NEBRASKA
Good Life. Great Roots.
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: July 18, 2018 | **Certificate Number:** 2018-063-1

Submitted By: FSCP Area 20
944 N 20th Rd
Unadilla, NE 68454

Point of Contact: Kurt Wenninghoff
Ph. 402-471-3422
email: *kurt.wenninghoff@nebraska.gov*
PO Number:

Test Item(s): (20)-25, (10)-50 &(20)-1000 lb weights
Serial Number(s): See Next Page
Manufacture: Various
Condition: Fair (significant wear)

Artifact(s) Description:

Date Received: July 13, 2018
ID / Asset Number: N/A
Class Specification: NIST Class F
Material: Cast iron

Reference Standards Used:
NSL lb standards

Procedure Used:
NIST HB 6969, SOP 8

Metrologist:
JPL

Equipment Used:
Mettler KA30-3
Mettler XP 604

Environmental Cond. **Temp:** 25.5 °C **Pressure:** 764.032 mmHg **Relative Humidity:** 48.8 %

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.

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: July 18, 2018 | **Certificate Number:** 2018-063-1

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	WM25-1	-1.40	y	0.41	0.14	2	1.1	7.2
25 lb	WM25-1S	-1.78	y	0.14	0.14	2	1.1	7.2
25 lb	WM25-2	-0.33	y	0.08	0.14	2	1.1	7.2
25 lb	WM25-3	0.08	y	-0.16	0.14	2	1.1	7.2
25 lb	WM25-4	-0.16	y	0.01	0.14	2	1.1	7.2
25 lb	WM25-5	0.01	y	0.58	0.14	2	1.1	7.2
25 lb	WM25-6	0.58	y	0.26	0.14	2	1.1	7.2
25 lb	WM25-7	0.26	y	-0.63	0.14	2	1.1	7.2
25 lb	WM25-8	-0.63	y	-0.13	0.14	2	1.1	7.2
25 lb	WM25-10	-0.13	y	-0.13	0.14	2	1.1	7.2
25 lb	WM25-11	-0.86	n	-0.86	0.14	2	1.1	7.2
25 lb	WM25-12	0.02	n	0.02	0.14	2	1.1	7.2
25 lb	WM25-13	-0.53	n	-0.53	0.14	2	1.1	7.2
25 lb	WM25-14	-0.44	n	-0.44	0.14	2	1.1	7.2
25 lb	WM25-15	-0.57	n	-0.57	0.14	2	1.1	7.2
25 lb	WM25-16	-1.14	y	-0.18	0.14	2	1.1	7.2
25 lb	WM25-17	-0.71	n	-0.71	0.14	2	1.1	7.2
25 lb	WM25-18	-0.23	n	-0.23	0.14	2	1.1	7.2
25 lb	WM25-19	-0.66	n	-0.66	0.14	2	1.1	7.2
25 lb	WM25-20	-0.99	y	0.06	0.14	2	1.1	7.2
50 lb	A5C*13	1.75	n	1.75	0.28	2	2.3	7.2
50 lb	A5C*20	1.02	n	1.02	0.28	2	2.3	7.2
50 lb	WM-C-A1	1.73	n	1.73	0.28	2	2.3	7.2
50 lb	WM-C-A2	-5.90	y	-0.33	0.28	2	2.3	7.2
50 lb	WM-C-A3	-7.35	y	-0.18	0.28	2	2.3	7.2
50 lb	WM-C-A5	2.46	y	1.10	0.28	2	2.3	7.2
50 lb	WM-C-A9	-7.32	y	-0.45	0.28	2	2.3	7.2
50 lb	WM-C-A10	-7.32	y	-0.28	0.28	2	2.3	7.2
50 lb	WM-OPI-C81	1.67	n	1.67	0.28	2	2.3	7.2
50 lb	WM-OPI-C85	2.72	y	1.11	0.28	2	2.3	7.2
1000 lb	2189	-14.4	n	-14.4	5.8	2	45	7.2
1000 lb	2190	-10.8	n	-10.8	5.8	2	45	7.2
1000 lb	2191	-39.6	y	7.8	5.8	2	45	7.2
1000 lb	2192	-7.1	n	-7.1	5.8	2	45	7.2
1000 lb	2194	-14.0	n	-14.0	5.8	2	45	7.2
1000 lb	2195	3.5	n	3.5	5.8	2	45	7.2
1000 lb	2196	-16.0	n	-16.0	5.8	2	45	7.2
1000 lb	2197	-25.0	n	-25.0	5.8	2	45	7.2
1000 lb	2198	-5.2	n	-5.2	5.8	2	45	7.2
1000 lb	A-1	-13.4	n	-13.4	5.8	2	45	7.2
1000 lb	A-3	-28.5	y	7.0	5.8	2	45	7.2
1000 lb	A-4	-1.7	y	7.4	5.8	2	45	7.2
1000 lb	A-7	-41.6	y	6.5	5.8	2	45	7.2
1000 lb	A-8	-50.1	y	6.7	5.8	2	45	7.2
1000 lb	A-9	-60.1	y	12.2	5.8	2	45	7.2
1000 lb	A-10	-11.3	y	7.8	5.8	2	45	7.2
1000 lb	A-14	-23.7	y	8.4	5.8	2	45	7.2
1000 lb	A-17	-46.2	y	9.9	5.8	2	45	7.2
1000 lb	A-18	-6.5	y	7.2	5.8	2	45	7.2
1000 lb	A-20	-0.3	y	7.8	5.8	2	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*

