

### Calibration Certificate of Mass

Calibration Date: October 10, 2018

Certificate Number: 2018-086-1

Submitted By: FSCP Area 80  
3721 West Cuming St.  
Lincoln, NE 68524

Point of Contact: Mike Johnson  
Ph. 402-471-3422  
email: mike.d.johnson@nebraska.gov  
PO Number: N/A

Test Item(s): (2)-15 & (20)-25 lb weights  
Serial Number(s): See Next Page  
Manufacture: Rice lake  
Condition: Good (some wear)

Artifact(s) Description:

Date Received: October 5, 2018  
ID / Asset Number: N/A  
Class Specification: NIST Class F  
Material: Cast Iron

Reference Standards Used:

NSL lb standards

Procedure Used:

NIST HB 6969, SOP 8

Equipment Used:

Mettler KA30-3

Metrologist:

JPL

Environmental Cond. Temp: 20.9 °C Pressure: 761.492 mmHg Relative Humidity: 43.1 %

Pertinent Information

- The artifact(s) listed in this document have been found and/or left within the maximum permissible error for the specification stated above, except as noted. An artifact is considered in-compliance when the correction plus the measurement uncertainty is equal to or less than the maximum permissible error. RED print indicates an out-of-compliance reading.
- All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale verses 8.0 g/cm<sup>3</sup> reference mass density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C.

Traceability Statement

The artifact(s) described in this certificate have been compared to the Standards of the State of Nebraska. The Standards of the State of Nebraska are traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The calibration number for this certificate is the only unique calibration number to be used in referencing measurement traceability for the artifact(s) described in this certificate.

Uncertainty Statement

The combined standard uncertainty includes uncertainties reported for the standard, uncertainties associated with the measurement process, uncertainties for any observed deviations from reference values which are less than surveillance limits and the standard uncertainty for any uncorrected errors associated with air buoyance corrections. The combined standard uncertainty is multiplied by a coverage factor (k), to give the expanded uncertainty, which defines an interval with a 95.45 percent level of confidence. The expanded uncertainty presented in this report is consistent with the Guide to the Expression of Uncertainty in Measurement (2008, revised 2012). Some components of the calibration can be evaluated through a Type A evaluation, or the method of evaluation of uncertainty by the statistical analysis (standard deviation) from the observations taken. Magnetic testing has not been performed, therefore, there are no components for the effects of it in the uncertainty budget.

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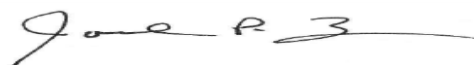
### Calibration Results

Nominal Mass	Serial Number / ID	As Found Conventional Mass Correction (g)	Adjusted (Y/N)	As Left Conventional Mass Correction (g)	Uncertainty ± (g)	(k) factor	NIST Class F MPE ± (g)	Assumed Density (g/cm <sup>3</sup> )
15 lb	WM15-11	1.156	y	0.346	0.082	2	0.68	7.2
15 lb	WM15-12	1.026	y	0.281	0.082	2	0.68	7.2
25 lb	NE-1	1.84	y	0.12	0.14	2	1.1	7.2
25 lb	NE-2	1.22	y	-0.27	0.14	2	1.1	7.2
25 lb	NE-3	1.12	y	0.22	0.14	2	1.1	7.2
25 lb	NE-4	1.52	y	-0.07	0.14	2	1.1	7.2
25 lb	NE-5	1.72	y	-0.02	0.14	2	1.1	7.2
25 lb	NE-6	1.31	y	-0.26	0.14	2	1.1	7.2
25 lb	NE-7	1.62	y	0.23	0.14	2	1.1	7.2
25 lb	NE-8	1.58	y	0.66	0.14	2	1.1	7.2
25 lb	NE-9	1.29	y	0.22	0.14	2	1.1	7.2
25 lb	NE-10	1.51	y	0.62	0.14	2	1.1	7.2
25 lb	NE-11	1.52	y	0.26	0.14	2	1.1	7.2
25 lb	NE-12	1.47	y	0.36	0.14	2	1.1	7.2
25 lb	NE-13	1.36	y	0.38	0.14	2	1.1	7.2
25 lb	NE-14	1.81	y	0.72	0.14	2	1.1	7.2
25 lb	NE-15	1.68	y	0.92	0.14	2	1.1	7.2
25 lb	NE-16	1.26	y	0.34	0.14	2	1.1	7.2
25 lb	NE-17	1.26	y	0.21	0.14	2	1.1	7.2
25 lb	NE-18	1.54	y	0.40	0.14	2	1.1	7.2
25 lb	NE-19	1.83	y	0.65	0.14	2	1.1	7.2
25 lb	NE-20	1.33	y	0.61	0.14	2	1.1	7.2

