

Calibration Certificate of Mass

Calibration Date: August 2, 2022

Certificate Number: 2022-109-1

Submitted By: FSCP Area 30
3721 West Cuming St.
Lincoln, NE 68524

Point of Contact: Jeff Saathoff
Ph. 402-471-3422
email: jeff.saathoff@nebraska.gov
PO Number: N/A

Test Item(s): Cast weights	Artifact(s) Description:	Date Received: August 1, 2022
ID / Asset Number: Area 30		Serial Number(s): See Next Page
Manufacture: Rice Lake		Class Specification: NIST Class F
Material: Cast Iron		Condition: Good (some wear)

Reference Standards Used: NSL lb standards	Procedure Used: NIST HB 6969, SOP 8 (2019) Metrologist: JPL	Equipment Used: Mettler XP 604
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Environmental Cond. **Temp:** 723.9 °C **Pressure:** 725.2 mmHg **Relative Humidity:** 46.8 %

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/cm³ reference mass density and an air density of 1.2 mg/cm³ 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.

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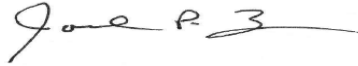
Calibration Results

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 ³)
15 lb	WM15-1	0.070	N	0.070	0.084	2	0.68	7.2
15 lb	WM15-2	0.455	N	0.455	0.084	2	0.68	7.2
25 lb	NE-81	0.05	N	0.05	0.14	2	1.1	7.2
25 lb	NE-82	0.03	N	0.03	0.14	2	1.1	7.2
25 lb	NE-83	-0.05	N	-0.05	0.14	2	1.1	7.2
25 lb	NE-84	0.45	N	0.45	0.14	2	1.1	7.2
25 lb	NE-85	0.69	N	0.69	0.14	2	1.1	7.2
25 lb	NE-86	0.40	N	0.40	0.14	2	1.1	7.2
25 lb	NE-87	0.47	N	0.47	0.14	2	1.1	7.2
25 lb	NE-88	0.64	N	0.64	0.14	2	1.1	7.2
25 lb	NE-89	0.56	N	0.56	0.14	2	1.1	7.2
25 lb	NE-90	0.43	N	0.43	0.14	2	1.1	7.2
25 lb	NE-91	0.34	N	0.34	0.14	2	1.1	7.2
25 lb	NE-92	-0.14	N	-0.14	0.14	2	1.1	7.2
25 lb	NE-93	0.88	N	0.88	0.14	2	1.1	7.2
25 lb	NE-94	0.50	N	0.50	0.14	2	1.1	7.2
25 lb	NE-95	0.97	Y	0.07	0.14	2	1.1	7.2
25 lb	NE-96	0.46	N	0.46	0.14	2	1.1	7.2
25 lb	NE-97	0.28	N	0.28	0.14	2	1.1	7.2
25 lb	NE-98	0.78	N	0.78	0.14	2	1.1	7.2
25 lb	NE-99	0.23	N	0.23	0.14	2	1.1	7.2
25 lb	NE-100	0.74	N	0.74	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

e-signature is copy only

8/5/2022

Date of Issue

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Calibration Certificate of Mass

Calibration Date: August 3, 2022

Certificate Number: 2022-109-2

Submitted By: FSCP Area 30
3721 West Cuming St.
Lincoln, NE 68524

Point of Contact: Jeff Saathoff
Ph. 402-471-3422
email: jeff.saathoff@nebraska.gov
PO Number:

Test Item(s): lb weight kit
Serial Number(s): 1477
Manufacture: Troemner
Material: Stainless Steel & Aluminum

Artifact(s) Description:

Date Received: August 1, 2022
ID / Asset Number: Area 30
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 CC10000S Mettler XPR 205
Sartorius CC 1201 Sartorius CCE6

Environmental Cond. **Temp:** 21.52 °C **Pressure:** 723.714 mmHg **Relative Humidity:** 50.57 %

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/cm³ reference mass density and an air density of 1.2 mg/cm³ 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

