NEBRASKA	Nebrecke Stepdende Lebergeter		Director of Agriculture
INCONTONAL	Nebraska Standards Laboratory 3721 West Cuming St.		Steve Wellman P.O. Box 9494
Good Life. Great Roots.	Lincoln, NE 68524		Lincoln, NE 68509-494
	(402)-471-2087		(402) 471-234
DEPARTMENT OF AGRICULTURE			www.nda.nebraska.go
Cal	<u>ibratio</u> n Certificat <u>e of</u>	Mass	
Calibration Date: April 28, 2020		Certificate Number:	2020-048-1
Submitted Bv: FSCP Area 65	Deint	of Contacts Prion Masor	
Submitted By: FSCP Area 65 3721 West Cuming St.	<u>P0111</u>	of Contact: Brian Maser Ph. 402-471-	2400
-			
Lincoln, NE 68524		email: brian.maser	@nebraska.gov
		2 <mark>0 Number:</mark> N/A	
Test Item(s): (2)-15 & (20)-25lb weig	ghts	Date Recei	ved: April 27, 2020
Serial Number(s): See Next Page	Artifact(s) Description:	ID / Asset Num	ber: FSCP Area 65
Manufacture: Rice Lake		Class Specificat	tion: NIST Class F
Condition: Good (some wear)		Mate	rial: Cast Iron
Reference Standards Used:	Procedure Used:	Equi	ipment Used:
NSL lb standards	NIST HB 6969, SOP 8 (2018)	Mettler XPR32	
NSE (D Stalidal ds	Metrologist:	Mettler AFK3	2003
	JPL		
	-		
Environmental Cond. Temp: 20.8 °	C Pressure: 736.092 mmHg Relativ	e Humidity: 45.2 %	
• • • • • • • • • • • • • • • •	Pertinent Information		
• The artifact(s) listed in this document have	Pertinent Information been found and/or left within the maximum p	ermissible error for the sp	
• The artifact(s) listed in this document have except as noted. An artifact is considered i	Pertinent Information been found and/or left within the maximum pon- compliance when the correction plus the mea	ermissible error for the sp surement uncertainty is e	equal to or less than the
• The artifact(s) listed in this document have except as noted. An artifact is considered i	Pertinent Information e been found and/or left within the maximum per n-compliance when the correction plus the means an out-of-compliance reading. All of the toler	ermissible error for the sp surement uncertainty is e ances and specifications w	equal to or less than the
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<ul> <li>The artifact(s) listed in this document have except as noted. An artifact is considered i maximum permissible error. RED print indicate</li> <li>All corrections stated in this report correlation of the artifact(s) described in this certificate have are traceable to the International System of comprehensive measurement assurance progreported by this laboratory. The calibration measurem</li> <li>The combined standard uncertainty includes uncertainties for any observed deviations from the consistent with the Guide to the Expression evaluated through a Type A evaluation, or</li> </ul>	Pertinent Information e been found and/or left within the maximum per- n-compliance when the correction plus the means is an out-of-compliance reading. All of the toleral ASTM E617 (2018) and/or NIST HB 105-1 (2017) the to a "Conventional Mass" (CM), also known as hass density and an air density of 1.2 mg/cm <sup>3</sup> and <u>Traceability Statement</u> the been compared to the Standards of the State of Units (SI) through the National Institute of St ram for ensuring continued accuracy and measure ion number for this certificate is the only unique ment traceability for the artifact(s) described in <u>Uncertainty Statement</u> uncertainties reported for the standard, uncertainties rom reference values which are less than surveil e corrections. The combined standard uncertainties val with a 95.45 percent level of confidence. The of Uncertainty in Measurement (2008, revised 2007) and and and and and and and and and and	ermissible error for the sp surement uncertainty is e ances and specifications w 9). "apparent mass", scale v 20 °C. of Nebraska. The Standard andards and Technology ( rement traceability within e calibration number to be this certificate. this certificate. this certificate with the lance limits and the stand ty is multiplied by a cover the expanded uncertainty p 012). Some components statistical analysis (standard)	equal to or less than the vere evaluated according to erses 8.0 g/cm <sup>3</sup> reference ds of the State of Nebraska NIST) and are part of a in the level of uncertainty e used in referencing the measurement process, dard uncertainty for any erage factor ( $k$ ), to give th presented in this report is of the calibration can be ard deviation) from the

# NEBRASKA

#### 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

Good Life. Great Roots.

