



Dave Heineman
Governor

State of Nebraska

DEPARTMENT OF AGRICULTURE
GREGORY A. IBACH
Director

Nebraska Standards Laboratory
3721 West Cuming Street
Lincoln, NE 68524

CERTIFICATION FOR STANDARDS OF MEASUREMENT

Agency: Dept of Ag. - Weights & Measures
17100 SW 14th Street
Martell, NE 68404-6002

Date: 9/8/2009
Agency ID: 70
NE Cert No: 20090127
P.O. No:

Submitted By: Scott Arner

Denomination	Serial Number	Weight Number	Tolerance Class
100 gal	18969	1	VL
20 gal	88220	1	VP
100 gal	8851397	1	VL
103 gal	A-4-L6998	1	VP

These field standards have been compared with our reference standards and found to be within the tolerances for their class, or condemned, as prescribed by the National Institute of Standards and Technology. These field standards also meet the required specifications.

The reference standards used are traceable to the National Institute of Standards and Technology (NIST). Our traceability is maintained through control charts, regional inter-comparisons and periodic recertifications. This certificate is issued by the Nebraska Department of Agriculture / Division of Weights and Measures.

See 'Test Results' attached

See report/letter attached

Craig E. Olsen

Nebraska State Metrologist

Department of Agriculture, 301 Centennial Mall South
Web Site: www.agr.ne.gov

Administration
P.O. Box 94947
Lincoln, NE 68509-4947
(402) 471-2341
FAX: (402) 471-6876

Agriculture Laboratories
3703 South 14th Street
Lincoln, NE 68502-5399
(402) 471-2176
FAX: (402) 471-0091

Bureau of Animal Industry
P.O. Box 94987
Lincoln, NE 68509-4787
(402) 471-2351
FAX: (402) 471-6893

Bureau of Dairies & Foods
P.O. Box 95064
Lincoln, NE 68509-5064
(402) 471-2536
FAX: (402) 471-2759

Bureau of Plant Industry
P.O. Box 94956
Lincoln, NE 68509-4756
(402) 471-2394
FAX: (402) 471-6892

Weights and Measures
P.O. Box 94757
Lincoln, NE 68509-4757
(402) 471-4292
FAX: (402) 471-2759

Nebraska Standards Laboratory
3721 West Cuming Street
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SOP 21 - Pressure Volume (LPG) Test Results

Agency ID: 70
Agency: Dept of Ag. - Weights & Measures
 17100 SW 14th Street
 Martell, NE 68404-6002

NE Cert No: 20090127
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Form No.: NE04LF14-R00

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Serial No: 88220	Eq Vol/gal: 20 gal
Retest No: 0	Tolerance Class: VP
Denomination: 20 gal	Material: MS
Observer: CEO	Coef of Expansion: 0.0000186 /°F

TEST DATA

Del#	Std ID	Delivery	Mat	Coef of Exp	Water Temp	Water Density	Delta
1	5gal	4.9991	MS	0.0000265 /°F	65.7 °F	0.998457	0 gal.
2	5gal	4.9991	MS	0.0000265 /°F	65.7 °F	0.998457	0 gal.
3	5gal	4.9991	MS	0.0000265 /°F	65.5 °F	0.998479	0 gal.
4	5gal	4.9991	MS	0.0000265 /°F	65.4 °F	0.998489	0 gal.

Test Measure Information

Water Temp: 67 °F
Water Density: 0.998315 g/cm³

Reading @ 0 psi	0.03 gal.
Reading @ 50 psi	0.01 gal.
Reading @ 100 psi	0 gal.
Reading @ 150 psi	-0.01 gal.
Reading @ 200 psi	-0.02 gal.

Final Test Results

Z60 Delivery: 20.000 gal.
Prover error @ 100 psi: -0.007 gal.
Uncertainty of measurement: 0.002 gal.
Tolerance: 0.010 gal.
Accept/Reject: A

Prover Reading Corrections*

Press Corr @ 0 psi:	-0.024 gal.
Press Corr @ 50 psi:	-0.007 gal.
Press Corr @ 100 psi:	0.000 gal.
Press Corr @ 150 psi:	0.007 gal.
Press Corr @ 200 psi:	0.014 gal.

