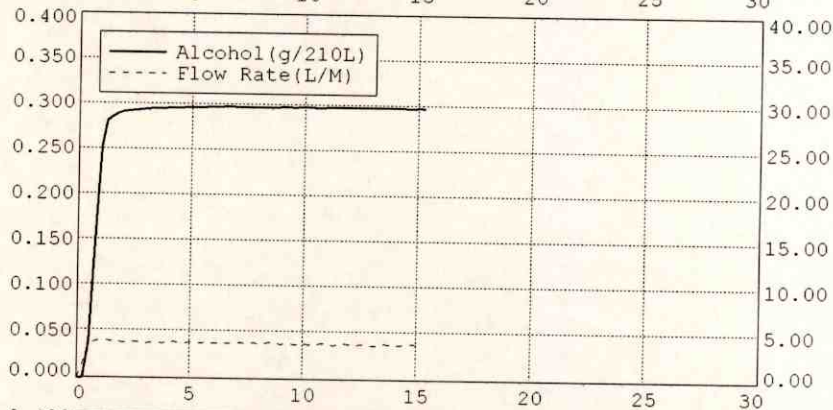
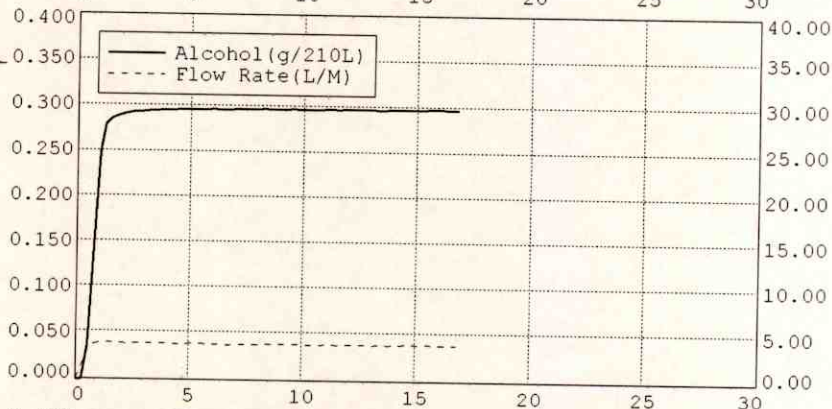
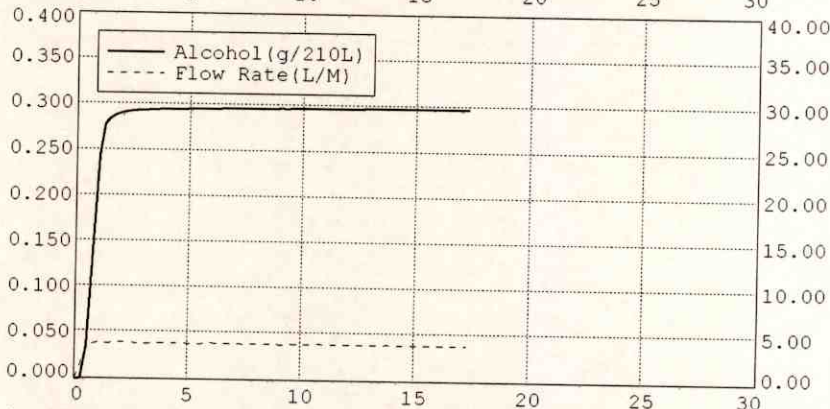
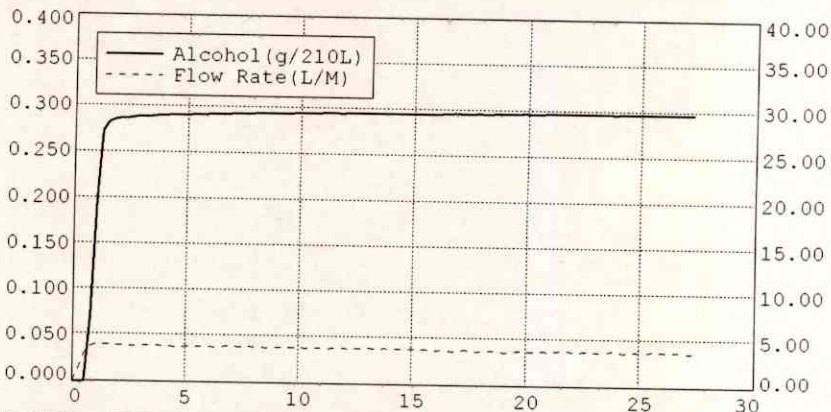
Average = 0.2956  
 Std Dev = 0.0005

Simulator Information

DR 4177

Cal: 10/8/19

BMB 8/24/20



DIAGNOSTIC RECORD

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Alaska Department of Public Safety  
DATAMASTER dmt: 100405  
-----

Date: 08/21/2020  
Time: 10:13:55

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       = 46.3°C                PASSED  
(38.0°C - 50.0°C)

SETTINGS

Lamp Voltage     = 1.72 V                    PASSED  
(1.01 V - 2.37 V)  
Cooler Voltage = 1.69 V                    PASSED  
(1.01 V - 2.37 V)  
Bias Voltage     = 81 V                    PASSED  
(49 V - 113 V)  
Chopper Freq    = 528 Hz                    PASSED  
(475 Hz - 575 Hz)  
Barometer       = 29.5 in

PUMP INFO

Flow Rate = 4.990 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 = 0.088 0.20% (0.00% - 4.00%)      PASSED

Technician Screen

-----  
DATAMASTER dmt: 100405  
-----

Date: 08/21/2020  
Time: 10:30 AM

Temperatures (°C)

Sample Cell: 48.7°C  
Breath Tube: 46.2°C

Current Barometer 29.5 in  
Volume (Ltr) 0.00

Settings

Lamp: 1.74 V  
Bias: 81 V  
Cooler: 1.69 V  
Chopper: 527 Hz

Voltages (V)

