DEPARTMENT OF COMMERCE
WEIGHTS & MEASURES DIVISION

14305 Southcross Drive #150
Burnsville, MN 55306-7008
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651.539.1555 FAX 952.435.4040
An equal opportunity employer

Receipt Date:	January 2, 2018	Report No.:	338673
Cal. Date:	January 2, 2018	Serial No.:	115702425
Report Date:	January 2, 2018	Barcode:	202799

Calibration Certificate

WESTMOR INDUSTRIES
3 DEVELOPMENT DRIVE
MORRIS, MN 56267-0600
Contact: KRISTIN MCNEILL
Phone: 800-992-8981
PO Number: None
Procedure: NIST SOP 19
Technician ID: 19

Item(s) Submitted:	50 Gallon Prover
Manufacturer:	Westmor
Material:	Stainless Steel (304)
Type:	No Bottom Zero
Condition:	Excellent
Temperature:	18.0 °C
Pressure:	744.3 mmHg
Relative Humidity:	39.6 %
Standard H_2O Temp.:	9.0 °C
Artifact H_2O Temp.:	9.1 °C

Nominal Volume (gal)		Calibrated Volume (gal)	Error (in^3)	k	U (in^3)	CCE (/°F)
50	As Found	50.0379	8.8	2.09	2.9	0.0000288
	As Left	50.0134	3.1			

Neck Calibration: No neck calibration was performed at this time.

This prover has been calibrated as a "to contain after wet down" vessel with a drain time of 30 seconds after cessation of full flow.

The vessel listed above has been compared by volumetric transfer methods to the standards of the State of Minnesota using water as the calibration medium. The standards are traceable to the SI through NIST. Statistical process control charts indicate standards are currently in control. All gauges were sealed in place.

All tolerances and specifications were evaluated according to NIST Handbook 105-3 (2010). Uncertainty calculations contain the components in NIST SOP 19 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to item identified in this report only.

CCE is the cubical coefficient of thermal expansion, and the reference temperature is 60 °F
Conversion to SI unit: 1 gallon = 231 in^3 = 0.00378541 m^3.

Erik Alfvin
Metrologist

Reviewed by:
Pete Whebbe
Metrologist

3 WM-17-451 Filed 01/31/2018 Pages: 11
Calibration Report
Westmor Industries, LLC

DEPARTMENT OF COMMERCE
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Receipt Date: January 3, 2018
Cal. Date: January 4, 2018
Report Date: January 4, 2018

Report No.: 338719
Serial No.: 061111194-0101
Barcode: 202680

Calibration Certificate

WESTMOR INDUSTRIES
3 DEVELOPMENT DRIVE
MORRIS, MN 56267-0600
Contact: KRISTIN MCNEILL
Phone: 800-992-8981
PO Number: None
Procedure: NIST SOP 19
Technician ID: 19

Item(s) Submitted: 50 Gallon Prover
Manufacturer: Determan Brownie
Material: Stainless Steel (304)
Type: No Bottom Zero
Condition: Good
Temperature: 18.1 °C
Pressure: 747.3 mmHg
Relative Humidity: 38.0 %
Standard H_2O Temp.: 9.1 °C
Artifact H_2O Temp.: 9.1 °C

Nominal Volume (gal)		Calibrated Volume (gal)	Error (in^3)	k	U (in^3)	CCE (/°F)
50	As Found	49.9930	-1.6	2.09	2.9	0.0000288
	As Left	49.9930	-1.6			

Neck Calibration: No neck calibration was performed at this time.

This prover has been calibrated as a "to contain after wet down" vessel with a drain time of 30 seconds after cessation of full flow.

The vessel listed above has been compared by volumetric transfer methods to the standards of the State of Minnesota using water as the calibration medium. The standards are traceable to the SI through NIST. Statistical process control charts indicate standards are currently in control. All gauges were sealed in place.

All tolerances and specifications were evaluated according to NIST Handbook 105-3 (2010). Uncertainty calculations contain the components in NIST SOP 19 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to item identified in this report only.

