



Receipt Date: October 30, 2017  
Cal. Date: November 1, 2017  
Report Date: November 1, 2017

Report No.: 338377  
Serial No.: 46801  
Barcode: 200668

## Calibration Certificate

WESTMOR FLUID SOLUTIONS LLC  
14044 W. FREEWAY DRIVE  
COLUMBUS, MN 55038  
Contact: Ryan Hartin  
Phone: 651-842-2551  
PO Number: NONE  
Procedure: NIST SOP 19  
Technician ID: 11

Item(s) Submitted: 5 Gallon Measure  
Manufacturer: Seraphin  
Material: Mild Steel  
Type: Measure  
Condition: Good  
Temperature: 19.2 °C  
Pressure: 728.3 mmHg  
Relative Humidity: 40.9 %  
Standard H<sub>2</sub>O Temp.: 17.3 °C  
Artifact H<sub>2</sub>O Temp.: 17.4 °C

Nominal		Calibrated				
Volume (gal)		Volume (gal)	Error (in <sup>3</sup> )	<i>k</i>	U (in <sup>3</sup> )	CCE (°F)
5	As Found	5.00022	0.05	2.05	0.25	0.0000186
	As Left	5.00022	0.05			

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

This measure has been calibrated as a "to contain after wet down" vessel with a pour time of 30 seconds followed by a drain time of 10 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<sup>3</sup> = 0.00378541 m<sup>3</sup>.

Pete Whebbe

Metrologist

Reviewed by:

Erik Alfvin

Metrologist



Receipt Date: October 30, 2017  
Cal. Date: November 1, 2017  
Report Date: November 1, 2017

Report No.: 338378  
Serial No.: 7312 B  
Barcode: 200758

## Calibration Certificate

WESTMOR FLUID SOLUTIONS LLC  
14044 W. FREEWAY DRIVE  
COLUMBUS, MN 55038  
Contact: Ryan Hartin  
Phone: 651-842-2551  
PO Number: NONE  
Procedure: NIST SOP 19  
Technician ID: 11

Item(s) Submitted: 5 Gallon Measure  
Manufacturer: Seraphin  
Material: Mild Steel  
Type: Measure  
Condition: Good  
Temperature: 19.2 °C  
Pressure: 728.3 mmHg  
Relative Humidity: 40.9 %  
Standard H<sub>2</sub>O Temp.: 17.4 °C  
Artifact H<sub>2</sub>O Temp.: 17.5 °C

Nominal Volume (gal)		Calibrated		<i>k</i>	U (in <sup>3</sup> ) CCE (°F)	
		Volume (gal)	Error (in <sup>3</sup> )			
5	As Found	5.00091	0.21	2.05	0.25	0.0000186
	As Left	5.00091	0.21			

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

This measure has been calibrated as a "to contain after wet down" vessel with a pour time of 30 seconds followed by a drain time of 10 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<sup>3</sup> = 0.00378541 m<sup>3</sup>.

Pete Whebbe

Metrologist

Reviewed by:

Erik Alfvin

Metrologist





Receipt Date: October 30, 2017  
Cal. Date: November 1, 2017  
Report Date: November 1, 2017

Report No.: 338379  
Serial No.: 07-05341  
Barcode: 200667

## Calibration Certificate

WESTMOR FLUID SOLUTIONS LLC  
14044 W. FREEWAY DRIVE  
COLUMBUS, MN 55038  
Contact: Ryan Hartin  
Phone: 651-842-2551  
PO Number: NONE  
Procedure: NIST SOP 19  
Technician ID: 11

Item(s) Submitted: 5 Gallon Measure  
Manufacturer: Seraphin  
Material: Stainless Steel  
Type: Measure  
Condition: Good  
Temperature: 19.2 °C  
Pressure: 728.3 mmHg  
Relative Humidity: 40.9 %  
Standard H<sub>2</sub>O Temp.: 17.5 °C  
Artifact H<sub>2</sub>O Temp.: 17.5 °C

Nominal Volume (gal)	Calibrated			k	U (in <sup>3</sup> )	CCE (1/°F)
	As Found	Volume (gal)	Error (in <sup>3</sup> )			
5	As Found	4.99811	-0.44	2.05	0.25	0.0000265
	As Left	5.00006	0.01			

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

This measure has been calibrated as a "to contain after wet down" vessel with a pour time of 30 seconds followed by a drain time of 10 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<sup>3</sup> = 0.00378541 m<sup>3</sup>.

Pete Whebbe

Metrologist

Reviewed by:

Erik Alfvín

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.