Flow: 1.05 V  
Detector: 0.052 V

LINEARITY CHECK

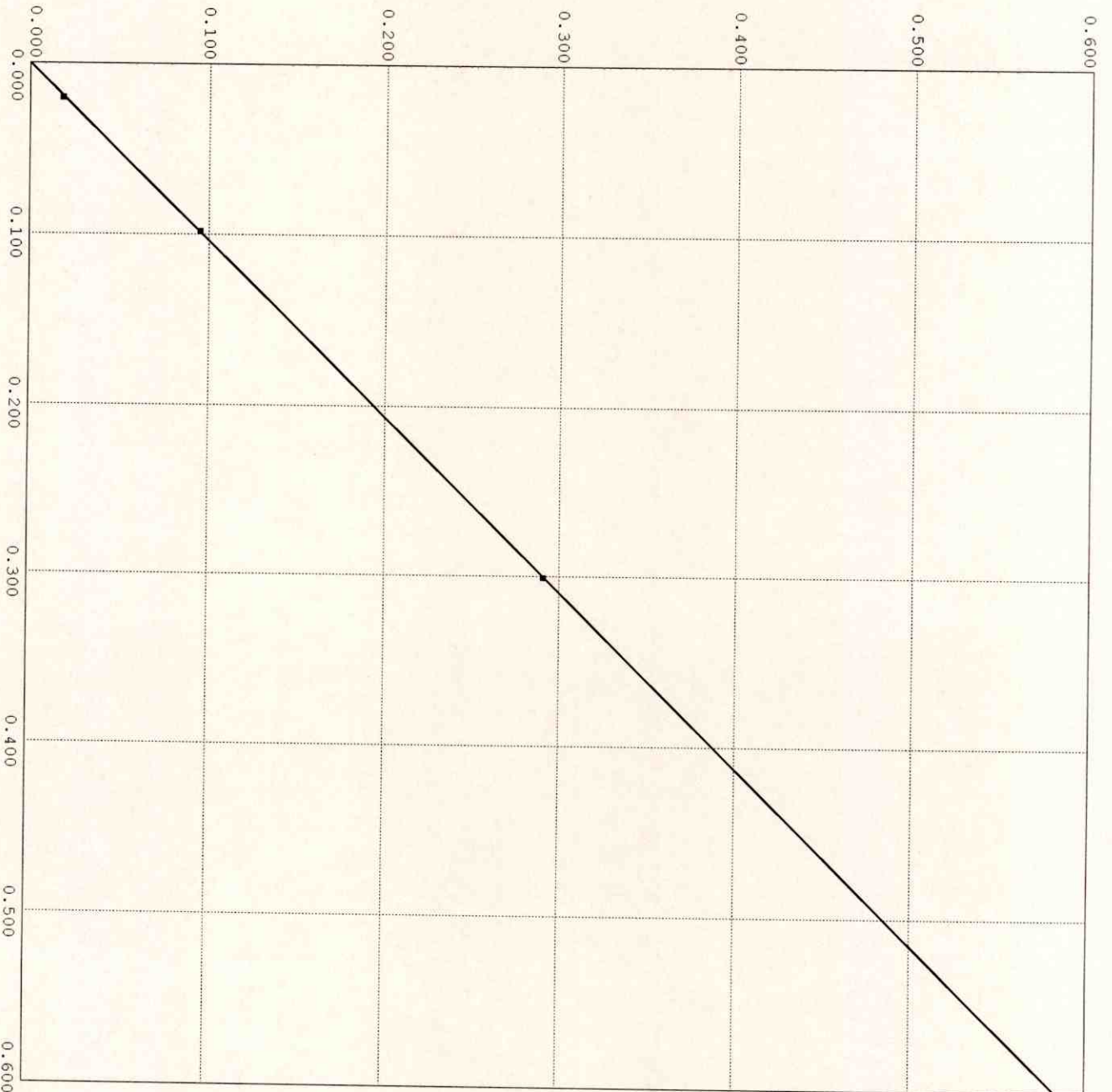
Alaska Department of Public Safety  
DATAMASTER dmt: 100405

Date: 08/21/2020  
Time: 10:42:28

SUPERVISOR NAME:  
BRANDI BARNETT  
OPERATOR'S #: 7038

TARGET	AVERAGE	STD. DEV.
0.020	0.0190	0.0000
0.098	0.0962	0.0004
0.300	0.2916	0.0005

SLOPE = 0.972323  
R<sup>2</sup> = 0.999975



BMB

LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety  
DATAMASTER dmt: 100405