CCE is the cubical coefficient of thermal expansion, and the reference temperature is 60 °F
Conversion to SI unit: 1 gallon = 231 in^3 = 0.00378541 m^3.

Erik Alfvin
Metrologist

Reviewed by:
Pete Whebbe
Metrologist

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Receipt Date: January 2, 2018
Cal. Date: January 3, 2018
Report Date: January 3, 2018

Report No.: 338711
Serial No.: 11-52086-01
Barcode: 201814

Calibration Certificate

WESTMOR INDUSTRIES
3 DEVELOPMENT DRIVE
MORRIS, MN 56267-0600
Contact: KRISTIN MCNEILL
Phone: 800-992-8981
PO Number: NONE
Procedure: NIST SOP 19
Technician ID: 11

Item(s) Submitted: 100 Gallon Prover
Manufacturer: Seraphin
Material: Stainless Steel
Type: No Bottom Zero
Condition: Good/Level Broken
Temperature: 18.3 °C
Pressure: 742.2 mmHg
Relative Humidity: 41.3 %
Standard H_2O Temp.: 8.9 °C
Artifact H_2O Temp.: 9.0 °C

Nominal Volume (gal)		Calibrated Volume (gal)	Error (in^3)	k	U (in^3)	CCE (/°F)
100	As Found	99.9859	-3.3	2.00	2.2	0.0000265
	As Left	99.9859	-3.3			

Neck Calibration: No neck calibration was performed at this time.

One level is broken; must be repaired prior to next calibration. Prover must be level to the neck.

This prover has been calibrated as a "to contain after wet down" vessel with a drain time of 30 seconds after cessation of full flow.

The vessel listed above has been compared by volumetric transfer methods to the standards of the State of Minnesota using water as the calibration medium. The standards are traceable to the SI through NIST. Statistical process control charts indicate standards are currently in control. All gauges were sealed in place.

All tolerances and specifications were evaluated according to NIST Handbook 105-3 (2010). Uncertainty calculations contain the components in NIST SOP 19 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to item identified in this report only.

CCE is the cubical coefficient of thermal expansion, and the reference temperature is 60 °F
Conversion to SI unit: 1 gallon = 231 in^3 = 0.00378541 m^3.

Pete Whebbe
Peter J Whebbe
Metrologist

Reviewed by:
Erik Alfvin
Metrologist

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Receipt Date:	December 4, 2017	Report No.:	338533
Cal. Date:	December 8, 2017	Serial No.:	0414571571-1
Report Date:	December 8, 2017	Barcode:	202639

Calibration Certificate

WESTMOR INDUSTRIES
3 DEVELOPMENT DRIVE
MORRIS, MN 56267-0600

Contact:	KRISTIN MCNEILL
Phone:	800-992-8981
PO Number:	None
Procedure:	NIST SOP 19
Technician ID:	19

Item(s) Submitted:	100 Gallon Prover
Manufacturer:	Westmor
Material:	Stainless Steel (304)
Type:	No Bottom Zero
Condition:	Good
Temperature:	18.6 °C
Pressure:	735.2 mmHg
Relative Humidity:	40.9 %
Standard H_2O Temp.:	11.3 °C
Artifact H_2O Temp.:	11.3 °C

Nominal Volume (gal)		Calibrated Volume (gal)	Error (in^3)	k	U (in^3)	CCE (/°F)
100	As Found	99.9881	-2.7	2.00	2.3	0.0000288
	As Left	99.9881	-2.7			

Neck Calibration: No neck calibration was performed at this time.

This prover has been calibrated as a "to contain after wet down" vessel with a drain time of 30 seconds after cessation of full flow.

The vessel listed above has been compared by volumetric transfer methods to the standards of the State of Minnesota using water as the calibration medium. The standards are traceable to the SI through NIST. Statistical process control charts indicate standards are currently in control. All gauges were sealed in place.

