

# Calibration Certificate of Mass

**Calibration Date:** July 13, 2022

**Certificate Number:** 2022-094-1

**Submitted By:** FSCP Area 60  
3721 West Cuming St.  
Lincoln, NE 68524

**Point of Contact:** Todd Blaske  
Ph. 402-471-3422  
**email:** Todd.blaske@nebraska.gov  
**PO Number:** N/A

<b>Test Item(s):</b> Cast weights	<b>Artifact(s) Description:</b>	<b>Date Received:</b> July 11, 2022
<b>ID / Asset Number:</b> Area 60		<b>Serial Number(s):</b> See Next Page
<b>Manufacture:</b> Troemner		<b>Class Specification:</b> NIST Class F
<b>Material:</b> Cast iron		<b>Condition:</b> Good (some wear)

<b>Reference Standards Used:</b> NSL lb standards	<b>Procedure Used:</b> NIST HB 6969, SOP 8 (2019) <b>Metrologist:</b> JPL	<b>Equipment Used:</b> Mettler XPR32003
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**Environmental Cond.**      **Temp:** 23.8 °C      **Pressure:** 728.8 mmHg      **Relative Humidity:** 46.4 %

**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.
- It is the end user's responsibility to verify that the weights meet the accuracy requirements outlined in NIST Handbook 44 (2022), Appendix A Fundamental Considerations, when using the weights for calibration of commercial (Legal for Trade) scales.

**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 13, 2022

Certificate Number: 2022-094-1

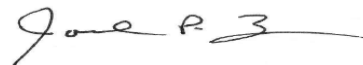
### Calibration Results

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 <sup>3</sup> )
15 lb	WM15-16	-0.235	N	-0.235	0.084	2	0.68	7.2
15 lb	WM15-16	-0.080	N	-0.080	0.084	2	0.68	7.2
25 lb	WM25-21	-0.34	N	-0.34	0.14	2	1.1	7.2
25 lb	WM25-23	0.35	N	0.35	0.14	2	1.1	7.2
25 lb	WM25-24	-1.72	Y	0.13	0.14	2	1.1	7.2
25 lb	WM25-25	-0.60	N	-0.60	0.14	2	1.1	7.2
25 lb	WM25-32	0.62	N	0.62	0.14	2	1.1	7.2
25 lb	WM25-36	0.07	N	0.07	0.14	2	1.1	7.2
25 lb	WM25-40	0.18	N	0.18	0.14	2	1.1	7.2
25 lb	WM25-120	-0.69	N	-0.69	0.14	2	1.1	7.2
25 lb	WM25-123	-0.21	N	-0.21	0.14	2	1.1	7.2
25 lb	WM25-126	0.46	N	0.46	0.14	2	1.1	7.2
25 lb	WM25-127	0.13	N	0.13	0.14	2	1.1	7.2
25 lb	WM25-128	-0.22	N	-0.22	0.14	2	1.1	7.2
25 lb	WM25-129	0.19	N	0.19	0.14	2	1.1	7.2
25 lb	WM25-130	-0.17	N	-0.17	0.14	2	1.1	7.2
25 lb	WM25-104	-1.47	Y	-0.08	0.14	2	1.1	7.2
25 lb	WM25-105	-0.54	N	-0.54	0.14	2	1.1	7.2
25 lb	WM25-107	0.55	N	0.55	0.14	2	1.1	7.2
25 lb	WM25-108	0.40	N	0.40	0.14	2	1.1	7.2
25 lb	WM25-109	-0.19	N	-0.19	0.14	2	1.1	7.2
25 lb	WM25-111	-0.18	N	-0.18	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

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7/18/2022

Date of Issue

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## Calibration Certificate of Mass

**Calibration Date:** July 13, 2022

**Certificate Number:** 2022-094-2

**Submitted By:** FSCP Area 60  
3721 West Cuming St.  
Lincoln, NE 68524

**Point of Contact:** Todd Blaske  
Ph. 402-471-3422  
**email:** [Todd.blaske@nebraska.gov](mailto:Todd.blaske@nebraska.gov)  
**PO Number:** N/A

**Test Item(s):** lb weight kit  
**Serial Number(s):** 14A9  
**Manufacture:** Troemner  
**Material:** Stainless Steel & Aluminum

**Artifact(s) Description:**  
**Date Received:** July 11, 2022  
**ID / Asset Number:** Area 60  
**Class Specification:** NIST Class F  
**Condition:** Good (some wear)

**Reference Standards Used:**

NSL lb standards

**Procedure Used:**

NIST HB 6969, SOP 8 (2019)

**Metrologist:**

JPL

**Equipment Used:**

Sartorius CC 1201 Sartorius CCE6

Mettler XPR 205

**Environmental Cond.**    **Temp:** 21.46 °C    **Pressure:** 731.07 mmHg    **Relative Humidity:** 51.22 %

**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.
- It is the end user's responsibility to verify that the weights meet the accuracy requirements outlined in NIST Handbook 44 (2020), Appendix A Fundamental Considerations, when using the weights for calibration of commercial (Legal for Trade) scales.

