



**DEPARTMENT OF COMMERCE
WEIGHTS & MEASURES DIVISION**

Receipt Date: December 18, 2017
Cal. Date: December 18, 2017
Report Date: December 18, 2017

Report No.: 338642
Serial No.: 102
Barcode: 017450

Calibration Certificate

CMS PETROLEUM EQUIPMENT
48150 210TH ST
MORRIS, MN 56267
Contact: Joel McNally
Phone: 320-589-9017
PO Number: None
Procedure: NIST SOP 19
Technician ID: 19

Item(s) Submitted: 100 Gallon Prover
Manufacturer: Kleespie
Material: Mild Steel
Type: No Bottom Zero
Condition: Good
Temperature: 18.3 °C
Pressure: 731.6 mmHg
Relative Humidity: 42.7 %
Standard H₂O Temp.: 10.5 °C
Artifact H₂O Temp.: 10.6 °C

Nominal	Calibrated				
Volume (gal)	Volume (gal)	Error (in ³)	k	U (in ³)	CCE (°F)
100	As Found	100.0112	2.6	2.00	2.3 0.0000186
	As Left	100.0112	2.6		

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 in³ = 0.00378541 m³.

Erik Alfvin

Metrologist

Reviewed by:

Pete Whebbe

Metrologist





DEPARTMENT OF COMMERCE
WEIGHTS & MEASURES DIVISION

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Receipt Date: December 18, 2017
Cal. Date: December 19, 2017
Report Date: December 19, 2017

Report No.: 338643
Serial No.: 33011
Barcode: 018524

Calibration Certificate

CMS PETROLEUM EQUIPMENT
48150 210TH ST
MORRIS, MN 56267
Contact: Joel McNally
Phone: 320-589-9017
PO Number: None
Procedure: NIST SOP 21
Technician ID: 19

Item(s) Submitted: 100 Gallon LPG Prover
Manufacturer: Arrow Tank & Eng
Material: Mild Steel
Description: Zero Bottom
Condition: Good
Temperature: 19.0 °C
Pressure: 737.3 mmHg
Relative Humidity: 40.4 %
Standard H₂O Temp. 11.1 °C
Artifact H₂O Temp.: 11.6 °C

Nominal		Calibrated			
Volume (gal)		Volume (gal)	Error (in ³)	k	U (in ³) CCE (°F)
100	As Found (at 100 psig)	99.9905	-2.2	2.02	5.3 0.0000186
	As Left (at 100 psig)	99.9905	-2.2		

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 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.

Erik Alfvin

Metrologist

Reviewed by:

Pete Whebbe

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