

Customer	Kinder Morgan
Location	Carrington, ND
Designation	Carrington Terminal Propane
Serial	E-6409
Prover Type	Unidirectional



# Certificate of Calibration

Jun 19, 2013

This is to certify that Meter Engineers, Inc. calibrated subject Unidirectional meter prover and established the volume at 60 degrees fahrenheit and atmospheric pressure for a one way trip of the displacer to be:

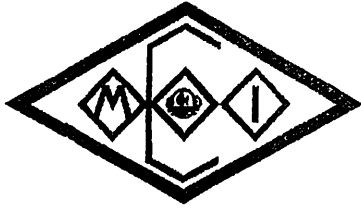
Average One Way Volume: 7.2736 bbl

The calibrating medium used was water and the calibration was performed in accordance with the latest edition of the API Standards Chapters 4, 11, & 12 by Gary Clark and certified by the undersigned. Test performed using trailer unit number 134.

Certified Test Measures Used:

Measure #	Gal	NIST #
1	100	6996
2	100	6997
3	50	6998
6	5	7002

Signed *Shaun [Signature]*



Customer	Kinder Morgan
Location	Carrington, ND
Designation	Carrington Terminal Propane
Serial	E-6409
Prover Type	Unidirectional

## UniDirectional Run Comparisons

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Run 1 = 70,567.6734		
	0.0014 %	
Run 2 = 70,566.6881		0.0047 %
	0.0061 %	
Run 3 = 70,570.9943		

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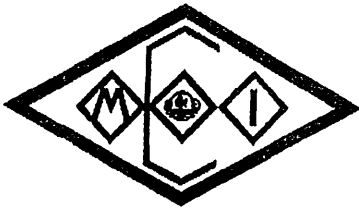
Previous Volume was 7.27191 barrels      Previous Volume was 70552.07082 inches

This WaterDraw 7.2736 barrels      .0232 % Diff from Previous Volume

This WaterDraw 70,568.4519 inches

(1.156390 cubic meters)

File Source: WaterDraws



Customer	Kinder Morgan
Location	Carrington, ND
Designation	Carrington Terminal Propane
Serial	E-6409
Prover Type	Unidirectional

## Prover Information

Prover Type	Unidirectional
Designation	Carrington
Serial	E-6409
Pipe I.D.	7.981
ANSI	
Ball Percent Oversize	3 %
Ball Composition	Yellow
Pipe Wall Thickness	.322
Mfg of Prover	F. H. Maloney
Mfg of Interchange	F. H. Maloney
Mfg of SwitchBase	F. H. Maloney
Mfg of Switches	F. H. Maloney
First Detector Switch Seal Number	
Second Detector Switch Seal Number	
Coated?	Yes
Insulated?	No
Metallic Composition	Carbon Steel
Coefficient of Cubical Expansion	.0000186
Modulus of Elasticity	30000000
Unit Number	134
Above or Below Ground	Above
Notes	new switch kit installed this water draw

### Methodology

CTL Temperature Correction Factor is based on API Petroleum Measurement manual Chapter 11.2.3

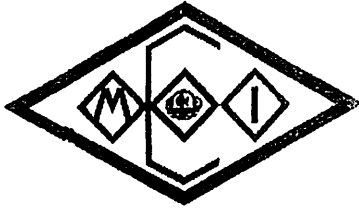
CTS Metal Correction Factor =  $(1 + ((\text{Can Temp in F} - 60) \text{ times the Can Coefficient of Expansion}))$   
 divided by  $(1 + ((\text{Prover Temp in F} - 60) \text{ times the Prover Coefficient of Expansion}))$

CPS =  $1 + (\text{Pressure times the Pipe ID} \text{ divided by the Modulus of Elasticity times the Prover Pipewall Thickness})$

CPL =  $1 \text{ divided by } \{1 - (\text{Compressibility Constant of Water times Prover Pressure})\}$

File Source: Waterdraws

Meter Engineers, Inc.



Customer	Kinder Morgan
Location	Carrington, ND
Designation	Carrington Terminal Propane
Serial	E-6409
Prover Type	Unidirectional

## Run Calculation Summary

Gary Clark

Run # 1                      Elapsed Time 5 : 23 min                      GPM 56.76                      Pressure 42

Measure	Certified Volume	Scale Reading	Actual Volume	Prover Temp	Can Temp	CTL Temp Correction	CTS Metal Correction	Adjusted Volume
Can # 3    50gal	11,549.47	100	11,649.47	57.4	57.5	0.999992	0.999982	11,649.1671
Can # 1    100gal	23,090.34	0	23,090.34	57.4	57.5	0.999992	0.999982	23,089.7397
Can # 2    100gal	23,091.12	1	23,092.12	57.4	57.6	0.999984	0.999984	23,091.3811
Can # 3    50gal	11,549.47	47	11,596.47	57.4	57.8	0.999969	0.999990	11,595.9945
Can # 6    5gal	1,153.39	0	1,153.39	57.4	58.2	0.999937	1.000000	1,153.3173
Volume This Run								70,579.5997
Divided by CPS								1.000035
Divided by CPL								1.000134

