NEBRASKA
Good Life. Great Roots.
DEPARTMENT OF AGRICULTURE

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

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

Calibration Certificate of Mass

Calibration Date: November 8, 2017 | **Certificate Number:** 2017-039-1

Submitted By: FSCP Area 10
84627 550th Ave
Norfolk, NE 68701

Point of Contact: Gene Haase
Ph. 402-326-2389
email: *gene.haase@nebraska.gov*
PO Number:

Test Item(s): 1000, 50 & 25 lb weights
Serial Number(s): See Page #2
Manufacture: Various
Condition: Good (some wear)

Artifact(s) Description:

Date Received: November 3, 2017
ID / Asset Number:
Class Specification: NIST Class F
Material: Cast Iron

Reference Standards Used:	Procedure Used:	Equipment Used:
NSL lb standards	NIST HB 6969, SOP 8	Mettler KA30-3
	Metrologist: JPL	Mettler XP 604

Environmental Cond. **Temp:** 20.7 °C **Pressure:** 772.03 mmHg **Relative Humidity:** 47.1 %

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^3 reference mass density and an air density of 1.2 mg/cm^3 at 20 °C.

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: November 8, 2017 | **Certificate Number:** 2017-039-1

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)
1000 lb	WME1	-10.3	n	-10.3	5.8	2	45	7.2
1000 lb	WME2	-25.9	n	-25.9	5.8	2	45	7.2
1000 lb	WME3	-99.3	y	4.6	5.8	2	45	7.2
1000 lb	WME4	-64.0	y	7.5	5.8	2	45	7.2
1000 lb	WME5	-55.6	y	0.2	5.8	2	45	7.2
1000 lb	WME6	-14.9	n	-14.9	5.8	2	45	7.2
1000 lb	WME7	50.9	y	1.3	5.8	2	45	7.2
1000 lb	WME9	-60.4	y	20.0	5.8	2	45	7.2
1000 lb	WME10	-69.8	y	-1.8	5.8	2	45	7.2
1000 lb	WME11	-34.4	n	-34.4	5.8	2	45	7.2
1000 lb	WME12	-51.7	y	2.4	5.8	2	45	7.2
1000 lb	WME13	-28.7	n	-28.7	5.8	2	45	7.2
1000 lb	WME14	-74.8	y	-1.2	5.8	2	45	7.2
1000 lb	WME15	-101.5	y	-1.8	5.8	2	45	7.2
1000 lb	WME17	-28.3	n	-28.3	5.8	2	45	7.2
1000 lb	WME19	-55.7	y	5.9	5.8	2	45	7.2
1000 lb	WME20	-47.6	y	5.8	5.8	2	45	7.2
1000 lb	WME21	-47.8	y	3.3	5.8	2	45	7.2
1000 lb	WME22	-38.9	n	-38.9	5.8	2	45	7.2
1000 lb	WME23	-19.3	n	-19.3	5.8	2	45	7.2
50 lb	A5C-5	-0.95	n	-0.95	0.46	2	2.3	7.2
50 lb	C-C1	1.30	n	1.30	0.46	2	2.3	7.2
50 lb	C-C2	0.25	n	0.25	0.46	2	2.3	7.2
50 lb	C-C3	0.03	n	0.03	0.46	2	2.3	7.2
50 lb	C-C4	-0.07	n	-0.07	0.46	2	2.3	7.2
50 lb	C-C6	-2.75	y	0.17	0.46	2	2.3	7.2
50 lb	C-C8	-0.05	n	-0.05	0.46	2	2.3	7.2
50 lb	C-C15	1.38	n	1.38	0.28	2	2.3	7.2
50 lb	C-C16	-0.60	n	-0.60	0.28	2	2.3	7.2
50 lb	C-C18	-0.52	n	-0.52	0.28	2	2.3	7.2
50 lb	C-C19	-2.93	y	-0.31	0.28	2	2.3	7.2
25 lb	WM25-24	-1.62	y	-0.71	0.14	2	1.1	7.2
25 lb	WM-D51	-2.49	y	-0.34	0.14	2	1.1	7.2
25 lb	WM-D52	-2.27	y	-0.26	0.14	2	1.1	7.2
25 lb	WM-D53	-2.26	y	-0.63	0.14	2	1.1	7.2
25 lb	WM-D54	-1.88	y	-0.58	0.14	2	1.1	7.2
25 lb	WM-D55	-1.33	y	-0.56	0.14	2	1.1	7.2
25 lb	WM-D56	-1.83	y	-0.41	0.14	2	1.1	7.2
25 lb	WM-D57	-0.93	y	0.40	0.14	2	1.1	7.2
25 lb	WM-D58	-2.07	y	-0.42	0.14	2	1.1	7.2
25 lb	WM-D59	-1.89	y	-0.21	0.14	2	1.1	7.2

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Lincoln, NE 68509-4947
(402) 471-2341
www.nda.nebraska.gov

