

Calibration Certificate of Mass

Calibration Date: **May 8, 2019**

Certificate Number: **2019-066-1**

Submitted By: FSCP Area 65
3721 West Cuming St.
Lincoln, NE 68524

Point of Contact: 0
Ph. 402-471-3422
email: 0
PO Number: N/A

Test Item(s): (20)-25, (2)-15 lb weights weights	Date Received: May 6, 2019
Serial Number(s): See Next Page	ID / Asset Number: N/A
Manufacture: Rice Lake	Class Specification: NIST Class F
Condition: Good (some wear)	Material: Cast Iron
Artifact(s) Description:	

Reference Standards Used:	Procedure Used:	Equipment Used:
NSL lb standards	NIST HB 6969, SOP 8 (2018)	Mettler KA30-3
	Metrologist: JPL	

Environmental Cond. Temp: 20.1 °C Pressure: 755.396 mmHg Relative Humidity: 58.5 %

Pertinent Information

- The artifact(s) listed in this document have been found and/or left within the maximum permissible error for the specification stated above, except as noted. An artifact is considered in-compliance when the correction plus the measurement uncertainty is equal to or less than the maximum permissible error. RED print indicates an out-of-compliance reading. All of the tolerances and specifications were evaluated according to ASTM E617 (2013) and NIST HB 105-1 (1990).
- 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.

Calibration Date: May 8, 2019

Certificate Number: 2019-066-1

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)
15 lb	WM15-5	-0.82	Y	0.04	0.15	2.04	0.68	7.2
15 lb	WM15-6	-0.72	Y	0.07	0.15	2.04	0.68	7.2
25 lb	NE-61	-0.44	N	-0.44	0.14	2	1.1	7.2
25 lb	NE-62	-0.56	N	-0.56	0.14	2	1.1	7.2
25 lb	NE-63	-0.11	N	-0.11	0.14	2	1.1	7.2
25 lb	NE-64	-0.16	N	-0.16	0.14	2	1.1	7.2
25 lb	NE-65	-0.25	N	-0.25	0.14	2	1.1	7.2
25 lb	NE-66	-0.89	Y	-0.32	0.14	2	1.1	7.2
25 lb	NE-67	-0.35	N	-0.35	0.14	2	1.1	7.2
25 lb	NE-68	0.09	N	0.09	0.14	2	1.1	7.2
25 lb	NE-69	-0.26	N	-0.26	0.14	2	1.1	7.2
25 lb	NE-70	-0.70	N	-0.70	0.14	2	1.1	7.2
25 lb	NE-71	-0.81	N	-0.81	0.14	2	1.1	7.2
25 lb	NE-72	0.27	N	0.27	0.14	2	1.1	7.2
25 lb	NE-73	-0.08	N	-0.08	0.14	2	1.1	7.2
25 lb	NE-74	0.32	N	0.32	0.14	2	1.1	7.2
25 lb	NE-75	-0.30	N	-0.30	0.14	2	1.1	7.2
25 lb	NE-76	-0.63	N	-0.63	0.14	2	1.1	7.2
25 lb	NE-77	-0.54	N	-0.54	0.14	2	1.1	7.2
25 lb	NE-78	-0.14	N	-0.14	0.14	2	1.1	7.2
25 lb	NE-79	0.24	N	0.24	0.14	2	1.1	7.2
25 lb	NE-80	0.49	N	0.49	0.14	2	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

5/8/2019

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 Date: 5/7/2019

**Certificate of Calibration
of Volume Transfer**

Certificate Number: 2019-066-2

Items Submitted:

Quantity	Nominal Volume	Manufacturer	Type
2	5 gal	Seraphin	Test Measure 4" Neck

Submitted By: FSCP Area 65
3721 West Cuming St.
Lincoln, NE 68524

POC: 0
402-471-3422
0

Test Results

Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (°F)	As Found Volume Delivered @ 60 °F	As left Volume Delivered @ 60 °F	Uncertainty (U)	(k)
5 gal	39422	SS	0.0000265	4.9976 gal	4.9976 gal	0.00100 gal	2.04
5 gal	39423	SS	0.0000265	4.9977 gal	4.9977 gal	0.00100 gal	2.04

The data in this report only applies to those items specifically listed on this report.

Volume delivered at 60°F after a 30 second pour and 10 second drain for test measures. For provers a 30 second drain time would apply.

Conversion Factors:

1 gal = 231 in³
1 gal = 3.785 412 E-03 m³

Traceability Statement:

The artifact(s) described in this report 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 report is the only unique calibration number to be used in referencing measurement traceability for the artifact(s) described in this report.