Pressure & Temperature Adjusted Volume This Run                      **70,567.6734**

Run # 2                      Elapsed Time 7 : 18 min                      GPM 41.85                      Pressure 42

Measure	Certified Volume	Scale Reading	Actual Volume	Prover Temp	Can Temp	CTL Temp Correction	CTS Metal Correction	Adjusted Volume
Can # 3    50gal	11,549.47	100	11,649.47	57.8	58	0.999984	0.999988	11,649.1438
Can # 1    100gal	23,090.34	0	23,090.34	57.8	58	0.999984	0.999988	23,089.6935
Can # 2    100gal	23,091.12	0	23,091.12	57.8	58.3	0.999959	0.999996	23,090.0809
Can # 3    50gal	11,549.47	47	11,596.47	57.8	58.4	0.999951	0.999999	11,595.8902
Can # 6    5gal	1,153.39	.5	1,153.89	57.8	58.8	0.999918	1.000009	1,153.8058

## Run Calculation Summary (cont)

Volume This Run	70,578.6142
Divided by CPS	1.000035
Divided by CPL	1.000134

Pressure & Temperature Adjusted Volume This Run      **70,566.6881**

Run # 3

Elapsed Time 5 : 22 min

GPM 56.94

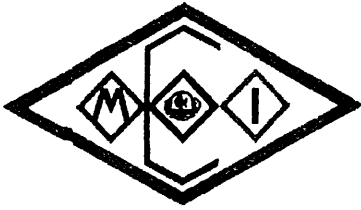
Pressure 42

Measure	Certified Volume	Scale Reading	Actual Volume	Prover Temp	Can Temp	CTL Temp Correction	CTS Metal Correction	Adjusted Volume
Can # 3    50gal	11,549.47	100	11,649.47	59.1	58.9	1.000017	0.999988	11,649.5282
Can # 1    100gal	23,090.34	0	23,090.34	59.1	59.1	1.000000	0.999993	23,090.1784
Can # 2    100gal	23,091.12	1	23,092.12	59.1	59.3	0.999983	0.999998	23,091.6813
Can # 3    50gal	11,549.47	49	11,598.47	59.1	59.4	0.999975	1.000001	11,598.1916
Can # 6    5gal	1,153.39	0	1,153.39	59.1	59.7	0.999949	1.000009	1,153.3416

Volume This Run	70,582.9211
Divided by CPS	1.000035
Divided by CPL	1.000134

Pressure & Temperature Adjusted Volume This Run      **70,570.9943**

Meter Engineers, Inc.



# WaterDraw Calibration Worksheet

Customer: Kinder Morgan  
 Location: Carrington, ND  
 Designation: Carrington Terminal Propane  
 Serial: E-6409  
 Prover Type: Unidirectional

*Slow*

Technician: Gary Clark  
 Scale Reading: 118.3 cubic inches  
 Tolerance: 14.1 cubic inches

Date: 6-19-13      1 57.4 42 5:23      2 57.8 42 7:10      3 59.1 42 5:22  
 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 <u>100</u>	<u>57.5</u>	3 <u>100</u>	<u>58</u>	3 <u>100</u>	<u>58.9</u>
Can # 1    100 gal	1 <u>0</u>	<u>57.5</u>	1 <u>0</u>	<u>58</u>	1 <u>0</u>	<u>59.1</u>
Can # 2    100 gal	2 <u>+1</u>	<u>57.6</u>	2 <u>0</u>	<u>58.3</u>	2 <u>+1</u>	<u>59.3</u>
Can # 3    50 gal	3 <u>47</u>	<u>57.8</u>	3 <u>47</u>	<u>58.4</u>	3 <u>49</u>	<u>59.4</u>
Can # 6    5 gal	6 <u>0</u>	<u>58.2</u>	6 <u>.5</u>	<u>58.8</u>	6 <u>0</u>	<u>59.7</u>
	<u>148</u> Total		<u>147.5</u> Total		<u>150</u> Total	

Thermometer Numbers: 4T1555 1630273

Witnesses: [Signature] (Company) MEI      Witnesses: \_\_\_\_\_ (Company) \_\_\_\_\_  
[Signature] (Company) Kinder Morgan      \_\_\_\_\_ (Company) \_\_\_\_\_  
 \_\_\_\_\_ (Company) \_\_\_\_\_      \_\_\_\_\_ (Company) \_\_\_\_\_



