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: August 21, 2018 | **Certificate Number:** 2018-074-1

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

Point of Contact: Gary Kliment
Ph. 402-471-3422
email: *gary.kliment@nebraska.gov*
PO Number:

Test Item(s): (2)-15lb, (20)-25lb & (1)-4kg weights
Serial Number(s): See Next Page
Manufacture: Rice Lake
Condition: Good (some wear)

Artifact(s) Description:

Date Received: August 20, 2018
ID / Asset Number: N/A
Class Specification: NIST Class F
Material: CI & SS

Reference Standards Used:
NSL lb standards
OPI & /Den Metric

Procedure Used:
NIST HB 6969, SOP 8

Metrologist:
JPL

Equipment Used:
Mettler KA30-3
Sartorius CC10000S

Environmental Cond. **Temp:** 22.6 °C **Pressure:** 769.62 mmHg **Relative Humidity:** 57.5 %

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 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: August 21, 2018 | **Certificate Number:** 2018-074-1

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)
15 lb	WM 15-5	-0.495	n	-0.495	0.081	2	0.68	7.2
15 lb	WM15-6	-0.469	n	-0.469	0.081	2	0.68	7.2
25 lb	NE-61	-0.36	n	-0.36	0.14	2	1.1	7.2
25 lb	NE-62	-0.41	n	-0.41	0.14	2	1.1	7.2
25 lb	NE-63	-0.02	n	-0.02	0.14	2	1.1	7.2
25 lb	NE-64	-0.08	n	-0.08	0.14	2	1.1	7.2
25 lb	NE-65	-0.12	n	-0.12	0.14	2	1.1	7.2
25 lb	NE-66	-0.81	n	-0.81	0.14	2	1.1	7.2
25 lb	NE-67	-0.28	n	-0.28	0.14	2	1.1	7.2
25 lb	NE-68	0.21	n	0.21	0.14	2	1.1	7.2
25 lb	NE-69	-0.21	n	-0.21	0.14	2	1.1	7.2
25 lb	NE-70	-0.62	n	-0.62	0.14	2	1.1	7.2
25 lb	NE-71	-0.65	n	-0.65	0.14	2	1.1	7.2
25 lb	NE-72	0.35	n	0.35	0.14	2	1.1	7.2
25 lb	NE-73	0.05	n	0.05	0.14	2	1.1	7.2
25 lb	NE-74	0.42	n	0.42	0.14	2	1.1	7.2
25 lb	NE-75	-0.23	n	-0.23	0.14	2	1.1	7.2
25 lb	NE-76	-0.52	n	-0.52	0.14	2	1.1	7.2
25 lb	NE-77	-0.51	n	-0.51	0.14	2	1.1	7.2
25 lb	NE-78	-0.04	n	-0.04	0.14	2	1.1	7.2
25 lb	NE-79	0.29	n	0.29	0.14	2	1.1	7.2
25 lb	NE-80	0.58	n	0.58	0.14	2	1.1	7.2
4 kg	2	-0.004	n	-0.004	0.048	2	0.4	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*

8/22/2018
Date of Issue

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Calibration Certificate of Mass

Calibration Date: August 21, 2018 | **Certificate Number:** 2018-074-2

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

Point of Contact: Gary Kliment
Ph. 402-471-3422
email: *gary.kliment@nebraska.gov*
PO Number: N/A

Test Item(s):	(1)-31 lb weight kit	**Date Received:**	August 20, 2018
Serial Number(s):	NSL-1A96	**ID / Asset Number:**	N/A
Manufacture:	Tromner	**Class Specification:**	NIST Class F
Condition:	Good (some 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 CC 1201 Sartorius CCE6
Mettler AT 106

Environmental Cond. **Temp:** 22.1 °C **Pressure:** 769.62 mmHg **Relative Humidity:** 54 %

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 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: August 21, 2018 | **Certificate Number: 2018-074-2**

