

Calibration Certificate of Mass

Calibration Date: August 16, 2017

Certificate Number: 2017-016-1

Submitted By: FSCP Area 25
112 Bronco Rd
Hershey, NE 69143

Point of Contact: Krystle Odell
Ph. 402-450-6438
email: Krystle.Odell@nebraska.gov
PO Number: none

Test Item(s): 31 lb weight kit
Serial Number(s): 7A1
Manufacture: Tromner
Condition: Good (some wear)

Artifact(s) Description:

Date Received: August 9, 2017

ID / Asset Number: N/A

Class Specification: NIST Class F

Material: ss

Reference Standards Used:

Rice Lake NSL-WK
NSL lb standards

Procedure Used:

NIST HB 6969, SOP 8

Metrologist:

JPL

Equipment Used:

Sartorius CC 1201 Sartorius CCE6
Mettler AT 106

Environmental Cond. Temp: 22.55 °C Pressure: 760.965 mmHg Relative Humidity: 51.5 %

Pertinent Information

- The artifact(s) listed in this document have been found and/or left within the maximum permissible error for the specification stated above, except as noted. An artifact is considered in-compliance when the correction plus the measurement uncertainty is equal to or less than the maximum permissible error. **RED** print indicates an out-of-compliance reading.
- All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale verses 8.0 g/cm³ reference mass density and an air density of 1.2 mg/cm³ at 20 °C.

Traceability Statement

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

Uncertainty Statement

The combined standard uncertainty includes uncertainties reported for the standard, uncertainties associated with the measurement process, uncertainties for any observed deviations from reference values which are less than surveillance limits and the standard uncertainty for any uncorrected errors associated with air buoyance corrections. The combined standard uncertainty is multiplied by a coverage factor (*k*), to give the expanded uncertainty, which defines an interval with a 95.45 percent level of confidence. The expanded uncertainty presented in this report is consistent with the *Guide to the Expression of Uncertainty in Measurement (2008, revised 2012)*. Some components of the calibration can be evaluated through a Type A evaluation, or the method of evaluation of uncertainty by the statistical analysis (standard deviation) from the observations taken. Magnetic testing has not been performed, therefore, there are no components for the effects of it in the uncertainty budget.

Calibration Date: August 16, 2017

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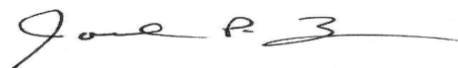
Calibration Results

