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900 SW Jackson, Room 456
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Jackie McClaskey, Secretary

Governor Sam Brownback

Expires on: 12/14/2016

Kansas Metrology Laboratory
Calibration Report

Report Number: K15192-3

Submitted by:

Nebraska Department Of Agriculture
Food Safety & Consumer Protection
Po Box 94757
Lincoln NE 68509

Submitted on: 12/14/2015

Reference Number: 16722

Item(s)

Tested	Adjusted	Rejected
1	0	0

Quantity	Nominal Volume	Type
1	20 gal	LPG Prover "To Deliver"

The calibration of items is performed according to NISTIR 7383, SOP 21 Volume Transfer. Tolerances are applied from NISTHB 105-4. The volume applies when a 30 second drain is observed. The drain time starts when the level of the liquid is observed in the lower sight glass and continues while the level is bled down to zero. The level of the liquid shall be at zero and the valve closed at the end of the 30 seconds.

Drain Characteristics

Time	Applied Pressure psig	Method
1 min 30 s	0	Pump

The time listed above is the total drain time which includes the 30 second drain time to the bottom zero.

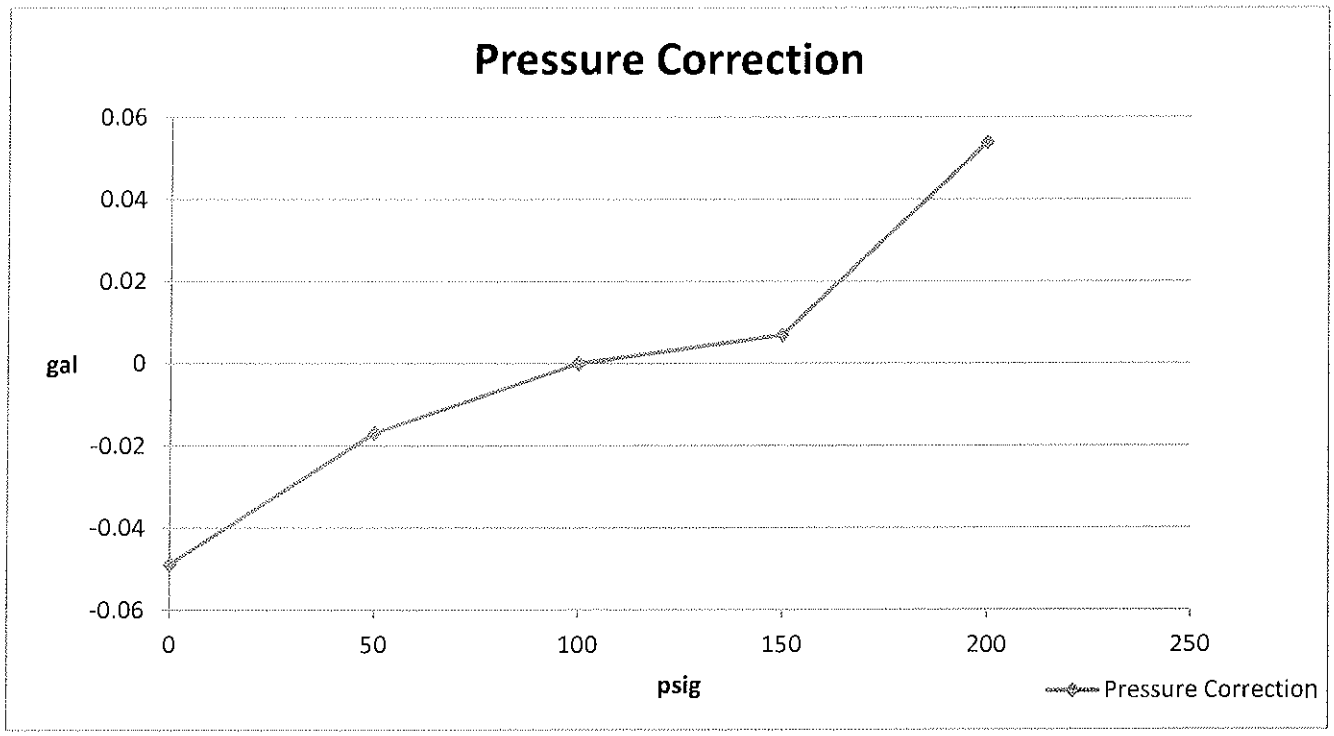
Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (/°F)	**Volume as Found @ 60 °F & 100 psig**	Tolerance ±	Expanded Uncertainty (U), (k=2.05), ±	**Volume as Left @ 60 °F & 100 psig**	Adjusted/ In Tolerance/ Rejected
20 gal	88220	Low Carbon Steel Pressure Vessel	0.000016	**20.0075 gal**	0.0400 gal	0.0084 gal	**20.0075 gal**	In Tolerance

The data in the above table of this report only applies to those items specifically listed on this report.