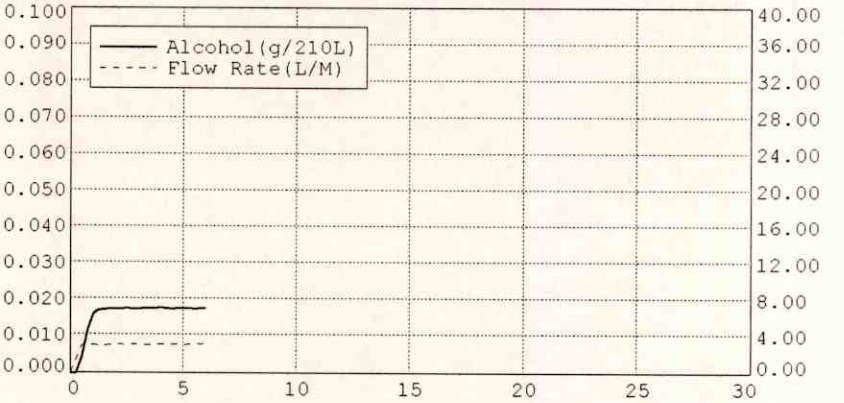
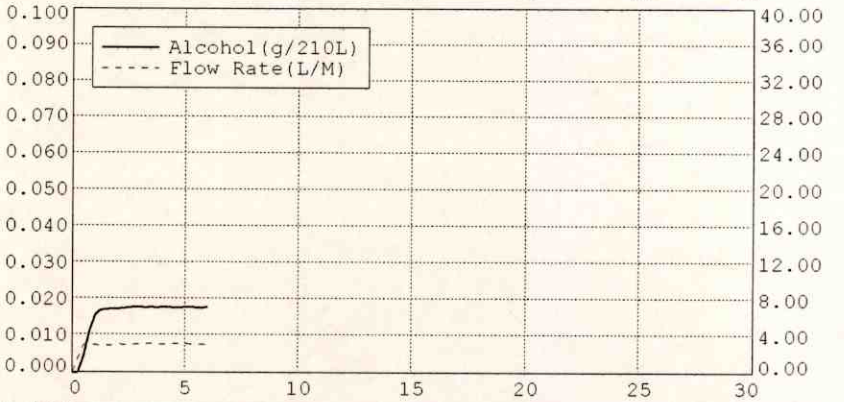
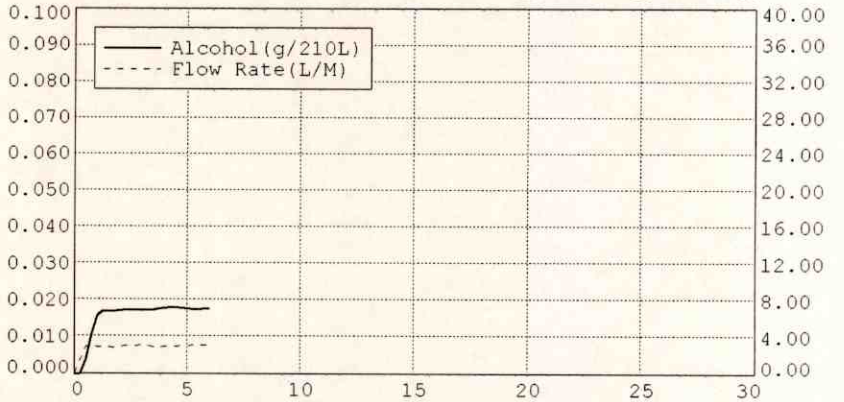
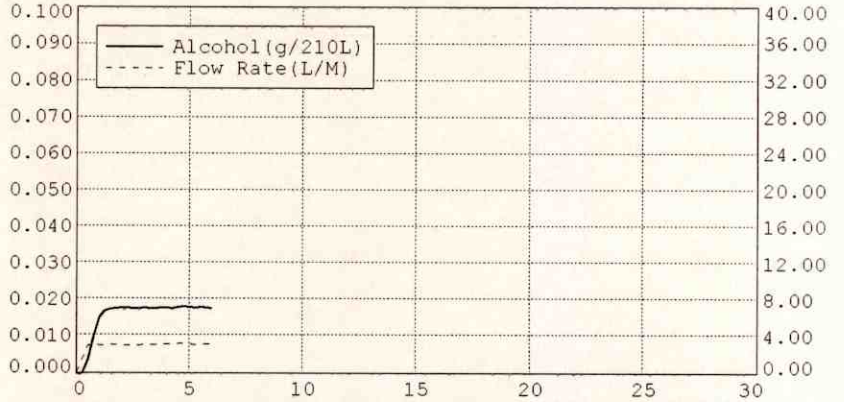
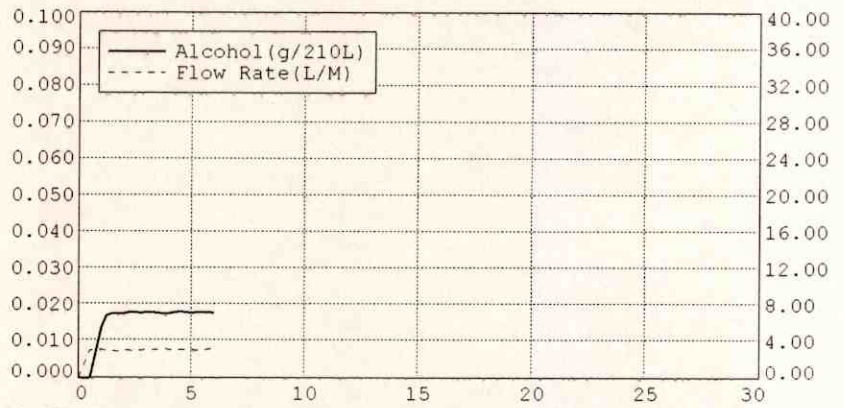
Date: 08/21/2020  
Time: 10:42:30

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020  
TARGET AT 29.46: 0.020  
LOT #: AG928203  
EXPIRATION: 10/09/2021  
TANK PRESSURE: 773 psi

BLANK TEST	0.000	10:47
INTERNAL STANDARD	VERIFIED	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
EXTERNAL STANDARD	0.019	10:51
BLANK TEST	0.000	10:52
EXTERNAL STANDARD	0.019	10:52
BLANK TEST	0.000	10:53

Average = 0.0190  
Std Dev = 0.0000



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety  
 DATAMASTER dmt: 100405

