

Agricultural Laboratory
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(785) 296-7020



Office of the Secretary
900 SW Jackson, Room 456
Topeka, Kansas 66612
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Jackie McClaskey, Secretary

Governor Sam Brownback

Expires on: 3/21/2017

Kansas Metrology Laboratory Calibration Report

Report Number: K15271_RF1

Submitted on: 3/21/2016

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

Item(s)		
Tested	Adjusted	Rejected
1	0	0
Quantity	Nominal Volume	Type
1	100 gal	RF Prover, "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
100 gal	7861642	Stainless Steel	0.0000265	99.990 gal	0.050 gal	0.014 gal	99.990 gal	In Tolerance

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

1 m³=1 000 L=264.1720 gal

Temperature Correction

Item	Temperature °F	in ³
Temperature Correction for 100 gal Stainless Steel Prover (CCE= 0.0000265/°F)	-20	-49.0
	-15	-45.9
	-10	-42.9
	-5	-39.8
	0	-36.7
	5	-33.7
	10	-30.6
	15	-27.5
	20	-24.5
	25	-21.4
	30	-18.4
	35	-15.3
	40	-12.2
	45	-9.2
	50	-6.1
	55	-3.1
	60	0.0
	65	3.1
	70	6.1
	75	9.2
	80	12.2
	85	15.3
	90	18.4
	95	21.4
	100	24.5
	105	27.5
	110	30.6
	115	33.7
	120	36.7

CCE = Coefficient of Cubical Expansion

Expires on: 3/21/2017

Kansas Metrology Laboratory Report Number: K15271_RF1

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:

49.80 °F

Documentary Standards:

-NIST Handbook 105-3 (2010)

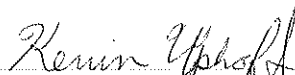
-NISTIR 7383 (2013), SOP 19

Environmental Conditions:

Temperature:	19.76 °C
Barometric Pressure:	731.51 mmHg
Relative Humidity:	28.5 %

Test Date: 3/21/2016

Due Date: 3/21/2017 -Per state statute K.S.A. 83-304(a).


Kevin Uphoff, Metrologist

3/23/2016



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Jackie McClaskey, Secretary

Governor Sam Brownback

Expires on: 3/21/2017

Kansas Metrology Laboratory Calibration Report

Report Number: K15271_RF2

Submitted on: 3/21/2016

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

Item(s)

Tested	Adjusted	Rejected
1	0	0

Quantity	Nominal Volume	Type
1	100 gal	RF Prover, "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
100 gal	888231102	Stainless Steel	0.0000265	99.982 gal	0.050 gal	0.014 gal	99.982 gal	In Tolerance

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

1 m³=1 000 L=264.1720 gal

Temperature Correction

Item	Temperature °F	in ³
Temperature Correction for 100 gal Stainless Steel Prover (CCE= 0.0000265/°F)	-20	-49.0
	-15	-45.9
	-10	-42.9
	-5	-39.8
	0	-36.7
	5	-33.7
	10	-30.6
	15	-27.5
	20	-24.5
	25	-21.4
	30	-18.4
	35	-15.3
	40	-12.2
	45	-9.2
	50	-6.1
	55	-3.1
	60	0.0
	65	3.1
	70	6.1
	75	9.2
	80	12.2
	85	15.3
	90	18.4
	95	21.4
	100	24.5
	105	27.5
	110	30.6
	115	33.7
	120	36.7

CCE = Coefficient of Cubical Expansion

Expires on: 3/21/2017

Kansas Metrology Laboratory

Report Number: K15271_RF2

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:

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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.

Water Temperature at Time of Test:

50.34 °F

Documentary Standards:


- NIST Handbook 105-3 (2010)
- NISTIR 7383 (2013), SOP 19

Environmental Conditions:

Temperature:	19.11 °C
Barometric Pressure:	730.81 mmHg
Relative Humidity:	29.7 %

Test Date: 3/21/2016

Due Date: 3/21/2017 -Per state statute K.S.A. 83-304(a).


