



## Verification of Quantitative Methods

Purpose	To show the instrument is fit for use after completion of annual preventative maintenance.
Analyte	Ethanol, Methanol, Acetone, Isopropanol
Units of Measure	g/100 mL
Analyst Performing Verification Study	Brooke A. Mendenhall
Responsible Supervisor	Corissa L. Rodgers
Start Date	March 2, 2023
Completion Date	March 2, 2023
Primary Matrix	Blood
Secondary Matrices	Serum, Plasma, Alcoholic Beverages, Other Liquid Specimens
Lowest Calibrator Concentration	0.010
Highest Calibrator Concentration	0.500 (Ethanol), 0.400 (Methanol, Acetone, Isopropanol)
Equipment/Instrument	Headspace 3 This instrument is fit for use on casework for Alcohol and Other Volatiles Analysis.
Instrument Serial Number	Headspace CN16140002 Gas Chromatograph US16163003
Method	ALC.M

### Verification Approval

Analyst: \_\_\_\_\_ 03/06/2023  
Date

Responsible Supervisor: \_\_\_\_\_ 03/06/2023  
Date

**Verification Study**Analyte: *Ethanol*Units: *g/100 mL*Instrument: *HeadSpace 3 FID1***BIAS AND PRECISION**Analyst: *Brooke A. Mendenhall*Study Dates: *3/2/2023 to 3/2/2023*Matrix: *Blood*

Run Date	Run Order	MQC2	BQC1	EQC	LMQC	
<i>Target Concentration (g/100 mL):</i>		<i>0.1539</i>	<i>0.0804</i>	<i>0.0800</i>	<i>0.0192</i>	
<b>Run 1</b> ALC_20230302_BAM	1	0.1492	0.0786	0.0801	0.0196	
	2	0.1516	0.0795	0.0803	0.0199	
	3	0.1513	0.0797	0.0803	0.0197	
<i>Within Run</i>		<b>Mean</b>	<b>0.1507</b>	<b>0.0793</b>	<b>0.0802</b>	<b>0.0197</b>
		<b>SD</b>	<b>0.001308</b>	<b>0.000586</b>	<b>0.000115</b>	<b>0.000153</b>
		<b>%CV</b>	<b>0.868%</b>	<b>0.739%</b>	<b>0.144%</b>	<b>0.774%</b>
		<b>% Bias</b>	<b>-2.08%</b>	<b>-1.41%</b>	<b>0.29%</b>	<b>2.78%</b>

Comments: MQC2 (Lot: 2108208); BQC1 (Lot: 2101199); EQC (Lot: 20012020-B); LMQC (Lot: 220502-LMQC)

Acceptance Criteria:

Bias:

 $\leq \pm 5\%$  if target concentration is  $>0.05$  g/100 mL $\leq \pm 10\%$  if target concentration is  $\leq 0.05$  g/100 mLWithin Run Precision:  $\%CV \leq \pm 10\%$ **Verification Study**Analyte: *Ethanol*Units: *g/100 mL*Instrument: *HeadSpace 3 FID2***BIAS AND PRECISION**Analyst: *Brooke A. Mendenhall*Study Dates: *3/2/2023 to 3/2/2023*Matrix: *Blood*

Run Date	Run Order	MQC2	BQC1	EQC	LMQC	
<i>Target Concentration (g/100 mL):</i>		<i>0.1539</i>	<i>0.0804</i>	<i>0.0800</i>	<i>0.0192</i>	
<b>Run 1</b> ALC_20230302_BAM	1	0.1487	0.0787	0.0795	0.0196	
	2	0.1510	0.0803	0.0798	0.0199	
	3	0.1502	0.0797	0.0797	0.0197	
<i>Within Run</i>		<b>Mean</b>	<b>0.1500</b>	<b>0.0796</b>	<b>0.0797</b>	<b>0.0197</b>
		<b>SD</b>	<b>0.001168</b>	<b>0.000808</b>	<b>0.000153</b>	<b>0.000153</b>
		<b>%CV</b>	<b>0.779%</b>	<b>1.016%</b>	<b>0.192%</b>	<b>0.774%</b>
		<b>% Bias</b>	<b>-2.56%</b>	<b>-1.04%</b>	<b>-0.42%</b>	<b>2.78%</b>

Comments: MQC2 (Lot: 2108208); BQC1 (Lot: 2101199); EQC (Lot: 20012020-B); LMQC (Lot: 220502-LMQC)

