Verification of Analytical Balance Weights Policy

(NC WW/GW LC Branch 04/20/2020)

The purpose of this policy is to expand upon and explain the requirements described in 15A NCAC 02H .0805 (a) (7) (J), which states, in part: The analytical balance shall be checked with one ASTM Type 1, Class 1 or 2, or equivalent standard weight each day used. These weights shall be verified every five years.

Verification may be accomplished by:

1. Sending laboratory weights to an ISO/IEC 17025:2017 compliant organization that can provide traceability showing compliance with maximum tolerances required in the ASTM specifications below, or;

2. Checking laboratory weights against certified reference weights (i.e., weights that have been recertified as in 1. above) and found to be within ASTM Class 1 or Class 2 tolerances (see table below). The balance service technician may provide this service if a balance with the proper resolution (i.e., 0.000001 gram) is available.

Note: Although some manufacturers will assign a one-year calibration due date, the NC WW/GW LC Branch considers 5 years to be an acceptable calibration interval. Laboratories may want to request that a 5-year calibration due date be stated on the traceability documentation when having weights verified or when ordering new weights.

Documentation of weight verifications or recertification must be maintained for 5 years. If the condition of any weight is in question at any time due to damage (e.g., corrosion, nicks, scratching, etc.), that weight must be re-verified as described above and in accordance with 15A NCAC 02H .0805 (a) (6).

Maximum Tolerances (Ref. ASTM E 617-18, 2018)

	Maximum Tolerance for ASTM Class 1 and 2 Weights, (± mg)	
Denomination	Class 1	Class 2
1 kg	2.5	5.0
500 g	1.2	2.5
300 g	0.75	1.5
200 g	0.50	1.0
100 g	0.25	0.50
50 g	0.12	0.25
30 g	0.074	0.15
20 g	0.074	0.10
10 g	0.050	0.074
5 g	0.034	0.054
3 g	0.034	0.054
2 g	0.034	0.054
1 g	0.034	0.054
500 mg	0.010	0.025
300 mg	0.010	0.025
200 mg	0.010	0.025
100 mg	0.010	0.025
50 mg	0.010	0.014
30 mg	0.010	0.014
20 mg	0.010	0.014
10 mg	0.010	0.014
5 mg	0.010	0.014
3 mg	0.010	0.014
2 mg	0.010	0.014
1 mg	0.010	0.014
0.5 mg	0.010	0.014
0.3 mg	0.010	0.014
0.2 mg	0.010	0.014
0.1 mg	0.010	n/a
0.05 mg	0.010	n/a