**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 13, 2022

Certificate Number: 2022-094-2

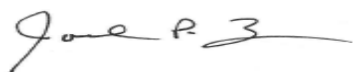
### Calibration Results

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	-0.013	n	-0.013	0.011	2	0.091	7.84
2 lb	3	-0.059	n	-0.059	0.011	2	0.091	7.84
2 lb	4	-0.040	n	-0.040	0.011	2	0.091	7.84
2 lb	5	-0.023	n	-0.023	0.011	2	0.091	7.84
2 lb	6	-0.027	n	-0.027	0.011	2	0.091	7.84
2 lb	7	-0.013	n	-0.013	0.011	2	0.091	7.84
2 lb	8	-0.027	n	-0.027	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	0.004	n	0.004	0.011	2	0.091	7.84
2 lb	11	-0.018	n	-0.018	0.011	2	0.091	7.84
2 lb	12	-0.039	n	-0.039	0.011	2	0.091	7.84
2 lb	13	-0.056	n	-0.056	0.011	2	0.091	7.84
2 lb	14	-0.035	n	-0.035	0.011	2	0.091	7.84
1 lb	15	-0.0157	n	-0.0157	0.0083	2	0.07	7.84
1 lb	16	-0.0248	n	-0.0248	0.0083	2	0.07	7.84
0.3 lb		-0.0085	n	-0.0085	0.0033	2	0.027	7.84
0.2 lb		-0.0031	n	-0.0031	0.0022	2	0.018	7.84
0.1 lb		-0.0027	n	-0.0027	0.0011	2	0.0091	7.84
0.05 lb		0.00188	n	0.00188	0.00054	2	0.0045	7.84
0.03 lb		-0.00168	n	-0.00168	0.00032	2	0.0027	7.84
0.02 lb		-0.00001	n	-0.00001	0.00022	2	0.0018	7.84
0.01 lb		-0.00072	n	-0.00072	0.00018	2	0.0015	7.84
0.005 lb		0.00014	n	0.00014	0.00014	2	0.0012	2.7
0.003 lb		-0.00056	n	-0.00056	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		0.000308	n	0.000308	0.000083	2	0.0007	2.7
0.001 lb	*	-0.000127	n	-0.000127	0.000083	2	0.0007	2.7
8 oz		0.0138	n	0.0138	0.0054	2	0.045	7.84
4 oz		0.0097	n	0.0097	0.0028	2	0.023	7.84
2 oz		-0.0001	n	-0.0001	0.0013	2	0.011	7.84
1 oz		0.00030	n	0.00030	0.00064	2	0.0054	7.84
1/2 oz		-0.00003	n	-0.00003	0.00034	2	0.0028	7.84
1/4 oz		0.00087	n	0.00087	0.00021	2	0.0017	7.84
1/8 oz		-0.00061	n	-0.00061	0.00016	2	0.0013	7.84
1/16 oz		0.00051	n	0.00051	0.00013	2	0.0011	7.84
1/16 oz	*	0.00065	n	0.00065	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

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7/18/2022

Date of Issue

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## Calibration Certificate of Mass

<b>Calibration Date:</b> July 15, 2022	<b>Certificate Number:</b> 2022-094-3
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<p><b>Submitted By:</b> FSCP Area 60 3721 West Cuming St. Lincoln, NE 68524</p>	<p><b>Point of Contact:</b> Todd Blaske Ph. 402-471-3422 <b>email:</b> Todd.blaske@nebraska.gov <b>PO Number:</b> N/A</p>
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<p><b>Test Item(s):</b> Precision weight kit <b>Serial Number(s):</b> WM-G89-6 <b>Condition:</b> Good (some wear) <b>Material:</b> Stainless Steel</p>	<p><b>Artifact(s) Description:</b></p>	<p><b>Date Received:</b> 7/11/2022 <b>ID / Asset Number:</b> Area 60 <b>Class Specification:</b> ASTM 4 <b>Manufacture:</b> Troemner</p>
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<p><b>Reference Standards Used:</b> NSL &amp; /Den Metric Volland-1707</p>	<p><b>Procedure Used:</b> NIST HB 6969, SOP 8 (2019) <b>Metrologist:</b> JPL</p>	<p><b>Equipment Used:</b> Sartorius CC 1201    Sartorius CCE6 Mettler XPR 205</p>
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**Environmental Cond.**    **Temp:** 21.36 °C    **Pressure:** 728.54 mmHg    **Relative Humidity:** 51.51 %

**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.

- It is the end user's responsibility to verify that the weights meet the accuracy requirements outlined in NIST Handbook 44 (2020), Appendix A Fundamental Considerations, when using the weights for calibration of commercial (Legal for Trade) scales.

