SARTORIUS

Application Note

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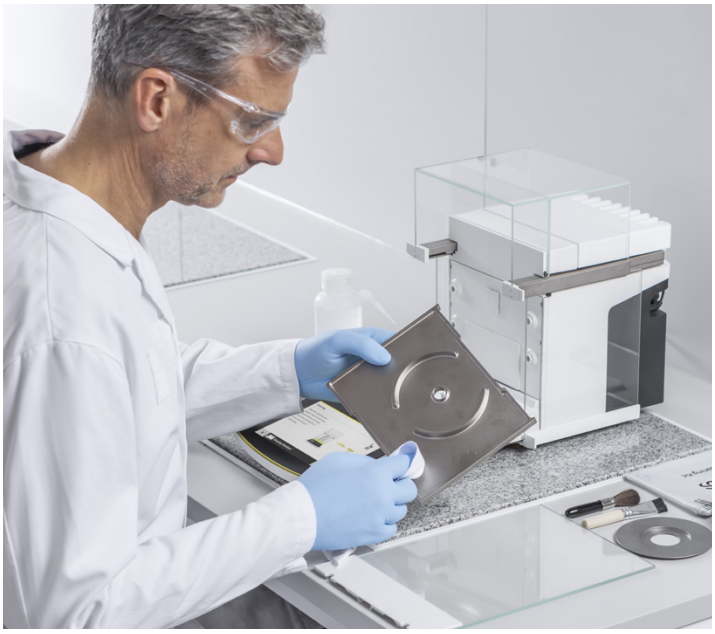
Lab balances, Cleaning, Weighing, Compliance, contamination, cleaning validation, analytical balance, weighing pan, draft shield, residue, spill over, accuracy, digital documentation, high-capacity micro balance, GxP compliance

# Best Cleaning Practices For Cubis® II Balances

## Important Considerations on How to Manage Contamination Of Your Sartorius Balance

### Introduction

The cleaning of a laboratory instrument could be part of your daily routine or even part of your validation process or your SOPs. When it comes to laboratory balances, the higher the resolution of the balance, the greater is the risk of compromised weighing accuracy due to contamination from small amounts of leftover residues. This can directly impact the outcome of your weighing results and the quality of your samples. However, users often feel insecure about how to clean their balances properly. Recent developments tackle this problem in the new generation of Cubis® II Ultra-High Resolution Balances from Sartorius. Both hardware technology and software design were optimized which made the cleaning process easier, safer and more efficient.



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# Key Discussion Points

- Cleaning Workflow: daily and extensive
- How the cleaning app offers intuitive guidance and maintains records?
- How can the cleaning process be part of your compliance and SOPs?
- What parts of the balance can be removed?
- What chemicals can be used?
- Do´s & Don´ts, our recommendations

# Cleaning Workflow

The preinstalled Cleaning App on our Cubis® II Balances provides an illustrated and guided workflow for cleaning. The App differs between two cleaning routines:

1. Daily Cleaning on a regular or daily basis

2. Advanced Cleaning during your in-depth maintenence.

Find the examplary workflows for Cubis II Ultra-High Resolution Balances below.

## Daily Routine: Keep Your Device Clean on a Regular Basis

The below described steps are recommended on a daily basis, after user logout or when changing the weighing task.


**Preparation:**

1. Put your balance in standby mode
2. Remove the tools from your cleaning kit (part of your packaging)
3. Pepare paper tissues and cleaning reagents (we recommend water or 70% ethanol)

**Balance Disassembly and Cleaning:**

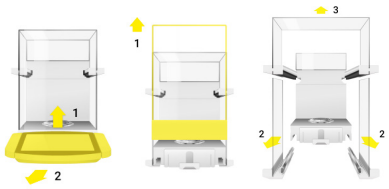
1. Remove the weighing pan and clean it with a brush than reinsert
2. Wipe the base plate with the soft brush or wet tissue to ensure there are no residues left on this area

# Extensive Cleaning: Schedule Your In-Depth Device Maintanence

In-depth cleaning is recommended at least on a quarterly basis or in case significant spill-over occurs.


