



APPLICATION FOR REGISTRATION AS A REGISTERED SERVICE COMPANY

Public Service Commission
SFN 51277 (2/2014)



TYPE OR PRINT - AN INCOMPLETE OR ILLEGIBLE APPLICATION WILL BE REJECTED

Name of Company MAGELLAN MIDSTREAM PARTNERS, L.P.	Email Address MARK.HAUBEN@MAGELLANLP.COM	Application Date 9/19/14	
Mailing Address 902 MAIN AVE EAST	City WEST FARBO	State ND	Zip Code 58078
Telephone Number 701-282-3208	Cell Phone Number 320-808-6352	Fax Number 701-281-9502	

Select below all device types your company will certify:

Scales (include maximum capacity, if applicable)	Liquid (include maximum flow rate, if applicable)
<input type="checkbox"/> 1. Rail <input type="checkbox"/> 2. Truck <input type="checkbox"/> 3. Livestock <input type="checkbox"/> 4. Hopper: Max. Capacity: _____ <input type="checkbox"/> 5. Belt <input type="checkbox"/> 6. Over 30 lbs.: Max. Capacity: _____ <input type="checkbox"/> 7. 30 lbs. or less <input type="checkbox"/> 8. Class II (indicate on your calibration report which weight kit is Class II certified) <input checked="" type="checkbox"/> 9. Other: Please List: _____ _____	<input type="checkbox"/> 1. Retail Fuel (less than 20 gal. per minute) <input type="checkbox"/> 2. High Flow Retail Fuel (20 gal. per minute or greater) <input type="checkbox"/> 3. Vehicle Tank: Max. Flow Rate: _____ <input type="checkbox"/> 4. Stationary Bulk (fuel or oil): Max. Flow Rate: _____ <input type="checkbox"/> 5. LPG <input type="checkbox"/> 6. Stationary LPG <input type="checkbox"/> 7. Fertilizer: Max. Flow Rate: _____ <input type="checkbox"/> 8. Chemical <input type="checkbox"/> 9. Anhydrous <input checked="" type="checkbox"/> 10. Loading Rack - 600 GPM PER <input type="checkbox"/> 11. Other: Please List: METER

List below all persons employed by your company as a North Dakota Registered Service Person and the device types they are registered to certify (attach a separate sheet to list additional employees):

Permit No.	Employee	Device Types Registered to Certify (list using device type numbers from above)
e.g. 1001	e.g. John Doe	e.g. Scales - 2, 3, 6, 8; e.g. Liquid - 1, 2, 6
1447	PERRY PALM	_____ 10
1695	DAN LEWIN	10
1746	MICHAEL TANKOFF	10

Application for Registration as a Registered Service Company
Page 2

List below all field standards (attach current calibration reports):

API STANDARDS 4,11+12	

Additional Application Items (initial where appropriate):

Standardized Test Report	<input checked="" type="checkbox"/> Copy enclosed <input type="checkbox"/> No change in report filed previously
Tested and Approved Sticker	<input type="checkbox"/> Copy enclosed <input checked="" type="checkbox"/> No change in sticker filed previously
Photocopy of Crimped Lead Wire Seal	<input type="checkbox"/> Copy enclosed <input checked="" type="checkbox"/> No change in crimped lead wire seal filed previously

Public Company Listing:

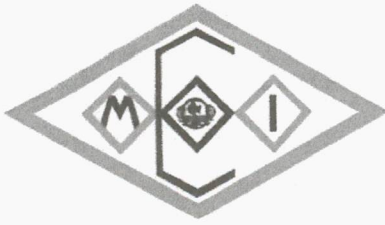
Include my company information on your registered service company list for public contact.
 Yes No

I am Mark J. Jorgensen, and have authority to represent this company.
By signing this application, I declare that I have examined this form and accompanying documentation, and to the best of my knowledge and belief, the facts stated and documentation provided is true, correct, and complete.

Mark J. Jorgensen
Signature

Send Completed Application and Related Documents To:

Public Service Commission
600 E Boulevard Ave Dept 408
Bismarck ND 58505-0480
Telephone: (701) 328-2400
Fax: (701) 328-2410



Customer	Magellan
Location	Fargo, ND
Designation	Truck Rack
Serial	3461-538
Prover Type	Atmospheric Tank
Date Completed	8/12/2014

Tank Run Comparisons

Established Prover Volume

Tank Volume gal	900
Tank Volume inches	207900
Tank Volume barrels	21.4285714

These values represent the design or initial volumes before any needed corrections.

Check Runs

Run 1 = 207,907.7819		Avg		Volume Diff 1 & 2 to Established %
	0.0023 %			
Run 2 = 207,912.5269			207,910.154	0.0049 %

Calibration Calculations

Established Vol	Avg Run Volume	Linear Measurement of Scale
207900	- 207910.154	X
		= ?

Scale Reading
Temp of Can

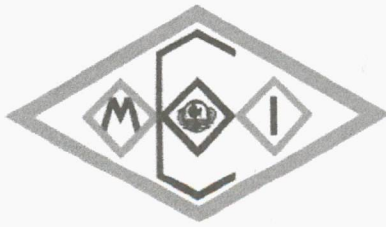
Scale was moved down ? inches which corresponds to the prover volume correction needed of -10.1544 cubic inches. Measure volume of can is temperature compensated.

Verification Runs (After Correction if any)

Run =		Avg		Volume Diff & to Established %
				-100 %
Run =				

New Prover Volume

If No corrections Needed	WITH Corrections
Tank Volume gal	Tank Volume gal
Tank Volume inches	Tank Volume inches
Tank Volume barrels	Tank Volume barrels



Customer	Magellan
Location	Fargo, ND
Designation	Truck Rack
Serial	3461-538
Prover Type	Atmospheric Tank

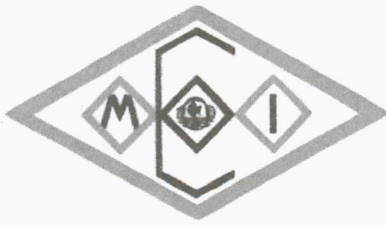
Prover Information

Prover Type	Atmospheric Tank
Designation	Truck Rack
Serial	3461-538
Mfg of Prover	Metric
Coated?	Yes
Insulated?	No
Metallic Composition	Carbon Steel
Coefficient of Cubical Expansion	.0000186
Modulus of Elasticity	30000000
Unit Number	
Notes	

Methodology

CTL Temperature Correction Factor is based on API Petroleum Measurement manual Chapter 11.2.:

CTS Metal Correction Factor = $(1 + ((\text{Can Temp in F} - 60) \text{ times the Can Coefficient of Expansion}))$
divided by $(1 + ((\text{Prover Temp in F} - 60) \text{ times the Prover Coefficient of Expansion}))$



Customer: Magellan
 Location: Fargo, ND
 Designation: Truck Rack
 Serial: 3461-538
 Prover Type: Atmospheric Tank
 Date Completed: 8/12/2014

Run Calculation Summary

Gary Clark

Run # 1

Measure	Certified Volume	Scale Reading	Actual Volume	Prover Temp	Can Temp	CTL Temp Correction	CTS Metal Correction	Adjusted Volume
Can # 3 50 gal	11,548.56	0	11,548.56	62	62.6	0.999943	1.000032	11,548.2713
Can # 1 100 gal	23,093.63	0	23,093.63	62	61.6	1.000038	1.000005	23,094.6230
Can # 2 100 gal	23,092.99	0	23,092.99	62	61.7	1.000028	1.000008	23,093.8214
Can # 3 50 gal	11,548.56	0	11,548.56	62	61.9	1.000010	1.000013	11,548.8256
Can # 1 100 gal	23,093.63	0	23,093.63	62	61.7	1.000028	1.000008	23,094.4614
Can # 2 100 gal	23,092.99	0	23,092.99	62	61.7	1.000028	1.000008	23,093.8214
Can # 3 50 gal	11,548.56	0	11,548.56	62	61.8	1.000019	1.000011	11,548.9065
Can # 1 100 gal	23,093.63	0	23,093.63	62	61.7	1.000028	1.000008	23,094.4614
Can # 2 100 gal	23,092.99	0	23,092.99	62	61.8	1.000019	1.000011	23,093.6828
Can # 3 50 gal	11,548.56	4	11,552.56	62	62	1.000000	1.000016	11,552.7448
Can # 1 100 gal	23,093.63	50	23,143.63	62	61.9	1.000010	1.000013	23,144.1623

Volume This Run: 207,907.7819
 Divided by CPS: ?
 Divided by CPL: _____

Pressure & Temperature Adjusted Volume This Run: ?

Run # 2

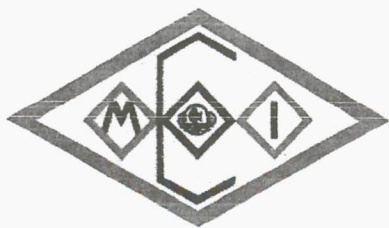
Measure	Certified Volume	Scale Reading	Actual Volume	Prover Temp	Can Temp	CTL Temp Correction	CTS Metal Correction	Adjusted Volume
Can # 3 50 gal	11,548.56	0	11,548.56	64.4	64.4	1.000000	1.000035	11,548.9642
Can # 1 100 gal	23,093.63	0	23,093.63	64.4	63.9	1.000051	1.000021	23,095.2928
Can # 2 100 gal	23,092.99	0	23,092.99	64.4	63.9	1.000051	1.000021	23,094.6527
Can # 3 50 gal	11,548.56	0	11,548.56	64.4	64	1.000041	1.000024	11,549.3107

Run Calculation Summary (cont)

Can # 1 100 gal	23,093.63	0	23,093.63	64.4	64	1.000041	1.000024	23,095.1311
Can # 2 100 gal	23,092.99	0	23,092.99	64.4	63.9	1.000051	1.000021	23,094.6527
Can # 3 50 gal	11,548.56	0	11,548.56	64.4	64.1	1.000031	1.000027	11,549.2298
Can # 1 100 gal	23,093.63	0	23,093.63	64.4	64	1.000041	1.000024	23,095.1311
Can # 2 100 gal	23,092.99	0	23,092.99	64.4	64.2	1.000021	1.000029	23,094.1447
Can # 3 50 gal	11,548.56	2	11,550.56	64.4	64.1	1.000031	1.000027	11,551.2299
Can # 1 100 gal	23,093.63	50	23,143.63	64.4	64.2	1.000021	1.000029	23,144.7872

Volume This Run	207,912.5269
Divided by CPS	?
Divided by CPL	?

