ASTM and OIML Calibration Weight Tolerances

The table below is a listing of the tolerances of various classes of masses. The weight value can deviate above or below the nominal value by the tolerance defined. To determine the tolerance of a mass, look at the denomination or nominal value of the weight and the appropriate class you need.

Metric Weight Tolerances - all tolerances stated in milligram (mg)															
Denomination Metric	American Society of Testing & Measurement ASTM E617								International Organization of Legal Metrology Recommendation R111						
	Ultra Class	Class 1 mg	Class 2 mg	Class 3 mg	Class 4 mg	Class 5 mg	Class 6 mg	Class 7 mg	E1 mg	E2 mg	F1 mg	F2 mg	M1 mg	M2 mg	M3 mg
5 kg	6.00	12	25	50	100	250	500	1400	2.5	7.5	25	75	250	750	2500
3 kg	3.80	7.5	15	30	60	150	300	1000							
2 kg	2.50	5.0	10	20	40	100	200	750	1.0	3.0	10	30	100	300	1000
1 kg	1.25	2.5	5.0	10	20	50	100	470	0.5	1.5	5	15	50	150	500
500 g	0.600	1.2	2.5	5.0	10	30	50	300	0.25	0.75	2.5	7.5	25	75	250
300 g	0.380	0.75	1.5	3.0	6.0	20	30	210							
200 g	0.250	0.50	1.0	2.0	4.0	15	20	160	0.1	0.30	1.0	3.0	10	30	100
100 g	0.125	0.25	0.50	1.0	2.0	9	10	100	0.05	0.15	0.5	1.5	5	15	50
50 g	0.060	0.12	0.25	0.60	1.2	5.6	7		0.030	0.10	0.30	1.0	3.0	10	30
30 g	0.037	0.074	0.15	0.45	0.90	4.0	5	44							
20 g	0.037	0.074	0.10	0.35	0.70	3.0	3	33	0.025	0.080	0.25	0.8	2.5	8	25
10 g	0025	0.050	0.074	0.25	0.50	2.0	2	21	0.020	0.060	0.20	0.6	2	6	20
5 g	0.017	0.034	0.054	0.18	0.36	1.3	2	13	0.015	0.050	0.15	0.5	1.5	5	15
3 g	0.017	0.034	0.054	0.15	0.30	0.95	2	9.4							
2 g	0.017	0.034	0.054	0.13	0.26	0.75	2	7.0	0.012	0.040	0.12	0.4	1.2	4	12
1 g	0.017	0.034	0.054	0.10	0.20	0.50	2	4.5	0.010	0.030	0.10	0.3	1.0	3	10
500 mg	0.005	0.010	0.025	0.080	0.16	0.38	1	3.0	0.008	0.025	0.08	0.25	0.80	2.5	
200 mg	0.005	0.010	0.025	0.060	0.12	0.26	1	1.8	0.006	0.020	0.06	0.20	0.6	2	
100 mg	0.005	0.010	0.025	0.050	0.10	0.20	1	1.2	0.005	0.015	0.05	0.15	0.5	1.5	
50 mg	0.005	0.010	0.014	0.042	0.085	0.16	0.5	0.88	0.004	0.012	0.04	0.12	0.4		
20 mg	0.005	0.010	0.014	0.035	0.070	0.12	0.5	0.56	0.003	0.010	0.03	0.10	0.30		
10 mg	0.005	0.010	0.014	0.030	0.060	0.10	0.5	0.4	0.002	0.008	0.025	0.08	0.25		
5 mg	0.005	0.010	0.014	0.028	0.055	0.080	0.2		0.002	0.006	0.020	0.06	0.20		
2 mg	0.005	0.010	0.014	0.025	0.050	0.060	0.2		0.002	0.006	0.020	0.06	0.20		
1 mg	0.005	0.010	0.014	0.025	0.050	0.050	0.1		0.002	0.006	0.020	0.06	0.20		

A balance should be calibrated using a weight with a class tolerance factor greater than the readability of the balance. For example, a milligram balance with readability of 0.001g should be calibrated with a weight having a known tolerance of at least 0.0009g.