#### Conversion Factors

1 ounce (avoirdupois) (oz) = 28.349 52 g

1 pound (avoirdupois) (lb) = 453.592 37 g exactly



Joel P. Lavicky Metrologist

10/11/2018

Date of Issue

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## Calibration Certificate of Mass

**Calibration Date:** October 10, 2018

**Certificate Number:** 2018-086-2

**Submitted By:** FSCP Area 80  
3721 West Cuming St.  
Lincoln, NE 68524

**Point of Contact:** Mike Johnson  
Ph. 402-471-3422  
**email:** [mike.d.johnson@nebraska.gov](mailto:mike.d.johnson@nebraska.gov)  
**PO Number:** N/A

**Test Item(s):** 31 lb Kit  
**Serial Number(s):** 9-OPI-11  
**Manufacture:** Tromner  
**Condition:** Good (some wear)

**Artifact(s) Description:**

**Date Received:** October 5, 2018

**ID / Asset Number:** N/A

**Class Specification:** NIST Class F

**Material:** SS & AL

**Reference Standards Used:**

NSL lb standards

**Procedure Used:**

NIST HB 6969, SOP 8

**Metrologist:**

JPL

**Equipment Used:**

Sartorius CC 1201 Sartorius CCE6

Mettler AT 106

**Environmental Cond.**    **Temp:** 21.4 °C    **Pressure:** 761.238 mmHg    **Relative Humidity:** 49.6 %

**Pertinent Information**

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- All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale verses 8.0 g/cm<sup>3</sup> reference mass density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C.

**Traceability Statement**

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**Uncertainty Statement**

The combined standard uncertainty includes uncertainties reported for the standard, uncertainties associated with the measurement process, uncertainties for any observed deviations from reference values which are less than surveillance limits and the standard uncertainty for any uncorrected errors associated with air buoyance corrections. The combined standard uncertainty is multiplied by a coverage factor (*k*), to give the expanded uncertainty, which defines an interval with a 95.45 percent level of confidence. The expanded uncertainty presented in this report is consistent with the *Guide to the Expression of Uncertainty in Measurement (2008, revised 2012)*. Some components of the calibration can be evaluated through a Type A evaluation, or the method of evaluation of uncertainty by the statistical analysis (standard deviation) from the observations taken. Magnetic testing has not been performed, therefore, there are no components for the effects of it in the uncertainty budget.