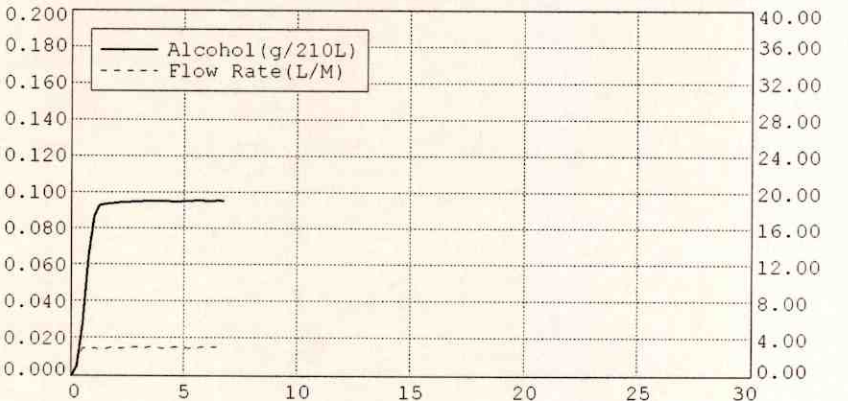
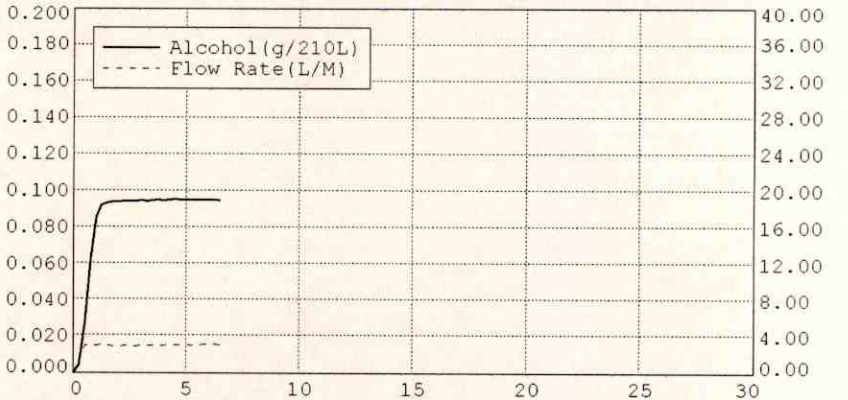
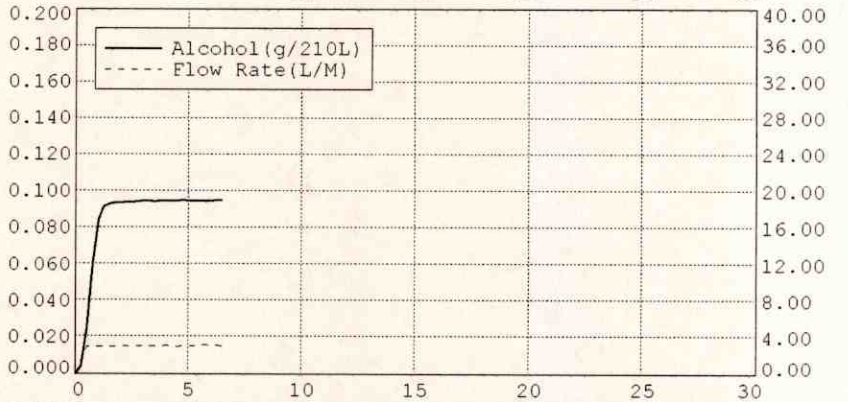
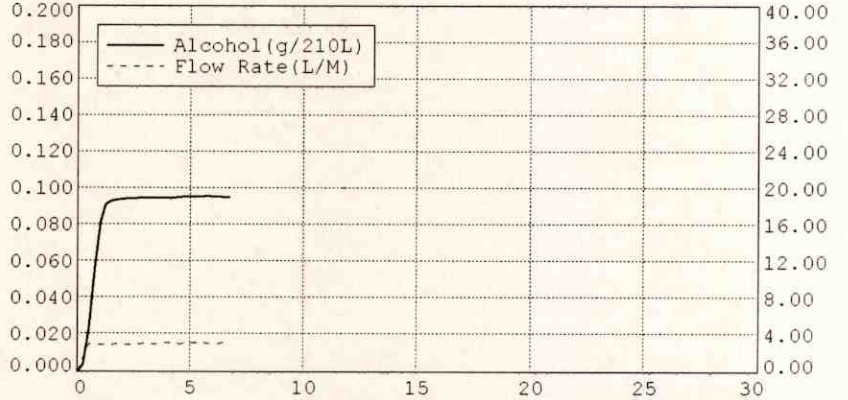
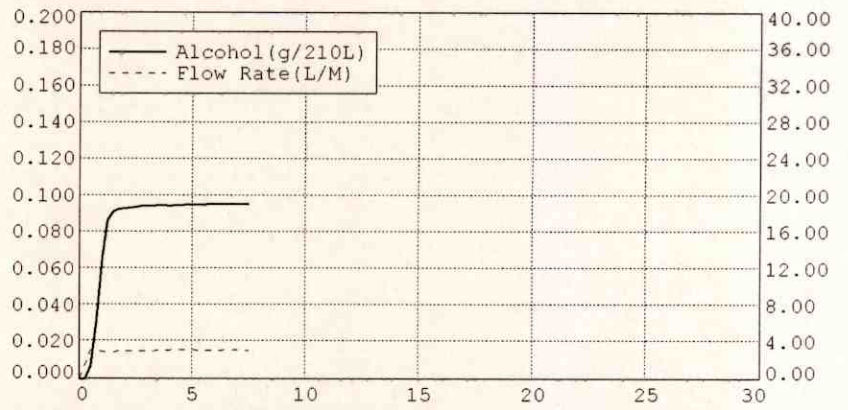
Date: 08/21/2020  
 Time: 10:56:30

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.100  
 TARGET AT 29.45: 0.098  
 LOT #: AG924701  
 EXPIRATION: 09/04/2021  
 TANK PRESSURE: 864 psi

BLANK TEST	0.000	10:57
INTERNAL STANDARD	VERIFIED	10:57
EXTERNAL STANDARD	0.096	10:57
BLANK TEST	0.000	10:58
EXTERNAL STANDARD	0.096	10:59
BLANK TEST	0.000	10:59
EXTERNAL STANDARD	0.096	11:00
BLANK TEST	0.000	11:01
EXTERNAL STANDARD	0.096	11:01
BLANK TEST	0.000	11:02
EXTERNAL STANDARD	0.097	11:02
BLANK TEST	0.000	11:03

Average = 0.0962  
 Std Dev = 0.0004





LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety  
 DATAMASTER dmt: 100405

Date: 08/21/2020  
 Time: 11:06:11

EXTERNAL STANDARD INFORMATION  
 NOMINAL: 0.300  
 LOT #: GUTH 19330  
 EXPIRATION: 11/13/2021

BLANK TEST	0.000	11:07
INTERNAL STANDARD	VERIFIED	11:07
EXTERNAL STANDARD	0.291	11:07
BLANK TEST	0.000	11:08
EXTERNAL STANDARD	0.292	11:09
BLANK TEST	0.000	11:10
EXTERNAL STANDARD	0.291	11:10
BLANK TEST	0.000	11:11
EXTERNAL STANDARD	0.292	11:11
BLANK TEST	0.000	11:12
EXTERNAL STANDARD	0.292	11:13
BLANK TEST	0.000	11:14

