# Calibration and Use of Mettler Toledo PB403-S/FACT Balance

1. SCOPE AND APPLICATION

    1.1. This method is based on the Mettler Toledo application manual for the Mettler Toledo B-S/FACT line of balances. It is applicable to the Mettler Toledo PB403-S/FACT balance and can be modified for similar balances. This method covers the basic functions of weighing, taring, and calibration. ASTM Class 2 weights are certified. ASTM Class 1 weights have been compared to Class 2 weights within the laboratory. The balance range is 0.001 to 410 grams.

2. SUMMARY OF METHOD

    2.1. The Mettler Toledo PB403-S/FACT balance is checked with Class 1 weights during each use. The balance is calibrated quarterly, when moved, or when Class 1 weights are not within tolerance. Quarterly, the balance is checked with all Class 1 weights. Annually, the balance is checked with a set of Class 2 weights bracketing measurements used alongside Class 1 weights. Class 1 weight measurements are recorded on appropriate bench sheets and logbooks (Calibration and Daily Use).

    2.2. Interferences:

        2.2.1. Air currents, temperature (>± 2ºC of room temperature), vibrations, dirty calibration weights, and improper calibration or taring.

3. EQUIPMENT AND SUPPLIES

    3.1. Calibration weights (Class 1 and/or Class 2 weights)

    3.2. PB403-S/FACT balance

    3.3. *Mettler PB403-S/FACT Ser. # 1128150043 calibration logbook*

    3.4. *Mettler PB403-S/FACT Ser. # 1128150043 daily use log.*

    3.5. Spatula

    3.6. Weigh boats

4. PREPARATION (CALIBRATION)

    4.1. Ensure that the balance platform is unloaded. Switch the balance on by pushing the **[on]** key (left side of key board). The display should light up for several seconds, giving a function check of the display. After the display check is completed, the display should show “0.000g”.

    4.2. Press and hold the **[Cal/Menu]** key down until “cal” appears on the display, then release the key. The balance automatically calibrates itself. The message “CAL done”



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appears briefly in the display; followed by “0.000g”. Record calibration in *Mettler PB403-S/FACT Ser. # 1128150043 calibration logbook*.

4.3. Quarterly, weigh and record all Class 1 weights. Annually, weigh and record all Class 2 weights. Notify supervisor if Class 1 weights are not within tolerances as found in the calibration logbook. Weight sets should be handled with the forceps provided in the weight box. The weights should not be touched by flesh nor be set on any surface outside the storage box other than the weighing platform.

5. PREPARATION (WEIGHING)

5.1. If the balance is not on, perform 4.1.

5.2. If “0.000g” is not displayed, press and immediately release the **[O/T]** key (middle of the key board). “0.000g” should be displayed.

5.3. Choose 2 weights (Class 1 or2 weights) which bracket the weight or range of weights to be measured; then weigh and record the measured weight and record the nominal weight of the Class 1 or 2 weights on the appropriate bench sheet and the *Mettler PB403-S/FACT Ser. # 1128150043 daily use log.*

5.3.1. If either of the weights is out of tolerance, notify a supervisor.

5.4. Place a properly sized weigh boat on the balance platform. Chemicals and/or objects that can damage the balance platform must never be placed directly on the balance platform. Press **[O/T]** to tare or zero out the balance.

5.5. Add the material to be weighed and record the result. If no weigh boat is being used, the material can be weighed directly on the balance platform.

5.5.1. If weighing a set amount of a substance, add the substance to the weigh boat until the desired weight is displayed. Use a clean spatula to remove any excess from the weigh boat. The excess substance should be discarded instead of being returned to its container.

5.6. To make more than one weight measurement, remove the weighed object or weigh boat and repeat 5.4 – 5.5.

5.7. To turn off the balance, press and hold the **[on]** key for three seconds.

5.8. Clean the balance by brushing/wiping away any spilled substances.

6. DATA ARCHIVAL

6.1. Use a black, waterproof pen for all bench sheets and logbooks.

6.2. Record weights as appropriate on bench sheets and in the *Mettler PB403-S/FACT Ser. # 1128150043 calibration* logbook and the *Mettler PB403-S/FACT Ser. # 1128150043 daily use log*.



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## 7. QUALITY CONTROL

7.1. Ensure Class 1 weights are within listed tolerances and are either checked annually against the Chemistry lab Class 2 weights, or they have been recertified.

## 8. SAFETY/HAZARDOUS WASTE MANAGEMENT

8.1. Proper laboratory protection, including lab hood or ventilation system, lab coat, gloves, and safety glasses, is required when working with chemicals and unprocessed samples.

8.2. Refer to the Laboratory Quality Manual for sample disposal.

8.3. Refer to the Laboratory Health and Safety Manual and Hazardous Waste Management Plan.

8.4. Read MSDS information for reagent handling and disposal.

## 9. REFERENCES

9.1. Mettler Toledo Application Manual for the Mettler Toledo B-S/FACT line of balances

9.2. DEP Quality Manual, https://publicfiles.dep.state.fl.us/DEAR/DEARweb/Labs/lab-qualitymanual-2025.pdf

9.3. DEP Laboratory Health and Safety Manual https://www.floridadep.net/resources/health-safety-manual

**Appendix of Significant Changes**

3/24/2022 Changed “S-weights” to “ASTM Class 1 weights” and “R-weights” to “ASTM Class 0 weights.” Updated links.

5/05/2023 Changed mentions of monthly five weight checks to quarterly all weight checks. Class 2 weights were incorrectly referred to as Class 0 weights in previous version of SOP. Class 0 to Class 2 corrections have been made.



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