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: August 3, 2022

Certificate Number: 2022-109-2

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	0.009	n	0.009	0.011	2	0.091	7.84
2 lb	2	0.034	n	0.034	0.011	2	0.091	7.84
2 lb	3	-0.075	n	-0.075	0.011	2	0.091	7.84
2 lb	4	-0.005	n	-0.005	0.011	2	0.091	7.84
2 lb	5	0.005	n	0.005	0.011	2	0.091	7.84
2 lb	6	-0.053	n	-0.053	0.011	2	0.091	7.84
2 lb	7	0.022	n	0.022	0.011	2	0.091	7.84
2 lb	8	0.039	n	0.039	0.011	2	0.091	7.84
2 lb	9	-0.035	n	-0.035	0.011	2	0.091	7.84
2 lb	10	0.066	n	0.066	0.011	2	0.091	7.84
2 lb	11	0.065	n	0.065	0.011	2	0.091	7.84
2 lb	12	-0.028	n	-0.028	0.011	2	0.091	7.84
2 lb	13	0.034	n	0.034	0.011	2	0.091	7.84
2 lb	14	0.051	n	0.051	0.011	2	0.091	7.84
1 lb	15	-0.0477	n	-0.0477	0.0083	2	0.07	7.84
1 lb	16	-0.0480	n	-0.0480	0.0083	2	0.07	7.84
0.3 lb		-0.0052	n	-0.0052	0.0033	2	0.027	7.84
0.2 lb		-0.0102	n	-0.0102	0.0022	2	0.018	7.84
0.1 lb		-0.0054	n	-0.0054	0.0011	2	0.0091	7.84
0.05 lb		0.00257	n	0.00257	0.00054	2	0.0045	7.84
0.03 lb		0.00066	n	0.00066	0.00032	2	0.0027	7.84
0.02 lb		0.00047	n	0.00047	0.00022	2	0.0018	7.84
0.01 lb		-0.00031	n	-0.00031	0.00018	2	0.0015	7.84
0.005 lb		-0.00133	y	-0.00068	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		0.00034	n	0.00034	0.00011	2	0.00087	2.7
0.001 lb		-0.000537	n	-0.000537	0.000083	2	0.0007	2.7
0.001 lb	*	-0.000059	n	-0.000059	0.000083	2	0.0007	2.7
8 oz		-0.0143	n	-0.0143	0.0054	2	0.045	7.84
8 oz	WM-30-1	-0.0126	n	-0.0126	0.0054	2	0.045	7.84
4 oz		-0.0014	n	-0.0014	0.0028	2	0.023	7.84
2 oz		0.0000	n	0.0000	0.0013	2	0.011	7.84
1 oz	**	0.00203	n	0.00203	0.00064	2	0.0054	7.84
1/2 oz		0.00123	n	0.00123	0.00034	2	0.0028	7.84
1/4 oz		0.00061	n	0.00061	0.00021	2	0.0017	7.84
1/8 oz		-0.00105	n	-0.00105	0.00016	2	0.0013	7.84
1/16 oz		-0.00034	n	-0.00034	0.00013	2	0.0011	7.84
1/16 oz	*	0.00077	n	0.00077	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

e-signature is copy only

8/5/2022

Date of Issue

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Calibration Date: 8/2/2022

**Certificate of Calibration
of Volume Transfer**

Certificate Number: 2022-109-3

Items Submitted:

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

Submitted By: FSCP Area 30
3721 West Cuming St.
Lincoln, NE 68524

POC: Jeff Saathoff
402-471-3422
jeff.saathoff@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	40702 C	SS	0.0000265	5.0017 gal	5.0017 gal	0.0012 gal	2.02
5 gal	40702 D	SS	0.0000265	5.0007 gal	5.0007 gal	0.0012 gal	2.02

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 (2019)

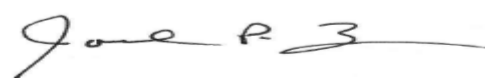
Environmental conditions at time of calibration:

Temp °C	23.9	Humidity %	45.3
Pressure mmHg	725.50		

Water temperature at time of calibration:

71.02 °F

Date Submitted: 8/1/2022



E-signature is copy only

8/5/2022

Joel P. Lavicky, Metrologist

Issue Date:

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Calibration Date: 8/2/2022

**Certificate of Calibration
of Volume Transfer**

Certificate Number: 2022-109-4

Items Submitted:

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

Submitted By: FSCP Area 30
3721 West Cuming St.
Lincoln, NE 68524

POC: Jeff Saathoff
402-471-3422
jeff.saathoff@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	00-16623-01	SS	0.0000265	5.0009 gal	5.0009 gal	0.0010 gal	2.01
5 gal	0016623-02	SS	0.0000265	4.9996 gal	4.9996 gal	0.0010 gal	2.01
5 gal	00-16623-03	SS	0.0000265	5.0028 gal	4.9992 gal	0.0010 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 in³
1 gal = 3.785 412 E-03 m³

Traceability Statement:

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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)

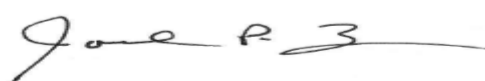
Environmental conditions at time of calibration:

Temp °C	24.1	Humidity %	46.5
Pressure mmHg	730.90		

Water temperature at time of calibration:

74.46 °F

Date Submitted: 8/1/2022



E-signature is copy only

8/5/2022

Joel P. Lavicky, Metrologist

Issue Date:

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