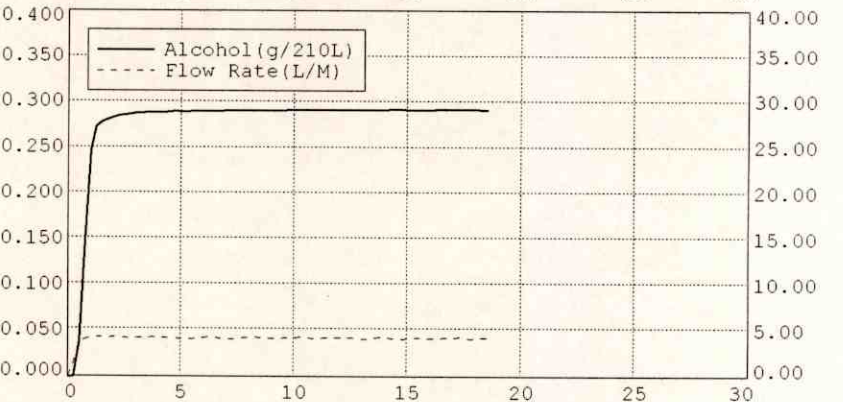
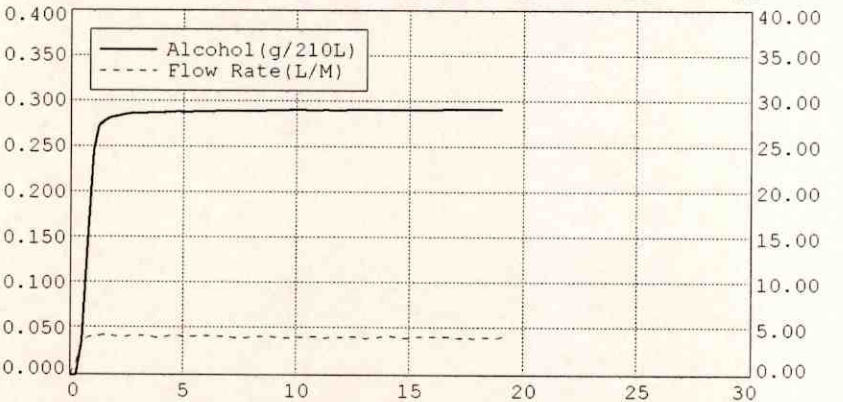
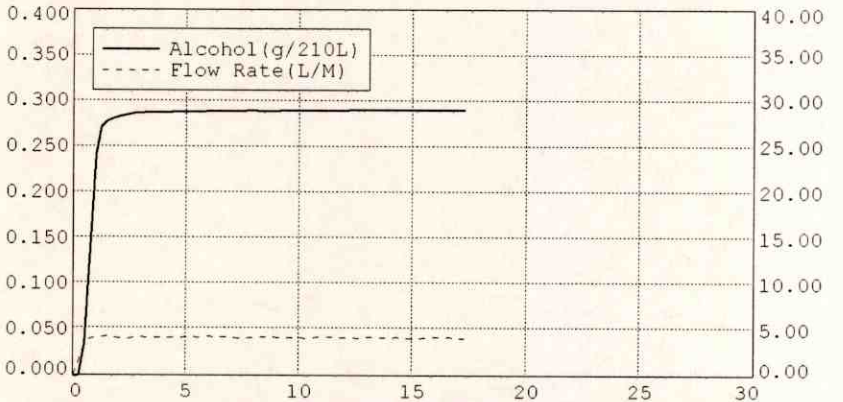
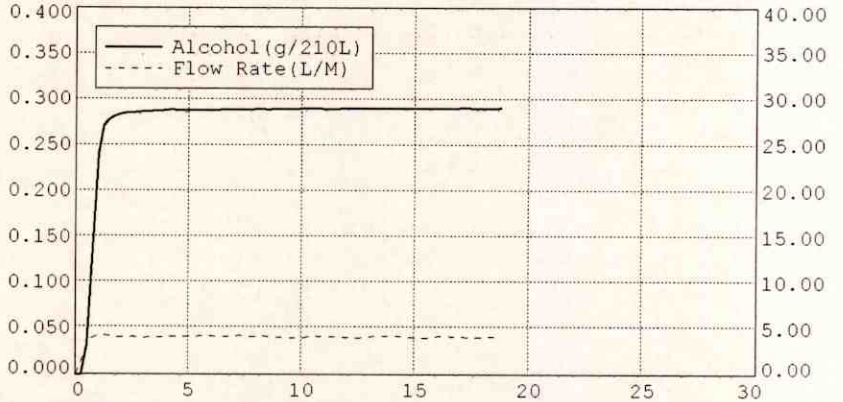
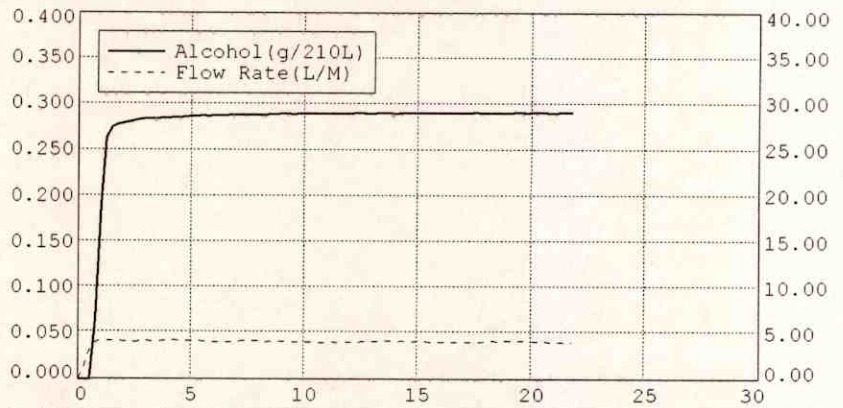
Average = 0.2916  
 Std Dev = 0.0005

Simulator Info.

DR4177

Cal: 10/8/19

BMB 8/24/20



DIAGNOSTIC RECORD

-----  
Alaska Department of Public Safety  
DATAMASTER dmt: 100353  
-----

Date: 08/21/2020  
Time: 09:31:16

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 = 2.33 V PASSED  
(1.30 V - 3.04 V)  
Cooler Voltage = 1.89 V PASSED  
(1.26 V - 2.94 V)  
Bias Voltage = 78 V PASSED  
(48 V - 112 V)  
Chopper Freq = 523 Hz PASSED  
(475 Hz - 575 Hz)  
Barometer = 29.5 in

PUMP INFO

Flow Rate = 4.970 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 = 0.094 0.19% (0.00% - 4.00%) PASSED

