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# Section 2.23. Weights

## A. Application

A.1. General. – This code applies to commercial weights; that is, weights used in connection with commercial weighing devices.

A.2. Exceptions. – This code does not apply to test weights or to other “standards” of mass.

A.3. Additional Code Requirements. – In addition to the requirements of this code, Weights shall meet the requirements of Section 1.10. General Code.

## S. Specifications

S.1. Material. – The material used for weights shall be as follows:

(a) Weights of 6 g or 100 gr and larger shall be made of a metal, or a metal alloy, not softer than brass.

(b) Weights of less than 6 g or 100 gr may be made of aluminum, but shall not be made of iron or of unplated steel, except stainless steel.

### S.2. Design.

S.2.1. Surface. – The surface of a weight shall be smooth and shall not be coated with thick, soft, or brittle material. A weight of more than 2 g or 30 gr or shall not have sharp edges, points, or corners.

S.2.2. Ring. – A ring on a weight shall not be split or removable.

S.3. Adjusting Material. – Adjusting material shall be securely positioned and shall not project beyond the surface of the weight.

### S.4. Marking Requirements.

S.4.1. General. – A weight shall be marked to show clearly its nominal value, which shall include identification of the unit; however, the nominal value of a weight of 30 gr or 2 g, or less, may be designated by dots, lines, figures, distinctive shape, or other appropriate means.

S.4.2. Apothecaries’ Weights. – On apothecaries’ dram, ounce, and pound weights, the letters “ap” shall be used in combination with the nominal value and the appropriate abbreviation of or symbol for the unit.

S.4.3. Troy Weights. – On troy ounce and pound weights, the letter “t” shall be used in combination with the nominal value and the appropriate symbol of the unit.

S.4.4. Metric Weights. – On metric weights, the symbols “kg,” “g,” and “mg” shall be used in combination with the nominal value of kilograms, grams, and milligrams, respectively.

S.4.5. Carat Weights. – On carat weights, the letter “c” shall be used in combination with the nominal value.

S.4.6. Counterpoise Weight. – A counterpoise weight shall be marked to show clearly both its nominal value and the value it represents when used on the multiplying-lever scale for which it is intended.

## N. Notes

N.1. Testing Procedures. – Commercial weights should be tested on a precision balance using standard weights, the errors of which, when used without correction, do not exceed 1/3 of the smallest tolerance to be applied. (Also see Appendix A, Fundamental Considerations, paragraphs 3.2. Tolerance for Standars and 3.3. Accuracy of Standards.)

## T. Tolerances

T.1. In Excess and In Deficiency. – The tolerances hereinafter prescribed shall be applied equally to errors in excess and errors in deficiency.

T.2. On Avoirdupois Weights. – The maintenance tolerances shall be as shown in Table 1. Maintenance Tolerance for Avoirdupois Weights. Acceptance tolerances shall be one-half the maintenance tolerances.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Table 1.  Maintenance Tolerance for Avoirdupois Weights | | | | | | | |
| **Maintenance Tolerance** | | | | | | | |
| **Nominal Value** | **Equal-Arm**  **Weights** | | **Counterpoise Weights** | | | | |
| **For scales with multiples of less than 1000** | | **For scales with multiples of 1000 or over** | | |
| **oz** | **Grains** | **mg** | **grains** | **mg** | **grains** | | **mg** |
| 1/64 | 0.1 | 6 |  |  | |  |  |
| 1/32 | 0.3 | 19 |  |  | |  |  |
| 1/16 | 0.4 | 26 |  |  | |  |  |
| 1/8 | 0.5 | 32 |  |  | |  |  |
| ¼ | 1.0 | 65 |  |  | |  |  |
| ½ | 1.5 | 97 | 1.0 | 65 | |  |  |
| 1 | 1.7 | 110 | 1.0 | 65 | |  |  |
| 2 | 2.0 | 130 | 1.0 | 65 | |  |  |
| 3 | 2.0 | 130 | 1.5 | 97 | |  |  |
| 4 | 3.0 | 190 | 1.5 | 97 | | 1.0 | 65 |
| 5 | 3.5 | 230 | 1.5 | 97 | | 1.0 | 65 |
| 6 | 3.5 | 230 | 1.5 | 97 | |  |  |
| 8 | 4.0 | 260 | 2.0 | 130 | | 1.5 | 97 |
| 10 | 4.0 | 260 | 2.5 | 160 | | 2.0 | 130 |
| 12 | 5.0 | 320 | 2.5 | 160 | | 2.0 | 130 |
| **Lb** | **Grains** | **mg** | **grains** | **mg** | | **grains** | **mg** |
| 1 | 5.0 | 320 | 3.0 | 190 | | 2.5 | 160 |
| 2 | 7.0 | 450 | 6.0 | 390 | | 4.0 | 260 |
| 3 | 9.0 | 580 | 9.0 | 580 | | 5.0 | 320 |
| 4 | 11.0 | 710 | 11.0 | 710 | | 6.0 | 390 |
| 5 | 15.0 | 970 | 12.0 | 780 | | 6.5 | 420 |
| 6 | 17.0 | 1190 |  |  | |  |  |
| 7 | 19.0 | 1200 |  |  | |  |  |
| 8 | 21.0 | 1400 | 15.0 | 970 | | 9.0 | 580 |
| 9 | 23.0 | 1500 |  |  | |  |  |
| 10 | 25.0 | 1600 | 18.0 | 1160 | | 10.0 | 650 |
| 15 | 28.0 | 1800 |  |  | |  |  |
| 20 | 30.0 | 1900 |  |  | |  |  |
| 25 | 35.0 | 2300 |  |  | |  |  |
| 30 | 40.0 | 2600 |  |  | |  |  |
| 40 | 45.0 | 2900 |  |  | |  |  |
| 50 | 50.0 | 3200 |  |  | |  |  |

