



STANDARD OPERATING PROCEDURE

Department: Production	SOP No.:
Title: Cleaning, Operation and Calibration of Analytical weighing balance	Effective Date:
Supersedes: Nil	Review Date:
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1.0 OBJECTIVE :

To lay down a procedure for Operation & Calibration of Weighing Balance (Analytical balance).

2.0 SCOPE:

This procedure is applicable for operation & calibration of Weighing Balance.

3.0 RESPONSIBILITY:

Officer / Executive / Assistant Manager.

Head Production / Stores: To ensure execution & compliance.

Head QA: To ensure the compliance.

4.0 PROCEDURE :

4.1 Cleaning of Weighing Balances :

4.1.1 Disconnect the power supply of the Weighing Balance.

4.1.2 Remove the weighing pan, breeze ring and clean the platform with clean dry lint free cloth, if weighing balance have pan.

4.1.3 Clean the weighing balance with clean dry duster.

4.1.4 Reassemble the dismantled ring and weighing pan.

4.1.5 Clean the floor below platform of the balance with air / vacuum cleaner / wet lint free cloth followed by dry lint free cloth.

4.2 Operation:

4.2.1 Switch 'ON' the mains using POWER ON/OFF switch provided on rear side of the balance.

4.2.2 This enables balance to complete diagnostic routine and show 0.000g on display. Allow 20 minutes warm-up to get consistent weight reading.

4.2.3 Use the standard weights duly certified by the Weights and Measures Department or certified agency.

4.3 Weighing:

4.3.1 Before weighing on the balance ensure the spirit level (bubble position) in center & Ensure



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that daily calibration of the balance is performed and the entry is made in the respective formats.

4.3.2 If the display shows other than 0.000 press 0/T key, now display shows 0.000 and Zero and stable indicators are ON.

4.4 Calibration:

4.4.1 Calibrate the weighing balance using calibrated certified weights only. Use hand gloves wherever required.

4.4.2 If the standard weights are showing results out of pre-defined values, re-calibrate the balance and if it is again out of tolerance limit, inform to Head-of concerned department for further action.

4.4.3 Update the Calibration Status label (Monthly).

4.4.4 **Frequency:** Daily Verification - Daily, Full scale Calibration-Monthly.

4.5 Daily Verification:

4.5.1 Verification of weighing balance shall be done daily before using for weighing.

4.5.2 Check the balance spirit level. (If the level is disturbed, correct it by adjusting the base screws). Record it on the annexure -I as ok / not ok.

4.5.3 Check for the zero error on the display by pressing '0/T' key to shown 0.000 g constantly. Record it on the annexure -I as ok / not ok.

4.5.4 Place the test weight 0.1g on the pan with help of forceps.

4.5.5 Note the displayed weight after the display is stable.

4.5.6 Repeat operation with 2.0g, 50.0g, 100.0 g, 200.0g standard weights.

4.5.7 Note the displayed weight after the display is stable & record in Annexure-I.

4.6 Tolerance:

4.6.1 Daily verification of balance $\pm 0.10\%$ of actual certified weight or \pm Least count ;whichever is higher.

4.7 Monthly Calibration:

4.7.1 Accuracy:

4.7.1.1 Tare the balance and place the standard weight of 0.1 g by means of forceps on the weighing pan and record the observation in Annexure-II.



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4.7.1.2 Similarly place the Standard weights of 0.2 g ,0.5 g , 1 g ,2 g , 5 g, 10 g, 20g, 50 g, 100 g, 200 g, record the observations Annexure-II

4.7.1.3 Calculate the Percentage variation by using the following formula:

$$\frac{\text{Observed Weight} - \text{Actual Weight (As per certificate)} \times 100}{\text{Actual Weight (As per certificate)}}$$

4.7.1.4 Acceptance criteria: Percentage variation shall not be more than $\pm 0.10\%$ or \pm least count; whichever is higher.

4.8 Repeatability:

4.8.1 Tare the balance and place the standard calibrated weight of 10.0 g by means of forceps in the center of pan of balance. Repeat this exercise nine more times in replicate and record the observation in the Annexure- II

4.8.2 If the standard deviation obtained is less than 0.41 d where d is the scale interval, replace this standard deviation with 0.41 d. In this case repeatability is satisfactory if two times 0.41d, divide by nominal value of the weight used, does not exceed 0.10%.

4.8.3 Calculate the Repeatability by using the formula as given below:

$$\text{Repeatability} = \frac{2 \times \text{Standard deviation}}{\text{Actual weight}} \times 100$$

$$\text{Where, Standard deviation} = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$$

Where, x = each observed weight

\bar{x} = Mean observed weight.

n = No. of observations.

4.9 Drift check :

4.9.1 It is applicable for the analytical balances.

4.9.2 After completion of internal calibration press tare to zero display.

4.9.3 Place 20 g standard weight on the pan.

4.9.4 Read the displayed weight after display is stable and note down the reading.



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- 4.9.5 Repeat five times the above procedure at different places on the pan and calculate average display weight.
- 4.9.6 The average display weight shall be fixed as average actual weight for the particular balance.
- 4.9.7 The observed weight should not exceed + 0.2 mg of the average/Mean weight and record in annexure-II.

5.0 ANNEXURE(S):

Annexure–II: Daily Verification of Analytical Weighing Balance.

Annexure–II: Monthly Calibration of Analytical Weighing Balance.

6.0 REFERENCE (S):

SOP: Preparation, Approval, Distribution control, revision and Destruction of Standard operating Procedure (SOP).

7.0 ABBREVIATION (S)/DEFINITION (S):

g – gram

QA – Quality Assurance.

d - Scale Interval.

REVISION CARD

S.No.	REVISION No.	REVISION DATE	DETAILS OF REVISION	REASON (S) FOR REVISION	REFERENCE CHANGE CONTROL No.
1.	00	---	---	New SOP	---