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)
2 lb	1	-0.023	n	-0.023	0.011	2	0.091	7.84
2 lb	2	-0.020	n	-0.020	0.011	2	0.091	7.84
2 lb	3	-0.012	n	-0.012	0.011	2	0.091	7.84
2 lb	4	-0.024	n	-0.024	0.011	2	0.091	7.84
2 lb	5	-0.020	n	-0.020	0.011	2	0.091	7.84
2 lb	6	-0.007	n	-0.007	0.011	2	0.091	7.84
2 lb	7	0.009	n	0.009	0.011	2	0.091	7.84
2 lb	8	0.013	n	0.013	0.011	2	0.091	7.84
2 lb	9	-0.024	n	-0.024	0.011	2	0.091	7.84
2 lb	10	-0.004	n	-0.004	0.011	2	0.091	7.84
2 lb	11	-0.005	n	-0.005	0.011	2	0.091	7.84
2 lb	12	-0.021	n	-0.021	0.011	2	0.091	7.84
2 lb	13	0.019	n	0.019	0.011	2	0.091	7.84
2 lb	14	0.005	n	0.005	0.011	2	0.091	7.84
1 lb		0.0059	n	0.0059	0.0083	2	0.07	7.84
1 lb	2	-0.0074	n	-0.0074	0.0083	2	0.07	7.84
0.2 lb		0.0082	n	0.0082	0.0022	2	0.018	7.84
0.2 lb	*	0.0092	n	0.0092	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		0.00047	n	0.00047	0.00054	2	0.0045	7.84
0.02 lb		0.00077	n	0.00077	0.00022	2	0.0018	7.84
0.02 lb	*	0.00069	n	0.00069	0.00022	2	0.0018	7.84
0.01 lb		0.00077	n	0.00077	0.00018	2	0.0015	7.84
0.005 lb		0.00069	n	0.00069	0.00014	2	0.0012	2.7
0.002 lb		0.00008	n	0.00008	0.00011	2	0.00087	2.7
0.002 lb	*	-0.00018	n	-0.00018	0.00011	2	0.00087	2.7
0.001 lb		0.000145	n	0.000145	0.000083	2	0.0007	2.7
8 oz		0.0039	n	0.0039	0.0054	2	0.045	7.84
4 oz		0.0015	n	0.0015	0.0028	2	0.023	7.84
2 oz		0.0011	n	0.0011	0.0013	2	0.011	7.84
1 oz		0.00053	n	0.00053	0.00064	2	0.0054	7.84
1/2 oz		0.00114	n	0.00114	0.00034	2	0.0028	7.84
1/4 oz		0.00088	n	0.00088	0.00021	2	0.0017	7.84
1/8 oz		0.00051	n	0.00051	0.00016	2	0.0013	7.84
1/16 oz		0.00083	n	0.00083	0.00014	2	0.0011	7.84
1/16 oz	*	-0.00048	n	-0.00048	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*

8/22/2018
Date of Issue

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Calibration Certificate of Mass

Calibration Date: August 21, 2018 | **Certificate Number:** 2018-074-3

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

Point of Contact: Gary Kliment
Ph. 402-471-3422
email: *gary.kliment@nebraska.gov*
PO Number: N/A

Test Item(s):	(1)-8 lb weight kit	**Date Received:**	August 20, 2018
Serial Number(s):	10-OPI-10	**ID / Asset Number:**	N/A
Manufacture:	Tromner	**Class Specification:**	NIST Class F
Condition:	Good (some 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 CC 1201 Sartorius CCE6
Mettler AT 106

Environmental Cond. **Temp:** 22.7 °C **Pressure:** 769.62 mmHg **Relative Humidity:** 55 %

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 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

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Calibration Date: August 21, 2018 | **Certificate Number:** 2018-074-3