| Nominal Mass | Serial Number / ID | As Found Conventional Mass Correction (g) | Adjusted (Y/N) | As Left Conventional Mass Correction (g) | Uncertainty ± (g) | (k) factor | NIST Class F MPE ± (g) | Assumed Density (g/cm ³) |
|--------------|--------------------|---|----------------|--|-------------------|------------|------------------------|--------------------------------------|
| 2 lb | 1 | -0.020 | n | -0.020 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 2 | -0.039 | n | -0.039 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 3 | -0.033 | n | -0.033 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 4 | -0.002 | n | -0.002 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 5 | -0.039 | n | -0.039 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 6 | -0.050 | n | -0.050 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 7 | -0.048 | n | -0.048 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 8 | -0.059 | n | -0.059 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 9 | -0.012 | n | -0.012 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 10 | -0.007 | n | -0.007 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 11 | -0.044 | n | -0.044 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 12 | -0.012 | n | -0.012 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 13 | -0.054 | n | -0.054 | 0.011 | 2 | 0.091 | 7.84 |
| 2 lb | 14 | -0.060 | n | -0.060 | 0.011 | 2 | 0.091 | 7.84 |
| 1 lb | 1 | -0.0100 | n | -0.0100 | 0.0083 | 2 | 0.07 | 7.84 |
| 1 lb | 2 | -0.0118 | n | -0.0118 | 0.0083 | 2 | 0.07 | 7.84 |
| 8 oz | | 0.0040 | n | 0.0040 | 0.0054 | 2 | 0.045 | 7.84 |
| 4 oz | | -0.0042 | n | -0.0042 | 0.0028 | 2 | 0.023 | 7.84 |
| 2 oz | | 0.0065 | n | 0.0065 | 0.0013 | 2 | 0.011 | 7.84 |
| 1 oz | | 0.00166 | n | 0.00166 | 0.00064 | 2 | 0.0054 | 7.84 |
| 1/2 oz | | 0.00080 | n | 0.00080 | 0.00035 | 2.001 | 0.0028 | 7.84 |
| 1/4 oz | | -0.00010 | n | -0.00010 | 0.00021 | 2 | 0.0017 | 7.84 |
| 1/8 oz | | -0.00069 | n | -0.00069 | 0.00016 | 2 | 0.0013 | 7.84 |
| 1/16 oz | | 0.00032 | n | 0.00032 | 0.00013 | 2 | 0.0011 | 7.84 |
| 1/16 oz | * | -0.00023 | n | -0.00023 | 0.00013 | 2 | 0.0011 | 7.84 |
| 0.3 lb | 1 | -0.0011 | n | -0.0011 | 0.0032 | 2 | 0.027 | 7.84 |
| 0.2 lb | 2 | 0.0006 | n | 0.0006 | 0.0022 | 2 | 0.018 | 7.84 |
| 0.1 lb | 3 | -0.0051 | n | -0.0051 | 0.0011 | 2 | 0.0091 | 7.84 |
| 0.05 lb | 4 | -0.00091 | n | -0.00091 | 0.00054 | 2 | 0.0045 | 7.84 |
| 0.03 lb | 5 | -0.00206 | n | -0.00206 | 0.00032 | 2 | 0.0027 | 7.84 |
| 0.02 lb | 6 | -0.00093 | n | -0.00093 | 0.00022 | 2 | 0.0018 | 7.84 |
| 0.01 lb | 7 | 0.00094 | n | 0.00094 | 0.00018 | 2 | 0.0015 | 7.84 |
| 0.005 lb | 8 | 0.00021 | n | 0.00021 | 0.00015 | 2 | 0.0012 | 2.7 |
| 0.003 lb | 9 | -0.00056 | n | -0.00056 | 0.00012 | 2 | 0.00099 | 2.7 |
| 0.002 lb | 10 | 0.00028 | n | 0.00028 | 0.00011 | 2 | 0.00087 | 2.7 |
| 0.001 lb | 11 | 0.000223 | n | 0.000223 | 0.000083 | 2 | 0.0007 | 2.7 |
| 0.001 lb | 12* | 0.000335 | n | 0.000335 | 0.000083 | 2 | 0.0007 | 2.7 |

Conversion Factors

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

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



Joel P. Lavicky Metrologist

8/16/2017

Date of Issue

The results in this certificate only applies to those item specifically listed in this certificate. This certificate cannot be considered complete unless it contains all pages. This document may not be reproduced except in full, without the written consent of the Nebraska Standards Laboratory.

Calibration Certificate of Mass

Calibration Date: August 11, 2017

Certificate Number: 2017-016-2

Submitted By: FSCP Area 25
112 Bronco Rd
hershey, NE 69143

Point of Contact: Krystle Odell
Ph. 402-450-6438
email: Krystle.Odell@nebraska.gov
PO Number: none

| | | |
|--|---------------------------------|--|
| Test Item(s): 1-4 kg, 2-15 lb, 20-25 lb weights | Artifact(s) Description: | Date Received: August 9, 2017 |
| Serial Number(s): See next page | | ID / Asset Number: N/A |
| Manufacture: Tromner | | Class Specification: NIST Class F |
| Condition: Good (some wear) | | Material: SS and CI |

| | | |
|--|---|--|
| Reference Standards Used: NSL lb standards | Procedure Used: NIST HB 6969, SOP 8 Metrologist: JPL | Equipment Used: Sartorius CC100005 Mettler KA30-3 |
|--|---|--|

Environmental Cond. Temp: 22.5 °C Pressure: 767.44 mmHg Relative Humidity: 50 %

Pertinent Information

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- All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale versus 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 buoyancy corrections. The combined standard uncertainty is multiplied by 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 2011)*. Some components of the calibration can be evaluated through a Type A evaluation, or the method of evaluation of uncertainty by 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.