All tolerances and specifications were evaluated according to NIST Handbook 105-3 (2010). Uncertainty calculations contain the components in NIST SOP 19 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to item identified in this report only.

CCE is the cubical coefficient of thermal expansion, and the reference temperature is 60 °F
Conversion to SI unit: 1 gallon = 231 in^3 = 0.00378541 m^3.

Erik Alfvin
Metrologist

Reviewed by:
Pete Whebbe
Metrologist

NVLAP CALIBRATION
NVLAP LAB CODE 105003-0

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Receipt Date:	December 8, 2017	Report No.:	338593
Cal. Date:	December 13, 2017	Serial No.:	414574568
Report Date:	December 13, 2017	Barcode:	202640

Calibration Certificate

WESTMOR INDUSTRIES
3 DEVELOPMENT DRIVE
MORRIS, MN 56267-0600

Contact:	KRISTIN MCNEILL
Phone:	800-992-8981
PO Number:	None
Procedure:	NIST SOP 19
Technician ID:	19

Item(s) Submitted:	250 Gallon Prover
Manufacturer:	Westmor
Material:	Stainless Steel (304)
Type:	No Bottom Zero
Condition:	Good
Temperature:	18.5 °C
Pressure:	726.0 mmHg
Relative Humidity:	40.2 %
Standard H_2O Temp.:	10.8 °C
Artifact H_2O Temp.:	10.8 °C

Nominal Volume (gal)		Calibrated Volume (gal)	Error (in^3)	k	U (in^3)	CCE (/°F)
250	As Found	249.9838	-3.7	2.00	5.8	0.0000288
	As Left	249.9838	-3.7			

Neck Calibration: No neck calibration was performed at this time.

This prover has been calibrated as a "to contain after wet down" vessel with a drain time of 30 seconds after cessation of full flow.

The vessel listed above has been compared by volumetric transfer methods to the standards of the State of Minnesota using water as the calibration medium. The standards are traceable to the SI through NIST. Statistical process control charts indicate standards are currently in control. All gauges were sealed in place.

All tolerances and specifications were evaluated according to NIST Handbook 105-3 (2010). Uncertainty calculations contain the components in NIST SOP 19 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including coverage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to item identified in this report only.

CCE is the cubical coefficient of thermal expansion, and the reference temperature is 60 °F
Conversion to SI unit: 1 gallon = 231 in^3 = 0.00378541 m^3.

Erik Alfvin
Metrologist

Reviewed by:
Pete Whebbe
Metrologist

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Receipt Date: December 8, 2017
Cal. Date: December 14, 2017
Report Date: December 14, 2017

Report No.: 338594
Serial No.: LPNH-5
Barcode: 017111

Calibration Certificate

WESTMOR INDUSTRIES
3 DEVELOPMENT DRIVE
MORRIS, MN 56267-0600
Contact: KRISTIN MCNEILL
Phone: 800-992-8981
PO Number: None
Procedure: NIST SOP 21
Technician ID: 19

Item(s) Submitted: 100 Gallon LPG Prover
Manufacturer: Kleespie
Material: Mild Steel
Description: Zero Bottom
Condition: Good
Temperature: 18.4 °C
Pressure: 737.3 mmHg
Relative Humidity: 39.7 %
Standard H_2O Temp. 10.6 °C
Artifact H_2O Temp.: 10.8 °C

Nominal Volume (gal)		Calibrated Volume (gal)	Error (in^3)	k	U (in^3)	CCE (/°F)
100	As Found (at 100 psig)	99.9493	-11.7	2.02	5.3	0.0000186
	As Left (at 100 psig)	99.9493	-11.7			

Neck Calibration: No neck calibration was performed at this time.

This prover has been calibrated as a "to contain after wet down" vessel with a drain time of 30 seconds after cessation of full flow. The prover listed above has been compared by volumetric transfer methods to the standards of the State of Minnesota using water as the calibration medium. The standards are traceable to the SI through NIST. Statistical process control charts indicate standards are currently in control. All gauges were sealed in place.

