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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.

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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 Standards 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.

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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				

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

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

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