



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: 9/7/2010  
Agency ID: 70  
NE Cert No: 20100118  
P.O. No:

Submitted By: Scott Arner

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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. Reproduction of this certificate must include the entire document (including all attached papers).

- See 'Test Results' attached
- See report/letter attached

Craig E. Olsen  
Nebraska State Metrologist

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**Nebraska Standards Laboratory**  
**3721 West Cuming Street**  
**Lincoln, NE 68524**  
**(402) 471-2087**

**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:** 20100118  
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*Form No.: NE04LF14-R00*

**Submitted By:** Scott Arner

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**Serial No:** 88220  
**Retest No:** 0  
**Denomination:** 20 gal  
**Observer:** CEO

**Eq Vol/gal:** 20 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	5gal	4.9991	MS	0.0000265 /°F	68.9 °F	0.998098	0 gal.
2	5gal	4.9991	MS	0.0000265 /°F	68.4 °F	0.998156	0 gal.
3	5gal	4.9991	MS	0.0000265 /°F	68.1 °F	0.998191	0 gal.
4	5gal	4.9991	MS	0.0000265 /°F	67.3 °F	0.998282	0 gal.

**Test Measure Information**

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

**Reading @ 0 psi** 0.04 gal.  
**Reading @ 50 psi** 0.02 gal.  
**Reading @ 100 psi** 0.01 gal.  
**Reading @ 150 psi** 0 gal.  
**Reading @ 200 psi** 0.02 gal.

**Final Test Results**

**Z60 Delivery:** 19.998 gal.  
**Prover error @ 100 psi:** -0.018 gal.  
**Uncertainty of measurement:** 0.002 gal.  
**Tolerance:** 0.040 gal.  
**Accept/Reject:** A

**Prover Reading Corrections\***

<b>Press Corr @ 0 psi:</b>	-0.024 gal.
<b>Press Corr @ 50 psi:</b>	-0.007 gal.
<b>Press Corr @ 100 psi:</b>	0.000 gal.
<b>Press Corr @ 150 psi:</b>	0.007 gal.
<b>Press Corr @ 200 psi:</b>	-0.016 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:** 0  
**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	66.8 °F	0.998338	0 gal.
2	1gal	1	MS	0.00001 /°F	66.8 °F	0.998338	0 gal.
3	1gal	1	MS	0.00001 /°F	66.8 °F	0.998338	0 gal.
4	1gal	1	MS	0.00001 /°F	66.8 °F	0.998338	0 gal.

**Test Measure Information**

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

**Reading @ 0 psi** 0.16 gal.  
**Reading @ 50 psi** 0.02 gal.  
**Reading @ 100 psi** -0.07 gal.  
**Reading @ 150 psi** -0.15 gal.  
**Reading @ 200 psi** -0.22 gal.

**Final Test Results**

**Z60 Delivery:** 103.009 gal.  
**Prover error @ 100 psi:** 0.046 gal.  
**Uncertainty of measurement:** 0.022 gal.  
**Tolerance:** 0.050 gal.  
**Accept/Reject:** A

**Prover Reading Corrections\***

<b>Press Corr @ 0 psi:</b>	-0.197 gal.
<b>Press Corr @ 50 psi:</b>	-0.073 gal.
<b>Press Corr @ 100 psi:</b>	0.000 gal.
<b>Press Corr @ 150 psi:</b>	0.063 gal.
<b>Press Corr @ 200 psi:</b>	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	66.8 °F	0.998338	0 gal.
2	1gal	1	MS	0.00001 /°F	66.8 °F	0.998338	0 gal.
3	1gal	1	MS	0.00001 /°F	66.8 °F	0.998338	0 gal.
4	1gal	1	MS	0.00001 /°F	66.8 °F	0.998338	0 gal.

**Test Measure Information**

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

**Reading @ 0 psi** 0.18 gal.  
**Reading @ 50 psi** 0.08 gal.  
**Reading @ 100 psi** 0 gal.  
**Reading @ 150 psi** -0.08 gal.  
**Reading @ 200 psi** -0.16 gal.

**Final Test Results**

**Z60 Delivery:** 102.994 gal.  
**Prover error @ 100 psi:** -0.039 gal.  
**Uncertainty of measurement:** 0.022 gal.  
**Tolerance:** 0.050 gal.  
**Accept/Reject:** A

**Prover Reading Corrections\***

<b>Press Corr @ 0 psi:</b>	-0.147 gal.
<b>Press Corr @ 50 psi:</b>	-0.063 gal.
<b>Press Corr @ 100 psi:</b>	0.000 gal.
<b>Press Corr @ 150 psi:</b>	0.063 gal.
<b>Press Corr @ 200 psi:</b>	0.127 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	67.9 °F	0.998214	0 in3

**Test Measure Information**

Water Temperature: 67.1 °F  
Water Density: 0.998214 g/cm<sup>3</sup>  
Scale Reading: -1 cu.in.

**Test Results**

Test Measure Volume @ 60° F at zero scale reading: 99.9846 gal.  
Tolerance: 0.0519 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	68.3 °F	0.998168	0 in3

**Test Measure Information**

Water Temperature: 67.4 °F  
Water Density: 0.998168 g/cm<sup>3</sup>  
Scale Reading: -4 cu.in.

**Test Results**

Test Measure Volume @ 60° F at zero scale reading: 99.9966 gal.  
Tolerance: 0.0519 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	66.4 °F	0.998382	0 in3

**Test Measure Information**

Water Temperature: 65.4 °F  
Water Density: 0.998382 g/cm<sup>3</sup>  
Scale Reading: -5 cu.in.

**Test Results**

Test Measure Volume @ 60° F at zero scale reading: 100.0007 gal.  
Tolerance: 0.0519 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	66.6 °F	0.998360	0 in3

Test Measure Information

Water Temperature: 65.6 °F  
Water Density: 0.998360 g/cm<sup>3</sup>  
Scale Reading: -5 cu.in.

Test Results

Test Measure Volume @ 60° F at zero scale reading: 100.0006 gal.  
Tolerance: 0.0519 gal.  
Uncertainty: 0.0223 gal.  
Accepted/Rejected: A