7/19/2018
Date of Issue

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Calibration Certificate of Mass

Calibration Date: July 17, 2018 | **Certificate Number:** 201-063-2

Submitted By: FSCP Area 20
944 N 20th Rd
Unadilla, NE 68454

Point of Contact: Kurt Wenninghoff
Ph. 402-471-3422
email: *kurt.wenninghoff@nebraska.gov*
PO Number: N/A

Test Item(s):	(1)-31 lb weight kit	**Date Received:**	July 13, 2018
Serial Number(s):	WM-289-4	**ID / Asset Number:**	N/A
Manufacture:	Rice Lake	**Class Specification:**	NIST Class F
Condition:	Fair (significant wear)	**Material:**	SS & AL

Artifact(s) Description:

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:** 22.8 °C **Pressure:** 766.572 mmHg **Relative Humidity:** 49 %

Pertinent Information

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Traceability Statement

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Uncertainty Statement

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Calibration Date: July 17, 2018 | **Certificate Number:** 201-063-2

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	-0.082	n	-0.082	0.028	2	0.23	7.84
5 lb	2	-0.108	n	-0.108	0.028	2	0.23	7.84
5 lb	3	-0.102	n	-0.102	0.028	2	0.23	7.84
5 lb	4	-0.044	n	-0.044	0.028	2	0.23	7.84
5 lb	5	-0.060	n	-0.060	0.028	2	0.23	7.84
1 lb	1	0.0092	n	0.0092	0.0083	2	0.07	7.84
1 lb	2	0.0324	n	0.0324	0.0083	2	0.07	7.84
1 lb	3	-0.0244	n	-0.0244	0.0083	2	0.07	7.84
1 lb	4	0.0015	n	0.0015	0.0083	2	0.07	7.84
1 lb	5	-0.0279	n	-0.0279	0.0083	2	0.07	7.84
0.2 lb		0.0083	n	0.0083	0.0022	2	0.018	7.84
0.2 lb	*	0.0081	n	0.0081	0.0022	2	0.018	7.84
0.1 lb		0.0041	n	0.0041	0.0011	2	0.0091	7.84
0.05 lb		0.00168	n	0.00168	0.00054	2	0.0045	7.84
0.02 lb		0.00034	n	0.00034	0.00022	2	0.0018	7.84
0.02 lb	*	0.00028	n	0.00028	0.00022	2	0.0018	7.84
0.01 lb		0.00037	n	0.00037	0.00018	2	0.0015	7.84
0.005 lb		0.00053	n	0.00053	0.00015	2	0.0012	2.7
0.002 lb		0.00002	n	0.00002	0.00011	2	0.00087	2.7
0.002 lb	*	0.00005	n	0.00005	0.00011	2	0.00087	2.7
0.001 lb		0.000204	n	0.000204	0.000083	2	0.0007	2.7
8 oz		0.0010	n	0.0010	0.0054	2	0.045	7.84
4 oz		-0.0001	n	-0.0001	0.0028	2	0.023	7.84
2 oz		-0.0027	n	-0.0027	0.0013	2	0.011	7.84
1 oz		0.00168	n	0.00168	0.00064	2	0.0054	7.84
1/2 oz		0.00042	n	0.00042	0.00034	2	0.0028	7.84
1/4 oz		-0.00116	n	-0.00116	0.00021	2	0.0017	7.84
1/8 oz		0.00008	n	0.00008	0.00016	2	0.0013	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*