Kevin Uphoff, Metrologist

3/23/2016



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Jackie McClaskey, Secretary

Governor Sam Brownback

Expires on: 3/23/2017

Kansas Metrology Laboratory Calibration Report

Report Number: K15271

Submitted on: 3/21/2016

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

Item(s)

Tested	Adjusted	Rejected
1	0	0
Quantity	Nominal Volume	Type
1	107 gal	LPG Prover "To Deliver"

The calibration of items is performed according to NISTIR 7383, SOP 21 Volume Transfer. Tolerances are applied from NISTHB 105-4. The volume applies when a 30 second drain is observed. The drain time starts when the level of the liquid is observed in the lower sight glass and continues while the level is bled down to zero. The level of the liquid shall be at zero and the valve closed at the end of the 30 seconds.

Drain Characteristics

Time	Applied Pressure psig	Method
11 min 21 s	0	Gravity

The time listed above is the total drain time which includes the 30 second drain time to the bottom zero.

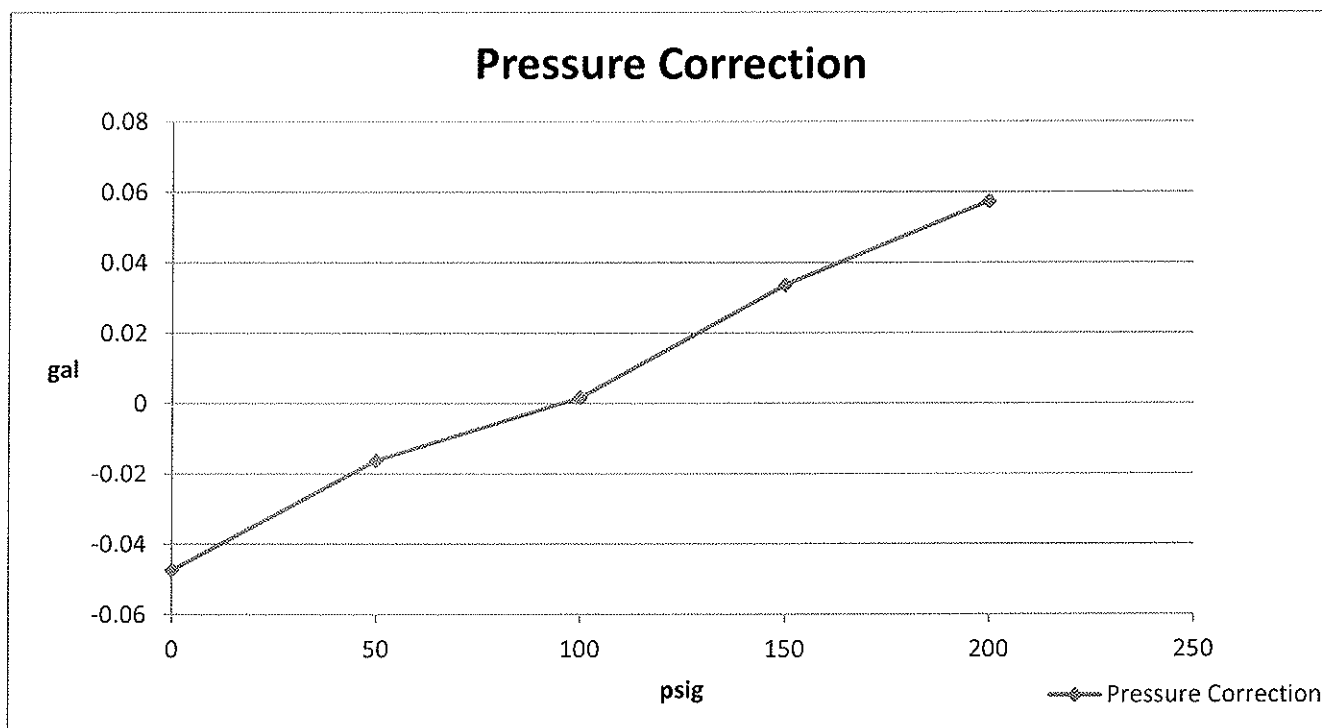
Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (1/°F)	Volume as Found @ 60 °F & 100 psig	Tolerance ±	Expanded Uncertainty (U), (k=2.05), ±	Volume as Left @ 60 °F & 100 psig	Adjusted/ In Tolerance/ Rejected
107 gal	3104	Low Carbon Steel Pressure Vessel	0.000016	106.825 gal	0.214 gal	0.013 gal	106.825 gal	In Tolerance