DEPARTMENT OF AGRICULTURE

Calibrati	on Date: A	pril 28, 2020			Certificat	te Numbe	r: 2020-048	-1	
Calibration Results									
Nominal Mass	Serial Number / ID	As Found Conventional Mass Correction (g)	Adjusted (Y/N)	As Left Conventional Mass Correction (g)	Uncertainty ± (g)	(k) factor	NIST Class F MPE ± (g)	Assumed Density (g/cm <sup>3</sup> )	
15 lb	WM15-6	-0.369	N	-0.369	0.083	2	0.68	7.2	
15 lb	WM15-5	-0.459	N	-0.459	0.083	2	0.68	7.2	
25 lb	NE-61	-0.64	Ν	-0.64	0.14	2	1.1	7.2	
25 lb	NE-62	-0.76	Ν	-0.76	0.14	2	1.1	7.2	
25 lb	NE-63	-0.28	Ν	-0.28	0.14	2	1.1	7.2	
25 lb	NE-64	-0.41	Ν	-0.41	0.14	2	1.1	7.2	
25 lb	NE-65	-0.50	Ν	-0.50	0.14	2	1.1	7.2	
25 lb	NE-66	-0.89	Ν	-0.89	0.14	2	1.1	7.2	
25 lb	NE-67	-0.52	Ν	-0.52	0.14	2	1.1	7.2	
25 lb	NE-68	-0.12	Ν	-0.12	0.14	2	1.1	7.2	
25 lb	NE-69	-0.39	Ν	-0.39	0.14	2	1.1	7.2	
25 lb	NE-70	-0.83	Ν	-0.83	0.14	2	1.1	7.2	
25 lb	NE-71	-1.05	Y	0.11	0.14	2	1.1	7.2	
25 lb	NE-72	0.01	Ν	0.01	0.14	2	1.1	7.2	
25 lb	NE-73	-0.32	N	-0.32	0.14	2	1.1	7.2	
25 lb	NE-74	0.18	Ν	0.18	0.14	2	1.1	7.2	
25 lb	NE-75	-0.44	N	-0.44	0.14	2	1.1	7.2	
25 lb	NE-76	-0.83	Ν	-0.83	0.14	2	1.1	7.2	
25 lb	NE-77	-0.73	N	-0.73	0.14	2	1.1	7.2	
25 lb	NE-78	-0.30	Ν	-0.30	0.14	2	1.1	7.2	
25 lb	NE-79	0.03	Ν	0.03	0.14	2	1.1	7.2	
25 lb	NE-80	0.19	N	0.19	0.14	2	1.1	7.2	

#### **Conversion Factors**

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

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

e P 3

Joel P. Lavicky Metrologist

## 5/21/2020

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 <u>all</u> pages. This document may not be reproduced except in <u>full</u>, without the written consent of the Nebraska Standards Laboratory.

Sood Life. Great Ro	ots.	Lincoln, NE 68524 (402) 471-2087							
Calibration Da	ate:	4/28/2020 Certificate of Calibration of Volume Transfer Certificate Number:					Number:	www.nda.nebraska.go 2020-048-2	
			Items Su	bmitted:		Submitted By:	FSCP Area 65		
	Quantity	Nominal Volume	Manu	ufacturer	Туре	3721 West Cuming St. Lincoln, NE 68524		g St.	
	2	5 gal Seraphin Test			Test Measure 4" Neck	Neck POC: Brian Maser			
			-	<b>Fest Results</b>		402-471-3422 brian.maser@nebras	ska.gov		
	Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (/°F)	As Found Volume Delivered @ 60 °F	As left Volume Delivered @ 60 °F	Uncertainty (U)	( <i>k</i> )	
	5 gal	89428-G	SS	0.0000265	4.9997 gal	4.9997 gal	0.0012 gal	2.08	
	5 gal	89428-H	SS	0.0000265	5.0008 gal	5.0008 gal	0.0012 gal	2.08	1

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

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

## **Conversion Factors:**

 $1 \text{ gal} = 231 \text{ in}^3$ 1 gal = 3.785 412 E-03 m<sup>3</sup>

## **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. All of the tolerances and specifications were evaluated according to NIST HB 105-3 (2010).

