

Calibration Certificate of Mass

Calibration Date: October 3, 2024

Certificate Number: 2024-125-3

Artifact(s) Owner: FSCP Area 20
3721 West Cuming St.
Lincoln, NE 68524

Submitted by: State of Nebraska
Point of Contact: NDA-Weights and Measures
Ph. 402-471-3422
email: agr.wam@nebraska.gov

Test Item(s): Metric weight kit
Serial Number(s): WM-2-89-4
Condition: Good (some wear)
Material: Stainless Steel

Artifact(s) Description:

Date Received: 10/1/2024
ID / Asset Number: Area 20
Class Specification: NIST Class F
Manufacture: Troemner

Reference Standards Used:

NSL & /Den Metric
Volland-1707

Procedure Used:

NIST HB 6969, SOP 8 (2019)

Metrologist:

JPL

Equipment Used:

Sartorius MCM5004

Sartorius CC 1201

Mettler XPR 205

Environmental Cond. Temp: 21.41 °C Pressure: 728.8 mmHg Relative Humidity: 51.58 %

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. It is the decision of the Laboratory to adjust the artifact(s) when the sum of the correction and the uncertainty exceed 95% of the maximum permissible error. All of the tolerances and design specifications (except density, hardness and magnetism) were evaluated according to ASTM E617 (2023) and/or NIST HB 105-1 (2019) for the artifacts designated class.
- All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale versus 8.0 g/cm³ reference mass density and an air density of 1.2 mg/cm³ at 20 °C.
- The Artifacts in "**red**" do not meet ASTM 4 tolerances but do meet ASTM 5 tolerances and should be evaluated before use.
- 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.

DEPARTMENT OF AGRICULTURE

Calibration Date: October 3, 2024

Certificate Number: 2024-125-3

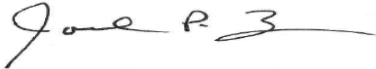
Calibration Results

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)
1 kg		-0.003	n	-0.003	0.012	2	0.1	7.84
500 g		-0.0141	n	-0.0141	0.0083	2	0.07	7.84
200 g		0.0014	n	0.0014	0.0048	2.002	0.04	7.84
200 g	*	-0.0062	n	-0.0062	0.0048	2.002	0.04	7.84
100 g		0.0104	n	0.0104	0.0024	2.002	0.02	7.84
50 g		-0.0065	n	-0.0065	0.0012	2.002	0.01	7.84
20 g		0.00088	n	0.00088	0.00048	2.002	0.004	7.84
20 g	*	0.00125	n	0.00125	0.00048	2.002	0.004	7.84
10 g		-0.00108	n	-0.00108	0.00024	2.002	0.002	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

10/28/2024

Date of Issue

The results in this certificate only applies to those item specifically listed in this certificate. This certificate cannot be considered complete unless it contains all pages. This document may not be reproduced except in full, without the written consent of the Nebraska Standards Laboratory.

Calibration Certificate of Mass

Calibration Date: October 1, 2024

Certificate Number: 2024-125-1

Artifact(s) Owner: FSCP Area 20
3721 West Cuming St.
Lincoln, NE 68524

Submitted by: State of Nebraska
Point of Contact: NDA-Weights and Measures
Ph. 402-471-3422
email: agr.wam@nebraska.gov

Test Item(s): 44-cast weights	Artifact(s) Description:	Date Received: October 1, 2024
ID / Asset Number: Area 20		Serial Number(s): See next page
Manufacture: Various		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 Mettler XPR32003
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Environmental Cond. **Temp:** 21.8 °C **Pressure:** 738.8 mmHg **Relative Humidity:** 42.4 %

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/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.
- This amended certificates replaces certificate 2023-159-1 to correct for missing weights DES-5009 & DES-5010.

