

National Metrology Laboratory

Technical Note : NML - Mass 1.

STANDARD MASSES

Weights are classified into the following (based on OIML Recommendation 111) :

E1, E2, F1, F2, M1, M2, M3.

CONSTRUCTION OF WEIGHTS

| Weight Class | Construction | Material |
|--------------|--|---|
| E1 and E2 | Solid, no cavity, integral construction | Similar or better than stainless steel - non-magnetic |
| F1 and F2 | One or more pieces of same material. May contain adjusting cavity. | Hardness/ brittleness - at least equal to drawn brass. Non -magnetic. |
| M1 | 1mg - 10g - no adjusting cavity 100g - 50kg - adjusting cavity 5kg - 50kg - rectangular parallelepiped shape. 100g - 10kg - cylindrical shape | 5 kg - 50kg - resistance to corrosion/brittleness at least equal to grey cast iron. 100g - 10kg - brass or similar material. 1g or less - material resistant to corrosion or oxidation. |
| M2 and M3 | 10g or less - no adjusting cavity 20g - 50kg - adjusting cavity 5kg - 50kg - rectangular parallelepiped shape. | 5 kg - 50kg - grey cast iron or similar material. 10kg - brittleness /hardness at least equal to grey cast iron. 100g or less - not made from cast iron. |

HANDLING OF WEIGHTS

Weights of classes E1,E2,F1 and F2 should be handled with great care. They should never:

- Be touched with bare hands - use clean gloves, tweezers or lifters.
- Be handled with sharp or abrasive tools, or implements which are not clean.
- Knocked together or come into contact with other objects.
Weights should be stored in their boxes and should never be packed or transported loosely.
- Slid across metal surfaces (e.g. balance pans)
- Placed on any surface (other than a balance pan or in their box) which is not suitably covered by tissue paper.
- Cleaned (except by an approved method).
- Come into contact with magnetic sources.
- Be used until they have reached temperature equilibrium with the environment in which they are being used.

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Policy on adjustment of weights

For a weight to be certified as being in a particular class its actual measured value, \pm the total uncertainty of the calibration, must not exceed the OIML tolerance for that class and denomination. However, the fact that weights can suffer wear between calibrations requires that adjustments are made to bring the measured value above the nominal value.

Class E1 and E2 weights are not adjustable, as are weights of all classes below 1 gram denomination.

If the measured value exceeds the nominal value by between one third and two thirds of the tolerance, there is no need to adjust the weight. Otherwise, NML adjusts weights according to the following, providing the client requires the adjustment.

If the measured value is less than the nominal value, or exceeds the nominal value by less than one third of the tolerance, the weight is adjusted until the measured value exceeds the nominal value by between one third and two thirds of the tolerance.

This will help to ensure that with reasonable wear, the weight should be within its relevant tolerance between calibrations.

On all weights that are adjusted, the NML Calibration Certificate gives the measured value before and after adjustment.

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Service Information

The National Metrology Laboratory (NML), Enterprise Ireland undertake mass calibration for all nominal weight values in the classes E2, F1, F2, M1, M2 and M3.

For further information on NML's weight calibration service, please contact any of the following:

Mr. Howard McQuoid Tel.: 01-8082657 Fax.: 01-8082026

Mr. Sean Peyton Tel.: 01-8082054 Fax.: 01-8082026

Mr. Paul Hetherington Tel.: 01-8082604 Fax.: 01-8082026

Email : howard.mcquoid@enterprise-ireland.com