| Good Life. Great | | 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 |
|---|--|--|---|--|
| | Cali | ibration Certificate of | Mass | |
| Calibration Date: | August 3, 2020 | Ce | rtificate Number: | 2020-078-1 |
| <u>Submitted By</u> : | FSCP Area 60 3721 West Cuming St. Lincoln, NE 68524 | | f Contact: Todd Blaske Ph. 402-471 <u>email:</u> Todd.blaske Number: N/A | -3422 |
| Serial Number(Manufactur | s): (20)-25 & (2)-15 lb weig s): See Next Page e: Troemner n: Good (some wear) | hts Artifact(s) Description: | ID / Asset Num Class Specifica | ved: August 3, 2020 ber: FSCP Area 60 tion: NIST Class F erial: Cast Iron |
| <u>Reference Standards</u> NSL lb standards | <u>Used:</u> | Procedure Used: NIST HB 6969, SOP 8 (2018) <u>Metrologist:</u> JPL | <u>Equ</u> Mettler XPR3 | ipment Used: 2003 |
| except as noted. maximum permissible | An artifact is considered in e error. RED print indicates ated in this report correlate | been found and/or left within the maximum per a-compliance when the correction plus the measu an out-of-compliance reading. All of the toleran ASTM E617 (2018) and/or NIST HB 105-1 (2019) e to a "Conventional Mass" (CM), also known as " ass density and an air density of 1.2 mg/cm ³ at 2 | urement uncertainty is aces and specifications apparent mass", scale s | equal to or less than the were evaluated according to |
| are traceable to comprehensive me | the International System or asurement assurance progra atory. The calibration numl | <u>Traceability Statement</u> e been compared to the Standards of the State of f Units (SI) through the National Institute of Star am for ensuring continued accuracy and measure ber for this certificate is the only unique calibrat ceability for the artifact(s) described in this certi | ndards and Technology ement traceability with tion number to be used | (NIST) and are part of a in the level of uncertainty |
| uncertainties for uncorrected errors as expanded uncertain consistent with the | any observed deviations fro sociated with air buoyance ity, which defines an interv <i>Guide to the Expression o</i> h a Type A evaluation, or t | <u>Uncertainty Statement</u> uncertainties reported for the standard, uncertain om reference values which are less than surveilla e corrections. The combined standard uncertainty val with a 95.45 percent level of confidence. The of Uncertainty in Measurement (2008, revised 20) he method of evaluation of uncertainty by the st een performed, therefore, there are no compone | nce limits and the stan y is multiplied by a cove e expanded uncertainty 12). Some components atistical analysis (stand | dard uncertainty for any erage factor (k) , to give the presented in this report is s of the calibration can be dard deviation) from the |

NEBRASKA

Nebraska Standards Laboratory

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Good Life. Great Roots.

| DEPARTMEN | NT OF AGRICULTU | JRE | | () | | | ww | w.nda.nebraska.gov | |
|---------------------|-----------------------|---|-------------------|--|-------------------|------------|---------------------------|----------------------------|--|
| Calibrati | on Date: A | ugust 3, 2020 | Certificat | e Numbe | r: 2020-078- | 1 | | | |
| Calibration Results | | | | | | | | | |
| Nominal Mass | Serial Number / ID | As Found Conventional Mass Correction (g) | Adjusted (Y/N) | As Left Conventional Mass Correction (g) | Uncertainty ± (g) | (k) factor | NIST Class F MPE ± (g) | Assumed Density (g/cm³) | |
| 15 lb | WM15-15 | -0.266 | N | -0.266 | 0.081 | 2 | 0.68 | 7.2 | |
| 15 lb | WM15-16 | -0.111 | N | -0.111 | 0.081 | 2 | 0.68 | 7.2 | |
| 25 lb | WM25-25 | 0.00 | Ν | 0.00 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-32 | 0.78 | N | 0.78 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-36 | 0.48 | Ν | 0.48 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-40 | 0.57 | Ν | 0.57 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-51 | 0.06 | Ν | 0.06 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-52 | 0.17 | Ν | 0.17 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-53 | 0.32 | Ν | 0.32 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-105 | -0.15 | N | -0.15 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-107 | 0.70 | Ν | 0.70 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-108 | 0.66 | Ν | 0.66 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-109 | 0.18 | Ν | 0.18 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-111 | 0.11 | Ν | 0.11 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-112 | -0.28 | Ν | -0.28 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-120 | -0.43 | Ν | -0.43 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-123 | 0.27 | Ν | 0.27 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-126 | 0.71 | Ν | 0.71 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-128 | 0.01 | N | 0.01 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-129 | 0.66 | Ν | 0.66 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-130 | 0.17 | Ν | 0.17 | 0.14 | 2 | 1.1 | 7.2 | |
| 25 lb | WM25-134 | 0.15 | Ν | 0.15 | 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