Technician Screen

-----  
DATAMASTER dmt: 100353  
-----

Date: 08/21/2020  
Time: 9:46 AM

Temperatures (°C)  
Sample Cell: 49.0°C  
Breath Tube: 48.1°C

Current Barometer 29.5 in  
Volume (Ltr) 0.00

Settings  
Lamp: 2.33 V  
Bias: 78 V  
Cooler: 1.92 V  
Chopper: 523 Hz

Voltages (V)  
Flow: 1.05 V  
Detector: 0.095 V

LINEARITY CHECK

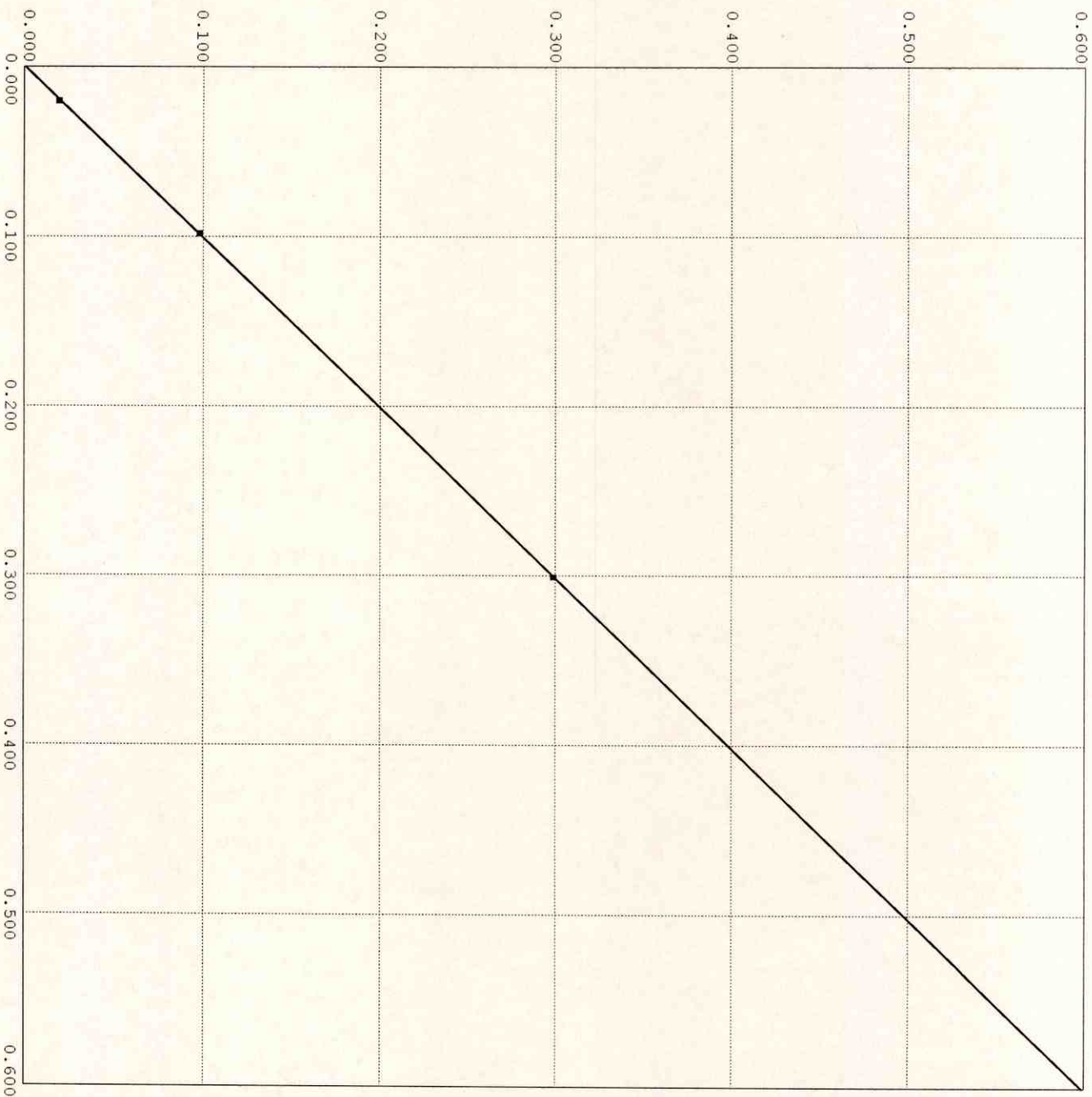
Alaska Department of Public Safety  
DATAMASTER dmt: 100353