Acceptance Criteria:

Bias:

 $\leq \pm 5\%$  if target concentration is  $>0.05$  g/100 mL $\leq \pm 10\%$  if target concentration is  $\leq 0.05$  g/100 mLWithin Run Precision:  $\%CV \leq \pm 10\%$

**Verification Study**

Analyte: *Methanol*  
 Units: *g/100 mL*  
 Instrument: *Headspace 3 FID1*

**BIAS AND PRECISION**

Analyst: *Brooke A. Mendenhall*  
 Study Dates: *3/2/2023 to 3/2/2023*  
 Matrix: *Blood*

Run Date	Run Order	MQC2	LMQC
<i>Target Concentration (g/100 mL):</i>		<i>0.0966</i>	<i>0.0192</i>
Run 1 ALC_20230302_BAM	1	0.0926	0.0203
	2	0.0948	0.0208
	3	0.0949	0.0204
Within Run	Mean	<b>0.0941</b>	<b>0.0205</b>
	SD	<b>0.001300</b>	<b>0.000265</b>
	%CV	<b>1.382%</b>	<b>1.291%</b>
	% Bias	<b>-2.59%</b>	<b>6.77%</b>

Comments: MQC2 (Lot: 2108208); LMQC (Lot: 220502-LMQC)

Acceptance Criteria:

Bias:  
 $\leq \pm 5\%$  if target concentration is  $>0.05$  g/100 mL  
 $\leq \pm 10\%$  if target concentration is  $\leq 0.05$  g/100 mL  
 Within Run Precision:  $\%CV \leq \pm 10\%$

**Verification Study**

Analyte: *Methanol*  
 Units: *g/100 mL*  
 Instrument: *Headspace 3 FID2*

**BIAS AND PRECISION**

Analyst: *Brooke A. Mendenhall*  
 Study Dates: *3/2/2023 to 3/2/2023*  
 Matrix: *Blood*

Run Date	Run Order	MQC2	LMQC
<i>Target Concentration (g/100 mL):</i>		<i>0.0966</i>	<i>0.0192</i>
Run 1 ALC_20230302_BAM	1	0.0927	0.0195
	2	0.0938	0.0200
	3	0.0933	0.0196
Within Run	Mean	<b>0.0933</b>	<b>0.0197</b>
	SD	<b>0.000551</b>	<b>0.000265</b>
	%CV	<b>0.591%</b>	<b>1.343%</b>
	% Bias	<b>-3.45%</b>	<b>2.60%</b>

Comments: MQC2 (Lot: 2108208); LMQC (Lot: 220502-LMQC)

Acceptance Criteria:

Bias:  
 $\leq \pm 5\%$  if target concentration is  $>0.05$  g/100 mL  
 $\leq \pm 10\%$  if target concentration is  $\leq 0.05$  g/100 mL  
 Within Run Precision:  $\%CV \leq \pm 10\%$

**Verification Study****BIAS AND PRECISION**

Analyte: *Isopropanol*  
 Units: *g/100 mL*  
 Instrument: *Headspace 3 FID1*

Analyst: *Brooke A. Mendenhall*  
 Study Dates: *3/2/2023 to 3/2/2023*  
 Matrix: *Blood*

Run Date	Run Order	MQC2	LMQC
<i>Target Concentration (g/100 mL):</i>		<i>0.0947</i>	<i>0.0192</i>
<b>Run 1</b> ALC_20230302_BAM	1	0.0947	0.0195
	2	0.0953	0.0194
	3	0.0950	0.0195
<i>Within Run</i>	<b>Mean</b>	<b>0.0950</b>	<b>0.0195</b>
	<b>SD</b>	<b>0.000300</b>	<b>0.000058</b>
	<b>%CV</b>	<b>0.316%</b>	<b>0.297%</b>
	<b>% Bias</b>	<b>0.32%</b>	<b>1.39%</b>

Comments: MQC2 (Lot: 2108208); LMQC (Lot: 220502-LMQC)

Acceptance Criteria:

**Bias:**  
 $\leq \pm 5\%$  if target concentration is  $>0.05$  g/100 mL  
 $\leq \pm 10\%$  if target concentration is  $\leq 0.05$  g/100 mL  
**Within Run Precision: %CV  $\leq \pm 10\%$**

