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DEPARTMENT OF AGRICULTURE

Nebraska Standards Laboratory
3721 West Cuming St.
Lincoln, NE 68524
(402)-471-2087

Director of Agriculture
Steve Wellman
P.O. Box 94947
Lincoln, NE 68509-4947
(402) 471-2341
www.nda.nebraska.gov

Calibration Certificate of Mass

Calibration Date: October 23, 2020 | **Certificate Number:** 2020-112-1

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*
PO Number: N/A

Test Item(s): (47)-Cast Iron Weights
Serial Number(s): See Next Page
Manufacture: Various
Condition: Good (some wear)

Artifact(s) Description:

Date Received: October 19, 2020
ID / Asset Number: **FSCP Area 10**
Class Specification: NIST Class F
Material: Cast Iron

Reference Standards Used:	Procedure Used:	Equipment Used:
NSL lb standards	NIST HB 6969, SOP 8 (2018)	Mettler XP 604
	Metrologist: JPL	Mettler XPR32003

Environmental Cond. **Temp:** 19.7 °C **Pressure:** 731.01 mmHg **Relative Humidity:** 53 %

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

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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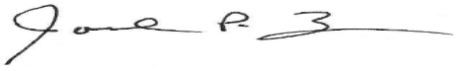
Calibration Date: October 23, 2020 | **Certificate Number:** 2020-112-1

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/cm³)
25 lb	D36	-0.03	N	-0.03	0.14	2	1.1	7.2
25 lb	WM-D51	-1.08	Y	-0.09	0.14	2	1.1	7.2
25 lb	WM-D52	-1.18	Y	-0.14	0.14	2	1.1	7.2
25 lb	WM-D53	-2.30	Y	0.07	0.14	2	1.1	7.2
25 lb	WM-D54	-0.41	N	-0.41	0.14	2	1.1	7.2
25 lb	WM-D55	-1.24	Y	-0.16	0.14	2	1.1	7.2
25 lb	WM-D56	-1.37	Y	-0.14	0.14	2	1.1	7.2
25 lb	WM-D57	-2.53	Y	0.00	0.14	2	1.1	7.2
25 lb	WM-D58	-0.49	N	-0.49	0.14	2	1.1	7.2
25 lb	WM-D59	-0.76	N	-0.76	0.14	2	1.1	7.2
25 lb	WM-D60	-1.69	Y	-0.14	0.14	2	1.1	7.2
25 lb	WM-D61	-1.18	Y	-0.06	0.14	2	1.1	7.2
50 lb	ASC*5	1.58	N	1.58	0.28	2	2.3	7.2
50 lb	C-C1	2.46	Y	-0.01	0.28	2	2.3	7.2
50 lb	C-C2	1.81	N	1.81	0.28	2	2.3	7.2
50 lb	C-C3	1.31	N	1.31	0.28	2	2.3	7.2
50 lb	C-C4	1.50	N	1.50	0.28	2	2.3	7.2
50 lb	C-C6	0.61	N	0.61	0.28	2	2.3	7.2
50 lb	C-C8	0.96	N	0.96	0.28	2	2.3	7.2
50 lb	C-C10	1.16	N	1.16	0.28	2	2.3	7.2
50 lb	C-C13	2.03	Y	-0.24	0.28	2	2.3	7.2
50 lb	C-C14	1.38	N	1.38	0.28	2	2.3	7.2
50 lb	C-C15	0.92	N	0.92	0.28	2	2.3	7.2
50 lb	C-C16	1.81	N	1.81	0.28	2	2.3	7.2
50 lb	C-C18	0.33	N	0.33	0.28	2	2.3	7.2
50 lb	C-C19	-0.23	N	-0.23	0.28	2	2.3	7.2
1000 lb	WME1	5.9	N	5.9	5.6	2.009	45	7.2
1000 lb	WME2	9.3	N	9.3	5.6	2.009	45	7.2
1000 lb	WME3	83.1	Y	3.6	5.6	2.009	45	7.2
1000 lb	WME4	18.7	N	18.7	5.6	2.009	45	7.2
1000 lb	WME5	13.9	N	13.9	5.6	2.009	45	7.2
1000 lb	WME6	-36.4	N	-36.4	5.6	2.009	45	7.2
1000 lb	WME7	-1.6	N	-1.6	5.6	2.009	45	7.2
1000 lb	WME9	-1.6	N	-1.6	5.6	2.009	45	7.2
1000 lb	WME10	-13.8	N	-13.8	5.6	2.009	45	7.2
1000 lb	WME11	1.9	N	1.9	5.6	2.009	45	7.2
1000 lb	WME12	1.9	N	1.9	5.6	2.009	45	7.2
1000 lb	WME13	-32.4	N	-32.4	5.6	2.009	45	7.2
1000 lb	WME14	-17.4	N	-17.4	5.6	2.009	45	7.2
1000 lb	WME15	5.3	N	5.3	5.6	2.009	45	7.2
1000 lb	WME17	-27.5	N	-27.5	5.6	2.009	45	7.2
1000 lb	WME19	5.1	N	5.1	5.6	2.009	45	7.2
1000 lb	WME20	-12.3	N	-12.3	5.6	2.009	45	7.2
1000 lb	WME21	-50.5	Y	6.5	5.6	2.009	45	7.2
1000 lb	WME22	7.2	N	7.2	5.6	2.009	45	7.2
1000 lb	WME23	-36.7	N	-36.7	5.6	2.009	45	7.2
1000 lb	WME24	8.1	N	8.1	5.6	2.009	45	7.2

