

# Recommendations for Handling, Storage and Cleaning of Weights and Mass Standards



# Sartorius Weights and Weight Sets

To ensure that you can rely on the accuracy of your weights and mass standards over the long term, you need to handle them with particular care. Below you will find a list of factors that determine the level of the care required.

- Maximum permissible errors for weights (accuracy class)
- Material properties
- Surface characteristics
- Storage
- Handling
- Environmental conditions
- Frequency of use
- Uncertainty of measurement according to calibration certificate

## Careful Handling

Any damage to the surface or any form of corrosion, dirt, moisture, fingerprints or mechanical wear and tear may alter the adjusted and/or calibrated mass values. The higher the accuracy class is for a weight, the more carefully you should proceed when handling it.

## Please avoid

- pulling or pushing weights over the supporting surfaces (e.g. the weighing pan or platform ledge for depositing weights)
- touching OIML class E and F weights with just your fingers
- contact with sharp-edged or rough objects
- high humidity or moisture
- adhesive dust or dirt
- contact with aggressive media (e.g., bases and acids)
- static electricity
- strong magnetic fields



# Handling

In accordance with the OIML R111 1-:2004 International Recommendation, Section 14, means such as tools means, such as tools, for handling weights may not damage or alter the surface of the weights when used.

## OIML Class E1

For handling weights according to OIML class E1, we strongly recommend that you use only carbon-tipped forceps, weight forks, weight pliers or lifting devices from our range of accessories.

## OIML Classes E2 and F1

For handling weights according to OIML classes E2 and F1, we recommend that you use the following tools from our range of accessories:

- For weights < 1 kg, use only forceps with protected tips (special silicone or carbon).
- For weights  $\geq 500$  g, weight forks, weight pliers or lifting devices are best.
- For weights  $\geq 1$  kg, cotton gloves are sufficient.

## OIML Classes F2 and M1

For handling weights according to OIML classes F2 and M1, we recommend that you use the following tools from our range of accessories:

- For weights < 1 g, use only forceps with protected tips (special silicone or carbon)
- For weights  $\geq 1$  g, please be sure to use forceps with protected tips (special silicone or carbon) or wear cotton gloves.
- For weights  $\geq 500$  g, weight forks, weight pliers or lifting devices are best.
- For weights  $\geq 2$  kg, cotton or fine leather gloves are recommended.

## OIML Classes M2 to M3

For handling weights according to OIML classes M2 and M3, we recommend that you use the following tools from our range of accessories:

- For weights < 1 g, use only forceps with protected tips (special silicone or carbon).
- For weights  $\geq 1$  g, please be sure to use only forceps with protected tips (special silicone or carbon) or wear cotton or fine leather gloves.
- Weights  $\geq 500$  g and painted cast iron weights can also be handled with your bare hands as long as the latter are clean and dry.



# Storage

In accordance with the OIML R111 1-:2004 International Recommendation, Section 14, weights must be stored in the appropriate cases, except for weights of classes M1-2, M2, M2-3, and M3.

Prior to use, weights and mass standards must always be visually inspected for contamination, such as dust, fingerprints, etc., or other changes to the surface, such as corrosion, foreign substances, and so on. If necessary, use a magnifying glass or a microscope to help you with this task.

## OIML Class E1

These weights should be stored inside glass bell jars from our range of accessories. We recommend that you use a dust-free storage site within the air-conditioned laboratory, preferably in a lockable laboratory cabinet. Prior to using weights, make sure that the temperature of the weights has adapted to the environmental conditions in the weighing location. Boxes for transport purposes should only be used outside the laboratory.

## OIML Classes E2 and F1

The weights should be stored inside glass bell jars or in suitable containers (cases) from our range of accessories. The drill holes and grooves integrated into the cases for the weights must be lined with soft, lint-free material. The materials used, such as wood or plastic, as well as the adhesives, may not evaporate or release emissions, so that the surface layers resulting from these do not modify the weights in any way. Prior to using weights, make sure that the temperature has made the necessary adjustment to the environmental conditions in the weighing location. To do so, you should open the cases to leave the weights exposed or remove the weights from the cases.