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: **October 1, 2024**

Certificate Number: **2024-125-1**

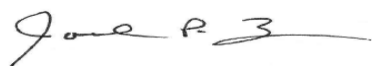
Calibration Results

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)
25 lb	WM25-19	1.00	Y	0.51	0.14	2.01	1.1	7.2
25 lb	WM25-20	0.72	N	0.72	0.14	2.01	1.1	7.2
25 lb	WM25-16	0.14	N	0.14	0.14	2.01	1.1	7.2
25 lb	WM25-8	0.84	N	0.84	0.14	2.01	1.1	7.2
25 lb	WM25-13	0.74	N	0.74	0.14	2.01	1.1	7.2
25 lb	WM25-2	0.38	N	0.38	0.14	2.01	1.1	7.2
25 lb	WM25-4	0.23	N	0.23	0.14	2.01	1.1	7.2
25 lb	WM25-5	0.40	N	0.40	0.14	2.01	1.1	7.2
25 lb	WM25-7	1.09	Y	0.76	0.14	2.01	1.1	7.2
25 lb	WM25-9	0.98	Y	0.34	0.14	2.01	1.1	7.2
25 lb	WM25-1	0.79	N	0.79	0.14	2.01	1.1	7.2
25 lb	WM25-12	0.84	N	0.84	0.14	2.01	1.1	7.2
25 lb	WM25-17	0.80	N	0.80	0.14	2.01	1.1	7.2
25 lb	WM25-14	0.66	N	0.66	0.14	2.01	1.1	7.2
25 lb	WM25-10	1.03	Y	0.25	0.14	2.01	1.1	7.2
25 lb	WM25-18	0.79	N	0.79	0.14	2.01	1.1	7.2
25 lb	WM25-15	0.07	N	0.07	0.14	2.01	1.1	7.2
25 lb	WM25-6	0.83	N	0.83	0.14	2.01	1.1	7.2
25 lb	WM25-11	0.95	Y	0.65	0.14	2.01	1.1	7.2
25 lb	WM25-3	0.79	N	0.79	0.14	2.01	1.1	7.2
50 lb	USC-C213	0.75	N	0.75	0.29	2.01	2.3	7.2
50 lb	A5C*20	-1.58	N	-1.58	0.29	2.01	2.3	7.2
50 lb	A5C*13	-1.28	N	-1.28	0.29	2.01	2.3	7.2
50 lb	OPI-C67	-1.42	N	-1.42	0.29	2.01	2.3	7.2
1000 lb	2195	24.5	N	24.5	5.7	2.01	45	7.2
1000 lb	A-3	-16.5	N	-16.5	5.7	2.01	45	7.2
1000 lb	A-7	-17.7	N	-17.7	5.7	2.01	45	7.2
1000 lb	A-18	8.5	N	8.5	5.7	2.01	45	7.2
1000 lb	2196	-14.4	N	-14.4	5.7	2.01	45	7.2
1000 lb	A-1	-10.9	N	-10.9	5.7	2.01	45	7.2
1000 lb	2187	66.5	Y	-2.0	5.7	2.01	45	7.2
1000 lb	A-17	-36.7	N	-36.7	5.7	2.01	45	7.2
1000 lb	2189	33.1	N	33.1	5.7	2.01	45	7.2
1000 lb	2192	-80.6	Y	-6.0	5.7	2.01	45	7.2
1000 lb	A-20	-32.1	N	-32.1	5.7	2.01	45	7.2
1000 lb	A-8	26.5	N	26.5	5.7	2.01	45	7.2
1000 lb	2198	7.4	N	7.4	5.7	2.01	45	7.2
1000 lb	A-10	-28.9	N	-28.9	5.7	2.01	45	7.2
1000 lb	A-14	0.5	N	0.5	5.7	2.01	45	7.2
1000 lb	2191	63.9	Y	30.7	5.7	2.01	45	7.2
1000 lb	A-4	-5.1	N	-5.1	5.7	2.01	45	7.2
1000 lb	A-9	-28.0	N	-28.0	5.7	2.01	45	7.2
1000 lb	2194	-28.0	N	-28.0	5.7	2.01	45	7.2
1000 lb	2190	17.2	N	17.2	5.7	2.01	45	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

10/28/2024

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Calibration Certificate of Mass

Calibration Date: October 3, 2024

Certificate Number: 2024-125-2

Artifact(s) Owner: FSCP Area 20
3721 West Cuming St.
Lincoln, NE 68524

Submitted by: State of Nebraska
Point of Contact: NDA-Weights and Measures
Ph. 402-471-3422
email: agr.wam@nebraska.gov

Test Item(s): lb weight kit
Serial Number(s): WM-2D86
Condition: Fair (significant wear)
Material: Stainless steel

Artifact(s) Description:

Date Received: October 1, 2024
ID / Asset Number: Area 20
Class Specification: NIST Class F
Manufacture: Rice Lake

Reference Standards Used:

NSL lb standards

Procedure Used:

NIST HB 6969, SOP 8 (2019)

Metrologist:

JPL

Equipment Used:

Sartorius MCM5004 Mettler XPR 205
Sartorius CC 1201 Sartorius CCE6

Environmental Cond. **Temp:** 20.95 °C **Pressure:** 727.4 mmHg **Relative Humidity:** 52.16 %

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Calibration Date: **October 3, 2024**

Certificate Number: **2024-125-2**

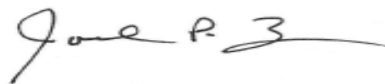
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Nominal Mass	Serial Number / ID	As Found Conventional Mass Correction (g)	Adjusted (Y/N)	As Left Conventional Mass Correction (g)	Uncertainty ± (g)	(k) factor	NIST Class F MPE ± (g)	Assumed Density (g/cm ³)
5 lb	1	-0.081	n	-0.081	0.028	2	0.23	7.84
5 lb	2	-0.109	n	-0.109	0.028	2	0.23	7.84
5 lb	3	-0.103	n	-0.103	0.028	2	0.23	7.84
5 lb	4	-0.043	n	-0.043	0.028	2	0.23	7.84
5 lb	5	-0.061	n	-0.061	0.028	2	0.23	7.84
1 lb	1	0.0080	n	0.0080	0.0083	2	0.07	7.84
1 lb	2	0.0314	n	0.0314	0.0083	2	0.07	7.84
1 lb	3	-0.0246	n	-0.0246	0.0083	2	0.07	7.84
1 lb	4	0.0003	n	0.0003	0.0083	2	0.07	7.84
1 lb	5	-0.0285	n	-0.0285	0.0083	2	0.07	7.84
0.2 lb		0.0083	n	0.0083	0.0022	2.002	0.018	7.84
0.2 lb	*	0.0081	n	0.0081	0.0022	2.002	0.018	7.84
0.1 lb		0.0042	n	0.0042	0.0011	2.002	0.0091	7.84
0.05 lb		0.00182	n	0.00182	0.00054	2.002	0.0045	7.84
0.02 lb		0.00027	n	0.00027	0.00021	2.002	0.0018	7.84
0.02 lb	*	0.00022	n	0.00022	0.00021	2.002	0.0018	7.84
0.01 lb		0.00038	n	0.00038	0.00018	2.002	0.0015	7.84
8 oz		0.0009	n	0.0009	0.0054	2.002	0.045	7.84
4 oz		0.0002	n	0.0002	0.0028	2.002	0.023	7.84
2 oz		-0.0025	n	-0.0025	0.0013	2.002	0.011	7.84
1 oz		0.00174	n	0.00174	0.00065	2.007	0.0054	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

10/28/2024

Date of Issue

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