All tolerances and specifications were evaluated according to NIST Handbook 105-4 (2016). Uncertainty calculations contain the components in NIST SOP 21 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including covereage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to item identified in this report only.

CCE is the cubical coefficient of thermal expansion, and the reference temperature is 60 °F.

Erik Alfvin
Metrologist

Reviewed by:
Pete Whebbe

Metrologist

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Receipt Date:	December 8, 2017	Report No.:	338594
Cal. Date:	December 14, 2017	Serial No.:	LPNH-5
Report Date:	December 14, 2017	Barcode:	017111

Pressure Correction Chart

WESTMOR INDUSTRIES
3 DEVELOPMENT DRIVE
MORRIS, MN 56267-0600

Contact:	KRISTIN MCNEILL
Phone:	800-992-8981
PO Number:	None
SOP:	NIST SOP 21
Technician ID:	19

Item(s) Submitted:	100 Gallon LPG Prover
Manufacturer:	Kleespie
Material:	Mild Steel
Description:	Zero Bottom
Condition:	Good
Temperature:	18.4 °C
Pressure:	737.3 mmHg
Relative Humidity:	39.7 %

Pressure Gauge Reading (psig)	Corrected Volume (gal)
0	99.852
10	99.864
20	99.877
30	99.889
40	99.902
50	99.914
60	99.921
70	99.928
80	99.935
90	99.942
100	99.949
110	99.957
120	99.964
130	99.972
140	99.979
150	99.987
160	99.994
170	100.001
180	100.008
190	100.015
200	100.022

Erik Alfvin
Metrologist

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Receipt Date: December 4, 2017
Cal. Date: December 7, 2017
Report Date: December 7, 2017

Report No.: 338534
Serial No.: 45765
Barcode: 202718

Calibration Certificate

WESTMOR INDUSTRIES
3 DEVELOPMENT DRIVE
MORRIS, MN 56267-0600
Contact: KRISTIN MCNEILL
Phone: 800-992-8981
PO Number: None
Procedure: NIST SOP 21
Technician ID: 19

Item(s) Submitted: 200 Gallon LPG Prover
Manufacturer: Arrow Tank
Material: Mild Steel
Description: Zero Bottom
Condition: Good
Temperature: 18.3 °C
Pressure: 743.2 mmHg
Relative Humidity: 40.8 %
Standard H_2O Temp. 11.5 °C
Artifact H_2O Temp.: 11.8 °C

Nominal Volume (gal)		Calibrated Volume (gal)	Error (in^3)	k	U (in^3)	CCE (/°F)
200	As Found (at 100 psig)	200.0180	4.1	2.02	9.6	0.0000186
	As Left (at 100 psig)	200.0180	4.1			

Neck Calibration: No neck calibration was performed at this time.

This prover has been calibrated as a "to contain after wet down" vessel with a drain time of 30 seconds after cessation of full flow. The prover listed above has been compared by volumetric transfer methods to the standards of the State of Minnesota using water as the calibration medium. The standards are traceable to the SI through NIST. Statistical process control charts indicate standards are currently in control. All gauges were sealed in place.

All tolerances and specifications were evaluated according to NIST Handbook 105-4 (2016). Uncertainty calculations contain the components in NIST SOP 21 and conform to the ISO/IEC Guide to the Expression of Uncertainty in Measurement (2008), including covereage factors (k) calculated at the approximate 95.45 % confidence level. Results apply to item identified in this report only.

CCE is the cubical coefficient of thermal expansion, and the reference temperature is 60 °F.

