



Weight Buying Guide

A complete guide to help you choose the correct weights for your weighing appliances.



You will require weights to perform regular checks on your weighing equipment to ensure it is performing correctly in between service visits.

UKAS (United Kingdom Accreditation Service) recommends performing checks daily or before use. Weights can be used for performing a calibration/adjustment to your weighing equipment.

Checks will determine if:

- Calibration drift* has occurred.
- Any faults with the equipment have developed.

(Both could lead to inaccurate weighing results)





Determining Which Weight Class To Use

To determine which weight class to use, you must identify:

- **Balance Type**
- **Balance Readability**

Once identified, the table below calculates the recommended weight class.

Balance Type	Balance Readability	Recommended Weight Class
Ultra Micro & Micro Balances	0.0001mg & 0.001mg	E2
Semi-Micro Balances	0.01mg	E2
Analytical Balances	0.1mg	E2
Milligram Balances	1mg	F1
Top pan Balances	0.01g	F1
Top pan Balances	0.1g	F1
Top pan Balances / Scales	1g (and less accurate)	M1



Test Points

To avoid linearity error (**Where a balance weighs accurately in one part of its range and inaccurately in another.**)

We recommend testing the balance across its operating range.

Example:

For a 200g x 0.1mg balance we recommend testing

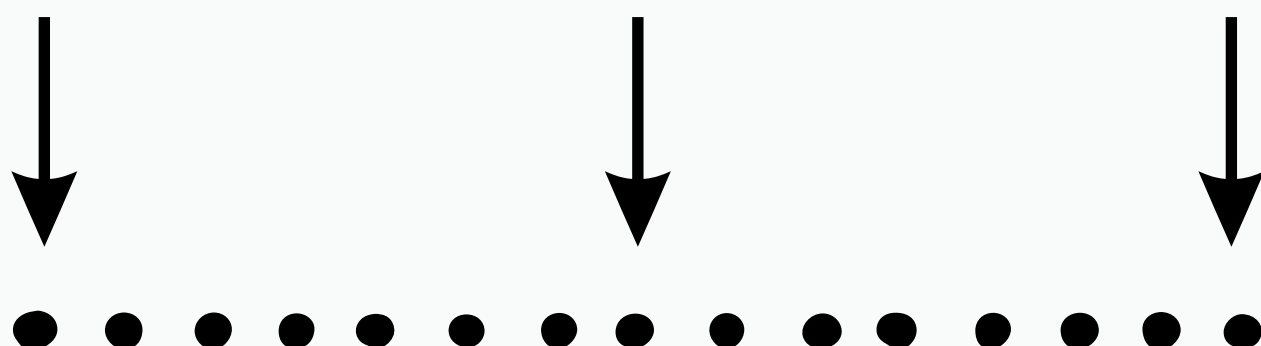
Top: 200g

Middle: 100g

Bottom: 100mg

These test points are only a suggestion. If you performed 80% of your weighing on the balance at

50g, then this would be a good test point.





Test Procedure

- If equipped, activate the internal calibration feature.
- Apply the certified weight and note the displayed reading.
- Compare the displayed reading against the measured value of the weight stated on the certificate and note difference.
- Determine if the difference meets your acceptance criteria.

Example:

A 100g E2 weight measure at 100.000 42g Tests a A 200g x 0.1 balance
Balance Display Reads 100.0001
Difference = 0.0003g



Weight materials

We supply weights made of aluminium, stainless steel and cast iron.

E2 weights and F1 weights are always made of stainless steel.

Except for 1mg – 5mg weights which are normally made of aluminium.

M1 weights are available either in stainless steel or cast iron.

Depending on your application, stainless steel may be a better solution, for example for use in a clean room.





Weight Form Factors

Weights are available in several form factors:



Flat Sheet: Used for milligram denomination weights.



Cylindrical: Not recommended for weight denominations of 5kg or above as they can be harder to handle. Normally made of stainless steel.



Grip Bar: Recommended form factor for 5kg and 10kg weights. They are also available in a 20kg denomination; however 20KG can be hard to handle due to their weight. Made either of stainless steel or cast iron.