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

1 m³=1 000 L=264.1720 gal

Pressure Correction

Applied Pressure psig	Pressure Corection (gal)	Volume as Left @ 60 °F (gal)
0	-0.047	106.783
50	-0.016	106.814
100	0.002	106.832
150	0.034	106.864
200	0.057	106.888



Temperature Correction

Item	Temperature °F	gal
Temperature Correction for 107 gal Low Carbon Steel Pressure Vessel Prover (CCE= 0.000016/°F)	-20	-0.137
	-15	-0.128
	-10	-0.120
	-5	-0.111
	0	-0.103
	5	-0.094
	10	-0.086
	15	-0.077
	20	-0.068
	25	-0.060
	30	-0.051
	35	-0.043
	40	-0.034
	45	-0.026
	50	-0.017
	55	-0.009
	60	0.000
	65	0.009
	70	0.017
	75	0.026
	80	0.034
	85	0.043
	90	0.051
	95	0.060
	100	0.068
	105	0.077
	110	0.086
	115	0.094
	120	0.103

CCE = Coefficient of Cubical Expansion

Expires on: 3/23/2017

Kansas Metrology Laboratory

Report Number: K15271

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, the standard uncertainty of the pressure gauge, 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:

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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.

Water Temperature at Time of Test:

58.08 °F

Documentary Standards:


- NIST Handbook 105-4 (2010)
- NISTIR 7383 (2013), SOP 21

Environmental Conditions:

Temperature	22.91 °C
Barometric Pressure	719.31 mmHg
Relative Humidity	48.1 %

Test Date: 3/23/2016

Due Date: 3/23/2017 -Per state statute K.S.A. 83-304(a).


Kevin Uphoff, Metrologist

3/23/2016



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Jackie McClaskey, Secretary

Governor Sam Brownback

Expires on: 3/3/2017

Kansas Metrology Laboratory Calibration Report

Report Number: K15251

Submitted by:

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

Submitted on: 2/29/2016

Item(s)		
Tested	Adjusted	Rejected
84	21	1

Quantity	Nominal Mass	Type
21	1 000 lb	Weight(s)
20	50 lb	Weight(s)
8	25 lb	Weight(s)
1	2 kg	Weight(s)
18	5 lb, 1 lb 8 oz to 1/4 oz	Weight Kit
16	5 kg to 100 mg	Weight Kit

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Food Safety & Consumer Protection