8/18/2020

Joel P. Lavicky Metrologist

Date of Issue

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| NEBRASKA | | Dir | ector of Agriculture |
|---------------------------------------|---|-------------------------------|-----------------------|
| NEDRAJAN | Nebraska Standards Labor | atory | Steve Wellman |
| | 3721 West Cuming St. | | P.O. Box 94947 |
| Good Life. Great Roots. | Lincoln, NE 68524 | Lin | coln, NE 68509-4947 |
| | (402)-471-2087 | | (402) 471-2341 |
| DEPARTMENT OF AGRICULTURE | | www | v.nda.nebraska.gov |
| | Calibration Certificate of | of Mass | |
| Calibration Date: August 5, | 2020 | Certificate Number: | 2020-077-2 |
| Submitted By: FSCP Area 60 | Poir | nt of Contact: Todd Blaske | |
| 3721 West Cu | | Ph. 402-471-34 | 177 |
| Lincoln, NE 6 | - | email: Todd.blaske@neb | |
| | JJZ-7 | PO Number: N/A | usku.gov |
| | | <u>ronumber.</u> N/A | |
| Test Item(s): Ib weight kit | | Date Received: | August 3, 2020 |
| Serial Number(s): 14A9 | Artifact(s) Description: | ID / Asset Number: | FSCP Area 60 |
| Manufacture: Troemner | | Class Specification: | NIST Class F |
| Condition: Good (some we | ar) | Material: | SS & AL |
| Reference Standards Used: | Procedure Used: | Equipme | ent Used: |
| NSL lb standards | NIST HB 6969, SOP 8 (2018) | Sartorius CC10000S | Mettler AT 106 |
| | <u>Metrologist:</u> JPL | Sartorius CC 1201 | Sartorius CCE6 |
| Environmental Cond. Temp: | 22 °C Pressure: 729.96 mmHg Rela | ative Humidity: 50.3 % | |
| | Pertinent Information | | |
| . , | nent have been found and/or left within the maxi | • | |
| | s considered in-compliance when the correction p | | |
| | or. RED print indicates an out-of-compliance read | - | ecifications were |
| e | valuaed according to ASTM E617 (2018) and NIST I | HB 105-1 (2019). | |
| • All corrections stated in this repo | ort correlate to a "Conventional Mass" (CM) also | known as "apparent mass" scal | $a verses 8.0 a/cm^3$ |

• 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.



Nebraska Standards Laboratory

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Good Life. Great Roots.

