

## Calibration Certificate of Mass

**Calibration Date:** August 8, 2018

**Certificate Number:** 2018-070-1

**Submitted By:** FSCP Area 30  
 3721 West Cuming St.  
 Lincoln, NE 68524

**Point of Contact:** Jeff Saathoff  
 Ph. 402-471-3422  
**email:** [jeff.saathoff@nebraska.gov](mailto:jeff.saathoff@nebraska.gov)  
**PO Number:** N/A

**Test Item(s):** (1)-4 kg, (2)-15, (20)-25 lb weights  
**Serial Number(s):** See Next Page  
**Manufacture:** Various  
**Condition:** Good (some wear)

**Artifact(s) Description:**  
**Date Received:** July 30, 2018  
**ID / Asset Number:** N/A  
**Class Specification:** NIST Class F  
**Material:** CI & SS

**Reference Standards Used:**

**Procedure Used:**

**Equipment Used:**

NSL lb standards  
 OPI & /Den Metric

NIST HB 6969, SOP 8  
**Metrologist:**  
 JPL

Mettler KA30-3  
 Sartorius CC10000S

**Environmental Cond.**    **Temp:** 25 °C    **Pressure:** 764.286 mmHg    **Relative Humidity:** 50.3 %

**Pertinent Information**

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- 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.

Calibration Date: August 8, 2018

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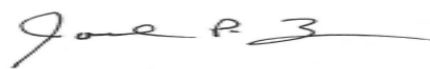
### Calibration Results

| 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 <sup>3</sup> ) |
|--------------|--------------------|---|----------------|--|-------------------|------------|------------------------|--------------------------------------|
| 15 lb        | WM15-1             | 0.876                                     | y              | 0.083                                    | 0.081             | 2          | 0.68                   | 7.2                                  |
| 15 lb        | WM15-2             | 0.599                                     | n              | 0.599                                    | 0.081             | 2          | 0.68                   | 7.2                                  |
| 25 lb        | WM25-22            | 0.91                                      | n              | 0.91                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-26            | 0.17                                      | n              | 0.17                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-31            | -0.22                                     | n              | -0.22                                    | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-34            | -0.18                                     | n              | -0.18                                    | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-35            | 1.39                                      | y              | 0.40                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-41            | 1.59                                      | y              | 0.39                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-54            | 0.60                                      | n              | 0.60                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-60            | 1.28                                      | y              | 0.68                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-61            | 1.29                                      | y              | 0.05                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-62            | 0.62                                      | n              | 0.62                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-63            | 0.84                                      | n              | 0.84                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-64            | 1.05                                      | y              | 0.68                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-132           | 1.43                                      | y              | 0.61                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-133           | 1.58                                      | y              | -0.80                                    | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-135           | 0.02                                      | n              | 0.02                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-136           | -0.05                                     | n              | -0.05                                    | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-137           | 0.21                                      | n              | 0.21                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-138           | 1.12                                      | y              | 0.49                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-139           | -0.15                                     | n              | -0.15                                    | 0.14              | 2          | 1.1                    | 7.2                                  |
| 25 lb        | WM25-140           | 1.26                                      | y              | 0.14                                     | 0.14              | 2          | 1.1                    | 7.2                                  |
| 4 kg         | 6                  | -0.011                                    | n              | -0.011                                   | 0.048             | 2          | 0.4                    | 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

8/8/2018

Date of Issue

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## Calibration Certificate of Mass

**Calibration Date:** August 8, 2018

**Certificate Number:** 2018-070-2

**Submitted By:** FSCP Area 30  
3721 West Cuming St.  
Lincoln, NE 68524

**Point of Contact:** Jeff Saathoff  
Ph. 402-471-3422  
**email:** [jeff.saathoff@nebraska.gov](mailto:jeff.saathoff@nebraska.gov)  
**PO Number:** N/A

**Test Item(s):** (1)-31 lb weight kit  
**Serial Number(s):** 7A73  
**Manufacture:** Tromner  
**Condition:** Good (some wear)

**Artifact(s) Description:**

**Date Received:** July 23, 2018

**ID / Asset Number:** N/A

**Class Specification:** NIST Class F

**Material:** SS & AL

**Reference Standards Used:**

NSL lb standards

**Procedure Used:**

NIST HB 6969, SOP 8

**Metrologist:**

JPL

**Equipment Used:**

Mettler AT 106

Sartorius CC 1201 Sartorius CCE6

**Environmental Cond.**    **Temp:** 22.7 °C    **Pressure:** 765.81 mmHg    **Relative Humidity:** 48 %

**Pertinent Information**

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- 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**

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**Uncertainty Statement**

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Calibration Date: August 8, 2018