**Verification Study****BIAS AND PRECISION**

Analyte: *Isopropanol*  
 Units: *g/100 mL*  
 Instrument: *Headspace 3 FID2*

Analyst: *Brooke A. Mendenhall*  
 Study Dates: *3/2/2023 to 3/2/2023*  
 Matrix: *Blood*

Run Date	Run Order	MQC2	LMQC
<i>Target Concentration (g/100 mL):</i>		<i>0.0947</i>	<i>0.0192</i>
<b>Run 1</b> ALC_20230302_BAM	1	0.0949	0.0196
	2	0.0954	0.0195
	3	0.0948	0.0196
<i>Within Run</i>	<b>Mean</b>	<b>0.0950</b>	<b>0.0196</b>
	<b>SD</b>	<b>0.000321</b>	<b>0.000058</b>
	<b>%CV</b>	<b>0.338%</b>	<b>0.295%</b>
	<b>% Bias</b>	<b>0.35%</b>	<b>1.91%</b>

Comments: MQC2 (Lot: 2108208); LMQC (Lot: 220502-LMQC)

Acceptance Criteria:

**Bias:**  
 $\leq \pm 5\%$  if target concentration is  $>0.05$  g/100 mL  
 $\leq \pm 10\%$  if target concentration is  $\leq 0.05$  g/100 mL  
**Within Run Precision: %CV  $\leq \pm 10\%$**

**Verification Study**

Analyte: **Acetone**  
 Units: **g/100 mL**  
 Instrument: **Headspace 3 FID1**

**BIAS AND PRECISION**

Analyst: **Brooke A. Mendenhall**  
 Study Dates: **3/2/2023 to 3/2/2023**  
 Matrix: **Blood**

Run Date	Run Order	MQC2	LMQC
<i>Target Concentration (g/100 mL):</i>		0.1409	0.0192
Run 1 ALC_20230302_BAM	1	0.1424	0.0192
	2	0.1417	0.0188
	3	0.1406	0.0193
<i>Within Run</i>	<b>Mean</b>	<b>0.1416</b>	<b>0.0191</b>
	<b>SD</b>	<b>0.000907</b>	<b>0.000265</b>
	<b>%CV</b>	<b>0.641%</b>	<b>1.385%</b>
	<b>% Bias</b>	<b>0.47%</b>	<b>-0.52%</b>

Comments: MQC2 (Lot: 2108208); LMQC (Lot: 220502-LMQC)

Acceptance Criteria:

**Bias:**  
 $\leq \pm 5\%$  if target concentration is  $>0.05$  g/100 mL  
 $\leq \pm 10\%$  if target concentration is  $\leq 0.05$  g/100 mL  
**Within Run Precision: %CV  $\leq \pm 10\%$**

**Verification Study**

Analyte: **Acetone**  
 Units: **g/100 mL**  
 Instrument: **Headspace 3 FID2**

**BIAS AND PRECISION**

Analyst: **Brooke A. Mendenhall**  
 Study Dates: **3/2/2023 to 3/2/2023**  
 Matrix: **Blood**

Run Date	Run Order	MQC2	LMQC
<i>Target Concentration (g/100 mL):</i>		0.1409	0.0192
Run 1 ALC_20230302_BAM	1	0.1422	0.0193
	2	0.1415	0.0189
	3	0.1399	0.0194
<i>Within Run</i>	<b>Mean</b>	<b>0.1412</b>	<b>0.0192</b>
	<b>SD</b>	<b>0.001179</b>	<b>0.000265</b>
	<b>%CV</b>	<b>0.835%</b>	<b>1.378%</b>
	<b>% Bias</b>	<b>0.21%</b>	<b>0.00%</b>

Comments: MQC2 (Lot: 2108208); LMQC (Lot: 220502-LMQC)

Acceptance Criteria:

**Bias:**  
 $\leq \pm 5\%$  if target concentration is  $>0.05$  g/100 mL  
 $\leq \pm 10\%$  if target concentration is  $\leq 0.05$  g/100 mL  
**Within Run Precision: %CV  $\leq \pm 10\%$**

## SUMMARY OF VERIFICATION PERFORMANCE

Units: *g/100 mL*

Instrument: *Headspace 3*

Analyst: *Brooke A. Mendenhall*

Study Dates: *3/2/2023 to 3/2/2023*

Matrix: *Blood*

Failed Runs (include dates/reasons):

N/A

Deviations from SOP:

N/A

Other Notes:

N/A

Conclusion:

Headspace 3 is fit for use on casework analysis of ethanol, methanol, isopropanol and acetone.