

## Calibration Certificate of Mass

**Calibration Date:** November 2, 2022

**Certificate Number:** 2022-137-1

**Submitted By:** FSCP Area 10  
3721 West Cuming St.  
Lincoln, NE 68524

**Point of Contact:** Gene Haase  
Ph. 402-471-3422  
**email:** [gene.haase@nebraska.gov](mailto:gene.haase@nebraska.gov)  
**PO Number:** N/A

**Test Item(s):** 47-cast weights  
**ID / Asset Number:** Area 10  
**Manufacture:** Various  
**Material:** Cast iron

**Artifact(s) Description:**

**Date Received:** October 31, 2022  
**Serial Number(s):** See next page  
**Class Specification:** NIST Class F  
**Condition:** Good (some wear)

**Reference Standards Used:**

**Procedure Used:**

**Equipment Used:**

NSL lb standards

NIST HB 6969, SOP 8 (2019)

Mettler XP 604

**Metrologist:**

JPL

Mettler XPR32003

**Environmental Cond.**

**Temp:** 22.4 °C    **Pressure:** 727.1 mmHg    **Relative Humidity:** 48.2 %

**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: November 2, 2022

Certificate Number: 2022-137-1

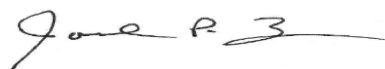
### Calibration Results

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> )
25 lb	WM-D51	0.59	N	0.59	0.14	2	1.1	7.2
25 lb	WM-D52	-0.12	N	-0.12	0.14	2	1.1	7.2
25 lb	WM-D53	0.16	N	0.16	0.14	2	1.1	7.2
25 lb	WM-D54	-0.56	N	-0.56	0.14	2	1.1	7.2
25 lb	WM-D55	0.72	N	0.72	0.14	2	1.1	7.2
25 lb	WM-D56	0.01	N	0.01	0.14	2	1.1	7.2
25 lb	WM-D57	0.53	N	0.53	0.14	2	1.1	7.2
25 lb	WM-D58	0.07	N	0.07	0.14	2	1.1	7.2
25 lb	WM-D59	-0.71	N	-0.71	0.14	2	1.1	7.2
25 lb	WM-D60	0.89	N	0.89	0.14	2	1.1	7.2
25 lb	WM-D61	0.78	N	0.78	0.14	2	1.1	7.2
25 lb	D36	-0.21	N	-0.21	0.14	2	1.1	7.2
50 lb	A5C*5	0.42	N	0.42	0.28	2	2.3	7.2
50 lb	C-C1	1.35	N	1.35	0.28	2	2.3	7.2
50 lb	C-C2	-0.72	N	-0.72	0.28	2	2.3	7.2
50 lb	C-C3	-0.23	N	-0.23	0.28	2	2.3	7.2
50 lb	C-C4	0.70	N	0.70	0.28	2	2.3	7.2
50 lb	C-C6	1.56	N	1.56	0.28	2	2.3	7.2
50 lb	C-C8	1.31	N	1.31	0.28	2	2.3	7.2
50 lb	C-C10	0.74	N	0.74	0.28	2	2.3	7.2
50 lb	C-C13	0.06	N	0.06	0.28	2	2.3	7.2
50 lb	C-C14	-5.43	Y	-0.06	0.28	2	2.3	7.2
50 lb	C-C15	1.19	N	1.19	0.28	2	2.3	7.2
50 lb	C-C16	0.17	N	0.17	0.28	2	2.3	7.2
50 lb	C-C18	0.08	N	0.08	0.28	2	2.3	7.2
50 lb	C-C19	1.47	N	1.47	0.28	2	2.3	7.2
1000 lb	WME1	-17.0	N	-17.0	5.8	2.018	45	7.2
1000 lb	WME2	-39.2	N	-39.2	5.8	2.018	45	7.2
1000 lb	WME3	-21.1	N	-21.1	5.8	2.018	45	7.2
1000 lb	WME4	4.1	N	4.1	5.8	2.018	45	7.2
1000 lb	WME5	-8.0	N	-8.0	5.8	2.018	45	7.2
1000 lb	WME6	19.0	N	19.0	5.8	2.018	45	7.2
1000 lb	WME7	-28.2	N	-28.2	5.8	2.018	45	7.2
1000 lb	WME9	12.1	N	12.1	5.8	2.018	45	7.2
1000 lb	WME10	-16.0	N	-16.0	5.8	2.018	45	7.2
1000 lb	WME11	-26.2	N	-26.2	5.8	2.018	45	7.2
1000 lb	WME12	-45.1	Y	3.6	5.8	2.018	45	7.2
1000 lb	WME13	-60.4	Y	3.6	5.8	2.018	45	7.2
1000 lb	WME14	-14.3	N	-14.3	5.8	2.018	45	7.2
1000 lb	WME15	-3.5	N	-3.5	5.8	2.018	45	7.2
1000 lb	WME17	15.7	N	15.7	5.8	2.018	45	7.2
1000 lb	WME19	70.7	Y	0.7	5.8	2.018	45	7.2
1000 lb	WME20	-3.9	N	-3.9	5.8	2.018	45	7.2
1000 lb	WME21	90.3	Y	15.9	5.8	2.018	45	7.2
1000 lb	WME22	-9.8	N	-9.8	5.8	2.018	45	7.2
1000 lb	WME23	-12.7	N	-12.7	5.8	2.018	45	7.2
1000 lb	WME24	-12.5	N	-12.5	5.8	2.018	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**