Date: 08/21/2020  
Time: 09:49:35

SUPERVISOR NAME:  
BRANDI BARNETT  
OPERATOR'S #: 7038

TARGET	AVERAGE	STD. DEV.
0.020	0.0202	0.0004
0.098	0.0990	0.0000
0.300	0.2996	0.0005

SLOPE = 0.996900  
R<sup>2</sup> = 0.999986



*BMB*

LINEARITY CHECK: Control Test 1

Alaska Department of Public Safety  
 DATAMASTER dmt: 100353

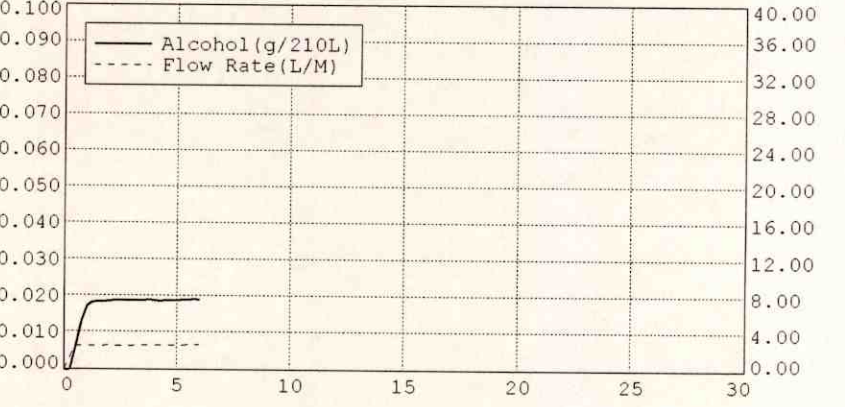
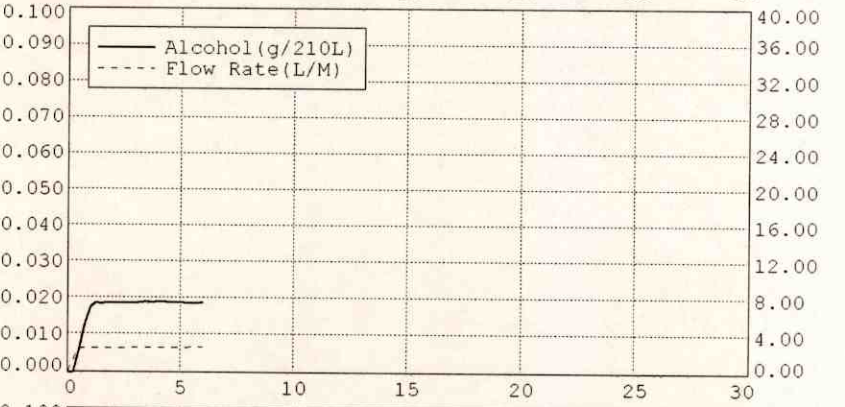
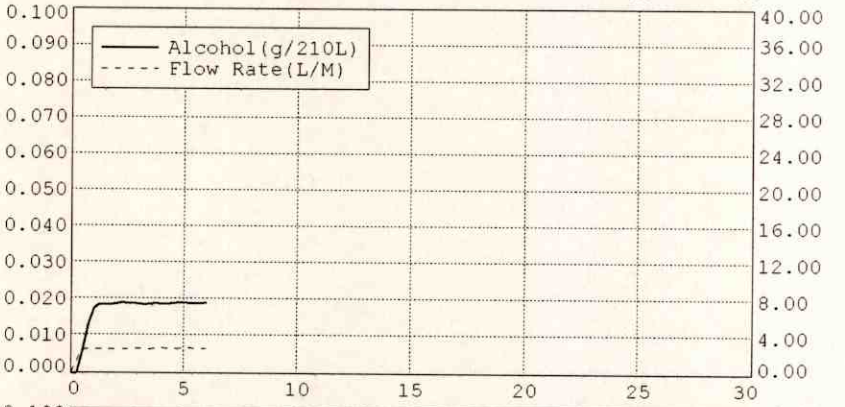
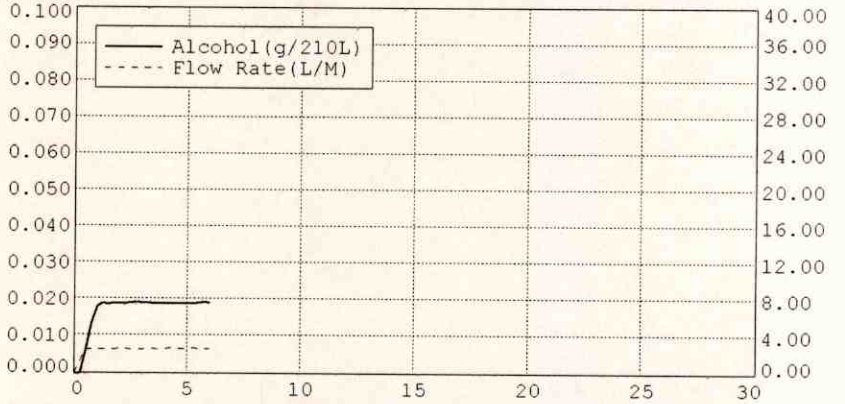
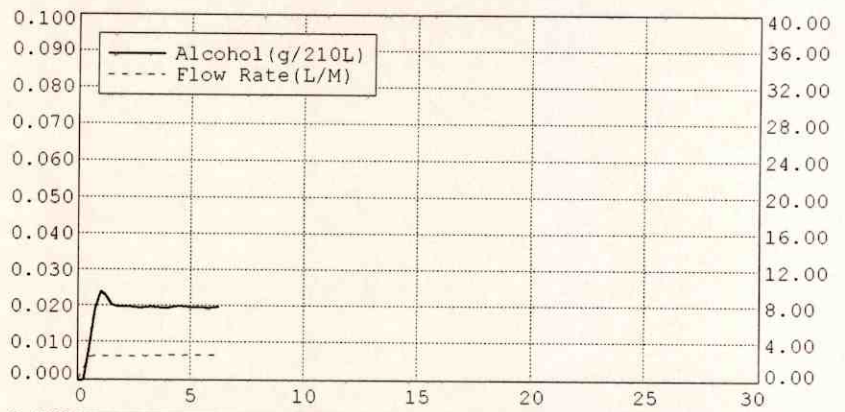
Date: 08/21/2020  
 Time: 09:49:37

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.020  
 TARGET AT 29.45: 0.020  
 LOT #: AG928203  
 EXPIRATION: 10/09/2021  
 TANK PRESSURE: 789 psi

BLANK TEST	0.000	09:51
INTERNAL STANDARD	VERIFIED	09:51
EXTERNAL STANDARD	0.021	09:51
BLANK TEST	0.000	09:52
EXTERNAL STANDARD	0.020	09:52
BLANK TEST	0.000	09:53
EXTERNAL STANDARD	0.020	09:53
BLANK TEST	0.000	09:54
EXTERNAL STANDARD	0.020	09:54
BLANK TEST	0.000	09:55
EXTERNAL STANDARD	0.020	09:55
BLANK TEST	0.000	09:56