Pressure & Temperature Adjusted Volume This Run	?
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WaterDraw Calibration Worksheet

Customer | Magellan
 Location | Fargo, ND
 Designation | Truck Rack
 Serial | 3461-538
 Prover Type | Atmospheric Tank

Technician: Gary Clark
 Scale Reading: 52.3 cubic inches
 Tolerance: 41.6 cubic inches

Date: 8.12.14 1 62.0 2 64.4
 Run Prv Temp Pres Time Run Prv Temp Pres Time Run Prv Temp Pres Time

Measure	Scale Reading	Temp	Scale Reading	Temp	Scale Reading	Temp
Can # 3 50 gal	3 \emptyset	62.6	3 \emptyset	64.4	3	
Can # 1 100 gal	1 \emptyset	61.6	1 \emptyset	63.9	1	
Can # 2 100 gal	2 \emptyset	61.7	2 \emptyset	63.9	2	
Can # 3 50 gal	3 \emptyset	61.9	3 \emptyset	64.0	3	
Can # 1 100 gal	1 \emptyset	61.7	1 \emptyset	64.0	1	
Can # 2 100 gal	2 \emptyset	61.7	2 \emptyset	63.9	2	
Can # 3 50 gal	3 \emptyset	61.8	3 \emptyset	64.1	3	
Can # 1 100 gal	1 \emptyset	61.7	1 \emptyset	64.0	1	
Can # 2 100 gal	2 \emptyset	61.8	2 \emptyset	64.2	2	
Can # 3 50 gal	3 4	62	3 2	64.1	3	
Can # 1 100 gal	1 50	61.9	1 50	64.2	1	

54 Total 52 Total _____ Total

Thermometer Numbers: 1630273 422158

Witnesses: *GRCH* (Company) MEI Witnesses: _____ (Company) _____



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-8361

REPORT OF CALIBRATION

FOR

A ONE HUNDRED (100) GALLON VOLUME PROVER
(Graduated Neck Type)

February 25, 2014

Manufacturer: Seraphin
Rancocas, NJ

NIST Seal Number: 7241
NIST Valve Seal No.: 001059
Material: Stainless Steel
Serial Number: 2470-A

submitted by

Meter Engineers, Inc.
7718 W. 53rd St. N
Maize, KS 67101

(Reference: Purchase Order Number 007468; dated February 4, 2014)

The volume of the prover described above was measured by the gravimetric method [1] and the standards used in this calibration are traceable to the System International through national standards. The gravimetric method uses the weight of the fluid necessary to fill the prover and the fluid density to calculate the volume. The fluid used was water from a reverse osmosis system and the prover was leveled using the vertical surface of the neck.[#]

The contained volume was drained from the prover by opening the valve at the bottom of the vessel. When this flow finished, the valve was held open for 30 seconds to complete the drain procedure. The delivered volume is for the scale reading of zero (0) and has been corrected for the reference temperature in Table 1 assuming a volumetric coefficient of expansion of 0.0000477 per °C (0.0000265 per °F) for the prover material.

¹ Bean, V. E., Espina, P. I., Wright, J. D., Houser, J. F., Sheckels, S. D., and Johnson, A. N., "NIST Calibration Services for Liquid Volume," NIST Special Publication 250-72, National Institute of Standards and Technology, November 24, 2009.

[#] One level indication was made in line with the neck scale and the other 90° to that indication, as stated in API MPMS Chapter 4.7. The levels on the can were not used.

Table 1. Delivered volume for the tested vessel for a scale reading of zero.

	Volume Delivered
gal at 60 °F	99.9724
in ³ at 60 °F	23093.63

The volume measurement procedure was repeated 5 times with the neck scale filled approximately to zero each time. The repeatability of the 5 measurements was 23 parts in 10⁶ and the expanded uncertainty in the measured volume is $\pm 0.008\%$. It was calculated according to References [1] and [2] with a 95 % confidence level[†] and is traceable to NIST mass, temperature, pressure, and humidity standards, and a NIST water density determination.

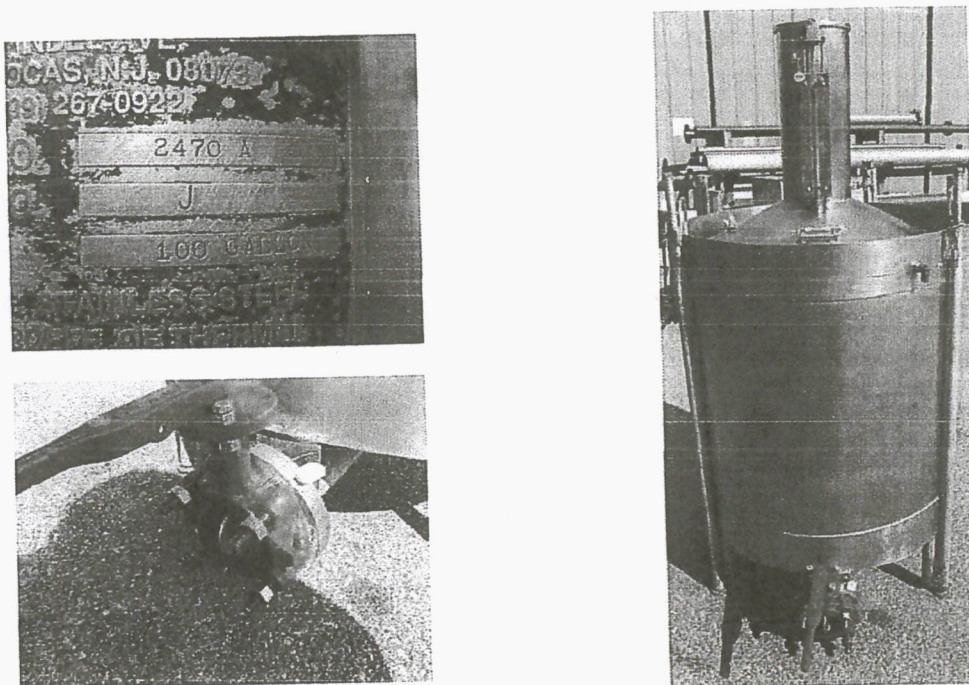


Figure 1. Photographs of the volume prover.

The input data used for calculation of the prover volume are given in the spreadsheet attached to this report. The calibration and uncertainties presented here are only valid over the range of the

² Taylor, B. N. and Kuyatt, C. E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results," NIST Technical Note 1297, National Institute of Standards and Technology (January 1993).

[†] Coverage factor of 2.09 for 21 effective degrees of freedom.

NIST calibration of this test measure. When the test measure is applied by the customer to measure liquid volume, uncertainties beyond the NIST calibration must be considered, for example: leveling of the test measure, reading the meniscus, cleanliness of the test measure interior, drainage effects due to liquid viscosity, etc.

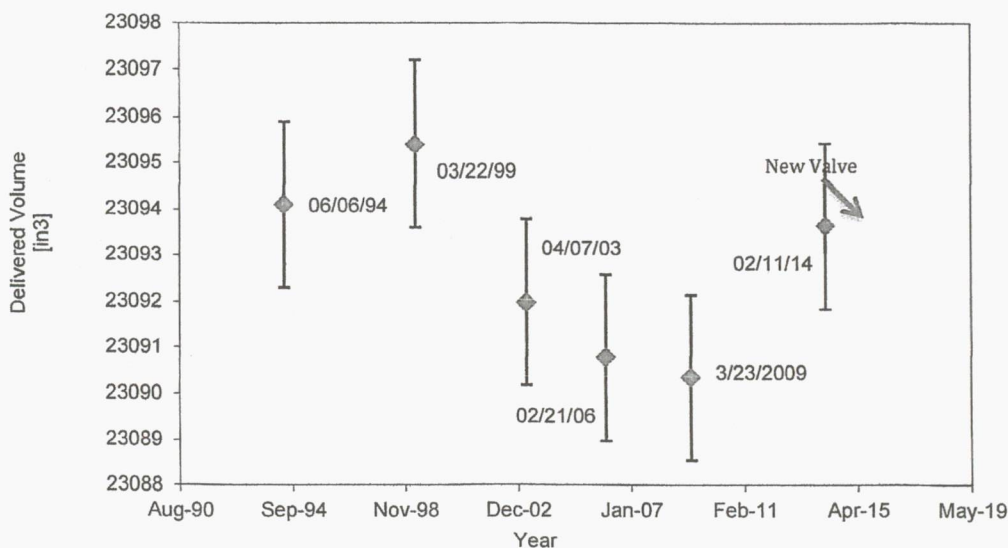


Figure 2. Calibration control chart for 100 gallon graduated neck test measure SN 2470-A

Table 2. Results of prior calibrations for the delivered volume.

Date	Delivered Volume [in³]	Difference from Prior [in³]	Degree of Equivalence [-]
02/11/14	23093.63	2.86	0.49
03/23/09	23090.34	-0.43	-0.07
02/21/06	23090.77	-1.20	-0.20
04/07/03	23091.97	-3.43	-0.58
03/22/99	23095.40	1.30	0.22
06/06/94	23094.10	-	-

For the Director,
National Institute of Standards and Technology

John D. Wright

Dr. John D. Wright
Project Leader
Fluid Metrology Group
Physical Measurement Laboratory
National Institute of Standards and Technology

Sherry Sheckels

Sherry Sheckels
Calibration Technician
Fluid Metrology Group
Physical Measurement Laboratory
National Institute of Standards and Technology



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-8361

REPORT OF CALIBRATION

FOR

A ONE HUNDRED (100) GALLON VOLUME PROVER
(Graduated Neck Type)

February 25, 2014

Manufacturer: Seraphin
Rancocas, NJ

NIST Seal Number: 7240
NIST Valve Seal No.: 001058
Material: Stainless Steel
Serial Number: 2470-B

submitted by

Meter Engineers, Inc.
7718 W. 53rd St. N
Maize, KS 67101

(Reference: Purchase Order Number 007468; dated February 4, 2014)

The volume of the prover described above was measured by the gravimetric method [1] and the standards used in this calibration are traceable to the System International through national standards. The gravimetric method uses the weight of the fluid necessary to fill the prover and the fluid density to calculate the volume. The fluid used was water from a reverse osmosis system and the prover was leveled using the vertical surface of the neck.[#]

The contained volume was drained from the prover by opening the valve at the bottom of the vessel. When this flow finished, the valve was held open for 30 seconds to complete the drain procedure. The delivered volume is for the scale reading of zero (0) and has been corrected for the reference temperature in Table 1 assuming a volumetric coefficient of expansion of 0.0000477 per °C (0.0000265 per °F) for the prover material.

