

Calibration Certificate of Mass

Calibration Date: November 14, 2017

Certificate Number: 2017-041-1

Submitted By: FSCP Area 35
140 W. 5th st
Minden, NE 68959

Point of Contact: Mike Boehler
Ph. 402-525-5302
email: michael.boehler@nebraska.gov
PO Number:

Test Item(s): 24-1000, 20-50, 8-25 lb weights	Artifact(s) Description:	Date Received: November 8, 2017
Serial Number(s): See Page #2 and #3		ID / Asset Number:
Manufacture: Tromner and various		Class Specification: NIST Class F
Condition: Good (some wear)		Material: Cast Iron

Reference Standards Used:

C24-1000lb
NSL-50-1-50lb
NSL-25-1-25lb

Procedure Used:

NIST HB 6969, SOP 8

Metrologist:
JPL

Equipment Used:

Mettler XP 604
Mettler KA30-3

Environmental Cond. **Temp:** 20.3 °C **Pressure:** 759.71 mmHg **Relative Humidity:** 55.5 %

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

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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 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)
1000 lb	1	10.1	n	10.1	5.8	2	45	7.2
1000 lb	2	60.1	y	7.9	5.8	2	45	7.2
1000 lb	3	107.3	y	11.0	5.8	2	45	7.2
1000 lb	4	65.3	y	7.5	5.8	2	45	7.2
1000 lb	5	79.2	y	0.1	5.8	2	45	7.2
1000 lb	6	24.2	n	24.2	5.8	2	45	7.2
1000 lb	7	68.3	y	11.6	5.8	2	45	7.2
1000 lb	8	20.7	n	20.7	5.8	2	45	7.2
1000 lb	9	20.2	n	20.2	5.8	2	45	7.2
1000 lb	10	86.6	y	9.0	5.8	2	45	7.2
1000 lb	11	91.0	y	10.0	5.8	2	45	7.2
1000 lb	12	44.2	y	8.4	5.8	2	45	7.2
1000 lb	13	32.9	n	32.9	5.8	2	45	7.2
1000 lb	14	113.0	y	9.8	5.8	2	45	7.2
1000 lb	15	141.0	y	12.7	5.8	2	45	7.2
1000 lb	16	55.4	y	3.2	5.8	2	45	7.2
1000 lb	17	11.9	n	11.9	5.8	2	45	7.2
1000 lb	18	-13.1	n	-13.1	5.8	2	45	7.2
1000 lb	19	80.2	y	37.9	5.8	2	45	7.2
1000 lb	20	11.7	n	11.7	5.8	2	45	7.2
1000 lb	21	18.9	n	18.9	5.8	2	45	7.2
1000 lb	22	78.4	y	29.3	5.8	2	45	7.2
1000 lb	23	62.8	y	11.1	5.8	2	45	7.2
1000 lb	24	5.8	n	5.8	5.8	2	45	7.2
50 lb	A5C*1	3.28	y	0.34	0.28	2	2.3	7.2
50 lb	A5C*4	3.37	y	0.16	0.28	2	2.3	7.2
50 lb	A5C*11	3.38	y	1.05	0.28	2	2.3	7.2
50 lb	B-C-1	1.73	n	1.73	0.28	2	2.3	7.2
50 lb	B-C-2	1.62	n	1.62	0.28	2	2.3	7.2
50 lb	B-C-3	1.44	n	1.44	0.28	2	2.3	7.2
50 lb	B-C-4	2.07	y	0.74	0.28	2	2.3	7.2
50 lb	B-C-5	1.14	n	1.14	0.28	2	2.3	7.2
50 lb	B-C-6	-0.42	n	-0.42	0.28	2	2.3	7.2
50 lb	B-C-7	3.42	y	-0.19	0.28	2	2.3	7.2
50 lb	B-C-8	3.82	y	0.89	0.28	2	2.3	7.2
50 lb	B-C-9	-0.14	n	-0.14	0.28	2	2.3	7.2
50 lb	B-C-10	2.10	y	0.77	0.28	2	2.3	7.2
50 lb	B-C-11	0.49	n	0.49	0.28	2	2.3	7.2
50 lb	B-C-12	3.93	y	-0.13	0.28	2	2.3	7.2
50 lb	WM50-7	-1.51	n	-1.51	0.28	2	2.3	7.2
50 lb	WM50-12	-1.29	n	-1.29	0.28	2	2.3	7.2
50 lb	WM50-16	1.97	n	1.97	0.28	2	2.3	7.2
50 lb	WM50-52	3.50	y	-0.92	0.28	2	2.3	7.2
50 lb	WM50-53	0.73	n	0.73	0.28	2	2.3	7.2

Calibration Date: November 14, 2017

Certificate Number: 2017-041-1

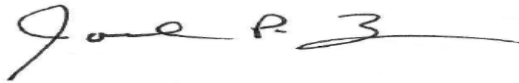
Calibration Results

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	WM-D15	0.51	n	0.51	0.14	2.002	1.1	7.2
25 lb	WM-D23	0.75	n	0.75	0.14	2.002	1.1	7.2
25 lb	WM-D24	0.47	n	0.47	0.14	2.002	1.1	7.2
25 lb	WM-D25	1.23	y	0.57	0.14	2.002	1.1	7.2
25 lb	WM-D26	1.18	y	0.42	0.14	2.002	1.1	7.2
25 lb	WM-D28	1.10	y	0.33	0.14	2.002	1.1	7.2
25 lb	WM-D29	0.03	n	0.03	0.14	2.002	1.1	7.2
25 lb	WM-D44	0.54	n	0.54	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