National Institute of Standards and Technology  
Technology Administration, U.S. Department of Commerce

# REPORT OF CALIBRATION

FOR

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

March 31, 2009

Manufacturer: Seraphin  
Rancocas, NJ

NIST Seal Number: 6996  
Material: Stainless Steel  
Serial Number: 2470-A

submitted by

Meter Engineers, Inc.  
7718 W. 53<sup>rd</sup> St. N.  
Mazie, KS 67101

(Reference: Purchase Order Number 003680, dated January 15, 2009)

The internal volume of the prover described above has been determined by the gravimetric method [1]. The gravimetric method requires weighing the vessel dry and empty and re-weighing it when filled with a fluid of known density. The internal or contained volume was determined in this way and the value is given in Table 1 using the requested units. The fluid used was distilled water and the prover was leveled before determining the volume.

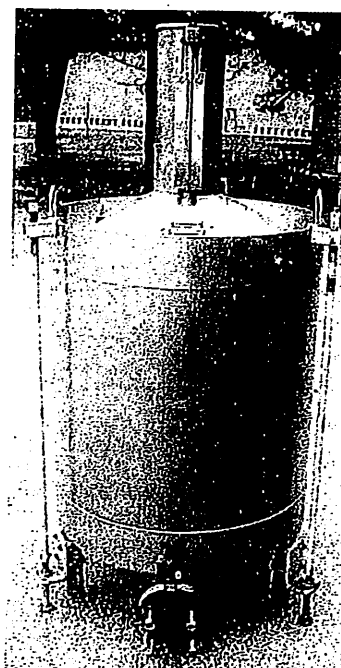
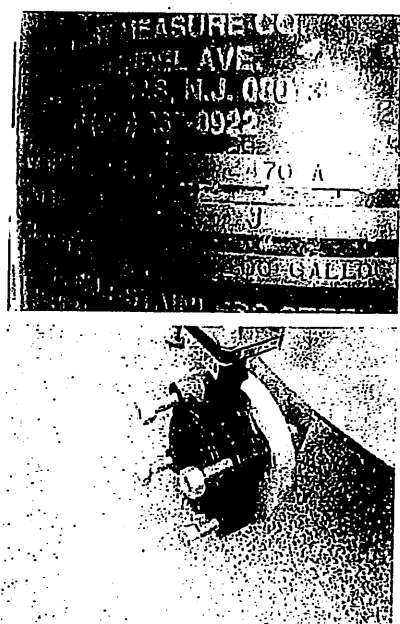
To determine the delivered volume, the contained volume is poured from the prover by opening the valve at the bottom of the vessel. When this flow finishes, the valve is held open for 30 seconds to complete the drain procedure. Subsequent re-weighing completes the gravimetric procedure and enables calculation of the delivered volume, also given in Table 1. Both the contained and delivered volumes are given for the scale reading of zero (0) and have been corrected for the reference temperature of 15.56 °C (60 °F), assuming a volumetric coefficient of expansion of 0.0000477 per °C (0.000265 per °F).

[1] Bean, V. E., Espina, R. 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, March 24, 2006.

**Table 1.** Contained and delivered volumes for the tested vessel for a scale reading of zero.

	Volume Contained	Volume Delivered
gal at 60 °F	99.9755	99.9582
in <sup>3</sup> at 60 °F	23094.35	23090.34

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 22 parts in 10<sup>6</sup> and the expanded uncertainty in the measured volume is ±0.007 %. 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 distilled 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 scale reading is determined by the intersection of the horizontal plane, tangent to the bottom of the meniscus reading on the gauge tube. For this vessel, the scale range was from -175 and +200 and each division is equivalent to 5 in<sup>3</sup>.

[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 20 effective degrees of freedom.