* This table is to be used in making pressure corrections to prover readings.

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Serial No: A-4-L6998	Eq Vol/gal: 103 gal
Retest No: 0	Tolerance Class: VP
Denomination: 103 gal	Material: MS
Observer: CEO	Coef of Expansion: 0.0000186 /°F

TEST DATA

Del#	Std ID	Delivery	Mat	Coef of Exp	Water Temp	Water Density	Delta
1	100gal	99.9872	MS	0.0000265 /°F	68 °F	0.998202	0 gal.
2	1gal	1	MS	0.00001 /°F	68 °F	0.998202	0 gal.
3	1gal	1	MS	0.00001 /°F	68 °F	0.998202	0 gal.
4	1gal	1	MS	0.00001 /°F	68 °F	0.998202	0 gal.

Test Measure Information

Water Temp: 68.5 °F
Water Density: 0.998145 g/cm³

Reading @ 0 psi 0.3 gal.
Reading @ 50 psi 0.2 gal.
Reading @ 100 psi 0.11 gal.
Reading @ 150 psi 0.03 gal.
Reading @ 200 psi -0.04 gal.

Final Test Results

Z60 Delivery: 102.998 gal.
Prover error @ 100 psi: -0.145 gal.
Uncertainty of measurement: 0.022 gal.
Tolerance: 0.050 gal.
Accept/Reject: R

Prover Reading Corrections*

Press Corr @ 0 psi:	-0.157 gal.
Press Corr @ 50 psi:	-0.073 gal.
Press Corr @ 100 psi:	0.000 gal.
Press Corr @ 150 psi:	0.063 gal.
Press Corr @ 200 psi:	0.117 gal.

* This table is to be used in making pressure corrections to prover readings.

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Serial No: A-4-L6998
Retest No: 1
Denomination: 103 gal
Observer: CEO

Eq Vol/gal: 103 gal
Tolerance Class: VP
Material: MS
Coef of Expansion: 0.0000186 /°F

TEST DATA

Del#	Std ID	Delivery	Mat	Coef of Exp	Water Temp	Water Density	Delta
1	100gal	99.9872	MS	0.0000265 /°F	68.5 °F	0.998145	0 gal.
2	1gal	1	MS	0.00001 /°F	68.5 °F	0.998145	0 gal.
3	1gal	1	MS	0.00001 /°F	68.5 °F	0.998145	0 gal.
4	1gal	1	MS	0.00001 /°F	68.5 °F	0.998145	0 gal.

Test Measure Information

Water Temp: 68.8 °F
Water Density: 0.998110 g/cm³

Reading @ 0 psi 0.3 gal.
Reading @ 50 psi 0.19 gal.
Reading @ 100 psi 0.09 gal.
Reading @ 150 psi 0.02 gal.
Reading @ 200 psi -0.07 gal.

Final Test Results

Z60 Delivery: 102.997 gal.
Prover error @ 100 psi: -0.126 gal.
Uncertainty of measurement: 0.022 gal.
Tolerance: 0.050 gal.
Accept/Reject: R

Prover Reading Corrections*

Press Corr @ 0 psi:	-0.177 gal.
Press Corr @ 50 psi:	-0.083 gal.
Press Corr @ 100 psi:	0.000 gal.
Press Corr @ 150 psi:	0.053 gal.
Press Corr @ 200 psi:	0.127 gal.

* This table is to be used in making pressure corrections to prover readings.

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Serial No: A-4-L6998
Retest No: 2
Denomination: 103 gal
Observer: CEO

Eq Vol/gal: 103 gal
Tolerance Class: VP
Material: MS
Coef of Expansion: 0.0000186 /°F

TEST DATA

Del#	Std ID	Delivery	Mat	Coef of Exp	Water Temp	Water Density	Delta
1	100gal	99.9872	MS	0.0000265 /°F	68.5 °F	0.998145	0 gal.
2	1gal	1	MS	0.00001 /°F	68.5 °F	0.998145	0 gal.
3	1gal	1	MS	0.00001 /°F	68.5 °F	0.998145	0 gal.
4	1gal	1	MS	0.00001 /°F	68.5 °F	0.998145	0 gal.