## OIML classes F2 to M3

Weights < 500 g should be stored in suitable containers (cases) such as plastic containers with threaded lids from our range of accessories. The drill holes and grooves integrated into the cases for the weights may not scratch the weights. The materials used, such as wood or plastic, as well as the adhesives, may not evaporate or release emissions, so that the surface layers resulting from these do not modify the weights in any way.

Weights in OIML class F2 of nominal values > 500 g must be stored in suitable containers.

Weights with nominal values of > 500 g, such as cast iron weights, can be stored in suitable clean places and do not necessarily need a container. To prevent contamination, large weights should still be covered with a suitable hood or film, however. Prior to using weights, make sure that the temperature of the weights has adapted to the environmental conditions in the weighing location. Avoid condensation at all times when using weights; their surface must never show any form of condensation.



# Cleaning

The OIML R111-1:2004 International Recommendation, Annex B.4, describes for how to clean weights correctly. Weights should be checked for contamination prior to every measurement process. When cleaning is being carried out, care must be taken to ensure that the properties and condition of the weight's surface are not altered by the cleaning procedure. The condition of the surface at the time the weight was calibrated or manufactured must not be affected or changed by the cleaning process. After thorough cleaning, the weight should be recalibrated to monitor the stability of the weight's mass value or mass standard.

You will find equipment for cleaning the weights in our range of accessories.

## OIML Class E1

Weights with nominal values of < 1 g should be blown off using a pair of bellows to remove dust particles.

If necessary, a brush can be used to clean weights with nominal values of > 1 g. If it is necessary to clean weights with liquids, such as pure alcohol, distilled water or other solvents, this may alter the mass value of weights significantly. The removal of fingerprints with a cotton or microfiber cloth from weights with nominal values of < 100 g must also be evaluated critically, since the calibrated mass values may change as a result of this.

## OIML Classes E2 and F1

Slightly adhesive dirt and dust particles should be removed using a pair of bellows or a brush.

For weights with nominal values of > 50 g, fingerprints and minor surface contamination can be removed with a cotton or microfiber cloth also. The removal of moist or sticky items stuck to the objects must be evaluated critically and may lead to changes to the mass values.

If it is necessary to clean weights with liquids, such as pure alcohol, distilled water or other solvents, this may alter the mass value of weights significantly. Weights with adjustment chambers may never be completely immersed in liquids (e.g., class F1 with a removable knob).

## OIML classes F2 to M3

Slightly adhesive dirt and dust particles can be removed with compressed air, a pair of bellows or a brush. Contaminated surfaces (fingerprints, moist or sticky items adhering to the objects) can be cleaned using a dry or damp cotton or microfiber cloth.

If it is necessary to clean weights with liquids, such as pure alcohol, distilled water or other solvents, this may alter the mass value of weights significantly. Weights with adjustment chambers may never be completely immersed in liquids. Care must be taken when cleaning painted surfaces; do not use substances that will corrode the paint finish.

Any layers of oxidation (rust) and damage to the paint finish will generally affect the mass value of weights. After removing coarse dirt, corrosion, or loose coats of paint, the weight must be recalibrated and, if necessary, adjusted.



**Waiting times after cleaning** based on the recommendations described in the OIML R111-1:2004 International Recommendation, Annex B.4

OIML classification	E1	E2	F1	F2 to M3
After cleaning with alcohol	7 – 10 days	3 – 6 days	1 – 2 days	1 hour
After cleaning with distilled water	4 – 6 days	2 – 3 days	1 day	1 hour
After cleaning with a cloth	1 day	3 – 4 hours	1 hour	Immediately
After cleaning with a brush or bellows	Immediately	Immediately	Immediately	Immediately



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