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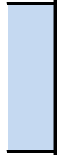
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Calibration Date: August 11, 2017

Certificate Number: 2017-016-2

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/cm ³) |
|--------------|--------------------|---|----------------|--|-------------------|------------|------------------------|--------------------------------------|
| 4 kg | 3 | 0.071 | n | 0.071 | 0.048 | 2 | 0.4 | 7.84 |
| 15 lb | WM15-17 | 0.62 | y | 0.23 | 0.14 | 2 | 0.68 | 7.2 |
| 15 lb | WM15-18 | 0.32 | n | 0.32 | 0.14 | 2 | 0.68 | 7.2 |
| 25 lb | NE-41 | -0.21 | n | -0.21 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-42 | 0.04 | n | 0.04 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-43 | 0.20 | n | 0.20 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-44 | 0.26 | n | 0.26 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-45 | 0.41 | n | 0.41 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-46 | -0.59 | n | -0.59 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-47 | 0.26 | n | 0.26 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-48 | -0.37 | n | -0.37 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-49 | -0.56 | n | -0.56 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-50 | 0.30 | n | 0.30 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-51 | -0.29 | n | -0.29 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-52 | 0.23 | n | 0.23 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-53 | -0.49 | n | -0.49 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-54 | -0.04 | n | -0.04 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-55 | -0.71 | n | -0.71 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-56 | -0.16 | n | -0.16 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-57 | 0.21 | n | 0.21 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-58 | -0.91 | y | -0.30 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-59 | 0.40 | n | 0.40 | 0.23 | 2 | 1.1 | 7.2 |
| 25 lb | NE-60 | -0.22 | n | -0.22 | 0.23 | 2 | 1.1 | 7.2 |

Conversion Factors

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

Joel P. Lavicky Metrologist

8/11/2017

Date of Issue

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Calibration Date: 8/14/2017

**Certificate of Calibration
of Volume Transfer**

Certificate Number: 2017-016-3

Items Submitted:

| Quantity | Nominal Volume | Manufacturer | Type |
|----------|----------------|--------------|---------------|
| 2 | 5 gal | Seraphin | Test Measures |

Submitted By: FSCP Area 25
112 Bronco Rd
Hershey, NE 69143

POC: Krystle Odell
402-450-6438
www.nda.gov

Test Results

| Nominal Volume | Serial Number | Material | Cubical Coefficient of Expansion (°F) | As Found Volume Delivered @ 60 °F | As left Volume Delivered @ 60 °F | Uncertainty (U) | (k) |
|----------------|---------------|----------|---------------------------------------|-----------------------------------|----------------------------------|-----------------|------|
| 5 gal | 39423 J | SS | 0.0000265 | 5.00057 gal | 5.00057 gal | 0.00069 gal | 2.03 |
| 5 gal | 39423 I | SS | 0.0000265 | 5.002 gal | 5.002 gal | 0.00069 gal | 2.03 |

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

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

Conversion Factors:

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

Traceability Statement:

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

Uncertainty Statement:

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Pertinent Information:

The artifact(s) listed above have been found and/or left within the maximum permissible error for the specification stated above, except as noted. An artifact is considered in-compliance when the correction plus the measurement uncertainty is equal to or less than the maximum permissible error.

Condition of Item(s) Submitted for Calibration:

Minor wear

Laboratory Reference Standard Used:

5 gallon Slicker Plate Standard S/N NE1586

Treatment of Item(s) before Calibration:

Item(s) were tested as found

Procedure Used:

NISTIR 7383 (2017), SOP 19

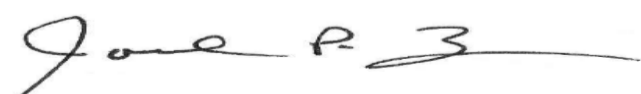
Environmental conditions at time of calibration:

| | | | |
|---------------|--------|------------|------|
| Temp °C | 23.1 | Humidity % | 58.2 |
| Pressure mmHg | 759.71 | | |

Water temperature at time of calibration:

68.58 °F

Date Submitted: 8/9/2017


Joel P. Lavicky, Metrologist

8/14/2017
Date:

Calibration Date: 8/14/2017

**Certificate of Calibration
of Volume Transfer**

Certificate Number: 2017-016-4

Items Submitted:

| Quantity | Nominal Volume | Manufacturer | Type |
|----------|----------------|--------------|---------------------|
| 3 | 5 gal | Seraphin | "Special" J provers |

