

Calibration Certificate of Mass

Calibration Date: July 22, 2020

Certificate Number: 2020-073-1

Submitted By: FSCP Area 15
3721 West Cuming St.
Lincoln, NE 68524

Point of Contact: Kent McConnell
Ph. 402-471-3422
email: kent.mcconnell@nebraska.gov
PO Number: N/A

Test Item(s): (20)-25 & (2)-15 lb, (2)-2kg weights	Artifact(s) Description:	Date Received: July 13, 2020
Serial Number(s): See Next Page		ID / Asset Number: FSCP Area 15
Manufacture: Rice Lake		Class Specification: NIST Class F
Condition: Good (some wear)		Material: Cast Iron & SS

Reference Standards Used:	Procedure Used:	Equipment Used:
NSL lb standards	NIST HB 6969, SOP 8 (2018)	Mettler XPR32003
	Metrologist:	Sartorius CC10000S
	JPL	

Environmental Cond. **Temp:** 24.7 °C **Pressure:** 726.19 mmHg **Relative Humidity:** 58.9 %

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 of the tolerances and specifications were evaluated according to ASTM E617 (2018) and/or NIST HB 105-1 (2019).
- All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale verses 8.0 g/cm³ reference mass density and an air density of 1.2 mg/cm³ 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.

Calibration Date: July 22, 2020

Certificate Number: 2020-073-1

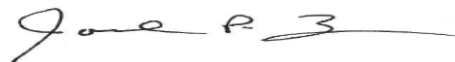
Calibration Results

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 ³)
15 lb	WM15-3	0.394	N	0.394	0.081	2	0.68	7.2
15 lb	WM15-4	-0.596	N	-0.596	0.081	2	0.68	7.2
25 lb	WM25-28	-0.38	N	-0.38	0.14	2	1.1	7.2
25 lb	WM25-38	-0.10	N	-0.10	0.14	2	1.1	7.2
25 lb	WM25-45	0.55	N	0.55	0.14	2	1.1	7.2
25 lb	WM25-55	-0.93	N	-0.93	0.14	2	1.1	7.2
25 lb	WM25-56	-0.50	N	-0.50	0.14	2	1.1	7.2
25 lb	WM25-57	0.02	N	0.02	0.14	2	1.1	7.2
25 lb	WM25-58	-0.02	N	-0.02	0.14	2	1.1	7.2
25 lb	WM25-59	0.15	N	0.15	0.14	2	1.1	7.2
25 lb	WM25-75	-0.44	N	-0.44	0.14	2	1.1	7.2
25 lb	WM25-76	0.18	N	0.18	0.14	2	1.1	7.2
25 lb	WM25-77	-0.46	N	-0.46	0.14	2	1.1	7.2
25 lb	WM25-78	-0.52	N	-0.52	0.14	2	1.1	7.2
25 lb	WM25-79	-0.23	N	-0.23	0.14	2	1.1	7.2
25 lb	WM25-96	0.78	N	0.78	0.14	2	1.1	7.2
25 lb	WM25-97	0.71	N	0.71	0.14	2	1.1	7.2
25 lb	WM25-98	-0.08	N	-0.08	0.14	2	1.1	7.2
25 lb	WM25-100	0.15	N	0.15	0.14	2	1.1	7.2
25 lb	WM25-101	0.54	N	0.54	0.14	2	1.1	7.2
25 lb	WM25-102	-0.02	N	-0.02	0.14	2	1.1	7.2
25 lb	WM25-103	0.77	N	0.77	0.14	2	1.1	7.2
2 kg	K5	0.004	N	0.004	0.024	2	0.2	7.84
2 kg	K6	0.008	N	0.008	0.024	2	0.2	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

7/23/2020

Date of Issue

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Calibration Certificate of Mass

Calibration Date: July 15, 2020

Certificate Number: 2020-073-2

Submitted By: FSCP Area 15
3721 West Cuming St.
Lincoln, NE 68524

Point of Contact: Kent McConnell
Ph. 402-471-3422
email: kent.mcconnell@nebraska.gov
PO Number: N/A

Test Item(s): lb weight kit
Serial Number(s): 3A11
Manufacture: Troemner
Condition: Good (some wear)

Artifact(s) Description:

Date Received: July 13, 2020
ID / Asset Number: Area 15
Class Specification: NIST Class F
Material: SS & AL

Reference Standards Used:

NSL lb standards

Procedure Used:

NIST HB 6969, SOP 8 (2018)

Metrologist:

JPL

Equipment Used:

Sartorius CC100005 Mettler AT 106
Sartorius CC 1201 Sartorius CCE6

Environmental Cond. Temp: 22.1 °C Pressure: 730.25 mmHg Relative Humidity: 42.1 %

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 of the tolerances and specifications were evaluated according to ASTM E617 (2018) and NIST HB 105-1 (2019).
- All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale verses 8.0 g/cm³ reference mass density and an air density of 1.2 mg/cm³ 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.