Average = 0.0202  
 Std Dev = 0.0004



LINEARITY CHECK: Control Test 2

Alaska Department of Public Safety  
 DATAMASTER dmt: 100353

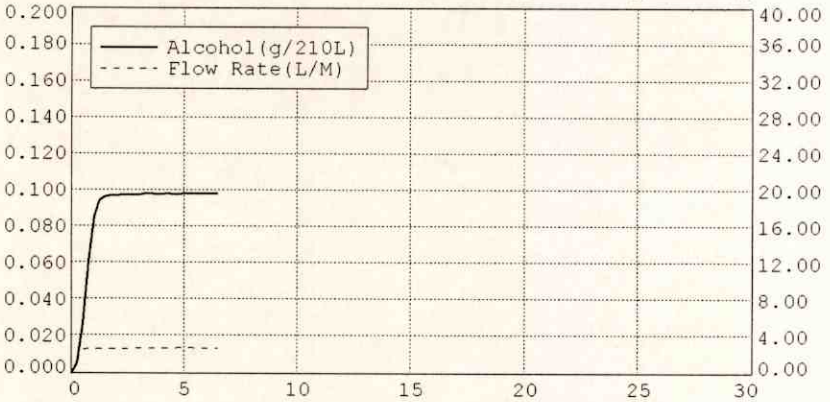
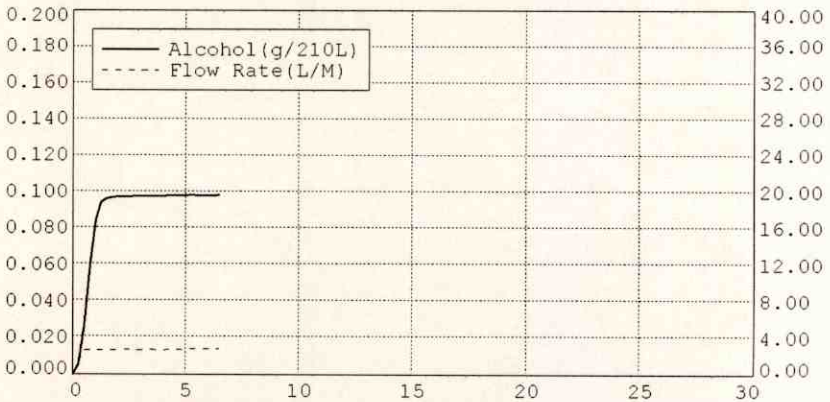
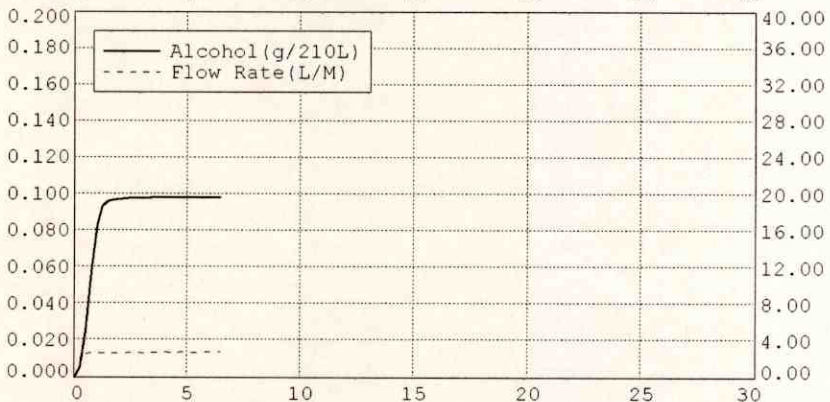
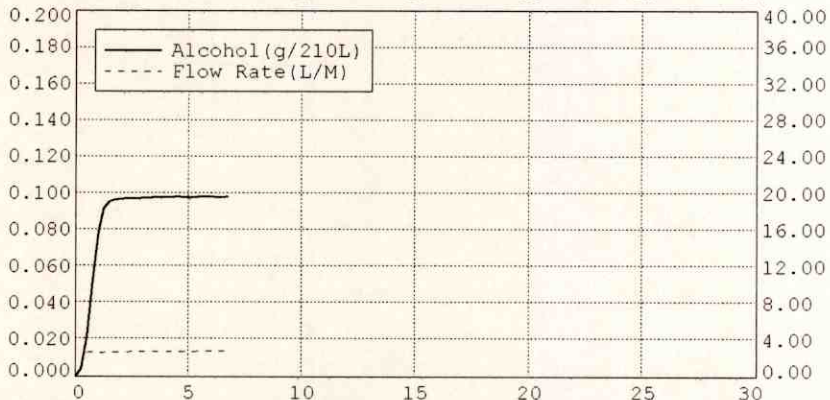
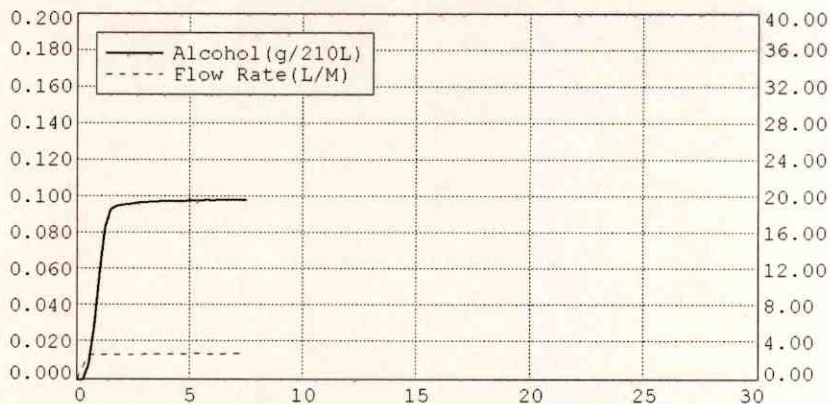
Date: 08/21/2020  
 Time: 09:58:16

EXTERNAL STANDARD INFORMATION

NOMINAL: 0.100  
 TARGET AT 29.45: 0.098  
 LOT #: AG924701  
 EXPIRATION: 09/04/2021  
 TANK PRESSURE: 882 psi

BLANK TEST	0.000	09:59
INTERNAL STANDARD	VERIFIED	09:59
EXTERNAL STANDARD	0.099	09:59
BLANK TEST	0.000	10:00
EXTERNAL STANDARD	0.099	10:00
BLANK TEST	0.000	10:01
EXTERNAL STANDARD	0.099	10:01
BLANK TEST	0.000	10:02
EXTERNAL STANDARD	0.099	10:03
BLANK TEST	0.000	10:03
EXTERNAL STANDARD	0.099	10:04
BLANK TEST	0.000	10:05

Average = 0.0990  
 Std Dev = 0.0000



LINEARITY CHECK: Control Test 3

Alaska Department of Public Safety  
 DATAMASTER dmt: 100353

Date: 08/21/2020  
 Time: 10:13:07

EXTERNAL STANDARD INFORMATION  
 NOMINAL: 0.300  
 LOT #: GUTH 19330  
 EXPIRATION: 11/13/2021

BLANK TEST	0.000	10:14
INTERNAL STANDARD	VERIFIED	10:15
EXTERNAL STANDARD	0.299	10:16
BLANK TEST	0.000	10:17
EXTERNAL STANDARD	0.299	10:17
BLANK TEST	0.000	10:18
EXTERNAL STANDARD	0.300	10:18
BLANK TEST	0.000	10:19
EXTERNAL STANDARD	0.300	10:20
BLANK TEST	0.000	10:21
EXTERNAL STANDARD	0.300	10:21
BLANK TEST	0.000	10:22

Average = 0.2996  
 Std Dev = 0.0005

Simulator Info

DR4177

Cal: 10/8/19

BMB 8/24/20