7/18/2018
Date of Issue

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Calibration Certificate of Mass

Calibration Date: July 9, 2018 | **Certificate Number:** 2018-063-3

Submitted By: FSCP Area 20
944 N 20th Rd
Unadilla, NE 68454

Point of Contact: Kurt Wenninghoff
Ph. 402-471-3422
email: *kurt.wenninghoff@nebraska.gov*
PO Number: N/A

Test Item(s):	1-Metric weight kit	**Date Received:**	July 13, 2018
Serial Number(s):	WM-2D86	**ID / Asset Number:**	N/A
Manufacture:	Tromner	**Class Specification:**	NIST Class F
Condition:	Good (some wear)	**Material:**	SS

Artifact(s) Description:

Reference Standards Used:	Procedure Used:	Equipment Used:
OPI & /Den Metric	NIST HB 6969, SOP 8	Sartorius CC 1201 Sartorius CCE6
Voland-1707	**Metrologist:** JPL	Mettler AT 106

Environmental Cond. **Temp:** 22.8 °C **Pressure:** 766.572 mmHg **Relative Humidity:** 49 %

Pertinent Information

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Calibration Date: July 9, 2018 | **Certificate Number:** 2018-063-3

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)
1 kg	1	-0.003	n	-0.003	0.012	2	0.1	7.84
500 g	2	-0.0100	n	-0.0100	0.0083	2	0.07	7.84
200 g	3	0.0017	n	0.0017	0.0048	2	0.04	7.84
200 g	4	-0.0059	n	-0.0059	0.0048	2	0.04	7.84
100 g		0.0116	n	0.0116	0.0024	2	0.02	7.84
50 g		-0.0064	n	-0.0064	0.0012	2	0.01	7.84
20 g		0.00100	n	0.00100	0.00048	2	0.004	7.84
20 g	*	0.00123	n	0.00123	0.00048	2	0.004	7.84
10 g		-0.00107	n	-0.00107	0.00024	2	0.002	7.84
5 g		0.00002	n	0.00002	0.00018	2	0.0015	7.84
2 g		0.00050	n	0.00050	0.00013	2	0.0011	7.84
2 g	*	0.00052	n	0.00052	0.00013	2	0.0011	7.84
1 g		-0.00028	n	-0.00028	0.00011	2	0.0009	7.84
500 mg		0.000292	n	0.000292	0.000086	2	0.00072	7.95
200 mg		0.000325	n	0.000325	0.000064	2	0.00054	7.95
200 mg	*	0.000281	n	0.000281	0.000064	2	0.00054	7.95
100 mg		-0.000068	n	-0.000068	0.000051	2	0.00043	7.95

Conversion Factors

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

Joel P. Lavicky *Metrologist*

7/18/2018
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.