¹ Bean, V. E., Espina, P. I., Wright, J. D., Houser, J. F., Sheckels, S. D., and Johnson, A. N., "NIST Calibration Services for Liquid Volume," NIST Special Publication 250-72, National Institute of Standards and Technology, November 24, 2009.

[#] One level indication was made in line with the neck scale and the other 90° to that indication, as stated in API MPMS Chapter 4.7. The levels on the can were not used.

Table 1. Delivered volume for the tested vessel for a scale reading of zero.

	Volume Delivered
gal at 60 °F	99.9696
in ³ at 60 °F	23092.99

The volume measurement procedure was repeated 5 times with the neck scale filled approximately to zero each time. The repeatability of the 5 measurements was 30 parts in 10⁶ and the expanded uncertainty in the measured volume is $\pm 0.009\%$. It was calculated according to References [1] and [2] with a 95 % confidence level[†] and is traceable to NIST mass, temperature, pressure, and humidity standards, and a NIST water density determination.

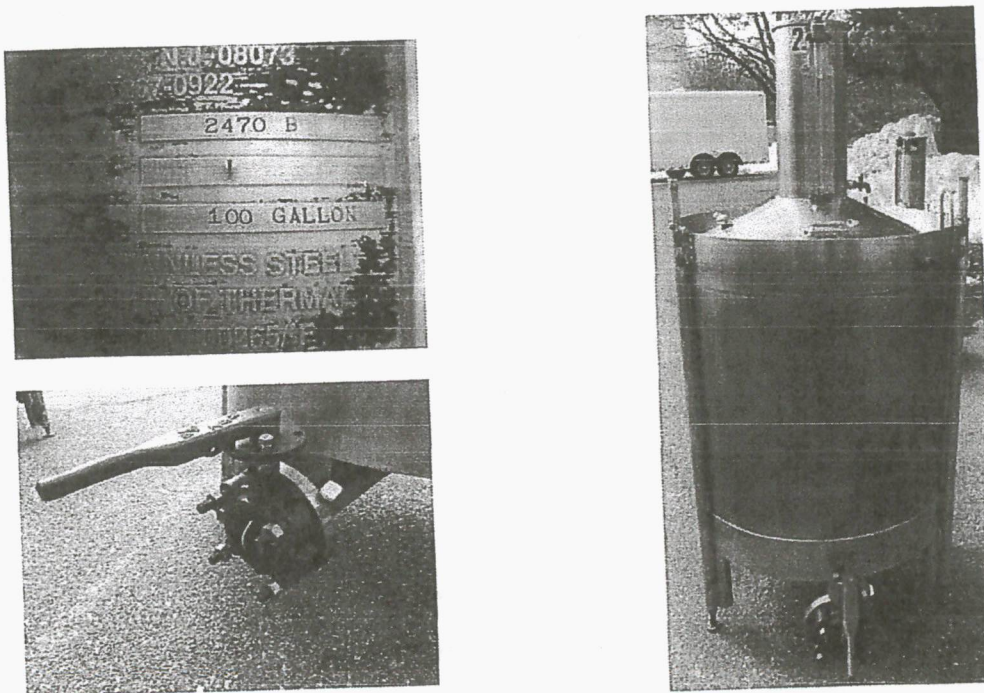


Figure 1. Photographs of the volume prover.

The input data used for calculation of the prover volume are given in the spreadsheet attached to this report. The calibration and uncertainties presented here are only valid over the range of the

² Taylor, B. N. and Kuyatt, C. E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results," NIST Technical Note 1297, National Institute of Standards and Technology (January 1993).

[†] Coverage factor of 2.12 for 16 effective degrees of freedom.

NIST calibration of this test measure. When the test measure is applied by the customer to measure liquid volume, uncertainties beyond the NIST calibration must be considered, for example: leveling of the test measure, reading the meniscus, cleanliness of the test measure interior, drainage effects due to liquid viscosity, etc.

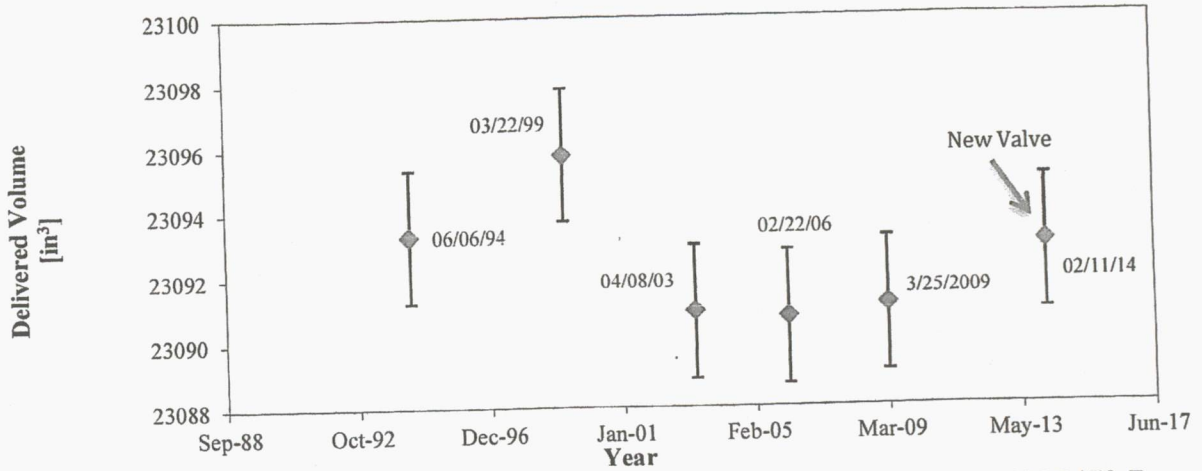


Figure 2. Calibration control chart for 100 gallon graduated neck test measure SN 2470-B

Table 2. Results of prior calibrations for the delivered volume.

Date	Delivered Volume [in ³]	Difference from Prior [in ³]	Degree of Equivalence [-]
02/11/14	23092.99	2.26	0.38
03/25/09	23091.12	0.39	0.07
02/22/06	23090.74	-0.19	-0.03
04/08/03	23090.93	-4.87	-0.83
03/22/99	23095.80	2.50	0.42
06/06/94	23093.30	-	-

For the Director,
 National Institute of Standards and Technology

John D. Wright

Dr. John D. Wright
 Project Leader
 Fluid Metrology Group
 Physical Measurement Laboratory
 National Institute of Standards and Technology

Sherry Sheckels

Sherry Sheckels
 Calibration Technician
 Fluid Metrology Group
 Physical Measurement Laboratory
 National Institute of Standards and Technology



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-8361

REPORT OF CALIBRATION

FOR

A FIFTY (50) GALLON VOLUME PROVER
(Graduated Neck Type)

February 25, 2014

Manufacturer: Seraphin
Rancocas, NJ

NIST Seal Number: 7242
NIST Valve Seal No.: 001060
Material: Stainless Steel
Serial Number: 7293-C

submitted by

Meter Engineers, Inc.
7718 W. 53rd St. N
Maize, KS 67101

(Reference: Purchase Order Number 007468; dated February 4, 2014)

The volume of the prover described above was measured by the gravimetric method [1] and the standards used in this calibration are traceable to the System International through national standards. The gravimetric method uses the weight of the fluid necessary to fill the prover and the fluid density to calculate the volume. The fluid used was water from a reverse osmosis system and the prover was leveled using the vertical surface of the neck.[#]

The contained volume was drained from the prover by opening the valve at the bottom of the vessel. When this flow finished, the valve was held open for 30 seconds to complete the drain procedure. The delivered volume is for the scale reading of zero (0) and has been corrected for the reference temperature in Table 1 assuming a volumetric coefficient of expansion of 0.0000477 per °C (0.0000265 per °F) for the prover material.

1 Bean, V. E., Espina, P. I., Wright, J. D., Houser, J. F., Sheckels, S. D., and Johnson, A. N., "NIST Calibration Services for Liquid Volume," NIST Special Publication 250-72, National Institute of Standards and Technology, November 24, 2009.

[#] One level indication was made in line with the neck scale and the other 90° to that indication, as stated in API MPMS Chapter 4.7. The levels on the can were not used.

Table 1. Delivered volume for the tested vessel for a scale reading of zero.

	Volume Delivered
gal at 60 °F	49.9937
in ³ at 60 °F	11548.56

The volume measurement procedure was repeated 5 times with the neck scale filled approximately to zero each time. The repeatability of the 5 measurements was 17 parts in 10⁶ and the expanded uncertainty in the measured volume is $\pm 0.010\%$. It was calculated according to References [1] and [2] with a 95 % confidence level[†] and is traceable to NIST mass, temperature, pressure, and humidity standards, and a NIST water density determination.

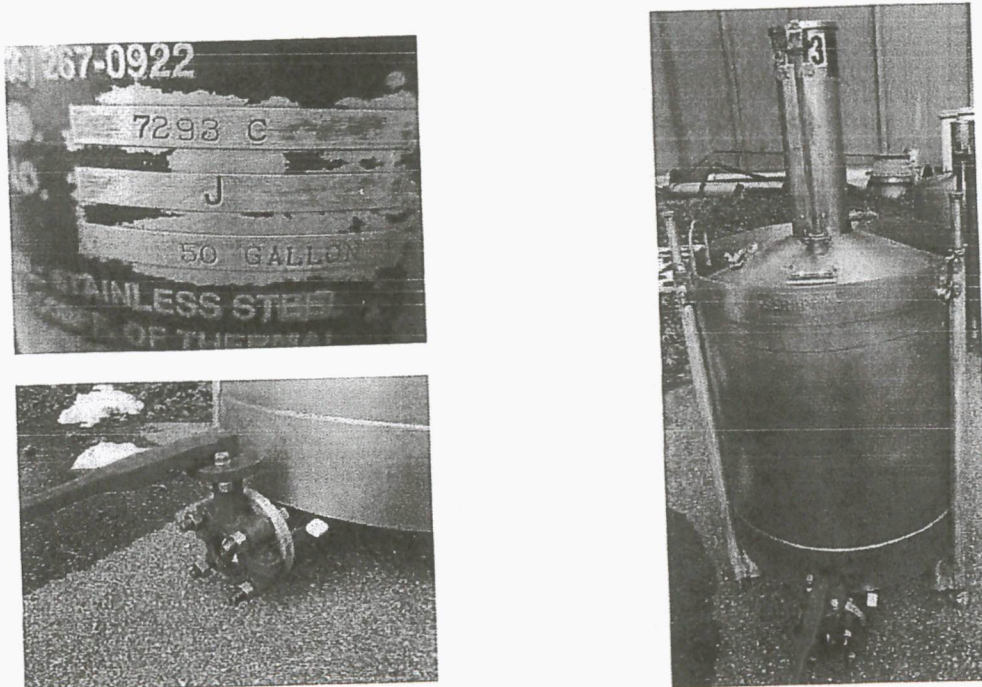


Figure 1. Photographs of the volume prover.

