

Calibration Date: 9/5/2017

**Certificate of Calibration
of Volume Transfer**

Certificate Number: 2017-021-1

Items Submitted:

Quantity	Nominal Volume	Manufacturer	Type
2	5 gal	Sensitive Measurement	2 " Neck Test Measure

Submitted By: FSCP Area 50

Box 202
1405 Chase Ave
Creighton, NE 68729

POC: Tom Demuth
402-326-1300

Test Results

Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (1/°F)	As Found Volume Delivered @ 60 °F	As left Volume Delivered @ 60 °F	Uncertainty (U)	(k)
5 gal	87280	SS	0.0000265	4.999 gal	4.999 gal	0.00048 gal	2.03
5 gal	87276	SS	0.0000265	4.99967 gal	4.99967 gal	0.00048 gal	2.03

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

Laboratory Reference Standard Used:

5 gal SP NE 1586

Treatment of Item(s) before Calibration:

Item(s) were tested as found

Procedure Used:

NISTIR 7383 (2017), SOP 19

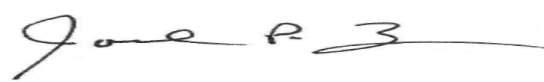
Environmental conditions at time of calibration:

Temp °C	21.9	Humidity %	47.0
Pressure mmHg	769.37		

Water temperature at time of calibration:

68.69 °F

Date Submitted: 8/31/2017



Joel P. Lavicky, Metrologist

9/5/2017

Date:

This document does not represent or imply endorsement by the State of Nebraska, The Nebraska Standards Laboratory or NIST. This document may not be reproduced, except in full, without the written permission of the Nebraska Standards Laboratory

Calibration Date: 9/5/2017

**Certificate of Calibration
of Volume Transfer**

Certificate Number: 2017-021-2

Items Submitted:

Quantity	Nominal Volume	Manufacturer	Type
3	5 gal	Sensitive Measurement	"Special" J Bottom drain prover

Submitted By: FSCP Area 50
Box 202
1405 Chase Ave
Creighton, NE 68729
POC: Tom Demuth
402-326-1300

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	236	SS	0.0000265	4.99989 gal	4.99989 gal	0.00061 gal	2.03
5 gal	237	SS	0.0000265	4.99884 gal	4.99884 gal	0.00061 gal	2.03
5 gal	238	SS	0.0000265	5.00085 gal	5.00085 gal	0.00061 gal	2.03

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

Laboratory Reference Standard Used:

5 gal SP NE 1586

Treatment of Item(s) before Calibration:

Item(s) were tested as found

Procedure Used:

NISTIR 7383 (2017), SOP 19

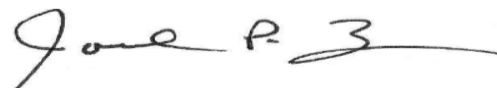
Environmental conditions at time of calibration:

Temp °C	21.9	Humidity %	47.0
Pressure mmHg	769.37		

Water temperature at time of calibration:

68.69 °F

Date Submitted: 8/31/2017


Joel P. Lavicky, Metrologist

9/5/2017

Date:

This document does not represent or imply endorsement by the State of Nebraska, The Nebraska Standards Laboratory or NIST. This document may not be reproduced, except in full, without the written permission of the Nebraska Standards Laboratory

Calibration Certificate of Mass

Calibration Date: September 6, 2017

Certificate Number: 2017-021-3

Submitted By: FSCP Area 50
Box 202 1405 Chase Ave
Norfolk, NE 68729

Point of Contact: Tom Demuth
Ph. 402-326-1300
email: tom.demuth@nebraska.gov
PO Number: none

Test Item(s): 1-4 kg, 2-15 lb, 20-25 lb weights	Artifact(s) Description:	Date Received: August 31, 2017
Serial Number(s): See page 2		ID / Asset Number: N/A
Manufacture: Tromner		Class Specification: NIST Class F
Condition: Good (some wear)		Material: SS and CI

Reference Standards Used:

Procedure Used:

Equipment Used:

OPI & /Den Metric
NSL lb standards

NIST HB 6969, SOP 8
Metrologist:
JPL

Sartorius CC10000S
Mettler KA30-3

Environmental Cond. **Temp:** 21.9 °C **Pressure:** 767.842 mmHg **Relative Humidity:** 49 %

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.

Calibration Date: September 6, 2017

Certificate Number: 2017-021-3

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/cm ³)
4 kg		0.058	n	0.058	0.048	2	0.4	7.84
15 lb	WM15-13	-2.40	y	-0.44	0.14	2	0.68	7.2
15 lb	WM15-14	-1.58	y	-0.14	0.14	2	0.68	7.2
25 lb	NE-81	-1.56	y	-0.61	0.14	2	1.1	7.84
25 lb	NE-82	-0.23	y	-0.23	0.14	2	1.1	7.84
25 lb	NE-83	-1.46	y	-0.77	0.14	2	1.1	7.84
25 lb	NE-94	-2.17	y	-0.96	0.14	2	1.1	7.84
25 lb	NE-99	-1.29	y	-0.79	0.14	2	1.1	7.84
25 lb	NE-100	-0.94	y	-0.94	0.14	2	1.1	7.84
25 lb	WM25-27	-1.08	y	-0.62	0.14	2	1.1	7.84
25 lb	WM25-29	-1.65	y	-0.90	0.14	2	1.1	7.84
25 lb	WM25-65	-1.04	y	-0.45	0.14	2	1.1	7.84
25 lb	WM25-66	-1.13	y	-0.53	0.14	2	1.1	7.84
25 lb	WM25-67	-0.87	y	0.02	0.14	2	1.1	7.84
25 lb	WM25-68	-1.03	y	-0.56	0.14	2	1.1	7.84
25 lb	WM25-69	-1.19	y	-0.66	0.14	2	1.1	7.84
25 lb	WM25-70	0.00	y	0.00	0.14	2	1.1	7.84
25 lb	WM25-71	-0.93	y	-0.93	0.14	2	1.1	7.84
25 lb	WM25-72	-0.57	y	-0.57	0.14	2	1.1	7.84
25 lb	WM25-73	0.09	y	0.09	0.14	2	1.1	7.84
25 lb	WM25-74	0.12	y	0.12	0.14	2	1.1	7.84
25 lb	WM25-106	-0.18	y	-0.18	0.14	2	1.1	7.84
25 lb	WM25-113	-0.99	y	-0.34	0.14	2	1.1	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

9/7/2017

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.

Calibration Certificate of Mass

Calibration Date: September 6, 2017

Certificate Number: 2017-021-4

Submitted By: FSCP Area 50
Box 202 1405 Chase Ave
Norfolk, NE 68729

Point of Contact: Tom Demuth
Ph. 402-326-1300
email: tom.demuth@nebraska.gov
PO Number: none

Test Item(s): 31 lb weight kit	Artifact(s) Description:	Date Received: August 31, 2017
Serial Number(s): 12A9		ID / Asset Number: N/A
Manufacture: Tromner		Class Specification: NIST Class F
Condition: Good (some wear)		Material: Stainless Steel

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:** 22.05 °C **Pressure:** 767.842 mmHg **Relative Humidity:** 50 %

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.

Calibration Date: September 6, 2017

Certificate Number: 2017-021-4

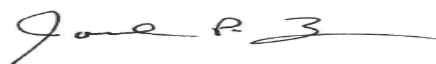
Calibration Results

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	-0.083	y	0.037	0.011	2	0.091	7.84
2 lb	2	-0.045	n	-0.045	0.011	2	0.091	7.84
2 lb	3	-0.035	n	-0.035	0.011	2	0.091	7.84
2 lb	4	-0.048	n	-0.048	0.011	2	0.091	7.84
2 lb	5	-0.019	n	-0.019	0.011	2	0.091	7.84
2 lb	6	-0.009	n	-0.009	0.011	2	0.091	7.84
2 lb	7	0.004	n	0.004	0.011	2	0.091	7.84
2 lb	8	-0.044	n	-0.044	0.011	2	0.091	7.84
2 lb	9	-0.018	n	-0.018	0.011	2	0.091	7.84
2 lb	10	0.005	n	0.005	0.011	2	0.091	7.84
2 lb	11	-0.031	n	-0.031	0.011	2	0.091	7.84
2 lb	12	-0.026	n	-0.026	0.011	2	0.091	7.84
2 lb	13	-0.017	n	-0.017	0.011	2	0.091	7.84
2 lb	14	0.015	n	0.015	0.011	2	0.091	7.84
1 lb	1	-0.0417	n	-0.0417	0.0083	2	0.07	7.84
1 lb	2	-0.0325	n	-0.0325	0.0083	2	0.07	7.84
8 oz		-0.0003	n	-0.0003	0.0054	2	0.045	7.84
4 oz		-0.0085	n	-0.0085	0.0028	2	0.023	7.84
2 oz		-0.0021	n	-0.0021	0.0013	2	0.011	7.84
1 oz		0.00037	n	0.00037	0.00064	2	0.0054	7.84
1/2 oz		0.00050	n	0.00050	0.00034	2	0.0028	7.84
1/8 oz		0.00018	n	0.00018	0.00016	2	0.0013	7.84
1/16 oz		0.00060	n	0.00060	0.00013	2	0.0011	7.84
1/16 oz	*	0.00028	n	0.00028	0.00013	2	0.0011	7.84
0.3 lb		-0.0201	n	-0.0201	0.0032	2	0.027	7.84
0.2 lb		-0.0142	n	-0.0142	0.0022	2	0.018	7.84
0.1 lb		-0.0020	n	-0.0020	0.0011	2	0.0091	7.84
0.05 lb	*	0.00156	n	0.00156	0.00054	2	0.0045	7.84
0.02 lb		0.00018	n	0.00018	0.00022	2	0.0018	7.84
0.01 lb		-0.00064	n	-0.00064	0.00018	2	0.0015	7.84
0.005 lb		-0.00002	n	-0.00002	0.00015	2	0.0012	2.7
0.003 lb		0.00060	n	0.00060	0.00012	2	0.00099	2.7
0.002 lb		0.00002	n	0.00002	0.00011	2	0.00087	2.7
0.001 lb		0.000023	n	0.000023	0.000083	2	0.0007	2.7
0.001 lb	*	-0.000172	n	-0.000172	0.000083	2	0.0007	2.7

Conversion Factors

1 ounce (avoirdupois) (oz) = 28.349 52 g

1 pound (avoirdupois) (lb) = 453.592 37 g exactly



Joel P. Lavicky Metrologist

9/7/2017

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.

Calibration Certificate of Mass

Calibration Date: September 6, 2017

Certificate Number: 2017-021-5

Submitted By: FSCP Area 50
Box 202 1405 Chase Ave
Norfolk, NE 68729

Point of Contact: Tom Demuth
Ph. 402-326-1300
email: tom.demuth@nebraska.gov
PO Number: none

Test Item(s): Decimal lb weight Kit
Serial Number(s): N-99-A
Manufacture: Rice lake
Condition: Good (some wear)

Artifact(s) Description:

Date Received: August 31, 2017

ID / Asset Number: N/A

Class Specification: NIST Class F

Material: Stainless Steel

Reference Standards Used:

NSL lb standards

Procedure Used:

NIST HB 6969, SOP 8

Metrologist:

JPL

Equipment Used:

Mettler AT 106

Sartorius CCE6

Environmental Cond. **Temp:** 22.05 °C **Pressure:** 767.842 mmHg **Relative Humidity:** 50 %

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.

Calibration Date: September 6, 2017

Certificate Number: 2017-021-5

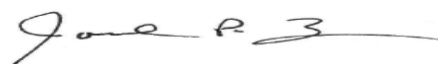
Calibration Results

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)
0.2 lb		0.0048	n	0.0048	0.0022	2	0.018	7.84
0.2 lb	*	0.0050	n	0.0050	0.0022	2	0.018	7.84
0.1 lb		0.0019	n	0.0019	0.0011	2	0.0091	7.84
0.05 lb		-0.00136	n	-0.00136	0.00054	2	0.0045	7.84
0.02 lb		-0.00084	n	-0.00084	0.00022	2	0.0018	7.84
0.02 lb	*	-0.00043	n	-0.00043	0.00022	2	0.0018	7.84
0.01 lb		0.00053	n	0.00053	0.00018	2	0.0015	7.84
0.005 lb		-0.00077	n	-0.00077	0.00015	2	0.0012	2.7
0.003 lb		0.00060	n	0.00060	0.00012	2	0.00099	2.7
0.002 lb		-0.00029	n	-0.00029	0.00011	2	0.00087	2.7
0.002 lb	*	0.00043	n	0.00043	0.00011	2	0.00087	2.7
0.001 lb		0.000489	n	0.000489	0.000083	2	0.0007	2.7

Conversion Factors

1 ounce (avoirdupois) (oz) = 28.349 52 g

1 pound (avoirdupois) (lb) = 453.592 37 g exactly



Joel P. Lavicky Metrologist

9/7/2017

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.