## Preparation:

1. Put your balance in standby mode
2. Remove the tools from your cleaning kit (part of your packaging)
3. Pepare paper tissues and cleaning reagents (we recommend water or 70% ethanol)

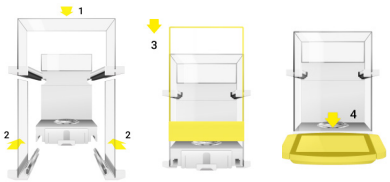



## Balance Disassembly:

Disassemble all removable parts in the following order:
1. Unclip the display from the base and slide the display towards yourself for enough space
2. Remove the draft shields: 1. Front shield, 2. Left and right draft shield, 3. Upper drafshield
3. Weighing pan and base plate

## Balance Cleaning:

Clean the removed parts and the balance itself usig a wet tissue and the tools from the Cleaning Kit. Keep the following in mind:
- Collect larger amounts of liquid or powder using a tissue, prush or foreceps
- Try to push the samples into the corners of the weighing chamber to avoid they enter any openings
- Metal parts can even be cleaned in the dishwasher




## Balance Reassembly:

Ensure all parts are dried completely. Reassemble in the following order:
1. Base plate and weighing pan
2. Upper draft shield, the left and right draft and front panel
3. Display


## Balance Tests:

To ensure the proper function of the balance we recommend the following tests/procedures:
1. Function of the draft shield without scratching over the complete range
2. Automatic motorized leveling
3. Internal calibration and adjustment (isoCAL)

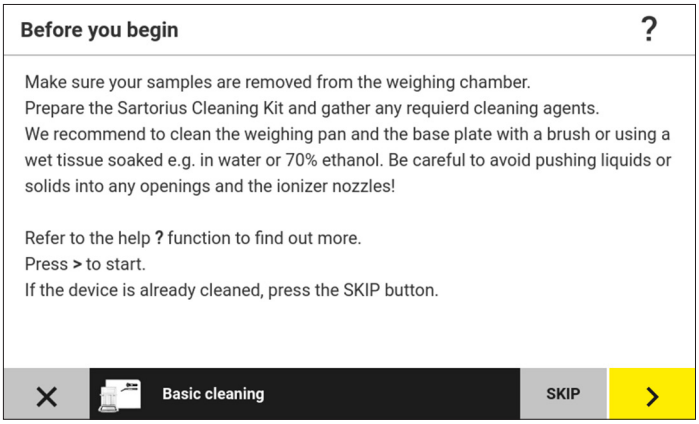
**Info Cleaning App:**
Every Cubis® II Balance with an MCA display comes with a cleaning app. Just click-on the app for an intuitive in-built guidance and to capture the cleaning event related data digitally.

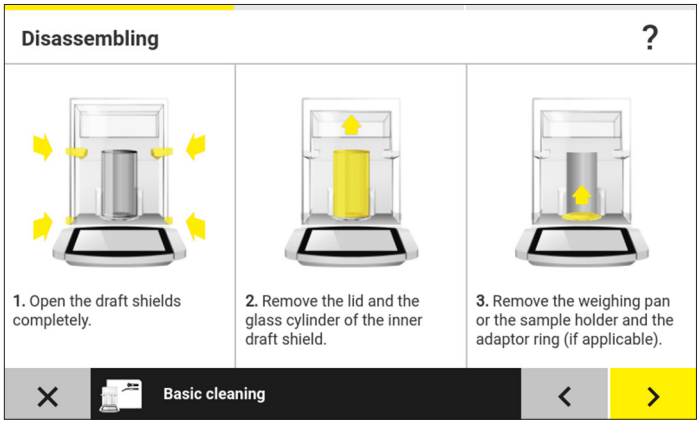
# How the Cleaning App Offers Intuitive Guidance And Maintains Records?