The input data used for calculation of the prover volume are given in the spreadsheet attached to this report. The calibration and uncertainties presented here are only valid over the range of the

² Taylor, B. N. and Kuyatt, C. E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results," NIST Technical Note 1297, National Institute of Standards and Technology (January 1993).

[†] Coverage factor of 1.97 for 339 effective degrees of freedom.

NIST calibration of this test measure. When the test measure is applied by the customer to measure liquid volume, uncertainties beyond the NIST calibration must be considered, for example: leveling of the test measure, reading the meniscus, cleanliness of the test measure interior, drainage effects due to liquid viscosity, etc.

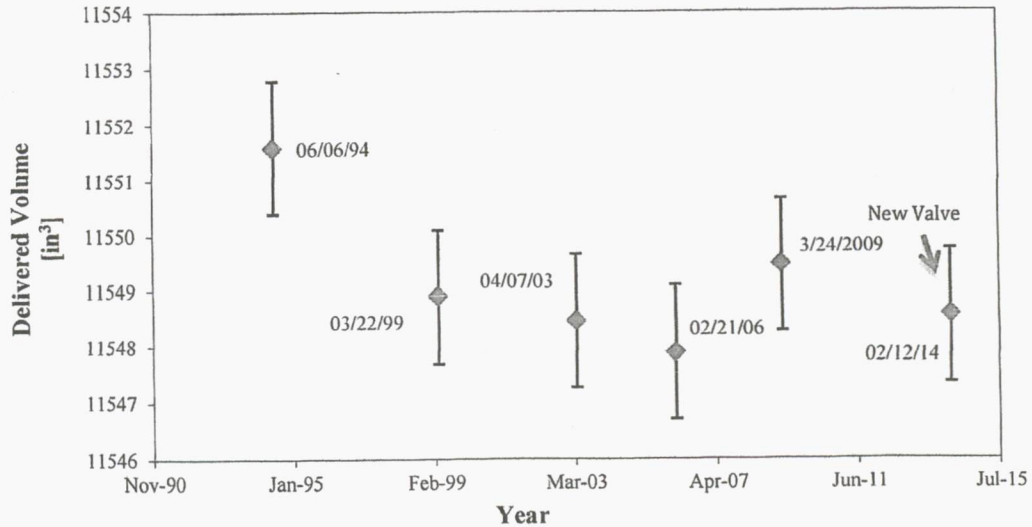


Figure 2. Calibration control chart for 50 gallon graduated neck test measure SN 7293-C

Table 2. Results of prior calibrations for the delivered volume.

Date	Delivered Volume [in ³]	Difference from Prior [in ³]	Degree of Equivalence [-]
02/12/14	11548.56	-0.91	-0.26
03/24/09	11549.47	1.57	0.18
02/21/06	11547.90	-0.56	-0.24
04/07/03	11548.46	-0.44	0.27
03/22/99	11548.90	-2.70	-0.67
06/06/94	11551.60	0.00	0.00

For the Director,
National Institute of Standards and Technology

Dr. John D. Wright
Project Leader
Fluid Metrology Group
Physical Measurement Laboratory
National Institute of Standards and Technology

Sherry Sheckels
Calibration Technician
Fluid Metrology Group
Physical Measurement Laboratory
National Institute of Standards and Technology

Unit # 134



Johnson Gage and Inspection, Inc.

5920 W 21st St. N., Wichita, KS 67205
Phone 316.943.7532; Fax 316.944.6256



Certificate of Calibration

Report Number: 141195
Customer: METER ENGINEERS, INC.

Page 1 of 1

Form 2511
REV C 12-01-11

7718 W. 53rd ST. NORTH
MAIZE KS 67101

Item: DIGITAL THERMOMETER
Unit Number: 1630273
Model Number: MARTEL BETA PROBE T1
Serial Number: 1630273
Location: PRODUCTION

Inspector: PK
Date Calibrated: Feb 3, 2014
Recalibration Date: Feb 3, 2015
Temperature: 73.3 °F
Relative Humidity: 22 %

Item Range: -58°F to 320°F Resolution: Adjustable from 0.1°F to 0.001°F
Tolerance: ±0.2°F Class: N/A
Controlling Specification(s): ISO 10012, ANSI/NCSL Z540-1
Calibration/Inspection Procedure(s): WP4001 Tolerance Source: C See Below

Standard Value Test Result Deviation Uncertainty @k=2

Standard Value	Test Result	Deviation	Uncertainty @k=2
32.00°F	31.96°F	-0.04°F	0.12°F
76.00°F	75.98°F	-0.02°F	0.12°F
120.00°F	119.98°F	-0.02°F	0.12°F

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%. This estimate was performed in accordance with guidelines set forth in ANSI/NCSL Z540-2. The acceptance or rejection of the item(s) is based on the actual test values shown, without adjustment for measurement uncertainty. All testing performed using standards traceable to NIST or to intrinsic standards. This document shall not be reproduced except in full, without the written permission of Johnson Gage and Inspection. Tolerance source key: C = Customer; S = Specification; M = Manufacturer; R = JGI Recommended.

Comments: FOUND IN TOLERANCE. NO ADJUSTMENT REQUIRED.

Note: CERTIFIED AT TEST POINTS SHOWN PER CUSTOMER REQUEST.

Additional Standard Used: HP34420A; SN: US36001770; CERTIFIED: 12-31-13; DUE: 12-31-14; TN: 60911AT

Condition: USED

RESULTS: ACCEPTED AS NOTED

CALIBRATION STANDARD

Manufacturer/type: BURNS ENGINEERING PRT
Date Certified: Aug 6, 2013
Date Due: Aug 6, 2015

Model Number: 3925
Serial Number: 496142

TRACEABILITY NUMBER: W207672

Approved by: *[Signature]* EM 2/4/14



Johnson Gage and Inspection, Inc.

5920 W 21st St. N., Wichita, KS 67205
Phone 316.943.7532; Fax 316.944.6256



Certificate of Calibration

Report Number: 140072C
Customer: METER ENGINEERS, INC.

Page 1 of 1

Form 2511
REV C 12-01-11

7718 W. 53rd ST. NORTH
MAIZE KS 67101

Item: MERCURY THERMOMETER
Unit Number: 4L2158
Model Number: MILLER & WEBER T-3426
Serial Number: 4L2158
Location: PRODUCTION

Inspector: WM
Date Calibrated: Jan 22, 2014
Recalibration Date: Jan 22, 2015
Temperature: 73.6 °F
Relative Humidity: 30 %

Item Range: 30°F/124°F Resolution: 0.05°F
Tolerance: ±0.2°F Class: N/A
Controlling Specification(s): ISO 10012, ANSI/NCSL Z540-1
Calibration/Inspection Procedure(s): WP4001

Tolerance Source: R See Below

Standard Value Test Result Deviation Uncertainty @k=2

Standard Value	Test Result	Deviation	Uncertainty @k=2
32.00°F	31.95°F	-0.05°F	0.12°F
76.00°F	76.00°F	NONE	0.12°F
120.00°F	120.00°F	NONE	0.12°F

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%. This estimate was performed in accordance with guidelines set forth in ANSI/NCSL Z540-2. The acceptance or rejection of the item(s) is based on the actual test values shown, without adjustment for measurement uncertainty. All testing performed using standards traceable to NIST or to intrinsic standards. This document shall not be reproduced except in full, without the written permission of Johnson Gage and Inspection. Tolerance source key: C = Customer, S = Specification; M = Manufacturer; R = JGI Recommended.

Comments: FOUND IN TOLERANCE. NO ADJUSTMENT REQUIRED.

ADDITIONAL STANDARD: HP34420A SN US36001770, CERTIFIED 12-31-13, DUE 12-31-14, TN 60911AT.

Condition: USED

RESULTS: ACCEPTED

CALIBRATION STANDARD

Manufacturer/type: BURNS ENGINEERING PRT
Date Certified: Aug 6, 2013
Date Due: Aug 6, 2015

Model Number: 3925
Serial Number: 496142

TRACEABILITY NUMBER: W207672

Approved by: *[Signature]* 1-23-14

Unit 134

ARROW LABORATORY, INC.

PO BOX 248
WICHITA KS 67201-0248
Phone: (316) 267-2893

Metallurgical Analysis and Testing

1333 N MAIN ST
WICHITA KS 67203
Fax: (316) 267-0171

Attn: BRAD WILLIAMS
METER ENGINEERS
7718 W 53rd St North
WICHITA KS 67101

01-02-14
Page 1 of 1

LABORATORY REPORT #d90nm714

PRESSURE GAGE CALIBRATION

One 4.5 inch Wika Xsel pressure gage, S/N 586, 0-60 psi capacity with 5 psi subdivisions, was received in usable condition and calibrated as shown below. The gage was checked with our Ashcroft dead weight gage tester. Testing was performed in accordance with ASME B40.100-2005, ISO 10012-2003, and ANSI/NCSL Z540.3-2006.

Calibration Data:

LOAD psi	Average GAGE READING as Left
5	4.8 psi
15	14.7
25	24.6
35	34.6
45	44.5
55	54.5

Maximum Error center 1/2 of scale: 0.9% of span
 Max Error upper and lower 1/4 of scale: 0.9% of span
 Maximum Friction: 0.3% of span
 Repeatability: +/- 0.2% of span
 Accuracy: +/- 0.9% of span
 Adjustments: none Limitations of use: none
 Calibrated: 12-24-13 Temperature: 72°F
 Client Provided Confirmation Interval: Annual

These results meet ASME B40.100 grade 1A accuracy requirements.