Calibration Date: **October 10, 2018**

Certificate Number: **2018-086-2**

**Calibration Results**

Nominal Mass	Serial Number / ID	As Found Conventional Mass Correction (g)	Adjusted (Y/N)	As Left Conventional Mass Correction (g)	Uncertainty ± (g)	(k) factor	NIST Class F MPE ± (g)	Assumed Density (g/cm <sup>3</sup> )
2 lb	1	-0.057	n	-0.057	0.011	2	0.091	7.84
2 lb	2	-0.056	n	-0.056	0.011	2	0.091	7.84
2 lb	3	-0.052	n	-0.052	0.011	2	0.091	7.84
2 lb	4	-0.035	n	-0.035	0.011	2	0.091	7.84
2 lb	5	-0.043	n	-0.043	0.011	2	0.091	7.84
2 lb	6	-0.031	n	-0.031	0.011	2	0.091	7.84
2 lb	7	-0.041	n	-0.041	0.011	2	0.091	7.84
2 lb	8	-0.061	n	-0.061	0.011	2	0.091	7.84
2 lb	9	-0.034	n	-0.034	0.011	2	0.091	7.84
2 lb	10	-0.054	n	-0.054	0.011	2	0.091	7.84
2 lb	11	-0.037	n	-0.037	0.011	2	0.091	7.84
2 lb	12	-0.055	n	-0.055	0.011	2	0.091	7.84
2 lb	13	-0.021	n	-0.021	0.011	2	0.091	7.84
2 lb	14	-0.060	n	-0.060	0.011	2	0.091	7.84
1 lb	15	-0.0274	n	-0.0274	0.0083	2	0.07	7.84
1 lb	16	-0.0258	n	-0.0258	0.0083	2	0.07	7.84
0.3 lb	26	-0.0095	y	-0.0131	0.0032	2	0.027	7.84
0.2 lb	27	-0.0037	n	-0.0037	0.0022	2	0.018	7.84
0.1 lb	28	-0.0009	n	-0.0009	0.0011	2	0.0091	7.84
0.05 lb		-0.00043	n	-0.00043	0.00054	2	0.0045	7.84
0.03 lb		-0.00108	n	-0.00108	0.00032	2	0.0027	7.84
0.02 lb		-0.00144	n	-0.00144	0.00022	2	0.0018	7.84
0.01 lb		0.00051	n	0.00051	0.00018	2	0.0015	7.84
0.005 lb		-0.00002	n	-0.00002	0.00014	2	0.0012	2.7
0.003 lb		-0.00042	y	-0.00042	0.00012	2	0.00099	2.7
0.002 lb		-0.00038	n	-0.00038	0.00011	2	0.00087	2.7
0.001 lb		0.000090	n	0.000090	0.000083	2	0.0007	2.7
0.001 lb	*	-0.000070	n	-0.000070	0.000083	2	0.0007	2.7
8 oz		0.0016	n	0.0016	0.0054	2	0.045	7.84
4 oz		-0.0032	n	-0.0032	0.0028	2	0.023	7.84
2 oz		0.0001	n	0.0001	0.0013	2	0.011	7.84
1 oz		0.00179	n	0.00179	0.00064	2	0.0054	7.84
1/2 oz		0.00160	n	0.00160	0.00034	2	0.0028	7.84
1/4 oz		0.00029	n	0.00029	0.00021	2	0.0017	7.84
1/8 oz		-0.00034	y	-0.00001	0.00016	2	0.0013	7.84
1/16 oz		-0.00016	n	-0.00016	0.00014	2	0.0011	7.84
1/16 oz	*	0.00063	n	0.00063	0.00014	2	0.0011	7.84

**Conversion Factors**

1 ounce (avoirdupois) (oz) = 28.349 52 g

1 pound (avoirdupois) (lb) = 453.592 37 g exactly

**Joel P. Lavicky Metrologist**

**10/11/2018**

**Date of Issue**

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## Calibration Certificate of Mass

**Calibration Date:** October 10, 2018

**Certificate Number:** 2018-086-3

**Submitted By:** FSCP Area 80  
3721 West Cuming St.  
Lincoln, NE 68524

**Point of Contact:** Mike Johnson  
Ph. 402-471-3422  
**email:** [mike.d.johnson@nebraska.gov](mailto:mike.d.johnson@nebraska.gov)  
**PO Number:** N/A

**Test Item(s):** 8 lb Kit  
**Serial Number(s):** 9-OPI-3  
**Manufacture:** Tromner  
**Condition:** Good (some wear)

**Artifact(s) Description:**

**Date Received:** October 5, 2018

**ID / Asset Number:** N/A

**Class Specification:** NIST Class F

**Material:** SS & AL

**Reference Standards Used:**

NSL lb standards

**Procedure Used:**

NIST HB 6969, SOP 8

**Metrologist:**

JPL

**Equipment Used:**

Sartorius CC 1201 Sartorius CCE6

Mettler AT 106

**Environmental Cond.** Temp: 21.4 °C Pressure: 761.238 mmHg Relative Humidity: 49.6 %

**Pertinent Information**

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- All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale verses 8.0 g/cm<sup>3</sup> reference mass density and an air density of 1.2 mg/cm<sup>3</sup> at 20 °C.

