

Supplementary Training Modules on Good Manufacturing Practice



Good Practices for Quality Control Laboratories

Part 2: Materials, equipment, instruments and other devices



Quality Control

Reagents

- Reagents, chemicals, solvents and materials used in tests and assays – of appropriate quality – with COA and MSDS
- From reputable, approved suppliers
- Preparation of reagents:
 - SOPs and as recommended in pharmacopoeia
 - Clear responsibility in job descriptions
- Records for the preparation, and standardization of volumetric solutions

10.1 – 10.3





Quality Control

- Reagents clearly labelled:
 - *the contents, the manufacturer, the date received and opened, concentration, storage conditions, expiry or re-test date*
 - *When prepared in the laboratory, also the name, date of preparation, initials of person, expiry date, concentration*
- Volumetric solutions:
 - *the name, molarity or concentration, date of preparation, the date of standardization and factor, and identify the responsible technician*
- Whenever possible, transportation in original containers
- When subdivided – into clean, fully labelled containers

10.4-10.7





Quality Control

Visual inspection

- Ensure seals are intact (receiving, distribution for use)
- Suggested to record this on the label (e.g. date, name and initial)
- If tampered with, rejected, unless identity and purity can be confirmed

Water

- Considered as a reagent – use grade as in pharmacopoeia
- Precautions to avoid contamination during:
 - *supply, storage and distribution*
 - *Meet specification*

10.8 - 10.12





Quality Control

Storage of reagents

- Appropriate storage conditions
- Store also clean bottles, vials, spoons, funnels, and labels required for dispensing reagents from larger to smaller containers
- Training in safe handling of chemicals and reagents

Store keeper responsibilities:

- Appropriate store facility, inventory, expiry dates

10.13 – 10.14





Quality Control

Reference substances and reference materials

- A person nominated responsible
- Use pharmacopoeia reference substances whenever possible
- Used for testing, calibration, qualification of equipment, instruments or other devices

Registration and labelling

- Identification number assigned
 - *a new identification number to each new batch*
 - *number marked on each vial and quoted on the analytical worksheet at every use (batch number)*

11.1. – 11.6, 11.8.





Quality Control

Maintain a register for reference substances and reference materials. Record e.g.: (1)

- identification number of the material
- precise description of the material
- source
- date of receipt
- batch designation or other identification code
- intended use of the material (e.g. as an infrared reference material, as an impurity reference material for thin-layer chromatography, etc.)
- location of storage in the laboratory, and any special storage conditions

11.7



Quality Control

Maintain a register for reference substances and reference materials. Record e.g.: (2)

- Other necessary information (e.g. the results of visual inspections)
- Expiry date or retest date
- Certificate (batch validity statement) of a pharmacopoeial reference substance (i.e. certified reference material which indicates its use, the assigned content, its status (validity))
- For secondary reference substances - the certificate of analysis

11.7.



Quality Control

Reference substances prepared in the laboratory:

- Keep a file with information (properties and safety data)
- Results of all tests and verifications
- Expiry date or retest date
- Signed by the responsible analyst

11.9. – 11.11.





Quality Control

Retesting (monitoring)

- Retesting at regular intervals
 - See *WHO General guidelines for the establishment, maintenance and distribution of chemical reference substances*
- Results recorded and signed by the responsible analyst
- If OOS - retrospective check of tests performed using this reference substance
- Risk analysis and CAPA
- Stored in accordance with the storage conditions

11.12 – 11.15





Quality Control

Calibration, validation and verification of equipment, instruments and other devices

- Unique identification (number) for equipment, instruments, devices used for testing, verification and/or calibration
- Also labels indicating status of calibration and due date
- DQ, IQ, OQ, PQ as necessary
- Performance verified at appropriate intervals according to a plan
- Plan for regular calibration implemented

12.1 - 12.5





Quality Control

Examples for calibration:

- SOPs should be in place for each instrument
- pH meters to be verified with standard certified buffer solution before use
- Balances calibrated annually, verified daily, and regularly checked with test weights
- What do you think should be appropriate intervals for the calibration and verification of:
 - HPLCs, GCs, FTIRs?

12.6.



Quality Control

- In the following slides, we will look at some instruments you may find in the quality control laboratory
- Discuss which parameters may be considered during calibration and verification
- Discuss appropriate intervals for calibration and verification
- Discuss some specific aspects to be observed when using the apparatus



Quality Control

Dissolution apparatus



Quality Control



Friability tester

Quality Control

Disintegration tester



Quality Control



Quality Control



**Analytical
balance**

Quality Control

Spectrophotometer



Quality Control



pH Meter

Inspecting the QC laboratory

- During your inspection of the QC laboratory you come across analytical equipment you are not familiar with.
- What questions could you ask?





Quality Control

- Authorized personnel to operate equipment
- SOPs readily available for use, maintenance, verification and calibration of equipment, instruments and devices
- Manuals kept
- The results of calibration and verification recorded
- SOPs for the safe handling, transport and storage of measuring equipment
- SOP for maintenance
 - e.g. regular servicing followed by verification of performance.

12.7. – 12.10.





Quality Control

Records kept of each item of equipment/ instrument/ device:

- Identity of the equipment, instrument or other device
- Manufacturer's name, model, serial number or other unique identification
- Qualification, verification and/or calibration required
- Current location
- Equipment manufacturer's instructions

12.8.



Quality Control

Records kept of each item of equipment/instrument/device:

- Dates, results and copies of reports, verifications and certificates of all calibrations, adjustments, acceptance criteria and the due date of the next qualification, verification and/or calibration
- Maintenance carried out, and the maintenance plan
- History of any damage, malfunction, modification or repair
- Use and “remarks or observations” made at the time the equipment, instruments or devices were used

12.8.





Quality Control

- Equipment, instruments and other devices - giving suspect results, shown to be defective or outside specified limits

....should be taken out of service

- Labelled or marked as such
- Not used until they have been repaired and requalified
- Requalify when appropriate
 - E.g. after major repair

12.11. – 12.12.





Quality Control

Traceability

- Result of analysis should be traceable (reported data, raw data, instruments, materials and reagents used)
- Includes traceability to a primary reference substance
- Also needed in case of OOS for investigations
- Calibrations or qualification of instruments should be traceable to certified reference materials and to SI units

13.1. – 13.2.