Calibration Date: July 15, 2020

Certificate Number: 2020-073-2

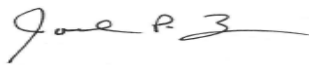
Calibration Results

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 ³)
2 lb	1	-0.068	n	-0.068	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	-0.043	n	-0.043	0.011	2	0.091	7.84
2 lb	4	-0.012	n	-0.012	0.011	2	0.091	7.84
2 lb	5	-0.051	n	-0.051	0.011	2	0.091	7.84
2 lb	6	-0.064	n	-0.064	0.011	2	0.091	7.84
2 lb	7	-0.054	n	-0.054	0.011	2	0.091	7.84
2 lb	8	-0.053	n	-0.053	0.011	2	0.091	7.84
2 lb	9	-0.056	n	-0.056	0.011	2	0.091	7.84
2 lb	10	-0.040	n	-0.040	0.011	2	0.091	7.84
2 lb	11	-0.008	n	-0.008	0.011	2	0.091	7.84
2 lb	12	-0.061	n	-0.061	0.011	2	0.091	7.84
2 lb	13	-0.051	n	-0.051	0.011	2	0.091	7.84
2 lb	14	-0.037	n	-0.037	0.011	2	0.091	7.84
1 lb	1	-0.0041	n	-0.0041	0.0083	2	0.07	7.84
1 lb	15	-0.0163	n	-0.0163	0.0083	2	0.07	7.84
0.3 lb	26	-0.0078	n	-0.0078	0.0032	2	0.027	7.84
0.2 lb	27	0.0064	n	0.0064	0.0022	2	0.018	7.84
0.1 lb	28	-0.0065	n	-0.0065	0.0011	2	0.0091	7.84
0.05 lb		0.00003	n	0.00003	0.00054	2	0.0045	7.84
0.03 lb		-0.00098	n	-0.00098	0.00032	2	0.0027	7.84
0.02 lb	*	0.00093	n	0.00093	0.00022	2	0.0018	7.84
0.01 lb		0.00079	n	0.00079	0.00018	2	0.0015	7.84
0.005 lb		0.00034	n	0.00034	0.00014	2	0.0012	2.7
0.003 lb		-0.00035	n	-0.00035	0.00012	2	0.00099	2.7
0.002 lb		0.00061	n	0.00061	0.00011	2	0.00087	2.7
0.001 lb		-0.000476	n	-0.000476	0.000083	2	0.0007	2.7
0.001 lb	*	0.000390	n	0.000390	0.000083	2	0.0007	2.7
8 oz	17	-0.0122	n	-0.0122	0.0054	2	0.045	7.84
4 oz		0.0012	n	0.0012	0.0028	2	0.023	7.84
2 oz		-0.0008	n	-0.0008	0.0013	2	0.011	7.84
1 oz	*	0.00153	n	0.00153	0.00064	2	0.0054	7.84
1/2 oz		-0.00150	n	-0.00150	0.00034	2	0.0028	7.84
1/4 oz		-0.00058	n	-0.00058	0.00021	2	0.0017	7.84
1/8 oz	*	0.00034	n	0.00034	0.00016	2	0.0013	7.84
1/16 oz		0.00064	n	0.00064	0.00013	2	0.0011	7.84
1/16 oz	*	0.00022	n	0.00022	0.00013	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

7/20/2020

Date of Issue

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Calibration Certificate of Mass

Calibration Date: July 15, 2020

Certificate Number: 2020-073-3

Submitted By: FSCP Area 15
3721 West Cuming St.
Lincoln, NE 68524

Point of Contact: Kent McConnell
Ph. 402-471-3422
email: kent.mcconnell@nebraska.gov
PO Number: N/A

Test Item(s): lb weight kit
Serial Number(s): 9-OPI-5
Manufacture: Tromner
Condition: Good (some wear)

Artifact(s) Description:

Date Received: July 12, 2020
ID / Asset Number: Area 15
Class Specification: NIST Class F
Material: SS & AL

Reference Standards Used:

NSL lb standards

Procedure Used:

NIST HB 6969, SOP 8 (2018)

Metrologist:

JPL

Equipment Used:

Sartorius CC10000S Mettler AT 106
Sartorius CC 1201 Sartorius CCE6

Environmental Cond. **Temp:** 22.1 °C **Pressure:** 730.25 mmHg **Relative Humidity:** 42.1 %

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 of the tolerances and specifications were evaluated according to ASTM E617 (2018) and NIST HB 105-1 (2019).
- All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale verses 8.0 g/cm³ reference mass density and an air density of 1.2 mg/cm³ at 20 °C.