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 \pm	Expanded Uncertainty (U), (k=2), \pm	Conventional Mass as Left	Adjusted/ In Tolerance/ Rejected
50 lb	A50-1	22680.33 g	2.3 g	0.32 g	22680.33 g	In Tolerance
50 lb	A50-11	22680.62 g	2.3 g	0.32 g	22680.62 g	In Tolerance
50 lb	A50-4	22681.08 g	2.3 g	0.32 g	22681.08 g	In Tolerance
50 lb	B-C-1	22681.22 g	2.3 g	0.32 g	22681.22 g	In Tolerance
50 lb	B-C-10	22681.13 g	2.3 g	0.32 g	22681.13 g	In Tolerance
50 lb	B-C-11	22678.80 g	2.3 g	0.32 g	22678.80 g	In Tolerance
50 lb	B-C-12	22680.37 g	2.3 g	0.32 g	22680.37 g	In Tolerance
50 lb	B-C-2	22678.88 g	2.3 g	0.32 g	22678.88 g	In Tolerance
50 lb	B-C-3	22678.41 g	2.3 g	0.32 g	22678.41 g	In Tolerance
50 lb	B-C-4	22679.02 g	2.3 g	0.32 g	22679.02 g	In Tolerance
50 lb	B-C-5	22677.98 g	2.3 g	0.32 g	22677.98 g	In Tolerance
50 lb	B-C-6	22679.44 g	2.3 g	0.32 g	22679.44 g	In Tolerance
50 lb	B-C-7	22677.22 g	2.3 g	0.32 g	22679.13 g	Adjusted
50 lb	B-C-8	22681.50 g	2.3 g	0.32 g	22681.50 g	In Tolerance
50 lb	B-C-9	22682.58 g	2.3 g	0.32 g	22679.89 g	Adjusted
50 lb	WM50-12	22678.49 g	2.3 g	0.32 g	22678.49 g	In Tolerance
50 lb	WM50-16	22681.23 g	2.3 g	0.32 g	22681.23 g	In Tolerance
50 lb	WM50-52	22361.59 g	2.3 g	0.32 g	22679.93 g	Adjusted
50 lb	WM50-53	22678.94 g	2.3 g	0.32 g	22678.94 g	In Tolerance
50 lb	WM50-7	22677.66 g	2.3 g	0.32 g	22677.66 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 \pm	Expanded Uncertainty (U), (k=2), \pm	Conventional Mass as Left	Adjusted/ In Tolerance/ Rejected
25 lb	WM-D15	11339.32 g	1.1 g	0.17 g	11339.32 g	In Tolerance
25 lb	WM-D23	11338.73 g	1.1 g	0.17 g	11339.81 g	Adjusted
25 lb	WM-D24	11339.39 g	1.1 g	0.17 g	11339.39 g	In Tolerance
25 lb	WM-D25	11338.46 g	1.1 g	0.17 g	11339.84 g	Adjusted
25 lb	WM-D26	11339.95 g	1.1 g	0.17 g	11339.95 g	In Tolerance
25 lb	WM-D28	11338.67 g	1.1 g	0.17 g	11340.30 g	Adjusted
25 lb	WM-D29	11339.14 g	1.1 g	0.17 g	11339.14 g	In Tolerance
25 lb	WM-D44	11339.43 g	1.1 g	0.17 g	11339.43 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 \pm (NIST Class F)	Expanded Uncertainty (U), (k=2), \pm	Conventional Mass as Left	Adjusted/ In Tolerance/ Rejected
5 lb	WM-2B86 1	2267.952 g	0.23 g	0.027 g	2267.952 g	In Tolerance
5 lb	WM-2B86 2	2267.984 g	0.23 g	0.027 g	2267.984 g	In Tolerance
5 lb	WM-2B86 3	2267.914 g	0.23 g	0.027 g	2267.914 g	In Tolerance
5 lb	WM-2B86 4	2267.952 g	0.23 g	0.027 g	2267.952 g	In Tolerance
5 lb	WM-2B86 5	2267.988 g	0.23 g	0.027 g	2267.988 g	In Tolerance