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 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	-0.020	n	-0.020	0.011	2	0.091	7.84
1 lb		-0.0394	n	-0.0394	0.0083	2	0.07	7.84
0.3 lb		0.0060	n	0.0060	0.0032	2	0.027	7.84
0.2 lb		-0.0052	n	-0.0052	0.0022	2	0.018	7.84
0.1 lb		-0.0013	n	-0.0013	0.0011	2	0.0091	7.84
0.05 lb		0.00238	n	0.00238	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		-0.00113	n	-0.00113	0.00022	2	0.0018	7.84
0.01 lb		0.00091	n	0.00091	0.00018	2	0.0015	7.84
0.005 lb		0.00102	n	0.00102	0.00014	2	0.0012	2.7
0.003 lb		0.00015	n	0.00015	0.00012	2	0.00099	2.7
0.002 lb		-0.00061	n	-0.00061	0.00011	2	0.00087	2.7
0.001 lb		0.000065	n	0.000065	0.000083	2	0.0007	2.7
0.001 lb	*	0.000101	n	0.000101	0.000083	2	0.0007	2.7
8 oz		0.0059	n	0.0059	0.0054	2	0.045	7.84
4 oz		0.0060	n	0.0060	0.0028	2	0.023	7.84
2 oz		0.0013	n	0.0013	0.0013	2	0.011	7.84
1 oz		0.00120	n	0.00120	0.00064	2	0.0054	7.84
1/2 oz		0.00179	n	0.00179	0.00034	2	0.0028	7.84
1/4 oz		0.00122	n	0.00122	0.00021	2	0.0017	7.84
1/8 oz		0.00006	y	-0.00030	0.00016	2	0.0013	7.84
1/16 oz		0.00058	n	0.00058	0.00014	2	0.0011	7.84
1/16 oz	*	0.00041	n	0.00041	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*

8/22/2018
Date of Issue

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Calibration Date: 8/21/2018

Certificate of Calibration of Volume Transfer

Certificate Number: 2018-074-4

Items Submitted:

Quantity	Nominal Volume	Manufacturer	Type
2	5 gal	Seraphin	Test Measures

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

POC: Gary Kliment
402-471-2087
gary.kliment@nebraska.gov

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	39423 H	SS	0.0000265	**4.99902 gal**	**4.99902 gal**	0.00065 gal	2.02
5 gal	39423 G	SS	0.0000265	**4.99859 gal**	**4.99859 gal**	0.00065 gal	2.02

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 and 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:

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. 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.

Pertinent Information:

The artifact(s) listed above 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.

Condition of Item(s) Submitted for Calibration:
Minor wear

Treatment of Item(s) before Calibration:
Item(s) were tested as found

Laboratory Reference Standard Used;
5 gal SP NE 1586

Procedure Used:
NISTIR 7383, SOP 19

Environmental conditions at time of calibration:

Temp ˚C	22.0	Humidity %	60.0
Pressure mmHg	768.85		

Water temperature at time of calibration:
68.34 °F

Date Submitted: 8/20/2018

Joel P. Lavicky, Metrologist — 8/20/2018 (Date:)

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Calibration Date: 8/21/2018

Certificate of Calibration of Volume Transfer

Certificate Number: 2018-074-5

Items Submitted:

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

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

POC: Gary Kliment
402-471-2087
gary.kliment@nebraska.gov

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	9038034	SS	0.0000265	**4.9986 gal**	**4.9986 gal**	0.00065 gal	2.02
5 gal	9038035	SS	0.0000265	**4.99859 gal**	**4.99859 gal**	0.00065 gal	2.02
5 gal	9038036	SS	0.0000265	**4.99858 gal**	**4.99858 gal**	0.00065 gal	2.02

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 and 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:

The artifact(s) listed above 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.

Condition of Item(s) Submitted for Calibration:
Minor wear

Treatment of Item(s) before Calibration:
Item(s) were tested as found

Environmental conditions at time of calibration:

Temp ˚C	22.0	Humidity %	60.0
Pressure mmHg	768.85		

Laboratory Reference Standard Used;
5 gal SP NE 1586

Procedure Used:
NISTIR 7383, SOP 19

Water temperature at time of calibration:
69.01 °F

Date Submitted: 8/20/2018

Joel P. Lavicky, Metrologist

8/22/2018
Date: