Agricultural Laboratory
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Kansas
Department of Agriculture
agriculture.ks.gov

Office of the Secretary
900 SW Jackson, Room 456
Topeka, Kansas 66612
(785) 296-3556

Jackie McClaskey, Secretary

Governor Sam Brownback

Expires on: 1/13/2017

Kansas Metrology Laboratory
Calibration Report

Report Number: K15208

Submitted by: Nebraska Department Of Agriculture Food Safety & Consumer Pro
Po Box 94757
Lincoln NE 68509

Submitted on: 1/11/2016

Item(s)

Tested	Adjusted	Rejected
5	5	0

Quantity	Nominal Volume	Type
3	5 gal	Bottom Drop Test Measure "To Deliver"
2	5 gal	Handheld Test Measure "To Deliver"

The calibration of items is performed according to NISTIR 7383, SOP 19 Volume Transfer. Tolerances are applied from NISTHB 105-3. The volume applies when a 10 second drain is observed for 5 gallon hand held test measures. For 5 gallon bottom drop test measures and provers a 30 second drain applies. The drain time starts when the cessation of the main flow is observed.

Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (/°F)	**Volume as Found @ 60 °F**	Tolerance ±	Expanded Uncertainty (U), (k=2.02), ±	**Volume as Left @ 60 °F**	Adjusted/ In Tolerance/ Rejected
5 gal	39423G	Stainless Steel	0.0000265	**5.00265 gal**	0.00250 gal	0.00085 gal	**4.99962 gal**	Adjusted
5 gal	39423H	Stainless Steel	0.0000265	**5.00265 gal**	0.00250 gal	0.00085 gal	**5.00006 gal**	Adjusted
5 gal	9038034	Stainless Steel	0.0000265	**5.00447 gal**	0.00250 gal	0.00088 gal	**5.00144 gal**	Adjusted
5 gal	9038035	Stainless Steel	0.0000265	**5.00577 gal**	0.00250 gal	0.00088 gal	**5.00014 gal**	Adjusted
5 gal	9038036	Stainless Steel	0.0000265	**5.00525 gal**	0.00250 gal	0.00088 gal	**5.00005 gal**	Adjusted

The data in the above table of this report only applies to those items specifically listed on this report.

1 m^3=1 000 L=264.1720 gal

Temperature Corrections

Item	Temperature °F	in³
Temperature Correction for 5 gal Stainless Steel Test Measure (CCE= 0.0000265/°F)	-20	-2.45
	-15	-2.30
	-10	-2.14
	-5	-1.99
	0	-1.84
	5	-1.68
	10	-1.53
	15	-1.38
	20	-1.22
	25	-1.07
	30	-0.92
	35	-0.77
	40	-0.61
	45	-0.46
	50	-0.31
	55	-0.15
	60	0.00
	65	0.15
	70	0.31
	75	0.46
	80	0.61
	85	0.77
	90	0.92
	95	1.07
	100	1.22
	105	1.38
	110	1.53
	115	1.68
	120	1.84

Item	Temperature °F	in³
Temperature Correction for 5 gal Low Carbon Steel Test Measure (CCE= 0.0000186/°F)	-20	-1.72
	-15	-1.61
	-10	-1.50
	-5	-1.40
	0	-1.29
	5	-1.18
	10	-1.07
	15	-0.97
	20	-0.86
	25	-0.75
	30	-0.64
	35	-0.54
	40	-0.43
	45	-0.32
	50	-0.21
	55	-0.11
	60	0.00
	65	0.11
	70	0.21
	75	0.32
	80	0.43
	85	0.54
	90	0.64
	95	0.75
	100	0.86
	105	0.97
	110	1.07
	115	1.18
	120	1.29

CCE = Coefficient of Cubical Expansion

Uncertainty Statement:

The combined standard uncertainty includes the standard uncertainty reported for the standards, the standard uncertainty for the measurement process, the standard uncertainty for the water density equation (Metrologia Tanaka, et al), the standard uncertainty for any uncorrected errors associated with temperature correction (applies to length and volume values only), the standard uncertainty for reading the meniscus (when applicable), the standard uncertainty for viscosity, and a component of uncertainty to account for any observed deviations from NIST(The National Institute of Standards and Technology) values that are less than surveillance limits. The combined standard uncertainty is multiplied by the coverage factor (k-value) reported to give an expanded uncertainty, which defines an interval having a level of confidence of 95.45 percent. The k-value reported is based on the effective degrees of freedom as outlined in JCGM 100:2008 section G.4. The expanded uncertainty presented in this report is consistent with the 1993 ISO Guide to the Expression of Uncertainty in Measurement and follows NISTIR 6969, SOP 29. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Traceability Statement:

The Kansas Metrology Laboratory Standards are traceable to the SI through 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 laboratory test number identified above is the unique report number to be used in referencing measurement traceability for artifacts identified in this report only.

Condition of Item(s) Submitted for Testing:

Minor wear.

Treatment of Item(s) before Testing:

Item(s) were tested as found.

Water Temperature at Time of Test:

70.39 °F

Documentary Standards:

-NIST Handbook 105-3 (2010)

-NISTIR 7383 (2013), SOP 19

Environmental Conditions:

Temperature:	20.96 °C
Barometric Pressure:	724.26 mmHg
Relative Humidity:	29.5 %

Test Date: 1/14/2016

Due Date: 1/13/2017 -Per state statute K.S.A. 83-304(a).

Kevin Uphoff , Metrologist 1/14/2016

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Jackie McClaskey, Secretary

Governor Sam Brownback

Test Date: 1/14/2016

Kansas Metrology Laboratory
Certificate of Calibration

Test No.: K15208-1.2

Nebraska Department Of Agriculture
Food Safety & Consumer Protection
301 Centennial Mall South
Lincoln NE 68509

Manufacturer: Troemner
S/N: WM-G89-9
Number of Pieces: 12 of 23 total

Nominal Mass	Weight's Markings	Assumed Density (g/cm^3)	Conventional Mass As Found (g)	Conventional Mass As Left (g)	Expanded Uncertainty ± (mg)	In Tolerance Adjusted Rejected
500 mg	500 mg	7.84	0.5000415	0.5000415	0.0012	In Tolerance
200 mg	200 mg	7.84	0.20000861	0.20000861	0.00066	In Tolerance
200 mg	200 mg ●	7.84	0.20000193	0.20000193	0.00066	In Tolerance
100 mg	100 mg	7.84	0.09997093	0.09997093	0.00073	In Tolerance
50 mg	50	7.84	0.05000200	0.05000200	0.00042	In Tolerance
20 mg	20	2.7	0.02001750	0.02001750	0.00028	In Tolerance
20 mg	20 ●	2.7	0.02001660	0.02001660	0.00028	In Tolerance
10 mg	10	2.7	0.00999046	0.00999046	0.00039	In Tolerance
5 mg	5	2.7	0.00500234	0.00500234	0.00034	In Tolerance
2 mg	2	2.7	0.00200271	0.00200271	0.00031	In Tolerance
2 mg	2 ●	2.7	0.00199945	0.00199945	0.00031	In Tolerance
1 mg	1	2.7	0.00099483	0.00099483	0.00039	In Tolerance

This document certifies the above mentioned artifacts were compared to the Standards of the State of Kansas which are traceable to the National Institute of Standards and Technology. The conventional mass is the weight in normal air (1.2 mg/cm^3) at 20 °C versus the reference density of 8.0 g/cm^3 Calibration of listed items was performed according to NISTIR 6969, SOP 4 (Double Substitution) and/or NISTIR 5672, SOP 5 (3-1).

Tolerances were evaluated to ASTM Class 4. Surface finish and magnetism were not evaluted as it is assumed to be done by the manufacturer.

Uncertainty Statement:

The combined standard uncertainty includes the standard uncertainty reported for the; standards, tare weights, the standard uncertainty for the measurement process, the standard uncertainty for air buoyancy corrections as stated in OIML R111-1 [2004E] eq. C.6.3-1 , and a component of uncertainty to account for any observed deviations (Bias) from NIST (National Institute of Standards and Technology) values that are less than surveillance limits. Factors not considered in the evaluation: magnetism, weights are considered to meet magnetism specifications unless measurement aberrations are noted, balance eccentricity and linearity, these factors are considered as a part of the measurement assurance process when using a check standard with adequate degrees of freedom. The combined uncertainty is multiplied by the coverage factor (k-value) reported to give an expanded uncertainty, which defines an interval having a level of confidence of 95.45 percent. The coverage factor reported is based on the effective degrees of freedom as outlined in JCGM 100:2008 section G.4. The expanded uncertainty presented in this report is also consistent with and follows NISTIR 6969, SOP 29. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Uncertainty Analysis:

Nominal	S_p	$u_{S\ (k=1)}$	$u_{tare\ (k=1)}$	$u_{Air\ Buoyancy\ Eq.}$	ρ_{air}	Procedure
500 mg	0.000503	0.000255	No Tare	0.0000217	1.14356	SOP 5
200 mg	0.000284	0.000150	No Tare	0.00000869	1.14291	SOP 5
200 mg	0.000284	0.000150	No Tare	0.00000866	1.14370	SOP 5
100 mg	0.000324	0.000150	No Tare	0.00000433	1.14378	SOP 5
50 mg	0.000180	0.0000950	No Tare	0.00000217	1.14323	SOP 5
20 mg	0.000117	0.0000650	No Tare	0.0000216	1.14327	SOP 5
20 mg	0.000117	0.0000650	No Tare	0.0000216	1.14294	SOP 5
10 mg	0.000179	0.0000700	No Tare	0.0000109	1.14210	SOP 5
5 mg	0.000149	0.0000550	No Tare	0.00000545	1.14211	SOP 5
2 mg	0.000140	0.0000550	No Tare	0.00000218	1.14199	SOP 5
2 mg	0.000140	0.0000550	No Tare	0.00000218	1.14222	SOP 5
1 mg	0.000177	0.0000650	No Tare	0.00000109	1.14253	SOP 5

All values listed as a component of the overall uncertainty are in units of milligrams (mg) or (mg/cm^3).

Traceability Statement:

The Kansas Metrology Laboratory Standards are traceable to the SI through 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 laboratory test number identified above is the unique report number to be used in referencing measurement traceability for artifacts identified in this report only.

Condition of Item(s) Submitted for Testing: Minor wear.
Treatment of Item(s) before Testing: Item(s) were tested as found.
Documentary Standards: NIST Handbook 105 Series, NISTIR 6969, SOP 4, NISTIR 5672, SOP 5, & ASTM E 617-13 or OIML R111-1

Item(s) Received on: 1/11/2016
Item(s) Acclimated: 1/11/2016 12:40:00 PM

Environmental Conditions:

Temperature	Barometric Pressure	Relative Humidity
20.2 °C	724.73 mmHg	42.8 %

Values are averages recorded over the duration of testing

1/14/2016

Keith Arkenberg , Metrologist **Date**

KML Software Version: 8.3

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Jackie McClaskey, Secretary

Governor Sam Brownback

Test Date: 1/14/2016

Kansas Metrology Laboratory
Certificate of Calibration

Test No.: K15208-1.0

Nebraska Department Of Agriculture
Food Safety & Consumer Protection
301 Centennial Mall South
Lincoln NE 68509

Manufacturer: Troemner
S/N: 2
Number of Pieces: 1

Nominal Mass	Weight's Markings	Assumed Density (g/cm^3)	Conventional Mass As Found (g)	Conventional Mass As Left (g)	Expanded Uncertainty ± (mg)	In Tolerance Adjusted Rejected
4 kg	4 kg 2	7.84	3999.9972	3999.9972	3.7	In Tolerance

This document certifies the above mentioned artifacts were compared to the Standards of the State of Kansas which are traceable to the National Institute of Standards and Technology. The conventional mass is the weight in normal air (1.2 mg/cm^3) at 20 °C versus the reference density of 8.0 g/cm^3 Calibration of listed items was performed according to NISTIR 6969, SOP 4 (Double Substitution) and/or NISTIR 5672, SOP 5 (3-1).

Tolerances were evaluated to ASTM Class 4. Surface finish and magnetism were not evaluted as it is assumed to be done by the manufacturer.

Uncertainty Statement:

The combined standard uncertainty includes the standard uncertainty reported for the; standards, tare weights, the standard uncertainty for the measurement process, the standard uncertainty for air buoyancy corrections as stated in OIML R111-1 [2004E] eq. C.6.3-1 , and a component of uncertainty to account for any observed deviations (Bias) from NIST (National Institute of Standards and Technology) values that are less than surveillance limits. Factors not considered in the evaluation: magnetism, weights are considered to meet magnetism specifications unless measurement aberrations are noted, balance eccentricity and linearity, these factors are considered as a part of the measurement assurance process when using a check standard with adequate degrees of freedom. The combined uncertainty is multiplied by the coverage factor (k-value) reported to give an expanded uncertainty, which defines an interval having a level of confidence of 95.45 percent. The coverage factor reported is based on the effective degrees of freedom as outlined in JCGM 100:2008 section G.4. The expanded uncertainty presented in this report is also consistent with and follows NISTIR 6969, SOP 29. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Uncertainty Analysis:

Nominal	S_p	$u_{S\ (k=1)}$	$u_{tare\ (k=1)}$	$u_{Air\ Buoyancy\ Eq.}$	ρ_{air}	Procedure
4 kg	1.68	0.310	0.0535	0.0746	1.14037	SOP 4

All values listed as a component of the overall uncertainty are in units of milligrams (mg) or (mg/cm^3).

Traceability Statement:

The Kansas Metrology Laboratory Standards are traceable to the SI through 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 laboratory test number identified above is the unique report number to be used in referencing measurement traceability for artifacts identified in this report only.

Condition of Item(s) Submitted for Testing: Minor wear.
Treatment of Item(s) before Testing: Item(s) were tested as found.
Documentary Standards: NIST Handbook 105 Series, NISTIR 6969, SOP 4, NISTIR 5672, SOP 5, & ASTM E 617-13 or OIML R111-1

Item(s) Received on: 1/11/2016
Item(s) Acclimated: 1/11/2016 12:40:00 PM

Environmental Conditions:

Temperature	Barometric Pressure	Relative Humidity
20.3 °C	723.12 mmHg	44.5 %

Values are averages recorded over the duration of testing

1/14/2016
Keith Arkenberg , Metrologist **Date**

KML Software Version: 8.3

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Jackie McClaskey, Secretary

Governor Sam Brownback

Test Date: 1/12/2016

Kansas Metrology Laboratory
Certificate of Calibration

Test No.: K15208-1.1

Nebraska Department Of Agriculture
Food Safety & Consumer Protection
301 Centennial Mall South
Lincoln NE 68509

Manufacturer: Troemner
S/N: WM-G89-9
Number of Pieces: 11 of 23 total

Nominal Mass	Weight's Markings	Assumed Density (g/cm^3)	Conventional Mass As Found (g)	Conventional Mass As Left (g)	Expanded Uncertainty ± (mg)	In Tolerance Adjusted Rejected
300 g	300g	7.84	300.005159	300.005159	0.098	In Tolerance
200 g	200g	7.84	200.000559	200.000559	0.093	In Tolerance
100 g	100g	7.84	100.000313	100.000313	0.018	In Tolerance
50 g	50g	7.84	49.999960	49.999960	0.011	In Tolerance
30 g	30g	7.84	29.9999166	29.9999166	0.0064	In Tolerance
20 g	20	7.84	20.0006072	20.0006072	0.0055	In Tolerance
10 g	10	7.84	10.0003402	10.0003402	0.0050	In Tolerance
5 g	5	7.84	5.0001454	5.0001454	0.0024	In Tolerance
3 g	3	7.84	3.0001562	3.0001562	0.0031	In Tolerance
2 g	2	7.84	2.0000366	2.0000366	0.0024	In Tolerance
1 g	1	7.84	1.0000161	1.0000161	0.0013	In Tolerance

This document certifies the above mentioned artifacts were compared to the Standards of the State of Kansas which are traceable to the National Institute of Standards and Technology. The conventional mass is the weight in normal air (1.2 mg/cm^3) at 20 °C versus the reference density of 8.0 g/cm^3 Calibration of listed items was performed according to NISTIR 6969, SOP 4 (Double Substitution) and/or NISTIR 5672, SOP 5 (3-1).

Tolerances were evaluated to ASTM Class 4. Surface finish and magnetism were not evaluted as it is assumed to be done by the manufacturer.

Uncertainty Statement:

The combined standard uncertainty includes the standard uncertainty reported for the; standards, tare weights, the standard uncertainty for the measurement process, the standard uncertainty for air buoyancy corrections as stated in OIML R111-1 [2004E] eq. C.6.3-1 , and a component of uncertainty to account for any observed deviations (Bias) from NIST (National Institute of Standards and Technology) values that are less than surveillance limits. Factors not considered in the evaluation: magnetism, weights are considered to meet magnetism specifications unless measurement aberrations are noted, balance eccentricity and linearity, these factors are considered as a part of the measurement assurance process when using a check standard with adequate degrees of freedom. The combined uncertainty is multiplied by the coverage factor (k-value) reported to give an expanded uncertainty, which defines an interval having a level of confidence of 95.45 percent. The coverage factor reported is based on the effective degrees of freedom as outlined in JCGM 100:2008 section G.4. The expanded uncertainty presented in this report is also consistent with and follows NISTIR 6969, SOP 29. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Uncertainty Analysis:

Nominal	S_p	$u_{S\ (k=1)}$	$u_{tare\ (k=1)}$	$u_{Air\ Buoyancy\ Eq.}$	ρ_{air}	Procedure
300 g	0.0408	0.0172	No Tare	-0.00312	1.16684	SOP 5
200 g	0.0408	0.0121	No Tare	-0.00210	1.16734	SOP 5
100 g	0.00151	0.00907	No Tare	-0.00106	1.16829	SOP 5
50 g	0.00238	0.00470	No Tare	-0.000482	1.16837	SOP 5
30 g	0.00109	0.00302	No Tare	-0.000290	1.16846	SOP 5
20 g	0.00158	0.00222	No Tare	-0.000194	1.16867	SOP 5
10 g	0.00160	0.00183	No Tare	-0.0000968	1.16860	SOP 5
5 g	0.000695	0.000970	No Tare	-0.0000457	1.16847	SOP 5
3 g	0.00125	0.000650	No Tare	-0.0000273	1.16814	SOP 5
2 g	0.00102	0.000495	No Tare	-0.0000177	1.16697	SOP 5
1 g	0.000459	0.000455	No Tare	-0.00000861	1.16613	SOP 5
500 g	0.0538	0.0273	No Tare	-0.00527	1.16774	SOP 5

All values listed as a component of the overall uncertainty are in units of milligrams (mg) or (mg/cm^3).

Traceability Statement:

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Condition of Item(s) Submitted for Testing: Minor wear.
Treatment of Item(s) before Testing: Item(s) were tested as found.
Documentary Standards: NIST Handbook 105 Series, NISTIR 6969, SOP 4, NISTIR 5672, SOP 5, & ASTM E 617-13 or OIML R111-1

Item(s) Received on: 1/11/2016
Item(s) Acclimated: 1/11/2016 2:03:00 PM

Environmental Conditions:

Temperature	Barometric Pressure	Relative Humidity
20.3 °C	739.87 mmHg	44.4 %

Values are averages recorded over the duration of testing

1/14/2016

Keith Arkenberg , Metrologist **Date**

KML Software Version: 8.3

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Jackie McClaskey, Secretary

Governor Sam Brownback

Expires on: 1/12/2017

Kansas Metrology Laboratory
Calibration Report

Report Number: K15208

Submitted by:

Nebraska Department Of Agriculture
Food Safety & Consumer Protection
301 Centennial Mall South
Lincoln NE 68509

Submitted on: 1/11/2016

Item(s)

Tested	Adjusted	Rejected
83	3	0

Quantity	Nominal Mass	Type
20	25 lb	Weight(s)
2	15 lb	Weight(s)
25	2 lb to 0.001 lb 8 oz to 1/16 oz	Weight Kit
36	2 lb to 0.001 lb 8 oz to 1/16 oz	Weight Kit

The calibration of items is performed according to NISTIR 6969, SOP 8. Tolerances are applied from NISTHB 105-1.

Nominal Mass	Serial Number	**Conventional Mass as Found**	Tolerance ±	Expanded Uncertainty (U), (k=2), ±	**Conventional Mass as Left**	Adjusted/ In Tolerance/ Rejected
25 lb	NE-61	**11340.14 g**	1.1 g	0.17 g	**11340.14 g**	In Tolerance
25 lb	NE-62	**11339.60 g**	1.1 g	0.17 g	**11339.60 g**	In Tolerance
25 lb	NE-63	**11340.06 g**	1.1 g	0.17 g	**11340.06 g**	In Tolerance
25 lb	NE-64	**11339.85 g**	1.1 g	0.17 g	**11339.85 g**	In Tolerance
25 lb	NE-65	**11338.45 g**	1.1 g	0.17 g	**11339.97 g**	***Adjusted***
25 lb	NE-66	**11339.03 g**	1.1 g	0.17 g	**11339.03 g**	In Tolerance
25 lb	NE-67	**11339.54 g**	1.1 g	0.17 g	**11339.54 g**	In Tolerance
25 lb	NE-68	**11339.30 g**	1.1 g	0.17 g	**11339.30 g**	In Tolerance
25 lb	NE-69	**11339.53 g**	1.1 g	0.17 g	**11339.53 g**	In Tolerance
25 lb	NE-70	**11339.44 g**	1.1 g	0.17 g	**11339.44 g**	In Tolerance
25 lb	NE-71	**11339.79 g**	1.1 g	0.17 g	**11339.79 g**	In Tolerance
25 lb	NE-72	**11340.16 g**	1.1 g	0.17 g	**11340.16 g**	In Tolerance
25 lb	NE-73	**11339.08 g**	1.1 g	0.17 g	**11339.08 g**	In Tolerance

The data in the above table of this report only applies to those items specifically listed on this report.

453.59237 g = 1 lb
28.349523125 g = 1 oz

The calibration of items is performed according to NISTIR 6969, SOP 8. Tolerances are applied from NISTHB 105-1.

Nominal Mass	Serial Number	**Conventional Mass as Found**	Tolerance ±	Expanded Uncertainty (U), (k=2), ±	**Conventional Mass as Left**	Adjusted/ In Tolerance/ Rejected
25 lb	NE-74	**11340.28 g**	1.1 g	0.17 g	**11340.28 g**	In Tolerance
25 lb	NE-75	**11339.62 g**	1.1 g	0.17 g	**11339.62 g**	In Tolerance
25 lb	NE-76	**11339.61 g**	1.1 g	0.17 g	**11339.61 g**	In Tolerance
25 lb	NE-77	**11339.69 g**	1.1 g	0.17 g	**11339.69 g**	In Tolerance
25 lb	NE-78	**11339.60 g**	1.1 g	0.17 g	**11339.60 g**	In Tolerance
25 lb	NE-79	**11340.34 g**	1.1 g	0.17 g	**11340.34 g**	In Tolerance
25 lb	NE-80	**11340.42 g**	1.1 g	0.17 g	**11340.42 g**	In Tolerance

The data in the above table of this report only applies to those items specifically listed on this report.

453.59237 g = 1 lb
28.349523125 g = 1 oz

The calibration of items is performed according to NISTIR 6969, SOP 8. Tolerances are applied from NISTHB 105-1.

Nominal Mass	Serial Number	**Conventional Mass as Found**	Tolerance ±	Expanded Uncertainty (U), (k=2), ±	**Conventional Mass as Left**	Adjusted/ In Tolerance/ Rejected
15 lb	WM-15-5	**6803.072 g**	0.68 g	0.090 g	**6803.952 g**	***Adjusted***
15 lb	WM-15-6	**6803.232 g**	0.68 g	0.090 g	**6804.022 g**	***Adjusted***

The data in the above table of this report only applies to those items specifically listed on this report.

453.59237 g = 1 lb
28.349523125 g = 1 oz

The calibration of items is performed according to NISTIR 6969, SOP 8. Tolerances are applied from NISTHB 105-1.

Nominal Mass	Serial Number	Conventional Mass as Found	Tolerance ±	Expanded Uncertainty (U), (k=2), ±	Conventional Mass as Left	Adjusted/ In Tolerance/ Rejected
2 lb	10-OPI-10 1	**907.167 g**	0.091 g	0.011 g	**907.167 g**	In Tolerance
2 lb	10-OPI-10 2	**907.201 g**	0.091 g	0.011 g	**907.201 g**	In Tolerance
2 lb	10-OPI-10 3	**907.166 g**	0.091 g	0.011 g	**907.166 g**	In Tolerance
1 lb	10-OPI-10	**453.6009 g**	0.070 g	0.0084 g	**453.6009 g**	In Tolerance
0.3 lb	10-OPI-10	**136.0847 g**	0.027 g	0.0032 g	**136.0847 g**	In Tolerance
0.2 lb	10-OPI-10	**90.7144 g**	0.018 g	0.0021 g	**90.7144 g**	In Tolerance
0.1 lb	10-OPI-10	**45.3582 g**	0.0091 g	0.0011 g	**45.3582 g**	In Tolerance
0.05 lb	10-OPI-10	**22.68226 g**	0.0045 g	0.00055 g	**22.68226 g**	In Tolerance
0.03 lb	10-OPI-10	**13.60625 g**	0.0027 g	0.00032 g	**13.60625 g**	In Tolerance
0.02 lb	10-OPI-10	**9.07078 g**	0.0018 g	0.00022 g	**9.07078 g**	In Tolerance
0.01 lb	10-OPI-10	**4.53685 g**	0.0015 g	0.00018 g	**4.53685 g**	In Tolerance
0.005 lb	10-OPI-10	**2.26892 g**	0.0012 g	0.00015 g	**2.26892 g**	In Tolerance
0.003 lb	10-OPI-10	**1.36093 g**	0.00099 g	0.00012 g	**1.36093 g**	In Tolerance
0.002 lb	10-OPI-10	**0.90665 g**	0.00087 g	0.00011 g	**0.90665 g**	In Tolerance
0.001 lb	10-OPI-10	**0.453632 g**	0.00070 g	0.000094 g	**0.453632 g**	In Tolerance
0.001 lb	10-OPI-10 •	**0.453562 g**	0.00070 g	0.000094 g	**0.453562 g**	In Tolerance
8 oz	10 OPI 10	**226.8005 g**	0.045 g	0.0053 g	**226.8005 g**	In Tolerance
4 oz	10 OPI 10	**113.4039 g**	0.023 g	0.0028 g	**113.4039 g**	In Tolerance
2 oz	10 OPI 10	**56.7004 g**	0.011 g	0.0013 g	**56.7004 g**	In Tolerance
1 oz	10 OPI 10	**28.35073 g**	0.0054 g	0.00065 g	**28.35073 g**	In Tolerance
1/2 oz	10 OPI 10	**14.17652 g**	0.0028 g	0.00033 g	**14.17652 g**	In Tolerance
1/4 oz	10 OPI 10	**7.08860 g**	0.0017 g	0.00020 g	**7.08860 g**	In Tolerance
1/8 oz	10 OPI 10	**3.54367 g**	0.0013 g	0.00016 g	**3.54367 g**	In Tolerance
1/16 oz	10 OPI 10	**1.77249 g**	0.0011 g	0.00014 g	**1.77249 g**	In Tolerance
1/16 oz	10 OPI 10 •	**1.77228 g**	0.0011 g	0.00014 g	**1.77228 g**	In Tolerance

The data in the above table of this report only applies to those items specifically listed on this report.

453.59237 g = 1 lb

28.349523125 g = 1 oz

The calibration of items is performed according to NISTIR 6969, SOP 8. Tolerances are applied from NISTHB 105-1.

Nominal Mass	Serial Number	Conventional Mass as Found	Tolerance ±	Expanded Uncertainty (U), (k=2), ±	Conventional Mass as Left	Adjusted/ In Tolerance/ Rejected
2 lb	NSL-1A96 1	**907.170 g**	0.091 g	0.011 g	**907.170 g**	In Tolerance
2 lb	NSL-1A96 2	**907.172 g**	0.091 g	0.011 g	**907.172 g**	In Tolerance
2 lb	NSL-1A96 3	**907.126 g**	0.091 g	0.011 g	**907.126 g**	In Tolerance
2 lb	NSL-1A96 4	**907.180 g**	0.091 g	0.011 g	**907.180 g**	In Tolerance
2 lb	NSL-1A96 5	**907.168 g**	0.091 g	0.011 g	**907.168 g**	In Tolerance
2 lb	NSL-1A96 6	**907.171 g**	0.091 g	0.011 g	**907.171 g**	In Tolerance
2 lb	NSL-1A96 7	**907.199 g**	0.091 g	0.011 g	**907.199 g**	In Tolerance
2 lb	NSL-1A96 8	**907.202 g**	0.091 g	0.011 g	**907.202 g**	In Tolerance
2 lb	NSL-1A96 9	**907.165 g**	0.091 g	0.011 g	**907.165 g**	In Tolerance
2 lb	NSL-1A96 10	**907.186 g**	0.091 g	0.011 g	**907.186 g**	In Tolerance
2 lb	NSL-1A96 11	**907.185 g**	0.091 g	0.011 g	**907.185 g**	In Tolerance
2 lb	NSL-1A96 12	**907.168 g**	0.091 g	0.011 g	**907.168 g**	In Tolerance
2 lb	NSL-1A96 13	**907.245 g**	0.091 g	0.011 g	**907.245 g**	In Tolerance
2 lb	NSL-1A96 14	**907.195 g**	0.091 g	0.011 g	**907.195 g**	In Tolerance
1 lb	NSL-1A96	**453.5569 g**	0.070 g	0.0084 g	**453.5569 g**	In Tolerance
1 lb	NSL-1A96 2	**453.5879 g**	0.070 g	0.0084 g	**453.5879 g**	In Tolerance
0.2 lb	17647	**90.7269 g**	0.018 g	0.0021 g	**90.7269 g**	In Tolerance
0.2 lb	17647 •	**90.7279 g**	0.018 g	0.0021 g	**90.7279 g**	In Tolerance
0.1 lb	17647	**45.3635 g**	0.0091 g	0.0011 g	**45.3635 g**	In Tolerance
0.05 lb	17647	**22.67949 g**	0.0045 g	0.00055 g	**22.67949 g**	In Tolerance
0.02 lb	17647	**9.07262 g**	0.0018 g	0.00022 g	**9.07262 g**	In Tolerance
0.02 lb	17647 •	**9.07264 g**	0.0018 g	0.00022 g	**9.07264 g**	In Tolerance
0.01 lb	17647	**4.53670 g**	0.0015 g	0.00018 g	**4.53670 g**	In Tolerance
0.005 lb	17647	**2.26867 g**	0.0012 g	0.00015 g	**2.26867 g**	In Tolerance
0.002 lb	17647	**0.90732 g**	0.00087 g	0.00011 g	**0.90732 g**	In Tolerance
0.002 lb	17647 •	**0.90704 g**	0.00087 g	0.00011 g	**0.90704 g**	In Tolerance
0.001 lb	17647	**0.453712 g**	0.00070 g	0.000094 g	**0.453712 g**	In Tolerance
8 oz	NSL-1A96	**226.8005 g**	0.045 g	0.0053 g	**226.8005 g**	In Tolerance
4 oz	NSL-1A96	**113.3997 g**	0.023 g	0.0028 g	**113.3997 g**	In Tolerance
2 oz	NSL-1A96	**56.7002 g**	0.011 g	0.0013 g	**56.7002 g**	In Tolerance
1 oz	NSL-1A96	**28.35027 g**	0.0054 g	0.00065 g	**28.35027 g**	In Tolerance
1/2 oz	NSL-1A96	**14.17592 g**	0.0028 g	0.00033 g	**14.17592 g**	In Tolerance
1/4 oz	NSL-1A96	**7.08830 g**	0.0017 g	0.00020 g	**7.08830 g**	In Tolerance
1/8 oz	NSL-1A96	**3.54418 g**	0.0013 g	0.00016 g	**3.54418 g**	In Tolerance
1/16 oz	NSL-1A96	**1.77272 g**	0.0011 g	0.00014 g	**1.77272 g**	In Tolerance
1/16 oz	NSL-1A96 •	**1.77144 g**	0.0011 g	0.00014 g	**1.77144 g**	In Tolerance

The data in the above table of this report only applies to those items specifically listed on this report.

453.59237 g = 1 lb

28.349523125 g = 1 oz

Uncertainty Statement:

The combined standard uncertainty includes the standard uncertainty reported for the standard, the standard uncertainty for the measurement process, the standard uncertainty for any uncorrected errors associated with buoyancy corrections(applies to mass values only), the standard uncertainty for any uncorrected errors associated with temperature correction(applies to length and volume values only), and a component of uncertainty to account for any observed deviations from NIST(The National Institute of Standards and Technology) values that are less than surveillance limits. The combined standard uncertainty is multiplied by a coverage factor of 2 to give an expanded uncertainty, which defines an interval having a level of confidence of approximately 95 percent. The expanded uncertainty presented in this report is consistent with the 1993 ISO Guide to the Expression of Uncertainty in Measurement and follows NISTIR 6969, SOP 29. The expanded uncertainty is not to be confused with a tolerance limit for the user during application.

Traceability Statement:

The Kansas Metrology Laboratory Standards are traceable to the SI through 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 laboratory test number identified above is the unique report number to be used in referencing measurement traceability for artifacts identified in this report only.

Condition of Item(s) Submitted for Testing:

Minor wear.

Treatment of Item(s) before Testing:

Item(s) were tested as found.

Documentary Standards:

NIST Handbook 105 Series
NISTIR 6969: SOP 8, SOP 4, and/or SOP 7
OR
ASTM E 617-13 or OIML R 111-1 2004(E)

Environmental Conditions:

Temperature:	20.0 °C
Barometric Pressure:	734.51 mmHg
Relative Humidity:	44.9 %

Test Date: 1/13/2016
Due Date: 1/12/2017 -Per state statute K.S.A. 83-304(a).

Keith Arkenberg , Metrologist 1/14/2016