



STANDARD OPERATING PROCEDURE

Department: Quality Control	SOP No.:
Title: Calibration of Glassware	Effective Date:
Supersedes: Nil	Review Date:
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1.0 OBJECTIVE:

To lay down a procedure for Calibration of Glassware.

2.0 SCOPE:

This SOP is applicable to Calibration of Glassware use for analysis in Quality Control laboratory.

3.0 RESPONSIBILITY:

Officer, Sr. officer, Section head – Quality Control
Head – Quality Control

4.0 PROCEDURE:

4.1 Use Certified Class A glassware in the Quality Control laboratory, which is not required to calibrate.

4.2 Before use of the Class A glassware verify the certificate with respective volumetric glassware limits which is mentioned in the calibration procedure. If any volumetric glassware results not matched with acceptance limits discard the same volumetric glassware.

4.3 If Class B volumetric glassware shall be received, perform the calibration before use.

4.4 Calibration:

4.4.1 Before use, Class B glassware shall be calibrated in the laboratory as described below. If any volumetric glassware results not matched with acceptance limits discard the same volumetric glassware.

4.4.2 Clean the glassware to be calibrated to remove any grease, dirt etc.

4.4.3 Rinse the glassware thoroughly under running water. Then rinse it twice with purified water and dry it in oven.

4.4.4 After drying is over, remove the glassware from oven and cool at room temperature.

4.4.5 Before starting of the calibration enter the details of the glassware in log book as per Annexure-1.

4.4.6 For Volumetric Flasks (10, 20, 25, 50, 100, 200, 500 and 1000 mL):

4.4.6.1 Place the volumetric flask to be calibrated on a weighing balance, record the weighing as W_1 .



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4.4.6.2 Remove the volumetric flask from the balance and fill with purified water (Temperature about 25°C) up to the mark. Weigh the filled glassware as W_2 .

Determine the weight of the water as $(W_2 - W_1)$ and record as W .

4.4.6.3 Divide weight of the water (W) with density of water at 25°C i.e. 0.99602 g/mL to obtain actual volume in milliliter.

Tolerance Limits :

Name of Glassware	Limit
10 mL volumetric flask	± 0.02 mL
20 mL volumetric flask	± 0.02 mL
25 mL volumetric flask	± 0.03 mL
50 mL volumetric flask	± 0.05 mL
100 mL volumetric flask	± 0.08 mL
200 mL volumetric flask	± 0.08 mL
250 mL volumetric flask	± 0.12 mL
500 mL volumetric flask	± 0.15 mL
1000 mL volumetric flask	± 0.30 mL

4.4.6 For Pipettes and Burettes:

(Burettes 10 mL, 25 mL and 50 mL; Pipettes 1, 2, 3, 5, 10, 15, 25 and 50mL)

4.4.6.1 Weigh an empty beaker, record the weighing as W_1 .

4.4.6.2 Fill the burette/pipette up to the mark with purified water (maintained at 25°C).

4.4.6.3 Empty the pipette / burette in the beaker and weigh the filled beaker. Note the weight as W_2 . Determine the weight of water as $(W_2 - W_1)$ and record as W . divide weight of the water (W) with weight per milliliter of water at 25°C i.e. 0.99602 g/mL to obtain actual volume in milliliter.

4.4.6.4 Tolerance Limits:

Name of Glassware	Limit
10 mL burette	± 0.02 mL
25 mL burette	± 0.03 mL



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50 mL burette	± 0.05 mL
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4.4.6.5

Name of Glassware	Limit
1 mL pipette	± 0.006 mL
2 mL pipette	± 0.006 mL
3 mL pipette	± 0.006 mL
5 mL pipette	± 0.01 mL
10 mL pipette	± 0.02 mL
25 mL pipette	± 0.03 mL
50 mL pipette	± 0.05 mL

4.4.7 Record the calibration details in format as per Annexure-II.

4.4.8 For measuring cylinders, refer party calibration certificate.

4.4.9 Acceptance Criteria :

All Calibrated glasswares should be within the Tolerances limits specified individually.

In case the Glassware is out of Tolerance limit, faulty glasswares should not be used and should be destroyed.

4.4.10 Frequency of calibration :

If required once in year for routinely used class B glassware.

5.0 ANNEXURE (S):

Annexure-I : Volumetric Glassware Calibration log book.

Annexure-II : Calibration record of volumetric glassware.

6.0 REFERENCE (S) :

USP/IP

SOP: Preparation, approval, distribution, control, revision and destruction of Standard Operating Procedure (SOP).



PHARMA DEVILS
QUALITY CONTROL DEPARTMENT

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7.0 ABBREVIATION (S)/DEFINITION (S):

USP – United state Pharmacopoeia

IP - Indian Pharmacopoeia

REVISION CARD

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



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ANNEXURE II

CALIBRATION RECORD OF VOLUMETRIC GLASSWARE

Name of Glassware		
Capacity (ml)		
Glassware Lot No./ Code No.		
Observation and calculation : Density of water at 25°C: 0.99602 g/mL Balance ID: EQ/QCD/ Weight of empty Beaker/Volumetric flask (W_1) = _____ g Weight of Beaker/ Volumetric flask + water (W_2) = _____ g Weight of water ($W = W_2 - W_1$) = _____ g Actual volume occupied = $\frac{\text{Weight of water (W)}}{0.99602}$ = _____		
Specification :	Observation :	
Tolerance limit :	Actual volume observed :	
Opinion: The glassware calibration is OK/Not OK and the glassware can be used/cannot be used for analysis in Quality control department.		
Calibrated By : Date	Checked By : Date	Approved By : Date