Calibration Date:	November 8, 2017	Certificate Number:	2017-039-1

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	WM-D60	-1.01	y	0.07	0.14	2.002	1.1	7.2
25 lb	WM-D61	-0.30	n	-0.30	0.14	2.002	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

11/9/2017
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: November 8, 2017 | **Certificate Number:** 2017-039-2

Submitted By: FSCP Area 10
84627 550th Ave
Norfolk, NE 68701

Point of Contact: Gene Haase
Ph. 402-326-2389
email: *gene.haase@nebraska.gov*
PO Number:

Test Item(s):	31 lb weight kit	**Artifact(s) Description:**	
Serial Number(s):	WM-2C86	**Date Received:**	November 3, 2017
Manufacture:	Rice lake	**ID / Asset Number:**	1468
Condition:	Good (some wear)	**Class Specification:**	NIST Class F
		Material:	SS

Reference Standards Used:
NSL lb standards

Procedure Used:
NIST HB 6969, SOP 8

Metrologist:
JPL

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

Environmental Cond. **Temp:** 20.7 °C **Pressure:** 772.03 mmHg **Relative Humidity:** 49 %

Pertinent Information

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Uncertainty Statement

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Calibration Date: November 8, 2017

Certificate Number: 2017-039-2

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	-0.125	n	-0.125	0.028	2	0.23	7.84
5 lb	2	-0.098	n	-0.098	0.028	2	0.23	7.84
5 lb	3	-0.123	n	-0.123	0.028	2	0.23	7.84
5 lb	4	-0.135	n	-0.135	0.028	2	0.23	7.84
5 lb	5	-0.137	n	-0.137	0.028	2	0.23	7.84
1 lb	6	-0.0183	n	-0.0183	0.0083	2	0.07	7.84
1 lb	7	0.0004	n	0.0004	0.0083	2	0.07	7.84
1 lb	8	-0.0037	n	-0.0037	0.0083	2	0.07	7.84
1 lb	9	0.0149	n	0.0149	0.0083	2	0.07	7.84
1 lb	10	0.0095	n	0.0095	0.0083	2	0.07	7.84
8 oz	11	0.0049	n	0.0049	0.0054	2	0.045	7.84
4 oz	12	0.0055	n	0.0055	0.0028	2	0.023	7.84
2 oz		0.0041	n	0.0041	0.0013	2	0.011	7.84
1 oz		0.00050	n	0.00050	0.00064	2	0.0054	7.84
1/2 oz		0.00078	n	0.00078	0.00034	2	0.0028	7.84
1/4 oz		-0.00008	n	-0.00008	0.00021	2	0.0017	7.84
1/8 oz		-0.00037	n	-0.00037	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*

11/9/2017
Date of Issue

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Calibration Certificate of Mass

Calibration Date: November 8, 2017 | **Certificate Number:** 2017-039-3

Submitted By: FSCP Area 10
84627 550th Ave
Norfolk, NE 68701

Point of Contact: Gene Haase
Ph. 402-326-2389
email: *gene.haase@nebraska.gov*
PO Number:

Test Item(s):	Metric Weight Kit	**Artifact(s) Description:**	
Serial Number(s):	WM2-89-5	**Date Received:**	November 3, 2017
Manufacture:	Tromner	**ID / Asset Number:**	1857
Condition:	Good (some wear)	**Class Specification:**	NIST Class F
		Material:	SS

Reference Standards Used:
OPI & /Den Metric

Procedure Used:
NIST HB 6969, SOP 8

Metrologist:
JPL

Equipment Used:
Sartorius CC 1201
Mettler AT 106
Sartorius CCE6

Environmental Cond. **Temp:** 20.7 °C **Pressure:** 772.03 mmHg **Relative Humidity:** 49 %

Pertinent Information

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Calibration Date: November 8, 2017

Certificate Number: 2017-039-3

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	1	0.067	n	0.067	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	0.0153	n	0.0153	0.0048	2	0.04	7.84
200 g	4	0.0081	n	0.0081	0.0048	2	0.04	7.84
100 g	5	-0.0071	n	-0.0071	0.0024	2	0.02	7.84
50 g	6	-0.0029	n	-0.0029	0.0012	2	0.01	7.84
20 g		-0.00064	n	-0.00064	0.00048	2	0.004	7.84
20 g	*	-0.00069	n	-0.00069	0.00048	2	0.004	7.84
10 g		0.00031	n	0.00031	0.00024	2	0.002	7.84
5 g		-0.00042	n	-0.00042	0.00018	2	0.0015	7.84
2 g		-0.00032	n	-0.00032	0.00013	2	0.0011	7.84
2 g	*	0.00060	n	0.00060	0.00013	2	0.0011	7.84
1 g		0.00013	n	0.00013	0.00011	2	0.0009	7.84
500 mg		0.000388	n	0.000388	0.000085	2	0.00072	7.84
200 mg		-0.000014	n	-0.000014	0.000064	2	0.00054	7.84
200 mg	*	0.000345	n	0.000345	0.000064	2	0.00054	7.84
100 mg		-0.000105	n	-0.000105	0.000051	2	0.00043	7.84

Conversion Factors

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