1 m^3=1 000 L=264.1720 gal

Pressure Correction

Applied Pressure psig	Pressure Corection (gal)	Volume as Left @ 60 °F (gal)
0	-0.0489	19.9586
50	-0.0169	19.9905
100	0.0000	20.0075
150	0.0069	20.0144
200	0.0539	20.0614



Temperature Correction

Item	Temperature °F	gal
Temperature Correction for 20 gal Low Carbon Steel Pressure Vessel Prover (CCE= 0.000016/°F)	-20	-0.0256
	-15	-0.0240
	-10	-0.0224
	-5	-0.0208
	0	-0.0192
	5	-0.0176
	10	-0.0160
	15	-0.0144
	20	-0.0128
	25	-0.0112
	30	-0.0096
	35	-0.0080
	40	-0.0064
	45	-0.0048
	50	-0.0032
	55	-0.0016
	60	0.0000
	65	0.0016
	70	0.0032
	75	0.0048
	80	0.0064
	85	0.0080
	90	0.0096
	95	0.0112
	100	0.0128
	105	0.0144
	110	0.0160
	115	0.0176
	120	0.0192

CCE = Coefficient of Cubical Expansion

Uncertainty Statement:

The combined standard uncertainty includes the standard uncertainty reported for the standards, the standard uncertainty for the measurement process, the standard uncertainty for the water density equation (Metrologia Tanaka, et al), the standard uncertainty for any uncorrected errors associated with temperature correction (applies to length and volume values only), the standard uncertainty for reading the meniscus (when applicable), the standard uncertainty for viscosity, the standard uncertainty of the pressure gauge, and a component of uncertainty to account for any observed deviations from NIST(The National Institute of Standards and Technology) values that are less than surveillance limits. The combined standard uncertainty is multiplied by the coverage factor (k-value) reported to give an expanded uncertainty, which defines an interval having a level of confidence of 95.45 percent. The k-value reported is based on the effective degrees of freedom as outlined in JCGM 100:2008 section G.4. The expanded uncertainty presented in this report is consistent with the 1993 ISO Guide to the Expression of Uncertainty in Measurement and follows NISTIR 6969, SOP 29. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Traceability Statement:

The Kansas Metrology Laboratory Standards are traceable to the SI through NIST and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The laboratory test number identified above is the unique report number to be used in referencing measurement traceability for artifacts identified in this report only.

Condition of Item(s) Submitted for Testing:

Minor wear.

Treatment of Item(s) before Testing:

Item(s) were tested as found.

Water Temperature at Time of Test:

57.00 °F

Documentary Standards:

-NIST Handbook 105-4 (2010)

-NISTIR 7383 (2013), SOP 21

Environmental Conditions:

Temperature	17.06 °C
Barometric Pressure	722.31 mmHg
Relative Humidity	50.1 %

Test Date: 12/15/2015

Due Date: 12/14/2016

Kevin Uphoff

Kevin Uphoff, Metrologist 12/21/2015

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Jackie McClaskey, Secretary

Governor Sam Brownback

Expires on: 12/13/2016

Kansas Metrology Laboratory
Calibration Report

Report Number: K15192

Submitted by:

Nebraska Department Of Agriculture
Food Safety & Consumer Protection
Po Box 94757
Lincoln NE 68509

Submitted on: 12/14/2015

Reference Number: 16722

Item(s)

Tested	Adjusted	Rejected
1	0	0

Quantity	Nominal Volume	Type
1	100 gal	RF Prover, "To Deliver"

The calibration of items is performed according to NISTIR 7383, SOP 19 Volume Transfer. Tolerances are applied from NISTHB 105-3. The volume applies when a 10 second drain is observed for 5 gallon hand held test measures. For 5 gallon bottom drop test measures and provers a 30 second drain applies. The drain time starts when the cessation of the main flow is observed.

Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (/°F)	**Volume as Found @ 60 °F**	Tolerance ±	Expanded Uncertainty (U), (k=2.02), ±	**Volume as Left @ 60 °F**	Adjusted/ In Tolerance/ Rejected
100 gal	18969	Stainless Steel	0.0000265	**99.989 gal**	0.050 gal	0.012 gal	**99.989 gal**	In Tolerance

The data in the above table of this report only applies to those items specifically listed on this report.