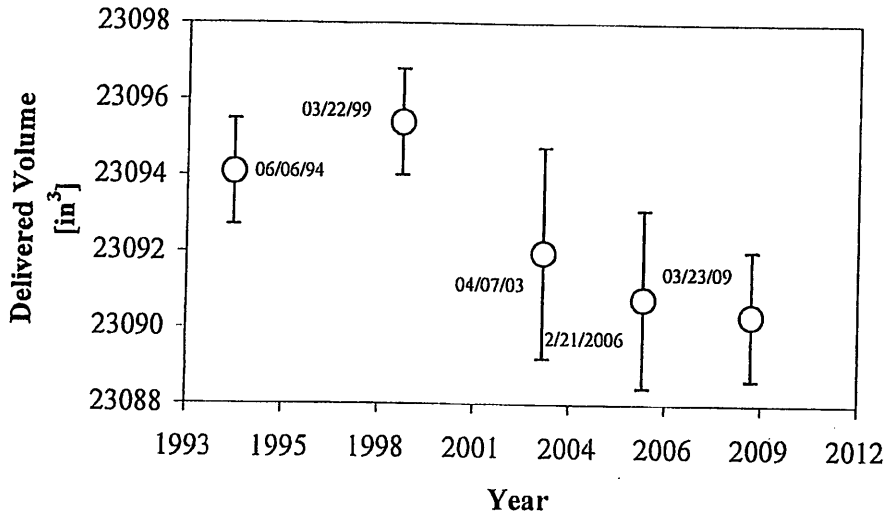


Figure 2. Calibration control chart for 100 gallon graduated neck test measure SN 2470-A.

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

Date	Delivered Volume [in <sup>3</sup> ]	Difference from Prior [in <sup>3</sup> ]	Degree of Equivalence [-]
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  
Process Measurements Division  
Chemical Science and Technology Laboratory  
National Institute of Standards and Technology

*Sherry Sheckels*

Sherry Sheckels  
Calibration Technician, Fluid Metrology Group  
Process Measurements Division  
Chemical Science and Technology Laboratory  
National Institute of Standards and Technology



National Institute of Standards and Technology  
Technology Administration, U.S. Department of Commerce

## REPORT OF CALIBRATION

FOR

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

March 31, 2009

Manufacturer: Seraphin  
Rancocas, NJ

NIST Seal Number: 6997  
Material: Stainless Steel  
Serial Number: 2470-B

submitted by

Meter Engineers, Inc.  
7718 W. 53<sup>rd</sup> St. N.  
Mazie, KS 67101

(Reference: Purchase Order Number 003680, dated January 15, 2009)

The internal volume of the prover described above has been determined by the gravimetric method [1]. The gravimetric method requires weighing the vessel dry and empty and re-weighing it when filled with a fluid of known density. The internal or contained volume was determined in this way and the value is given in Table 1 using the requested units. The fluid used was distilled water and the prover was leveled before determining the volume.

To determine the delivered volume, the contained volume is poured from the prover by opening the valve at the bottom of the vessel. When this flow finishes, the valve is held open for 30 seconds to complete the drain procedure. Subsequent re-weighing completes the gravimetric procedure and enables calculation of the delivered volume, also given in Table 1. Both the contained and delivered volumes are given for the scale reading of zero (0) and have been corrected for the reference temperature of 15.56 °C (60 °F), assuming a volumetric coefficient of expansion of 0.0000477 per °C (0.0000265 per °F).

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[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, March 24, 2006.

Table 1. Contained and delivered volumes for the tested vessel for a scale reading\* of zero.

	Volume Contained	Volume Delivered
gal at 60 °F	99.9812	99.9615
in <sup>3</sup> at 60 °F	23095.67	23091.12

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 28 parts in 10<sup>6</sup> 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<sup>†</sup> and is traceable to NIST mass, temperature, pressure, and humidity standards, and a NIST distilled water density determination.

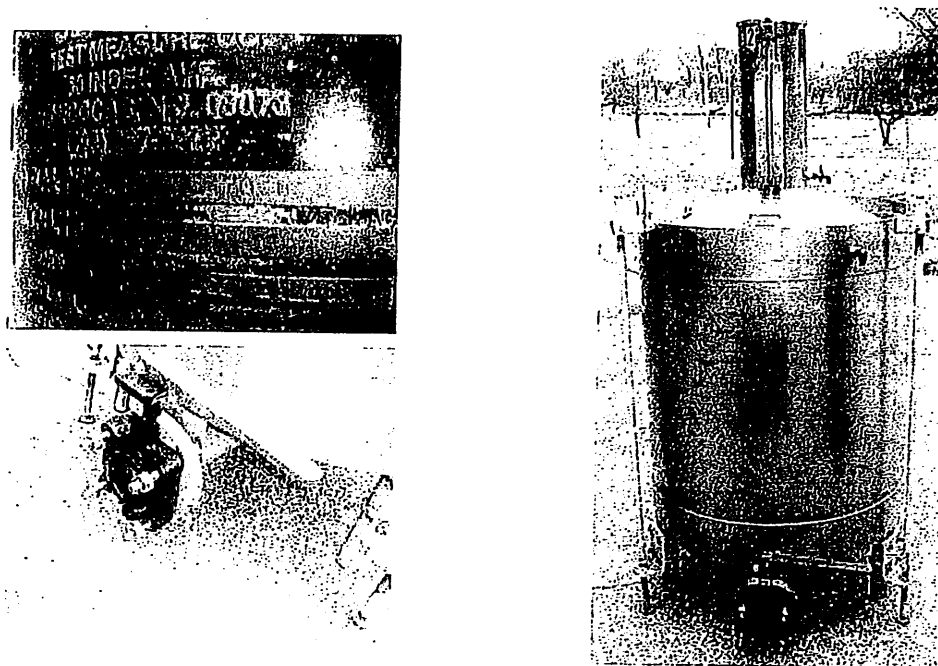


Figure 1. Photographs of the volume prover.