DEPARTMENT OF AGRICULTURE

| Calibration Date: August 5, 2020 | | | | | Certifica | te Numbe | r: 2020-077 | -2 | |
|----------------------------------|-----------------------|--|-------------------|---|-------------------|------------|---------------------------|----------------------------|--|
| Calibration Results | | | | | | | | | |
| Nominal Mass | Serial Number / ID | As Found Conventional Mass Correction (g) | Adjusted (Y/N) | As Left Conventional Mass Correction (g) | Uncertainty ± (g) | (k) factor | NIST Class F MPE ± (g) | Assumed Density (g/cm³) | |
| 2 lb | 1 | -0.058 | n | -0.058 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 2 | -0.015 | n | -0.015 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 3 | -0.059 | n | -0.059 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 4 | -0.022 | n | -0.022 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 5 | -0.040 | n | -0.040 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 6 | -0.026 | n | -0.026 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 7 | -0.013 | n | -0.013 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 8 | -0.027 | n | -0.027 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 9 | -0.056 | n | -0.056 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 10 | 0.004 | n | 0.004 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 11 | -0.017 | n | -0.017 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 12 | -0.038 | n | -0.038 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 13 | -0.056 | n | -0.056 | 0.011 | 2 | 0.091 | 7.84 | |
| 2 lb | 14 | -0.035 | n | -0.035 | 0.011 | 2 | 0.091 | 7.84 | |
| 1 lb | 15 | -0.0152 | n | -0.0152 | 0.0083 | 2 | 0.07 | 7.84 | |
| 1 lb | 16 | -0.0241 | n | -0.0241 | 0.0083 | 2 | 0.07 | 7.84 | |
| 0.3 lb | | -0.0089 | n | -0.0089 | 0.0032 | 2 | 0.027 | 7.84 | |
| 0.2 lb | | -0.0032 | n | -0.0032 | 0.0022 | 2 | 0.018 | 7.84 | |
| 0.1 lb | | -0.0028 | n | -0.0028 | 0.0011 | 2 | 0.0091 | 7.84 | |
| 0.05 lb | | 0.00195 | n | 0.00195 | 0.00054 | 2 | 0.0045 | 7.84 | |
| 0.03 lb | | -0.00215 | n | -0.00215 | 0.00032 | 2 | 0.0027 | 7.84 | |
| 0.02 lb | | 0.00047 | n | 0.00047 | 0.00022 | 2 | 0.0018 | 7.84 | |
| 0.01 lb | | -0.00073 | n | -0.00073 | 0.00018 | 2 | 0.0015 | 7.84 | |
| 0.005 lb | | 0.00009 | n | 0.00009 | 0.00014 | 2 | 0.0012 | 2.7 | |
| 0.003 lb | | -0.00057 | n | -0.00057 | 0.00012 | 2 | 0.00099 | 2.7 | |
| 0.002 lb | | -0.00045 | n | -0.00045 | 0.00011 | 2 | 0.00087 | 2.7 | |
| 0.001 lb | | 0.000195 | n | 0.000195 | 0.000083 | 2 | 0.0007 | 2.7 | |
| 0.001 lb | * | -0.000190 | n | -0.000190 | 0.000083 | 2 | 0.0007 | 2.7 | |
| 8 oz | | 0.0136 | n | 0.0136 | 0.0054 | 2 | 0.045 | 7.84 | |
| 4 oz | | 0.0096 | n | 0.0096 | 0.0028 | 2 | 0.023 | 7.84 | |
| 2 oz | | -0.0001 | n | -0.0001 | 0.0013 | 2 | 0.011 | 7.84 | |
| 1 oz | | 0.00009 | n | 0.00009 | 0.00064 | 2 | 0.0054 | 7.84 | |
| 1/2 oz | | -0.00012 | n | -0.00012 | 0.00034 | 2 | 0.0028 | 7.84 | |
| 1/4 oz | | 0.00085 | n | 0.00085 | 0.00021 | 2 | 0.0017 | 7.84 | |
| 1/8 oz | | -0.00060 | n | -0.00060 | 0.00016 | 2 | 0.0013 | 7.84 | |
| 1/16 oz | | 0.00051 | n | 0.00051 | 0.00013 | 2 | 0.0011 | 7.84 | |
| 1/16 oz | * | 0.00065 | n | 0.00065 | 0.00013 | 2 | 0.0011 | 7.84 | |