Ashcroft Gage Tester: S/N DWT 11436, Uncertainty: +/- 0.07%
Weights: Tester weights were compared with weights calibrated on NIST.
Test #'s 822/262551-0 and 822/268214-03. Cal Due: 5-31-14

Piston Assembly:

The piston diameter and cylinder bore were measured by Precision Metrology Test# 1001438847 and certified to +/- 0.05% using masters traceable to NIST. Cal Due: 4-30-15

DER/dr
Rec'd 12-23-13

Project Supervisor



Dale E. Roark

The sample or instrument was received in suitable condition for the tests performed except as noted above.
Chemical Analysis of Carbon & Sulfur: Combustion/IR, Silicon: grav., Others: ICP/AA.
Tensile per ASTM E 8-11, B 557-10, or A 370-12a. Hardness per ASTM E 10-12, E 18-12, E 384-11.
The recording of false, fictitious, or fraudulent statements or entries on the certificate may be punished as a felony under federal law.
This report may not be reproduced except in full.



APPLICATION FOR REGISTRATION AS A REGISTERED SERVICE COMPANY
 Public Service Commission
 SFN 51277 (2/2014)



TYPE OR PRINT - AN INCOMPLETE OR ILLEGIBLE APPLICATION WILL BE REJECTED

Name of Company MAGUIAN M. O'STEEN PARTNERS, L.P.	Email Address MARK.HAUGEN@MAGUIANLP.COM	Application Date 9/19/14	
Mailing Address 3930 GATEWAY DRIVE	City GRANDFORKS	State ND	Zip Code 58201
Telephone Number 701-775-6256	Cell Phone Number 320-808-6352	Fax Number 701-775-7606	

Select below all device types your company will certify:

Scales (include maximum capacity, if applicable)	Liquid (include maximum flow rate, if applicable)
<input type="checkbox"/> 1. Rail <input type="checkbox"/> 2. Truck <input type="checkbox"/> 3. Livestock <input type="checkbox"/> 4. Hopper: Max. Capacity: _____ <input type="checkbox"/> 5. Belt <input type="checkbox"/> 6. Over 30 lbs.: Max. Capacity: _____ <input type="checkbox"/> 7. 30 lbs. or less <input type="checkbox"/> 8. Class II (indicate on your calibration report which weight kit is Class II certified) <input type="checkbox"/> 9. Other: Please List:	<input type="checkbox"/> 1. Retail Fuel (less than 20 gal. per minute) <input type="checkbox"/> 2. High Flow Retail Fuel (20 gal. per minute or greater) <input type="checkbox"/> 3. Vehicle Tank: Max. Flow Rate: _____ <input type="checkbox"/> 4. Stationary Bulk (fuel or oil): Max. Flow Rate: _____ <input type="checkbox"/> 5. LPG <input type="checkbox"/> 6. Stationary LPG <input type="checkbox"/> 7. Fertilizer: Max. Flow Rate: _____ <input type="checkbox"/> 8. Chemical <input type="checkbox"/> 9. Anhydrous <input checked="" type="checkbox"/> 10. Loading Rack - 600 GPM PER METE 2 <input type="checkbox"/> 11. Other: Please List:

List below all persons employed by your company as a North Dakota Registered Service Person and the device types they are registered to certify (attach a separate sheet to list additional employees):

Permit No.	Employee	Device Types Registered to Certify (list using device type numbers from above)
e.g. 1001	e.g. John Doe	e.g. Scales - 2, 3, 6, 8; e.g. Liquid - 1, 2, 6
1445	KEITH PETRON	10

Application for Registration as a Registered Service Company
Page 2

List below all field standards (attach current calibration reports):

API STANDARDS CHARTERS	
4, 11, + 12	

Additional Application Items (initial where appropriate):

Standardized Test Report	<input checked="" type="checkbox"/> Copy enclosed
	<input type="checkbox"/> No change in report filed previously
Tested and Approved Sticker	<input type="checkbox"/> Copy enclosed
	<input checked="" type="checkbox"/> No change in sticker filed previously
Photocopy of Crimped Lead Wire Seal	<input type="checkbox"/> Copy enclosed
	<input checked="" type="checkbox"/> No change in crimped lead wire seal filed previously

Public Company Listing:

Include my company information on your registered service company list for public contact.

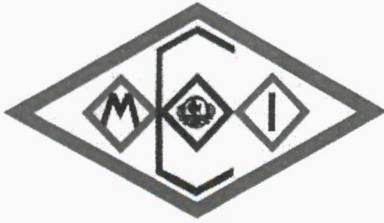
Yes No

I am Mark L Jase, and have authority to represent this company. By signing this application, I declare that I have examined this form and accompanying documentation, and to the best of my knowledge and belief, the facts stated and documentation provided is true, correct, and complete.

Mark L Jase
Signature

Send Completed Application and Related Documents To:

Public Service Commission
600 E Boulevard Ave Dept 408
Bismarck ND 58505-0480
Telephone: (701) 328-2400
Fax: (701) 328-2410



Customer	Magellan
Location	Grand Forks, ND
Designation	Truck Rack
Serial	96647
Prover Type	Atmospheric Tank
Date Completed	8/11/2014

Tank Run Comparisons

Established Prover Volume

Tank Volume gal	1000
Tank Volume inches	231000
Tank Volume barrels	23.8095238

These values represent the design or initial volumes before any needed corrections.

Check Runs

Run 1 = 230,990.8847	}	0.0005 %	Avg	Volume Diff 1 & 2 to Established %
Run 2 = 230,989.6769			230,990.281	-0.0042 %

Calibration Calculations

Established Vol	Avg Run Volume	Linear Measurement of Scale	
231000	- 230990.281	X	= ?

Scale Reading

Temp of Can

Scale was moved up ? inches which corresponds to the prover volume correction needed of 9.7192 cubic inches. Measure volume of can is temperature compensated.

Verification Runs (After Correction if any)

Run =	}	Avg	Volume Diff & to Established %
Run =			-100 %

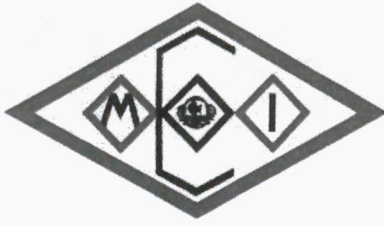
New Prover Volume

If No corrections Needed

Tank Volume gal	999.958
Tank Volume inches	230,990.281
Tank Volume barrels	23.809

WITH Corrections

Tank Volume gal	
Tank Volume inches	
Tank Volume barrels	



Customer	Magellan
Location	Grand Forks, ND
Designation	Truck Rack
Serial	96647
Prover Type	Atmospheric Tank

Prover Information

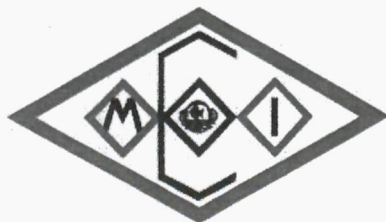
Prover Type	Atmospheric Tank
Designation	Truck Rack
Serial	96647
Mfg of Prover	Brown Tank Co.
Coated?	No
Insulated?	No
Metallic Composition	Carbon Steel
Coefficient of Cubical Expansion	.0000186
Modulus of Elasticity	30000000
Unit Number	
Notes	Moved scale 0.26 inches up resealed with #0125

Methodology

CTL Temperature Correction Factor is based on API Petroleum Measurement manual Chapter 11.2.:

CTS Metal Correction Factor = $(1 + ((\text{Can Temp in F} - 60) \text{ times the Can Coefficient of Expansion}))$
divided by $(1 + ((\text{Prover Temp in F} - 60) \text{ times the Prover Coefficient of Expansion}))$

Meter Engineers, Inc.



Customer	Magellan
Location	Grand Forks, ND
Designation	Truck Rack
Serial	96647
Prover Type	Atmospheric Tank
Date Completed	8/11/2014

Run Calculation Summary

Gary Clark

Run # 1

Measure	Certified Volume	Scale Reading	Actual Volume	Prover Temp	Can Temp	CTL Temp Correction	CTS Metal Correction	Adjusted Volume
Can # 1 100 gal	23,093.63	0	23,093.63	69.8	70.2	0.999951	1.000088	23,094.5306
Can # 2 100 gal	23,092.99	0	23,092.99	69.8	70	0.999976	1.000083	23,094.3524
Can # 3 50 gal	11,548.56	0	11,548.56	69.8	70	0.999976	1.000083	11,549.2413
Can # 1 100 gal	23,093.63	0	23,093.63	69.8	69.9	0.999988	1.000080	23,095.2003
Can # 2 100 gal	23,092.99	0	23,092.99	69.8	69.9	0.999988	1.000080	23,094.5603
Can # 3 50 gal	11,548.56	0	11,548.56	69.8	70	0.999976	1.000083	11,549.2413
Can # 1 100 gal	23,093.63	0	23,093.63	69.8	69.9	0.999988	1.000080	23,095.2003
Can # 2 100 gal	23,092.99	0	23,092.99	69.8	70	0.999976	1.000083	23,094.3524
Can # 3 50 gal	11,548.56	0	11,548.56	69.8	70.1	0.999964	1.000086	11,549.1374
Can # 1 100 gal	23,093.63	-5	23,088.63	69.8	70.1	0.999964	1.000086	23,089.7844
Can # 2 100 gal	23,092.99	-3	23,089.99	69.8	70.1	0.999964	1.000086	23,091.1444
Can # 3 50 gal	11,548.56	45	11,593.56	69.8	70.1	0.999964	1.000086	11,594.1396

Volume This Run 230,990.8847
 Divided by CPS ?
 Divided by CPL

Pressure & Temperature Adjusted Volume This Run ?