T.3. On Metric Weights. – The maintenance tolerances shall be as shown in Table 2. Maintenance Tolerances for Metric Weights. Acceptance tolerances shall be one-half the maintenance tolerances.

T.4. On Carat Weights. – The maintenance tolerances shall be as shown in Table 2. Maintenance Tolerances for Metric Weights. Acceptance tolerances shall be one‑half the maintenance tolerances.

|  |  |  |  |
| --- | --- | --- | --- |
| Table 2.  Maintenance Tolerances for Metric Weights | | | |
| **Nominal**  **Value**  **(mg)** | **Maintenance**  **Tolerance**  **(mg)** | **Nominal**  **Value**  **(g)** | **Maintenance**  **Tolerance**  **(mg)** |
| 5 or less  10  20  30  50  100  200  300  500 | 0.1  0.3  0.4  0.6  0.8  1.0  1.5  2.0  3.0 | 1  2  3  5  10  20  30  50  100  200  300  500 | 4  6  8  10  15  20  30  40  70  100  150  175 |
| **Nominal**  **Value**  **(kg)** | **Maintenance**  **Tolerance**  **(mg)** | **Nominal**  **Value**  **(carats)** | **Maintenance**  **Tolerance**  **(mg)** |
| 1  2  3  5  10  20 | 250  400  500  800  1000  1500 | 0.25\*  0.5\*\*  1.0  2.0  3.0  5.0  10.0  20.0  30.0  50.0  100.0 | 0.6  1.0  1.5  2.0  3.0  4.0  6.0  10.0  12.0  15.0  25.0 |
|  |  | \*25 points or less  \*\*50 points |  |

T.5. On Apothecaries and Troy Weights. – The maintenance tolerances shall be as shown in Table 3. Maintenance Tolerances for Apothecaries’ and Troy Weights. Acceptance tolerances shall be one-half the maintenance tolerances.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table 3.  Maintenance Tolerances for Apothecaries’ and Troy Weights | | | | | |
| **Nominal**  **Value** | **Maintenance Tolerance** | | **Nominal**  **Value** | **Maintenance Tolerance** | |
| **grains** | **grains** | **mg** | **oz** | **grains** | **mg** |
| 1  2  3  5  10  20 | 0.01  0.02  0.03  0.03  0.04  0.06 | 0.6  1.3  2.0  2.0  2.5  4.0 | 1  2  3  4  5 | 0.4  0.6  1.0  1.5  1.6 | 25.0  40.0  65.0  100.0  105.0 |
| **scruples** | **grains** | **mg** | **oz** | **grains** | **mg** |
| 1  2 | 0.06  0.10 | 4.0  6.5 | 6  7  8  9  10 | 1.8  1.9  2.0  2.1  2.2 | 115.0  125.0  130.0  135.0  145.0 |
| **dr** | **grains** | **mg** | **oz** | **grains** | **mg** |
| 0.5  1.0  2.0  3.0  4.0  5.0  6.0 | 0.07  0.10  0.20  0.30  0.40  0.50  0.60 | 4.5  6.5  13.0  20.0  25.0  30.0  40.0 | 11  12  20  30  50 | 2.4  2.5  2.9  3.7  5.4 | 155.0  160.0  190.0  240.0  350.0 |
| **dwt** | **grains** | **mg** | **oz** | **grains** | **mg** |
| 1  2  3  4  5  10 | 0.06  0.10  0.15  0.20  0.30  0.40 | 4.0  6.5  10.0  13.0  20.0  25.0 | 100  200  300  500  1 000 | 7.7  12.3  15.4  23.1  38.6 | 500.0  800.0  1 000.0  1 500.0  2 500.0 |

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