Every Cubis® II MCA Balance comes with the Cleaning Application that with its in-built guidance makes the cleaning process more intuitive and hassle free. We offer two types of cleaning procedure, for regular daily cleaning and for scheduled deep cleaning.

The basic cleaning is recommended on a daily basis, or before user logout. This process ensures that sample traces are completely removed avoiding weighing inaccuracy and sample contamination.

**Figure 1 and 2:** *Example Screenshots Representing the Basic Cleaning Process in a Few Simple Steps.*



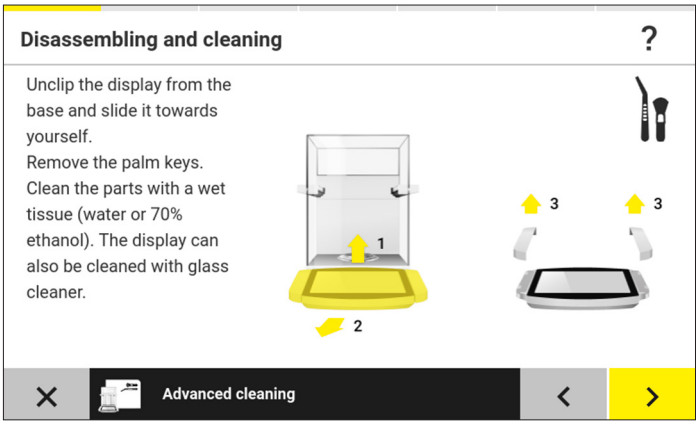



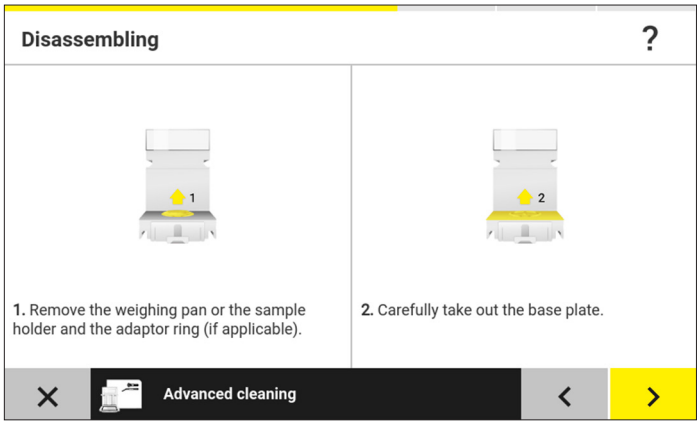

The advanced cleaning procedure is useful when more comprehensive cleaning process is required. We recommend this process to be part of your device maintenance routine and shall be performed at least on a quarterly basis.

It is recommended that a laboratory balance should be regularly cleaned to ensure, product traces are completely removed before a new weighing workflow is started.

The interval of the respective cleaning procedure as well as the contamination criterion can be adapted to the user's needs. The balance can be configured to actively trigger the respective cleaning workflow by displaying the contamination status prominently in the status center or recommending for a cleanup before logout. At the same time function tests assure the weighing performance after the cleaning process is completed which further ensures a proper cleaning process.

**Figure 3 and 4:** *Example Screenshots Representing the Advanced Cleaning Process for Deep Cleaning.*



# How Can the Cleaning Process Be Part of Your Compliance And SOPs?

In recent years, cleaning validation guidelines have become as complex as process validation due to the raising concerns over the quality of the cleaning. For those laboratories, where tracing is required, we offer built-in cleaning workflows (basic cleaning and advanced cleaning) which can be configurated according to the need/frequency/user, and most importantly, the cleaning related events are captured digitally and part of the audit report. Combined with the QApp Pharma Package the cleaning process can be signed with an electronic signature. This enables to keep accurate records of your cleaning tasks and therefore be part of your compliance or to your SOPs.