The input data used for calculation of the prover volume are given in the spreadsheet attached to this report.

\* The scale reading is determined by the intersection of the horizontal plane, tangent to the bottom of the meniscus reading on the gauge tube. For this vessel, the scale range was from -200 and +200 and each division is equivalent to 5 in<sup>3</sup>.

[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 2.14 for 15 effective degrees of freedom.

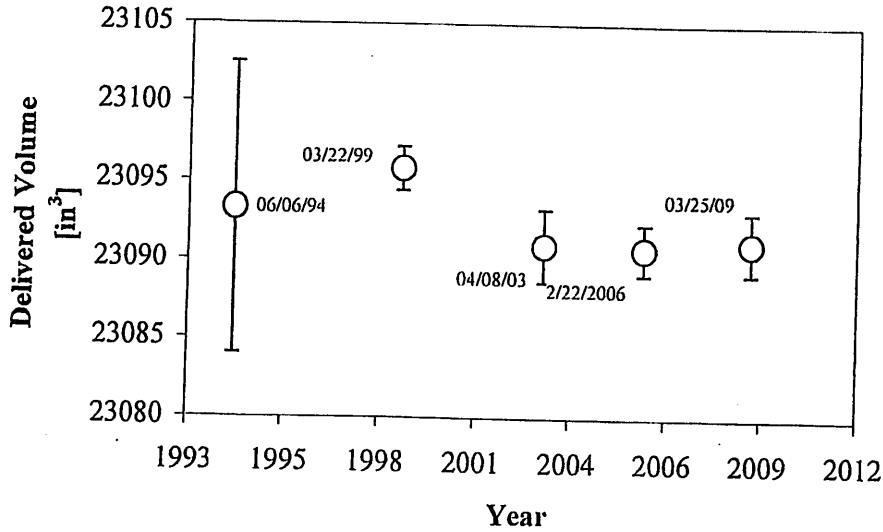


Figure 2. Calibration control chart for 100 gallon graduated neck test measure SN 2470-B.

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

Date	Delivered Volume [in³]	Difference from Prior [in³]	Degree of Equivalence [-]
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

Dr. John D. Wright  
Project Leader, Fluid Metrology Group  
Process Measurements Division  
Chemical Science and Technology Laboratory  
National Institute of Standards and Technology

Sherry Sheckels  
Calibration Technician, Fluid Metrology Group  
Process Measurements Division  
Chemical Science and Technology Laboratory  
National Institute of Standards and Technology



National Institute of Standards and Technology  
Technology Administration, U.S. Department of Commerce

# REPORT OF CALIBRATION

FOR

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

March 31, 2009

Manufacturer: Seraphin  
Rancocas, NJ

NIST Seal Number: 6998  
Material: Stainless Steel  
Serial Number: 7293-C

submitted by

Meter Engineers, Inc.  
7718 W. 53<sup>rd</sup> St. N.  
Mazie, KS 67101

(Reference: Purchase Order Number 003680, dated January 15, 2009)

The internal volume of the prover described above has been determined by the gravimetric method [1]. The gravimetric method requires weighing the vessel dry and empty and re-weighing it when filled with a fluid of known density. The internal or contained volume was determined in this way and the value is given in Table 1 using the requested units. The fluid used was distilled water and the prover was leveled before determining the volume.

To determine the delivered volume, the contained volume is poured from the prover by opening the valve at the bottom of the vessel. When this flow finishes, the valve is held open for 30 seconds to complete the drain procedure. Subsequent re-weighing completes the gravimetric procedure and enables calculation of the delivered volume, also given in Table 1. Both the contained and delivered volumes are given for the scale reading of zero (0) and have been corrected for the reference temperature of 15.56 °C (60 °F), assuming a volumetric coefficient of expansion of 0.0000477 per °C (0.0000265 per °F).