**Traceability Statement**

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Calibration Date: **October 10, 2018**

Certificate Number: **2018-086-3**

**Calibration Results**

Nominal Mass	Serial Number / ID	As Found Conventional Mass Correction (g)	Adjusted (Y/N)	As Left Conventional Mass Correction (g)	Uncertainty ± (g)	(k) factor	NIST Class F MPE ± (g)	Assumed Density (g/cm <sup>3</sup> )
2 lb	1	0.014	n	0.014	0.011	2	0.091	7.84
2 lb	2	0.039	n	0.039	0.011	2	0.091	7.84
2 lb	3	0.028	n	0.028	0.011	2	0.091	7.84
1 lb	4	-0.0017	n	-0.0017	0.0083	2	0.07	7.84
0.3 lb		0.0007	n	0.0007	0.0032	2	0.027	7.84
0.2 lb		-0.0065	n	-0.0065	0.0022	2	0.018	7.84
0.1 lb		-0.0060	n	-0.0060	0.0011	2	0.0091	7.84
0.05 lb		0.00276	n	0.00276	0.00054	2	0.0045	7.84
0.03 lb		0.00216	n	0.00216	0.00032	2	0.0027	7.84
0.02 lb		-0.00009	n	-0.00009	0.00022	2	0.0018	7.84
0.01 lb		0.00003	n	0.00003	0.00018	2	0.0015	7.84
0.005 lb		-0.00035	n	-0.00035	0.00014	2	0.0012	2.7
0.003 lb		0.00045	n	0.00045	0.00012	2	0.00099	2.7
0.002 lb		0.00073	n	0.00073	0.00011	2	0.00087	2.7
0.001 lb		0.000327	n	0.000327	0.000083	2	0.0007	2.7
0.001 lb	*	0.000166	n	0.000166	0.000083	2	0.0007	2.7
8 oz	5	-0.0062	n	-0.0062	0.0054	2	0.045	7.84
4 oz	6	-0.0086	n	-0.0086	0.0028	2	0.023	7.84
2 oz	7	-0.0049	n	-0.0049	0.0013	2	0.011	7.84
1 oz	8	0.00024	n	0.00024	0.00064	2	0.0054	7.84
1/2 oz		-0.00005	n	-0.00005	0.00034	2	0.0028	7.84
1/4 oz		0.00054	n	0.00054	0.00021	2	0.0017	7.84
1/8 oz		-0.00063	n	-0.00063	0.00016	2	0.0013	7.84
1/16 oz		0.00034	n	0.00034	0.00014	2	0.0011	7.84
1/16 oz	*	0.00036	n	0.00036	0.00014	2	0.0011	7.84

**Conversion Factors**

1 ounce (avoirdupois) (oz) = 28.349 52 g

1 pound (avoirdupois) (lb) = 453.592 37 g exactly



**Joel P. Lavicky Metrologist**

**10/11/2018**

**Date of Issue**

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Calibration Date: 10/8/2018

**Certificate of Calibration  
of Volume Transfer**

Certificate Number: 2018-086-4

**Items Submitted:**

Quantity	Nominal Volume	Manufacturer	Type
2	5 gal	Seraphin	Test Measure 4" Neck

**Submitted By:** FSCP Area 80  
3721 West Cuming ST.  
Lincoln, NE 68524

**POC:** Mike Johnson  
402-471-3422  
steve.lavin@crompco.com

**Test Results**

Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (°F)	As Found Volume Delivered @ 60 °F	As left Volume Delivered @ 60 °F	Uncertainty (U)	(k)
5 gal	39423 C	SS	0.0000265	5.001 gal	5.001 gal	0.0022 gal	2.08
5 gal	4393-5-B	SS	0.0000265	4.9986 gal	4.9986 gal	0.0022 gal	2.08

The data in this report only applies to those items specifically listed on this report.

