

Vermont Weights and Measures Metrology Laboratory  
Test Report

Issued To:

Advanced Scale  
13 Delta Drive Unit 6  
Londonderry, NH 03053-2372  
603-626-0242

Date of Receipt: January 27, 2023

Vermont Test Number: VT23-25

Date of Test: January 30, 2023

Report of Test for Item (Make/Model/Serial Number(s)/#Pieces):

N/A/10 lb to 0.001 lb Stainless Steel Weight Kit/VT05-180/28 Pieces

The mass standards described above have been compared to the standards of the State of Vermont, by NISTIR 6969, SOP 8 (2019), and have been found at time of test, or been adjusted, to meet the maximum permissible errors stated in ASTM E617-18 Standard Specification for Laboratory Weights and Precision Mass Standards. Standards of the state of Vermont are traceable to the SI and National Institute of Standards and Technology (NIST). The Vermont Laboratory is recognized by NIST, under the Laboratory Metrology Program at Mass Echelon III. The mass standards described above were found to have a mass value at the time of test as indicated in the following tabulation. Weights are considered within the MPE when the absolute value of the conventional mass correction plus the uncertainty is less than or equal to the specified MPE. Weights received with a conventional mass outside the MPE show a value in the "before adjustment" column.

The uncertainties shown are expressed as the sum of the following sources of inaccuracy; (1) Type B, systematic uncertainties relative to the reference standard and procedure used, and (2) Type A, random uncertainties determined by the standard deviation of the measurement process. Type A and Type B uncertainties are combined by the root sum squared method and multiplied by a coverage factor of k (in chart) for an approximate 95 % confidence interval.

Environmental conditions at time of test:

Temperature: 21.5 °C to 21.9 °C

Relative Humidity: 50.9 % to 54.7 %

Barometric Pressure: 765.00 mmHg to 766.00 mmHg

Mass Comparator: MT XP64003L, MT XP5003S, MT XP205, MT XP2U

Technician: Scott, Sumner, Ryan



| Nominal & Marking | Conventional Mass Correction Before Adjustment | Conventional Mass Correction As Left | Uncertainty | ASTM Class 5 MPE | Units | k Factor |
|-------------------|------------------------------------------------|--------------------------------------|-------------|------------------|-------|----------|
| 10 lb             |                                                | 35                                   | 20          | 230              | mg    | 2.01     |
| 10 lb *           |                                                | 15                                   | 20          | 230              | mg    | 2.01     |
| 5 lb              |                                                | -8.3                                 | 6.3         | 110              | mg    | 2.01     |
| 1 lb              |                                                | 16.5                                 | 2.3         | 27               | mg    | 2.02     |
| 1 lb *            |                                                | 4.5                                  | 2.3         | 27               | mg    | 2.02     |
| 1 lb **           |                                                | 18.5                                 | 2.3         | 27               | mg    | 2.02     |
| 1 lb ***          |                                                | 16.5                                 | 2.3         | 27               | mg    | 2.02     |
| 1 lb ****         |                                                | 16.5                                 | 2.3         | 27               | mg    | 2.02     |
| 4 oz              |                                                | 2.83                                 | 0.55        | 10               | mg    | 2.02     |
| 4 oz *            |                                                | 4.37                                 | 0.55        | 10               | mg    | 2.02     |
| 4 oz **           |                                                | 6.34                                 | 0.55        | 10               | mg    | 2.02     |
| 1 oz              |                                                | 2.45                                 | 0.13        | 3.9              | mg    | 2.02     |
| 1 oz *            |                                                | 1.54                                 | 0.13        | 3.9              | mg    | 2.02     |
| 1 oz **           |                                                | 1.23                                 | 0.13        | 3.9              | mg    | 2.02     |
| 1/2 oz            |                                                | 1.283                                | 0.070       | 2.5              | mg    | 2.02     |
| 1/2 oz *          |                                                | 1.363                                | 0.070       | 2.5              | mg    | 2.02     |
| 1/4 oz            |                                                | 0.997                                | 0.046       | 1.5              | mg    | 2.04     |
| 0.2 lb            |                                                | 5.51                                 | 0.43        | 8                | mg    | 2.02     |
| 0.2 lb *          |                                                | 0.90                                 | 0.43        | 8                | mg    | 2.02     |
| 0.1 lb            |                                                | 3.59                                 | 0.22        | 5.1              | mg    | 2.02     |
| 0.05 lb           |                                                | 0.16                                 | 0.11        | 3.0              | mg    | 2.02     |
| 0.02 lb           |                                                | 0.736                                | 0.046       | 1.8              | mg    | 2.02     |
| 0.02 lb *         |                                                | 0.836                                | 0.046       | 1.8              | mg    | 2.02     |
| 0.01 lb           |                                                | 0.138                                | 0.039       | 1.2              | mg    | 2.02     |
| 0.005 lb          |                                                | 0.725                                | 0.032       | 0.9              | mg    | 2.02     |
| 0.002 lb          |                                                | 0.254                                | 0.022       | 0.50             | mg    | 2.04     |
| 0.002 lb *        |                                                | 0.169                                | 0.022       | 0.50             | mg    | 2.04     |
| 0.001 lb          |                                                | 0.245                                | 0.018       | 0.4              | mg    | 2.04     |

MPE: Maximum Permissible Error

In addition to meeting ASTM E617-18 Class 5 MPE, all standard also meet NIST Class F Tolerance requirements.

The following weights were adjusted: None

Calibration Performed at:  
 163 Admin Drive  
 Randolph Center, VT 05061

Additional documentation material available on request.

**Scott Dolan**

 Digitally signed by Scott Dolan  
 Date: 2023.01.30 12:53:26 -05'00'

Scott Dolan/Vermont Agency of Agriculture  
 Consumer Protection Section/Metrologist  
 Consumer Protection Specialist

End of Report