1 m^3=1 000 L=264.1720 gal

Temperature Correction

Item	Temperature °F	in^3
Temperature Correction for 100 gal Stainless Steel Prover (CCE= 0.0000265/°F)	-20	-49.0
	-15	-45.9
	-10	-42.9
	-5	-39.8
	0	-36.7
	5	-33.7
	10	-30.6
	15	-27.5
	20	-24.5
	25	-21.4
	30	-18.4
	35	-15.3
	40	-12.2
	45	-9.2
	50	-6.1
	55	-3.1
	60	0.0
	65	3.1
	70	6.1
	75	9.2
	80	12.2
	85	15.3
	90	18.4
	95	21.4
	100	24.5
	105	27.5
	110	30.6
	115	33.7
	120	36.7

CCE = Coefficient of Cubical Expansion

Uncertainty Statement:

The combined standard uncertainty includes the standard uncertainty reported for the standards, the standard uncertainty for the measurement process, the standard uncertainty for the water density equation (Metrologia Tanaka, et al), the standard uncertainty for any uncorrected errors associated with temperature correction (applies to length and volume values only), the standard uncertainty for reading the meniscus (when applicable), the standard uncertainty for viscosity, and a component of uncertainty to account for any observed deviations from NIST(The National Institute of Standards and Technology) values that are less than surveillance limits. The combined standard uncertainty is multiplied by the coverage factor (k-value) reported to give an expanded uncertainty, which defines an interval having a level of confidence of 95.45 percent. The k-value reported is based on the effective degrees of freedom as outlined in JCGM 100:2008 section G.4. The expanded uncertainty presented in this report is consistent with the 1993 ISO Guide to the Expression of Uncertainty in Measurement and follows NISTIR 6969, SOP 29. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Traceability Statement:

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Condition of Item(s) Submitted for Testing:

Minor wear.

Treatment of Item(s) before Testing:

Item(s) were tested as found.

Water Temperature at Time of Test:

55.38 °F

Documentary Standards:

-NIST Handbook 105-3 (2010)

-NISTIR 7383 (2013), SOP 19

Environmental Conditions:

Temperature:	19.26 °C
Barometric Pressure:	724.51 mmHg
Relative Humidity:	42.4 %

Test Date: 12/14/2015

Due Date: 12/13/2016

Kevin Uphoff

Kevin Uphoff, Metrologist 12/21/2015

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Jackie McClaskey, Secretary

Governor Sam Brownback

Expires on: 12/13/2016

Kansas Metrology Laboratory Calibration Report

Report Number: K15192-1

Submitted by:

Nebraska Department Of Agriculture
Food Safety & Consumer Protection
Po Box 94757
Lincoln NE 68509

Submitted on: 12/14/2015

Reference Number: 16722

Item(s)

Tested	Adjusted	Rejected
1	0	0

Quantity	Nominal Volume	Type
1	100 gal	RF Prover, "To Deliver"

The calibration of items is performed according to NISTIR 7383, SOP 19 Volume Transfer. Tolerances are applied from NISTHB 105-3. The volume applies when a 10 second drain is observed for 5 gallon hand held test measures. For 5 gallon bottom drop test measures and provers a 30 second drain applies. The drain time starts when the cessation of the main flow is observed.

Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (/°F)	**Volume as Found @ 60 °F**	Tolerance ±	Expanded Uncertainty (U), (k=2.02), ±	**Volume as Left @ 60 °F**	Adjusted/ In Tolerance/ Rejected
100 gal	8851397	Stainless Steel	0.0000265	**100.004 gal**	0.050 gal	0.012 gal	**100.004 gal**	In Tolerance

The data in the above table of this report only applies to those items specifically listed on this report.

1 m^3=1 000 L=264.1720 gal

Temperature Correction

Item	Temperature °F	in^3
Temperature Correction for 100 gal Stainless Steel Prover (CCE= 0.0000265/°F)	-20	-49.0
	-15	-45.9
	-10	-42.9
	-5	-39.8
	0	-36.7
	5	-33.7
	10	-30.6
	15	-27.5
	20	-24.5
	25	-21.4
	30	-18.4
	35	-15.3
	40	-12.2
	45	-9.2
	50	-6.1
	55	-3.1
	60	0.0
	65	3.1
	70	6.1
	75	9.2
	80	12.2
	85	15.3
	90	18.4
	95	21.4
	100	24.5
	105	27.5
	110	30.6
	115	33.7
	120	36.7

CCE = Coefficient of Cubical Expansion

Uncertainty Statement:

