Effective January 1, 2000

Specifications and Tolerances for Field Standard Weights (NIST Handbook 105-1 Class F, Revised 1990)

These specifications and tolerances are minimum requirements for standard used primarily to test weighing devices.

Key words: Field standard weights; specifications; test weights; tolerances; weights and measures inspection.

Introduction

A Class F field standard weight (after this, simply called "weight") is intended to be used primarily to test commercial weighing devices for compliance with the requirements of NIST Handbook 44.[1] Class F weights may be used to test most accuracy class [2] III scales, all scales of class III L or IIII, and scales not marked with a class designation.

A weight shall be verified to be within tolerance prior to use. The within-tolerance status of a weight shall be rechecked as often as regulations or circumstances require, especially when damage to it is known or suspected.

General

These specifications apply to new weights placed in service after the publication of this standard; the tolerances apply to all weights in service.

A weight in service prior to the publication of this standard (1990) that has maintained Class F tolerances between verification tests shall continue to be acceptable.

The specifications permit the use of a weight at its nominal value in normal testing operations, where the tolerance on the item under test is at least three times as great as the tolerance of the weight.[3]

Specifications

1. Material

1.1. A weight made of brass or a fabricated weight (such as a laminated weight or a weight of nonuniform density) shall not be placed in service after the publication date of this standard (1990).

1.2. A weight smaller than 5 grams/0.01 lb shall be constructed of stainless steel, tantalum, nickel-chromium alloy, aluminum alloy, or other material sufficiently resistant to corrosion and oxidation that the surface need not be protected or coated.

[1] NBS Handbook44, Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices. (See current edition.)

[2] See Handbook 44, Section 2, Scales Code.

[3] See Handbook 44, Appendix A, par 3.2.

Class F Tolerances for Field Standard Weights

Metric

DENOMINATION	TOLERANCE	DENOMINATION	TOLERANCE
500 kg	50 g	20 g	4.0 mg
300 kg	30 g	10 g	2.0 mg
200 kg	20 g	5 g	1.5 mg
100 kg	10 g	3 g	1.3 mg
50 kg	5.0 g	2 g	1.1 mg
30 kg	3.0 g	1 g	0.90 mg
20 kg	2.0 g	500 mg	0.72 mg
10 kg	1.0 g	300 mg	0.61 mg
5 kg	.50 g	200 mg	0.54 mg
3 kg	.30 g	100 mg	0.43 mg
2 kg	.20 g	50 mg	0.35 mg
1 kg	.10 g	30 mg	0.30 mg
500 g	70 mg	20 mg	0.26 mg
300 g	60 mg	10 mg	0.21 mg
200 g	40 mg	5 mg	0.17 mg
100 g	20 mg	3 mg	0.14 mg
50 g	10 mg	2 mg	0.12 mg
30 g	6.0mg	1 mg	0.10 mg

Avoirdupois

DENOMINATION	TOLERANCE		DENOMINATION	TOLERANCE	
10,000 lb	1.0 lb	450 g	0.02 lb	4.0 µlb	1.8 mg
5,000 lb	0.50 lb	230 g	0.01 lb	3.2 µlb	1.5 mg
3,000 lb	0.30 lb	140 g	0.005 lb	2.6 µlb	1.2 mg
2,500 lb	0.25 lb	110 g	0.003 lb	2.2 µlb	0.99 mg
2,000 lb	0.20 lb	91 g	0.002 lb	1.9 µlb	0.87 mg
1,000 lb	0.10 lb	45 g	0.001 lb	1.5 µlb	0.70 mg
500 lb	0.050 lb	23 g	8 oz	100 µlb	45 mg
100 lb	0.010 lb	4.5 g	4 oz	50 µlb	23 mg
50 lb	0.0050 lb	2.3 g	2 oz	25 µlb	11 mg
30 lb	0.0030 lb	1.4 g	1 oz	12 µlb	5.4 mg
25 lb	0.0025 lb	1.1 g	0.5 (1/2) oz	6.2 µlb	2.8 mg
20lb	0.0020 lb	0.91 g	0.3 oz	3.9 µlb	1.8 mg
10 lb	0.0010 lb	0.45 g	0.25 (1/4) oz	3.7 µlb	1.7 mg
5 lb	500 µlb	230 mg	0.2 oz	3.4 µlb	1.6 mg
3 lb	300 µlb	140 mg	0.125 (1/8) oz	3.0 µlb	1.3 mg
2 lb	200 µlb	91 mg	0.1 oz	2.8 µlb	1.3 mg
1lb	150 µlb	70 mg	0.0625 (1/16) oz	2.4 µlb	1.1 mg
0.5 lb	100 µlb	45 mg	0.05 oz	2.2 µlb	1.0 mg
0.3 lb	60 µlb	27 mg	0.03125 (1/32) oz	1.9 µlb	0.87 mg
0.2lb	40 µlb	18 mg	0.03 oz	1.9 µlb	0.85 mg
0.1 lb	20 µlb	9.1 mg	0.02 oz	1.7 µlb	0.75 mg
0.05 lb	10 µlb	4.5 mg	0.015625 (1/64) oz	1.5 µlb	0.69 mg
0.03 lb	6.0 µlb	2.7 mg	0.01 oz	1.3 µlb	0.60 mg

1 µlb = 0.000001 lb