Run # 2

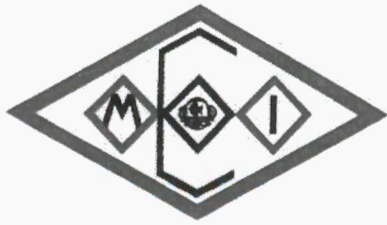
Measure	Certified Volume	Scale Reading	Actual Volume	Prover Temp	Can Temp	CTL Temp Correction	CTS Metal Correction	Adjusted Volume
Can # 1 100 gal	23,093.63	0	23,093.63	70.5	71.1	0.999926	1.000099	23,094.2072
Can # 2 100 gal	23,092.99	0	23,092.99	70.5	70.8	0.999963	1.000091	23,094.2369
Can # 3 50 gal	11,548.56	0	11,548.56	70.5	70.8	0.999963	1.000091	11,549.1836

Run Calculation Summary (cont)

Can # 1 100 gal	23,093.63	0	23,093.63	70.5	70.7	0.999975	1.000089	23,095.1079
Can # 2 100 gal	23,092.99	0	23,092.99	70.5	70.8	0.999963	1.000091	23,094.2369
Can # 3 50 gal	11,548.56	0	11,548.56	70.5	70.8	0.999963	1.000091	11,549.1836
Can # 1 100 gal	23,093.63	0	23,093.63	70.5	70.7	0.999975	1.000089	23,095.1079
Can # 2 100 gal	23,092.99	0	23,092.99	70.5	70.7	0.999975	1.000089	23,094.4679
Can # 3 50 gal	11,548.56	0	11,548.56	70.5	70.8	0.999963	1.000091	11,549.1836
Can # 1 100 gal	23,093.63	1	23,094.63	70.5	70.7	0.999975	1.000089	23,096.1080
Can # 2 100 gal	23,092.99	0	23,092.99	70.5	70.7	0.999975	1.000089	23,094.4679
Can # 3 50 gal	11,548.56	35	11,583.56	70.5	70.8	0.999963	1.000091	11,584.1855

Volume This Run 230,989.6769
 Divided by CPS ?
 Divided by CPL

Pressure & Temperature Adjusted Volume This Run ?



WaterDraw Calibration Worksheet

Customer | Magellan
 Location | Grand Forks, ND
 Designation | Truck Rack
 Serial | 96647
 Prover Type | Atmospheric Tank

Technician: Gary Clark
 Scale Reading: 59.3 cubic inches
 Tolerance: 46.2 cubic inches

Date: 8-11-14 1 69.8 2 70.5

Measure	Scale Reading	Temp	Run	Prv	Temp	Pres	Time	Run	Prv	Temp	Pres	Time	Run	Prv	Temp	Pres	Time
			Scale Reading	Temp	Scale Reading	Temp	Scale Reading	Temp									
Can # 1 100 gal	1	\emptyset	70.2	1	71.1 \emptyset	71.0	1						1				
Can # 2 100 gal	2	\emptyset	70.0	2	\emptyset	70.8	2						2				
Can # 3 50 gal	3	\emptyset	70.0	3	\emptyset	70.8	3						3				
Can # 1 100 gal	1	\emptyset	69.9	1	\emptyset	70.7	1						1				
Can # 2 100 gal	2	\emptyset	69.9	2	\emptyset	70.8	2						2				
Can # 3 50 gal	3	\emptyset	70.0	3	\emptyset	70.8	3						3				
Can # 1 100 gal	1	\emptyset	69.9	1	\emptyset	70.7	1						1				
Can # 2 100 gal	2	\emptyset	70.0	2	\emptyset	70.7	2						2				
Can # 3 50 gal	3	\emptyset	70.1	3	\emptyset	70.8	3						3				
Can # 1 100 gal	1	-5	70.1	1	1	70.7	1						1				
Can # 2 100 gal	2	-3	70.1	2	0	70.7	2						2				
Can # 3 50 gal	3	45	70.1	3	35	70.8	3						3				

37 Total 36 Total _____ Total

Thermometer Numbers: 1630273 41-2158

Witnesses: [Signature] (Company) MEI

Witnesses: _____ (Company) _____



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-8361

REPORT OF CALIBRATION

FOR

A ONE HUNDRED (100) GALLON VOLUME PROVER
(Graduated Neck Type)

February 25, 2014

Manufacturer: Seraphin
Rancocas, NJ

NIST Seal Number: 7241
NIST Valve Seal No.: 001059
Material: Stainless Steel
Serial Number: 2470-A

submitted by

Meter Engineers, Inc.
7718 W. 53rd St. N
Maize, KS 67101

(Reference: Purchase Order Number 007468; dated February 4, 2014)

The volume of the prover described above was measured by the gravimetric method [1] and the standards used in this calibration are traceable to the System International through national standards. The gravimetric method uses the weight of the fluid necessary to fill the prover and the fluid density to calculate the volume. The fluid used was water from a reverse osmosis system and the prover was leveled using the vertical surface of the neck.[#]

The contained volume was drained from the prover by opening the valve at the bottom of the vessel. When this flow finished, the valve was held open for 30 seconds to complete the drain procedure. The delivered volume is for the scale reading of zero (0) and has been corrected for the reference temperature in Table 1 assuming a volumetric coefficient of expansion of 0.0000477 per °C (0.0000265 per °F) for the prover material.

1 Bean, V. E., Espina, P. I., Wright, J. D., Houser, J. F., Sheckels, S. D., and Johnson, A. N., "NIST Calibration Services for Liquid Volume," NIST Special Publication 250-72, National Institute of Standards and Technology, November 24, 2009.

[#] One level indication was made in line with the neck scale and the other 90° to that indication, as stated in API MPMS Chapter 4.7. The levels on the can were not used.

Table 1. Delivered volume for the tested vessel for a scale reading of zero.

	Volume Delivered
gal at 60 °F	99.9724
in ³ at 60 °F	23093.63

The volume measurement procedure was repeated 5 times with the neck scale filled approximately to zero each time. The repeatability of the 5 measurements was 23 parts in 10⁶ and the expanded uncertainty in the measured volume is $\pm 0.008\%$. It was calculated according to References [1] and [2] with a 95 % confidence level[†] and is traceable to NIST mass, temperature, pressure, and humidity standards, and a NIST water density determination.

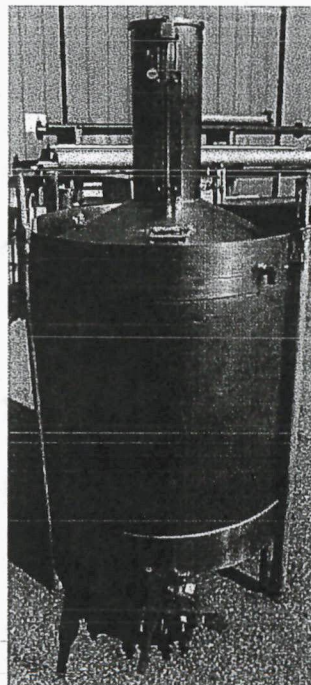
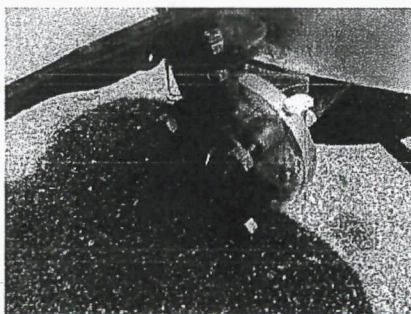
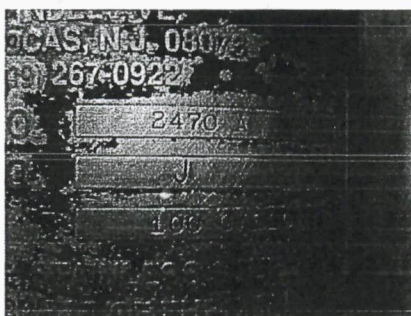


Figure 1. Photographs of the volume prover.

The input data used for calculation of the prover volume are given in the spreadsheet attached to this report. The calibration and uncertainties presented here are only valid over the range of the

² Taylor, B. N. and Kuyatt, C. E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results," NIST Technical Note 1297, National Institute of Standards and Technology (January 1993).

[†] Coverage factor of 2.09 for 21 effective degrees of freedom.

NIST calibration of this test measure. When the test measure is applied by the customer to measure liquid volume, uncertainties beyond the NIST calibration must be considered, for example: leveling of the test measure, reading the meniscus, cleanliness of the test measure interior, drainage effects due to liquid viscosity, etc.

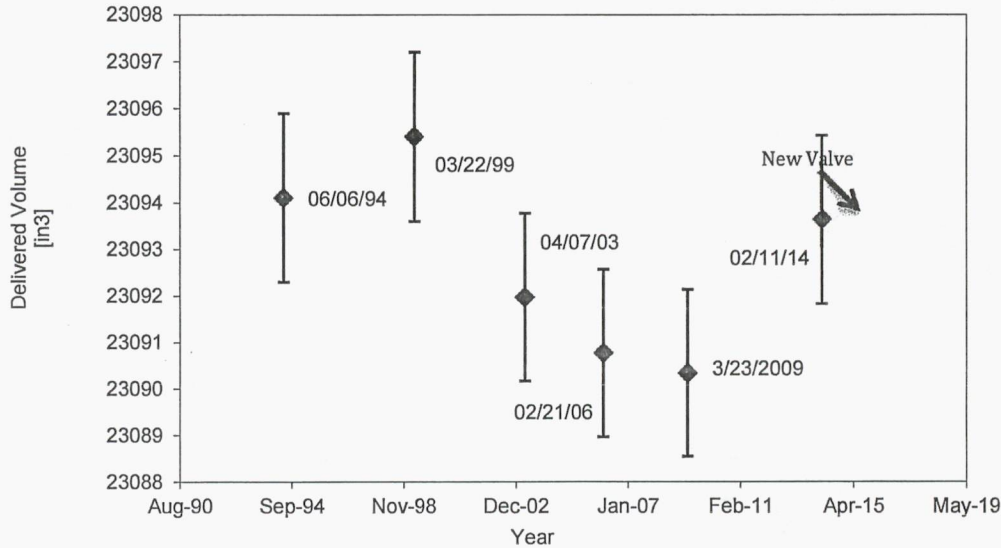


Figure 2. Calibration control chart for 100 gallon graduated neck test measure SN 2470-A

Table 2. Results of prior calibrations for the delivered volume.