Uncertainty Statement:

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Pertinent Information:

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Condition of Item(s) Submitted for Calibration:

Good

Laboratory Reference Standard Used:

5 gal SP NE 1586

Treatment of Item(s) before Calibration:

Tested as Found

Procedure Used:

NISTIR 7383, SOP 19 (2016)

Environmental conditions at time of calibration:

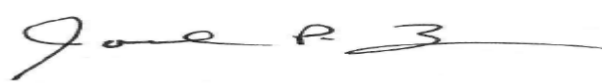
Temp °C	20.0	Humidity %	47.3
Pressure mmHg	768.09		

Water temperature at time of calibration:

50.97 °F

Date Submitted:

5/6/2019


Joel P. Lavicky, Metrologist

5/7/2019

Date:

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Calibration Date: 5/9/2019

**Certificate of Calibration
of Volume Transfer**

Certificate Number: 2019-066-3

Items Submitted:

Quantity	Nominal Volume	Manufacturer	Type
3	5 gal	SMI	"Special" J Prover

Submitted By: FSCP Area 65
3721 West Cuming St.
Lincoln, NE 68524

POC: 0
402-471-3422
0

Test Results

Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (/°F)	As Found Volume Delivered @ 60 °F	As left Volume Delivered @ 60 °F	Uncertainty (U)	(k)
5 gal	9038-034	SS	0.0000265	4.99906 gal	4.99906 gal	0.00061 gal	2.03
5 gal	9038-035	SS	0.0000265	4.99821 gal	4.99821 gal	0.00061 gal	2.03
5 gal	9038-036	SS	0.0000265	4.99883 gal	4.99883 gal	0.00061 gal	2.03

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Conversion Factors:

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1 gal = 3.785 412 E-03 m³

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Condition of Item(s) Submitted for Calibration:

Good

Laboratory Reference Standard Used:

5 gal SP NE 1586

Treatment of Item(s) before Calibration:

Tested as Found

Procedure Used:

NISTIR 7383, SOP 19 (2016)

Environmental conditions at time of calibration:

Temp °C	20.1	Humidity %	46.2
Pressure mmHg	764.28		

Water temperature at time of calibration:

52.36 °F

Date Submitted: 5/6/2019

5/9/2019

Joel P. Lavicky, Metrologist

Date:

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Calibration Certificate of Mass

Calibration Date: May 10, 2019

Certificate Number: 2019-066-4

Submitted By: FSCP Area 65
3721 West Cuming St.
Lincoln, NE 68524

Point of Contact: 0
Ph. 402-471-3422

email: 0

PO Number: N/A

Test Item(s): 8 lb wt kit

Serial Number(s): 10-OPI-10

Manufacture: Tromner

Condition: Fair (significant wear)

Artifact(s) Description:

Date Received: May 10, 2019

ID / Asset Number: Area 65

Class Specification: NIST Class F

Material: Stainless Steel

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: 20.75 °C

Pressure: 769.62 mmHg

Relative Humidity:

45.5 %

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.

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Calibration Date: **May 10, 2019**

Certificate Number: **2019-066-4**

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 lb	1	0.014	n	0.014	0.011	2	0.091	7.84
2 lb	2	-0.021	n	-0.021	0.011	2	0.091	7.84
2 lb	3	-0.021	n	-0.021	0.011	2	0.091	7.84
1 lb	1	-0.0398	n	-0.0398	0.0083	2	0.07	7.84
0.3 lb		0.0056	n	0.0056	0.0032	2	0.027	7.84
0.2 lb		-0.0053	n	-0.0053	0.0022	2	0.018	7.84
0.1 lb		-0.0014	n	-0.0014	0.0011	2	0.0091	7.84
0.05 lb		0.00237	n	0.00237	0.00054	2	0.0045	7.84
0.03 lb		-0.00153	n	-0.00153	0.00032	2	0.0027	7.84
0.02 lb		-0.00109	n	-0.00109	0.00022	2	0.0018	7.84
0.01 lb		0.00089	n	0.00089	0.00018	2	0.0015	7.84
0.005 lb		0.00100	y	0.00100	0.00014	2	0.0012	2.7
0.003 lb		0.00016	n	0.00016	0.00012	2	0.00099	2.7
0.002 lb		-0.00060	n	-0.00060	0.00011	2	0.00087	2.7
0.001 lb		0.000043	n	0.000043	0.000083	2	0.0007	2.7
0.001 lb	*	0.000268	n	0.000268	0.000083	2	0.0007	2.7
8 oz		0.0056	n	0.0056	0.0054	2	0.045	7.84
4 oz		0.0057	n	0.0057	0.0028	2	0.023	7.84
2 oz		0.0016	n	0.0016	0.0013	2	0.011	7.84
1 oz		0.00127	n	0.00127	0.00064	2	0.0054	7.84
1/2 oz		0.00185	n	0.00185	0.00034	2	0.0028	7.84
1/4 oz		0.00124	n	0.00124	0.00021	2	0.0017	7.84
1/8 oz		0.00002	n	0.00002	0.00016	2	0.0013	7.84
1/16 oz		0.00059	n	0.00059	0.00014	2	0.0011	7.84
1/16 oz	*	0.00042	n	0.00042	0.00014	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

5/10/2019

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