The combined standard uncertainty includes the standard uncertainty reported for the standards, the standard uncertainty for the measurement process, the standard uncertainty for the water density equation (Metrologia Tanaka, et al), the standard uncertainty for any uncorrected errors associated with temperature correction (applies to length and volume values only), the standard uncertainty for reading the meniscus (when applicable), the standard uncertainty for viscosity, and a component of uncertainty to account for any observed deviations from NIST(The National Institute of Standards and Technology) values that are less than surveillance limits. The combined standard uncertainty is multiplied by the coverage factor (k-value) reported to give an expanded uncertainty, which defines an interval having a level of confidence of 95.45 percent. The k-value reported is based on the effective degrees of freedom as outlined in JCGM 100:2008 section G.4. The expanded uncertainty presented in this report is consistent with the 1993 ISO Guide to the Expression of Uncertainty in Measurement and follows NISTIR 6969, SOP 29. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Traceability Statement:

The Kansas Metrology Laboratory Standards are traceable to the SI through NIST and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The laboratory test number identified above is the unique report number to be used in referencing measurement traceability for artifacts identified in this report only.

Condition of Item(s) Submitted for Testing:

Minor wear.

Treatment of Item(s) before Testing:

Item(s) were tested as found.

Water Temperature at Time of Test:

55.02 °F

Documentary Standards:

-NIST Handbook 105-3 (2010)

-NISTIR 7383 (2013), SOP 19

Environmental Conditions:

Temperature:	19.11 °C
Barometric Pressure:	724.81 mmHg
Relative Humidity:	44.3 %

Test Date: 12/14/2015

Due Date: 12/13/2016

Kevin Uphoff

Kevin Uphoff, Metrologist 12/21/2015

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Jackie McClaskey, Secretary

Governor Sam Brownback

Expires on: 12/14/2016

Kansas Metrology Laboratory
Calibration Report

Report Number: K15192-2

Submitted by:

Nebraska Department Of Agriculture
Food Safety & Consumer Protection
Po Box 94757
Lincoln NE 68509

Submitted on: 12/14/2015

Reference Number: 16722

Item(s)

Tested	Adjusted	Rejected
1	0	0

Quantity	Nominal Volume	Type
1	103 gal	LPG Prover "To Deliver"

The calibration of items is performed according to NISTIR 7383, SOP 21 Volume Transfer. Tolerances are applied from NISTHB 105-4. The volume applies when a 30 second drain is observed. The drain time starts when the level of the liquid is observed in the lower sight glass and continues while the level is bled down to zero. The level of the liquid shall be at zero and the valve closed at the end of the 30 seconds.

Drain Characteristics

Time	Applied Pressure psig	Method
2 min 59 s	0	Pump

The time listed above is the total drain time which includes the 30 second drain time to the bottom zero.

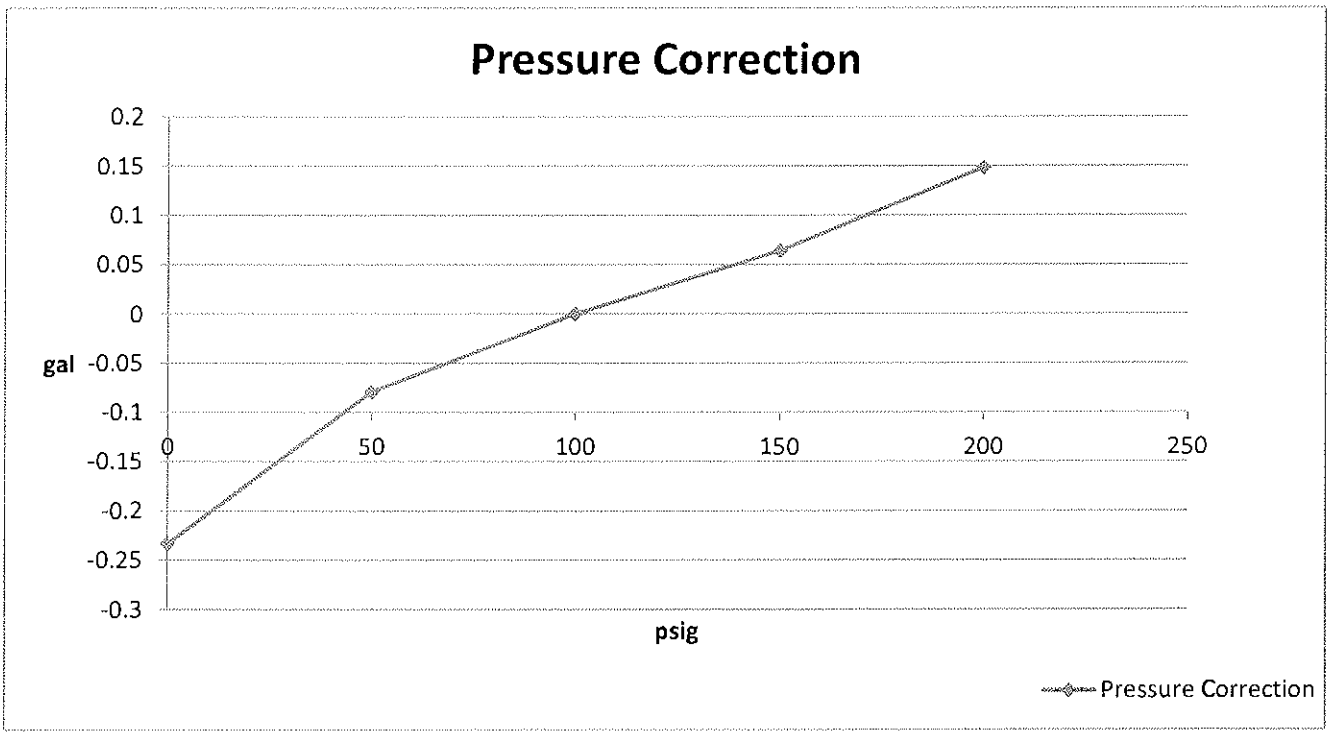
Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (/°F)	**Volume as Found @ 60 °F & 100 psig**	Tolerance ±	Expanded Uncertainty (U), (k=2.05), ±	**Volume as Left @ 60 °F & 100 psig**	Adjusted/ In Tolerance/ Rejected
103 gal	A-4-L6998	Low Carbon Steel Pressure Vessel	0.000016	**103.003 gal**	0.206 gal	0.012 gal	**103.003 gal**	In Tolerance