11/8/2022

**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:** November 1, 2022

**Certificate Number:** 2022-137-2

**Submitted By:** FSCP Area 10  
3721 West Cuming St.  
Lincoln, NE 68524

**Point of Contact:** Gene Haase  
Ph. 402-471-3422  
**email:** [gene.haase@nebraska.gov](mailto:gene.haase@nebraska.gov)  
**PO Number:** N/A

**Test Item(s):** Lb weight kit  
**Serial Number(s):** WM-2C86  
**Manufacture:** Rice Lake  
**Material:** Stainless Steel

**Artifact(s) Description:**

**Date Received:** October 31, 2022  
**ID / Asset Number:** Area 10  
**Class Specification:** NIST Class F  
**Condition:** Fair (significant 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:** 21.25 °C    **Pressure:** 728.92 mmHg    **Relative Humidity:** 50.7 %

**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: November 1, 2022

Certificate Number: 2022-137-2

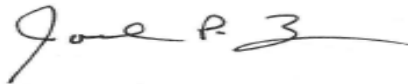
### Calibration Results

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> )
5 lb	1	-0.124	n	-0.124	0.028	2	0.23	7.84
5 lb	2	-0.093	n	-0.093	0.028	2	0.23	7.84
5 lb	3	-0.122	n	-0.122	0.028	2	0.23	7.84
5 lb	4	-0.136	n	-0.136	0.028	2	0.23	7.84
5 lb	5	-0.134	n	-0.134	0.028	2	0.23	7.84
1 lb	6	-0.0184	n	-0.0184	0.0083	2	0.07	7.84
1 lb	7	0.0056	n	0.0056	0.0083	2	0.07	7.84
1 lb	8	-0.0033	n	-0.0033	0.0083	2	0.07	7.84
1 lb	9	0.0159	n	0.0159	0.0083	2	0.07	7.84
1 lb	10	0.0096	n	0.0096	0.0083	2	0.07	7.84
8 oz	11	0.0039	n	0.0039	0.0054	2	0.045	7.84
4 oz		0.0056	n	0.0056	0.0028	2	0.023	7.84
2 oz		0.0043	n	0.0043	0.0013	2	0.011	7.84
1 oz		0.00088	n	0.00088	0.00064	2	0.0054	7.84
1/2 oz		0.00092	n	0.00092	0.00034	2	0.0028	7.84
1/4 oz		-0.00002	n	-0.00002	0.00021	2	0.0017	7.84
1/8 oz		-0.00039	n	-0.00039	0.00016	2	0.0013	7.84
1/16 oz		0.00040	n	0.00040	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

11/8/2022

Date of Issue

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## Calibration Certificate of Mass

<b>Calibration Date:</b> November 1, 2022	<b>Certificate Number:</b> 2022-137-3
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<p><b>Submitted By:</b> FSCP Area 10 3721 West Cuming St. Lincoln, NE 68524</p>	<p><b>Point of Contact:</b> Gene Haase Ph. 402-471-3422 <b>email:</b> gene.haase@nebraska.gov <b>PO Number:</b> N/A</p>
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<p><b>Test Item(s):</b> Metric weight kit <b>Serial Number(s):</b> WM2-89-5 <b>Condition:</b> Good (some wear) <b>Material:</b> Stainless Steel</p>	<p><b>Artifact(s) Description:</b></p>	<p><b>Date Received:</b> 10/31/2022 <b>ID / Asset Number:</b> Area 10 <b>Class Specification:</b> NIST Class F <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 CC100005 Mettler XPR 205 Sartorius CC 1201 Sartorius CCE6</p>
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**Environmental Cond.**      **Temp:** 20.9 °C      **Pressure:** 736.41 mmHg      **Relative Humidity:** 46.77 %

**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.
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Calibration Date: November 1, 2022

Certificate Number: 2022-137-3

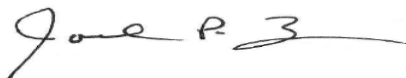
Calibration Results

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 kg	K1	-0.029	n	-0.029	0.024	2	0.2	7.84
1 kg	1	0.065	n	0.065	0.012	2	0.1	7.84
500 g	2	0.0366	n	0.0366	0.0083	2	0.07	7.84
200 g	3	0.0085	n	0.0085	0.0048	2	0.04	7.84
200 g	4	0.0015	n	0.0015	0.0048	2	0.04	7.84
100 g	5	-0.0088	n	-0.0088	0.0024	2	0.02	7.84
50 g	6	-0.0031	n	-0.0031	0.0012	2	0.01	7.84
20 g		-0.00085	n	-0.00085	0.00048	2	0.004	7.84
20 g	*	-0.00076	n	-0.00076	0.00048	2	0.004	7.84
10 g		0.00031	n	0.00031	0.00024	2	0.002	7.84
5 g		-0.00038	n	-0.00038	0.00018	2	0.0015	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

11/8/2022

Date of Issue

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