<i>Date</i>	<i>Delivered Volume [in³]</i>	<i>Difference from Prior [in³]</i>	<i>Degree of Equivalence [-]</i>
02/11/14	23093.63	2.86	0.49
03/23/09	23090.34	-0.43	-0.07
02/21/06	23090.77	-1.20	-0.20
04/07/03	23091.97	-3.43	-0.58
03/22/99	23095.40	1.30	0.22
06/06/94	23094.10	-	-

For the Director,
 National Institute of Standards and Technology

Dr. John D. Wright
 Project Leader
 Fluid Metrology Group
 Physical Measurement Laboratory
 National Institute of Standards and Technology

Sherry Sheckels
 Calibration Technician
 Fluid Metrology Group
 Physical Measurement Laboratory
 National Institute of Standards and Technology



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-8361

REPORT OF CALIBRATION

FOR

A ONE HUNDRED (100) GALLON VOLUME PROVER
(Graduated Neck Type)

February 25, 2014

Manufacturer: Seraphin
Rancocas, NJ

NIST Seal Number: 7240
NIST Valve Seal No.: 001058
Material: Stainless Steel
Serial Number: 2470-B

submitted by

Meter Engineers, Inc.
7718 W. 53rd St. N
Maize, KS 67101

(Reference: Purchase Order Number 007468; dated February 4, 2014)

The volume of the prover described above was measured by the gravimetric method [1] and the standards used in this calibration are traceable to the System International through national standards. The gravimetric method uses the weight of the fluid necessary to fill the prover and the fluid density to calculate the volume. The fluid used was water from a reverse osmosis system and the prover was leveled using the vertical surface of the neck.[#]

The contained volume was drained from the prover by opening the valve at the bottom of the vessel. When this flow finished, the valve was held open for 30 seconds to complete the drain procedure. The delivered volume is for the scale reading of zero (0) and has been corrected for the reference temperature in Table 1 assuming a volumetric coefficient of expansion of 0.0000477 per °C (0.0000265 per °F) for the prover material.

¹ Bean, V. E., Espina, P. I., Wright, J. D., Houser, J. F., Sheckels, S. D., and Johnson, A. N., "NIST Calibration Services for Liquid Volume," NIST Special Publication 250-72, National Institute of Standards and Technology, November 24, 2009.

[#] One level indication was made in line with the neck scale and the other 90° to that indication, as stated in API MPMS Chapter 4.7. The levels on the can were not used.

Table 1. Delivered volume for the tested vessel for a scale reading of zero.

	Volume Delivered
gal at 60 °F	99.9696
in ³ at 60 °F	23092.99

The volume measurement procedure was repeated 5 times with the neck scale filled approximately to zero each time. The repeatability of the 5 measurements was 30 parts in 10⁶ and the expanded uncertainty in the measured volume is $\pm 0.009\%$. It was calculated according to References [1] and [2] with a 95 % confidence level[†] and is traceable to NIST mass, temperature, pressure, and humidity standards, and a NIST water density determination.

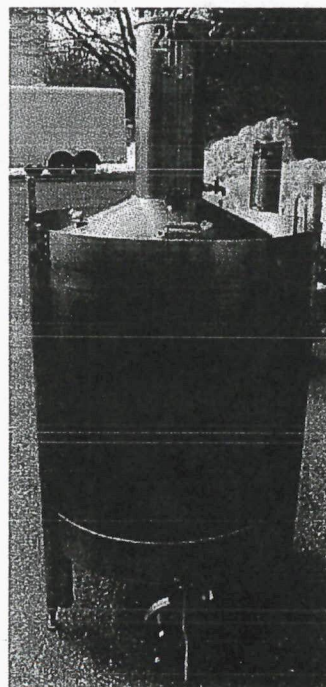
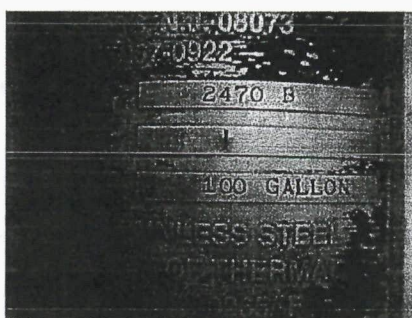


Figure 1. Photographs of the volume prover.

The input data used for calculation of the prover volume are given in the spreadsheet attached to this report. The calibration and uncertainties presented here are only valid over the range of the

² Taylor, B. N. and Kuyatt, C. E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results," NIST Technical Note 1297, National Institute of Standards and Technology (January 1993).

[†] Coverage factor of 2.12 for 16 effective degrees of freedom.

NIST calibration of this test measure. When the test measure is applied by the customer to measure liquid volume, uncertainties beyond the NIST calibration must be considered, for example: leveling of the test measure, reading the meniscus, cleanliness of the test measure interior, drainage effects due to liquid viscosity, etc.

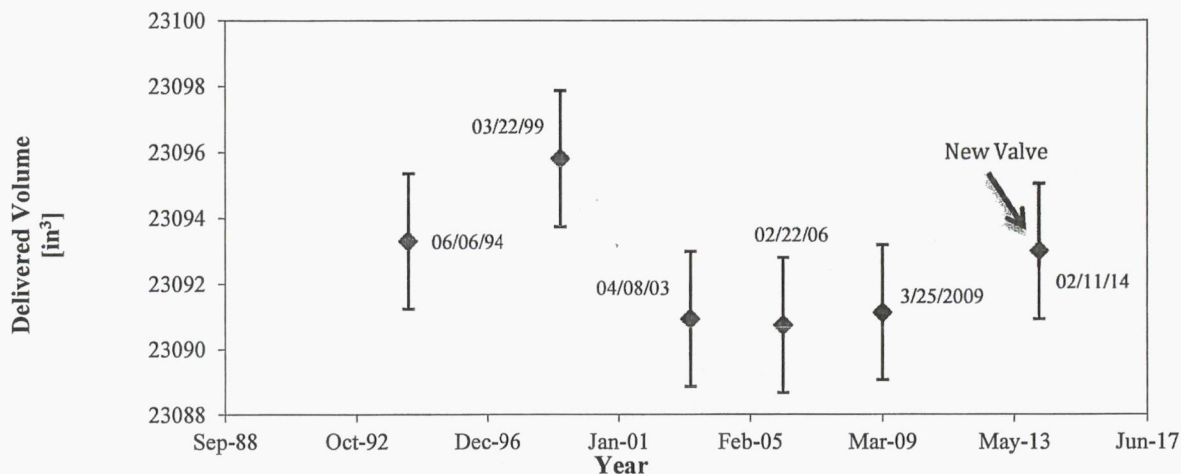


Figure 2. Calibration control chart for 100 gallon graduated neck test measure SN 2470-B

Table 2. Results of prior calibrations for the delivered volume.

Date	Delivered Volume [in ³]	Difference from Prior [in ³]	Degree of Equivalence [-]
02/11/14	23092.99	2.26	0.38
03/25/09	23091.12	0.39	0.07
02/22/06	23090.74	-0.19	-0.03
04/08/03	23090.93	-4.87	-0.83
03/22/99	23095.80	2.50	0.42
06/06/94	23093.30	-	-

For the Director,
 National Institute of Standards and Technology

John D. Wright

Dr. John D. Wright
 Project Leader
 Fluid Metrology Group
 Physical Measurement Laboratory
 National Institute of Standards and Technology

Sherry Sheckels

Sherry Sheckels
 Calibration Technician
 Fluid Metrology Group
 Physical Measurement Laboratory
 National Institute of Standards and Technology



UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-8361

REPORT OF CALIBRATION

FOR

A FIFTY (50) GALLON VOLUME PROVER
(Graduated Neck Type)

February 25, 2014

Manufacturer: Seraphin	NIST Seal Number: 7242
Rancocas, NJ	NIST Valve Seal No.: 001060
	Material: Stainless Steel
	Serial Number: 7293-C

submitted by

Meter Engineers, Inc.
7718 W. 53rd St. N
Maize, KS 67101

(Reference: Purchase Order Number 007468; dated February 4, 2014)

The volume of the prover described above was measured by the gravimetric method [1] and the standards used in this calibration are traceable to the System International through national standards. The gravimetric method uses the weight of the fluid necessary to fill the prover and the fluid density to calculate the volume. The fluid used was water from a reverse osmosis system and the prover was leveled using the vertical surface of the neck.[#]

The contained volume was drained from the prover by opening the valve at the bottom of the vessel. When this flow finished, the valve was held open for 30 seconds to complete the drain procedure. The delivered volume is for the scale reading of zero (0) and has been corrected for the reference temperature in Table 1 assuming a volumetric coefficient of expansion of 0.0000477 per °C (0.0000265 per °F) for the prover material.

1 Bean, V. E., Espina, P. I., Wright, J. D., Houser, J. F., Sheckels, S. D., and Johnson, A. N., "NIST Calibration Services for Liquid Volume," NIST Special Publication 250-72, National Institute of Standards and Technology, November 24, 2009.

[#] One level indication was made in line with the neck scale and the other 90° to that indication, as stated in API MPMS Chapter 4.7. The levels on the can were not used.

Table 1. Delivered volume for the tested vessel for a scale reading of zero.

	Volume Delivered
gal at 60 °F	49.9937
in ³ at 60 °F	11548.56

The volume measurement procedure was repeated 5 times with the neck scale filled approximately to zero each time. The repeatability of the 5 measurements was 17 parts in 10⁶ and the expanded uncertainty in the measured volume is $\pm 0.010\%$. It was calculated according to References [1] and [2] with a 95 % confidence level[†] and is traceable to NIST mass, temperature, pressure, and humidity standards, and a NIST water density determination.

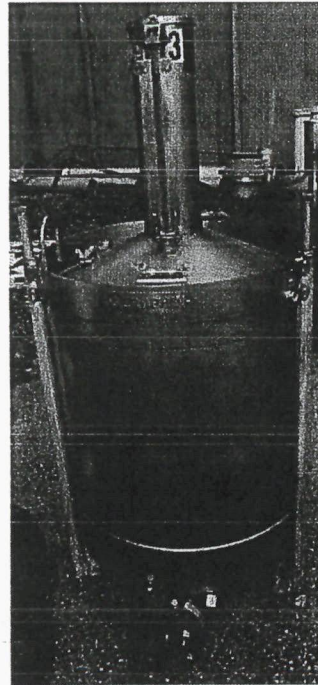
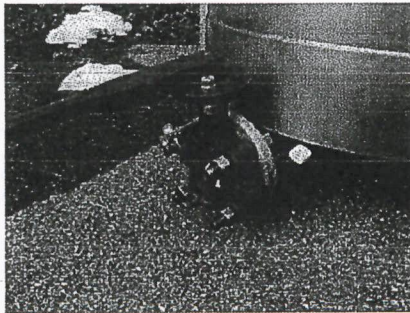
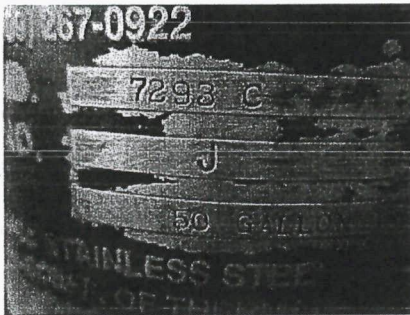


Figure 1. Photographs of the volume prover.