Conversion Factors

1 ounce (avoirdupois) (oz) = 28.349 52 g
1 pound (avoirdupois) (lb) = 453.592 37 g exactly



e-signature is copy only

Joel P. Lavicky *Metrologist*

10/30/2020
Date of Issue

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Calibration Certificate of Mass

Calibration Date: October 21, 2020 | **Certificate Number:** 2020-112-2

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*
PO Number: N/A

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

Artifact(s) Description:

Date Received: October 19, 2020
ID / Asset Number: Area 10
Class Specification: NIST Class F
Condition: Good (some wear)

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:** 21.1 ºC **Pressure:** 734.2 mmHg **Relative Humidity:** 40 %

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 ºC.

- 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: October 21, 2020 | **Certificate Number: 2020-112-2**

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/cm³)
5 lb	1	-0.126	n	-0.126	0.028	2	0.23	7.84
5 lb	2	-0.101	n	-0.101	0.028	2	0.23	7.84
5 lb	3	-0.124	n	-0.124	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	-0.139	n	-0.139	0.028	2	0.23	7.84
1 lb	6	-0.0171	n	-0.0171	0.0083	2	0.07	7.84
1 lb	7	0.0059	n	0.0059	0.0083	2	0.07	7.84
1 lb	8	-0.0031	n	-0.0031	0.0083	2	0.07	7.84
1 lb	9	0.0160	n	0.0160	0.0083	2	0.07	7.84
1 lb	10	0.0099	n	0.0099	0.0083	2	0.07	7.84
8 oz		0.0044	n	0.0044	0.0054	2	0.045	7.84
4 oz		0.0055	n	0.0055	0.0028	2	0.023	7.84
2 oz		0.0042	n	0.0042	0.0013	2	0.011	7.84
1 oz		0.00069	n	0.00069	0.00064	2	0.0054	7.84
1/2 oz		0.00086	n	0.00086	0.00034	2	0.0028	7.84
1/4 oz		-0.00006	n	-0.00006	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

e-signature is copy only

Joel P. Lavicky *Metrologist*

10/30/2020
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.*

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Calibration Certificate of Mass

Calibration Date: October 21, 2020 | **Certificate Number:** 2020-112-3

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*
PO Number: N/A

Test Item(s):	Metric weight kit	**Artifact(s) Description:**	
Serial Number(s):	**WM2-89-5**	**Date Received:**	10/19/2020
Manufacture:	Troemner	**ID / Asset Number:**	**Area 10**
Condition:	Good (some wear)	**Class Specification:**	NIST Class F
		Material:	Stainless Steel

Reference Standards Used:
OPI & /Den Metric
Voland-1707

Procedure Used:
NIST HB 6969, SOP 8 (2018)

Metrologist:
JPL

Equipment Used:
Sartorius CC10000S
Sartorius CC 1201
Mettler AT 106
Sartorius CCE6

Environmental Cond. **Temp:** 21.4 °C **Pressure:** 734.2 mmHg **Relative Humidity:** 40 %

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.

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Calibration Date: October 21, 2020 | **Certificate Number:** 2020-112-3

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/cm³)
2 kg	K1	-0.026	n	-0.026	0.024	2	0.2	7.84
1 kg		0.067	n	0.067	0.012	2	0.1	7.84
500 g		0.0369	n	0.0369	0.0083	2	0.07	7.84
200 g		0.0154	n	0.0154	0.0048	2	0.04	7.84
200 g	*	0.0082	n	0.0082	0.0048	2	0.04	7.84
100 g		-0.0080	n	-0.0080	0.0024	2	0.02	7.84
50 g		-0.0030	n	-0.0030	0.0012	2	0.01	7.84
20 g		-0.00072	n	-0.00072	0.00048	2	0.004	7.84
20 g	*	-0.00068	n	-0.00068	0.00048	2	0.004	7.84
10 g		0.00033	n	0.00033	0.00024	2	0.002	7.84
5 g		-0.00037	n	-0.00037	0.00018	2	0.0015	7.84

Conversion Factors

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

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