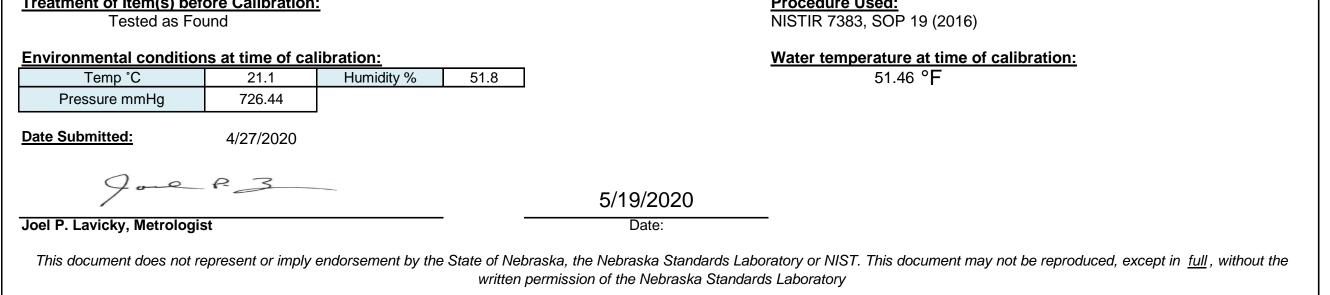
## Condition of Item(s) Submitted for Calibration:

Good

## Laboratory Reference Standard Used; 5 gal SP NE 1586

Treatment of Item(s) before Calibration:

**Procedure Used:** 



<b>NEBRASKA</b> Good Life. Great Roots. <b>DEPARTMENT OF AGRICULTURE</b>			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 Date: 4/29		4/29/2020	Certificate of Calibration			Certificate	Number:	2020-048-3	
				of Vol	ume Transfe	r			
	Quantity	Nominal Volume	Items Su Man	<b>Ibmitted</b> : Jufacturer	Туре	Submitted By:	FSCP Area 65 3721 West Cumin Lincoln, NE 68524	•	
	3	5 gal		SMI	"Special" J Prover	POC	Brian Maser		
				Τε	est Results		402-471-3422 brian.maser@neb	raska.gov	
	Nominal Volume	Serial Number	Material	Cubical Coefficient of Expansion (/°F)	As Found Volume Delivered @ 60 °F	As left Volume Delivered @ 60 °F	Uncertainty (U)	( <i>k</i> )	
	5 gal	9038-034	SS	0.0000265	5.0008 gal	5.0008 gal	0.0011 gal	2.03	
l l l l l l l l l l l l l l l l l l l	5 gal	9038-035	SS	0.0000265	4.9980 gal	4.9980 gal	0.0011 gal	2.03	]
Γ	5 gal	9038-036	SS	0.0000265	4.9988 gal	4.9988 gal	0.0011 gal	2.03	]
		The	data in this	s report only app	lies to those items s	specifically listed or	n this report.		-

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

## **Conversion Factors:**

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

## **Traceability Statement:**

The artifact(s) described in this report have been compared to the Standards of the State of Nebraska. The Standards of the State of Nebraska are traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and measurement traceability within the level of uncertainty reported by this laboratory. The calibration number for this report is the only unique calibration number to be used in referencing measurement traceability for the artifact(s) described in this report.

## **Uncertainty Statement:**

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 incompliance when the correction plus the measurement uncertainty is equal to or less than the maximum permissible error. All of the tolerances and specifications were evaluated according to NIST HB 105-3 (2010).

## Condition of Item(s) Submitted for Calibration:

# Laboratory Reference Standard Used;

Good

# Treatment of Item(s) before Calibration:

Tested as Found

### Environmental conditions at time of calibration:

Temp °C	19.4	Humidity %	51.8
Pressure mmHg	731.52		

Date Submitted: 4/28/2020

gove P3

### Joel P. Lavicky, Metrologist

5 gal SP NE 1586

Procedure Used: NISTIR 7383, SOP 19 (2016)

Water temperature at time of calibration: 56.95 °F

5/19/2020 Date:

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NEBRASKA		Dir	ector of Agriculture
NEDRAJAA	Nebraska Standards Labord	atory	Steve Wellman
	3721 West Cuming St.		P.O. Box 94947
Good Life. Great Roots.	Lincoln, NE 68524	Line	coln, NE 68509-4947
	(402)-471-2087		(402) 471-2341
DEPARTMENT OF AGRICULTURE		www	v.nda.nebraska.gov
Ca	libration Certificate c	of Mass	
Calibration Date: April 30, 202	0 C	ertificate Number:	2020-048-4
Submitted By: FSCP Area 65		<u>t of Contact:</u> Brian Maser	
3721 West Cumir	-	Ph. 402-471-34	
Lincoln, NE 6852	4	email: brian.maser@nebr	aska.gov
		PO Number: N/A	
Test Item(s): lb weight kit		Date Received:	April 27, 2020
Serial Number(s): NSL-1A69 / 17647	Artifact(s) Description:	ID / Asset Number:	FSCP Area 65
Manufacture: Troemner		Class Specification:	NIST Class F
Condition: Good (some wear)		Material:	SS & AL
Reference Standards Used:	Procedure Used:	Equipme	ent Used:
NSL lb standards	NIST HB 6969, SOP 8 (2018)	Sartorius CC 1201	Sartorius CCE6
	Metrologist:	Mettler AT 106	
	JPL		
Environmental Cond. Temp: 21.6	°C Pressure: 729.8 mmHg Relat	tive Humidity: 58.4 %	
<u> </u>	Pertinent Information	tive fullificity. 50.4 %	
• The artifact(s) listed in this document	have been found and/or left within the maxim	num permissible error for the s	pecification stated
. ,	nsidered in-compliance when the correction pl	-	
	RED print indicates an out-of-compliance readi		
	aed according to ASTM E617 (2018) and NIST H	•	-

• All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale verses 8.0 g/cm<sup>3</sup> reference mass density and an air density of 1.2 mg/cm<sup>3</sup> 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.



Good Life. Great Roots.

# 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

DEPARTMENT OF AGRICULTURE

Calibra	tion Date:	April 30, 2020			Certifica	te Numbe	r: 2020-048	-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 <sup>3</sup> )	
2 lb	1	-0.023	У	-0.015	0.011	2	0.091	7.84	
2 lb	2	-0.021	У	0.016	0.011	2	0.091	7.84	
2 lb	3	-0.013	У	-0.005	0.011	2	0.091	7.84	
2 lb	4	-0.026	У	-0.019	0.011	2	0.091	7.84	
2 lb	5	-0.022	У	-0.009	0.011	2	0.091	7.84	
2 lb	6	-0.009	У	-0.069	0.011	2	0.091	7.84	
2 lb	7	0.007	У	-0.069	0.011	2	0.091	7.84	
2 lb	8	0.004	У	-0.006	0.011	2	0.091	7.84	
2 lb	9	-0.026	У	-0.008	0.011	2	0.091	7.84	
2 lb	10	-0.005	У	-0.069	0.011	2	0.091	7.84	
2 lb	11	-0.008	n	-0.008	0.011	2	0.091	7.84	
2 lb	12	-0.023	n	-0.023	0.011	2	0.091	7.84	
2 lb	13	0.000	n	0.000	0.011	2	0.091	7.84	
2 lb	14	0.003	n	0.003	0.011	2	0.091	7.84	
1 lb		-0.0395	n	-0.0395	0.0083	2	0.07	7.84	
1 lb	**	-0.0046	n	-0.0046	0.0083	2	0.07	7.84	
0.2 lb		0.0083	n	0.0083	0.0022	2	0.018	7.84	
0.2 lb	*	0.0094	n	0.0094	0.0022	2	0.018	7.84	
0.1 lb		0.0042	n	0.0042	0.0011	2	0.0091	7.84	
0.05 lb		0.00262	n	0.00262	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	*	0.00078	n	0.00078	0.00022	2	0.0018	7.84	
0.01 lb		0.00079	n	0.00079	0.00018	2	0.0015	7.84	
0.005 lb		0.00065	n	0.00065	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	*	-0.00019	n	-0.00019	0.00011	2	0.00087	2.7	
0.001 lb		0.000140	n	0.000140	0.000083	2	0.0007	2.7	
8 oz		0.0046	n	0.0046	0.0054	2	0.045	7.84	
4 oz		0.0017	n	0.0017	0.0028	2	0.023	7.84	
2 oz		0.0002	n	0.0002	0.0013	2	0.011	7.84	
1 oz		0.00032	n	0.00032	0.00064	2	0.0054	7.84	
1/2 oz		0.00098	n	0.00098	0.00034	2	0.0028	7.84	
1/4 oz		0.00077	n	0.00077	0.00021	2	0.0017	7.84	
1/8 oz		0.00026	n	0.00026	0.00016	2	0.0013	7.84	
1/16 oz		0.00013	n	0.00013	0.00014	2	0.0011	7.84	
1/16 oz		0.00049	n	0.00049	0.00014	2	0.0011	7.84	

#### **Conversion Factors**

1 ounce (avoirdupois) (oz) = 28.349 52 g 1 pound (avoirdupois) (lb) = 453.592 37 g exactly

Joel P. Lavicky Metrologist

5/21/2020 Date of Issue

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