# What Chemicals Can Be Used?

**Chemical Compatibility**
Sartorius balances are long lasting instruments.
The selection of materials is driven by meeting highest requirements in terms of weighing performance as well es chemical compatibility. The latter ensures that contamination does not easily damage your balance and the respective spill over can be easily removed using various cleaning agents and solvents.

For cleaning of the balance, we recommend the following cleaning agents that are compatible with all parts shown in the previous chapter:

- Water
- Ethanol (70 %)
- Isopropanol (70 %)

**Table 1:** *Detailed Chemical Compatibility for Ultramicro- and Microbalances**

| Part of the balance | Ethanol 70% | Isopropanol 70% | Acetone 100% | Citric acid 10% | Hydrogen peroxide 3.5% | Sodium hydroxide 32% | Klercide Sporicidal Chloride |
|---|---|---|---|---|---|---|---|
| Draft shield | + | + | + | + | + | - | + |
| Filter draft shield | + | + | + | + | + | - | + |
| Filter draft shield lid | + | + | + | + | + | o | + |
| Weighing pan (normal and filter) | + | + | + | + | + | o | + |
| Bush | + | + | + | - | - | - | + |
| Internal draft shield (Ultra Micro) | + | + | + | + | + | - | + |
| Shield plate | + | + | + | + | + | - | + |
| Display | + | + | + | + | + | + | + |
| Palm keys | + | + | - | + | + | - | + |
| Weighing chamber | + | + | + | - | - | - | + |
| Housing | + | + | - | + | + | + | + |
| IR Sensor | + | + | + | + | + | o | + |
| Draft shield back panel | + | + | + | + | + | + | + |
| LED light strip | + | o | + | o | + | - | + |
| E-Box | + | + | - | - | - | - | - |

| Symbol | Meaning |
|---|---|
| + | Well resistant |
| o | Partially resistant (optical changes without affecting the mechanical stability may occur) |
| - | Not resistant |
| * | Avoid contact of any cleaning agent with attached labels as these can be removed or destroyed |

**Table 2:** *Detailed Chemical Compatibility for Cubis® II High-Capacity Micro Balance and Semimicrobalances Gen. 3 (i.e. MCA225-**3**S00-D QP99 HWL)**

| Part of the balance | Ethanol 70% | Isopropanol 70% | Acetone 100% | Citric acid 10% | Hydrogen peroxide 3.5% | Sodium hydroxide 32% | Klercide Sporicidal Chloride |
|---|---|---|---|---|---|---|---|
| Upper draft shield | + | + | + | o | o | - | o |
| Draft shield left/right | + | + | - | o | o | - | + |
| Front panel | + | + | + | + | + | - | + |
| Weighing pan | + | + | + | + | + | o | + |
| Adaptor ring | + | + | + | + | + | o | + |
| Base plate | + | + | + | + | + | o | + |
| Back panel | o | + | + | + | + | + | + |
| Display | + | + | + | + | + | + | + |
| Palm keys | + | + | - | + | + | - | + |
| Weighing chamber | + | + | + | + | + | + | + |
| Rear housing (plastic) | + | o | + | + | + | + | + |
| Rear housing (heat sink) | + | o | o | + | + | + | + |
| Inner draft shield glass cylinder + lid | + | + | + | - | o | - | + |
| Back panel inner draft shield | + | + | + | + | + | o | + |
| Inner draft shield base | + | + | + | + | + | o | + |