Certificate Number: 2018-070-2

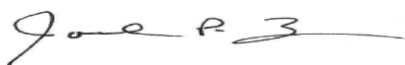
**Calibration Results**

| 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 <sup>3</sup> ) |
|--------------|--------------------|---|----------------|--|-------------------|------------|------------------------|--------------------------------------|
| 2 lb         | 1                  | 0.009                                     | n              | 0.009                                    | 0.011             | 2          | 0.091                  | 7.84                                 |
| 2 lb         | 2                  | -0.020                                    | n              | -0.020                                   | 0.011             | 2          | 0.091                  | 7.84                                 |
| 2 lb         | 3                  | -0.072                                    | n              | -0.072                                   | 0.011             | 2          | 0.091                  | 7.84                                 |
| 2 lb         | 3*                 | -0.002                                    | n              | -0.002                                   | 0.011             | 2          | 0.091                  | 7.84                                 |
| 2 lb         | 5                  | 0.008                                     | n              | 0.008                                    | 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                  | 0.022                                     | n              | 0.022                                    | 0.011             | 2          | 0.091                  | 7.84                                 |
| 2 lb         | 8                  | 0.041                                     | n              | 0.041                                    | 0.011             | 2          | 0.091                  | 7.84                                 |
| 2 lb         | 9                  | -0.033                                    | n              | -0.033                                   | 0.011             | 2          | 0.091                  | 7.84                                 |
| 2 lb         | 10                 | 0.068                                     | n              | 0.068                                    | 0.011             | 2          | 0.091                  | 7.84                                 |
| 2 lb         | 11                 | 0.068                                     | n              | 0.068                                    | 0.011             | 2          | 0.091                  | 7.84                                 |
| 2 lb         | 12                 | -0.025                                    | n              | -0.025                                   | 0.011             | 2          | 0.091                  | 7.84                                 |
| 2 lb         | 13                 | 0.036                                     | n              | 0.036                                    | 0.011             | 2          | 0.091                  | 7.84                                 |
| 2 lb         | 14                 | 0.053                                     | n              | 0.053                                    | 0.011             | 2          | 0.091                  | 7.84                                 |
| 1 lb         | 15                 | -0.0468                                   | n              | -0.0468                                  | 0.0083            | 2          | 0.07                   | 7.84                                 |
| 1 lb         | 16                 | -0.0467                                   | n              | -0.0467                                  | 0.0083            | 2          | 0.07                   | 7.84                                 |
| 0.3 lb       | 1                  | -0.0048                                   | n              | -0.0048                                  | 0.0032            | 2          | 0.027                  | 7.84                                 |
| 0.2 lb       | 2                  | -0.0098                                   | y              | 0.0113                                   | 0.0022            | 2          | 0.018                  | 7.84                                 |
| 0.1 lb       | 3                  | -0.0055                                   | n              | -0.0055                                  | 0.0011            | 2          | 0.0091                 | 7.84                                 |
| 0.05 lb      | 4                  | 0.00255                                   | n              | 0.00255                                  | 0.00054           | 2          | 0.0045                 | 7.84                                 |
| 0.03 lb      | 5                  | 0.00063                                   | n              | 0.00063                                  | 0.00032           | 2          | 0.0027                 | 7.84                                 |
| 0.02 lb      | 6                  | 0.00043                                   | n              | 0.00043                                  | 0.00022           | 2          | 0.0018                 | 7.84                                 |
| 0.01 lb      | 7                  | -0.00033                                  | n              | -0.00033                                 | 0.00018           | 2          | 0.0015                 | 7.84                                 |
| 0.005 lb     | 8                  | -0.00123                                  | y              | -0.00106                                 | 0.00014           | 2          | 0.0012                 | 2.7                                  |
| 0.003 lb     | 9                  | -0.00050                                  | n              | -0.00050                                 | 0.00012           | 2          | 0.00099                | 2.7                                  |
| 0.002 lb     | 10                 | 0.00027                                   | n              | 0.00027                                  | 0.00011           | 2          | 0.00087                | 2.7                                  |
| 0.001 lb     | 11                 | -0.000569                                 | n              | -0.000569                                | 0.000083          | 2          | 0.0007                 | 2.7                                  |
| 0.001 lb     | 12*                | -0.000099                                 | n              | -0.000099                                | 0.000083          | 2          | 0.0007                 | 2.7                                  |
| 8 oz         | 17                 | -0.0147                                   | n              | -0.0147                                  | 0.0054            | 2          | 0.045                  | 7.84                                 |
| 8 oz         | WM-30-1            | -0.0121                                   | n              | -0.0121                                  | 0.0054            | 2          | 0.045                  | 7.84                                 |
| 4 oz         | 18                 | -0.0014                                   | n              | -0.0014                                  | 0.0028            | 2          | 0.023                  | 7.84                                 |
| 2 oz         |                    | -0.0003                                   | n              | -0.0003                                  | 0.0013            | 2          | 0.011                  | 7.84                                 |
| 1 oz         | **                 | 0.00155                                   | n              | 0.00155                                  | 0.00064           | 2          | 0.0054                 | 7.84                                 |
| 1/2 oz       |                    | 0.00108                                   | n              | 0.00108                                  | 0.00034           | 2          | 0.0028                 | 7.84                                 |
| 1/4 oz       |                    | 0.00054                                   | n              | 0.00054                                  | 0.00021           | 2          | 0.0017                 | 7.84                                 |
| 1/8 oz       |                    | -0.00105                                  | n              | -0.00105                                 | 0.00016           | 2          | 0.0013                 | 7.84                                 |
| 1/16 oz      |                    | -0.00032                                  | n              | -0.00032                                 | 0.00014           | 2          | 0.0011                 | 7.84                                 |
| 1/16 oz      | *                  | 0.00076                                   | n              | 0.00076                                  | 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