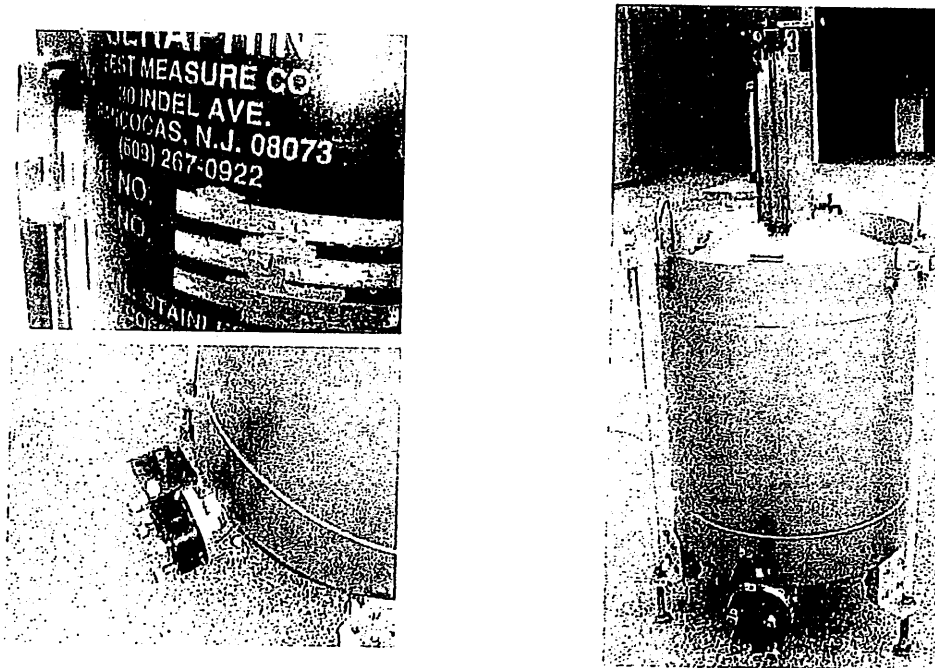
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[1] Bean, V. E., Espina, P. I., Wright, J. D., Houser, J. F., Sheckels, S. D., and Johnson, A. N., "NIST Calibration Services for Liquid Volume," NIST Special Publication 250-72, National Institute of Standards and Technology, March 24, 2006.

**Table 1.** Contained and delivered volumes for the tested vessel for a scale reading<sup>\*</sup> of zero.

	Volume Contained	Volume Delivered
gal at 60 °F	50.0078	49.9977
in <sup>3</sup> at 60 °F	11551.80	11549.47

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 8 parts in 10<sup>6</sup> and the expanded uncertainty in the measured volume is ±0.009 %. It was calculated according to References [1] and [2] with a 95 % confidence level<sup>†</sup> and is traceable to NIST mass, temperature, pressure, and humidity standards, and a NIST distilled 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 scale reading is determined by the intersection of the horizontal plane, tangent to the bottom of the meniscus reading on the gauge tube. For this vessel, the scale range was from -110 and +100 and each division is equivalent to 2 in<sup>3</sup>.

[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 1.96 for 5227 effective degrees of freedom.

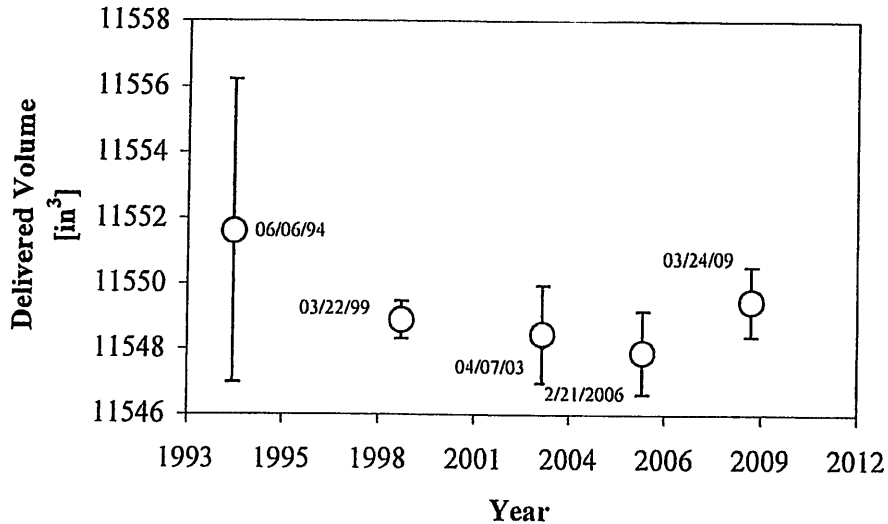


Figure 2. Calibration control chart for 50 gallon graduated neck test measure SN 7293-C.