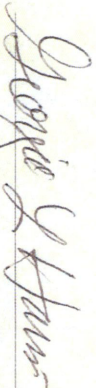
The Office of Weights and Measures Program assesses laboratories to NIST Handbook 143 - Program Handbook for State Weights and Measures Laboratories and ISO/IEC 17025:2005.

### Scope

<b>Mass Echelon I</b> 10 kg to 1 mg	<b>Mass Echelon III</b> 50 kg to 1 mg 5000 lb to 0.001 lb 4 oz to 0.03125 oz	<b>Volume Gravimetric, I</b> 20 L to 10 mL 100 gal to 0.25 qt
<b>Mass Echelon II</b> 50 kg to 1 mg 1000 lb to 0.001 lb 4 oz to 0.03125 oz	<b>Weight Carts</b> 10 000 lb to 2000 lb	<b>Volume Transfer, II</b> 1500 gal to 5 gal 100 gal to 25 gal LPG
	<b>Wheel Load Weighers</b> 20 000 lb to 2000 lb	
	<b>Railroad Test Cars</b> 110 000 lb to 80 000 lb	



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.



Receipt Date: February 14, 2018  
Cal. Date: February 26, 2018  
Report Date: February 26, 2018

Report No.: 338940  
Serial No.: 0615785533-2  
Barcode: 202963

## Calibration Certificate

WESTMOR FLUID SOLUTIONS LLC  
14044 W. FREEWAY DRIVE  
COLUMBUS, MN 55038  
Contact: Ryan Hartin  
Phone: 651-842-2551  
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 - Valve Replaced  
Temperature: 18.6 °C  
Pressure: 737.0 mmHg  
Relative Humidity: 43.5 %  
Standard H<sub>2</sub>O Temp.: 5.3 °C  
Artifact H<sub>2</sub>O Temp.: 5.4 °C

Nominal		Calibrated				
Volume (gal)		Volume (gal)	Error (in <sup>3</sup> )	<i>k</i>	U (in <sup>3</sup> )	CCE (°F)
100	As Found	99.9821	-4.1	2.00	2.2	0.0000288
	As Left	99.9821	-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 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<sup>3</sup> = 0.00378541 m<sup>3</sup>.

Erik Alfvin

Metrologist

Reviewed by:

Pete Whebbe

Metrologist



**DEPARTMENT OF COMMERCE  
WEIGHTS & MEASURES DIVISION**

14305 Southcross Drive #150  
Burnsville, MN 55306-7008  
mn.gov/commerce/  
651.539.1555 FAX 952.435.4040  
An equal opportunity employer



Receipt Date: February 14, 2018  
Cal. Date: February 23, 2018  
Report Date: February 23, 2018

Report No.: 338939  
Serial No.: 0615785533-1  
Barcode: 202964

## Calibration Certificate

WESTMOR FLUID SOLUTIONS LLC  
14044 W. FREEWAY DRIVE  
COLUMBUS, MN 55038  
Contact: Ryan Hartin  
Phone: 651-842-2551  
PO Number: None  
Procedure: NIST SOP 19  
Technician ID: 19

Item(s) Submitted: 1000 Gallon Prover  
Manufacturer: Westmor  
Material: Stainless Steel (304)  
Type: Bottom Zero  
Condition: Good  
Temperature: 18.6 °C  
Pressure: 741.2 mmHg  
Relative Humidity: 38.6 %  
Standard H<sub>2</sub>O Temp.: 5.8 °C  
Artifact H<sub>2</sub>O Temp.: 6.0 °C

Nominal		Calibrated				
Volume (gal)		Volume (gal)	Error (in <sup>3</sup> )	<i>k</i>	U (in <sup>3</sup> )	CCE (°F)
1000	As Found	999.922	-18	2.00	22	0.0000288
	As Left	999.922	-18			

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

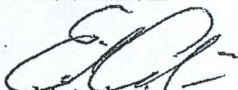
This prover has been calibrated as a "to contain after wet down" vessel with a drain time of 30 seconds after cessation of full flow.

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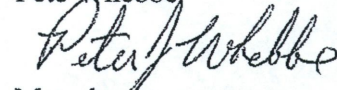
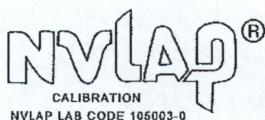
CCE is the cubical coefficient of thermal expansion, and the reference temperature is 60 °F  
Conversion to SI unit: 1 gallon = 231 in<sup>3</sup> = 0.00378541 m<sup>3</sup>.

Erik Alfvín

  
Metrologist

Reviewed by:

Pete Whebbe

  
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

2018 to 2019



#### 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

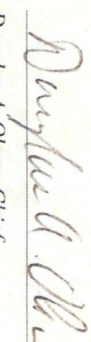
20 L to 10 ml

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