Submitted By: FSCP Area 25
112 Bronco Rd
Hershey, NE 69143

POC: Krystle Odell
402-450-6438
www.nda.gov

Test Results

| Nominal Volume | Serial Number | Material | Cubical Coefficient of Expansion (°F) | As Found Volume Delivered @ 60 °F | As left Volume Delivered @ 60 °F | Uncertainty (U) | (k) |
|----------------|---------------|----------|---------------------------------------|-----------------------------------|----------------------------------|-----------------|------|
| 5 gal | 99-10030-01 | SS | 0.0000265 | 5.00186 gal | 5.00186 gal | 0.00069 gal | 2.03 |
| 5 gal | 99-10030-02 | SS | 0.0000265 | 5.00206 gal | 5.00206 gal | 0.00069 gal | 2.03 |
| 5 gal | 99-10030-03 | SS | 0.0000265 | 5.00169 gal | 5.00169 gal | 0.00069 gal | 2.03 |

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

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

Conversion Factors:

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

Traceability Statement:

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Condition of Item(s) Submitted for Calibration:

Minor wear

Laboratory Reference Standard Used:

5 gallon Slicker Plate Standard S/N NE1586

Treatment of Item(s) before Calibration:

Item(s) were tested as found

Procedure Used:

NISTIR 7383 (2017), SOP 19


Environmental conditions at time of calibration:

| | | | |
|---------------|--------|------------|------|
| Temp °C | 24.4 | Humidity % | 53.3 |
| Pressure mmHg | 759.71 | | |

Water temperature at time of calibration:

68.52 °F

Date Submitted: 8/9/2017


Joel P. Lavicky, Metrologist

8/14/2017

Date:

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Calibration Certificate of Mass

Calibration Date: August 16, 2017

Certificate Number: 2017-016-5

Submitted By: FSCP Area 25
112 Bronco Rd
Hershey, NE 69143

Point of Contact: Krystle Odell
Ph. 402-450-6438
email: Krystle.Odell@nebraska.gov
PO Number: none

| | | |
|--|---------------------------------|--|
| Test Item(s): 18-50 lb and 21-1000 lb weights | Artifact(s) Description: | Date Received: August 14, 2017 |
| Serial Number(s): See next page | | ID / Asset Number: N/A |
| Manufacture: Tromner/Webb | | Class Specification: NIST Class F |
| Condition: Fair (significant wear) | | Material: Cast Iron |

Reference Standards Used:

NSL-50-1-50lb
C24-1000lb

Procedure Used:

NIST HB 6969, SOP 8

Metrologist:
JPL

Equipment Used:

Mettler KA30-3
Mettler XP 604

Environmental Cond. **Temp:** 24.1 °C **Pressure:** 758.95 mmHg **Relative Humidity:** 46.8 %

Pertinent Information

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Calibration Date: August 16, 2017

