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. It covers the basic functions of weighing, taring and calibration. S-weights are certified. R-weights have been checked/compared to S-weights within the laboratory. The PB403-S/FACT weighs to 0.001 grams. The maximum allowable load is 410 grams.

2. SUMMARY OF METHOD

2.1. The Mettler Toledo PB403-S/FACT balance is calibrated (internal calibration) a minimum of monthly and anytime that it is moved or S-weights are not within tolerance. The balance is checked with S-weights during each use and once monthly with five (5) S-weights and quarterly with all biology S-weights. S-weight measurements are recorded on appropriate bench sheets and logbooks (Calibration and Daily Use).

2.1.1. Use of this SOP constitutes acknowledgement that the user has read the appropriate (weighing, taring and calibration) sections of the Mettler Toledo application manual for the Mettler Toledo B-S/FACT line of balances. It is presumed that the balance has been used and has remained in a specific location. Anytime there appears to be a problem (S-weights and/or calibration out of tolerance), a supervisor must be notified.

2.2. Interferences:

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

3. EQUIPMENT AND SUPPLIES

3.1. Calibration weights (S-weights) or (R-weights)

3.2. PB403-S/FACT balance

3.3. Small flat-blade screwdriver

3.4. *Mettler PB403-S/FACT Ser. # 1123052001 calibration logbook*

3.5. *Mettler PB403-S/FACT Ser. # 1123052001 daily use log.*

3.6. Spatula

3.7. Weigh boats

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4. PREPARATION (CALIBRATION)

Note: Calibration is performed before the balance is used for the first time, at regular intervals during the service life of the balance, after change of location and when S-weights/R-weights are out of tolerance.

4.1. Ensure that the weighing pan is unloaded. Switch the balance on by pressing and then immediately releasing 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' appears briefly in the display; followed by '0.000g' Record calibration in *Mettler PB403-S/FACT Ser. # 1123052001 calibration logbook.*

4.3. Monthly, weigh and record a minimum of five (5) S-weights. Quarterly, weigh and record all S-weights. Notify supervisor if S-weights are not within tolerances as found in the calibration logbook. S-weights should be handled with the forceps provided in the S-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 (S-weights or R-weights) which bracket the weight or range of weights measured; then weigh and record the measured weight and record the nominal weight of the S-weights/R-weights on the appropriate bench sheet and the *Mettler PB403-S/FACT Ser. # 1123052001 daily use log.*

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

5.4. Place the proper-size weigh boat for the substance/object being weighed on the balance platform. Chemicals and/or objects that can damage the balance platform must never be placed directly on the balance platform.

5.5. If using a weigh boat, after placing the weigh boat on the balance platform, press **[O/T]** to tare the balance. Add the substance/object to be weighed to the weigh boat. Record the displayed weight. Else, place the object to be weighed on the platform balance, record the displayed weight.

5.6. 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.

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

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

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5.9. Clean the balance by brushing/wiping 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. # 1123052001 calibration* logbook and the *Mettler PB403-S/FACT Ser. # 1123052001 daily use log*.

6.3. To correct raw data entries, place a single line through the incorrect or illegible entry. Write the corrected entry near the error, date and initial the correction. Do not overwrite entries.

6.3.1. The corrected entry is written as near its appropriate space as possible or else in the comment box on the appropriate bench sheet.

6.3.2. If the correction requires an explanation, write a comment and reference the error. Initial and date the explanation.

6.3.3. Use sequential alphabetical annotation to identify errors and corresponding comments (use A for first error and use A for corresponding explanatory comment; use B for second error, etc.).

7. QUALITY CONTROL

7.1. Ensure S-weights are within listed tolerances and are either checked annually against the Chemistry lab S-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).

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. Laboratory Quality Manual http://www.floridadep.org/labs/library/progplan.htm .

9.3. Laboratory Health and Safety Manual https://www.fldepnet.org/content/dear/bureau-laboratories-safety-documents

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Appendix of Changes

08/08/2011	Corrected names of logbooks to match actual titles.
06/04/2013	Reformatted SOP.
02/09/2015	Formatted for 508 compliance.
10/15/2015	Updated links. Minor corrections.
10/10/2016	Updated links and references.
10/05/2017	Moved Step 5.7. up to Step 5.3.; minor corrections.

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