**Traceability Statement**

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**Uncertainty Statement**

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Calibration Date: July 15, 2022

Certificate Number: 2022-094-3

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	ASTM 4 MPE ± (g)	Assumed Density (g/cm <sup>3</sup> )
300 g		0.00381	n	0.00381	0.00089	2	0.006	7.84
200 g		0.0015	n	0.0015	0.0018	2	0.004	7.84
100 g		0.00051	n	0.00051	0.00024	2.001	0.002	7.84
50 g		0.00031	n	0.00031	0.00015	2.003	0.0012	7.84
30 g		0.00003	n	0.00003	0.00011	2.003	0.0009	7.84
20 g		0.000181	n	0.000181	0.000094	2.003	0.0007	7.84
10 g		0.000082	n	0.000082	0.000063	2.009	0.0005	7.84
5 g		0.000118	n	0.000118	0.000045	2.001	0.00036	7.84
3 g		0.000278	n	0.000278	0.000038	2.001	0.0003	7.84
2 g		0.000098	n	0.000098	0.000033	2.001	0.00026	7.84
1 g		0.000053	n	0.000053	0.000025	2.004	0.0002	7.84

Conversion Factors

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

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



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Joel P. Lavicky Metrologist

7/18/2022

Date of Issue

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Calibration Date: 7/14/2022

**Certificate of Calibration  
of Volume Transfer**

Certificate Number: 2022-094-4

**Items Submitted:**

Quantity	Nominal Volume	Manufacturer	Type
2	5 gal	Seraphin	Test Measure 3" Neck

**Submitted By:** FSCP Area 60  
3721 West Cuming St.  
Lincoln, NE 68524

**POC:** Todd Blaske  
402-471-3422  
Todd.blaske@nebraska.gov

**Test Results**

Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (1/°F)	As Found Volume Delivered @ 60 °F	As left Volume Delivered @ 60 °F	Uncertainty (U)	(k)
5 gal	06-01161	SS	0.0000265	5.0011 gal	5.0011 gal	0.0011 gal	2.03
5 gal	06-01165	SS	0.0000265	5.0007 gal	5.0007 gal	0.0011 gal	2.03

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

**Traceability 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 (2019)

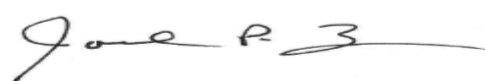
**Environmental conditions at time of calibration:**

Temp °C	23.8	Humidity %	45.8
Pressure mmHg	729.40		

**Water temperature at time of calibration:**

70.95 °F

**Date Submitted:** 7/11/2022



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7/19/2022

Joel P. Lavicky, Metrologist

Issue Date:

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Calibration Date: 7/15/2022

**Certificate of Calibration  
of Volume Transfer**

Certificate Number: 2022-094-5

**Items Submitted:**

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

**Submitted By:** FSCP Area 60  
3721 West Cuming St.  
Lincoln, NE 68524

**POC:** Todd Blaske  
402-471-3422  
Todd.blaske@nebraska.gov

**Test Results**

Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (1/°F)	As Found Volume Delivered @ 60 °F	As left Volume Delivered @ 60 °F	Uncertainty (U)	(k)
5 gal	05-41610-03	SS	0.0000265	4.99984 gal	4.99984 gal	0.00082 gal	2.01
5 gal	05-41610-08	SS	0.0000265	4.99986 gal	4.99986 gal	0.00082 gal	2.01
5 gal	05-41609-15	SS	0.0000265	4.99893 gal	4.99893 gal	0.00082 gal	2.01

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 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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**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 (2019)

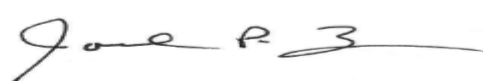
**Environmental conditions at time of calibration:**

Temp °C	24.4	Humidity %	49.9
Pressure mmHg	728.60		

**Water temperature at time of calibration:**

73.40 °F

**Date Submitted:** 7/11/2022



E-signature is copy only

7/19/2022

Joel P. Lavicky, Metrologist

Issue Date:

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