1 lb	WM-2B86 6	453.5889 g	0.070 g	0.0084 g	453.5889 g	In Tolerance
1 lb	WM-2B86 7	453.5649 g	0.070 g	0.0084 g	453.5649 g	In Tolerance
1 lb	WM-2B86 8	453.5929 g	0.070 g	0.0084 g	453.5929 g	In Tolerance
1 lb	WM-2B86 9	453.5639 g	0.070 g	0.0084 g	453.5639 g	In Tolerance
1 lb	WM-2B86 10	453.6059 g	0.070 g	0.0084 g	453.6059 g	In Tolerance
8 oz	WM-2B86 11	226.7915 g	0.045 g	0.0053 g	226.7915 g	In Tolerance
4 oz	WM-2B86 13	113.4121 g	0.023 g	0.0028 g	113.4121 g	In Tolerance
4 oz	WM-2B86	113.3791 g	0.023 g	0.0028 g	113.3791 g	In Tolerance
2 oz	WM-2B86 15	56.7088 g	0.011 g	0.0013 g	56.7020 g	Adjusted
1 oz	WM-2B86 16	28.34916 g	0.0054 g	0.00065 g	28.34916 g	In Tolerance
1/2 oz	WM-2B86	14.17459 g	0.0028 g	0.00033 g	14.17459 g	In Tolerance
1/4 oz	WM-2B86	7.08722 g	0.0017 g	0.00020 g	7.08722 g	In Tolerance
1/8 oz	WM-2B86	3.54380 g	0.0013 g	0.00016 g	3.54380 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 \pm (NIST Class F)	Expanded Uncertainty (U), (k=2), \pm	Conventional Mass as Left	Adjusted/ In Tolerance/ Rejected
2 kg	K2	1999.921 g	0.20 g	0.024 g	1999.921 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 \pm (NIST Class F)	Expanded Uncertainty (U), (k=2), \pm	Conventional Mass as Left	Adjusted/ In Tolerance/ Rejected
1 kg	WM-2-89-3	1000.050 g	0.10 g	0.012 g	1000.050 g	In Tolerance
500 g	WM-2-89-3	500.0391 g	0.070 g	0.0084 g	500.0391 g	In Tolerance
200 g	WM-2-89-3	200.0220 g	0.040 g	0.0048 g	200.0220 g	In Tolerance
200 g	WM-2-89-3 •	200.0203 g	0.040 g	0.0048 g	200.0203 g	In Tolerance
100 g	WM-2-89-3	99.9983 g	0.020 g	0.0024 g	99.9983 g	In Tolerance
50 g	WM-2-89-3	50.0062 g	0.010 g	0.0012 g	50.0062 g	In Tolerance
20 g	WM-2-89-3	20.00017 g	0.0040 g	0.00047 g	20.00017 g	In Tolerance
20 g	WM-2-89-3 •	19.99922 g	0.0040 g	0.00047 g	19.99922 g	In Tolerance
10 g	WM-2-89-3	10.00092 g	0.0020 g	0.00024 g	10.00092 g	In Tolerance
5 g	WM-2-89-3	4.99955 g	0.0015 g	0.00018 g	4.99955 g	In Tolerance
2 g	WM-2-89-3 •	2.00058 g	0.0011 g	0.00014 g	2.00058 g	In Tolerance
1 g	WM-2-89-3	1.00048 g	0.00090 g	0.00011 g	1.00048 g	In Tolerance
500 mg	WM-2-89-3	0.500482 g	0.00072 g	0.000096 g	0.500482 g	In Tolerance
200 mg	WM-2-89-3	0.200288 g	0.00054 g	0.000078 g	0.200288 g	In Tolerance
200 mg	WM-2-89-3 •	0.200298 g	0.00054 g	0.000078 g	0.200298 g	In Tolerance
100 mg	WM-2-89-3	0.099926 g	0.00043 g	0.000067 g	0.099926 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:

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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:

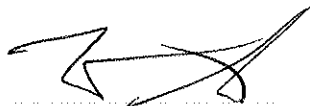
NIST Handbook 105 Series
NISTIR 6969: SOP 8, SOP 4, and/or SOP 7
OR
ASTM E 617-13 or OIML R 111-1 2004(E)

Environmental Conditions:

Temperature:	20.9 °C
Barometric Pressure:	735.14 mmHg
Relative Humidity:	44.5 %

Test Date: 3/3/2016

Due Date: 3/3/2017 -Per state statute K.S.A. 83-304(a).



Keith Arkenberg , Metrologist

3/3/2016



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Calibration Certificate

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Page 1 of 7 Pages
Weight

Certificate Number 883192X-1
Date of Calibration 18-JUL-2016

SECTION 1: NAME AND ADDRESS OF CUSTOMER

End user

State of Nebraska (Dept . Agr.)
Standards Lab/Wts Measure
3721 Wesr Cuming Street
Lincoln NE 68524

Client

Department of Agriculture
PO Box 94947
Lincoln NE 68509

SECTION 2: APPROVED SIGNATORY


Joseph Moran, Metrology Manager

SECTION 3: PERSON PERFORMING WORK

Lindim Bahtajari

SECTION 4: CERTIFICATE INFORMATION

Description of Masses: Grip Handle

Accuracy Class : NIST 105-1 Class F
Order Number : 675212ZO
Construction : Two Piece
Material : Cast Iron

Date Received : 26-AUG-2016
Date of Calibration : 18-JUL-2016
Date of Issue : 26-AUG-2016
Weight Range : 1000 lb

SECTION 5: ENVIRONMENTAL CONDITIONS DURING TEST

Temperature: 20.93 °C

Pressure: 763.20 mm Hg

Relative Humidity: 55%

SECTION 6: PERTINENT INFORMATION

The Weights listed on this calibration report have been compared to reference mass standards that are traceable to the SI through the National Institute of Standards and Technology under Test No. 822-275872-11.

Reference standards and balances used to perform the calibration are listed in Section 10.

The weights calibrated for this report have been calibrated in accordance with Troemner's calibration process. The calibration performed meets Echelon III criteria as described in the NIST/NVLAP Technical Guide 150-2.

This calibration also meets specifications as outlined in ISO 9001, ISO/IEC 17025, ANSI/NCSL Z540-1-1994, and applicable documents.

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Page 2 of 7 Pages
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SECTION 7: TRUE MASS (MASS IN VACUUM) CALIBRATION DATA

Nominal Mass Value	Serial Number	True Mass	Density ¹ of Weight	Uncertainty (+ or -)
1000 lb	1	453612.897 g	7.2000 g/cm ³	4500 mg
1000 lb	2	453619.699 g	7.2000 g/cm ³	4500 mg
1000 lb	3	453622.999 g	7.2000 g/cm ³	4500 mg
1000 lb	4	453619.199 g	7.2000 g/cm ³	4500 mg
1000 lb	5	453616.998 g	7.2000 g/cm ³	4500 mg
1000 lb	6	453612.897 g	7.2000 g/cm ³	4500 mg
1000 lb	7	453614.098 g	7.2000 g/cm ³	4500 mg
1000 lb	8	453613.298 g	7.2000 g/cm ³	4500 mg
1000 lb	9	453615.898 g	7.2000 g/cm ³	4500 mg
1000 lb	10	453617.398 g	7.2000 g/cm ³	4500 mg
1000 lb	11	453618.698 g	7.2000 g/cm ³	4500 mg
1000 lb	12	453618.798 g	7.2000 g/cm ³	4500 mg
1000 lb	13	453617.098 g	7.2000 g/cm ³	4500 mg
1000 lb	14	453614.798 g	7.2000 g/cm ³	4500 mg
1000 lb	15	453613.698 g	7.2000 g/cm ³	4500 mg
1000 lb	16	453617.298 g	7.2000 g/cm ³	4500 mg
1000 lb	17	453617.398 g	7.2000 g/cm ³	4500 mg
1000 lb	18	453617.998 g	7.2000 g/cm ³	4500 mg
1000 lb	19	453620.299 g	7.2000 g/cm ³	4500 mg
1000 lb	20	453616.998 g	7.2000 g/cm ³	4500 mg
1000 lb	21	453615.998 g	7.2000 g/cm ³	4500 mg
1000 lb	22	453613.198 g	7.2000 g/cm ³	4500 mg
1000 lb	23	453617.198 g	7.2000 g/cm ³	4500 mg
1000 lb	24	453613.998 g	7.2000 g/cm ³	4500 mg