**Table 3:** *Detailed Chemical Compatibility for Analytical and Semimicro Balances Gen. 2 (i.e. MCA225S-**2**S00-A QP99)*

| Part of the balance | Ethanol 70% | Isopropanol 70% | Acetone 100% | Citric acid 10% | Hydrogen peroxide 3.5% | Sodium hydroxide 32% | Klercide Sporicidal Chloride |
|---|---|---|---|---|---|---|---|
| Upper draft shield | + | + | + | + | + | - | + |
| Draft shield left & right pane | + | + | + | + | + | - | o |
| Draft shield frame | + | + | + | + | + | - | + |
| Shield plate | + | + | + | + | + | + | + |
| Front shield | + | + | + | + | + | - | + |
| Draft shield back panel | + | + | + | + | + | - | + |
| Rear wall (housing) | + | + | - | + | + | - | + |
| Weighing pan | + | + | + | + | + | + | + |
| Base plate | + | + | + | + | + | + | + |
| Display | + | + | + | + | + | + | + |
| Palm keys | + | + | - | + | + | - | + |
| Weighing chamber | + | + | + | - | - | - | + |
| Housing | + | + | - | + | + | - | + |

| Symbol | Meaning |
|---|---|
| + | Well resistant |
| o | Partially resistant (optical changes without affecting the mechanical stability may occur) |
| - | Not resistant |
| * | Avoid contact of any cleaning agent with attached lables as these can be removed or destroyed. |

**Table 4:** *Detailed Chemical Compatibility for Precision Balances**

| Part of the balance | Ethanol 70% | Isopropanol 70% | Acetone 100% | Citric acid 10% | Hydrogen peroxide 3.5% | Sodium hydroxide 32% | Klercide Sporicidal Chloride |
|---|---|---|---|---|---|---|---|
| Weighing pan | + | + | + | + | + | + | + |
| Shield plate | + | + | + | + | + | + | + |
| Base plate | + | + | + | - | - | - | - |
| Weighing chamber | + | + | + | - | - | - | - |
| Display | + | + | + | + | + | + | + |
| Housing | + | + | - | + | + | - | + |

Symbol Meaning
+ Well resistant
- Not resistant
* Avoid contact of any cleaning agent with attached labels as these can be removed or destroyed

**Table 5:** *Detailed Chemical Compatibility for High Capacity Balances**

| Part of the balance | Ethanol 70% | Isopropanol 70% | Acetone 100% | Citric acid 10% | Hydrogen peroxide 3.5% | Sodium hydroxide 32% | Klercide Sporicidal Chloride |
|---|---|---|---|---|---|---|---|
| Weighing pan | + | + | + | + | + | + | + |
| Pan retainer | + | + | + | - | - | - | - |
| Base plate | + | + | + | + | + | - | + |
| Display | + | + | + | + | + | + | + |
| Housing | + | + | - | + | + | - | + |

Symbol Meaning
+ Well resistant
- Not resistant
* Avoid contact of any cleaning agent with attached labels as these can be removed or destroyed

# Do’s & Don’ts, Our Recommendations

## How to Handle the Balance Parts?

To avoid any parts of the balance from breaking, it is recommended to handle them with care. Especially the parts of the draft shield can be damaged rather easily while uninstalled.

Be sure to have enough place around your balance before starting the cleaning procedure to keep the balance parts somewhere safe while taking care of the contamination.

## How to Handle Sample Spilling?

Be careful to avoid to not push liquids or solids in any openings as it can cause severe damage to the weighing system.

In case you have spilled sample in the weighing chamber, try to collect it in the chambers corners or carefully absorb it with a tissue.

## Why Is Drying of the Parts Important After Cleaning?

In case you have used cleaning agents or rinsed these parts under water, it is extremely important to dry them properly before reassembly.

A wet weighing pan, sample holder and adapter ring (if applicable) can lead to moisture entering the weighing system and can cause drifts in weighing results due to evaporation or even severe damage.

## How to Handle the Ionizer Nozzles?

Be careful to avoid cleaning the ionizer nozzles. These nozzles can be easily damaged.

## When to Call Service?

- If large amounts of liquids or solids entered any openings on the balance.
- If the rails of the draft shields are already dirty and movement is limited.
- If any parts break during the cleaning procedure.

Sartorius Instrument Service: https://www.sartorius.com/en/services/instrument-service/

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