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

Date	Delivered Volume [in <sup>3</sup> ]	Difference from Prior [in <sup>3</sup> ]	Degree of Equivalence [-]
03/24/09	11549.47	1.57	0.46
02/21/06	11547.90	-0.56	-0.16
04/07/03	11548.46	-0.44	-0.13
03/22/99	11548.90	-2.70	-0.78
06/06/94	11551.60	-	-

For the Director,  
 National Institute of Standards and Technology

Dr. John D. Wright  
 Project Leader, Fluid Metrology Group  
 Process Measurements Division  
 Chemical Science and Technology Laboratory  
 National Institute of Standards and Technology

Sherry Sheckels  
 Calibration Technician, Fluid Metrology Group  
 Process Measurements Division  
 Chemical Science and Technology Laboratory  
 National Institute of Standards and Technology



National Institute of Standards and Technology  
Technology Administration, U.S. Department of Commerce

# REPORT OF CALIBRATION

FOR

A FIVE (5) GALLON VOLUME PROVER  
(Graduated Neck Type)

March 31, 2009

Manufacturer: Seraphin  
Rancocas, NJ

NIST Seal Number: 7002  
Material: Stainless Steel  
Serial Number: 7293F

submitted by

Meter Engineers, Inc.  
7718 W. 53<sup>rd</sup> St. N.  
Mazie, KS 67101

(Reference: Purchase Order Number 003680, dated January 15, 2009)

The internal volume of the prover described above has been determined by the gravimetric method [1]. The gravimetric method requires weighing the vessel dry and empty and re-weighing it when filled with a fluid of known density. The internal or contained volume was determined in this way and the value is given in Table 1 using the requested units. The fluid used was distilled water and the prover was leveled before determining the volume.

To determine the delivered volume, the contained volume is poured from the vessel by tilting it through a continuously increasing angle so that the poured flow is smooth and not oscillating. When this flow finishes, the vessel is held for 10 seconds at an angle of 70° with the horizontal to complete the drain procedure. Subsequent re-weighing completes the gravimetric procedure and enables calculation of the delivered volume, also given in Table 1. Both the contained and delivered volumes are given for the scale reading of zero (0) and have been corrected for the reference temperature of 15.56 °C (60 °F), assuming a volumetric coefficient of expansion of 0.0000477 per °C (0.0000265 per °F).

[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, March 24, 2006.

Table 1. Contained and delivered volumes for the tested vessel for a scale reading\* of zero.

	Volume Contained	Volume Delivered
gal at 60 °F	4.9965	4.9930
in <sup>3</sup> at 60 °F	1154.20	1153.39

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 272 parts in 10<sup>6</sup> and the expanded uncertainty in the measured volume is  $\pm 0.075\%$ . It was calculated according to References [1] and [2] with a 95 % confidence level<sup>†</sup> and is traceable to NIST mass, temperature, pressure, and humidity standards, and a NIST distilled 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 scale reading is determined by the intersection of the horizontal plane, tangent to the bottom of the meniscus reading on the gauge tube. For this vessel, the scale range was from -20 and +20 and each division is equivalent to 1 in<sup>3</sup>.

[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 2.45 for 6 effective degrees of freedom.

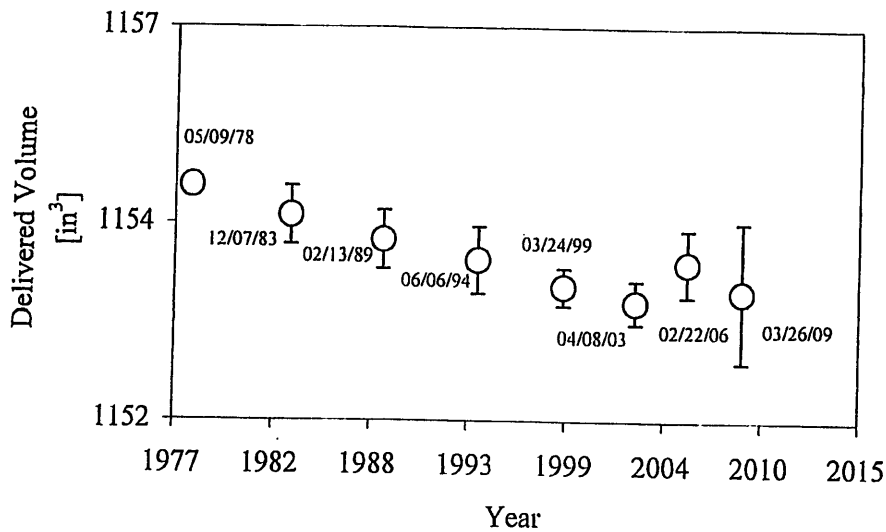


Figure 2. Calibration control chart for 5 gallon graduated neck test measure SN 7293F.