The data in the above table of this report only applies to those items specifically listed on this report.

1 m^3=1 000 L=264.1720 gal

Pressure Correction

Applied Pressure psig	Pressure Corection (gal)	Volume as Left @ 60 °F (gal)
0	-0.233	102.769
50	-0.079	102.923
100	0.000	103.003
150	0.064	103.067
200	0.148	103.151



Temperature Correction

Item	Temperature °F	gal
Temperature Correction for 103 gal Low Carbon Steel Pressure Vessel Prover (CCE= 0.000016/°F)	-20	-0.132
	-15	-0.124
	-10	-0.115
	-5	-0.107
	0	-0.099
	5	-0.091
	10	-0.082
	15	-0.074
	20	-0.066
	25	-0.058
	30	-0.049
	35	-0.041
	40	-0.033
	45	-0.025
	50	-0.016
	55	-0.008
	60	0.000
	65	0.008
	70	0.016
	75	0.025
	80	0.033
	85	0.041
	90	0.049
	95	0.058
	100	0.066
	105	0.074
	110	0.082
	115	0.091
	120	0.099

CCE = Coefficient of Cubical Expansion

Uncertainty Statement:

The combined standard uncertainty includes the standard uncertainty reported for the standards, the standard uncertainty for the measurement process, the standard uncertainty for the water density equation (Metrologia Tanaka, et al), the standard uncertainty for any uncorrected errors associated with temperature correction (applies to length and volume values only), the standard uncertainty for reading the meniscus (when applicable), the standard uncertainty for viscosity, the standard uncertainty of the pressure gauge, and a component of uncertainty to account for any observed deviations from NIST(The National Institute of Standards and Technology) values that are less than surveillance limits. The combined standard uncertainty is multiplied by the coverage factor (k-value) reported to give an expanded uncertainty, which defines an interval having a level of confidence of 95.45 percent. The k-value reported is based on the effective degrees of freedom as outlined in JCGM 100:2008 section G.4. The expanded uncertainty presented in this report is consistent with the 1993 ISO Guide to the Expression of Uncertainty in Measurement and follows NISTIR 6969, SOP 29. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Traceability Statement:

The Kansas Metrology Laboratory Standards are traceable to the SI through NIST and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The laboratory test number identified above is the unique report number to be used in referencing measurement traceability for artifacts identified in this report only.

Condition of Item(s) Submitted for Testing:

Minor wear.

Treatment of Item(s) before Testing:

Item(s) were tested as found.

Water Temperature at Time of Test:

59.88 °F

Documentary Standards:

-NIST Handbook 105-4 (2010)

-NISTIR 7383 (2013), SOP 21

Environmental Conditions:

Temperature	18.56 °C
Barometric Pressure	724.16 mmHg
Relative Humidity	49.0 %

Test Date: 12/15/2015

Due Date: 12/14/2016

Kevin Uphoff

Kevin Uphoff, Metrologist 12/21/2015