Volume delivered at 60°F after a 30 second pour and 10 second drain for test measures. For provers and a 30 second drain time would apply.

**Conversion Factors:**

1 gal = 231 in<sup>3</sup>  
1 gal = 3.785 412 E-03 m<sup>3</sup>

**Traceability Statement:**

The artifact(s) described in this report have been compared to the Standards of the State of Nebraska. The Standards of the State of Nebraska are traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The calibration number for this report is the only unique calibration number to be used in referencing measurement traceability for the artifact(s) described in this report.

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**Pertinent Information:**

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**Condition of Item(s) Submitted for Calibration:**

Minor wear

**Laboratory Reference Standard Used:**

5 gal SP NE 1586

**Treatment of Item(s) before Calibration:**

Item(s) were tested as found

**Procedure Used:**

NISTIR 7383, SOP 19

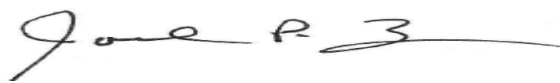
**Environmental conditions at time of calibration:**

Temp °C	21.0	Humidity %	54.4
Pressure mmHg	760.73		

**Water temperature at time of calibration:**

66.02 °F

**Date Submitted:** 10/5/2018



10/12/2018

Joel P. Lavicky, Metrologist

Date:

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Calibration Date: 10/8/2018

**Certificate of Calibration  
of Volume Transfer**

Certificate Number: 2018-086-5

**Items Submitted:**

Quantity	Nominal Volume	Manufacturer	Type
3	5 gal	Seraphin	"Sepcial" J Prover

**Submitted By:** FSCP Area 80  
3721 West Cuming ST.  
Lincoln, NE 68524

**POC:** Mike Johnson  
402-471-3422  
steve.lavin@crompco.com

**Test Results**

Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (/°F)	As Found Volume Delivered @ 60 °F	As left Volume Delivered @ 60 °F	Uncertainty (U)	(k)
5 gal	04-20943-01	SS	0.0000265	4.99879 gal	4.99879 gal	0.00061 gal	2.05
5 gal	04-20943-02	SS	0.0000265	5.00012 gal	5.00012 gal	0.00061 gal	2.05
5 gal	04-20943-03	SS	0.0000265	4.99947 gal	4.99947 gal	0.00061 gal	2.05

The data in this report only applies to those items specifically listed on this report.

Volume delivered at 60°F after a 30 second pour and 10 second drain for test measures. For provers and a 30 second drain time would apply.

**Conversion Factors:**

1 gal = 231 in<sup>3</sup>  
1 gal = 3.785 412 E-03 m<sup>3</sup>

**Traceability Statement:**

The artifact(s) described in this report have been compared to the Standards of the State of Nebraska. The Standards of the State of Nebraska are traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The calibration number for this report is the only unique calibration number to be used in referencing measurement traceability for the artifact(s) described in this report.

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**Pertinent Information:**

The artifact(s) listed above have been found and/or left within the maximum permissible error for the specification stated above, except as noted. An artifact is considered in-compliance when the correction plus the measurement uncertainty is equal to or less than the maximum permissible error.

**Condition of Item(s) Submitted for Calibration:**

Minor wear

**Laboratory Reference Standard Used:**

5 gal SP NE 1586

**Treatment of Item(s) before Calibration:**

Item(s) were tested as found

**Procedure Used:**

NISTIR 7383, SOP 19

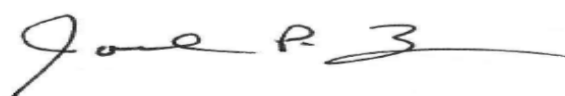
**Environmental conditions at time of calibration:**

Temp °C	21.0	Humidity %	55.8
Pressure mmHg	759.96		

**Water temperature at time of calibration:**

66.43 °F

**Date Submitted:** 10/5/2018



Joel P. Lavicky, Metrologist

10/12/2018

Date:

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