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

Date	Delivered Volume [in <sup>3</sup> ]	Difference from Prior [in <sup>3</sup> ]	Degree of Equivalence [-]
03/26/09	1153.3879	-0.36	-0.29
02/22/06	1153.7442	0.48	0.39
04/08/03	1153.2600	-0.19	-0.15
03/24/99	1153.4500	-0.33	-0.27
06/06/94	1153.7800	-0.25	-0.20
02/13/89	1154.0300	-0.30	-0.24
12/07/83	1154.3300	-0.36	-0.29
05/09/78	1154.6900	-	-

For the Director,  
National Institute of Standards and Technology

*John D. Wright*

Dr. John D. Wright  
Project Leader, Fluid Metrology Group  
Process Measurements Division  
Chemical Science and Technology Laboratory  
National Institute of Standards and Technology

*Sherry Sheckels*

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National Institute of Standards and Technology



6820 W. Zilshausen Ave., Wichita, KS 67208  
 Phone: 316.946.7532 Fax: 316.944.6256

ISO 9001:2008  
 Calibration Lab  
 Cert #2820.01

# Certificate of Calibration

Report Number: 122131B  
 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: 4J1555  
 Model Number: MILLER & WEBER T-3426  
 Serial Number: 4J1555  
 Location: PRODUCTION

Inspector: WM  
 Date Calibrated: Jan 17, 2013  
 Recalibration Date: Jan 17, 2014  
 Temperature: 69.4 °F  
 Relative Humidity: 32 %

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	32.00°F	NONE	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:12-18-12; DUE:12-18-13; TN:58056AT

Condition: USED

RESULTS: ACCEPTED

### CALIBRATION STANDARD

Manufacturer/type: BURNS ENGINEERING PRT Model Number: 3925  
 Date Certified: Jul 27, 2011 Serial Number: 496142  
 Date Due: Jul 27, 2013 TRACEABILITY NUMBER: UM87470



4020 W. 115th St., Wichita, KS 67205  
 Phone: 316 944-7532 Fax: 316 944-6256

Accredited  
 CALIB 7 (136117)  
 Cert # 282001

# Certificate of Calibration

Report Number: 122403N  
 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: WM  
 Date Calibrated: Jan 30, 2013  
 Recalibration Date: Jan 30, 2014  
 Temperature: 71.8 °F  
 Relative Humidity: 36 %

\*\*\*\*\*  
 Item Range: -58°F/320°F Resolution: 0.01°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	31.98°F	-0.02°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. NOTE: TEST POINTS PER CUSTOMER REQUEST.

ADDITIONAL STANDARD: HP34420A SN:US36001770; CERTIFIED:12-18-12; DUE:12-18-13; TN:58056AT

RESOLUTION AVAILABLE FROM 0.001°F TO 0.1°F

Condition: USED

RESULTS: ACCEPTED AS NOTED

\*\*\*\*\*  
 CALIBRATION STANDARD

Manufacturer/type: BURNS ENGINEERING PRT Model Number: 3925  
 Date Certified: Jul 27, 2011 Serial Number: 496142  
 Date Due: Jul 27, 2013 TRACEABILITY NUMBER: U187370

Unit 134

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

# ARROW LABORATORY, INC.

Metallurgical Analysis and Testing

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

Attn: DEB JACOBS  
METER ENGINEERS  
7718 W 53rd St North  
WICHITA KS 67101

12-28-12  
Page 1 of 1

## LABORATORY REPORT #d90mm654 PRESSURE GAGE CALIBRATION

One 4.5 inch WIKA XSEL pressure gage, S/N 586, 0-60 psi capacity with 0.5 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	14.6
25	24.5
35	34.4
45	44.3
55	54.3

Maximum Error center 1/2 of scale: 1.3% of span  
 Max Error upper and lower 1/4 of scale: 1.3% of span  
 Maximum Friction: 2.5% of span  
 Repeatability: +/- 0.2% of span  
 Accuracy: +/- 1.3% of span  
 Adjustments: none Limitations of use: none  
 Calibrated: 12-27-12 Temperature: 74°F  
 Client Provided Confirmation Interval: Annual

These results meet ASME B40.100 grade B 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: 5-31-13

### Piston Assembly:

The piston diameter and cylinder bore were measured by Dresser Industries Test# IR700547 and certified to +/- 0.05% using masters traceable to NIST. Cal Due: 2-28-13

DER/dr  
Rec'd 12-27-12

Project Supervisor  
*Dale Roark*  
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 18-08b, 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.

Kinder Morgan

July 9 2013

Carrington Terminal

Carrington, ND



Public Service Commission

Enclosed is the final report for the water draw at Carrington. This includes the reports of calibration and certificates of calibration. If there is anything else I can provide let me know.

Thank you

A handwritten signature in black ink, appearing to read "E. M. Drewlow".

Eugene M. Drewlow

Carrington Terminal Supervisor