

# STANDARD OPERATING PROCEDURE

**Title: Operation and Maintenance of Mettler Balances**

Effective Date: \_\_\_\_\_

**Approvals** (Signature and Date):

\_\_\_\_\_  
Responsible Department Head

\_\_\_\_\_  
Technical Authority

\_\_\_\_\_  
QA/QC

## 1. PURPOSE

- 1.1 To describe the methods of operation, accuracy inspection, and calibration of analytical and pan balances used by the QC department.

## 2. SCOPE

- 2.1 Applies to Mettler balances used by the QA/QC department.

## 3. RESPONSIBILITY

- 3.1 QA/QC or Facilities department personnel are responsible for checking accuracy of balances according to Calibration Management Schedule.
- 3.2 Facilities personnel are responsible for arranging Preventative Maintenance (PM) and calibration of balances. All calibration documentation will be kept in the Calibration History Files.
- 3.3 Accuracy inspection documents for all Mettler analytical and pan balances used by the QA/QC department will be kept in the Master Equipment Files (MEF).

## 4. REFERENCES AND APPLICABLE DOCUMENTS

- 4.1 Operating instructions for Mettler analytical balances AE100
- 4.2 Operating instructions for Mettler J series balances
- 4.3 Operating instructions for Mettler AT261
- 4.4 Mettler publication "Weighing the right way with Mettler"
- 4.5 11-0033-SOP-1.0, Instrumentation Calibration Program
- 4.6 1992 ASTM Standards, (General Test Methods) E898-88

## 5. MATERIALS AND EQUIPMENT

- 5.1 Class S or Class P calibrated weights in denominations listed in accuracy inspection procedure for Mettler AE100 analytical balance, Mettler PJ6000 pan balance, and Mettler AT261 balance
- 5.2 Lint-free gloves or forceps for handling calibrated weights

## 6. HEALTH AND SAFETY CONSIDERATIONS

6.1 None

## 7. DOCUMENTATION REQUIREMENTS

7.1 Attachment A: Accuracy Inspection of Balances. To be used for sections 10.0, 11.0, and 13.0.

## 8. PROCEDURE

- 8.1 All balances should be located on a sturdy bench, free of vibration and drafts. The balance should be leveled. Adjust the position of the bubble in the level indicator by using the screw feet at the bottom of the instrument. The bubble should be in the center of the circle. Leave balance on at all times to maintain thermal equilibrium.
- 8.2 Clean balance after each use using a non-abrasive cleaner or a lint-free brush. Use only clean weighing vessels for weighing. Disposable, plastic weigh boats are most convenient for weighing of various chemicals.
- 8.3 Place weighing vessel (use smallest possible container) squarely in the center of the weighing pan.
- 8.4 Tare the instrument by pressing the re-zero or tare position on the control bar of the instrument. Instrument should read zero before adding substance. The weight of the container is now tared out.
- 8.5 With a clean scoop, add a small portion of sample at a time to avoid overshooting target weight. Avoid touching weigh vessel or pan. After reaching target weight, remove weigh vessel with sample and re-tare (re-zero) balance by pressing the tare (re-zero) position on the control bar.

## 9. ACCURACY INSPECTION OF METTLER PJ6000 BALANCE (PAN BALANCE)

- 9.1 Use calibrated weights that encompass the range of the balance (Range: 0.0 to 6000g, readability: to 0.1 g). Calibrated weights to be used are the following:

High Range	5000 g
Mid Range	1000 g
Low Range	50 g

- 9.2 First tare the instrument by pressing the right side (tare) of the control bar, so the reading is 0.0. Remove the 1000 g weight from its container. **HANDLE WEIGHTS WITH LINT-FREE GLOVES** provided with weights. Gently place the 1000 g weight squarely in the center of the weighing pan and allow the reading to settle. Note the exact weight on "Accuracy Inspection of Balances" form. Replace the weight in its container, along with the glove.
- 9.3 Repeat Step 8.2 using the 5000 g weight next, and then the 50 g weight. Enter each result in the appropriate log. If the reading of any weight is off by more than 0.1% the balance should be checked by the outside contractor and re-calibrated.
- 9.4 Complete "Accuracy Inspection of Balances" form and submit to supervisor for review. File reviewed form in Equipment History files located in Document Control.
- 9.5 Place completed "calibration" label on balance. Update calendar/schedule with due date for next accuracy inspection.