Erik Alfvin
Metrologist

Reviewed by:
Pete Whebbe
Metrologist

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Receipt Date:	December 4, 2017	Report No.:	338534
Cal. Date:	December 7, 2017	Serial No.:	45765
Report Date:	December 7, 2017	Barcode:	202718

Pressure Correction Chart

WESTMOR INDUSTRIES
3 DEVELOPMENT DRIVE
MORRIS, MN 56267-0600

Contact:	KRISTIN MCNEILL
Phone:	800-992-8981
PO Number:	None
SOP:	NIST SOP 21
Technician ID:	19

Item(s) Submitted:	200 Gallon LPG Prover
Manufacturer:	Arrow Tank
Material:	Mild Steel
Description:	Zero Bottom
Condition:	Good
Temperature:	18.3 °C
Pressure:	743.2 mmHg
Relative Humidity:	40.8 %

Pressure Gauge Reading (psig)	Corrected Volume (gal)
0	199.788
10	199.819
20	199.850
30	199.881
40	199.912
50	199.943
60	199.958
70	199.973
80	199.988
90	200.003
100	200.018
110	200.037
120	200.056
130	200.075
140	200.094
150	200.113
160	200.130
170	200.147
180	200.164
190	200.181
200	200.198

Erik Alfvin
Metrologist

United States Department of Commerce

National Institute of Standards and Technology

Certificate of Metrological Traceability For:

Minnesota

This laboratory has demonstrated evidence of an unbroken chain of metrological traceability of its standards to the international system of units (SI), documented measurement uncertainties, uses documented measurement procedures, successfully completed training and proficiency tests, documented calibration intervals, submitted a quality management system, and demonstrated suitable measurement assurance for the Scope listed on this certificate.

The Office of Weights and Measures Program assesses laboratories to NIST Handbook 143 - Program Handbook for State Weights and Measures Laboratories and ISO/IEC 17025:2005.

Scope

Mass Echelon I
10 kg to 1 mg

Mass Echelon II
50 kg to 1 mg
1000 lb to 0.001 lb
4 oz to 0.03125 oz

Mass Echelon III
50 kg to 1 mg
5000 lb to 0.001 lb
4 oz to 0.03125 oz

Weight Carts
10 000 lb to 2000 lb

Wheel Load Weighers
20 000 lb to 2000 lb

Railroad Test Cars
110 000 lb to 80 000 lb

Volume Gravimetric, I
20 L to 10 mL
100 gal to 0.25 qt

Volume Transfer, II
1500 gal to 5 gal
100 gal to 25 gal LPG

2017

Georgia L. Harris, Acting Chief
NIST Office of Weights and Measures

Effective Dates: 2017-01-01 to 2017-12-31

Amended: 2016-12-31
Scope modified for 2017.

(Rev.: March 2013)

United States Department of Commerce

National Institute of Standards and Technology

Certificate of Metrological Traceability For:

Minnesota

This laboratory has demonstrated evidence of an unbroken chain of metrological traceability of its standards to the international system of units (SI), documented measurement uncertainties, uses documented measurement procedures, successfully completed training and proficiency tests, documented calibration intervals, submitted a quality management system, and demonstrated suitable measurement assurance for the Scope listed on this certificate.

The Office of Weights and Measures Program assesses laboratories to NIST Handbook 143 - Program Handbook for State Weights and Measures Laboratories and ISO/IEC 17025:2005.

2018 to 2019

Scope

Mass Echelon I
20 kg to 1 mg
50 lb to 0.001 lb

Mass Echelon II
20 kg to 1 mg
1000 lb to 500 lb
50 lb to 0.001 lb
4 oz to 0.03125 oz

Mass Echelon III
50 kg to 1 mg
5000 lb to 0.001 lb
4 oz to 0.03125 oz

Weight Carts
10 000 lb to 2000 lb

Wheel Load Weighers
20 000 lb to 2000 lb

Railroad Test Cars
110 000 lb to 80 000 lb

Volume Gravimetric, I
20 L to 10 mL
100 gal to 0.25 gal

Volume Transfer, II
1500 gal to 5 gal
200 gal to 25 gal LPG

Douglas A. Olson, Chief
NIST Office of Weights and Measures

Effective Dates: 2018-01-01 to 2019-12-31

(Rev.: March 2013)