Conversion Factors

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

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

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Joel P. Lavicky Metrologist

8/19/2020 Date of Issue

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| Good Life. Great Roc DEPARTMENT OF AGRICULT | ots. | | Ne | 372 Lir (• | tandards Lab 1 West Curning St. ncoln, NE 68524 402) 471-2087 | | | | Director of Agricultur Steve Wellmar P.O. Box 9494 Lincoln, NE 68509-494 (402) 471-234 www.nda.nebraska.go |
|--|--|---|--|--|--|---|---|---|---|
| Calibration Da | te: | 8/5/2020 | | | icate of Calibr plume Transfe | | Certificate | Number: | 2020-077-3 |
| r | | | Items Su | bmitted: | | Submitted By: | | 0. | |
| | Quantity | Nominal Volume | Manu | facturer | Туре | | 3721 West Cuming St. Lincoln, NE 68524 C: Todd Blaske 402-471-3422 | | |
| l | 2 | 5 gal | Ser | aphin | Test Measure 3" Neck | POC: | | | |
| | | | | | Fest Results | | Todd.blaske@nebr | aska.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 | 06-01161 | SS | 0.0000265 | 5.0009 gal | 5.0009 gal | 0.0011 gal | 2.1 | |
| | 5 gal | 06-01165 | SS | 0.0000265 | 5.0050 gal | 5.0050 gal | 0.0011 gal | 2.1 | |
| | | The d | lata in this re | port only appli | ies to those items sp | ecifically listed on this | s report. | | |
| | I in this report Jnits (SI) throu ntinued accura ation number t uncertainty ind n reference va by a coverage this report is o ated through a | 412 E-03 m ³ have been comp ugh the National acy and measure o be used in refe cludes uncertaint lues which are le factor (<i>k</i>), to giv consistent with th Type A evaluation | Institute of ment tracea rencing me ies reported ess than sui e the expar e Guide to on, or the m | Standards at ability within t asurement tr d for the stan veillance lim nded uncertai the Expression the the of eva | nd Technology (NIS the level of uncerta aceability for the ar dard, uncertainties its and the standar inty, which defines on of Uncertainty in iluation of uncertainty e error for the specifi | ST) and are part of a inty reported by this rtifact(s) described i associated with the d uncertainty for any an interval with a 95 Measurement (200 hty by the statistical cation stated above, e | a comprehensive i laboratory. The ca n this report. e measurement pro- y uncorrected erro 5.45 percent level 8, revised 2012). analysis (standard except as noted. An | measureme alibration n occess, unc rs. The con of confiden Some corr d deviation) artifact is co | ent assurance umber for this report ertainties for any nbined standard ce. The expanded ponents of the from the |
| Condition of Item(s) Su Treatment of Item(s) be | Good | | | | | Laboratory Reference 5 gal SP NE 1586 Procedure Used: | ence Standard Us | sed; | |
| Tested as For | | | | | | NISTIR 7383, SOP | 9 19 (2016) | | |
| Environmental condition | ons at time of 24.7 | calibration: Humidity % | 47.6 | | | Water temperatur 71.38 | | ration: | |
| Pressure mmHg | 730.25 | J | | | | | | | |
| Date Submitted: | 8/3/2020 | | | | | | | | |
| | 2 J | - | | 0/2 | | | | | |
| govert | 0 | | | 0/2 | 21/2020 | | | | |
| Joel P. Lavicky, Metrolog | | | · . | | 21/2020 sue Date: | | | | |

| OOD LIFE. Great Roc DEPARTMENT OF AGRICULT | ts. | Nebraska Standards Laboratory 3721 West Cuming St. Lincoln, NE 68524 (402) 471-2087 Certificate of Calibration | | | | | Director of Agriculture Steve Wellman P.O. Box 94947 Lincoln, NE 68509-4947 (402) 471-2341 www.nda.nebraska.gov | |
|---|----------------------|--|---|--|---|--|--|---|
| Calibration Date: | - | | ume Transfe | | Certificate | Number: | 2020-077-4 | |
| Quant | ty Nominal Volume | | ubmitted: nufacturer | Туре | Submitted By: | FSCP Area 60 3721 West Cumin Lincoln, NE 68524 | • | |
| 3 | 5 gal | Se | eraphin | "Special" J Prover | POC : Todd Blaske | | | |
| | | | Te | est Results | | 402-471-3422 Todd.blaske@neb | oraska.gov | |
| Nomin Volum | 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 ga | 05-41610-08 | SS | 0.0000265 | 5.0005 gal | 5.0005 gal | 0.0011 gal | 2.1 | |
| 5 ga | 05-41609-15 | SS | 0.0000265 | 4.9992 gal | 4.9992 gal | 0.0011 gal | 2.1 | |
| 5 ga | 05-41610-03 | SS | 0.0000265 | 4.9834 gal | 4.9996 gal | 0.0011 gal | 2.1 | 1 |
| L | The | data in this | s report only app | lies to those items | specifically listed o | 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:

Repaired before Calibration

Environmental conditions at time of calibration:

| Temp °C | 22.2 | Humidity % | 55.5 | |
|---------------|--------|------------|------|--|
| Pressure mmHg | 731.01 | | | |

Date Submitted: 8/3/2020

gove P 3

Joel P. Lavicky, Metrologist

8/21/2020

Issue Date:

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5 gal SP NE 1586

Procedure Used: NISTIR 7383, SOP 19 (2016)

Water temperature at time of calibration: 73.96 °F