Certificate Number: 2017-016-5

Calibration Results

| Nominal Mass | Serial Number / ID | As Found Conventional Mass Correction (g) | Adjusted (Y/N) | As Left Conventional Mass Correction (g) | Uncertainty ± (g) | (k) factor | NIST Class F MPE ± (g) | Assumed Density (g/cm ³) |
|--------------|--------------------|---|----------------|--|-------------------|------------|------------------------|--------------------------------------|
| 50 lb | A5C*2 | 1.62 | n | 1.62 | 0.28 | 2 | 2.3 | 7.2 |
| 50 lb | A5C*8 | 5.26 | y | 0.06 | 0.28 | 2 | 2.3 | 7.2 |
| 50 lb | A5C*9 | 1.44 | n | 1.44 | 0.28 | 2 | 2.3 | 7.2 |
| 50 lb | A5C*17 | 1.57 | n | 1.57 | 0.28 | 2 | 2.3 | 7.2 |
| 50 lb | A5C*19 | 1.73 | n | 1.73 | 0.28 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-2 | 1.46 | n | 1.46 | 0.28 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-11 | 0.96 | n | 0.96 | 0.28 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-14 | 1.73 | n | 1.73 | 0.28 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-17 | 1.85 | n | 1.85 | 0.28 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-18 | 0.27 | n | 0.27 | 0.28 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-19 | 2.89 | y | 0.95 | 0.46 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-23 | 1.70 | n | 1.70 | 0.46 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-24 | 2.78 | y | 1.82 | 0.46 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-27 | 1.26 | n | 1.26 | 0.46 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-45 | 2.39 | y | 0.98 | 0.46 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-50 | -0.12 | n | -0.12 | 0.46 | 2 | 2.3 | 7.2 |
| 50 lb | WM50-57 | 0.37 | n | 0.37 | 0.46 | 2 | 2.3 | 7.2 |
| 50 lb | WM-OPI-C28 | 0.83 | n | 0.83 | 0.46 | 2 | 2.3 | 7.2 |
| 1000 lb | C-12 | 9.7 | n | 9.7 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | C-18 | 0.0 | n | 0.0 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | C-21 | 12.5 | n | 12.5 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-2 | -36.3 | y | 12.9 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-6 | -18.9 | n | -18.9 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-7 | -31.2 | n | -31.2 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-8 | -58.6 | y | 6.6 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-9 | -25.9 | n | -25.9 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-12 | -26.0 | n | -26.0 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-14 | -31.6 | n | -31.6 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-15 | -39.0 | y | 6.6 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-16 | -41.3 | y | 17.9 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-17 | -20.4 | n | -20.4 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-19 | -25.4 | n | -25.4 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-20 | -38.2 | y | 7.8 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-22 | -26.2 | n | -26.2 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-23 | -60.1 | y | 9.0 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-24 | -28.9 | n | -28.9 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-25 | -16.8 | n | -16.8 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-26 | -47.9 | y | -0.4 | 5.8 | 2 | 45 | 7.2 |
| 1000 lb | D-27 | -29.2 | n | -29.2 | 5.8 | 2 | 45 | 7.2 |

Conversion Factors

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

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



Joel P. Lavicky Metrologist

8/17/2017

Date of Issue

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Calibration Certificate of Mass

Calibration Date: August 16, 2017

Certificate Number: 2017-016-6

Submitted By: FSCP Area 25
112 Bronco Rd
Hershey, NE 69143

Point of Contact: Krystle Odell
Ph. 402-450-6438
email: Krystle.Odell@nebraska.gov
PO Number: none

Test Item(s): 31 lb weight kit
Serial Number(s): WM 5A03
Manufacture: Rice lake
Condition: Good (some wear)

Artifact(s) Description:

Date Received: August 14, 2017
ID / Asset Number: N/A
Class Specification: NIST Class F
Material: SS

Reference Standards Used:

Rice Lake NSL-WK
NSL lb standards

Procedure Used:

NIST HB 6969, SOP 8
Metrologist:
JPL

Equipment Used:

Sartorius CC100005 Mettler AT 106
Sartorius CC 1201 Sartorius CCE6

Environmental Cond. Temp: 22.5 °C Pressure: 759.57 mmHg Relative Humidity: 50 %

Pertinent Information

- The artifact(s) listed in this document have been found and/or left within the maximum permissible error for the specification stated above, except as noted. An artifact is considered in-compliance when the correction plus the measurement uncertainty is equal to or less than the maximum permissible error. RED print indicates an out-of-compliance reading.
- All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale verses 8.0 g/cm³ reference mass density and an air density of 1.2 mg/cm³ at 20 °C.

Traceability Statement

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

Uncertainty Statement

The combined standard uncertainty includes uncertainties reported for the standard, uncertainties associated with the measurement process, uncertainties for any observed deviations from reference values which are less than surveillance limits and the standard uncertainty for any uncorrected errors associated with air buoyance corrections. The combined standard uncertainty is multiplied by a coverage factor (*k*), to give the expanded uncertainty, which defines an interval with a 95.45 percent level of confidence. The expanded uncertainty presented in this report is consistent with the *Guide to the Expression of Uncertainty in Measurement (2008, revised 2012)*. Some components of the calibration can be evaluated through a Type A evaluation, or the method of evaluation of uncertainty by the statistical analysis (standard deviation) from the observations taken. Magnetic testing has not been performed, therefore, there are no components for the effects of it in the uncertainty budget.