¹ Density is assumed unless otherwise stated

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Page 3 of 7 Pages
Weight

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SECTION 8: CONVENTIONAL MASS CALIBRATION VALUE VS. REFERENCE DENSITY 8000 kg/m³

Nominal Mass Value	Serial Number	Conventional Mass Value	Uncertainty (+ or -)	Tolerance (+ or -)
1000 lb	1	453605.336 g	4500 mg	45.0000 g
1000 lb	2	453612.137 g	4500 mg	45.0000 g
1000 lb	3	453615.438 g	4500 mg	45.0000 g
1000 lb	4	453611.637 g	4500 mg	45.0000 g
1000 lb	5	453609.437 g	4500 mg	45.0000 g
1000 lb	6	453605.336 g	4500 mg	45.0000 g
1000 lb	7	453606.536 g	4500 mg	45.0000 g
1000 lb	8	453605.736 g	4500 mg	45.0000 g
1000 lb	9	453608.337 g	4500 mg	45.0000 g
1000 lb	10	453609.837 g	4500 mg	45.0000 g
1000 lb	11	453611.137 g	4500 mg	45.0000 g
1000 lb	12	453611.237 g	4500 mg	45.0000 g
1000 lb	13	453609.537 g	4500 mg	45.0000 g
1000 lb	14	453607.236 g	4500 mg	45.0000 g
1000 lb	15	453606.136 g	4500 mg	45.0000 g
1000 lb	16	453609.737 g	4500 mg	45.0000 g
1000 lb	17	453609.837 g	4500 mg	45.0000 g
1000 lb	18	453610.437 g	4500 mg	45.0000 g
1000 lb	19	453612.737 g	4500 mg	45.0000 g
1000 lb	20	453609.437 g	4500 mg	45.0000 g
1000 lb	21	453608.437 g	4500 mg	45.0000 g
1000 lb	22	453605.636 g	4500 mg	45.0000 g
1000 lb	23	453609.637 g	4500 mg	45.0000 g
1000 lb	24	453606.436 g	4500 mg	45.0000 g

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Page 4 of 7 Pages
Weight

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SECTION 9: CONVENTIONAL MASS CALIBRATION DATA VS. REFERENCE DENSITY 8000 kg/m³

Nominal Mass Value	Serial Number	Conventional Mass Correction	Uncertainty (+ or -)	Tolerance (+ or -)
1000 lb	1	12966 mg	4500 mg	45.0000 g
1000 lb	2	19767 mg	4500 mg	45.0000 g
1000 lb	3	23068 mg	4500 mg	45.0000 g
1000 lb	4	19267 mg	4500 mg	45.0000 g
1000 lb	5	17067 mg	4500 mg	45.0000 g
1000 lb	6	12966 mg	4500 mg	45.0000 g
1000 lb	7	14166 mg	4500 mg	45.0000 g
1000 lb	8	13366 mg	4500 mg	45.0000 g
1000 lb	9	15967 mg	4500 mg	45.0000 g
1000 lb	10	17467 mg	4500 mg	45.0000 g
1000 lb	11	18767 mg	4500 mg	45.0000 g
1000 lb	12	18867 mg	4500 mg	45.0000 g
1000 lb	13	17167 mg	4500 mg	45.0000 g
1000 lb	14	14866 mg	4500 mg	45.0000 g
1000 lb	15	13766 mg	4500 mg	45.0000 g
1000 lb	16	17367 mg	4500 mg	45.0000 g
1000 lb	17	17467 mg	4500 mg	45.0000 g
1000 lb	18	18067 mg	4500 mg	45.0000 g
1000 lb	19	20367 mg	4500 mg	45.0000 g
1000 lb	20	17067 mg	4500 mg	45.0000 g
1000 lb	21	16067 mg	4500 mg	45.0000 g
1000 lb	22	13266 mg	4500 mg	45.0000 g
1000 lb	23	17267 mg	4500 mg	45.0000 g
1000 lb	24	14066 mg	4500 mg	45.0000 g