Traceability Statement

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Uncertainty Statement

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Calibration Date: July 15, 2020

Certificate Number: 2020-073-3

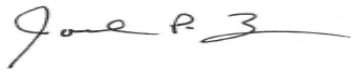
Calibration Results

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 ³)
2 lb	1	-0.002	n	-0.002	0.011	2	0.091	7.84
2 lb	11	-0.055	n	-0.055	0.011	2	0.091	7.84
2 lb	4	-0.066	n	-0.066	0.011	2	0.091	7.84
1 lb	16	-0.0411	n	-0.0411	0.0083	2	0.07	7.84
0.2 lb		0.0070	n	0.0070	0.0022	2	0.018	7.84
0.2 lb	*	0.0083	n	0.0083	0.0022	2	0.018	7.84
0.1 lb		0.0039	n	0.0039	0.0011	2	0.0091	7.84
0.05 lb		0.00146	n	0.00146	0.00054	2	0.0045	7.84
0.02 lb		-0.00107	n	-0.00107	0.00022	2	0.0018	7.84
0.02 lb	*	-0.00032	n	-0.00032	0.00022	2	0.0018	7.84
0.01 lb		-0.00008	n	-0.00008	0.00018	2	0.0015	7.84
0.005 lb		0.00058	n	0.00058	0.00014	2	0.0012	2.7
0.002 lb		0.00016	n	0.00016	0.00011	2	0.00087	2.7
0.002 lb	*	0.00016	n	0.00016	0.00011	2	0.00087	2.7
0.001 lb		0.000075	n	0.000075	0.000083	2	0.0007	2.7
8 oz	17	-0.0039	n	-0.0039	0.0054	2	0.045	7.84
4 oz	18	-0.0010	n	-0.0010	0.0028	2	0.023	7.84
2 oz		-0.0033	n	-0.0033	0.0013	2	0.011	7.84
1 oz		0.00068	n	0.00068	0.00064	2	0.0054	7.84
1/2 oz		0.00156	y	0.00157	0.00034	2	0.0028	7.84
1/4 oz		0.00028	n	0.00028	0.00021	2	0.0017	7.84
1/8 oz		-0.00077	n	-0.00077	0.00016	2	0.0013	7.84
1/16 oz		-0.00017	n	-0.00017	0.00013	2	0.0011	7.84
1/16 oz	*	0.00002	n	0.00002	0.00013	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

7/20/2020

Date of Issue

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Calibration Date: 7/16/2020

**Certificate of Calibration
of Volume Transfer**

Certificate Number: 2020-073-4

Items Submitted:

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

Submitted By: FSCP Area 15
3721 West Cuming St.
Lincoln, NE 68524

POC: Kent McConnell
402-471-3422
kent.mcconnell@nebraska.gov

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	05-40547-01	SS	0.0000265	4.9988 gal	4.9988 gal	0.00100 gal	2.04
5 gal	05-40547-02	SS	0.0000265	5.0007 gal	5.0007 gal	0.00100 gal	2.04
5 gal	05-40547-03	SS	0.0000265	4.9988 gal	4.9988 gal	0.00100 gal	2.04

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 a 30 second drain time would apply.

Conversion Factors:

1 gal = 231 in³
1 gal = 3.785 412 E-03 m³

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.

Uncertainty Statement:

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Pertinent Information:

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Condition of Item(s) Submitted for Calibration:

Good

Laboratory Reference Standard Used:

5 gal SP NE 1586

Treatment of Item(s) before Calibration:

Tested as Found

Procedure Used:

NISTIR 7383, SOP 19 (2016)

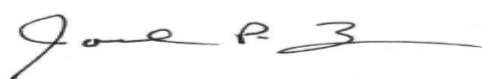
Environmental conditions at time of calibration:

Temp °C	23.1	Humidity %	51.2
Pressure mmHg	731.52		

Water temperature at time of calibration:

72.93 °F

Date Submitted: 7/13/2020



Joel P. Lavicky, Metrologist

7/23/2020

Issue Date:

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Calibration Date: 7/16/2020

**Certificate of Calibration
of Volume Transfer**

Certificate Number: 2020-073-5

Items Submitted:

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

Submitted By: FSCP Area 15

3721 West Cuming St.
Lincoln, NE 68524

POC: Kent McConnell

402-471-3422
kent.mcconnell@nebraska.gov

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 A	SS	0.0000265	5.0007 gal	5.0007 gal	0.0011 gal	2.1
5 gal	39423 D	SS	0.0000265	5.0007 gal	5.0007 gal	0.0011 gal	2.1

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 a 30 second drain time would apply.

Conversion Factors:

1 gal = 231 in³
1 gal = 3.785 412 E-03 m³

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:

Good

Laboratory Reference Standard Used:

5 gal SP NE 1586

Treatment of Item(s) before Calibration:

Tested as Found

Procedure Used:

NISTIR 7383, SOP 19 (2016)

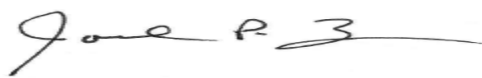
Environmental conditions at time of calibration:

Temp °C	23.7	Humidity %	54.0
Pressure mmHg	731.52		

Water temperature at time of calibration:

73.45 °F

Date Submitted: 7/13/2020



Joel P. Lavicky, Metrologist

7/23/2020

Issue Date:

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