Calibration Date: August 16, 2017

Certificate Number: 2017-016-6

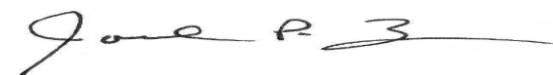
Calibration Results

| Nominal Mass | Serial Number / ID | As Found Conventional Mass Correction (g) | Adjusted (Y/N) | As Left Conventional Mass Correction (g) | Uncertainty ± (g) | (k) factor | NIST Class F MPE ± (g) | Assumed Density (g/cm ³) |
|--------------|--------------------|---|----------------|--|-------------------|------------|------------------------|--------------------------------------|
| 5 lb | 1 | 0.061 | n | 0.061 | 0.028 | 2 | 0.23 | 7.84 |
| 5 lb | 2 | 0.075 | n | 0.075 | 0.028 | 2 | 0.23 | 7.84 |
| 5 lb | 3 | 0.090 | n | 0.090 | 0.028 | 2 | 0.23 | 7.84 |
| 5 lb | 4 | 0.078 | n | 0.078 | 0.028 | 2 | 0.23 | 7.84 |
| 5 lb | 5 | 0.074 | n | 0.074 | 0.028 | 2 | 0.23 | 7.84 |
| 1 lb | 6 | 0.0321 | n | 0.0321 | 0.0083 | 2 | 0.07 | 7.84 |
| 1 lb | 7 | 0.0217 | n | 0.0217 | 0.0083 | 2 | 0.07 | 7.84 |
| 1 lb | 8 | 0.0209 | n | 0.0209 | 0.0083 | 2 | 0.07 | 7.84 |
| 1 lb | 9 | 0.0220 | n | 0.0220 | 0.0083 | 2 | 0.07 | 7.84 |
| 1 lb | 10 | 0.0234 | n | 0.0234 | 0.0083 | 2 | 0.07 | 7.84 |
| 0.5 lb | | 0.0202 | n | 0.0202 | 0.0054 | 2 | 0.045 | 7.84 |
| 0.2 lb | | 0.0066 | n | 0.0066 | 0.0022 | 2 | 0.018 | 7.84 |
| 0.2 lb | * | 0.0062 | n | 0.0062 | 0.0022 | 2 | 0.018 | 7.84 |
| 0.1 lb | | 0.0024 | n | 0.0024 | 0.0011 | 2 | 0.0091 | 7.84 |
| 0.05 lb | | 0.00143 | n | 0.00143 | 0.00054 | 2 | 0.0045 | 7.84 |
| 0.02 lb | | -0.00004 | n | -0.00004 | 0.00022 | 2 | 0.0018 | 7.84 |
| 0.02 lb | * | 0.00048 | n | 0.00048 | 0.00022 | 2 | 0.0018 | 7.84 |
| 0.01 lb | | 0.00014 | n | 0.00014 | 0.00018 | 2 | 0.0015 | 7.84 |
| 0.005 lb | | 0.00035 | n | 0.00035 | 0.00015 | 2 | 0.0012 | 2.7 |
| 0.002 lb | | 0.00034 | n | 0.00034 | 0.00011 | 2 | 0.00087 | 2.7 |
| 0.002 lb | * | 0.00031 | n | 0.00031 | 0.00011 | 2 | 0.00087 | 2.7 |
| 0.001 lb | | 0.000110 | n | 0.000110 | 0.000083 | 2 | 0.0007 | 2.7 |

Conversion Factors

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

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



Joel P. Lavicky Metrologist

8/16/2017

Date of Issue

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Calibration Certificate of Mass

Calibration Date: August 16, 2017

Certificate Number: 2017-016-7

Submitted By: FSCP Area 25
112 Bronco Rd
Hershey, NE 69143

Point of Contact: Krystle Odell
Ph. 402-450-6438
email: Krystle.Odell@nebraska.gov
PO Number: none

Test Item(s): Gram Kit
Serial Number(s): WM-2-89-1
Manufacture: Tromner
Condition: Good (some wear)

Artifact(s) Description:

Date Received: August 14, 2017

ID / Asset Number: N/A

Class Specification: NIST Class F

Material: ss

Reference Standards Used:

OPI & /Den Metric
Volland-1707

Procedure Used:

NIST HB 6969, SOP 8

Metrologist:
JPL

Equipment Used:

Sartorius CC 1201 Sartorius CCE6
Mettler AT 106

Environmental Cond. Temp: 22.5 °C Pressure: 758.57 mmHg Relative Humidity: 49 %

Pertinent Information

- The artifact(s) listed in this document have been found and/or left within the maximum permissible error for the specification stated above, except as noted. An artifact is considered in-compliance when the correction plus the measurement uncertainty is equal to or less than the maximum permissible error. **RED** print indicates an out-of-compliance reading.
- All corrections stated in this report correlate to a "Conventional Mass" (CM), also known as "apparent mass", scale verses 8.0 g/cm³ reference mass density and an air density of 1.2 mg/cm³ at 20 °C.

Traceability Statement

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

Uncertainty Statement

The combined standard uncertainty includes uncertainties reported for the standard, uncertainties associated with the measurement process, uncertainties for any observed deviations from reference values which are less than surveillance limits and the standard uncertainty for any uncorrected errors associated with air buoyance corrections. The combined standard uncertainty is multiplied by a coverage factor (*k*), to give the expanded uncertainty, which defines an interval with a 95.45 percent level of confidence. The expanded uncertainty presented in this report is consistent with the *Guide to the Expression of Uncertainty in Measurement (2008, revised 2012)*. Some components of the calibration can be evaluated through a Type A evaluation, or the method of evaluation of uncertainty by the statistical analysis (standard deviation) from the observations taken. Magnetic testing has not been performed, therefore, there are no components for the effects of it in the uncertainty budget.

Calibration Date: August 16, 2017

Certificate Number: 2017-016-7

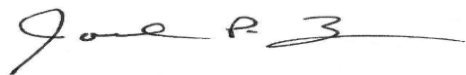
Calibration Results

| Nominal Mass | Serial Number / ID | As Found Conventional Mass Correction (g) | Adjusted (Y/N) | As Left Conventional Mass Correction (g) | Uncertainty ± (g) | (k) factor | NIST Class F MPE ± (g) | Assumed Density (g/cm ³) |
|--------------|--------------------|---|----------------|--|-------------------|------------|------------------------|--------------------------------------|
| 1 kg | | 0.043 | n | 0.043 | 0.012 | 2 | 0.1 | 7.84 |
| 500 g | | 0.0370 | n | 0.0370 | 0.0083 | 2 | 0.07 | 7.84 |
| 200 g | | -0.0002 | n | -0.0002 | 0.0048 | 2 | 0.04 | 7.84 |
| 200 g | * | -0.0057 | n | -0.0057 | 0.0048 | 2 | 0.04 | 7.84 |
| 100 g | | 0.0118 | n | 0.0118 | 0.0024 | 2 | 0.02 | 7.84 |
| 50 g | | -0.0033 | n | -0.0033 | 0.0012 | 2 | 0.01 | 7.84 |
| 20 g | | 0.00236 | n | 0.00236 | 0.00048 | 2 | 0.004 | 7.84 |
| 20 g | * | 0.00215 | n | 0.00215 | 0.00048 | 2 | 0.004 | 7.84 |
| 10 g | | 0.00097 | n | 0.00097 | 0.00024 | 2 | 0.002 | 7.84 |
| 5 g | | 0.00013 | n | 0.00013 | 0.00018 | 2 | 0.0015 | 7.84 |
| 2 g | | 0.00022 | n | 0.00022 | 0.00013 | 2 | 0.0011 | 7.84 |
| 2 g | * | 0.00066 | n | 0.00066 | 0.00013 | 2 | 0.0011 | 7.84 |
| 1 g | | -0.00010 | n | -0.00010 | 0.00011 | 2 | 0.0009 | 7.84 |
| 500 mg | | -0.000008 | n | -0.000008 | 0.000097 | 2 | 0.00072 | 16.6 |
| 200 mg | | -0.000018 | n | -0.000018 | 0.000067 | 2 | 0.00054 | 16.6 |
| 200 mg | * | 0.000186 | n | 0.000186 | 0.000067 | 2 | 0.00054 | 16.6 |
| 100 mg | | -0.000151 | n | -0.000151 | 0.000052 | 2 | 0.00043 | 16.6 |

Conversion Factors

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

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



Joel P. Lavicky Metrologist

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