The input data used for calculation of the prover volume are given in the spreadsheet attached to this report. The calibration and uncertainties presented here are only valid over the range of the

² Taylor, B. N. and Kuyatt, C. E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results," NIST Technical Note 1297, National Institute of Standards and Technology (January 1993).

[†] Coverage factor of 1.97 for 339 effective degrees of freedom.

NIST calibration of this test measure. When the test measure is applied by the customer to measure liquid volume, uncertainties beyond the NIST calibration must be considered, for example: leveling of the test measure, reading the meniscus, cleanliness of the test measure interior, drainage effects due to liquid viscosity, etc.

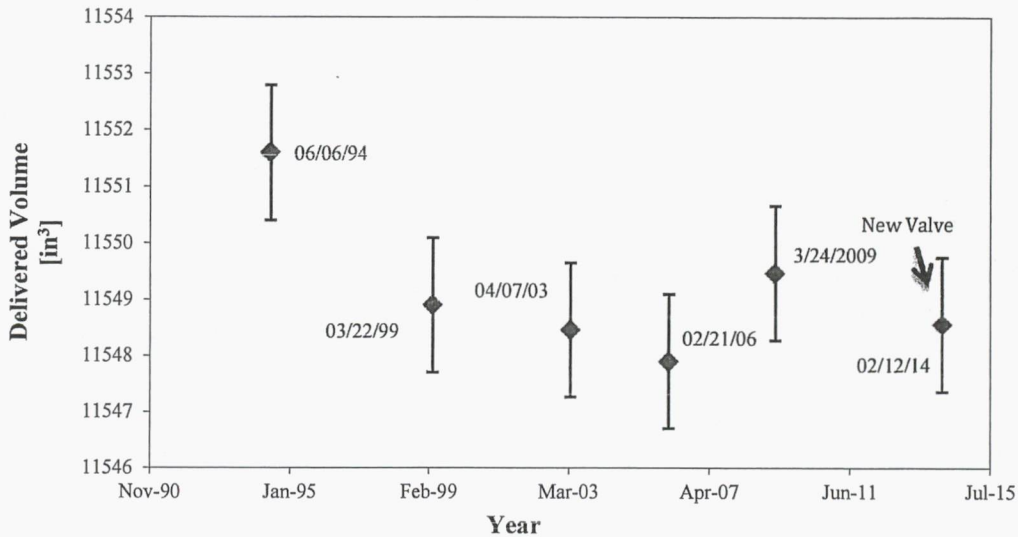


Figure 2. Calibration control chart for 50 gallon graduated neck test measure SN 7293-C

Table 2. Results of prior calibrations for the delivered volume.

<i>Date</i>	<i>Delivered Volume [in³]</i>	<i>Difference from Prior [in³]</i>	<i>Degree of Equivalence [-]</i>
02/12/14	11548.56	-0.91	-0.26
03/24/09	11549.47	1.57	0.18
02/21/06	11547.90	-0.56	-0.24
04/07/03	11548.46	-0.44	0.27
03/22/99	11548.90	-2.70	-0.67
06/06/94	11551.60	0.00	0.00

For the Director,
 National Institute of Standards and Technology

Dr. John D. Wright
 Project Leader
 Fluid Metrology Group
 Physical Measurement Laboratory
 National Institute of Standards and Technology

Sherry Sheckels
 Calibration Technician
 Fluid Metrology Group
 Physical Measurement Laboratory
 National Institute of Standards and Technology

Unit # 134

Johnson Gage and Inspection, Inc.

5920 W 21st St. N., Wichita, KS 67205
Phone 316.943.7532; Fax 316.944.6256



Certificate of Calibration

Report Number: 141195
Customer: METER ENGINEERS, INC.

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Form 2511
REV C 12-01-11

7718 W. 53rd ST. NORTH
MAIZE KS 67101

Item: DIGITAL THERMOMETER
Unit Number: 1630273
Model Number: MARTEL BETA PROBE T1
Serial Number: 1630273
Location: PRODUCTION

Inspector: PK
Date Calibrated: Feb 3, 2014
Recalibration Date: Feb 3, 2015
Temperature: 73.3 °F
Relative Humidity: 22 %

Item Range: -58°F to 320°F Resolution: Adjustable from 0.1°F to 0.001°F
Tolerance: ±0.2°F Class: N/A

Controlling Specification(s): ISO 10012, ANSI/NCSL Z540-1

Calibration/Inspection Procedure(s): WP4001

Tolerance Source: C See Below

Standard Value	Test Result	Deviation	Uncertainty @k=2
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32.00°F	31.96°F	-0.04°F	0.12°F
76.00°F	75.98°F	-0.02°F	0.12°F
120.00°F	119.98°F	-0.02°F	0.12°F

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%. This estimate was performed in accordance with guidelines set forth in ANSI/NCSL Z540-2. The acceptance or rejection of the item(s) is based on the actual test values shown, without adjustment for measurement uncertainty. All testing performed using standards traceable to NIST or to intrinsic standards. This document shall not be reproduced except in full, without the written permission of Johnson Gage and Inspection. Tolerance source key: C = Customer; S = Specification; M = Manufacturer; R = JGI Recommended.

Comments: FOUND IN TOLERANCE. NO ADJUSTMENT REQUIRED.

Note: CERTIFIED AT TEST POINTS SHOWN PER CUSTOMER REQUEST.

Additional Standard Used: HP34420A; SN: US36001770; CERTIFIED: 12-31-13; DUE: 12-31-14; TN: 60911AT

Condition: USED

RESULTS: ACCEPTED AS NOTED

CALIBRATION STANDARD

Manufacturer/type: BURNS ENGINEERING PRT
Date Certified: Aug 6, 2013
Date Due: Aug 6, 2015

Model Number: 3925
Serial Number: 496142

TRACEABILITY NUMBER: W207672

Approved by: *[Signature]* EM 2.4.14



Johnson Gage and Inspection, Inc.

5920 W 21st St. N., Wichita, KS 67205
Phone 316.943.7532; Fax 316.944.6256



Certificate of Calibration

Report Number: 140072C
Customer: METER ENGINEERS, INC.

Page 1 of 1

Form 2511
REV C 12-01-11

7718 W. 53rd ST. NORTH
MAIZE KS 67101

Item: MERCURY THERMOMETER
Unit Number: 4L2158
Model Number: MILLER & WEBER T-3426
Serial Number: 4L2158
Location: PRODUCTION

Inspector: WM
Date Calibrated: Jan 22, 2014
Recalibration Date: Jan 22, 2015
Temperature: 73.6 °F
Relative Humidity: 30 %

Item Range: 30°F/124°F Resolution: 0.05°F
Tolerance: ±0.2°F Class: N/A

Controlling Specification(s): ISO 10012, ANSI/NC SL Z540-1

Calibration/Inspection Procedure(s): WP4001

Tolerance Source: R See Below

Standard Value	Test Result	Deviation	Uncertainty @k=2
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Standard Value	Test Result	Deviation	Uncertainty @k=2
32.00°F	31.95°F	-0.05°F	0.12°F
76.00°F	76.00°F	NONE	0.12°F
120.00°F	120.00°F	NONE	0.12°F

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%. This estimate was performed in accordance with guidelines set forth in ANSI/NC SL Z540-2. The acceptance or rejection of the item(s) is based on the actual test values shown, without adjustment for measurement uncertainty. All testing performed using standards traceable to NIST or to intrinsic standards. This document shall not be reproduced except in full, without the written permission of Johnson Gage and Inspection. Tolerance source key: C = Customer; S = Specification; M = Manufacturer; R = JGI Recommended.

Comments: FOUND IN TOLERANCE. NO ADJUSTMENT REQUIRED.

ADDITIONAL STANDARD: HP34420A SN US36001770, CERTIFIED 12-31-13, DUE 12-31-14, TN 60911AT.

Condition: USED

RESULTS: ACCEPTED

CALIBRATION STANDARD

Manufacturer/type: BURNS ENGINEERING PRT
Date Certified: Aug 6, 2013
Date Due: Aug 6, 2015

Model Number: 3925
Serial Number: 496142

TRACEABILITY NUMBER: W207672

Approved by:

Unit 134

ARROW LABORATORY, INC.

PO BOX 248
WICHITA KS 67201-0248
Phone: (316) 267-2893

Metallurgical Analysis and Testing

1333 N MAIN ST
WICHITA KS 67203
Fax: (316) 267-0171

Attn: BRAD WILLIAMS
METER ENGINEERS
7718 W 53rd St North
WICHITA KS 67101

01-02-14
Page 1 of 1

LABORATORY REPORT #d90nm714

PRESSURE GAGE CALIBRATION

One 4.5 inch Wika Xsel pressure gage, S/N 586, 0-60 psi capacity with 5 psi subdivisions, was received in usable condition and calibrated as shown below. The gage was checked with our Ashcroft dead weight gage tester. Testing was performed in accordance with ASME B40.100-2005, ISO 10012-2003, and ANSI/NC SL Z540.3-2006.

Calibration Data:

LOAD psi	Average GAGE READING as Left
5	4.8 psi
15	14.7
25	24.6
35	34.6
45	44.5
55	54.5

Maximum Error center 1/2 of scale: 0.9% of span
 Max Error upper and lower 1/4 of scale: 0.9% of span
 Maximum Friction: 0.3% of span
 Repeatability: +/- 0.2% of span
 Accuracy: +/- 0.9% of span

Adjustments: none Limitations of use: none

Calibrated: 12-24-13 Temperature: 72°F

Client Provided Confirmation Interval: Annual

These results meet ASME B40.100 grade 1A accuracy requirements.

Ashcroft Gage Tester: S/N DWT 11436, Uncertainty: +/- 0.07%

Weights: Tester weights were compared with weights calibrated on NIST.

Test #'s 822/262551-0 and 822/268214-03. Cal Due: 5-31-14

Piston Assembly:

The piston diameter and cylinder bore were measured by Precision Metrology Test# 1001438847 and certified to +/- 0.05% using masters traceable to NIST. Cal Due: 4-30-15

DER/dr
Rec'd 12-23-13

Project Supervisor



Dale E. Roark

The sample or instrument was received in suitable condition for the tests performed except as noted above.
 Chemical Analysis of Carbon & Sulfur: Combustion/IR, Silicon: grav., Others: ICP/AA.
 Tensile per ASTM E 8-11, B 557-10, or A 370-12a. Hardness per ASTM E 10-12, E 18-12, E 384-11.
 The recording of false, fictitious, or fraudulent statements or entries on the certificate may be punished as a felony under federal law.
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