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Page 5 of 7 Pages
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SECTION 10: CALIBRATION PROCEDURE DATA

Nominal Mass Value	Serial Number	Standard Set No.	Cal Due	Balance Used	Cal Due	Procedure Used
1000 lb	1	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	2	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	3	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	4	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	5	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	6	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	7	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	8	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	9	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	10	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	11	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	12	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	13	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	14	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	15	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	16	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	17	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	18	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	19	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	20	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	21	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	22	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	23	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B
1000 lb	24	P1000L	10/01/16	XP604KM-A05	10/01/16	Multi A-B

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Page 6 of 7 Pages

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SECTION 11: GENERAL INFORMATION

This calibration was performed in Troemner's High Precision Level I Mass Metrology Laboratory at 201 Wolf Drive, Thorofare, New Jersey 08086 unless otherwise noted on page one. The internal procedures used are CAL-CLASSI and NIST HB145.

SECTION 12: DEFINITIONS AND TERMS

TRUE MASS - The mass of a weight as if it were measured in a vacuum. Also known as Mass in a Vacuum.

CONVENTIONAL MASS - The conventional value of the result of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of a density of 8000 kg/m³ which it balances in air of a density of 1.2 kg/m³.

AS FOUND TRUE MASS - The measured value of the mass(es) as they were received by Troemner.

AS LEFT TRUE MASS - The measured value of the mass(es) after adjustment, repair, or replacement when necessary. The As Found True Mass will equal the As Left True Mass if the mass(es) did not require adjustment, repair or replacement.

NOMINAL MASS - The mass value as marked on the weight.

CORRECTION - The difference between the conventional mass value of a weight and its nominal value. A positive correction indicates that the conventional mass value is greater than the nominal value by the amount of the correction.

AS FOUND CONVENTIONAL MASS CORRECTION - The conventional correction of the result, as it was received by Troemner, of weighing in air in accordance to International Recommendation D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m³ which it balances in air density of 1.2 kg/m³. If the customer requires cleaning prior to calibration, the after cleaning correction would be reported.

AS LEFT CONVENTIONAL MASS CORRECTION - The conventional correction of the result, after adjustment, repair, or replacement of weighing in air in accordance to International Recommendation D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m³ which it balances in air density of 1.2 kg/m³. The As Found will equal the As Left Conventional Mass Correction if the mass(es) did not require adjustment, repair or replacement.

(continued on next page)

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Page 7 of 7 Pages

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SECTION 12: DEFINITIONS AND TERMS (continued)

UNCERTAINTY - Non-negative parameter characterizing the dispersion of the quantity values being attributed to a measurand, based on the information used. The uncertainty is calculated in accordance with NIST TechNote 1297 / UKAS M3003 using a coverage factor of $k = 2$ ($k = 2$ defines an interval having a level of confidence of approximately 95 percent). The uncertainty does not include possible effects of magnetism.

TOLERANCE - Defines the limits in which the correction value and the uncertainty must fall to meet the tolerance specification for the given Class.

AS FOUND CONVENTIONAL MASS VALUE - The measured value of the mass(es) as they were received by Troemner, of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the conventional mass is the mass of a reference weight of density 8000 kg/m³ which it balances in air density of 1.2 kg/m³. If the customer requires cleaning prior to calibration, the after cleaning value would be reported.

AS LEFT CONVENTIONAL MASS VALUE - The measured value of the mass(es) after they were adjusted, repaired or replaced when necessary, of weighing in air in accordance to International Recommendation OIML D 28. For a weight taken at 20 °C, the Conventional Mass is the mass of a reference weight of density 8000 kg/m³ which it balances in air density of 1.2 kg/m³. The As Found will equal the As Left Conventional Mass Value if the mass(es) did not require adjustment, repair or replacement.

ASTM E617 - Weights meet the tolerance specification for ASTM E617. Weights 2kg - 1g screened for magnetism using a Gaussmeter.