Test Measure Information

Water Temp: 68.8 °F
Water Density: 0.998110 g/cm³

Reading @ 0 psi 0.18 gal.
Reading @ 50 psi 0.07 gal.
Reading @ 100 psi -0.02 gal.
Reading @ 150 psi -0.12 gal.
Reading @ 200 psi -0.2 gal.

Final Test Results

Z60 Delivery: 102.997 gal.
Prover error @ 100 psi: -0.016 gal.
Uncertainty of measurement: 0.022 gal.
Tolerance: 0.050 gal.
Accept/Reject: A

Prover Reading Corrections*

Press Corr @ 0 psi:	-0.167 gal.
Press Corr @ 50 psi:	-0.073 gal.
Press Corr @ 100 psi:	0.000 gal.
Press Corr @ 150 psi:	0.083 gal.
Press Corr @ 200 psi:	0.147 gal.

* This table is to be used in making pressure corrections to prover readings.

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SOP 19 - Volume Transfer Test Results

Agency ID: 70

Form No.: NE03LF12-R00

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Serial #: 18969
Retest #: 0
Denomination: 100 gal
Observer: CEO

Eq Vol/cu.in.: 23100 cu.in.
Tolerance Class: VL
Material: SS
Coef of Expansion: 0.0000265 °F

Test Data

Del#	Std ID	Delivery	Material	Coef of Exp	Water Temp	Water Density	Delta
1	100gal	99.9872	SS	0.0000265 /°F	67.5 °F	0.998259	0 in3

Test Measure Information

Water Temperature: 67.3 °F
Water Density: 0.998259 g/cm³
Scale Reading: -1 cu.in.

Test Results

Test Measure Volume @ 60° F at zero scale reading: 99.9898 gal.
Tolerance: 0.0216 gal.
Uncertainty: 0.0223 gal.
Accepted/Rejected: A

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Serial #: 18969
Retest #: 1
Denomination: 100 gal
Observer: CEO

Eq Vol/cu.in.: 23100 cu.in.
Tolerance Class: VL
Material: SS
Coef of Expansion: 0.0000265 °F

Test Data

Del#	Std ID	Delivery	Material	Coef of Exp	Water Temp	Water Density	Delta
1	100gal	99.9872	SS	0.0000265 /°F	68.6 °F	0.998133	0 in3

Test Measure Information

Water Temperature: 67.4 °F
Water Density: 0.998133 g/cm³
Scale Reading: -3 cu.in.

Test Results

Test Measure Volume @ 60° F at zero scale reading: 99.9896 gal.
Tolerance: 0.0216 gal.
Uncertainty: 0.0223 gal.
Accepted/Rejected: A

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Serial #: 8851397
Retest #: 0
Denomination: 100 gal
Observer: CEO

Eq Vol/cu.in.: 23100 cu.in.
Tolerance Class: VL
Material: SS
Coef of Expansion: 0.0000265 °F

Test Data

Del#	Std ID	Delivery	Material	Coef of Exp	Water Temp	Water Density	Delta
1	100gal	99.9872	SS	0.0000265 /°F	68.4 °F	0.998156	0 in3

Test Measure Information

Water Temperature: 67.3 °F
Water Density: 0.998156 g/cm³
Scale Reading: -4 cu.in.

Test Results

Test Measure Volume @ 60° F at zero scale reading: 99.9949 gal.
Tolerance: 0.0216 gal.
Uncertainty: 0.0223 gal.
Accepted/Rejected: A

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Serial #: 8851397
Retest #: 1
Denomination: 100 gal
Observer: CEO

Eq Vol/cu.in.: 23100 cu.in.
Tolerance Class: VL
Material: SS
Coef of Expansion: 0.0000265 °F

Test Data

Del#	Std ID	Delivery	Material	Coef of Exp	Water Temp	Water Density	Delta
1	100gal	99.9872	SS	0.0000265 /°F	68 °F	0.998202	0 in3

Test Measure Information

Water Temperature: 67 °F
Water Density: 0.998202 g/cm³
Scale Reading: -4 cu.in.

Test Results

Test Measure Volume @ 60° F at zero scale reading: 99.9958 gal.
Tolerance: 0.0216 gal.
Uncertainty: 0.0223 gal.
Accepted/Rejected: A