8/8/2018

Date of Issue

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Calibration Date: **8/7/2018**

**Certificate of Calibration  
of Volume Transfer**

Certificate Number: **2018-070-3**

**Items Submitted:**

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

**Submitted By:** FSCP Area 30  
3721 West Cuming St  
Lincoln, NE 68524

**POC:** Jeff Saathoff  
402-471-3422  
[jeff.saathoff@nebraska.gov](mailto:jeff.saathoff@nebraska.gov)

**Test Results**

| Nominal Volume | Serial Number | Material | Cubical Coefficient of Expansion (1/°F) | As Found Volume Delivered @ 60 °F | As left Volume Delivered @ 60 °F | Uncertainty (U) | (k)  |
|----------------|---------------|----------|---|-----------------------------------|----------------------------------|-----------------|------|
| 5 gal          | 00-16623-01   | SS       | 0.0000265                               | <b>5.00094 gal</b>                | <b>5.00094 gal</b>               | 0.00065 gal     | 2.02 |
| 5 gal          | 00-16623-02   | SS       | 0.0000265                               | <b>5.00082 gal</b>                | <b>5.00082 gal</b>               | 0.00065 gal     | 2.02 |
| 5 gal          | 00-16623-03   | SS       | 0.0000265                               | <b>5.00385 gal</b>                | <b>5.00017 gal</b>               | 0.00065 gal     | 2.02 |

*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 in<sup>3</sup>  
1 gal = 3.785 412 E-03 m<sup>3</sup>

**Traceability Statement:**

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

Minor wear

**Laboratory Reference Standard Used:**

5 gal SP NE 1586

**Treatment of Item(s) before Calibration:**

Item(s) were tested as found

**Procedure Used:**

NISTIR 7383, SOP 19

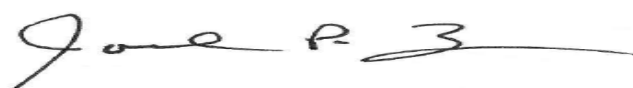
**Environmental conditions at time of calibration:**

|               |        |            |      |
|---------------|--------|------------|------|
| Temp °C       | 24.5   | Humidity % | 54.9 |
| Pressure mmHg | 765.04 |            |      |

**Water temperature at time of calibration:**

67.95 °F

**Date Submitted:** 8/2/2018



**Joel P. Lavicky, Metrologist**

**8/7/2018**

Date:

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Calibration Date: 8/6/2018

**Certificate of Calibration  
of Volume Transfer**

Certificate Number: 2018-070-4

**Items Submitted:**

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

**Submitted By:** FSCP Area 30  
3721 West Cuming St  
Lincoln, NE 68524

**POC:** Jeff Saathoff  
402-471-3422  
[jeff.saathoff@nebraska.gov](mailto:jeff.saathoff@nebraska.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          | 40702 C       | SS       | 0.0000265                             | 4.99926 gal                       | 4.99926 gal                      | 0.00065 gal     | 2.02 |
| 5 gal          | 40702 D       | SS       | 0.0000265                             | 4.99908 gal                       | 4.99908 gal                      | 0.00065 gal     | 2.02 |

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 in<sup>3</sup>  
1 gal = 3.785 412 E-03 m<sup>3</sup>

**Traceability Statement:**

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

Minor wear

**Laboratory Reference Standard Used:**

5 gal SP NE 1586

**Treatment of Item(s) before Calibration:**

Item(s) were tested as found

**Procedure Used:**

NISTIR 7383, SOP 19

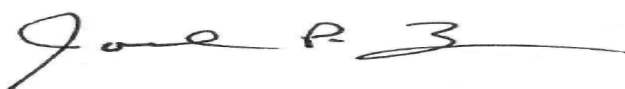
**Environmental conditions at time of calibration:**

|               |        |            |      |
|---------------|--------|------------|------|
| Temp °C       | 25.0   | Humidity % | 52.3 |
| Pressure mmHg | 765.04 |            |      |

**Water temperature at time of calibration:**

68.02 °F

**Date Submitted:** 8/2/2018



Joel P. Lavicky, Metrologist

8/6/2018

Date:

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