11/17/2017

Date of Issue

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Calibration Certificate of Mass

Calibration Date: November 16, 2017

Certificate Number: 2017-041-2

Submitted By: FSCP Area 35
140 W. 5th St.
Minden, NE 68959

Point of Contact: MikeBoehler
Ph. 402-525-5302
email: michael.boehler@nebraska.gov
PO Number:

Test Item(s): Metric Weight Kit
Serial Number(s): WM-2-89-3
Manufacture: Tromner
Condition: Good (some wear)

Artifact(s) Description:

Date Received: November 9, 2017

ID / Asset Number:
Class Specification: NIST Class F
Material: SS

Reference Standards Used:

Procedure Used:

Equipment Used:

OPI & /Den Metric

NIST HB 6969, SOP 8

Sartorius CC10000S Mettler AT 106

Metrologist:
JPL

Sartorius CC 1201 Sartorius CCE6

Environmental Cond. **Temp:** 21.2 °C **Pressure:** 768.223 mmHg **Relative Humidity:** 51 %

Pertinent Information

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Traceability Statement

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Uncertainty Statement

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Calibration Date: November 16, 2017

Certificate Number: 2017-041-2

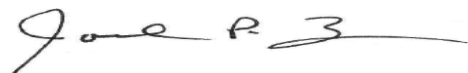
Calibration Results

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 ³)
2 kg	K2	-0.175	n	-0.175	0.024	2	0.2	7.84
1 kg	1	0.049	n	0.049	0.012	2	0.1	7.84
500 g	2	0.0374	n	0.0374	0.0083	2	0.07	7.84
200 g	3	0.0216	n	0.0216	0.0048	2	0.04	7.84
200 g	4	0.0199	n	0.0199	0.0048	2	0.04	7.84
100 g	5	-0.0024	n	-0.0024	0.0024	2	0.02	7.84
50 g	6	0.0062	n	0.0062	0.0012	2	0.01	7.84
20 g		0.00013	n	0.00013	0.00048	2	0.004	7.84
20 g	*	-0.00090	n	-0.00090	0.00048	2	0.004	7.84
10 g		0.00093	n	0.00093	0.00024	2	0.002	7.84
5 g		-0.00039	n	-0.00039	0.00018	2	0.0015	7.84
2 g		0.00057	n	0.00057	0.00013	2	0.0011	7.84
1 g		0.00047	n	0.00047	0.00011	2	0.0009	7.84
500 mg		0.000487	n	0.000487	0.000085	2	0.00072	7.84
200 mg		0.000308	n	0.000308	0.000064	2	0.00054	7.84
200 mg	*	0.000361	n	0.000361	0.000064	2	0.00054	7.84
100 mg		-0.000103	n	-0.000103	0.000051	2	0.00043	7.84

Conversion Factors

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Joel P. Lavicky Metrologist

11/17/2017

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Calibration Certificate of Mass

Calibration Date: November 16, 2017

Certificate Number: 2017-041-3

Submitted By: FSCP Area 35
140 W. 5th st
Minden, NE 68959

Point of Contact: Mike Boehler
Ph. 402-525-5302
email: michael.boehler@nebraska.gov
PO Number:

Test Item(s): 31 lb weight Kit
Serial Number(s): WM-2B86
Manufacture: Rice lake
Condition: Good (some wear)

Artifact(s) Description:

Date Received: November 8, 2017

ID / Asset Number:
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:** 21.2 °C **Pressure:** 768.241 mmHg **Relative Humidity:** 51 %

Pertinent Information

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Calibration Date: November 16, 2017

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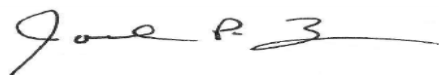
Calibration Results

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)
5 lb	1	-0.014	n	-0.014	0.028	2	0.23	7.84
5 lb	2	0.028	n	0.028	0.028	2	0.23	7.84
5 lb	3	-0.055	n	-0.055	0.028	2	0.23	7.84
5 lb	4	-0.016	n	-0.016	0.028	2	0.23	7.84
5 lb	5	0.021	n	0.021	0.028	2	0.23	7.84
1 lb	6	-0.0009	n	-0.0009	0.0083	2	0.07	7.84
1 lb	7	-0.0285	n	-0.0285	0.0083	2	0.07	7.84
1 lb	8	0.0006	n	0.0006	0.0083	2	0.07	7.84
1 lb	9	-0.0291	n	-0.0291	0.0083	2	0.07	7.84
1 lb	10	0.0229	n	0.0229	0.0083	2	0.07	7.84
8 oz	11	-0.0065	n	-0.0065	0.0054	2	0.045	7.84
4 oz		-0.0187	n	-0.0187	0.0028	2	0.023	7.84
4 oz	18	0.0144	n	0.0144	0.0028	2	0.023	7.84
2 oz		0.0031	n	0.0031	0.0013	2	0.011	7.84
1 oz		-0.00039	n	-0.00039	0.00064	2	0.0054	7.84
1/2 oz		-0.00021	n	-0.00021	0.00034	2	0.0028	7.84
1/4 oz		-0.00015	n	-0.00015	0.00021	2	0.0017	7.84
1/8 oz		0.00018	n	0.00018	0.00016	2	0.0013	7.84

Conversion Factors

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