Hexagonal: Available in denominations of 1kg and 2kg. Normally made of cast iron



Weight Classes

There are several different weight class systems: OIML, ASTM and NIST.

These systems divide weights into different classes based on the tolerance of weight required.

In the UK the OIML weight classification system is used. The OIML tolerances by class are in the below table.

Denomination	Class Tolerances (+/- mg)						
	E1	E2	F1	F2	M1	M2	M3
5000 kg	N/A	N/A	25000	80000	250000	800000	2500000
2000 kg	N/A	N/A	10000	30000	100000	300000	1000000
1000 kg	N/A	1600	5000	16000	50000	160000	500000
500 kg	N/A	800	2500	8000	25000	80000	250000
200 kg	N/A	300	1000	3000	10000	30000	100000
100 kg	N/A	160	500	1600	5000	16000	50000
50 kg	25	80	250	800	2500	8000	25000
20 kg	10	30	100	300	1000	3000	10000
10 kg	5	16	50	160	500	1600	5000
5 kg	2.5	8	25	80	250	800	2500
2 kg	1	3	10	30	100	300	1000
1 kg	0.5	1.6	5	16	50	160	500
500 g	0.25	0.8	2.5	8	25	80	250
200 g	0.1	0.3	1	3	10	30	100
100 g	0.05	0.16	0.5	1.6	5	16	50
50 g	0.03	0.1	0.3	1	3	10	30
20 g	0.025	0.08	0.25	0.8	2.5	8	25
10 g	0.02	0.06	0.2	0.6	2	6	20
5 g	0.016	0.05	0.16	0.5	1.6	5	16
2 g	0.012	0.04	0.12	0.4	1.2	4	12
1 g	0.01	0.03	0.1	0.3	1	3	10
500 mg	0.008	0.025	0.08	0.25	0.8	2.5	N/A
200 mg	0.006	0.02	0.06	0.2	0.6	2	N/A
100 mg	0.005	0.016	0.05	0.16	0.5	1.6	N/A
50 mg	0.004	0.012	0.04	0.12	0.4	N/A	N/A
20 mg	0.003	0.01	0.03	0.1	0.3	N/A	N/A
10 mg	0.003	0.008	0.025	0.08	0.25	N/A	N/A
5 mg	0.003	0.006	0.02	0.06	0.2	N/A	N/A
2 mg	0.003	0.006	0.02	0.06	0.2	N/A	N/A
1 mg	0.003	0.006	0.02	0.06	0.2	N/A	N/A



Frequently Asked Questions

UKAS Certified weights vs Non-Certified weights

To ensure the validity and integrity of your weighing results we recommend you use UKAS certified weights, non-certified weights do not have traceability.

Adjustable weights vs non-adjustable weights

Some manufacturers offer adjustable weights, which enables the weights to be adjusted if they drift. non-adjustable weights cannot be adjusted.

What is the difference between a calibration weight, test weight and a scale weight?

Weights are quite often referred to as calibration, test or scale weights. However, there is no such thing as a specific calibration, test or scale weight. These are applications you may use a weight for, there are no weights made inherently for this purpose. When selecting weights you use your application to determine what tolerance you require and then use that desired tolerance to choose the required weight class.

Should you get a weight set or individual weights?

Weights can be bought either individually or in weight sets. If for example you only want to do checks on a single balance/scale, you may only need a few individual weights. However, if you have multiple balances/scales with different ranges, you may be better off getting a full weight set. Weight sets also have the benefit of having one serial number for traceability.

Weight materials

We supply weights made of aluminium, stainless steel and cast iron. E2 weights and F1 weights are always made of stainless steel, except for 1mg – 5mg weights which are normally made of aluminium. M1 weights are available either in stainless steel or cast iron. Depending on your application, stainless steel maybe a better solution, for example for use in a clean room.

For any queries or further guidance please contact: **Sales@ei.co.uk**
Or to speak to one of the team please call: **01865 750375**